**APC-104**
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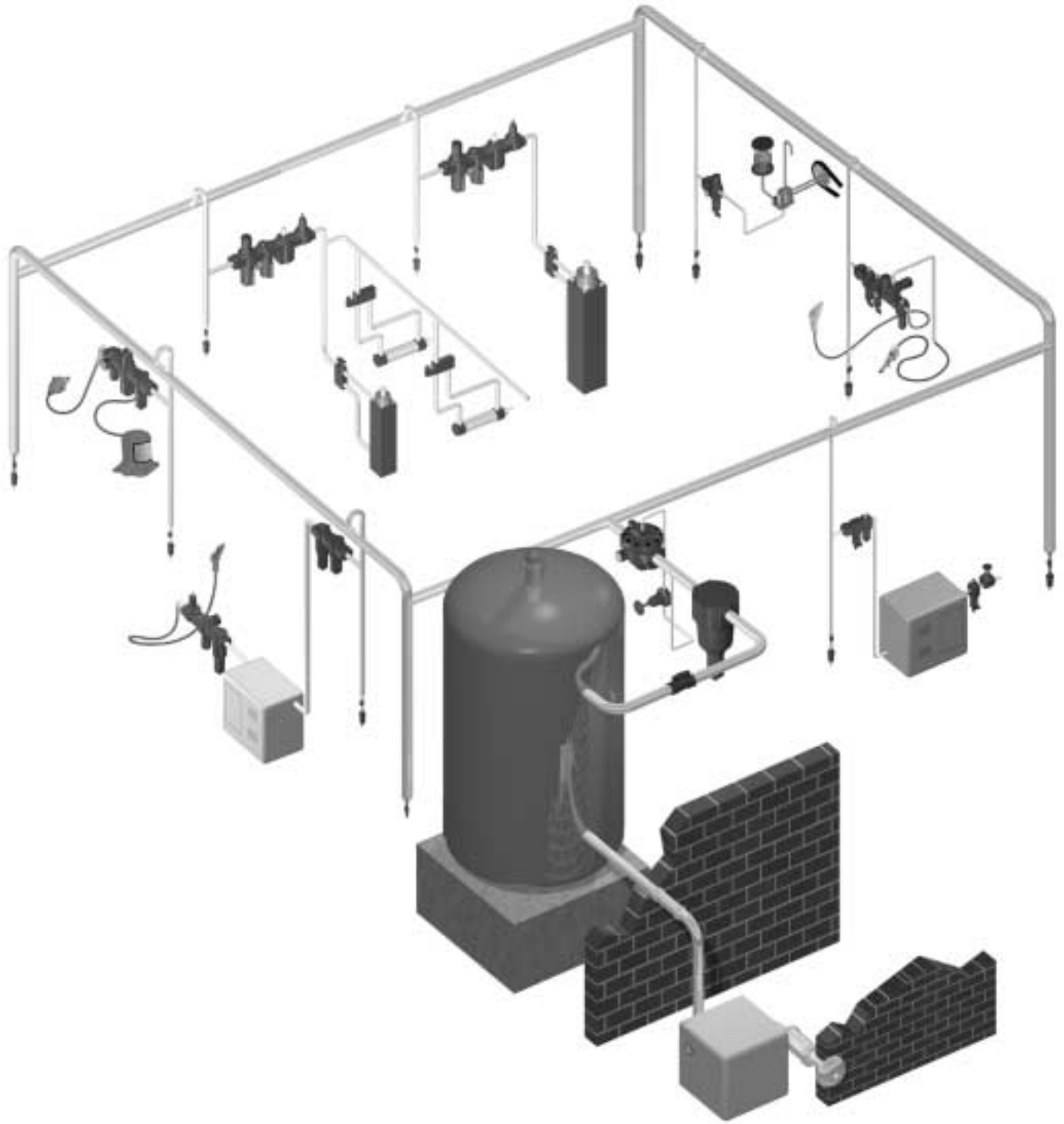
# Norgren Air Preparation Products and Accessories

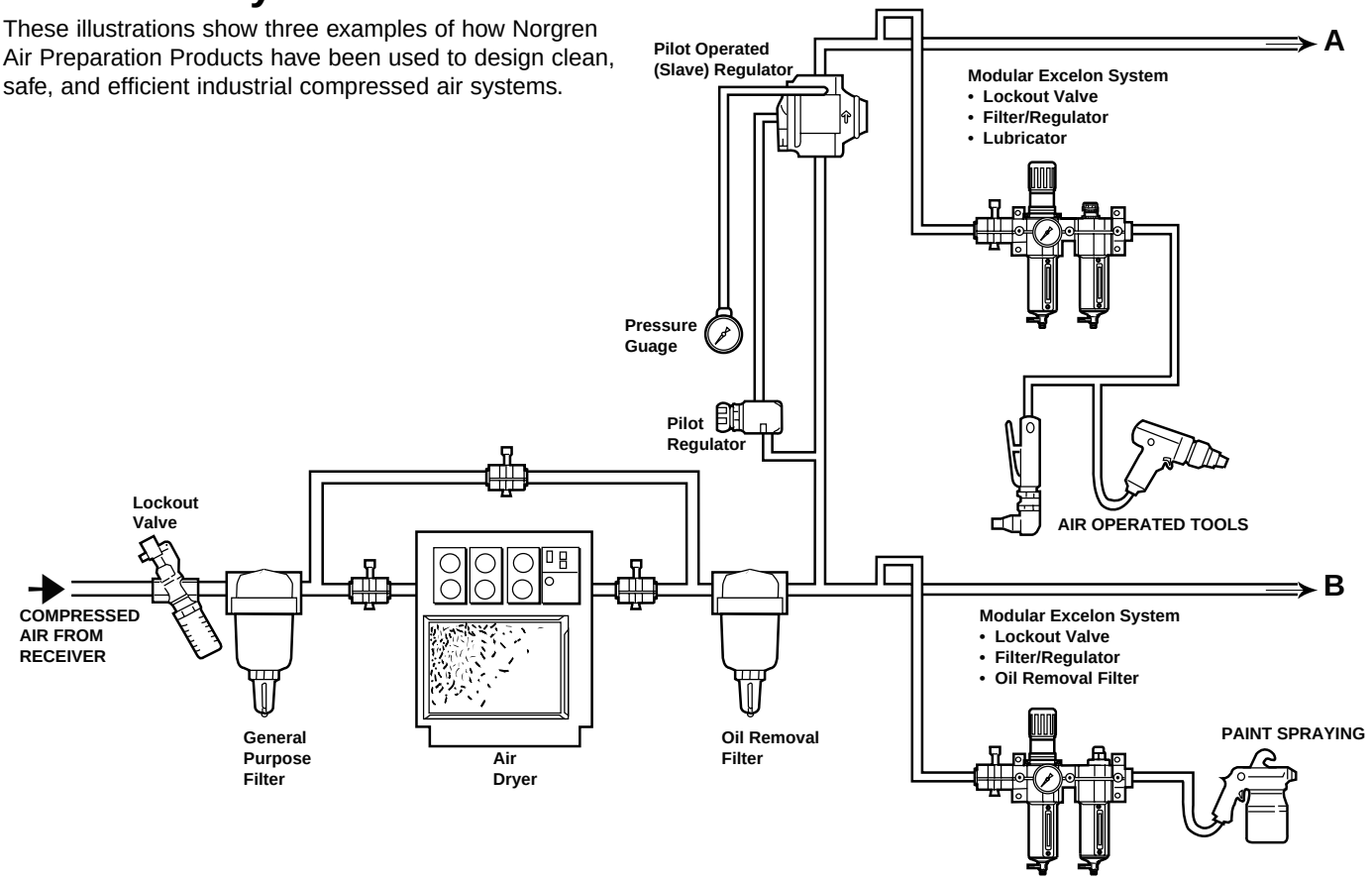
# Norgren Air Preparation Products: Protecting your pneumatic system from the hazards of contaminated air.

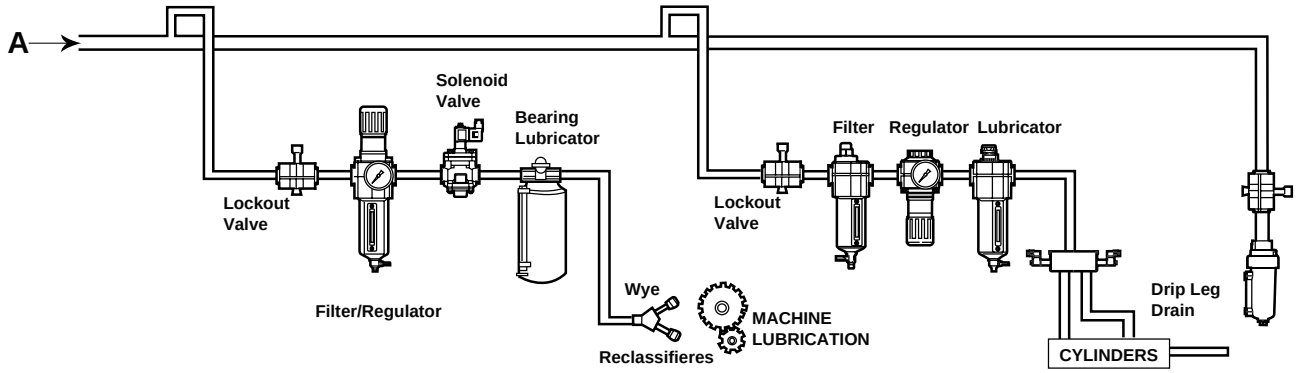
The air leaving a compressor is hot, dirty, wet and generally at a higher pressure than the downstream equipment requires. A typical 100 scfm (50 dm3/sec) compressor will push 1200 gallons (4500 liters) of water and 2 gallons (8 liters) of degraded compressor oil into the system in a year along with considerable amounts of dirt particles. Before this air can be used it needs to be treated to remove the contaminants, have its pressure reduced to the right level, and in many cases have oil added to lubricate downstream equipment.

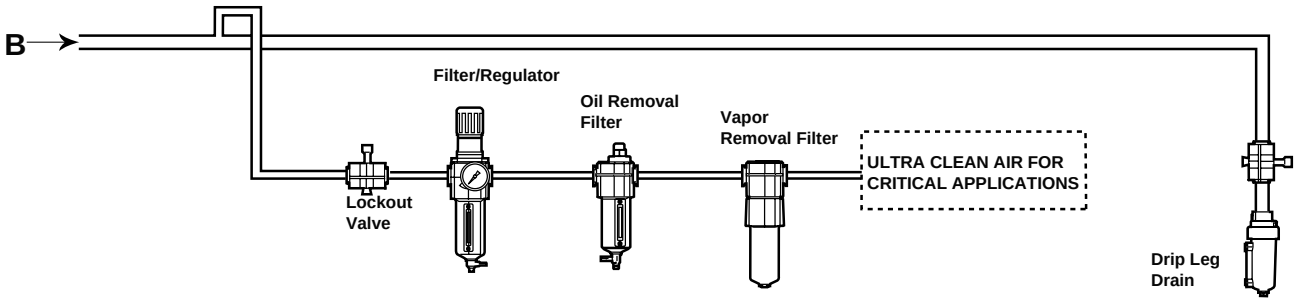


# Build Your System!

These illustrations show three examples of how Norgren Air Preparation Products have been used to design clean, safe, and efficient industrial compressed air systems.



# Norgren knowledge and products save you money

**Compressed air** is often wrongly assumed to be a cheap or even 'free' source of power. In fact it can be 10 times as expensive as electricity by the time all generation, transmission, treatment and system costs are taken into account. Good air preparation must therefore consider the energy consumption of the system and air treatment equipment.

The process of air preparation has been at the core of Norgren's business for over 70 years. The aim of this booklet is to offer guidance on the correct, economic and safe treatment of compressed air in industrial applications. Here we can only provide a brief summary of the extensive experience Norgren has as a world leader in FRL technology.

## APPLICATIONS

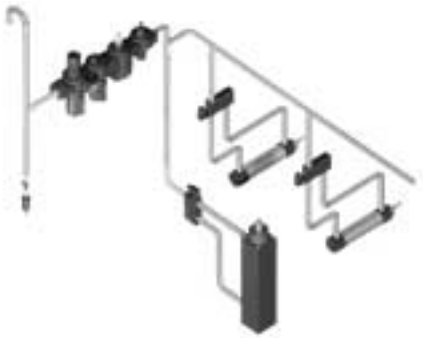
The following section shows several typical systems of a generic type and the equipment normally used for the application. Remember every system should be treated on its merits and broken down into several elements to ensure optimum installation, running and maintenance costs are achieved.

The applications below are typically branches taken off a large works distribution mains and isolating valves are usually placed in front of all branches to permit isolation from the mains to allow for maintenance to take place without recourse to complete plant shut-down.

General Pneumatic Circuits:
eg: directional control valves and cylinders, in multi-valve circuits, machine cleaning, air motors and high speed tools.

A Micro-Fog lubricator is required for the several varying flow paths to ensure full lubrication. (Figure 2)

Figure 2.



Shut-off valve, filter/reg, Micro-Fog lubricator, soft start/dump, relief valve.

Multiple Simple Applications:
eg: OEM machines.

It is often a case that with fairly simple machines, lubricated air is required for valving and pneumatic circuitry and oil-free air for air bearings. To keep costs low two separate lines are unnecessary and a typical arrangement from one air supply only can be arranged as shown.

Other elements such as pressure switches and check valves may be made available within modular systems. (Figure 3).

Figure 2

Shut-off valve, filter/regulator, oil removal filter, porting block, Micro-Fog lubricator.

Oil-Free Applications:
eg paint spraying, foodstuffs, film processing, powders.

These applications need to be free from any water deposits in the downstream system. For many installations this will require air drying. The drying medium (for desiccant or deliquescent dryers) will need protecting from oil to allow it to work efficiently and the downstream system will also need protection from accidental migration of the material into it. A typical arrangement would be as figure 26 and in some instances it might be worth considering an oil vapour removal filter too. (Figure 4)

Figure 4.

Shut-off valve, general purpose filter, oil removal filter, drier, oil removal filter, regulator, relief valve.

Heavy Duty Lubrication:
eg: large slow moving cylinders.

In such applications large amounts of lubricant are required for effective lubrication. Again a soft start/dump valve is shown but is dependent upon the application. (Figure 5).

Figure 5.

Shut-off valve, filter/reg, Oil-Fog lubricator, soft start/dump valve, relief valve.

Critical Pressure Control (Instrumentation):
eg: precision regulation, fluidic systems, air gauging, process control.

A typical arrangement is shown, where oil aerosols which can prevent fast response of downstream devices, need to be removed. Dependant upon air quality drying may not be required. (Figure 6)

Figure 6.

Shut-off valve, general purpose filter, oil removal filter, drier, oil removal filter, precision regulator.

Continuous Processes

Another facet of Norgren's Olympian Plus is the ability to make duplex systems. This is invaluable for systems which cannot be shut-down, such as continuous process plant. Two identical air sets are joined together and one may be isolated (and serviced) whilst the other set is in operation. (Figure 8)

Figure 8.

Duplex system: shut-off valve, filter/reg, lubricator, porting block, oil removal filter and shut-off valve x 2 with manifold block connectors.

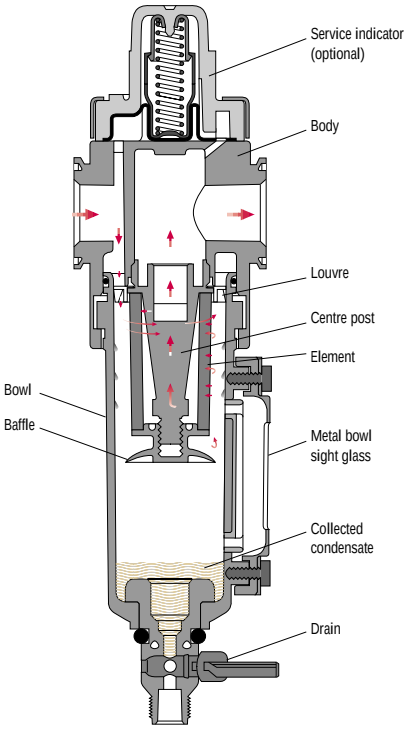
## Filter Contents

# Filters

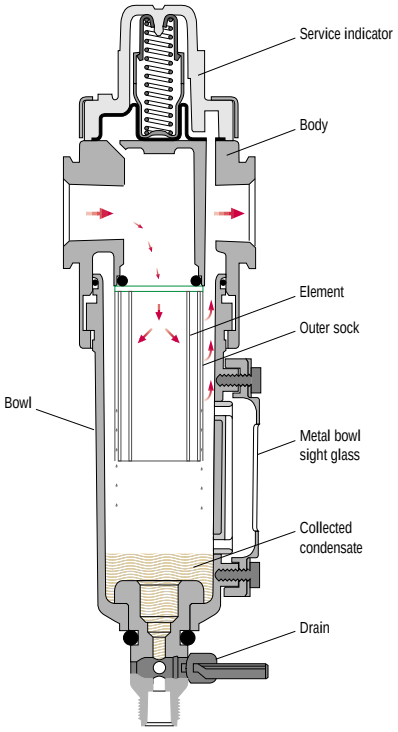
## General Purpose Filters, Oil Removal (Coalescing) Filters, Oil Vapor Removal (Adsorbing) Filters, and Compressed Air Membrane Dryers

## 1.1 GENERAL OVERVIEW

GENERAL PURPOSE FILTER




COALESCING FILTER




Three main types of filters exist: The general purpose filter for water and particles, the coalescing oil removal filter for oil aerosols and the activated carbon filter for the removal of oil vapors.

The general purpose filter is used for most filter applications and is available from 1/8" to 2" pipe sizes. Uses are main headers, branch lines, tools, cylinders, valves and valve circuits, air agitators etc. Oil removal filters are used where very clean, oil-free air is required, such as for the supply to fluidic devices, instrumentation, air gauging equipment and air bearings.

Activated Carbon filters are used for systems where the oil vapors in the air are not acceptable; such as instrumentation and paint spraying.

### 1.1.1 How Do General Purpose Filters Work?

The dirt and moisture-laden air enters the inlet port and is directed into the louvers which centrifugally separate the entrained liquids and dirt which fall to the bottom of the bowl. Near the bottom of the bowl a baffle creates a quiet zone, preventing the turbulent air re-entraining the contaminants. The air, now free of water droplets and large dirt particles, passes through the filter element which removes small dirt particles. Solid particles eventually plug the element necessitating replacement.

### 1.1.2 How Do Oil Removal Filters Work?

Air enters the filter and passes through the element from inside to outside, where oil aerosols impinge on the borosilicate micro-fibers and are coalesced into larger drops. The drops are carried through the element until they reach the outer porous sock. The outer sock, because of its cellular construction, retains these liquids and allows them to drain by gravity to the bottom of the bowl.

Solid partilces are retained in the element and cause the pressure drop to slowly increase throught the working life of the element. When the pressure drop across the element reaches 10 psid, the service life indicator on top of the filter will show more red than green and the element should be replaced.

### 1.1.3 How do Vapor removal Filters Work?

Carbon filters are used to remove oil vapors and odors. The activated carbon has a porous structure which results in a large surface area. The oil vapors are attracted and adhere to this surface. There is usually a small sintered medium included in an activated carbon element to prevent the carbon particles from migrating downstream. The carbon filter reduces the maximum oil content of air leaving the filter to 0.003ppm at 70°F, i.e. To ISO 8573 class 1.7.1. If protected upstream by general and oil removal filters life is between 400 and 1000 hours.

### 1.1.4 Why use a Pre-Filter?

A pre-filter is simply a general purpose filter placed upstream of a higher grade filter to remove the majority of the water and larger particle contaminants and thus lengthen the life of the higher grade filter element.

A 5 micron pre-filter should always be used ahead of an oil removal filter.

An oil removal (coalescing) filter must be used ahead of a vapor removal adsorbing filter.

## 1.2 AIR QUALITY

### 1.2.1 What is ISO 8573?

(See ALE-1-G for specification)

This is an international standard on air quality. It covers compressed air for general industrial use.

The air quality is specified using a 3 digit code expressing the remaining content of a specific contaminant after the filter (or dryer).

### 1.2.2 Air Classes for Norgren Filters:

Particulate filters condition compressed air to different degrees, dependent on the micron rating of the filter. The finer filter, 5 µm, will achieve ISO 8573 class 3.7. or class 3. Applying a 40 µm filter will result in ISO 8573 class 5.7. or class 5 air.

Coalescing filters improve the quality of downstream air to ISO 8573 class 1.7.2, the particle size is reduced down to 0.01µm, with a remaining oil content of less than 0.01ppm. Coalescing filters cannot remove oil which is in the vapor state in the supply air. One way to remove vapor is to reduce the temperature of the air flow allowing the vapor to condense, alternatively remove the vapor chemically using an activated carbon filter.

### 1.2.3 What Micron Ratings are Available?

The standard Norgren general purpose elements are 40 and 5 microns, with 40 microns being suitable for most industrial applications. Certain industries have 25 or 75 micron as a standard and some product ranges have these options available.

For a given element size, the smaller the micron rating the higher the pressure drop across the filter. The service life between cleaning is also less for the smaller micron filters, as small holes plug more quickly than bigger holes.

Figure 1. (See "Rating Filter Elements and ISO Standard 8573-1" in this section.
RECOMMENDED FILTRATION LEVELS.

| Application | Typical Quality Classes | |
|---|---|---|
| | Oil | Dirt |
| Air agitation | 1 | 3 |
| Air bearings | 2 | 2 |
| Air gauging | 2 | 2 |
| Air motors | 4 | 4 |
| Brick and glass machines | 5 | 4 |
| Cleaning of machine parts | 3 | 4 |
| Construction | 4 | 5 |
| Conveying, granular products | 2 | 4 |
| Conveying, powder products | 1 | 3 |
| Fluidics, power circuits | 2 | 5 |
| Fluidics, sensors | 2 | 3 |
| Foundry machines | 4 | 5 |
| Food and beverages | 1 | 1 |
| Hand operated air tools | 5 | 5 |
| Machine tools | 5 | 4 |
| Mining | 5 | 5 |
| Micro-electronics manufacture | 1 | 1 |
| Packaging and textile machines | 5 | 3 |
| Photographic film processing | 1 | 2 |
| Pneumatic cylinders | 3 | 5 |
| Pneumatic tools | 5 | 4 |
| Pneumatic tools (high speed) | 4 | 3 |
| Process control instruments | 2 | 3 |
| Paint spraying | 1 | 1 |
| Sand Blasting | 4 | 5 |
| Welding macines | 5 | 5 |
| General Workshop air | 5 | 4 |

### 1.2.4 How do Service Life Indicators Work?

The service life (pressure drop) indicator found on top of coalescing or general purpose filters is green when the filter is new. As a pressure differential develops across the filter element with use, a spring biased red outer sleeve is pushed up. When more red is visible than green, then the pressure differential across the element is in excess of 10 psi (0.7 bar) and the element should be replaced.

### 1.2.5 When does the Carbon Pack Indicator Turn Pink?

The white ring around the base of the vapor removal carbon pack turns pink in the presence of liquid oil. Therefore if the ring turns pink the coalescing filter is passing liquid oil and needs replacing. If this occurs soon after the filter has been installed then it usually indicates a seal failure in the coalescing filter. Remember that visual detection is a not a substitute for scheduled maintenance.

### 1.2.6 How Long does an Element Last?

This depends entirely on the quality of the inlet air. If it is very poor the elements will need replacing more frequently.

In general, air service equipment should be maintained annually. Use, quality of air and condition at examination may indicate adjustment of the maintenance interval.

The following guidelines can be given:

| | |
|---|---|
| General Purpose Filter: | Replace/maintain annually. The element can lose 15% efficiency each time it is cleaned. Elements are low cost, so it is advisable to replace them. |
| Coalescing: | Evaluate after 12 months of servicing. If the pressure drop across the element exceeds 10 psig (0.7bar) then the element requires changing. |
| Activated Carbon Packs: | Should be changed every 1,000 hours usage or when odor is detected. The life depends significantly on ambient temperature. |

## 1.3 PLASTIC BOWLS

Norgren transparent plastic bowls are made from polycarbonate. Some competitors use other materials such as Grilamid.

Both these materials are extremely resilient and have an excellent safety record. However these transparent plastics will degrade when subjected to excessive heat, solvents and some chemicals, which can lead to crazing and finally bowl failure.

Over the last few years metal bowls and guarded plastic bowls have become increasingly popular driven by the emergence of guidelines recommending the use of guards.

Some organizations have their own internal standards which call for guarded plastic or metal bowl and the general market trend is away from plastic bowls in the $^1/_2$" or above port size units. This trend is reflected in our latest Excelon 74 and Olympian Plus product ranges. Plastic bowls remain the most common option for $^1/_4$" and smaller units.

Never use polycarbonate bowls at conditions which exceed the maximum rated pressure and temperature of 150 psig (10 bar) and 125°F (50°C).

Certain chemicals, common in some oils and solvents, can attack polycarbonate and cause the bowl to burst. If the compressor intake is located in an area containing incompatible vapors, these contaminants can be drawn into the compressor and conveyed to the bowl in the compressed air. This can result in bowl failure.

Synthetic compressor oils may be drawn in from the compressor and can also result in bowl failure.

If doubt exists as to the compatibility of certain fluids with polycarbonate, please contact Applications Engineering.

Metal bowls should be used where temperatures exceed 125°F (50°C) and/or pressures exceed 150 psig (10 bar), or when materials are present which are incompatible with polycarbonate. Maximum rated operating conditions for metal bowls depend on the range; check APC-104.

## 1.4 DRAINS

1.4.1 Semi Automatic:

A semi-auto drain is one which operates when the air-line is depressurized eg at the end of a shift. It is a normally open two-way valve which is held closed by 7-10 psig (0.7-0.8 bar). When the filter is pressurized, the drain may be operated manually by pushing the tube, which protrudes outside the bowl, upwards.

1.4.2 Automatic:

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

1.4.3 Where should an Automatic Drain be Used?

Automatic Drains should be used where the filter location may make servicing difficult, where filters may be hidden from view and consequently be overlooked or where equipment is in continual use. Areas where large quantities of liquid may accumulate over a short period of time should also be equipped with auto-drain filters. High labor costs for draining a large number of filters manually will generally justify the use of auto-drains.

Machines which have been shut down for a long period of time, such as over a weekend, can draw slugs of water during start-up which can overload a filter unless drained immediately. (This situation can normally be handled by a drip leg drain, see.)

Norgren float type automatic drains are 'normally open' type drains. During periods when the air line pressure is shut off, the automatic drain will open allowing liquids to drain rather than flood the air line piping system. When re-pressurizing the air line, the automatic drain valve will close when pressure reaches approximately 10 psig (0.7bar). This results in a flow through the drain to atmosphere of about 1.77 scfm (0.84$dm^3/s$) until the valve automatically closes. (See 1.4.4 below.)

1.4.4 Where should a Low Flow Automatic Drain be used?

In systems where the compressor capacity is insufficient to close a number of standard auto drains a 'low flow' drain is available which requires only 0.5 scfm flow before closing. An ultra low flow auto drain is also available. 'Low flow' drains have less clearance around the valve for expelling contaminants, so should only be used where the standard unit cannot be used. 'Low flow' drains can be identified by red plastic parts.

1.4.5 07 Automatic (spitter) Drain:

When a rapid increase in flow occurs through the filter it results in the pressure above the drain's diaphragm being less than that below it. This differential pressure causes the drain to momentarily lift and 'spit' out the condensate collected underneath the drain.

1.4.6 Where should a Drip Leg Drain be Used?

The drip leg drain is a system protection device. Most compressed air distribution systems have varying flows and/or are shut down at the end of a working day. As the system cools, water in the compressed air condenses and collects in the distribution pipe work. This water will run along the pipe work and settle at the low point(s). On start up of the plant this water can be pushed under pressure into the nearest device or process and cause malfunction or damage.

By running a vertical pipe down from these low points water will flow into the drip leg drain where the automatic drain will expel it.

A filter screen within the drip leg drain prevents particles interfering with the auto-drain operation. A ball valve should be included above the drip leg drain to allow for maintenance when the system is running.

## 1.5 PERFORMANCE

1.5.1 Performance of General Purpose Filters

Filters have their flow measured in terms of the pressure drop across them. As the flow increases then the pressure drop also increases. These pressure drops are energy losses in the system.

A well designed filter not only removes water and particles efficiently, but also has a low pressure drop at a given flow. The flow figures quoted in Norgren catalogues for general purpose filters are at a pressure drop of 5 psig (0.3 bar), from a 100 psig (7 bar) inlet pressure.

**Beware!** not all competitors quote their flows under the same conditions. If a higher inlet pressure is used or a higher pressure drop is quoted then the apparent flow will be higher. This does not mean it is a better unit , simply that a different point on the curve has been selected. Often the only way to compare units is to test them under the same laboratory conditions.

1.5.2 Performance of Coalescing Filters:

The maximum flow of an oil removal filter is usually determined by the oil removal efficiency under saturated conditions. In the catalog there are maximum flows quoted 'to maintain stated oil removal characteristics.' These are the steady state flows which should not be exceeded to guarantee that the oil in the outlet air remains below the 0.01ppm (parts per million) quoted. Cyclic or pulsating flows will result in oil carry over, as will elevated temperatures.

If a higher oil carry over is acceptable (or there is no oil in the air-line) then higher flows are achievable, and will be determined by the 'acceptable' pressure drop. For a new (dry) element a flow which gives a pressure drop of less than 5 psid (0.3 bar) is recommended.

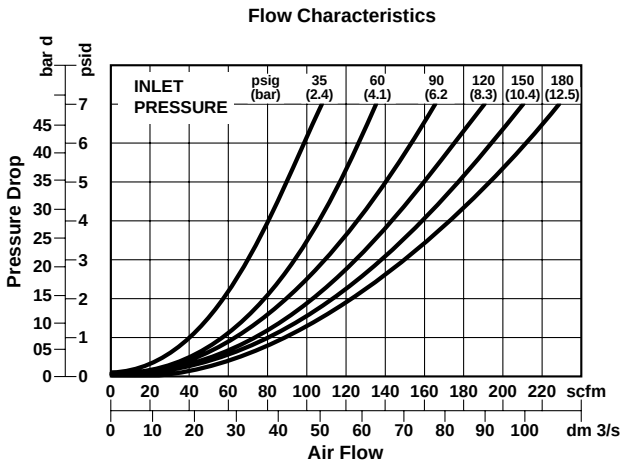
## 1.6 FILTER SIZING

Selecting the proper size of filter for any application should be done by determining the maximum allowable pressure drop which can be caused by the filter. The pressure drop can be determined by referring to flow curves provided by the manufacturer.

The flow characteristic curves should relate to the fluid used, pressure, pipe port size and micron rating of the filter element. Often the parameters of pressure and flow are labeled in metric and imperial units. The vertical axis is the pressure drop across the filter, and the horizontal axis is the air flow through the filter. Each curved line represents the filter flow and pressure drop characteristics for different operating pressures.

Example Find the pressure drop across the filter when operating at 90 psig (6.2 bar) and when 50 scfm (24 $dm^3/s$) is flowing through the filter.

Answer Locate 50 scfm (24 $dm^3/s$) on the horizontal axis. Read up to the intersecting point on the 90 psig (6.2 bar)operating curve. The pressure drop (or $\Delta$ p) is approximately .6 psid (.04bar) on the vertical axis on the left of the graph. (See graph)




## 1.7 MEMBRANE DRYERS

For those applications where a low-pressure dewpoint and low installation/operational cost are required, Norgren provides an Excelon® Membrane Dryer. This new product can provide dewpoint suppression up to 80°F (26°C) below ambient temperature and is available with nominal flows of 2, 5, 10, 20, and 30 scfm.

The Membrane Dryer is a variable dew point suppression device constructed of an anodized aluminum body with end caps. Inside the body are bundles of special hollow fibers (membranes) which are semi-permeable. Moisture-laden air enters the fibers and water vapor permeates through the walls to the outside of the fibers. Dry air exits the device through the outlet port. A small percentage of dry air is diverted across the outside of the fibers to sweep away and vent water vapor to atmosphere.

This device provides variable dew point suppression inversely related to flow. Lower flows through a unit will increase contact time with the membrane fibers, resulting in greater dew point suppression. Higher flows will result in a decreased level of dew point suppression. Additionally, dew point suppression is directly related to operating pressure. Increasing the pressure applied will result in a greater level of dew point suppression. Therefore, it is always recommend placing regulators downstream of a membrane dryer to ensure the highest pressure possible through the membrane dryer.

### Typical Flows for Membrane Dryers

| Model | Port | Outlet Flow | Inlet Flow | Purge Flow | Press. Drop |
|---|---|---|---|---|---|
| W07M2ANNNA | 1/4" | 2 scfm | 2.2 scfm | 0.2 scfm | 0.4 psid |
| W72M2ANNNB | 1/4" | 5 scfm | 5.6 scfm | 0.6 scfm | 0.32 psid |
| W72M2ANNNC | 1/4" | 10 scfm | 11.2 scfm | 1.2 scfm | 0.90 psid |
| W74M4ANNND | 1/2" | 20 scfm | 22.2 scfm | 2.2 scfm | 0.65 psid |
| W74M4ANNNE | 1/2" | 30 scfm | 33.4 scfm | 3.4 scfm | 1.35 psid |

## 1.7 SIMPLE FILTER TROUBLESHOOTING

| Malfunction | Possible cause | Remedy |
|---|---|---|
| Excessive pressure drop. | Micron rating of element to small | Use larger micron element size for application. |
| | Filter element blocked. | 1. Clean element (not coalescing element). Note: Some residual contamination will remain.<br>2. Replace with new element. |
| | Flow requirement greater than filter capacity. | Use larger filter. |
| Dirt passing through filter. | Element seals missing or defective. (N.B. Seals not required on some units). | Replace seal<br>2. Tighten element. |
| | Damaged element. | Replace element. |
| Water passing through filter. | Water level in bowl above baffle. | Drain water. |
| | Flow capacity of filter exceeded. | Maintain flow within capacity of filter or change to filter capable of handling desired flows. |
| Crazing of Polycarbonate bowl or milky appearance. | Bowl has been cleaned with incompatible fluid. | Replace bowl.<br>(Clean only in clean warm water and soap.) |
| | Bowl is being used in an area containing fumes or vapors incompatible with polycarbonate. | Replace bowl.<br>Eliminate source of problem or convert from plastic to metal bowls. |
| | Compressor oil vapor may be causing problem. | Replace bowl.<br>Eliminate source of problem or convert from plastic to metal bowls. |
| | Air intake to compressor may contain fumes or vapor | Replace bowl.<br>Eliminate source of problem or incompatible with polycarbonate.convert from plastic to metal bowls. |
| Water beyond the filter | Inlet air has a high temperature and as it cools downstream, moisture condenses to water. | Fit dryer, pre-cool air or fit filter immediately prior to application. |

## Absence of an Industrial Standard for Rating Pneumatic Filter Elements

There is not an industry wide standard for establishing the micron rating of pneumatic filter elements. Standards by various industry associations, including the National Fluid Power Association (NFPA) and International Standard Organization (ISO), are in discussion. In the absence of an industry standard, some manufacturers of pneumatic filters make claims concerning the micron rating of their so called “standard” element which can not be substantiated and are probably not valid.

## Norgren’s Method of Rating and Testing Pneumatic Filter Elements

Norgren particle removal filter elements are rated by the size of the particle they will trap (i.e., a 40-micron element will remove particles 40-microns and larger). Norgren tests filter elements by using ***standard coarse*** and ***fine*** test dusts of known particle size distribution. ***Coarse*** dust consists of 12% particles smaller than 5-microns; ***fine*** grain dust consists of 39% particles smaller than 5-microns. Test results show that a Norgren filter element rated at 40-microns actually removes over 98% of particles 5-microns and larger.

## How to Size a Filter Element

The downstream equipment being protected determines the micron rating of the filter element. Industrial tools, such as air hammers and drills, typically require only a 40-micron element. Air operated instruments and small, high speed tools typically require a 5-micron element. Always consult the equipment manufacturer for filtration requirements.

*Generally, the smaller the micron rating of the element,*

- the higher the pressure drop across the filter,
- the shorter the element service life.

*Therefore, the use of a 5-micron element where a 40-micron is adequate penalizes the customer in increased pressure losses and frequent down time for changing or cleaning the filter element.*

## ISO Standard 8573-1. Compressed Air for General Use

Contaminant’s found in industrial compressed air systems include solid particles, water, and oil. ISO 8573-1:1991 provides a simple method of classifying these contaminant’s. A quality class required for a particular application can be defined by listing, in order, the class required for solids, water, and oil.

**Table 1. Summary of ISO 8573-1:1991 Air Quality Classes ***

| Quality Class | Solid Particle Maximum Size µm | Water Maximum Pressure Dewpoint °F (°C) | Oil Maximum Remaining Oil Content $mg/m^3$ ** (ppm) |
|---|---|---|---|
| 1 | 0.1 | -94 (-70) | 0.01 (.0084) |
| 2 | 1 | -40 (-40) | 0.1 (.084) |
| 3 | 5 | -4 (-20) | 1 (.84) |
| 4 | 15 | 38 (3) | 5 (4.2) |
| 5 | 40 | 45 (7) | 25 (21) |
| 6 | — | 50 (10) | — |

* See ISO standard 8573-1 for complete information.
** At 1 bar absolute pressure.

Examples:
Air of Quality Class 2.2.2 is filtered to 1µm solid particle size, dried to -40°F (-40°C) pressure dewpoint, and filtered to an oil concentration of $0.1mg/m^3$.

Air of Quality Class 5.3.4 is filtered to 40µm solid particle size, dried to -4°F (-20°C) pressure dewpoint, and filtered to an oil concentration of $5mg/m^3$.

When a class for a particular contaminant solid, water, or oil is not specified, the number designating the class is replaced with a hyphen.

Example: Air of Quality Class 1.–.1 does not specify the pressure dewpoint.

# General Purpose Filters

**Compressed air, general purpose filters are available in modular or inline models, in port sizes from 1/8" to 2".**



F07

F72G

F73G

F74G

F64G

F68

F17

F18

# F07

## Miniature Series 07 General Purpose Filter
## 1/8" and 1/4" Port Sizes

- **Compact design**
- **Protects air operated devices by removing liquid and solid contaminants**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering Information.** Models listed include PTF threads, automatic drain, transparent bowl and 5 µm element.

| Port Size | Model Numbers | Flow scfm ($dm^3/s$) * | Weight lbs (kg) |
|---|---|---|---|
| 1/8" | F07-100-A1TA | 19 (9) | 0.28 (0.13) |
| 1/4" | F07-200-A1TA | 24 (11.5) | 0.28 (0.13) |

* Approximate flow at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

### Alternative Models

F 0 7 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8" | 1 |
| 1/4" | 2 |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

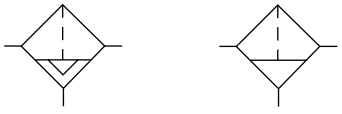
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Bowl | Substitute |
|---|---|
| Transparent | T |
| Metal | M |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 40 µm | 3 |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

### ISO Symbols



**Auto Drain** **Manual Drain**

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure:
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature:*
- Transparent bowl: -30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 175°F (-34° to 80°C)

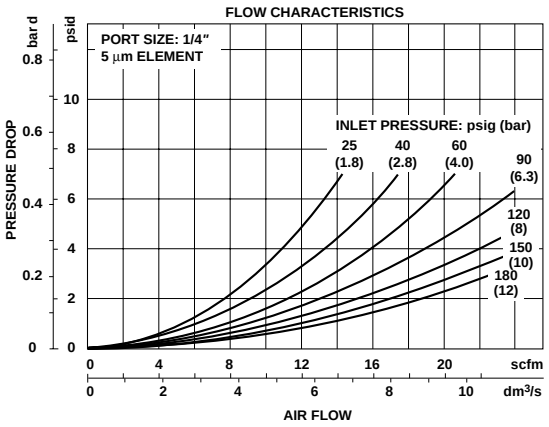
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Particle removal: 5 µm or 40 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow at 90 psig (6.3 bar) inlet pressure at 5 psig (0.35 bar) pressure drop:
- 1/8" Ports, 5 µm element: 19 scfm (9 $dm^3/s$)
- 1/4" Ports, 5 µm element: 24 scfm (11.5 $dm^3/s$)

Nominal bowl size: 1 fluid ounce (31 ml)
Drain connection: 1/8" pipe thread
Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.
Materials
- Body: Zinc
- Bowl
  - Transparent: Polycarbonate
  - Metal: Zinc (without sight glass)
- Element: Sintered polypropylene
- Elastomers: Neoprene & nitrile

For water extraction information please contact Applications Engineering.

## Typical Performance Characteristics

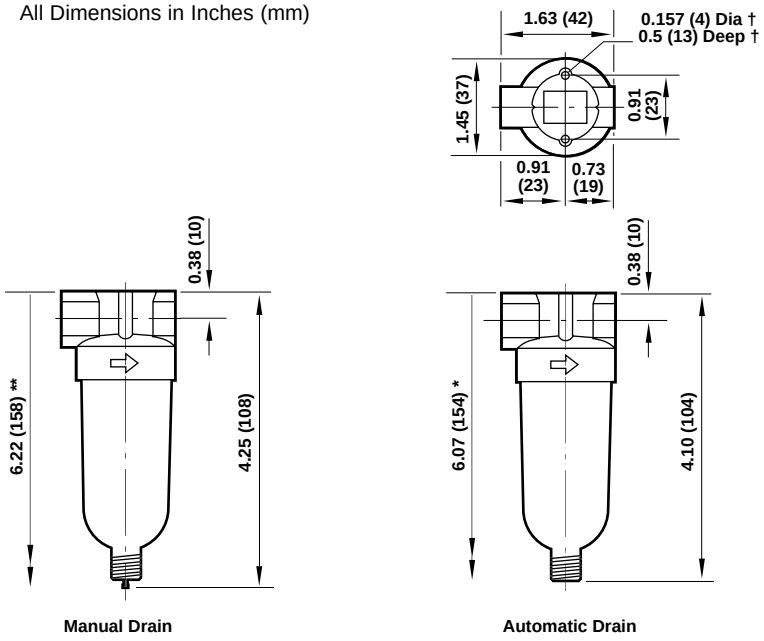



## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | 5 µm element | 3652-17 |
| | 40 µm element | 3652-18 |
| Replacement drains | Manual | 773-03 |
| | Automatic | 3654-02 |

Service kit includes element, element gasket, and bowl o-ring.

All Dimensions in Inches (mm)




**Manual Drain** **Automatic Drain**

** Minimum clearance to remove bowl.
† Mounting holes.

# F72G

## Excelon 72 General Purpose Filter
## 1/4" and 3/8" Port Sizes

- **Excelon design allows in-line or modular installation**
- **High efficiency water and particle removal**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens on metal bowls**
- **Optional service indicator turns from green to red when the filter element needs to be replaced**
- **Optional electrical service indicator also available**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed include PTF threads, automatic drain, long transparent bowl without guard, 40 µm element. Models do not include the service life indicator.

| Port Size | Model | Flow† scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | F72G-2AN-AL3 | 55 (26) | 1.15 (0.52) |
| 3/8" | F72G-3AN-AL3 | 55 (26) | 1.15 (0.52) |

† Typical flow with a 40µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

### Alternative Models

F 7 2 G - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

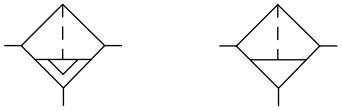
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | E |
| Transparent without guard | L |
| Transparent with guard | W |

| Service Life Indicator | Substitute |
|---|---|
| With (visual) | D |
| With (electrical) | E |
| Without | N |

| Drain | Substitute |
|---|---|
| 1/4 turn manual | Q |
| Semi automatic | S |
| Auto drain* | A |

### ISO Symbols



**Auto Drain** **Manual Drain**

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure:
- Transparent bowl: 150 psig (10 bar)
- Metal bowl:
  - Manual or semi automatic drain: 250 psig (17 bar)
  - Automatic drain: 150 psig (10 bar)

Operating temperature*:
- Transparent bowl: -30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm or 40 µm. Within ISO 8573-1, Class 3 and Class 5
Typical flow at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop:
- 5 µm element: 47 scfm (22 $dm^3/s$)
- 40 µm element: 55 scfm (26 $dm^3/s$)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Semi automatic drain connection: Push on 5/16″ (8 mm) ID tube
Semi automatic drain operating conditions (pressure operated):
- Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)
- Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)
- Minimum air flow required to close drain: 1 scfm (0.5 $dm^3/s$)
- Manual operation: Lift stem to drain bowl

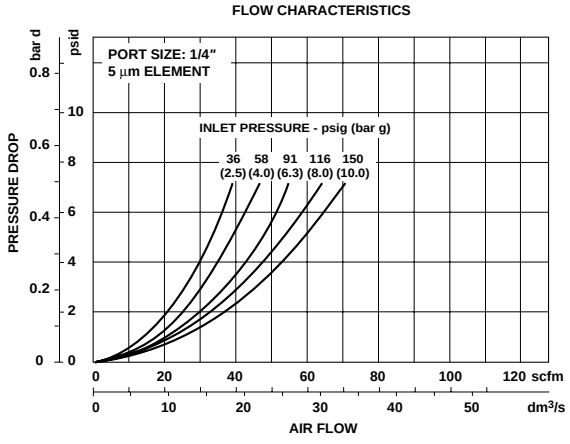
Automatic drain connection:Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.35 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

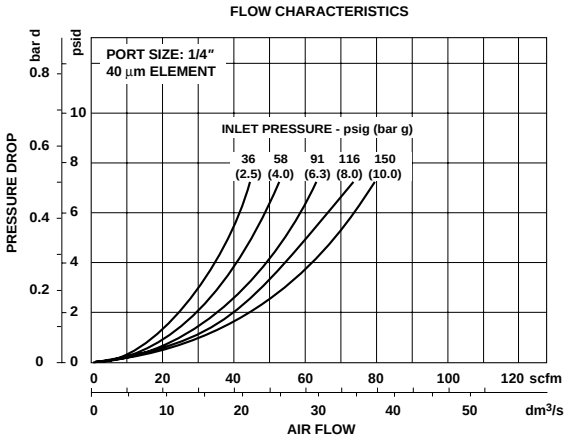
Nominal bowl size:
- Long bowl: 2.2 fluid ounce (65 ml)

Materials
- Body: Zinc
- Bowl
  - Transparent: Polycarbonate
  - Guard for transparent bowl: Zinc
  - Metal: Zinc
- Metal bowl liquid level indicator lens:
  - Transparent nylon
- Element: Sintered polypropylene
- Elastomers: Neoprene and nitrile

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics



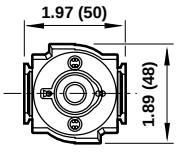




## Service Kits

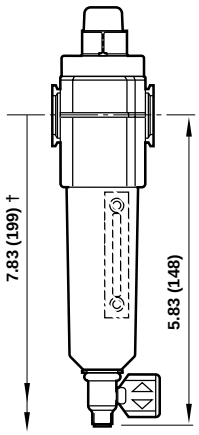
| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal and gasket | 4380-500 |
| Elements | 5 µm | 5925-03 |
| | 25 µm | 5925-01 |
| | 40 µm | 5925-02 |
| Liquid level lens kit | Prismatic | 4380-030 |
| Replacement drains | 1/4 turn manual | 619-50 |
| | Semi automatic | 5379-RK |
| | Automatic | 4000-50R |

Service kit includes drain and bowl o-rings.

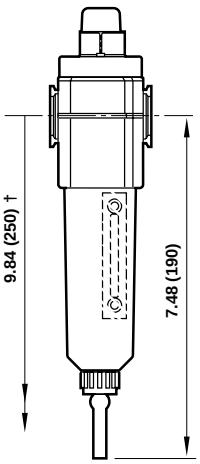
All Dimensions in Inches (mm)



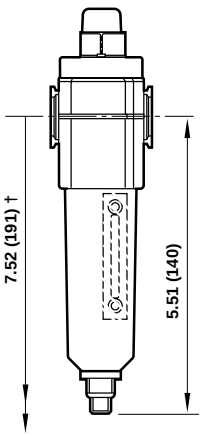

(Top)




**Bowl with 1/4 Turn Manual Drain**




**Bowl with Semi auto Drain**




**Bowl with Automatic Drain**

† Minimum clearance required to remove bowl.

# F73G

**Excelon 73 General Purpose Filter**
**1/4", 3/8", 1/2" Port Sizes**

- **Excelon design allows in-line or modular installation**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Optional mechanical service indicator turns from green to red when the filter element needs to be replaced**
- **Optional electrical service indicator provides electrical output when the filter element needs to be replaced**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**


**Ordering information.** Models listed include PTF threads, automatic drain, metal bowl with liquid level indicator, and a 40 µm element.

| Port Size | Model | Flow* scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | F73G-2AN-AD3 | 53 (25) | 1.1 (0.50) |
| 3/8" | F73G-3AN-AD3 | 65 (31) | 1.1 (0.50) |
| 1/2" | F73G-4AN-AD3 | 69 (33) | 1.1 (0.50) |

* Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

### Alternative Models

F 7 3 G - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

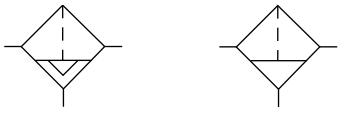
| Service Indicator | Substitute |
|---|---|
| With electrical service indicator * | E |
| With mechanical service indicator | D |
| Without | N |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |
| Transparent | T |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1/4 turn | Q |

### ISO Symbols



**Auto Drain** **Manual Drain**

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure:
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*:
- Transparent bowl: -30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 175°F (-34° to 80°C)

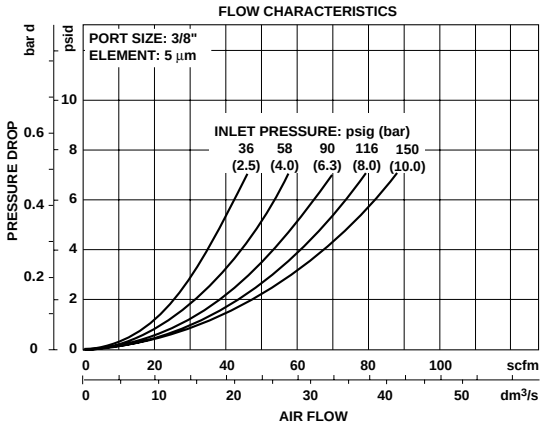
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

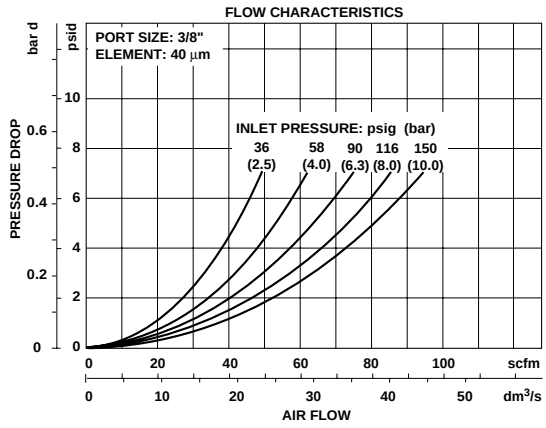
Particle removal: 5 µm, 25 µm, or 40 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 65 scfm (31 $dm^3/s$)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)
Materials
- Body: Aluminum
- Bowl
  - Transparent: Polycarbonate
  - Transparent with guard: Polycarbonate, steel guard
  - Metal: Aluminum
  - Metal bowl liquid level indicator lens: Transparent nylon
- Element: Sintered polypropylene
- Elastomers: Neoprene and nitrile

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics



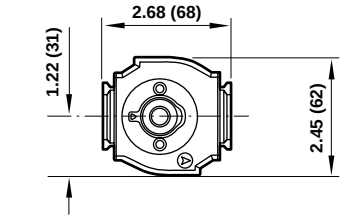



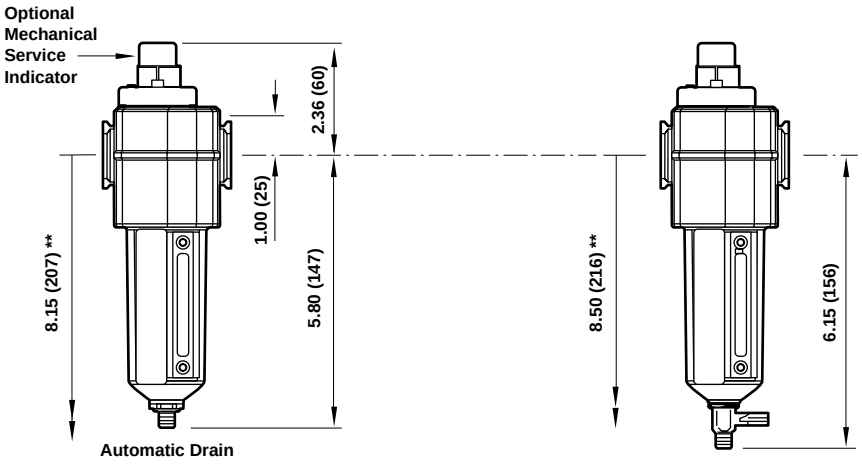

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & Gasket | 4380-600 |
| Replacement elements | 5 µm | 4438-01 |
| | 25 µm | 4438-02 |
| | 40 µm | 4438-03 |
| Liquid level lens kit | Prismatic | 4380-020 |
| Replacement drains | Automatic | 4000-51R |
| | Manual quarter turn | 619-50 |

Service kit includes automatic drain seal and bowl seal.

All Dimensions in Inches (mm)




** Minimum clearance required to remove bowl.

# F74G

**Excelon 74 General Purpose Filter**
**3/8", 1/2", 3/4" Port Sizes**

- **Excelon design allows in-line or modular installation**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Optional mechanical service indicator turns from green to red when the filter element needs to be replaced**
- **Optional electrical service indicator provides electrical output when the filter element needs to be replaced**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**


**Ordering information.** Models listed include PTF threads, automatic drain, metal bowl with liquid level indicator, and a 40 µm element.

| Port Size | Model | Flow* scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 3/8" | F74G-3AN-AD3 | 112 (53) | 1.82 (0.83) |
| 1/2" | F74G-4AN-AD3 | 140 (66) | 1.79 (0.81) |
| 3/4" | F74G-6AN-AD3 | 140 (66) | 1.75 (0.79) |

* Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

**Alternative Models**

F 7 4 G - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

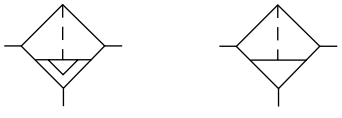
| Service Life Indicator | Substitute |
|---|---|
| With (visual) | D |
| With (electrical) | E |
| Without | N |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1/4 turn | Q |

**ISO Symbols**



**Auto Drain** **Manual Drain**

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*:
- Transparent bowl: -34° to 125°F (-30° to 50°C)
- Metal bowl: -34° to 175°F (-30° to 80°C)

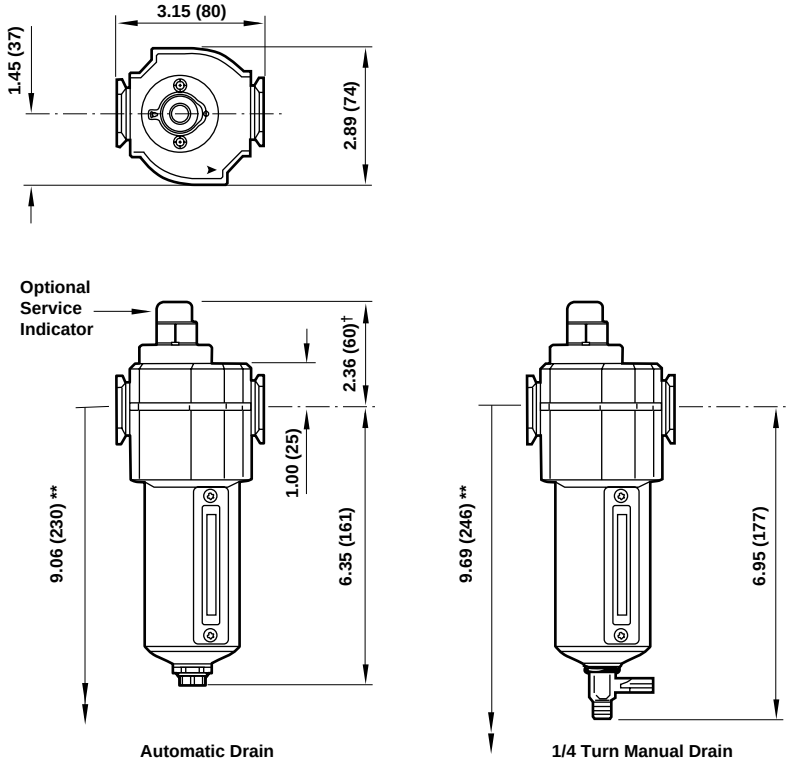
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5, 25, or 40 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 140 scfm (66 $dm^3/s$)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 7 fluid ounce (0.2 liter)
Materials
- Body: Aluminum
- Bowl
  - Transparent: Polycarbonate with steel bowl guard
  - Metal: Aluminum
- Metal bowl liquid level indicator lens: Transparent nylon
- Element: Sintered polypropylene
- Elastomers: Neoprene and Nitrile

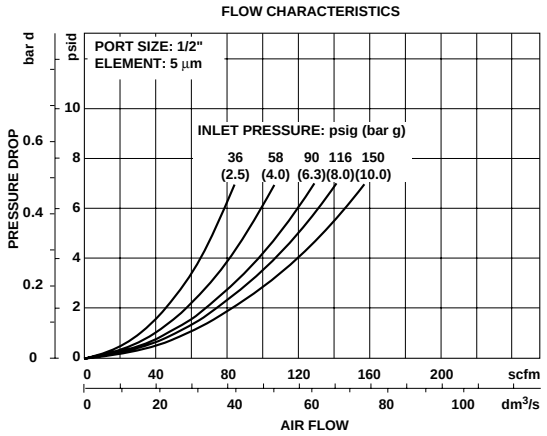
An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

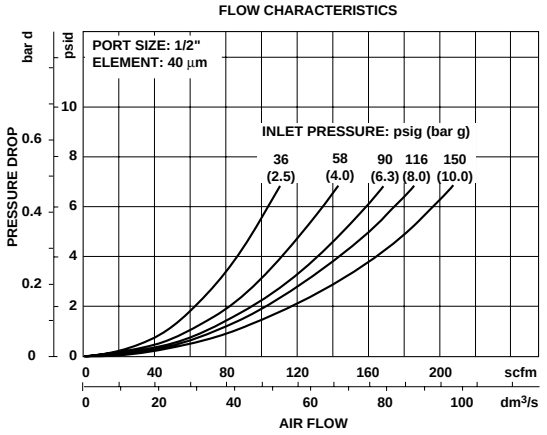
All Dimensions in Inches (mm)




* Minimum clearance required to remove bowl.
† Dimension for alternative electrical service indicator is 1.98″ (50.4 mm)

## Typical Performance Characteristics




## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & gasket | 4380-700 |
| Replacement elements | 5 µm | 4338-04 |
| | 25 µm | 4338-07 |
| | 40 µm | 4338-05 |
| Liquid level lens kit | Prismatic | 4380-050 |
| Replacement drains | Automatic (1/8 NPT outlet) | 3000-10 |
| | Manual quarter turn | 619-50 |

Service kit includes louvre/element seal, drain seal, bowl seal.

# F64G

**Olympian Plus General Purpose Filter**
**1/4", 3/8", 1/2", 3/4" Port Sizes**

- **Olympian Plus plug in design**
- **High efficiency water and particle removal**
- **Quick release bayonet bowl**
- **High visibility prismatic sight glass**
- **Optional service indicator**


**Ordering Information.** Models listed include PTF threads, yoke, automatic drain, metal bowl, 40 µm element. Models do not include the service life indicator.

| Port Size | Model | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | F64G-2AN-AD3 | 59 (28) | 3.13 (1.42) |
| 3/8" | F64G-3AN-AD3 | 118 (56) | 3.13 (1.42) |
| 1/2" | F64G-4AN-AD3 | 125 (59) | 2.91 (1.32) |
| 3/4" | F64G-6AN-AD3 | 125 (59) | 3.79 (1.72) |

† Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and a 5 psig (0.35 bar) pressure drop.

## Alternative Models

F 6 4 G - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |
| No yoke | N |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |
| No yoke | N |

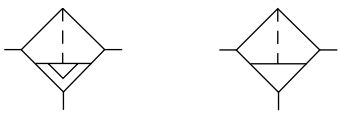
| Service Life Indicator | Substitute |
|---|---|
| With (visual) | D |
| With (electrical) | E |
| Without | N |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |

| Drain | Substitute |
|---|---|
| Auto drain | A |
| Manual, 1/4 turn | Q |

### ISO Symbols



**Auto Drain** **Manual Drain**

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure
- Guarded transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*:
- Guarded transparent bowl: -30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 175°F (-34° to 80°C)

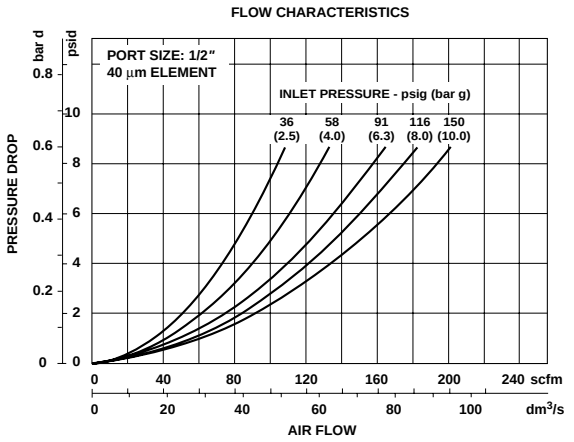
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Partical removal: 5 µm, 25 µm or 40 µm. Within ISO 8573-1, Class 3 and Class 5
Typical flow with 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 125 scfm (59 $dm^3/s$)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 7 fluid ounce (0.2 liter)
Materials
- Body: Zinc
- Yoke: Zinc
- Metal bowl: Aluminum
- Standard metal bowl prismatic liquid level indicator lens: Grilamid
- Optional metal bowl sight glass: Pyrex
- Optional transparent bowl: Polycarbonate
- Element: Polypropylene
- Elastomers: Nitrile

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics

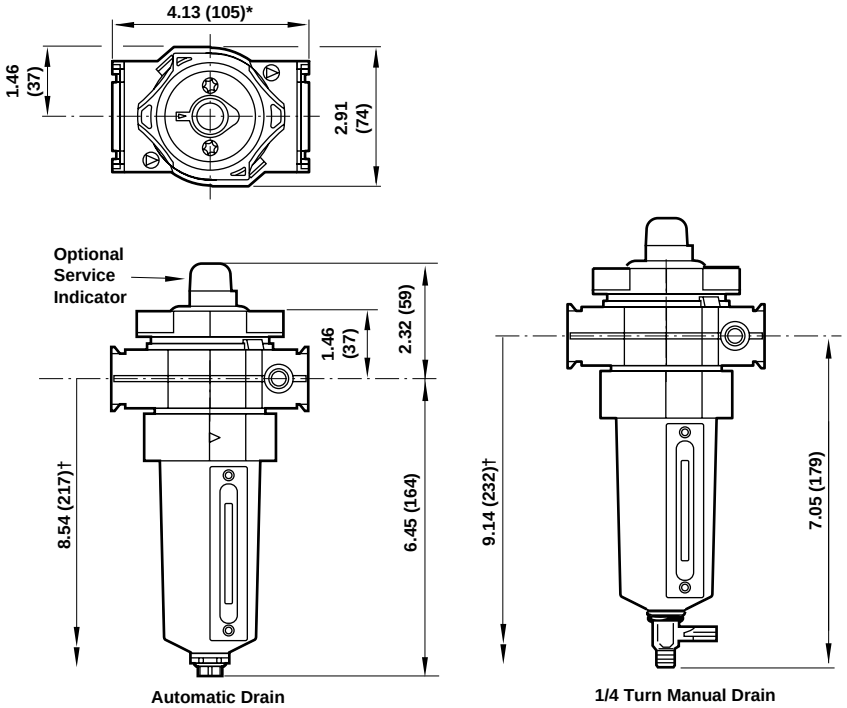



## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal and gasket | 4380-200 |
| Elements | 5 µm | 4338-01 |
| | 25 µm | 4338-99 |
| | 40 µm | 4338-02 |
| Liquid level lens kit | Prismatic | 4380-040 |
| | Pyrex | 4380-041 |
| Replacement drains | Automatic | 3000-10 |
| | Manual | 684-84 |

Service kit includes port seals, louver o-ring, bowl o-ring and drain gasket.

All Dimensions in Inches (mm)




* 6.18″ (157 mm) for 3/4" models

† Minimum clearance required to remove bowl.

# F68E/G

**Olympian Plus General Purpose Filter**
**3/4″, 1″, 1-1/4″, 1-1/2″ Port Sizes**

- **Olympian Plus plug in system**
- **Effective liquid removal and positive solid particle filtration**
- **Large filter element area provides minimum pressure drop**
- **Optional visual service indicator turns from green to red when the filter element needs to be replaced**
- **Factory option electrical service life indicator provides electrical output when the filter element needs to be replaced - see page ALE-25-23.**


**Ordering Information.** Models listed include a 1 quart bowl with 40 µm long element, automatic drain, and yoke with PTF threads.

| Port Size | Model | Flow† scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 3/4 | F68E-6AN-AU3 | 339 (160) | 2.45 (5.3) |
| 1 | F68E-8AN-AU3 | 403 (190) | 2.33 (5.1) |
| 1-1/4 | F68E-AAN-AU3 | 424 (200) | 2.43 (5.3) |
| 1-1/2 | F68E-BAN-AU3 | 424 (200) | 2.30 (5.0) |

† Typical flow with a 40µm element at 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop.

## Alternative Models

F 6 8 E - ★ ★ ★ - ★ ★ ★

| Bowl/Element Type | Substitute |
|---|---|
| 1 pint (0.5 liter) bowl w/short element | G |
| 1 quart (1 liter) bowl w/long element | E |

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |
| None | N |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |
| None | N |

| Service Life Indicator | Substitute |
|---|---|
| Visual | D |
| Electrical | E |
| Without | N |

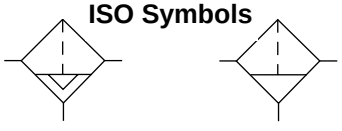
| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Bowl | Substitute |
|---|---|
| 1 quart (1 liter) without liquid level indicator | C** |
| 1 pint (0.5 liter) without liquid level indicator | M* |
| 1 pint (0.5 liter) with liquid level indicator | R* |
| 1 quart (1 liter) with liquid level indicator | U** |

| Drain | Substitute |
|---|---|
| Automatic | A |
| No drain (Closed bowl) | E |
| Manual | M |
| Manual, 1/4 turn | Q |

* Only available with F68G
** Only available with F68E

**ISO Symbols**



**Auto Drain** **Manual Drain**

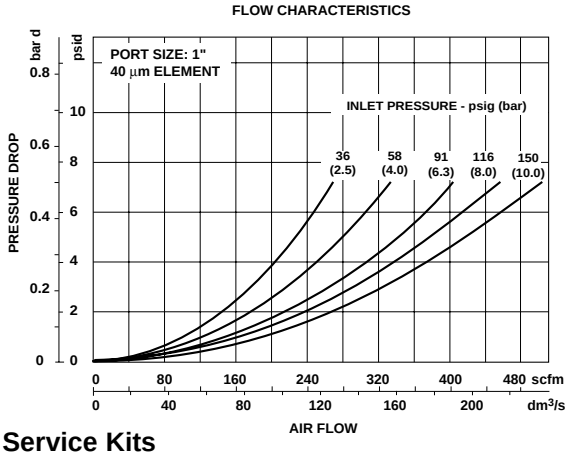
## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to +175°F (-20° to +80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).

Particle removal: 5, 25 or 40 µm
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and a 7 psig (0.5 bar) pressure drop:
403 scfm (190 $dm^3/s$)
1/4 turn manual drain connection: 1/8″ pipe thread
Automatic drain connection: 1/8″ pipe thread
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size:
1 pint U.S. (0.5 liter)
1 quart U.S. (1 liter)
Materials:
Body: Aluminum
Yoke: Aluminum
Bowl: Aluminum
Liquid level indicator: Pyrex
Element: Sintered bronze or polypropylene
Elastomers: Synthetic rubber
An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics

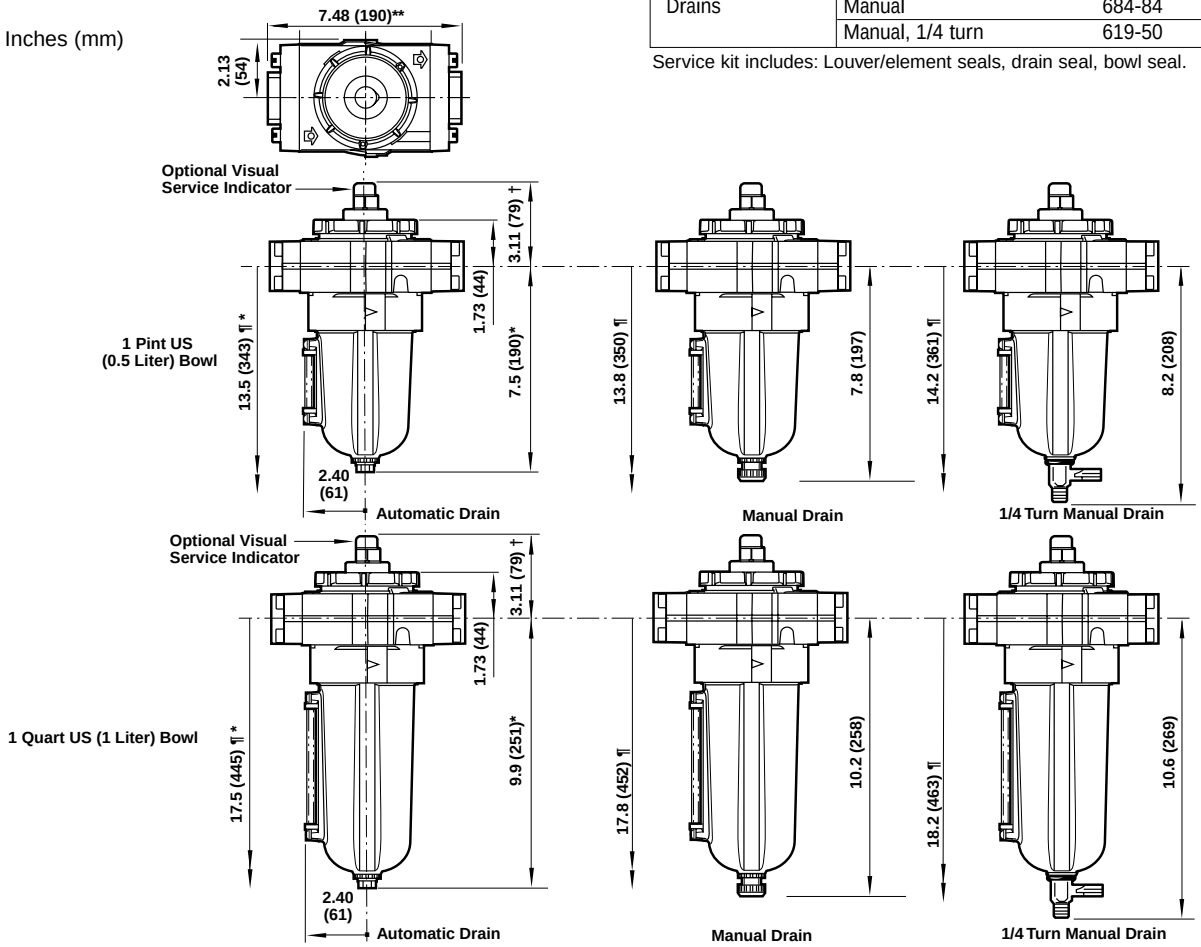



## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service Kit | Seal and gasket | 4380-300 |
| Replacement Elements | 5 µm (1 pint bowl) | 5576-97 |
| | 25 µm (1pint bowl) | 5576-98 |
| | 40 µm (1 pint bowl) | 5576-99 |
| | 5 µm (1 quart bowl) | 5311-01 |
| | 25 µm (1 quart bowl) | 5311-02 |
| | 40 µm (1 quart bowl) | 5311-03 |
| Replacement Sight Glass | 1 pint bowl | 4380-060 |
| | 1 quart bowl | 4380-061 |
| Replacement Drains | Automatic (G 1/8 outlet) | 3000-97 |
| | Automatic (1/8 NPT outlet) | 3000-10 |
| | Manual | 684-84 |
| | Manual, 1/4 turn | 619-50 |

Service kit includes: Louver/element seals, drain seal, bowl seal.

All Dimensions in Inches (mm)




† For optional electrical service life indicator add 0.20" (5 mm) .
** For 1-1/4" and 1-1/2" ported yokes, add 0.39" (10 mm).
*Dimension also applies to closed bottom bowl.
¶Minimum clearance required to remove bowl.

# 17 Series General Purpose Filter
# 3/4", 1", 1-1/4", 1-1/2" Port Sizes

- **Protects air operated devices by removing liquid and solid contaminants from compressed air**
- **Screw-on bowl reduces maintenance time**
- **Can be serviced without the use of tools or removal from the air line**
- **Optional visual service indicator turns from green to red when the filter element needs to be cleaned or replaced**
- **Optional electrical service indicator also available**

**Ordering Information.** Models listed include automatic drain, 40 µm element, metal bowl with sight glass, and PTF threads.

| Port Size | Model Numbers | Flow scfm (dm³/s)* | Weight lbs (kg) |
|---|---|---|---|
| 3/4" | F17-600-A3DA | 325 (153) | 4.26 (1.93) |
| 1" | F17-800-A3DA | 425 (201) | 4.15 (1.88) |
| 1-1/4" | F17-A00-A3DA | 425 (201) | 4.39 (1.99) |
| 1-1/2" | F17-B00-A3DA | 425 (201) | 4.30 (1.95) |

* Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

## Alternative Models

F 1 7 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Service Indicator | Substitute |
|---|---|
| With (visual) | 1 |
| With (electrical) | 4 |
| Without | 0 |

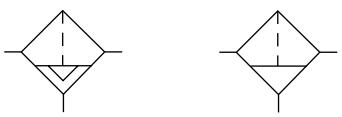
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| BSPP (1-1/2″ ported units only) | C |
| ISO G parallel (not available with 1-1/2″ ported units) | G |

| Bowl | Substitute |
|---|---|
| 1 quart (1 liter) metal with sight glass | D |
| 1 quart (1 liter) metal | M |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |
| 75 µm | 4 |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

## ISO Symbols



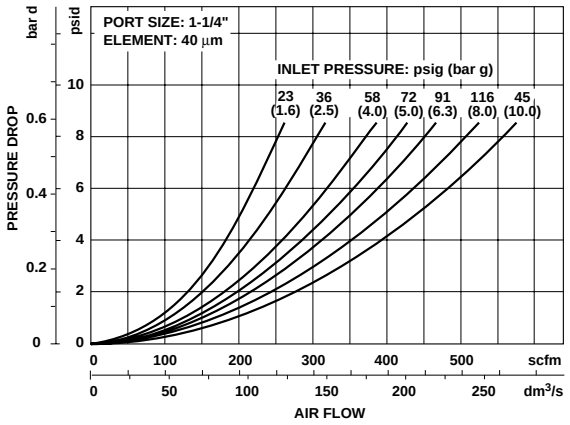
**Auto Drain** **Manual Drain**

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature:* -30° to 175°F (-34° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
Particle removal: 5 µm, 25 µm, 40 µm, or 75 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 425 scfm (201 $dm^3/s$)
Nominal bowl size: 1 quart (1 liter)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Materials
Body: Aluminum
Bowl: Aluminum
Bowl sight glass: Pyrex
Elastomers: Neoprene and nitrile
Filter element
5 µm: Sintered bronze
25 µm: Sintered bronze
40 µm: Sintered bronze
75 µm: Stainless steel screen
An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics

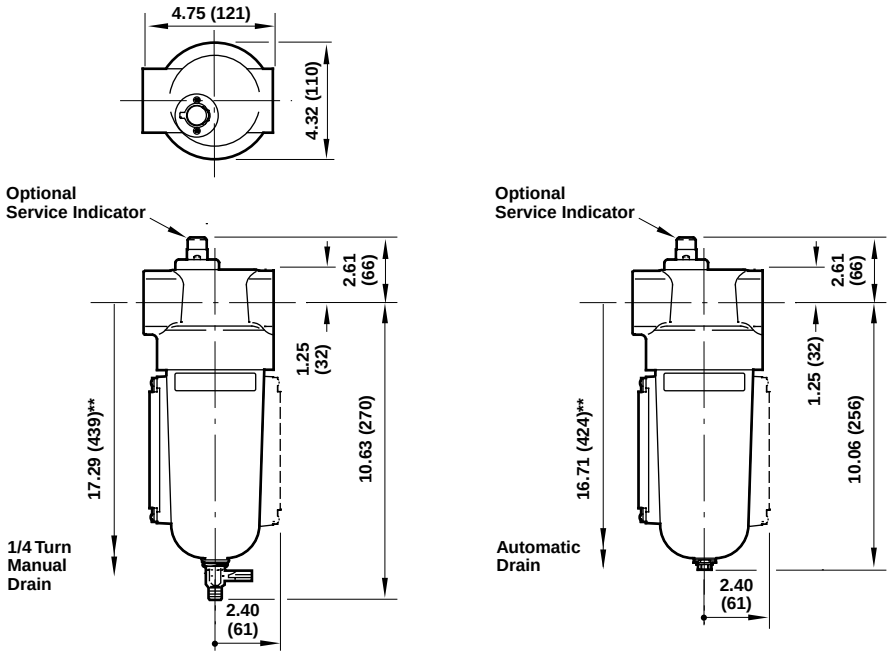



## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kits | All filters | 5578-05 |
| Replacement elements | 5 µm | 5311-01 |
| | 25 µm | 5311-02 |
| | 40 µm | 5311-03 |
| | 75 µm | 5656-01 |
| Replacement drain | Automatic | 3000-10 |
| | Manual (1/4 turn) | 619-50 |

Service kit 5778-05 includes bowl o-ring, drain gasket, and element gasket.

All Dimensions in Inches (mm)




** Minimum clearance required to remove bowl

## 18 Series General Purpose Filter
## 1-1/2" and 2" Port Sizes

- **Protects air operated devices by removing liquid and solid contaminants**
- **Highly visible, prismatic liquid level indicator lens**
- **Can be disassembled without removal from the air line**
- **Optional visual service indicator turns from green to red when the filter element needs to be cleaned or replaced**
- **Optional electrical service indicator also available**

**Ordering Information.** Models listed include automatic drain, 40 µm element, metal bowl with sight glass, and PTF threads.

| Port Size | Model Numbers | Flow scfm (dm³/s) * | Weight lbs (kg) |
|---|---|---|---|
| 1-1/2" | F18-B00-A3DA | 1400 (661) | 14.90 (6.76) |
| 2" | F18-C00-A3DA | 1400 (661) | 14.65 (6.65) |

* Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop.

### Alternative Models

F 1 8 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1-1/2" | B |
| 2" | C |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Service Indicator | Substitute |
|---|---|
| Without | 0 |
| With pneumatic | 1 |
| With electrical | 4 |

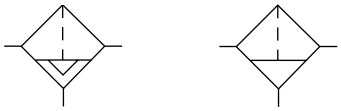
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Bowl | Substitute |
|---|---|
| Metal with sight glass | D |
| Metal | M |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |
| 100 µm | 4 |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual 1/4 turn | M |

### ISO Symbols



**Auto Drain** **Manual Drain**

**See Section ALE-24 for Accessories**

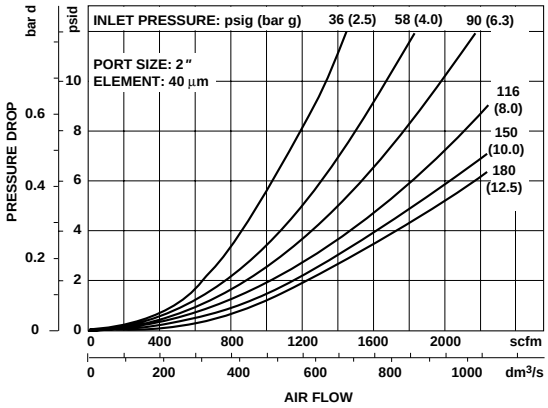
## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, 40 µm or 100 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with a 40 µm element at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 1300 scfm (614 $dm^3/s$)Nominal bowl size: 7 fluid ounce (0.2 liter)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Materials
Body: Aluminum
Intermediate body: Aluminum
Bowl: Aluminum
Metal bowl liquid level indicator: Transparent nylon
Filter element: Sintered bronze
Elastomers: Neoprene and nitrile
An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics

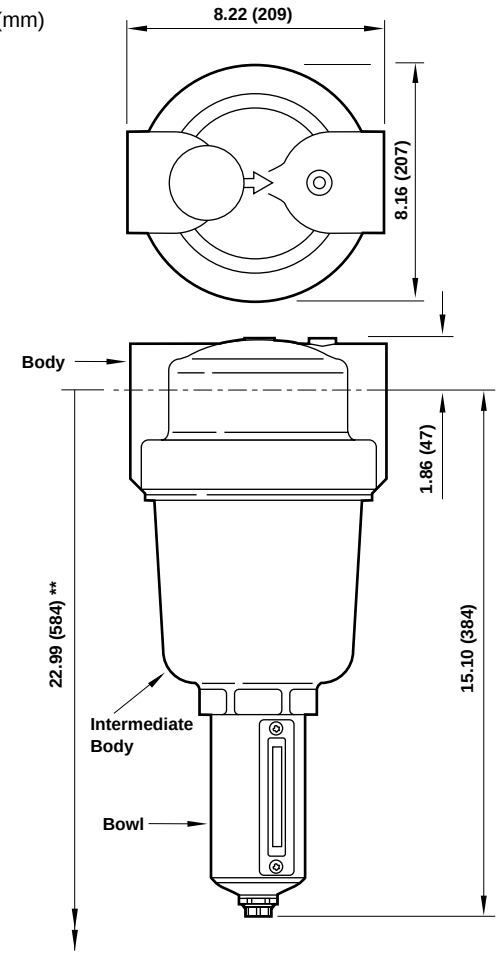



## Service Kits

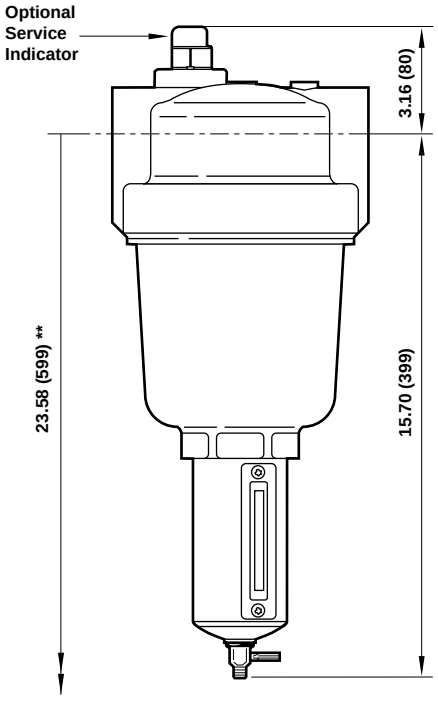
| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & Gasket | 5945-50 |
| Replacement elements | 5 µm | 5882-11 |
| | 25 µm | 5882-12 |
| | 40 µm | 5882-13 |
| | 100 µm | 5882-14 |
| Liquid level lens kit | Prismatic | 4380-050 |
| Replacement drains | Automatic | 3000-10 |
| | Manual quarter turn | 619-50 |

Service kit contains body o-ring, element gasket, automatic drain gasket, and bowl o-ring.

All Dimensions in Inches (mm)




Automatic Drain




1/4 Turn Manual Drain

** Minimum clearance required to remove intermediate body and bowl.

# Oil Removal (Coalescing) Filters

## Port sizes from 1/8" to 2"



F39

F72C

F73C

F74C/H

F64C/H

F68

F46

F47

# Miniature Series 07 Oil Removal (Coalescing) Filter 1/8" and 1/4" Port Sizes

- **Compact design**
- **High efficiency oil and particle removal**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering Information.** Models listed include PTF threads, automatic drain and transparent bowl.

| Port Size | Model Numbers | Saturated Flow* Flow scfm ($dm^3/s$) | Dry Flow Flow scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|---|
| 1/8" | F39-100-A0TA | 6.0 (2.8) | 11.2 (5.3) | 0.28 (0.13) |
| 1/4" | F39-200-A0TA | 6.4 (3.0) | 12.2 (5.8) | 0.28 (0.13) |

* Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

## Alternative Models

F 3 9 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8" | 1 |
| 1/4" | 2 |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

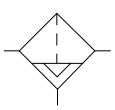
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Bowl | Substitute |
|---|---|
| Transparent | T |
| Metal | M |

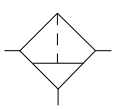
| Element | Substitute |
|---|---|
| Coalescing | 0 |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

## ISO Symbols



Automatic and Semi Automatic Drain



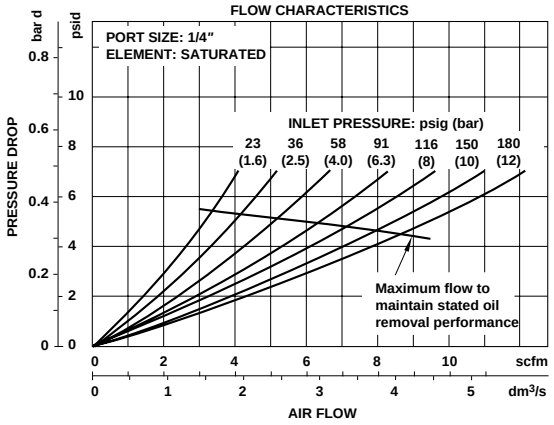
Manual Drain

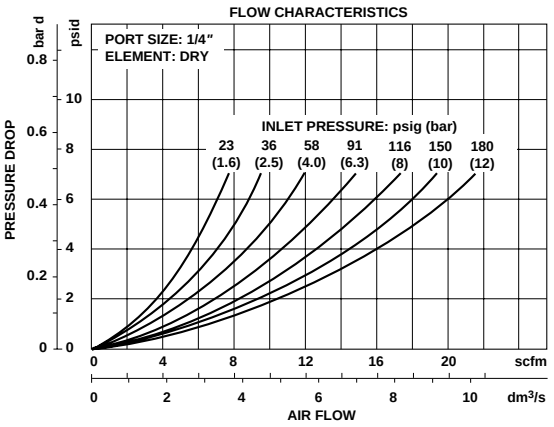
**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure:
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature:*
Transparent bowl: -30° to 125°F (-34° to 50°C)
Metal bowl: -30° to 150°F (-34° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 2°C (35°F)
Particle removal: Down to 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
Maximum remaining oil content of air leaving the filter: 0.01ppm at 70°F (21°C) with an inlet oil concentration of 17 ppm.
Maximum flow with 90 psig (6.3 bar) inlet pressure†:
1/8 ports, 6.0 scfm (2.8 $dm^3/s$)
1/4 ports, 6.4 scfm (3 $dm^3/s$)
† Maximum flow to maintain stated oil removal performance.
Nominal bowl size: 1 fluid ounce (31 ml)
Drain connection: 1/8″ pipe thread
Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.
Materials:
Body: Zinc
Bowl:
Transparent: Polycarbonate
Metal: Zinc
Element: Synthetic fiber and polyurethane foam
Elastomers: Neoprene & nitrile

## Typical Performance Characteristics



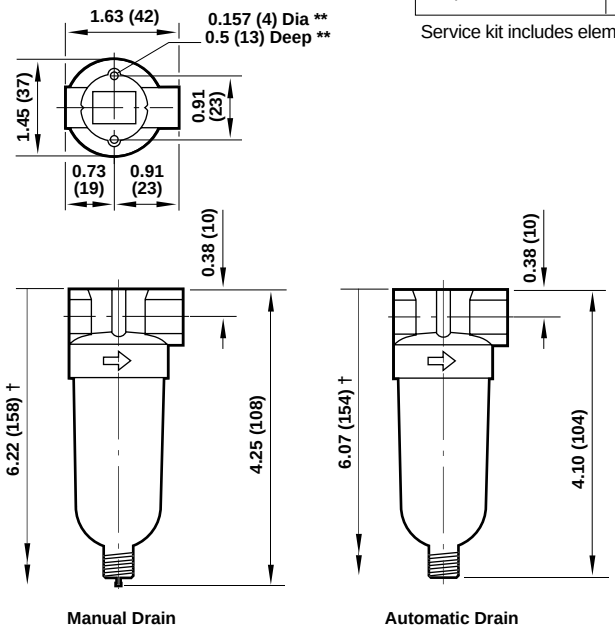




## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | All models | 4141-10 |
| Replacement drains | Manual | 773-03 |
| | Automatic | 3654-02 |

Service kit includes element, element o-ring, and bowl o-ring.

All Dimensions in Inches (mm)




** Mounting holes
† Minimum clearance to remove bowl

# F72C

## Excelon F72C Oil Removal Filter (Coalescing) 1/4" and 3/8" Port Sizes

- **Excelon design allows in-line or modular installation**
- **High efficiency oil and particle removal**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens on metal bowls**
- **Standard visual service life indicator turns from green to red when the filter element needs to be replaced**
- **Optional electrical service indicator also available**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

Install an F72G filter with a 5 µm filter element upstream of the F72C filter for optimum coalescing element life.

**Ordering Information.** Models listed include PTF threads, service life indicator, automatic drain, transparent bowl without guard.

| Port Size | Model | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | F72C-2AD-AL0 | 9.5 (4.5) | 1.2 (0.54) |
| 3/8" | F72C-3AD-AL0 | 9.5 (4.5) | 1.2 (0.54) |

† Maximum flow with 90 psig (6.3 bar) inlet pressure, to maintain stated oil removal performance.

### Alternative Models

F 7 2 C - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

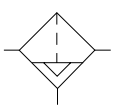
| Service Life Indicator | Substitute |
|---|---|
| With (visual) | D |
| With (electrical) | E |
| Without | N |

| Element | Substitute |
|---|---|
| Coalescing | 0 |

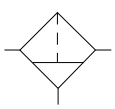
| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | E |
| Transparent without guard | L |
| Transparent with guard | W |

| Drain | Substitute |
|---|---|
| 1/4 turn manual | Q |
| Semi automatic | S |
| Auto drain* | A |

### ISO Symbols



Automatic and Semi Automatic Drain



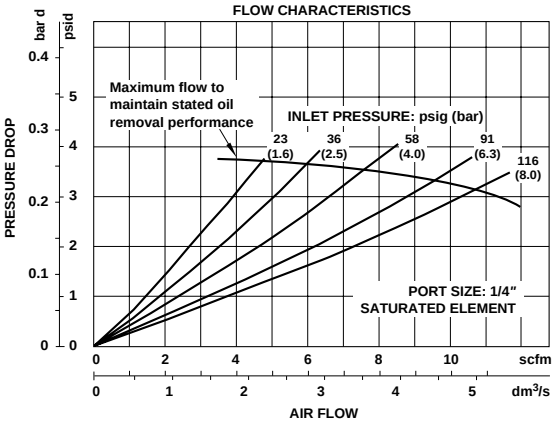
Manual Drain

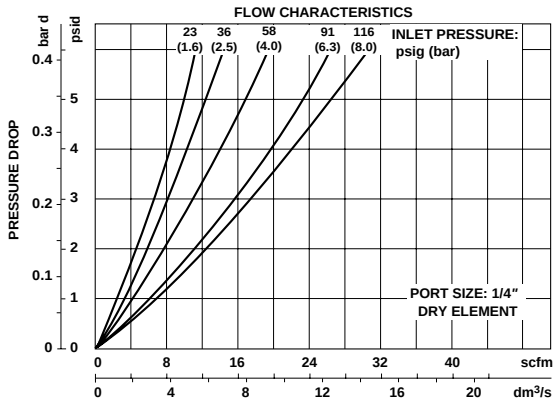
**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure:
Transparent bowl: Manual or semi automatic drain: 150 psig (10 bar)
Automatic drain: 116 psig (8 bar)
Metal bowl: Manual or semi automatic drain: 250 psig (17 bar)
Automatic drain: 116 psig (8 bar)
Operating temperature*: Transparent bowl: -30° to 125°F (-34° to 50°C)
Metal bowl: -30° to 150°F (-34° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
Maximum remaining oil content in outlet air:
0.01 ppm at 70°F (21°C) with an inlet concentration of 17 ppm.
Maximum flow with 90 psig (6.3 bar) inlet pressure**: 9.5 scfm (4.5 $dm^3/s$)
** Maximum flow to maintain stated oil removal performance.
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Semi automatic drain connection: Push on 5/16" (8 mm) ID tube
Semi automatic drain operating conditions (pressure operated):
Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)
Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)
Minimum air flow required to close drain: 1 scfm (0.5 $dm^3/s$)
Manual operation: Lift stem to drain bowl
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size
Long bowl: 2.2 fluid ounce (65 ml)
Materials
Body: Zinc
Bowl
Transparent: Polycarbonate
Guard for transparent bowl: Zinc
Metal: Zinc
Metal bowl liquid level indicator lens: Transparent nylon
Element: Synthetic fiber and polyurethane foam
Elastomers: Neoprene and nitrile
Service life indicator
Body: transparent nylon.
Internal parts: acetal.
Spring: stainless steel.
Elastomers nitrile
An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics



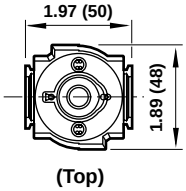




## Service Kits

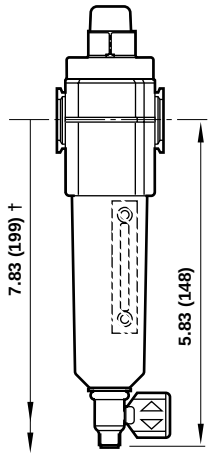
| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal and gasket | 4380-500 |
| Element | Coalescing | 5925-09 |
| Liquid level lens kit | Prismatic | 4380-030 |
| Replacement drains | 1/4 turn manual | 619-50 |
| | Semi automatic | 5379-RK |
| | Automatic | 4000-50R |

Service kit includes bowl o-rings.

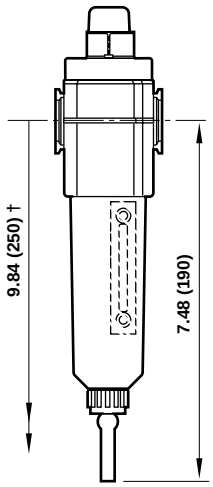
All Dimensions in Inches (mm)



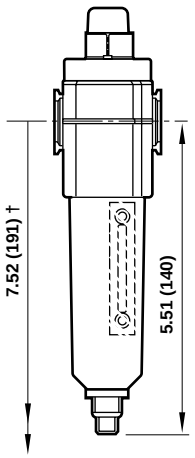

(Top)




Bowl with 1/4 Turn Manual Drain




Bowl with Semi auto Drain




Bowl with Automatic Drain

† Minimum clearance required to remove bowl.

## Excelon 73C Oil Removal Filter (Coalescing) 1/4", 3/8", and 1/2" Port Sizes

- **Excelon design allows in-line or modular installation**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Standard mechanical service indicator turns from green to red when the filter element needs to be replaced**
- **Optional electrical service indicator provides electrical output when the filter element needs to be replaced**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

Install an F73G pre-filter with a 5 µm filter element upstream of the F73C filter for optimum coalescing element life.


**Ordering Information.** Models listed include PTF threads, service indicator, automatic drain, and a metal bowl with liquid level indicator.

| Port Size | Model | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | F73C-2AD-AD0 | 21.2 (10.0) | 1.2 (0.54) |
| 3/8" | F73C-3AD-AD0 | 21.2 (10.0) | 1.2 (0.54) |
| 1/2" | F73C-4AD-AD0 | 21.2 (10.0) | 1.2 (0.54) |

† Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

### Alternative Models

F 7 3 C - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

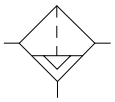
| Service Indicator | Substitute |
|---|---|
| With electrical service indicator | E |
| With mechanical service indicator | D |
| Without | N |

| Element | Substitute |
|---|---|
| Coalescing | 0 |

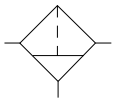
| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |
| Transparent | T |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1/4 turn | Q |

### ISO Symbols



Automatic and Semi Automatic Drain



Manual Drain

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*
- Transparent bowl: -30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

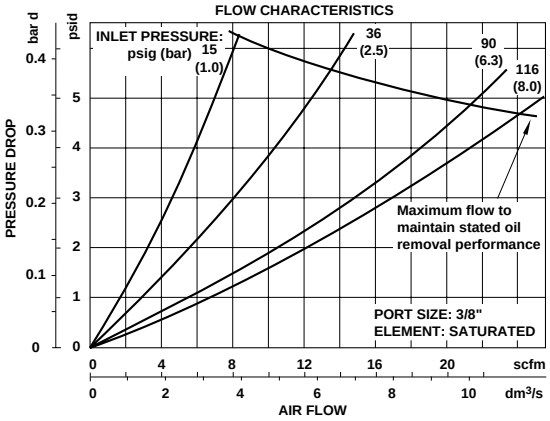
Particle removal: Down to 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (20°C) with an inlet concentration of 17 ppm
Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance: 21.2 scfm (10 $dm^3/s$)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

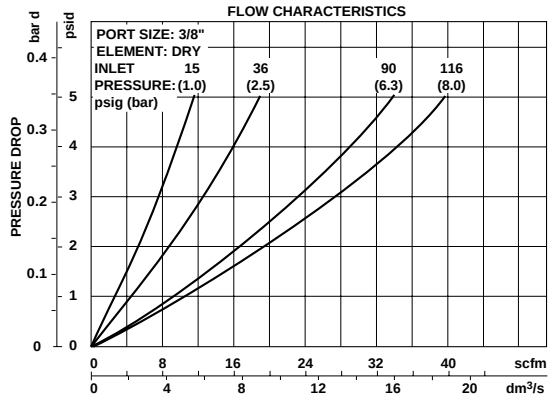
Nominal bowl size: 3.5 fluid ounce (0.1 liter)
Filter materials
- Body: Aluminum
- Bowl
  - Transparent: Polycarbonate
  - Transparent with guard: Polycarbonate, steel guard
  - Metal: Aluminum
  - Metal bowl liquid level indicator lens: Transparent nylon
- Element: Synthetic fiber and polyurethane foam
- Elastomers: Neoprene and nitrile

Mechanical service indicator materials
- Body: Transparent nylon
- Internal parts: Acetal
- Spring: Stainless steel
- Elastomers: Nitrile

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics



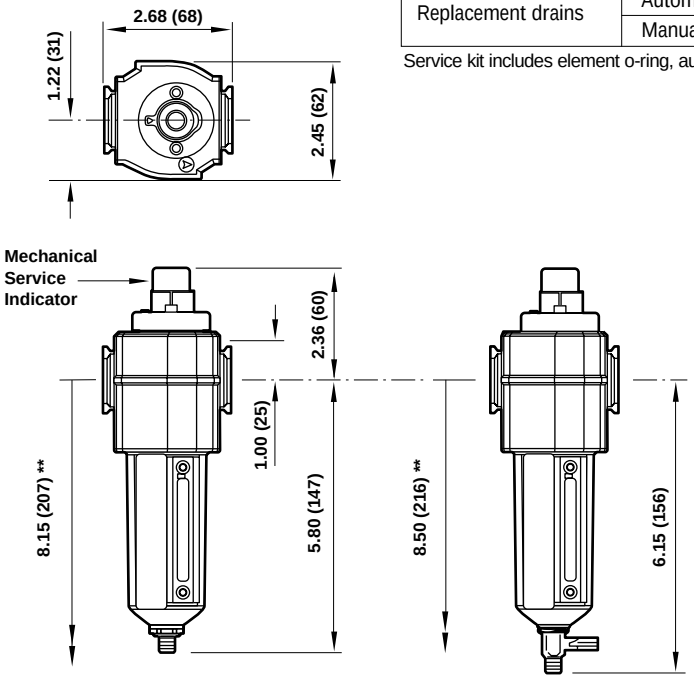




## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & Gasket | 4380-602 |
| Replacement elements | Coalescing | 4444-01 |
| Liquid level lens kit | Prismatic | 4380-020 |
| Replacement drains | Automatic | 4000-51R |
| | Manual quarter turn | 619-50 |

Service kit includes element o-ring, automatic drain seal and bowl o-ring.

All Dimensions in Inches (mm)




** Minimum clearance required to remove bowl.

# F74C/H

## Excelon 74 Oil Removal Filters (Coalescing) 3/8", 1/2", and 3/4" Port Sizes

- **Excelon design allows in-line or modular installation**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Standard visual service indicator turns from green to red when the filter element needs to be replaced**
- **Optional electrical service indicator provides electrical output when the filter element needs to be replaced**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

Install an F74G pre-filter with a 5 µm filter element upstream of the F74C and F74H filters for optimum coalescing element life.


**Ordering Information.** Models listed include PTF threads, service indicator, automatic drain, and a metal bowl with liquid level indicator.

| Main Port Size | Body and Element | Model Number | Maximum Flow* scfm ( $dm^3/s$) | Weight lb (kg) |
|---|---|---|---|---|
| 3/8" | Standard | F74C-3AD-AD0 | 33.9 (16.0) | 1.88 (0.85) |
| 1/2" | Standard | F74C-4AD-AD0 | 33.9 (16.0) | 1.84 (0.83) |
| 1/2" | High Flow | F74H-4AD-AD0 | 59.3 (28.0) | 2.45 (1.11) |
| 3/4" | High Flow | F74H-6AD-AD0 | 59.3 (28.0) | 2.40 (1.10) |

* Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

### Alternative Models

F 7 4 ★ - ★ ★ ★ - ★ ★ ★

| Body and Element | Substitute |
|---|---|
| Standard* | C |
| High Flow** | H |

| Port Size | Substitute |
|---|---|
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Service Life Indicator | Substitute |
|---|---|
| With (visual) | D |
| With (electrical) | E |
| Without | N |

* available with 3/8″ or 1/2″ ports
** available with 1/2″ or 3/4″ ports

| Element | Substitute |
|---|---|
| Coalescing | 0 |

| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual 1⁄4 turn | Q |

### Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal and gasket | 4380-730 |
| Replacement elements | Standard | 4344-01 |
| | High flow | 4344-02 |
| Liquid level kit | Prismatic | 4380-050 |
| Replacement drains | Automatic (1/8 NPT outlet) | 3000-10 |
| | Manual quarter turn | 619-50 |

Service kits include element seal, bowl seal and drain seal.

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*
- Transparent bowl: -30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

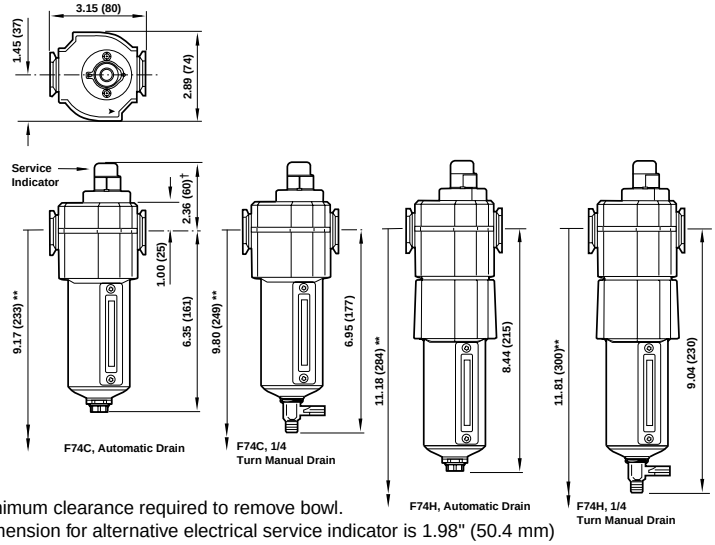
Particle removal: Down to 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (20°C) with an inlet concentration of 17 ppm
Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance
- F74C: 33.9 scfm (16 $dm^3/s$)
- F74H: 59.3 scfm (28 $dm^3/s$)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 7 fluid ounce (0.2 liter)
Materials
- Body: Aluminum
- Bowl
  - Transparent: Polycarbonate with steel bowl guard
  - Metal: Aluminum
- Metal bowl liquid level indicator lens: Transparent nylon
- Element: Synthetic fiber and polyurethane foam
- Elastomers: Neoprene and Nitrile
- Service indicator
  - Body: Transparent nylon
  - Internal parts: Acetal
  - Spring: Stainless steel
  - Elastomers: Nitrile

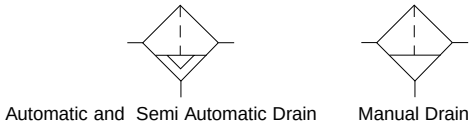
An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

All Dimensions in Inches (mm)

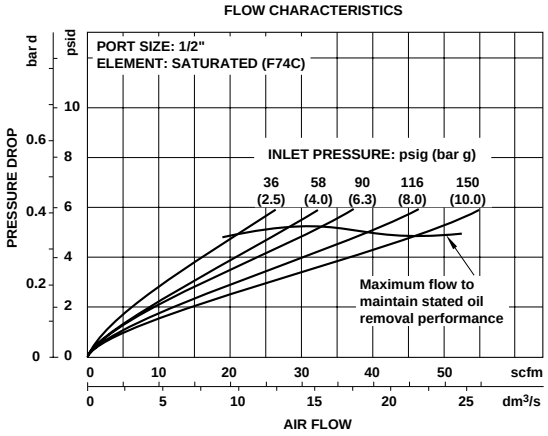


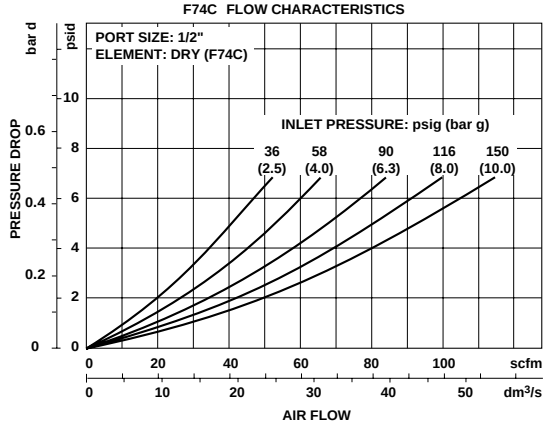

** Minimum clearance required to remove bowl.
† Dimension for alternative electrical service indicator is 1.98" (50.4 mm)

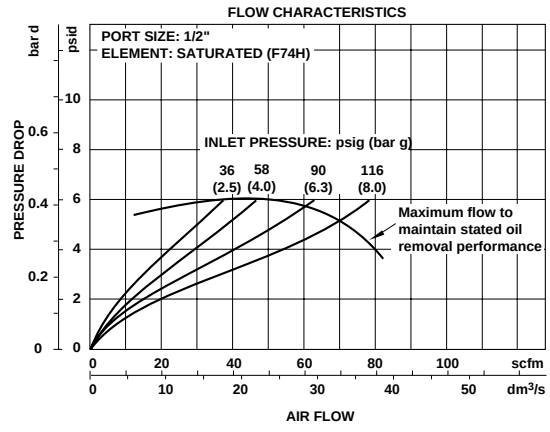
## ISO Symbols

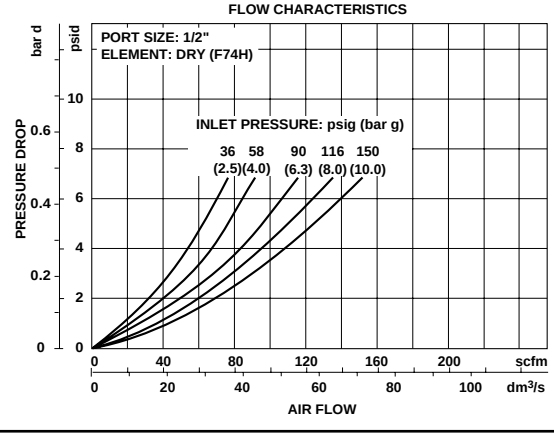



## Typical Performance Characteristics



# F64C/H

## Olympian Plus Puraire High Efficiency Oil Removal Filter 1/4", 3/8", 1/2", and 3/4" Port Sizes

- **Olympian Plus plug in design**
- **High efficiency oil and particle removal**
- **Quick release bayonet bowl**
- **High visibility prismatic sight glass**
- **Coalescing element service indicator**

Install an F64G pre-filter with a 5 µm filter element upstream of the F64C filter for optimum coalescing element life.


**Ordering Information.** Models listed include PTF threads, service indicator, automatic drain, and metal bowl.

| Drain Type | Port Size | F64C/H (only) Model | Maximum Flow* scfm ( $dm^3/s$) | Weight lb (kg) |
|---|---|---|---|---|
| Automatic | 1/4" | F64C-2AD-AD0 | 34 (16) | 3.26 (1.48) |
| | 3/8" | F64H-3AD-AD0 | 60 (28) | 3.75 (1.70) |
| | 1/2" | F64H-4AD-AD0 | 60 (28) | 3.68 (1.67) |
| | 3/4" | F64H-6AD-AD0 | 60 (28) | 4.43 (2.01) |

For replacement Filter (without yoke or pre-filter) substitute 'N' at the 5th and 6th digits eg: F64H-**NN**D-AD0.

* Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

### Alternative Models

F 6 4 ★ - ★ ★ ★ - ★ ★ ★

| Body type | Substitute |
|---|---|
| For 1/4 | C |
| For 3/8, 1/2, 3/4 | H |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

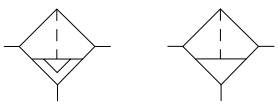
| Element | Substitute |
|---|---|
| Coalescing | 0 |

| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |

| Drain | Substitute |
|---|---|
| Manual, 1/4 turn | Q |
| Auto drain | A |

| Service Life Indicator | Substitute |
|---|---|
| With (visual) | D |
| Without | N |
| With (electrical)† | E |

### ISO Symbols



Automatic and Semi Automatic Drain | Manual Drain

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to +150°F (-20° to +65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).

Particle removal: 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content).
Maximum remaining oil content: 0.01 mg/$m^3$ at +70°F (+20°C) with an inlet concentration of 17 mg/$m^3$.
Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance:
1/2″ ports: 74 scfm (35 $dm^3$/s)
3/4″ ports: 74 scfm (35 $dm^3$/s)
1″ ports: 127 scfm (60 $dm^3$/s)
1/4 turn manual drain connection: 1/8″ pipe thread
Automatic drain connection: 1/8″ pipe thread
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 2 scfm (1 $dm^3$/s)
Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size:
1 pint U.S. (0.5 liter)
1 quart U.S. (1 liter)
Materials:
Body: Aluminum
Yoke: Aluminum
Bowl: Aluminum
Liquid level indicator: Pyrex
Element: Synthetic fibre and polyurethane foam
Elastomers: Synthetic rubber
Service life indicator:
Body: Transparent nylon
Internal parts: Acetal
Spring: Stainless steel
Elastomers Nitrile
An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics

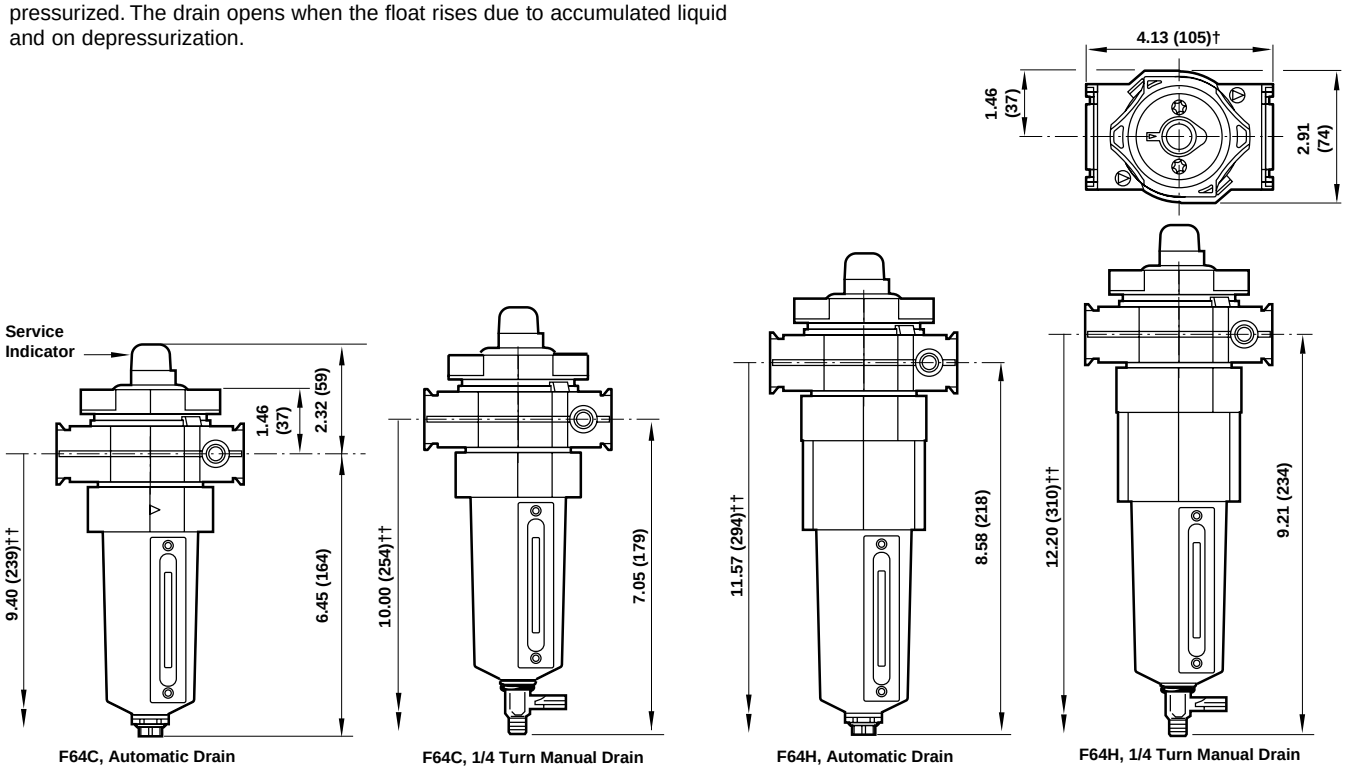
| Inlet Pressure | | Maximum Flow† | | | |
|---|---|---|---|---|---|
| | | F64C | | F64H | |
| psig | (bar) | scfm | ($dm^3$/s) | scfm | ($dm^3$/s) |
| 15 | (1) | 14 | (6.4) | 24 | (11.2) |
| 45 | (3) | 23 | (11.0) | 41 | (19.3) |
| 70 | (5) | 30 | (14.3) | 53 | (24.9) |
| 90 | (6.3) | 34 | (16.0) | 59 | (28.0) |
| 100 | (7) | 36 | (16.9) | 63 | (29.5) |
| 130 | (9) | 40 | (19.1) | 71 | (33.5) |

† Maximum flow to maintain stated oil removal performance.

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | F64C/H | 4380-200 |
| Service kit (pre-filter) | F64G | 4380-200 |
| Element F64G (pre-filter) | 5 µm | 4338-01 |
| Element F64C | Coalescing | 4344-01 |
| Element F64H | Coalescing | 4344-02 |
| Replacement sight glass | Prismatic (standard) | 4380-040 |
| | Pyrex | 4380-041 |
| Replacement drains | Automatic | 3000-97 |
| | Manual | 684-84 |

Service kit includes port seals, louver o-ring, bowl o-ring and drain gasket.




F64C, Automatic Drain | F64C, 1/4 Turn Manual Drain | F64H, Automatic Drain | F64H, 1/4 Turn Manual Drain

† 6.18" (157) for 3/4" ports.
†† Minimum clearance required to remove unit.

# F68C/H

**68 Series Oil Removal (Coalescing) Filter**
**1/2", 3/4", and 1" Port Sizes**

- **Olympian Plus plug-in system**
- **Coalescing element provides high efficiency oil and particle removal**
- **Standard visual service indicator turns from green to red when the filter element needs to be replaced**
- **Oil and dirt contamination in outlet air within ISO 8573-1: Quality Class 1.7.2**
- **Factory optional electrical service life indicator provides electrical output when the filter element needs to be replaced - see page ALE-25-23**

Install an F68G pre-filter with a 5 µm filter element upstream of the F68C/H filter for optimum coalescing element life.


**Ordering Information.** Models listed include a yoke with PTF threads, filter with service life indicator, automatic drain, and bowl with liquid level indicator.

| Port Size | Type | Model | Weight lb (kg) |
|---|---|---|---|
| 1/2 | Standard flow (short element) | F68C-4AD-AR0 | 5.19 (2.36) |
| 3/4 | High flow (long element) | F68H-6AD-AU0 | 5.85 (2.66) |
| 1 | High flow (long element) | F68H-8AD-AU0 | 5.72 (2.60) |

## Alternative Models

F 6 8 ★ - ★ ★ ★ - ★ ★ ★

| Flow | Substitute |
|---|---|
| Standard, 1 pint (0.5 liter bowl) | C |
| High, 1 quart (1 liter) bowl | H |

| Port Size | Substitute |
|---|---|
| 1/2" | 4* |
| 3/4" | 6 |
| 1" | 8 |
| None | N |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |
| None | N |

| Service Life Indicator | Substitute |
|---|---|
| Visual | D |
| Electrical | E |
| Without | N |

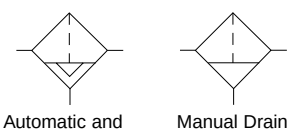
| Element | Substitute |
|---|---|
| Coalescing | 0 |

| Bowl | Substitute |
|---|---|
| 1 quart (1 liter) without liquid level indicator | C** |
| 1 pint (0.5 liter) without liquid level indicator | M* |
| 1 pint (0.5 liter) with liquid level indicator | R* |
| 1 quart (1 liter) with liquid level indicator | U** |

| Drain | Substitute |
|---|---|
| Automatic | A |
| No drain (Closed bowl) | E |
| Manual | M |
| Manual, 1/4 turn | Q |

* Only available with F68C.
** Only available with F68H.

### ISO Symbols



Automatic and Semi Automatic Drain | Manual Drain

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to +150°F (-20° to +65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).

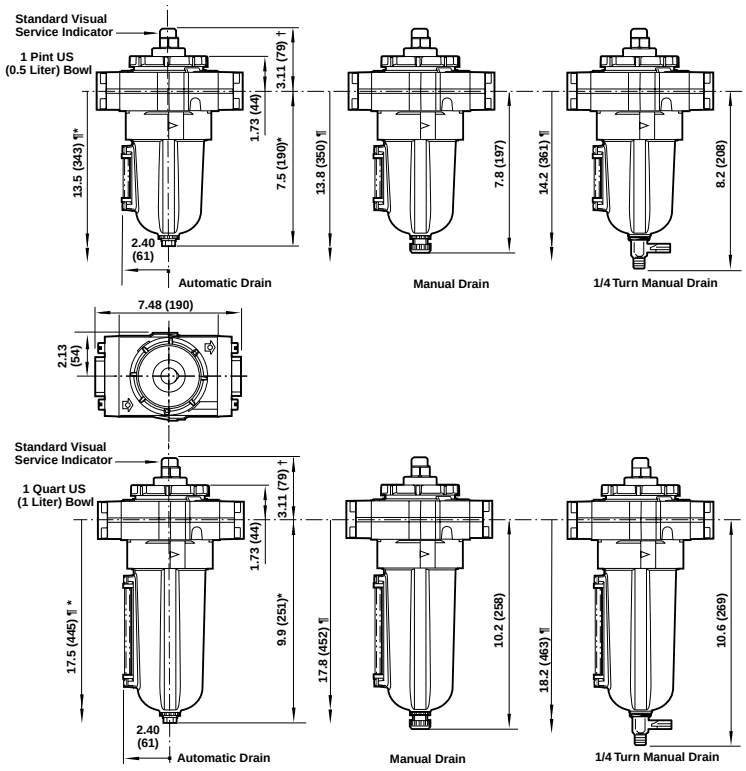
Particle removal: 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content).
Maximum remaining oil content: 0.01 mg/m$^3$ at +70°F (+20°C) with an inlet concentration of 17 mg/m$^3$.
Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance:
- 1/2″ ports: 74 scfm (35 dm$^3$/s)
- 3/4″ ports: 74 scfm (35 dm$^3$/s)
- 1″ ports: 127 scfm (60 dm$^3$/s)

1/4 turn manual drain connection: 1/8″ pipe thread
Automatic drain connection: 1/8″ pipe thread
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 dm$^3$/s)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size:
- 1 pint U.S. (0.5 liter)
- 1 quart U.S. (1 liter)

Materials:
- Body: Aluminum
- Yoke: Aluminum
- Bowl: Aluminum
- Liquid level indicator: Pyrex
- Element: Synthetic fibre and polyurethane foam
- Elastomers: Synthetic rubber
- Service life indicator:
  - Body: Transparent nylon
  - Internal parts: Acetal
  - Spring: Stainless steel
  - Elastomers Nitrile

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

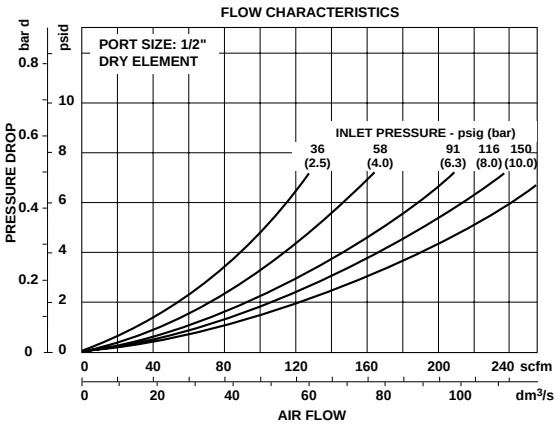


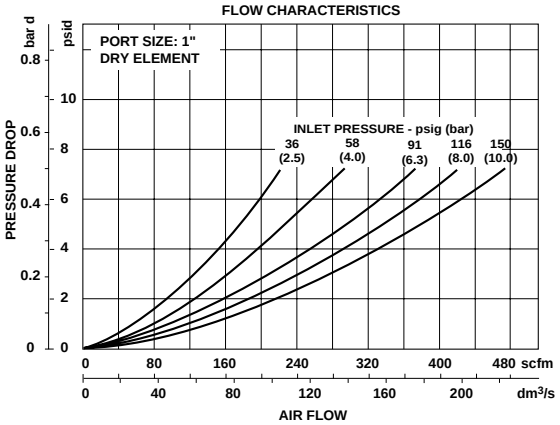

† For optional electrical service life indicator, add 0.02" (5 mm). * Dimension also applies to closed bottom bowl.
¶ Minimum clearance required to remove bowl.

## Typical Performance Characteristics

| Inlet Pressure | | Maximum Flow* F68C 1/2″ Ports | | F68H 3/4″ Ports | | F68H 1″ Ports | |
|---|---|---|---|---|---|---|---|
| psig | (bar) | scfm | (dm$^3$/s) | scfm | (dm$^3$/s) | scfm | (dm$^3$/s) |
| 15 | (1) | 30 | (14) | 30 | (14) | 51 | (24) |
| 45 | (3) | 51 | (24) | 51 | (24) | 87 | (41) |
| 70 | (5) | 66 | (31) | 66 | (31) | 112 | (53) |
| 90 | (6.3) | 74 | (35) | 74 | (35) | 127 | (60) |
| 100 | (7) | 78 | (36.7) | 78 | (36.7) | 133 | (63) |
| 130 | (9) | 89 | (42) | 89 | (42) | 153 | (72) |

* Maximum flow to maintain stated oil removal performance.




## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service Kit | Seal and gasket | 4380-301 |
| Replacement Elements | Standard flow (F68C) | 5351-08 |
| | High flow (F68H) | 5351-03 |
| Replacement Sight Glass | 1 pint US (0.5 liter) | 4380-060 |
| | 1 quart US (1 liter) | 4380-061 |
| Replacement Drains | Automatic (G 1/8 outlet) | 3000-04 |
| | Automatic (1/8 NPT outlet) | 3000-03 |
| | Manual | 684-84 |
| | Manual, 1/4 turn | 619-50 |

Service kit Includes element seal, bowl seal, drain seal.

# F46 Oil Removal (Coalescing) Filter 3/4", 1", and 1-1/4" Port Sizes

- **High efficiency oil and particle removal**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**
- **Standard service indicator turns from green to red when the filter element needs to be replaced**

**NOTE:** Install an F17 filter with a 5 µm filter element upstream of the F46 filter for maximum service life.

**Ordering Information.** Models listed include service indicator, automatic drain, metal bowl with sight glass, and PTF threads.

| Port Size | Model Numbers | Maximum Flow* scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| 3/4" | F46-601-A0DA | 90 (42) | 4.11 (1.86) |
| 1" | F46-801-A0DA | 125 (59) | 4.05 (1.84) |
| 1-1/4" | F46-A01-A0DA | 125 (59) | 4.29 (1.95) |

* Maximum flow for oil-saturated element at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

## Alternative Models

F 4 6 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/4" | 6 |
| 1" | 8 |
| 1-1/4" | A |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Service Life Indicator | Substitute |
|---|---|
| Without | 0 |
| With (visual) | 1 |
| With (electrical) | 4 |

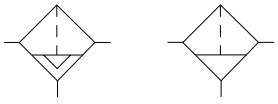
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Bowl | Substitute |
|---|---|
| Metal with sight glass | D |
| Metal | M |

| Element | Substitute |
|---|---|
| Coalescing | 0 |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

## ISO Symbols



Automatic and Semi Automatic Drain | Manual Drain

**See Section ALE-24 for Accessories**

## Technical Data

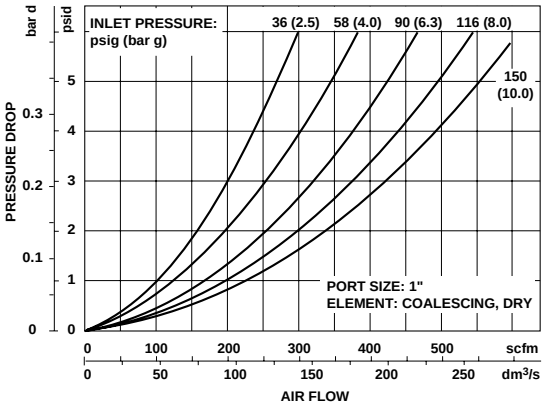
Fluid: Compressed air
Maximum pressure: 250 psig (17 bar )
Operating temperature:* -30° to 150°F (-34° to 65°C )
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
Particle removal: Down to 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
Maximum remaining oil content in outlet air: 0.01ppm at 70°F (20°C) with an inlet oil concentration of 17 ppm.
Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance:
- 3/4" ports: 90 scfm (42 $dm^3/s$)
- 1" ports: 125 scfm (59 $dm^3/s$)
- 1-1/4" ports: 125 scfm (59 $dm^3/s$)

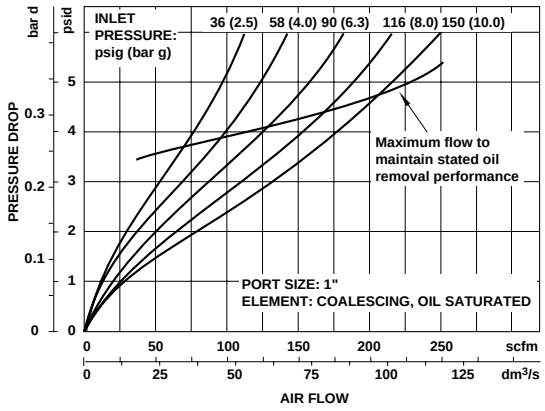
Nominal bowl size: 1 quart US (1 liter)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Materials
- Body: Aluminum
- Bowl: Aluminum
- Bowl sight glass: Pyrex
- Elastomers: Neoprene and nitrile
- Filter element: Synthetic fiber and polyurethane foam

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristic



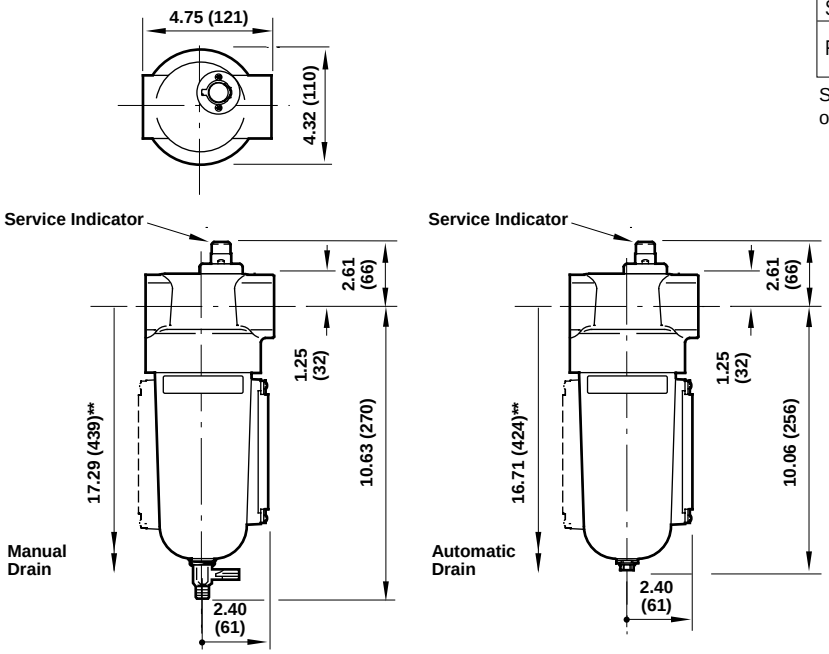




## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | O-ring, gaskets & element | 5351-04 |
| Replacement drains | Automatic (1/8 NPT outlet) | 3000-18 |
| | Manual (1/4 Turn) | 619-50 |

Service kit contains coalescing element, element o-ring, bowl o-ring, and drain gasket.

All Dimensions in Inches (mm)




** Minimum clearance required to remove bowl.

# F47

## 18 Series Oil Removal Filter (Coalescing) 1-1/2" and 2" Port Sizes

- **High efficiency oil and particle removal**
- **Highly visible, prismatic liquid level indicator lens**
- **Patented quarter turn manual drain**
- **Can be disassembled without removal from the air line**
- **Standard service indicator turns from green to red when the filter element needs to be replaced**
- **Optional electrical service indicator also available**

**Ordering Information.** Models listed include service indicator, automatic drain, metal bowl with sight glass, and PTF threads.

| Port Size | Body and Element | Model Numbers | Flow scfm ($dm^3/s$)* | Weight lbs (kg) |
|---|---|---|---|---|
| 1-1/2" | Standard | F47-B01-A0DA | 250 (118) | 15.51 (7.04) |
| 2" | Standard | F47-C01-A0DA | 300 (142) | 14.26 (6.47) |
| 2" | High Flow | F47-C21-A0DA | 600 (283) | 22.17 (10.06) |

* Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

### Alternative Models

F 4 7 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1-1/2″ | B |
| 2″ | C |

| Option | Substitute |
|---|---|
| Standard body and element | 0 |
| High flow body and element (use only with 2″ ports) | 2 |

| Service Indicator | Substitute |
|---|---|
| Without | 0 |
| With (visual) | 1 |
| With (electrical) | 4 |

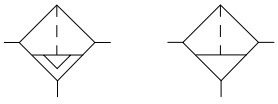
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Bowl | Substitute |
|---|---|
| Metal with sight glass | D |
| Metal | M |

| Element | Substitute |
|---|---|
| Coalescing | 0 |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1/4 turn | M |

### ISO Symbols



Automatic and Semi Automatic Drain

Manual Drain

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature:* -30° to 150°F (-34° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: Down to 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (20°C) with an inlet concentration of 17 ppm
Maximum flow for oil-saturated element at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance
- 1-1/2" Ports: 250 scfm (118 $dm^3/s$)
- 2" Ports: 300 scfm (142 $dm^3/s$)
- 2" Ports, high flow element: 600 scfm (283 $dm^3/s$)

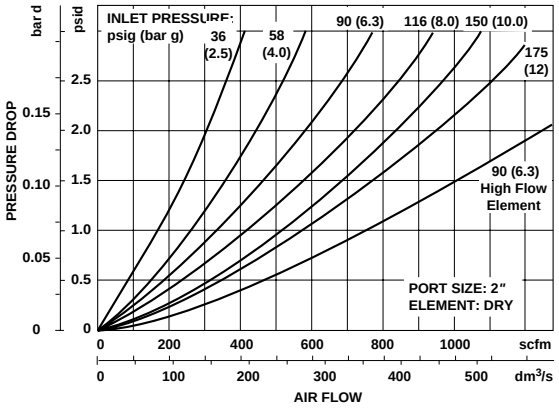
Typical flow for dry element at 90 psig (6.3 bar) inlet pressure and 5 psid (0.3 bar) pressure drop
- 1-1/2" Ports: 780 scfm (368 $dm^3/s$)
- 2" Ports: 830 scfm (392 $dm^3/s$)
- 2" Ports, high flow element: 2300 scfm (1086 $dm^3/s$)

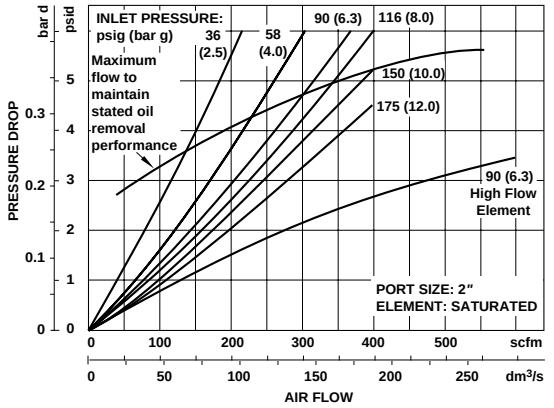
Nominal bowl size: 7 fluid ounce (0.2 liter)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread. - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Materials
- Body, intermediate body, bowl: Aluminum
- Metal bowl liquid level indicator lens: Transparent nylon
- Filter element: Synthetic fiber and polyurethane foam
- Elastomers: Neoprene and nitrile
- Service indicator
  - Body: Transparent nylon
  - Internal parts: Acetal
  - Spring: Stainless steel
  - Elastomers: Nitrile

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics

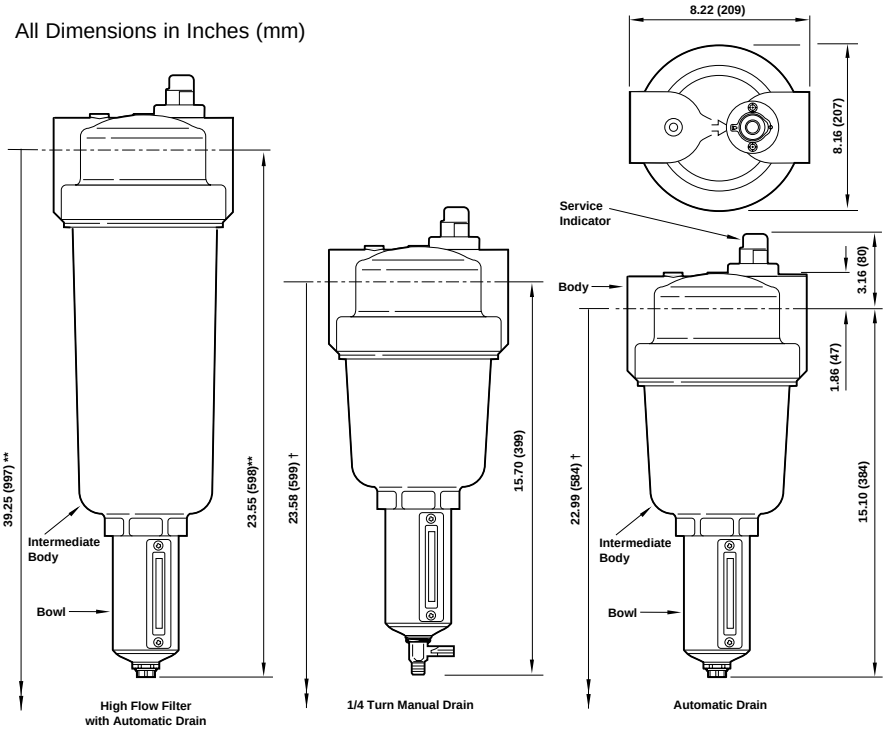



## Service Kits

| Item | Type | Part number |
|---|---|---|
| Element kit | Standard | 3203-02 |
| | High flow | 3203-05 |
| Sightglass kit | All | 2273-08 |

All Dimensions in Inches (mm)




** Minimum clearance required to remove intermediate body and bowl. Add 0.59" (15 mm) for 1/4 turn manual drain.
† Minimum clearance required to remove intermediate body and bowl.

# Oil Vapor Removal (Adsorbing) Filters

**available in port sizes 1/4" to 1".**



**F72V**

**F74V**

**F64 B/L**

**F68**

**F46**

# F72V

## Excelon 72 Oil Vapor Removal Filter 1/4″, 3/8″ Port Sizes

- **Excelon design allows in-line or modular installation**
- **Adsorbing type activated carbon element removes oil vapors and most hydrocarbon odors**
- **Quick release bayonet bowl**
- **Long service life of filter element.**
- **Color indicator for oil presence.**
- **Modular installations with EXCELON 72, 73, and 74 series can be made to suit particular applications**


**Ordering Information.** Models listed include PTF threads and a long transparent bowl without guard and closed bottom.

| Port Size | Model | Flow* scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | F72V-2AN-ELC | 3.4 (1.6) | 0.88 (0.40) |
| 3/8" | F72V-3AN-ELC | 3.4 (1.6) | 0.88 (0.40) |

* Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

### Alternative Models

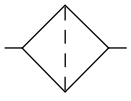
F 7 2 V - ★ ★ N - E ★ C

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Bowl | Substitute |
|---|---|
| Metal | C |
| Transparent without guard | L |
| Transparent with guard | W |

### ISO Symbols



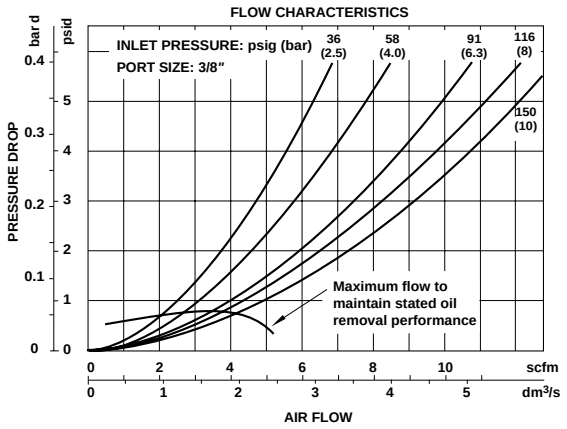
**Auto Drain**

**See Section ALE-25 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 150°F (-20° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Required prefilter: Norgren oil removal filter with equivalent pipe size and flow capacity equal to or greater than the vapor removal filter.
Air quality: Within ISO 8573-1, Class 1** (oil content) when installed downstream of an oil removal filter
** See ALE-1-G for specification details.
Maximum remaining oil content in outlet air: 0.003 ppm at 70°F (20°C)
Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance: 3.4 scfm (1.6 dm³/s)
Nominal bowl size
2.2 fluid ounce (65 ml)
Materials
Body: Zinc
Bowl
Transparent: Polycarbonate
Guard for transparent bowl: Zinc
Metal: Zinc
Element: Activated carbon and polycarbonate
Elastomers: Nitrile

## Typical Performance Characteristics

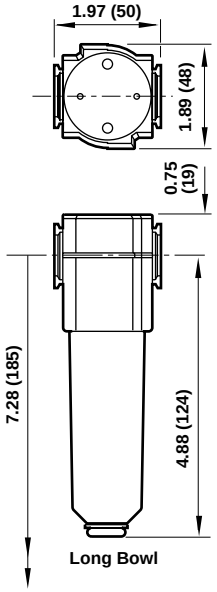



## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal and Gasket | 4380-500 |
| Replacement element | Adsorbing | 4241-01 |

Service kit includes element seal and bowl seal.

All Dimensions in Inches (mm)




† Minimum clearance required to remove bowl.

# F74V

## Excelon 74 Oil Vapor Removal Filter 3/8″, 1/2″, 3/4″ Port Sizes

- **Excelon design allows in-line or modular installation**
- **Adsorbing type activated carbon element removes oil vapors and most hydrocarbon odors**
- **Quick release bayonet bowl**
- **Long service life of filter element. Minimum life of 400 hours when an oil removal filter is installed upstream and the filtration temperature is in the region of 70° to 80°F (20° to 26°C).**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**


**Ordering Information.** Models listed include PTF threads and a closed bottom metal bowl.

| Port Size | Model | Flow* scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 3/8" | F74V-3AN-EMA | 27 (13) | 2.54 (1.15) |
| 1/2" | F74V-4AN-EMA | 27 (13) | 2.51 (1.14) |
| 3/4" | F74V-6AN-EMA | 27 (13) | 2.46 (1.12) |

* Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil vapor removal performance.

### Alternative Models

F 7 4 V - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

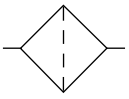
| Options | Substitute |
|---|---|
| No options | N |

| Element | Substitute |
|---|---|
| Adsorbing (Activated carbon without color indicator) | A |

| Bowl | Substitute |
|---|---|
| Metal | M |
| Transparent with guard | P |

| Drain | Substitute |
|---|---|
| Closed bottom (no drain) | E |

### ISO Symbols



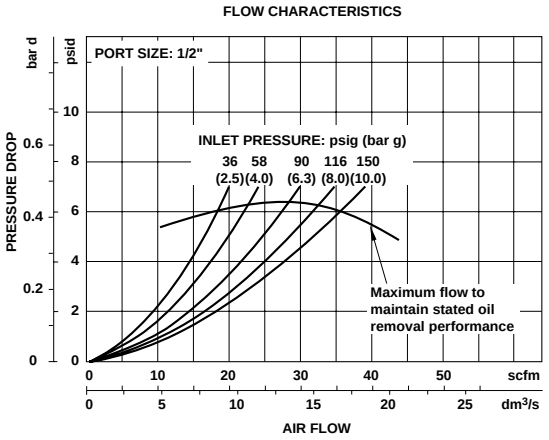
**Auto Drain**

**See Section ALE-25 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure:
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*:
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 150°F (-20° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
Air quality: Within ISO 8573-1, Class 1 **(oil content) when installed downstream of an oil removal filter
** See ALE-1-G for specification details.
Maximum remaining oil content in outlet air: 0.003 ppm at 70°F (20°C)
Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance: 27 scfm (13 $dm^3/s$)
Nominal bowl size: 7 fluid ounce (0.2 liter)
Required prefilter: Oil removal filter with equivalent pipe size and flow capacity equal to or greater than the vapour removal filter.
Materials
Body: Aluminum
Bowl:
Transparent: Polycarbonate with steel bowl guard
Metal: Aluminum
Element: Activated carbon and aluminum
Elastomers: Neoprene and Nitrile

## Typical Performance Characteristics

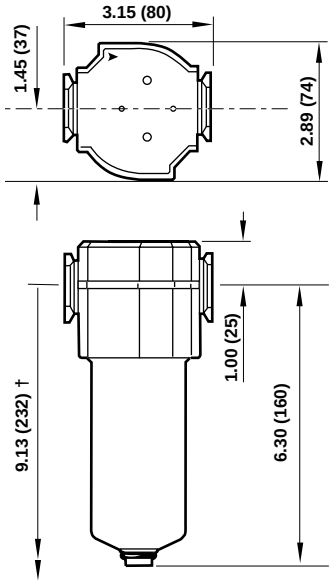



## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal and Gasket | 4380-750 |
| Replacement element | Adsorbing | 4341-01 |

Service kit includes element seal and bowl seal.

All Dimensions in Inches (mm)




† Minimum clearance required to remove bowl.

# F64B/L

**Olympian Plus Coalescing/Adsorbing Filter 1/4", 3/8", 1/2", 3/4" Port Sizes**

- **Olympian Plus plug in design**
- **Combined oil and vapor removal filter**
- **Oil and dirt contamination in outlet air within ISO 8573-1: Quality class 1.7.1**

For optimum coalescing filter element life install a 5 µm F64G pre-filter upstream.

**Ordering Information.** Models listed include PTF threads, automatic drain and metal bowl.

| Drain Type | Port Size | F64B/L (only) Model | Weight lb (kg) |
|---|---|---|---|
| Automatic | 1/4" | F64B-2AN-AR0 | 4.07 (1.83) |
| | 3/8" | F64L-3AN-AR0 | 4.91 (2.21) |
| | 1/2" | F64L-4AN-AR0 | 5.56 (2.50) |
| | 3/4 " | F64L-6AN-AR0 | 6.40 (2.88) |

For replacement Filter (without yoke or pre-filter) substitute 'N' at the 5th and 6th digits eg: F64L-**NN**N-AR0.

**Alternative Models**

F 6 4 ★ - ★ ★ ★ - ★ ★ ★

| Body type | Substitute |
|---|---|
| For 1/4" ports | B |
| For 3/8", 1/2", 3/4" ports | L |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

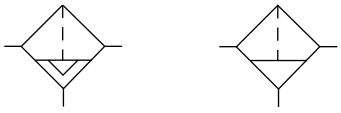
| Element | Substitute |
|---|---|
| Coalescing | 0 |

| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |

| Drain | Substitute |
|---|---|
| Manual | M |
| Auto drain | A |

| Option | Substitute |
|---|---|
| None | N |

**ISO Symbols**



**Auto Drain** **Manual Drain**

**See Section ALE-25 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure:
Guarded transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*:
Guarded transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Partical removal: 0.01 µm.
Air quality: Within ISO 8573-1, Class 1.7.1**
** See ALE-1-G for specification details.
Maximum remaining oil content in outlet air:
0.003 ppm at 70°C (21°C) with an inlet concentration of 17 ppm
Maximum flow at 90 psig (6.3 bar) inlet pressure†:
15 scfm (7 dm³/s) F64B, 23 scfm (11 dm³/s) F64L
Automatic drain connection: 1/8" pipe thread
Automatic drain operating conditions (float operated)
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 2 scfm (1 dm³/s)
Manual operation: Depress pin inside drain outlet to drain bowl
For F64G pre-filter technical data please refer to separate sheet.
Materials
Body: Zinc
Yoke: Zinc
Metal bowl: Zinc
Optional transparent bowl: Polycarbonate
Integral pre-filter element: Sintered bronze
Main filter element and activated carbon pack: Composite materials
Elastomers: Synthetic rubber
Standard sight glass for metal bowl: Pyrex

## Typical Performance Characteristics

| Inlet Pressure | | Maximum Flow† | | | |
|---|---|---|---|---|---|
| | | F64B | | F64L | |
| psig | (bar) | scfm | (dm³/s) | scfm | dm³/s |
| 15 | (1) | 6 | (2.8) | 9.3 | (4.4) |
| 45 | (3) | 10 | (4.8) | 16 | (7.6) |
| 70 | (5) | 13 | (6.2) | 20.8 | (9.8) |
| 90 | (6.3) | 15 | (7.0) | 23.3 | (11.0) |
| 100 | (7) | 15.5 | (7.3) | 24.4 | (11.5) |
| 130 | (9) | 17.8 | (8.4) | 28 | (13.2) |

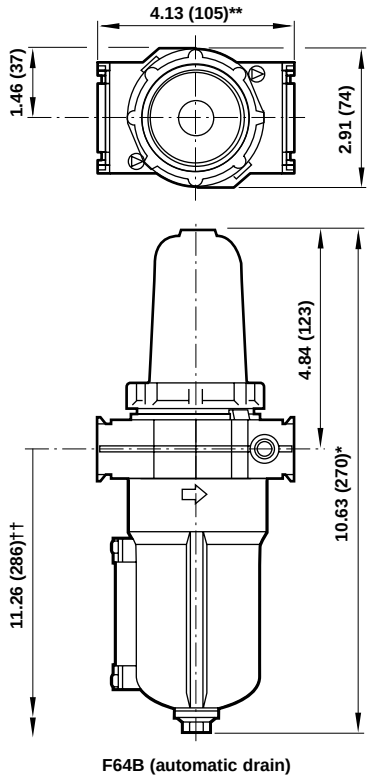
† Maximum flow to maintain stated oil removal performance.

## Service Kits

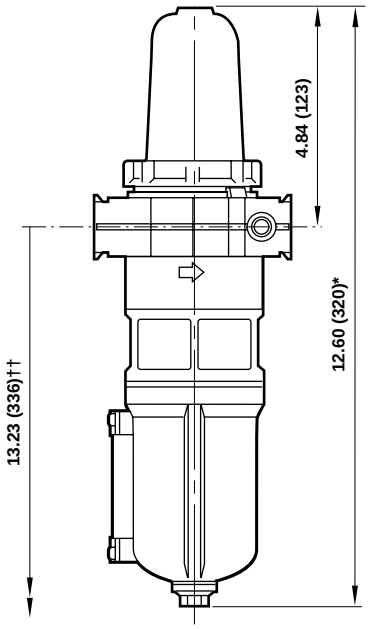
| Item | Type | Part Number |
|---|---|---|
| Service kit | F64B/L | 4380-201 |
| Service kit (pre-filter) | F64G | 4380-200 |
| Element F64G (pre-filter) | 5 µm | 4338-01 |
| Elements (F64B/L) | Coalescing (F64B) | 5350-99 |
| | Coalescing (F64L) | 5350-98 |
| | Integral pre-filter (F64B/L) | 3698-02 |
| | Activated carbon (F64B/L) | 5568-01 |
| Replacement sight glass | Prismatic (F64G) | 4380-040 |
| | Pyrex (F64G option) | 4380-041 |
| | Pyrex (F64B/L) | 2273-97 |
| Replacement drains | Automatic | 3000-04 |
| | Manual | 684-84 |

Service kit includes port seals, bowl o-ring and drain gasket.

All Dimensions in Inches (mm)




F64B (automatic drain)




F64L (automatic drain)

* Automatic drain shown.
Add 0.39″ (10 mm) for manual drain
†† Minimum clearance required to remove bowl.
** 6.18″ (157 mm) for models with 3/4" ports

# F68V/Y

**Olympian Plus Oil Vapor Removal (Adsorbing) Filter**
**1/2″, 3/4″, 1″ Port Sizes**

- **Olympian Plus plug in system**
- **Adsorbing type activated carbon element removes oil vapours and most hydrocarbon odours**
- **Long service life of filter element. Minimum life of 400 hours when an oil removal filter is installed upstream and the filtration temperature is in the region of 70° to 80°F (20° to 26°C).**
- **Oil and dirt contamination in outlet air within ISO 8573-1: Quality Class 1.7.1 when inlet air is prefiltered with an F68G and F68C/H.**

**Ordering Information.** Models listed include a yoke with PTF threads, and a filter with closed bottom (no drain) bowl.

| Port Size | Type | Model | Weight lb (kg) |
|---|---|---|---|
| 1/2 | Standard flow (short element) | F68V-4AN-EMA | 5.13 (2.33) |
| 3/4 | High flow (long element) | F68Y-6AN-ECA | 5.74 (2.61) |
| 1 | High flow (long element) | F68Y-8AN-ECA | 5.70 (2.59) |

## Alternative Models

F 6 8 ★ - ★ ★ ★ - ★ ★ ★

| Flow | Substitute |
|---|---|
| Standard flow | V |
| High flow | Y |

| Port Size | Substitute |
|---|---|
| 1/2″ | 4* |
| 3/4″ | 6 |
| 1″ | 8 |
| None | N |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |
| None | N |

| Option | Substitute |
|---|---|
| No options | N |

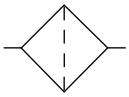
| Element | Substitute |
|---|---|
| Adsorbing (Activated carbon without color indicator) | A |

| Bowl | Substitute |
|---|---|
| 1 pint (0.5 liter) | M* |
| 1 quart (1 liter) | C** |

| Drain | Substitute |
|---|---|
| Closed bottom (no drain) | E |

* Only available with F68V.
** Only available with F68Y.

**ISO Symbols**



**Closed Bottom**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to 150°F (-20° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).
Air quality: Within ISO 8573-1, Class 1 (oil content) when installed downstream of an oil removal filter
Maximum remaining oil content in outlet air: 70°F (0.003 mg/$m^3$ at 20°C)
Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance:
1/2" ports: 53 scfm (25 $dm^3/s$)
3/4" ports: 74 scfm (35 $dm^3/s$)
1" ports: 127 scfm (60 $dm^3/s$)
Nominal bowl sizes:
1 quart US (1 liter)
1 pint US (0.5 liter)
Required pre-filter: Oil removal filter with equivalent pipe size and flow capacity equal to or greater than the vapor removal filter. It is recommended that a general purpose filter with a 5µm element be installed upstream of the oil removal filter.
Materials:
Body: Aluminum
Yoke: Aluminum
Bowl: Aluminum
Element: Activated carbon and aluminum
Elastomers: Synthetic rubber

## Typical Performance Characteristics

| Inlet Pressure | | Maximum Flow* F68V 1/2" Ports | | Maximum Flow* F68Y 1" Ports | |
|---|---|---|---|---|---|
| psig | (bar) | scfm | ($dm^3/s$) | scfm | ($dm^3/s$) |
| 36 | (2.5) | 33.3 | (15.7) | 80.1 | (37.8) |
| 58 | (4) | 42.4 | (20) | 101.8 | (48) |
| 90 | (6.3) | 53 | (25) | 127.2 | (60) |
| 116 | (8) | 60 | (28.3) | 143.7 | (67.8) |
| 150 | (10) | 66.8 | (31.5) | 160.3 | (75.6) |

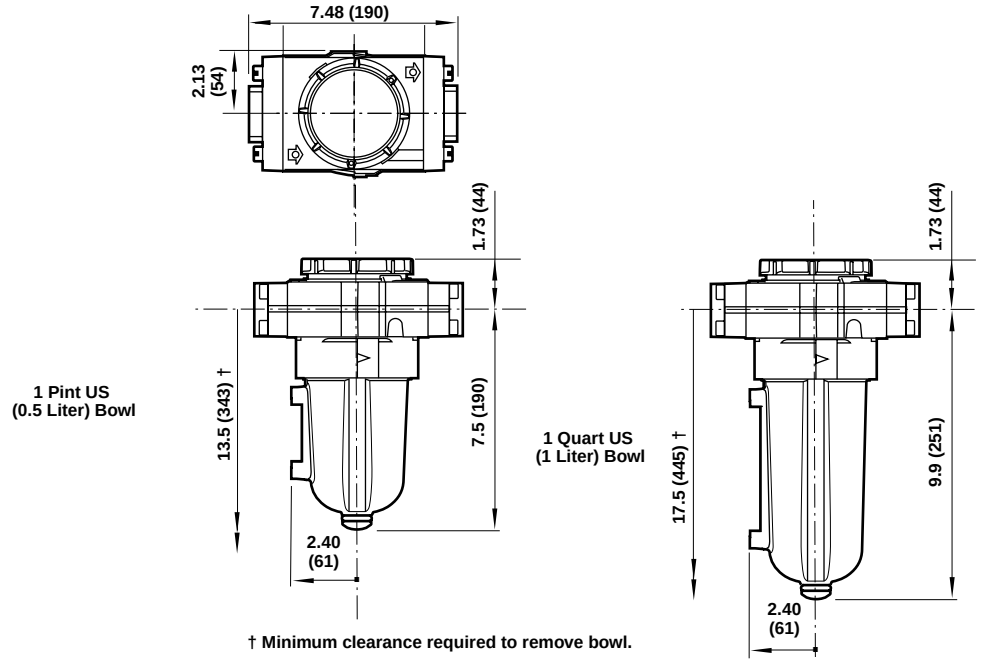
* Maximum flow to maintain stated oil removal performance.

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal and Gasket | 4380-302 |
| Replacement element | Standard Flow (F68V) | 665-72 |
| | High Flow (F68Y) | 665-70 |

Service kit includes element seal and bowl seal.

All Dimensions in Inches (mm)




† Minimum clearance required to remove bowl.

# F46 Oil Vapor Removal Filter

**17 Series Oil Vapor Removal (Adsorbing) Filter 3/8″, 1/2″, and 3/4″ Port Sizes**

- **Adsorbing type activated-carbon filter element removes oil vapors**
- **Long service life of filter element. Minimum life of 1000 hours when an oil removal filter is installed upstream and filtration temperature is in the range of 70° to 80°F (21° to 26°C).**
- **Use in critical industrial applications that require compressed air virtually free of oil vapors**
- **Typical applications include precision pneumatic instrumentation, temperature control, paper separation, film processing, and production of electronic equipment**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering Information.** Models listed include manual drain, metal bowl, and PTF threads.

| Type | Port Size | Model Numbers | Flow* scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|---|
| F46 Compact bowl | 3/8" | F46-323-MAGA | 60 (28) | 3.62 (1.64) |
| | 1/2" | F46-423-MAGA | 60 (28) | 3.53 (1.60) |
| F46 Standard bowl | 1/2" | F46-424-MAMA | 60 (28) | 4.01 (1.82) |
| | 3/4" | F46-624-MAMA | 60 (28) | 3.92 (1.78) |
| F46 Standard bowl | 1" | F46-827-MAMA | 100 (47) | 3.73 (1.69) |

* Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

## Alternative Models

F 4 6 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |
| 1″ | 8 |

| Element | Substitute |
|---|---|
| Compact | 23 ** |
| Standard | 24 ** |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

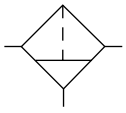
| Bowl | Substitute |
|---|---|
| Metal, Compact | G ** |
| Metal, Standard | M ** |

| Element | Substitute |
|---|---|
| Adsorbing | A |

| Drain | Substitute |
|---|---|
| Manual | M |

** A ***23*** requires a ***G*** in the 9th position of the model number, and a ***24*** requires an ***M.***

**ISO Symbols**



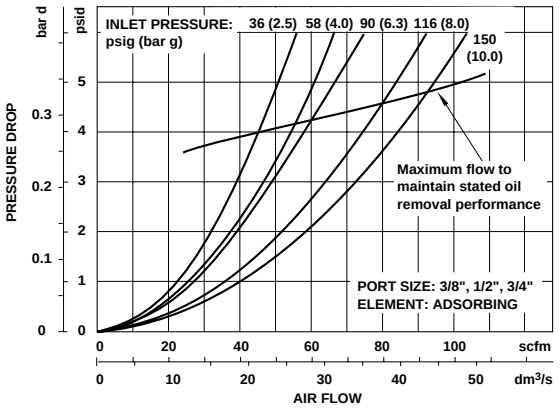
**Manual Drain**

**See Section ALE-25 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature: *0° to 150°F (-20° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
Air quality: Within ISO 8573-1, Class 1** (oil content) when air is prefiltered with a Norgren oil removal filter
** See ALE-1-G for specification details.
Maximum remaining oil content of air leaving the filter: 0.003 ppm at 70°F (20°C) when air is prefiltered with a Norgren oil removal filter
Maximum flow at 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance: 60 scfm (28 $dm^3/s$)
Required prefilter: Oil removal filter with equivalent pipe size and flow capacity equal to or greater than the vapor removal filter.
Materials:
Body: Aluminum
Bowl: Aluminum
Filter element: Activated carbon, nylon, aluminum
Elastomers: Neoprene and nitrile

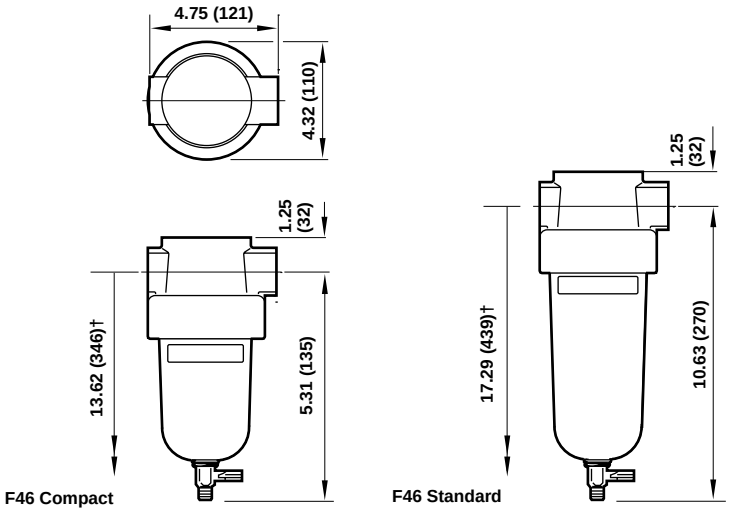
## Typical Performance Characteristics




## Service Kit

| Item | Type | Part number |
|---|---|---|
| 3/8", 1/2", 3/4" Service kit | Element and element o-ring | 665-08 |
| 1" Service kit | Element and element o-ring | 665-70 |
| Replacement drain | Manual (1/4 Turn) | 619-50 |

All Dimensions in Inches (mm)

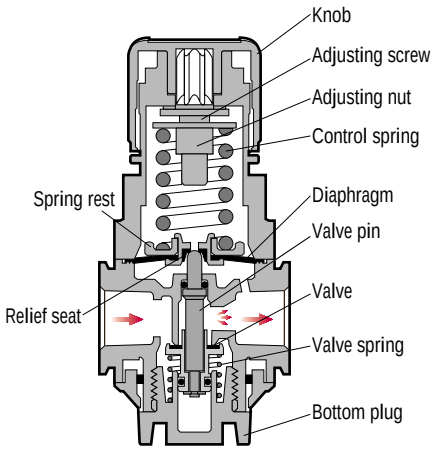



† Minimum clearance required to remove bowl.

# Regulators

## General Purpose Regulators, Specialty Regulators, Manifolding Regulators, Precision and Instrument Regulators, Pilot Regulators, Pilot Operated Regulators, U.L. Listed Industrial, and Beverage Regulators

GENERAL PURPOSE REGULATOR




## 1.1 GENERAL OVERVIEW

Regulators ideally provide a constant outlet pressure independent of variations in inlet pressure or flow. Regulators are typically used to:

i. reduce pressure to the level required for downstream equipment.
ii. limit the force of cylinders.
iii. minimize pressure variation at the point of use.

The range of different regulators and options within each type are wide and varied, but each can broadly be put into one of 3 categories.

- General Purpose Regulators
- Pilot Operated Regulators
- Application Specific Regulators

1.1.1 General Purpose Regulators:

General purpose regulators are designed to give the maximum flow capacity (for their size) while maintaining, to a reasonable accuracy, the outlet pressure to the set level.

They are used to control pressures in compressed air line installations to different parts of machines or to pneumatic tools and motors.

General purpose regulators are available in relieving or non-relieving types. Relieving regulators can be adjusted from a high pressure to a low pressure. Even in a dead end situation relieving regulators will allow the excess downstream pressure to be exhausted. This causes a loud hissing sound which is perfectly normal.

Non relieving regulators when similarly adjusted will not allow the downstream pressure to escape. The trapped air will need to be released in some other way, e.g. by operating a downstream valve.

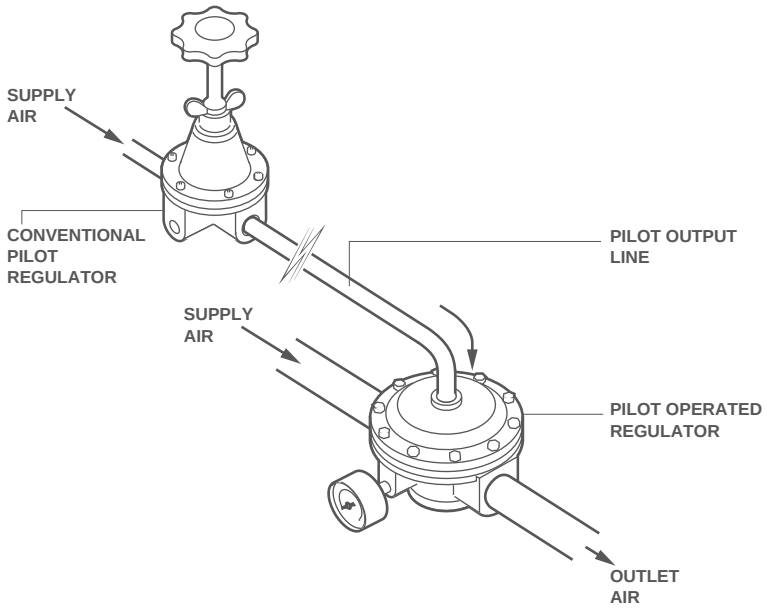
General purpose regulators have a control spring which acts on a diaphragm to regulate the air pressure. The rating of this control spring determines the adjustment range of the regulator. The outlet pressure setting is obtained by turning the knob (or T handle) clockwise to increase pressure, counter clockwise to decrease pressure.

1.1.2 Pilot Operated Regulators:

Pilot operated regulators are used in high flow applications and where access to the main regulator is limited or difficult. This type of regulator does not have a control spring to regulate, instead an air pilot signal is used to control the outlet pressure of the main regulator.

This air pilot signal is controlled by a small 'pilot operator' regulator typically of a precision type eg 11-018. The flow through the pilot operator is negligible. The better the pilot, the better the performance from the main regulator.

### Typical Pilot Operation




The pilot signal for the main regulator valve is usually onto a large diaphragm area. This results in pilot operated regulators having better regulation characteristics than spring operated general purpose regulators.

1.1.3 Feedback Pilot Regulators:

For even greater control of the outlet pressure a 'feedback' pilot operator can be used. Here the outlet pressure from the pressure critical point in the system can be fed back to the controlling pilot operated regulator.

Feedback systems are very responsive to downstream pressure requirements. If performance does not meet expectations, consult with Application Engineering.

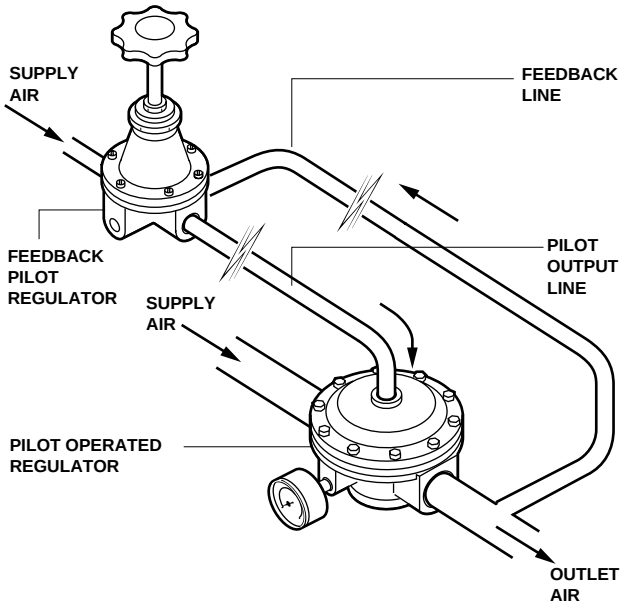
Very few applications require feedback and it is usually better to recommend a standard 11-400 or a general purpose regulator as a pilot operator.

1.1.4 Application Specific Regulators:

Norgren produces a wide range of application specific regulators, each having some enhanced feature over a general purpose regulator. Some of them are listed below.

| | | |
|---|---|---|
| 11-018/-118 | - | extremely accurate outlet pressure control, with high flow for a precision regulator. Requires oil-free air, pre-filtered to 5µm. |
| R38 | - | Instrument regulator, aluminum body (also available in stainless steel to NACE standard), excellent regulation, no constant bleed to atmosphere. |
| R05/R22 | - | General purpose regulators with stainless steel bodies to NACE specification. |
| R06/R91 | - | Brass or plastic bodied specifically for water. Potable and non potable water options available. |
| Miniature Regulators | - | Generally based around a modification to a basic R07 including low flow (with improved regulation), plastic bodied (for water), different elastomeric materials (for fluid compatibility) |
| R24 | - | Good regulation, extremely high relief capacity. Available in spring or pilot operated versions. |

## Feedback Operation




## Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

## 1.2 WHAT CAN WE PRODUCE?

1.2.1 Do Norgren Produce Regulators for Inlet Pressure above 400 psig?

The R38, R43 and R18 can accept inlet pressures of up to 450 psig. Norgren has higher pressure regulators for industrial gases up to 3000 psi. Consult Application Engineering for details.

1.2.2 Do we Produce Units for Low/High Temperatures?

Low or high temperature units may be possible in some ranges. Material selection is critical. Consult Air Line for details.
**Note:** changing to viton elastomers does not in itself make a unit suitable for higher temperatures.

1.2.3 Can we Produce Sub-Base Regulators?

The USA R40/R41 pilot and feedback pilot regulators are available. A sub-base R06 is also available.

1.2.4 Can we Produce Manifolding Regulators?

Manifolding regulators are designed to have a straight through primary pressure with secondary outlets at 90 degrees. Norgren has:

- Excelon 72 R72M - manifold using Quikclamps.
- R30M Plastic R91 style with integral PIF. Manifold using adapters.
- R06 type brass bodied R06, manifold using fittings.

1.2.5 Do we Produce Liquid (water) Regulators?

Norgren has regulators suitable for liquids, primarily water.

These include plastic bodied miniature regulators eg R91G/W and 11-044, as well as brass R06's and R43's.

All are suitable for non potable water some for potable water. Check catalogue sheets for details.

A number of units already have the approval of some water control bodies eg WRC (Water Research Council) UK and NSF USA.

Water regulators can be used with other liquids but it is necessary to check corrosion resistance and material compatibility. Differences in viscosity may effect performance.

Water regulators can be used on air but normally have poorer performance characteristics than air regulators.

1.2.6 Can we do 11-818 Precision Regulators with Gauges?

Yes, we do have some special models, contact Application Engineering for details.

1.2.7 Can we Produce Back Pressure Regulators?

Yes, a back pressure regulator behaves as a very precise relief valve and so controls the rate of relief. With automatic adjustment of its outlet flow to atmosphere the system pressure remains substantially constant. These can be produced as specials.

1.2.8 Can we Produce Reverse Flow Regulators?

Reverse flow regulators allow the outlet pressure to flow back, through the regulator (via an internal check valve) when the inlet pressure is switched off. This is important when the regulator is placed between a valve and cylinder.

This option is available in Excelon 74, 73 and 72 Series and Olympian Plus. The R07, being an unbalanced valve regulator can also be reverse flowed.

## 1.3 ADJUSTMENT MECHANISMS

1.3.1 What Different Adjustment Mechanisms are Available?

A non-rising knob is the standard adjustment mechanism for most general purpose regulators. A T-handle will provide added leverage and is standard for regulators with 250 psig springs. They are also a common alternative to a knob in applications where the operator is wearing gloves, or has greasy hands.

A slotted adjusting screw enables the customer to adjust using a screwdriver and a hexagon-headed screw is also available. Handwheels can be fitted to most units and are standard on precision regulators.

1.3.2 What is the Difference between Tamper Resistant, Tamper Evident, and Tamperproof?

Tamper Resistant: a device which makes alterations of set pressure difficult.

Units which normally have a T-bar can have the T-bar replaced by a screw driver slotted adjusting screw over which a metal cap is fitted. In this way the set pressure can be protected from accidental adjustment.

Units with adjusting knobs are made tamper resistant by preventing the knob being pulled into its unlocked position for example:-

- R07 insert self tapping screw through the top of the knob.
- R72/73/74/64 use tamper resistant kit and seal with a padlock or seal wire.

Tamper Evident: shows if the set pressure has been altered by the breaking of a seal.

Tamperproof: something which cannot be tampered with at all. It is difficult to describe anything as tamper proof because if someone is intent on making regulator adjustments then they can always find a way. As a result we do not call our regulators tamper proof.

1.3.3 What Presetting Options are Available?

Most regulators can be 'set' in some way, if in doubt contact Air Line Division as this is generally a factory operation.

- Max Set: unit is modified to prevent the regulator being adjusted above a specified maximum.
- Min Set: unit is modified to prevent the regulator being adjusted below a specified minimum.
- Min/Max Set: unit can only be adjusted between two specified upper and lower units.
- Preset (Factory Set): unit outlet pressure is set and locked prior to despatch. These units are not tamper resistant (unless requested).

## 1.4 REGULATORS IN APPLICATIONS

1.4.1 Can the Regulators be Adjusted Outside the Recommended Range?

The recommended range is that at which the regulator will perform at its optimum. These are not the maximum and minimum values. Regulators can be set outside these limits. For units which cannot be set outside of a specified range see 1.3.3.

1.4.2 Will Regulators Shut Off?

Yes, screwing the adjustment 'up' (counterclockwise) closes the valve. It is possible to achieve zero psig with a regulator, however they are not designed to fulfill this function. If shut off is required use a shut off valve.

1.4.3 Will Regulators Work Mounted Upside Down?

Regulators can be mounted in any orientation without affecting their function.

1.4.4 How do you Set a Regulator?

Always set on a rising pressure, i.e. on an increasing spring load.

To adjust a regulator from 100 psig to 70 psig, back the regulator off to below 70 psig and adjust back up to the required pressure.

1.4.5 Can Air Regulators be used on Water?

Generally the answer is no for air regulators with balanced valves. It is possible with the R06 type which does not have a balanced valve and is considered dual service. See 1.2.5.

1.4.6 Can we use Air Regulators on other Gases?

Air regulators are generally suitable for use with C02, argon, nitrogen or other inert gases. However units are designed and tested to compressed air standards only (unless specified in the literature) and external leakage rates may vary depending on the gas involved.

Compressed air regulators should never be used with flammable or noxious gases eg LPG, hydrogen etc.

1.4.7 Instability - what is it and how can it be prevented?

Instability (humming or whistling) is the rapid cyclic fluctuation of the outlet pressure from around the set pressure.

Instability is ultimately a problem occurring due to the flow path through the regulator or system. The usual solution is to change the regulator characteristics by replacing the control spring with one of a higher rating to increase the force on the diaphragm or changing the diaphragm material.

There is no magic answer, it is a case of trial and error in those applications where instability occurs.

1.4.8 What is a Constant Bleed Regulator?

Constant bleed in regulators is designed to provide improved response. A hissing noise is normal. R24 and 11-018 are all constant bleed regulators.

## 1.5 PERFORMANCE

1.5.1 Flow Quoted?

Flow characteristic is the measurement of the flow through the unit for a given deviation from the set outlet pressure.

For example, take a regulator and set the pressure at 90 psig under no flow conditions. As the flow through the unit is increased then the actual outlet pressure falls away from the set pressure. This is called droop (from set). Normally Norgren quotes regulator flow measured under the following conditions: Inlet pressure = 150 psig, set pressure = 90 psig and a 15 psig droop from set.

1.5.2 What are Regulation Characteristics?

Regulation characteristics show how the outlet pressure from the regulator varies when the inlet pressure varies (under constant or no flow conditions).

For example, take a regulator set at 60 psig outlet pressure, with 150 psig at the inlet. If the inlet pressure reduces, ideally the outlet pressure would remain the same.

However, in regulators with an unbalanced valve (eg R07) the outlet pressure actually increases slightly as the inlet pressure decreases. In regulators with balanced valves this variation is reduced.

Standard regulators have an acceptable deviation for most pneumatic application and customers tend to be interested in regulation characteristics in critical applications only. Where this is so, consider using a precision regulator, or consult Application Engineering about ways to improve the performance of standard regulators.

1.5.3 What is the Repeatability of a Regulator?

Repeatability can be defined in terms of changes in flow, inlet pressure or time. It is important to understand which the customer requires.

a. *Repeatability with Respect to Changes in Flow:* ie the ability of a regulator to hold a set pressure with increasing or decreasing flow.
b. *Repeatability with Respect to Time Changes:* ie the ability of a regulator to hold a set pressure over a time period.
c. *Repeatability with Respect to Inlet Pressure Changes:* ie the ability of a regulator to hold a set pressure with changes in supply pressure.

For more information refer to catalogue graphs, or consult Application Engineering.

## 1.6 SIMPLE REGULATOR TROUBLESHOOTING

| Problem | Problem Cause | Remedy |
|---|---|---|
| Regulator creep (increase in secondary pressure due to leak from primary). | Dirty or cut valve elastomers. Nick in valve seat. | Replace or clean valve. If body or valve seat is damaged it can be replaced on some models. On others replacement of complete regulator is required. |
| Won't relieve secondary pressure? | Non-relieving diaphragm assembly. | If this feature is required, replace with relieving type diaphragm assembly. |
| Won't reach desired pressure? | Regulating spring with low spring rate. | Use regulating spring with spring rate designed to cover desired range. |
| Excessive leak from relief hole? | Damaged relief seat. Ruptured diaphragm. | Replace diaphragm assembly. |
| | Leakage past valve causing secondary to increase somewhat and open relief seat. | Replace or clean valve. |
| Regulator chatter? | A resonant condition is generally only encountered under a certain set of conditions of flow and pressure and then only in some applications in which regulator couples with other system components. | Replace spring with a higher pressure range spring.<br><br>Replace with a piston type regulator since they have less tendency to chatter. |
| Regulator difficult to adjust? | Adjusting screw or knob locking device in locked position. | Pull to unlock knob and adjust; push knob to lock<br><br>Threaded adjusting screws: loosen lock nut, remove adjusting screw, clean thread and lubricate. |
| | Contaminants in adjusting screw threads. | Place some lubricant on tip of screw. |

# General Purpose Regulators

## Compressed air regulators are available in modular or inline models, in port sizes from 1/8" to 2".



R07

R46

R72G/R

R73G/R

R74G/R

R64G/R

R68

R17

R18

# R07

## Miniature Series 07 General Purpose Regulator 1/8″ and 1/4″ Port Sizes

- **Compact design**
- **Full flow gauge ports**
- **Low torque, non-rising adjusting knob**
- **Snap action knob locks pressure setting when pushed in**
- **Standard relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering Information.** Models listed include PTF threads, relieving diaphragm, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range*, with gauge.

| Port Size | Model Number | Flow† scfm (dm³/s) | Weight lbs (kg) |
|---|---|---|---|
| 1/8" | R07-100-RGKA | 14 (6.5) | 0.31 (0.19) |
| 1/4" | R07-200-RGKA | 15 (7) | 0.31 (0.19) |

† Approximate flow at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 14.5 psig (1 bar) from set.

### Alternative Models

R 0 7 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8″ | 1 |
| 1/4″ | 2 |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Option | Substitute |
|---|---|
| Standard | 0 |
| Low flow seat | 2 |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

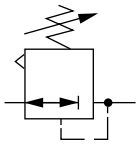
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 1 to 10 psig (0.1 to 0.7 bar) | A |
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 100 psig (0.3 to 7 bar) | K |
| 5 to 125 psig (0.3 to 8.6 bar) | L |

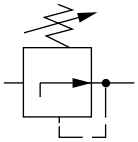
| Gauges | Substitute |
|---|---|
| With | G |
| Without | N |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

### ISO Symbols



Relieving



Non relieving

**See Section ALE-24 for Accessories**

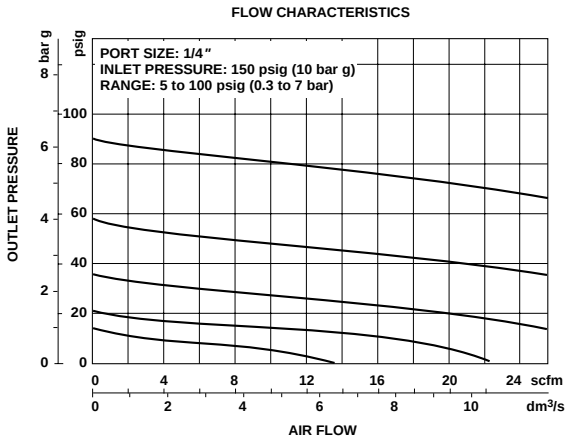
## Technical Data

Fluid: Compressed air
Maximum pressure: 300 psig (20 bar)
Operating temperature: -34° to 150°F (-35° to 65°C) *
* Air supply must be dry enough to avoid ice formation at temperatures below 2°C (35°F).
Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set:
- 1/8" ports: 14 scfm (6.5 $dm^3/s$)
- 1/4" ports: 15 scfm (7 $dm^3/s$)

Gauge ports:
- 1/8" PTF with PTF main ports
- 1/8" ISO Rc with ISO Rc main ports
- 1/8" ISO Rc with ISO G main ports

Materials:
- Body: Zinc
- Bonnet: Acetal
- Valve: Brass/nitrile
- Valve seat: Acetal
- Elastomers: Nitrile

## Typical Performance Characteristics

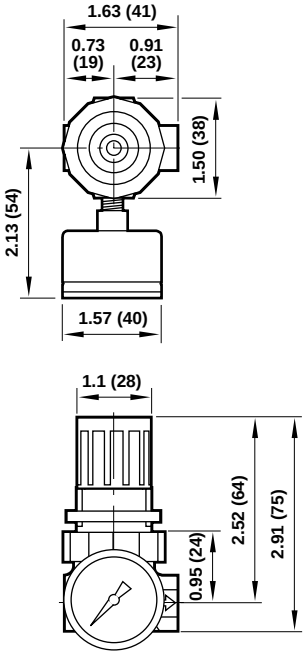



## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Relieving | 3407-02 |
| | Non relieving | 3407-01 |

Service kit includes slip ring, diaphragm, standard valve seat with o-ring, valve, valve spring.

All Dimensions in Inches (mm)




Panel mounting hole diameter 1.19″ (30 mm)
Maximum panel thickness 0.25″ (6 mm)

# R46

## Miniature Non-repairable Pressure Regulator 1/4" Port Size

- **Reliable pressure regulation at air flows up to 13 scfm (6 dm³/s)**
- **Compact design and light weight construction**
- **Wrench flats for easy installation**
- **Relieving piston design allows reduction of downstream pressure when the system is dead-ended**
- **Choice of left to right or right to left flow**

**Ordering Information.** Model listed has left to right flow, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*, and PTF threads. Gauge is not included.

| Port Size | Model | Flow† scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | R46-200-RNLA | 13 (6) | 0.2 (0.09) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

### Alternative Models

R 4 6 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |

| Flow Direction With Knob Up and Gauge Visible | Substitute |
|---|---|
| Left to Right | 00 |
| Right to Left | 02 |

| Piston Type | Substitute |
|---|---|
| Relieving | R |

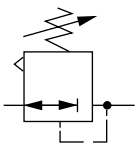
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 125 psig (0.3 to 8.5 bar) | L |
| 5 to 150 psig (0.3 to 10 bar) | M |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

### ISO Symbols



Relieving

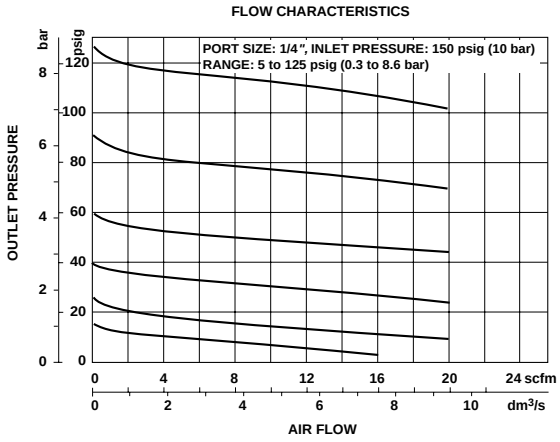
**See Section ALE-24 for Accessories**

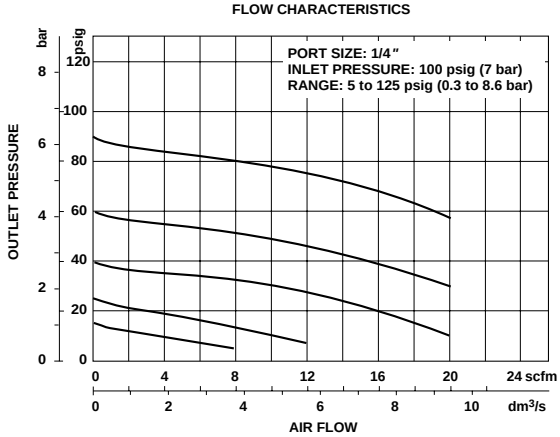
## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: -30° to 150°F (-34° to 65°C)
*Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from from set: 13 scfm (6 $dm^3/s$)
Gauge ports:
- 1⁄8 PTF with PTF main ports
- Rc1/8 with ISO G and ISO Rc main ports

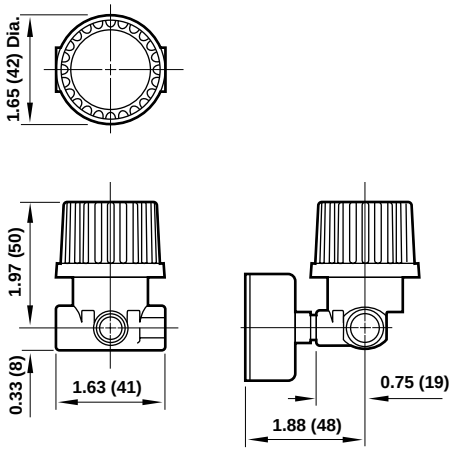
Materials
- Body: Zinc
- Knob: Nylon
- Valve: Nitrile compound
- Valve seat: Acetal
- Elastomers: Nitrile

## Typical Performance Characteristics




All Dimensions in Inches (mm)



# R72G/R

## Excelon 72 Pressure Regulator 1/4″, 3/8″ Port Sizes

- **Excelon design allows in-line or modular installation**
- **Full flow gauge ports**
- **Balanced valve design for optimum pressure control**
- **Push to lock adjusting knob with tamper resistant accessory**
- **R72R reverse flow option**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed include unidirectional flow, PTF threads, knob adjustment, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range* with gauge.

| Port Size | Model | Flow† scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | R72G-2AK-RMG | 70 (33) | 0.79 (0.36) |
| 3/8" | R72G-3AK-RMG | 70 (33) | 0.79 (0.36) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

### Alternative Models

R 7 2 ★ - ★ ★ ★ - ★ ★ ★

| Flow Type | Substitute |
|---|---|
| Standard | G |
| Reverse flow | R |

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

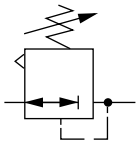
| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 30 psig (0.3 to 2 bar) | C |
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

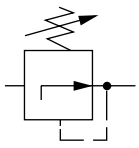
| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

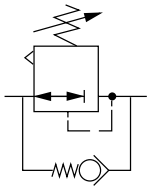
### ISO Symbols



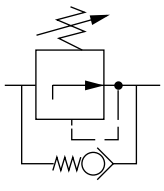
R72G Relieving



R72G Non Relieving



R72R Relieving



R72R Non Relieving

**See Section ALE-24 for Accessories**

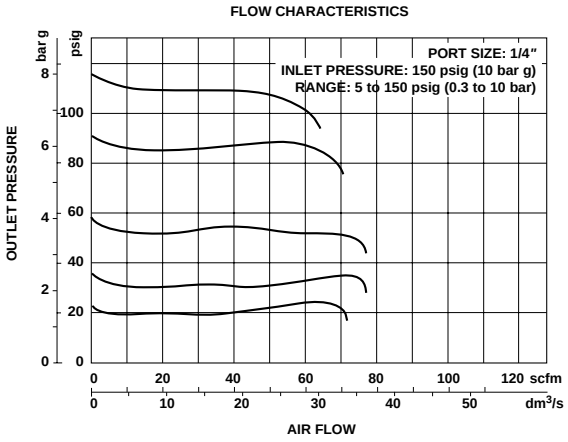
## Technical Data

Fluid: Compressed air
Maximum pressure: 300 psig (20 bar)
Operating temperature*: -30° to 150°F (-34° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Approximate flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 70 scfm (33 $dm^3/s$)
Gauge ports:
- 1/8″ PTF with PTF main ports
- 1/8″ ISO Rc with ISO Rc main ports
- 1/8″ ISO Rc with ISO G main ports

Materials:
- Body: Zinc
- Bonnet: Acetal
- Valve: Brass
- Elastomers: Nitrile
- Bottom plug: Acetal

## Typical Performance Characteristics




## Service Kits

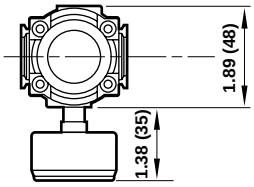
| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4381-500 |
| | Non relieving | 4381-501 |

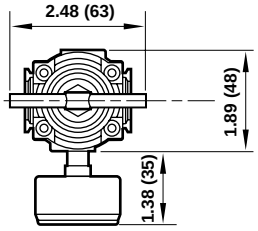
Service kit includes diaphragm assembly, valve assembly, valve spring and o-rings.

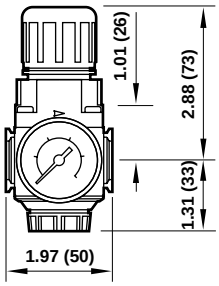
All Dimensions in Inches (mm)

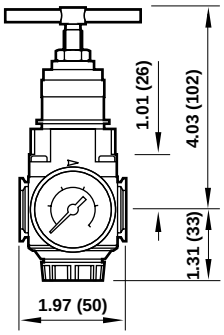
Panel mounting hole diameter: 1.57″ (40 mm)

Maximum panel thickness: 0.16" (4 mm)



# R73G/R

**Excelon 73 Pressure Regulator**
**1/4″ 3/8″, 1/2″ Port Sizes**

- **Excelon design allows in-line or modular installation**
- **Full flow gauge ports**
- **Balanced valve design minimizes effect of variation in the inlet pressure on the outlet pressure**
- **Standard relieving models allow reduction of downstream pressure when the system is dead-ended**
- **Optional reverse flow models available for use downstream of directional control valves**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed include uni-directional flow, PTF threads, knob adjustment, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range*, with gauge.

| Port Size | Model | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | R73G-2AK-RMG | 91 (43) | 1.36 (0.6) |
| 3/8" | R73G-3AK-RMG | 144 (68) | 1.36 (0.6) |
| 1/2" | R73G-4AK-RMG | 144 (68) | 1.36 (0.6) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

## Alternative Models

R 7 3 ★ - ★ ★ ★ - ★ ★ ★

| Flow Type | Substitute |
|---|---|
| Uni-directional | G |
| Reverse | R |

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |
| 1/2″ | 4 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

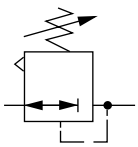
| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar) | S |

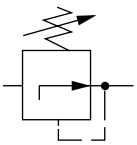
| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

## ISO Symbols



Relieving



Non relieving

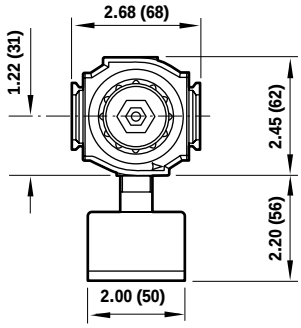
**See Section ALE-24 for Accessories**

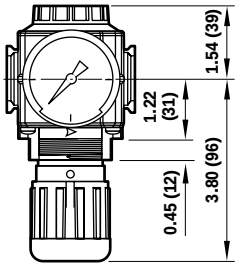
## Technical Data

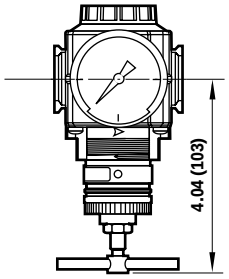
Fluid: Compressed air
Maximum pressure: 300 psig (20 bar)
Operating temperature*: -30° to 175°F (-34° to 80°C)
*Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from from set: 144 scfm (68 $dm^3/s$)
Gauge ports:
- 1⁄4 PTF with PTF main ports
- Rc1/4 with ISO Rc main ports
- Rc1/8 with ISO G main ports

Materials
- Body: Aluminum
- Bonnet: Aluminum or Zinc
- Valve: Brass
- Elastomers: Nitrile
- Bottom plug: Acetal

All Dimensions in Inches (mm)

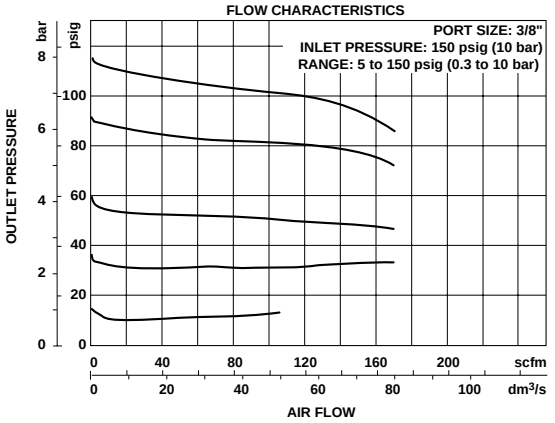


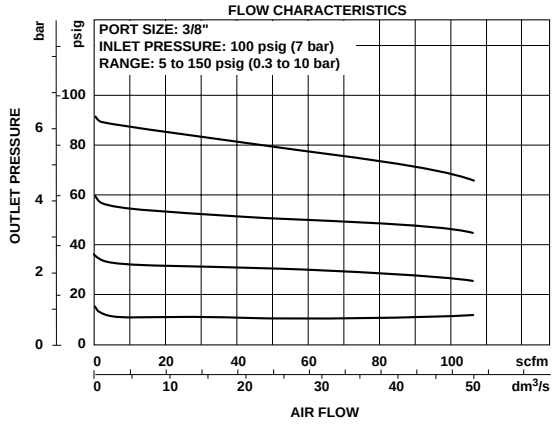




Panel mounting hole diameter: 1.89" (48 mm)
Panel thickness: 0.06" to 0.25" (2 to 6 mm)

## Typical Performance Characteristics




## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4381-600 |
| | Non-relieving | 4381-601 |

Service kit includes diaphragm assembly, valve assembly, valve spring, bottom plug o-ring.

# R74G/R

## Excelon 74 Pressure Regulator
## 3/8″, 1/2″, 3/4″ Port Sizes

- **Excelon design allows in-line or modular installation**
- **Full flow gauge ports**
- **Balanced valve design minimizes effect of variation in the inlet pressure on the outlet pressure**
- **Standard relieving models allow reduction of downstream pressure when the system is dead-ended**
- **Optional reverse flow models available for use downstream of directional control valves**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed include uni-directional flow, PTF threads, knob adjustment, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range*,with gauge.

| Port Size | Model | Flow† scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 3/8" | R74G-3AK-RMG | 208 (98) | 1.80 (0.82) |
| 1/2" | R74G-4AK-RMG | 220 (105) | 1.77 (0.80) |
| 3/4" | R74G-6AK-RMG | 220 (105) | 1.73 (0.78) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set.

### Alternative Models

R 7 4 ★ - ★ ★ ★ - ★ ★ ★

| Flow Type | Substitute |
|---|---|
| Uni-directional | G |
| Reverse | R |

| Port Size | Substitute |
|---|---|
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar)** | S |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) outlet pressure range are available only with the T-bar adjustment; therefore substitute **T** at the 7th position and **S** at the 9th position.

**See Section ALE-24 for Accessories**

## Technical Data

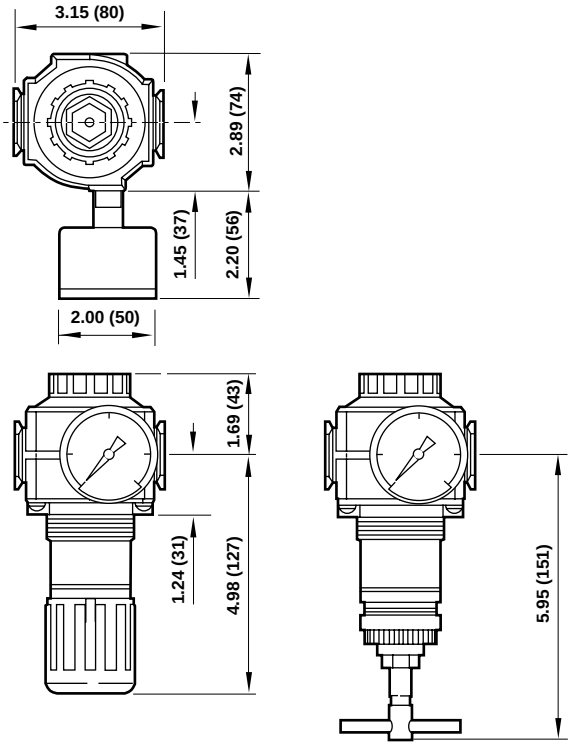
Fluid: Compressed air
Maximum pressure: 300 psig (20 bar)
Operating temperature*: -30° to 175°F (-34° to 80°C)
*Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 220 scfm (105 $dm^3/s$)

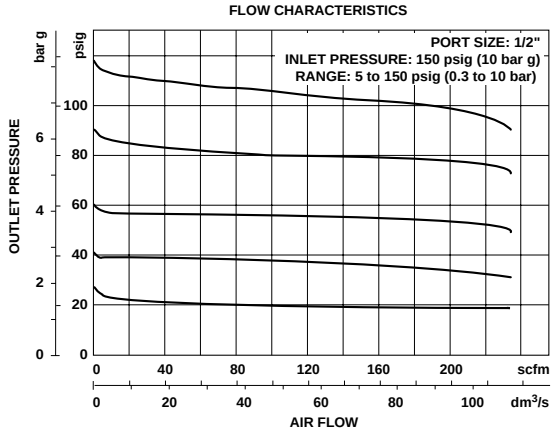
Gauge ports:
- 1/4 PTF with PTF main ports
- Rc1/4 with ISO Rc main ports
- Rc1/8 with ISO G main ports

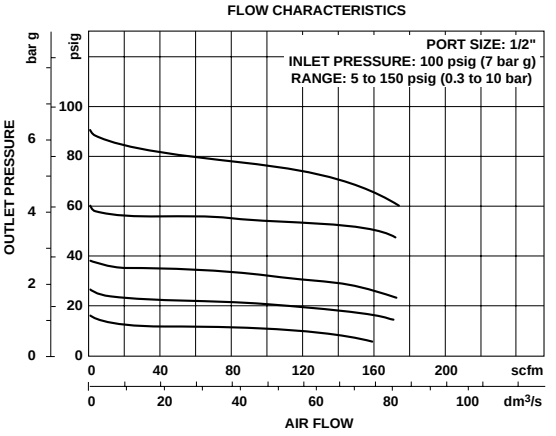
Materials:
- Body: Aluminum
- Bonnet : Aluminum
- Valve: Brass
- Elastomers: Nitrile
- Bottom plug: Acetal

All Dimensions in Inches (mm)




## Typical Performance Characteristics



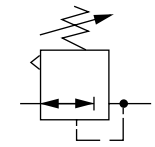

## Service Kits

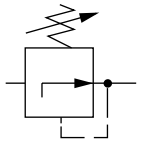
| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4381-700 |
| | Non relieving | 4381-701 |

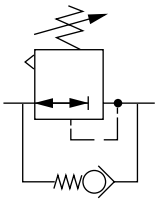
Service kit includes diaphragm assembly, valve assembly, valve spring, bottom plug o-ring.

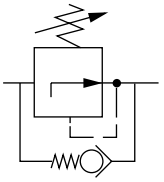
Panel mounting hole diameter: 2.06″ (52 mm)
Panel thickness: 0.06″ to 0.25″ (2 to 6 mm)

## ISO Symbols


R74G Relieving


R74G Non Relieving


R74R Relieving


R74R Non Relieving

# R64G/R

## Olympian Plus Regulator
## 1/4″, 3/8″, 1/2″, 3/4″ Port Sizes

- **Olympian Plus plug in design**
- **High flow general purpose regulator**
- **Push to lock adjusting knob with tamper resistant option**
- **Mount in any orientation**


**Ordering Information.** Models listed include unidirectional flow, PTF threads, knob adjustment, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range* with gauge.

| Port Size | Model | Flow† scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | R64G-2AK-RMG | 74 (35) | 3.42 (1.54) |
| 3/8 " | R64G-3AK-RMG | 170 (80) | 3.38 (1.52) |
| 1/2" | R64G-4AK-RMG | 254 (120) | 3.31 (1.49) |
| 3/4 " | R64G-6AK-RMG | N.A. | 4.11 (1.85) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

For replacement regulator (without yoke) substitute 'N' at the 5th and 6th digits eg: R64G-**NN**K-RMN.

### Alternative Models

R 6 4 ★ - ★ ★ ★ - ★ ★ ★

| Flow Type | Substitute |
|---|---|
| Standard | G |
| Reverse flow | R |

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar) | S** |

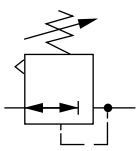
| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

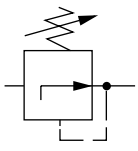
* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) outlet pressure range are available only with the T-bar adjustment; therefore substitute ***T*** at the 7th digit and ***S*** at the 9th position.

### ISO Symbols



Relieving



Non Relieving

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)

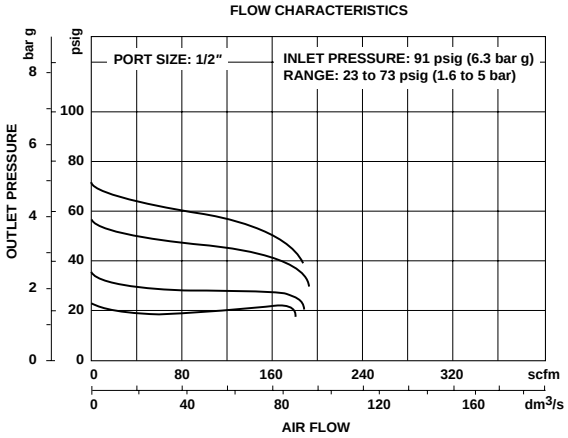
Operating temperature*: -30° to 175°F (-34° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

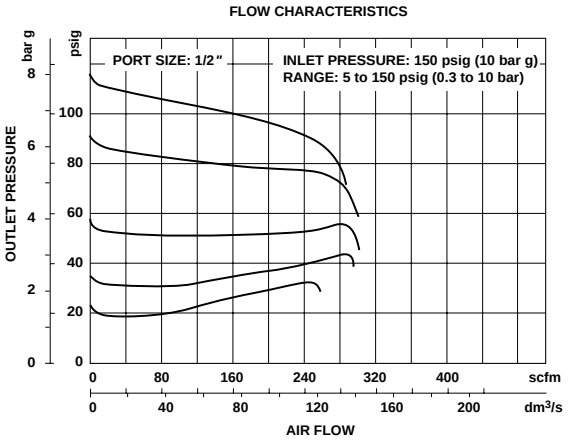
Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 254 scfm (120 $dm^3/s$)

Gauge Ports:
- 1/8" PTF with PTF main ports
- 1/8" ISO Rc with ISO Rc main ports
- 1/8" ISO Rc with ISO G main ports

Materials:
- Body: Zinc
- Bonnet: Aluminium
- Yoke: Zinc
- Valve: Brass
- Elastomers: Synthetic rubber

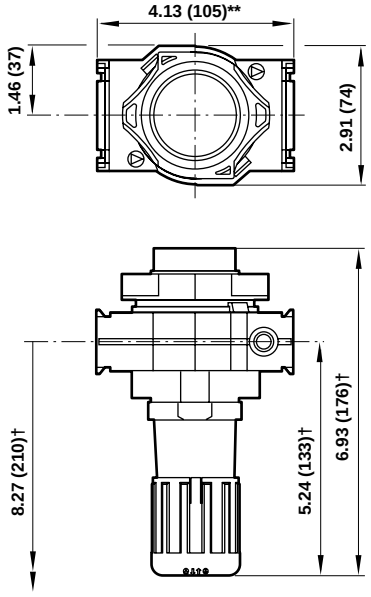
## Typical Performance Characteristics




All Dimensions in Inches (mm)

Panel mounting hole diameter: 2.06" (52 mm)
Maximum panel thickness: 0.25" (6 mm)




† Reduces by 4 mm with knob in locked position. Add 37 mm for unit with 'T' handle.

** 6.18" (157 mm) for models with 3/4" ports

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4381-200 |
| | Non relieving | 4381-201 |

Service kit includes port and bottom plug 'O' rings, valve assembly, valve spring and diaphragm.

# R68G

## Olympian Regulator
## 3/4″, 1″, 1-1/4″,1-1/2″ Port Sizes

- **Olympian plug in design**
- **Robust and compact**
- **High flow unit with large valve and diaphragm**
- **Push to lock adjusting knob with tamper resistant option**
- **Excellent flow and regulation characteristics**

**Ordering Information.** Models listed include PTF threads, knob adjustment, relieving diaphragm, 5 to 120 psig (0.4 to 8 bar) outlet pressure adjustment range* with gauge.

| Port Size | Model | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 3/4 | R68G-6AK-RLG | 318 (150) | 4.29 (1.95) |
| 1 | R68G-8AK-RLG | 360 (170) | 4.16 (1.89) |
| 1-1/4 | R68G-AAK-RLG | 360 (170) | 4.24 (1.93) |
| 1-1/2 | R68G-BAK-RLG | 360 (170) | 4.33 (1.97) |

### Alternative Models

R 6 8 G - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |
| None | N |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |
| No Yoke (***N*** in 5th position) Rc threaded gauge ports | N |
| No Yoke (***N*** in 5th position) PTF threaded gauge ports | A |

| Option | Substitute |
|---|---|
| Adjusting knob | K |
| T-bar | T |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 0 to 60 psig (0 to 4 bar) | F |
| 5 to 120 psig (0.4 to 8 bar) | L |
| 10 to 250 psig (0.7 to 17 bar) | S** |

| Type | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |
| Relieving, Viton option | F |
| Non relieving, Viton option | E |

### ISO Symbol

Relieving Non Relieving

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) adjustment range are available only with the T-bar adjustment; therefore substitute ***T*** at the 7th digit and ***S*** at the 9th position.

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

## Technical Data

Fluid: Compressed air

Maximum pressure: 300 psig (20 bar)

Operating temperature*: 0° to +175°F (-20° to +80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).

Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set:

370 scfm (170 $dm^3/s$)

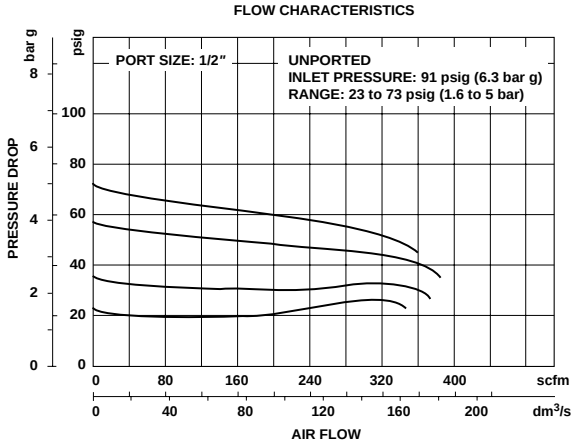
Gauge ports:

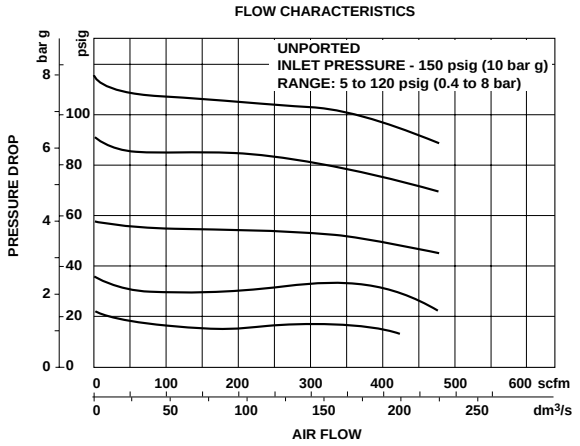
- 1/8 PTF with PTF yoke ports
- Rc1/8 with ISO Rc yoke ports
- Rc1/8 with ISO G yoke ports

Materials:

- Body: Aluminum
- Yoke: Aluminum
- Bonnet: Aluminum
- Adjusting knob: Acetal resin
- Valve: Aluminium
- Optional T-bar adjusting screw: Steel
- Elastomers: Synthetic rubber

## Typical Performance Characteristics



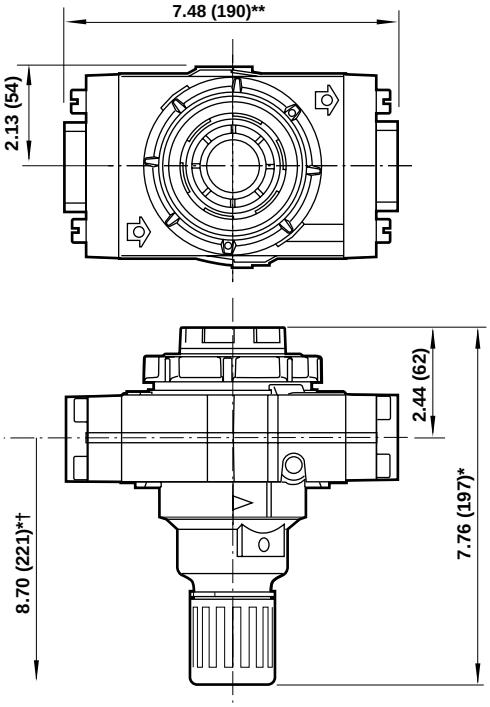




## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4381-300 |
| | Non relieving | 4381-301 |

Service kit includes port and bottom plug 'O' rings, valve assembly, valve spring and diaphragm.

All Dimensions in Inches (mm)




*** Add 1.46" (37mm) for unit with T-bar.**
**** Add 0.39" (10mm) 1-1/4" and 1-1/2" models.**
**† Minimum clearance required to remove unit.**

# R17

## 17 Series General Purpose Regulator
## 3/4", 1", 1-1/4", and 1-1/2" Port Sizes

- **Accurate and quick response to changes in flow demand and line pressure variations**
- **Balanced valve minimizes effect of changes in inlet pressure on outlet pressure**
- **Standard relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Full flow gauge ports**
- **Low torque, non-rising adjusting knob**
- **Integral locking device on knob adjustment**
- **Can be serviced without removal from the air line**

**Ordering Information.** Models listed are knob adjustment, relieving type with gauge, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*, and PTF threads.

| Port Size | Model Number | Flow† scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| 3/4" | R17-600-RGLA | 440 (208) | 2.31 (1.05) |
| 1" | R17-800-RGLA | 480 (227) | 2.02 (0.92 |
| 1-1/4" | R17-A00-RGLA | 400 (189) | 2.68 (1.22) |
| 1-1/2" | R17-B00-RGLA | 440 (208) | 2.59 (1.18) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

### Alternative Models

R 1 7 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Adjustment | Substitute |
|---|---|
| Knob | 0 |
| T-bar | 1 |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

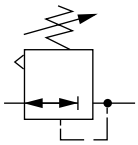
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| BSPP (1-1/2″ ported units only) | C |
| ISO G parallel (not available with1-1/2″ ported units) | G |

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 125 psig (0.3 to 8.5 bar) | L |
| 10 to 250 psig (0.7 to 17 bar) | S |

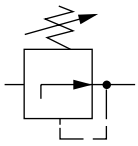
| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

### ISO Symbols



Relieving



Non relieving

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 300 psig (20 bar)
Operating temperature: -30° to 175°F (-34° to 80°C)*

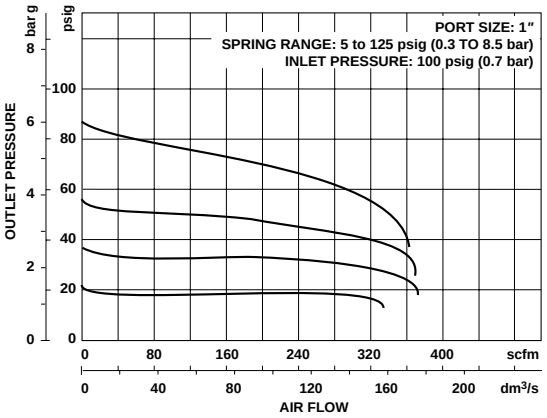
* Air supply must be dry enough to avoid ice formation at temperatures 35°F (2°C).

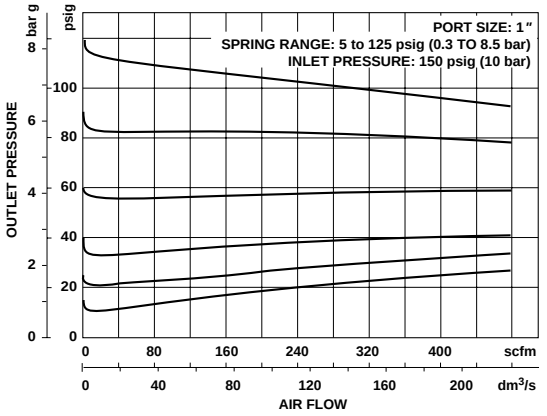
Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure, and a droop of 15 psig (1 bar) from set: 480 scfm (227 $dm^3/s$)

Gauge ports:
- 1/4" PTF with PTF main ports
- R1/4 with ISO Rc, ISO G, and BSPP main ports

Materials
- Body: Aluminum
- Bonnet: Aluminum
- Bottom plug: Acetal
- Valve: Aluminum and nylon
- Elastomers: Nitrile

## Typical Performance Characteristics



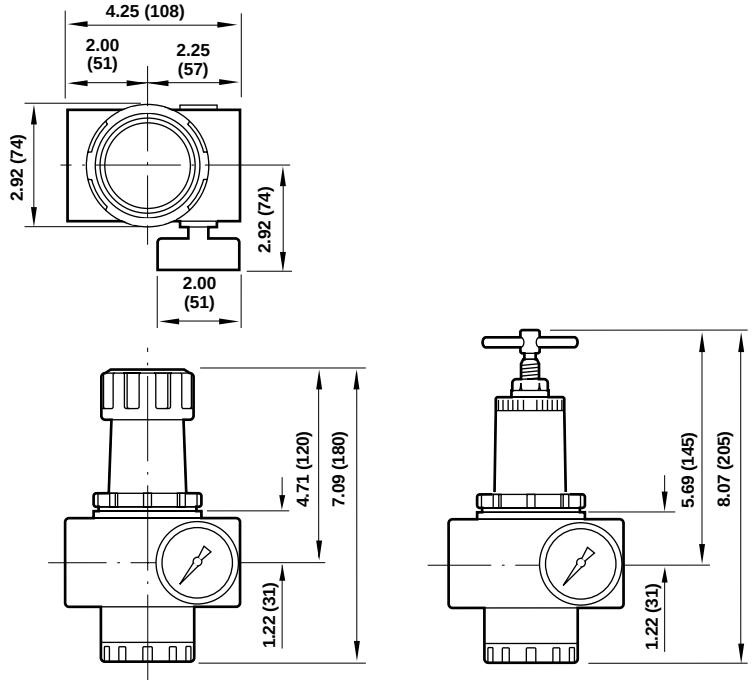




## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Relieving | 5578-02 |
| | Non relieving | 5578-01 |

Service kit contains, diaphragm, all o-rings, valve, and valve spring.

All Dimensions in Inches (mm)




Panel mounting hole diameter: 2.28″ (58 mm)
Panel thickness: 0.06″ *to* 0.16″ (2 to 4 mm)

## 18 Series General Purpose Pressure Regulator
## 1-1/2″ and 2″ Port Sizes

- **The R18 with the conventional integral pilot provides good pressure regulation, rapid response to changing flow demands, and excellent stability.**
- **The R18 with the feedback integral pilot provides superior pressure regulation under changing flow demands where changes in flow demand are not sudden or cyclic.**
- **Balanced valve minimizes effect of changes in inlet pressure on outlet pressure**
- **Constant bleed feature in pilot regulator provides quick response and minimum dead-band**
- **Exceptionally high relief flow**
- **Full flow gauge ports**
- **Low torque, non-rising adjusting knob**
- **Integral locking device on knob adjustment**

**Ordering Information.** Models listed include R40 conventional integral pilot, relieving diaphragm, with gauge, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*, and PTF threads.

| Port Size | Model | Flow† scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 1-1/2" | R18-B05-RGLA | 2000 (944) | 8.48 (3.85) |
| 2" | R18-C05-RGLA | 2000 (944) | 8.27 (3.75) |

† Typical flow with 100 psig (0.7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set.

### Alternative Models

R 1 8 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1-1/2″ | B |
| 2″ | C |

| Pilot Regulator Type | Substitute |
|---|---|
| R40 Conventional | 05 |
| R41 Feedback ** | 06 |

| Port Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 125 psig (0.3 to 8.5 bar) | L |
| 10 to 250 psig (0.7 to 17 bar) | S |

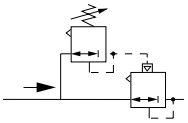
| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

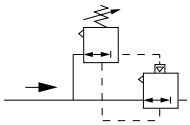
* Outlet pressures can be adjusted to pressures in excess or, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Requires relieving diaphragm and 250 psig (17 bar) spring (**R** in 7th position and **S** in 9th position) e.g. R18-B06-**R**N**S**G .

### ISO Symbols



R18 with Conventional Pilot Regulator



R18 with Feedback Pilot Regulator

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Inlet pressure range: 10 psig (0.7 bar) minimum to 450 psig (31 bar) maximum
Operating temperature: -30° to 175°F (-34° to 80°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Typical flow with 100 psig (0.7 bar) inlet pressure, 90 psig (6.3 bar) set pressure, and a droop of 115 psig ( bar) from set: 2000 scfm (944 $dm^3/s$)

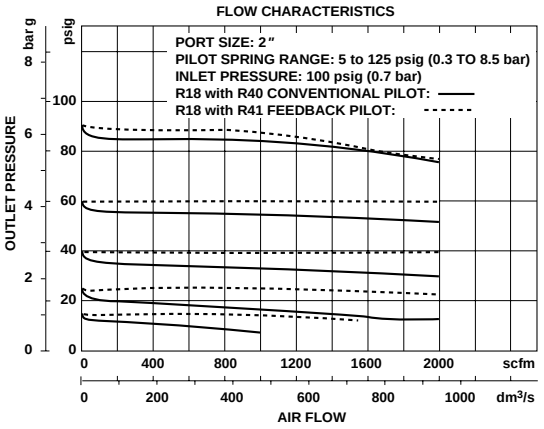
Gauge ports:
- 1/4" PTF with PTF main ports
- G1/4 with ISO G main ports
- R1/4 with ISO Rc main ports

Exhaust port:
- 3/4" PTF with PTF main ports
- G3/4 with ISO G main ports
- R3/4 with ISO Rc main ports

Maximum bleed rate: 0.25 scfm (0.12 $dm^3/s$) at 50 psig (3.5 bar) outlet pressure.

Materials
- Body: Aluminum
- Bonnet: Aluminum
- Bottom Plug: Aluminum
- Valve
  - Integral Pilot Regulator: Teflon
  - Pilot Operated Regulator: Aluminum
- Elastomers: Nitrile

## Typical Performance Characteristics



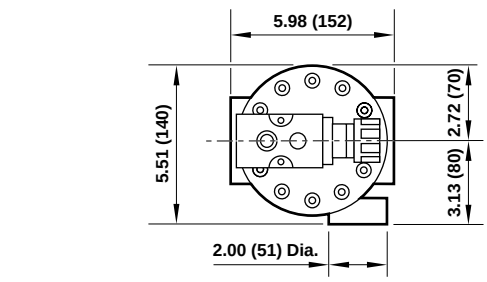

## Service Kits

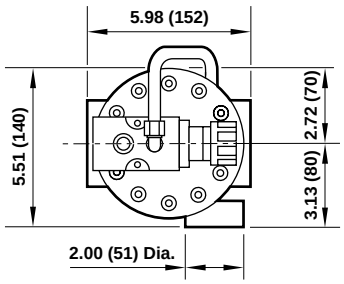
| Item | Type | Part number |
|---|---|---|
| Service kits | R18 Pilot operated regulator** | 5945-40 |
| | R40 and R41 Pilot regulators† | 5945-41 |

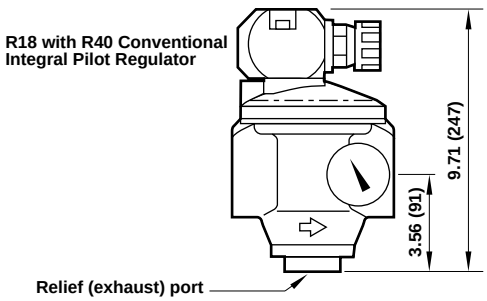
** Contains filter screen and all o-rings for R18 pilot operated regulator.

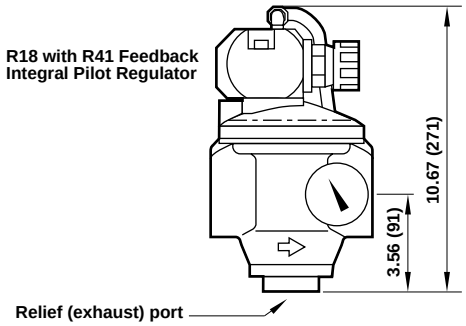
† Contains diaphragm, valve spring, valve, guide bushing, filter screen, and all o-rings for R40 and R41 pilot regulators.

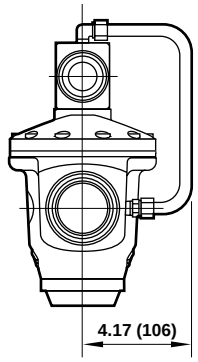
All Dimensions in Inches (mm)



# Specialty Regulators

## Specialty regulators for air or water, tube connection, factory preset pressure, large diaphragm, high relief flow, and field adjustable pressure limits, 1/8" to 1-1/4".

**Contents**



**R06**

**11-044**

**R91**

**R14 and R16**

**R43**

**11-009**

**11-002**

**R24**

# R06

**Miniature Brass Body Regulator**
**Water and Compressed Air Service**
**1/8″ and 1/4″ PTF Port Sizes**

- **Compact design, corrosion resistant construction**
- **Brass body with choice of plastic or brass bonnet**
- **Plastic bonnet equipped with low torque, non-rising pressure adjusting knob. Snap action knob locks pressure setting when pushed in**
- **Brass bonnet equipped with pressure adjusting screw**
- **Non-relieving models for air and water service**
- **Relieving models for air service allow reduction of outlet pressure even when the system is dead-ended**
- **Can be disassembled without the use of tools or removal from the air or water line**

**Ordering Information.** Models listed include PTF threads, plastic bonnet with knob adjustment, non-relieving diaphragm, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range†, and without gauge.

| Port | Model | Flow* scfm ($dm^3/s$) | Flow** gpm (lpm) | Weight lb (kg) |
|---|---|---|---|---|
| 1/8" PTF | R06-121-NNKA | 12 (5.7) | 1.3 (4.9) | 0.2 (0.09) |
| 1/4" PTF | R06-221-NNKA | 12 (5.7) | 1.3 (4.9) | 0.2 (0.09) |

* Approximate flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.
** Approximate flow with100 psig ( 7 bar) inlet pressure, 60 psig (4 bar) set pressure and a 15 psig (1 bar) droop from set.

### Alternative Models

R 0 6 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8″ | 1 |
| 1/4" | 2 |

| Bonnet | Substitute |
|---|---|
| Plastic | 21 |
| Brass | 22 |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

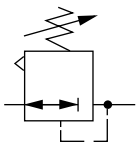
| Threads | Substitute |
|---|---|
| PTF | A |

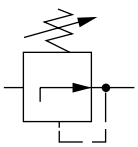
| Outlet Pressure Adjustment Range† | Substitute |
|---|---|
| 1 to 10 psig (0.1 to 0.7 bar) | A |
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 100 psig (0.3 to 7 bar) | K |
| 5 to 125 psig (0.3 to 8.6 bar) | L |

| Gauges | Substitute |
|---|---|
| With | G |
| Without | N |

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

### ISO Symbols


Relieving


Non relieving

**See Section ALE-24 for Accessories**

## Technical Data

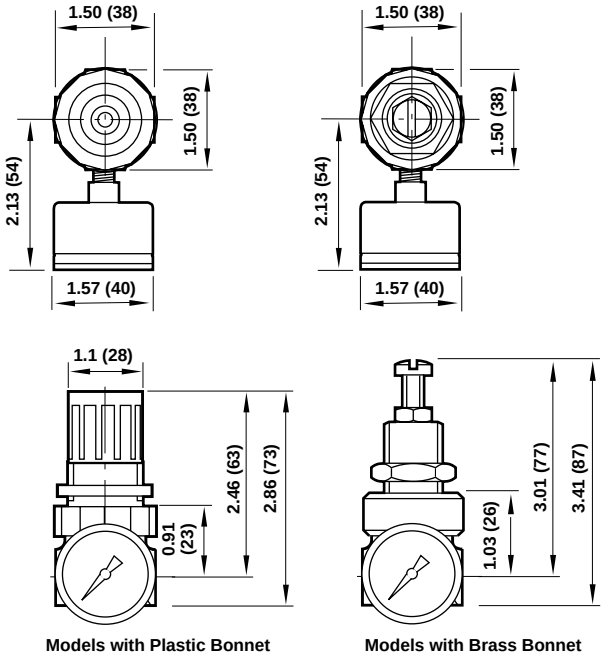
Fluid: Water and compressed air
Maximum pressure: 400 psig (27 bar)
Operating temperature
Water service: 35° to 150°F (2° to 65°C)†
Air service: -30° to 150°F (-34° to 65°C) *†

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow for water service at 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of 15 psig (1 bar) from set: 1.3 gpm (4.9 lpm)
Typical flow for compressed air service at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 12 scfm (5.7 $dm^3/s$)
Gauge ports: 1/8" PTF
Materials
Body: Brass
Bonnet
Standard: Acetal resin
Optional: Brass
Valve: Brass/nitrile
Valve seat: Acetal resin
Elastomers: Nitrile

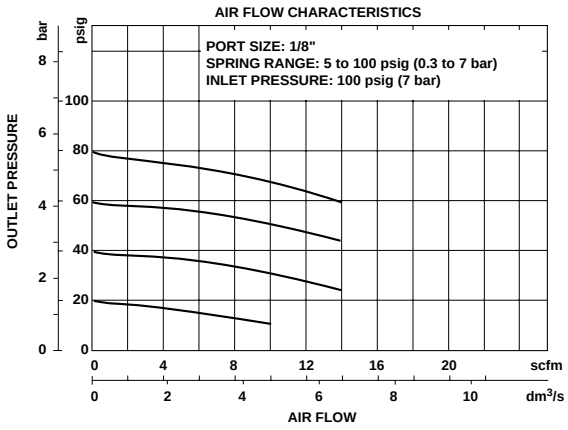
All Dimensions in Inches (mm)

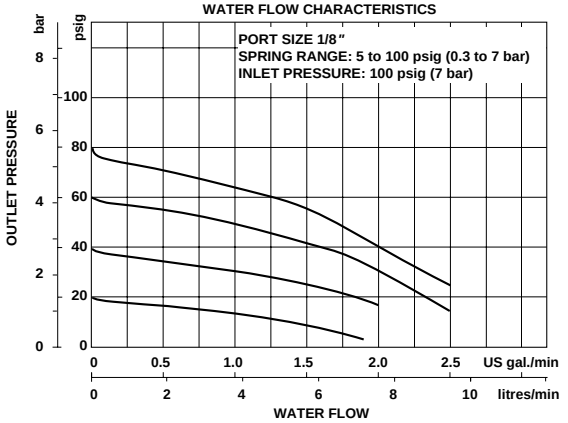
Panel mounting hole diameter:
Models with plastic bonnet: 1.19″ (30 mm)
Models with brass bonnet: 0.81" (21mm)
Maximum panel thickness: 0.25″ (6 mm)




**Models with Plastic Bonnet** **Models with Brass Bonnet**

## Typical Performance Characteristics




## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Relieving | 3407-18 |
| | Non relieving | 3407-17 |

Service kit includes slip ring, diaphragm, standard valve seat with o-ring, valve, valve spring.

† Brass bonnet & body combination max temperature 200°F

# 11-044

**Water and Compressed Air Service**
**Pressure Regulator 1/4″ Tube Connection**

- **Non-relieving models.**
- **Acetal plastic, corrosion resistant construction**
- **Low torque, non-rising adjusting knob.**
- **Snap action knob locks pressure setting when pushed down.**
- **Designed for use with deionized water and potable water systems. Plastics and metals in contact with fluid are approved by the National Sanitation Foundation (NSF) for use in potable water systems. Elastomers are food grade.**
- **Can be disassembled without the use of tools or removal from the air or water line.**

**Ordering Information.** Models listed include non-relieving diaphragm, and 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range †.

| Port Connection | Model | Flow* scfm ($dm^3/s$) | Flow** U.S. gpm (lpm) | Weight lb (kg) |
|---|---|---|---|---|
| 1/4" tube nut and ferrule | 11-044-003 | 3.0 (1.4) | 0.7 (2.65) | 0.16 (0.08) |

**Alternative Models**

1 1 - 0 4 4 - ★ ★ ★

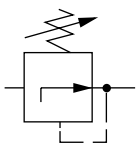
| Outlet Pressure Adjustment Range† | Substitute |
|---|---|
| 1 to 10 psig (0.1 to 0.7 bar) | 001 |
| 2 to 50 psig (0.3 to 3.5 bar) | 002 |
| 5 to 100 psig (0.3 to 7 bar) | 003 |

* Approximate flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

** Approximate flow with 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a 15 psig (1 bar) droop from set.

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**ISO Symbols**



Non relieving

**See Section ALE-24 for Accessories**

## Technical Data

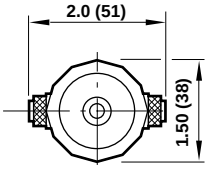
Fluid: Water and compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature:
Water service: 35° to 150°F (2° to 66°C)
Air service: -30° to 150°F (-34° to 66°C) *

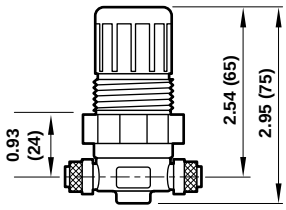
* When used in air service, air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Port connections: 1/4" OD tube (brass nut and plastic ferrule supplied)
Recommended tubing: 1/4" soft PVC or Polyethylene tubing. Avoid aluminum, copper, and hard plastic tubing.
Typical flow:
Compressed air service at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 3.0 scfm (1.4 $dm^3/s$)
Water service at 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of 15 psig (1 bar) from set:
0.7 U.S. gpm (2.65 liters per minute)
No gauge ports
Materials
Body: Acetal
Bonnet: Acetal
Valve: Stainless steel with EPDM seal (NSF approved)
Valve seat: Acetal
Diaphragm: Stainless steel and nitrile (NSF approved)

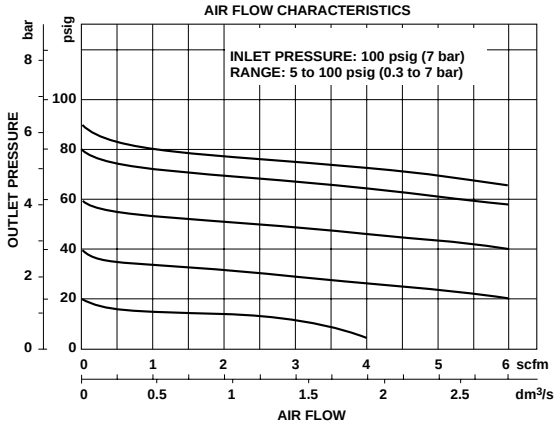
All Dimensions in Inches (mm)

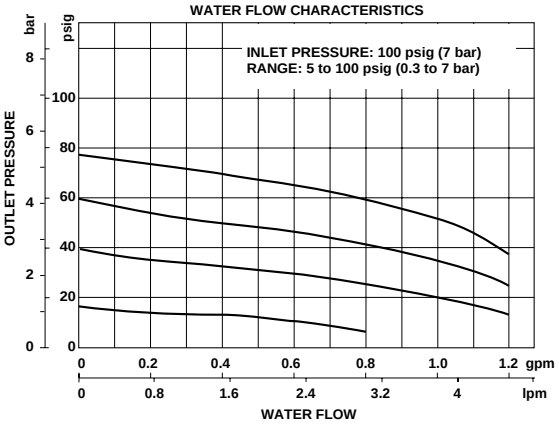
Panel mounting hole diameter: 1.19″ (30 mm)
Maximum panel thickness: 0.25″ (6 mm)




## Typical Performance Characteristics




## Service Kits

| Type | Part number |
|---|---|
| Non-relieving | 3407-59 |

Service kit includes slip ring, valve seat, valve, valve spring, and diaphragm.

# R91

## Water or Compressed Air Pressure Regulator 1/4″ Port Size

- **Bonnet and body made from acetal plastic.**
- **R91W designed for use with deionized water and potable water systems. Plastics and metals in contact with fluid are approved by the National Sanitation Foundation (NSF) or the Food And Drug Administration (FDA) for use in potable water systems. Elastomers are food grade. Non relieving models only.**
- **R91G designed for use with non-potable water and compressed air systems. Non relieving and relieving models.**
- **Low torque, non-rising adjusting knob.**
- **Snap action knob locks pressure setting when pushed down.**
- **Can be disassembled without the use of tools or removal from the air or water line.**

**Ordering Information.** Models listed include PTF threads, knob adjustment, non relieving diaphragm, 5 to 125 psig (0.3 to 8.6 bar) outlet pressure adjustment range†, and without gauge.

| Inlet Port | Application | Model | Flow* scfm ($dm^3/s$) | Flow** gpm (lpm) | Weight lb (kg) |
|---|---|---|---|---|---|
| 1/4" | Industrial air and non-potable water | R91G-2AK-NLN | 24 (11) | 1.75 (6.6) | 0.15 (0.07) |
| 1/4" | Potable water and deionized water | R91W-2AK-NLN | 24 (11) | 1.75 (6.6) | 0.15 (0.07) |

### Alternative Models

R 9 1 ★ - ★ ★ ★ - ★ ★ ★

| Application | Substitute |
|---|---|
| Industrial air, non-potable water | G |
| Potable water, deionized water | W |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Adjustment | Substitute |
|---|---|
| Knob | K |

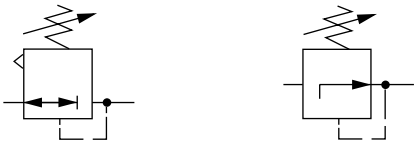
| Gauge | Substitute |
|---|---|
| With | G † |
| Without | N |

| Outlet Pressure Adjustment Range†† | Substitute |
|---|---|
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 125 psig (0.3 to 8.6 bar) | L |

| Diaphragm | Substitute |
|---|---|
| Non relieving | N |
| Relieving ¶ | R |

* Approximate flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.
** Approximate flow with 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a 15 psig (1 bar) droop from set.
† Gauge with NSF approved materials not available.
†† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.
¶ Relieving diaphragm only available with the R91G regulator.

### ISO Symbols




**See Section ALE-24 for Accessories**

## Technical Data

Fluid
- R91G: Compressed air and non-potable water
- R91W: Potable water, deionized water

Maximum pressure: 150 psig (10 bar)

Operating temperature
- Water service: 35° to 125°F (2° to 52°C)
- Air service: 0° to 125°F (-20° to 52°C) *

* When used in air service, air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow for compressed air service at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 24 scfm (11 dm³/s).

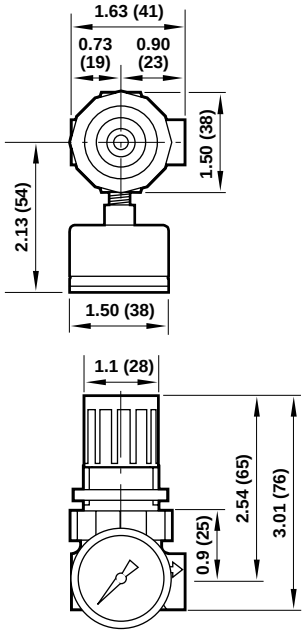
Typical flow for water service at 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of 15 psig (1 bar) from set: 1.75 US gpm per minute (6.6 liters)

Gauge ports:
- 1/8 PTF with PTF main ports
- R1/8 with ISO Rc main ports
- R1/8 with ISO G main ports

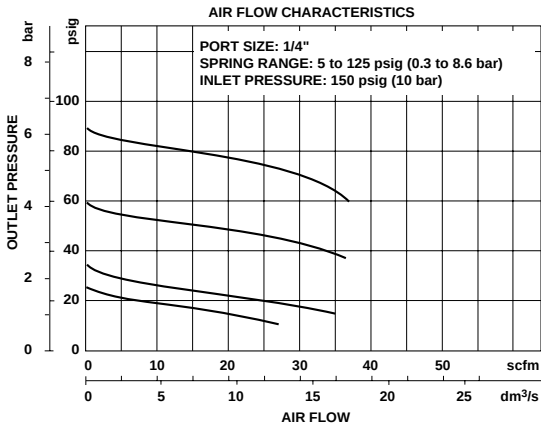
Materials
- Body and bonnet: Acetal
- Valve
  - R91G: Brass/nitrile
  - R91W: Stainless steel/food grade EPDM
- Valve seat: Acetal
- Valve seat o-ring
  - R91G: Nitrile
  - R91W: Food grade EPDM
- Diaphragm
  - R91G: Acetal/nylon inserted nitrile
  - R91W: Acetal/nylon inserted nitrile, food grade
- Gauge port plugs: Polypropylene (furnished only with PTF-ported units)

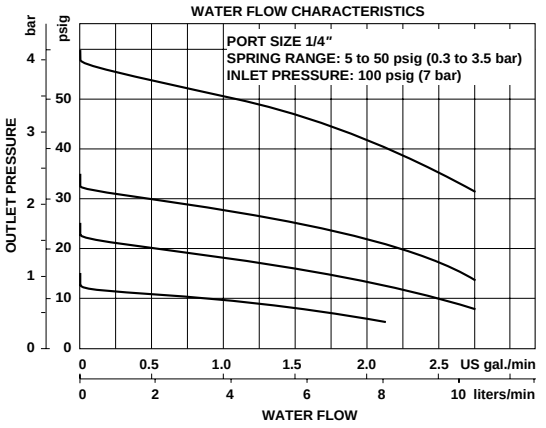
All Dimensions in Inches (mm)

Panel mounting hole diameter 1.19″ (30 mm)
Maximum panel thickness 0.25″ (6 mm)




## Typical Performance Characteristics




## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | R91W, non relieving | 3407-93 |
| | R91G, non relieving | 3407-94 |
| | R91G, relieving | 3407-95 |

Service kit contains slip ring, diaphragm, valve seat with o-ring, valve, and valve spring.

# R14, R16

**Miniature, Preset, Nonadjustable Pressure Regulator**
**Water and Compressed Air Service**
**1/8″ or 1/4″ PTF Port Sizes**

- **Non-relieving models for air and water service**
- **Relieving models for air service allow reduction of outlet pressure even when the system is dead-ended**
- **R14 has aluminum body and bonnet**
- **R16 has brass body and bonnet**
- **Factory preset, tamper resistant pressure setting**
- **Non-repairable**

**Ordering Information.** Models listed are relieving type for compressed air service with PTF threads and with gauge ports

| Port | Model | Flow† scfm ($dm^3/s$) | Flow†† U.S. gpm (lpm) | Weight lb (kg) |
|---|---|---|---|---|
| 1/8" PTF | R14-100-R**A | 12 (5.7) | 1.3 (4.9) | 0.2 (0.09) |
| 1/8" PTF | R16-100-R**A | 12 (5.7) | 1.3 (4.9) | 0.7 (0.32) |
| 1/4" PTF | R14-200-R**A | 12 (5.7) | 1.3 (4.9) | 0.2 (0.09) |
| 1/4" PTF | R16-200-R**A | 12 (5.7) | 1.3 (4.9) | 0.7 (0.32) |

† Approximate flow with 100 psig (7 bar) inlet pressure, 80 psig 5.5 bar() set pressure and a 15 psig (1 bar) droop from set.
†† Approximate flow with 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a 15 psig (1 bar) droop from set.

## Alternative Models

R ★ ★ - ★ ★ ★ - ★ ★ ★ ★

| Type/Service | Substitute |
|---|---|
| Piston; air service only | 14 |
| Diaphragm; air and water service | 16 |

| Port Size | Substitute |
|---|---|
| 1/8″ | 1 |
| 1/4" | 2 |

| Gauge ports in body | Substitute |
|---|---|
| With gauge ports | 00 |
| Without gauge ports | 01 |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

| Threads | Substitute |
|---|---|
| PTF | A |

** The ***8th*** and ***9th*** positions of the model number contain the ***Modified Outlet Pressure Setting***. The ***Modified Outlet Pressure Setting*** is the desired outlet pressure, modified to allow for inlet pressures other than 100 psig, and for flows other than zero. Insert the modified outlet pressure setting in positions 8 and 9 as described below.

1. Write down the desired outlet pressure and the flow through the regulator. EXAMPLE: ***30 psig outlet pressure at 10 scfm flow.***
2. Modifications for inlet pressures other than 100 psig:
   If inlet pressure exceeds 100 psig*, add 1 psig to the desired outlet pressure for each 20 psig the inlet pressure is above 100 psig*.
   EXAMPLE: If the inlet pressure is 180 psig, add 4 to the desired outlet pressure. Following through with the example in step 1, add 4 to 30 for a modified outlet pressure setting of ***34 psig.***
   If inlet pressure is less than 100 psig*, subtract 1 psig from the desired outlet pressure for each 20 psig the inlet pressure is below 100 psig*.
   EXAMPLE: If the inlet pressure is 60 psig, subtract 2 from the desired outlet pressure. Following through with the example in step 1, subtract 2 from 30 for a modified outlet pressure setting of ***28 psig.***
3. Modifications for flows other than zero:
   Determine the pressure drop from the appropriate flow curve above. Add the pressure drop to the modified outlet pressure setting.
   EXAMPLE: If the desired outlet pressure is 30 psig at a flow of 10 scfm, add 10 to the modified outlet pressure setting. The quantity of 10 is the difference between the outlet pressure (30 psig) at the desired flow (10 scfm) and outlet pressure (40 psig) at no flow. See dashed lines on the air flow curve for example. Following through with the first example in Step 2 above, add 10 to the 34 to obtain a modified outlet pressure setting of ***44.*** Enter ***44*** in the 8th and 9th positions of the model number.

* 125 psig for outlet pressure settings of 95 through 99 psig.

## Technical Data

Fluid
- R14: Compressed air
- R16: Water and compressed air

Maximum pressure: 400 psig (27 bar)

Operating temperature
- Water service: 35° to 175°F (2° to 79°C)†
- Air service: -30° to 175°F (-34° to 79°C) *†

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Type
- R14: Piston, relieving or non-relieving
- R16: Diaphragm. relieving or non-relieving

Typical flow for water service at 100 psig (7 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of 15 psig (1 bar) from set: 1.3 U.S. gpm (4.9 liters per minute)

Typical flow for compressed air service at 100 psig (7 bar) inlet pressure, 80 psig (5.5 bar) set pressure and a droop of 15 psig (1 bar) from set: 12 scfm (5.7 $dm^3/s$)

Gauge ports: 1/8" PTF

Factory preset outlet pressure settings: 0,2 to 6,8 bar (3 to 99 psig)

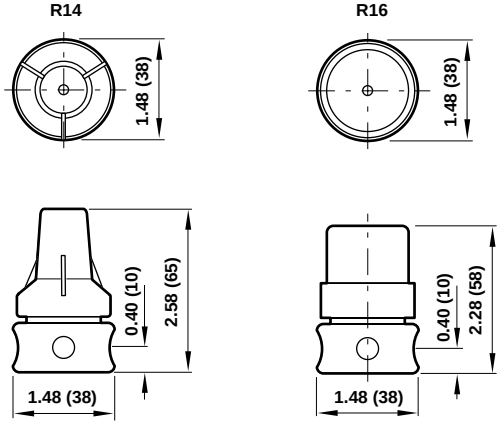
Outlet pressure tolerance:

| Outlet pressure setting - psig (bar) | Tolerance - psig (bar) ** |
|---|---|
| 3 to 20 psig (0.21 to 1.38 bar) | ± 1.0 psig (0.07 bar) |
| 21 to 50 psig (1.45 to 3.45 bar) | ± 2.0 psig (0.14 bar) |
| 51 to 99 psig (3.52 to 6.84 bar) | ± 3.0 psig (0.21 bar) |

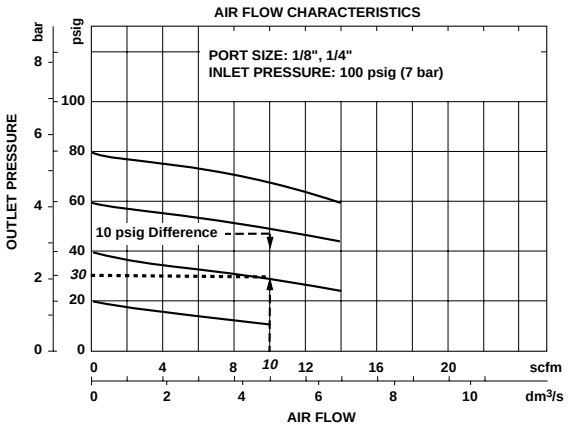
** When outlet pressure is preset at the factory, the following conditions exist
- Flow thru regulator: No flow
- Inlet pressure:
  - 100 psig (6.9 bar) for outlet pressures up through 95 psig (6.6 bar)
  - 125 psig (8.6 bar) for outlet pressures of 96 through 99 psig (6.7 through 6.8 bar)

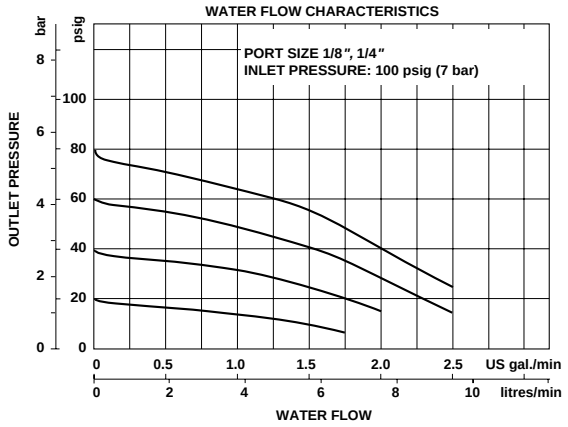
Materials
- Body and bonnet
  - R14: Aluminum
  - R16: Brass
- Valve: Brass
- Valve seat: Acetal resin
- Elastomers: Nitrile

All Dimensions in Inches (mm)

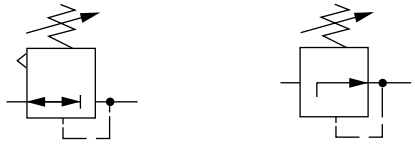



## Typical Performance Characteristics




## ISO Symbols




† R16 brass bonnet & body combination max temperature 200°F

**See Section ALE-24 for Accessories**

# R43

## Water and Compressed Air Service Pressure Regulator 1/4″, 3/8″ and 1/2″ Port Sizes

- **Non-relieving models**
- **Brass body, corrosion resistant construction**
- **Balanced valve minimizes effects of inlet pressure variations on outlet pressure**
- **T-bar adjustment standard, nonrising knob adjustment optional**
- **Full flow gauge ports can be used as auxiliary outlets**
- **Panel mounting nut standard**
- **Can be disassembled without the use of tools or removal from the air or water line.**

**Ordering Information.** Models listed have T-handle adjustment, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*, and PTF threads. A gauge is not included.

| Port | Model | Flow† U.S. gpm (lpm) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | R43-201-NNLA | 6 (23) | 2.4 (1.09) |
| 3/8" | R43-301-NNLA | 6 (23) | 2.4 (1.09) |
| 1/2" | R43-406-NNLA | 9 (34) | 2.4 (1.09) |

### Alternative Models

R 4 3 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |
| 1/2″ | 4 |

| Adjustment | Substitute |
|---|---|
| Knob | 00 |
| T-handle with 1/4″ and 3/8″ ports | 01 |
| T-handle with 1/2″ ports | 06 |

| Diaphragm | Substitute |
|---|---|
| Non relieving | N |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

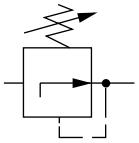
| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 125 psig (0.3 to 8.6 bar) | L |
| 15 to 250 psig (1 to 17 bar) | S |

| Gauges | Substitute |
|---|---|
| With | G |
| Without | N |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

### ISO Symbols



Non relieving

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Water and compressed air
Maximum pressure: 400 psig (27 bar)
Operating temperature:
Water service: 35° to 200°F (2° to 93°C)
Air service: -30° to 200°F (-34° to 93°C) *

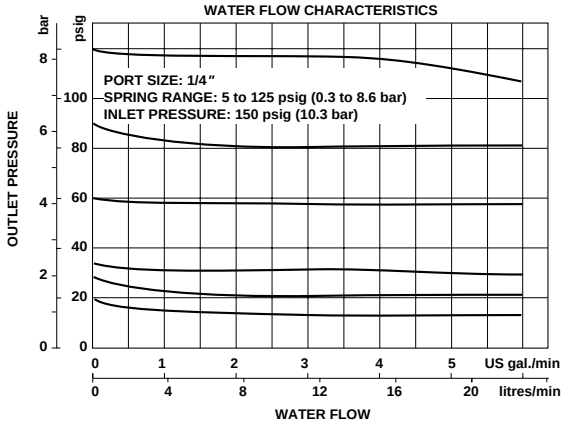
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

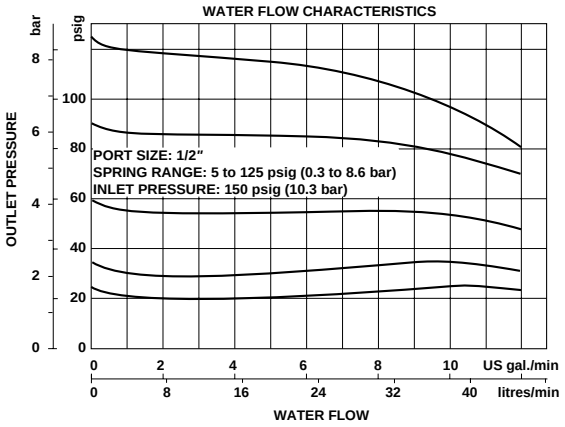
Typical flow for water service at 150 psig (10.3 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of less than 5 psig (0.35 bar) from set:
1/4", 3/8" Ports: 6 U.S. gpm (22 liters per minute)
1/2" Ports: 9 U.S. gpm (45 liters per minute)

Gauge ports
1/4" PTF with PTF main ports
1/4" ISO G with ISO G main ports
1/4" ISO Rc with ISO Rc main ports

Materials:
Body: Brass
Bonnet: Aluminum
Valve: Brass
Bottom plug: Brass
Elastomers: Nitrile

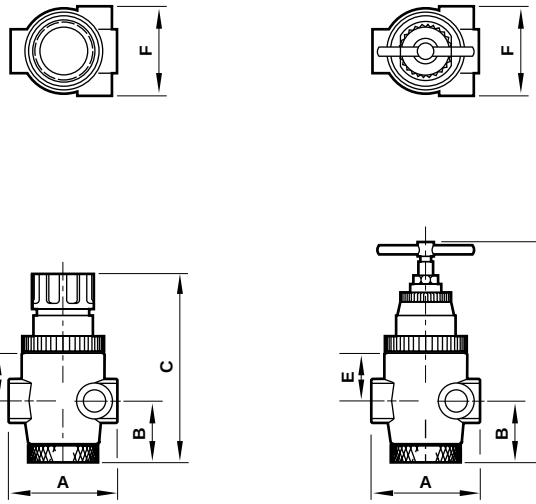
## Typical Performance Characteristics




All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.89" (48 mm)
Maximum panel thickness: 0.19" (5 mm)




| Port Size | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1/4", 3/8" | 2.76 (70) | 1.52 (39) | 4.86 (124) | 5.75 (146) | 1.21 (31) | 2.31 (59) |
| 1/2" | 3.34 (85) | 1.59 (41) | 5.01 (127) | 5.90 (150) | 1.28 (33) | 2.44 (62) |

## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | For 1/4" and 3/8" ported units | 5298-03 |
| | For 1/2" ported units | 5298-10 |

Service kit includes diaphragm, o-rings, valve, valve spring.

# 11-009

## Water and Compressed Air Service
## Pressure Regulator 3/4″, 1″ Port Sizes

- **Non-relieving models**
- **Brass body, corrosion resistant construction**
- **Balanced valve minimizes effects of inlet pressure variations on outlet pressure**
- **T-bar adjustment standard, screw adjustment optional**
- **Large diaphragm provides accurate and quick response to changes in line pressure and varying flow demands**
- **Can be disassembled without removal from the air or water line.**

**Ordering Information.** Models listed have PTF threads, T-bar adjustment, non-relieving diaphragm, and 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*. A gauge is not included.

| Port Size | Model Number | Flow † U.S. gpm (lpm) | Weight lbs (kg) |
|---|---|---|---|
| 3/4" | 11-009-065 | 27.5 (104) | 3.54 (7.8) |
| 1" | 11-009-081 | 27.5 (104) | 3.40 (7.5) |

*Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Typical flow with 100 psig (6.9 bar) inlet pressure, 60 psig (4 bar) set pressure and 15 psig (1 bar) droop from set.

### Alternative Models

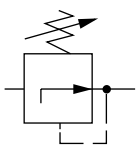
1 1 - ★ 0 9 - ★ ★ ★ - ★ ★

| Threads | Substitute |
|---|---|
| PTF | 0 |
| ISO G parallel | 8 |
| ISO G Rc | 9 |

| Option | Substitute |
|---|---|
| Screw adjustment | -7G |
| Hand wheel adjustment | -7V |
| Mounting bracket assembled to unit | -1D |

| With Gauge | Substitute |
|---|---|
| 3/4" Ported Unit | 073 |
| 1" Ported Unit | 089 |

### ISO Symbols



Non relieving

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Water and compressed air
Maximum pressure: 400 psig (28 bar)
Operating temperature
Water service: 35° to 200°F (2° to 93°C)
Air service: -30° to 200°F (-34° to 93°C) *

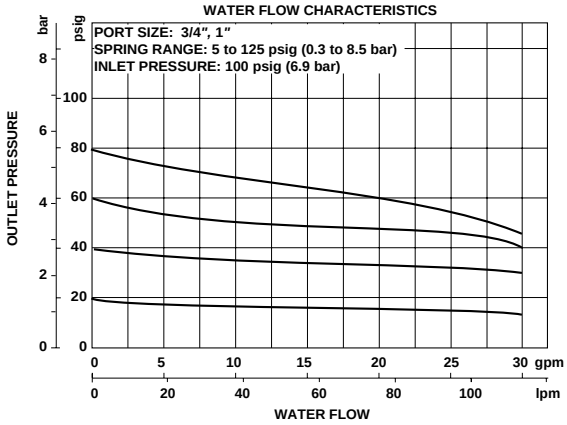
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow at 100 psig (6.9 bar) inlet pressure, 60 psig (4 bar) set pressure and a 15 psig (1 bar) droop from set:
27.5 U.S. gpm (104 liters per minute)

Gauge ports:
1/8" PTF with PTF main ports
G1/8 with ISO G main ports
Rc1/4 with ISO Rc main ports

Materials
Body: Brass
Bonnet: Aluminum and steel
Valve: Brass
Bottom plug: Brass
Elastomers: Nitrile

## Typical Performance Characteristics

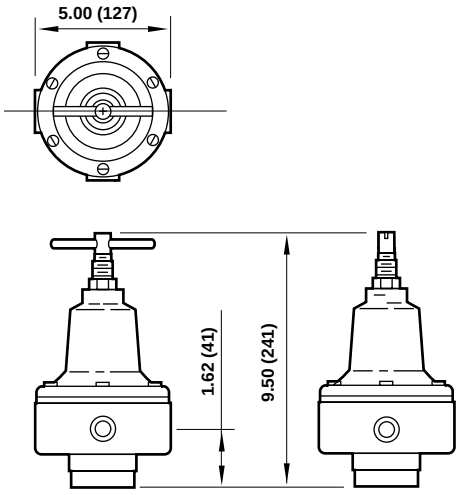



## Service Kits

| Type | Part number |
|---|---|
| Non-relieving | 2436-03 |

Service kit includes diaphragm, valve seat, valve pin, valve pin gasket, valve, valve spring, and o-rings.

All Dimensions in Inches (mm)



# 11-002

## Pressure Regulator
## 1/4", 3/8", 1/2" Port Sizes

- **Large diaphragm provides accurate and quick response to changing flow demands and line pressure**
- **Floating valve pin provides positive valve seating**
- **Balanced valve minimizes effect of variations in inlet pressure on outlet pressure**
- **Standard relieving models allow reduction of downstream pressure when the system is dead-ended**

**Ordering Information.** Models listed have PTF threads, T-bar adjustment, relieving diaphragm, and 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range*.

| Port Size | Model Number | Flow† scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| 1/4" | 11-002-013 | 110 (52) | 1.9 (0.86) |
| 3/8" | 11-002-037 | 110 (52) | 1.9 (0.86) |
| 1/2" | 11-002-061 | 260 (123) | 2.0 (0.91) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.
*Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

### Alternative Models

11 - ★02 - ★★★ - ★★

| Threads | Substitute |
|---|---|
| PTF | 0 |
| ISO G parallel | 8 |
| ISO G Rc | 9 |

| Option | Substitute |
|---|---|
| Handwheel adjustment | 8C |
| Screw adjustment | 8B |
| Mounting bracket assembled to unit | 1A |
| Threaded bonnet for panel mounting, hand wheel adjustment | 2A |
| Threaded bonnet for panel mounting, T-bar adjustment | 2B |
| Threaded bonnet for panel mounting, screw adjustment | 2C |

| Outlet Pressure Adjustment Range* 5 to 50 psig (0.3 to 3.5 bar) | | | |
|---|---|---|---|
| Port Size | Relief Type | Gauge | Substitute |
| 1/4" | Non-relieving | Without | 003 |
| 1/4" | Relieving | Without | 015 |
| 3/8" | Non-relieving | Without | 027 |
| 3/8" | Relieving | Without | 039 |
| 1/2" | Non-relieving | Without | 051 |
| 1/2" | Relieving | Without | 063 |
| 1/4" | Non-relieving | With | 009 |
| 1/4" | Relieving | With | 021 |
| 3/8" | Non-relieving | With | 033 |
| 3/8" | Relieving | With | 045 |
| 1/2" | Non-relieving | With | 057 |
| 1/2" | Relieving | With | 069 |

| Outlet Pressure Adjustment Range* 5 to 125 psig (0.3 to 8.5 bar) | | | |
|---|---|---|---|
| Port Size | Relief Type | Gauge | Substitute |
| 1/4" | Non-relieving | Without | 001 |
| 1/4" | Relieving | Without | 013 |
| 3/8" | Non-relieving | Without | 025 |
| 3/8" | Relieving | Without | 037 |
| 1/2" | Non-relieving | Without | 049 |
| 1/2" | Relieving | Without | 061 |
| 1/4" | Non-relieving | With | 007 |
| 1/4" | Relieving | With | 019 |
| 3/8" | Non-relieving | With | 031 |
| 3/8" | Relieving | With | 043 |
| 1/2" | Non-relieving | With | 055 |
| 1/2" | Relieving | With | 067 |

| Outlet Pressure Adjustment Range* 5 to 250 psig (0.3 to 17 bar) | | | |
|---|---|---|---|
| Port Size | Relief Type | Gauge | Substitute |
| 1/4" | Non-relieving | Without | 005 |
| 1/4" | Relieving | Without | 017 |
| 3/8" | Non-relieving | Without | 029 |
| 3/8" | Relieving | Without | 041 |
| 1/2" | Non-relieving | Without | 053 |
| 1/2" | Relieving | Without | 065 |
| 1/4" | Non-relieving | With | 011 |
| 1/4" | Relieving | With | 023 |
| 3/8" | Non-relieving | With | 035 |
| 3/8" | Relieving | With | 047 |
| 1/2" | Non-relieving | With | 059 |
| 1/2" | Relieving | With | 071 |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**See Section ALE-24 for Accessories**

## Technical Data

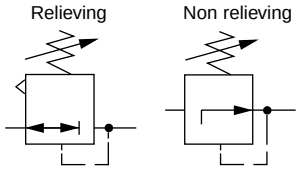
Fluid: Compressed air
Maximum pressure: 400 psig (28 bar)
Operating temperature*: -30° to 175°F (-34° to 80°C)
*Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from from set:
1/4" and 3/8" ports: 110 scfm (52 $dm^3/s$)
1/2" ports: 260 scfm (123 $dm^3/s$)
Gauge ports
1/8" PTF with PTF main ports
Rc1/8 with ISO G and ISO Rc main ports
Materials
Body: Zinc
Bonnet: Aluminum
Valve: Brass and nitrile
Valve seat: Brass
Elastomers: Nitrile
Bottom plug
1/4" and 3/8" Ports: Brass
1/2" Ports: Nylon

## Service Kits

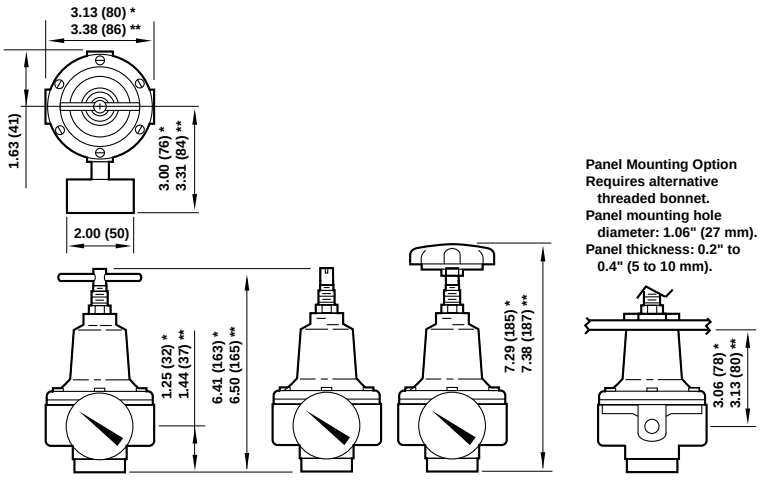
| Type | Part number |
|---|---|
| Relieving, 1/4" and 3/8" ports | 529-03 |
| Relieving, 1/2" ports | 535-03 |
| Non-relieving, 1/4" and 3/8" ports | 529-01 |
| Non-relieving, 1/2" ports | 535-01 |

Service kit includes diaphragm, valve, valve spring, and o-rings.

## ISO Symbols

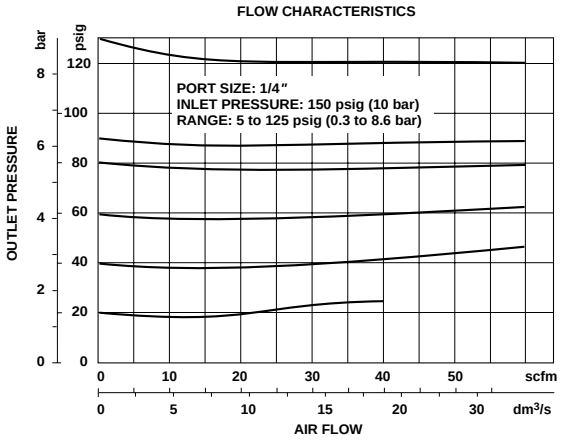


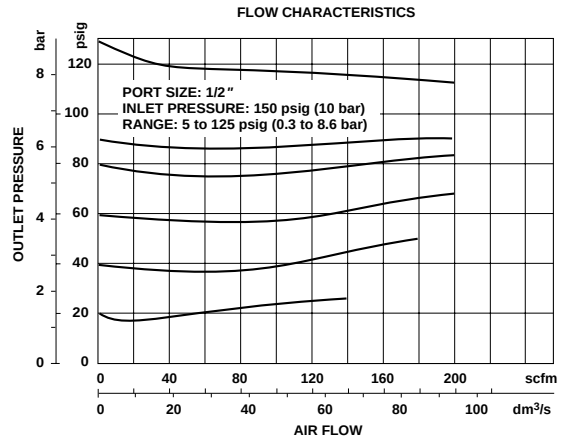

All Dimensions in Inches (mm)

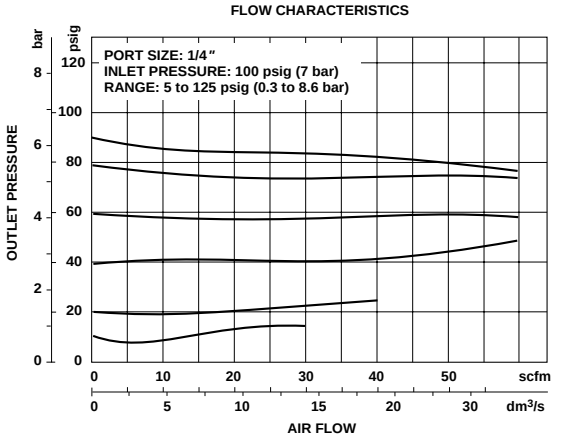


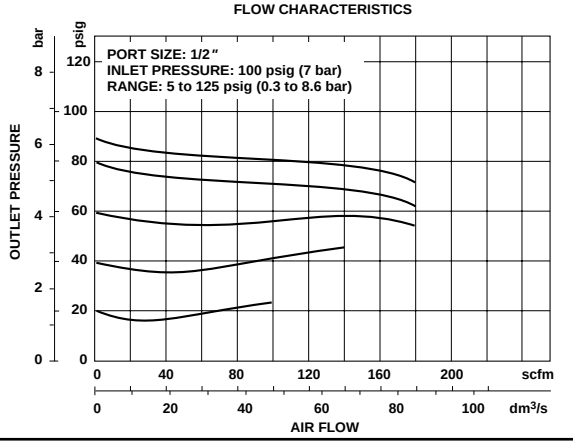

* Regulators with 1/4" and 3/8" ports.
** Regulators with 1/2" ports.

## Typical Performance Characteristics



# R24

## Micro Trol Pressure Regulator
## 1/4" to 1-1/4" Port Sizes

- **High flow regulator with exceptional high relief flow**
- **Adjusting knob can be set in the field to stop at some maximum pressure setting or some minimum pressure setting**
- **Easy to adjust even at high output pressures**
- **Balanced valve minimizes effect of variations in inlet pressure on outlet pressure**
- **Constant bleed feature provides maximum sensitivity to system changes**
- **Relieving feature allows reduction of downstream pressure when the system is dead-ended**
- **Full flow gauge ports**

**Ordering Information.** Models listed are constant bleed units with relieving diaphragm, 10 to 125 psig (0.7 to 8 bar) outlet pressure adjustment range, and PTF threads.

| Port Size | Model | Weight lb (kg) |
|---|---|---|
| 1⁄4" | R24-200-RGLA | 1.90 (0.86) |
| 3⁄8" | R24-300-RGLA | 1.83 (0.83) |
| 1⁄2" | R24-400-RGLA | 1.79 (0.81) |
| 3⁄4" | R24-600-RGLA | 2.73 (1.24) |
| 1" | R24-800-RGLA | 2.73 (1.24) |
| 1-1⁄4" | R24-A00-RGLA | 2.65 (1.20) |

### Alternative Models

R 2 4 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |
| 1" | 8 |
| 1-1/4" | A |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Type | Substitute |
|---|---|
| Knob adjusting | 0 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 5 to 30 psig (0.3 to 2 bar) | C |
| 5 to 60 psig (0.3 to 4 bar) | F |
| 10 to 125 psig (0.7 to 8 bar) | L |
| 10 to 250 psig (0.7 to 17 bar) | S |

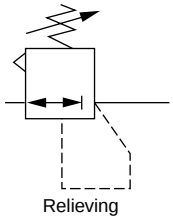
| Gauge | Substitute |
|---|---|
| With | G** |
| Without | N |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** A factory installed gauge is only available with PTF threads (***A*** in last position of model number). If a gauge is desired with ISO threads (***B*** or ***G*** in last position), order the desired gauge and appropriate reducing bushing from ***Accessories***.

### ISO Symbol




**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum inlet pressure: 300 psig (20 bar)
Operating temperature: 0° to 150°F (-20° to 80°C)*

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from from set
- 1/2" ports: 200 scfm (94 $dm^3/s$)
- 1-1/4" ports: 700 scfm (330 $dm^3/s$)

Maximum bleed rate at 50 psig (3.5 bar) outlet pressure: 0.031 scfm (0.016 $dm^3/s$) †

† Maximum bleed rate occurs under dead-end (no flow) conditions.

Port sizes:

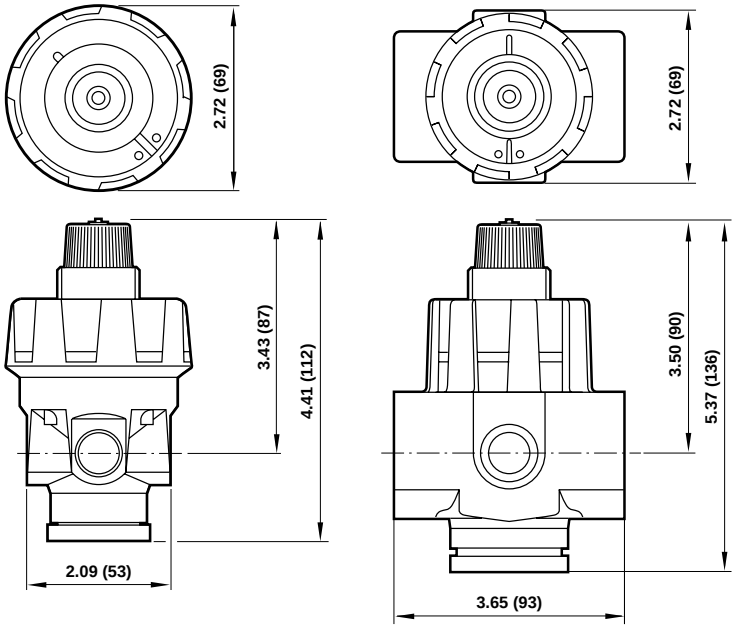
| Main | Gauge |
|---|---|
| 1/4" | 1/4" |
| 3/8" | 3/8" |
| 1/2", 3/4", 1", 1-1/4" | 1/2" |

Thread type: PTF, ISO G, or Rc

Materials
- Body, top cap: Zinc
- Main valve, adjusting screw: Brass
- Pilot valve, relief valve: Acetal
- Elastomers: Nitrile
- Bottom Plug: Acetal

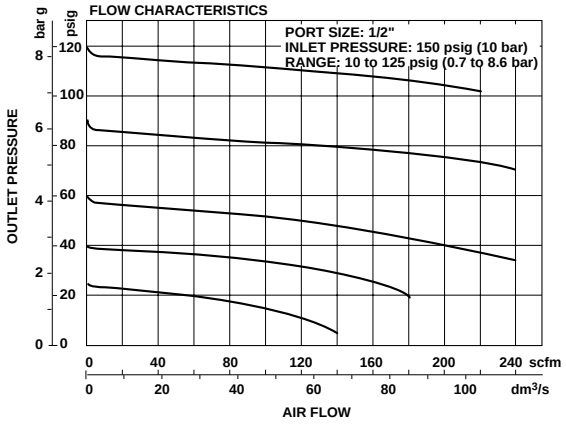
All Dimensions in Inches (mm)

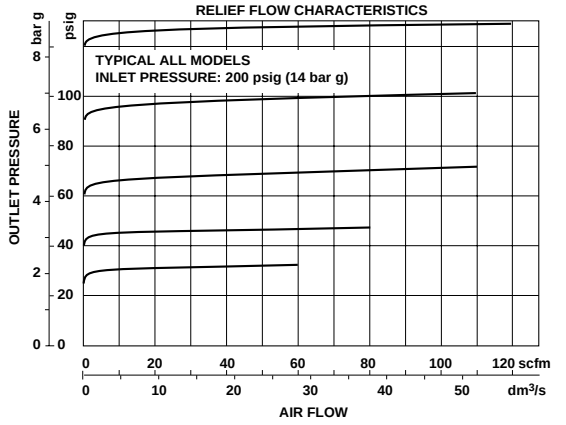
Panel mounting hole diameter: 1.26" (32 mm)
Maximum panel thickness: 0 to 0.12" (3 mm)

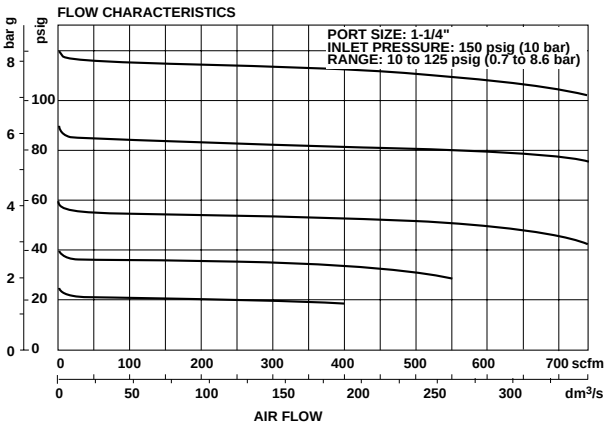



## Typical Performance Characteristics

RANGE: 10 to 232 psi (0.7 to 16 bar)




## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | 1/4, 3/8, 1/2 | 5292-52 |
| Service kit | 3/4, 1, 1-1/4 | 5292-53 |

Service kits include seals, main valve and spring.

# Manifold Regulators

## 8mm, 10mm, 1/4" and 3/8" port sizes.

**Contents**



**R30M**

**R72M**

# R30M SERIES

**Manifold Regulator**
**8 mm and 10 mm Port Sizes**

- **Push-in fittings in ports. No need for threaded connectors and fittings**
- **Push to lock adjusting knob with tamper resistant accessory**
- **Integral base mounting**
- **Water or compressed air only**

**Ordering Information.** Models listed include 10 mm push-in fittings, knob adjustment, relieving diaphragm, 0 to 70 psig (0 to 4.8 bar) outlet pressure adjustment range* with gauge, with porting plug.

| Port | Model | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 8 mm | R30M-8DK-RGG | 17 (8) | 0.22 (0.10) |
| 10 mm | R30M-ADK-RGG | 17 (8) | 0.22 (0.10) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

**Alternative Models**

R 3 0 M - ★ D K - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 8 mm | 8 |
| 10 mm | A |

| Push-In Form | Substitute |
|---|---|
| Metric | D |

| Adjustment | Substitute |
|---|---|
| Knob | K |

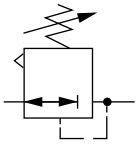
* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

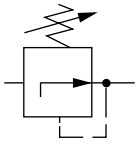
| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 0 to 70 psig (0 to 4.8 bar) | G |
| 5 to 100 psig (0.3 to 7 bar) | K |

| Type | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

**ISO Symbols**



Relieving



Non relieving

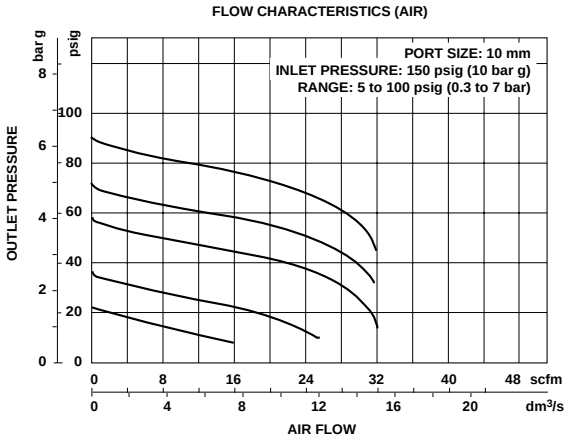
**See Section ALE-24 for Accessories**

## Technical Data

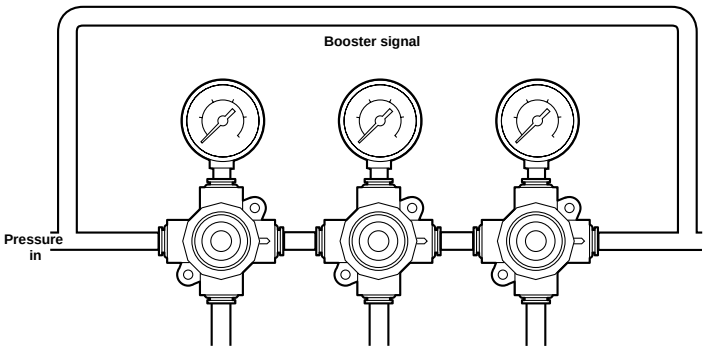
Fluid: Compressed air or water
Maximum pressure: 150 psig (10 bar)
Operating temperature*: 23° to 104°F (-5° to 40°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Approximate flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 17 scfm (8 $dm^3/s$)
Gauge port:
(can be used as additional outlet port)
10 mm OD tube with 10 mm OD tube main ports
8 mm OD tube with 8 mm OD tube main ports
Two inlet ports:
10 mm OD tube or 8 mm o/d tube
One outlet port:
10 mm OD tube with 10 mm OD tube inlet
8 mm OD tube with 8 mm OD tube inlet
Materials:
Body: Acetal
Bonnet: Acetal
Valve: Brass/nitrile
Elastomers: Nitrile
Valve seat: Acetal

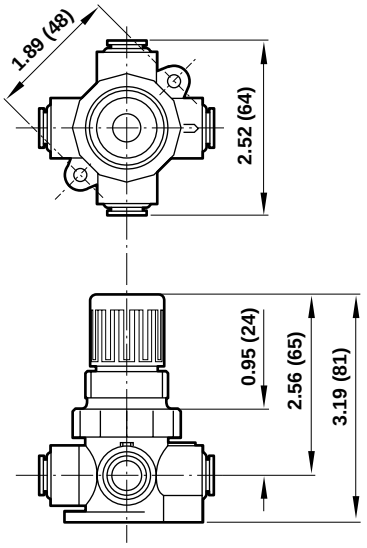
## Typical Performance Characteristics




## Typical Manifold Regulator Application




All Dimensions in Inches (mm)
Panel mounting hole diameter: 1.19" (30 mm)
Maximum panel thickness: 0.25" (6 mm)



# R72M

## Excelon 72 Manifold Regulator
## 1/4″, 3/8″ Port Sizes

- **Excelon design allows in-line or modular installation**
- **Manifold typically up to six regulators without booster signal**
- **Balanced valve design for optimum pressure control**
- **Push to lock adjusting knob with tamper resistant accessory**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed include PTF threads, knob adjustment, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range* with gauge.

| Inlet Port (2) | Outlet Port (1) | Model | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|---|
| 1/4" | 1/4" | R72M-2AK-RMG | 83 (39) | 0.79 (0.36) |
| 3/8" | 1/4" | R72M-3AK-RMG | 83 (39) | 0.79 (0.36) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

### Alternative Models

R 7 2 ★ - ★ ★ ★ - ★ ★ ★

| Type | Substitute |
|---|---|
| Manifold | M |

| Inlet Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

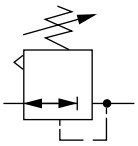
| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 30 psig (0.3 to 2 bar) | C |
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |

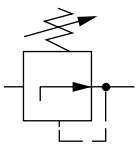
| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

### ISO Symbols



Relieving



Non Relieving

**See Section ALE-24 for Accessories**

## Technical Data

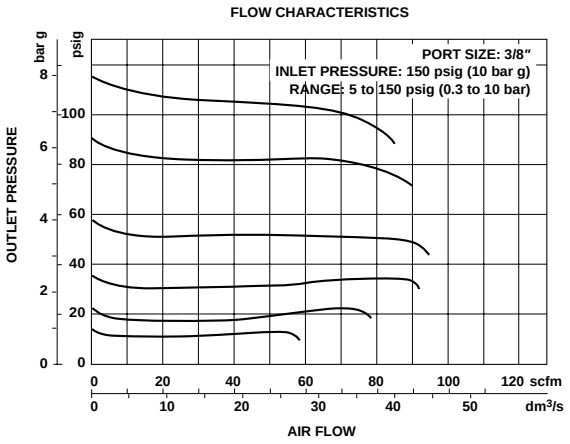
Fluid: Compressed air
Maximum pressure: 290 psig (20 bar)
Operating temperature*: -30° to 150°F (-34° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 83 scfm (39 dm³/s)
Two inlet ports:
- 1/4" or 3/8" PTF
- 1/4" or 3/8" ISO Rc
- 1/4" or 3/8" ISO G

One outlet port:
- 1/4" PTF with PTF inlet ports
- 1/4" ISO Rc with ISO Rc inlet ports
- 1/4" ISO Rc with ISO G inlet ports

One gauge port:
- 1/8" PTF with PTF inlet ports
- 1/8" ISO Rc with ISO Rc inlet ports
- 1/8" ISO Rc with ISO G inlet ports

Materials
- Body: Zinc
- Bonnet: Acetal
- Valve: Brass
- Elastomers: Nitrile
- Bottom plug: Acetal

## Typical Performance Characteristics

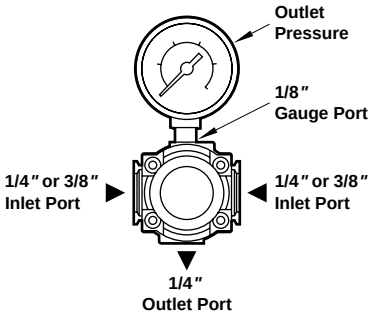


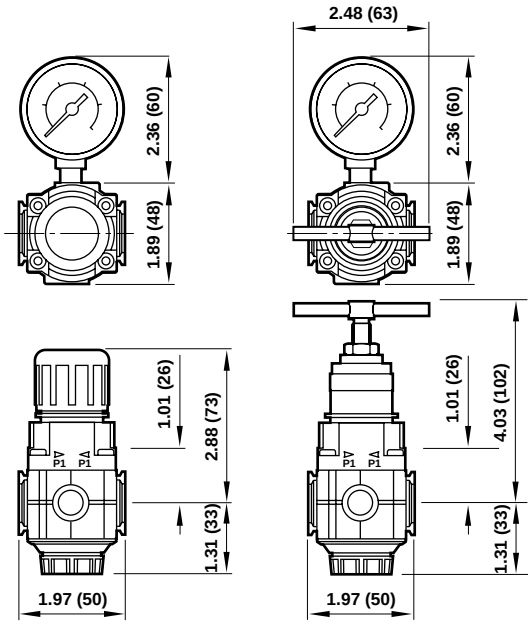

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4381-500 |
| | Non relieving | 4381-501 |

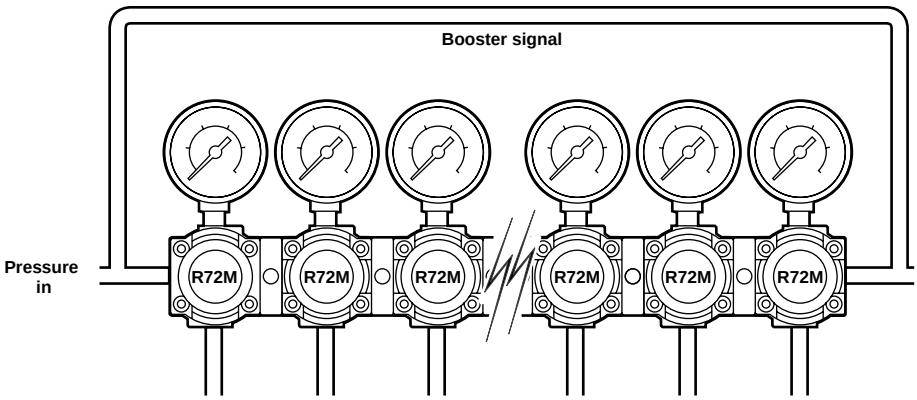
Service kit includes diaphragm assembly, valve assembly, valve spring and o-rings.

All Dimensions in Inches (mm)
Panel mounting hole diameter: 1.57" (40 mm)
Maximum panel thickness: 0.16" (4 mm)




## Typical Manifold Regulator Application



Section 7

# Precision and Instrument Regulators

## 1/4" port size

Contents



**11-018**

**R38**

# 11-018

## Precision Air Pressure Regulator
## 1/4" Port Size

- **Fast response**
- **Minimum overshoot during flow changes**
- **Precision regulation obtained by pilot valve design - small change in the pilot valve position results in a large change in the main valve position**
- **Constant bleed feature provides maximum sensitivity to system changes**
- **Relieving feature allows reduction of downstream pressure when the system is dead-ended**

**Ordering Information.** Models listed have PTF threads, hand wheel adjustment, and relieving diaphragm. A gauge is not included.

| Port Size | Outlet Pressure Adjustment Range* | Model Number | Flow scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|---|
| 1/4" | 0.4 to 10 psig (0.03 to 0.69 bar) | 11-018-146 | 12 (5.66)† | 1.4 (0.64) |
| 1/4" | 1.0 to 60 psig (0.1 to 4.1 bar) | 11-018-100 | 12 (5.66)† | 1.4 (0.64) |
| 1/4" | 3 to 150 psig (0.2 to 10.3 bar) | 11-018-110 | 12 (5.66)†† | 1.4 (0.64) |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.
† Typical flow with 100 psig (7 bar) inlet pressure, 60 psig (4.1 bar) set pressure and 0.125 psig (0.009 bar) droop from set.
†† Typical flow with 200 psig (14 bar) inlet pressure, 60 psig (4.1 bar) set pressure and 0.250 psig (0.017 bar) droop from set.
**Note: 5 micron prefiltration required.**

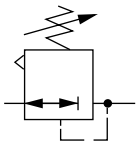
### Alternative Models

1 1 - ★ 1 8 - ★ ★ ★

| Threads | Substitute |
|---|---|
| PTF | 0 |
| ISO G parallel | 8 |
| ISO G Rc | 9 |

| Screw Adjustment | Substitute |
|---|---|
| -100 with slotted screw adjustment | 101 |
| -110 with slotted screw adjustment | 112 |

### ISO Symbols



Relieving

### Service Kits

| Type | Part number |
|---|---|
| Low Pressure Models | 2787-01 |
| High Pressure Models | 2787-02 |
| Special tool to install main valve seat | 681-01 |

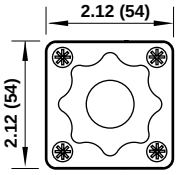
Service kit includes o-rings, seals, pilot diaphragm, pilot spring, main diaphragm, main valve, main valve seat, diffuser screen, constant bleed orifice and orifice filter

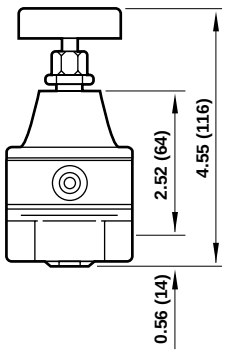
**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Low Pressure Models:
11-018-100 and 11-018-146
High Pressure Models:
11-018-110
Inlet pressure range*
Low Pressure Models: 8 to 150 psig (0.55 to 10.3 bar)
High Pressure Models: 10 to 200 psig (0.7 to 13.8 bar)
* Inlet pressure must be at least 7 psig (0.5 bar) greater than the adjusted outlet pressure for proper operation.
Operating temperature*: 32° to 160°F (0° to 70°C)
** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Flow capacity with 100 psig (6.9 bar) inlet pressure
11-018-146: 12 scfm (5.7 $dm^3/s$) with set pressure of 10 psig (0.7 bar)
11-018-100 and 11-018-110: 20 scfm (9.4 $dm^3/s$) with set pressure of 20 psig (1.4 bar). A small pressure droop occurs at flows above 12 scfm (5.7 $dm^3/s$).
Repeatability
Low Pressure Models: 0.02 psig (0.001 bar) for flow change; 0.05 psig (0.004 bar) when turning supply off and on
High Pressure Models: 0.08 psig (0.006 bar) for flow change; 0.16 psig (0.011 bar) when turning supply off and on
Constant bleed feature: Under dead-end conditions, a small, constant bleed of pilot air will escape thru the relief passage in the bottom plug. This will be accompanied by a slight residual outlet pressure of 1 to 4 inches $H_2O$ (2.5 to 10 millibar).
Gauge ports:
1/4" PTF with PTF main ports
Rc1/4 with ISO G and ISO Rc main ports
Materials
Body: Zinc
Bonnet: Zinc
Main valve: Polycarbonate
Main valve seat: Teflon
Pilot valve: Stainless steel
Pilot valve seat: Aluminum
Main diaphragm: Nitrile
Pilot diaphragm
Low Pressure Models:302 SS
High Pressure Models: Nitrile
Bottom plug: Brass
Elastomers: Nitrile, neoprene, polyurethane

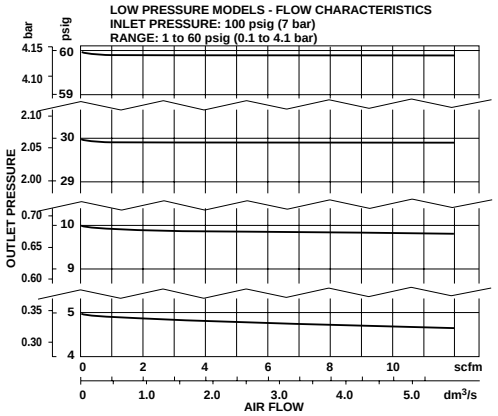
All Dimensions in Inches (mm)

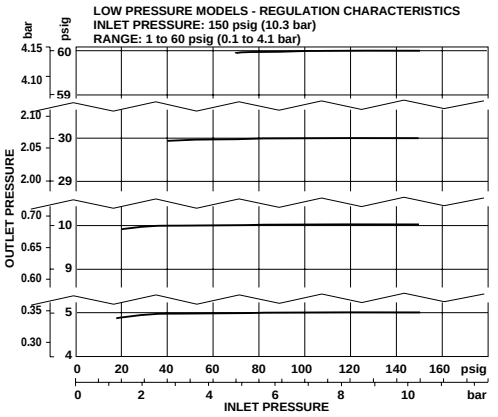


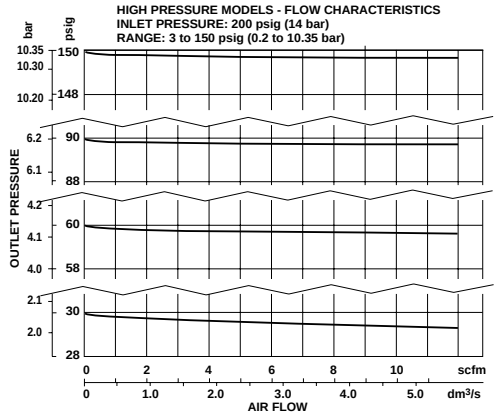



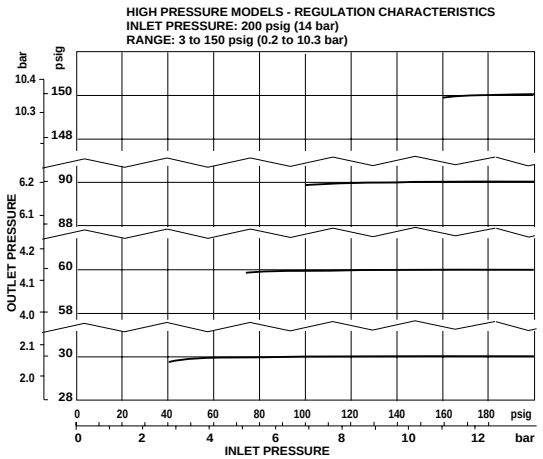

Panel mounting hole diameter: 0.47" (12 mm)
Maximum panel thickness: 0.094" (2.4 mm)

## Typical Performance Characteristics



# R38

## Instrument Regulator
## Aluminum Model 1/4" Port Size

- **Compact instrument units with high performance**
- **Stable regulation with temperature compensation**
- **Excellent flow and regulation characteristics**
- **Panel Mounting facility**

**Ordering Information.** Models listed are relieving type with 0.6 to 30 psig (0.04 to 2 bar) outlet pressure adjustment range *, and PTF threads. A gauge is not included.

| Port Size | Model Number | Flow† scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| 1/4" PTF | R38-200-RNCA | 17 (8) | 1.06 (0.48) |

† Typical flow with 100 psig (7 bar) inlet pressure, 15 psig (1 bar) set pressure and 1 psig (0.05 bar) droop from set.

R 3 8 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" PTF | 2 |

| Material | Substitute |
|---|---|
| Aluminum, nitrile elastomers | 0 |
| Aluminum, Viton elastomers | 1 |

| Mounting Option | Substitute |
|---|---|
| Without | 0 |
| With bracket and nut | 1 |
| With panel nut only | 2 |
| With handwheel and nut | 3 |
| With handwheel, bracket and nut | 4 |
| With handwheel only | 5 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | D |
| API.LP.INT | K |

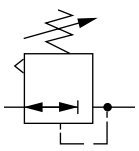
| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 0.6 to 30 psig (0.04 to 2 bar) | C |
| 1 to 60 psig (0.07 to 4 bar) | F |
| 3.6 to 100 psig (0.25 to 7 bar) | K |

| Gauges | Substitute |
|---|---|
| Without | N |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

### ISO Symbol



**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 290 psig (20 bar)
Operating temperature: -40° to 175°F (-40° to 80°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow at 100 psig (7 bar) inlet pressure, 15 psig (1 bar) set pressure and a droop of 1 psig (0.07 bar) from set: 17 scfm (8 $dm^3/s$)

Typical relief differential at 30 psig (2 bar) outlet pressure:
2.3 psig (0.16 bar)

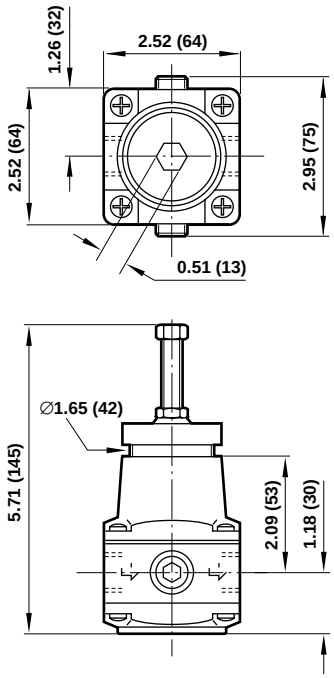
Maximum bleed flow at 30 psig (2 bar) outlet pressure (relieving types only):
0.003 scfm (1.5 $cm^3/s$)†

† Maximum bleed rate occurs under dead-end (noflow) conditions.

Gauge ports:
1/4 NPT

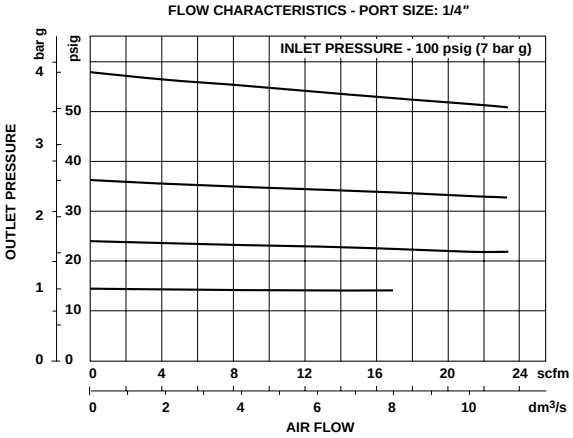
Materials
Body: Aluminum
Bonnet: Aluminum
Adjusting screw: Steel
Elastomeric materials: Nitrile

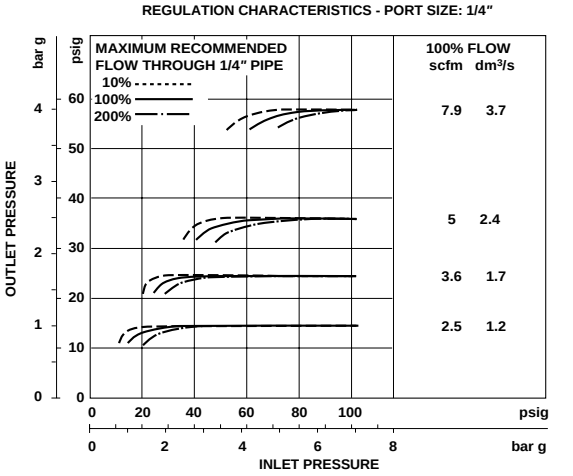
All Dimensions in Inches (mm)




Panel mounting hole diameter: 1.65" (42 mm)
Panel thickness: 0" to 0.24" (0 to 6 mm)

## Typical Performance Characteristics




## Service Kits

| Item | Type | Part number |
|---|---|---|
| 30 psig (2 bar) Range | Relieving | R38-100-R |
| | Non relieving | R38-100-NR |
| 60, 105 psig (4 bar, 7 bar) Range | Relieving | R38-101-R |
| | Non relieving | R38-101-NR |

Service kit includes diaphragm assembly, o-ring, valve, valve spring and 8 pan head screws.

# Pilot Regulators

## Pressure control for Pilot Operated Regulators 1/4" port size

Contents



R40 and R41

11-400 and 20AL

11-104

# R40, R41

## R40 Conventional Pilot Regulator
## R41 Feedback Pilot Regulator
## 1/4" Port Size

- **Pilot regulators are used to control the outlet pressure of a pilot operated regulator (ordered separately)**
- **The pilot regulator is installed in an accessible location in the compressed air system; pilot operated regulator is installed at any point without regard to accessibility**
- **Conventional pilot regulator provides good pressure regulation, rapid response to changing flow demands, and excellent stability.**
- **Feedback pilot regulator provides superior pressure regulation under changing flow demands where changes in flow demand are not sudden or cyclic.**
- **Constant bleed feature provides maximum sensitivity to system changes**
- **Relief feature allows reduction of downstream pressure when the system is dead-ended**

**Ordering Information.** Models listed are relieving with constant bleed, 10 to 250 psig (0.7 to 17 bar) outlet pressure adjustment range *, PTF ports.

| Port Size | Type | Model | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|---|
| 1/4" | Conventional Pilot | R40-200-BNSA | 6.4 (3) | 1.66 (0.75) |
| 1/4" | Feedback Pilot | R41-204-BNSA†† | 6.4 (3) | 1.66 (0.75) |

† Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

†† Do not use the R41 feedback pilot regulator to control outlet pressures at or less than 100 psig (7 bar). Use the 11-104 feedback pilot regulator at those pressures.

### Alternative Models

R ★ ★ - 2 ★ ★ - B N ★ ★

| Type | Substitute |
|---|---|
| R40 Conventional | 40 |
| R41 Feedback | 41 |

| Mounting/Type | Substitute |
|---|---|
| Remote/R40 Conventional | 00 |
| Remote/R41 Feedback | 04 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

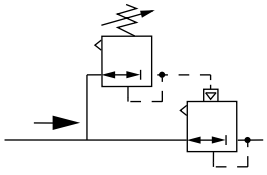
| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 2 to 50 psig (0.1 to 3.5 bar) R40 only | E |
| 5 to 125 psig (0.3 to 8.5 bar) R40 only | L |
| 10 to 250 psig (0.7 to 17 bar) | S |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

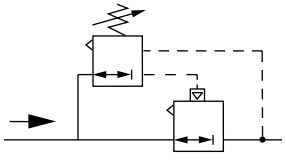
### Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

### ISO Symbols



R40 Conventional Pilot Regulator with Pilot Operated Regulator



R41 Feedback Pilot Regulator with Pilot Operated Regulator

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) to 450 psig (31 bar) maximum*

* For best performance, inlet pressure should be at least 10 psig (0.7 bar) greater than the desired regulated pressure, but must not exceed the specified maximum.

Operating temperature: 0° to 175°F (-20° to 80°C) **

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from from set: 6.4 scfm (3 $dm^3/s$)

Maximum bleed rate at 50 psig (3.5 bar) outlet pressure: 0.25 scfm (0.12 $dm^3/s$)†

†Maximum bleed rate occurs under dead-end (no flow) conditions.

Pilot ports: 1/4" PTF, ISO G, or ISO Rc

R41 feedback port: 1/8" PTF, ISO G, or ISO Rc

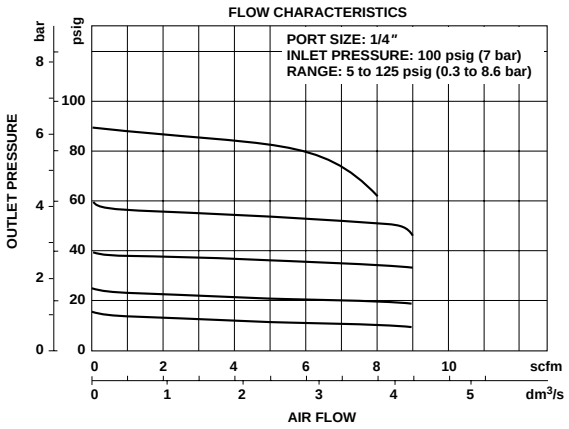
Materials

Body, bonnet: Aluminum

Valve: Teflon

Elastomers: Nitrile

## Typical Performance Characteristics



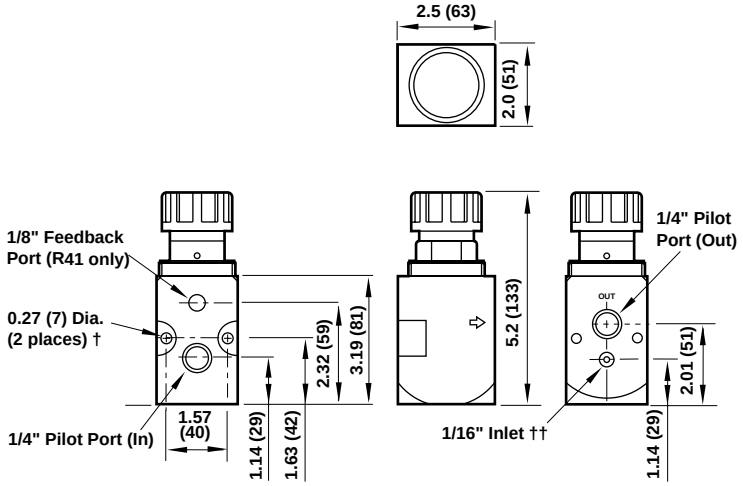

## Service Kits

| Type | Part number |
|---|---|
| R40, R41 | 5945-41 |

Service kit contains diaphragm, valve spring, guide bushing, valve, valve spring, filter screen, and all o-rings.

All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.89" (48 mm)
Maximum panel thickness: 0.13" (3 mm)




**† Mounting holes for subbase mounting.**
**†† Air inlet for subbase mounting.**

# 11-400, 20AL

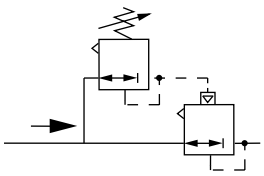
**Conventional Pilot Regulators**
**1/4″ Port Size**

- **Pilot regulators are used to control the outlet pressure of a pilot operated regulator (ordered separately)**
- **The pilot regulator is installed in an accessible location in the compressed air system; pilot operated regulator is installed at any point without regard to accessibility**
- **Conventional pilot regulator provides good pressure regulation, rapid response to changing flow demands, and excellent stability.**
- **Constant bleed feature provides maximum sensitivity to system changes**
- **Relief feature allows reduction of downstream pressure when the system is dead-ended**

**Ordering Information.** Models listed are relieving with constant bleed, PTF threads, without gauge.

| Port Size | Model Number | Range psig (bar) | Weight lbs (kg) |
|---|---|---|---|
| 1/4" | 11-400-2G/AC103 | 1 to 30 (0.06 to 2) | 1.98 (0.90) |
| 1/4" | 11-400-2G/AE103 | 1 to 60 (0.06 to 4) | 2.07 (0.94) |
| 1/4" | 11-400-2G/AG103 | 2 to 100 (0.16 to 7) | 2.2 (1.00) |
| 1/4" | 20AL-X2G/AK103 | 100 to 300 (7 to 20) | 2.3 (1.05) |

**ISO Symbol**



Conventional Pilot Regulator
with Pilot Operated Regulator

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air filtered to 5µm

Maximum inlet pressure: 360 psig (25 bar)

Operating temperature: 0° to 175°F (-20° to 80°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 100 psig (7 bar) inlet pressure, 23 psig (1.6 bar) set pressure and 1.5 psig (0.1 bar) droop from from set: 4.2 scfm (2 $dm^3/s$)

Gauge ports: 1/8" PTF

Materials:

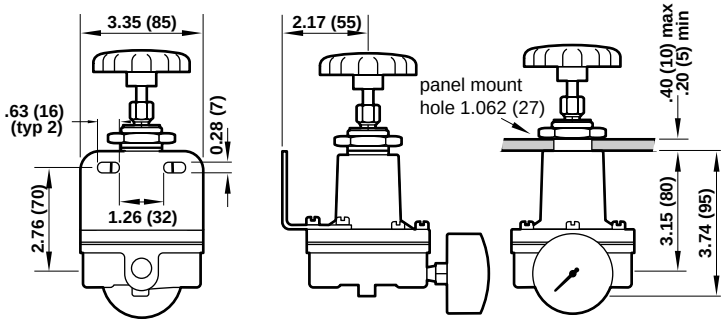
Body, bonnet: Zinc

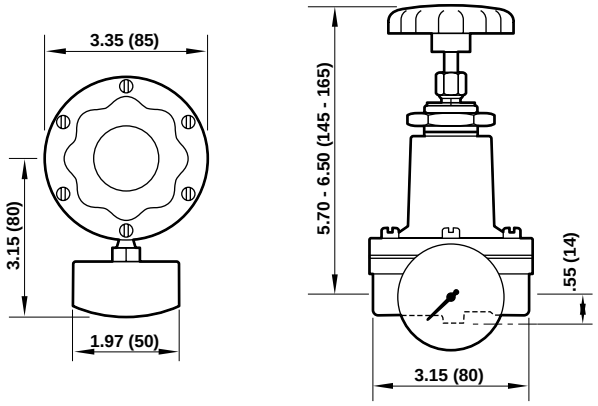
Elastomers: Nitrile

All Dimensions in Inches (mm)

## Mounting Dimensions

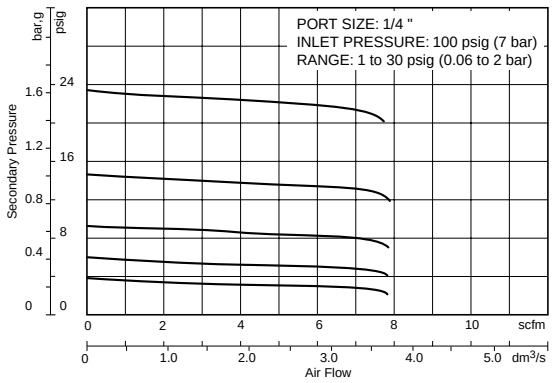
(Shown with optional gauge and mounting bracket)



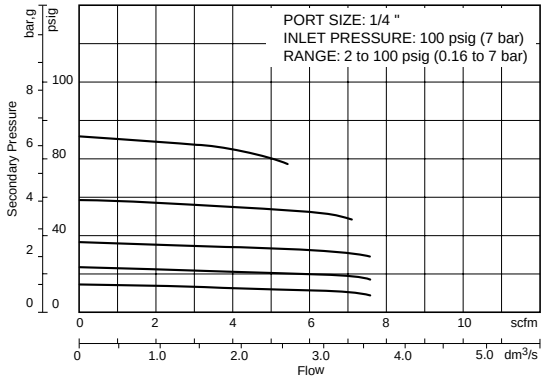




## Typical Performance Characteristics

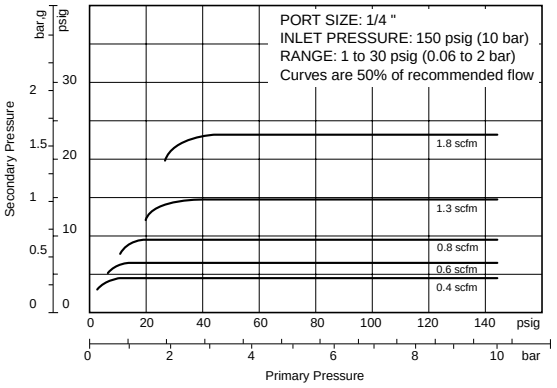
FLOW CHARACTERISTICS



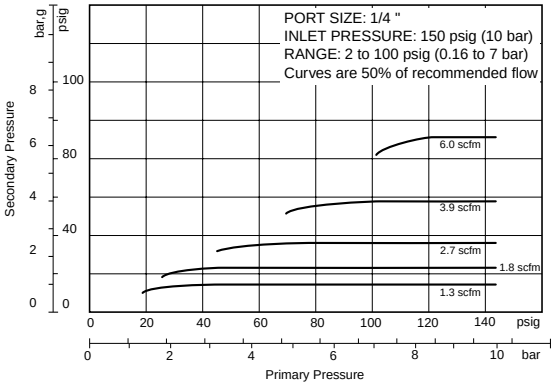

FLOW CHARACTERISTICS




REGULATION CHARACTERISTICS




REGULATION CHARACTERISTICS




## Service Kits

| Type | Part number |
|---|---|
| 11 400-20AL-X | 11 400-100/20AL |

Service kit includes: diaphragm assemblies, valve assembly, valve spring o-rings and valve seats for pilots.

# 11-104

## Feedback Pilot Regulator
## 1/4″ Port Size

- **Pilot regulators are used to control the outlet pressure of a pilot operated regulator (ordered separately)**
- **The pilot regulator is installed in an accessible location in the compressed air system; pilot operated regulator is installed at any point without regard to accessibility**
- **Feedback pilot regulator provides superior pressure regulation under changing flow demands where changes in flow demand are not sudden or cyclic.**
- **Constant bleed feature provides maximum sensitivity to system changes**
- **Relief feature allows reduction of downstream pressure when the system is dead-ended**

**Ordering Information** Model listed is relieving, constant bleed, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range†, with PTF ports.

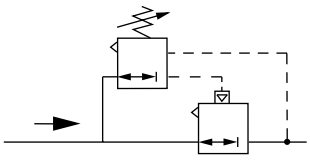
| Port Size | Type | Model | Weight lb (kg) | Pressure psig (bar) |
|---|---|---|---|---|
| 1/4" PTF | Feedback Pilot | 11-104-001 | 3.38 ( 1.53) | 5-105 (.3-7) |
| 1/4" PTF | Feedback Pilot | 11-104-002 | 3.38 ( 1.53) | 50-250 (3-17) |

† Outlet pressures can be adjusted to pressures in excess or, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

### Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

**ISO Symbols**



11-104 Feedback Pilot Regulator with Pilot Operated Regulator

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) to 400 psig (27.6 bar) maximum*

* For best performance, inlet pressure should be at least 10 psig (0.7 bar) greater than the desired regulated pressure, but must not exceed the specified maximum.

Operating temperature: 0 to 175°F (-20° to 80°C) **

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Maximum bleed rate at 50 psig (3.5 bar) outlet pressure:

0.25 scfm (0.12 $dm^3/s$)†

†Maximum bleed rate occurs under dead-end (no flow) conditons.

Pilot ports: 1/4" PTF

Feedback port: 1/8" PTF

Materials

Body, bonnet: Zinc

Valve seat: Brass

Valve ball: Stainless steal

Elastomers: Nitrile

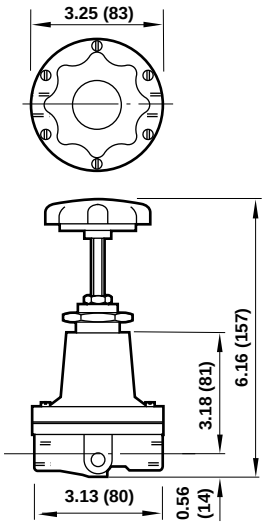
## Service Kits

| Type | Part number |
|---|---|
| 11-104 | 1970-11 |

Service kit contains diaphragm, valve pin, valve springs, valve seat, valve ball, and all o-rings.

All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.06" (27 mm)
Maximum panel thickness: 0.38″ (10 mm)



Section 9

# Pilot Operated Regulators

## 1/4" to 2" port sizes.

**Contents**



**R24**

**11-042**

**11-008**

**R18**

# 11-042

**Pilot Operated Regulator**
**1/4", 3/8", 1/2", 3/4", 1" and 1-1/4" Port Sizes**

- **Designed for systems that require high flow or pressure regulation at an inaccessible location.**
- **A pilot regulator (ordered separately) controls the outlet pressure of the pilot operated regulator.**
- **For general purpose applications, order an R72 or R07 pilot regulator.**
- **For precision applications, order an R40, R41, or 11-104 pilot regulator.**
- **Exceptionally high relief flow.**

### 11-042 Pilot Operated Regulator Ordering Information

Models listed include relieving diaphragm and PTF threads. Also order a pilot regulator.

| Port Size | Model | Flow* scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | 11-042-001 | 120 (57) | 2.8 (1.3) |
| 3/8" | 11-042-002 | 120 (57) | 2.7 (1.2) |
| 1/2" | 11-042-003 | 120 (57) | 2.6 (1.2) |
| 3/4" | 11-042-007 | 300 (142) | 4.8 (2.2) |
| 1" | 11-042-008 | 300 (142) | 4.6 (2.1) |
| 1-1/4" | 11-042-009 | 300 (142) | 4.3 (2.0) |

* Typical flow with 100 psig (0.7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 5 psig (0.35 bar) from set.

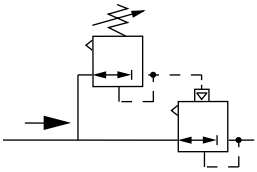
### 11-042 Alternative Models

1 1 - ★ 4 2 - ★ ★ ★

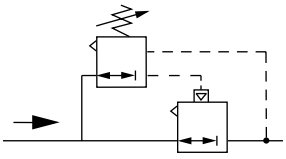
| Threads | Substitute |
|---|---|
| PTF | 0 |
| ISO G parallel | 8 |
| ISO G Rc | 9 |

| With Gauge | Substitute |
|---|---|
| 1/4" main ports | 004 |
| 3/8" main ports | 005 |
| 1/2" main ports | 006 |
| 3/4" main ports | 010 |
| 1" main ports | 011 |
| 1-1/4" main ports | 012 |

### ISO Symbols



With Conventional Pilot Regulator



With Feedback Pilot Regulator

### Warning - Feedback Pilot Regulators

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If it is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot operator is turned clockwise.

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) to 400 psig (27.6 bar) *

* For best performance, inlet pressure should be at least 10 psig (0.7 bar) greater than the desired regulated pressure, but must not exceed the specified maximum.

Operating temperature: 0° to 175°F (-20° to 80°C) **

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with a conventional pilot regulator at 100 psig (6.9 bar) inlet pressure, 90 psig (6.3 bar) set pressure, and a droop of 5 psig (0.35 bar) from set:

1/2" ports: 120 scfm (57 $dm^3/s$)

1" ports: 300 scfm (142 $dm^3/s$)

Port sizes:

| Main | Gauge | Pilot | Exhaust |
|---|---|---|---|
| 1/4" | 1/4" | 1/4" | 3/4" |
| 3/8" | 3/8" | 1/4" | 3/4" |
| 1/2", 3/4", 1", 1-1/4" | 1/2" | 1/4" | 3/4" |

Thread type

Main and gauge ports: PTF, ISO G, or ISO Rc

Pilot port: PTF with PTF main ports, ISO G with ISO G and ISO Rc main ports

Exhaust port: PTF with PTF main ports, ISO G with ISO G and ISO Rc main ports

Materials

Body: Zinc

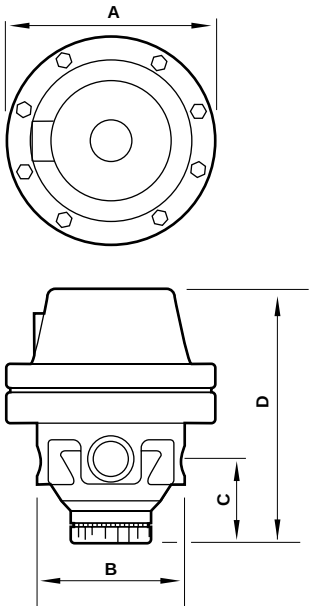
Bonnet: Aluminum

Bottom plug: Acetal

Valve: Brass

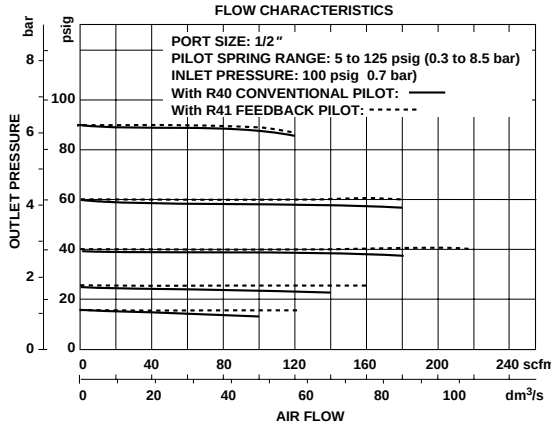
Elastomers: Nitrile

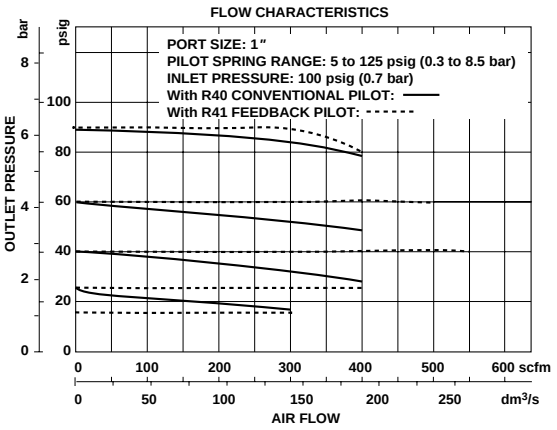
All Dimensions in Inches (mm)

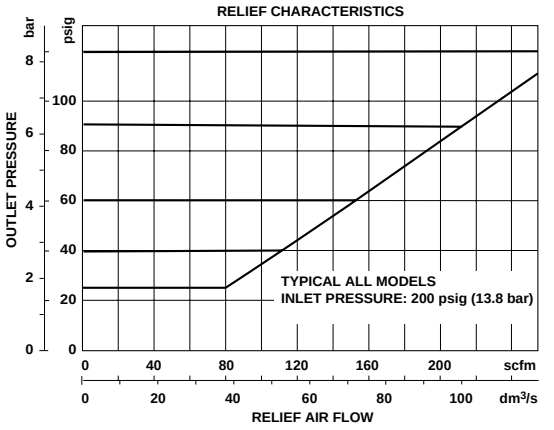



| Port Size | A | B | C | D |
|---|---|---|---|---|
| 1/4", 3/8", 1/2" | 4.16 (106) | 2.71 (69) | 1.48 (38) | 5.07 (129) |
| 3/4", 1", 1-1/4" | 4.16 (106) | 3.65 (93) | 1.86 (47) | 5.97 (152) |

## Typical Performance Characteristics




## Service Kits

| Type | Part number |
|---|---|
| Major kit for 1/4", 3/8", 1/2" ported units | 4158-01 |
| Major kit for 3/4", 1", 1-1/4" ported units | 4158-02 |
| O-ring kit for 1/4", 3/8", 1/2" ported units | 4158-03 |
| O-ring kit for 3/4", 1", 1-1/4" ported units | 4158-04 |

Major kit contains filter screen, diaphragm, and all o-rings.
O-ring kit contains filter screen and all o-rings.

# 11-008

**Pilot Operated Regulator**
**1/2″, 3/4″ and 1″ Port Sizes**

- **Designed for systems that require pressure regulation at an inaccessible location.**
- **A pilot regulator (ordered separately) controls the outlet pressure of the pilot operated regulator.**
- **For general purpose applications, order an R72 or R07 pilot regulator.**
- **For precision applications, order an R40, R41, or 11-104 pilot regulator.**
- **Constant bleed feature provides quick maximum sensitivity to system changes**

## Pilot Operated Regulator Ordering Information

Models listed include relieving diaphragm and PTF threads. Also order a pilot regulator.

| Port Size | Model | Flow* scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 1/2" | 11-008-130 | 70 (33) | 1.6 (0.7) |
| 3/4" | 11-008-009 | 110 (52) | 4.9 (2.2) |
| 1" | 11-008-110 | 180 (85) | 4.6 (2.1) |

* Typical flow with a conventional pilot at 150 psig (10.3 bar) inlet pressure, 100 psig (6.9 bar) set pressure and a droop of less than 5 psig (0.35 bar) from set.

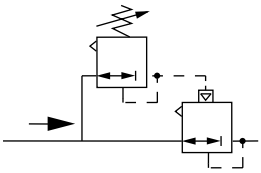
## Alternative Models

1 1 - ★ 0 8 - ★ ★ ★

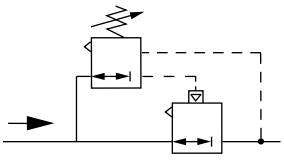
| Threads | Substitute |
|---|---|
| PTF | 0 |
| ISO G parallel | 8 |
| ISO G Rc | 9 |

| With 150 psig (10 bar) Gauge | Substitute |
|---|---|
| 1/2" main ports | 142 |
| 3/4" main ports | 021 |
| 1" main ports | 122 |

## ISO Symbols



With Conventional Pilot Regulator



With Feedback Pilot Regulator

## Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) to 400 psig (27.6 bar)*

* For best performance, inlet pressure should be at least 10 psig (0.7 bar) greater than the desired regulated pressure, but must not exceed the specified maximum.

Operating temperature: 0° to 175°F (-20° to 80°C)**

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with a conventional pilot regulator at 150 psig (10.3 bar) inlet pressure, 100 psig (6.9 bar) set pressure, and a droop of less than 5 psig (0.35 bar) from set:

- 1/2" ports: 70 scfm (33 $dm^3/s$)
- 3/4" ports: 110 scfm (52 $dm^3/s$)
- 1" ports: 180 scfm (85 $dm^3/s$)

Maximum bleed rate at 50 psig (3.5 bar) outlet pressure: 0.34 scfm (0.16 $dm^3/s$)†

†Maximum bleed rate occurs under dead-end (no flow) conditions.

Port sizes

- Main: 1/2", 3/4", 1"
- Gauge: 1/8"
- Pilot: 1/4"

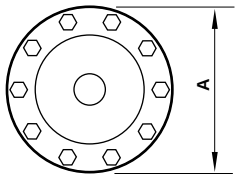
Thread type

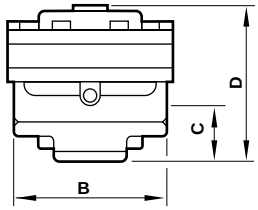
- Main and gauge ports: PTF, ISO G, or ISO Rc
- Pilot port: PTF with PTF main ports, ISO G with ISO G and ISO Rc main ports

Materials

- Body: Zinc
- Bonnet: Aluminum
- Bottom plug:
  - 1/2", 3/4 ports: Brass
  - 1" ports: Glass filled nylon
- Valve: Brass
- Elastomers: Nitrile

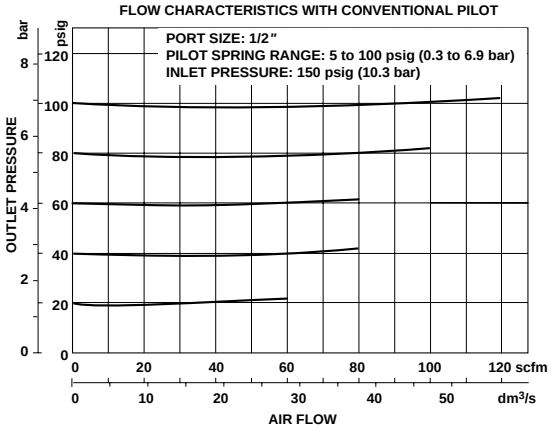
All Dimensions in Inches (mm)

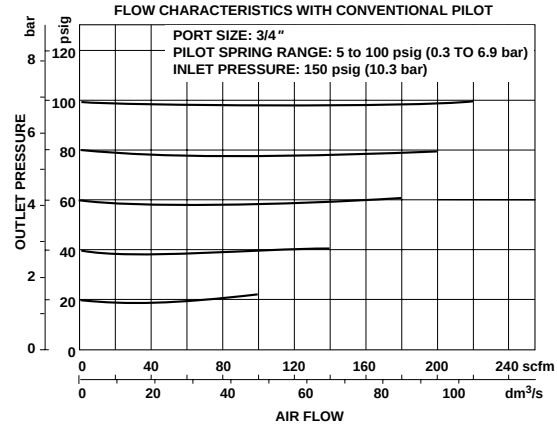


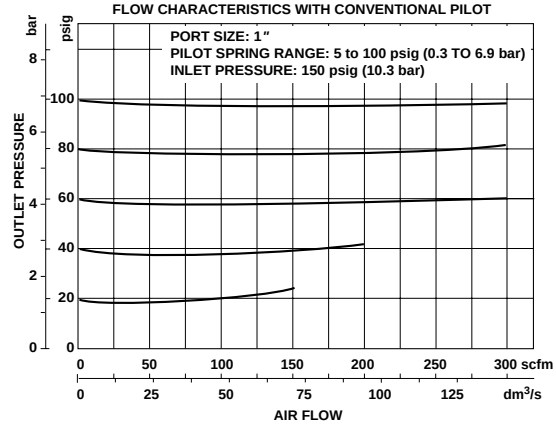




| Port Size | A | B | C | D |
|---|---|---|---|---|
| 1/2" | 3.34 (85) | 3.38 (86) | 1.50 (38) | 3.30 (84) |
| 3/4", 1" | 4.91 (125) | 4.63 (118) | 1.69 (43) | 4.36 (111) |

## Typical Performance Characteristics




## Service Kits

| Type | Part number |
|---|---|
| 1/2" ported units | 695-01 |
| 3/4", 1" ported units | 696-01 |

Kit contains diaphragm, valve, and all o-rings.

# R18

## 18 Series Pilot Operated Regulator
## 1-1/2″ and 2″ Port Sizes

- **Designed for systems that require high flow or pressure regulation at an inaccessible location.**
- **A pilot regulator (ordered separately) controls the outlet pressure of the pilot operated regulator.**
- **For general purpose applications, order an R72 or R07 pilot regulator.**
- **For precision applications, refer to R40, R41, or 11-104 pilot regulator (ALE-9).**
- **Exceptionally high relief flow.**

**Ordering Information.** Models listed include relieving diaphragm and PTF threads. Also order a pilot regulator.

| Port Size | Model | Flow* scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 1-1/2" | R18-B00-RNXA | 2000 (944) | 6.82 (3.09) |
| 2" | R18-C00-RNXA | 2000 (944) | 6.61 (2.99) |

* Typical flow with 100 psig (0.7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set.

### Alternative Models - R18

R 1 8 - ★ 0 0 - ★ ★ X ★

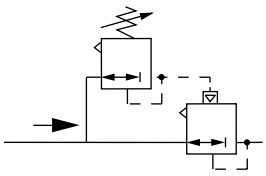
| Port Size | Substitute |
|---|---|
| 1-1/2″ | B |
| 2″ | C |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving (do not use with a feedback pilot regulator) | N |

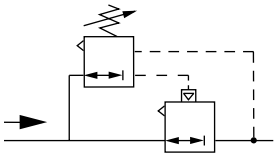
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Gauge | Substitute |
|---|---|
| Without | N |

### ISO Symbols



R18 with Conventional Pilot Regulator



R18 with Feedback Pilot Regulator

### Warning - Feedback Pilot Regulators

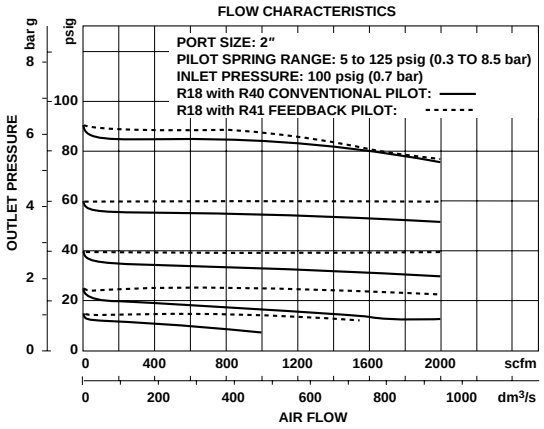
The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If it is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot operator is turned clockwise.

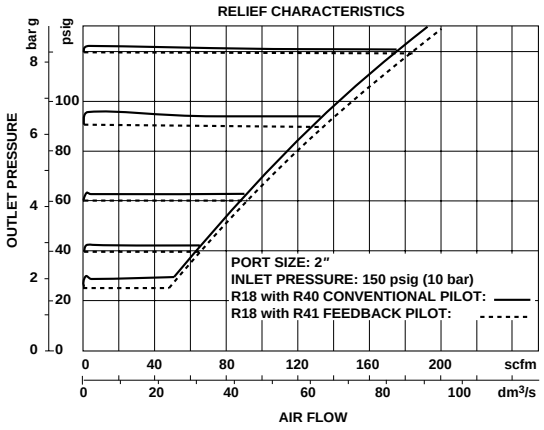
**See Section ALE-24 for Accessories**

## Technical Data

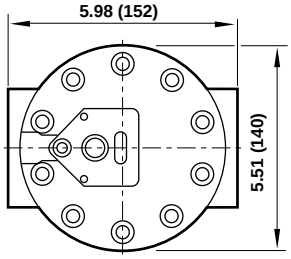
Fluid: Compressed air
Inlet pressure range: 10 psig (0.7 bar) minimum to 450 psig (31 bar) maximum
Operating temperature: 0° to 175°F (-18° to 80°C)*
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Typical flow with 100 psig (0.7 bar) inlet pressure, 90 psig (6.3 bar) set pressure, and a droop of 15 psig (1 bar) from set:
2000 scfm (950 $dm^3/s$)
Main ports: 1-1/2" or 2" PTF, ISO G, or ISO Rc
Pilot and gauge ports: 1/4" PTF, ISO G, or ISO Rc
Exhaust port: 3/4" PTF, ISO G, or ISO Rc
Materials
Body, bonnet, bottom plug, valve: Aluminium
Elastomers: Nitrile

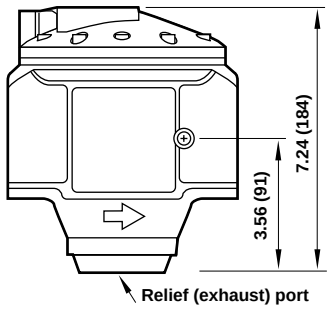
## Typical Performance Characteristics




All Dimensions in Inches (mm)




## Service Kits

| Type | Part number |
|---|---|
| R18 | 5945-40 |

R18 service lit contains filter screen and all o-rings.

# Pilot Operated 'Micro Trol' Regulator 1/4" to 1-1/4"

- **High flow and relief flow characteristics**
- **Easy to adjust even at high output pressures**
- **Balanced valve minimizes effect of variations in inlet pressure on outlet pressure**
- **Relieving feature allows outlet pressure reduction even when the system is dead ended**
- **Full flow gauge ports**
- **Panel mounting facility**

**Ordering Information.** Models listed are constant bleed units with relieving diaphragm, and PTF threads. A gauge is not included. Also order a pilot operator.

| Port Size | Model | Weight lb (kg) |
|---|---|---|
| 1⁄4" | R24-201-RNXA | 1.16 (0.73) |
| 3⁄8" | R24-301-RNXA | 1.54 (0.70) |
| 1⁄2" | R24-401-RNXA | 1.50 (0.68) |
| 3⁄4" | R24-601-RNXA | 2.60 (1.18) |
| 1" | R24-801-RNXA | 2.60 (1.18) |
| 1-1⁄4" | R24-A01-RNXA | 2.51 (1.14) |

## Alternative Models

R 2 4 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |
| 1" | 8 |
| 1-1/4" | A |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Type | Substitute |
|---|---|
| Pilot operated | 1 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

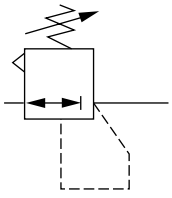
| Spring | Substitute |
|---|---|
| None | X |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |

* A factory installed gauge is only available with PTF threads (***A*** in last position of model number). If a gauge is desired with ISO threads (***B*** or ***G*** in last position), order the desired gauge and appropriate reducing bushing from ***Accessories*** on page 3.

## ISO Symbol




## Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air

Inlet pressure range: 10 psig (0.7 bar) to 300 psig (20 bar)*

* For best performance, inlet pressure should be at least 10 psig (0.7 bar) greater than the desired regulated pressure, but must not exceed the specified maximum.

Operating temperature: 0° to 175°F (-20° to 80°C)**

** Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set:
1/2 ports: 220 scfm (104 $dm^3/s$)
1-1/4 ports: 700 scfm (330 $dm^3/s$)

Port sizes

| Main | Gauge | Pilot |
|---|---|---|
| 1/4" | 1/4" | 1/4" |
| 3/8" | 3/8" | 1/4" |
| 1/2", 3/4", 1", 1-1/4" | 1/2" | 1/4" |

Thread type
Main ports: PTF, ISO G, or Rc
Gauge ports: PTF, ISO G, or Rc
Pilot port: PTF with PTF main ports, ISO G with ISO G and Rc main ports

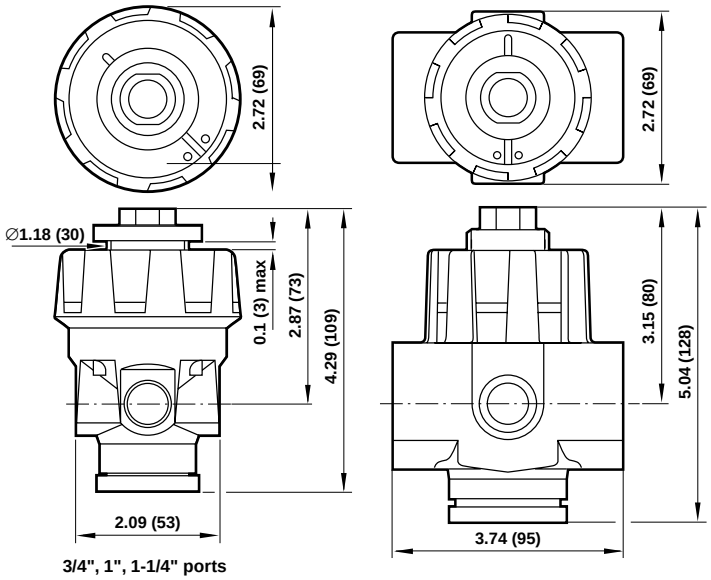
Materials
Body, top cap: Zinc
Main valve, adjusting screw: Brass
Pilot valve, relief valve: Acetal
Elastomers: Nitrile
Bottom Plug: Acetal

## Service Kits

| Item | Port Size | Part number |
|---|---|---|
| Service kit | 1/4", 3/8", 1/2" | 5292-54 |
| Service kit | 3/4", 1", 1-1/4" | 5292-55 |

Service kits include seals, main valve and spring.

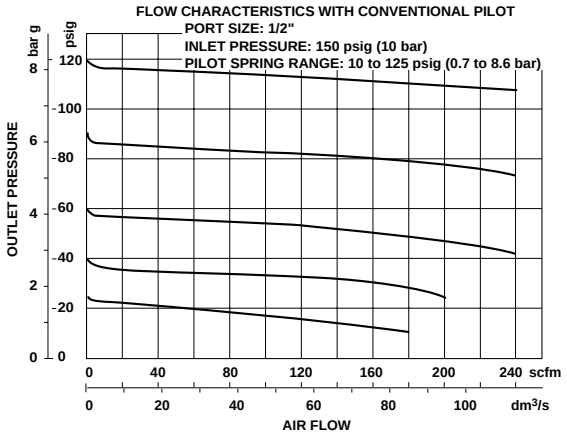
All Dimensions in Inches (mm)

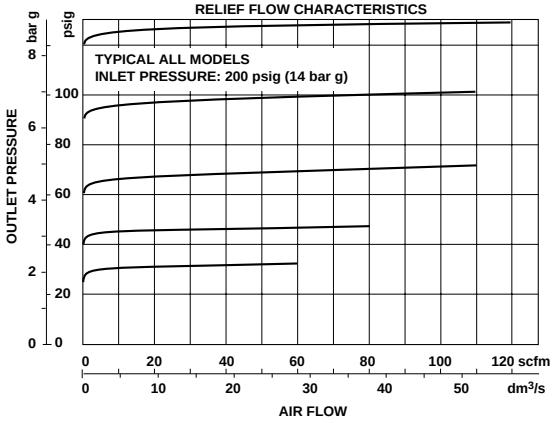


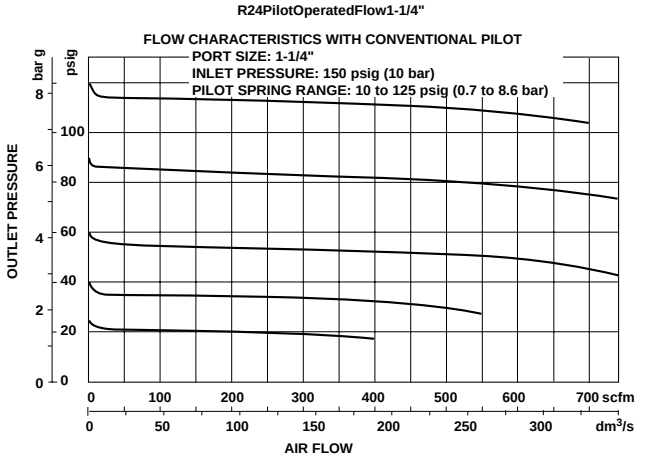

3/4", 1", 1-1/4" ports

## Typical Performance Characteristics

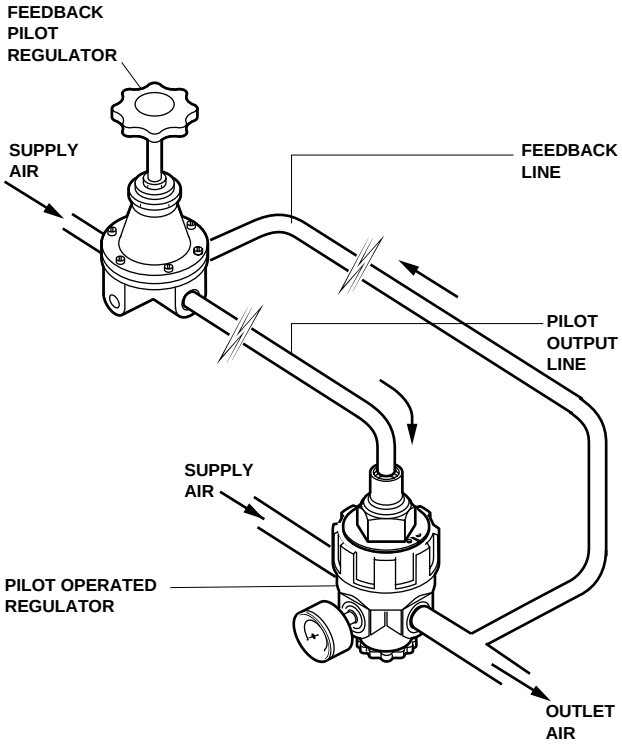
RANGE: 10 to 232 psi (0.7 to 16 bar)



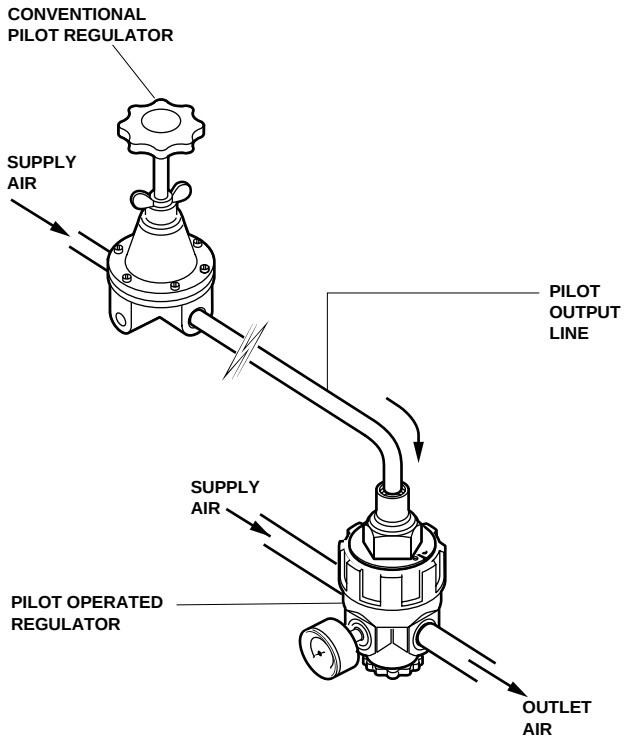
## Typical Installation - Feedback Pilot and Pilot Operated Regulator




## Feedback Pilot Regulator Warning

The feedback line must sense the pilot operated regulator outlet pressure and must be connected before turning on the air supply. If the feedback line is not connected, the pilot operated regulator outlet pressure will rapidly increase to the inlet pressure when the adjusting knob on the pilot regulator is turned clockwise.

## Typical Installation - Conventional Pilot and Pilot Operated Regulator



# UL Listed Cylinder Gas Regulators for Industrial Service

## Regulators for use with compressed air, and inert gases such as carbon dioxide, argon helium, krypton, neon, nitrogen, and xenon.

**Contents**



**R44**
**Low pressure, secondary regulator**

**R83**
**High pressure, primary regulator**

# R44

**UL Listed Miniature Pressure Regulator**
**Compressed Air, Carbon Dioxide, Inert Gases**
**1/8″ or 1/4″ PTF Port Sizes**

- **Underwriters Laboratories, Inc. listed (file number SA1089) for use with air, carbon dioxide, and inert gases. For use with other gases, including oxygen, consult Norgren.**
- **Compact design**
- **Brass, zinc, or aluminum bodies with plastic bonnet; brass body also available with brass bonnet**
- **Plastic bonnet equipped with low torque, non-rising pressure adjusting knob. Snap action knob locks pressure setting when pushed in. Brass bonnet equipped with pressure adjusting screw**
- **Non-relieving and relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering Information.** Models listed include PTF threads, relieving diaphragm, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range†, and without gauge.

| Body | Bonnet | Medium | Port PTF | Model | Flow* scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|---|---|---|
| Aluminum | Plastic | Air, inert gases | 1/8"<br>1/4" | R44-100-RNKA<br>R44-200-RNKA | 10 (4.7)<br>10 (4.7) | 0.23 (0.11)<br>0.23 (0.11) |
| Brass | Plastic | Air, $CO_2$, inert gases | 1/8"<br>1/4" | R44-121-RNKA<br>R44-221-RNKA | 10 (4.7)<br>10 (4.7) | 0.45 (0.21)<br>0.45 (0.21) |
| Zinc | Plastic | Air, inert gases | 1/8"<br>1/4" | R44-122-RNKA<br>R44-222-RNKA | 10 (4.7)<br>10 (4.7) | 0.31 (0.14)<br>0.31 (0.14) |
| Brass | Brass | Air, $CO_2$, inert gases | 1/8"<br>1/4" | R44-133-RNKA<br>R44-233-RNKA | 10 (4.7)<br>10 (4.7) | 0.54 (0.25)<br>0.54 (0.25) |

**Alternative Models**

R 4 4 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8" | 1 |
| 1/4" | 2 |

| Body/Bonnet | Substitute |
|---|---|
| Aluminum/Plastic | 00 |
| Brass/Plastic | 21 |
| Zinc/Plastic | 22 |
| Brass/Brass | 33 |

| Threads | Substitute |
|---|---|
| PTF | A |

| Outlet Pressure Adjustment Range† | Substitute |
|---|---|
| 1 to 10 psig (0.1 to 0.7 bar) | A |
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 100 psig (0.3 to 7 bar) | K |

| Gauges | Substitute |
|---|---|
| With | G |
| Without | N |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

* Approximate flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**See Section ALE-24 for Accessories**

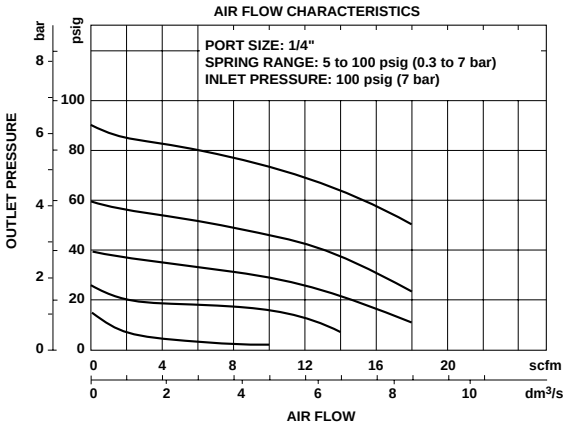
## Technical Data

Fluid: Compressed air, carbon dioxide, inert gases
Maximum pressure: 250 psig (17 bar)
Operating temperature: -30° to 150°F (-34° to 66°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig 1 bar() from set: 10 scfm (4.7 $dm^3/s$)
Gauge ports: 1/8" PTF
Materials
- Body and bonnet
  - R44-100/-200: Aluminum body; acetal plastic bonnet
  - R44-121/-221: Brass body; acetal plastic bonnet
  - R44-122/-222: Zinc body; acetal plastic bonnet
  - R44-133/-233: Brass body; brass bonnet
- Valve: Brass/nitrile
- Valve seat: Acetal
- Elastomers: Nitrile

## Typical Performance Characteristics



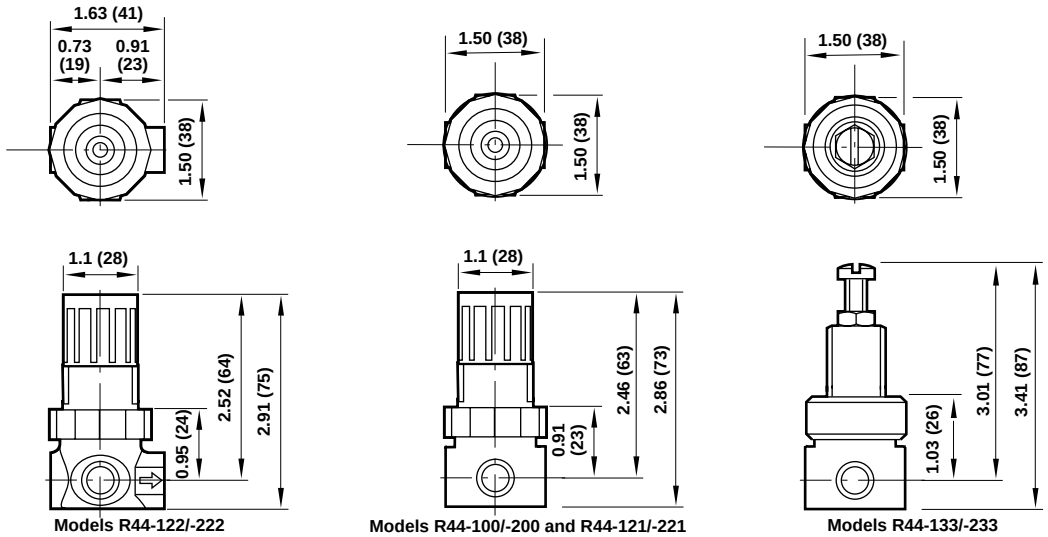

## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Relieving | 3407-02 |
| | Non relieving | 3407-01 |

Service kit includes slip ring, diaphragm, standard valve seat with seal, valve, valve spring.

All Dimensions in Inches (mm)

Panel mounting hole diameter:
Models with plastic bonnet: 1.19″ (30 mm)
Models with brass bonnet: 0.81" (21mm)
Maximum panel thickness: 0.25″ (6 mm)




**Models R44-122/-222 (Zinc Body and Plastic Bonnet)**

**Models R44-100/-200 and R44-121/-221 (Aluminum or Brass Body and Plastic Bonnet)**

**Models R44-133/-233 (Brass Body and Brass Bonnet)**

# R83

## UL Listed Pressure Regulator for Industrial Cylinder Gas 1/4″ PTF Port Size

- **Underwriters Laboratories, Inc. listed (file number SA1089) for use with air, argon, carbon dioxide, helium, krypton, neon, nitrogen, xenon. For use with other gases, including oxygen, consult Norgren.**
- **Non-relieving and relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Two high pressure inlet ports and two regulated pressure outlet ports**
- **Diametrically opposite inlet ports provide easy manifolding of several regulators**
- **Easily replaceable valve cartridge contains valve, valve seat, valve spring, and filter element**

**Ordering Information.** Models listed include PTF threads, relieving diaphragm, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range†, and without gauge.

| Port | Model | Flow * scfm $dm^3/s$() | Weight lb (kg) |
|---|---|---|---|
| 1/4" | R83-200-RNLA | 11 (5.2) | 1.3 (0.59) |

### Alternative Models

R 8 3 - 2 0 0 - ★ N ★ A

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

| Outlet Pressure Adjustment Ranges † | Substitute |
|---|---|
| 2 to 50 psig (0.1 to 3.5 bar) | E |
| 5 to 125 psig (0.3 to 8.5 bar) | L |
| 10 to 175 psig (0.7 to 12 bar) | N |

* Approximate flow with 1000 psig (69 bar) inlet pressure, 60 psig (4 bar) set pressure and a 5 psig (0.35 bar) droop from set.

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Air, argon, carbon dioxide, helium, krypton, neon, nitrogen, and xenon. For use with other gases, including oxygen, consult Norgren. Do not use the R83 regulator in beverage dispensing applications. Other Norgren regulators (R81 for soft drink, R82 for beer, R84 for carbonators) are available for use in dispensing systems.

Maximum pressure: 3000 psig (207 bar)

Operating temperature: -30° to 140°F (-34° to 60°C) *

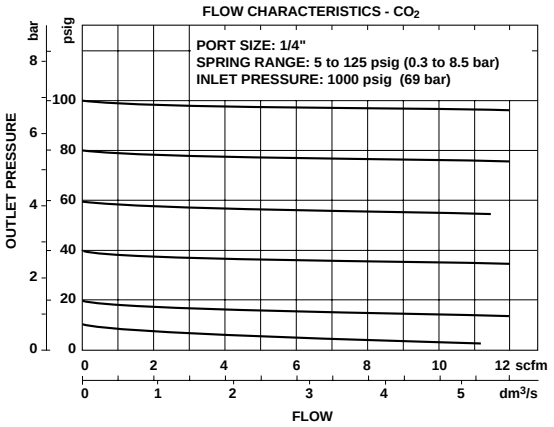
* Fluid must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow at 1000 psig (69 bar) inlet pressure, 60 psig (4 bar) set pressure and a droop of 5 psig (0.35 bar) from set: 11 scfm (5.2 $dm^3/s$)

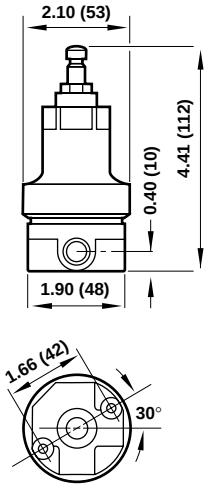
Materials

- Body: Brass
- Bonnet: Zinc
- Cartridge valve: Teflon, brass, stainless steel
- Diaphragm: Acetal and nitrile
- Seals: Nitrile

## Typical Performance Characteristics




All Dimensions in Inches (mm)







**Mounting Holes (2 Places)**
**0.18" (4.6mm) dia. by 0.39 (10mm) deep.**
**Use 10-32 thread forming screws.**

## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kits | Diaphragm, relieving | 570-51 |
| | Diaphragm, non relieving | 570-10 |
| | Valve cartridge | 5086-55 |

Valve cartridge includes the sealed cartridge and cartridge o-ring.

## Warning

These products are intended for use with industrial compressed air, argon, carbon dioxide, helium, krypton, neon, nitrogen, and xenon. Do not use these products where *pressures* and *temperatures* can exceed those listed under **'Technical Data'.**

Before using these products with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult Norgren.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.

***System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.***

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.

# U.L. Listed Beverage Regulators

## Cylinder Gas Pressure ($CO_2$) Regulators for Soft Drink and Beer dispensing systems.



**R84**

**R81**

**R82**

# R84 Regulator and C84 Configurations

**UL Listed, Cylinder Gas Pressure Regulator**
**1/4" PTF Port Size, $CO_2$ Regulator for Soft Drink Carbonator**

- **Underwriters Laboratories, Inc. listed (file number SA1089)**
- **Integral relief valve easily replaced without disassembly of regulator and without affecting relief pressure setting**
- **Back flow check valve, or manifold with integral check valve at each outlet, can be installed in regulator outlet port. Manifolds available with 3 or 5 outlets and include one outlet cap.**
- **Relieving diaphragm allows outlet pressure setting to be reduced even though the system is dead-ended. Pressure downstream of check valves will not be reduced.**
- **Easily replaceable valve cartridge contains valve, valve seat, valve spring, and filter element**
- **Two high pressure ports (inlet and primary gauge) and two regulated pressure ports (outlet and secondary gauge)**
- **Bonnet wrench hex same size as tank adapter - one wrench fits both**

### Technical Data

Fluid: Carbon dioxide. The R84 regulator is designed to be used exclusively as a carbonator regulator in soft drink dispensing systems to control cylinder gas (carbon dioxide) pressure to the carbonator tank. Other Norgren regulators (R81 for soft drink syrup containers, R82 for beer, R83 for industrial cylinder gases) are available for use in other systems.

Maximum pressure: 3000 psig (207 bar)

Operating temperature: 0° to 140°F (-18° to 60°C)

Integral relief valve cracking pressure:
150 ± 5 psig (10.4 ± 0.33 bar)

Materials:
- Body: Brass
- Bonnet: Zinc
- Valve cartridge: Teflon, brass, stainless steel
- Diaphragm: Acetal and nitrile
- Relief valve: Brass, polycarbonate, nitrile, aluminum
- Seals: Nitrile

**NOTE**

The integral relief valve on the R84 regulator does not meet the requirements of Paragraph 4.5c of NSDA Pamphlet TD02, ***Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems,*** dated July,1980. The end cap on the relief valve is color coded red for visual identification and is for use only on the Norgren R84 regulator.

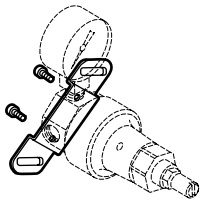
**See Section ALE-24 for Accessories**

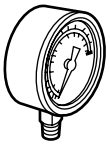
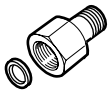
**Ordering Information.** Models listed include integral relief valve with cracking pressure of 150 ± 5 psig (10.4 ± 0.33 bar), PTF threads, relieving diaphragm, 5 to 125 psig (0.34 to 8.6 bar) outlet pressure adjustment range†. A gauge is not included.

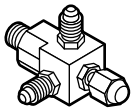
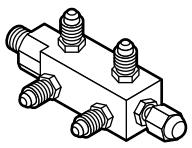
| Port | Model | Weight lb (kg) |
|---|---|---|
| 1/4" | R84-200-MNLA | 1.3 (0.59) |

† Outlet pressure can be adjusted to pressures in excess of, and less than, that specified. Do not use these units to control pressures outside of the specified range.

## Accessories

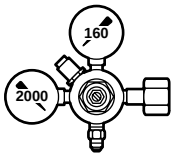
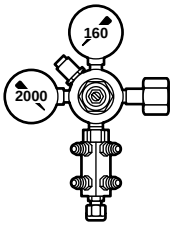
|  Wall Mounting Bracket |  Pipe Plug, Hex Socket 1/4" PTF |  Hex Nipple 1/4" PTF male |  Union Adapter with Cap 1/4" PTF to 1/4" tube (45° flare) |
|---|---|---|---|
| Strap Type: 5095-51 | 2891-97 | 18-006-067 | 18-006-068 |
| | | | Adapter only: 18-006-027 |
| | | | Cap only: 3302-50 |

|  2" (Ø 50 mm) diameter, 1/4" PTF connection | Inlet Fittings  Nitrogen Service Cylinder Connector 0.906-14 RH external thread |  Carbon Dioxide Service Cylinder Connector 0.830-14 RH internal thread |
|---|---|---|
| 15 psig (1 bar): 18-013-082 | CGA No. 580: 18-008-004 | 1.44" (37 mm) long nipple |
| 30 psig (2 bar), UL Listed: 18-013-030 | | CGA No. 320: 18-008-002 |
| 60 psig (4 bar), UL Listed: 18-013-083 | | 2.25" (57 mm) long nipple |
| 100 psig (7 bar), UL Listed: 18-013-084 | | 18-008-015 |
| 160 psig (11 bar), UL Listed: 18-013-085 | | Replacement gasket: 1390-02 |
| 300 psig (20 bar), UL Listed: 18-013-086 | | |
| 2000 psig (135 bar), UL Listed: 18-013-244 | | |
| 3000 psig (205 bar), UL Listed: 18-013-087 | | |

| Single Outlet Fittings - Check Valves ††  | Multiple Outlet Fittings - Manifolds with integral check valves †† 2 or 3 Port  4 or 5 Port  Manifold Extension  |
|---|---|
| Check Valve, 1/4" PTF male to 1/4" tube (45°flare): 16-009-001 | 2 or 3 outlets, 1/4" PTF male to 1/4" tube (45°flare): 3228-54 |
| Check Valve, 1/4" PTF male to 1/2-16 BSF: 16-009-002 | 2 or 3 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-55 |
| Check Valve, 1/4" PTF male to 1/4" PTF female: 16-009-003 | 4 or 5 outlets, 1/4" PTF male to 1/4" tube (45°flare): 3228-60 |
| | 4 or 5 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-61 |
| | Manifold extension, 1/4" PTF male to 1/4" PTF female: 2340-50 |

†† The listed check valves and manifolds with integral check valves are designed for use with Norgren R84 regulators and C84 regulator configurations. They are not recommended for use with other regulators and regulator configurations unless separate pressure relief protection is provided in each of the outlet lines.

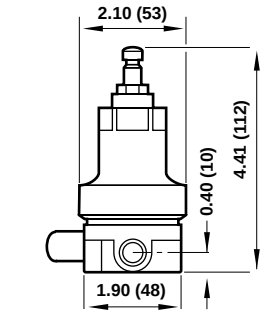
**Ordering Information - C84 Regulator Configurations.** Models listed include PTF threads, relieving diaphragm, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range†.

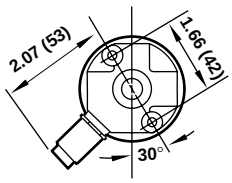
| One Outlet<br>Model C84-700 | Four or Five Outlets<br>Model C84-666 |
|---|---|
|  |  |
| **Model C84-700 Includes:**<br>● R84-200-MNLA regulator with 150 psig (10.4 bar) integral relief valve (1)<br>● 18-013-244 inlet pressure gauge (1)<br>● 18-013-085 outlet pressure gauge (1)<br>● 18-008-002 cylinder connector (1)<br>● 16-009-001 check valve (1) | **Model C84-666 Includes:**<br>● R84-200-MNLA regulator with 150 psig (10.4 bar) integral relief valve (1)<br>● 18-013-244 inlet pressure gauge (1)<br>● 18-013-085 outlet pressure gauge (1)<br>● 18-008-002 cylinder connector (1)<br>● 3228-60 manifold (1) |

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

All Dimensions in Inches (mm)

**R84 Regulator**



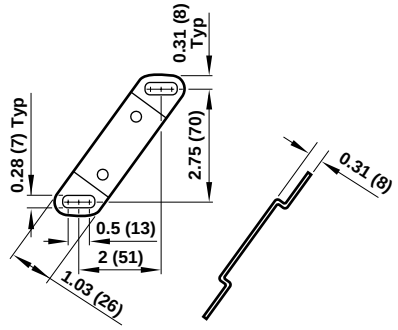

**Mounting Holes (2 Places)**
**0.18" (4.6mm) dia. by 0.39 (10mm) deep.**
**Use 10-32 thread forming screws.**

## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kits | Diaphragm, relieving | 570-51 |
| | Valve cartridge and seal | 5086-55 |
| | Kit, major | 6309-04 * |
| | Relief valve and seal | 5779-54 †† |

* Kit contains diaphragm, slip ring, valve cartridge, and o-rings.
†† Relief valve is marked 150 PSIG RELIEF VALVE and has a brass body with a red end cap.

**5095-51 Strap Type Bracket**



## WARNING

For safety in systems using Norgren Model R84 regulators, the following procedures must be followed.

1. Pressure relief valves of sufficient capacity must always be used in the secondary (outlet) lines downstream of each pressure regulator, whether as an integral part of the regulator, as is the case with Norgren Model R84 Regulator, or separately installed elsewhere in the outlet lines. Do not remove or attempt to adjust, plug, block or otherwise defeat the purpose of the relief valve. Do not replace a relief valve with any but an identical model. The relief valve used on the R84 regulator is preset and marked ***150 PSIG RELIEF VALVE.*** Replace only with the same 150 psig relief valve, part number 5779-54. The end cap on the 5779-54 relief valve is color coded red for visual identification. Failure to provide a pressure relief valve of sufficient capacity to hold outlet pressure below the lowest working pressure rating of any piece of equipment installed in the outlet lines can result in equipment damage and/or personal injury.
2. A back flow check valve must always be installed at the regulator or at each manifold outlet in liquid dispensing applications to prevent reverse flow through the regulator and possible introduction of liquids and other contaminants into the regulator.
3. Regulators must not be used where temperature or pressure may exceed those specified in the ***Technical Data*** paragraph.
4. The accuracy of the indication of pressure gauges can change, both during shipment (despite care in packaging) and during the service life. If a pressure gauge is to be used in conjunction with these products and if inaccurate indications may be hazardous to personnel or property, the gauge should be calibrated before initial installation and at regular intervals during use. For gauge standards refer to ANSI B40.1.
5. These regulators are not intended for use in life support systems, beer dispensing systems, with soft drink product (syrup) containers, or industrial cylinder gas systems.

# R81 Regulator and C81 Configurations

**UL Listed, Cylinder Gas Pressure Regulator**
**1/4" PTF Port Size, $CO_2$ Regulator for Soft Drink Dispensing Systems**

- **Underwriters Laboratories, Inc. listed (file number SA1089)**
- **The R81 regulator and C81 regulator configurations with integral relief valve and outlet check valves meet the requirements of paragraphs 4.5 and 4.6 of NSDA Pamphlet TD02, *Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems*, dated July, 1980.**
- **Integral relief valve easily replaced without disassembly of regulator and without affecting relief pressure setting**
- **Back flow check valve, or manifold with integral check valve at each outlet, can be installed in regulator outlet port. Manifolds available with 3 or 5 outlets and include one outlet cap.**
- **Relieving diaphragm allows outlet pressure setting to be reduced even though the system is dead-ended. Pressure downstream of check valves will not be reduced.**
- **Easily replaceable valve cartridge contains valve, valve seat, valve spring, and filter element**
- **Two high pressure ports (inlet and primary gauge) and two regulated pressure ports (outlet and secondary gauge)**
- **Diametrically opposite inlet ports facilitate manifolding for multiple dispensing applications. Each manifolded regulator operates independently as though attached directly to the gas supply source.**
- **Bonnet wrench hex same size as tank adapter - one wrench fits both**

Materials:

Body: Brass
Bonnet: Zinc
Valve cartridge: Teflon, brass, stainless steel
Diaphragm: Acetal and nitrile
Relief valve: Brass, polycarbonate, nitrile, aluminum
Seals: Nitrile

### Technical Data

Fluid: Carbon dioxide. The R81 regulator is designed for use in soft drink dispensing systems to control cylinder gas (carbon dioxide, nitrogen, air) pressure to the product containers. Other Norgren regulators (R84 for soft drink carbonators, R82 for beer, R83 for industrial cylinder gases) are available for use in other systems.

Maximum pressure: 3000 psig (207 bar)

Operating temperature: 0° to 140°F (-18° to 60°C)

Integral relief valve cracking pressure:
130 ± 4 psig (9.0 ± 0.28 bar)

**See Section ALE-24 for Accessories**

**Ordering Information.** Models listed include integral relief valve with cracking pressure of 130 ± 4 psig (9.0 ± 0.28 bar), PTF threads, relieving diaphragm, 5 to 100 psig (0.34 to 6.9 bar) outlet pressure adjustment range†. A gauge is not included.

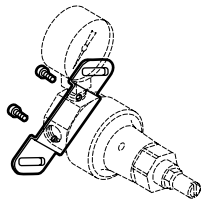
| Port | Model | Weight lb (kg) |
|---|---|---|
| 1/4" | R81-200-LNKA | 1.3 (0.59) |

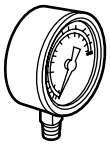
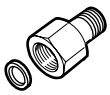
## Alternative Models

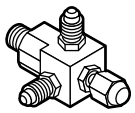
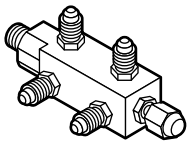
R 8 1 - 2 0 0 - L N ★ A

| Outlet Pressure Adjustment Ranges † | Substitute |
|---|---|
| 1 to 25 psig (0.07 to 1.7 bar) | T |
| 2 to 50 psig (0.14 to 3.4 bar) | E |
| 5 to 100 psig (0.34 to 6.9 bar) | K |

## Accessories

|  Wall Mounting Bracket |  Pipe Plug, Hex Socket 1/4" PTF |  Hex Nipple 1/4" PTF male |  Union Adapter with Cap 1/4" PTF to 1/4" tube (45° flare) |
|---|---|---|---|
| Strap Type: 5095-51 | 2891-97 | 18-006-067 | 18-006-068 |
| | | | Adapter only: 18-006-027 |
| | | | Cap only: 3302-50 |

|  2" (50 mm) diameter, 1/4 PTF connection | Inlet Fittings  Nitrogen Service Cylinder Connector 0.906-14 RH external thread |  Carbon Dioxide Service Cylinder Connector 0.830-14 RH internal thread |
|---|---|---|
| 15 psig (1 bar): 18-013-082 | CGA No. 580: 18-008-004 | 1.44" (27 mm) long nipple CGA No. 320: 18-008-002 |
| 30 psig (2 bar), UL Listed: 18-013-030 | | |
| 60 psig (4 bar), UL Listed: 18-013-083 | | 2.25" (57 mm) long nipple 18-008-015 |
| 100 psig (7 bar), UL Listed: 18-013-084 | | |
| 160 psig (11 bar), UL Listed: 18-013-085 | | Replacement gasket: 1390-02 |
| 300 psig (20 bar), UL Listed: 18-013-086 | | |
| 2000 psig(135 bar), UL Listed: 18-013-244 | | |
| 3000 psig (205 bar), UL Listed: 18-013-087 | | |

| Single Outlet Fittings | | | Multiple Outlet Fittings | | | |
|---|---|---|---|---|---|---|
| Check Valve††  | Check Valve††  | Check and Relief Valve, * Relief cracking pressure: 130 ± 4 psig (9.0 ± 0.28 bar)  | 2 or 3 Port  | 4 or 5 Port  | Manifold Extension  |  |
| | | | Manifolds with integral check valves †† | | | Streamline Wye ** |
| Check Valve, 1/4" PTF male to 1/4" tube (45° flare): 16-009-001 | | | 2 or 3 outlets, 1/4" PTF male to 1/4" tube (45° flare): 3228-54 | | | 1/4" NPT male to 1/4" NPT female: 16-006-107 |
| Check Valve, 1/4" PTF male to 1/2-16 BSF: 16-009-002 | | | 2 or 3 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-55 | | | |
| Check Valve, 1/4" PTF male to 1/4" PTF female: 16-009-003 | | | 4 or 5 outlets, 1/4" PTF male to 1/4" tube (45° flare): 3228-60 | | | |
| Check and Relief Valve, 1/4" PTF male to 1/4" tube (45° flare): 16-006-107 | | | 4 or 5 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-61 | | | |
| | | | Manifold extension, 1/4" PTF male to 1/4" PTF female: 2340-50 | | | |

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

†† The listed check valves and manifolds with integral check valves are designed for use with Norgren R81 regulators and C81 regulator configurations. They are not recommended for use with other regulators and regulator configurations unless separate pressure relief protection is provided in each of the outlet lines.

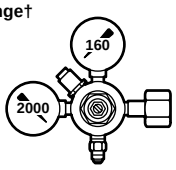
* The 16-006-107 check and relief valve meets the pressure and flow requirements of paragraphs 4.5 and 4.6 of NSDA Pamphlet TD02, ***Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems***, dated July, 1980.

** Check valves, or manifolds with integral check valves, must be installed in the outlet ports of the wye when the wye is installed in the outlet port of the Norgren R81 regulator.

## Cylinder Connected, One Regulator Configurations

### Model C81-700 (One Outlet)

**5 to 100 psig range†**

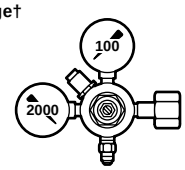



**Model C81-700 Includes:**

- R81-200-LNKA regulator (1)
- 18-013-244 (2000 psi) inlet pressure gauge (1))
- 18-013-085 (160 psi) outlet pressure gauge (1)
- 18-008-002 cylinder connector (1)
- 16-009-001 check valve (1)

### Model C81-702 (One Outlet)

**5 to 100 psig range†**

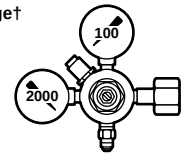



**Model C81-702 Includes:**

- R81-200-LNKA regulator (1)
- 18-013-244 (2000 psi) inlet pressure gauge (1)
- 18-013-084 (100 psi) outlet pressure gauge (1)
- 18-008-002 cylinder connector (1)
- 16-009-001 check valve (1)

### Model C81-651 (One Outlet)

**5 to 100 psig range†**

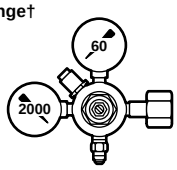



**Model C81-651 Includes:**

- R81-200-LNKA regulator (1)
- 18-013-244 (2000 psi) inlet pressure gauge (1)
- 18-013-084 (100 psi) outlet pressure gauge (1)
- 18-008-002 cylinder connector (1)
- 16-009-002 check valve (1)

### Model C81-269 (One Outlet)

**2 to 50 psig range†**

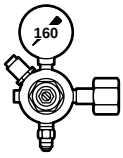



**Model C81-269 Includes:**

- R81-200-LNEA regulator (1)
- 18-013-244 (2000 psi) inlet pressure gauge (1)
- 18-013-083 (60 psi) outlet pressure gauge (1)
- 18-008-002 cylinder connector (1)
- 16-009-001 check valve (1)

### Model C81-684 (One Outlet)

**5 to 100 psig range†**

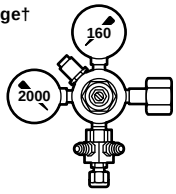



**Model C81-684 Includes:**

- R81-200-LNKA regulator (1)
- 2891-97 pipe plug (1)
- 18-013-085 (160 psi) outlet pressure gauge (1)
- 18-008-002 cylinder connector (1)
- 16-009-001 check valve (1)

### Model C81-685 (Two or Three Outlets)

**5 to 100 psig range†**



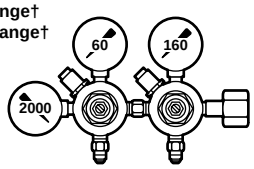

**Model C81-685 Includes:**

- R81-200-LNKA regulator (1)
- 18-013-244 (2000 psi) inlet pressure gauge (1)
- 18-013-085 (160 psi) outlet pressure gauge (1)
- 18-008-002 cylinder connector (1)
- 3228-54 manifold (1)

## Cylinder Connected, Two Regulator Configurations

### Model C81-254 (Two Outlets)

**2 to 50 psig range†**
**5 to 100 psig range†**

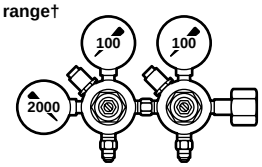



**Model C81-254 Includes:**

- R81-200-LNEA regulator (1)
- R81-200-LNKA regulator (1)
- 18-013-244 (2000 psi) inlet pressure gauge (1)
- 18-013-083 (60 psi) outlet pressure gauge (1)
- 18-013-085 (160 psi) outlet pressure gauge (1)
- 18-006-067 hex nipple (1)
- 18-008-002 cylinder connector (1)
- 16-009-001 check valve (2)

### Model C81-652 (Two Outlets)

**5 to 100 psig range†**

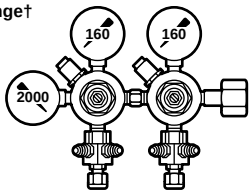



**Model C81-652 Includes:**

- R81-200-LNKA regulator (2)
- 18-013-244 (2000 psi) inlet pressure gauge (1)
- 18-013-084 (100 psi) outlet pressure gauge (2)
- 18-006-067 hex nipple (1)
- 18-008-002 cylinder connector (1)
- 16-009-002 check valve (2)

### Model C81-573 (Four to Six Outlets)

**5 to 100 psig range†**



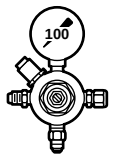

**Model C81-573 Includes:**

- R81-200-LNKA regulator (2)
- 18-013-244 (2000 psi) inlet pressure gauge (1)
- 18-013-085 (160 psi) outlet pressure gauge (2)
- 18-006-067 hex nipple (1)
- 18-008-002 cylinder connector (1)
- 3228-55 manifold (2)

## Wall Mounted, One Regulator Configurations

### Model C81-541 (One Outlet)

**5 to 100 psig range†**

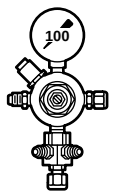



**Model C81-541 Includes:**

- R81-200-LNKA regulator with 9,0 bar (130 psig) integral relief valve (1)
- 18-013-084 (100 psi) outlet pressure gauge (1)
- 18-006-027 half-union adapter (1)
- 18-006-068 half-union adapter with cap (1)
- 16-009-001 check valve (1)
- 5095-51 mounting bracket (1)

### Model C81-554 (Two or Three Outlets)

**5 to 100 psig range†**

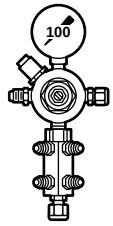



**Model C81-554 Includes:**

- R81-200-LNKA regulator with 9,0 bar (130 psig) integral relief valve (1)
- 18-013-084 (100 psi) outlet pressure gauge (1)
- 18-006-027 half-union adapter (1)
- 18-006-068 half-union adapter with cap (1)
- 3228-54 manifold (1)
- 5095-51 mounting bracket (1)

### Model C81-559 (Four or Five Outlets)

**5 to 100 psig range†**



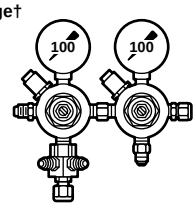

**Model C81-559 Includes:**

- R81-200-LNKA regulator with 9,0 bar (130 psig) integral relief valve (1)
- 18-013-084 (100 psi) outlet pressure gauge (1)
- 18-006-027 half-union adapter (1)
- 18-006-068 half-union adapter with cap (1)
- 3228-60 manifold (1)
- 5095-51 mounting bracket (1)

## Wall Mounted, Two Regulator Configurations

### Model C81-540 (Three or Four Outlets)

**5 to 100 psig range†**

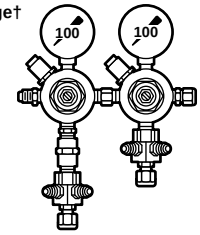



**Model C81-540 Includes:**

- R81-200-LNKA regulator (2)
- 18-013-084 (100 psi) outlet pressure gauge (2)
- 18-006-067 hex nipple (1)
- 18-006-027 half-union adapter (1)
- 18-006-068 half-union adapter with cap (1)
- 16-009-001 check valve (1)
- 3228-54 manifold (1)
- 5095-51 mounting bracket (2)

### Model C81-570 (Four to Six Outlets)

**5 to 100 psig range†**

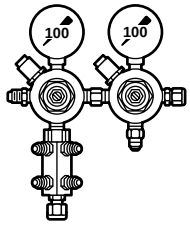



**Model C81-570 Includes:**

- R81-200-LNKA regulator (2)
- 18-013-084 (100 psi) outlet pressure gauge (2)
- 18-006-067 hex nipple (1)
- 18-006-027 half-union adapter (1)
- 18-006-068 half-union adapter with cap (1)
- 2340-50 manifold extension (1)
- 3228-54 manifold (2)
- 5095-51 mounting bracket (2)

### Model C81-657 (Five or Six Outlets)

**5 to 100 psig range†**



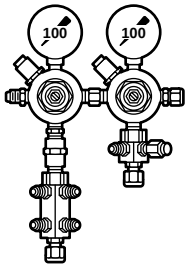

**Model C81-657 Includes:**

- R81-200-LNKA regulator (2)
- 18-013-084 (100 psi) outlet pressure gauge (2)
- 18-006-067 hex nipple (1)
- 18-006-027 half-union adapter (1)
- 18-006-068 half-union adapter with cap (1)
- 16-009-001 check valve (1)
- 3228-60 manifold (1)
- 5095-51 mounting bracket (2)

## Wall Mounted, Three Regulator Configuration

### Model C81-724 (Five to Eight Outlets)

**5 to 100 psig range†**

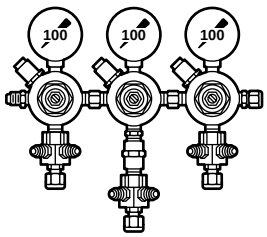



**Model C81-724 Includes:**

- R81-200-LNKA regulator (2)
- 18-013-084 (100 psi) outlet pressure gauge (2)
- 18-006-067 hex nipple (1)
- 18-006-027 half-union adapter (1)
- 18-006-068 half-union adapter (1)
- 2340-50 manifold extension (1)
- 3228-56 manifold (1) - Same as 3228-54 but includes two caps
- 3228-60 manifold (1)
- 5095-51 mounting bracket (2)

### Model C81-324 (Six to Nine Outlets)

**5 to 100 psig range†**



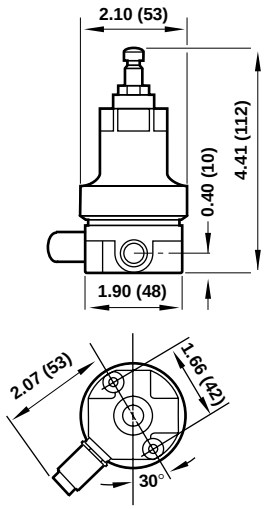

**Model C81-324 Includes:**

- R81-200-LNKA regulator (3)
- 18-013-084 (100 psi) outlet pressure gauge (3)
- 18-006-067 hex nipple (2)
- 18-006-027 half-union adapter (1)
- 18-006-068 half-union adapter (1)
- 2340-50 manifold extension (1)
- 3228-54 manifold (3)
- 5095-51 mounting bracket (2)

† Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

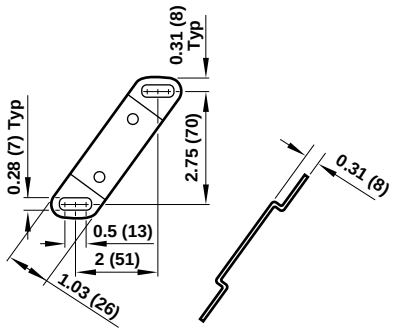
All Dimensions in Inches (mm)

**R81 Regulator**




**Mounting Holes (2 Places)**
**0.18" (4.6 mm) dia. by 0.39 (10 mm) deep.**
**Use 10-32 thread forming screws.**

**5095-51 Strap Type Bracket**




## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kits | Diaphragm, relieving | 570-51 |
| | Valve cartridge and seal | 5086-55 |
| | Kit, major | 6309-04 * |
| | Relief valve and seal | 5779-55 † |

* Kit contains diaphragm, slip ring, valve cartridge, and o-rings.
† Relief valve is marked 130 PSIG RELIEF VALVE and has a brass body with a black end cap.

## WARNING

Soft drink dispensing systems must be designed, installed, and operated in accordance with the guidelines set forth in NSDA pamphlet TD02, ***Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems***, dated July, 1980 or subsequent revisions.

1. Pressure relief valves of sufficient capacity must always be used in the secondary (outlet) lines downstream of each pressure regulator, whether as an integral part of the regulator, as is the case with Norgren Model R81 Regulator, or separately installed elsewhere in the outlet lines. Do not remove or attempt to adjust, plug, block or otherwise defeat the purpose of the relief valve. Do not replace a relief valve with any but an identical model. The relief valve used on the R81 regulator is preset and marked ***130 PSIG RELIEF VALVE.*** Replace only with the same 130 psig relief valve, part number 5779-55. The end cap on the 5779-55 relief valve is color coded black for visual identification. Failure to provide a pressure relief valve of sufficient capacity to hold outlet pressure below the lowest working pressure rating of any piece of equipment installed in the outlet lines can result in equipment damage and/or personal injury.
2. A back flow check valve must always be installed at the regulator or at each manifold outlet in liquid dispensing applications to prevent reverse flow through the regulator and possible introduction of liquids and other contaminants into the regulator.
3. Regulators must not be used where temperature or pressure may exceed those specified in the ***Technical Data*** paragraph.
4. The accuracy of the indication of pressure gauges can change, both during shipment (despite care in packaging) and during the service life. If a pressure gauge is to be used in conjunction with these products and if inaccurate indications may be hazardous to personnel or property, the gauge should be calibrated before initial installation and at regular intervals during use. For gauge standards refer to ANSI B40.1.
5. These regulators are not intended for use in life support systems, beer dispensing systems, soft drink carbonator systems, or industrial cylinder gas systems.

# R82 Regulator

**UL Listed, Cylinder Gas Pressure Regulator**
**1/4" PTF, $CO_2$ Regulator for Beer Dispensing Systems**

- **Underwriters Laboratories, Inc. listed (file number SA1089)**
- **The R82 regulator with integral relief valve meets the requirements of Proposed Section 9.7, *Draught Beer Dispensing Equipment and Related Components* (Seventh Draft dated October 17, 1980), of ANSI-ASME F2.1-1975, Food, Drug, and Beverage Equipment.**
- **Integral relief valve easily replaced without disassembly of regulator and without affecting relief pressure setting**
- **Back flow check valve, or manifold with integral check valve at each outlet, can be installed in regulator outlet port. Manifolds available with 3 or 5 outlets and include one outlet cap.**
- **Relieving diaphragm allows outlet pressure setting to be reduced even though the system is dead-ended. Pressure downstream of check valves will not be reduced.**
- **Easily replaceable valve cartridge contains valve, valve seat, valve spring, and filter element**
- **Two high pressure ports (inlet and primary gauge) and two regulated pressure ports (outlet and secondary gauge)**
- **Diametrically opposite inlet ports facilitate manifolding for multiple dispensing applications. Each manifolded regulator operates independently as though attached directly to the gas supply source.**
- **Bonnet wrench hex same size as tank adapter - one wrench fits both**

Materials:

Body: Brass
Bonnet: Zinc
Valve cartridge: Teflon, brass, stainless steel
Diaphragm: Acetal and nitrile
Relief valve: Brass, polycarbonate, nitrile, aluminum
Seals: Nitrile

### Technical Data

Fluid: Carbon dioxide. The R82 regulator is designed for use in beer dispensing systems to control cylinder gas (carbon dioxide) pressure to the beer keg. Other Norgren regulators (R81 for soft drink syrup containers, R84 for soft drink carbonators, R83 for industrial cylinder gases) are available for use in other systems.

Maximum pressure: 3000 psig (207 bar)

Operating temperature: 0° to 140°F (-18° to 60°C)

Maximum outlet pressure adjustment limit: Factory set at 40 to 45 psig (2.8 to 3.1 bar)

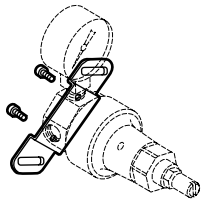
Integral relief valve cracking pressure:
60 ± 4 psig (4.1 ± 0.28 bar)

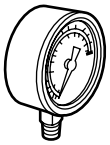
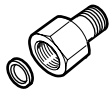
**See Section ALE-24 for Accessories**

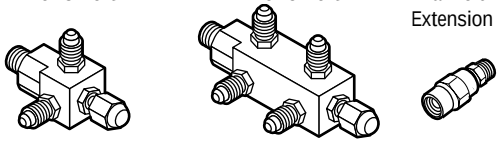
**Ordering Information.** Models listed include integral relief valve with cracking pressure of 60 ± 4 psig (4.1 ± 0.28 bar), PTF threads, relieving diaphragm, 2 to 45 psig (0.14 to 3.1 bar) outlet pressure adjustment range†. A gauge is not included.

| Port | Model | Weight lb (kg) |
|---|---|---|
| 1/4" | R82-200-ENEA | 1.3 (0.59) |

## Accessories

|  Wall Mounting Bracket |  Pipe Plug, Hex Socket 1/4" PTF |  Hex Nipple 1/4" PTF male |  Union Adapter with Cap 1/4" PTF to 1/4" tube (45° flare) |
|---|---|---|---|
| Strap Type: 5095-51 | 2891-97 | 18-006-067 | 18-006-068 |
| | | | Adapter only: 18-006-027 |
| | | | Cap only: 3302-50 |

|  Ø 50 mm (2") diameter, 1/4" PTF connection | Inlet Fittings  Nitrogen Service Cylinder Connector 0.906-14 RH external thread |  Carbon Dioxide Service Cylinder Connector 0.830-14 RH internal thread |
|---|---|---|
| 15 psig (1 bar): 18-013-082 | CGA No. 580: 18-008-004 | 1.44" (37 mm) long nipple CGA No. 320: 18-008-002 |
| 30 psig (2 bar), UL Listed: 18-013-030 | | |
| 60 psig (4 bar), UL Listed: 18-013-083 | | 2.25" (57 mm) long nipple 18-008-015 |
| 100 psig (7 bar), UL Listed: 18-013-084 | | |
| 160 psig (11 bar), UL Listed: 18-013-085 | | Replacement gasket: 1390-02 |
| 300 psig (20 bar), UL Listed: 18-013-086 | | |
| 2000 psig (135 bar), UL Listed: 18-013-244 | | |
| 3000 psig (205 bar), UL Listed: 18-013-087 | | |

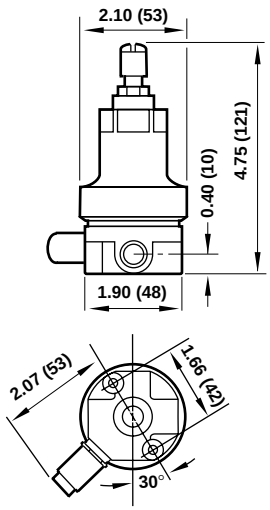
| Single Outlet Fittings - Check Valves ††  | Multiple Outlet Fittings - Manifolds with integral check valves †† 2 or 3 Port / 4 or 5 Port / Manifold Extension  |
|---|---|
| Check Valve, 1/4" PTF male to 1/4" tube (45° flare): 16-009-001 | 2 or 3 outlets, 1/4" PTF male to 1/4" tube (45° flare): 3228-54 |
| Check Valve, 1/4" PTF male to 1/2-16 BSF: 16-009-002 | 2 or 3 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-55 |
| Check Valve, 1/4" PTF male to 1/4" PTF female: 16-009-003 | 4 or 5 outlets, 1/4" PTF male to 1/4" tube (45° flare): 3228-60 |
| | 4 or 5 outlets, 1/4" PTF male to 1/2-16 BSF: 3228-61 |
| | Manifold extension, 1/4" PTF male to 1/4" PTF female: 2340-50 |

† Outlet pressure can be adjusted to pressures in excess of, and less than, that specified. Do not use these units to control pressures outside of the specified range.

†† The listed check valves and manifolds with integral check valves are designed for use with Norgren R82 regulators. They are not recommended for use with other regulators unless separate pressure relief protection is provided in each of the outlet lines.

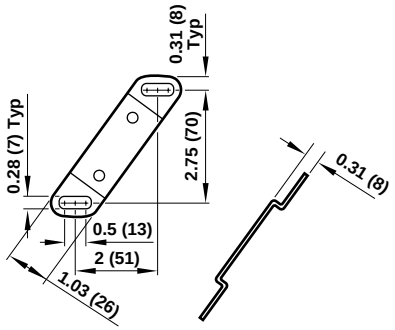
All Dimensions in Inches (mm)

**R82 Regulator**




**Mounting Holes (2 Places)**
**0.18" (4.6 mm) dia. by 0.39" (10 mm) deep.**
**Use 10-32 thread forming screws.**

**5095-51 Strap Type Bracket**




## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kits | Diaphragm, relieving | 570-51 |
| | Valve cartridge and seal | 5086-55 |
| | Kit, major | 6309-04 * |
| | Relief valve and seal | 5779-56 † |

* Kit contains diaphragm, slip ring, valve cartridge, and o-rings.

† Relief valve is marked ***60 PSIG RELIEF VALVE*** and has a brass body with a natural (silver colored) aluminum end cap.

## WARNING

Beer dispensing systems must be designed, installed, and operated in accordance with the applicable guidelines such as the proposed Section 9.7, ***Draught Beer Dispensing Equipment and Related Components*** (Seventh Draft dated October 17, 1980), of ANSI-ASME F2.1-1975, Food, Drug and Beverage Equipment or subsequent revisions.

1. Pressure relief valves of sufficient capacity must always be used in the secondary (outlet) lines downstream of each pressure regulator, whether as an integral part of the regulator, as is the case with Norgren Model R82 Regulator, or separately installed elsewhere in the outlet lines. Do not remove or attempt to adjust, plug, block or otherwise defeat the purpose of the relief valve. Do not replace a relief valve with any but an identical model. The relief valve used on the R82 regulator is preset and marked ***60 PSIG RELIEF VALVE.*** Replace only with the same 60 psig relief valve, part number 5779-56. The end cap on the 5779-56 relief valve is color coded silver for visual identification. Failure to provide a pressure relief valve of sufficient capacity to hold outlet pressure below the lowest working pressure rating of any piece of equipment installed in the outlet lines can result in equipment damage and/or personal injury.
2. A back flow check valve must always be installed at the regulator or at each manifold outlet in liquid dispensing applications to prevent reverse flow through the regulator and possible introduction of liquids and other contaminants into the regulator.
3. Regulators must not be used where temperature or pressure may exceed those specified in the ***Technical Data*** paragraph.
4. The accuracy of the indication of pressure gauges can change, both during shipment (despite care in packaging) and during the service life. If a pressure gauge is to be used in conjunction with these products and if inaccurate indications may be hazardous to personnel or property, the gauge should be calibrated before initial installation and at regular intervals during use. For gauge standards refer to ANSI B40.1.
5. These regulators are not intended for use in life support systems, soft drink carbonator systems, with soft drink product (syrup) containers, or industrial cylinder gas systems.

# Filter/Regulators

## Compressed air, general purpose, and Instrument Filter/Regulators 1/8" to 1-1/2" port sizes



**B07**

**B72G**

**B73G**

**B74G**

**B64G**

**B68G**

**B39**

**B38**

## Series 07 General Purpose Filter/Regulator
## 1/8″ and 1/4″ Port Sizes

- **Compact design**
- **Full flow gauge ports**
- **Low torque, non-rising adjusting knob**
- **Snap action knob locks pressure setting when pushed in**
- **Standard relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Protects air operated devices by removing liquid and solids contaminants**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering Information.** Models listed include PTF threads, transparent bowl, relieving diaphragm, gauge, automatic drain, 5 µm element, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range* .

| Port Size | Model Number | Flow† scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| 1/8" | B07-102-A1KA | 13 (6.2 $dm^3/s$) | 0.57 (0.26) |
| 1/4" | B07-202-A1KA | 14 (6.5 $dm^3/s$) | 0.57 (0.26) |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

### Alternative Models

B 0 7 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8″ | 1 |
| 1/4″ | 2 |

| Bowl | Relief Type | Gauge | Substitute |
|---|---|---|---|
| Transparent | Relieving | Without | 01 |
| Transparent | Relieving | With | 02 |
| Transparent | Non-relieving | Without | 03 |
| Transparent | Non-relieving | With | 23 |
| Metal | Relieving | Without | 33 |
| Metal | Relieving | With | 34 |
| Metal | Non-relieving | Without | 35 |
| Metal | Non-relieving | With | 36 |

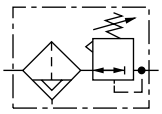
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 1 to 10 psig (0.1 to 0.7 bar) | A |
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 100 psig (0.3 to 7 bar) | K |
| 5 to 125 psig (0.3 to 8.6 bar) | L |

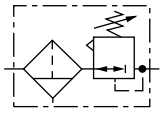
| Element | Substitute |
|---|---|
| 5 µm | 1 |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

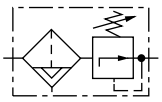
### ISO Symbols



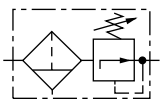
Automatic Drain
Relieving



Manual Drain
Relieving



Automatic Drain
Non Relieving



Manual Drain
Non Relieving

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*
- Transparent bowl: 30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 150°F (-34° to 65°C)

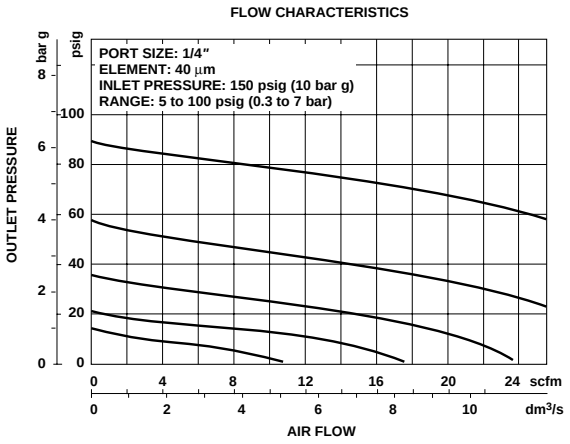
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Particle removal: 5 µm or 40 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set
- 1/8" Ports: 13 scfm (6.2 $dm^3/s$) with 5 µm element
- 1/4" Ports: 14 scfm (6.5 $dm^3/s$) with 5 µm element

Nominal bowl size: 1 fluid ounce (31 ml)
Gauge ports:
- 1/8" PTF with PTF main ports
- 1/8" ISO Rc with ISO Rc main ports
- 1/8" ISO Rc with ISO G main ports

Drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.
Materials:
- Body: Zinc
- Bonnet: Acetal
- Valve: Brass/nitrile
- Valve seat: Acetal
- Bowl
  - Transparent: Polycarbonate
  - Metal: Zinc
- Element: Sintered polypropylene
- Elastomers: Nitrile

## Typical Performance Characteristics

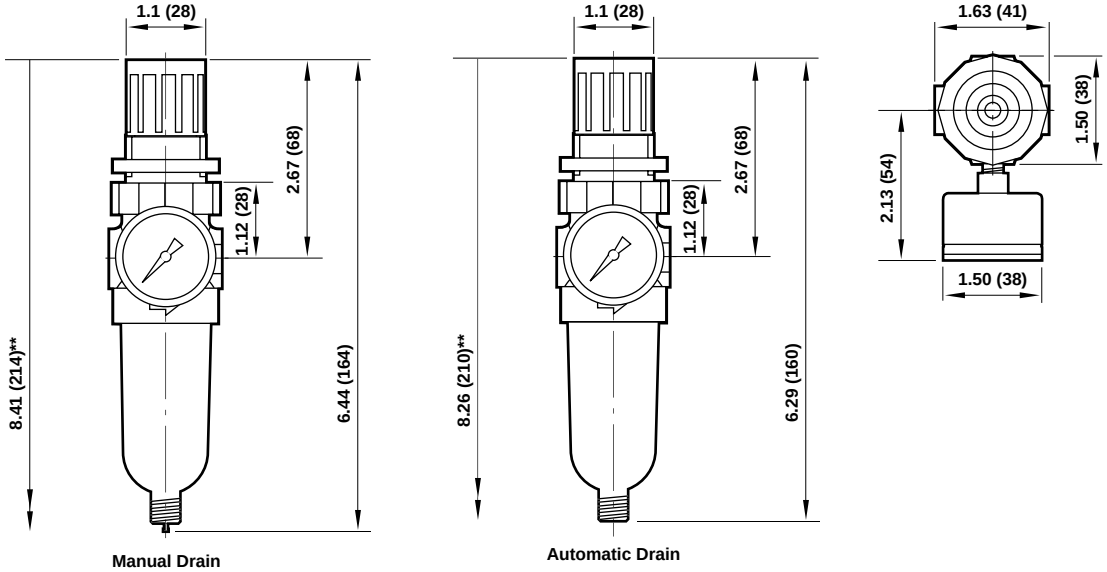



## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Relieving models, 5 µm element | 3820-12 |
| | Non relieving models, 5 µm element | 3820-11 |
| Replacement drains | Manual | 773-03 |
| | Automatic | 3654-02 |

Service kit includes slip ring, diaphragm, valve seat with o-ring, valve, valve spring, element, element gasket, and bowl o-ring.

All Dimensions in Inches (mm)




** Minimum clearance to remove bowl
Panel mounting hole diameter 1.19″ (30 mm)
Panel thickness: 0.25″ (6 mm)

## Excelon® 72 Series Filter/Regulator 1/4″ and 3/8″ Port Sizes

- **EXCELON design allows in-line or modular installation**
- **High efficiency water and particle removal**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens on metal bowls**
- **Full flow gauge ports**
- **Balanced valve design for optimum pressure control**
- **Push to lock adjusting knob with tamper resistant accessory**
- **Modular installations with EXCELON 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed include PTF threads, knob adjustment, automatic drain, transparent bowl without guard, 40 µm element, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment rang*, with gauge.

| Port Size | Model | Flow† scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | B72G-2AK-AL3-RMG | 80 (38) | 1.3 (0.59) |
| 3/8" | B72G-3AK-AL3-RMG | 80 (38) | 1.3 (0.59) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

### Alternative Models

B 7 2 G - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 30 psig (0.3 to 2 bar) | C |
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

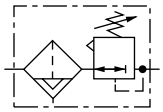
| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Bowl | Substitute |
|---|---|
| Long metal with liquid level indicator | E |
| Long transparent without guard | L |
| Long transparent with guard | W |

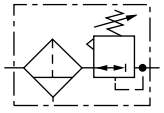
| Drain | Substitute |
|---|---|
| 1/4 turn manual | Q |
| Semi automatic | S |
| Auto drain | A |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

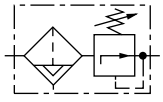
### ISO Symbols



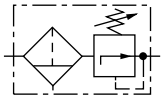
Automatic and Semi Automatic Drain Relieving



Manual Drain Relieving



Automatic and Semi Automatic Drain Non Relieving



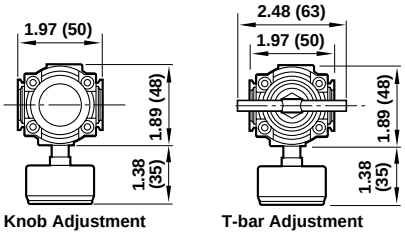
Manual Drain Non Relieving

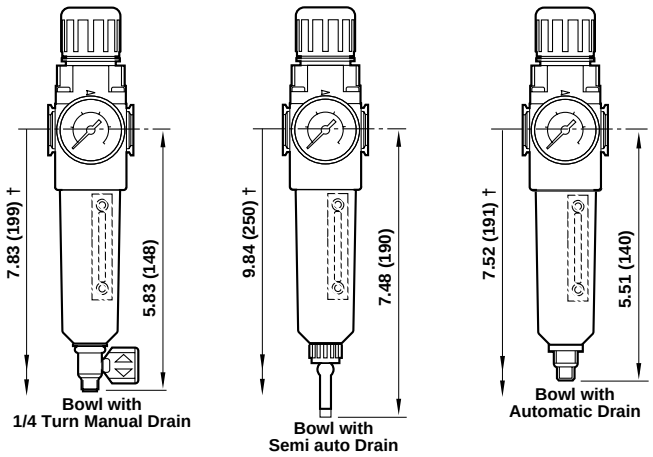
**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: Transparent bowl: 150 psig (10 bar)
Metal bowl: Manual or semi automatic drain: 250 psig (17 bar)
Automatic drain: 150 psig (10 bar)
Operating temperature*: Transparent bowl: -30° to 125°F (-34° to 50°C)
Metal bowl: -30° to 150°F (-34° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C ).

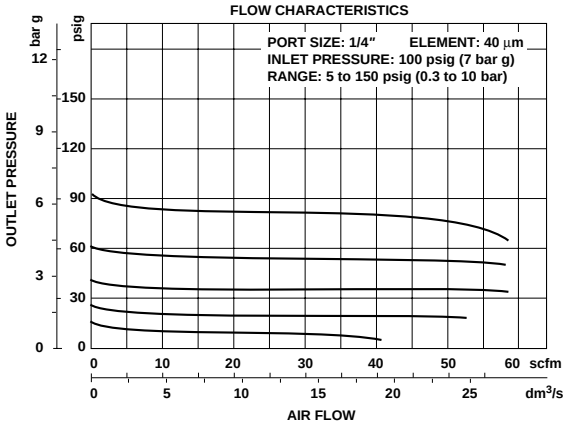
Particle removal: 5 µm, 25 µm or 40 µm. Within ISO 8573-1, Class 3 and Class 5
Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 1 bar (15 psig) from set: 80 scfm (38 $dm^3/s$)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Semi automatic drain connection: Push on 5/16" (8 mm) ID tube
Semi automatic drain operating conditions (pressure operated):
Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)
Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)
Minimum air flow required to close drain: 1 scfm (0.5 $dm^3/s$)
Manual operation: Lift stem to drain bowl
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Gauge ports: 1/8"PTF with PTF main ports
1/8" ISO Rc with ISO Rc main ports
1/8" ISO Rc with ISO G main ports
Nominal bowl size: Bowl: 2.2 fluid ounce (65 ml)
Materials
Body: Zinc
Bonnet: Acetal
Valve: Brass
Bowl
Transparent: Polycarbonate
Guard for transparent bowl: Zinc
Metal bowl liquid level indicator lens:
Transparent nylon
Element: Sintered polypropylene
Elastomers: Neoprene and nitrile
An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

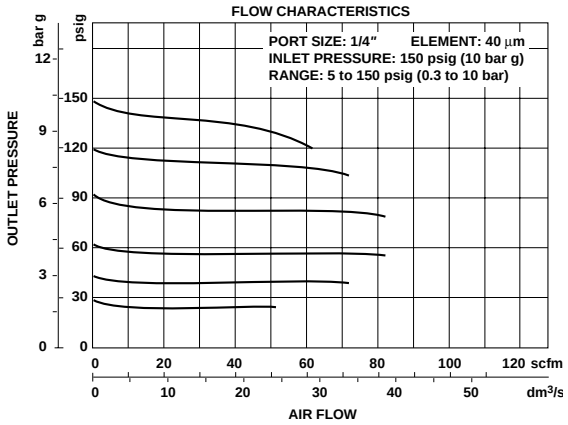



† Minimum clearance required to remove bowl.

## Typical Performance Characteristics




## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4383-500 |
| | Non relieving | 4383-501 |
| Replacement elements | 5 µm | 5925-03 |
| | 25 µm | 5925-01 |
| | 40 µm | 5925-02 |
| Liquid level lens kit | Prismatic | 4380-030 |
| Replacement drains | 1/4 turn manual | 619-50 |
| | Semi automatic | 5379-RK |
| | Automatic | 4000-50R |

Service kit includes diaphragm assembly, valve assembly, valve spring, louvre o-ring, bowl o-ring, drain seal.

All Dimensions in Inches (mm)

Panel mounting hole diameter 1.57" (40 mm)
Panel thickness: 0.16 (4 mm)

## Excelon® 73 Series Filter/Regulator
## 1/4″, 3/8″, 1/2″ Port Sizes

- **Excelon design allows in-line or modular installation**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Full flow gauge ports**
- **Balanced valve design minimizes effect of variation in the inlet pressure on the outlet pressure**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**


**Ordering Information.** Models listed include PTF threads, knob adjustment, automatic drain, metal bowl with liquid level indicator, 40 µm element, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range* with gauge.

| Main Port Size | Model Number | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | B73G-2AK-AD3-RMG | 78 (37) | 1.76 (0.82) |
| 3/8" | B73G-3AK-AD3-RMG | 123 (58) | 1.76 (0.82) |
| 1/2" | B73G-4AK-AD3-RMG | 123 (58) | 1.76 (0.82) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

### Alternative Models

B 7 3 G - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |
| 1/2″ | 4 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1/4 turn | Q |

| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |
| Transparent | T |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar)** | S |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

*Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**Units with 250 psig (17 bar) outlet pressure range are available only with the standard metal bowl.

**See Section ALE-24 for Accessories**

All Dimensions in Inches (mm)

## Technical Data

Fluid: Compressed air
Maximum pressure
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*
- Transparent bowl: -30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 175°F (-34° to 80°C)

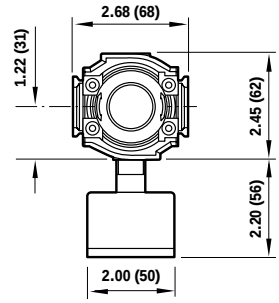
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm or 40 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set: 123 scfm (58 $dm^3/s$)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread - Flexible tube with 3/16" (5mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

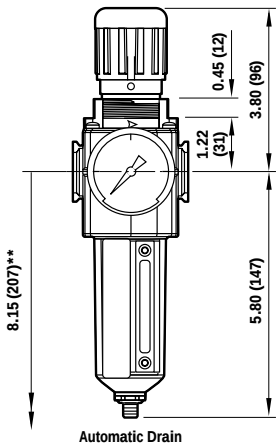
Nominal bowl size: 3.5 fluid ounce (0.1 liter)
Gauge ports:
- 1/4" PTF with PTF main ports
- Rc1/4 with ISO Rc main ports
- Rc1/8 with ISO G main ports

Materials
- Body: Aluminum
- Bonnet: Aluminum or Zinc
- Valve: Brass
- Bowl:
  - Transparent: Polycarbonate
  - Transparent with guard: Polycarbonate, steel guard
  - Metal: Aluminum
  - Metal bowl liquid level indicator lens: Transparent nylon
- Element: Sintered polypropylene
- Elastomers: Neoprene and nitrile

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

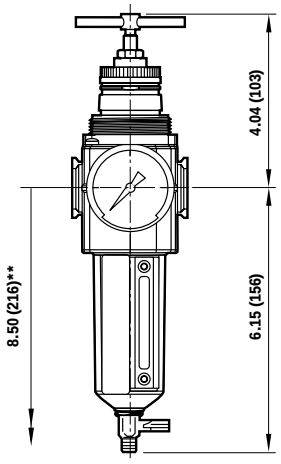



Panel mounting hole diameter 1.89″ (48 mm)
Panel thickness: 0.25 (6 mm)



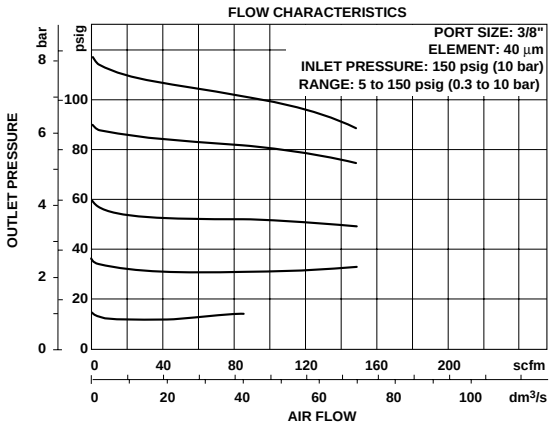

Automatic Drain

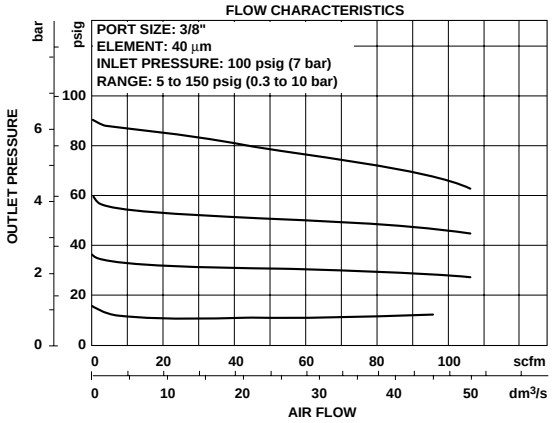
** Minimum clearance to remove bowl.




1/4 Turn Manual Drain

## Typical Performance Characteristics



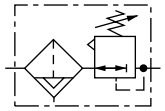



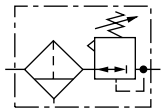

## Service Kits

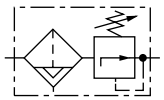
| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4383-600 |
| | Non-relieving | 4383-601 |
| Replacement elements | 5 µm | 4438-01 |
| | 25 µm | 4438-02 |
| | 40 µm | 4438-03 |
| Liquid level lens kit | Prismatic | 4380-020 |
| Replacement drains | Automatic | 4000-51R |
| | Manual quarter turn | 619-50 |

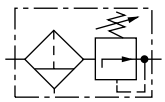
Service kit includes diaphragm assembly, valve assembly, valve spring, bowl o-ring, and automatic drain seal.

## ISO Symbols


Automatic Drain, Relieving


Manual Drain, Relieving


Automatic Drain, Non-Relieving


Manual Drain, Non-Relieving

## Excelon® 74 Series Filter/Regulator
## 3/8", 1/2", 3/4" Port Sizes

- **EXCELON design allows in-line or modular installation**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Full flow gauge ports**
- **Balanced valve design minimizes effect of variation in the inlet pressure on the outlet pressure**
- **Modular installations with EXCELON 72, 73, and 74 series can be made to suit particular applications**


**Ordering Information.** Models listed include PTF threads, knob adjustment, automatic drain, metal bowl with liquid level indicator, 40 µm element, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range*, with gauge.

| Main Port Size | Model Number | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 3/8" | B74G-3AK-AD3-RMG | 163 (77) | 2.62 (1.19) |
| 1/2" | B74G-4AK-AD3-RMG | 212 (100) | 2.59 (1.17) |
| 3/4" | B74G-6AK-AD3-RMG | 212 (100) | 2.55 (1.16) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

### Alternative Models

B 7 4 G - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1/4 turn | Q |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig(0.3 to 10 bar ) | M |
| 10 to 250 psig (0.7 to 17 bar )** | S |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

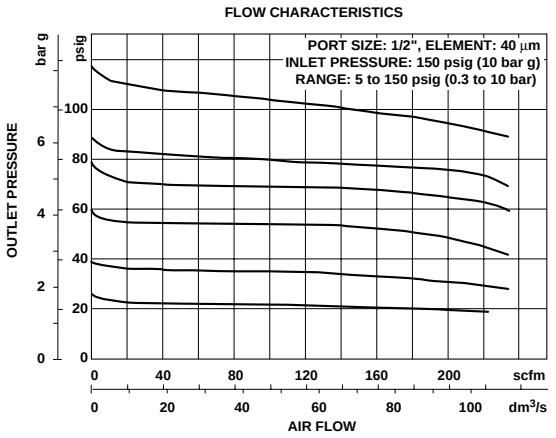
** Units with 250 psig (17 bar) outlet pressure range are available only with the T-bar adjustment; therefore substitute ***T*** at the 7th digit and ***S*** at the 12th position.

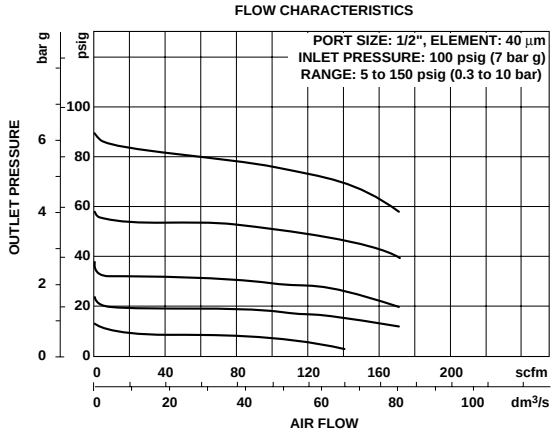
**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure:
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*:
Transparent bowl: -30° to 125°F (-34° to 50°C)
Metal bowl: -30° to 175°F (-34° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: 5, 25 or 40 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with 150 psig (10 bar) inlet pressure, 6.3 (90 psig) set pressure and a droop of 15 psig (1 bar) from set: 212 scfm (100 $dm^3/s$)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size: 7 fluid ounce(0.2 liter )
Gauge ports:
1⁄4" PTF with PTF main ports
Rc1⁄4 with ISO Rc main ports
Rc1⁄8 with ISO G main ports
Materials
Body: Aluminum
Bonnet: Aluminum
Valve: Brass
Bowl
Transparent: Polycarbonate with steel bowl guard
Metal: Aluminum
Metal bowl liquid level indicator lens: Transparent nylon
Element: Sintered plastic
Elastomers: Neoprene and Nitrile
An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics



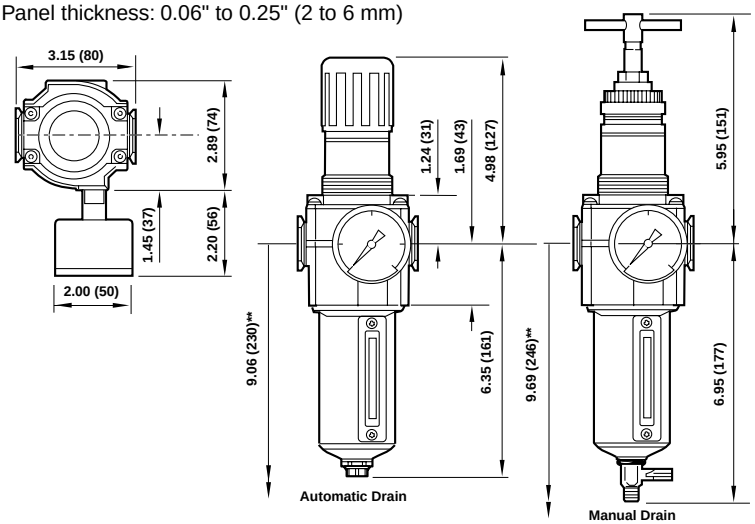




## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4383-700 |
| | Non relieving | 4383-701 |
| Replacement elements | 5 µm | 4338-04 |
| | 25 µm | 4338-07 |
| | 40 µm | 4338-05 |
| Liquid level lens kit | Prismatic | 4380-050 |
| Replacement drains | Automatic (1/8 NPT outlet) | 3000-10 |
| | Manual quarter turn | 619-50 |

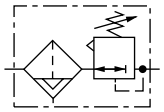
Service kit includes diaphragm assembly, valve assembly, valve spring, louvre o-ring, bowl o-ring, drain seal.

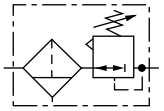
Panel mounting hole diameter: 2.06" (52 mm)
Panel thickness: 0.06" to 0.25" (2 to 6 mm)

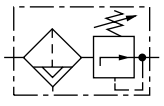


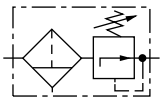

** Minimum clearance to remove bowl.

## ISO Symbols


Automatic Drain, Relieving


Manual Drain, Relieving


Automatic Drain, Non Relieving


Manual Drain, Non Relieving

# B64G

## Olympian Plus Filter/Regulator
## 1/4″, 3/8″, 1/2″, 3/4″ Port Sizes

- **Olympian Plus plug in design**
- **High Efficiency water and particle removal**
- **Quick release bayonet bowl**
- **High visibility prismatic sight glass**
- **Push to lock adjusting knob with tamper resistant option**


**Ordering Information.** Models listed include PTF threads, knob adjustment, automatic drain, metal bowl, 40 µm element, relieving diaphragm, 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range* with gauge.

| Port Size | Model | Flow† scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 1/4" | B64G-2AK-AD3-RMG | 64 (30) | 3.80 (1.71) |
| 3/8" | B64G-3AK-AD3-RMG | 161 (76) | 3.76 (1.69) |
| 1/2" | B64G-4AK-AD3-RMG | 225 (106) | 3.69 (1.66) |
| 3/4" | B64G-6AK-AD3-RMG | 225 (106) | 4.49 (2.02) |

† Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.

### Alternative Models

B 6 4 G - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |
| No Yoke | N |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar) | S** |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Guarded Transparent | P |

| Drain | Substitute |
|---|---|
| 1/4 turn manual | Q |
| Automatic | A |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) adjustment range are available only with the T-bar adjustment; therefore substitute ***T*** at the 7th digit and ***S*** at the 12th position.

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure
- Guarded transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*
- Guarded transparent bowl: -30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 175°F (-34° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5, 25 or 40 µm. Within ISO 8573-1, Class 3 and Class 5
Typical flow at 90 psig (6.3 bar) inlet pressure:
- 225 scfm (106 $dm^3/s$)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions:
- Minimum pressure: 10 psig (0.7 bar).
- Drain opens when bowl pressure drops below 3 psig (0.2 bar).
- Minimum air flow: 2 scfm (1 $dm^3/s$) required to close drain.

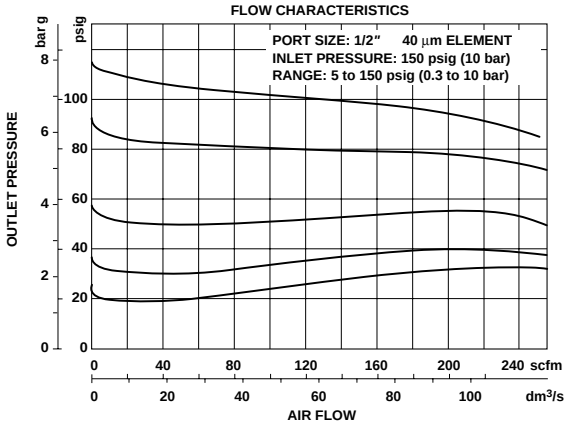
Gauge Ports:
- 1/8" PTF with PTF main ports
- 1/8" ISO Rc with ISO Rc main ports
- 1/8" ISO Rc with ISO G main ports

Nominal bowl size:
- 7 fluid ounce (0.2 liter)

Materials:
- Body: Zinc
- Bonnet: Aluminum
- Valve: Brass
- Yoke: Zinc
- Metal bowl: Aluminum
- Standard metal bowl prismatic liquid level indicator lens: Grilamid
- Optional metal bowl sight glass: Pyrex
- Optional transparent bowl: Polycarbonate
- Element: Sintered plastic
- Elastomers: Synthetic rubber

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

## Typical Performance Characteristics

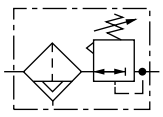



## Service Kits

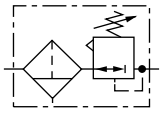
| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4383-200 |
| | Non relieving | 4383-201 |
| Replacement elements | 5 µm | 4338-01 |
| | 25 µm | 4338-99 |
| | 40 µm | 4338-02 |
| Replacement Sight Glass | Prismatic (standard) | 4380-040 |
| | Pyrex | 4380-041 |
| Replacement Drains | Automatic | 3000-10 |
| | Manual | 684-84 |

Service kit includes diaphragm assembly, valve assembly, valve spring, louver o-ring, bowl o-ring, drain seal.

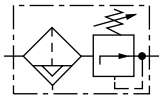
## ISO Symbols



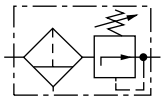
Automatic Drain
Relieving



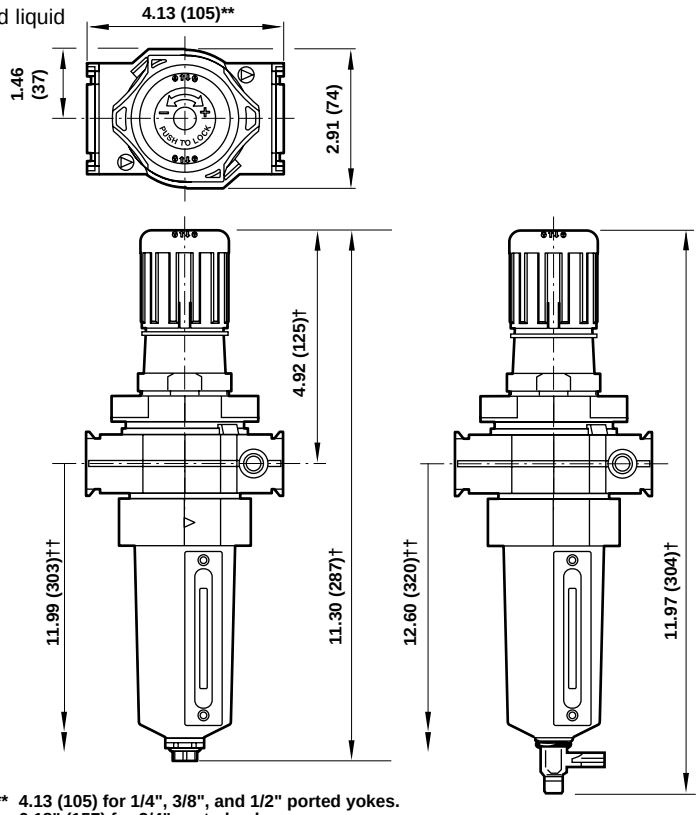
Manual Drain
Relieving



Automatic Drain
Non Relieving



Manual Drain
Non Relieving




** 4.13 (105) for 1/4", 3/8", and 1/2" ported yokes.
6.18" (157) for 3/4" ported yokes.
† Add 1.46 (37) for units with T-handle adjustment.
†† Minimum clearance required to remove unit.
Add 1.46 (37) for units with T-handle adjustment.

# B68E/G

## Olympian Plus Filter/Regulator
## 3/4″, 1″, 1-1/4″, 1-1/2″ Port Sizes

- **Olympian Plus plug in system**
- **Effective liquid removal and positive solid particle filtration**
- **Large filter element area provides minimum pressure drop**
- **High flow unit with large valve and diaphragm**
- **Push to lock adjusting knob with tamper resistant option**
- **Excellent flow and regulation characteristics**

**Ordering Information.** Models listed include a 1 quart w/long element, yoke with PTF threads, knob adjustment, automatic drain, 40 µm element, relieving diaphragm, and a 5 to 120 psig (0.4 to 8 bar) outlet pressure adjustment range*. A gauge is not included.

| Port Size | Model | Flow** scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 3/4 | B68E-6AK-AU3-RLN | 509 (240) | 6.47 (2.94) |
| 1 | B68E-8AK-AU3-RLN | 509 (240) | 6.20 (2.82) |
| 1-1/4 | B68E-AAK-AU3-RLN | 509 (240) | 6.42 (2.92) |
| 1-1/2 | B68E-BAK-AU3-RLN | 509 (240) | 6.07 (2.76) |

### Alternative Models

B 6 8 E - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Bowl/Element Type | Substitute |
|---|---|
| 1 quart (1 liter) bowl w/long element | E |
| 1 pint (0.5 liter) bowl w/short element | G |

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |
| No Yoke | N |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |
| No Yoke (***N*** in 5th position) Rc threaded gauge ports | N |
| No Yoke (***N*** in 5th position) PTF threaded gauge ports | A |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Drain | Substitute |
|---|---|
| Automatic | A |
| No drain (Closed bowl) | E |
| Manual | M |
| Manual, 1/4 turn | Q |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 0 to 60 psig(0 to 4 bar) | F |
| 5 to 120 psig (0.4 to 8 bar) | L |
| 10 to 250 psig (0.7 to 17 bar) | S*** |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Bowl | Substitute |
|---|---|
| 1 quart (1 liter) without liquid level indicator | C†† |
| 1 pint (0.5 liter) without liquid level indicator | M† |
| 1 pint (0.5 liter) with liquid level indicator | R† |
| 1 quart (1 liter) with liquid level indicator | U†† |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.
** Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a 15 psig (1 bar) droop from set.
*** Units with 250 psig (17 bar) adjustment range are available only with the T-bar adjustment; therefore substitute ***T*** at the 7th digit and ***S*** at the 12th position.
† Only available with B68G.
†† Only available with B68EE

All Dimensions in Inches (mm)

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to +175°F (-20° to +80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).

Partical removal: 5, 25 or 40 µm
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 509 scfm (240 $dm^3/s$)
1/4 turn manual drain connection: 1/8" pipe thread
Automatic drain connection: 1/8" pipe thread
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

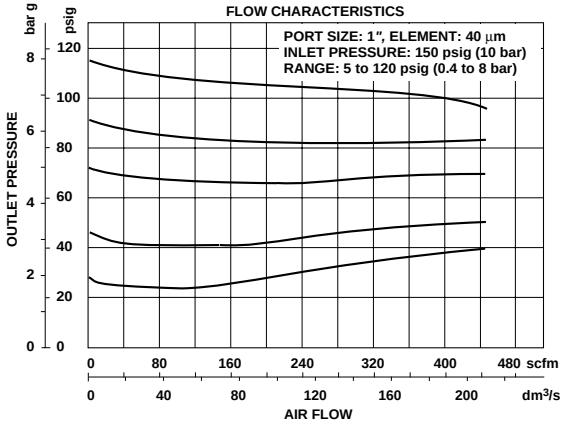
Nominal bowl size:
- 1 pint U.S. (0.5 liter)
- 1 quart U.S. (1 liter)

Gauge ports:
- 1/8 PTF with PTF yoke ports
- Rc1/8 with ISO Rc yoke ports
- Rc1/8 with ISO G yoke ports

Materials:
- Body: Aluminum
- Yoke: Aluminum
- Bonnet: Aluminum
- Adjusting knob: Acetal resin
- Optional T-bar adjusting screw: Steel
- Valve: Aluminum
- Bowl: Aluminum
- Sight glass: Pyrex
- Element: Sintered bronze or polypropylene
- Elastomers: Synthetic rubber

An automatic drain is a two-way valve, which will close when the system is pressurized. The drain opens when the float rises due to accumulated liquid and on depressurization.

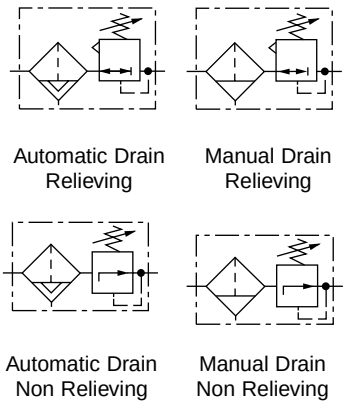
## Typical Performance Characteristics

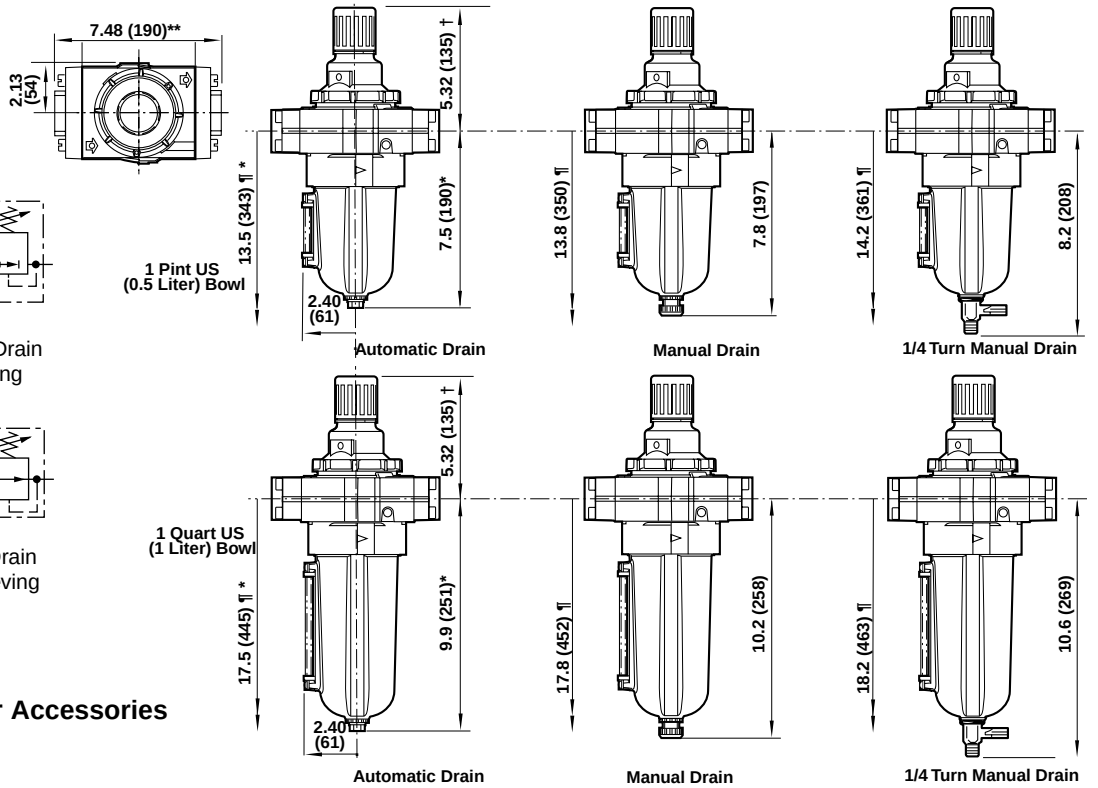



## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Relieving | 4383-300 |
| | Non relieving | 4383-301 |
| Replacement elements | 5 µm (1 pint bowl) | 5576-97 |
| | 25 µm (1 pint bowl) | 5576-98 |
| | 40 µm (1 pint bowl) | 5576-99 |
| | 5 µm (1 quart bowl) | 5311-01 |
| | 25 µm (1 quart bowl) | 5511-02 |
| | 40 µm (1 quart bowl) | 5511-03 |
| Replacement sight glass kit | 1 pint bowl | 4380-060 |
| | 1 quart bowl | 4380-061 |
| Replacement Drains | Automatic (G 1/8 outlet) | 3000-97 |
| | Automatic (1/8 NPT outlet) | 3000-10 |
| | Manual | 684-84 |
| | Manual quarter turn | 619-50 |

Service kit includes, valve spring, slip ring, valve assembly, diaphragm assembly and necessary seals and 'o' rings.




† Add 1.46" (37 mm) for unit with T-bar adjustment.
** For 1-1/4" and 1-1/2" ported yokes, add 0.39" (10 mm).
* Dimension also applies to closed bottom bowl.
¶ Minimum clearance required to remove bowl.

**See Section ALE-24 for Accessories**

# Miniature Series 07 Oil Removal Filter/Regulator 1/8″ and 1/4″ Port Sizes

- **Compact design**
- **High efficiency oil and particle removal**
- **Low torque, non-rising adjusting knob**
- **Snap action knob locks pressure setting when pushed in**
- **Standard relieving models allow reduction of outlet pressure even when the system is dead-ended**

**Ordering Information.** Models listed include PTF threads, transparent bowl, relieving diaphragm, gauge, automatic drain, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range* .

| Port Size | Model Number | Flow† scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| 1/8" | B39-102-A0KA | 4.0 (1.9) | 0.57 (0.26) |
| 1/4" | B39-202-A0KA | 4.0 (1.9) | 0.57 (0.26) |

† Maximum flow with 90 psig (6.3 bar) inlet pressure to maintain stated oil removal performance.

## Alternative Models

B 3 9 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8" | 1 |
| 1/4" | 2 |

| Bowl | Relief Type | Gauge | Substitute |
|---|---|---|---|
| Transparent | Relieving | Without | 01 |
| Transparent | Relieving | With | 02 |
| Transparent | Non-relieving | Without | 03 |
| Transparent | Non-relieving | With | 23 |
| Metal | Relieving | Without | 33 |
| Metal | Relieving | With | 34 |
| Metal | Non-relieving | Without | 35 |
| Metal | Non-relieving | With | 36 |

* Do not use these units to control pressures outside of the specified ranges.

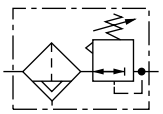
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 1 to 10 psig (0.1 to 0.7 bar) | A |
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 100 psig (0.3 to 7 bar) | K |
| 5 to 125 psig (0.3 to 8.6 bar) | L |

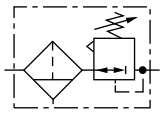
| Element | Substitute |
|---|---|
| Coalescing | 0 |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

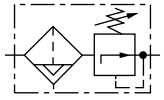
## ISO Symbols



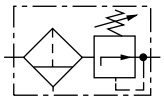
Automatic Drain
Relieving



Manual Drain
Relieving



Automatic Drain
Non Relieving



Manual Drain
Non Relieving

**See Section ALE-24 for Accessories**

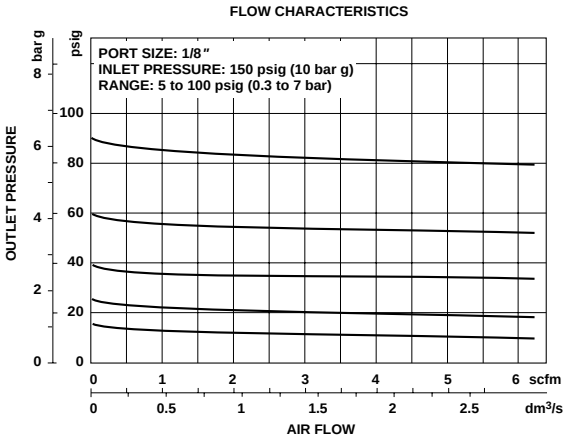
## Technical Data

Fluid: Compressed air
Maximum pressure
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*
Transparent bowl: -30° to 125°F (-34° to 50°C)
Metal bowl: -30° to 150°F (-34° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Particle removal: Down to 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (21°C) with an inlet concentration of 17 ppm.
Maximum flow with 90 psig (6.3 bar) inlet pressure†:
4.0 scfm (1.9 $dm^3/s$)

† Maximum flow to maintain stated oil removal performance.
Nominal bowl size: 1 fluid ounce (31 ml)
Gauge ports:
1/8" PTF with PTF main ports
1/8" ISO Rc with ISO Rc main ports
1/8" ISO Rc with ISO G main ports
Drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.
Materials
Body: Zinc
Bonnet: Acetal
Valve: Brass/nitrile
Valve seat: Acetal
Bowl
Transparent: Polycarbonate
Metal: Zinc
Element: Synthetic fiber and polyurethane foam
Elastomers: Nitrile

## Typical Performance Characteristics



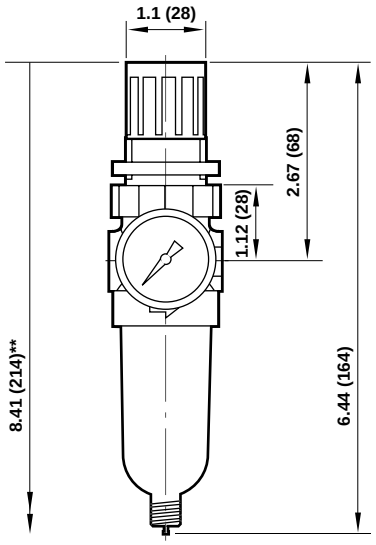

## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Relieving models | 3407-66 |
| | Non relieving models | 3407-65 |
| | Element | 4141-10 |
| Replacement drains | Manual | 773-03 |
| | Automatic | 3654-02 |

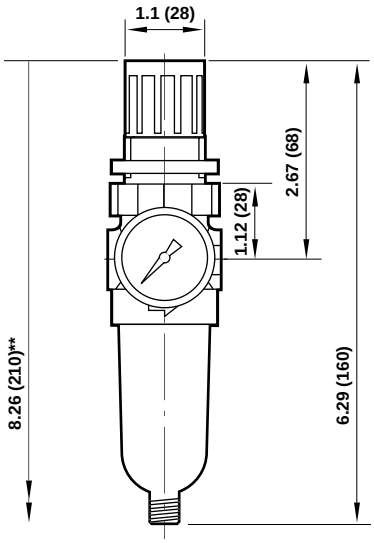
Relieving and non-relieving service kits include slip ring, diaphragm, valve seat with o-ring, valve, and valve spring. Element kit contains element, element gasket, and bowl o-ring.

All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.19" (30 mm)
Maximum panel thickness: 0.25" (6 mm)

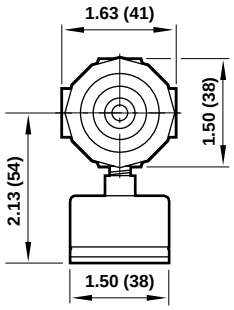



**Manual Drain**




**Automatic Drain**

** Minimum clearance to remove bowl



# B38

## Instrument Filter/Regulator
## Aluminum Model 1/4" PTF

- **Compact instrument units with high performance**
- **Stable regulation and temperature compensation**
- **Excellent flow and regulation characteristics**

**Ordering Information.** Models listed are relieving type with PTF threads, manual drain, 25 µm element, screw adjustment, 0.6 to 30 psig (0.04 to 2 bar) outlet pressure adjustment range and without gauge.

| Port Size | Model Number | Flow† scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| 1/4" PTF | B38-200-B2CA | 17 (8) | 1.18 (0.53) |

† Typical flow 100 psig (7bar) inlet pressure, 15 psig (1 bar) set pressure, and a droop of 1 psig (0.05 bar) from set.

### Alternative Models

B 3 8 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" PTF | 2 |

| Type | Substitute |
|---|---|
| Aluminum | 0 |

| Diaphragm | Substitute |
|---|---|
| Relieving | 0 |
| Non relieving | 1 |
| Relieving, bracket and nut | 2 |
| Non relieving, bracket and nut | 3 |
| Relieving with nut | 4 |
| Non relieving with nut | 5 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | D |
| API.LP.INT | K |

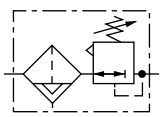
| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 0.6 to 30 psig (0.04 to 2 bar) | C |
| 1 to 60 psig (0.07 to 4 bar) | F |
| 3.6 to 100 psig (0.25 to 7 bar) | K |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |

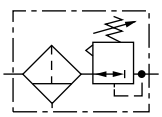
| Drain | Substitute |
|---|---|
| Manual | B |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

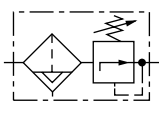
### ISO Symbols



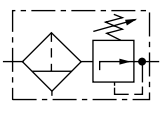
Automatic Drain, Relieving



Manual Drain, Relieving



Automatic Drain, Non Relieving



Manual Drain, Non Relieving

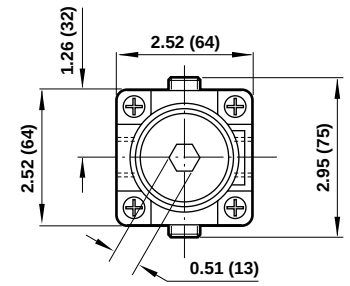
**See Section ALE-24 for Accessories**

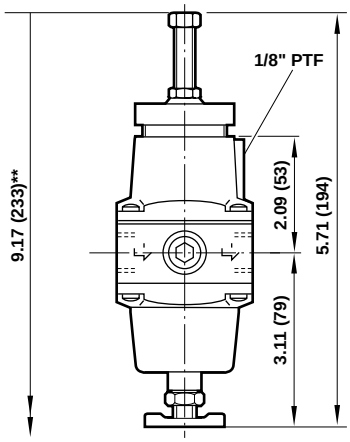
## Technical Data

Fluid: Compressed air
Maximum pressure
Manual drain: 300 psig (20 bar)
Operating temperature: -40° to 175°F (-40° to 80°C) *
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: 5 µm or 25 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with 100 psig (7 bar) inlet pressure, 15 psig (1 bar) set pressure and a droop of 1 psig (0.05 bar) from set:
17 scfm (8 dm³/s)
Manual Drain
Nominal bowl size:
2.4 fluid ounce (70 ml)
Gauge ports:
1/4" PTF

Materials
Body: Aluminum
Bonnet: Aluminum
Bowl: Aluminum
Adjusting screw: Steel
Elements
25 µm: High density polyethylene
5 µm: Ceramic pyrolith
Elastomeric materials: Synthetic rubber

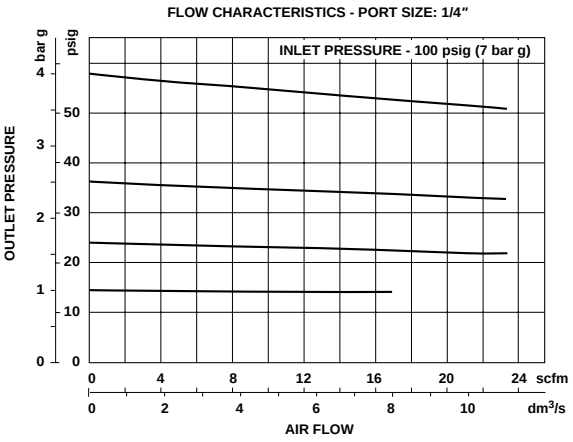
All Dimensions in Inches (mm)

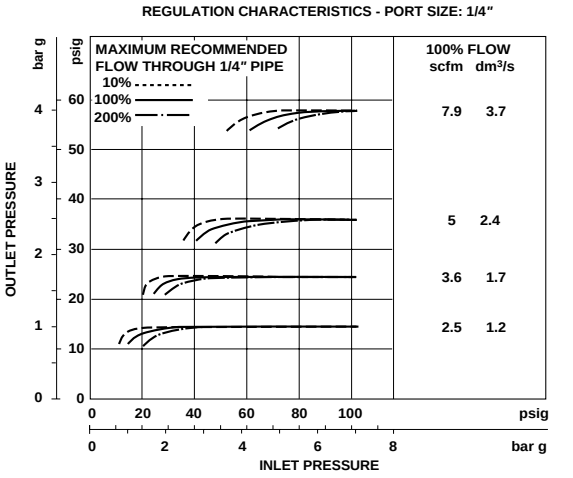



** Minimum clearance required to remove bowl.
Panel mounting hole diameter: 1.65" (42 mm)
Maximum panel thickness: 0.24" (6 mm)

## Typical Performance Characteristics



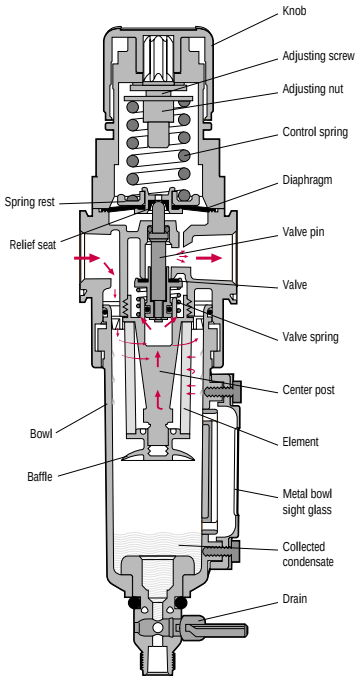




## Service Kits

| Item | Type | Part number |
|---|---|---|
| 30 psig (2 bar) range | Relieving | R38-100R |
| | Non relieving | R38-100NR |
| 60 and 100 psig | Relieving | R38-101R |
| (4 bar and 7 bar) range | Non relieving | R38-101NR |
| 5 micron element | | B38-100A (5) |
| 25 micron element | | B38-100A (25) |

Service kits includes diaphragm assembly, o-ring, valve, valve spring and 8 pan head screws.

GENERAL PURPOSE FILTER/REGULATOR




## 1.1 GENERAL OVERVIEW

Filter/regulators combine the features of a filter and regulator with a single compact body.

Air passes through the filter section first removing water and particle contaminants, and is then regulated by the top regulator section.

See individual filter and regulator sections for details.

## 1.2 PERFORMANCE CHARACTERISTICS

The regulator section of the filter/regulator determines the flow and regulation characteristics of the unit.

Flow is therefore measured in terms of pressure droop from set pressure (see regulators) and not flow versus pressure drop as in a filter.

Regulation characteristics are determined in the same way as regulators.

## 1.3 SPECIALS

1.3.1 Can we do a Coalescing Filter/Regulator?

Yes. We have a B39 unit in the 07 Series. Other sizes could be considered for volume customers.

1.3.2 Can we do special materials?

Units are available in stainless steel (B05 and B38) for harsh environments and process applications.

# Lubricators

## Compressed air tool lubricators are available in modular or inline models in port sizes from 1/8" to 2". Machine bearing lubricators are available in 8 to 32 inch ratings.

Contents



L07

L72M/C

L73M/C

L74M/C

L64M/C

L68

L17

10-028

10-076

10-015

## 1.1 GENERAL OVERVIEW

Norgren manufactures two main types of lubricators: Oil-Fog and Micro-Fog. These units are mounted directly into the pipe and add small amounts of oil to the air flowing through them.

*Oil Fog-Lubricators:*
All the oil droplets seen in the sight feed dome are added directly into the air flow. This results in relatively large oil droplets passing downstream, suitable for heavy lubrication applications eg single cylinders and tools. Most competitive in line lubricators are of the Oil-Fog type.

*Micro-Fog Lubricators:*
The oil droplets seen in the sight feed dome are atomized and collected in the area above the oil in the bowl. The smaller lighter particles are drawn into the air flow and pass downstream.

As a result typically only 10% of the oil seen as drops in the sight feed dome is passed downstream. The remainder falls back into the oil reservoir. Consequently, drip rate settings are somewhat higher than their Oil-Fog equivalent. This makes setting much easier, particularly in low flow applications.

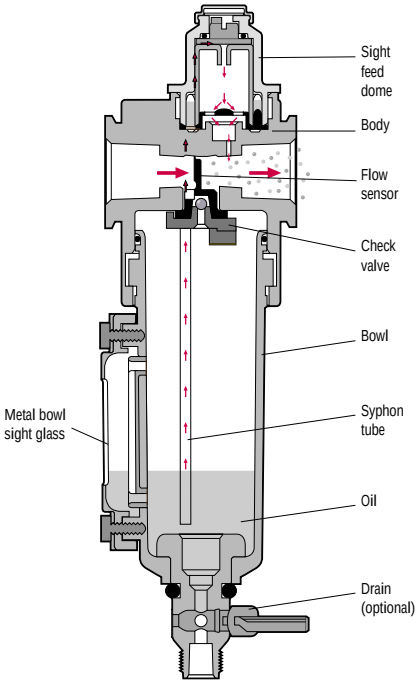
The fine Micro-Fog oil particles can travel long distances through complex pipe work making Micro-Fog lubricators suitable for multiple valve and cylinder circuits.

## 1.2 WHAT ARE THE DIFFERENCES BETWEEN MICRO-FOG AND OIL-FOG?

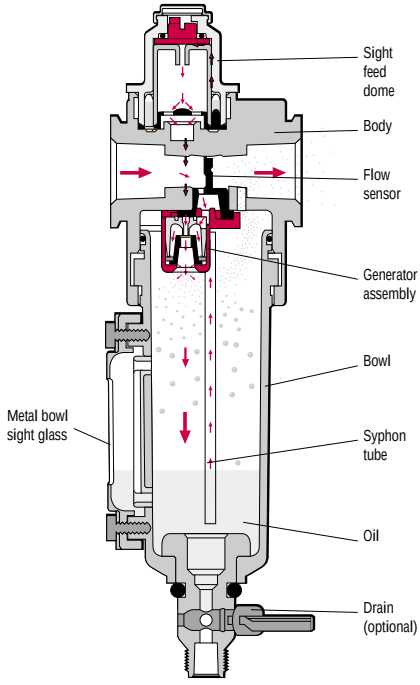
1.2.1 Oil-Fog:

- Large oil particles not as fine as micro-fog.
- All oil drips seen in sight feed domes are delivered downstream.
- For applications over short distances.
- Should be mounted at same level or higher than device being lubricated.
- Standard bowls can be filled under pressure. (Not on rapid cycle units).
- Suitable for heavy lubrication applications eg single large cylinders and tools.
- Has a flow sensor which provides constant oil output density for varying flows.

OIL-FOG LUBRICATOR




MICRO-FOG LUBRICATOR



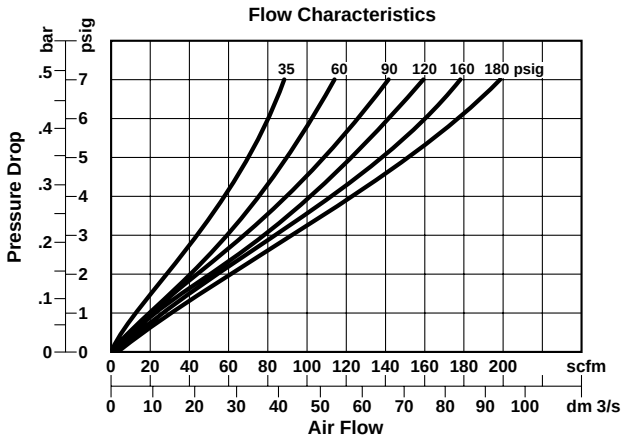

1.2.2 Micro-Fog:

- Small oil particles; less than 2 micron.
- Only 10% of 'drip rate' is delivered downstream as active lubricant (remainder is returned to main oil reservoir).
- High drip rates make drip setting easier in low flow applications.
- Can be mounted above or below the point of application.
- Cannot be filled without shutting off upstream air (unless a quick fill cap or remote fill device is used).
- For use with lengthy air lines, multiple valve and cylinder circuits.
- Has a flow sensor to provide an almost constant oil output density for varying flows.

1.2.3 Can Oil-Fog and Micro-Fog Units be Converted?

Generally not, simply changing a green (Oil-Fog) sight feed dome for a red (Micro-Fog) sight dome does not change the function.

Some lubricators are designed around a cartridge insert. In this case it may be possible to swap the cartridge and sight domes to change the function.




## 1.3 LUBRICATOR SIZING

Lubricators are sized by downstream flow requirements. An analysis of air flow use must be made. After determining how much air flow is needed, a lubricator can be chosen. Manufacturers' curves will be like the one shown. For example, 50 scfm of 90 psig lubricated air is required. Enter the curve on the horizontal axis at the required flow. Read up to intersect the 90 psig line. Read the pressure drop on left, vertical axis as approximately 2.3 psid. Pressure drop should be less than 5 psid. If pressure drop is more than 5 psid, choose a larger lubricator.

Always be sure that the lubricants in your system are compatible with the materials in the lubricator you choose. This is especially important for plastic lubricator reservoirs. If in doubt, check with the factory or use a metal reservoir.

## 1.4 SETTING LUBRICATOR DRIP RATES

1.4.1 What is the Correct Drip Rate Setting?

The drip rate will depend on the application, the amount of lubrication required, the flow through the lubricator and the lubricator type. In Micro-Fog lubricators only 10% of the droplets in the sight dome are carried downstream. The drip rate in Micro-Fog lubricators therefore tends to be much higher.

The following table can be used to estimate drip rate for required flow. This is very much a rule of thumb. In practice it is necessary to fine tune the oil drip rate in each application.

| Typical Drip Rate per Minute Micro-Fog | Typical Drip Rate per Minute Oil-Fog | Approx Flow scfm ($dm^3/s$) |
|---|---|---|
| 20 | 2 | 10 (5) |
| 40 | 4 | 20 (10) |
| 60 | 6 | 30 (15) |
| 80 | 8 | 40 (20) |
| 100 | 10 | 50 (25) |
| 120 | 12 | 60 (30) |

1.3.2 Can the Drip Rate be Shut Off?

In lubricators with needle valve type sight dome, yes.

Some Norgren sight domes use a felt pad which is soaked in oil at the point where the drops are formed. With this type of sight dome the oil droplets cease once the felt pad dries out.

With the new style dome (L72/73/74 and L07) complete shut off is not possible. Minimum adjustment for the drip rate is around 1 drop per minute.

## 1.5 FILLING METHODS

1.5.1 Oil-Fog and Micro-Fog Lubricators:

The standard Oil-Fog lubricators can be filled under pressure ie without switching off the upstream air. When a fill plug is removed a check valve in the lubricator body isolates the inlet pressure from the bowl and the reservoir will depressurize. The lubricator can then be filled with oil. When the fill plug is replaced, the reservoir will re-pressurize.

The standard Micro-Fog unit can only be filled without isolating the upstream pressure if a remote fill or quick fill nipple accessory is fitted. To remove the fill plug of a Micro-Fog lubricator whilse under pressure can be dangerous. If in doubt shut off the upstream air!

1.5.2 Remote Fill Devices:

The remote oil fill system provides a means of filling from a remote fill point, a single lubricator or a bank of lubricators manifolded together. The remote fill point may be connected to a portable reservoir or to a centralized, permanent reservoir. A portable reservoir permits the use of different lubricants in different groups of lubricators to suit the requirements of the machinery being lubricated. The lubrication oil must be fed in at a higher pressure than exists in the bowl.

The devices are NOT intended for connection to an oil feed line which is under constant pressure from a pump or pressurized reservoir. The device cannot reset until the pressure is removed. Such lines are a potential safety hazard if they should leak or become broken.

1.5.3 Quick Fill Nipples:

The quick fill system is an alternative which allows ease of filling a single Micro-Fog or Oil-Fog lubricator without switching off the mains air (on some units the quick fill nipple replaces the filler plug).

To fill the lubricator, a quick fill connector piped to a portable oil reservoir is snapped in place over the quick fill nipple. The main oil reservoir can now be pumped (or pressurized) to a pressure greater than the lubricator bowl and the lubricator filled.

## 1.6 OPTIONS AND ACCESSORIES

1.6.1 Where can Liquid Level Switches be Fitted?

Liquid level detection methods can be attached to the 1 quart bowl and 2 & 5 gallon tanks.

1.6.2 Where can Remote Fill and Liquid Level Switches be Fitted?

The smaller bowls, L73 and up, are all capable of either remote fill or liquid level detection (but not both at the same time!). The 2 quart and 2 & 5 gallon tanks only can have the liquid level switches fitted.

1.6.3 How do Liquid Level Switches Work?

Liquid level switches are bipolar reed switches which change state when the float rises and falls.

Liquid level switches are normally connected to give an electrical signal when the float falls (ie when the liquid level is too low). In critical applications the logic could be reversed. Maximum and minimum settings are possible too.

## 1.7 LARGE TANKS/RESERVOIRS

1.7.1 Which Units have Large Tanks/Reservoirs?

All units in basic 1/2" and above have optional larger bowls/tanks.

Olympian Plus and Excelon 74 are limited to 1 quart as standard. For 2 and 5 gallon capacity use 15/17 Series, or the 10-028/-076 (2") lubricators.

## 1.8 APPLICATION SPECIFIC UNITS

1.8.1 Do we Make Bearing Lubricators?

Yes. These are aerosol type lubricators. These lubricators use air to get the oil to the point of lubrication, however the tool or application is not powered by the air.

1.8.2 What is a Fixed Venturi (Bi-Directional) Lubricator?

Standard Norgren lubricators use a flow sensor to achieve constant oil density with varying flows. In some applications high flow is more important than constant density and a fixed venturi can be used instead of a flow sensor. It may also be useful in systems with rapid cycling. Consult Air Line for more details.

## 1.9 OILS

1.9.1 What Oils are Recommended?

Recommended oils fall into 2 categories:-

1 Oils recommended for use with all Norgren units (valves, cylinders, fittings and FRL's).

2 Oils which can be used with Norgren lubricators but not necessarily with other Norgren equipment.

Refer to ALE-29-2 for recommended lubricants.

## 1.10 SIMPLE LUBRICATOR TROUBLESHOOTING

| Problem | Possible Cause | Remedy |
|---|---|---|
| No Drip Rate | Oil adjustment knob fully clockwise. | Readjust knob. |
| | Low oil level. | Check oil level. |
| | Airflow through lubricator too low. | Use smaller size lubricator. |
| | Plugged siphon tube | Remove bowl and sight feed adjustment dome and clear siphon tube. |
| | Blocked oil filter screen. | Remove sight feed adjustment dome and clean or replace screen located in dome assembly. |
| | Air leaks. | Check bowl, filler plug and sight dome seals. Tighten if necessary. |
| Oil Foaming | Over aeration. | Check bowl seals for slight leaks. |
| Oil Emulsified | Water in lubricator. | Fit filter immediately upstream. |
| Drip Rate changes after setting | Fade. Changes in flow rate, temperature affecting oil viscosity | Readjust drip rate. |

## OIL FOG LUBRICATORS ONLY

| Problem | Possible Cause | Remedy |
|---|---|---|
| Reservoir will not pressurize (causes no drip rate) | Reservoir charge check valve has plugged orifice. | Remove check valve and clean orifice. Make certain all passageways are open. |
| | Cycle rate too great to permit pressurization of reservoir. | Remove bowl charge check valve. |
| | Reservoir, bowl adjustment dome or fill plug seal leaking. | Check seals, replace if necessary. |
| Flooding of oil in sight-feed glass or dome | Rapid reduction of applied pressure | This can occur in lubricators containing bowl pressurization (charge) check valves. Can be prevented by slowly reducing applied pressure or removing charge check valve. |
| Unable to reduce drip rate, 10-076 only. | Action of throttling disc and pressure plate may be impaired | Replace parts using standard repair kit. |
| | Plugged orifices and throttling disc | Disassemble needle valve assembly and remove throttling disc, drip gland and venturi tube. Clean parts, making certain all passageways are clear. |
| | Plugged oil filter screen. | 10-076 Remove Bowl. Screen is located on end of siphon tube. |

* Caution: Before working on lubricators, make sure all pressure has been reduced to zero.

# Miniature Series 07 Micro-Fog Lubricator 1/8″ and 1/4″ Port Sizes

- **Compact design**
- **Provides air line lubrication to one or more air driven tools or other devices**
- **Nearly constant oil density output with varying air flow**
- **All around (360°) visibility of the sight-feed dome simplifies installation and adjustment**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering Information.** Models listed include PTF threads and transparent bowl with manual drain.

| Port Size | Model Numbers | Flow scfm ($dm^3/s$)* | Weight lbs (kg) |
|---|---|---|---|
| 1/8" | L07-100-MPAA | 10 (5.0 $dm^3/s$) | 0.28 (0.13) |
| 1/4" | L07-200-MPAA | 14 (6.7 $dm^3/s$) | 0.28 (0.13) |

* Approximate flow at 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop.

## Alternative Models

L 0 7 - ★ ★ ★ - M P ★ ★

| Port Size | Substitute |
|---|---|
| 1/8″ | 1 |
| 1/4″ | 2 |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

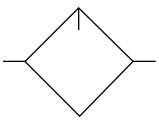
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Bowl and Drain | Substitute |
|---|---|
| Transparent without drain | Q |
| Metal with drain | M |
| Transparent with drain | A |

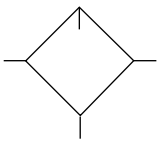
| Flow | Substitute |
|---|---|
| Unidirection | P |

| Lubricator Type | Substitute |
|---|---|
| Micro-Fog | M |

## ISO Symbols



No drain



Manual drain

**See Section ALE-24 for Accessories**

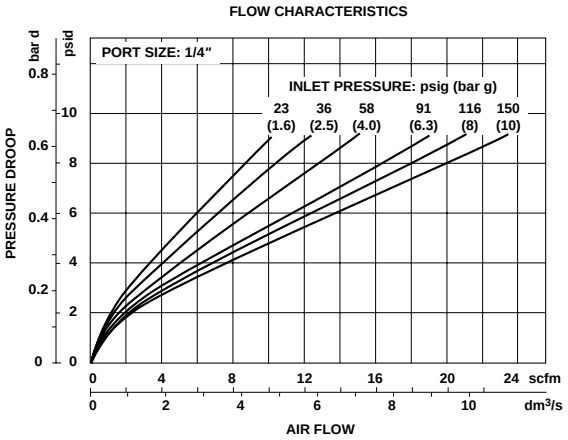
## Technical Data

Fluid: Compressed air
Maximum pressure
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Start point (i.e. minimum flow required for lubricator operation): 0.5 scfm (0.24 $dm^3/s$) at 90 psig (6.3 bar) inlet pressure
Typical flow at 90 psig (6.3 bar) inlet pressure at 7 psig (0.5 bar) pressure drop:
1/8" ports: 10 scfm (5 $dm^3/s$)
1/4" ports: 14 scfm (6.7 $dm^3/s$)
Nominal bowl size: 1 fluid ounce (31 ml)
Drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Recommended lubricants: See Section ALE-29.
Materials
Body: Zinc
Bowl
Transparent: Polycarbonate
Metal: Zinc
Sight-feed dome: Transparent nylon
Elastomers: Neoprene & nitrile

## Typical Performance Characteristics



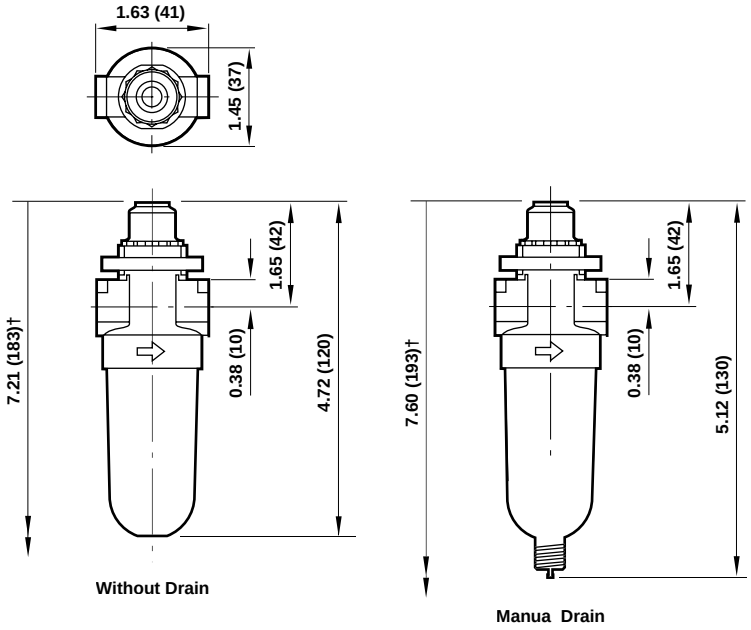

## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Seal and o-ring | 3795-03 |
| Replacement drain | Manual | 773-03 |

Service kit includes o-ring, seal, and bowl o-ring.

All Dimensions in Inches (mm)

Panel mounting hole diameter: 1.9" (30 mm)
Maximum panel thickness: 0.25" (6 mm)




† Minimum clearance to remove bowl.

# L72M, L72C

## Excelon 72 Micro-Fog and Oil-Fog Lubricator 1/4″, 3/8″ Port Sizes

- **Excelon design allows in-line or modular installation**
- **Quick release bayonet bowl**
- **Flow sensor provides a consistent oil/air ratio over a wide range of flows**
- **Highly visible, prismatic liquid level indicator lens on metal bowls**
- **All round (360°) visibility of sight-feed dome for ease of drip rate setting**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

Use Micro-Fog models in applications with one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder or other air driven device.

**Ordering Information.** Models listed include PTF threads, manual drain, and transparent bowl without guard.

| Type | Main Port Size | Model Number | Flow* scfm (dm³/s) | Weight lb (kg)† |
|---|---|---|---|---|
| Micro-Fog | 1/4" | L72M-2AP-QLN | 51 (24) | 1.1 (0.49) |
| | 3/8" | L72M-3AP-QLN | 51 (24) | 1.1 (0.49) |
| Oil-Fog | 1/4" | L72C-2AP-QLN | 51 (24) | 1.1 (0.49) |
| | 3/8" | L72C-3AP-QLN | 51 (24) | 1.1 (0.49) |

* Typical flow with 90 psig (6.3 bar) inlet pressure and a pressure drop of 7 psig (0.5 bar).

### Alternative Models

L 7 2 ★ - ★ ★ P - ★ ★ ★

| Type | Substitute |
|---|---|
| Oil-Fog | C |
| Micro-Fog | M |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Options | Substitute |
|---|---|
| None | N |
| Pyrex dome | P† |

| Bowl | Substitute |
|---|---|
| Metal with plastic liquid level indicator | E |
| Metal with Pyrex liquid level indicator | U |
| Transparent without guard | L |
| Transparent with guard | W |

| Drain | Substitute |
|---|---|
| Closed bottom bowl | E |
| 1/4 turn manual | Q |

† For use with metal bowl with Pyrex sight glass

**See Section ALE-24 for Accessories**

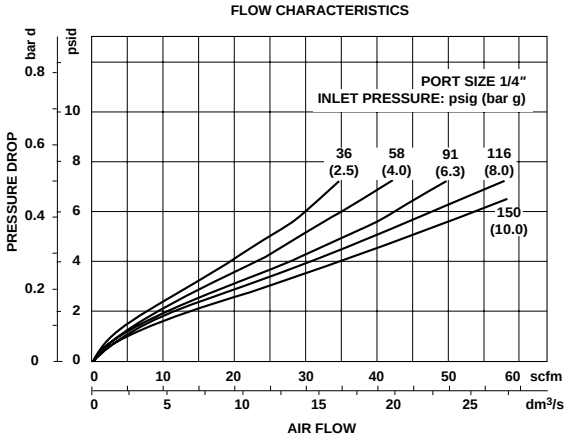
## Technical Data

Fluid: Compressed air
Maximum pressure:
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*:
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Start point (i.e. minimum flow required for lubricator operation) at 90 psig (6.3 bar) inlet pressure:
Micro-Fog: 2.0 scfm (0.94 $dm^3/s$)
Oil-Fog: 1.0 scfm (0.47 $dm^3/s$)
Typical flow at 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop: 51 scfm (24 $dm^3/s$)
Nominal reservoir capacity:
Bowl: 2.2 fluid ounce (65 ml)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Recommended lubricants: See Section ALE-29.
Materials:
Body: Zinc
Reservoir:
Transparent: Polycarbonate
Guard for transparent reservoir: Zinc
Metal: Zinc
Metal reservoir liquid level indicator lens:
Transparent nylon
Sight-feed dome: Transparent nylon
Elastomers: Neoprene, nitrile, and Geolast®

## Typical Performance Characteristics

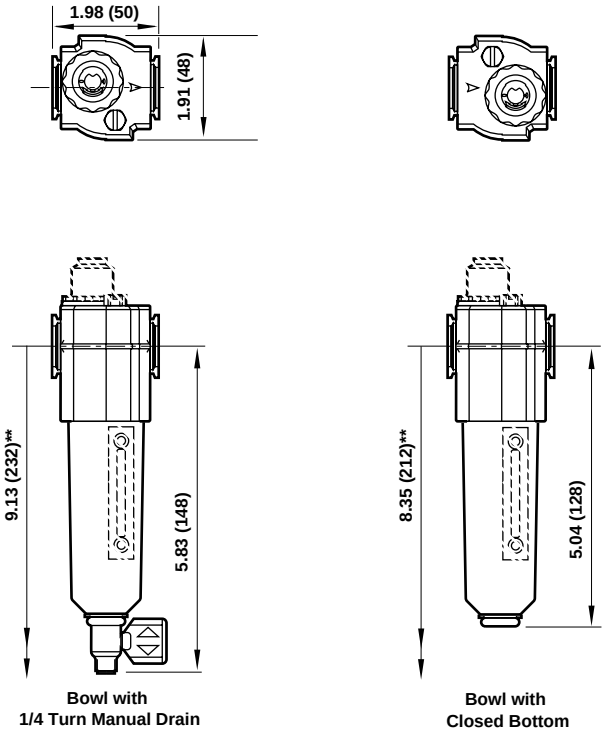



## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal and gasket | 4382-500 |
| Liquid level lens kit | Prismatic | 4380-030 |
| Replacement drain | 1/4 turn manual | 619-50 |

Service kit includes plug o-ring, sight-feed dome seal, manual drain o-ring and bowl o-ring.

All Dimensions in Inches (mm)




**Bowl with 1/4 Turn Manual Drain**

**Bowl with Closed Bottom**

** Minimum clearance required to remove bowl.

† Optional pyrex sight-feed dome.

# L73M, L73C

## Excelon 73 Micro-Fog and Oil-Fog Lubricators 1/4″, 3/8″, 1/2″ Port Sizes

- **Excelon design allows in-line or modular installation**
- **Quick release bayonet bowl**
- **Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows**
- **Highly visible, prismatic liquid level indicator lens**
- **All around (360°) visibility of the sight-feed dome simplifies installation and adjustment**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.


**Ordering Information.** Models listed include PTF threads, manual drain, and metal bowl with plastic liquid level indicator.

| Type | Main Port Size | Model Number | Flow* scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|---|
| Micro-Fog | 1/4" | L73M-2AP-QDN | 60 (28) | 1.1 (0.50) |
| | 3/8" | L73M-3AP-QDN | 60 (28) | 1.1 (0.50) |
| | 1/2" | L73M-4AP-QDN | 60 (28) | 1.1 (0.50) |
| Oil-Fog | 1/4" | L73C-2AP-QDN | 60 (28) | 1.1 (0.50) |
| | 3/8" | L73C-3AP-QDN | 60 (28) | 1.1 (0.50) |
| | 1/2" | L73C-4AP-QDN | 60 (28) | 1.1 (0.50) |

* Maximum recommended air flow. Higher flows create excessive air velocity, turbulence, and pressure losses.

### Alternative Models

L 7 3 ★ - ★ ★ ★ - ★ ★ ★

| Type | Substitute |
|---|---|
| Oil-Fog | C |
| Micro-Fog | M |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Air Flow Direction | Substitute |
|---|---|
| Uni-directional | P |

| Options | Substitute |
|---|---|
| None | N |
| Pyrex sight-feed dome † | P |
| Quick fill nipple | Q |

| Bowl | Substitute |
|---|---|
| Metal with plastic liquid level indicator | D |
| Transparent with guard | P |
| Metal with Pyrex liquid level indicator† | R |
| Transparent | T |

| Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual 1/4 turn | Q |

† Order optional Pyrex sight-feed dome when ordering metal bowl with Pyrex liquid level indicator.

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*
- Transparent bowl: 0° to 125°F ( -20° to 50°C)
- Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Start point (minimum flow required for lubricator operation): 1.5 scfm (0.71 $dm^3/s$) at 90 psig (6.3 bar) inlet pressure

Typical flow with 90 psig (6.3 bar) inlet pressure and 3.5 psig (0.25 bar) pressure drop: 80 scfm (38 $dm^3/s$)

Maximum recommended flow: 60 scfm (28 $dm^3/s$). Air flows above 60 scfm (28 $dm^3/s$) create excessive air velocity, turbulence, and pressure losses. In addition, the fog produced by the lubricator will wet out on the pipe walls and will not be carried by the compressed air to the point of application.

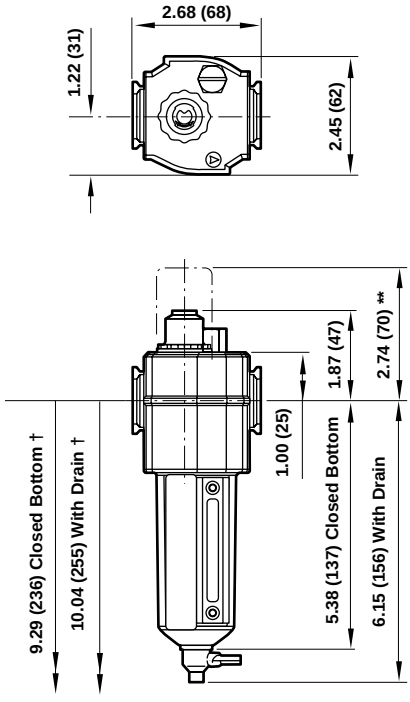
Nominal bowl size: 3.5 fluid ounce (0.1 liter)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

Recommended lubricants: See Section ALE-29.

Materials
- Body: Aluminum
- Bowl
  - Transparent: Polycarbonate
  - Transparent with guard: Polycarbonate, steel guard
  - Metal: Aluminum
  - Metal bowl liquid level indicator lens: Transparent nylon
- Sight-Feed dome: Transparent nylon
- Elastomers: Neoprene and nitrile

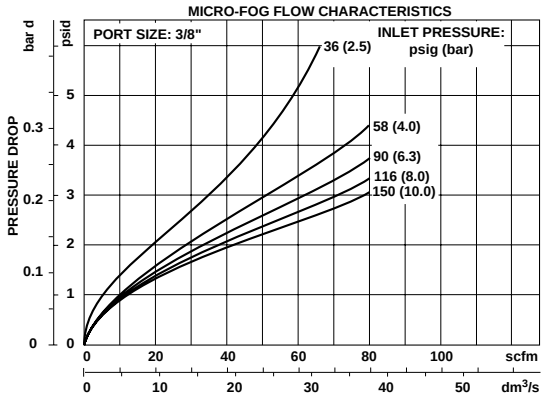
All Dimensions in Inches (mm)

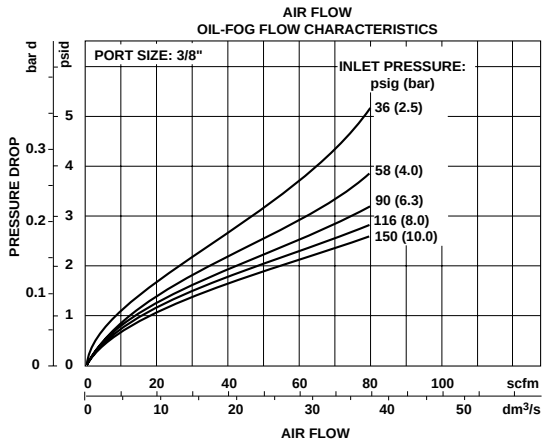



** Optional pyrex sight-feed dome.

† Minimum clearance to remove bowl.

## Typical Performance Characteristics




## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & Gasket | 4382-600 |
| Liquid level lens kit | Prismatic | 4380-020 |
| Replacement drain | Manual 1/4 turn | 619-50 |

Service kit includes dome seal, drain seal, bowl seal and fill plug seal.

# L74M, L74C

## Excelon 74 Micro-Fog and Oil-Fog Lubricators 3/8″, 1/2″, 3/4″ Port Sizes

- **Excelon design allows in-line or modular installation**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows**
- **All around (360°) visibility of the sight-feed dome simplifies installation and adjustment**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**


Use Micro-Fog models in applications with one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.

**Ordering Information.** Models listed include PTF threads, manual drain, and 7 fluid ounce (0.2 liter) metal bowl with plastic liquid level indicator.

| Type | Main Port Size | Model Number * | Flow** scfm ($dm^3/s$) | Weight lb (kg)† |
|---|---|---|---|---|
| Micro-Fog | 3/8" | L74M-3AP-QDN | 114 (54) | 1.70 (0.77) |
| | 1/2" | L74M-4AP-QDN | 154 (73) | 1.61 (0.73) |
| | 3/4" | L74M-6AP-QDN | 142 (67) | 1.55 (0.71) |
| Oil-Fog | 3/8" | L74C-3AP-QDN | 118 (56) | 1.70 (0.77) |
| | 1/2" | L74C-4AP-QDN | 192 (91) | 1.61 (0.73) |
| | 3/4" | L74C-6AP-QDN | 186 (88) | 1.55 (0.71) |

* Models listed in the order table must not be located downstream of frequently cycling directional control valves. Order the optional bi-directional Oil-Fog Lubricator for use under such conditions.
** Typical flow with 90 psig (6.3 bar) inlet pressure and a pressure drop of 7 psig (0.5 bar).
† Lubricators with 1 quart (1 litre) metal bowl: Add 2.01 lbs (0.91 kg).

### Alternative Models

L | 7 | 4 | ★ | - | ★ | ★ | ★ | - | ★ | ★ | ★

| Type | Substitute |
|---|---|
| Oil-Fog | C |
| Micro-Fog | M |

| Port Size | Substitute |
|---|---|
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Air Flow Direction | Substitute |
|---|---|
| Bi-directional (Oil-Fog only) | E |
| Uni-directional | P |

| Options | Substitute |
|---|---|
| Low oil level switch *** | L |
| None | N |
| Pyrex dome *† | P |
| Quick fill nipple | Q |

| Bowl | Substitute |
|---|---|
| 1 quart US (1 liter) metal with Pyrex liquid level indicator †† | A |
| 7 fluid oz. (0.2 liter) metal with plastic liquid level indicator | D |
| 7 fluid oz. (0.2 liter) transparent with guard | P |
| 7 fluid oz. (0.2 liter) metal with Pyrex liquid level indicator†† | R |

| Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual 1/4 turn | Q |
| Remote fill device - Use only with 7 fluid oz. (0.2 liter) bowl. | R |

*** Low oil level switch requires 1 litre bowl, type **'A'** at 9th digit.
*† Pyrex dome used only with bowl type **'A' or 'R' at** 9th digit.
†† Pyrex liquid level indicator used only with option '**P**' at 10th digit.

## Technical Data

Fluid: Compressed air
Maximum pressure:
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*:
- Transparent bowl: 0° to 125°F (-20° to 50°C)
- Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

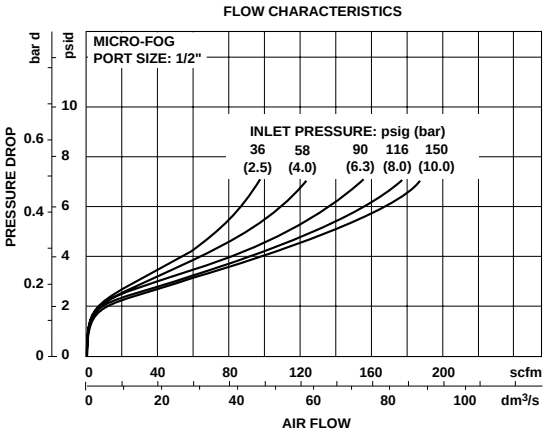
Start point (i.e. minimum flow required for lubricator operation): 2.5 scfm (0.94 $dm^3/s$) at 90 psig (6.3 bar) inlet pressure

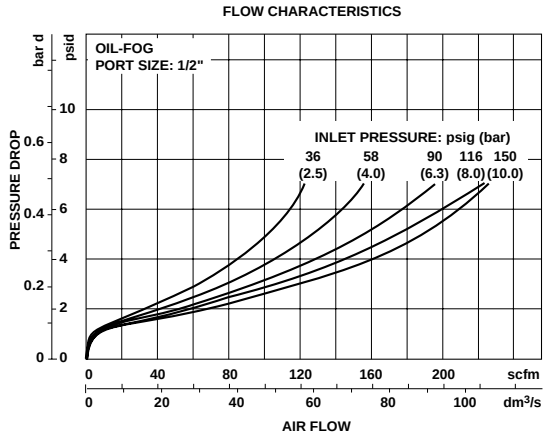
Typical flow with 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop
- Micro-fog: 154 scfm (73 $dm^3/s$)
- Oil-fog: 192 scfm (91 $dm^3/s$)

Nominal bowl size:
- Standard: 7 fluid ounce (0.2 liter)
- Optional: 1 quart US (1 liter)

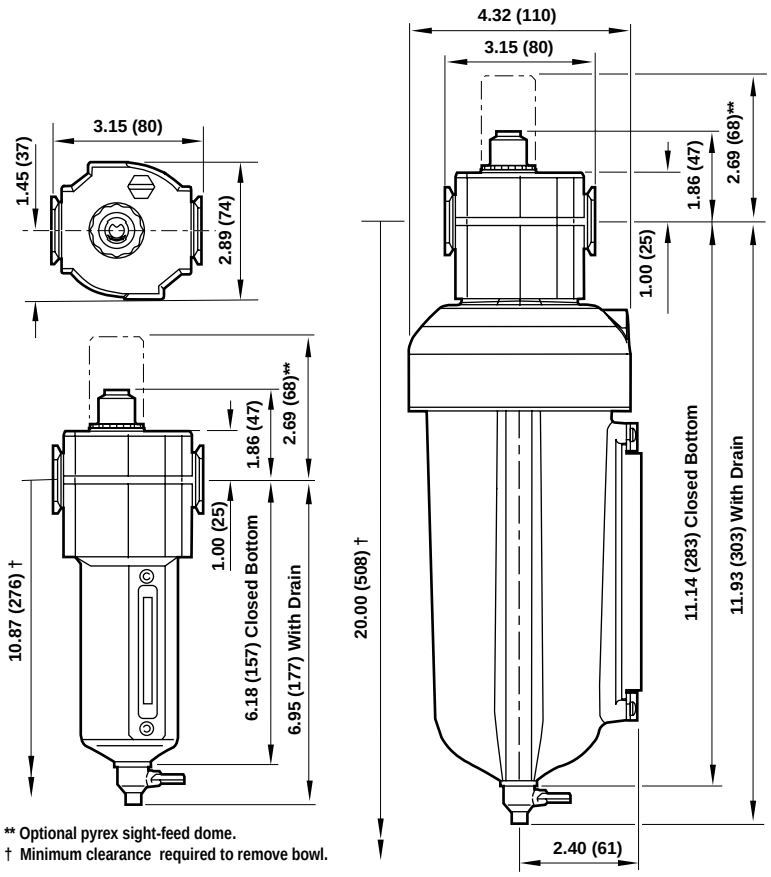
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Recommended lubricants: See Section ALE-29.
Materials
- Body: Aluminum
- Bowl
  - Transparent: Polycarbonate with steel bowl guard
  - Metal: Aluminum
- Metal bowl liquid level indicator lens:
  - 7 fluid ounce (0.2 liter): Transparent nylon
  - 1 quart US (1 liter): Pyrex
- Sight-feed dome: Transparent nylon
- Elastomers: Neoprene and Nitrile

## Typical Performance Characteristics




All Dimensions in Inches (mm)



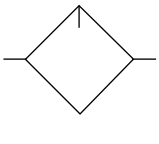

** Optional pyrex sight-feed dome.
† Minimum clearance required to remove bowl.

## Service Kits

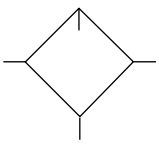
| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & Gasket | 4382-700 |
| Liquid level lens kit | 7 fluid ounce (0.2 liter) bowl | 4380-050 |
| | 1 quart US (1 liter) bowl | 2273-22 |
| Replacement drain | Manual 1/4 turn | 619-50 |

Service kit includes dome seal, drain seal, bowl seal and fill plug seal

## ISO Symbols



No Drain



With Drain

**See Section ALE-24 for Accessories**

# L64M, L64C

## Olympian Plus Micro-Fog and Oil-Fog Lubricators 1/4″, 3/8″, 1/2″, 3/4″ Port Sizes

- **Olympian Plus plug in design**
- **Constant oil density output with varying flow**
- **Easy fill with quick release bayonet bowl**
- **High visibility prismatic sight glass**


Use Micro-Fog models in applications with one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder or other air driven device.

**Ordering Information.** Models listed include PTF threads and 7 fluid ounce (0.2 liter) metal reservoir with drain.

| Type | Port Size | Model | Weight lb ( kg) |
|---|---|---|---|
| Micro-Fog | 1/4" | L64M-2AP-QDN | 3.13 (1.42) |
| | 3/8" | L64M-3AP-QDN | 3.09 (1.40) |
| | 1/2" | L64M-4AP-QDN | 3.02 (1.37) |
| | 3/4" | L64M-6AP-QDN | 3.81 (1.73) |

**Alternative Models**

L 6 4 ★ - ★ ★ P - ★ ★ ★

| Type | Substitute |
|---|---|
| Oil-Fog | C |
| Micro-Fog | M |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |
| No yoke | N |

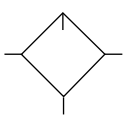
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |
| No yoke | N |

| Options | Substitute |
|---|---|
| None | N |
| Quick fill device | Q |

| Bowl | Substitute |
|---|---|
| 7 oz.Metal with liquid level indicator | D |
| 7 oz. Transparent with guard | P |
| 1 qt. metal with pyrex liquid level indicator | A |

| Drain | Substitute |
|---|---|
| Closed bottom bowl | E |
| Manual 1/4 turn | Q |
| Remote fill device<br>Use only with 7 oz. (0.2 liter) bowl. | R |

**ISO Symbol**



**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure:
- Guarded transparent bowl: 150 psig (10 bar)
- Metal bowll: 250 psig (17 bar)

Operating temperature*
- Guarded transparent bowl: 0° to 125°F (-20° to 50°C)
- Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

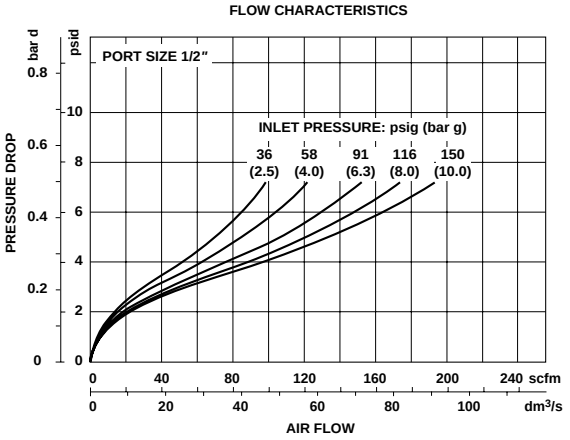
Start point (i.e. minimum flow required for lubricator operation) at 90 psig (6.3 bar) inlet pressure
- Micro-Fog: 3.2 scfm (1.5 $dm^3/s$)
- Oil-Fog: 3.2 scfm (1.5 $dm^3/s$)

Typical flow at 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop: 153 scfm (72 $dm^3/s$)

Nominal bowl capacity
- Transparent bowl without guard: 7 fluid ounce (0.2 liter)
- Metal bowl: 7 fluid ounce (0.2 liter) standard, 1 quart US (1 liter) optional

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Recommended lubricants: See Section ALE-29.
Materials
- Body: Zinc
- Yoke: Zinc
- Metal bowl: Aluminium
- Standard metal bowl prismatic liquid level indicator lens: Grilamid
- Optional metal bowl sight glass [standard on 1 quart (1 liter bowl)]: Pyrex
- Optional transparent bowl: Polycarbonate
  - Sight-feed dome: Polycarbonate
- Elastomeric materials: Synthetic rubber

## Typical Performance Characteristics

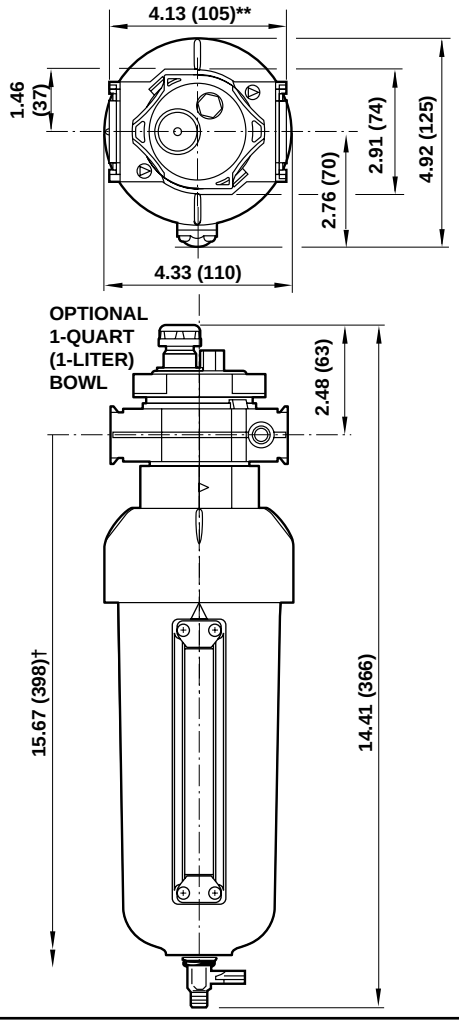



## Service Kits

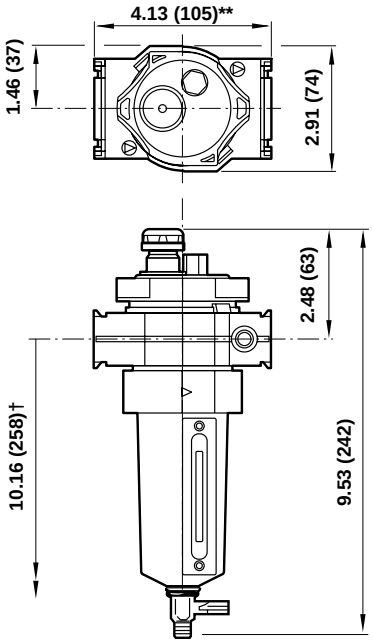
| Item | Type | Part Number |
|---|---|---|
| Service kit | All models | 4382-200 |
| Replacement sight glass 7 fluid oz. (0.2 liter bowl) | Prismatic (standard) | 4380-042 |
| | Pyrex (optional) | 4380-041 |
| Replacement sight glass 1 quart US (1 liter) | Pyrex | 2273-22 |

Service kit includes all seals, flow sensor, eyelet, dome screen, ball and spring.

**Optional 1 quart US (1 liter) bowl**




**Standard 7 fluid ounce (0.2 liter) bowl**




****6.18" (157) for models with 3/4" ports.**
**† Minimum clearance required to remove unit.**

# L68M, L68C

**Olympian Micro-Fog and Oil-Fog Lubricator**
**3/4″, 1, 1-1/4″, 1-1/2″ Port Sizes**

- **Olympian plug-in design**
- **Built in flow sensor gives almost consistant oil/air ratio over a wide range of flows**
- **1 pint and 1 quart US (0.5 and 1 liter) models can be filled under pressure**
- **Simple and accurate drip rate adjustment, snap action lock**
- **Ideal for general lubrication applications**

Use Micro-Fog models in applications with one or more points of lubrication.

Use Oil-Fog models to lubricate a single tool, cylinder or other air driven device.

Use Fixed Venturi for high flow general purpose applications.

**Ordering Information.** Models listed include yoke with PTF threads, 1/4 turn manal drain, and 1 quart bowl with sight glass.

| Type | Main Port Size | Model Number | Flow* scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|---|
| Micro-Fog | 3/4 | L68M-6AP-QUN | 424 (200) | 4.63 (2.10) |
| | 1 | L68M-8AP-QUN | 424 (200) | 4.49 (2.04) |
| | 1-1/4 | L68M-AAP-QUN | 424 (200) | 4.59 (2.08) |
| | 1-1/2 | L68M-BAP-QUN | 424 (200) | 4.67 (2.12) |
| Oil-Fog | 3/4 | L68C-6AP-QUN | 396 (187) | 4.63 (2.10) |
| | 1 | L68C-8AP-QUN | 396 (187) | 4.49 (2.04) |
| | 1-1/4 | L68C-AAP-QUN | 396 (187) | 4.59 (2.08) |
| | 1-1/2 | L68C-BAP-QUN | 396 (187) | 4.67 (2.12) |

* Typical flow with 90 psig (6.3 bar) inlet pressure and a pressure drop of 7 psig (0.5 bar).

## Alternative Models

L 6 8 ★ - ★ ★ ★ - ★ ★ ★

| Type | Substitute |
|---|---|
| Oil-Fog | C |
| Micro-Fog | M |

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |
| None | N |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |
| None | N |

| Type | Substitute |
|---|---|
| Uni directional | P |
| Fixed venturi (Oil-Fog) | E |

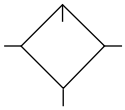
* Remote fill only available with 1 pint and 1 quart US (1/2 and 1 liter bowls)

| Options | Substitute |
|---|---|
| None | N |
| Quick fill device | Q |

| Bowl | Substitute |
|---|---|
| 1 quart US (1 liter), without sight glass | C* |
| 2 gallons US (8 liter) | X |
| 5 gallons US (20 liter) | Y |
| 1 pint US (0.5 liter), without sight glass | M* |
| 1 pint US (0.5 liter) with sight glass | R* |
| 1 quart US (1 liter) with sight glass | U* |

| Drain | Substitute |
|---|---|
| Closed bottom bowl | E |
| Manual | M |
| No drain | N |
| Manual, 1/4 turn | Q |
| Remote fill | R* |

**ISO Symbol**



**See Section ALE-24 for Accessories**

All Dimensions in Inches (mm)

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to +175°F (-20° to +80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).

Start point (i.e. minimum flow required for lubricator operation) at 90 psig (6.3 bar) inlet pressure:
- Micro-Fog: 13 scfm (6 $dm^3/s$)
- Oil-Fog: 13 scfm (6 $dm^3/s$)
- Fixed venturi: 110 scfm (52 $dm^3/s$)

Typical flow at 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop:
- Micro-Fog: 424 scfm (200 $dm^3/s$)
- Oil-Fog: 396 scfm (187 $dm^3/s$)
- Fixed venturi: 848 scfm (400 $dm^3/s$)

Nominal bowl sizes:
- 1 pint US (0.5 liter)
- 1 quart US (1 liter)
- 2 gallons US (8 liter)
- 5 gallons US (20 liter)

Recommended lubricants: See page ALE-29-2

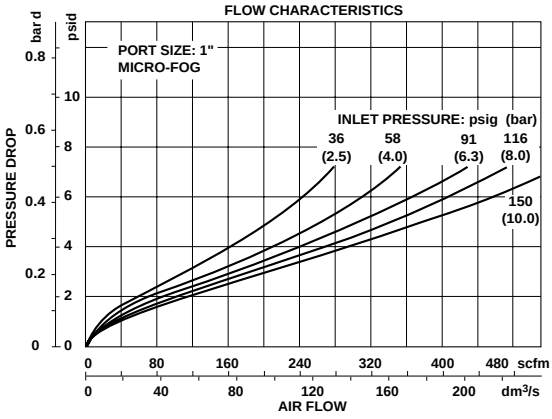
Materials:
- Body: Aluminum
- Yoke: Aluminum
- Bowl, 1 pint US (0.5 liter) and 1 quart US (1 liter): Aluminum
- Bowl sight glass: Pyrex
- Reservoirs, 2 gallons US (8 liter) and 5 gallons US (20 liter): Steel
- Reservoir sight tube: Polythene
- Elastomers: Synthetic rubber

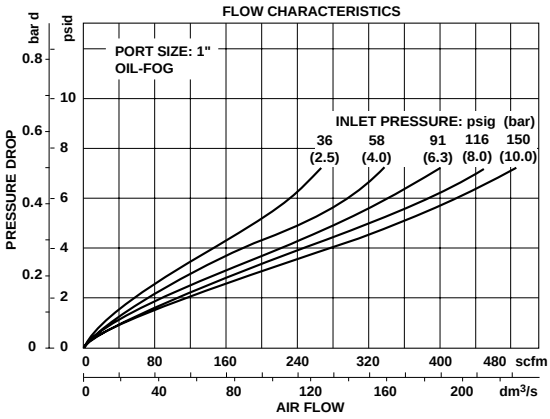
## Service Kits

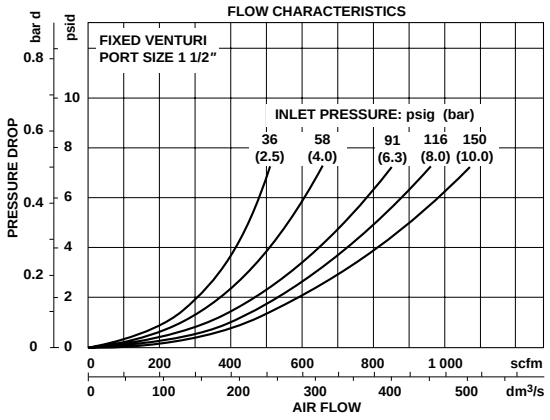
| Item | Type | Part Number |
|---|---|---|
| Service kit | Micro-Fog | 4382-301 |
| | Oil-Fog | 4382-300 |
| | Fixed venturi | 4382-302 |
| Replacement sight glass | 1 pint US (0.5 liter) | 4380-060 |
| | 1 quart US (1 liter) | 4380-061 |
| | 2 & 5 gal (8 & 20 liter) | 2274-01 |
| Replacement drain | Manual | 684-84 |
| | Manual, 1/4 turn | 619-50 |

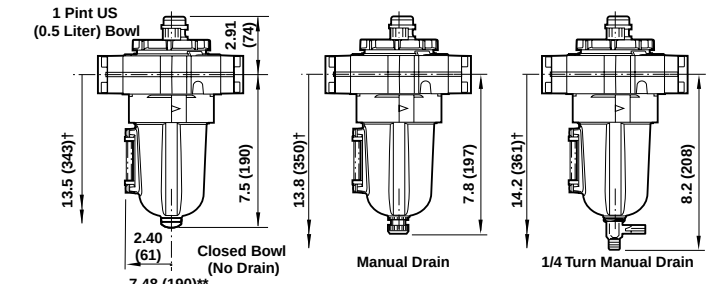
Service kit includes sight dome, screen, filler plug, seals and o-rings.
Oil fog service kit also contains check valve spring.

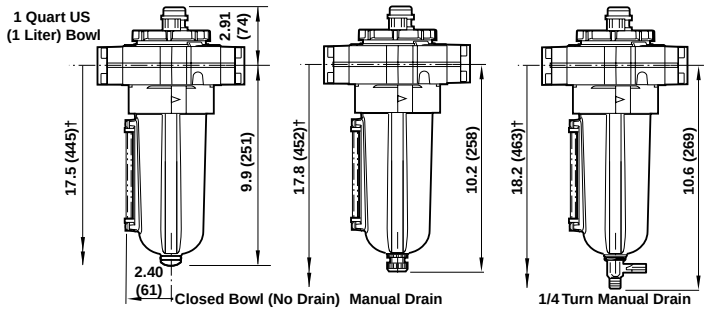
## Typical Performance Characteristics



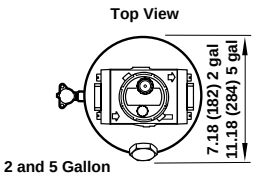



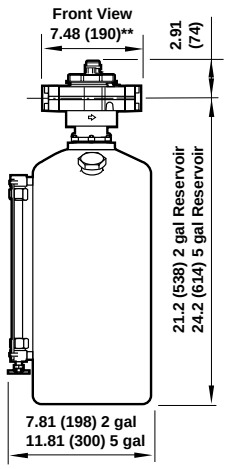




** Add 0.39" (10 mm) for 1-1/4" and 1-1/2"models. † Minimum clearance required to remove bowl.



## 17 Series Micro-Fog and Oil-Fog Lubricators
## 3/4″, 1″, 1-1/4″ and 1-1/2″ Port Sizes

- **All around (360°) visibility of the sight-feed dome simplifies installation and adjustment**
- **Screw-on bowl reduces maintenance time**
- **Can be serviced without the use of tools or removal from the air line**
- **Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows**

Use Micro-Fog models in applications containing one or more points of lubrication

Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device

**Ordering Information.** Models listed are uni-directional and include a 1 quart US (1 liter) metal bowl with drain, sight glass, and PTF threads.

| Port Size†† | Micro-Fog Models* | Oil-Fog Models* | Flow† scfm ( dm3/s) | Weight lbs ( kg) |
|---|---|---|---|---|
| 3/4" | L17-600-MPDA | L17-600-OPDA | 160 (76) | 3.73 (1.69) |
| 1" | L17-800-MPDA | L17-800-OPDA | 275 (130) | 3.56 (1.62) |
| 1-1/4" | L17-A00-MPDA | L17-A00-OPDA | 275 (130) | 4.65 (2.11) |
| 1-1/2" | L17-B00-MPDA | L17-B00-OPDA | 275 (130) | 3.67 (1.67) |

* Models listed in the order table must not be located downstream of frequently cycling directional control valves. Order the optional bi-directional Oil-Fog Lubricator for use under such conditions.

† Typical flow with 90 psig (6.3 bar) inlet pressure and a pressure drop of 5 psig (0.35 bar).

†† Smaller port sizes available upon request.

### Alternative Models

L 1 7 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |

| Option | Substitute |
|---|---|
| Not applicable | 00 |

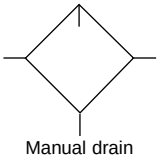
| Lubricator Type | Substitute |
|---|---|
| Micro-Fog | M |
| Oil-Fog | O |

| Flow | Substitute |
|---|---|
| Bi-directional (Oil-Fog only) | E |
| Uni-directional | P |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| BSPP (1-1/2″ ported units) | C |
| ISO G parallel (not available with 1-1/2″ ported units) | G |

| Reservoir | Substitute |
|---|---|
| 1 quart US (1 liter) metal, drain, sight glass | D |
| 1 quart US (1 liter) metal, remote fill, sight glass | 4 |
| 2 quart US (2 liter) metal, drain, sight glass | H |
| 2 gallon US (8 liter) metal, drain, sight glass | J |
| 5 gallon US (20 liter) metal, drain, sight glass | K |

### ISO Symbol

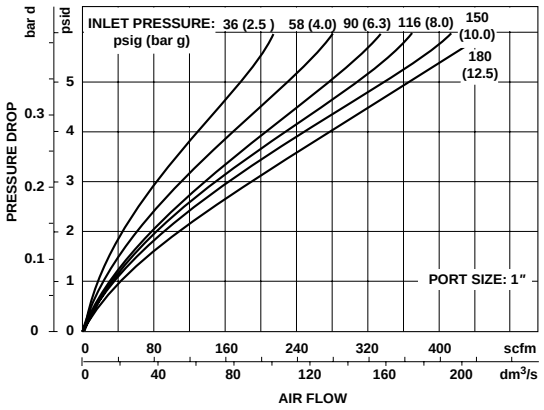



**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Start point (minimum flow required for lubricator operation): 8 scfm (3.8 $dm^3/s$) at 90 psig (6.3 bar) inlet pressure
Typical flow with 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop:
1" ports: 275 scfm (130 $dm^3/s$)
Nominal reservoir size
Standard: 1 quart US (1 liter)
Optional: 2 quart US (2 liter)
2 gallon US (8 liter)
5 gallon US (20 liter)
Manual drain connection on 1 quart reservoir: Will fit 1/8-27 and 1/8-28 pipe thread
Recommended lubricants: See Section ALE-29.
Materials
Body: Aluminum
Reservoir:
1 quart US (1 liter): Aluminum
2 quart US (2 liter) and larger: Steel**
Reservoir sight glass: Pyrex
Sight-feed dome
Standard: Transparent nylon
Optional: Pyrex and aluminum
Elastomers: Neoprene and nitrile
** The 2 and 5 gallon (8 and 20 liter) steel reservoirs are ASME rated according to the ASME Pressure Vessel Code, Section VIII

## Typical Performance Characteristics




## Service Kits

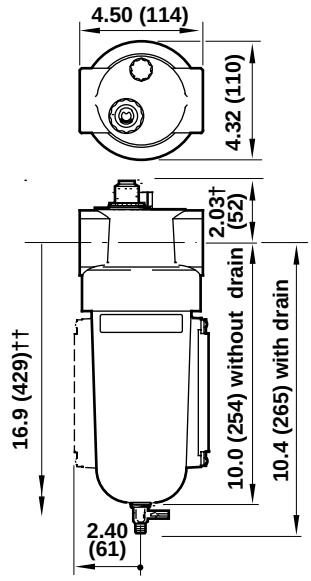
| Item | Type | Part Number |
|---|---|---|
| Service kit | Oil-Fog and Micro-Fog | 5771-02 |
| Reservoir sight glass kit | 1 quart US (1 liter) | 2273-22 |
| | 2 quart US (2 liter) | 2273-04 |
| | 2/5 gallon US (8/20 liter) | 2274-01 |
| Replacement drain | 1/4 Turn | 619-50 |

Service kit 5771-02 includes o-rings, seals and gaskets.

Reservoir sight glass kits, include all o-rings, seals, glass, guard, and sight glass hardware.

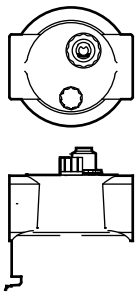
All Dimensions in Inches (mm)

**L17 Micro-Fog**

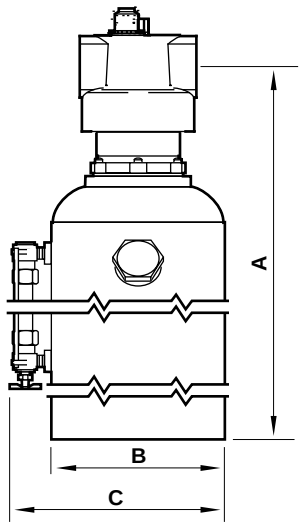



**1 quart US (1 liter) reservoir**
**1/4 turn drain**

**L17 Oil-Fog**



**Micro-Fog shown, Typical of Oil Fog**




**2 quart US (2 liter) reservoir**
**2 gallon US (8 liter) reservoir**
**5 gallon US (20 liter) reservoir**

| Reservoir | A | B ∅ | C |
|---|---|---|---|
| 2 quart US (2 liter) | 13.1 ( 333) | 4.63 (118) | 5.38 (137) |
| 2 gallon US (8 liter) | 21.2 (538) | 6.25 (159) | 7.44 (189) |
| 5 gallon US (20 liter) | 24.2 (614) | 10.3 (260) | 11.4 (291) |

† Standard dome: 2.03″ (52 mm)
Pyrex dome: 2.72″ (69 mm)

†† Minimum clearance required to remove bowl.

# 10-028

**Oil-Fog Lubricator**
**1-1/2″ Port Size**

- **Designed to lubricate a single tool, valve, cylinder, air motor, or other air driven device.**
- **One Oil-Fog lubricator should be provided for each device requiring lubrication**
- **All around (360°) visibility of the sight-feed dome simplifies installation and adjustment**
- **Lubricators equipped with 1 and 2 quart (1 and 2 liter) reservoirs can be filled under pressure**
- **The 2 and 5 U.S. gallon (8 and 20 liter) reservoirs are rated to ASME Pressure Vessel Code, Section VIII**

**Ordering Information.** Models listed have 1-1/2" PTF parallel threads.

| Model Number | Reservoir Nominal Size | Reservoir Working Capacity Fluid Ounce (Liter) | Recommended Operating Flow Range** scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|---|
| 10-028-545 | 1 quart (1 liter) * | 19 (0.56) | 110 to 590 (52 to 278) | 5 (0.91) |
| 10-028-046 | 2 quart (2 liter) * | 45 (1.33) | 110 to 590 (52 to 278) | 6 (2.72) |
| 10-028-047 | 2 U.S. gallon (8 liter) | 113 (3.34) | 110 to 590 (52 to 278) | 16 (7.26) |
| 10-028-048 | 5 U.S. gallon (20 liter) | 316 (9.34) | 110 to 590 (52 to 278) | 28 (12.70) |

* Models with 1 and 2 quart reservoirs must not be located downstream of frequently cycling directional control valves. Models with the 2 and 5 gallon reservoirs may be located downstream of frequently cycling directional control valves.

** At 100 psig (6.9 bar) inlet pressure and pressure drop of 5 psid (0.35 bar).

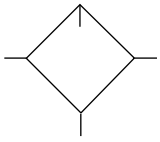
**Alternative Models**

1 0 - ★ 2 8 - ★ ★ ★ - ★ ★

| Threads | Substitute |
|---|---|
| PTF | 0 |
| ISO G parallel | 8 |

| Option | Add |
|---|---|
| Factory installed quick fill nipple | -2J |
| Factory installed sight feed dome | -8W |

**ISO Symbol**



With Drain

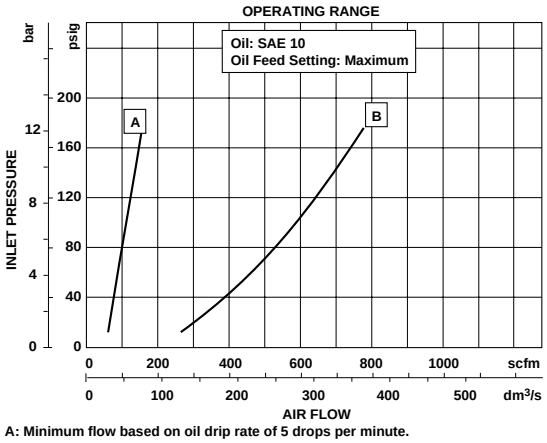
**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Start point (minimum flow required for lubricator operation) at 90 psig (6.3 bar) inlet pressure: 103 scfm (49 $dm^3/s$)
Typical flow at 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 568 scfm (268 $dm^3/s$)
Nominal reservoir sizes:
- 1 quart (1 liter)
- 2 quart (2 liter)
- 2 U.S. gallon (8 liter)
- 5 U.S. gallon (20 liter)

Recommended lubricants: See Section ALE-29.
Materials
- Body: Aluminum
- Reservoir: Steel
- Reservoir liquid level indicator lens: Pyrex
- Sight-feed dome
  - Standard: Transparent nylon
  - Optional: Pyrex and aluminum
- Elastomers: Neoprene and Nitrile

## Typical Performance Characteristics




**A: Minimum flow based on oil drip rate of 5 drops per minute.**
**B: Maximum flow based on pressure drop of 5 psid (0.35 bar).**

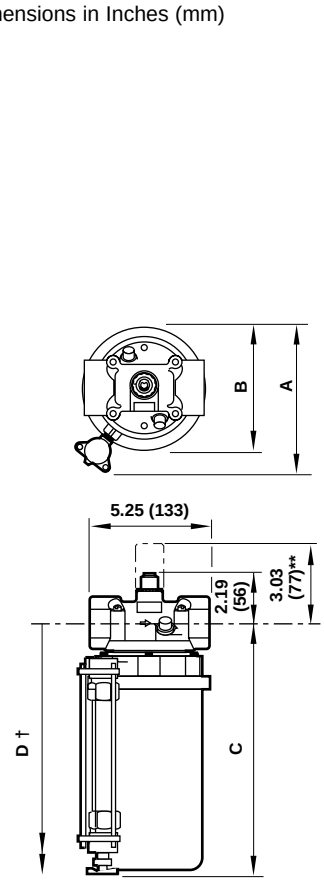
## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Liquid level lens kit | 1 quart reservoir | 2273-22 |
| | 2 quart reservoir | 2273-04 |
| | 2 and 5 gallon reservoir | 2274-01 |
| Replacement drain | Manual petcock | 684-01 |

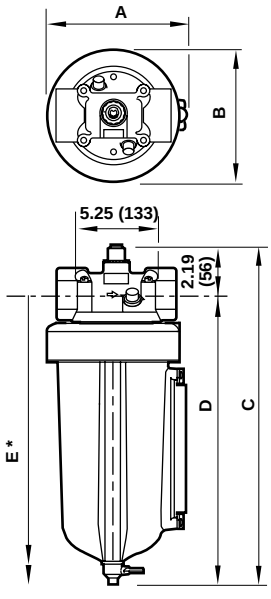
Liquid level lens kit include sight glass, sight glass guards, seals, and hardware.

| Reservoir | A | B | C | D |
|---|---|---|---|---|
| 1 quart (1 liter) | 4.72 (120) | 4.06 (103) | 8.27 (210) | 15 (376) |
| 2 quart (2 liter) | 5.28 (134) | 4.63 (118) | 10.52 (267) | 19 (477) |
| 2 gallon (8 liter) | 7.81 (198) | 7.18 (182) | 18.34 (466) | 32 (813) |
| 5 gallon (20 liter) | 11.81 (300) | 11.18 (284) | 21.59 (548) | 37 (940) |

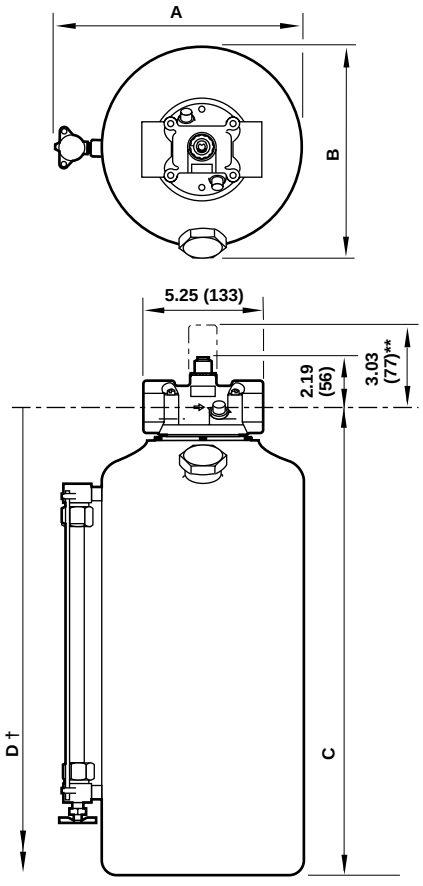
All Dimensions in Inches (mm)




**2 quart (2 liter) reservoir**




**10-015-504**
**1 quart (1 liter) reservoir**




**2 and 5 gallon (8 and 20 liter) reservoir**

**** Optional pyrex sight-feed dome.**
**† Minimum clearance required to remove bowl.**

# 10-076

**Oil-Fog Lubricator**
**2″ Port Size**

- **Designed to lubricate a single tool, valve, cylinder, air motor, or other air driven device**
- **One Oil-Fog lubricator should be provided for each device requiring lubrication**
- **All around (360°) visibility of the sight-feed dome simplifies installation and adjustment**
- **The 2 and 5 U.S. gallon (8 and 20 liter) reservoirs are rated to ASME Pressure Vessel Code, Section VIII**

**Ordering Information.** Models listed have 2" PTF threads.

| Model Number | Reservoir Nominal Size | Reservoir Working Capacity Fluid Ounce (Liter) | Recommended Operating Flow Range* scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|---|
| 10-076-004 | 2 U.S. gallon (8 liter) | 113 (3.34) | 250 to 1000 (118 to 472) | 19 (8.6) |
| 10-076-005 | 5 U.S. gallon (20 liter) | 316 (9.34) | 250 to 1000 (118 to 472) | 32 (14.5) |

* At 100 psig (6.9 bar) inlet pressure and pressure drop of 5 psid (0.35 bar).

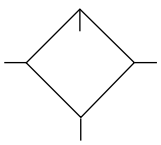
**Alternative Models**

1 0 - ★ 7 6 - ★ ★ ★ - ★ ★

| Threads | Substitute |
|---|---|
| PTF | 0 |
| ISO G parallel | 8 |

| Option | Add |
|---|---|
| Factory installed pyrex sight feed dome | 8W |

**ISO Symbol**



With Drain

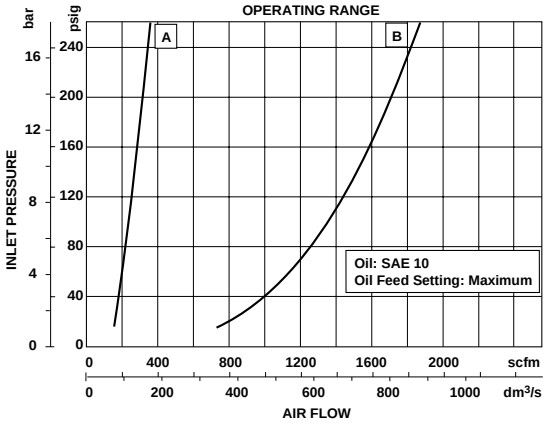
**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Start point (minimum flow required for lubricator operation) at 90 psig (6.3 bar) inlet pressure: 240 scfm (123 $dm^3/s$)
Typical flow with 90 psig (6.3 bar) inlet pressure and 5 psig (0.35 bar) pressure drop: 1300 scfm (614 $dm^3/s$)
Nominal reservoir sizes:
- 2 U.S. gallon (8 liter)
- 5 U.S. gallon (20 liter)

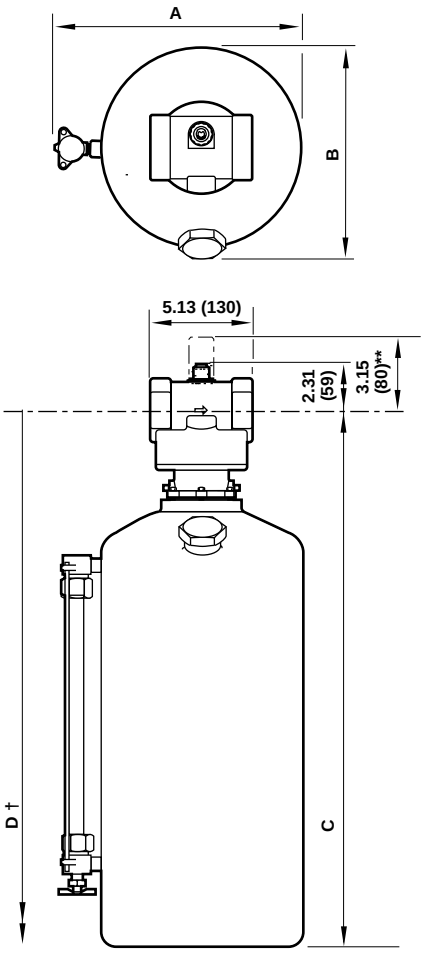
Recommended lubricants: See Section ALE-29.
Materials
- Body and adapter: Aluminum
- Reservoir: Steel
- Reservoir liquid level indicator lens: Pyrex
- Sight-feed dome
  - Standard: Transparent nylon
  - Optional: Pyrex and aluminum
- Elastomers: Nitrile

## Typical Performance Characteristics




**A: Minimum flow based on oil drip rate of 5 drops per minute.**
**B: Maximum flow based on pressure drop of 5 psid (0.35 bar).**

All Dimensions in Inches (mm)




**2 and 5 gallon (8 and 20 liter) reservoir**

**** Optional pyrex sight-feed dome.**
**† Minimum clearance required to remove bowl.**

| Reservoir | A | B | C | D |
|---|---|---|---|---|
| 2 gallon (8 liter) | 7.81 (198) | 7.18 (182) | 21.53 (547) | 35 (887) |
| 5 gallon (20 liter) | 11.81 (300) | 11.18 (284) | 24.78 (629) | 40 (1014) |

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Liquid level lens kit | 8 and 20 liter reservoir | 2274-01 |
| Replacement drain | Manual petcock | 684-01 |
| Seal kit | Models after 2000 | 3035-06 |
| Seal kit | Models prior 2000 | 3035-02 |

Reservoir sight glass kits include sight glass, sight glass guards, seals, and hardware.

# 10-015, 10-065

**Micro-Fog® Machine Bearing Lubricator**
**8 to 32 Bearing Inch Ratings 1/4″ Port Size**

- **Provides centralized air-borne lubrication for machine bearings, gears, chains, slides, ways, etc**
- **Controls can be installed to start-up and shut-down the lubricator with the machine**
- **Delivers a fog of oil to the application points, coating bearing surfaces with a thin oil film and reducing oil consumption**
- **Air carrying the lubricants passes through the bearing housing, reducing bearing temperature and contamination, providing longer bearing life**
- **The 2 and 5 U.S. gallon (8 and 20 liter) reservoirs are rated to ASME Pressure Vessel Code, Section VIII**
- **Refer to Norgren Publication NT-1 for system design, bearing-inch ratings, and reclassifier selection**

**Ordering Information.** Models listed have 1/4" PTF threads and are rated from 8 to 32 bearing inches.

| Model Number | Reservoir - Nominal Size | Reservoir - Working Capacity | Weight lbs (kg) |
|---|---|---|---|
| 10-015-100 * | 1/2 pint (0.25 liter) | — | 2 (0.91) |
| 10-015-002 | 1/2 pint (0.25 liter) | 5 fluid ounce (0.15 liter) | 2 (0.91) |
| 10-015-504 | 1 quart (1 liter) | 19 fluid ounce (0.56 liter) | 4.0 (1.8) |
| 10-015-005 | 2 quart (2 liter) | 45 fluid ounce (1.33 liter) | 6 (2.72) |
| 10-065-006 | 2 U.S. gallon (8 liter) | 113 fluid ounce (3.34 liter) | 15.4 (7.0) |
| 10-065-007 | 5 U.S. gallon (20 liter) | 316 fluid ounce (9.34 liter) | 28 (12.7) |

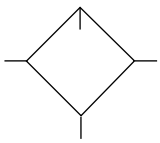
* Equipped with factory installed remote fill device.

**Alternative Models**

1 0 - 0 ★ ★ - ★ ★ ★ - ★ ★

| Option | Add | To order separately (for field install) |
|---|---|---|
| Wall bracket attached to 10-015 models | -1B | 18-001-009 |
| Quick fill | -2H | 18-011-006 |
| Pyrex sight feed dome | -7C | 1804-03 |
| Low oil level switch with 10-015-504 | -3A | 18-023-018 |
| Low oil level switch with 10-015-005 | -3A | 18-023-018 |
| Low oil level switch with 10-065-006 | -3D | 18-023-022 |
| Low oil level switch with 10-065-007 | -3E | 18-023-024 |
| Bowl guard for 0.5 pint reservoir | -2U | 18-012-002 |

**ISO Symbol**



With Drain

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Nominal reservoir sizes
10-015-002: 1/2 pint (0.25 liter)
10-015-100: 1/2 pint (0.25 liter)
10-015-504: 1 quart (1 liter)
10-015-005: 2 quart (2 liter)
10-065-006: 2 U.S. gallon (8 liter)
10-065-007: 5 U.S. gallon (20 liter)
Recommended lubricants: See Section ALE-29.
Materials
Body: Zinc
Bowl:
Transparent 1/2 pint (0.25 liter): Polycarbonate
Metal
1 quart (1 liter): Aluminum
2 quart, 2 and 5 gallon (2, 8, 20 liter): Steel
Metal bowl liquid level indicator lens: Pyrex
Sight-feed dome
Standard: Polycarbonate
Optional: Pyrex and brass
Elastomers: Neoprene and nitrile

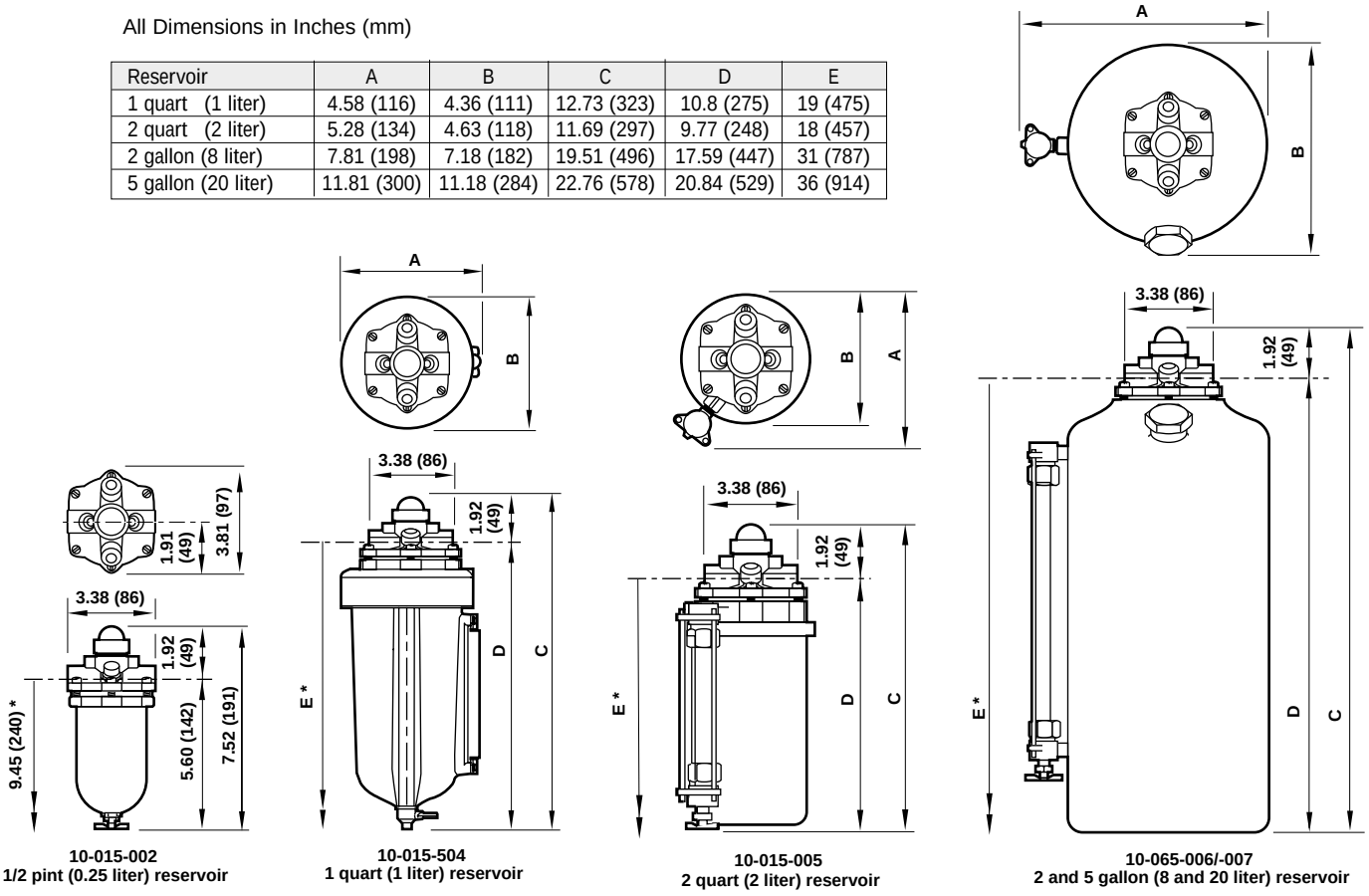
## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & Gasket | 714-01 |
| Liquid level lens kit | 1 quart reservoir | 2273-22 |
| | 2 quart reservoir | 2273-04 |
| | 2 and 5 gallon reservoir | 2274-01 |
| Replacement drain | Manual petcock | 684-01 |

Service kit 714-01 includes dome, o-rings, gaskets, siphon tube filter, siphon tube check ball.
Reservoir sight glass kits include sight glass, sight glass guards, seals, and hardware.

All Dimensions in Inches (mm)

| Reservoir | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 quart (1 liter) | 4.58 (116) | 4.36 (111) | 12.73 (323) | 10.8 (275) | 19 (475) |
| 2 quart (2 liter) | 5.28 (134) | 4.63 (118) | 11.69 (297) | 9.77 (248) | 18 (457) |
| 2 gallon (8 liter) | 7.81 (198) | 7.18 (182) | 19.51 (496) | 17.59 (447) | 31 (787) |
| 5 gallon (20 liter) | 11.81 (300) | 11.18 (284) | 22.76 (578) | 20.84 (529) | 36 (914) |




10-015-002
1/2 pint (0.25 liter) reservoir

10-015-504
1 quart (1 liter) reservoir

10-015-005
2 quart (2 liter) reservoir

10-065-006/-007
2 and 5 gallon (8 and 20 liter) reservoir

*** Minimum clearance required to remove bowl.**

## Machine Bearing Lubricators

Machine bearing lubricators deliver a fog of small oil particles through a manifold system to various machine elements (bearings, gears, chains, etc). At the machine elements a nozzle-like fitting, called a reclassifier, causes the small oil particles to combine into larger particles. The larger particles cover the bearing surfaces with a protective film of clean oil. An air line filter and pressure regulator must be installed immediately upstream of the lubricator.

### How to Select

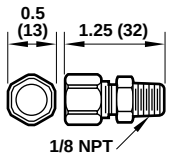
Selection requires a careful analysis of the lubrication requirements of the machine. After the analysis, the proper lubricator, reservoir, and reclassifiers may be ordered. The following is an abbreviated summary of the steps required to analysis lubrication requirements of the machine. See Norgren Publications NT-1, *Design Manual for Machine Lubrication*, for complete details.

1. Determine the bearing inch requirement.
   a. List and identify the bearing-inch rating of all machine elements requiring lubrication.
   b. List the reclassifier ratings required at each point of lubrication.
   c. Total the reclassifier ratings. This is the bearing-inch requirement to use in selecting the lubricator.
2. Determine reservoir capacity required.
   a. Calculate rate of oil usage based on bearing-inch rating.
   b. Determine how often the reservoir can be refilled.
   c. Select reservoir capacity.
3. Determine the air flow required. See the *Operating Ranges and Air Flow Requirements* chart for air flow requirements of the lubricator.
4. Determine any accessories required.

### Operating Ranges and Air Flow Requirements

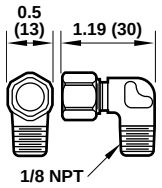
| Bearing Inch Requirement | Lubricator Inlet Pressure psig (bar) | Air Flow scfm ($dm^3/s$) | Manifold Pressure Inches $H_2O$ |
|---|---|---|---|
| 16<br>24<br>32 | 8 (0.6)<br>17 (1.2)<br>26 (1.8) | 1.6 (0.76)<br>2.4 (1.13)<br>3.1 (1.46) | 8 |
| 16<br>24<br>32 | 10 (0.7)<br>20 (1.4)<br>31 (2.2) | 1.8 (0.85)<br>2.7 (1.27)<br>3.6 (1.70) | 10 |
| 16<br>24<br>32 | 12 (0.8)<br>23 (1.7)<br>35 (2.4) | 2.0 (0.94)<br>3.0 (1.42)<br>4.0 (1.89) | 12 |
| 8<br>16<br>24<br>32 | 6 (0.4)<br>15 (1.0)<br>26 (1.8)<br>40 (2.8) | 1.1 (0.52)<br>2.2 (1.04)<br>3.3 (1.56)<br>4.5 (2.12) | 15 |

### Reclassifiers with Bearing Inch (BI) Ratings - Dimensions in mm (inches)



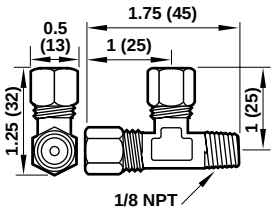

Straight, compression tube

| Model | BI Rating |
|---|---|
| 18-009-003 | 0 to 1 |
| 18-009-010 | 1 to 2 |
| 18-009-012 | 2 to 4 |
| 18-009-014 | 4 to 8 |



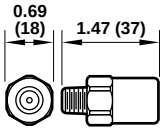

Elbow, compression tube

| Model | BI Rating |
|---|---|
| 18-009-008 | 0 to 1 |
| 18-009-011 | 1 to 2 |
| 18-009-013 | 2 to 4 |
| 18-009-015 | 4 to 8 |



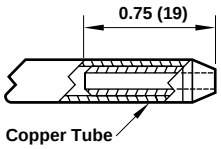

Pressure jet, compression tube

| Model | BI Rating |
|---|---|
| 18-009-030 | 0 to 1 |
| 18-009-031 | 1 to 2 |
| 18-009-032 | 2 to 4 |




Straight, pipe thread*

| Model | BI Rating |
|---|---|
| 18-009-001 | 0 to 1 |
| 18-009-002 | 0 to 1 |
| 18-009-005 | 2 to 4 |
| 18-009-006 | 2 to 4 |
| 18-009-007 | 4 to 8 |




1/4 OD copper tube, solder

| Model | BI Rating |
|---|---|
| 18-009-029 | 2 to 4 |

* 1/4 NPT female x 1/8 NPT male threads all models except 18-009-002 and -006, which have 1/4 NPT female and male threads.

# Pressure Relief Valves

## Compressed air Relief Valves from 1/8" to 1-1/2" port size. Water Relief Valve in 1/8" and 1/4" port. Tank Relief Valve in 1/8" and 1/4" port size.



**V07**

**V72G**

**V74G**

**V64H**

**V68H**

**16-004**

**V06**

# V07

## 07 Series Pressure Relief Valve
## 1/8" and 1/4" Port Sizes

- **Compact design**
- **Low torque, non-rising adjusting knob**
- **Helps protect air operated equipment from over pressure by retarding excessive pressure build up**
- **Snap action knob locks pressure setting when pushed in**
- **Can be factory preset**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering information.** Models listed include PTF threads and 5 to 100 psig (0.3 to 7 bar) relief pressure adjustment range.

| Port Size | Model Number | Weight lbs (kg) |
|---|---|---|
| 1/8" | V07-100-NNKA | 0.28 (0.13) |
| 1/4" | V07-200-NNKA | 0.28 (0.13) |

### Alternative Models

V 0 7 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8" | 1 |
| 1/4" | 2 |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

| Option | Substitute |
|---|---|
| Not applicable | 0 |

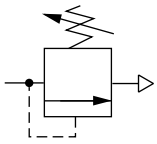
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Relief Pressure Adjustment Ranges | Substitute |
|---|---|
| 1 to 10 psig (0.1 to 0.7 bar) | A |
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 100 psig (0.3 to 7 bar) | K |
| 5 to 125 psig (0.3 to 8.6 bar) | L |
| 5 to 150 psig (0.3 to 10 bar) | M |

| Gauges | Substitute |
|---|---|
| With | G |
| Without | N |

| Factory Preset Relief Pressure | Substitute |
|---|---|
| Not factory preset | N |
| Factory set, non adjustable relief pressure. Also specify desired relief pressure on order. | P |

### ISO Symbol



**See Section ALE-24 for Accessories**

## Technical Data

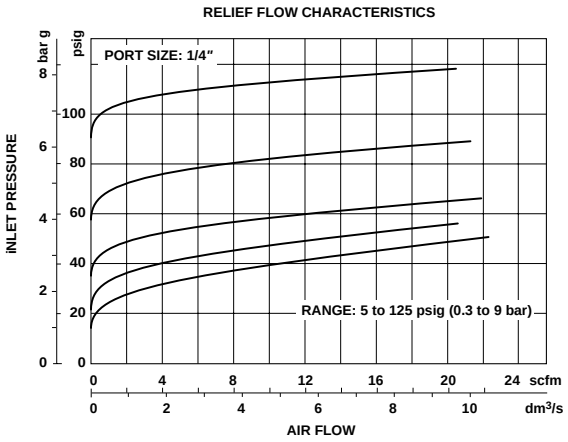
Fluid: Compressed air
Maximum pressure: 300 psig (20 bar)
Operating temperature: -30° to 150°F (-34° to 65°C) *

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Gauge ports:
- 1/8″ PTF with PTF main ports
- 1/8″ ISO Rc with ISO Rc main ports
- 1/8″ ISO Rc with ISO G main ports

Materials:
- Body: Zinc
- Bonnet: Acetal
- Valve seat: Polyphenylene
- Elastomers: Nitrile

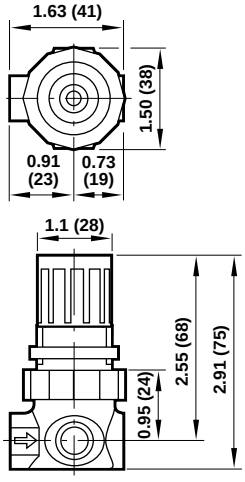
## Typical Performance Characteristics




## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kits | Diaphragm and valve seat seal | 3407-80 |
| | Valve seat and valve seat seal | 3439-11 |
| | Diaphragm seat and seal | 3407-19 |

All Dimensions in Inches (mm)




Panel mounting hole diameter: 1.19" (30 mm)
Maximum panel thickness: 0.25" (6 mm)

# V72G

**72 Series Pressure Relief Valve 1/4", 3/8" Port Size**

- **Excelon design allows in-line or modular installation**
- **Push to lock adjusting knob with tamper resistant accessory**
- **Helps protect air operated equipment from over pressure by retarding excessive pressure build up**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**
- **Relief port located on bottom allows easy installation**

**Ordering Information.** Models listed include PTF threads, knob adjustment, and a 5 to 150 psig (0.3 to 10 bar) outlet pressure adjustment range*.

| Port Size | Model | Weight lb (kg) |
|---|---|---|
| 1/4" | V72G-2AK-NMN | 0.73 (0.33) |
| 3/8" | V72G-3AK-NMN | 0.73 (0.33) |

**Alternative Models**

V 7 2 G - ★ ★ ★ - N ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

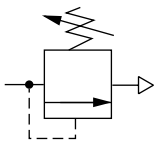
* Relief valve can be adjusted to pressures in excess of and less than those specified. Do not use these units to control pressures outside of the specified ranges.

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 30 psig (0.3 to 2 bar) | C |
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

**ISO Symbol**



**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 300 psig (20 bar)
Operating Temperature*: -30° to 150°F (-34° to 65°C)

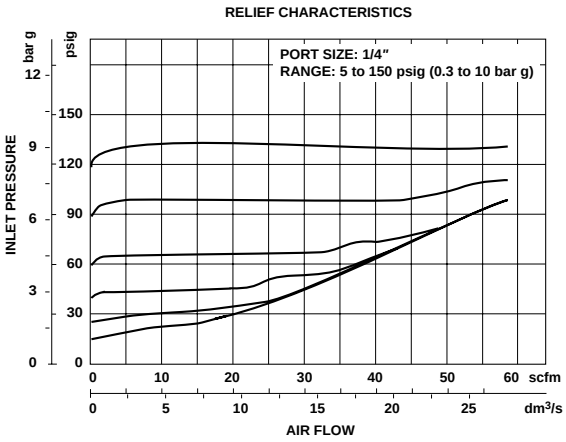
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Gauge Ports:
- 1/8″ PTF with PTF main ports
- 1/8″ ISO Rc with ISO Rc main ports
- 1/8″ ISO Rc with ISO G main ports

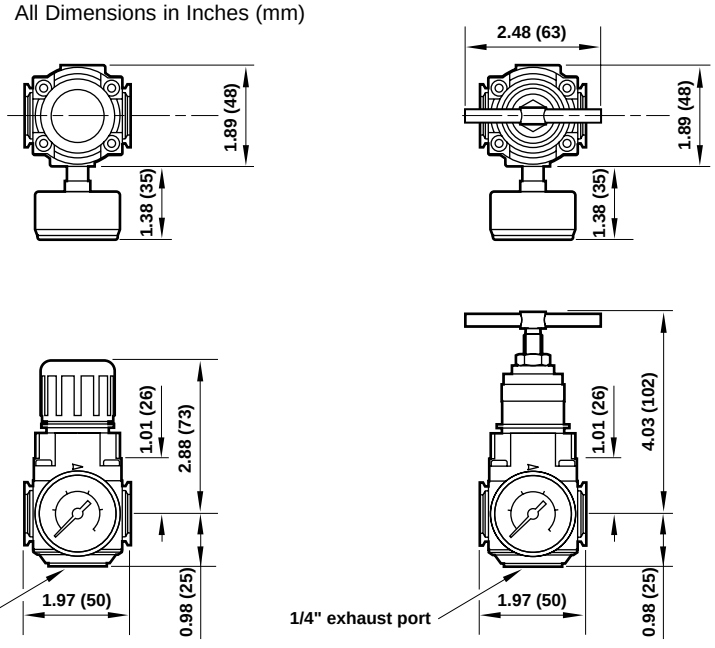
Exhaust Port:
- 1/4″ PTF with PTF main ports
- 1/4″ ISO Rc with ISO Rc main ports
- 1/4″ ISO Rc with ISO G main ports

Materials
- Body: Zinc
- Bonnet: Acetal
- Valve: Brass
- Elastomers: Neoprene
- Bottom Plug: Acetal

## Typical Performance Characteristics




All Dimensions in Inches (mm)




Panel mounting hole diameter: 1.57″ (40 mm)
Maximum panel thickness: 0.16″ (4 mm)

# V74G

**74 Series Pressure Relief Valve**
**3/8", 1/2", 3/4" Port Sizes**

- **Excelon design allows in-line or modular installation**
- **Push to lock adjusting knob with tamper resistant accessory**
- **Easily disassembled for servicing without removal from air line**
- **Helps protect air operated equipment from over pressure by retarding excessive pressure build up**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed include PTF threads, knob adjustment, and a 5 to 150 psig (0.3 to 10 bar) relief pressure adjustment range*.

| Port Size | Model | Weight lb (kg) |
|---|---|---|
| 3/8" | V74G-3AK-NMN | 0.69 (1.53) |
| 1/2" | V74G-4AK-NMN | 0.68 (1.50) |
| 3/4" | V74G-6AK-NMN | 0.67 (1.47) |

**Alternative Models**

V 7 4 G - ★ ★ ★ - N ★ ★

| Port Size | Substitute |
|---|---|
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

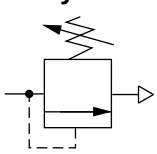
| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Relief Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar)** | S |

* Relief valve can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) relief pressure range are available only with the T-bar adjustment; therefore substitute ***T*** at the 7th position and ***S*** at the 9th position.

**ISO Symbol**



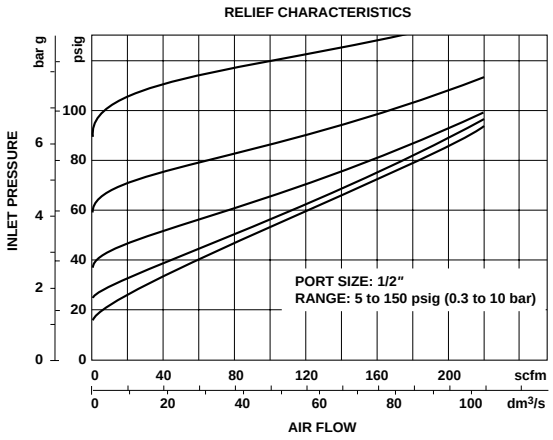
**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 300 psig (20 bar)
Operating temperature*: -30° to 175°F (-34° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Gauge ports:
- 1/4" PTF with PTF main ports
- Rc1/4 with ISO Rc main ports
- Rc1/8 with ISO G main ports

Materials
- Body: Aluminum
- Bonnet: Aluminum
- Valve: Aluminum and Nitrile
- Elastomers: Nitrile
- Bottom plug: Acetal

## Typical Performance Characteristics

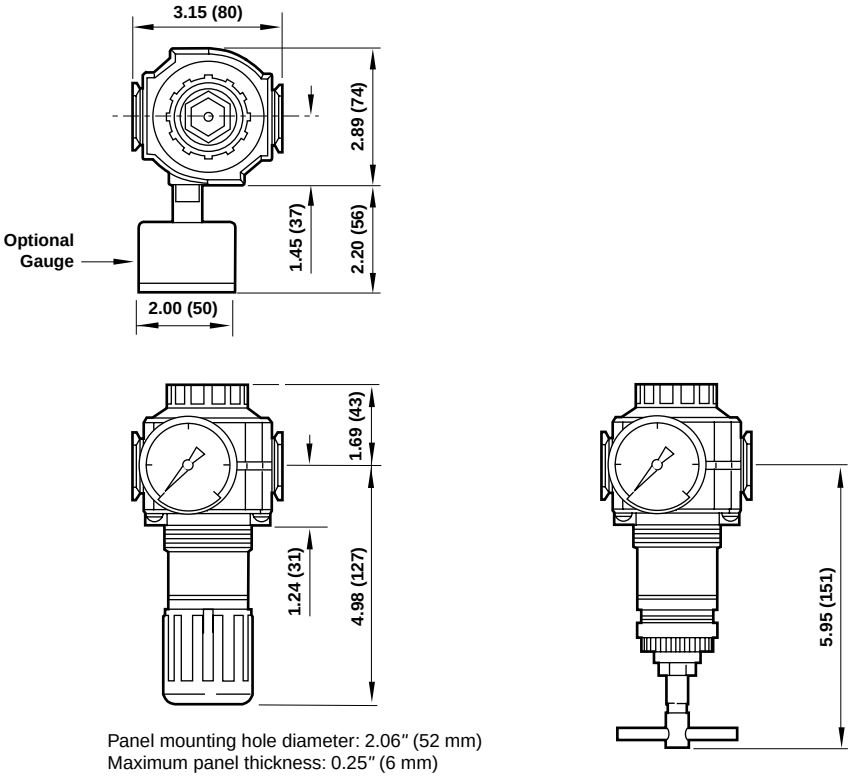



## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Diaphragm & Seal | 4384-700 |

Service kit includes diaphragm, bottom plug o-ring.

All Dimensions in Inches (mm)




Panel mounting hole diameter: 2.06″ (52 mm)
Maximum panel thickness: 0.25″ (6 mm)

# V64H

## Olympian Plus Pressure Relief Valve
## 1/4", 3/8", 1/2", 3/4" Port Sizes

- **Olympian Plus plug in design**
- **Helps protect air operated equipment from over pressure by retarding excessive pressure build up**
- **High relief capacity**
- **Threaded relief port for silencer or piped exhaust**
- **Relief port located on bottom allows easy installation**


**Ordering Information.** Models listed include PTF threads, 5 to 150 psig (0.3 to 10 bar) operating pressure range* without gauge.

| Port Size | Model | Weight lb (kg) |
|---|---|---|
| 1/4" | V64H-2AD-RMN | 3.73 (1.68) |
| 3/8" | V64H-3AD-RMN | 3.69 (1.66) |
| 1/2" | V64H-4AD-RMN | 3.62 (1.63) |
| 3/4" | V64H-6AD-RMN | 4.42 (1.99) |

For replacement relief valve (without yoke) substitute 'N' at the 5th and 6th digits eg: V64H-**NN**D-RMN.

### Alternative Models

V 6 4 H - ★ ★ ★ - R ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

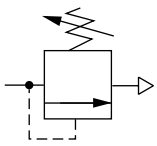
| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 15 to 150 psig (1 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar) | S |

| Adjustment | Substitute |
|---|---|
| Slotted screw | D |

* Relief valve can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

### ISO Symbol



**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 300 psig (20 bar)
Operating temperature*: -30° to 175°F (-34° to 80°C)

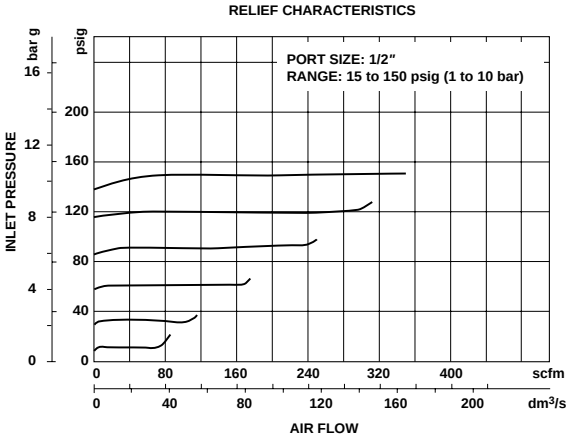
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Gauge ports:
- 1/8" PTF with PTF main ports
- 1/8" ISO Rc with ISO Rc main ports
- 1/8" ISO Rc with ISO G main ports

Exhaust port:
- 1/2" PTF with PTF main ports
- 1/2" ISO Rc with ISO Rc main ports
- 1/2" ISO Rc with ISO G main ports

Materials
- Body: Zinc
- Bonnet: Zinc
- Bottom plug: Aluminum alloy
- Yoke: Zinc
- Adjusting screw: Steel
- Valve: Brass
- Elastomers: Synthetic rubber

## Typical Performance Characteristics

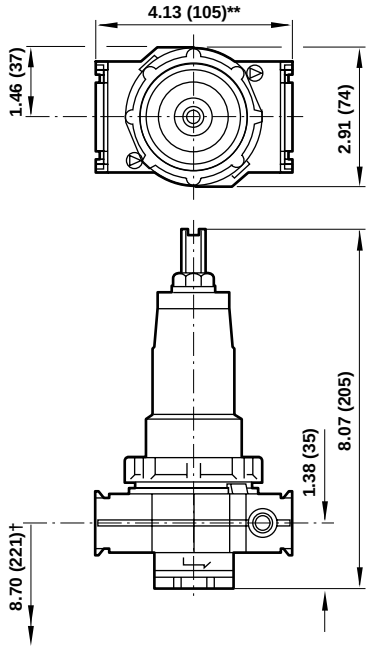



## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | All models | 4384-200 |
| Gasket kit | All models | V13-GK |

Service kit includes port and bottom plug o-rings, gasket, slip ring, valve assembly, valve spring, diaphragm, diaphragm stop and pilot valve assembly.

All Dimensions in Inches (mm)




Panel mounting hole diameter: 2.06″ (52 mm)
Maximum panel thickness: 0.16″ (4 mm)
** 6.18″ (157 mm) for models with 3/4" ports

† Minimum clearance required to remove unit.

# V68H

**Olympian Pressure Relief Valve**
**3/4", 1", 1-1/4", 1-1/2", Port Sizes**

- **Olympian plug in system**
- **Helps protect compressed air systems from over pressure by retarding excessive pressure build up**
- **Integral pilot design provides superior sensitivity, accuracy, and quick response to over pressure conditions**
- **High relief flow**
- **Threaded relief port for silencer or piped exhaust**


**Ordering Information.** Models listed include PTF threads, 1 to 10 bar (15 to 150 psig) operating adjustment range* without gauge.

| Port Size | Model | Weight lb (kg) |
|---|---|---|
| 3/4" | V68H-6AD-RMN | 4.91 (2.21) |
| 1" | V68H-8AD-RMN | 4.89 (2.20) |
| 1-1/4" | V68H-AAD-RMN | 4.93 (2.22) |
| 1-1/2" | V68H-BAD-RMN | 5.02 (2.26) |

## Alternative Models

V 6 8 H - ★ ★ ★ - R ★ ★

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |
| None | N |

| Thread | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |
| No Yoke (***N*** in 5th position) Rc gauge and exhaust ports. | N |
| No Yoke (***N*** in 5th position). PTF gauge and exhaust ports. | A |

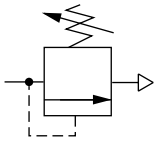
| Adjustment | Substitute |
|---|---|
| Slotted screw | D |

| Gauge | Substitute |
|---|---|
| With | G |
| Without | N |

| Outlet Pressure Adjustment Range* | Substitute |
|---|---|
| 0 to 60 psig (0.4 to 4 bar) | F |
| 15 to 150 psig (1 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar) | S |

* Relief valve can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**ISO Symbol**



## Technical Data

Fluid: Compressed air

Maximum pressure: 300 psig (20 bar)

Operating temperature*: 0° to +175°F (-20° to +80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).

Gauge ports:

- 1/8 PTF with PTF yoke ports
- Rc1/8 with ISO Rc yoke ports
- Rc1/8 with ISO G yoke ports

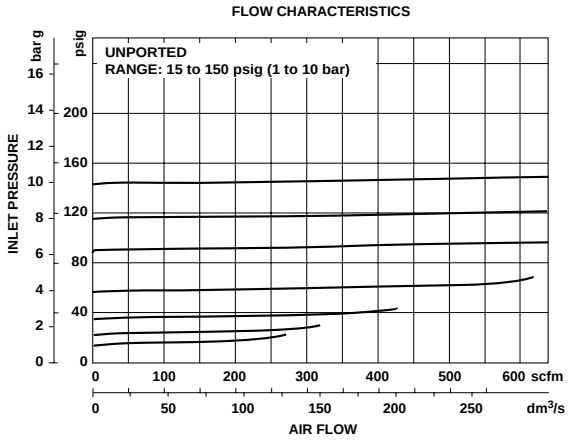
Exhaust port:

- 1″ PTF with PTF yoke ports
- Rc1 with ISO Rc yoke ports
- Rc1 with ISO G yoke ports

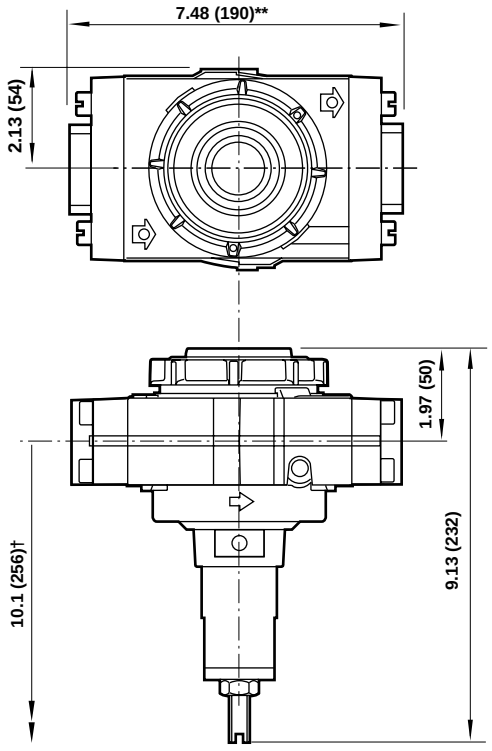
Materials:

- Body: Aluminum
- Intermediate body: Aluminum
- Bonnet: Aluminum
- Bottom plug: Aluminum
- Adjusting screw: Steel
- Elastomers: Synthetic rubber
- Yoke: Aluminum

## Typical Performance Characteristics




All Dimensions in Inches (mm)




**** Add 0.39" (10mm) 1-1/4" and 1-1/2" models.**
**† Minimum clearance required to remove unit.**

# 16-004

**Miniature Brass Body Tank Relief Valve**
**Compressed Air Service**
**1/8" and 1/4" PTF Port Sizes**

- **Used in low-volume air tanks to retard excessive pressure buildup**
- **If pressure exceeds the relief pressure setting, the valve opens and air from the tank is vented to atmosphere. Valve closes when pressure is reduced to the relief pressure setting.**
- **Compact design, corrosion resistant construction**
- **Constructed of brass and stainless steel for compressed air and water service**
- **Available with adjustable or non-adjustable, factory preset, relief pressure setting**

## Ordering information

| Port Size | Model Numbers - Relief Pressure Adjustment Ranges * 25 to 50 psig (1.7 to 3.5 bar) | 25 to 75 psig (1.7 to 5.2 bar) | 70 to 150 psig (5 to 10.4 bar) | 125 to 300 psig (8.6 to 20.7 bar) | Weight lbs (kg) |
|---|---|---|---|---|---|
| 1/8" | 16-004-001 | 16-004-002 | 16-004-003 | 16-004-004 | 0.11 (0.05) |
| 1/4" | 16-004-009 | 16-004-010 | 16-004-011 | 16-004-012 | 0.11 (0.05) |

## Alternative Models

16 - 004 - ★★★ - ★★★★

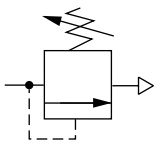
| Factory set, non adjustable pressure | Add ** |
|---|---|
| Locktite adjusting cap | Z |

| Factory Set Relief Pressure Setting | Add ** |
|---|---|
| Insert desired relief pressure setting in psig | 025 through 300 |

* Relief valves can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Example: 16-004-001-***Z025***
Locking method: Locktite cap
Relief pressure setting: 25 psig

## ISO Symbol

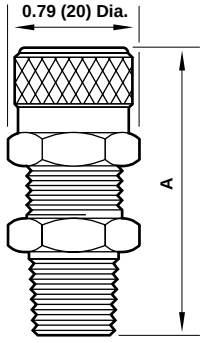


**See Section ALE-24 for Accessories**

## Technical Data

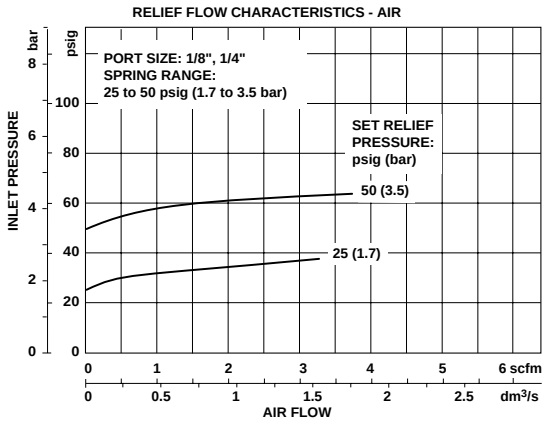
Fluid: Compressed air and water
Maximum pressure: 300 psig (20 bar)
Operating temperature*: -30° to 200°F (-34° to 93°C)
*Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Repeatability: ± 20% of relief pressure setting
Materials
Body, cap, springrest: Brass
Valve: Brass and nitrile
Regulating spring: Stainless steel

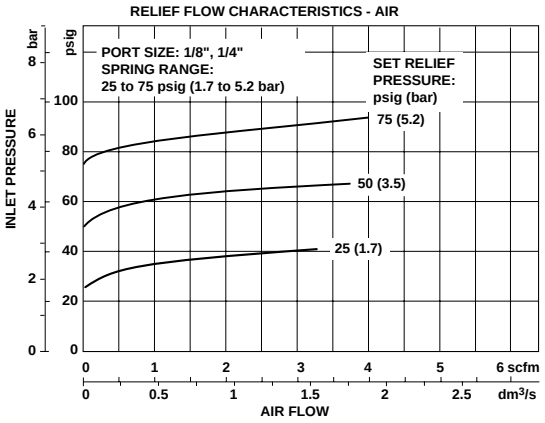
All Dimensions in Inches (mm)

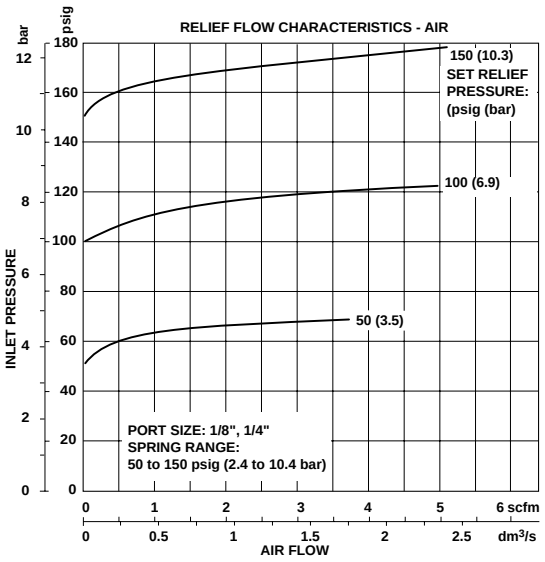



**A: 1.56 (62) for 1/8" pipe size**
**1.75 (44) for 1/4" pipe size**

## Typical Performance Characteristics



# V06

**Miniature Brass Body Relief Valve**
**Water and Compressed Air Service**
**1/8" and 1/4" PTF Port Sizes**

- **Helps protect water systems from excessive pressure buildup by venting water when pressure exceeds setting of the relief valve. Relief valve closes when pressure is reduced to the relief pressure setting.**
- **Compact design, corrosion resistant construction**
- **Brass body with choice of plastic or brass bonnet**
- **Plastic bonnet equipped with low torque, non-rising pressure adjusting knob. Snap action knob locks pressure setting when pushed in**
- **Brass bonnet equipped with pressure adjusting screw and locknut**
- **Can be disassembled without the use of tools or removal from the air line**
- **Can be factory preset**

**Ordering information.** Models listed include PTF threads, plastic bonnet with knob adjustment, and 5 to 100 psig (0.3 to 7 bar) relief pressure adjustment range.† A gauge is not included.

| Port Size | Model Number | Weight lbs (kg) |
|---|---|---|
| 1/8" | V06-121-NNKA | 0.2 (0.09) |
| 1/4" | V06-221-NNKA | 0.2 (0.09) |

**Alternative Models**

V 0 6 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8" | 1 |
| 1/4" | 2 |

| Bonnet | Substitute |
|---|---|
| Plastic | 21 |
| Brass | 22 |

| Factory Set Relief Pressure | Substitute |
|---|---|
| Not factory set | N |
| Factory set, non adjustable relief pressure. Also specify desired relief pressure on order. | P |

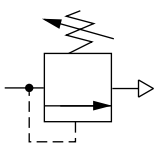
| Threads | Substitute |
|---|---|
| PTF | A |

| Relief Pressure Adjustment Range† | Substitute |
|---|---|
| 1 to 10 psig (0.1 to 0.7 bar) | A |
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 100 psig (0.3 to 7 bar) | K |

| Gauges | Substitute |
|---|---|
| With | G |
| Without | N |

† Relief valve can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**ISO Symbol**

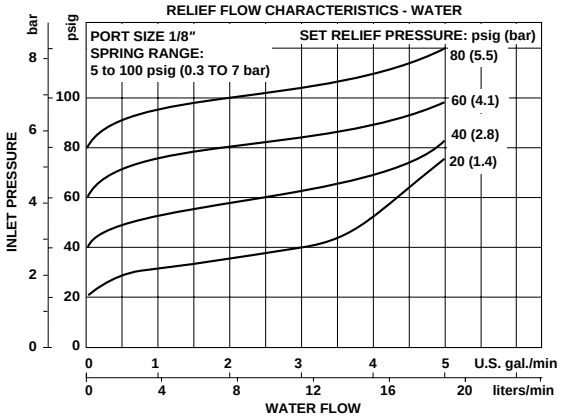


**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Water and compressed air
Maximum pressure: 400 psig (27.6 bar)
Operating temperature:
Plastic bonnet: 35° to 150°F (2° to 65°C)
Brass bonnet: 35° to 200°F (2° to 94°C)
Gauge ports: 1/8" PTF
Materials
Body: Brass
Bonnet
Standard: Acetal resin
Optional: Brass
Valve seat: Acetal resin
Elastomers: Nitrile

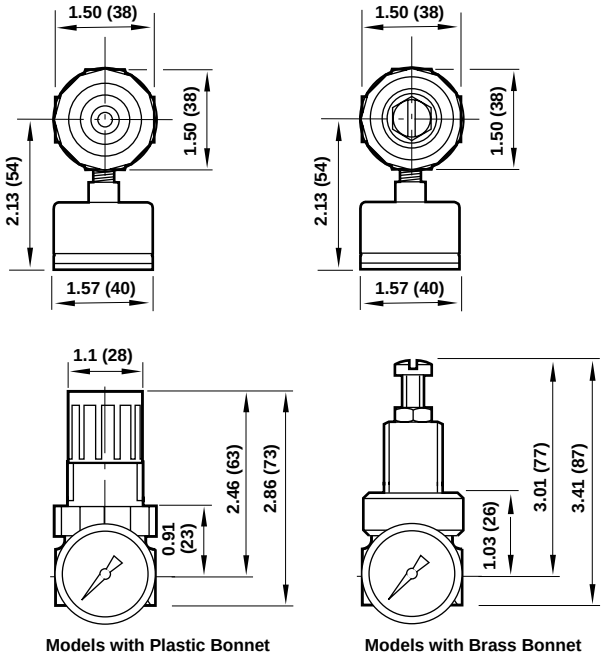
## Typical Performance Characteristics




## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Valve seat and seal | 3439-11 |
| | Diaphragm | 3440-03 |

All Dimensions in Inches (mm)




**Models with Plastic Bonnet** **Models with Brass Bonnet**

Panel mounting hole diameter:
Models with plastic bonnet: 1.19″ (30 mm)
Models with brass bonnet: 0.81" (21mm)
Maximum panel thickness: 0.25″ (6 mm)

1.1.2 How do they Work?

The inlet port is connected to the system and the valve limits the downstream pressure by exhausting when the system pressure exceeds the preset pressure of the valve. The valve is normally closed, only opening when unusual system conditions prevail.

1.1.3 Are they Safety Valves?

No. Safety valves are covered by a variety of national standards eg BS 1123. Norgren relief valves are not designed to these standards.

## 1.2 SIZING

1.2.1 How do I Size a Relief Valve?

If the relief valve is to be fitted to prevent excess pressure then it needs to be sized to cope with the maximum flow that the system can see - often the output flow capacity of the compressor.

The relief valve needs to be able to cope with this flow within acceptable pressure limits. See catalogue data sheets for relief flow characteristics.

1.2.2 Should the Relief Valve be the same Size as the Regulator?

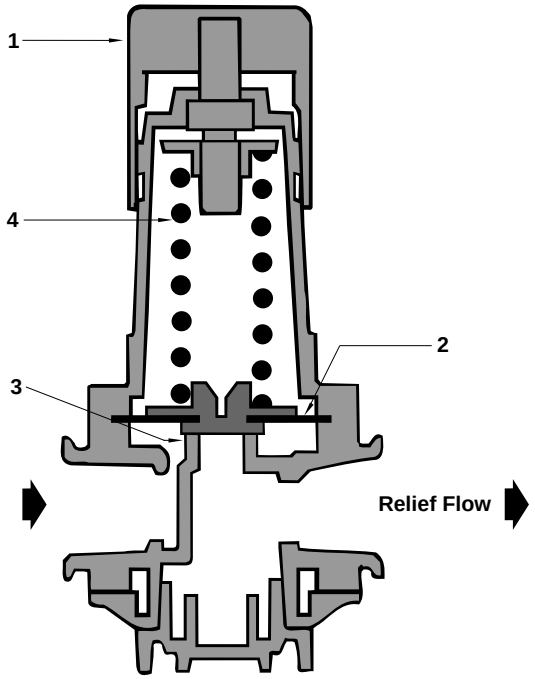
Not necessarily. In general the failure flow of a regulator will require use of a relief valve of larger basic size. Detailed graphs are available for sizing - please call Application Engineering.

1.2.3 What is Failure Flow?

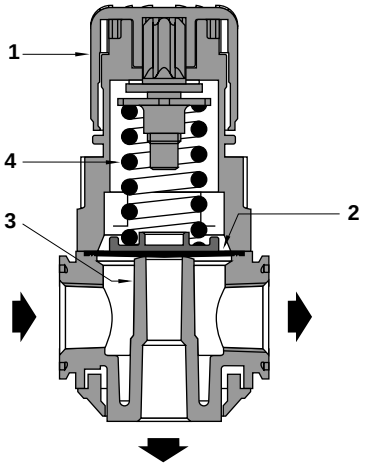
This is the maximum flow that will pass through a regulator in the event of its total failure.

It varies with system pressure and the test results on all Norgren regulators are available from Application Engineering.

The failure flow is used for sizing relief valves downstream of regulators.




**"T" Installation (Type V07, V74, 16-001)**




**Inline Installation (Type V72 Only)**

# Shut-off & Lockout Valves

## 1/4" to 1-1/2" port size

Contents



T72

T73

T74

T64

T68

C00

## Excelon T72 Shut-off & Lockout Valves
## 1/4", 3/8" Port Sizes

- **EXCELON design allows in-line installation or modular installation**
- **T72B 2-port/2-position shut-off valves no exhaust**
- **T72T 3-port/2-position shut-off valves with 10-32 tapped exhaust**
- **T72E 3-port/2-position lockout valves help conform to OSHA Lockout Regulations in USA market. Exhaust outlet is not tapped.**
- **Valves can be locked in closed position only**
- **Modular installations with EXCELON 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed have PTF threads.

| Port Size | 2-Port/2-Position No Exhaust Outlet | 3-Port/2-Position (OSHA) Exhaust Port not tapped | 3-Port/2-Position Threaded Exhaust Port | Weight lbs (kg) |
|---|---|---|---|---|
| 1/4" | T72B-2AA-P1N | T72E-2AA-P1N | T72T-2AA-P1N | 0.79 (0.36) |
| 3/8" | T72B-3AA-P1N | T72E-2AA-P1N | T72T-3AA-P1N | 0.86 (0.39) |

**Alternative Models**

T 7 2 ★ - ★ ★ A - P 1 ★

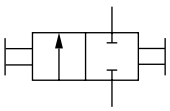
| Valve Type | Substitute |
|---|---|
| 2-port/2-position Black slide, No exhaust outlet | B |
| 3-port/2-position Yellow slide, Unthreaded exhaust outlet | E |
| 3-port/2-position Red slide, Threaded exhaust port | T |

| Options | Substitute |
|---|---|
| None | N |
| T73T with exhaust silencer | S |
| T73T with exhaust diffuser | D |

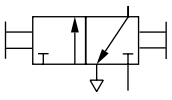
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |

**ISO Symbols**



2-Port/2-Position



3-Port/2-Position

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum Pressure: 250 psig (17 bar)
Operating Temperature*: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Cv factor from IN to OUT ports
- 1/4" ports: 4.0
- 3/8" ports: 8.0

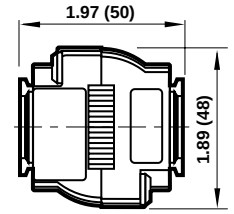
Cv factor from OUT to EXHAUST ports on 3-port/2-position valves: 0.2.
Exhaust port threads on T72T models: 10-32
Hole diameter in slide for padlock: 5/16" (8 mm)
Materials
- Body: Zinc
- Slide: Acetal plastic
- Elastomers: Nitrile

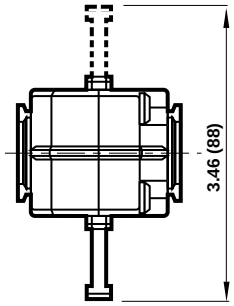
## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Actuator seals and slide | 4384-513 |

Service kit includes actuator seals and slide.

All Dimensions in Inches (mm)



## Excelon T73 Shut-Off & Lockout Valves
## 1/4", 3/8", 1/2" Port Sizes

- **EXCELON design allows in-line or modular installation**
- **T73B 2-port/2-position shut-off valves no exhaust**
- **T73T 3-port/2-position shut-off valves with 10-32 tapped exhaust**
- **T73E 3-port/2-position lockout valves help conform to OSHA Lockout Regulations in USA market. Exhaust outlet is not tapped.**
- **Valves can be locked in closed position only.**
- **Modular installations with EXCELON 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed have PTF parallel threads.

| Port Size | 2-Port/2-Position<br>No exhaust outlet | 3-Port/2-Position<br>Unthreaded exhaust outlet | 3-Port/2-Position<br>Threaded exhaust port | Weight lbs (kg) |
|---|---|---|---|---|
| 1/4" | T73B-2AA-P1N | T73E-2AA-P1N | T73T-2AA-P1N | 0.7 (0.3) |
| 3/8" | T73B-3AA-P1N | T73E-3AA-P1N | T73T-3AA-P1N | 0.7 (0.3) |
| 1/2" | T73B-4AA-P1N | T73E-4AA-P1N | T73T-4AA-P1N | 0.7 (0.3) |

### Alternative Models

T 7 3 ★ - ★ ★ A - P 1 ★

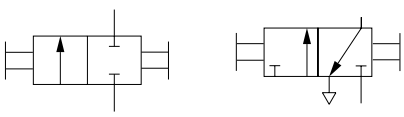
| Valve Type | Substitute |
|---|---|
| 2-port/2-position<br>Black slide, No exhaust outlet | B |
| 3-port/2-position<br>Yellow slide, Unthreaded exhaust outlet | E |
| 3-port/2-position<br>Red slide, Threaded exhaust port | T |

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |
| 1/2″ | 4 |

| Options | Substitute |
|---|---|
| None | N |
| T73T with exhaust silencer | S |
| T73T with exhaust diffuser | D |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO $R_C$ taper | B |
| ISO G parallel | G |

### ISO Symbols



2-Port/2-Position  3-Port/2-Position

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature: -30° to 150°F (-34° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Cv factor
- IN to OUT ports:
  - 1/4″ ports: 4.0
  - 3/8″ ports: 8.0
  - 1/2″ ports: 7.8
- OUT to EXHAUST ports on 3-port/2-position valves: 0.2

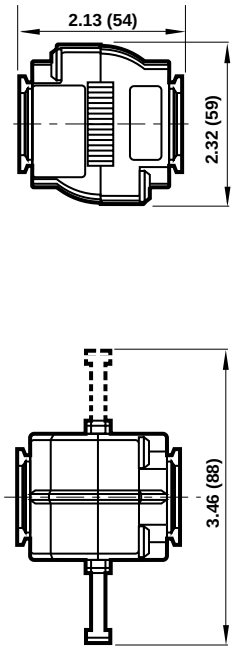
Exhaust port threads on T73T models: 10-32
Hole diameter in slide for padlock: 5/16" (8 mm)
Materials
- Body: Zinc
- Slide: Acetal plastic
- Elastomers: Nitrile

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | T73B (black slide) | 4384-610 |
| | T73E (yellow slide) | 4384-611 |
| | T73T (red slide) | 4384-612 |

Service kit includes seals and slide.

All Dimensions in Inches (mm)



## Excelon T74 Shut-Off & Lockout Valves 3/8", 1/2", 3/4" Port Sizes

- **EXCELON design allows in-line or modular installation**
- **T74B 2-port/2-position shut-off valves no exhaust**
- **T74T 3-port/2-position shut-off valves with 1/8″ tapped exhaust**
- **T74E 3-port/2-position lockout valves help conform to OSHA Lockout Regulations in USA market. Exhaust outlet is not tapped.**
- **Valves can be locked in the closed position only**
- **Modular installations with EXCELON 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed have PTF threads.

| Port Size | 2-Port/2-Position Padlock closed only. No exhaust outlet. | 3-Port/2-Position OSHA Padlock closed only. Unthreaded exhaust outlet. | 3-Port/2-Position Padlock closed only. Threaded exhaust port. | Weight lbs (kg) |
|---|---|---|---|---|
| 3/8" | T74B-3AA-P1N | T74E-3AA-P1N | T74T-3AA-P1N | 0.69 (0.32) |
| 1/2" | T74B-4AA-P1N | T74E-4AA-P1N | T74T-4AA-P1N | 0.65 (0.30) |
| 3/4" | T74B-6AA-P1N | T74E-6AA-P1N | T74T-6AA-P1N | 0.62 (0.28) |

### Alternative Models

T 7 4 ★ - ★ ★ A - P 1 ★

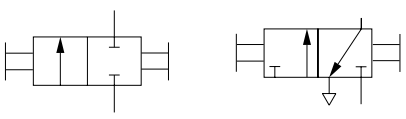
| Valve Type | Substitute |
|---|---|
| 2-port/2-position Black slide, No exhaust outlet | B |
| 3-port/2-position Yellow slide, Unthreaded exhaust outlet | E |
| 3-port/2-position Red slide, Threaded exhaust port | T |

| Options | Substitute |
|---|---|
| None | N |
| Silencer installed in T74T exhaust port | S |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO $R_c$ taper | B |
| ISO G parallel | G |

| Port Size | Substitute |
|---|---|
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |

### ISO Symbols



2-Port/2-Position 3-Port/2-Position

**See Section ALE-24 for Accessories**

## Technical Data

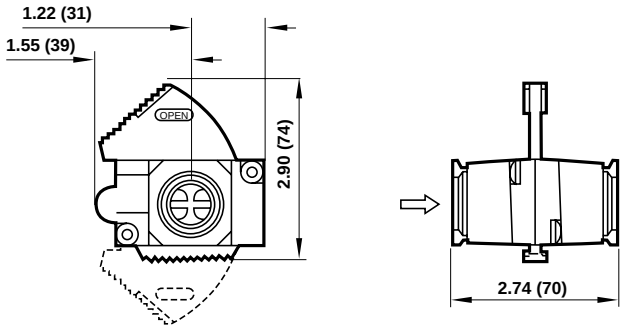
Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Temperature range: -30° to 150°F (-34° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35∞F (2∞C).
Cv factor
IN to OUT ports:
3/8" ports: 7.1
1/2" ports: 8.1
3/4" ports: 7.7
OUT to EXHAUST ports on 3-port/2-position valves: 0.2
Exhaust port threads on T74T models:
1/8 PTF with PTF main ports
1/8" ISO $R_C$ with ISO G and ISO $R_C$ main ports
Hole diameter in slide for padlock: 0.29" (7.5 mm)
Materials
Body: Zinc
Slide: Acetal plastic
Elastomers: Nitrile

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | T74B (black slide) | 4384-711 |
| | T74E (yellow slide) | 4384-710 |
| | T74T (red slide) | 4384-713 |

Service kit includes seals and slide.

All Dimensions in Inches (mm)



## Olympian Plus T64 Shut-off & Lockout Valves 1/4", 3/8", 1/2", 3/4" Port Sizes

- **Olympian Plus plug in design**
- **T64B 2-port/2-position shut-off valves no exhaust**
- **T64T 3-port/2-position shut-off valves with 1/8" tapped exhaust**
- **T64E 3-port/2-position lockout valves help conform to OSHA Lockout Regulations in USA market. Exhaust outlet is not tapped.**
- **Valves can be locked in closed position only**
- **Attaches to yoke, upstream or downstream of air processing units**

**Ordering Information.** Models listed have PTF threads.

| Port Size | 2-Port/2-Position No exhaust outlet | 3-Port/2-Position OSHA Unthreaded exhaust port | 3-Port/2-Position Threaded exhaust port | Weight lbs (kg) |
|---|---|---|---|---|
| 1/4" | T64B-2AB-P1N | T64E-2AB-P1N | T64T-2AB-P1N | 0.89 (0.40) |
| 3/8" | T64B-3AB-P1N | T64E-3AB-P1N | T64T-3AB-P1N | 0.88 (0.40) |
| 1/2" | T64B-4AB-P1N | T64E-4AB-P1N | T64T-4AB-P1N | 0.84 (0.38) |
| 3/4" | T64B-6AB-P1N | T64E-6AB-P1N | T64T-6AB-P1N | 0.84 (0.38) |

### Alternative Models

T 6 4 ★ - ★ ★ ★ - P 1 N

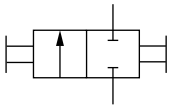
| Valve Type | Substitute |
|---|---|
| 2-port/2-position Black slide, No exhaust outlet | B |
| 3-port/2-position Yellow slide, Unthreaded exhaust outlet | E |
| 3-port/2-position Red slide, Threaded exhaust port | T |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

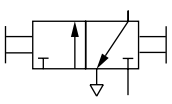
| Porting | Substitute |
|---|---|
| Threaded inlet only | B |
| Threaded outlet only | C |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

### ISO Symbols



2-Port/2-Position



3-Port/2-Position

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Cv factor from IN to OUT ports
- 1/4 port size: 2.6
- 3/8 port size: 5.5
- 1/2 port size: 6.7
- 3/4 port size: 7.5

Exhaust port threads on T64T models:
- 1/8 PTF with PTF main ports
- 1/8 ISO Rc with ISO G and ISO Rc main ports

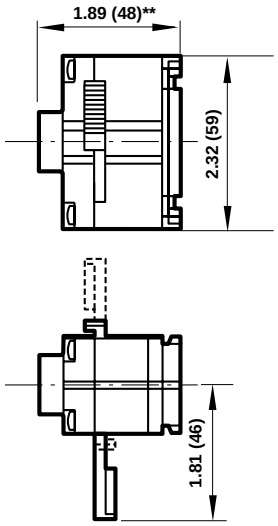
Materials
- Body: Zinc
- Slide: Acetal plastic
- Elastomers: Nitrile

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | T64B (red slide) | 4384-210 |
| | T64E (yellow slide) | 4384-211 |
| | T64T (red slide) | 4384-210 |

Service kit includes seals and slide.

All Dimensions in Inches (mm)




** Models with 3/4" ports

## Olympian Plus T68 Shut-off & Lockout Valves
## 3/4", 1", 1-1/4", 1-1/2" Port Sizes

- **Olympian plug in system**
- **2-port/2-position and 3-port/2-position shut-off valves**
- **Full flow to exhaust obtained with quick 1/4 turn of knob**
- **Ball valve design provides low pressure drop**
- **Can be locked in open or closed position**
- **Models available for attachment to the inlet or outlet end of the yoke**
- **Inline models available**
- **T68E 3-port/2-position lockout valves help conform to OSHA Lockout Regulations in USA market. Exhaust outlet is not tapped.**

**Ordering Information.** Models listed have PTF threads and include screws and seals for yoke connection. Yellow handle locks in closed position.

| Port Size | 3-Port/2-Position, Unthreaded Exhaust Port | Weight lbs (kg) | 2-Port/2-Position No Exhaust Outlet | Weight lbs (kg) |
|---|---|---|---|---|
| 3/4" | T68E-6AB-B2N | 2.21 (1.00) | T68A-6AB-B2N | 2.21 (1.00) |
| 1" | T68E-8AB-B2N | 2.12 (0.96) | T68A-8AB-B2N | 1.92 (0.87) |
| 1-1/4" | T68E-AAB-B2N | 2.07 (0.94) | T68A-AAB-B2N | 2.21 (1.00) |
| 1-1/2" | T68E-BAB-B2N | 2.16 (0.98) | T68A-BAB-B2N | 2.16 (0.98) |

### Alternative Models

T 6 8 ★ - ★ ★ ★ - B 2 ★

| Valve Type | Substitute |
|---|---|
| 2-port/2-position No exhaust outlet. | A |
| 3-port/2-position Unthreaded exhaust. | C |
| 3-port/2-position Yellow handle locks in closed position only. Unthreaded exhaust. | E |
| 3-port/2-position Threaded exhaust port. | H |

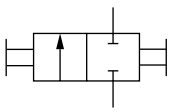
| Options | Substitute |
|---|---|
| None | N |
| Silencer installed in T68H exhaust port | S |

| Porting | Substitute |
|---|---|
| Threaded inlet (upstream) | B |
| Threaded outlet (downstream) | C |
| Inline mounting (Threaded inlet and outlet port) | A |

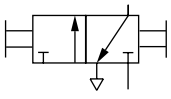
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO $R_C$ taper | B |
| ISO G parallel | G |

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |

### ISO Symbols



2-Port/2-Position



3-Port/2-Position

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air

Maximum pressure: 250 psig (17 bar)

Operating temperature*: 0° to +175°F (-20° to +80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).

Cv factor:

IN to OUT port: 27.5

OUT to EXHAUST port: 0.16

Exhaust port threads on T68H models: 1/4

Materials:

Body: Aluminum

Handle: Zinc

Seals: Nitrile

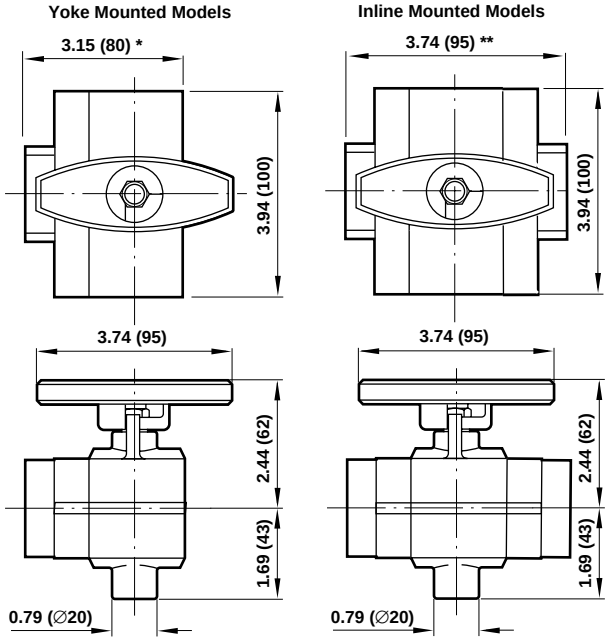
Ball: Brass

## Service Kits

| Item | Part Number |
|---|---|
| Service kit | 4384-300 |

Service kit includes, valve spring, slip ring, valve assembly, diaphragm assembly and necessary seals and 'o' rings.

All Dimensions in Inches (mm)




*** 3.35" (85 mm) for 1-1/2" ported models.**
**** 4.13" (105 mm) for 1-1/2" ported models.**

# Inline Lockout Valves

**For installation in 1/4" through 1-1/2" air lines.**

- **3-way, manually operated, full flow lockout valves can be locked in the closed position with a customer supplied padlock.**
- **In the closed position, these valves shut off the flow of air between the inlet and outlet ports and exhaust the downstream air.**
- **Helps you comply to OSHA regulations, as they relate to OSHA regulation 29 CFR Part 1910, standard for lockout/tagout procedures.**

### Options

C0021A/D and C0023A/D Valves with fluorocarbon elastomers: Specify ***1FA*** after the desired valve model number.

C0022A/D and C0024A/D Valves with fluorocarbon elastomers: Specify ***1EX*** after the desired valve model number.

C0021A/D Valves with tapped muffler base that accepts a muffler with 3/4" NPT male threads: Specify ***1M2*** after the desired valve model number. Recommended muffler:***MB006A***.

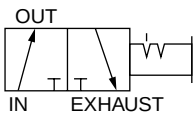
C0022A/D Valves with tapped muffler base that accepts a muffler with 1" NPT male threads: Specify ***1M1*** after the desired valve model number. Recommended muffler ***MB008A***.

Note: Standard valves have a black handle. To order valves with a red handle, change the second position of the model number to an R (e.g., C0021A would change to CR021A).

### Order Information

| Basic Size | Port Size PTF | Model Numbers Without Muffler | Model Numbers With Muffler | Basic Size | Port Size ISO G | Model Numbers Without Muffler | Model Numbers With Muffler | Cv Factor In-Out Ports | Cv Factor Out-Exhaust Ports |
|---|---|---|---|---|---|---|---|---|---|
| 1/2" | 1/4" | C0021A | C0023A | 1/2" | G1/4 | C0041A | C0043A | 4.2 | 6.0 |
| | 3/8" | C0021B | C0023B | | G3/8 | C0041B | C0043B | 6.6 | 6.6 |
| | 1/2" | C0021C | C0023C | | G1/2 | C0041C | C0043C | 9.3 | 7.9 |
| | 3/4" | C0021D | C0023D | | G3/4 | C0041D | C0043D | 12.6 | 8.6 |
| 1" | 3/4" | C0022A | C0024A | 1" | G3/4 | C0042A | C0044A | 10.6 | 8.0 |
| | 1" | C0022B | C0024B | | G1 | C0042B | C0044B | 16.2 | 9.2 |
| | 1-1/4" | C0022C | C0024C | | G1-1/4 | C0042C | C0044C | 25.3 | 8.9 |
| | 1-1/2" | C0022D | C0024D | | – | – | – | 22.4 | 10.0 |

### Graphic Symbol



## Technical Data

Fluid: Compressed air
Maximum Pressure: 300 psig (20.4 bar)
Temperature Range: -20° to 175°F* (-29° to 79°C).
*With a dew point of supply air less than air temperature below 35°F (2°C).
Maximum Diameter of Lock Shackle: 5/16" (8mm)
Materials of Construction
- Valve Body: Aluminum
- Muffler Base: Zinc
- Spool, T-Handle, Muffler Shell: Aluminum
- Spring Detent: Stainless Steel
- Elastomers
  - Standard: Nitrile and Polyurethane
  - Optional: Fluorocarbon

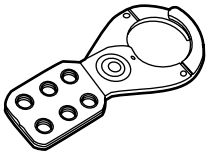
Repair Kits
C0021A/D and C0023A/D Valves:
- Standard Elastomers: 53474-43
- Fluorocarbon Elastomers: 53474-44

C0022A/D and C0024A/D Valves:
- Standard Elastomers: 53475-34
- Fluorocarbon Elastomers: 53475-36

Replacement Mufflers* for C0021A/C0024D Valves
- C0021A/D and C0023A/D Valves: ML004F
- C0022A/D and C0024A/D Valves: ML008F

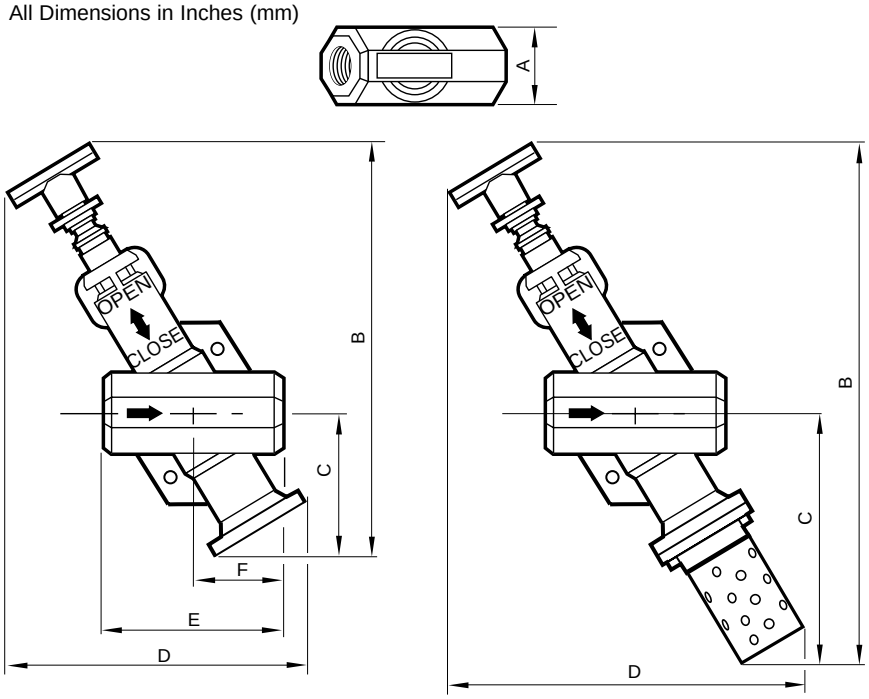
*Contains all bolts and washers required to flange mount with the respective sized lockout valve.
Lockout Hasp
- Part Number: 54547-01

The 1-1/2" diameter jaws can be used with all Norgren Inline, Olympian, and Poppet Lockout Valves except the T15. High-tensile steel affords extra protection against unauthorized access. Red vinyl coated and plated to resist rust. Locking holes accommodate padlocks up to 11/32" shackle diameter.



Lockout Hasp

All Dimensions in Inches (mm)




| Valve Type | A | B Without Muffler | B With Muffler | C Without Muffler | C With Muffler | D Without Muffler | D With Muffler | E | F |
|---|---|---|---|---|---|---|---|---|---|
| All 1/2" basic | 1.87 (48) | 9.33 (237) | 11.78 (299) | 2.90 (74) | 5.35 (136) | 6.97 (177) | 7.97 (202) | 4.00 (102) | 2.00 (51) |
| All 1" basic | 2.26 (57) | 12.07 (307) | 15.72 (399) | 4.13 (105) | 7.78 (198) | 8.65 (220) | 10.46 (266) | 5.00 (127) | 2.50 (64) |

1.3.1 What Options are Available?

The Olympian 1" product line has a ball valve (T15), but recent products have moved to the slide type. They are generally available in 2/2 (non-exhausting) and 3/2 types, for use upstream or optionally downstream of FRL units.

1.3.2 Can they be Locked?

All the slide valves in Excelon and Olympian Plus can be locked closed using the padlock hole provided in the blade. For certain applications where it is vital that the air is not turned off, a lock open and closed option is possible (eg T64A or T64C). The T15 can be locked by dropping in the lock ring and fitting a padlock.

1.3.3 What is Patented about the T64/T74?

The design of a slide valve where the exhaust air is captured rather than venting to atmosphere past the slide is the patented feature.

1.3.4 Why are the Blades Different Colors?

The colour of the slide depends on the valve function and the market in which it is sold.
Yellow = 3/2 exhaust not tapped OSHA (USA)
Black = 2/2 Excelon 74
Red = 3/2 exhaust tapped (Europe)

1.3.5 Do we have Downstream Shut Off Valves?

Yes. The Excelon valves can be used either upstream or downstream, and will always vent the downstream system. In Olympian Plus you need to use a special downstream version.

1.3.6 Is there a Shut Off which Fits Between Yokes in Olympian Plus?

Yes. This can be used within a build, or in Duplex assemblies.

1.3.7 Can I Use an Upstream Shut Off Downstream?

The Excelon family valves can be used either upstream or downstream. If used downstream, remember that the FRL units remain pressurized - the valve vents the downstream system.

There are special versions of the Olympian Plus and 15 Series valves for downstream use.

# Stainless Steel Products

## Products for use in offshore, instrumentation, and compatiblity applications.

Contents




F22

R05

R22

R38

B05


B38

L22

# F22

**Stainless Steel Filter**
**1/2 PTF**

- **Designed for use in corrosive environments**
- **Metallic parts meet NACE† Standard MR-01-75***
- **Provides effective liquid removal and positive solid filtration**
- **Large filter element area for minimum pressure drop**
- **Automatic Drain is operated by liquid level and also opens upon depressurization**
- **Meets certain requirements of Military Specifications****


* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.

** Meets certain requirements of MIL-S-901C (Navy) 15 Jan 1963: Military Specifications Shock Test H.I. (High Impact); Shipboard Machinery, Equipment and Systems and MIL-STD-167-1 (Ships) Military Standard Mechanical Vibrations of Shipboard Equipment.

**Ordering Information.** Model listed has PTF threads, automatic drain and 25 µm element.

| Port Size | Model Number | Flow† scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| 1/2 PTF | F22-405-A2DA | 98 (46) | 4.18 (1.88) |

† Typical flow with 25 µm element at 90 psig (6.3 bar) inlet pressure, and 5 psig (0.35 bar) pressure drop.

## Alternative Models

F 2 2 - ★ 0 ★ - ★ ★ D ★

| Port Size | Substitute |
|---|---|
| 1/2" | 4 |
| Special | 6** |

| Modification | Substitute |
|---|---|
| 1/8" thread auto-drain fitting | 0 |
| 1/4" thread auto-drain fitting | 5 |
| Special | 7** |

| Thread | Substitute |
|---|---|
| PTF | A |
| ISO G | D |
| Special | S** |

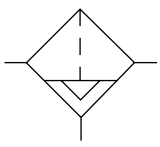
| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |

| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

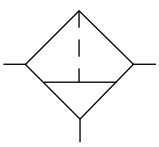
** 3/4″ body (3/4 x 16 UNF) F22-**6**X**7**-XXX**S**

Please contact our technical service for details of non standard models.

## ISO Symbols



Automatic Drain



Manual Drain

**See Section ALE-24 for Accessories**

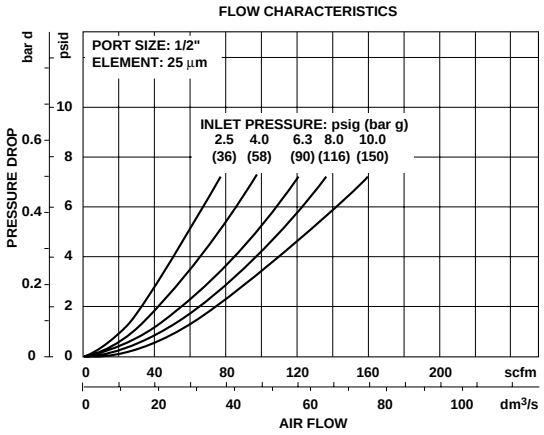
## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature: 0° to 175°F (-20° to 80°C) *
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal:
- 25 µm standard
- 5 µm optional

Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with 25 µm element at 90 psig (6.3 bar) inlet pressure, and 5 psig (0.35 bar) pressure droop: 98 scfm (46 dm³/s)
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 dm³/s)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 8 fluid ounce (0.24 liter)
Materials
- Body: Stainless steel
- Bowl: Stainless steel
- Element: Sintered stainless steel
- Elastomers: Synthetic rubber

## Typical Performance Characteristics

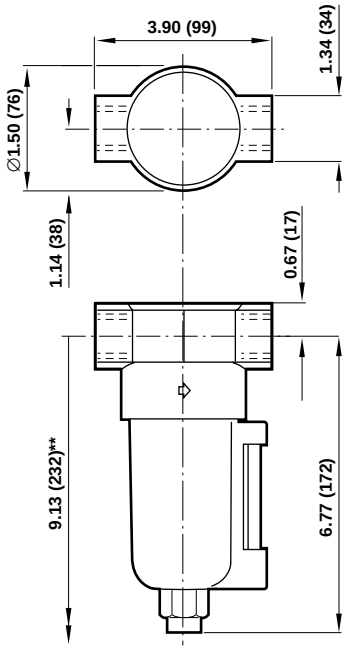



## Service Kits

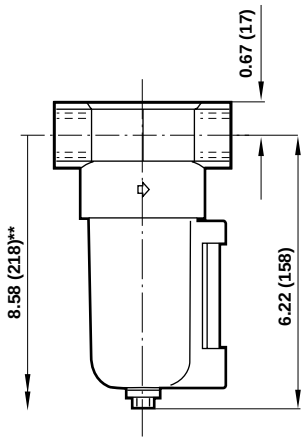
| Item | Type | Part number |
|---|---|---|
| Service kits | 25 µm, automatic drain | F22-100A |
| | 5 µm, automatic drain | F22-100A(5) |
| | 25 µm, manual drain | F22-100M |
| | 5 µm, manual drain | F22-100M(5) |
| Replacement drains | Automatic | 3000-87 |
| | Manual | 2273-18 |
| Service kit | Orientable metal bowl | 5860-RK |

Service kits include o-rings, gaskets, specified filter elements, drain strainer and strainer cap.

All Dimensions in Inches (mm)




Automatic Drain




Manual Drain

**Minimum clearance required to remove bowl

# R05

## Miniature Stainless Steel Regulator
## 1/4" PTF Ports

- **Designed for use in corrosive environments**
- **Metallic parts meet NACE Standard MR-01-75***
- **Applications include marine environments, oil and gas production, chemical and food processing, medical analysis**
- **Relieving or non relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Can be disassembled without the use of tools or removal from the air line**

* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.

**Ordering Information.** Model listed is relieving type with 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range** and PTF threads. A gauge is not included.

| Port Size | Model | Flow† scfm ($dm^3/s$) | Weight lb (kg) |
|---|---|---|---|
| 1/4" PTF | R05-200-RNLA | 7 (3.3) | 0.41 (0.19) |

**Alternative Models**

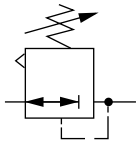
R 0 5 - 2 0 0 - ★ N ★ A

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 125 psig (0.3 to 8.5 bar) | L |

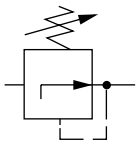
| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

† Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.
** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**ISO Symbols**



Relieving



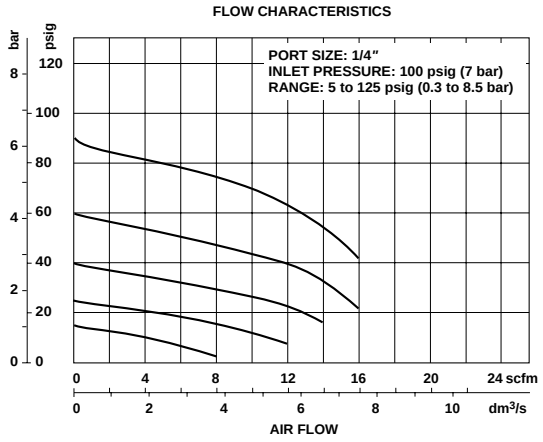
Non Relieving

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature: -30° to 150°F (-34° to 66°C) *
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 7 scfm (3.3 $dm^3/s$)
Gauge ports:
1/8 PTF
Materials
Body: 316 stainless steel
Bonnet: Acetal with stainless steel adjusting screw
Valve: Stainless steel with fluorocarbon elastomer
Valve seat: Acetal
Springs: Stainless steel
Elastomers: Fluorocarbon

## Typical Performance Characteristics

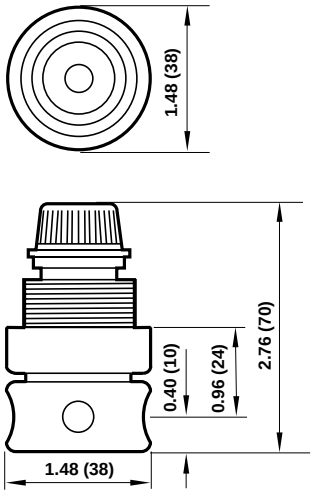



## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Relieving | 3407-71 |
| | Non relieving | 3407-72 |

Service kit includes slip ring, diaphragm, valve seat with seal, valve, valve spring.

All Dimensions in Inches (mm)




Panel mounting hole diameter: 1.19" (30 mm)
Panel thickness: 25" (6 mm)

## R22 Stainless Steel Regulator
## 1/2 PTF

- **Designed for use in corrosive environments**
- **Metallic parts meet NACE Standard MR-01-75***
- **Compact instrument units with high performance**
- **Stable regulation and temperature compensation**
- **Excellent flow and regulation characteristics**

* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.

**Ordering Information.** Models listed have T-handle adjustment, relieving diaphragm, 5 to 150 psig (0.4 to 10 bar) outlet pressure adjustment range and PTF threads. A gauge is not included.

| Port Size | Model Number | Flow** scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| 1/2 PTF | R22-401-RNMA | 106 (50) | 3.35 (1.52) |

** Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3) set pressure, and a 15 psig (1 bar) droop from set.

### Alternative Models

R 2 2 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/2″ | 4 |
| Special** | 6 |

| Option | Substitute |
|---|---|
| Standard | 0 |
| Oxygen degreased | 1 |

| Modification | Substitute |
|---|---|
| T-handle adjustment | 1 |
| Plastic handwheel | 5 |
| Viton plastic handwheel | 6 |
| Special plastic handwheel** | 7 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO G | D |
| Special** | S |

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 5 to 150 psig (0.3 to 10 bar) | M |
| 5 to 60 psig (0.3 to 4 bar) | F |
| 10 to 250 psig (0.7 to 17 bar) | S |

| Gauges | Substitute |
|---|---|
| Without | N |

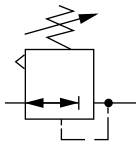
| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

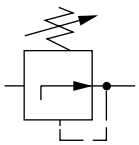
** 3/4″ body (3/4 x 16 UNF) R22-**6**X**7**-XXX**S**

Please contact our technical service for details of non standard models including maximum pressure stop, etc.

### ISO Symbols



Relieving



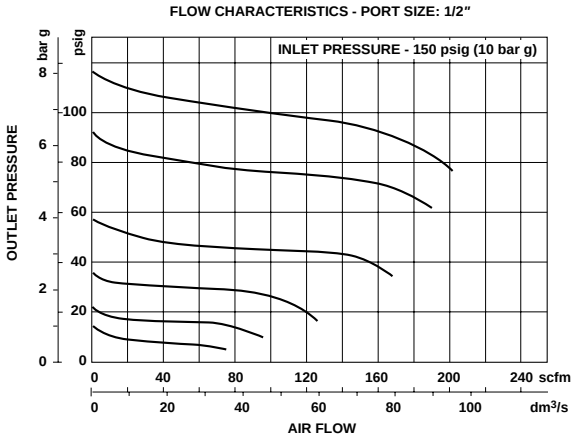
Non Relieving

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 290 psig (20 bar)
Operating temperature: -4° to 175°F (-20° to 80°C) *
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Typical flow with 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 106 scfm (50 $dm^3/s$)
Gauge ports:
1/4 PTF
Materials
Body: Stainless steel
Bonnet: Stainless steel
Adjusting screw: Stainless steel
Elastomers: Synthetic rubber

## Typical Performance Characteristics

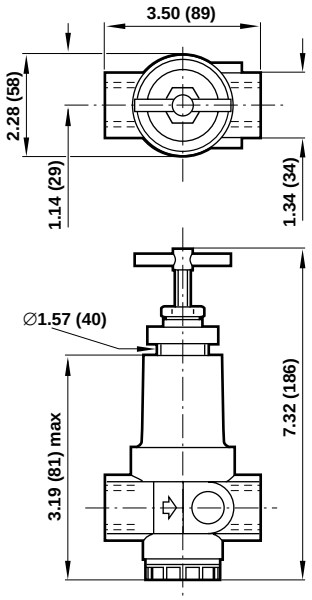



## Standard Service Kits

| Type | Part number |
|---|---|
| Relieving | R22-100R |
| Non relieving | R22-100NR |
| Viton relieving | 5550-26 |
| Viton non relieving | 5550-29 |

Service kits includes diaphragm assembly, o-ring, valve, valve spring.

All Dimensions in Inches (mm)




Panel mounting hole diameter: 1.65" (42 mm)
Maximum Panel thickness: 0.37" (9.5 mm)

# R38

## Stainless Steel Instrument Regulator
## 1/4 NPT

- **Compact instrument units with high performance**
- **Stable regulation with temperature compensation**
- **Excellent flow and regulation characteristics**
- **Panel Mounting facility**
- **Designed for use in corrosive environments**
- **Metallic parts meet NACE Standard MR-01-75***
- **Applications include marine environments, oil and gas production, chemical and food processing, medical analysis**
- **Relieving or non relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended**

* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.

**Ordering Information.** Models listed are relieving type with 0.6 to 30 psig (0.04 to 2 bar) outlet pressure adjustment range **, and PTF threads. A gauge is not included.

| Port Size | Model Number | Flow† scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| 1/4" PTF | R38-240-RNCA | 17 (8) | 1.56 (0.71) |

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Typical flow with 100 psig (7 bar) inlet pressure, 15 psig (1 bar) set pressure and 1 psig (0.05 bar) droop from set.

R 3 8 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" PTF | 2 |

| Materials | Substitute |
|---|---|
| Stainless Steel, nitrile elastomers | 4 |
| Stainless Steel, Viton elastomers | 5 |
| Stainless Steel, fluorosilicon elastomers | 6 |

| Mounting Option | Substitute |
|---|---|
| Without | 0 |
| With bracket and nut | 1 |
| With panel nut only | 2 |
| With handwheel and nut | 3 |
| With handwheel, bracket and nut | 4 |
| With handwheel only | 5 |

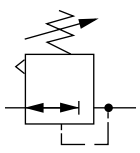
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | D |
| API.LP.INT | K |

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 0.6 to 30 psig (0.04 to 2 bar) | C |
| 1 to 60 psig (0.07 to 4 bar) | F |
| 3.6 to 100 psig (0.25 to 7 bar) | K |
| 7.2 to 150 psig (0.50 to 10 bar) | M |

| Gauges | Substitute |
|---|---|
| Without | N |

| Diaphragm | Substitute |
|---|---|
| Relieving | R |
| Non relieving | N |

**ISO Symbol**



**See Section ALE-24 for Accessories**

## Technical Data

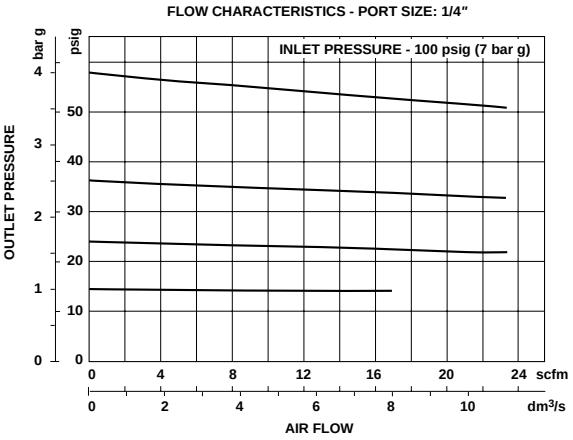
Fluid: Compressed air
Maximum pressure: 451 psig (31 bar)
Operating temperature: -40° to 175°F (-40° to 80°C) *

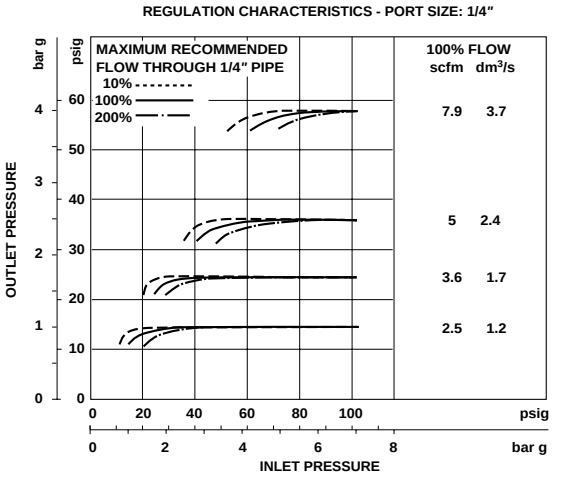
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Typical flow at 100 psig (7 bar) inlet pressure, 15 psig (1 bar) set pressure and a droop of 1 psig (0.07 bar) from set: 17 scfm (8 $dm^3/s$)
Typical relief differential at 30 psig (2 bar) outlet pressure: 2.3 psig (0.16 bar)
Maximum bleed flow at 30 psig (2 bar) outlet pressure (relieving types only): 0.003 scfm (1.5 $cm^3/s$)†
Gauge ports: 1/4" PTF
Relief Port: 1/8" PTF
Materials
- Body: Stainless steel
- Bonnet: Stainless steel
- Adjusting screw: Stainless steel
- Elastomeric materials: Synthetic rubber

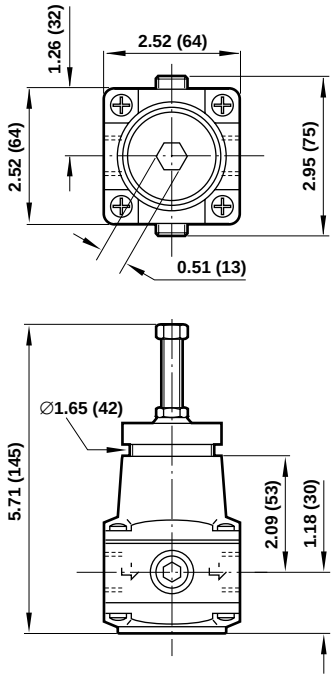
† Maximum bleed rate occurs under dead-end (no flow) conditions.

## Typical Performance Characteristics




All Dimensions in Inches (mm)




Panel mounting hole diameter: 1.65" (42 mm)
Maximum panel thickness: 0.24" (6 mm)

## Service Kits

| Item | Type | Part number |
|---|---|---|
| 30 psig (2 bar) range | Relieving | R38-100-R |
| | Non relieving | R38-100-NR |
| 60 & 100 psig (4 & 7 bar) range | Relieving | R38-101-R |
| | Non relieving | R38-101-NR |
| 150 psig (10 bar) range | Relieving | R38-102-R |
| | Non relieving | R38-102-NR |

Service kits includes diaphragm assembly, o-ring, valve, valve spring and 8 pan head screws.

# Miniature Stainless Steel Filter/Regulator 1/4 PTF Ports

- **Designed to filter and regulate compressed air in corrosive environments**
- **Metallic parts meet NACE Standard MR-01-75***
- **Applications include marine environments, oil and gas production, chemical and food processing, medical analysis**
- **Relieving or non relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended**
- **Can be disassembled without the use of tools or removal from the air line**

* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.


**Ordering Information.** Model listed includes a relieving diaphragm, manual drain, 40 µm element, 5 to 125 psig (0.3 to 8.5 bar) outlet pressure adjustment range** and PTF threads. A gauge is not included.

| Port Size | Model | Flow† scfm (dm³/s) | Weight lb (kg) |
|---|---|---|---|
| 1/4 PTF | B05-233-M2LA | 7 (3.3) | 0.99 (0.45) |

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.
† Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and 15 psig (1 bar) droop from set.

## Alternative Models

B 0 5 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |

| Diaphragm | Substitute |
|---|---|
| Relieving | 33 |
| Non relieving | 35 |

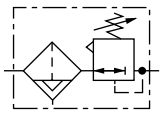
| Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

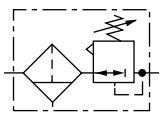
| Threads | Substitute |
|---|---|
| PTF | A |

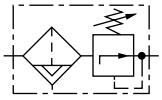
| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 5 to 50 psig (0.3 to 3.5 bar) | E |
| 5 to 125 psig (0.3 to 8.5 bar) | L |

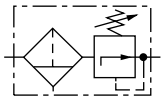
| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 40 µm | 2 |

## ISO Symbols


Automatic Drain, Relieving


Manual Drain, Relieving


Automatic Drain, Non-Relieving

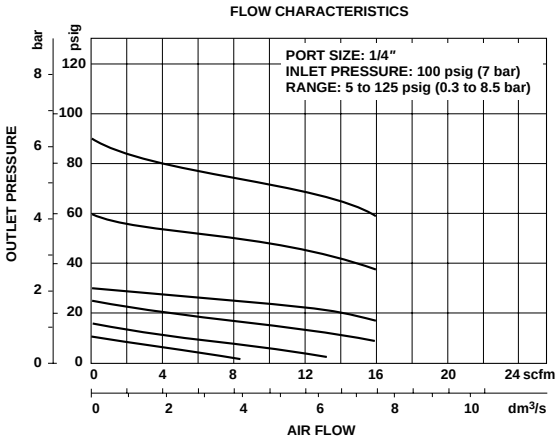

Manual Drain, Non-Relieving

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature: -30° to 150°F (-34° to 66°C) *
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
Particle removal: 5 µm or 40 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set: 7 scfm (3.3 $dm^3/s$)
Nominal bowl size: 1 fluid ounce (31 ml)
Gauge ports: 1/8 PTF
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread.
Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.
Materials
- Body and bowl: 316 stainless steel
- Bonnet: Acetal with stainless steel adjusting screw
- Valve: Stainless steel with fluorocarbon elastomer
- Valve seat: Acetal
- Springs: Stainless steel
- Drain: Acetal
- Element: Sintered polypropylene
- Elastomers: Fluorocarbon

## Typical Performance Characteristics

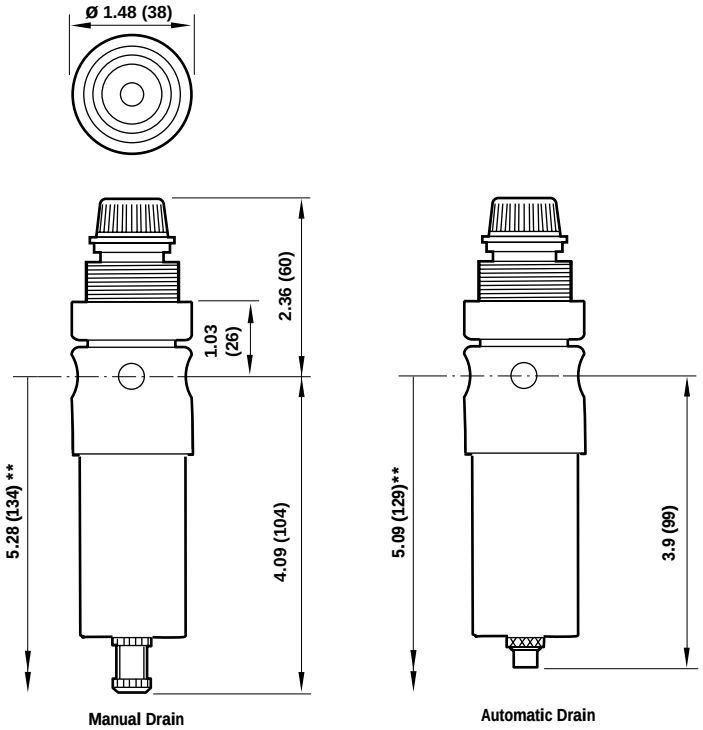



## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Relieving | 3820-08 |
| | Non relieving | 3820-09 |
| Drain | Manual | 684-51 |

Service kit includes diaphragm, seals, o-rings, and valve.

All Dimensions in Inches (mm)




**** Minimum clearance required to remove bowl.**
Panel mounting hole diameter: 1.19" (30 mm)
Panel thickness: 25" (6 mm)

# Filter/Regulator Stainless Steel Model 1/4 or 1/2" PTF

- **Compact instrument units with high performance**
- **Stable regulation with temperature compensation**
- **Excellent flow and regulation characteristics**
- **Panel Mounting facility**
- **Designed for use in corrosive environments**
- **Metallic parts meet NACE Standard MR-01-75***
- **Applications include marine environments, oil and gas production, chemical and food processing, medical analysis**
- **Relieving or non relieving models. Relieving models allow reduction of outlet pressure even when the system is dead-ended**

* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.


**Ordering Information.** Models listed are relieving type with manual drain, 5µm element, and PTF threads. A gauge is not included.

| Port Size | Model Number | Outlet pressure range psig (bar) | Flow** scfm ($dm^3/s$) | Weight kg (lbs) |
|---|---|---|---|---|
| 1/4" PTF | B38-240-B1KA | 4 to 100 (0.3 to 7) | 15 (7) | 3.11 (1.4) |
| 1/2" PTF | B38-440-M1LA | 4 to 125 (0.3 to 9) | 106 (50) | 4.75 (2.2) |

** Typical flow with 175 psig (12 bar) inlet pressure, 115 psig (8 bar) set pressure and 15 psig (1 bar) droop from set.

## Alternative Models

B 3 8 - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" PTF | 2 |
| 1/2" PTF | 4 |

| Materials | Substitute |
|---|---|
| Stainless steel, nitrile elastomers | 4 |
| Stainless steel, Viton elastomers | 5 † |

| Diaphragm | Substitute |
|---|---|
| Relieving | 0 |
| Non relieving | 1 |
| Relieving, bracket and nut | 2 |
| Non relieving, bracket and nut | 3 |
| Relieving with nut | 4 |
| Non relieving with nut | 5 |
| Relieving with handwheel and nut | 6 |
| Non relieving with handwheel and nut | 7 |
| Relieving with handwheel, bracket and nut | 8 |
| Non relieving with handwheel, bracket and nut | 9 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | D |
| API.LP.INT | K |

| Outlet Pressure Adjustment Ranges* | Substitute |
|---|---|
| 0.6 to 30 psig (0.04 to 2 bar) | C |
| 1 to 60 psig (0.07 to 4 bar) | F |
| 3.6 to 100 psig (0.25 to 7 bar) | K † |
| 4 to 125 psig (0.3 to 9 bar) | L †† |
| 7.2 to 150 psig (0.5 to 10 bar) | M † |
| 10 to 250 psig (0.7 to 17 bar) | S †† |

| Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |

| Bowl/Drain | Substitute |
|---|---|
| Long bowl with automatic drain | A |
| Short bowl with manual drain | B |
| Long bowl with manual drain | M |

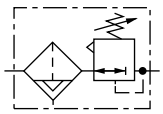
* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† 1/4" ported units only.

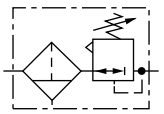
†† 1/2" ported units only.

**See Section ALE-24 for Accessories**

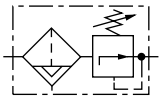
## ISO Symbols



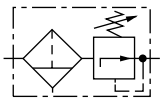
Automatic Drain, Relieving



Manual Drain, Relieving



Automatic Drain, Non Relieving



Manual Drain, Non Relieving

## Technical Data

Fluid: Compressed air
Maximum pressure
- Manual drain: 450 psig (31 bar)
- Automatic drain: 250 psig (17 bar)

Operating temperature: -40° to 175°F (-40° to 80°C) *
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: 5 µm or 25 µm filter element
Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)
Typical flow with 175 psig (12 bar) inlet pressure, 115 psig (8 bar) set pressure and a droop of 15 psig (1.0 bar) from set
- 1/4": 15 scfm (7 $dm^3/s$)
- 1/2": 106 scfm (50 $dm^3/s$)

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain 2 scfm (1 $dm^3/s$)

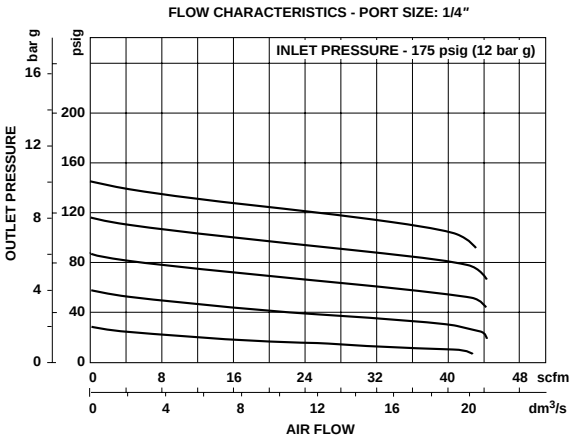
Nominal bowl size
- Short bowl with manual drain: 25 ml (1 fluid ounce)
- Long bowl with manual drain: 3 fluid ounce (90 ml)
- Long bowl with automatic drain: 1 fluid ounce (25 ml)

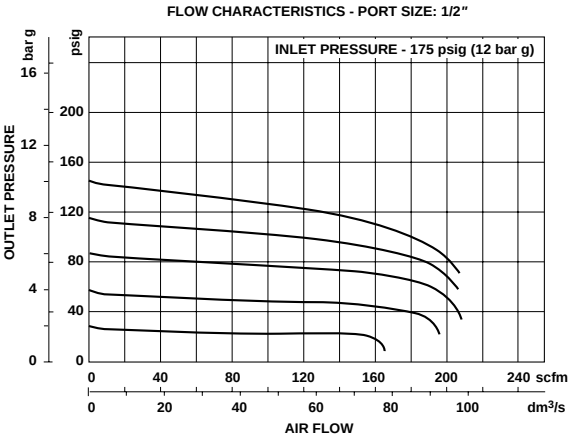
Gauge ports:
- 1/4" PTF

Relief port:
- 1/8" PTF

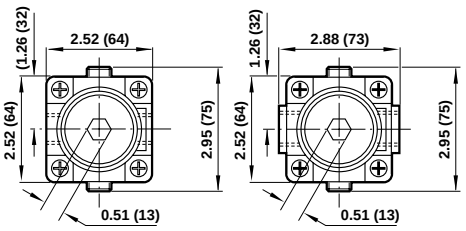
Materials (standard option)
- Body: Stainless steel
- Bonnet: Stainless steel
- Bowl: Stainless steel
- Adjusting screw: Stainless steel
- Elements
  - 5 µm & 25 µm: High density polyethylene
  - 1/4" only 5 µm: Ceramic pyrolith
- Elastomeric materials: Synthetic rubber

## Typical Performance Characteristics

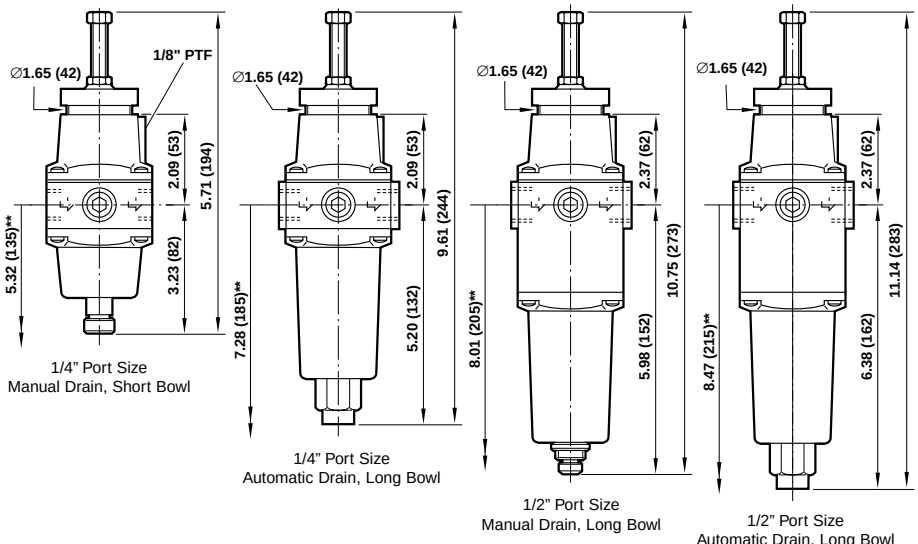



All Dimensions in Inches (mm)




Panel mounting hole diameter: 1.65" (42 mm)
Maximum panel thickness: 0.24" (6 mm)




** Minimum clearance required to remove bowl.

## Service Kits (standard option)

### 1/4" Filter

| Item | Part number |
|---|---|
| 5 µm | B38-100A (5) |
| 25 µm | B38-100S (25) |

### 1/2" Filter

| Item | Part number |
|---|---|
| 5 µm | 2787-43 |
| 25 µm | 2787-44 |

Filter service kits include element, seals and screws.

### Automatic Drain Assembly

| Item | Part number |
|---|---|
| Automatic Drain Assembly | 3000-90 |

### 1/4" Regulator

| Item | Type | Part number |
|---|---|---|
| 30 psig spring | Relieving | R38-100R |
| | Non relieving | R38-100NR |
| 60 & 100 psig spring | Relieving | R38-101R |
| | Non relieving | R38-101NR |
| 150 psig spring | Relieving | R38-102R |
| | Non relieving | R38-102NR |

### 1/2" Regulator

| Item | Type | Part number |
|---|---|---|
| All available spring ranges | Relieving | 2787-41 |
| | Non relieving | 2787-42 |

Regulator service kits include diaphragm assembly, o-ring,valve, valve spring and 8 pan head screws.

## L22 Stainless Steel Oil-Fog Lubricator
## 1/2 PTF

- **Metallic parts meet NACE Standard MR-01-75***
- **Low flow start point**
- **Built-in flow sensor gives almost constant oil/air ratio over a wide range of flows**
- **Can be filled under pressure**
- **Simple and accurate drip rate adjustment**
- **Ideal for general lubrication applications**
- **Meets certain requirements of Military Specifications****

* National Association of Corrosion Engineers (NACE) MR-01-75 defines requirements for sulphide stress cracking resistant materials used in well-head and other corrosive environments.

** Meets certain requirements of MIL-S-901C (Navy) 15 Jan 1963: Military Specifications Shock Test H.I. (High Impact); Shipboard Machinery, Equipment and Systems and MIL-STD-167-1 (Ships) Military Standard Mechanical Vibrations of Shipboard Equipment.

**Ordering Information.** Models listed are oil-fog units with closed bowl (no drain) and PTF threads.

| Type | Model Number | Flow† scfm ($dm^3/s$) | Weight lbs (kg) |
|---|---|---|---|
| Oil-Fog | L22-405-OP8A | 102 scfm (48 $dm^3/s$) | 4.29 (1.93) |

†Typical flow with 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop.

### Alternative Models

L 2 2 - ★ 0 ★ - O P ★ ★

| Port Size | Substitute |
|---|---|
| 1/2″ | 4 |
| Special | 6** |

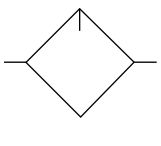
| Modification | Substitute |
|---|---|
| Closed bowl | 0 |
| Plugged closed bowl | 5 |
| Special | 7* |

| Thread | Substitute |
|---|---|
| PTF | A |
| ISO G | D |
| Special | S* |

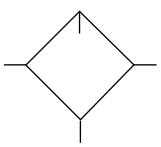
| Bowl | Substitute |
|---|---|
| Closed bowl | 8 |
| Manual drain | D |

** 3/4″ body (3/4 x 16 UNF) L22-**6**X**7**-OPX**S**

### ISO Symbols



No Drain



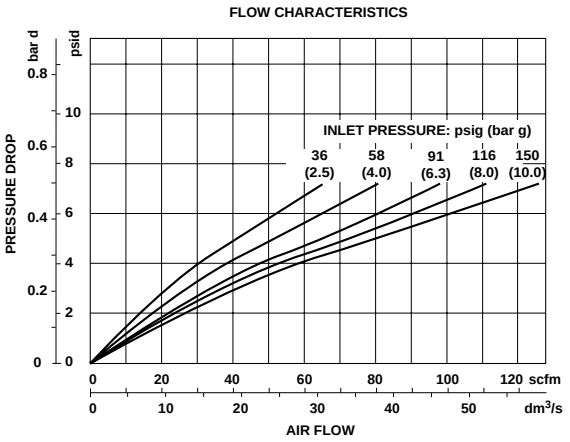
With Drain

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature: -4° to 175°F (-20° to 80°C)*
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C ).
Start point (i.e. minimum flow required for lubricator operation) at 90 psig (6.3 bar) inlet pressure:
3.5 scfm (1.7 dm³/s)
Typical flow with 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop:
102 scfm (48 dm³/s)
Nominal bowl size:
7 fluid ounce (0.2 liter)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Recommended lubricants: See Section ALE-29.
Materials:
Body: Stainless steel
Bowl: Stainless steel
Elastomers: Synthetic rubber

## Typical Performance Characteristics

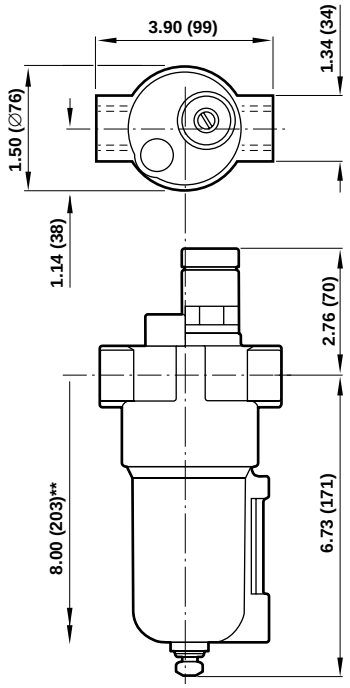



## Service Kits

| Item | Part number |
|---|---|
| Service kit | L22-100A |

Service kits includes all seals, check valve ball and spring, sight dome and filter plug assemblies.

All Dimensions in Inches (mm)




**** Minimum clearance required to remove bowl.**

# Valves

## Smooth Start, Soft Start/Exhaust, Directional Control, Directional Control with Lockout 1/4" to 1-1/2" Port Sizes



**P72E**

**P74E**

**P72C**
**P72F**

**P74 Air Operated**

**P74F**

**P74 Solenoid Operated**

**P74 Solenoid w/lockout**

**P64 Soft Start/ Dump**

**P68F Smooth Start/ Exhaust Valve**

# P72E

## Excelon 72 Smooth Start Valves
## 1/4", 3/8" Port Sizes

- **Excelon design allows in-line or modular installation**
- **High-flow, spring return, 2 port/2 position normally closed valves**
- **Reduces rate of downstream air pressure buildup at system start up**
- **Cylinders and other air operated devices are eased into normal starting positions, reducing the possibility of equipment damage and hazards to the user.**
- **Adjustable rate of pressure increase**
- **Cushioned poppets for long service life**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed are with PTF threads.

| Port Size | Model | Weight lb (kg) |
|---|---|---|
| 1/4" | P72E-2AN-NNN | 1.86 (0.84) |
| 3/8" | P72E-3AN-NNN | 1.80 (0.82) |

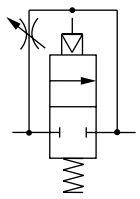
**Alternative Models**

P 7 2 E - ★ ★ N - N N N

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G taper | G |

**ISO Symbol**



**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Minimum operating pressure: 44 psig (3 bar)
Temperature range*: -0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formaton at temperatures below 35°F (2°C).

Ports:
- PTF ports
- ISO G ports
- ISO Rc ports

Maximum flow with 90 psig (6.3 bar) inlet pressure and pressure drop of 7 psig (0.5 bar): 45 scfm (21 $dm^3/s$)

Snap pressure:
- Full flow when downstream pressure reaches 50 – 80% of inlet pressure

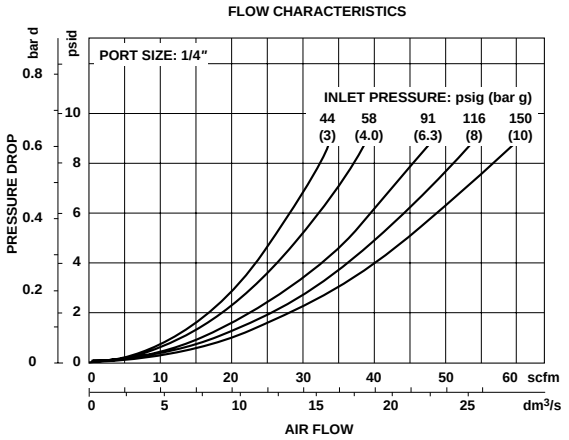
Charge time:
- For 0.53 gallon US (2 liter) downstream volume and 90 psig (6.3 bar) inlet pressure
- 0.8 sec. minimum
- 76 sec. maximum

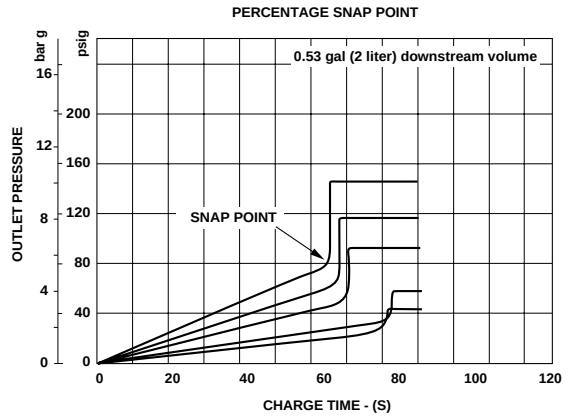
Average flow factor (Cv): 1.35

Materials
- Body: Zinc alloy
- Elastomers: Synthetic materials
- Internal components: Brass/steel

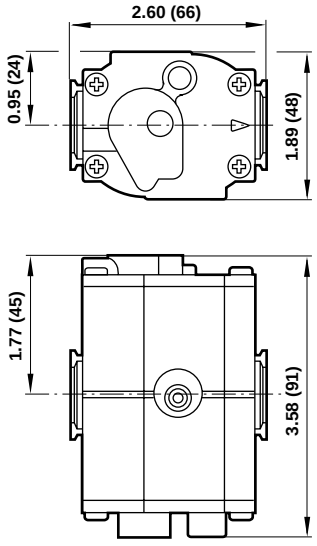
Note: Smooth start valves never shut off completely, and must be installed downstream of a directional control valve such as a Norgren Poppet or Lockout Valve.

## Ordering Information




All Dimensions in Inches (mm)



# P74E

**Excelon 74 Smooth Start Valves**
**Unthreaded Ports, 1/2" Basic Size**

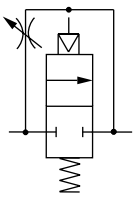
- **Modular installation only**
- **High-flow, spring return, 2-port/2-position normally closed valves.**
- **Reduces rate of downstream air pressure buildup at system start up**
- **Cylinders and other air operated devices are eased into normal starting positions, reducing the possibility of equipment damage and hazards to the user.**
- **Adjustable rate of pressure increase**
- **Cushioned poppets for long service life**

**Ordering Information**

| Installation Type | 2 Port/2 Position Normally Closed | Weight lb (kg) |
|---|---|---|
| Modular | P74E-NNN-NNN | 1.17 (0.53) |

* Valve ports are unthreaded. To install in air line use Quikclamp™ and Quikclamp pipe adapters or connect to other Excelon 74 units.

**ISO Symbol**



**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Filtered and lubricated compressed air
Inlet pressure range: 30 to 250 psig (2 to 17 bar)
Temperature range*: -20° to 175°F (-30° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Time delay: Application of full downstream pressure can be delayed for as long as 50 seconds, depending on the setting of the adjustable needle valve and downstream air volume.
Average flow factor (Cv): 4.0
Materials:
Body: Zinc
Pistons, poppets: Aluminum
Elastomers: Nitrile

Note: Smooth start valves never shut off completely, and must be installed downstream of a directional control valve such as a Norgren Poppet or Lockout Valve.

## Service Kit

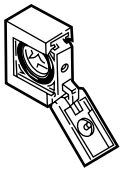
| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & Gasket | 53474-37 |
| Quikclamp service kit | 2 o-rings | 4384-770 |

Service kit includes all o-rings, head gasket and seals.

## Modular Components (necessary for using this valve)

Quikmount Pipe Adapters (each kit contains one adapter) **

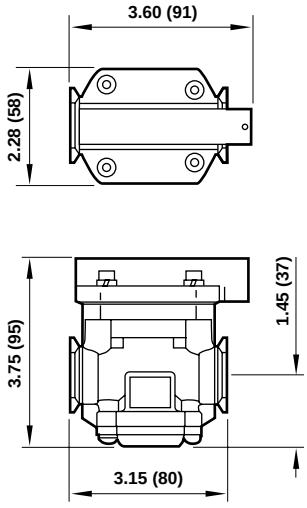
| Size | PTF Threads | ISO Rc Threads | ISO G Threads |
|---|---|---|---|
| 1/4" | 4315-01 | 4315-05 | 4315-09 |
| 3/8" | 4315-01 | 4315-06 | 4315-10 |
| 1/2" | 4315-03 | 4315-07 | 4315-11 |
| 3/4" | 4315-04 | 4315-08 | 4315-12 |



Quikclamp †
4314-51

** Each pipe adapter adds 0.71" (18 mm) to the overall length of a valve.
† Each Quikclamp adds 0.7" (13.6 mm) to the overall length of a valve.

All Dimensions in Inches (mm)



# P72F

## Excelon 72 Smooth Start/Exhaust Valve 1/4", 3/8" Port Sizes

- **Excelon design allows in-line or modular installation**
- **Controls increase of downstream pressure on start up. Cylinders and other air operated devices are eased into normal operating positions, reducing the possibility of equipment damage and hazards to the user.**
- **3 port/2 position, normally closed, soft start valve**
- **Blocks inlet air and exhausts downstream air when pilot signal is removed**
- **Solenoid pilot or air pilot operation**
- **Designed primarily for use in start-up and shutdown of equipment, not as a frequently cycling directional control valve. Norgren offers a wide variety of valves designed for frequent cycling and other applications. Please refer to the P72C and P74C valves, and to other Norgren valve catalogs.**

**Ordering Information.** Models listed are with PTF threads. Solenoid operated models include 24 VDC coil and plug without indicator.

| Port Size | Solenoid Operated* Model | Weight lb (kg) | Air Pilot Operated Model | Weight lb (kg) |
|---|---|---|---|---|
| 1/4" | P72F-2AC-PFA | 2.00 (0.91) | P72F-2AA-NNN | 1.93 (0.88) |
| 3/8" | P72F-3AC-PFA | 1.98 (0.90) | P72F-3AA-NNN | 1.91 (0.87) |

* To select other solenoid type and coil voltage refer to alternative models table below.

### Alternative Models

P 7 2 F - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Operator | Substitute |
|---|---|
| Air pilot** | A |
| 22 mm miniature solenoid | C |
| CNOMO | L |

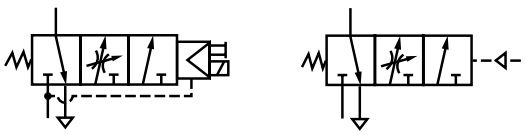
| Solenoid Manual Operator | Substitute |
|---|---|
| Shrouded push button | P |
| None | N |

| Connectors | Substitute |
|---|---|
| 3 pin plug with cable gland, no indicator | A |
| Without | N |

| Coil Voltage | Nominal Power Rating | Substitute |
|---|---|---|
| 24 V d.c. | 2 W | F |
| 12 V d.c. | 2 W | E |
| 6 V d.c. | 2 W | D |
| 220/240 V 50/60 Hz | 4/2.5 VA | B |
| 110/120 V 50/60 Hz | 4/2.5 VA | A |
| No coil | 2 W | Z |
| No solenoid | | N |

** to order air pilot models also substitute 'NNN' at digits 8, 9 and 10 e.g. P72F-2GA-**NNN**.

### ISO Symbols



Solenoid operated  Air pilot

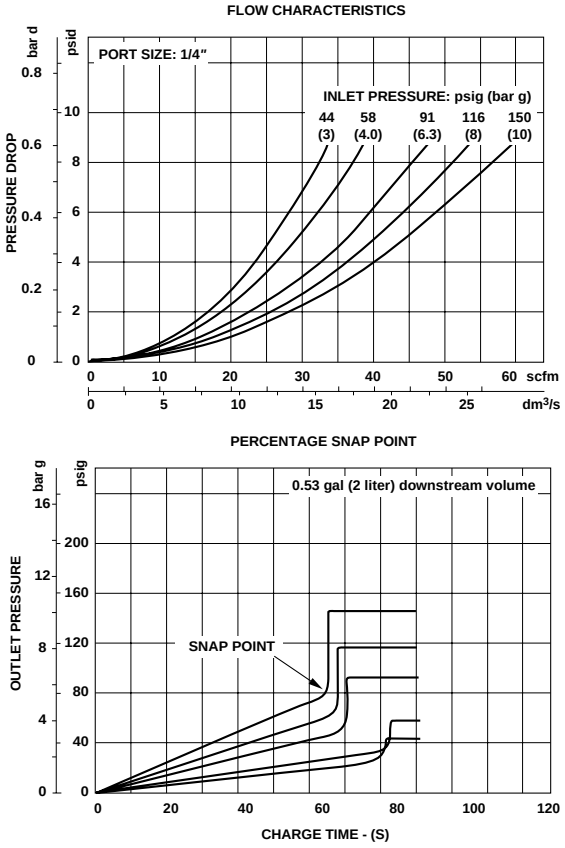
**See Section ALE-24 for Accessories**

## Technical Data

**System air supply: Turn on system air supply prior to applying pilot signal to operator. Failure to do so may cause valve to continuously exhaust.**

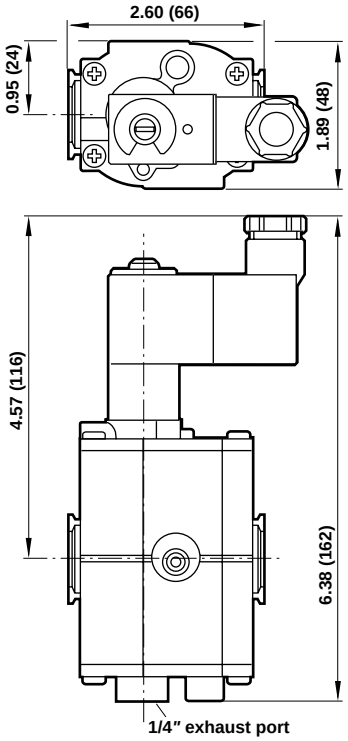
Fluid: Compressed air
Maximum pressure solenoid operated:
Dependant on solenoid rating
[must not exceed 250 psig (17 bar)]
Maximum pressure pilot operated: 250 psig (17 bar) max.
Minimum operating pressure: 44 psig (3 bar)
Operating temperature solenoid operated:
Dependant on solenoid rating
[must be within range 0°* to 150°F (-20°* to 65°C)]
Operating temperature pilot operated:
0°* to 150°F (-20°* to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Air Pilot Port:
10-32 UNF with PTF main ports
M5 with ISO main ports
Exhaust Port:
1/4" PTF with PTF main ports
1/4" ISO Rc with ISO Rc main ports
1/4" ISO Rc with ISO G main ports
Maximum flow with 90 psig (6.3 bar) inlet pressure and pressure drop of 7 psig (0.5 bar): 45 scfm (21 dm³/s) [$P_1$ to $P_2$ = Cv 1.59] [$P_2$ to $P_3$ = Cv 1.72]
Snap pressure:
Full flow when downstream pressure reaches 50 – 80% of inlet pressure
Charge time:
For 0.53 gallon US (2 liter) downstream volume and 90 psig (6.3 bar) inlet pressure
Minimum 0.8 sec.
Typical maximum 99 sec.
Materials
Body: Zinc alloy
Elastomers: Synthetic materials
Filter discs: Sintered plastic
Internal components: Brass/steel

## Typical Performance Characteristics

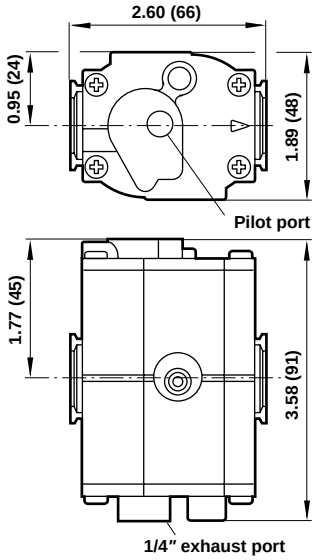



All Dimensions in Inches (mm)

**Solenoid operated**




**Air pilot operated**



# P74F

## Excelon 74 Smooth Start/Exhaust Valve 3/8", 1/2", 3/4" Port Size

- **Excelon design allows in-line or modular installation**
- **Controls increase of downstream pressure on start up. Cylinders and other air operated devices are eased into normal operating positions, reducing the possibility of equipment damage and hazards to the user.**
- **3 port/2 position, normally closed, soft start valve with optional manual lockout slide**
- **Blocks inlet air and exhausts downstream air when pilot signal is removed or when the optional manual lockout slide is closed**
- **Optional manual slide can be padlocked in closed position**
- **Solenoid pilot or air pilot operation**
- **Designed primarily for use in start-up and shutdown of equipment, not as a frequently cycling directional control valve. Norgren offers a wide variety of valves designed for frequent cycling and other applications. Please refer to the P72C and P74C valves, and to other Norgren valve catalogs.**

**Ordering Information.** Models listed are with PTF ports. Solenoid operated models include 24 V d.c. coil and plug without indicator.

| Port Size | Solenoid Operated* Model | Weight lb (kg) | Air Pilot Operated Model | Weight lb (kg) |
|---|---|---|---|---|
| 3⁄8" | P74F-3AC-PFA | 2.4 (1.08) | P74F-3AA-NNN | 2.3 (1.05) |
| 1⁄2" | P74F-4AC-PFA | 2.3 (1.05) | P74F-4AA-NNN | 2.2 (1.02) |
| 3⁄4" | P74F-6AC-PFA | 3.1 (1.41) | P74F-6AA-NNN | 3.0 (1.35) |

* To select other solenoid type and coil voltage refer to alternative models table below.

### Alternative Models

P 7 4 F - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Operator | Substitute |
|---|---|
| Air pilot** | A |
| Air pilot with manual lockout slide** | B |
| 22 mm miniature solenoid | C |
| 22 mm miniature solenoid with manual lockout slide | D |
| CNOMO solenoid | L |
| CNOMO solenoid with manual lockout slide | M |

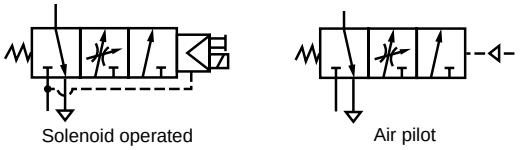
| Connectors | Substitute |
|---|---|
| 3 pin plug with cable gland, no indicator light | A |
| Cable grip w/indicator light † | B |
| 1/2" Conduit | C |
| Without | N |

| Coil Voltage | Nominal Power Rating | Substitute |
|---|---|---|
| 24 V d.c. | 2 W | F |
| 12 V d.c. | 2 W | E |
| 6 V d.c. | 2 W | D |
| 220/240 V 50/60 Hz | 4/2.5 VA | B |
| 110/120 V 50/60 Hz | 4/2.5 VA | A |
| No coil | 2 W | Z |
| No solenoid | | N |

| Solenoid Operator | Substitute |
|---|---|
| Shrouded push button | P |
| Screw driver slot**** | S |
| None | N |

** To order air pilot models also substitute 'NNN' at digits 8, 9 and 10 e.g. P74F-4AA-**NNN**.
**** Not available with D or M operator.
† Use with A and F coils only.

### ISO Symbols



Solenoid operated  Air pilot

**See Section ALE-24 for Accessories**

## Technical Data

**System air supply: Turn on system air supply prior to applying pilot signal to operator. Failure to do so may cause valve to continuously exhaust.**

Fluid: Compressed air

Maximum pressure solenoid operated:
- Dependant on solenoid rating
- [must not exceed 250 psig (17 bar)]

Maximum pressure pilot operated: 250 psig (17 bar) max.

Minimum operating pressure: 44 psig (3 bar)

Operating temperature solenoid operated:
- Dependant on solenoid rating
- [must be within range 0°* to 175°F (-20°* to 80°C)]

Operating temperature pilot operated:
- 0°* to 175°F (-20°* to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Air pilot port:
- ISO Rc1/4 with ISO Rc main ports
- ISO Rc1/4 with ISO G main ports
- 1/4" PTF with PTF main ports

Exhaust port:
- ISO G1/2 with ISO G main ports
- ISO G1/2 with ISO Rc main ports
- 1/2" PTF with PTF main ports

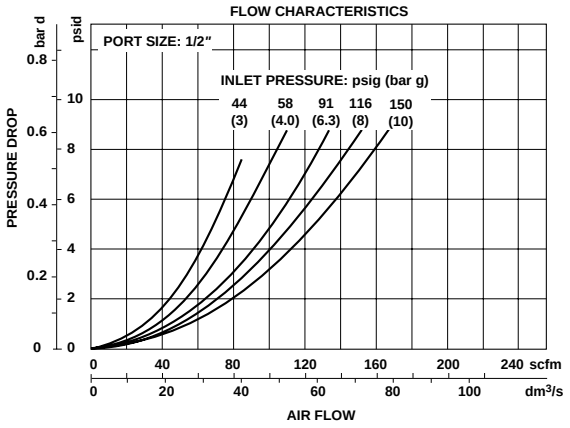
Typical flow with 90 psig (6.3 bar) inlet pressure and pressure drop of 7 psig (0.5 bar):
- 57 $dm^3/s$ ($P_1$ to $P_2$ = Cv 4.4) ($P_2$ to $P_3$ = Cv 5.6)

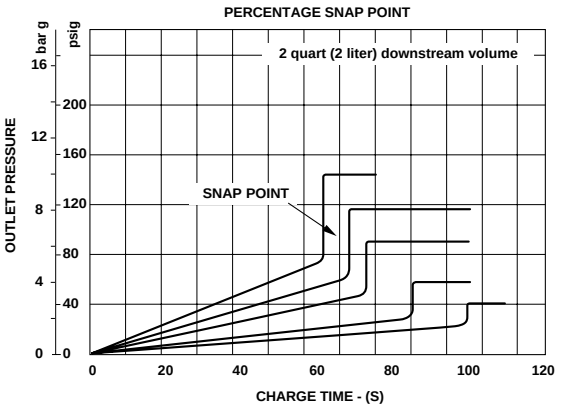
Snap pressure:
- Full flow when downstream pressure reaches 50 – 80% of inlet pressure

Charge time:
- For 2 liter downstream volume and 90 psig (6.3 bar) inlet pressure:
- 0.2 sec. minimum
- 76 sec. maximum

Materials
- Body: Aluminium
- Intermediate body: Aluminium
- Elastomers: Synthetic materials
- Filter discs: Sintered plastic
- Internal components: Brass/steel
- Top plate: Zinc
- Exhaust bonnet: Zinc

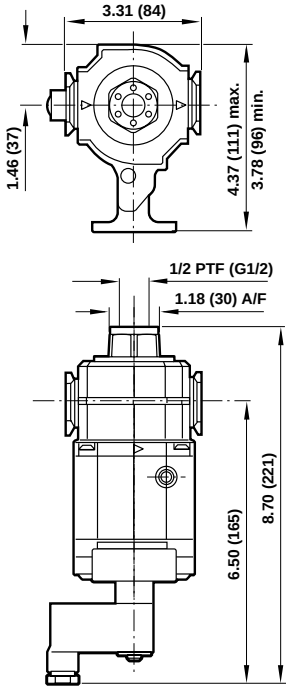
## Typical Performance Characteristics



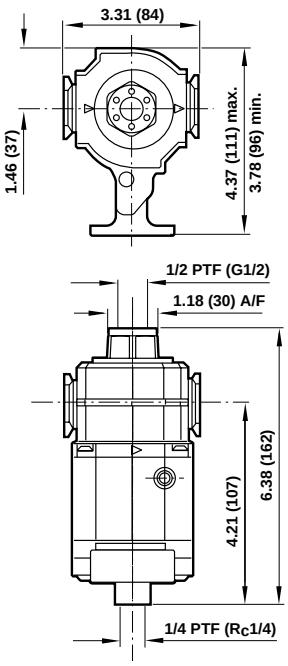




All Dimensions in Inches (mm)

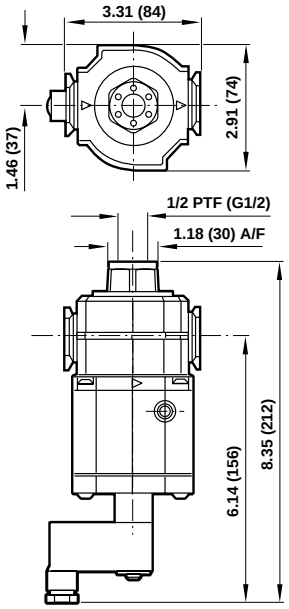
**Solenoid operated plus manual shut-off with lockout**



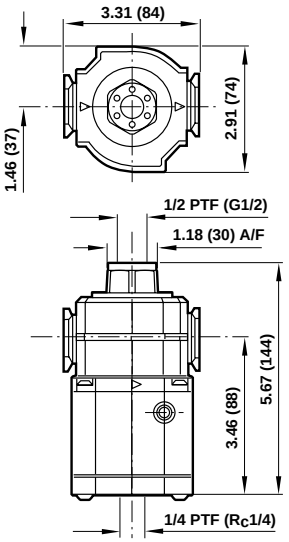

**Air pilot operated plus manual shut-off with lockout**




**Solenoid operated**




**Air pilot operated**



## Olympian Plus 64 Smooth Start/Exhaust Valve
## 1/4", 3/8", 1/2", 3/4" Port Sizes

- **Olympian Plus plug in design**
- **Controls increase of downstream pressure on start up. Cylinders and other air operated devices are eased into normal operating positions, reducing the possibility of equipment damage and hazards to the user.**
- **3 port/2 position, normally closed, soft start valve with optional manual lockout slide**
- **Blocks inlet air and exhausts downstream air when pilot signal is removed or when the optional manual lockout slide is closed**
- **Optional manual slide can be padlocked in closed position**
- **Solenoid pilot or air pilot operation**
- **Designed primarily for use in start-up and shutdown of equipment, not as a frequently cycling directional control valve. Norgren offers a wide variety of valves designed for frequent cycling and other applications. Please refer to the P72C and P74C valves, and to other Norgren valve catalogs.**

**Ordering Information.** Models listed are with PTF threads. Solenoid operated models include 24 v.d.c. coil and plug without indicator.

| Port Size | Solenoid Operated* Model | Weight lb (kg) | Air Pilot Operated Model | Weight lb (kg) |
|---|---|---|---|---|
| 1⁄4" | P64F-2AC-PFA | 4.6 (2.07) | P64F-2AA-NNN | 4.3 (1.96) |
| 3⁄8" | P64F-3AC-PFA | 4.5 (2.05) | P64F-3AA-NNN | 4.3 (1.94) |
| 1⁄2" | P64F-4AC-PFA | 4.4 (2.02) | P64F-4AA-NNN | 4.2 (1.91) |
| 3⁄4" | P64F-6AC-PFA | 5.2 (2.38) | P64F-6AA-NNN | 5.0 (2.27) |

* Solenoid operated models are supplied with solenoids but without solenoid coils. To select solenoid type and coil voltage refer to alternative models table below.
For replacement soft start/exhaust valve, without yoke substitute 'NN' at 5th and 6th digit eg.P64F-**NN**C-PZN.

### Alternative Models

P 6 4 F - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Operator | Substitute |
|---|---|
| Air pilot** | A |
| Air pilot with manual shut-off** | B |
| 22 mm miniature solenoid | C |
| 22 mm miniature solenoid with manual shut-off | D |

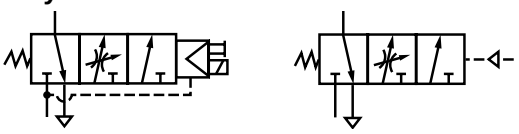
| Connectors | Substitute |
|---|---|
| 3 pin plug with cable gland, no indicator | A |
| Cable grip w/indicator light † | B |
| 1/2" Conduit | C |
| Without | N |

| Coil Voltage | Nominal Power Rating | Substitute |
|---|---|---|
| 24 V d.c. | 2 W | F |
| 12 V d.c. | 2 W | E |
| 6 V d.c. | 2 W | D |
| 220/240 V 50/60 Hz | 4/2.5 VA | B |
| 110/120 V 50/60 Hz | 4/2.5 VA | A |
| No coil | 2 W | Z |
| No solenoid | | N |

| Solenoid Manual Operator | Substitute |
|---|---|
| Shrouded push button | P |
| Screw driver slot**** | S |
| None | N |

** to order air pilot models also substitute 'NNN' at digits 8, 9 and 10 e.g. P64F-2GA-**NNN**.
**** Not available with D operator.
† Use with A and F coils only.

### ISO Symbols



Solenoid operated  Air pilot

**See Section ALE-24 for Accessories**

## Technical Data

**System air supply: Turn on system air supply prior to applying pilot signal to operator. Failure to do so may cause valve to continuously exhaust.**

Fluid: Compressed air

Maximum pressure solenoid operated:
Dependant on solenoid rating
[must not exceed 250 psig (17 bar)]

Maximum pressure pilot operated: 250 psig (17 bar)

Minimum operating pressure: 44 psig (3 bar)

Operating temperature solenoid operated: Dependant on solenoid rating
[must be within range 0°* to 125°F (-20°* to 50°C)]

Operating temperature pilot operated:
0°* to 175°F (-20°* to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Gauge ports: 1/8" (PTF with PTF main ports, Rc with ISO G and ISO Rc main ports)

Air pilot port: 1/4" (PTF with PTF main ports, Rc with ISO G and ISO Rc main ports)

Exhaust port: 1/2" (PTF with PTF main ports, G1/2 with ISO G and ISO Rc main ports)

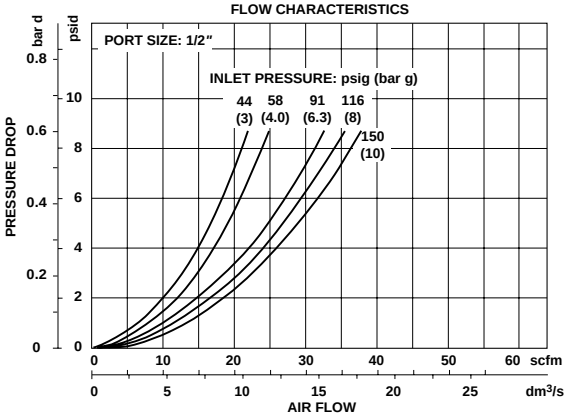
Typical flow with 90 psig (6.3 bar) inlet pressure and pressure drop of 7 psig (0.5 bar): 57 $dm^3/s$ (120 scfm) ($P_1$ to $P_2$ = Cv 4.2) ($P_2$ to $P_3$ = Cv 5.6)

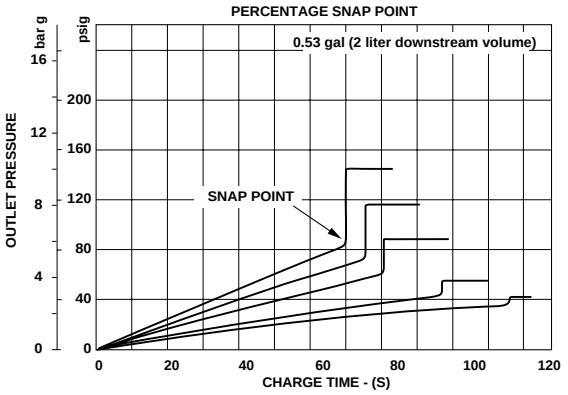
Snap pressure:
Full flow when downstream pressure reaches 50 – 80% of inlet pressure

Charge time:
For 2 liter downstream volume and 90 psig (6.3 bar) inlet pressure
Minimum 0.2 sec.
Typical maximum 58 sec.

Materials:
Body: Zinc alloy
Intermediate body and top plate: Aluminium
Exhaust bonnet: Zinc alloy
Yoke: Zinc alloy
Elastomers: Synthetic materials
Filter discs: Sintered plastic
Internal components: Brass/steel

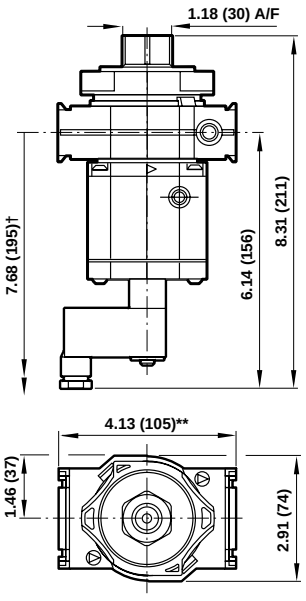
## Typical Performance Characteristics



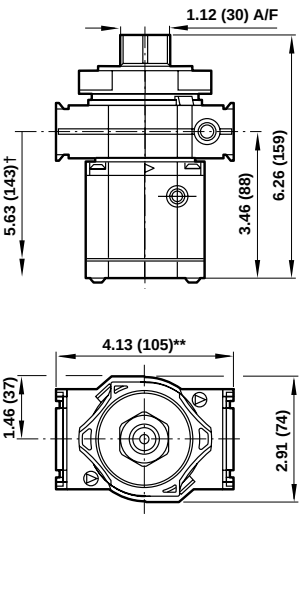




All Dimensions in Inches (mm)

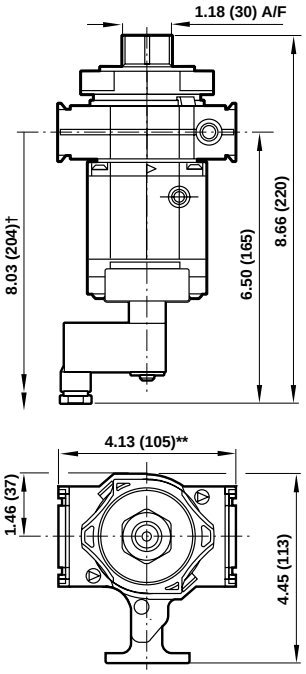
**Solenoid operated**



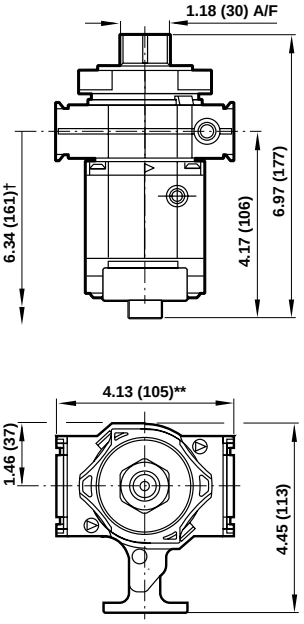

**Air pilot operated**




**Solenoid operated plus manual shut-off with lockout**




**Air pilot operated plus manual shut-off with lockout**




** 6.18″ (157 mm) for models with 3/4" ports.
† Minimum clearance required to remove unit.

# P68F

## Olympian Plus 68 Smooth Start/Exhaust Valve
## 3/4", 1", 1-1/4", 1-1/2" Port Sizes

- **Olympian plug in design**
- **Controls increase of downstream pressure on start up. Cylinders and other air operated devices are eased into normal operating positions, reducing the possibility of equipment damage and hazards to the user.**
- **3 port/2 position, normally closed, soft start valve with optional manual lockout slide**
- **Blocks inlet air and exhausts downstream air when pilot signal is removed or when the optional manual lockout slide is closed**
- **Optional manual slide can be padlocked in closed position**
- **Solenoid pilot or air pilot operation**
- **Designed primarily for use in start-up and shutdown of equipment, not as a frequently cycling directional control valve. Norgren offers a wide variety of valves designed for frequent cycling and other applications. Please refer to the P72C and P74C valves, and to other Norgren valve catalogs.**

**Ordering Information.** Models listed include a yoke with PTF threads and an operator with manual lockout slide. Solenoid operated models include a 22 mm operator with manual override, a 24 Vdc coil, and a connector without indicator light.

| Port Size | Solenoid Operated* Model | Weight lb (kg) | Air Pilot Operated Model | Weight lb (kg) |
|---|---|---|---|---|
| 3/4 | P68F-6AD-PFA | 6.56 (2.95) | P68F-6AB-NNN | 6.16 (2.77) |
| 1 | P68F-8AD-PFA | 6.51 (2.93) | P68F-8AB-NNN | 6.11 (2.75) |
| 1-1/4 | P68F-AAD-PFA | 6.44 (2.90) | P68F-AAB-NNN | 6.04 (2.72) |
| 1-1/2 | P68F-BAD-PFA | 6.49 (2.92) | P68F-BAB-NNN | 6.09 (2.74) |

**Alternative Models**

P 6 8 F - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 3/4" | 6 |
| 1" | 8 |
| 1-1/4" | A |
| 1-1/2" | B |
| No Yoke | N |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |
| No Yoke (***N*** in 5th position) ISO G pilot and exhaust ports | N |
| No Yoke (***N*** in 5th position) PTF pilot and exhaust ports | A |

| Operator | Substitute 150 psig (10 bar) Inlet Pressure | Substitute 250 psig (17 bar) Inlet Pressure |
|---|---|---|
| Air pilot | A | A |
| Air pilot with manual lockout | B | B |
| Low watt miniature (22 mm) solenoid | C † | S † |
| Low watt miniature (22 mm) solenoid with manual lockout | D † | T † |

| Connectors | Substitute |
|---|---|
| 3 pin plug with cable gland, without indicator light. | A |
| Without connector | N |

| Coil Voltage | Low Watt Coil - For use with 22mm Nominal Power Rating | Substitute |
|---|---|---|
| 24 V d.c. | 2 W * | F |
| 12 V d.c. | 2 W * | E |
| 6 V d.c. | 2 W * | D |
| 220/240 V 50/60 H | 4/2.5 VA * | B |
| 110/120 V 50/60 Hz | 4/2.5 VA * | A |
| No coil | | Z |
| No solenoid | | N |

| Solenoid Operator Manual Override | Substitute |
|---|---|
| Shrouded push button | P |
| None | N |

† Also specify desired low watt coil in 9th position.

†† Also specify desired standard watt coil in 9th position.

* Nominal power rating for the low watt coil used with the 247 psi (17 bar) solenoid is 7.5 watt or 12/8 VA.

## Technical Data

**System air supply: Turn on system air supply prior to applying pilot signal to operator. Failure to do so may cause valve to continuously exhaust.**

Fluid: Compressed air

Maximum pressure solenoid operated:
Dependent on solenoid rating
[must not exceed 250 psig (17 bar)]

Maximum pressure pilot operated: 250 psig (17 bar) max.

Minimum operating pressure: 44 psig (3 bar)

Operating temperature solenoid operated:
Dependent on solenoid rating
[must be within range 0°* to 175°F (-20°* to 80°C)]

Operating temperature pilot operated:
0°* to +175°F (-20°* to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Air pilot port:
ISO G1/4 with ISO Rc main ports
ISO G1/4 with ISO G main ports
1/4 PTF with PTF main ports

Exhaust port:
ISO G1 with ISO G main ports
ISO G1 with ISO Rc main ports
1" PTF with PTF main ports

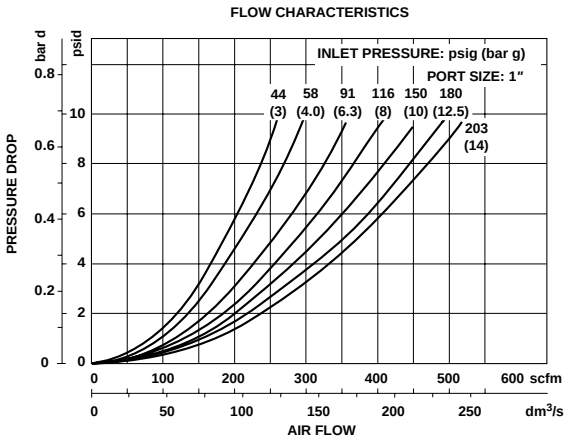
Typical flow with 90 psig (6.3 bar) inlet pressure and pressure drop of 7 psig (0.5 bar):
147 $dm^3/s$ ($P_1$ to $P_2$ = Cv 11.2) ($P_2$ to $P_3$ = Cv >11)

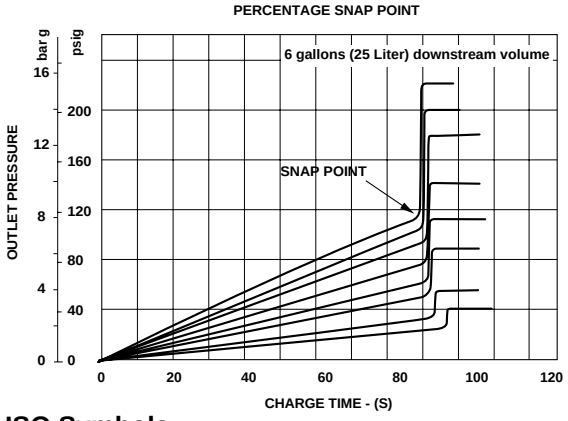
Snap pressure:
Full flow when downstream pressure reaches
50 – 80% of inlet pressure

Charge time
For 25 litre downstream volume and 90 psig (6.3 bar) inlet pressure:
Minimum 6.4 sec.
Typical maximum 115 sec.

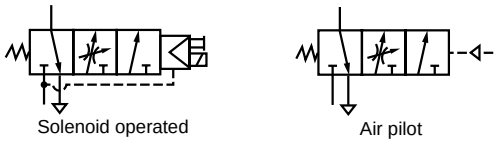
Materials
Body: Aluminum
Top plate: Aluminum
Bottom plate: Aluminum
Yoke: Aluminum
Elastomers: Synthetic materials
Filter discs: Sintered plastic
Internal components: Brass/steel

## Typical Performance Characteristics



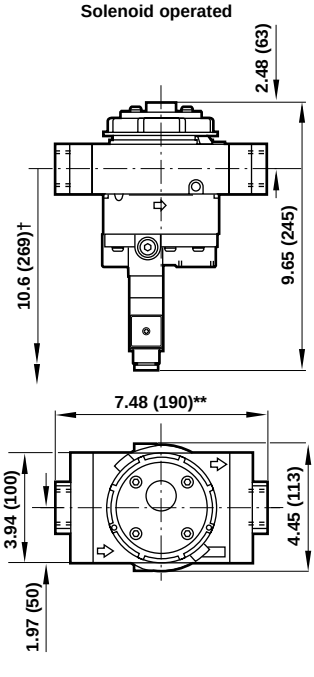




## ISO Symbols

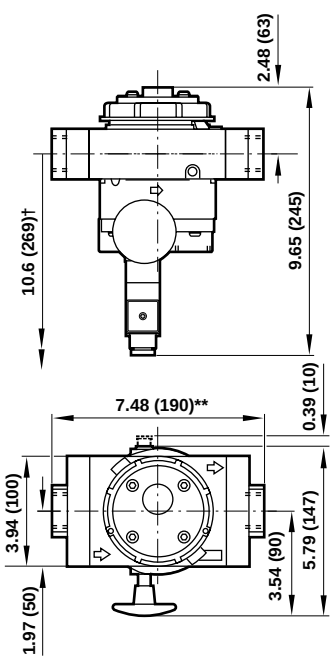



All Dimensions in Inches (mm)

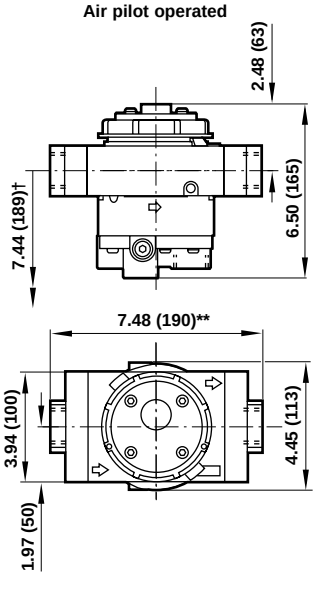
**Solenoid operated**



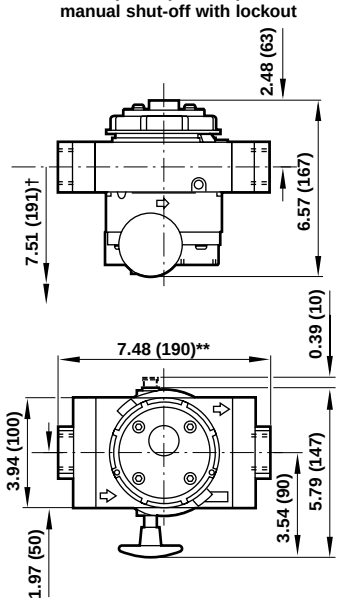

**Solenoid operated plus manual shut-off with lockout**




**Air pilot operated**




**Air pilot operated plus manual shut-off with lockout**




**See Section ALE-24 for Accessories**

** 7.87" (200 mm) for 1-1/4, 1-1/2 models. † Minimum clearance required to remove unit.

# P72C

## Excelon 72 Air or Solenoid Operated Directional Control Valves 1/4", 3/8" Port Sizes

- **Excelon design allows in-line or modular installation**
- **3 port/2 position valves, normally closed**
- **Solenoid or air pilot operated**
- **Customised poppets for long service life**
- **High flow spring return**
- **Modular installations with Excelon 72, 73, and 74 series can be made to suit particular applications**

**Ordering Information.** Models listed are with PTF threads. Solenoid operated models include 24 V d.c. coil and plug without indicator.

| Port Size | Solenoid Operated* Model | Weight lb (kg) | Air Pilot Operated Model | Weight lb (kg) |
|---|---|---|---|---|
| 1/4" | P72C-2AC-PFA | 2.11 (0.96) | P72C-2AA-NNN | 1.86 (0.84) |
| 3/8" | P72C-3AC-PFA | 2.05 (0.93) | P72C-3AA-NNN | 1.80 (0.82) |

* To select other solenoid type and coil voltage refer to alternative models table below.

### Alternative Models

P 7 2 C - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Operator | Substitute |
|---|---|
| Air pilot** | A |
| 22 mm miniature solenoid | C |
| CNOMO | L |

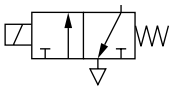
| Solenoid Manual Operator | Substitute |
|---|---|
| Shrouded push button | P |
| None | N |

| Connectors | Substitute |
|---|---|
| 3 pin plug with cable gland, no indicator | A |
| Without | N |

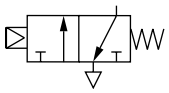
| Coil Voltage | Nominal Power Rating | Substitute |
|---|---|---|
| 24 V d.c. | 2 W | F |
| 12 V d.c. | 2 W | E |
| 6 V d.c. | 2 W | D |
| 220/240 V 50/60 Hz | 4/2.5 VA | B |
| 110/120 V 50/60 Hz | 4/2.5 VA | A |
| No coil | 2 W | Z |
| No solenoid | | N |

** To order air pilot models also substitute 'NNN' at digits 8, 9 and 10 e.g. P72C-2AA-**NNN**.

### ISO Symbols



Solenoid operated



Air pilot

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure solenoid operated: Dependant on solenoid rating [must not exceed 150 psig (10 bar)]
Maximum pressure pilot operated: 150 psig (10 bar)
Minimum operating pressure: 15 psig (1 bar)
Operating temperature solenoid operated:
Dependant on solenoid rating [must be within range 0°* to 150°F (-20°* to 65°C)]
Operating temperature pilot operated:
0°* to 150°F (-20°* to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Air Pilot Port:
10-32 UNF with PTF main ports
M5 with ISO main ports
Exhaust Port:
1/4″ PTF with PTF main ports
1/4″ ISO Rc with ISO Rc main ports
1/4″ ISO Rc with ISO G main ports
Average flow factor (Cv)
IN to OUT ports: 1.31
OUT to EXHAUST ports: 1.27
Materials
Body: Zinc alloy
Elastomers: Synthetic materials
Filter discs: Sintered plastic
Internal components: Brass/steel

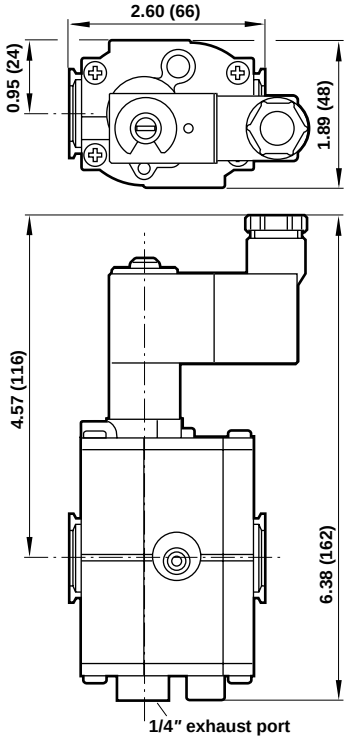
## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | All models | 4384-520 |

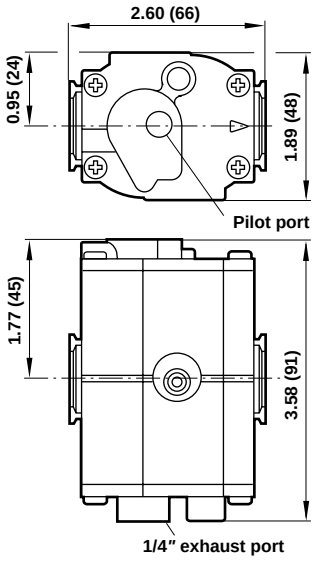
Service kit includes all seals, valve assembly and tamper resistant plug.

All Dimensions in Inches (mm)

**Solenoid operated**




**Air pilot operated**



# P74 Air Operated

## Excelon 74 Air Operated Directional Control Valves
## Unthreaded Ports, 1/2" Basic Size

- **Modular installation only**
- **High-flow, spring return valves**
- **2-port/2-position valves available as normally closed or normally open valves**
- **3-port/2-position valves available as normally closed valves.**
- **Cushioned poppets for long life**

**Ordering Information.** Models listed include PTF threads in the pilot and exhaust ports.

| Installation Type | 2 Port/2 Position Normally Closed | 2 Port/2 Position Normally Open | 3 Port/2 Position Normally Closed | Weight lb (kg) |
|---|---|---|---|---|
| Modular* | P74A-NAA-NNN | P74B-NAA-NNN | P74C-NAA-NNN | 1.20 (0.54) |

* Valve main ports are unthreaded. To install in air line use Quikclamp™ and Quikclamp pipe adapters or connect to other Excelon 74 units.

### Alternative Models

P 7 4 ★ - ★ ★ ★ - ★ ★ ★

| Type | Substitute |
|---|---|
| 2-port/2-position, NC | A |
| 2-port/2-position, NO | B |
| 3-port/2-position, NC | C |

| Main Port Threads | Substitute |
|---|---|
| No threaded ports | N |

| Pilot and Exhaust Port Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc | B |
| ISO G | G |

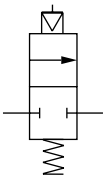
| Connector | Substitute |
|---|---|
| None | N |

| Coil | Substitute |
|---|---|
| None | N |

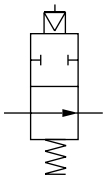
| Manual Override | Substitute |
|---|---|
| None | N |

| Operator | Substitute |
|---|---|
| Air | A |

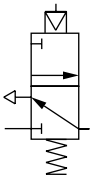
### ISO Symbols



2-Port/2-Position
Normally Closed



2-Port/2-Position
Normally Open



3-Port/2-Position
Normally Closed

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Filtered and lubricated compressed air
Main valve inlet pressure range: 0 to 250 psig (0 to 17 bar)
Pilot supply inlet pressure range: Equal to or greater than main valve inlet pressure, but not less than 30 psig (2 bar) and not greater than 250 psig (17 bar).
Temperature range*: -20° to 175°F (-30° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Average flow factor (Cv) of 2-port valves: 4.0
Average flow factor (Cv) of 3-port valves
In-out ports: 3.2
Out-exhaust ports: 5.3
Pilot port: 1/4 PTF, ISO G, or ISO Rc
Exhaust port on 3 port/2 position valves: 1/2 PTF, ISO G, or ISO Rc
Materials
Body: Zinc
Pistons, poppets: Aluminum
Elastomers: Nitrile
Operator: Aluminum

## Service Kit

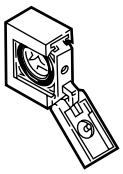
| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & Gasket | 53474-37 |
| Quikclamp service kit | 2 o-rings | 4384-770 |

Service kit includes all o-rings, head gasket and seals.

## Modular Components (necessary for using this valve)

Quikmount Pipe Adapters (each kit contains one adapter) **

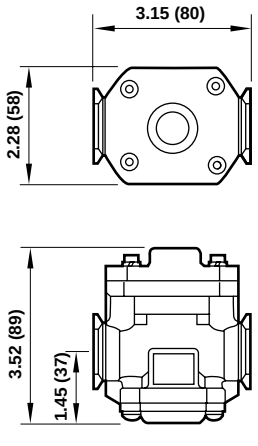
| Size | PTF Threads | ISO Rc Threads | ISO G Threads |
|---|---|---|---|
| 1/4" | 4315-01 | 4315-05 | 4315-09 |
| 3/8" | 4315-01 | 4315-06 | 4315-10 |
| 1/2" | 4315-03 | 4315-07 | 4315-11 |
| 3/4" | 4315-04 | 4315-08 | 4315-12 |



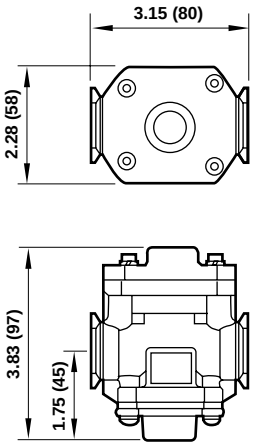
Quikclamp †
4314-51

** Each pipe adapter adds 0.71" (18 mm) to the overall length of a valve.
† Each Quikclamp adds 0.7" (13.6 mm) to the overall length of a valve.

All Dimensions in Inches (mm)




2 Port/2 Position




3 Port/2 Position

# P74 Solenoid Operated Valve

## Excelon 74 Solenoid Operated Directional Control Valve
## Unthreaded Ports, 1/2" Basic Size

- **Modular installation only**
- **High-flow, spring return valves**
- **2-port/2-position valves available as normally closed or normally open valves**
- **3-port/2-position valves available only as normally closed valves.**
- **Cushioned poppets for long life**

**Ordering Information.** Models listed include ISO G exhaust port threads, non-locking override,110/120Vac standard coil, and cable grip connector.

| Installation Type | 2 Port/2 Position Normally Closed | 2 Port/2 Position Normally Open | 3 Port/2 Position Normally Closed | Weight lb (kg) |
|---|---|---|---|---|
| Modular* | P74A-NNC-PJA | P74B-NNC-PJA | P74C-NAC-PJA | 1.63 (0.74) |

* Valve ports are unthreaded. To install in air line use Quikclamp™ and Quikclamp pipe adapters or connect to other Excelon 74 units.

### Alternative Models

P 7 4 ★ - ★ ★ ★ - ★ ★ ★

| Type | Substitute |
|---|---|
| 2-port/2-position, NC | A |
| 2-port/2-position, NO | B |
| 3-port/2-position, NC | C |

| Main Port Threads | Substitute |
|---|---|
| No threaded ports | N |

| Exhaust Port Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc | B |
| ISO G | G |
| No exhaust port (2/2 valves) | N |

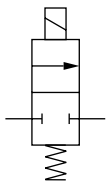
| Operator | Substitute |
|---|---|
| Solenoid, internal air pilot | C |

| Solenoid Operator Override | Substitute |
|---|---|
| Non-locking, push button | P |
| Locking, screwdriver slot | S |
| No solenoid operator | N |

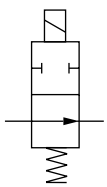
| Connector | Substitute |
|---|---|
| Cable grip | A |
| Cable grip with indicator lights and surge protection. Use only with ***A, F, J*** and ***P*** coils. | B |
| No connector | N |

| Solenoid Operator | Substitute | |
|---|---|---|
| Coil Voltage | Standard Coil | Low Watt Coil |
| 6 Vdc | — | D |
| 12 Vdc | Q | E |
| 24 Vdc | P | F |
| 24 Vac | L | C |
| 110/120 Vac | J | A |
| 220/240 Vac | K | — |
| No coil | Y | Z |
| No solenoid operator | N | N |

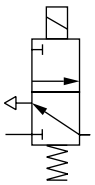
### ISO Symbols



2-Port/2-Position Normally Closed



2-Port/2-Position Normally Open



3-Port/2-Position Normally Closed

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Filtered and lubricated compressed air
Main valve inlet pressure range: 30 to 150 psig (2 to 10 bar)
Temperature range*: -20° to 130°F (-30° to 55°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Average flow factor (Cv) of 2-port valves: 4.0
Average flow factor (Cv) of 3-port valves:
- In-out ports: 3.2
- Out-exhaust ports: 5.3

Response times of 3 port/2 position valve (elapsed time from solenoid energized to an increase in the main valve pressure):
- Standard operator: 11 ms at 90 psig (6.3 bar) inlet pressure
- Low wattage operator: 13.5 ms at 90 psig (6.3 bar) inlet pressure

Exhaust port on 3-port/2-position valves: 1/2 PTF, ISO G, or ISO Rc
Solenoid operator specifications
- Voltage and power requirements:

| Voltage | Standard Coil | Low Watt Coil |
|---|---|---|
| 6Vdc | — | 2W |
| 12Vdc | 7.5W | 2W |
| 24Vdc | 6.0W | 3.5W |
| 24V 50/60Hz | 7.5W | 3.5W |
| 110/120V 50/60Hz | 7.5W | 3.5W |
| 220/240V 50/60Hz | 7.5W | — |

Duty: Continuous at 90% to 110% of rated voltage.
Coil Type: Molded with three pin plug-in connector.
Enclosure Classification: NEMA 1, NEMA 4 and IP 65.
Connector Plug: Cable grip for cables 1/4″ to 5/16″ (6 to 8 mm) diameter. Electrical connectors conform to *Industry Standard Form B for Three-Pin Electrical Plug Connectors, 11 mm spacing.*
Override: Manual, locking or non-locking
Materials
- Body: Zinc
- Pistons, poppets: Aluminum
- Elastomers: Nitrile
- Operator housing: PPS plastic
- Operator base: Aluminum
- Plunger, spring: Stainless steel

## Service Kit

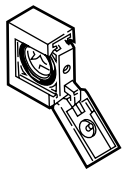
| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & Gasket | 53474-37 |
| Quikclamp service kit | 2 o-rings | 4384-770 |

Service kit includes all o-rings, head gasket and seals.

## Modular Components **(necessary for using this valve)**

Quikmount Pipe Adapters (each kit contains one adapter) **

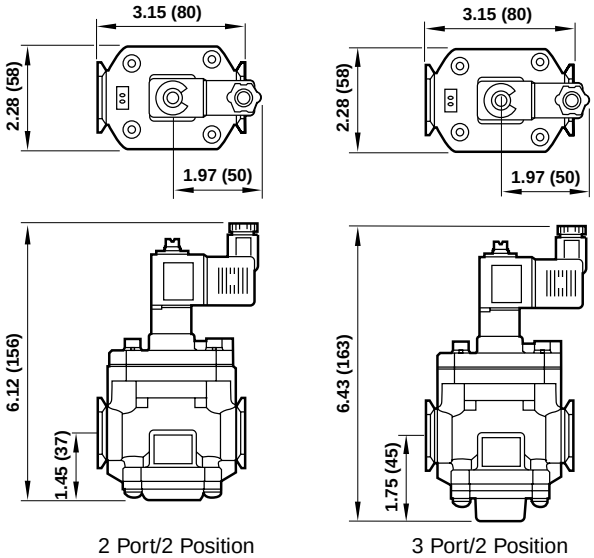
| Size | PTF Threads | ISO Rc Threads | ISO G Threads |
|---|---|---|---|
| 1/4" | 4315-01 | 4315-05 | 4315-09 |
| 3/8" | 4315-01 | 4315-06 | 4315-10 |
| 1/2" | 4315-03 | 4315-07 | 4315-11 |
| 3/4" | 4315-04 | 4315-08 | 4315-12 |



Quikclamp †
4314-51

** Each pipe adapter adds 0.71" (18 mm) to the overall length of a valve.
† Each Quikclamp adds 0.7" (13.6 mm) to the overall length of a valve.

All Dimensions in Inches (mm)




2 Port/2 Position
3 Port/2 Position

# P74 Lockout Valve

## Excelon 74 Solenoid Operated Valve with Lockout Unthreaded Ports, 1/2" Basic Size

- **Modular installation only**
- **High-flow, 3-port/2-position, normally closed**
- **Manually operated lockout slide can be locked in the closed position with a customer supplied padlock.**
- **Coloured yellow for easy identification as a lockout valve**
- **Cushioned poppets for long life**

**Ordering Information.** Models listed include PTF exhaust port threads, non-locking override, 110/120Vac coil, and cable grip connector.

| Installation Type | 3 Port/2 Position Normally Closed | Weight lb (kg) |
|---|---|---|
| Modular* | P74C-NAD-PJA | 2.03 (0.92) |

* Valve ports are unthreaded. To install in air line use Quikclamp™ and Quikclamp pipe adapters or connect to other Excelon 74 units.

### Alternative Models

P 7 4 ★ - ★ ★ ★ - ★ ★ ★

| Type | Substitute |
|---|---|
| 3-port/2-position, NC | C |

| Main Port Threads | Substitute |
|---|---|
| No threaded ports | N |

| Exhaust Port Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc | B |
| ISO G | G |

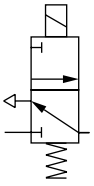
| Operator | Substitute |
|---|---|
| Solenoid, internal air pilot with lockout slide | D |

| Solenoid Operator Override | Substitute |
|---|---|
| Non-locking, push button | P |

| Connector | Substitute |
|---|---|
| Cable grip | A |
| Cable grip with indicator lights and surge protection. Use only with ***A, F, J*** and ***P*** coils. | B |
| No connector | N |

| Solenoid Operator Coil Voltage | Substitute Standard Coil | Substitute Low Watt Coil |
|---|---|---|
| 6 Vdc | — | D |
| 12 Vdc | Q | E |
| 24 Vdc | P | F |
| 24 Vac | L | C |
| 110/120 Vac | J | A |
| 220/240 Vac | K | — |
| No coil | Y | Z |
| No solenoid operator | N | N |

### ISO Symbol



3-Port/2-Position
Normally Closed

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Filtered and lubricated compressed air
Main valve inlet pressure range: 30 to 150 psig (2 to 10 bar)
Temperature range*: -20° to 130°F (-30° to 55°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Average flow factor (Cv):
In-out ports: 3.2
Out-exhaust ports: 5.3
Response times (elapsed time from solenoid energized to an increase in the main valve pressure): 11 ms at 90 psig (6.3 bar) inlet pressure
Maximum diameter of customer supplied padlock shackle: 5/16″ (8 mm)
Exhaust port: 1/2 PTF, ISO G, or ISO Rc
Solenoid operator specifications
Voltage and power requirements:

| Voltage | Standard Coil | Low Watt Coil |
|---|---|---|
| 6Vdc | — | 2W |
| 12Vdc | 7.5W | 2W |
| 24Vdc | 7.5W | 3.5W |
| 24V 50/60Hz | 7.5W | 3.5W |
| 110/120V 50/60Hz | 7.5W | 3.5W |
| 220/240V 50/60Hz | 7.5W | — |

Duty: Continuous at 90% to 110% of rated voltage.
Coil Type: Molded with three pin plug-in connector.
Enclosure Classification: NEMA 1, NEMA 4 and IP 65.
Connector Plug: Cable grip for cables 6 to 8 mm (1/4″ to 5/16″) diameter. Electrical connectors conform to *Industry Standard Form B for Three-Pin Electrical Plug Connectors, 11 mm spacing.*
Override: Manual, non-locking
Materials:
Body: Zinc
Pistons, poppets: Aluminum
Elastomers: Nitrile
Operator housing: PPS plastic
Operator base: Aluminum
Plunger, spring: Stainless steel

## Service Kit

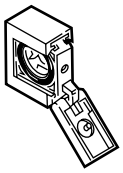
| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal & Gasket | 53474-40 |
| Quikclamp service kit | 2 o-rings | 4384-770 |

Service kit includes all o-rings, lockout slide spring, head gasket and seals.

## Modular Components **(necessary for using this valve)**

Quikmount Pipe Adapters (each kit contains one adapter) **

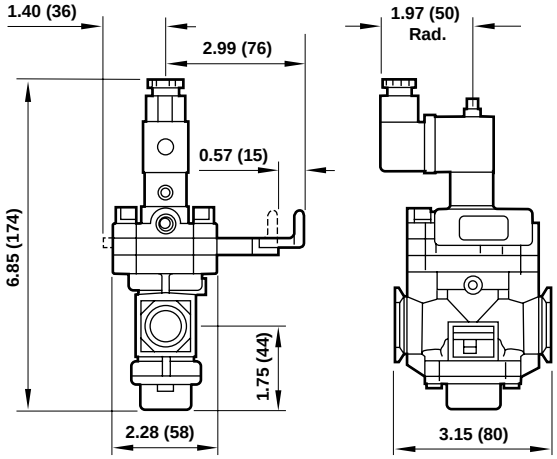
| Size | PTF Threads | ISO Rc Threads | ISO G Threads |
|---|---|---|---|
| 1/4" | 4315-01 | 4315-05 | 4315-09 |
| 3/8" | 4315-01 | 4315-06 | 4315-10 |
| 1/2" | 4315-03 | 4315-07 | 4315-11 |
| 3/4" | 4315-04 | 4315-08 | 4315-12 |



Quikclamp †
4314-51

** Each pipe adapter adds 0.71" (18 mm) to the overall length of a valve.
† Each Quikclamp adds 0.7" (13.6 mm) to the overall length of a valve.

All Dimensions in Inches (mm)



## 1.1 SOFT START/DUMP VALVES

1.1.1 What Sizes are Available?

We can do units in 1/4" through 11/2" actual port size, based on Excelon 72 (1/4 - 3/8), Olympian Plus 64 (1/4 - 3/4), Excelon 74 (3/8 - 3/4) or the new P68F (3/4 - 11/2").

1.1.2 What Operators are Available?

All valves have air pilot, 22mm solenoid and CNOMO solenoid options. In addition the P68F can use the Webber Excel 32mm solenoid.

1.1.3 Do we have an Emergency Dump?

Yes. The P64F/P74F have an optional dump slide with a yellow handle, used to break the pilot signal and dump the downstream system. The slide can be locked out using a standard 8mm padlock or lockout hasp. The P68F has a dump handle as standard (optional without). Again this can be locked out.

1.1.4 How Fast/Slow can it go?

The snap point where full pressure kicks in is fixed for a given line pressure. You can control the time between signalling the valve and the snap by using the needle valve adjuster. Refer to catalogue sheet for minimum/maximum times, which will depend on the downstream system volume.

1.1.5 What is the Minimum Operating Pressure?

The snap action requires a minimum line pressure of 44 psig (3 bar).

1.1.6 Will the Unit Soft Start Only?

The combined function valves are not intended for use as soft start only. If you need such a valve use the Excelon 74 individual valves, or the AOY poppet valves for Olympian.

1.1.7 Will the Unit Dump Only?

The combined function valves are not intended for use as dump only. If you need such a valve use the Excelon 74 individual valves, or the DYO poppet valves for Olympian.

## 1.2 EXCELON VALVES

1.2.1 What Versions are Available?

The individual valves for use in Excelon 74 are 2/2 and 3/2 poppet valves P74A and P74B. There is a 2/2 soft start (P74E) and 3/2 on-off valves with solenoid or pilot operator (P74C). The 3/2 valves have optional lockout slides.

1.2.2 Are the Excelon Valves Direct Ported?

The valves in the Excelon 74 range are intended for modular installation only. If you need a threaded inlet/outlet use a Quikclamp and pipe adapter.

# Additional Compressed Air Products

## Exhaust Silencers, Drip Leg Drains, Gauges, Needle Valves, and Blow guns.

**Contents**



**CS15**

**CS13**

**17-016**

**Gauges**

**Needle Valves**

**Blow Gun**

# CS13

## Olympian Plus Coalescing Exhaust Silencers
## 1/4″, 3/8″, 1/2″, 3/4″ Port Sizes

- **Olympian plug in design**
- **Reduces noise from multi valve and cylinder circuits**
- **Removes oil mist and sub micron particles from exhausting air**
- **Flow in either direction**
- **Helps to meet noise at work directive**

**Ordering Information.** Models listed include PTF threads.

| Port Size | Model | Weight lb (kg) |
|---|---|---|
| 1/4" | CS13-264-10AA | 2.98 (1.35) |
| 3/8" | CS13-364-10AA | 2.93 (1.33) |
| 1/2" | CS13-464-10AA | 2.87 (1.30) |
| 3/4" | CS13-664-10AA | 3.66 (1.66) |

For single silencer with one main outlet plugged substitute 'X' for 'G' at the 11th digit eg: CS13-464-10G**X**.

### Alternative Models

C S 1 3 - ★ 6 4 - ★ 0 ★ ★

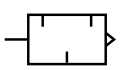
| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |
| No yoke* | 0 |

| Option | Substitute |
|---|---|
| With yoke | 1 |
| Without yoke* | 0 |

| Port Option | Substitute |
|---|---|
| PTF threaded | A A |
| ISO G threaded | D D |
| ISO Rc threaded | B B |
| One main outlet plugged (PTF) | A X |
| One main outlet plugged (ISO G) | D X |
| One main outlet plugged (ISO Rc) | B X |
| No yoke* | 0 0 |

* For replacement Silencer (without yoke) substitute '0' at the 5th, 8th, 10th and 11th digits eg: CS13-**0**64-**0**0**00.**

### ISO Symbol



**See Section ALE-24 for Accessories**

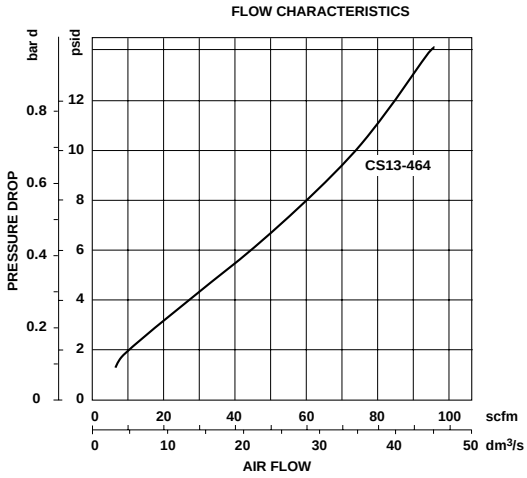
## Technical Data

Fluid: Compressed air
Maximum pressure:
0°* to 122°F (-20°* to 50°C)

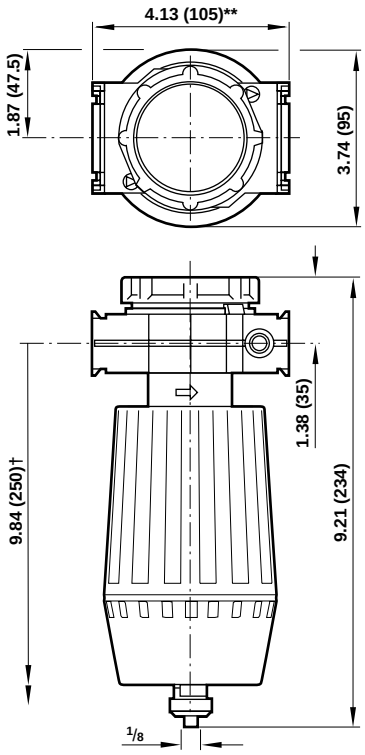
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Materials
Body: Zinc
Yoke: Zinc
Cage: Aluminum
Element: Composite materials
Elastomers: Synthetic rubber
Bowl: Polypropylene

## Typical Performance Characteristics




All Dimensions in Inches (mm)




** 6.18″ (157 mm) for 3/4 models

† Minimum clearance required to remove bowl.

## Service Kits

| Item | Part Number |
|---|---|
| Service kit | CS13RK |
| Replacement element | 3236-01 |

Service kit includes bowl, drain plug and drain retainer.

# CS15

## Olympian Coalescing Exhaust Silencers 3/4″, 1″, 1-1/4″, 1-1/2″ Port Sizes

- **Olympian plug in design**
- **Effectively reduce noise emission of multi valve and cylinder systems**
- **Remove oil mist and sub-micron particles from exhaust air**
- **Single or double units for high flow rates**
- **Flow in either direction**

**Ordering Information.** Models listed include PTF threads.

| Port Size | Single | Weight lb (kg) | Double | Weight lb (kg) |
|---|---|---|---|---|
| 3/4" | CS15-600-10AA | 5.20 (2.34) | CS15-600-20AA | 9.47 (4.26) |
| 1" | CS15-800-10AA | 5.09 (2.29) | CS15-800-20AA | 9.36 (4.21) |
| 1-1/4" | CS15-A00-10HA | 5.22 (2.35) | CS15-A00-20AA | 9.49 (4.27) |
| 1-1/2" | CS15-B00-10HA | 5.24 (2.36) | CS15-B00-20AA | 9.51 (4.28) |

For replacement silencer without yoke substitute **'0'** at the 5th, 8th, 10th and 11th digits eg:CS15-**0**00-**0**0**0**.

### Alternative Models

C S 1 5 - ★ 0 0 - ★ 0 ★ ★

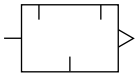
| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1 1/4″ | A |
| 1 1/2″ | B |
| No yoke | 0* |

| Option | Substitute |
|---|---|
| No Yoke | 0 * |
| Single yoke | 1 |
| Double yoke | 2 |

| Port Options | Substitute |
|---|---|
| PTF threaded | A A |
| ISO G threaded | D D |
| ISO Rc threaded | B B |
| One port plugged (PTF) | A X |
| One port plugged (ISO G) | D X |
| One port plugged (ISO Rc) | B X |
| No yoke | 0 0 * |

* For replacement silencer without yoke, use 0 in 5th through 11th positions.

### ISO Symbol



Automatic Drain

**See Section ALE-24 for Accessories**

All Dimensions in Inches (mm)

## Technical Data

Fluid: Compressed air

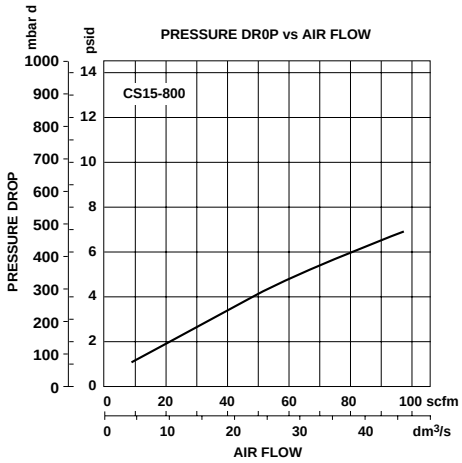
Operating temperature*: 0° to +122°F (-20° to +50°C)

* Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).

Materials:

- Body: Aluminum
- Yoke: Aluminum
- Cage: Aluminum
- Bowl: Polypropylene
- Element: Steel, synthetic foam, fiber
- Elastomers: Nitrile

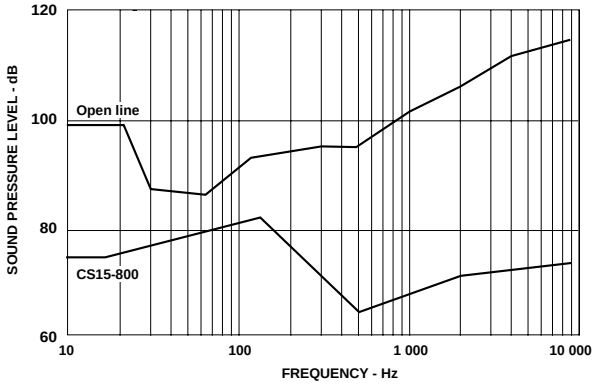
## Typical Performance Characteristics




## Service Kits

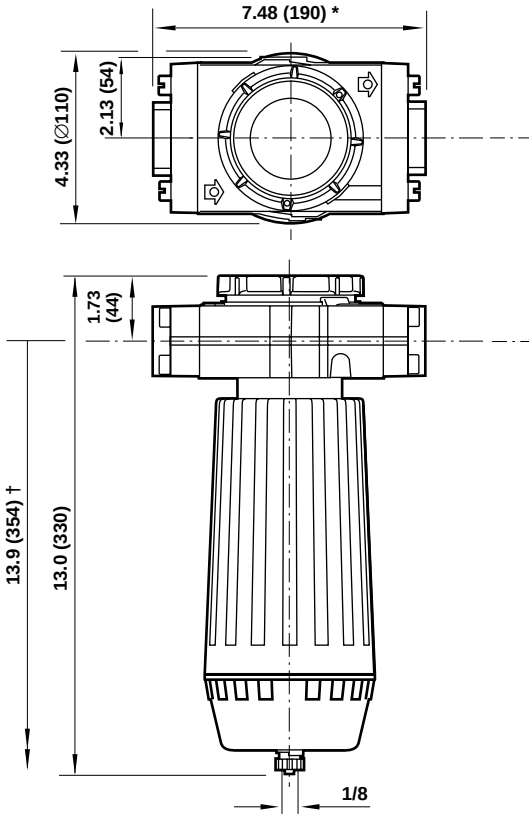
| Item | Part Number |
|---|---|
| Service kit | CS15RK |
| Replacement elements | 5576-97 |

Service kit includes: bowl, drain plug and drain retainer.

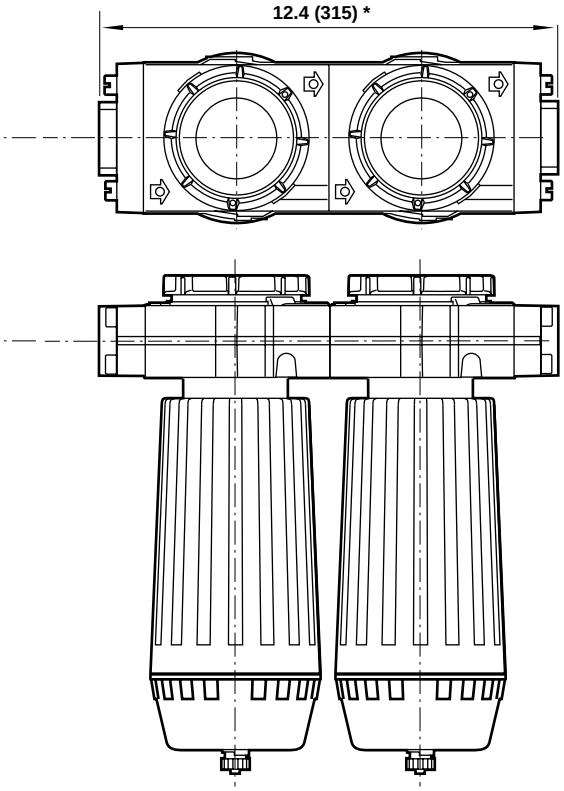



**Single unit**

**Single**




**Double unit**




*** Add 0.39" (10 mm) for 1-1/4" and 1-1/2" models.**
**† Minimum clearance required to remove bowl.**

† Minimum clearance required to remove bowl.

# 17-016

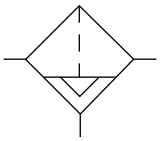
**Drip Leg Drain**
**1/2″ Port Size**

- **Automatically expels liquids from the piping network**
- **Can be disassembled without the use of tools or removal from the air line**
- **Automatic drain valve opens when system is unpressurized, allowing water to escape by gravity**
- **Automatic drain valve is float operated when system is pressurized**
- **Install at low points and at far end of piping network**

**Ordering Information.**

| Port Size | Bowl Type | Bowl Size | Model Number | Weight lbs (kg) |
|---|---|---|---|---|
| 1/2" PTF | Transparent | 1/3 pint (0.16 liter) | 17-016-104 | 0.8 (0.38) |
| 1/2" PTF | Metal with sight glass | 1/3 pint (0.16 liter) | 17-016-107 | 1.3 (0.59) |
| 1/2" PTF | Transparent | 3 fluid ounce (0.09 liter) | 17-016-102 | 0.8 (0.38) |

**ISO Symbol**



Automatic Drain

## Technical Data

Fluid: Compressed air
Maximum pressure
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*
- Transparent bowl: 0° to 125°F (-20° to 50°C)
- Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Automatic drain connection: 1/8" pipe thread
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Minimum air flow thru drain required to close drain: 2 scfm (1 $dm^3/s$).
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Manual operation: Depress pin inside drain outlet to drain bowl
- Flexible tube with 0.125" (3mm) minimum I.D. can be connected to the drain.
- Avoid restrictions in the tube.

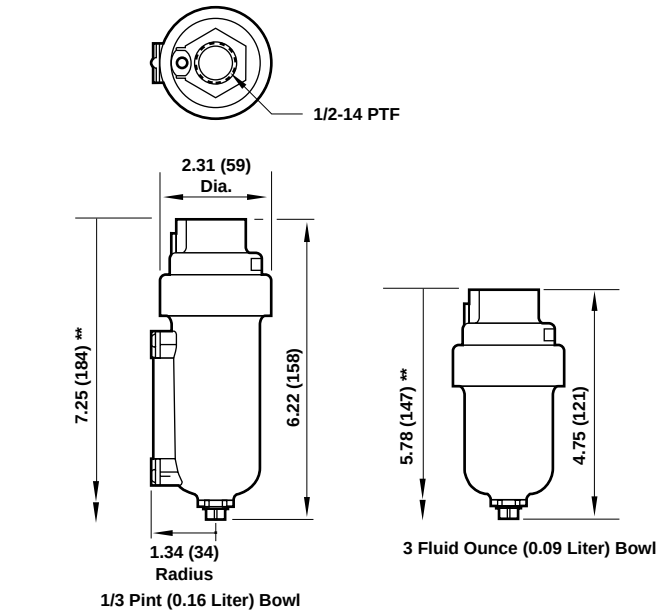
Nominal bowl size
- Standard: 1/3 pint (0.16 liter)
- Optional: 3 fluid ounce (0.09 liter)

Materials
- Body: Zinc
- Bowl
  - Transparent: Polycarbonate
  - Metal: Zinc
- Drain mechanism: Acetal, Nitrile, stainless steel
- Metal bowl liquid level indicator lens: Pyrex
- Elastomers: Nitrile

### Service Kits

| Item | Type | Part Number |
|---|---|---|
| Replacement drain | Automatic | 3000-10 |
| Liquid level lens kit | Pyrex | 2273-20 |

All Dimensions in Inches (mm)




** Minimum clearance required to remove bowl.

# 18-013, 5PG

**Air Pressure Gauges**
**1/8" and 1/4" Port Sizes**

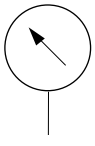
- **Monitor pressures in compressed air systems for optimum efficiency**
- **Triple calibrated scale indicates pressure in psi, bar, and Mpa (megapascal)**
- **Back or bottom connection**
- **Panel mount, stainless steel, and Underwriters Laboratories, Inc. listed gauges available**

## Technical Data

Fluid: Compressed air and inert gasses
Maximum pressure: 100% of full scale on gauge
Operating temperature: -30° to 175°F (-34° to 80°C)*
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Accuracy:
- 2% of full scale at midrange
- 3% of full scale at other ranges

Materials
- Body
  - Standard: Gauges may have a steel or plastic body
  - Optional: Stainless steel
- Crystal:
  - Standard steel and plastic bodies have plastic crystal
  - Optional stainless steel body has glass crystal
- Connector:
  - Standard steel and plastic bodies have brass connector
  - Optional stainless steel body has stainless steel connector

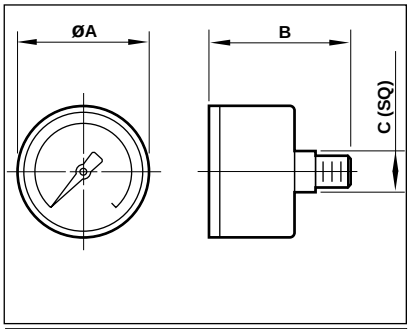
## ISO Symbol



**Ordering Information, Black Face Gauges** - psi outer scale, bar middle scale, Mpa inner scale

**Center Back Connection**

| Scale Range | | | | | | |
|---|---|---|---|---|---|---|
| Outer Scale psig | Middle Scale bar | Inner Scale Mpa | 1/8 NPT 1.5" (40mm) Diameter | 1/8 NPT 2" (50mm) Diameter | 1/4 NPT 2" (50mm) Diameter | R1/4 2" (50mm) Diameter |
| 0 to 30 | 0 to 2 | 0 to 0.2 | 18-013-214 | 18-013-201 | 18-013-207 | — |
| 0 to 60 | 0 to 4 | 0 to 0.4 | 18-013-211 | 18-013-202 | 18-013-208 | 18-013-268 |
| 0 to 100 | 0 to 7 | 0 to 0.7 | — | 18-013-203 | 18-013-235 | — |
| 0 to 160 | 0 to 11 | 0 to 1.1 | 18-013-212 | 18-013-204 | 18-013-209 | 18-013-269 |
| 0 to 300 | 0 to 20 | 0 to 2.1 | — | 18-013-205 | 18-013-210 | 18-013-270 |
| 0 to 400 | 0 to 28 | 0 to 2.8 | — | 18-013-206 | — | — |

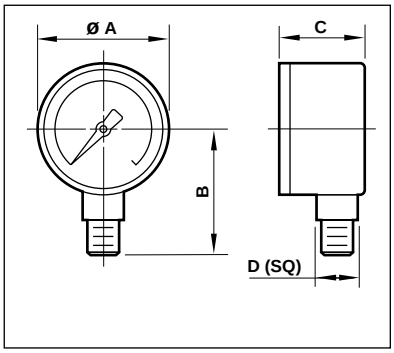



| A | B | C |
|---|---|---|
| 1.5 (40) | 1.60 (41) | 0.47 (12) |
| 2.0 (50) | 1.85 (47) | 0.55 (14) |

**Bottom Connection** - 2" (50 mm) diameter gauges do not have the Mpa scale

| Scale Range | | | | |
|---|---|---|---|---|
| Outer Scale psig | Middle Scale bar | Inner Scale Mpa | 1/8 NPT 1.5" (40mm) Diameter | 1/4 NPT 2" (50mm) Diameter |
| 0 to 15 | 0 to 1 | — | — | 18-013-082 |
| 0 to 30 | 0 to 2 | 0 to 0.2 | 18-013-224 | 18-013-030 * |
| 0 to 60 | 0 to 4 | 0 to 0.4 | 18-013-225 | 18-013-083 * |
| 0 to 100 | 0 to 7 | 0 to 0.7 | 18-013-265 | 18-013-084 * |
| 0 to 160 | 0 to 11 | 0 to 1.1 | 18-013-273 | 18-013-085 * |
| 0 to 300 | 0 to 20 | — | — | 18-013-086 * |
| 0 to 2000 | 0 to 135 | — | — | 18-013-244 *† |
| 0 to 3000 | 0 to 205 | — | — | 18-013-087 *† |

* Underwriters Laboratories Inc. Listed
† Shipped with pulsation dampener installed.

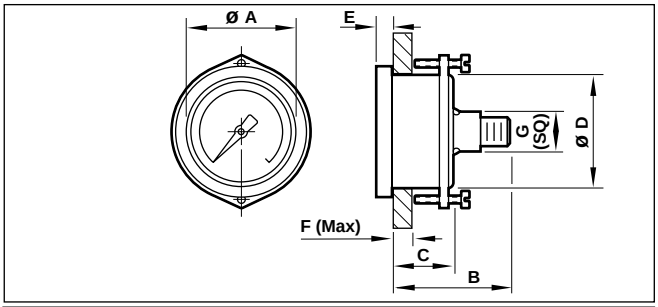



| A | B | C | D |
|---|---|---|---|
| 1.5 (40) | 1.42 (36) | 0.90 (23) | 0.47 (12) |
| 2.0 (50) | 1.73 (44) | 1.03 (26) | 0.55 (14) |

**Center Back Connection, Panel Mounted**

| Scale Range | | | 1/8 NPT Male and 10-32 Female |
|---|---|---|---|
| Outer Scale psig | Middle Scale bar | Inner Scale Mpa | 1.5" (40mm) Diameter |
| 0 to 30 | 0 to 2 | 0 to 0.2 | 5PG-306-000 ** |
| 0 to 60 | 0 to 4 | 0 to 0.4 | 5PG-312-000 ** |
| 0 to 100 | 0 to 7 | 0 to 0.7 | 5PG-320-000 ** |

** Requires 1.63" (41 mm) diameter panel hole.




| A | B | C | D | E | F (Max) | G |
|---|---|---|---|---|---|---|
| 1.5 (40) | 1.51 (38) | 0.86 (22) | 1.61 (41) | 0.18 (5) | 0.5 (13) | 0.55 (14) |

## Alternative Models

Pulsation Dampener: Add ***-9D*** to the end of the model number.

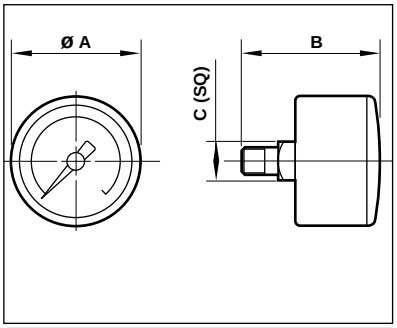
# Air Pressure Gauges

All Dimensions in Inches (mm)

## Ordering Information, White Face Gauges - bar outer scale, Mpa middle scale, psi inner scale

### Center Back Connection

| Scale Range | | | | | |
|---|---|---|---|---|---|
| Outer Scale bar | Middle Scale Mpa | Inner Scale psi | R1/8 1.5" (40mm) Diameter | R1/8 2" (50mm) Diameter | R1/8 2.5" (63mm) Diameter |
| 0 to 1.6 | 0 to 0.16 | 0 to 23 | 18-013-991 | 18-013-010 | — |
| 0 to 4 | 0 to 0.4 | 0 to 56 | 18-013-990 | 18-013-011 | — |
| 0 to 6 | 0 to 0.6 | 0 to 84 | — | 18-013-012 | — |
| 0 to 10 | 0 to 1.0 | 0 to 140 | 18-013-989 | 18-013-013 | 18-013-856 |
| 0 to 16 | 0 to 1.6 | 0 to 240 | — | — | 18-013-855 |
| 0 to 25 | 0 to 2.5 | 0 to 360 | 18-013-908 | 18-013-014 | — |




| A | B | C |
|---|---|---|
| 1.5 (40) | 1.77 (45)* | 0.55 (14) |
| 2.0 (50) | 1.93 (49) | 0.55 (14) |
| 2.5 (63) | 1.89 (48) | 0.55 (14) |

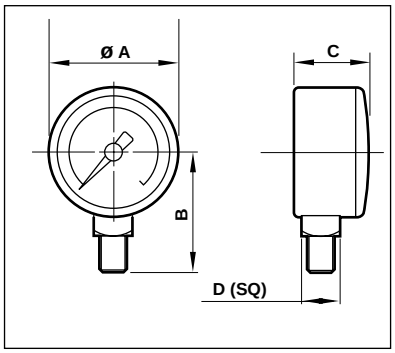
* 1.57 (40) on 1/8 PTF stainless steel gauges
1.85 (47) on 1/4 PTF stainless steel gauges

Stainless Steel Gauges - gauges do not have the Mpa scale

| Scale Range | | | |
|---|---|---|---|
| Outer Scale bar | Inner Scale psi | 1/8 PTF 1.5" (40mm) Diameter | 1/4 PTF 1.5" (40mm) Diameter |
| 0 to 6 | 0 to 84 | — | 18-013-913 |
| 0 to 10 | 0 to 140 | 18-013-844 | 18-013-909 |
| 0 to 25 | 0 to 360 | — | 18-013-905 |

### Bottom Connection

| Scale Range | | | | |
|---|---|---|---|---|
| Outer Scale bar | Middle Scale Mpa | Inner Scale psi | R1/8 2" (50mm) Diameter | G1/4A 2.5" (63mm) Diameter |
| 0 to 1.6 | 0 to 0.16 | 0 to 23 | 18-013-024 | — |
| 0 to 4 | 0 to 0.4 | 0 to 56 | 18-013-025 | — |
| 0 to 6 | 0 to 0.6 | 0 to 84 | 18-013-026 | — |
| 0 to 10 | 0 to 1.0 | 0 to 140 | 18-013-027 | 18-013-854 |
| 0 to 16 | 0 to 1.6 | 0 to 240 | — | 18-013-853 |
| 0 to 25 | 0 to 2.5 | 0 to 360 | 18-013-028 | — |

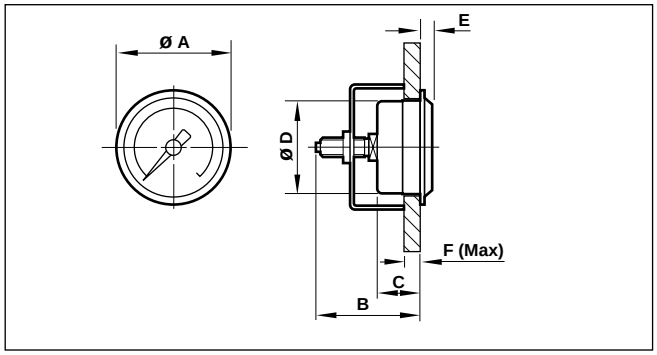



| A | B | C | D |
|---|---|---|---|
| 2.0 (50) | 1.77 (45) | 1.10 (28) | 0.55 (14) |
| 2.5 (63) | 2.09 (53) | 1.10 (28) | 0.55 (14) |

### Center Back Connection, Panel Mount

| Scale Range | | | | |
|---|---|---|---|---|
| Outer Scale bar | Middle Scale Mpa | Inner Scale psi | G1/8A 2" (50mm) Diameter | G1/8A 2.5" (63mm) Diameter |
| 0 to 6 | 0 to 0.6 | 0 to 84 | 18-013-858 * | — |
| 0 to 10 | 0 to 1.0 | 0 to 140 | 18-013-857 * | 18-013-852 † |
| 0 to 16 | 0 to 1.6 | 0 to 240 | — | 18-013-851 † |

* Requires 2.01" (51 mm) diameter panel hole.
† Requires 2.52" (64 mm) diameter panel hole.



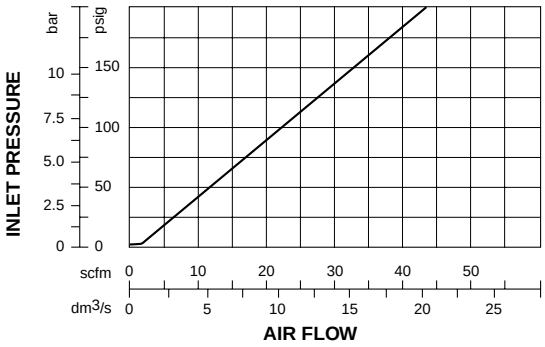

| A | B | C | D | E | F |
|---|---|---|---|---|---|
| 2.0 (50) | 2.17 (55) | 1.02 (26) | 1.93 (49) | 0.20 (5) | 0.37 (9.5) |
| 2.5 (63) | 2.20 (56) | 1.06 (27) | 2.44 (62) | 0.24 (6) | 0.37 (9.5) |

# High Pressure Needle Valves

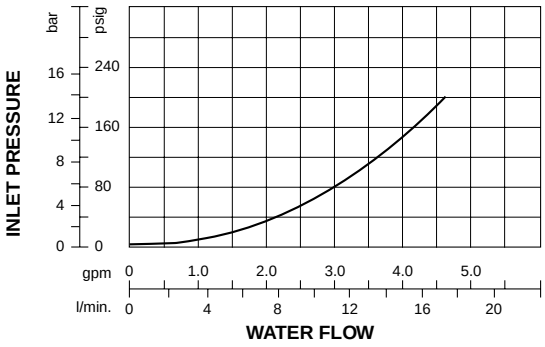
**1/8" and 1/4" Port Sizes**

- **Bar stock machined brass body**
- **Tapered brass needle**
- **Adjustable stem packing nut with Teflon® seal**
- **Retained adjustment stem**
- **Metal to metal sealing surfaces**
- **Accurate metering of fluids**
- **3,000 psig inlet pressure**

Fluid: Air
Outlet Pressure: Atmoshpere
Adjustment Knob: Full Open




Fluid: Water
Outlet Pressure: Atmoshpere
Adjustment Knob: Full Open




**Specifications**

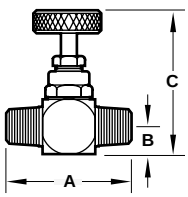
Fluid: Compressed air, water, steam, and other non-flammable, inert gases and liquids
Max. Inlet Pressure: 3,000 psig (207 bar)
Temperature Range: -40° to 500°F (-40° to 260°C)
Maximum Differential Pressure: 15 psid (1 bar d)
Ports: 1/8 or 1/4 NPT
Orifice Size: Ø0.187" (5 mm)
CV: 0.401

**Materials of Construction**

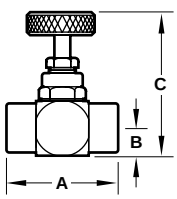
Body, needle, packing nut, knob: Brass
Stem Seal: Teflon®

| Size (NPT) | Port In | Port Out | Part Number | Dimensions A | B | C Closed | C Open |
|---|---|---|---|---|---|---|---|
| 1/8" | Male | Male | 17-001-106 | 1.63 (41) | 0.38 (10) | 2.13 (54) | 2.25 (57) |
| | Female | Female | 17-001-109 | 1.63 (41) | 0.38 (10) | 2.13 (54) | 2.25 (57) |
| | Female | Male | 17-001-112 | 1.63 (41) | 0.38 (10) | 2.13 (54) | 2.25 (57) |
| 1/4" | Male | Male | 17-001-107 | 1.81 (46) | 0.38 (10) | 2.13 (54) | 2.25 (57) |
| | Female | Female | 17-001-110 | 1.63 (41) | 0.38 (10) | 2.13 (54) | 2.25 (57) |
| | Male | Female | 17-001-114 | 1.72 (44) | 0.38 (10) | 2.13 (54) | 2.25 (57) |

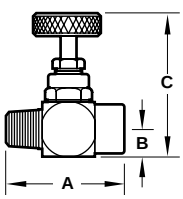
**17-001-106**
**17-001-107**




**17-001-109**
**17-001-110**




**17-001-112**
**17-001-114**



# Regulated Blow Gun

**1/4" Port Size**

- **Nozzle pressure regulated to below 30 psig (2.1 bar) even if nozzle is obstructed**
- **OSHA compliant**
- **Large lever for comfort and easy actuation**
- **Permanently assembled, tamper resistant construction**
- **Surface scratching reduced by ordering model with rubber tipped nozzle**
- **Replaceable nozzle tip**
- **10" extension nozzle available**

### Specifications

Fluid: Compressed air
Maximum Inlet Pressure: 250 psig (17.2 bar)
Temperature Range: 32° to 175°F (0° to 79°C)
Outlet (Regulated) Pressure: Below 30 psig (2.1 bar)
Nozzle Orifice: Ø0.16" (Ø4 mm)
Port Size: 1/4 PTF (female)

### Materials of Construction

Body: Polyester
Nozzle Tip: Metal (aluminum or brass) or Rubber
Elastomers: Nitrile

### Accessories

Hanging Hook: 5320-01
10" Extension Nozzle: 5363-50

### Replacement Parts

Nozzle with Air Shield: 1135-05
Nozzle without Air Shield: 1135-06
Nozzle Rubber Tip: 1135-07

| Port (PTF) | Part Number | Nozzle Type |
|---|---|---|
| 1/4 | 17-104-302 | Metal Tip with Air Shield |
| 1/4 | 17-104-304 | Metal Tip |
| 1/4 | 17-104-306 | Rubber Tip |

# Filter-Filter

## Modular prefilter and oil removal filter combination units in port size from 1/4" to 3/4"



**F72 Filter-Filter Combination Unit**


**F73 Filter-Filter Combination Unit**


**F74 Filter-Filter Combination Unit**

# F72G, F72C

## Excelon 72 Filter Combination Units 1/4" and 3/8" Port Sizes

- **True modularity with Norgren Quikclamp™ connections**
- **F72G prefilter and F72C oil removal filter provide high efficiency oil removal and particle removal down to 0.01 µm**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Service indicator turns from green to red when the filter element needs to be replaced**

**Ordering information.** Models listed include PTF threads, service indicator, automatic drain, and long transparent bowl without guard on both filters.

| Port Size | Model | Weight lb (kg) |
|---|---|---|
| 1/4" | H72A-2AB-AL1-NNN-LNN | 2 (0.91) |
| 3/8" | H72A-3AB-AL1-NNN-LNN | 2 (0.91) |

### Alternative Models

★ 7 2 A - ★ ★ ★ - ★ ★ ★ - N N N - ★ N ★

| Shutoff/Lockout Valve, Quikmount | Substitute |
|---|---|
| Standard Combination (No Shutoff/Lockout Valve, no Quikmount) | H |
| With Shutoff/Lockout valve on inlet | J |
| With Quikmount pipe adapters on inlet and outlet | M |
| With Shutoff/Lockout Valve on inlet and Quikmount pipe adapter on outlet | N |

| Combination Unit Type | Substitute |
|---|---|
| F72G general purpose filter and F72C coalescing filter | A |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Mechanical Service Indicator | Substitute |
|---|---|
| Indictor on F72G and F72C | B |
| Indictor only on F72C | C |
| Indictor only on F72G | D |
| No indicator | N |

| F72G and F72C Drain | Substitute |
|---|---|
| Automatic** | A |
| Manual, 1⁄4 turn | Q |
| Semi automatic | S |

** Supplied in long bowl options only.

| Quikclamp Wall Brackets | Substitute |
|---|---|
| With | B |
| Without | N |

| Adsorbing Filter Bowl | Substitute |
|---|---|
| No Adsorbing filter | N |

| F72C Bowl | Substitute |
|---|---|
| Short metal with liquid level indicator | D |
| Long metal with liquid level indicator | E |
| Short transparent without guard | T |
| Long transparent without guard | L |
| Long transparent with guard | W |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| F72G Filter Element | Substitute |
|---|---|
| 5 µm | 1 |

| F72G Bowl | Substitute |
|---|---|
| Short metal with liquid level indicator | D |
| Long metal with liquid level indicator | E |
| Short transparent without guard | T |
| Long transparent without guard | L |
| Long transparent with guard | W |

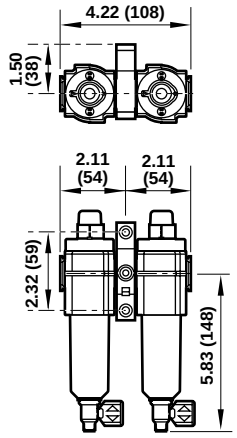
**See Section ALE-24 for Accessories**

All Dimensions in Inches (mm)

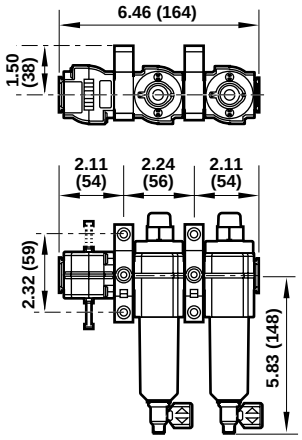
## Technical Data

Fluid: Compressed air
Maximum pressure:
Transparent bowl: Manual or semi automatic drain: 150 psig (10 bar)
Automatic drain: 116 psig (8 bar)
Metal bowl: Manual or semi automatic drain: 250 psig (17 bar)
Automatic drain: 116 psig (8 bar)
Operating temperature*: Transparent bowl: -30° to 125°F (-34° to 50°C)
Metal bowl: -30° to 150°F (-34 to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: Down to 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (20°C) with an inlet concentration of 17 ppm
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Semi automatic drain connection: Push on 5/16″ (8 mm) ID tube
Semi automatic drain operating conditions (pressure operated)
Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)
Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)
Minimum air flow required to close drain: 1 scfm (0.5 $dm^3/s$)
Manual operation: Lift stem to drain bowl
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Flexible tube with 3/16" (5 mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5 mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated)
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size
Short bowl: 1.9 fluid ounce (56 ml)
Long bowl: 2.2 fluid ounce (65 ml)
Materials
Body: Zinc
Bowl
Transparent: Polycarbonate
Transparent with guard: Polycarbonate, zinc guard
Metal: Zinc
Metal bowl liquid level indicator lens: Transparent nylon
F72G element: Sintered polypropylene
F72C element: Synthetic fiber and polyurethane foam
Elastomers: Neoprene and nitrile
Service indicator materials
Body: Transparent nylon
Internal parts: Acetal
Spring: Stainless steel
Elastomers: Nitrile

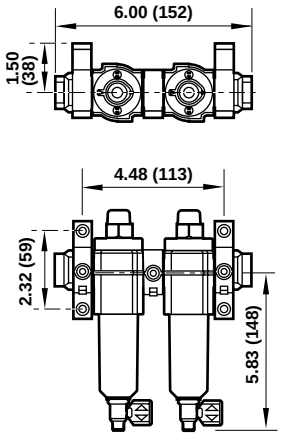
**Standard Type H72A-**
Shown with optional Quikclamp wall bracket.



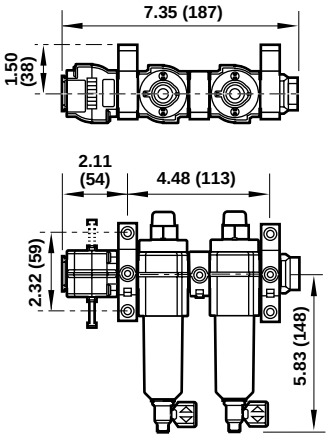

**Alternative Type J72A-**
**Includes Shutoff/Lockout valve.**
Shown with optional Quikclamp wall brackets.



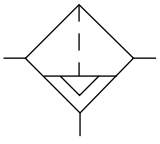

**Alternative Type M72A-**
**Includes Quikmount pipe adapters.**
Shown with optional Quikclamp wall brackets.



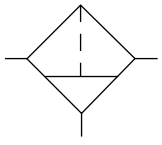

**Alternative Type N72A-**
**Includes Shutoff/Lockout valve and Quikmount pipe adapter.**
Shown with optional Quikclamp wall brackets.




## ISO Symbols



Automatic and Semi Automatic Drain



Manual Drain

# F73G, F73C

## Excelon 73 Filter Combination Units
## 1/4", 3/8", 1/2" Port Sizes

- **True modularity with Norgren Quikclamp connections**
- **F73G prefilter and F73C oil removal filter provide high efficiency oil removal and particle removal down to 0.01 µm**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Service indicator turns from green to red when the filter element needs to be replaced**


**Ordering information.** Models listed include PTF parallel threads, service indicator, automatic drain, and metal bowl with liquid level indicator on both filters.

| Port Size | Model | Weight lb (kg) |
|---|---|---|
| 1/4" | H73A-2AB-AD1-NNN-DNN | 2.7 (1.22) |
| 3/8" | H73A-3AB-AD1-NNN-DNN | 2.7 (1.22) |
| 1/2" | H73A-4AB-AD1-NNN-DNN | 2.7 (1.22) |

### Alternative Models

★ 7 3 A - ★ ★ ★ - ★ ★ ★ - N N N - ★ N ★

| Lockout Valve/Quikmount | Substitute |
|---|---|
| Standard Combination (No Lockout Valve, no Quikmount) | H |
| With Lockout valve on inlet | J |
| With Quikmount pipe adapters on inlet and outlet | M |
| With Lockout Valve on inlet and Quikmount pipe adapter on outlet | N |

| Combination Unit Type | Substitute |
|---|---|
| F73G general purpose filter and F73C coalescing filter | A |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Mechanical Service Indicator | Substitute |
|---|---|
| Indictor on F73G and F73C | B |
| Indictor only on F73C | C |
| Indictor only on F73G | D |
| No indicator | N |

| Quikclamp Wall Brackets | Substitute |
|---|---|
| With | B |
| Without | N |

| Adsorbing Filter Bowl | Substitute |
|---|---|
| No Adsorbing filter | N |

| F73C Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |
| Transparent | T |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| F73G Filter Element | Substitute |
|---|---|
| 5 µm | 1 |

| F73G Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |
| Transparent | T |

| F73G and F73C Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1/4 turn | Q |

All Dimensions in Inches (mm)

## Technical Data

Fluid: Compressed air
Maximum pressure:
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

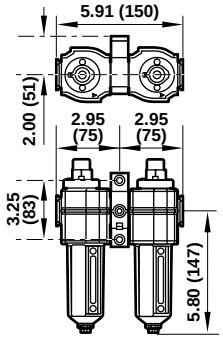
Operating temperature*:
- Transparent bowl: -30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 150°F (-34° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

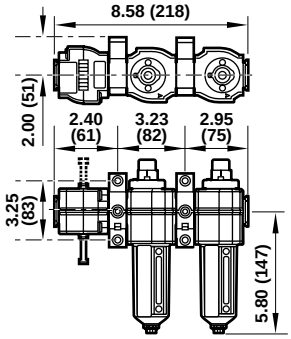
Particle removal: Down to 0.01 µm
Air quality: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
Maximum remaining oil content in outlet air: 0.01 ppm at 70°F (20°C) with an inlet concentration of 17 ppm
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Flexible tube with 3/16" (5 mm) minimum I.D. can be connected to the automatic drain. Drain may fail to operate if the tube I.D. is less than 3/16" (5 mm). Avoid restrictions in the tube.
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)
Materials
- Body: Aluminum
- Bowl
  - Transparent: Polycarbonate
  - Transparent with guard: Polycarbonate, steel guard
  - Metal: Aluminum
  - Metal bowl liquid level indicator lens: Transparent nylon
- F73G element: Sintered polypropylene
- F73C element: Synthetic fiber and polyurethane foam
- Elastomers: Neoprene and nitrile
- Service indicator materials
  - Body: Transparent nylon
  - Internal parts: Acetal
  - Spring: Stainless steel
  - Elastomers: Nitrile

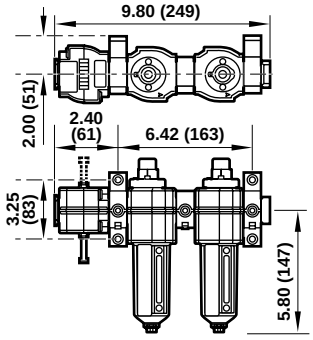
**Standard Type H73A-**
Shown with optional Quikclamp wall bracket.



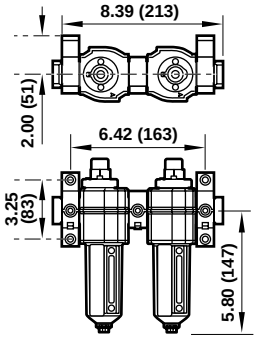

**Alternative Type J73A-**
**Includes Lockout Valve**
Shown with optional Quikclamp wall brackets.



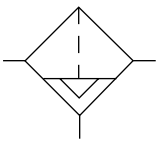

**Alternative Type N73A-**
**Includes Lockout Valve and Quikmount Pipe Adapters**
Shown with optional Quikclamp wall brackets.



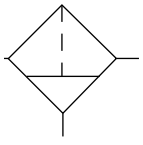

**Alternative Type M73A-**
**Includes Quikmount Pipe Adapters**
Shown with optional Quikclamp wall brackets.




## ISO Symbols



Automatic Drain



Manual Drain

**See Section ALE-24 for Accessories**

# F74G, F74C/H, F74V

## Excelon 74 Filter Combination Units
## 3/8", 1/2", 3/4" Port Sizes

- **True modularity with Norgren Quikclamp™ connections**
- **F74G prefilter and F74C oil removal filter provide high efficiency oil removal and particle removal down to 0.01 µm**
- **F74V oil vapor removal filter uses an adsorbing type activated carbon element to remove oil vapors and most hydrocarbon odors**
- **Quick release bayonet bowl**
- **Highly visible, prismatic liquid level indicator lens**
- **Service indicator turns from green to red when the filter element needs to be replaced**


### Technical Data

Fluid: Compressed air
Maximum pressure
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

F74G and F74C/H operating temperature*:
- Transparent bowl: -30° to 125°F (-34° to 50°C)
- Metal bowl: -30° to 150°F (-34° to 65°C)

F74V temperature range*: -30° to 150°F (-34° to 65°C).

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

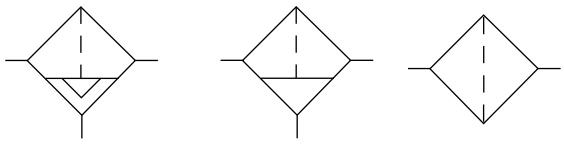
Particle removal: Down to 0.01 µm
Air quality:
- F74G, F74C/H: Within ISO 8573-1, Class 1 (particulates) and Class 2 (oil content)
- F74G, F74C, F74V: Within ISO 8573-1, Class 1 (particulates) and Class 1 (oil content)

Maximum remaining oil content in outlet air with an inlet concentration of 17 ppm
- F74G, F74C/H: 0.01 ppm at 70°F (20°C)
- F74G, F74H, F74V: 0.003 ppm at 70°F (20°C)

Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 7 fluid ounce (0.2 liter)
Materials
- Body: Aluminum
- Bowl
  - Transparent: Polycarbonate with steel bowl guard
  - Metal: Aluminum
- Metal bowl liquid level indicator lens: Transparent nylon
- F74G element: Sintered polypropylene
- F74C/H element: Synthetic fiber and polyurethane foam
- F74V element: Activated carbon and aluminum
- Elastomers: Neoprene and nitrile
- Service indicator materials:
  - Body: Transparent nylon
  - Internal parts: Acetal
  - Spring: Stainless steel
  - Elastomers: Nitrile

### ISO Symbols




**See Section ALE-24 for Accessories**

**Ordering information.** Models listed include PTF parallel threads, service indicator on the general purpose and coalescing filters, automatic drain and metal bowl with liquid level indicator on the general purpose and coalescing filters.

| Combination Unit | Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|---|
| General Purpose and Coalescing Filters | Standard | 3/8" | H74A-3AB-AD1-NNN-DNN | 4.15 (1.88) |
| | Standard | 1/2" | H74A-4AB-AD1-NNN-DNN | 4.06 (1.84) |
| | High Flow | 1/2" | H74B-4AB-AD1-NNN-DNN | 4.67 (2.12) |
| | High Flow | 3/4" | H74B-6AB-AD1-NNN-DNN | 4.61 (2.09) |
| General Purpose,Coalescing, and Adsorbing Filters | Standard | 3/8" | H74F-3AB-AD1-NNN-DMN | 7.12 (3.23) |
| | Standard | 1/2" | H74F-4AB-AD1-NNN-DMN | 7.01 (3.18) |

## Alternative Models

★ 7 4 ★ - ★ ★ ★ - ★ ★ ★ - N N N - ★ ★ ★

| Lockout Valve/ Quikmount | Substitute |
|---|---|
| Standard combination (no lockout valve or Quikmount) | H |
| With lockout valve on inlet | J |
| With Quikmount pipe adapters on inlet and outlet | M |
| With lockout valve on inlet and Quikmount pipe adapter on outlet | N |

| Combination Unit Type | Substitute |
|---|---|
| General purpose filter and standard coalescing filter | A |
| General purpose filter and high flow coalescing filter | B |
| General purpose filter, standard coalescing filter, and adsorbing filter | F |

| Port Size | Substitute |
|---|---|
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Service Indicator | Substitute |
|---|---|
| On general purpose and coalescing filters | B |
| Only on coalescing filter | C |
| Only on general purpose filter | D |
| No service Indicator | N |

| Quikclamp Wall Brackets | Substitute |
|---|---|
| With | B |
| Without | N |

| Adsorbing Filter Bowl | Substitute |
|---|---|
| Metal, closed bottom | M |
| No adsorbing filter | N |

| Coalescing Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with metal guard | P |

| Regulator Option | Substitute |
|---|---|
| Non applicable | N |

| Regulator Option | Substitute |
|---|---|
| Non applicable | N |

| Regulator Option | Substitute |
|---|---|
| Non applicable | N |

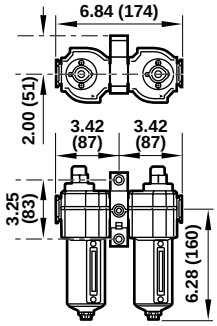
| General Purpose Filter Element | Substitute |
|---|---|
| 5 µm | 1 |

| General Purpose Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |

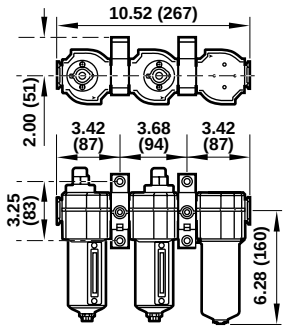
| General Purpose Filter and Coalescing Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1⁄4 turn | Q |

All Dimensions in Inches (mm)

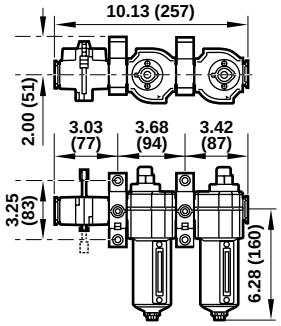
**Standard Type H74A Shown (H74B Similar)**
Shown with optional Quikclamp wall bracket.



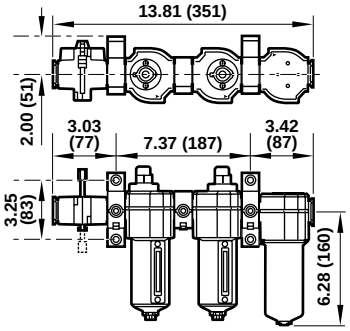

**Standard Type H74F**
Shown with optional Quikclamp wall bracket.



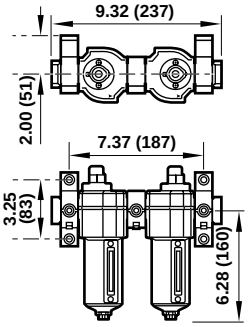

**Standard Type J74A Shown (J74B Similar)**
**Includes Shutoff/Lockout valve**
Shown with optional Quikclamp wall brackets.



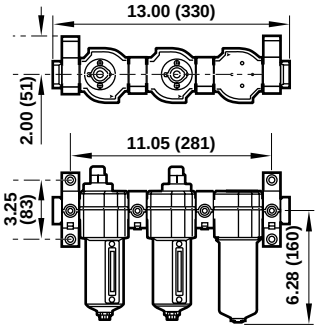

**Alternative Type J74F-**
**Includes Shutoff/Lockout valve**
Shown with optional Quikclamp wall brackets.



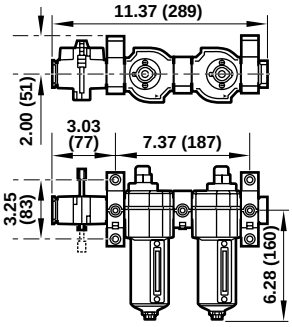

**Standard Type M74A Shown (M74B Similar)**
**Includes Quikmount pipe adapters.**
Shown with optional Quikclamp wall bracket.



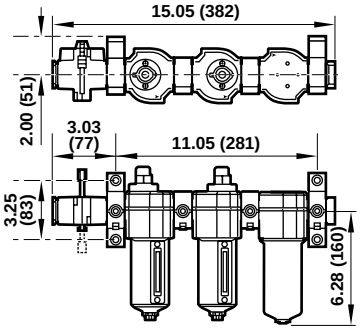

**Alternative Type M74F-**
**Includes Quikmount pipe adapters.**
Shown with optional Quikclamp wall brackets.




**Standard Type N74A Shown (N74B Similar)**
**Includes Shutoff/Lockout valve and Quikmount pipe adapter.**
Shown with optional Quikclamp wall brackets.




**Alternative Type N74F-**
**Includes Shutoff/Lockout valve and Quikmount pipe adapter.**
Shown with optional Quikclamp wall brackets.



# Filter/Regulator-Lubricator

## Combination units in port sizes from 1/8" to 3/4".



**07 Series F/R-L**

**72 Series F/R-L**

**73 Series F/R-L**

**74 Series F/R-L**

**64 Series F/R-L**

# P1H, PTH Combination Unit

**07 Series Filter/Regulator-Lubricator**
**1/8" and 1/4" Port Sizes**

- **Compact design**
- **Filter removes liquids and solid particles down to 5 µm**
- **Push to lock adjusting knob with tamper resistant option**
- **Micro-Fog lubricator provides air line lubrication to one or more air driven tools or other devices**
- **Nearly constant oil density output with varying air flow**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering Information.** Models listed include PTF threads, transparent bowls, filter/regulator with relieving diaphragm, automatic drain, 5 µm element, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range*, gauge, and lubricator with auto drain.

| Port Size | Model Number | Weight lbs (kg) |
|---|---|---|
| 1/8" | PTH-100-A1AA | 0.87 (40) |
| 1/4" | PTH-200-A1AA | 0.87 (40) |

## Alternative Models

P ★ H - ★ ★ ★ - ★ ★ ★ ★

| Integral Wall Bracket | Substitute |
|---|---|
| Without (P1H Combination Unit) | 1 |
| With (PTH Combination Unit) | T |

| Port Size | Substitute |
|---|---|
| 1/8" | 1 |
| 1/4" | 2 |

| Filter/Regulator Bowl | Outlet Pressure Adjustment Range* bar | psig | Relief Type | Gauge | Substitute |
|---|---|---|---|---|---|
| Transparent | 5 to 100 | 0.3 to 7 | Relieving | With | 00 |
| Transparent | 5 to 100 | 0.3 to 7 | Relieving | Without | 01 |
| Transparent | 5 to 100 | 0.3 to 7 | Non-relieving | Without | 02 |
| Transparent | 5 to 100 | 0.3 to 7 | Non-relieving | With | 03 |
| Transparent | 5 to 50 | 0.3 to 3.5 | Relieving | Without | 04 |
| Transparent | 5 to 50 | 0.3 to 3.5 | Relieving | With | 05 |
| Transparent | 5 to 50 | 0.3 to 3.5 | Non-relieving | Without | 06 |
| Transparent | 5 to 50 | 0.3 to 3.5 | Non-relieving | With | 07 |
| Metal / no sight glass | 5 to 100 | 0.3 to 7 | Relieving | With | 40 |
| Metal / no sight glass | 5 to 100 | 0.3 to 7 | Relieving | Without | 41 |
| Metal / no sight glass | 5 to 100 | 0.3 to 7 | Non-relieving | Without | 42 |
| Metal / no sight glass | 5 to 100 | 0.3 to 7 | Non-relieving | With | 43 |
| Metal / no sight glass | 5 to 50 | 0.3 to 3.5 | Relieving | Without | 44 |
| Metal / no sight glass | 5 to 50 | 0.3 to 3.5 | Relieving | With | 45 |
| Metal / no sight glass | 5 to 50 | 0.3 to 3.5 | Non-relieving | Without | 46 |
| Metal / no sight glass | 5 to 50 | 0.3 to 3.5 | Non-relieving | With | 47 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Lubricator Reservoir | Substitute |
|---|---|
| Transparent with drain | A |
| Transparent without drain | Q |
| Metal with drain | M |
| Metal without drain | F |

| Filter/Regulator Element | Substitute |
|---|---|
| 5 µm | 1 |
| 40 µm | 3 |

| Filter/Regulator Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

**See Section ALE-24 for Accessories**

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

## Technical Data

Fluid: Compressed air
Maximum pressure
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 150°F (-20° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
Typical flow at 100 psig (7 bar) inlet pressure, 90 psig (6.3 bar) set pressure and a droop of 15 psig (1 bar) from set:
1/8" ports: T.B.A.
1/4" ports: 6 scfm (3 $dm^3/s$)
Drain connection: 1/8" pipe

**Filter/Regulator**

Particle removal: 5 µm or 40 µm. Within ISO 8573-1, Class 3 and Class 5
Gauge ports:
1/8" PTF with PTF main ports
1/8" ISO Rc with ISO Rc main ports
1/8" ISO Rc with ISO G main ports
Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.

**Lubricator**

Start point (i.e., minimum flow required for lubricator operation): 0.5 scfm (0.24 $dm^3/s$) at 90 psig (6.3 bar) inlet pressure
Nominal bowl capacity: 1 fluid ounce (31 ml)
Recommended lubricants: See Section ALE-29.
Materials
Bodies: Zinc
Filter/Regulator bonnet: Acetal
Filter/Regulator valve: Brass/nitrile
Filter/Regulator valve seat: Acetal
Bowls
Transparent: Polycarbonate
Metal: Zinc
Lubricator sight-feed dome: Transparent nylon
Filter element: Sintered polypropylene
Elastomers: Nitrile

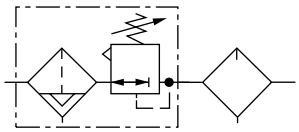
## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kits, filter/regulator | relieving, 5 µm element | 3820-02 |
| | non relieving, 5 µm element | 3820-01 |
| Service kit, lubricator | | 3795-03 |
| Replacement drains | Manual | 773-03 |
| | Automatic | 3654-02 |
| Replacement wall bracket for PTH unit | Integral 2 piece | 6700-30 |

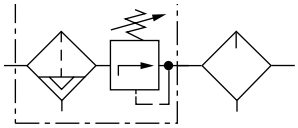
Filter/regulator service kit contains slip ring, diaphragm, valve seat with o-ring, valve, valve spring, element, element gasket, and bowl o-ring.

Lubricator service kit contains sight-feed dome seal, cartridge o-ring, and bowl o-ring.

## ISO Symbols

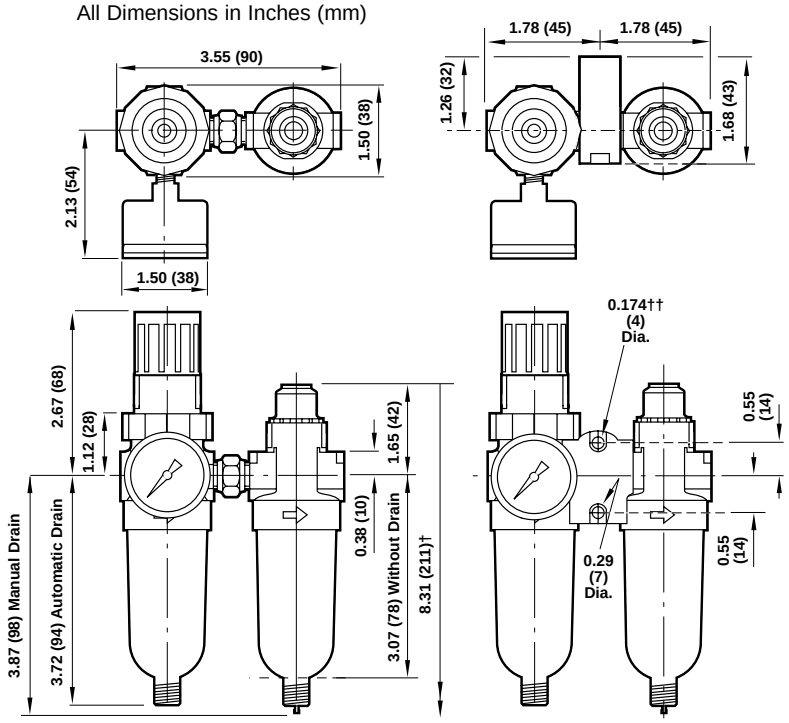


Relieving filter/regulator with automatic drain, lubricator with manual drain



Non relieving filter/regulator with automatic drain, lubricator with manual drain

All Dimensions in Inches (mm)




†Minimum distance required to remove bowl
†† Mounting holes

# B72, L72 Combination Units

## Excelon 72 Series Filter/Regulator-Lubricator
## 1/4" and 3/8" Port Sizes

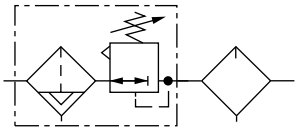
- **True modularity with Norgren Quikclamp™ connections**
- **Quick release bayonet bowl**
- **Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows**
- **All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment**
- **Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure**

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.

### Technical Data

Fluid: Compressed air
Maximum pressure:
Transparent bowl: 150 psig (10 bar)
Metal bowl (manual or semi automatic drain): 250 psig (17 bar)
Automatic drain: 150 psig (10 bar)
Operating temperature*:
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 150°F (-20° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C ).
Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Semi automatic drain connection: Push on 5/16″ (8 mm) ID tube
Semi automatic drain operating conditions (pressure operated)
Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)
Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)
Minimum air flow required to close drain: 1 scfm (0.5 $dm^3/s$)
Manual operation: Lift stem to drain bowl
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size
Bowl: 2.2 fluid ounce (65 ml)
Gauge ports: 1/8 PTF with PTF main ports
Rc 1/8 with ISO Rc and ISO G main ports
Recommended lubricants: See Section ALE-29.
Materials
Body: Zinc
Bonnet: Acetal
Filter/Regulator valve: Brass
Bowl: Transparent: Polycarbonate
Transparent with guard: Polycarbonate, zinc guard
Metal: Zinc
Metal bowl liquid level indicator lens: Transparent nylon
Sight-Feed dome: Transparent nylon
Element: Sintered polypropylene
Elastomers: Neoprene, nitrile

### ISO Symbol



Filter with automatic drain, Regulator with relieving diaphragm, Lubricator with manual drain

**See Section ALE-24 for Accessories**

**Ordering information.** Models include PTF threads. Filter/Regulator (F/R) has knob adjustment, automatic drain, transparent bowl with guard, 40 µm element, relieving diaphragm, and 150 psig (10 bar) regulating spring, and gauge. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and transparent bowl with guard.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter/Regulator-Lubricator (F/R-L) | 1/4" | C72H-2AK-AW3-RMG-QWN | 2.37 (1.08) |
| | 3/8" | C72H-3AK-AW3-RMG-QWN | 2.37 (1.08) |

## Alternative Models

★ 7 2 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Shutoff/Lockout Valve, Quikmount | Substitute |
|---|---|
| Standard Combination (No Shutoff/Lockout Valve, no Quikmount) | C |
| With Shutoff/Lockout valve on inlet | D |
| With Quikmount pipe adapters on inlet and outlet | E |
| With Shutoff/Lockout Valve on inlet and Quikmount pipe adapter on outlet | G |

| Combination Unit Type | Substitute |
|---|---|
| Standard Micro-Fog F/R-L | H |
| Standard Oil-Fog F/R-L | J |
| Micro-Fog F/R-L with porting block between filter/regulator and lubricator | K |
| Oil-Fog F/R-L with porting block between filter/regulator and lubricator | L |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Pressure Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Filter Drain | Substitute |
|---|---|
| Automatic † | A |
| Manual, 1⁄4 turn | Q |
| Semi automatic | S |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | E |
| Transparent without guard | L |
| Transparent with guard W | |

| Accessories | Substitute |
|---|---|
| Quikclamp wall brackets | B |
| No accessories | N |

| Lubricator Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | E |
| Transparent without guard | L |
| Transparent with guard | W |

| Lubricator Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual, 1⁄4 turn | Q |

| Regulator Gauge | Substitute |
|---|---|
| With gauge | G |
| No gauge | N |

| Regulation spring ** | Substitute |
|---|---|
| 5 to 30 psig (0.3 to 2 bar) | C |
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |

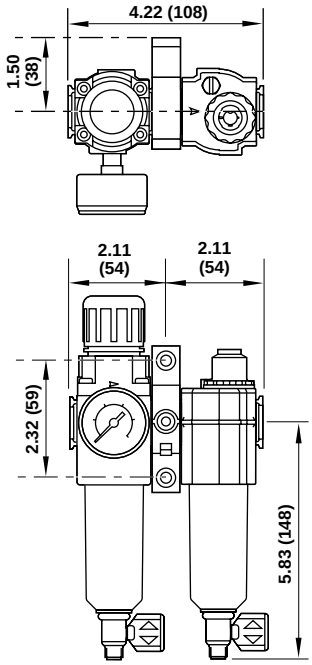
| Regulator Diaphragm | Substitute |
|---|---|
| Non-relieving | N |
| Relieving | R |

| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**Standard Micro-Fog Type C72H-**
**Standard Oil-Fog Type C72J-**

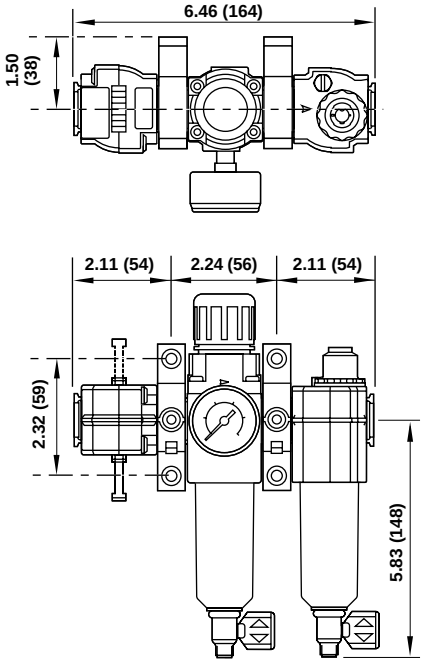
Shown with optional Quikclamp wall bracket.




**Alternative Micro-Fog Type D72H-**
**Alternative Oil-Fog Type D72J-**

**Includes Shutoff/Lockout valve.**

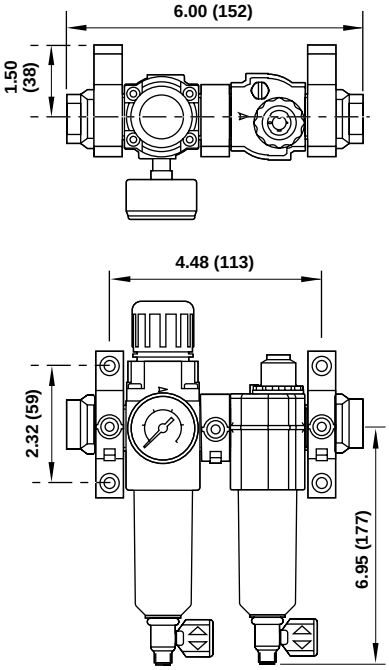
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type E72H-**
**Alternative Oil-Fog Type E72J-**

**Includes Quikmount pipe adapters.**

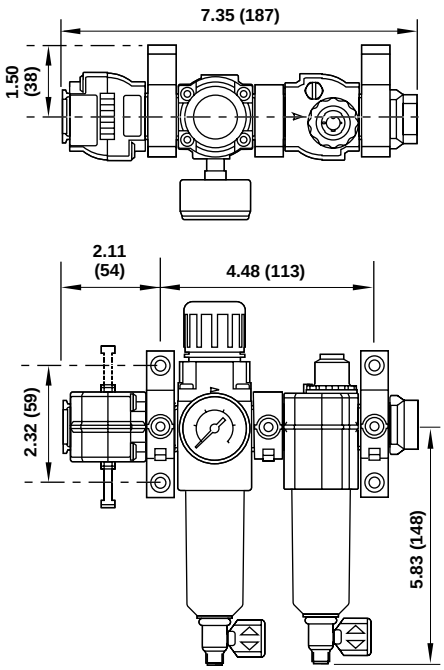
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type G72H-**
**Alternative Oil-Fog Type G72J-**

**Includes Shutoff/Lockout valve and Quikmount pipe adapter.**

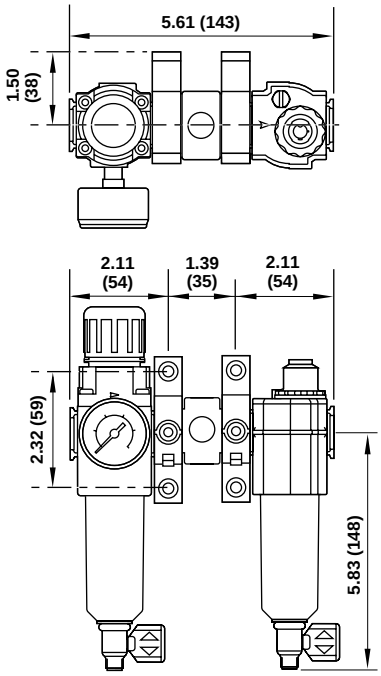
Shown with optional Quikclamp wall brackets.



**Alternative Micro-Fog Type C72K-**
**Alternative Oil-Fog Type C72L-**

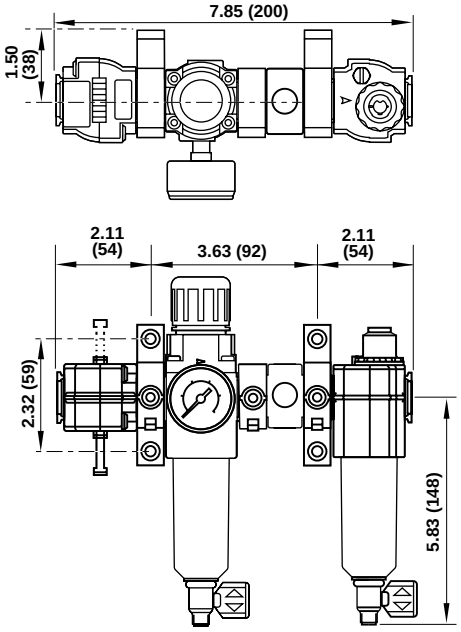
**Includes porting block.**

Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type D72K-**
**Alternative Oil-Fog Type D72L-**

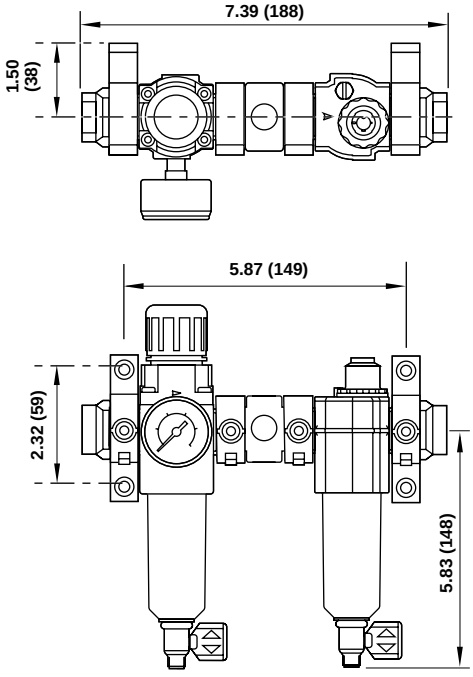
**Includes Shutoff/Lockout valve and porting block.**
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type E72K-**
**Alternative Oil-Fog Type E72L-**

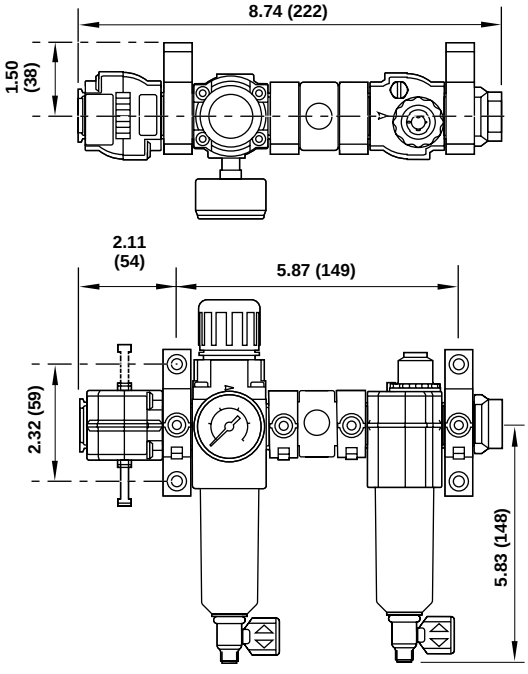
**Includes Quikmount pipe adapters and porting block.**

Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type G72K-**
**Alternative Oil-Fog Type G72L-**

**Includes Shutoff/Lockout valve, Quikmount pipe adapter, and porting block.**
Shown with optional Quikclamp wall brackets.



# B73, L73 Combination Units

## Excelon 73 Series Filter/Regulator-Lubricator
## 1/4", 3/8", and 1/2" Port Sizes

- **True modularity with Norgren Quikclamp™ connections**
- **Quick release bayonet bowl**
- **Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows**
- **All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment**
- **Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure**


Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.

### Technical Data

Fluid: Compressed air
Maximum pressure:
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*:
- Transparent bowl: 0° to 125°F (-20° to 50°C)
- Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)
Gauge ports:
- 1⁄4 PTF with PTF main ports
- ISO Rc1/4 with ISO Rc main ports
- ISO Rc1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.
Materials
- Body: Aluminum
- Bonnet: Aluminum
- Filter/Regulator valve: Brass
- Bowl
  - Transparent: Polycarbonate
  - Transparent with guard: Polycarbonate, steel guard
  - Metal: Aluminum or Zinc
  - Metal bowl liquid level indicator lens: Transparent nylon
- Sight-Feed dome: Transparent nylon
- Element: Sintered plastic
- Elastomers: Neoprene and nitrile

**See Section ALE-24 for Accessories**

## Ordering information

Models listed in order table have PTF parallel threads. Filter/Regulator (F/R) has knob adjustment, automatic drain, metal bowl with liquid level indicator, 40 µm element, relieving diaphragm, and 150 psig (10 bar) regulating spring, with gauge.
Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and metal bowl with liquid level indicator.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter/Regulator-Lubricator (F/R-L) | 1/4" | C73H-2AK-AD3-RMG-QDN | 3.0 (1.36) |
| | 3/8" | C73H-3AK-AD3-RMG-QDN | 3.0 (1.36) |
| | 1/2" | C73H-4AK-AD3-RMG-QDN | 3.0 (1.36) |

## Alternative Models

★ 7 3 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Lockout Valve/ Quikmount | Substitute |
|---|---|
| Standard Combination (No Lockout Valve, no Quikmount) | C |
| With Lockout valve on inlet | D |
| With Quikmount pipe adapters on inlet and outlet | E |
| With Lockout valve on inlet and Quikmount pipe adapter on outlet | G |

| Combination Unit Type | Substitute |
|---|---|
| Standard Micro-Fog F/R-L | H |
| Standard Oil-Fog F/R-L | J |
| Micro-Fog F/R-L with porting block between filter/regulator and lubricator | K |
| Oil-Fog F/R-L with porting block between filter/regulator and lubricator | L |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Pressure Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) outlet pressure range are available only with the standard metal bowl.

| Accessories | Substitute |
|---|---|
| Quikclamp wall brackets | B |
| Accessories ***B*** and ***Q*** | C |
| No accessories | N |
| Lubricator quick fill nipple | Q |

| Lubricator Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |
| Transparent | T |

| Lubricator Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual, 1/4 turn | Q |

| Filter/Regulator Gauge | Substitute |
|---|---|
| With gauge | G |
| No gauge | N |

| Regulation Spring * | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar)** | S |

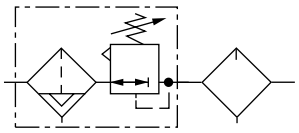
| Filter/Regulator Diaphragm | Substitute |
|---|---|
| Non-relieving | N |
| Relieving | R |

| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with steel guard | P |
| Transparent | T |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1/4 turn | Q |

## ISO Symbol



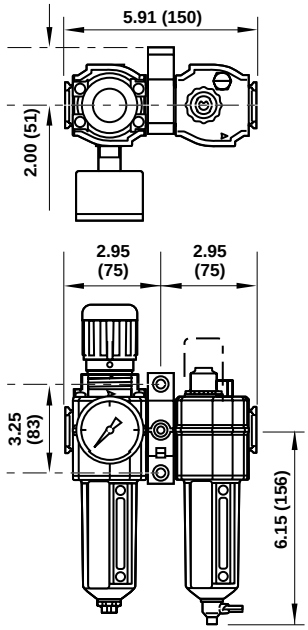
Relieving, automatic drain on filter, manual drain on lubricator

# Excelon 73 Filter/Regulator-Lubricator

All Dimensions in Inches (mm)

**Standard Micro-Fog Type C73H-**
**Standard Oil-Fog Type C73J-**

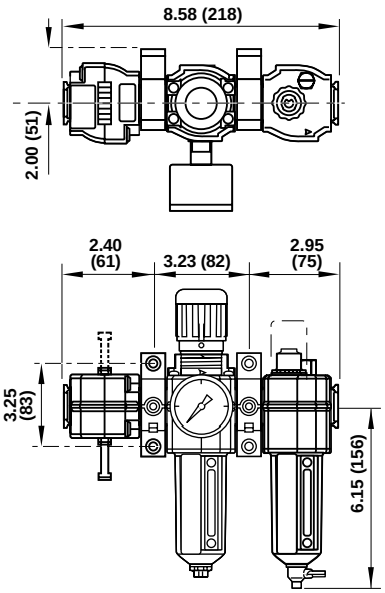
Shown with optional Quikclamp wall bracket.




**Alternative Micro-Fog Type D73H-**
**Alternative Oil-Fog Type D73J-**

**Includes lockout valve.**

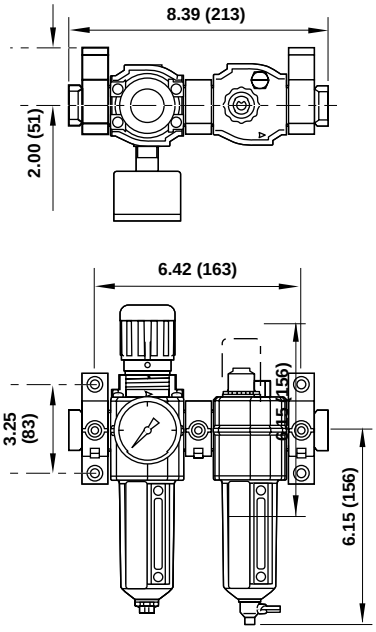
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type E73H-**
**Alternative Oil-Fog Type E73J-**

**Includes Quikmount pipe adapters.**

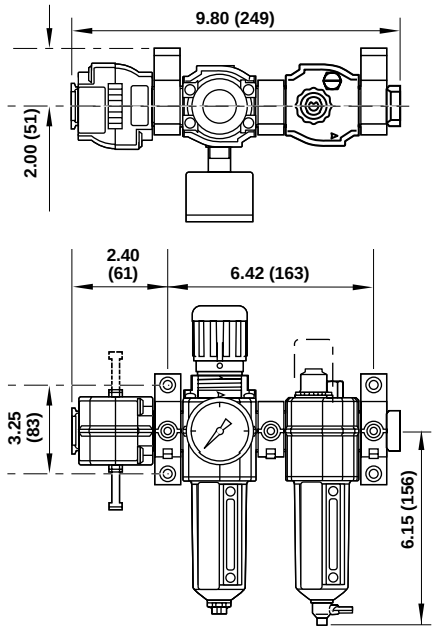
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type G73H-**
**Alternative Oil-Fog Type G73J-**

**Includes lockout valve and Quikmount pipe adapter.**

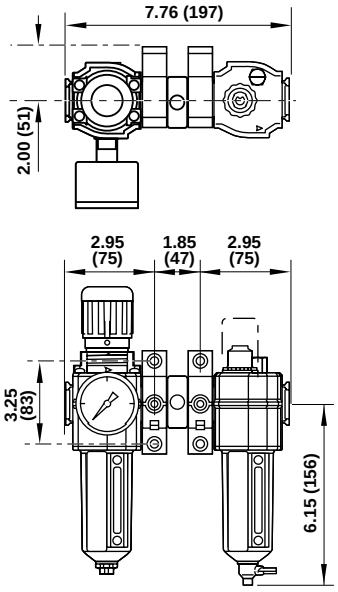
Shown with optional Quikclamp wall brackets.



**Alternative Micro-Fog Type C73K-**
**Alternative Oil-Fog Type C73L-**

**Includes porting block.**

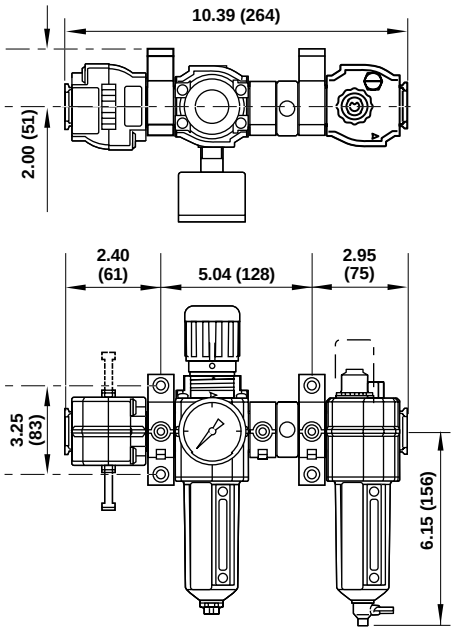
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type D73K-**
**Alternative Oil-Fog Type D73L-**

**Includes lockout valve and porting block.**

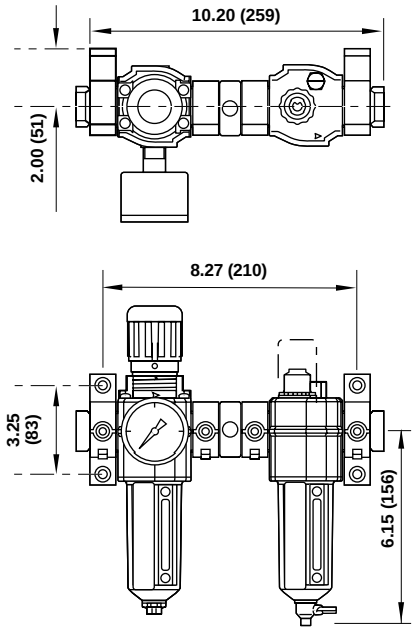
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type E73K-**
**Alternative Oil-Fog Type E73L-**

**Includes Quikmount pipe adapters and porting block.**

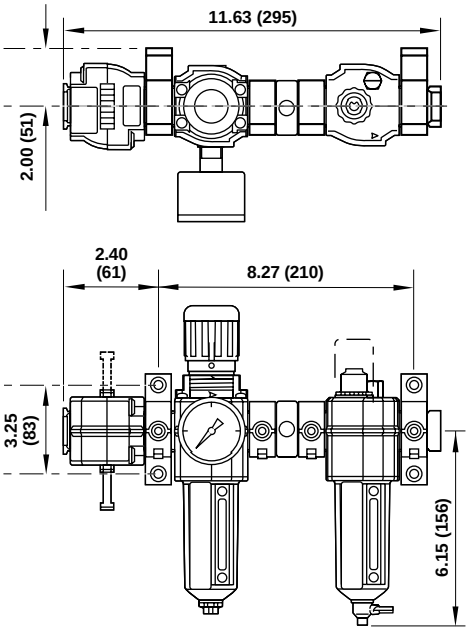
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type G73K-**
**Alternative Oil-Fog Type G73L-**

**Includes lockout valve, Quikmount pipe adapter, and porting block.**

Shown with optional Quikclamp wall brackets.



# B74, L74 Combination Units

**74 Series Filter/Regulator-Lubricator**
**3/8", 1/2", and 3/4" Port Sizes**

- **True modularity with Norgren Quikclamp™ connections**
- **Quick release bayonet bowl**
- **Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows**
- **All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment**
- **Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure**


Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.

### Technical Data

Fluid: Compressed air
Maximum pressure:
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*:
- Transparent bowl: 0° to 125°F (-20° to 50°C)
- Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: 1/8"
Automatic drain connection: 1/8"
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size:
- Standard: 7 fluid ounce (0.2 liter)
- Optional size for lubricator: 1 quart US (1 liter)

Gauge Ports:
- 1/4" PTF with PTF main ports
- Rc 1/4 with ISO Rc main ports
- Rc 1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.
Materials:
- Body: Aluminum
- Bonnet: Aluminum
- Filter/Regulator valve: Brass
- Bowl
  - Transparent: Polycarbonate with steel bowl guard
  - Metal: Aluminum
- Metal bowl liquid level indicator lens:
  - 7 fluid ounce (0.2 liter): Transparent nylon
  - 1 quart US (1 liter): Pyrex
- Sight-Feed dome: Transparent nylon
- Element: Sintered polypropylene
- Elastomers: Neoprene and nitrile

**See Section ALE-24 for Accessories**

**Ordering information.** Models listed include Micro-Fog lubricator, PTF threads, knob pressure adjustment, metal filter bowl with liquid level indicator and automatic drain, 40 µm filter element, relieving diaphragm, 150 psig (10 bar) regulating spring, with gauge, 7 fluid oz. (0.2 liter) metal lubricator bowl with liquid level indicator and 1/4 turn manual drain.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter/Regulator-Lubricator (F/R-L) | 3/8" | C74H-3AK-AD3-RMG-QDN | 5.20 (2.36) |
| | 1/2" | C74H-4AK-AD3-RMG-QDN | 5.07 (2.30) |
| | 3/4" | C74H-6AK-AD3-RMG-QDN | 5.00 (2.27) |

## Alternative Models

★ 7 4 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Lockout Valve/ Quikmount | Substitute |
|---|---|
| Standard combination (no lockout valve or Quikmount) | C |
| With lockout valve on inlet | D |
| With Quikmount pipe adapters on inlet and outlet | E |
| With lockout valve on inlet and Quikmount pipe adapter on outlet | G |

| Combination Unit Type | Substitute |
|---|---|
| Standard Micro-Fog F/R-L | H |
| Standard Oil-Fog F/R-L | J |
| Micro-Fog F/R-L with porting block between filter/regulator and lubricator | K |
| Oil-Fog F/R-L with porting block between filter/regulator and lubricator | L |

| Port Size | Substitute |
|---|---|
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Pressure Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Units with 250 psig (17 bar) outlet pressure range are available only with the T-bar adjustment; therefore substitute ***T*** at the 7th position and ***S*** at the 12th position.

†† Use remote fill only with 7 fluid oz. (0.2 liter) bowls.

| Accessories | Substitute |
|---|---|
| Quikclamp wall brackets | B |
| Quikclamp wall brackets and lubricator quick fill nipple | C |
| No accessories | N |
| Lubricator quick fill nipple | Q |

| Lubricator Bowl | Substitute |
|---|---|
| 1 quart US (1 liter) metal with liquid level indicator | A |
| 7 fluid oz. (0.2 liter) metal with liquid level indicator | D |
| 7 fluid oz. (0.2 liter) transparent with zinc guard | P |

| Lubricator Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual, 1/4 turn | Q |
| Remote fill †† | R |

| Filter/Regulator Gauge | Substitute |
|---|---|
| With gauge | G |
| No gauge | N |

| Regulation spring ** | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar)† | S |

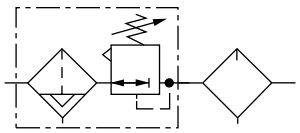
| Filter/Regulator Diaphragm | Substitute |
|---|---|
| Non relieving | N |
| Relieving | R |

| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1/4 turn | Q |

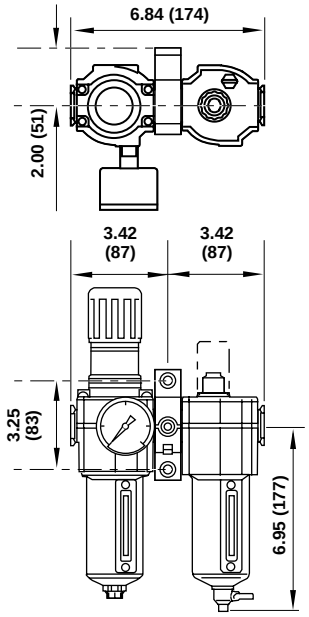
## ISO Symbol



Filter with automatic drain, Regulator with relieving diaphragm, Lubricator with manual drain

**Standard Micro-Fog Type C74H-**
**Standard Oil-Fog Type C74J-**

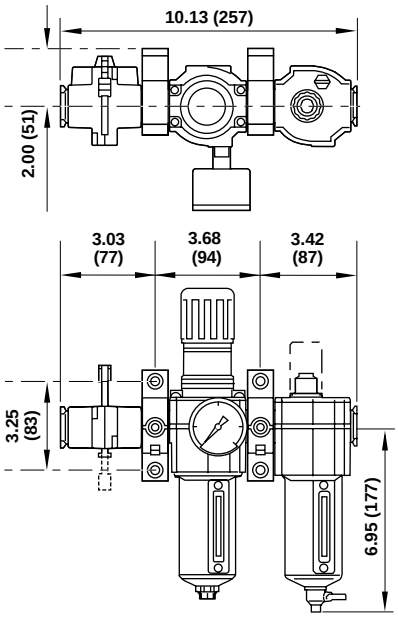
Shown with optional Quikclamp wall bracket.




**Alternative Micro-Fog Type D74H-**
**Alternative Oil-Fog Type D74J-**

**Includes lockout valve.**

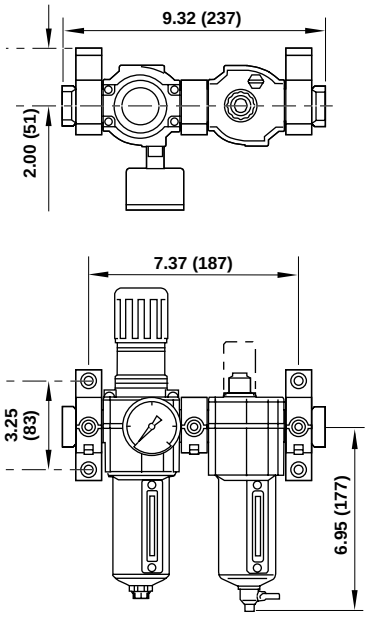
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type E74H-**
**Alternative Oil-Fog Type E74J-**

**Includes Quikmount pipe adapters.**

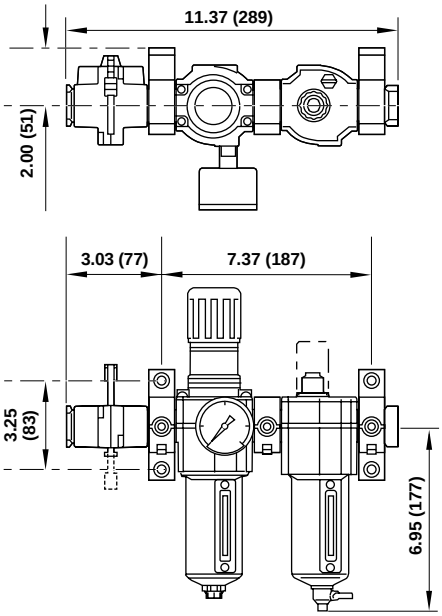
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type G74H-**
**Alternative Oil-Fog Type G74J-**

**Includes lockout valve and Quikmount pipe adapter.**

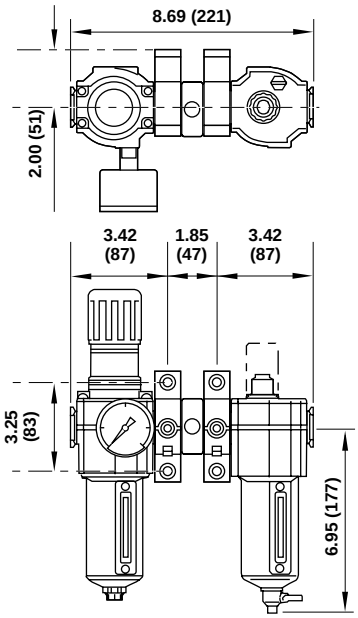
Shown with optional Quikclamp wall brackets.



**Alternative Micro-Fog Type C74K-**
**Alternative Oil-Fog Type C74L-**

**Includes porting block.**

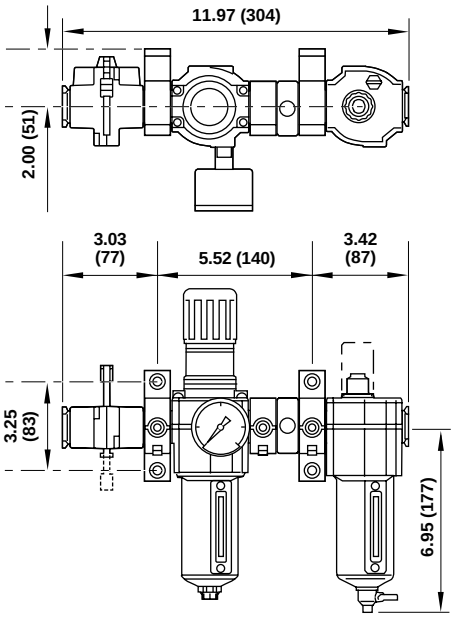
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type D74K-**
**Alternative Oil-Fog Type D74L-**

**Includes lockout valve and porting block.**

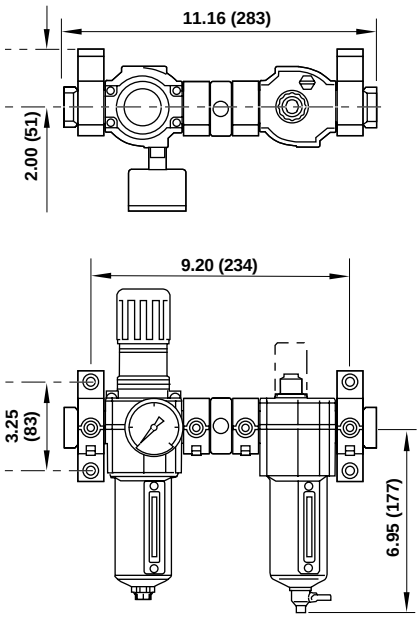
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type E74K-**
**Alternative Oil-Fog Type E74L-**

**Includes Quikmount pipe adapters and porting block.**

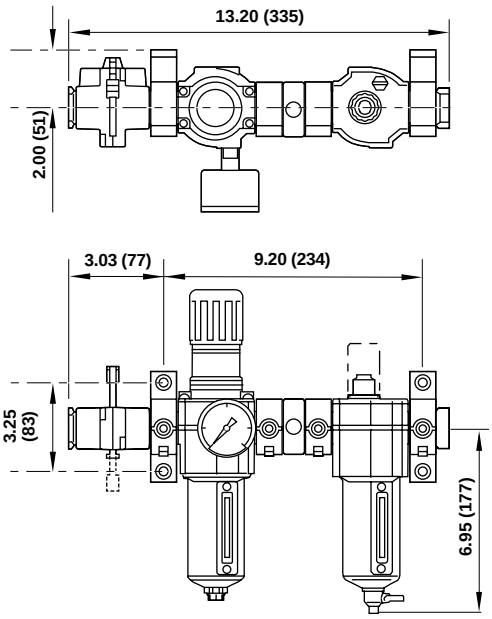
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type G74K-**
**Alternative Oil-Fog Type G74L-**

**Includes lockout valve, Quikmount pipe adapter, and porting block.**

Shown with optional Quikclamp wall brackets.



# BL64 Olympian Plus Combination Units

**Filter/Regulator-Lubricator**
**1/4", 3/8", 1/2", and 3/4" Port Sizes**

- **Olympian Plus plug in design**
- **High Efficiency water and particle removal**
- **Quick release bayonet bowls**
- **High visibility prismatic sight glass**
- **Push to lock adjusting knob with tamper resistant option**
- **Constant oil density output with varying flow**


## Technical Data

Fluid: Compressed air
Maximum pressure:
  Transparent bowl: 150 psig (10 bar)
  Metal bowl: 250 psig (17 bar)
Operating temperature*:
  Transparent bowl: 0° to 125°F (-20° to 50°C)
  Metal bowl: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated):
  Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
  Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
  Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
  Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size:
  Standard: 7 fluid ounce (0.2 liter)
  Optional size for lubricator: 1 quart (1 liter)
Gauge Ports:
  1/4" PTF with PTF main ports
  Rc 1/8 with ISO Rc main ports
  Rc 1/8 with ISO G main ports
Recommended lubricants: See Section ALE-29.
Materials:
  Body and yoke: Zinc
  Bonnet: Aluminum
  Filter/Regulator valve: Brass
  Bowl:
    Transparent: Polycarbonate
    Metal: Aluminum
  Metal bowl liquid level indicator lens:
    7 fluid ounce (0.2 liter): Transparent nylon
    1 quart (1 liter): Pyrex
  Sight-Feed dome: Polycarbonate
  Element: Sintered polypropylene
  Elastomers: Neoprene and nitrile

**See Section ALE-24 for Accessories**

**Ordering information.** Models listed include Micro-Fog lubricator, yoke with PTF threads, filter/regulator with knob adjustment, auto drain, metal bowl with liquid level indicator, 40 µm element, relieving diaphragm, 10 bar (150 psig) regulating spring, gauge; lubricator with 1/4 turn manual drain, 7 fluid ounce (0.2 liter) metal bowl with liquid level indicator.

| Combination Unit Type | Port Size | Model | Weight kg (lb) |
|---|---|---|---|
| Filter/Regulator-Lubricator (F/R-L) | 1/4 | C64H-2AK-AD3-RMG-QDN | 7.4 (5.20) |
| | 3/8 | C64H-3AK-AD3-RMG-QDN | 6.9 (5.07) |
| | 1/2 | C64H-4AK-AD3-RMG-QDN | 6.9 (5.00) |
| | 3/4 | C64H-6AK-AD3-RMG-QDN | 6.0 (2.73) |

## Alternative Models

★ 6 4 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Lockout Valve | Substitute |
|---|---|
| No lockout valve | C |
| With lockout valve on inlet | D |

| Combination Unit Type | Substitute |
|---|---|
| Standard Micro-Fog F/R-L | H |
| Standard Oil-Fog F/R-L | J |
| Micro-Fog F/R-L with porting block between filter/regulator and lubricator | K |
| Oil-Fog F/R-L with porting block between filter/regulator and lubricator | L |

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Pressure Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, petcock | D |
| Manual, 1⁄4 turn | Q |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Metal, no liquid level indicator | M |
| Transparent with guard | P |
| Metal with pyrex liquid level indicator | R |

| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |
| 75 µm | 4 |

| Accessories | Substitute |
|---|---|
| Wall brackets | B |
| B and Q | C |
| B and L * | F |
| Lubricator low oil level switch * | L |
| No accessories | N |
| Lubricator quick fill cap | Q |

| Lubricator Bowl | Substitute |
|---|---|
| 1 quart (1 liter) metal with pyrex liquid level indicator | A |
| 7 fluid oz. (0.2 liter) metal with plastic liquid level indicator | D |
| 7 fluid oz. (0.2 liter) transparent with guard | P |

| Lubricator Drain | Substitute |
|---|---|
| Manual, petcock | D |
| Closed bottom | E |
| Manual, 1⁄4 turn | Q |
| Remote fill †† | R |

| Filter/Regulator Gauge | Substitute |
|---|---|
| With gauge | G |
| No gauge | N |

| Regulation spring ** | Substitute |
|---|---|
| 0,3 to 4 bar (5 to 60 psig) | F |
| 0,3 to 10 bar (5 to 150 psig) | M |
| 0,7 to 17 bar (10 to 250 psig)† | S |

| Filter/Regulator Diaphragm | Substitute |
|---|---|
| Non relieving | N |
| Relieving | R |

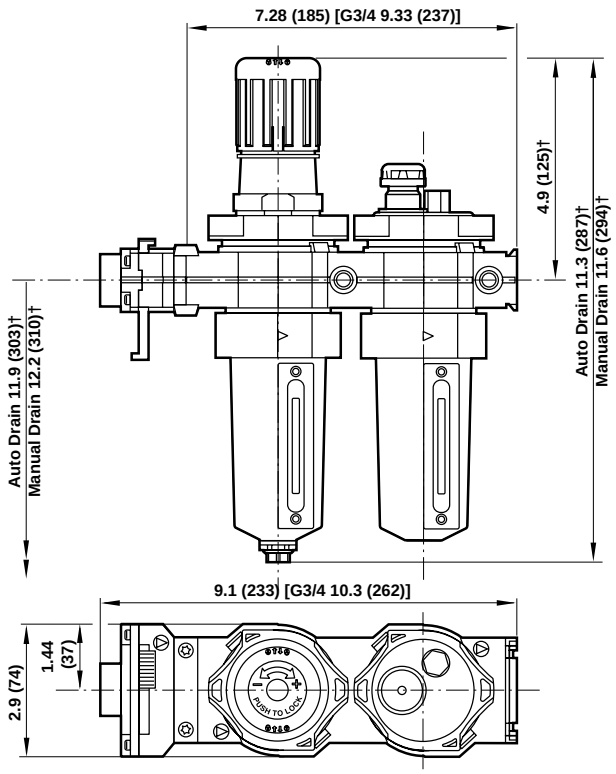
* Lubricator low oil level switch available only with 1 quart (1 liter) bowl.

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Filter/regulator with 250 psig (17 bar) regulating spring available only the T-bar adjustment .

†† Lubricator with remote fill available only with 0,2 litre (7 fluid oz.) bowls.

All Dimensions in Inches (mm)




† **Reduces by .16 (4mm) with knob in locked position. Add .15 (37mm) for unit with T-handle.**

## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Relieving Filter-Regulator | 4383-200 |
| Service kit | Non-relieving Filter-Regulator | 4383-201 |
| Service kit | Lubricator | 4382-200 |
| Replacement elements | 5 µm | 4338-01 |
| | 25 µm | 4338-99 |
| | 40 µm | 4338-02 |
| Replacement sight glass | B64, plastic | 4380-040 |
| | L64, plastic | 4380-042 |
| | B64 and L64, Pyrex | 4380-041 |
| | L64, 1 quart bowl, Pyrex | 2273-22 |
| Replacement drains | Automatic | 3000-10 |
| | Manual, 1/4 turn | 619-50 |

Filter-Regulator service kit includes port seals, louver 'O' ring, bowl 'O' ring and drain gasket, slip ring, valve assembly, valve spring and diaphragm. Lubricator service kit includes all seals, flow sensor, eyelet, dome screen, ball and spring.

# Filter-Regulator-Lubricator

## Combination units in ports sizes from 1/8" to 1-1/2".



**07 Series F-R-L**

**72 Series F-R-L**

**73 Series F-R-L**

**74 Series F-R-L**

**64 Series F-R-L**

**17 Series F-R-L**

# P1A Combination Unit

## 07 Series Filter-Regulator-Lubricator
## 1/8" and 1/4" Port Sizes

- **Compact design**
- **Filter removes liquids and solid particles down to 5 µm**
- **Push to lock adjusting knob with tamper resistant option**
- **Micro-Fog lubricator provides air line lubrication to one or more air driven tools or other devices**
- **Nearly constant oil density output with varying air flow**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering Information.** Models listed include PTF threads, transparent bowls, filter with automatic drain, 5 µm element; regulator with relieving diaphragm, 5 to 100 psig (0.3 to 7 bar) outlet pressure adjustment range*, gauge; lubricator with manual drain.

| Port Size | Model Numbers | Weight lbs (kg) |
|---|---|---|
| 1/8" | P1A-100-A1AA | 1.17 (0.53) |
| 1/4" | P1A-200-A1AA | 1.17 (0.53) |

### Alternative Models

P 1 A - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8" | 1 |
| 1/4" | 2 |

| Filter Bowl | Outlet Pressure Adjustment Range* psig | bar | Relief Type | Gauge | Substitute |
|---|---|---|---|---|---|
| Transparent | 5 to 100 | 0.3 to 7 | Relieving | With | 00 |
| Transparent | 5 to 100 | 0.3 to 7 | Relieving | Without | 01 |
| Transparent | 5 to 100 | 0.3 to 7 | Non-relieving | Without | 02 |
| Transparent | 5 to 100 | 0.3 to 7 | Non-relieving | With | 03 |
| Transparent | 5 to 50 | 0.3 to 3.5 | Relieving | Without | 04 |
| Transparent | 5 to 50 | 0.3 to 3.5 | Relieving | With | 05 |
| Transparent | 5 to 50 | 0.3 to 3.5 | Non-relieving | Without | 06 |
| Transparent | 5 to 50 | 0.3 to 3.5 | Non-relieving | With | 07 |
| Metal / no sight glass | 5 to 100 | 0.3 to 7 | Relieving | With | 40 |
| Metal / no sight glass | 5 to 100 | 0.3 to 7 | Relieving | Without | 41 |
| Metal / no sight glass | 5 to 100 | 0.3 to 7 | Non-relieving | Without | 42 |
| Metal / no sight glass | 5 to 100 | 0.3 to 7 | Non-relieving | With | 43 |
| Metal / no sight glass | 5 to 50 | 0.3 to 3.5 | Relieving | Without | 44 |
| Metal / no sight glass | 5 to 50 | 0.3 to 3.5 | Relieving | With | 45 |
| Metal / no sight glass | 5 to 50 | 0.3 to 3.5 | Non-relieving | Without | 46 |
| Metal / no sight glass | 5 to 50 | 0.3 to 3.5 | Non-relieving | With | 47 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Lubricator Reservoir | Substitute |
|---|---|
| Transparent with drain | A |
| Transparent without drain | Q |
| Metal with drain | M |
| Metal without drain | F |

| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 100 µm | 5 |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 150°F (-20° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)
Drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

**Filter**

Partical removal: 5 µm or 40 µm. Within ISO 8573-1, Class 3 and Class 5
Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.

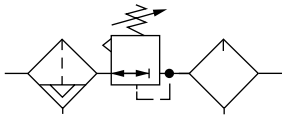
**Regulator**

Recommended regulating pressure ranges†:
5 to 100 psig (0.3 to 7 bar) standard
5 to 50 psig (0.3 to 3.5 bar) optional
† Outlet pressures can be adjusted to pressures in excess of, and less than those specified. Do not use these units to control pressures outside of the specified ranges.
Gauge ports:
1/8" PTF with PTF main ports
1/8" ISO Rc with ISO Rc main ports
1/8" ISO Rc with ISO G main ports

**Lubricator**

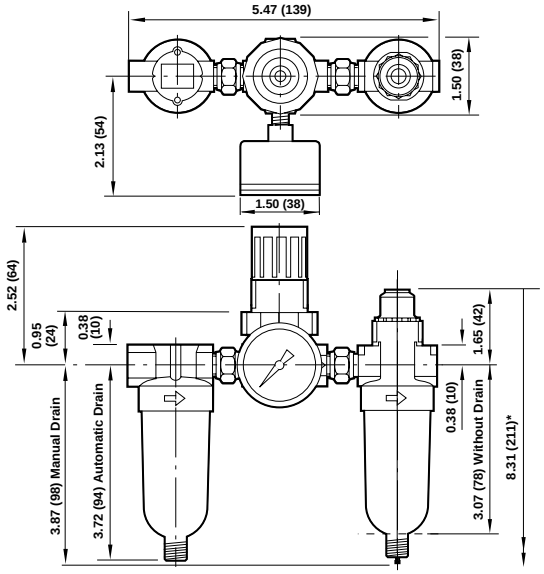
Start point (i.e. minimum flow required for lubricator operation): 0.5 scfm (0.24 $dm^3/s$) at 90 psig (6.3 bar) inlet pressure
Nominal bowl size: 1 fluid ounce (31 ml)
Recommended lubricants: See Section ALE-29.
Materials
Bodies: Zinc
Filter/Regulator bonnet: Acetal
Filter/Regulator valve: Brass/nitrile
Filter/Regulator valve seat: Acetal
Bowls
Transparent: Polycarbonate
Metal: Zinc
Lubricator sight-feed dome: Transparent nylon
Filter element: Sintered polypropylene
Elastomers: Nitrile

### ISO Symbols



Filter with automatic drain, relieving regulator, lubricator with manual drain.

All Dimensions in Inches (mm)




* Minimum clearance to remove bowl.
** Use 2″ (51 mm) long screws, 5/32″ diameter, to mount PTA Unit to wall.

# F72G, R72, L72 Combination Units

**Excelon 72 Filter-Regulator-Lubricator**
**1/4" and 3/8" Port Sizes**

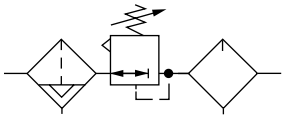
- **True modularity with Norgren Quikclamp™ connections**
- **Quick release bayonet bowl**
- **Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows**
- **All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment**
- **Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure**

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.

### Technical Data

Fluid: Compressed air
Maximum pressure
Transparent bowl: 150 psig (10 bar)
Metal bowl (Manual or semi automatic drain): 250 psig (17 bar)
Automatic drain: 150 psig (10 bar)
Operating temperature*
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 150°F (-20° to 65°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Semi automatic drain connection: Push on 5/16″ (8 mm) ID tube
Semi automatic drain operating conditions (pressure operated)
Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)
Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)
Minimum air flow required to close drain: 1 scfm (0.5 $dm^3/s$)
Manual operation: Lift stem to drain bowl
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated)
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size
Bowl: 2.2 fluid ounce (65 ml)
Gauge ports: 1/8 PTF with PTF main ports
Rc1/8 with ISO Rc main ports
Rc1/8 with ISO G main ports
Recommended lubricants: See Section ALE-29.
Materials
Body: Zinc
Bonnet: Acetal
Regulator valve: Brass
Regulator bottom plug: Acetal
Bowl
Transparent: Polycarbonate
Transparent with guard: Polycarbonate, zinc guard
Metal: Zinc
Metal bowl liquid level indicator lens: Transparent nylon
Sight-Feed dome: Transparent nylon
Element: Sintered polypropylene
Elastomers: Neoprene, nitrile

### ISO Symbols



Filter with automatic drain, relieving regulator, lubricator with manual drain.

**See Section ALE-24 for Accessories**

**Ordering information.** Models listed include PTF threads. Filter (F) includes automatic drain, transparent bowl without guard, and a 40µm element. Regulator (R) is relieving type with knob adjustment, 150 psig (10 bar) regulating spring, and gauge. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and transparent bowl without guard.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter-Regulator-Lubricator (F-R-L) | 1/4" | C72A-2AK-AL3-RMG-QLN | 3.23 (1.47) |
| | 3/8" | C72A-3AK-AL3-RMG-QLN | 3.23 (1.47) |

## Alternative Models

★ 7 2 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Shutoff/Lockout Valve, Quikmount | Substitute |
|---|---|
| Standard Combination (No Shutoff/Lockout Valve, no Quikmount) | C |
| With Shutoff/Lockout valve on inlet | D |
| With Quikmount pipe adapters on inlet and outlet | E |
| With Shutoff/Lockout Valve on inlet and Quikmount pipe adapter on outlet | G |

| Combination Unit Type | Substitute |
|---|---|
| Micro-Fog F-R-L | A |
| Oil-Fog F-R-L | B |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Pressure Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Filter Drain | Substitute |
|---|---|
| Automatic † | A |
| Manual, 1⁄4 turn | Q |
| Semi automatic | S |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | E |
| Transparent without guard | L |
| Transparent with guard | W |

| Accessories | Substitute |
|---|---|
| Quikclamp wall brackets | B |
| No accessories | N |

| Lubricator Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | E |
| Transparent without guard | L |
| Transparent with guard | W |

| Lubricator Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual, 1⁄4 turn | Q |

| Regulator Gauge | Substitute |
|---|---|
| With gauge | G |
| No gauge | N |

| Regulation spring ** | Substitute |
|---|---|
| 5 to 30 psig (0.3 to 2 bar) | C |
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |

| Regulator Diaphragm | Substitute |
|---|---|
| Non-relieving | N |
| Relieving | R |

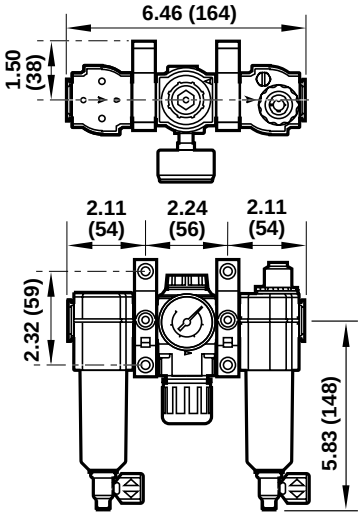
| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Supplied in long bowl options only.

**Standard Micro-Fog Type C72A-**
**Standard Oil-Fog Type C72B-**

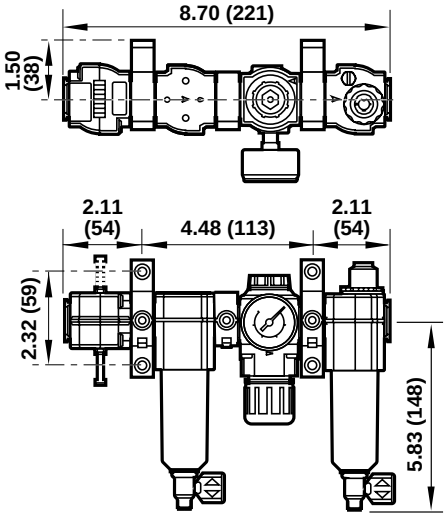
Shown with optiona Quikclamp wall bracket.




**Alternative Micro-Fog Type D72A-**
**Alternative Oil-Fog Type D72B-**

**Includes Shutoff/Lockout valve.**

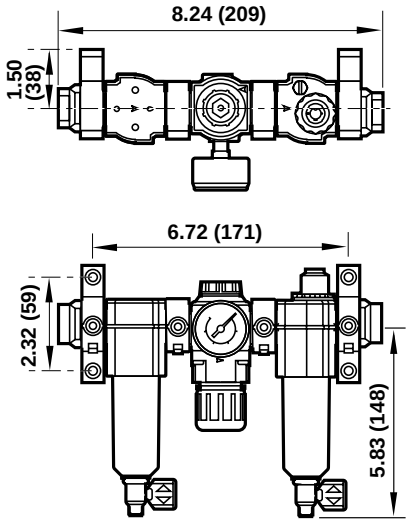
Shown with optional Quikclamp wall brackets.



**Alternative Micro-Fog Type E72A-**
**Alternative Oil-Fog Type E72B-**

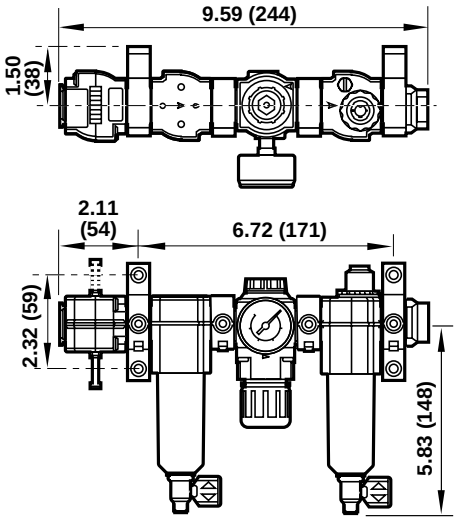
**Includes Quikmount pipe adapters.**

Shown with optional gauge and Quikclamp wall brackets.




**Alternative Micro-Fog Type G72A-**
**Alternative Oil-Fog Type G72B-**

**Includes Shutoff/Lockout valve and Quikmount pipe adapter.**
Shown with optional gauge and Quikclamp wall brackets.



# F73G, R73, L73 Combination Units

**Excelon 73 Filter-Regulator-Lubricator**
**1/4", 3/8", 1/2" Port Sizes**

- **True modularity with Norgren Quikclamp™ connections**
- **Quick release bayonet bowl**
- **Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows**
- **All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment**
- **Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure**

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.


### Technical Data

Fluid: Compressed air
Maximum pressure
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*
- Transparent bowl: 0° to 125°F (-20° to 50°C)
- Metal bowl: 0° to 175°F (-20° to 80°C)

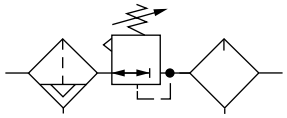
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 3.5 fluid ounce (0.1 liter)
Gauge ports:
- 1/4 PTF with PTF main ports
- ISO Rc1/4 with ISO Rc main ports
- ISO Rc1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.
Materials
- Body: Aluminum
- Bonnet: Aluminum or Zinc
- Regulator valve: Brass
- Regulator bottom plug: Acetal
- Bowl
  - Transparent: Polycarbonate
  - Transparent with guard: Polycarbonate, steel guard
  - Metal: Aluminum
  - Metal bowl liquid level indicator lens: Transparent nylon
- Sight-Feed dome: Transparent nylon
- Element: Sintered plastic
- Elastomers: Neoprene and nitrile

### ISO Symbols



Filter with automatic drain, relieving regulator, lubricator with manual drain.

**See Section ALE-24 for Accessories**

## Ordering information

Models listed in order table have PTF threads. Filter (F) has automatic drain, metal bowl with liquid level indicator, and a 40 µm element. Regulator (R) has knob adjustment, relieving diaphragm, 150 psig (10 bar) regulating spring, and gauge. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and metal bowl with liquid level indicator.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter-Regulator-Lubricator (F-R-L) | 1/4" | C73A-2AK-AD3-RMG-QDN | 4.36 (1.98) |
| | 3/8" | C73A-3AK-AD3-RMG-QDN | 4.36 (1.98) |
| | 1/2" | C73A-4AK-AD3-RMG-QDN | 4.36 (1.98) |

## Alternative Models

★ 7 3 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Lockout Valve/ Quikmount | Substitute |
|---|---|
| Standard Combination (No Lockout Valve, no Quikmount) | C |
| With Lockout valve on inlet | D |
| With Quikmount pipe adapters on inlet and outlet | E |
| With Lockout valve on inlet and Quikmount pipe adapter on outlet | G |

| Combination Unit Type | Substitute |
|---|---|
| Micro-Fog F-R-L | A |
| Oil-Fog F-R-L | B |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Pressure Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1⁄4 turn | Q |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with steel guard | P |
| Transparent | T |

| Accessories | Substitute |
|---|---|
| Accessories ***B*** and ***D*** | A |
| Quikclamp wall brackets | B |
| Accessories ***B*** and ***Q*** | C |
| Filter service indicator | D |
| Accessories ***B***, ***D,*** and ***Q*** | H |
| No accessories | N |
| Lubricator quick fill nipple | Q |

| Lubricator Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |
| Transparent | T |

| Lubricator Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual, 1⁄4 turn | Q |

| Regulator Gauge | Substitute |
|---|---|
| With gauge | G |
| No gauge | N |

| Regulation spring * | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar)** | S |

| Regulator Diaphragm | Substitute |
|---|---|
| Non-relieving | N |
| Relieving | R |

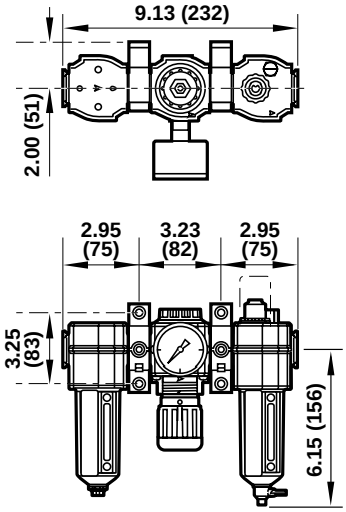
| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 250 psig (17 bar) outlet pressure range are available only with the standard metal bowl.

**Standard Micro-Fog Type C73A-**
**Standard Oil-Fog Type C73B-**

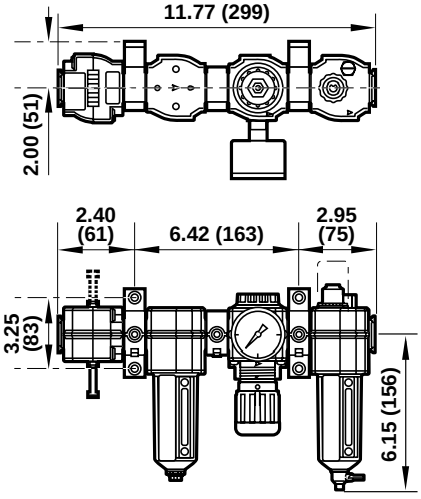
Shown with optional Quikclamp wall bracket.




**Alternative Micro-Fog Type D73A-**
**Alternative Oil-Fog Type D73B-**

**Includes lockout valve.**

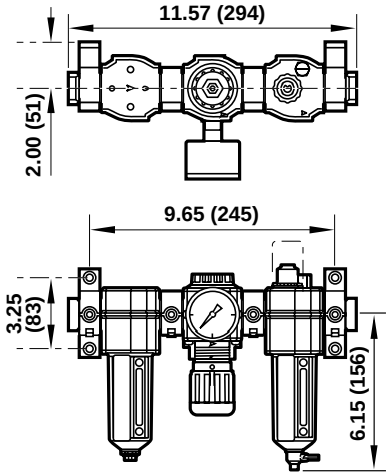
Shown with optional Quikclamp wall bracket.



**Alternative Micro-Fog Type E73A-**
**Alternative Oil-Fog Type E73B-**

**Includes Quikmount pipe adapters.**

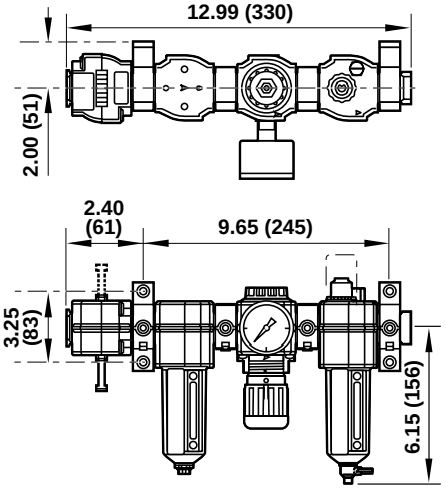
Shown with optional
Quikclamp wall bracket.




**Alternative Micro-Fog Type G73A-**
**Alternative Oil-Fog Type G73B-**

**Includes lockout valve and Quikmount pipe adapter.**

Shown with optional
Quikclamp wall bracket.



# F74G, R74, L74 Combination Units

**Excelon 74 Filter-Regulator-Lubricator**
**3/8", 1/2", 3/4" Port Sizes**

- **True modularity with Norgren Quikclamp™ connections**
- **Quick release bayonet bowl**
- **Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows**
- **All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment**
- **Regulator balanced valve minimizes effect of variation in the inlet pressure on the outlet pressure**

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.


### Technical Data

Fluid: Compressed air
Maximum pressure
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*
- Transparent bowl: 0° to 125°F (-20° to 50°C)
- Metal bowl: 0° to 175°F (-20° to 80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

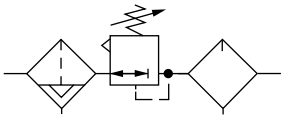
Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size:
- Standard: 7 fluid ounce (0.2 liter)
- Optional size for lubricator: 1 quart US (1 liter)

Gauge Ports:
- 1/4" PTF with PTF main ports
- Rc 1/4 with ISO Rc main ports
- Rc 1/8 with ISO G main ports

Recommended lubricants: See Section ALE-29.
Materials
- Body: Aluminum
- Bonnet: Aluminum
- Regulator valve: Brass
- Regulator bottom plug: Acetal
- Bowl
  - Transparent: Polycarbonate with steel bowl guard
  - Metal: Aluminum
- Metal bowl liquid level indicator lens:
  - 7 fluid ounce (0.2 liter): Transparent nylon
  - 1 quart US (1 liter): Pyrex
- Sight-Feed dome: Transparent nylon
- Element: Sintered polypropylene
- Elastomers: Neoprene and nitrile

### ISO Symbols



Filter with automatic drain, relieving regulator, lubricator with manual drain.

**See Section ALE-24 for Accessories**

**Ordering information.** Models listed include Micro-Fog lubricator, PTF threads, knob pressure adjustment, metal filter bowl with liquid level indicator and automatic drain, 40 µm filter element, relieving diaphragm, 150 psig (10 bar) regulating spring, gauge, 7 fluid oz. (0.2 liter) metal lubricator bowl with liquid level indicator and 1/4 turn manual drain.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter-Regulator-Lubricator (F-R-L) | 3/8" | C74A-3AK-AD3-RMG-QDN | 6.22 (2.82) |
| | 1/2" | C74A-4AK-AD3-RMG-QDN | 6.04 (2.74) |
| | 3/4" | C74A-6AK-AD3-RMG-QDN | 5.91 (2.68) |

## Alternative Models

★ 7 4 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ ★ - ★ ★ ★

| Lockout Valve/ Quikmount | Substitute |
|---|---|
| Standard combination (no lockout valve or Quikmount) | C |
| With lockout valve on inlet | D |
| With Quikmount pipe adapters on inlet and outlet | E |
| With Lockout valve on inlet and Quikmount pipe adapter on outlet | G |

| Combination Unit Type | Substitute |
|---|---|
| Micro-Fog F-R-L | A |
| Oil-Fog F-R-L | B |

| Port Size | Substitute |
|---|---|
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Pressure Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1⁄4 turn | Q |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |

| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Accessories | Substitute |
|---|---|
| Quikclamp wall brackets and filter service indicator | A |
| Quikclamp wall brackets | B |
| Quikclamp wall brackets and lubricator quick fill nipple | C |
| Filter service indicator | D |
| Quikclamp wall brackets, filter service indicator and lubricator quick fill nipple | H |
| No accessories | N |
| Lubricator quick fill nipple | Q |

| Lubricator Bowl | Substitute |
|---|---|
| 1 quart US (1 liter) metal with liquid level indicator | A |
| 7 fluid oz. (0.2 liter) metal with liquid level indicator | D |
| 7 fluid oz. (0.2 liter) transparent with zinc guard | P |

| Lubricator Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual, 1⁄4 turn | Q |
| Remote fill †† | R |

| Regulator Gauge | Substitute |
|---|---|
| With gauge | G |
| No gauge | N |

| Regulation spring ** | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar)† | S |

| Regulator Diaphragm | Substitute |
|---|---|
| Non relieving | N |
| Relieving | R |

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

† Units with 250 psig (17 bar) outlet pressure range are available only with the T-bar adjustment; therefore substitute ***T*** at the 7th position and ***S*** at the 12th position.

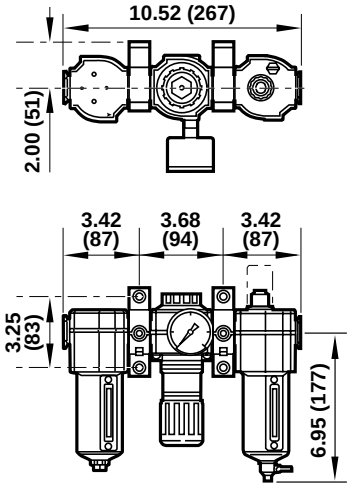
†† Use remote fill only with 7 fluid oz. (0.2 liter) bowls.

# F74G-R74-L74 Combination Unit

All Dimensions in Inches (mm)

**Standard Micro-Fog Type C74A-**
**Standard Oil-Fog Type C74B-**

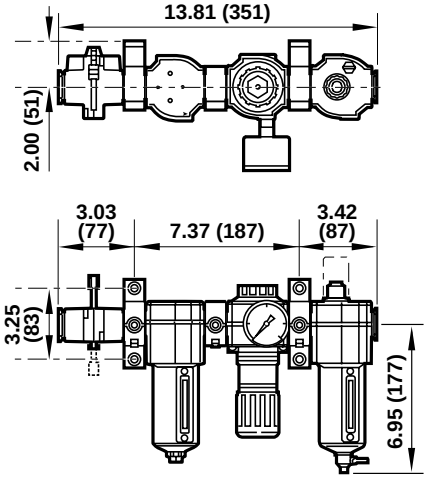
Shown with optional Quikclamp wall bracket.




**Alternative Micro-Fog Type D74A-**
**Alternative Oil-Fog Type D74B-**

**Includes Shutoff/Lockout valve.**

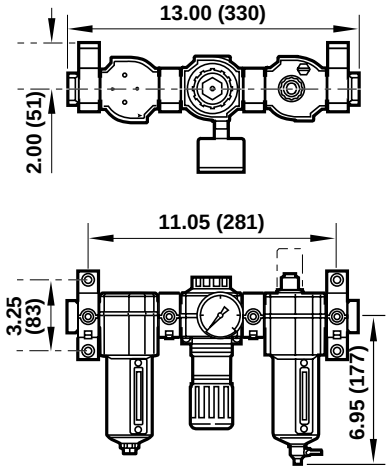
Shown with optional Quikclamp wall brackets.



**Alternative Micro-Fog Type E74A-**
**Alternative Oil-Fog Type E74B-**

**Includes Quikmount pipe adapters.**

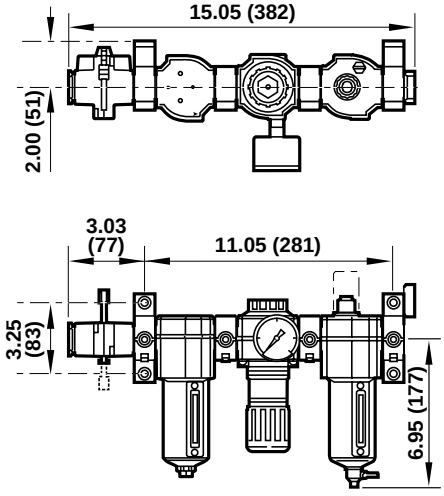
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type G74A-**
**Alternative Oil-Fog Type G74B-**

**Includes Shutoff/Lockout valve and Quikmount pipe adapter.**

Shown with optional Quikclamp wall brackets.



# P8A, P8B Combination Units

## 17 Series Filter-Regulator-Lubricator
## 3/4", 1", 1-1/4" and 1-1/2" Port Sizes

- **Depth type, 40 µm filter element**
- **Balanced regulator valve minimizes effect of changes in inlet pressure on outlet pressure**
- **Low torque, non-rising regulator pressure adjusting knob**
- **All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment**
- **Lubricator flow sensor provides a nearly constant oil/air ratio over a wide range of air flows**

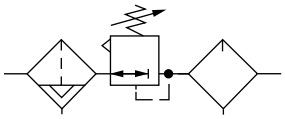
Use Micro-Fog combinations in applications containing one or more points of lubrication

Use Oil-Fog combinations to lubricate a single tool, cylinder, or other air driven device

### Technical Data

Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Start point (minimum flow required for lubricator operation): 8 scfm (3.8 $dm^3/s$) at 90 psig (6.3 bar) inlet pressure
Regulator gauge ports:
1/4" PTF with PTF main ports
R1/4 with ISO Rc, ISO G, and BSPP main ports
Nominal bowl size: 1 quart US (1 liter)
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated)
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Recommended lubricants: See Section ALE-29.
Materials
Bodies, bowls, regulator bonnet: Aluminum
Bowl sight glass: Pyrex
Filter element: Sintered bronze
Regulator bottom plug: Acetal
Regulator valve: Aluminum and nylon
Lubricator sight-feed dome: Transparent nylon
Elastomers: Neoprene and nitrile

### ISO Symbols



Filter with automatic drain, relieving regulator, lubricator with manual drain

**See Section ALE-24 for Accessories**

**Ordering Information.** Models listed have PTF port threads . Filters and lubricators have metal bowl with sight glass. Filters have 40 µm element and automatic drain. Lubricators have manual drain. Regulators are relieving type with gauge, knob adjustment, and outlet pressure adjustment range of 5 to 125 psig (0.3 to 8.5 bar)*.

| Port Size | Micro-Fog Models | Oil-Fog Models | Weight lbs (kg) |
|---|---|---|---|
| 3/4" | P8A-660-A3DA | P8B-660-A3DA | 6.69 (3.03) |
| 1" | P8A-860-A3DA | P8B-860-A3DA | 6.29 (2.85) |
| 1-1/4" | P8A-A60-A3DA | P8B-A60-A3DA | 7.51 (3.41) |
| 1-1/2" | P8A-B60-A3DA | P8B-B60-A3DA | 6.88 (3.12) |

* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

## Alternative Models

★ 8 ★ - ★ ★ ★ - ★ ★ ★ ★

| Regulator Adjustment | Substitute |
|---|---|
| T-bar | H |
| Knob | P |

| Lubricator Type | Substitute |
|---|---|
| Micro-Fog | A |
| Oil-Fog | B |

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| BSPP (1-1/2″ ported units only) | C |
| ISO G parallel (not available with 1-1/2″ ported units) | G |

| Lubricator Reservoir | Substitute |
|---|---|
| 1 quart US (1 liter) metal, drain, sight glass | D |

| Filter Element | Substitute |
|---|---|
| 40 µm | 3 |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

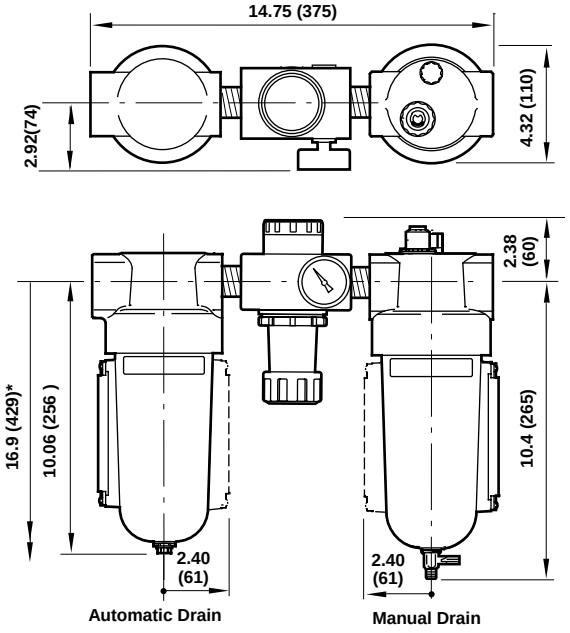
| Filter Bowl | Outlet Pressure Adjustment Range* psig | bar | Relief Type | Gauge | Substitute |
|---|---|---|---|---|---|
| Metal, sight glass | 5 to 125 | 0.3 to 8.5 | Relieving | With | 60 |
| Metal, sight glass | 5 to 125 | 0.3 to 8.5 | Relieving | Without | 61 |
| Metal, sight glass | 5 to 125 | 0.3 to 8.5 | Non relieving | Without | 62 |
| Metal, sight glass | 5 to 125 | 0.3 to 8.5 | Non relieving | With | 63 |
| Metal, sight glass | 5 to 50 | 0.3 to 3.5 | Relieving | Without | 64 |
| Metal, sight glass | 5 to 50 | 0.3 to 3.5 | Relieving | With | 65 |
| Metal, sight glass | 5 to 50 | 0.3 to 3.5 | Non relieving | Without | 66 |
| Metal, sight glass | 5 to 50 | 0.3 to 3.5 | Non relieving | With | 67 |
| Metal, sight glass | 10 to 250 | 0.7 to 17 | Relieving | Without | 76 |
| Metal, sight glass | 10 to 250 | 0.7 to 17 | Relieving | With | 77 |
| Metal, sight glass | 10 to 250 | 0.7 to 17 | Non relieving | Without | 76 |
| Metal, sight glass | 10 to 250 | 0.7 to 17 | Non relieving | With | 79 |

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Lubricator service kit | All o-rings, seals, gaskets | 5771-02 |
| Filter service kit | All o-rings, seals, gaskets | 5578-05 |
| | 40 µm element | 5311-03 |
| Replacement drain | Automatic | 3000-10 |
| Sight glass kit * | Pyrex | 2273-22 |
| Regulator service kit ** | Relieving | 5578-02 |
| | Non relieving | 5578-01 |
| Replacement drain | 1/4 Turn | 619-50 |

* Sight glass kit contains bowl o-ring plus all o-rings, seals, screws, glass, and glass guard.
** Regulator service kit contains, diaphragm, all o-rings, valve, and valve spring.

All Dimensions in Inches (mm)




*** Minimum clearance required to remove bowl.**

# 64 Series F-R-L Combination Units

## 64 Series Filter-Regulator-Lubricator
## 1/4", 3/8", 1/2", and 3/4" Port Sizes

- **Olympian Plus plug in design**
- **High Efficiency water and particle removal**
- **Quick release bayonet bowls**
- **High visibility prismatic sight glass**
- **Push to lock adjusting knob with tamper resistant option**
- **Constant oil density output with varying flow**

### Technical Data

Fluid: Compressed air
Maximum pressure:
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*:
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size:
Standard: 7 fluid ounce (0.2 liter)
Optional size for lubricator: 1 quart (1 liter)
Gauge Ports:
1/4" PTF with PTF main ports
Rc 1/8 with ISO Rc main ports
Rc 1/8 with ISO G main ports
Recommended lubricants: See Section ALE-29.
Materials
Body and yoke: Zinc
Bonnet: Aluminum
Regulator valve: Brass
Bowl:
Transparent: Polycarbonate
Metal: Aluminum
Metal bowl liquid level indicator lens:
7 fluid ounce (0.2 liter): Transparent nylon
1 quart (1 liter): Pyrex
Sight-Feed dome: Polycarbonate
Element: Sintered polypropylene
Elastomers: Neoprene and nitrile

**See Section ALE-24 for Accessories**

**Ordering information.** Models listed include Micro-Fog lubricator, yoke with PTF threads, knob adjustment, filter with auto drain, metal bowl with liquid level indicator, 40 µm element; regulator with relieving diaphragm, 10 bar (150 psig) regulating spring, gauge; lubricator with 1/4 turn manual drain, 7 fluid ounce (0.2 liter) metal bowl with liquid level indicator.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter-Regulator-Lubricator (F-R-L) | 1/4" | C64A-2AK-AD3-RMG-QDN | 10.2 (4.61) |
| | 3/8" | C64A-3AK-AD3-RMG-QDN | 9.7 (4.42) |
| | 1/2" | C64A-4AK-AD3-RMG-QDN | 9.6 (4.35) |
| | 3/4" | C64A-6AK-AD3-RMG-QDN | 8.8 (3.97) |

## Alternative Models

★ 6 4 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Lockout Valve | Substitute |
|---|---|
| No lockout valve | C |
| With lockout valve on inlet | D |

| Combination Unit Type | Substitute |
|---|---|
| Standard Micro-Fog F-R-L | A |
| Standard Oil-Fog F-R-L | B |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Pressure Adjustment | Substitute |
|---|---|
| Knob | K |
| T-bar | T |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, petcock | D |
| Manual, 1⁄4 turn | Q |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Metal, no liquid level indicator | M |
| Transparent with guard | P |
| Metal with pyrex liquid level indicator | R |

| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |
| 75 µm | 4 |

| Accessories | Substitute |
|---|---|
| B and D | A |
| Wall brackets | B |
| B and Q | C |
| Filter service indicator | D |
| B and L * | F |
| B, D, and Q | H |
| B, D, and L | K |
| Lubricator low oil level switch * | L |
| No accessories | N |
| Lubricator quick fill cap | Q |

| Lubricator Bowl | Substitute |
|---|---|
| 1 quart (1 liter) metal with pyrex liquid level indicator | A |
| 7 fluid oz. (0.2 liter) metal with plastic liquid level indicator | D |
| 7 fluid oz. (0.2 liter) transparent with guard | P |

| Lubricator Drain | Substitute |
|---|---|
| Manual, petcock | D |
| Closed bottom | E |
| Manual, 1⁄4 turn | Q |
| Remote fill †† | R |

| Regulator Gauge | Substitute |
|---|---|
| With gauge | G |
| No gauge | N |

| Regulation spring ** | Substitute |
|---|---|
| 5 to 60 psig (0.3 to 4 bar) | F |
| 5 to 150 psig (0.3 to 10 bar) | M |
| 10 to 250 psig (0.7 to 17 bar)† | S |

| Regulator Diaphragm | Substitute |
|---|---|
| Non relieving | N |
| Relieving | R |

* Lubricator low oil level switch available only with 1 quart (1 liter) bowl.

** Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

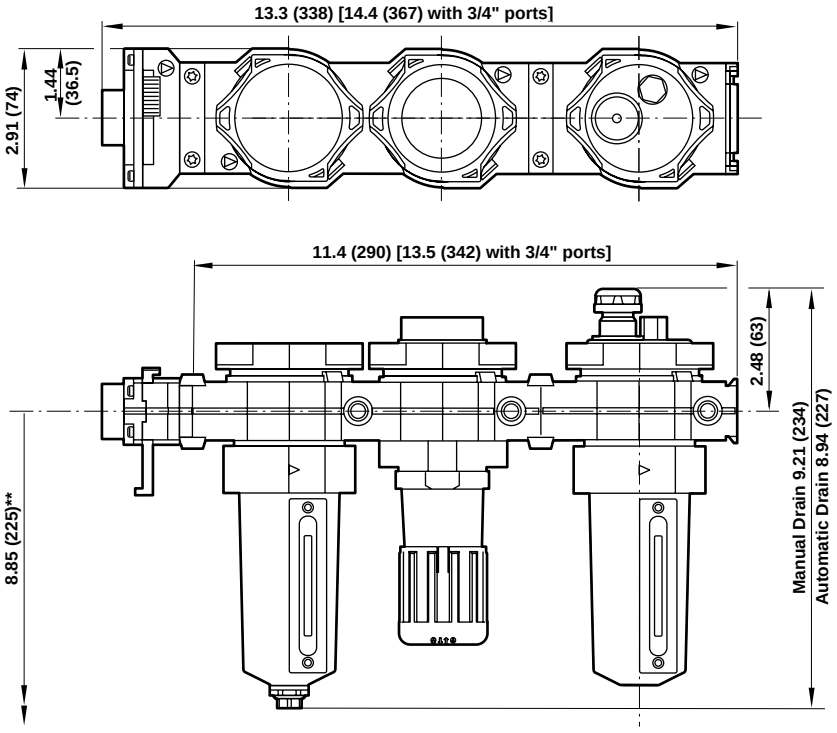
† Regulator with 250 psig (17 bar) regulating spring available only the T-bar adjustment .

†† Lubricator with remote fill available only with 7 fluid oz. (0.2 liter) bowls.

## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Filter | 4380-200 |
| Service kit | Relieving Regulator | 4381-200 |
| Service kit | Non-relieving Regulator | 4381-201 |
| Service kit | Lubricator | 4382-200 |
| Replacement elements | 40 µm | 4338-02 |
| | 5 µm | 4338-01 |
| Replacement sight glass | B64, plastic | 4380-040 |
| | L64, plastic | 4380-042 |
| | B64 & L64, pyrex | 4380-041 |
| | L64, 1 quart, pyrex | 2273-22 |
| Replacement drains | Automatic | 3000-10 |
| | Manual, 1/4 turn | 619-50 |
| Filter service indicator | | 5797-50 |

Filter service kit includes port seals, lourve 'O' ring, bowl 'O' ring and drain gasket.
Regulator service kit includes port and bottom plug, 'O' rings, valve assembly, valve spring and diaphragm.
Lubricator service kit includes all seals, flow sensor, eyelet, dome screen, ball and spring.




****Minimum clearance required to remove bowl.**

# Filter-Lubricators

## Combination units from 1/8" to 1-1/2".



**07 Series**

**72 Series**

**73 Series**

**74 Series**

**64 Series**

**17 Series**

# P1C, PTC Combination Unit

## 07 Series Filter-Lubricator
## 1/8" and 1/4" Port Sizes

- **Compact design**
- **Filter removes liquids and solid particles down to 5 µm**
- **Micro-Fog lubricator provides air line lubrication to one or more air driven tools or other devices**
- **Nearly constant oil density output with varying air flow**
- **Can be disassembled without the use of tools or removal from the air line**

**Ordering information.** Models listed include PTF threads, filter with transparent bowl, automatic drain, 5 µm element, lubricator with transparent reservoir and manual drain.

| Port Size | Model Numbers | Weight lb (kg) |
|---|---|---|
| 1/8" | P1C-100-A1AA | 0.58 (0.26) |
| 1/4" | P1C-200-A1AA | 0.58 (0.26) |

### Alternative Models

P 1 C - ★ ★ ★ - ★ ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/8" | 1 |
| 1/4" | 2 |

| Filter Bowl | Substitute |
|---|---|
| Transparent | 00 |
| Metal | 40 |

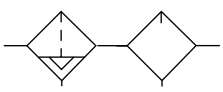
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Lubricator Reservoir | Substitute |
|---|---|
| Transparent with drain | A |
| Transparent without drain | Q |
| Metal with drain / no sight glass | M |
| Metal without drain / no sight glass | F |

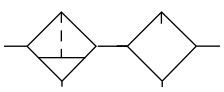
| Filiter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 40 µm | 3 |

| Filiter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

### ISO Symbols



Filter with automatic drain, lubricator with manual drain



Filter manual drain, lubricator with manual drain

**See Section ALE-24 for Accessories**

## Technical Data

Fluid: Compressed air
Maximum pressure:
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature *
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Nominal bowl size: 1 fluid ounce (31 ml)
Drain connection: Will fit 1/8-27 and 1/8-28 pipe thread

**Filter**

Automatic drain operation: Spitter type drain operates momentarily when a rapid change in air flow occurs or when the supply pressure is reduced.

**Lubricator**

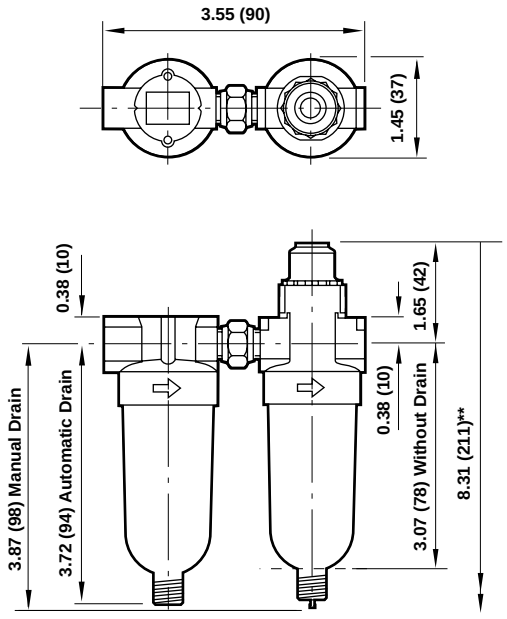
Start point (i.e. minimum flow required for lubricator operation): 0.5 scfm (0.24 $dm^3/s$) at 90 psig (6.3 bar) inlet pressure
Nominal bowl size: 1 fluid ounce (31 ml)
Recommended lubricants: See Section ALE-29.
Materials:
Body: Zinc
Bowl
Transparent: Polycarbonate
Metal: Zinc
Filter element: Sintered polypropylene
Sight feed dome: Transparent nylon
Elastomers: Neoprene and nitrile

## Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kits, filter | 5 µm element | 3652-17 |
| | 40 µm element | 3852-18 |
| Service kit, lubricator | | 3795-03 |
| Replacement drains | Manual | 773-03 |
| | Automatic | 3654-02 |

Filter service kit contains element, element gasket, and bowl o-ring. Lubricator service kit contains sight-feed dome seal, cartridge o-ring, and bowl o-ring.

All Dimensions in Inches (mm)




**** Minimum clearance to remove bowl**

# F72G, L72 Combination Units

**Excelon 72 Filter-Lubricator**
**1/4" and 3/8" Port Sizes**

- **True modularity with Norgren Quikclamp™ connections**
- **Quick release bayonet bowl**
- **Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows**
- **Highly visible, prismatic liquid level indicator lens**
- **All around (360°) visibility of the sight-feed dome simplifies installation and adjustment**

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.

### Technical Data

Fluid: Compressed air
Maximum pressure:
- Transparent bowl: 150 psig (10 bar)
- Metal bowl:
  - Manual or semi automatic drain: 250 psig (17 bar)
  - Automatic drain: 150 psig (10 bar)

Operating temperature*:
- Transparent bowl: 0° to 125°F (-20° to 50°C)
- Metal bowl: 0° to 150°F (-20° to 65°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

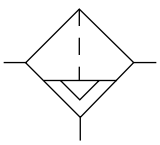
Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Semi automatic drain connection: Push on 5/16" (8 mm) ID tube
Semi automatic drain operating conditions (pressure operated)
- Bowl pressure required to close drain: Greater than 1.5 psig (0.1 bar)
- Bowl pressure required to open drain: Less than 1.5 psig (0.1 bar)
- Minimum air flow required to close drain: 1 scfm (0.5 $dm^3/s$)
- Manual operation: Lift stem to drain bowl

Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated)
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

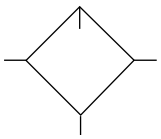
Nominal bowl size
- Bowl: 2.2 fluid ounce (65 ml)

Recommended lubricants: See Section ALE-29.
Materials
- Body: Zinc
- Bowl
  - Transparent: Polycarbonate
  - Transparent with guard: Polycarbonate, Zinc guard
  - Metal: Zinc
  - Metal bowl liquid level indicator lens: Transparent nylon
- Element: Sintered polypropylene
- Sight-Feed dome: Transparent nylon
- Elastomers: Neoprene, nitrile

### ISO Symbols



Filter with Automatic Drain



Lubricator with Drain

**See Section ALE-24 for Accessories**

**Ordering information.** Models listed include PTF threads. Filter (F) has automatic drain, long transparent bowl without guard, and a 40 µm element. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and long transparent bowl with guard.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter-Lubricator (F-L) | 1/4" | C72C-2AN-AL3-NNN-QLN | 2.3 (1.04) |
| | 3/8" | C72C-3AN-AL3-NNN-QLN | 2.3 (1.04) |

## Alternative Models

★ 7 2 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Shutoff/Lockout Valve, Quikmount | Substitute |
|---|---|
| Standard Combination (No Shutoff/Lockout Valve, no Quikmount) | C |
| With Shutoff/Lockout valve on inlet | D |
| With Quikmount pipe adapters on inlet and outlet | E |
| With Shutoff/Lockout Valve on inlet and Quikmount pipe adapter on outlet | G |

| Combination Unit Type | Substitute |
|---|---|
| Micro-Fog F-L | C |
| Oil-Fog F-L | D |

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1⁄4 turn | Q |
| Semi automatic | S |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | E |
| Transparent without guard | L |
| Transparent with guard | W |

| Accessories | Substitute |
|---|---|
| Quikclamp wall brackets | B |
| No accessories | N |

| Lubricator Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | E |
| Transparent without guard | L |
| Transparent with guard | W |

| Lubricator Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual, 1⁄4 turn | Q |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

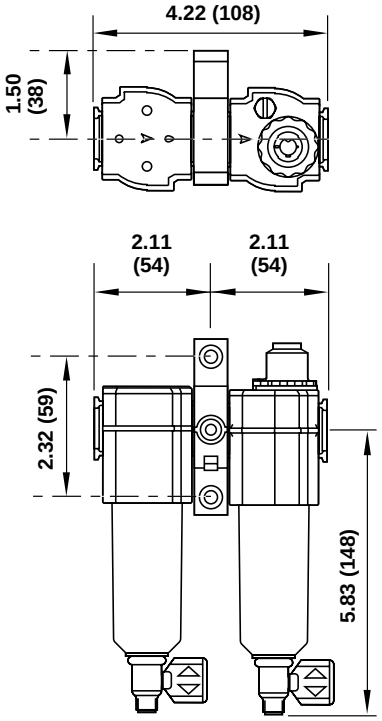
| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

**Standard Micro-Fog Type C72C-**
**Standard Oil-Fog Type C72D-**

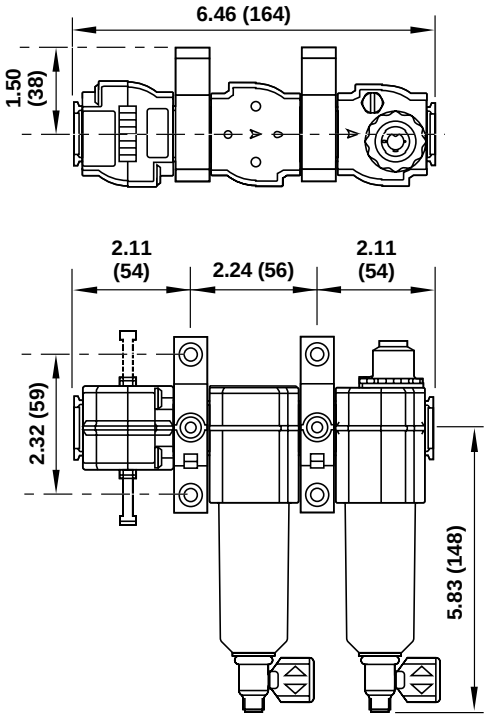
Shown with optional Quikclamp wall bracket.




**Alternative Micro-Fog Type D72C-**
**Alternative Oil-Fog Type D72D-**

**Includes Shutoff/Lockout valve.**

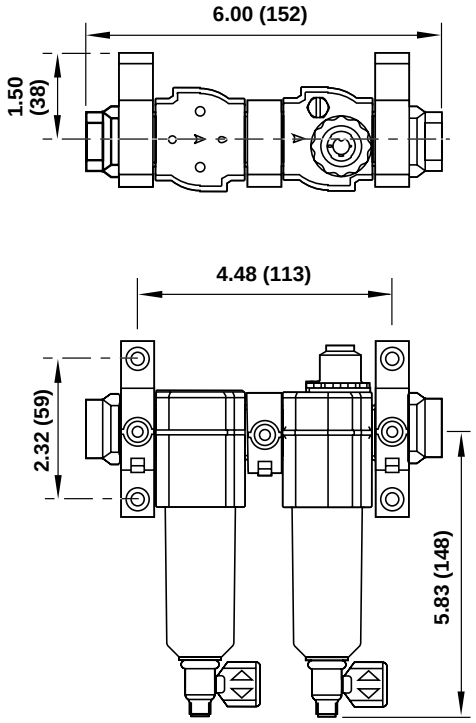
Shown with optional Quikclamp wall brackets.



**Alternative Micro-Fog Type E72C-**
**Alternative Oil-Fog Type E72D-**

**Includes Quikmount pipe adapters.**

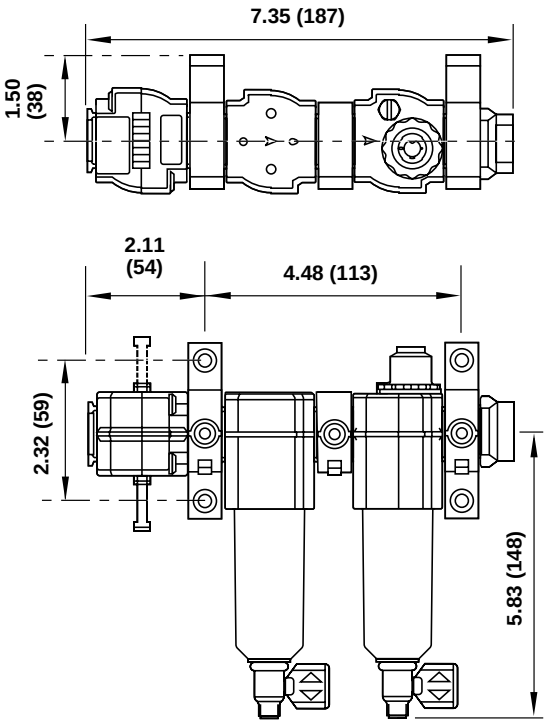
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type G72C-**
**Alternative Oil-Fog Type G72D-**

**Includes Shutoff/Lockout valve and Quikmount pipe adapter.**

Shown with optional Quikclamp wall brackets.



# F73G, L73 Combination Units

**Excelon 73 Filter-Lubricator**
**1/4", 3/8", 1/2" Port Sizes**

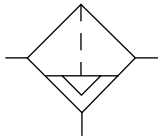
- **True modularity with Norgren Quikclamp™ connections**
- **Quick release bayonet bowl**
- **Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows**
- **Highly visible, prismatic liquid level indicator lens**
- **All around (360°) visibility of the sight-feed dome simplifies installation and adjustment**

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.

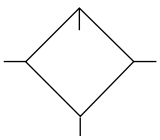

### Technical Data

Fluid: Compressed air
Maximum pressure
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe threads
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe threads
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 0.2 scfm (0.1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size: 3.5 fluid ounce (0.1 liter)
Recommended lubricants: See Section ALE-29.
Materials
Body: Aluminum
Bowl
Transparent: Polycarbonate
Transparent with guard: Polycarbonate, steel guard
Metal: Aluminum
Metal bowl liquid level indicator lens: Transparent nylon
Element: Sintered polypropylene
Sight-Feed dome: Transparent nylon
Elastomers: Neoprene and nitrile

### ISO Symbols



Filter with Automatic Drain



Lubricator with Drain

**See Section ALE-24 for Accessories**

## Ordering information

Models listed in order table have PTF threads. Filter (F) has automatic drain, metal bowl with liquid level indicator, and a 40 µm element. Lubricator (L) is a Micro-Fog model with 1/4 turn manual drain and metal bowl with liquid level indicator.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter-Lubricator (F-L) | 1/4" | C73C-2AN-AD3-NNN-QDN | 2.6 (1.18) |
| | 3/8" | C73C-3AN-AD3-NNN-QDN | 2.6 (1.18) |
| | 1/2" | C73C-4AN-AD3-NNN-QDN | 2.6 (1.18) |

## Alternative Models

★ 7 3 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Lockout Valve/ Quikmount | Substitute |
|---|---|
| Standard Combination (No Lockout Valve, no Quikmount) | C |
| With Lockout valve on inlet | D |
| With Quikmount pipe adapters on inlet and outlet | E |
| With Lockout valve on inlet and Quikmount pipe adapter on outlet | G |

| Combination Unit Type | Substitute |
|---|---|
| Micro-Fog F-L | C |
| Oil-Fog F-L | D |

| Port Size | Substitute |
|---|---|
| 1/4″ | 2 |
| 3/8″ | 3 |
| 1/2″ | 4 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1⁄4 turn | Q |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with zinc guard | P |
| Transparent | T |

| Accessories | Substitute |
|---|---|
| Accessories ***B*** and ***D*** | A |
| Quikclamp wall brackets | B |
| Accessories ***B*** and ***Q*** | C |
| Filter service indicator | D |
| Accessories ***B***, ***D,*** and ***Q*** | H |
| No accessories | N |
| Lubricator quick fill nipple | Q |

| Lubricator Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |
| Transparent | T |

| Lubricator Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual, 1⁄4 turn | Q |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

| Regulator Option | Substitute |
|---|---|
| Non Applicable | N |

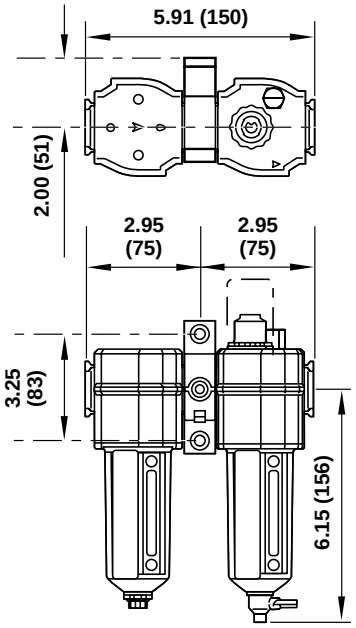
| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

# F73-L73 Combination Unit

All Dimensions in Inches (mm)

**Standard Micro-Fog Type C73C-**
**Standard Oil-Fog Type C73D-**

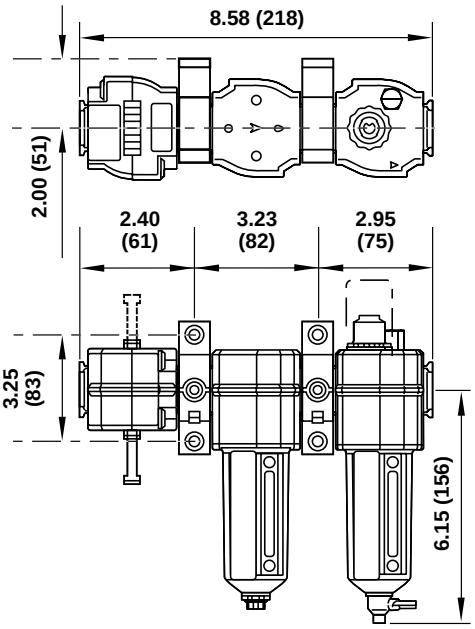
Shown with optional Quikclamp wall bracket.




**Alternative Micro-Fog Type D73C-**
**Alternative Oil-Fog Type D73D-**

**Includes lockout valve.**

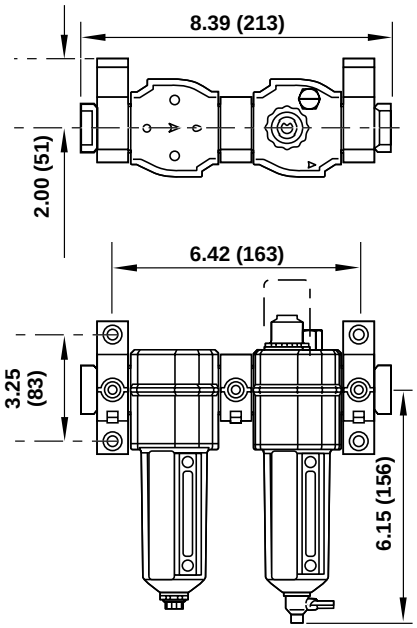
Shown with optional Quikclamp wall bracket.



**Alternative Micro-Fog Type E73C-**
**Alternative Oil-Fog Type E73D-**

**Includes Quikmount pipe adapters.**

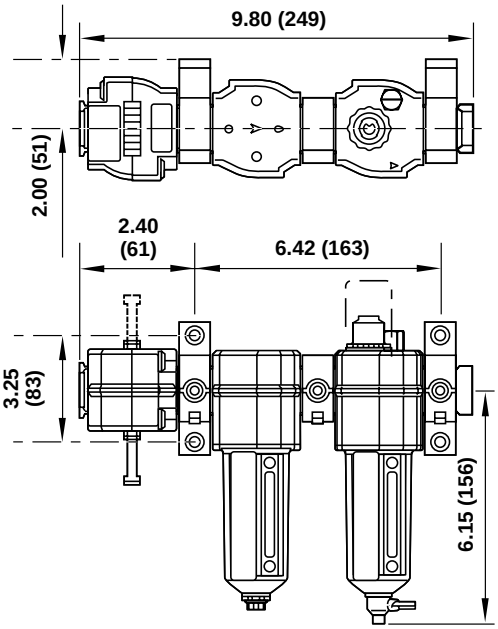
Shown with optional Quikclamp wall bracket.




**Alternative Micro-Fog Type G73C-**
**Alternative Oil-Fog Type G73D-**

**Includes lockout valve and Quikmount pipe adapter.**

Shown with optional Quikclamp wall bracket.



# F74G, L74 Combination Units

**Excelon 74 Filter-Lubricator**
**3/8", 1/2", 3/4" Port Sizes**

- **True modularity with Norgren Quikclamp™ connections**
- **Quick release bayonet bowl**
- **Flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows**
- **Highly visible, prismatic liquid level indicator lens**
- **All around (360°) visibility of the sight-feed dome simplifies installation and adjustment**

Use Micro-Fog models in applications containing one or more points of lubrication.
Use Oil-Fog models to lubricate a single tool, cylinder, or other air driven device.


### Technical Data

Fluid: Compressed air
Maximum pressure:
- Transparent bowl: 150 psig (10 bar)
- Metal bowl: 250 psig (17 bar)

Operating temperature*:
- Transparent bowl: 0° to 125°F (-20° to 50°C)
- Metal bowl: 0° to 175°F (-20° to 80°C)

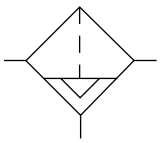
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe threads
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe threads
Automatic drain operating conditions (float operated):
- Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
- Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
- Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
- Manual operation: Depress pin inside drain outlet to drain bowl

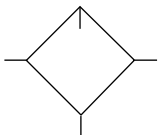
Nominal bowl size:
- Standard: 7 fluid ounce (0.2 liter)
- Optional size for lubricator: 1 quart US (1 liter)

Recommended lubricants: See Section ALE-29.
Materials
- Body: Aluminum
- Bowl
  - Transparent: Polycarbonate with steel bowl guard
  - Metal: Aluminum
- Metal bowl liquid level indicator lens
  - 7 fluid ounce (0.2 liter): Transparent nylon
  - 1 quart US (1 liter): Pyrex
- Sight-Feed dome: Transparent nylon
- Elastomers: Neoprene and Nitrile
- Element: Sintered polypropylene
- Elastomers: Neoprene and Nitrile

### ISO Symbols



Filter with Automatic Drain



Lubricator with Drain

**See Section ALE-24 for Accessories**

**Ordering information.** Models listed include Micro-Fog lubricator, PTF threads, metal filter bowl with liquid level indicator and automatic drain, 40 µm filter element, 7 fluid oz. (0.2 liter) metal lubricator bowl with liquid level indicator and 1/4 turn manual drain.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter-Lubricator (F-L) | 3/8" | C74C-3AN-AD3-NNN-QDN | 3.97 (1.80) |
| | 1/2" | C74C-4AN-AD3-NNN-QDN | 3.84 (1.74) |
| | 3/4" | C74C-6AN-AD3-NNN-QDN | 3.75 (1.70) |

## Alternative Models

★ 7 4 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Lockout Valve/ Quikmount | Substitute |
|---|---|
| Standard combination (no lockout valve or Quikmount) | C |
| With lockout valve on inlet | D |
| With Quikmount pipe adapters on inlet and outlet | E |
| With lockout valve on inlet and Quikmount pipe adapter on outlet | G |

| Combination Unit Type | Substitute |
|---|---|
| Micro-Fog F-L | C |
| Oil-Fog F-L | D |

| Port Size | Substitute |
|---|---|
| 3/8″ | 3 |
| 1/2″ | 4 |
| 3/4″ | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Regulator Option | Substitute |
|---|---|
| Non applicable | N |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, 1⁄4 turn | Q |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Transparent with guard | P |

| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |

| Accessories | Substitute |
|---|---|
| Quikclamp wall brackets and filter service indicator | A |
| Quikclamp wall brackets | B |
| Quikclamp wall brackets and lubricator quick fill nipple | C |
| Filter service indicator | D |
| Quikclamp wall brackets, filter service indicator and lubricator quick fill nipple | H |
| No accessories | N |
| Lubricator quick fill nipple | Q |

| Lubricator Bowl | Substitute |
|---|---|
| 1 quart US (1 liter) metal with liquid level indicator | A |
| 7 fluid oz. (0.2 liter) metal with liquid level indicator | D |
| 7 fluid oz. (0.2 liter) transparent with zinc guard | P |

| Lubricator Drain | Substitute |
|---|---|
| Closed bottom | E |
| Manual, 1⁄4 turn | Q |
| Remote fill * | R |

| Regulator Option | Substitute |
|---|---|
| Non applicable | N |

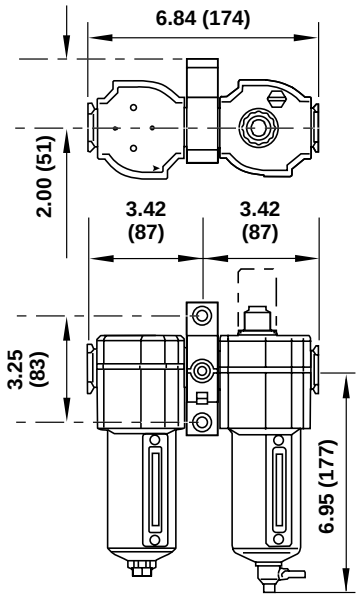
| Regulator Option | Substitute |
|---|---|
| Non applicable | N |

| Regulator Option | Substitute |
|---|---|
| Non applicable | N |

* Use remote fill only with 7 fluid oz. (0.2 liter) bowls.

**Standard Micro-Fog Type C74C-**
**Standard Oil-Fog Type C74D-**

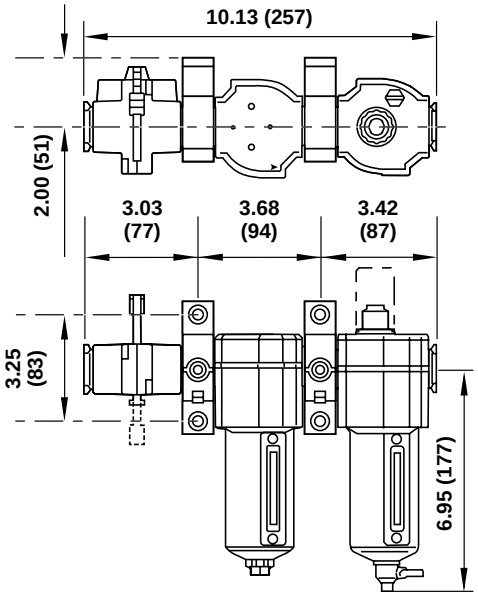
Shown with optional Quikclamp wall bracket.




**Alternative Micro-Fog Type D74C-**
**Alternative Oil-Fog Type D74D-**

**Includes Shutoff/Lockout valve.**

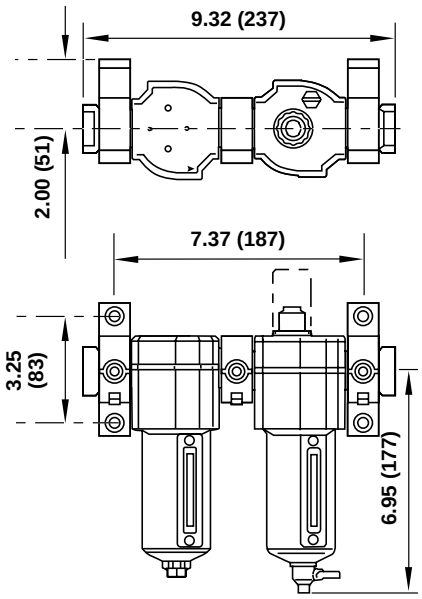
Shown with optional Quikclamp wall brackets.



**Alternative Micro-Fog Type E74C-**
**Alternative Oil-Fog Type E74D-**

**Includes Quikmount pipe adapters.**

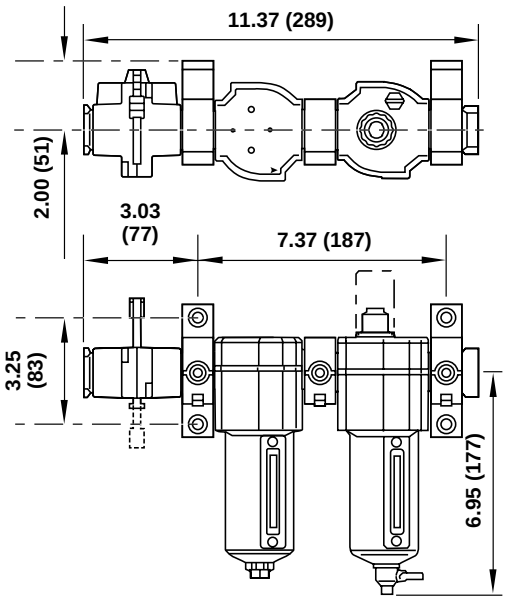
Shown with optional Quikclamp wall brackets.




**Alternative Micro-Fog Type G74C-**
**Alternative Oil-Fog Type G74D-**

**Includes Shutoff/Lockout valve and Quikmount pipe adapter.**

Shown with optional Quikclamp wall brackets.



# P8C and P8D Combination Units

**17 Series Filter-Lubricator**
**3/4", 1", 1-1/4" and 1-1/2" Port Sizes**

- **Combines outstanding features of the Norgren F17 filters and L17 lubricators**
- **All around (360°) visibility of the lubricator sight-feed dome simplifies installation and adjustment**
- **Screw-on bowl reduces maintenance time**
- **Can be disassembled without the use of tools or removal from the air line**
- **Lubricator flow sensor design provides a nearly constant oil/air ratio over a wide range of air flows**

Use Micro-Fog combinations in applications containing one or more points of lubrication

Use Oil-Fog combinations to lubricate a single tool, cylinder, or other air driven device

**Ordering Information.** Models listed include 1 quart (1 liter) metal bowls with sight glass, automatic drain on filter, manual drain on lubricator, and PTF.

| Port Size | Micro-Fog Models | Oil-Fog Models | Weight lbs (kg) |
|---|---|---|---|
| 3/4" | P8C-660-A3DA | P8D-660-A3DA | 8.49 (3.85) |
| 1" | P8C-860-A3DA | P8D-860-A3DA | 8.32 (3.77) |
| 1-1/4" | P8C-A60-A3DA | P8D-A60-A3DA | 9.54 (4.33) |
| 1-1/2" | P8C-B60-A3DA | P8D-B60-A3DA | 8.36 (3.79) |

## Alternative Models

P 8 ★ - ★ ★ ★ - ★ ★ ★ ★

| Lubricator Type | Substitute |
|---|---|
| Micro-Fog | C |
| Oil-Fog | D |

| Port Size | Substitute |
|---|---|
| 3/4″ | 6 |
| 1″ | 8 |
| 1-1/4″ | A |
| 1-1/2″ | B |

| Filter Bowl | Substitute |
|---|---|
| Metal with sight glass | 60 |

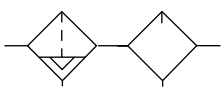
| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| BSPP (1-1/2″ ported units only) | C |
| ISO G parallel (not available with 1-1/2″ ported units) | G |

| Lubricator Reservoir | Substitute |
|---|---|
| 1 quart (1 liter) metal, drain, sight glass | D |

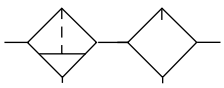
| Filter Element | Substitute |
|---|---|
| 40 µm | 3 |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual | M |

## ISO Symbols



Filter with automatic drain, Lubricator with manual drain



Filter manual drain, Lubricator with manual drain

**See Section ALE-24 for Accessories**

## Technical Data

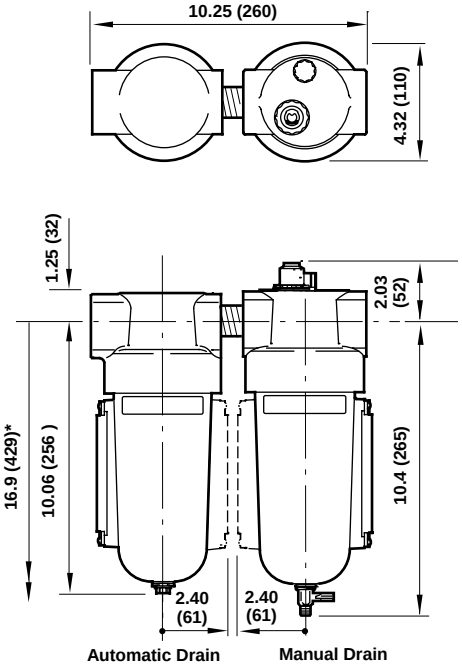
Fluid: Compressed air
Maximum pressure: 250 psig (17 bar)
Operating temperature*: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 2°C (35°F).
Start point (minimum flow required for lubricator operation): 8 scfm (3.8 $dm^3/s$) at 90 psig (6.3 bar) inlet pressure
Typical flow with 90 psig (6.3 bar) inlet pressure and 7 psig (0.5 bar) pressure drop:
1" Ports: 250 scfm (118 $dm^3/s$)
Nominal bowl size: 1 quart US (1 liter)
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions
Minimum pressure: 10 psig (0.7 bar).
Drain opens when bowl pressure drops below 3 psig (0.2 bar).
Minimum air flow: 2 scfm (1 $dm^3/s$) required to close drain.
Recommended lubricants: See Section ALE-29.
Materials
Body: Aluminum
Bowls: Aluminum
Bowl sight glass: Pyrex
Sight-feed dome: Transparent nylon
Elastomers: Neoprene and nitrile

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Lubricator service kit | All o-rings, seals, gaskets | 5771-02 |
| Filter service kit | All o-rings, seals, gaskets | 5578-05 |
| | 40 µm element | 5311-03 |
| Replacement drain | Automatic | 3000-10 |
| | Manual (1/4 Turn) | 619-50 |
| Sight glass kit | All o-rings, seals, gaskets | 2273-22 |

Sight glass kit contains bowl o-ring plus all o-rings, seals, screws, glass, and glass guard.

All Dimensions in Inches (mm)




* Minimum clearance required to remove bowl.

# FL64 Combination Units

## Olympian Plus 64 Filter and Lubricator
## 1/4", 3/8", 1/2", and 3/4" Port Sizes

- **Olympian Plus plug in design**
- **High Efficiency water and particle removal**
- **Easy fill lubricator with quick release bayonet bowls**
- **High visibility prismatic sight glass**
- **Constant oil density output with varying flow**


### Technical Data

Fluid: Compressed air
Maximum pressure:
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Particle removal: 5 µm, 25 µm, or 40 µm filter element
Manual drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain connection: Will fit 1/8-27 and 1/8-28 pipe thread
Automatic drain operating conditions (float operated):
Bowl pressure required to close drain: Greater than 5 psig (0.3 bar)
Bowl pressure required to open drain: Less than 3 psig (0.2 bar)
Minimum air flow required to close drain: 2 scfm (1 $dm^3/s$)
Manual operation: Depress pin inside drain outlet to drain bowl
Nominal bowl size
Standard: 7 fluid ounce (0.2 liter)
Optional size for lubricator: 1 quart (1 liter)
Recommended lubricants: See Section ALE-29.
Materials
Body and yoke: Zinc
Bowl:
Transparent: Polycarbonate
Metal: Aluminum
Metal bowl liquid level indicator lens:
7 fluid ounce (0.2 liter): Transparent nylon
1 quart (1 liter): Pyrex
Sight-Feed dome: Polycarbonate
Element: Sintered polypropylene
Elastomers: Neoprene and nitrile

### Service Kits

| Item | Type | Part number |
|---|---|---|
| Service kit | Filter | 4380-200 |
| Service kit | Lubricator | 4382-200 |
| Replacement elements | 40 µm | 4338-02 |
| | 5 µm | 4338-01 |
| Replacement sight glass | F64, plastic | 4380-040 |
| | L64, plastic | 4380-042 |
| | F64, L64, pyrex | 4380-041 |
| | L64, 1 quart, pyrex | 2273-22 |
| Replacement drains | Automatic | 3000-10 |
| | Manual, 1/4 turn | 619-50 |
| Service Indicator | | 5797-50 |

Filter service kit includes port seals, louver 'O' ring, bowl 'O' ring and drain gasket.
Lubricator service kit includes all seals, flow sensor, eyelet, dome screen, ball and spring.

**See Section ALE-24 for Accessories**

**Ordering information.** Models listed include Micro-Fog lubricator, yoke with PTF threads, filter with auto drain, metal bowl with liquid level indicator, 40 µm element; lubricator with 1/4 turn manual drain, 7 fluid ounce (0.2 liter) metal bowl with liquid level indicator.

| Combination Unit Type | Port Size | Model | Weight lb (kg) |
|---|---|---|---|
| Filter-Lubricator (F-L) | 1/4" | C64C-2AN-AD3-NNN-QDN | 10.2 (4.61) |
| | 3/8" | C64C-3AN-AD3-NNN-QDN | 9.7 (4.42) |
| | 1/2" | C64C-4AN-AD3-NNN-QDN | 9.6 (4.35) |
| | 3/4" | C64C-6AN-AD3-NNN-QDN | 8.8 (3.97) |

## Alternative Models

★ 6 4 ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★ - ★ ★ ★

| Lockout Valve | Substitute |
|---|---|
| No lockout valve | C |
| With lockout valve on inlet | D |

| Combination Unit Type | Substitute |
|---|---|
| Standard Micro-Fog F-L | C |
| Standard Oil-Fog F-L | D |

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |
| 3/4" | 6 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Regulator Option | Substitute |
|---|---|
| Not Applicable | N |

| Filter Drain | Substitute |
|---|---|
| Automatic | A |
| Manual, petcock | D |
| Manual, 1⁄4 turn | Q |

| Filter Bowl | Substitute |
|---|---|
| Metal with liquid level indicator | D |
| Metal, no liquid level indicator | M |
| Transparent with guard | P |
| Metal with pyrex liquid level indicator | R |

| Filter Element | Substitute |
|---|---|
| 5 µm | 1 |
| 25 µm | 2 |
| 40 µm | 3 |
| 75 µm | 4 |

| Accessories | Substitute |
|---|---|
| B and D | A |
| Wall brackets | B |
| B and Q | C |
| Filter service indicator | D |
| B and L * | F |
| B, D, and Q | H |
| B, D, and L | K |
| Lubricator low oil level switch * | L |
| No accessories | N |
| Lubricator quick fill cap | Q |

| Lubricator Bowl | Substitute |
|---|---|
| 1 quart (1 liter) metal with pyrex liquid level indicator | A |
| 7 fluid oz. (0.2 liter) metal with plastic liquid level indicator | D |
| 7 fluid oz. (0.2 liter) transparent with guard | P |

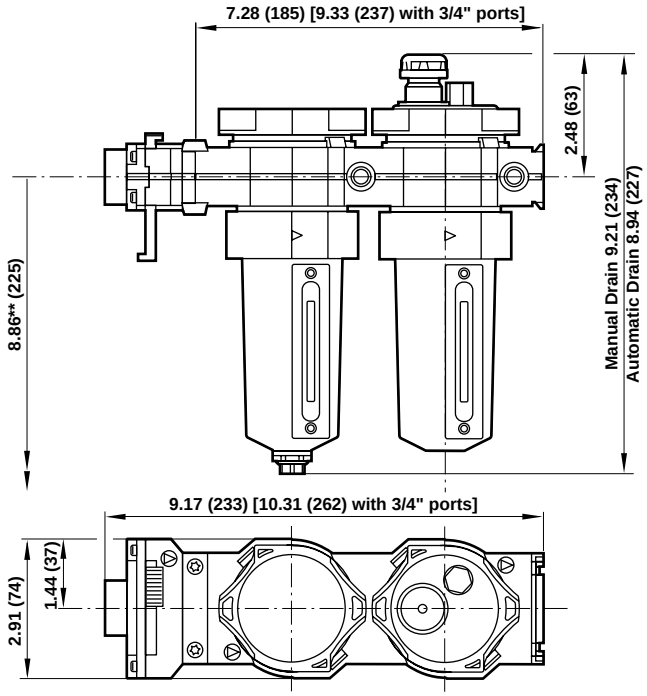
| Lubricator Drain | Substitute |
|---|---|
| Manual, petcock | D |
| Closed bottom | E |
| Manual, 1⁄4 turn | Q |
| Remote fill ** | R |

| Regulator Option | Substitute |
|---|---|
| Not Applicable | N |

| Regulator Option | Substitute |
|---|---|
| Not Applicable | N |

| Regulator Option | Substitute |
|---|---|
| Not Applicable | N |

* Lubricator low oil level switch available only with 1 quart (1 liter) bowl.
** Lubricator with remote fill available only with 7 fluid oz. (0.2 litre) bowls.

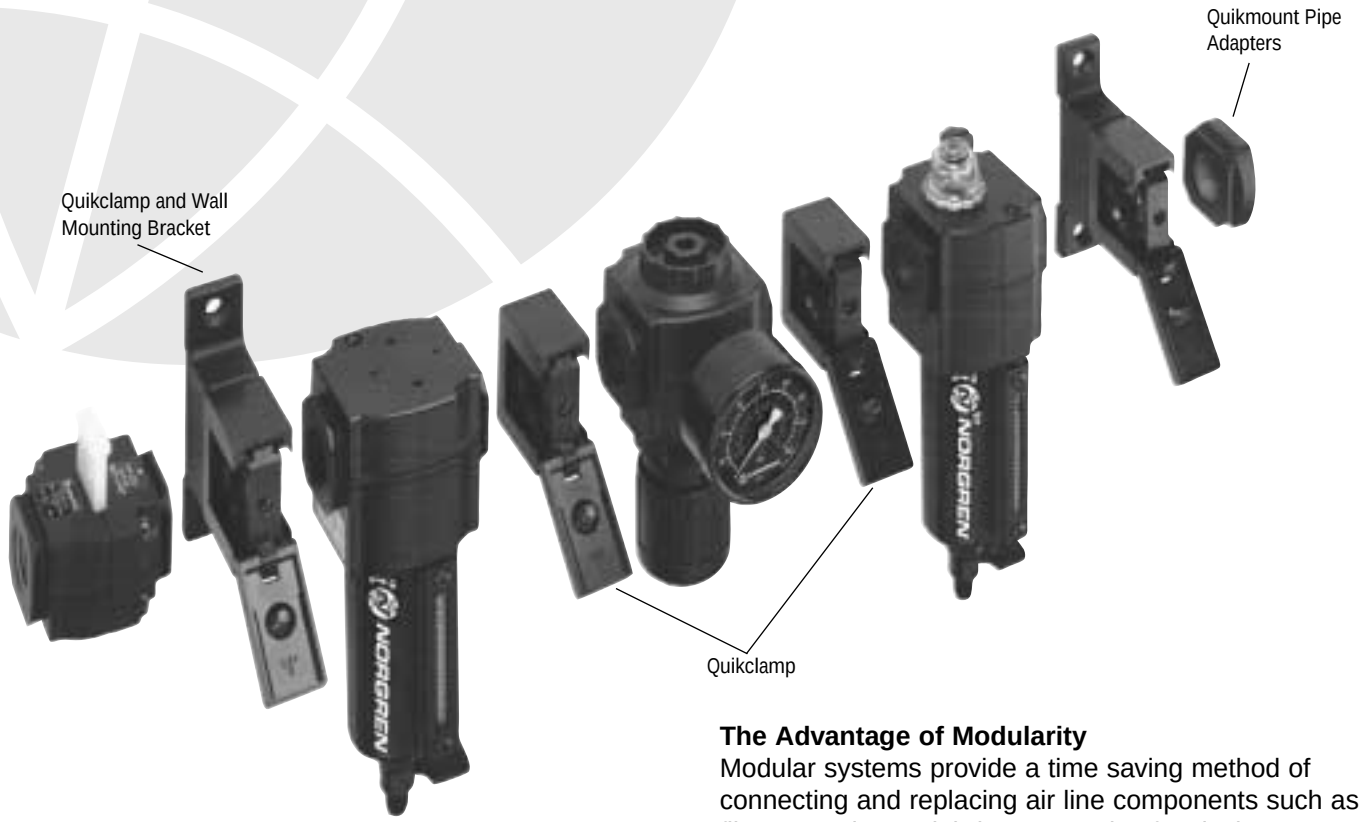



**** Minimum clearance required to remove bowl.**

# Modular Components

## Modular combination unit components for Excelon 72, 73, and 74 Series, and Olympian Plus 64 and 68 Series.






**The Advantage of Modularity**

Modular systems provide a time saving method of connecting and replacing air line components such as filters, regulators, lubricators, and safety lockout valves.

The heart of the Excelon system is the simple, one-piece Quikclamp that allows installation and removal of Excelon air preparation components and accessories without breaking a pipe connection.

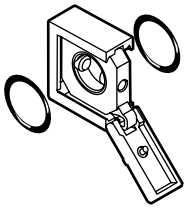
All Excelon 72, 73, and 74 products are designed with integral flanges that slide into V-grooves on the Quikclamp. Two face sealing o-rings provide a positive seal when the clamp is closed and the captive screw is tightened.

### Quikclamp

Maximum Pressure: 17 bar (250 psig)
Maximum Temperature: 65°C (150°F)

Use with all Excelon 72 Products to provide modular installation capability. Flanges on the products slide into V grooves in the Quikclamp. Two face-sealing o-rings in the Quikclamp provide a positive seal when the clamp is closed and the captive screw is tightened.
Tighten screw with a 3 mm hex wrench or a T15 Torx wrench.

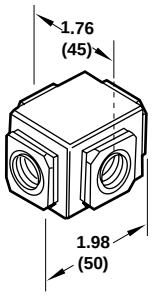
Quikclamp Service Kit (contains 2 Nitrile o-rings): 4384-570
A Quikclamp adds 0.26" (6.5 mm) to the overall length of a combination unit.



Part Number: 4214-51

### Manifold Block

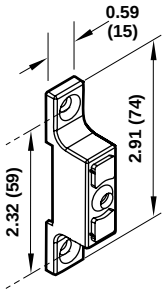
Installs with Quikclamps. Ports are threaded 3/8" pipe to provide manifolding capability for up to three components.




| Side Port Threads | Part Number |
|---|---|
| 3/8" PTF | 4228-01 |
| 3/8" ISO Rc | 4228-02 |
| 3/8" ISO G | 4228-03 |

### Quikclamp Wall Mounting Bracket

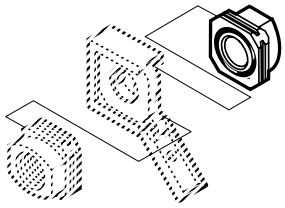
Use with the Quikclamp to provide secure mounting to a wall, machine panel or other flat surface.
Use 3/16" (5 mm) screws to mount bracket to wall.




Part Number 4213-89

### Quikmount Pipe Adapters

Use with the Quikclamp to provide threaded connections to the system piping.

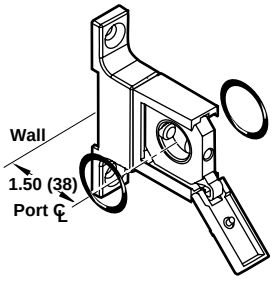


A pipe adapter adds 0.63" (16 mm) to the overall length of a combination unit.

| Port Size and Thread | Part No. (Quantity of 1) |
|---|---|
| 1/4" PTF | 4215-02 |
| 3/8" PTF | 4215-03 |
| 1/4" ISO $R_C$ | 4215-05 |
| 3/8" ISO $R_C$ | 4215-06 |
| 1/4" ISO G | 4215-08 |
| 3/8" ISO G | 4215-09 |

### Quikclamp and Wall Mounting Bracket

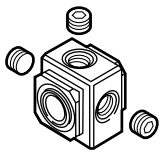
See Quikclamp paragraph for descriptions and dimensions.
Use 3/16" (5 mm) screws to mount bracket to wall.




Part Number 4214-52

### Porting Block

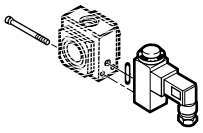
Installs between two Quikclamps to provide three additional 1/4" outlets for auxiliary air.
A Porting Block adds 1.13" (28.5 mm) to the overall length of a combination unit.



| Auxiliary Port Size & Thread | Part Number |
|---|---|
| 1/4" NPT | 4216-50 |
| 1/4" ISO Rc | 4216-51 |
| 1/4" IS0 G | 4216-52 |

### Replacement Pressure Switch

Use only with pressure switch sub-base. Cannot be used with the standard porting block.



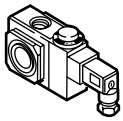
Part Number: 4246-01

### Sub-base Mounted Pressure Switch

Monitors air pressure and provides an electrical output when the pressure drops below or exceeds an adjustable preset pressure. Installs between two Quikclamps. Also provides two additional 1/4" outlets for auxiliary air.

| | |
|---|---|
| $P_1$max: | 250 psig (17 bar) |
| Temperature: | 14° to 150°F (-10° to 65°C) |
| Adjustable | 30 to 150 psig (2 to 10 bar). Shipped from factory preset at 90 psig (6.3 bar) |
| Max. Voltage: | 240 V a.c./d.c. |
| Max. Current: | 5 Amp |
| Hysteresis at Midpoint: | 12% |

A Sub-base Mounted Pressure Switch adds 1.13" (29 mm) to the overall length of a combination unit.



| Auxiliary Port Threads | Part Number |
|---|---|
| 1/4" PTF | 4246-50 |
| 1/4" ISO G | 4246-52 |

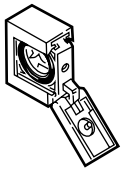
### Transition Connector

Enables connection of Excelon 72 to 74 units. Typically this will allow F74C/H high grade coalescing filters to be flow matched with R72 regulators.

Part Number: 4417-01

### Quikclamp

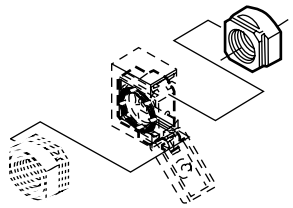
Use with all 73 and 74 Series Products to provide modular installation capability. Flanges on the products slide into V grooves in the Quikclamp. Two face-sealing o-rings in the Quikclamp provide a positive seal when the clamp is closed and the captive screw is tightened. A Quikclamp adds 0.54" (13.6 mm) to the overall length of a combination unit. Tighten screw with a 5/32" (4 mm) hex or T25 Torx wrench. (30 in. lbs. Torque)



| | |
|---|---|
| Material: | Zinc |
| Quikclamp part number: | 4314-51 |
| O-ring kit part number: | 4384-770 |

### Quikmount Pipe Adapters

Use with the Quikclamp to provide threaded connections to the system piping.
Each pipe adapter adds 0.71" (18 mm) to the overall length of a combination unit (each kit contains one adapter).

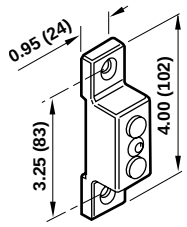


Material: Aluminum

| Part number (Qty 1) | Port size and thread |
|---|---|
| 4315-01 | 1/4" PTF |
| 4315-02 | 3/8" PTF |
| 4315-03 | 1/2" PTF |
| 4315-04 | 3/4" PTF |
| 4315-05 | 1/4" ISO Rc |
| 4315-06 | 3/8" ISO Rc |
| 4315-07 | 1/2" ISO Rc |
| 4315-08 | 3/4" ISO Rc |
| 4315-09 | 1/4" ISO G |
| 4315-10 | 3/8" ISO G |
| 4315-11 | 1/2" ISO G |
| 4315-12 | 3/4" ISO G |

### Quikclamp Wall Mounting Bracket

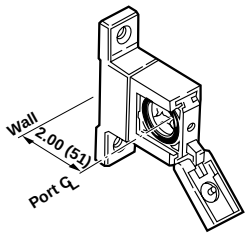
Use with the Quikclamp to provide secure mounting to a wall, machine panel or other flat surface.
Use No. 12 (6 mm) screws to mount bracket to wall.




| | |
|---|---|
| Material: | Zinc |
| Part number: | 4313-50 |

### Quikclamp and Wall Mounting Bracket

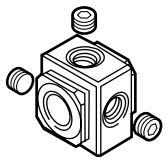
See preceding paragraphs for descriptions and dimensions.




| | |
|---|---|
| Material: | Zinc |
| Part number: | 4314-52 |
| L74 1 quart | 4314-55 |

### Porting Block

Installs between two Quikclamps to provide three additional 1/4" outlets for auxiliary air.
A Porting Block adds 1.30" (33 mm) to the overall length of a combination unit.

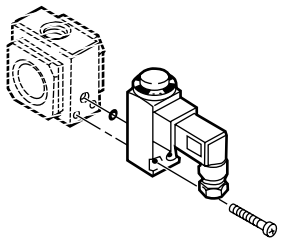


Material: Zinc

| Part number | Auxiliary port size and thread |
|---|---|
| 4316-50 | 1/4" PTF |
| 4316-51 | 1/4" ISO Rc |
| 4316-52 | 1/4" IS0 G |

### Replacement Pressure Switch

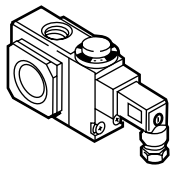
Use only with the pressure switch subbase. Cannot be used with the standard porting block.



| | |
|---|---|
| Material: | Aluminum |
| Pressure switch part number: | 4346-01 |
| Replacement connector: | 4346-01R |

### Subbase Mounted Pressure Switch

Monitors air pressure and provides an electrical output when the pressure drops below or exceeds an adjustable preset pressure. Installs between two Quikclamps. Also provides three additional 1/4" outlets for auxiliary air. A Subbase Mounted Pressure Switch adds 1.30" (33 mm) to the overall length of a combination unit.



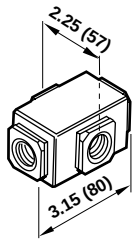
Specifications

| | |
|---|---|
| Maximum Pressure: | 300 psig (20 bar) |
| Maximum Temperature: | 175°F (80°C) |
| Adjustable Range: | 30 to150 psig (2 to 10 bar) Shipped from factory preset at 90 psig (6.2 bar). |
| Maximum Voltage: | 240V ac/dc |
| Maximum Current: | 5 Amp |
| Hysteresis at Midpoint: | 12% |
| Materials: | Zinc subbase, Aluminum switch |

| Part number | Auxiliary port thread |
|---|---|
| 4346-50 | 1/4" PTF |
| 4346-51 | 1/4" ISO Rc |
| 4346-52 | 1/4" ISO G |

### Manifold Block

Installs with Quikclamps. Ports are threaded 3/4" pipe to provide manifolding capability for up to three components.



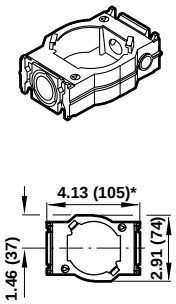

| Material: / Part number | Zinc / Side port threads |
|---|---|
| 4328-50 | 3/4" PTF |
| 4328-53 | 3/4" ISO G |
| 4328-52 | 3/4"ISO Rc |

### Transition Connector

Enables connection of Excelon 72 to 74 units. A transition connector adds 0.06" (1.5mm) to the overall length of a combination unit.

| | |
|---|---|
| Material: | Aluminum |
| Part Number: | 4417-01 |

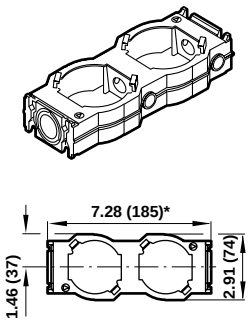
### Single Yoke




* 3/4= 6.18 (157)

| | |
|---|---|
| 1/4 | Y64A-2AA-N1N |
| 3/8 | Y64A-3AA-N1N |
| 1/2 | Y64A-4AA-N1N |
| 3/4 | Y64A-6AA-N1N |

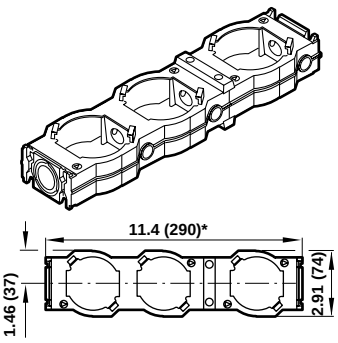
### Double Yoke




* 3/4 = 9.33 (237)

| | |
|---|---|
| 1/4 | Y64A-2AA-N2N |
| 3/8 | Y64A-3AA-N2N |
| 1/2 | Y64A-4AA-N2N |
| 3/4 | Y64A-6AA-N2N |

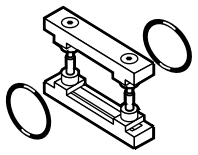
### Triple Yoke




* 3/4 = 13.46 (342)

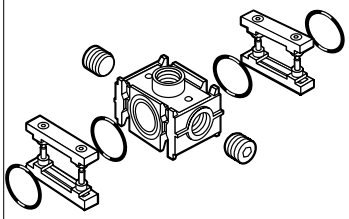
| | |
|---|---|
| 1/4 | Y64A-2AA-N3N |
| 3/8 | Y64A-3AA-N3N |
| 1/2 | Y64A-4AA-N3N |
| 3/4 | Y64A-6AA-N3N |

### Yoke Connector

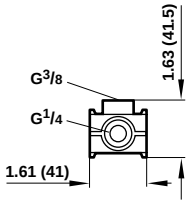


| |
|---|
| 74503-51 |

### Porting Block



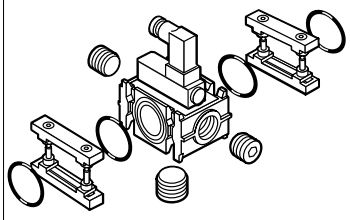
- (2) 1/4 outlets
- (1) 3/8 outlet



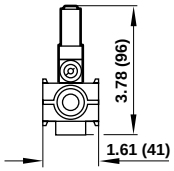

$P_1$ max. = 250 psi (17 bar)
T max. = 175°F (80°C)

| |
|---|
| 74507-52 PTF |
| 74507-50 ISO G |
| 74507-51 ISO Rc |

### Adjustable Pressure Switch



- 30-150 psi (2–10 bar) adjustable
- Porting block mounted
- DIN 43650 form C connector



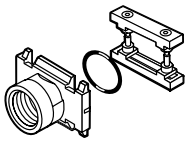

$P_1$ max. = 250 psi (17 bar)
T max. = 175°F (80°C)

I max. = 5 A
V max. = 240 V

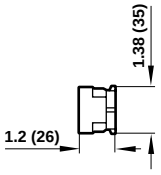
Reset differential
= 15 psi (1 bar) nominal

| |
|---|
| 4346-99 |

### End Connector

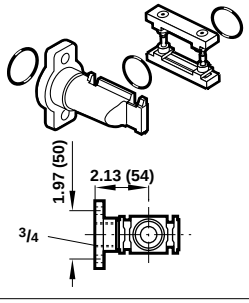


- For use with end mounted porting block
- 1/2 or 3/4 over porting



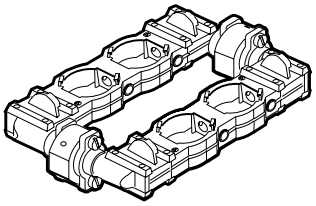

| | |
|---|---|
| 1/2 | 74505-52 PTF |
| 3/4 | 74505-55 PTF |
| 1/2 | 74505-50 ISO G |
| 3/4 | 74505-53 ISO G |

### Rear Entry Bracket Kit



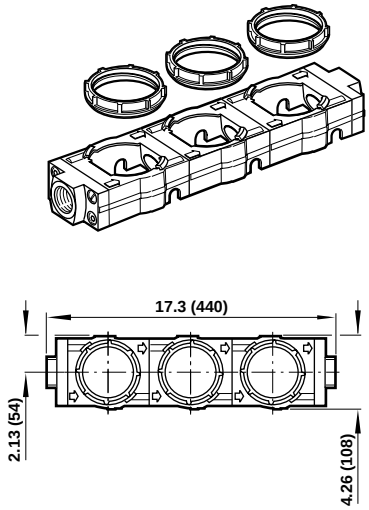

| |
|---|
| 18-026-981 |

### Duplex Kit



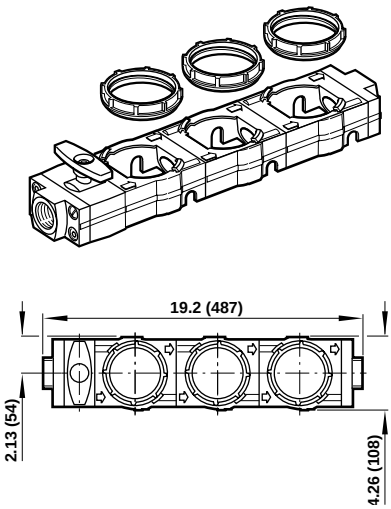
| |
|---|
| 18-026-978 |

**Triple Yoke Assembly**




| Port Size | |
|---|---|
| NPT 1/2 | Y68A-4AN-N3N |
| NPT 3/4 | Y68A-6AN-N3N |
| NPT 1 | Y68A-8AN-N3N |
| NPT 1-1/4 | Y68A-AAN-N3N |
| NPT 1-1/2 | Y68A-BAN-N3N |

**Triple Yoke Assembly with Shut-off**




| Port Size | |
|---|---|
| NPT 1/2 | Y68B-4AN-E3N |
| NPT 3/4 | Y68B-6AN-E3N |
| NPT 1 | Y68B-8AN-E3N |
| NPT 1-1/4 | Y68B-AAN-E3N |
| NPT 1-1/2 | Y68B-BAN-E3N |

## Alternative 68 Series Yoke Assembly Models

Y 6 8 ★ - ★ ★ N - ★ ★ ★

| Shut-Off Valve and Porting Block | Substitute |
|---|---|
| No shut-off valve, No porting block | A |
| With shut-off valve, No porting block | B |
| With shut-off valve, With porting block | E |
| No shut-off valve, With porting block | F |

| Port Size | Substitute |
|---|---|
| 3/4" | 6 |
| 1" | 8 |
| 1 1/4" | A |
| 1 1/2" | B |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Wall Mounting Bracket | Substitute |
|---|---|
| Without | N |
| With | B |

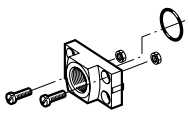
| Yoke | Substitute |
|---|---|
| Single | 1 |
| Double | 2 |
| Triple | 3 |

| Shut-Off Valve Type | Substitute |
|---|---|
| 2-port/2-position, Padlocks open or closed, No exhaust, Black handle | A |
| 3-port/2-position, Padlocks open or closed, Unthreaded exhaust, Black handle | C |
| 3-port/2-position, Not lockable, Threaded exhaust, Black handle | D |
| 3-port/2-position, Padlocks closed only, Unthreaded exhaust, Yellow handle | E * |
| 2-port/2-position, Not lockable, No exhaust, Black handle | G |
| No shut-off valve | N |

* Meets OSHA requirements.

All Dimensions in Inches (mm)

### End Connector Kit



Note: Two kits are required per unidaptor. Each kit contains end connector, screws, nuts and o-ring.

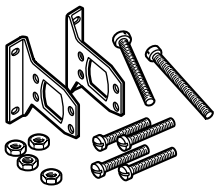
| Port Size | |
|---|---|
| NPT 1/2 | 5524-56 |
| NPT 3/4 | 5524-53 |
| NPT 1 | 5524-50 |
| NPT 1-1/4 | 5523-50 |
| NPT 1-1/2 | 5523-95 |

### Yoke Connecting Kit

Comprising seal, screws and nuts.Part Number 18-026-987

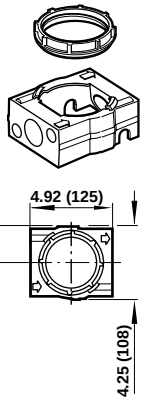
### Mounting Bracket

Brackets slip over end connectors and are bolted to Yoke Assembly with nuts and screws provided. Note: Each kit contains 6 screws (2 x 80 mm and 4 x 35 mm) and 4 nuts.



| Part Number | |
|---|---|
| 1/2" ported yoke | 18-001-979 |
| 3/4" ported yoke | 18-001-979 |
| 1" ported yoke | 18-001-979 |
| 1-1/4" ported yoke | 18-001-978 |
| 1-1/2" ported yoke | N/A |

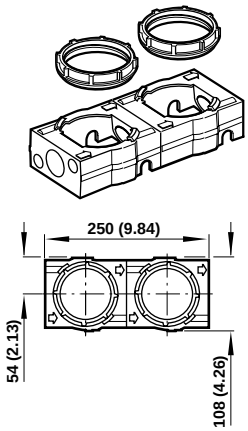
### Single Yoke




Part Number: 74785-98

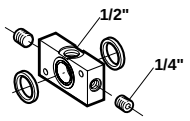
### Double Yoke

Part Number: 74785-51




### Porting Block

May be fitted to end connectors, shut-off valves, or yokes. Provides additional outlets for auxiliary air.




A porting block adds 29 mm (1.14") to the overall length of a combination unit.

**To order separately:**

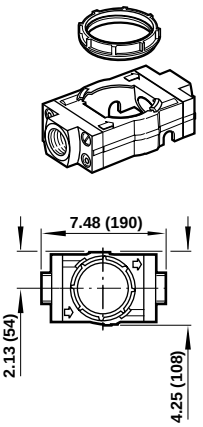
| Thread Type | Part Number |
|---|---|
| ISO G | 18-026-986 |
| N.P.T. | 18-026-983 |

**To order unidaptor with porting block installed after 1st yoke:**

With shut-off valve and porting block: Change ***B*** to ***E*** in 4th position of unidaptor model number.

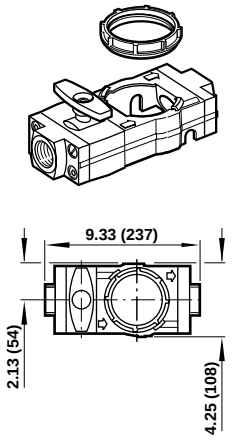
Without shut-off valve, with porting block: Change ***A*** to ***F*** in 4th position of unidaptor model number.

### Single Yoke Assembly



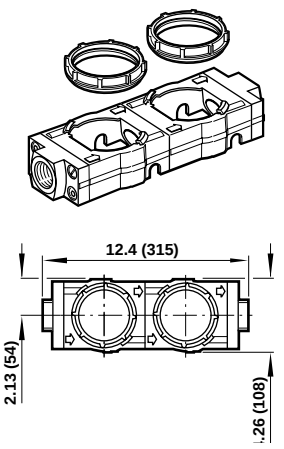

| Port Size | |
|---|---|
| NPT 1/2 | Y68A-4AN-N1N |
| NPT 3/4 | Y68A-6AN-N1N |
| NPT 1 | Y68A-8AN-N1N |
| NPT 1-1/4 | Y68A-AAN-N1N |
| NPT 1-1/2 | Y68A-BAN-N1N |

### Single Shut-off Yoke Assembly



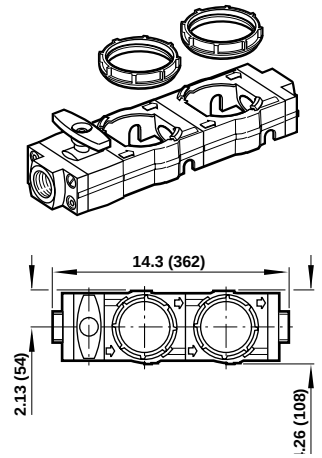

| Port Size | |
|---|---|
| NPT 1/2 | Y68B-4AN-E1N |
| NPT 3/4 | Y68B-6AN-E1N |
| NPT 1 | Y68B-8AN-E1N |
| NPT 1-1/4 | Y68B-AAN-E1N |
| NPT 1-1/2 | Y68B-BAN-E1N |

### Double Yoke Assembly




| Port Size | |
|---|---|
| NPT 1/2 | Y68A-4AN-N2N |
| NPT 3/4 | Y68A-6AN-N2N |
| NPT 1 | Y68A-8AN-N2N |
| NPT 1-1/4 | Y68A-AAN-N2N |
| NPT 1-1/2 | Y68A-BAN-N2N |

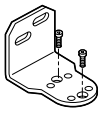
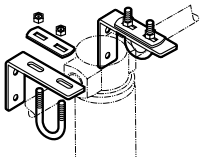
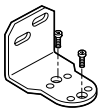
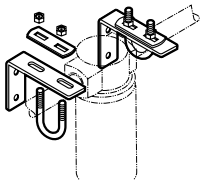
### Double Shut-off Yoke Assembly




| Port Size | |
|---|---|
| NPT 1/2 | Y68B-4AN-E2N |
| NPT 3/4 | Y68B-6AN-E2N |
| NPT 1 | Y68B-8AN-E2N |
| NPT 1-1/4 | Y68B-AAN-E2N |
| NPT 1-1/2 | Y68B-BAN-E2N |

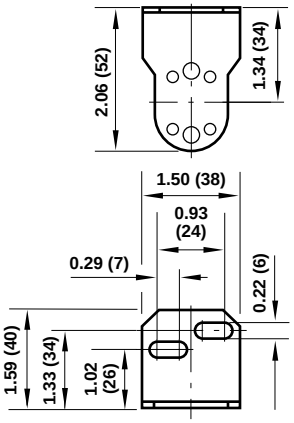
# Accessories for Filters, Regulators, and Lubricators

Contents

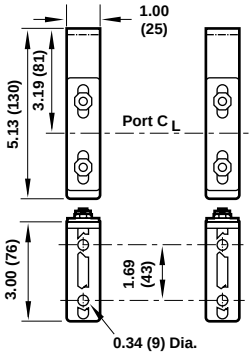
| Product | Accessory | Part No. |
|---|---|---|
| F07 | Wall bracket  | 5939-06 |
| F17 | Wall bracket  | 3/4", 1" Ports: 6212-50<br>1-1/4", 1-1/2" Ports: 6212-51 |
| F22 | Wall bracket  | 18-001-962 |
| F39 | Wall bracket  | 5939-06 |
| F46 | Wall bracket  | 3/4", 1" Ports: 6212-50<br>1-1/4", 1-1/2" Ports: 6212-51 |
| F64 | Wall bracket  | 74504-50 |

All Dimensions in Inches (mm)

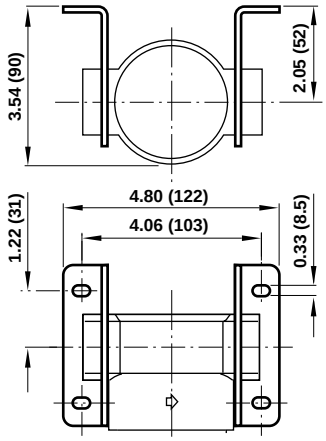
**F07, F39 Bracket (**5939-06)



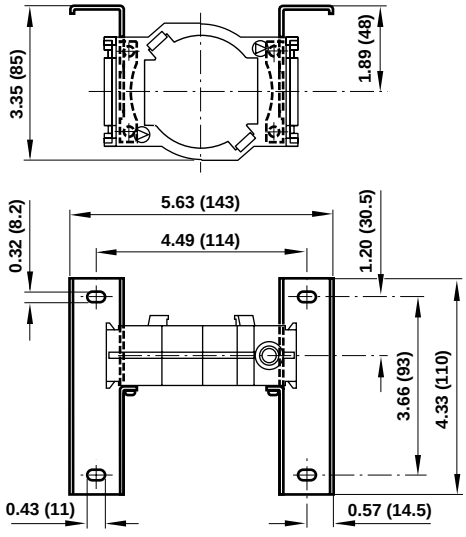

**F17, F46 Bracket** (6212-50, 6212-51)

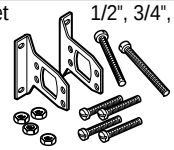
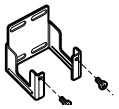
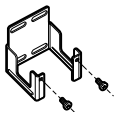
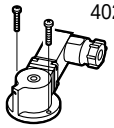
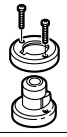
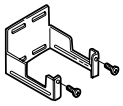
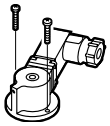



**F22 Bracket** (18-001-962)



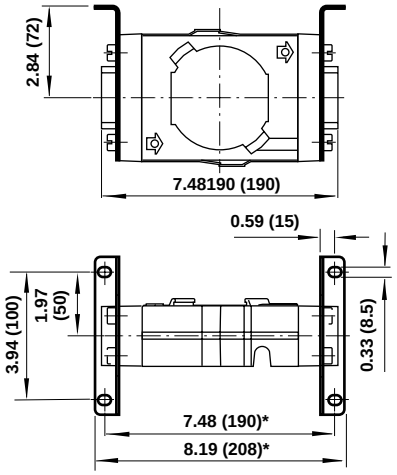

**F64 Bracket** (74504-50)



| Product | Accessory | Part No. |
|---|---|---|
| F68 | Wall bracket  | 1/2", 3/4", 1", 1-1/4" Ports: 18-001-978<br>1-1/2" Ports: Not Available |
| F72 | Wall bracket  | 4224-50 |
| F73 | Wall Bracket  | 4424-50 |
| | Electric service indicator<br>Provides electrical signal when element needs to be replaced.<br>Rated NEMA 4.  | 4020-51R |
| | Visual service indicator<br>Turns from green to red when element needs to be replaced.  | 5797-50 |
| F74 | Wall bracket  | 4324-50 |
| | Electric service indicator<br>Rated NEMA 4<br>Provides electrical signal when element needs to be replaced.  | 4020-51R |
| | Visual service indicator<br>Turns from green to red when element needs to be replaced.  | 5797-50 |

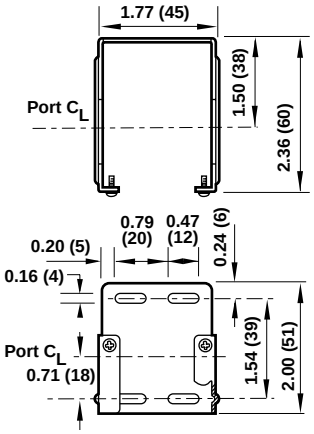
All Dimensions in Inches (mm)

**F68 Bracket** (18-001-978)

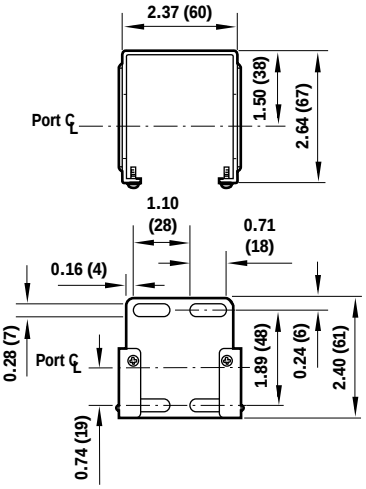



*** Add 0.39" (10) for 1-1/4" ported yokes.**

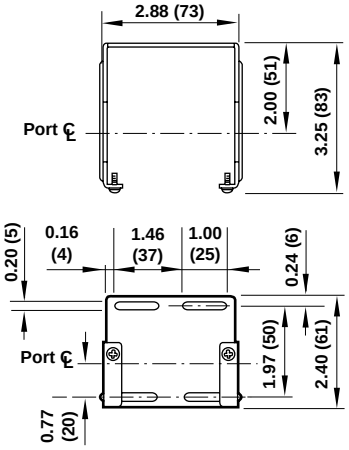
**F72 Bracket** (4224-50)

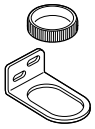
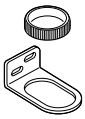



**F73 Bracket** (4424-50)



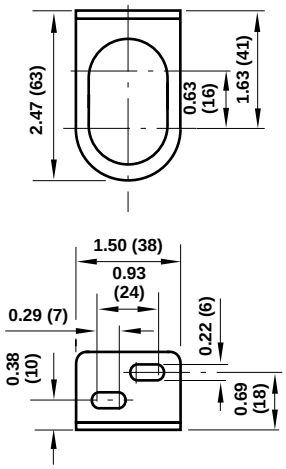

**F74 Bracket** (4324-50)



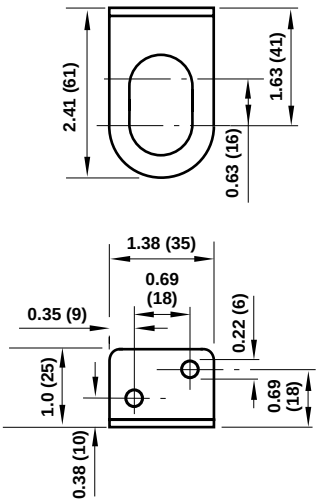
| Product | Accessory | Part No. |
|---|---|---|
| R05 | Plastic panel nut  | 2962-89 |
| R06 | Wall bracket for R06 with plastic bonnet  | Bracket and plastic nut: 18-025-003<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| | Wall bracket for R06 with brass bonnet  | Bracket and metal nut: 18-001-021<br>Metal nut: 616-01 |
| | Tamper resistant knob kit  | 18-001-092 |
| R07 | Wall bracket with plastic nut  | Bracket and plastic nut: 18-025-003<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| | Tamper resistant knob kit  | 18-001-092 |
| R17 | Wall bracket with plastic nut  | Bracket and metal nut: 5570-04<br>Metal nut: 5226-97 |
| | Tamper resistant seal wire  | 2117-01 |
| R18 | Muffler  | 3/4 PTF: MB006A<br>R 3/4: MB006B |

All Dimensions in Inches (mm)

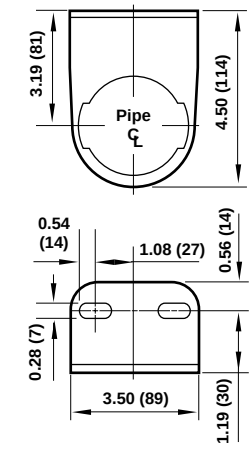
**R06, R07 Bracket** (18-025-003)

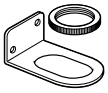



**R06 Bracket for Brass Bonnet** (18-001-021)



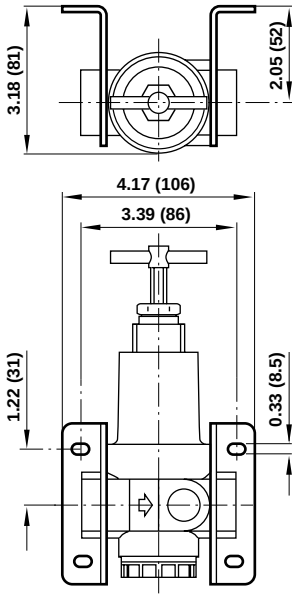

**R17 Bracket** (5570-04)



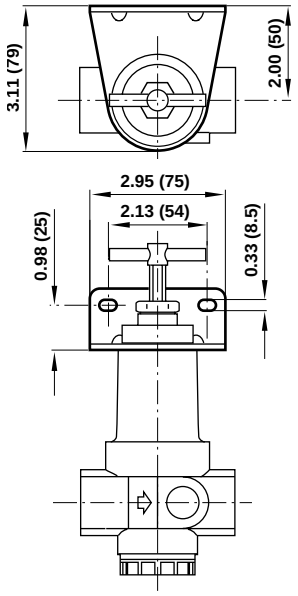
| Product | Accessory | | Part No. |
|---|---|---|---|
| R22 | Stainless steel wall bracket |  | 18-001-962 |
| | Wall bracket (neck mount) |  | Stainless steel wall bracket and metal nut: 18-001-959<br>Metal nut: 5988-02 |
| R24 | Wall bracket with metal nut |  | Bracket and metal nut: 18-999-412<br>Bracket: 18-001-996<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| | Reducing bushing for gauge ports |  | 3/8 to 1/4 PTF: 5950-01<br>1/2 to 1/4 PTF: 2339-04<br>R1/4 to G1/8: 150232818<br>R3/8 to G1/8: 150233818<br>R1/2 to G1/8: 150234818 |
| | Tamper resistant cap | | 18-021-006 |
| R30M | Plastic panel nut<br>Metal panel nut |  | 2962-89<br>2962-04 |
| | Tamper resistant knob kit |  | 18-001-092 |
| | Push-in connector |  | 8 mm: 11-002-0800<br>10 mm: 11-002-1000 |
| | Push-in plug |  | 8 mm: 11-004-0800<br>10 mm: 11-004-1000 |
| | Push-in gauge adapter |  | 8 mm: 74679-02<br>10 mm: 74679-03 |

All Dimensions in Inches (mm)

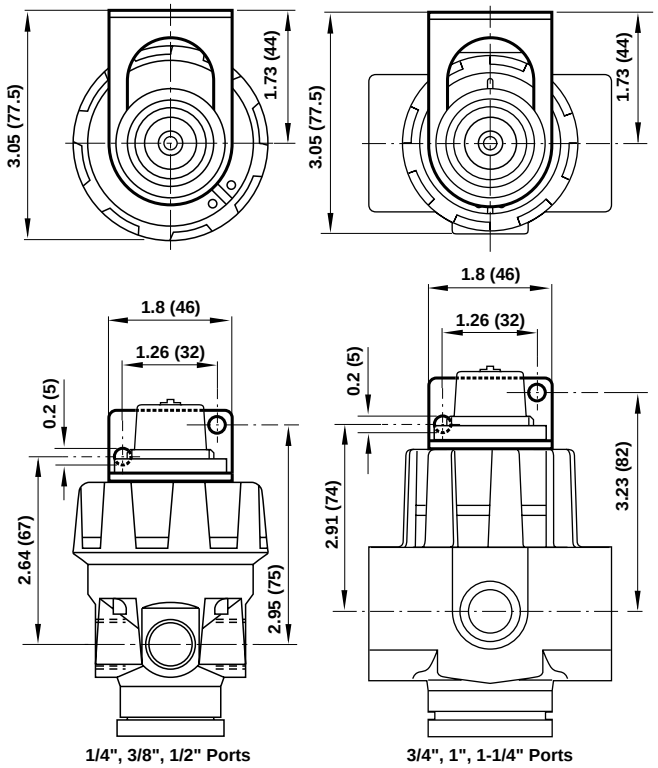
**R22 Bracket** (18-001-962)




**R22 Neck Bracket** (18-001-959)




**R24 Bracket** (18-999-412)



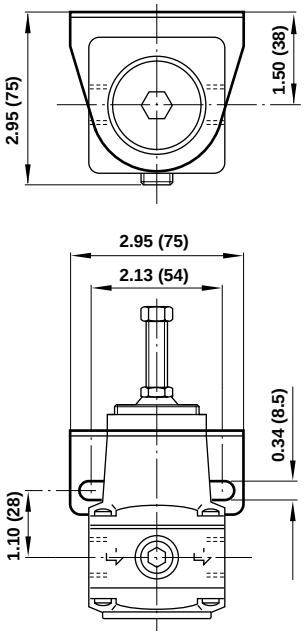

1/4", 3/8", 1/2" Ports

3/4", 1", 1-1/4" Ports

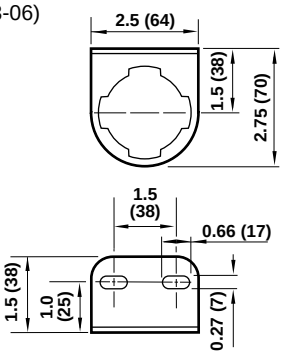
| Product | Accessory | Part No. |
|---|---|---|
| R38 | Aluminum wall bracket and nut: 18-001-974<br>Aluminum nut: 5988-01 | |
| | Stainless steel wall bracket and nut: 18-001-973<br>Stainless steel nut: 5988-02 | |
| | Plastic adjusting knob | 655-97 |
| | Tamper resistant cap | 18-004-987 |
| R40<br>R41<br>R43 | Wall bracket with metal nut | Bracket and metal nut: 5203-06<br>Plastic nut: 5191-89<br>Metal nut: 5191-88 |
| | Tamper resistant seal wire | 2117-01 |
| R44 | Wall bracket for R44 with plastic bonnet | Bracket and plastic nut: 18-025-003<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| | Wall bracket for R44 with brass bonnet | Bracket and metal nut: 18-001-021<br>Metal nut: 616-01 |
| | Tamper resistant knob | 18-001-092 |

All Dimensions in Inches (mm)

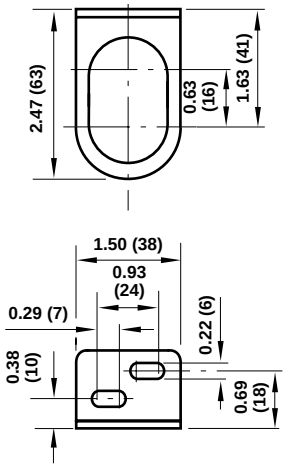
**R38 Bracket** (18-001-974)



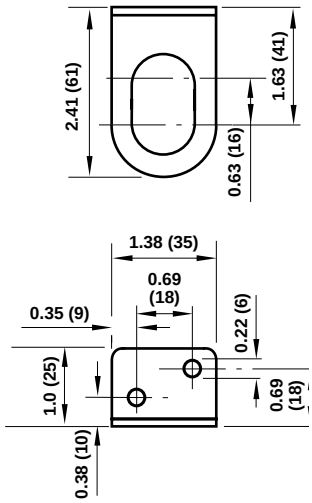

**R40, R41, R43 Bracket** (5203-06)

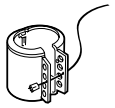
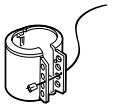
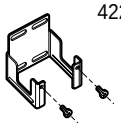
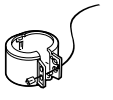



**R44 Bracket** (18-025-003)



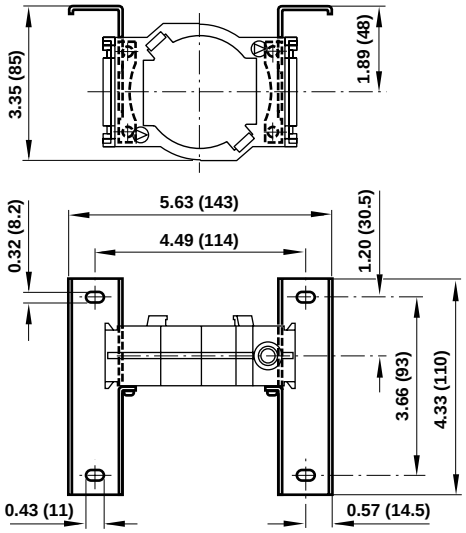

**R44 Bracket for Brass Bonnet** (18-001-021)



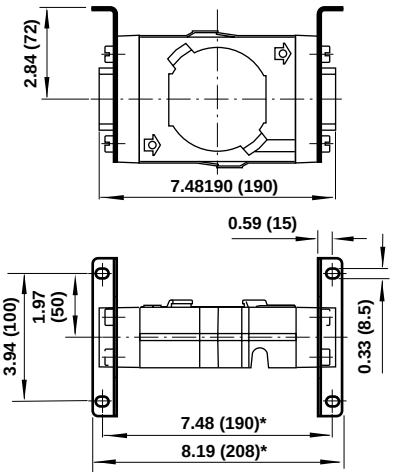
| Product | Accessory | Part No. |
|---|---|---|
| R64 | Wall bracket  | 74504-50 |
| | Metal panel nut  | 4348-89 |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.  | Cover and wire: 4355-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| R68 | Wall bracket  | 1/2", 3/4", 1", 1-1/4" Ports: 18-001-978<br>1-1/2" Ports: Not Available |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.  | Cover and wire: 4355-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| R72 | Wall bracket  | 4224-50 |
| | Wall bracket/plastic nut  | Bracket and plastic nut: 74316-50<br>Plastic nut: 4248-89<br>Metal Nut: 4248-01 |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 2 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.  | Cover and wire: 4255-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |

All Dimensions in Inches (mm)

**R64 Bracket** (74504-50)

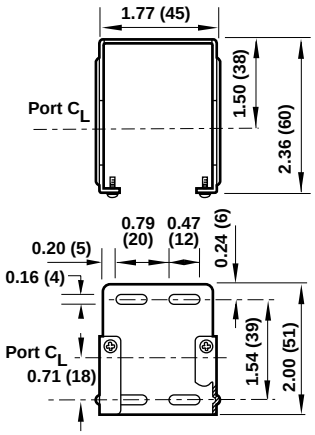



**R68 Bracket** (18-001-978)

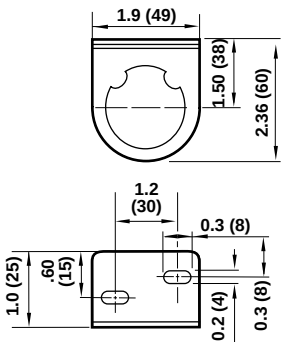


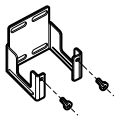
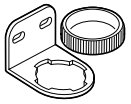
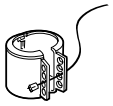
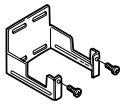
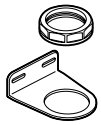
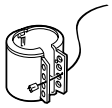

*** Add 0.39" (10) for 1-1/4" ported yokes.**

**R72 Bracket** (4224-50)



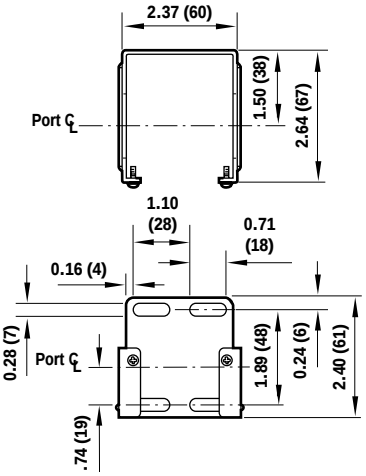

**R72 Neck Bracket** (74316-02)



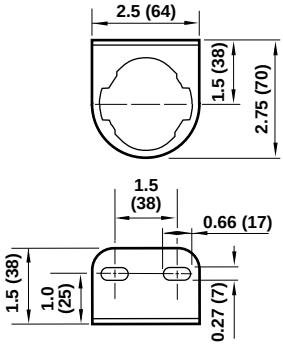
| Product | Accessory | Part No. |
|---|---|---|
| R73 | Wall bracket  | 4424-50 |
| | Wall bracket/metal nut  | Bracket and metal nut: 4461-50<br>Metal Nut: 5191-88<br>Plastic Nut: 5191-89 |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.  | Cover and wire: 4455-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| R74 | Wall bracket  | 4324-50 |
| | Wall bracket/metal nut  | Bracket and metal nut: 4368-51<br>Metal Nut: 4348-89 |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.  | Cover and wire: 4355-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |

All Dimensions in Inches (mm)

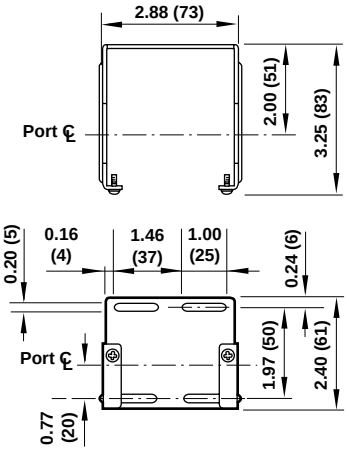
**R73 Bracket** (4424-50)



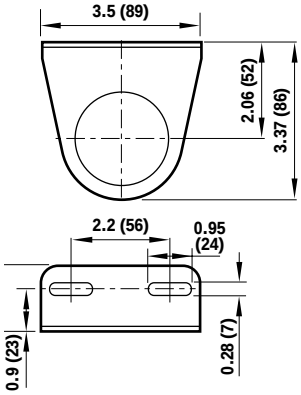

**R73 Neck Bracket** (4461-50)

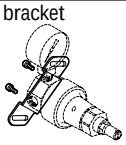
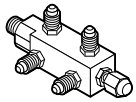



**R74 Bracket** (4324-50)



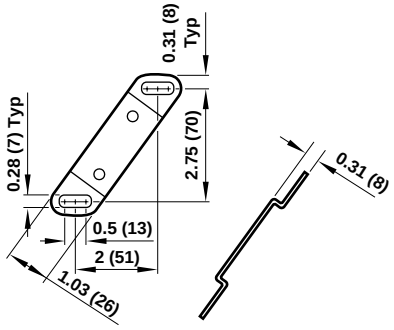

**R74 Neck Bracket** (4368-51)



| Product | Accessory | Part No. |
|---|---|---|
| R81<br>R82<br>R83<br>R84 | Wall bracket  | 5095-51 |
| | Pipe plug, hex socket  | 1/4 PTF: 2891-97 |
| | Nipple  | 1/4 PTF male: 18-006-067 |
| | Union adapter with cap  | 1/4 PTF to 1/4 tube (45° flare): 18-006-068<br>Adapter only: 18-006-027<br>Cap only: 3302-50 |
| | Cylinder connector, nitrogen service, 0.906-14 RH external thread  | CGA No. 580: 18-008-004 |
| | Cylinder connector, carbon dioxide service, 0.830-14 RH internal thread  | CGA No 320: 18-008-002<br>With 2.25" (57mm) long nipple: 18-008-015<br>Replacement gasket: 1390-02 |
| | Check valves *  | 1/4 PTF male to 1/4 tube (45° flare): 16-009-001<br>1/4 PTF male to 1/2-16 BSF: 16-009-002<br>1/4 PTF male to 1/4 PTF female: 16-009-003 |
| | Check and relief valve **<br>Relief cracking pressure: 130±4 psig (9 ±0.28 bar)  | 1/4 PTF male to 1/4 tube (45° flare): 16-006-107 |
| | Manifolds with integral check valve *   | 2 or 3 outlets, 1/4 PTF male to 1/4 tube (45° flare): 3228-54<br>2 or 3 outlets, 1/4 PTF male to 1/2-16 BSF: 3228-55<br>4 or 5 outlets, 1/4 PTF male to 1/4 tube (45° flare): 3228-60<br>4 or 5 outlets, 1/4 PTF male to 1/2-16 BSF: 3228-61 |
| | Manifold extension  | 1/4 PTF male to 1/4 PTF female: 2340-50 |
| | Streamline wye †  | 1/4 PTF male to 1/4 PTF female: 18-006-016 |

All Dimensions in Inches (mm)

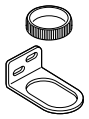
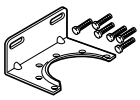
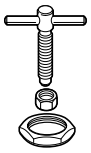
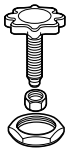
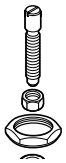
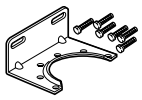
**R81, R82, R83, R84 Bracket (**5095-51)




* The listed check valves and manifolds with integral check valves are designed for use with Norgren beverage regulators (R81, R82, R84) to help prevent the back flow of liquids into the regulator.

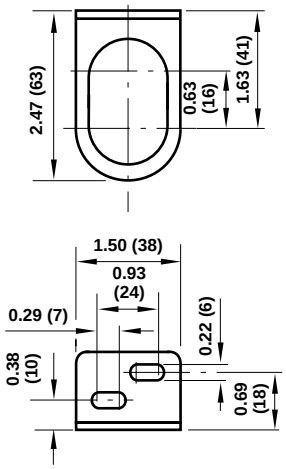
** The 16-006-107 check and relief valve meets the pressure and flow requirements of paragraphs 4.5 and 4.6 of NSDA Pamphlet TD02, ***Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems***, dated July, 1980.

† Check valves, or manifolds with integral check valves, must be installed in the outlet ports of the wye when the wye is installed in the outlet port of Norgren beverage regulators.

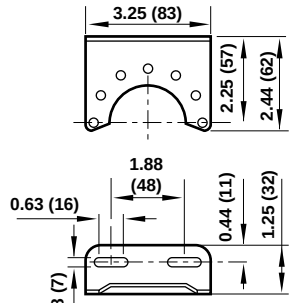
| Product | Accessory | Part No. |
|---|---|---|
| R91 | Wall bracket with plastic nut | Bracket and plastic nut: 18-025-003<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| |  | |
| | Tamper resistant knob | 18-001-092 |
| |  | |
| 11-002 | Wall bracket | 18-001-003 |
| |  | |
| | Panel mount kit with T-bar adjustment<br>Bonnet included | 18-003-004 |
| |  | |
| | Panel mount kit with hand wheel adjustment<br>Bonnet included | 18-003-002 |
| |  | |
| | Panel mount kit with screw adjustment<br>Bonnet included | 18-003-006 |
| |  | |
| 11-008 | Wall bracket | Units with 1/2" ports: 18-001-003<br>Units with 3/4" and 1" ports: 18-001-027 |
| |  | |

All Dimensions in Inches (mm)

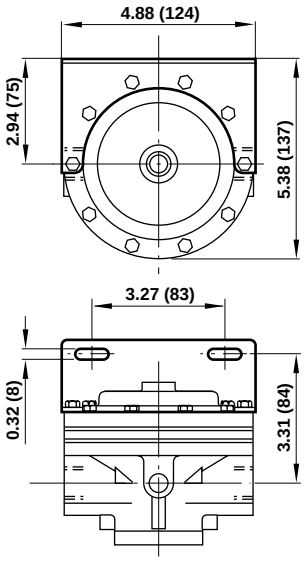
**R91 Bracket** (18-025-003)

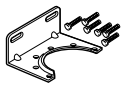
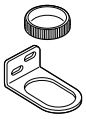
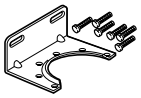



**11-002 Bracket**
**11-008 Bracket (Units with 1/2" Ports)**
(18-001-003)



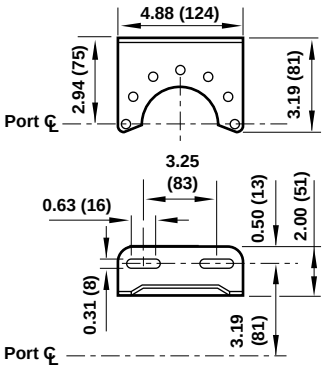

**11-008 Bracket (Units with 3/4" and 1" Ports)** (18-001-027)



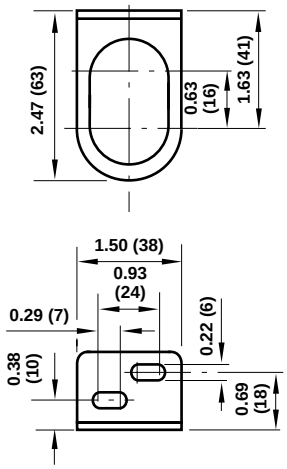
| Product | Accessory | Part No. |
|---|---|---|
| 11-009 | Wall bracket  | 18-001-029 |
| | Screw adjustment  | 1095-02 |
| 11-018 | Tamper resistant cap  | 639-02 |
| 11-042 | Muffler  | 3/4 PTF: MB006A<br>R3/4: MB006B |
| 11-044 | Wall bracket with plastic nut  | Bracket and plastic nut: 18-025-003<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| | Tamper resistant knob  | 18-001-092 |
| 11400-<br>20AL-<br>11-104- | Wall bracket  | 18-001-003 |

All Dimensions in Inches (mm)

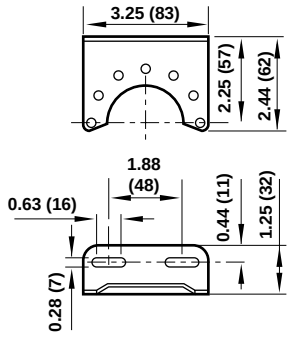
**11-009 Bracket** (18-001-029)




**11-044 Bracket** (18-025-003)



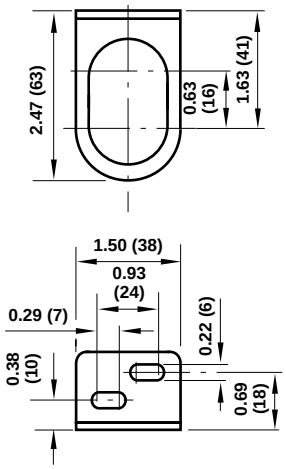

**11400- Bracket**
**20AL Bracket**
(18-001-003)



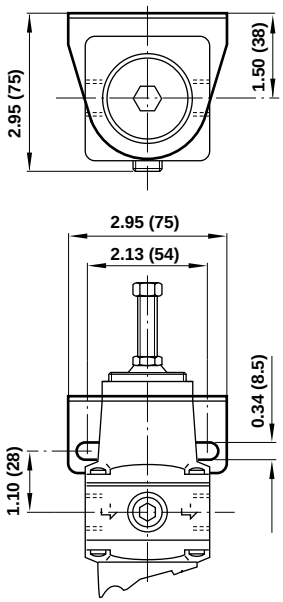
| Product | Accessory | Part No. |
|---|---|---|
| B05 | Plastic Panel Nut | 2962-89 |
| B07 | Wall bracket with plastic nut | Bracket and plastic nut: 18-025-003<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| | Tamper resistant knob | 18-001-092 |
| B38 | | Aluminum wall bracket and nut: 18-001-974<br>Aluminum nut: 5988-01 |
| | | Stainless steel wall bracket and nut: 18-001-973<br>Stainless steel nut: 5988-02 |
| | Plastic adjusting knob | 655-97 |
| | Tamper resistant cap | 18-004-987 |
| B39 | Wall bracket with plastic nut | Bracket and plastic nut: 18-025-003<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| | Tamper resistant knob | 18-001-092 |

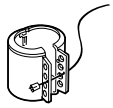
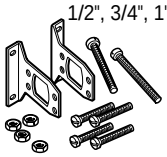
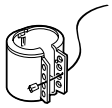
All Dimensions in Inches (mm)

**B07, B39 Bracket** (18-025-003)



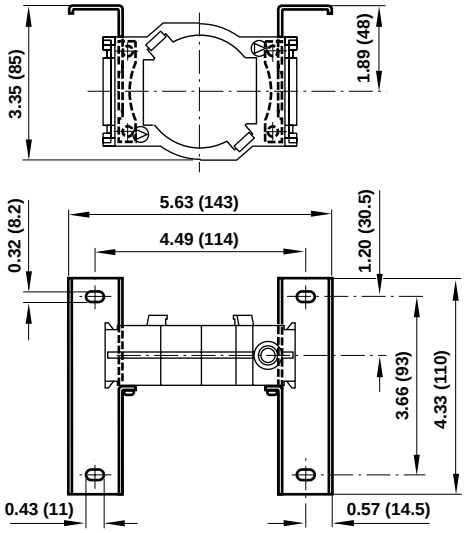

**B38 Bracket** (18-001-974)



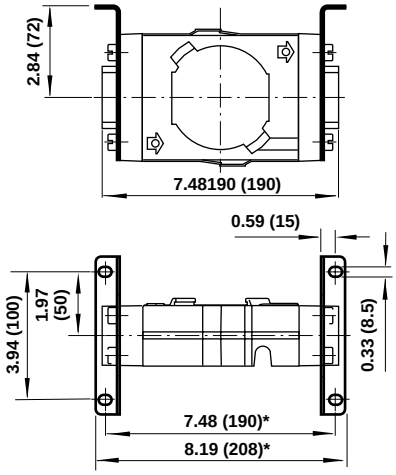
| Product | Accessory | Part No. |
|---|---|---|
| B64 | Wall bracket  | 74504-50 |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.  | Cover and wire: 4355-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| B68 | Wall bracket  | 1/2", 3/4", 1", 1-1/4" Ports: 18-001-978<br>1-1/2" Ports: Not Available |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.  | Cover and wire: 4355-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |

All Dimensions in Inches (mm)

**B64 Bracket** (74504-50)




**B68 Bracket** (18-001-978)

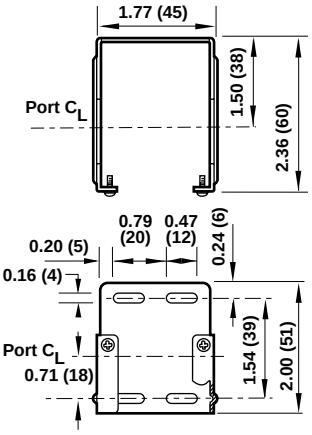



*** Add 0.39" (10) for 1-1/4" ported yokes.**

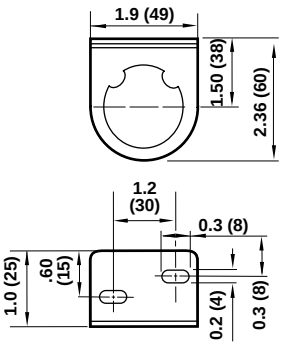
| Product | Accessory | Part No. |
|---|---|---|
| B72 | Wall bracket | 4224-50 |
| | Wall bracket/plastic nut | Bracket and plastic nut: 74316-50<br>Plastic nut: 4248-89<br>Metal Nut: 4248-01 |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 2 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used. | Cover and wire: 4255-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle. | 54547-01 |
| B73 | Wall bracket | 4424-50 |
| | Wall bracket/metal nut | Bracket and metal nut: 4461-50<br>Metal Nut: 5191-88<br>Plastic Nut: 5191-89 |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used. | Cover and wire: 4455-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle. | 54547-01 |
| B74 | Wall bracket | 4324-50 |
| | Wall bracket/metal nut | Bracket and metal nut: 4368-51<br>Metal Nut: 4348-89 |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used. | Cover and wire: 4355-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle. | 54547-01 |

All Dimensions in Inches (mm)

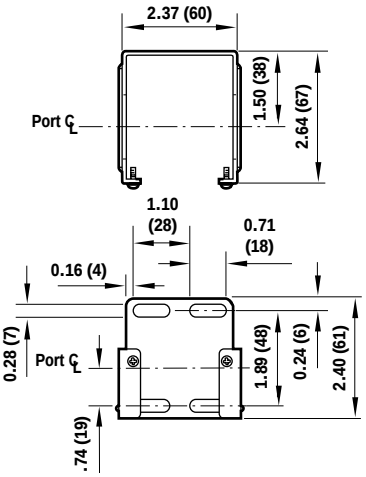
**B72 Bracket** (4224-02)



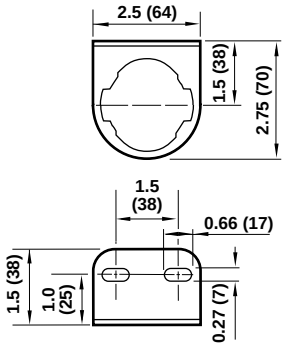

**B72 Neck Bracket** (74316-02)



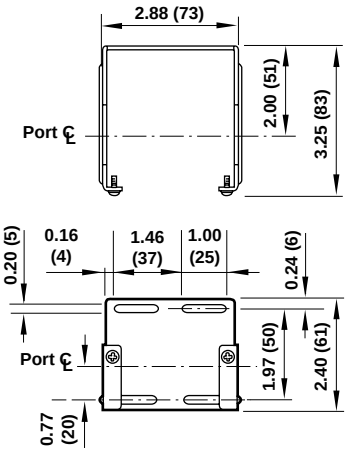

**B73 Bracket** (4424-50)



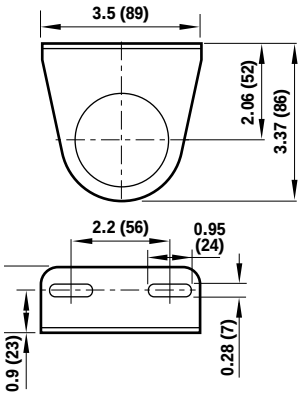

**B73 Neck Bracket** (4461-50)

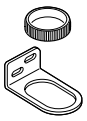
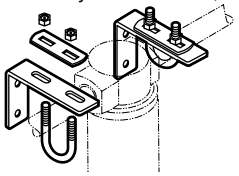
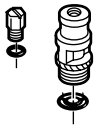



**B74 Bracket** (4324-50)



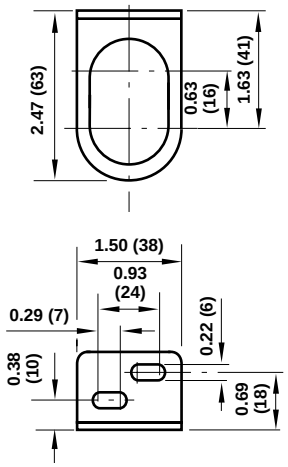

**B74 Neck Bracket** (4368-51)



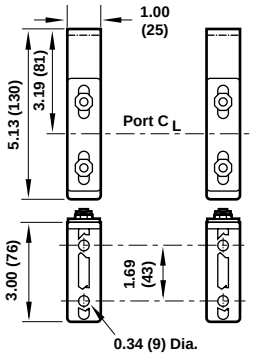
| Product | Accessory | Part No. |
|---|---|---|
| L07 | Wall bracket with plastic nut  | Bracket and plastic nut: 18-025-003<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| L17 | Wall bracket - use with 1 and 2 quart reservoirs only  | 3/4", 1" Ports: 6212-50<br>1-1/4", 1-1/2" Ports: 6212-51 |
| | Wall strap - use with 2 and 5 gal reservoirs only  | 2 gal reservoir: 18-001-056<br>5 gal reservoir: 18-001-039 |
| | Low oil level switch. Provides electrical signal for warning or shut-down when oil level is low.  | 2 qt reservoir: 18-023-612<br>2 gal reservoir: 18-023-614<br>5 gal reservoir: 18-023-616 |
| | High/Low Level switch Provides electrical signal for warning or shut-down when oil level is full or low. | 5 gal reservoir: 18-023-658 |
| | Pyrex dome and metal fill plug  | 5605-60 |
| | Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.  | 18-011-021 |
| | Fill plug with 1/8 PTF tapped hole. Use with customer supplied pressurized oil source to refill reservoir without shutting off air supply. Replaces standard fill plug.  | 5301-52 |
| L22 | Wall bracket  | 18-001-962 |

All Dimensions in Inches (mm)

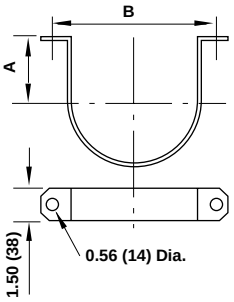
**L07 Bracket** (18-025-003)




**L17 Bracket** (6212-50, 6212-51)

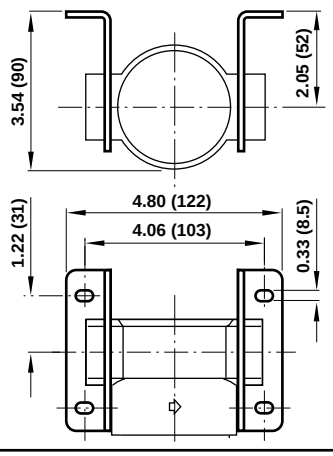


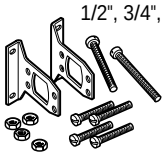
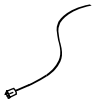

**L17 Strap** (18-001-039/056)




| Bracket | A | B |
|---|---|---|
| 18-001-056 | 3.00 (76) | 8.84 (225) |
| 18-001-039 | 5.00 (127) | 13.0 (330) |

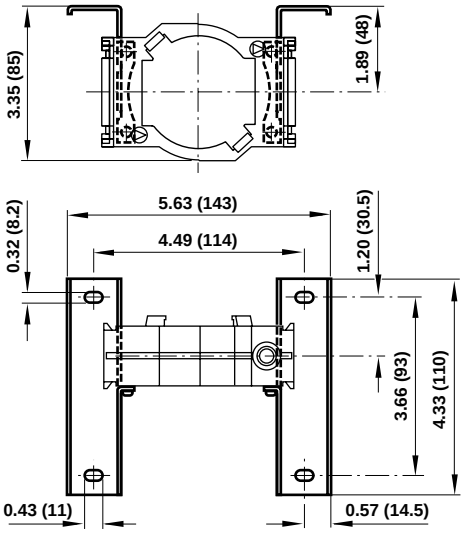
**L22 Bracket** (18-001-962)



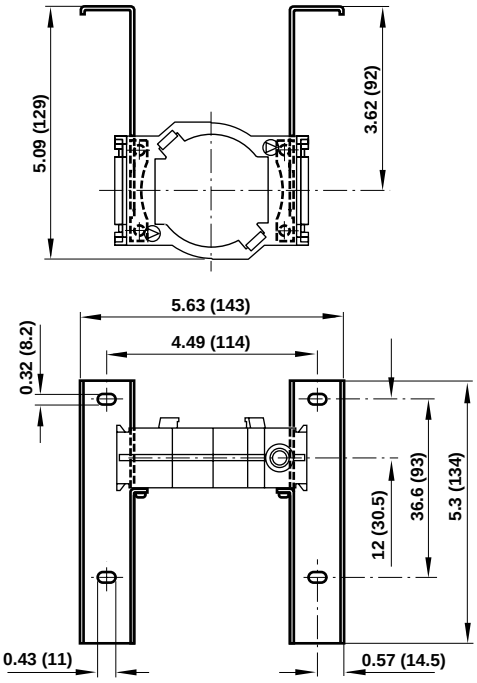
| Product | Accessory | Part No. |
|---|---|---|
| L64 | Wall bracket  | 7 ounce bowl: 74504-50<br>1 quart bowl: 74504-52 |
| | Tamper resistant seal wire for sight-feed dome  | 2117-01 |
| | Low oil level switch. Provides electrical signal for warning or shut-down when oil level is low.  | 1 qt reservoir: 18-023-610 |
| | Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.  | 18-011-024 |
| | Remote fill - use with 7 ounce reservoir only Use with customer supplied pressurized oil source to automatically refill reservoir.  | 5335-50 |
| L68 | Wall bracket  | 1/2", 3/4", 1", 1-1/4" Ports: 18-001-978<br>1-1/2" Ports: Not Available |
| | Tamper resistant seal wire for sight-feed dome  | 2117-01 |
| | Low oil level switch. Provides electrical signal for warning or shut-down when oil level is low.  | 2 gal reservoir: 18-007-975<br>5 gal reservoir: 18-007-974 |
| | Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.  | 18-011-021 |
| | Remote fill - use with 1 qt reservoirs only Use with customer supplied pressurized oil source to automatically refill reservoir.  | 5335-52 |

All Dimensions in Inches (mm)

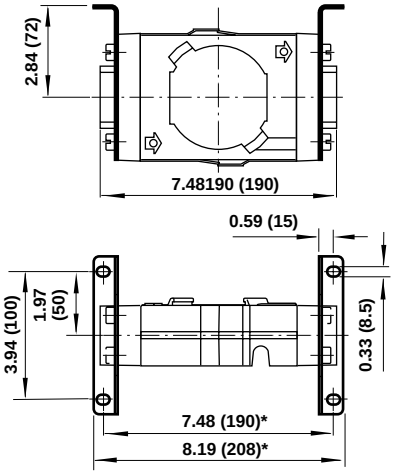
**L64 Bracket**
(74504-50)

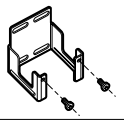
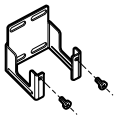
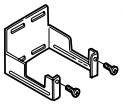



**L64 Bracket**
(74504-52)



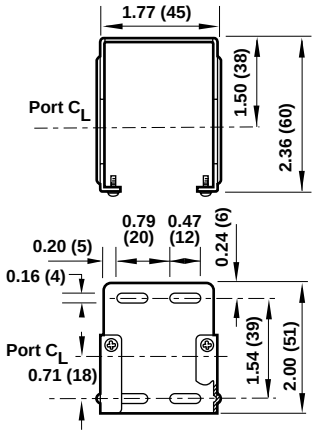

**L68 Bracket**
(18-001-978)



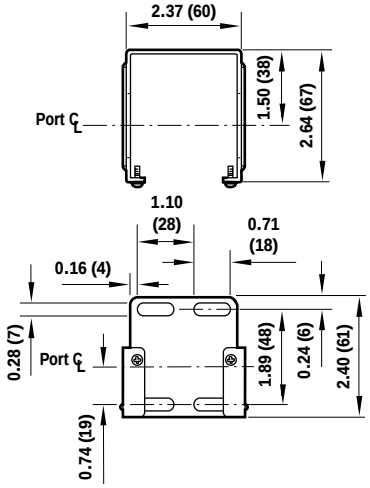
| Product | Accessory | Part No. |
|---|---|---|
| L72 | Wall bracket  | 4224-50 |
| L73 | Wall bracket  | 4424-50 |
| | Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.  | 18-011-024 |
| L74 | Wall bracket  | 7 ounce bowl: 4324-50<br>1 quart bowl: 4324-51 |
| | Low oil level switch - use with 1 qt reservoir only. Provides electrical signal for warning or shut-down when oil level is low.  | 18-023-610 |
| | Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.  | 18-011-024 |
| | Remote fill - use with 7 ounce reservoir only. Use with customer supplied pressurized oil source to automatically refill reservoir.  | 5335-50 |

All Dimensions in Inches (mm)

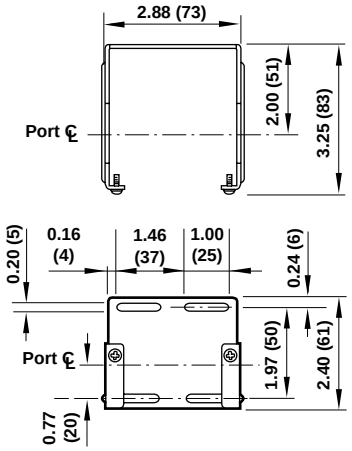
**L72 Bracket** (4224-50)

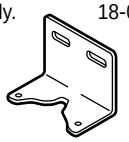
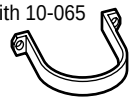
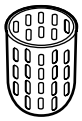
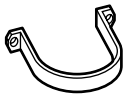
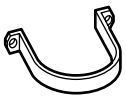



**L73 Bracket** (4424-50)



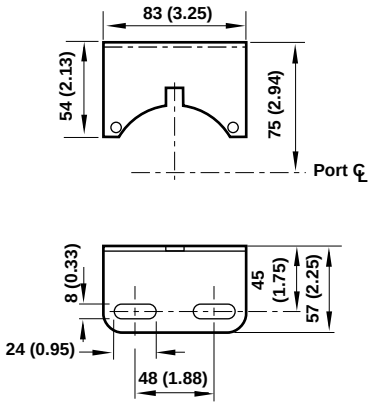

**L74 Bracket** (4324-50)



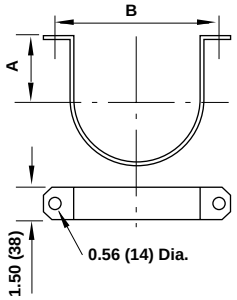
| Product | Accessory | Part No. |
|---|---|---|
| 10-015 and 10-065 | Wall bracket kit - use with 10-015 only. Includes screws to attach lubricator  | 18-001-009 |
| | Wall strap - use with 10-065  | 10-065-006: 18-001-056<br>10-065-007: 18-001-039 |
| | Low oil level switch. Provides electrical signal for warning or shut-down when oil level is low.  | 10-015-504: 18-023-018<br>10-015-005: 18-023-018<br>10-065-006: 18-023-022<br>10-065-007: 18-023-024 |
| | Pyrex dome kit  | 1804-03 |
| | Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.  | 18-011-006 |
| | Bowl guard for 10-015-002 and 10-015-100  | 18-012-002 |
| | Streamline wye 1/4 PTF male to 1/4 PTF female:  | 18-006-016 |
| 10-028 | Wall strap  | 2 gal reservoir: 18-001-056<br>5 gal reservoir: 18-001-039 |
| | Quick fill cap. Use with Norgren 18-010-003 oil pump, pail, and hose assembly (see catalog sheet NC-26) to refill reservoir without shutting off air supply. Replaces fill plug.  | 18-011-008 |
| | Pyrex/aluminum dome  | 5605-50 |
| 10-076 | Wall strap  | 2 gal reservoir: 18-001-056<br>5 gal reservoir: 18-001-039 |
| | Pyrex/aluminum dome  | 5605-50 |

All Dimensions in Inches (mm)

**10-015 Bracket**
(18-001-009)




**10-028, 10-065, 10-076 Strap**
(18-001-039/056)

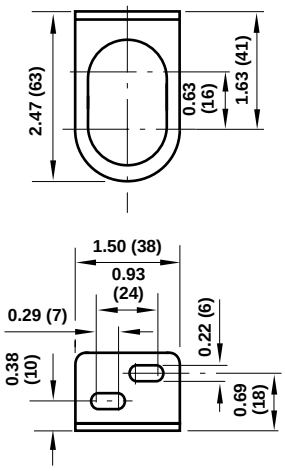



| Bracket | A | B |
|---|---|---|
| 18-001-056 | 3.00 | 8.84 |
| | (76) | (225) |
| 18-001-039 | 5.00 | 13.0 |
| | (127) | (330) |

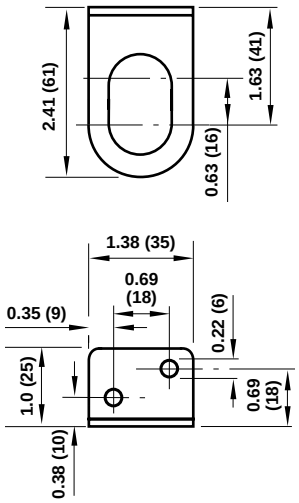
| Product | Accessory | Part No. |
|---|---|---|
| V06 | Wall bracket for V06 with plastic bonnet | Bracket and plastic nut: 18-025-003<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| | Wall bracket for V06 with brass bonnet | Bracket and metal nut: 18-001-021<br>Metal nut: 616-01 |
| | Tamper resistant knob kit | 18-001-092 |
| V07 | Wall bracket with plastic nut | Bracket and plastic nut: 18-025-003<br>Plastic nut: 2962-89<br>Metal nut: 2962-04 |
| | Tamper resistant knob kit | 18-001-092 |
| V64 | Wall bracket | 74504-50 |
| | Muffler | 1/2 PTF: MB004A<br>R1/2: MB004B |
| | Tamper resistant cap | 1581-90 |
| V68 | Wall bracket | 3/4", 1", 1-1/4" Ports: 18-001-978<br>1-1/2" Ports: Not Available |
| | Muffler | 1/2 PTF: MB008A<br>R1/2: MB008B |

All Dimensions in Inches (mm)

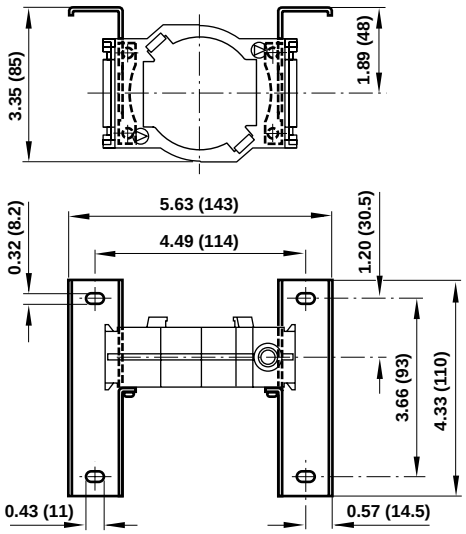
**V06, V07 Bracket**
(18-025-003)



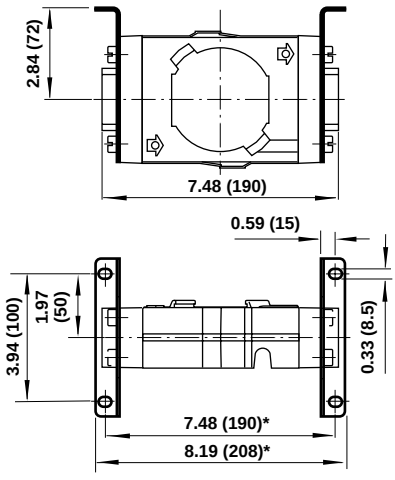

**V06 Bracket for Brass Bonnet**
(18-001-021)



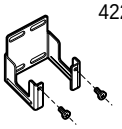
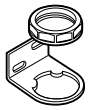
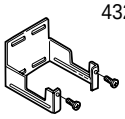
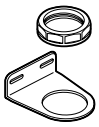
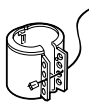

**V64 Bracket** (74504-50)




**V68 Bracket** (18-001-978)

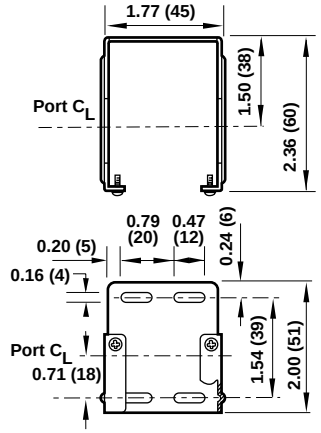



*** Add 0.39" (10) for 1-1/4" ported yokes.**

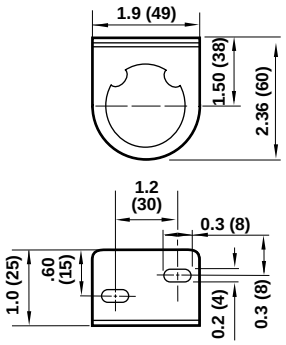
| Product | Accessory | Part No. |
|---|---|---|
| V72 | Wall bracket  | 4224-50 |
| | Wall bracket/plastic nut  | Bracket and plastic nut: 74316-50<br>Bracket and metal nut: 74316-51<br>Plastic nut: 4248-89<br>Metal Nut: 4248-01 |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 2 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.  | Cover and wire: 4255-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| V74 | Wall bracket  | 4324-50 |
| | Wall bracket/metal nut  | Bracket and metal nut: 4368-51<br>Metal Nut: 4348-89 |
| | Tamper resistant cover and wire. Install over knob to help prevent tampering of pressure setting. Use up to 4 padlocks with 5/16" (8mm) diameter shackle to secure cover. Lockout hasp may also be used.  | Cover and wire: 4355-51<br>Wire: 2117-01 |
| | Lockout hasp. Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |

All Dimensions in Inches (mm)

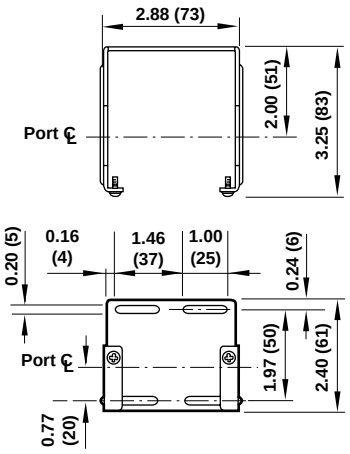
**V72 Bracket** (4224-50)



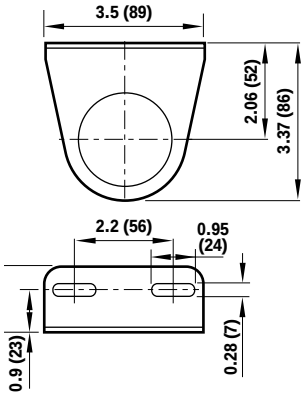

**V72 Neck Bracket** (74316-02)

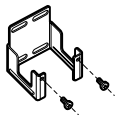
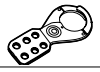
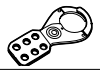



**V74 Bracket** (4324-50)



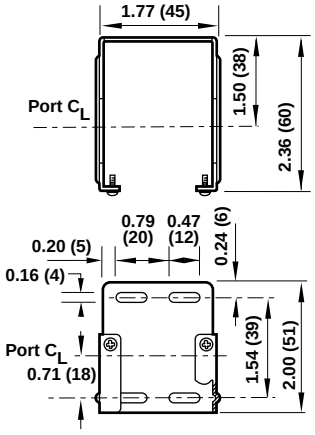

**V74 Neck Bracket** (4368-51)

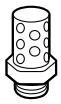
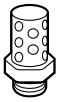
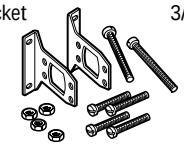
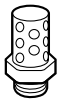
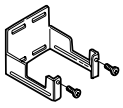
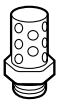


| Product | Accessory | Part No. |
|---|---|---|
| T72 | Wall bracket  | 4224-50 |
| | Mufflers (T72T)  Diffuser (10-32 and M5): 54463-01<br>  Muffler (10-32): MS000A<br>Muffler (M5): T40M0500 | |
| | Lockout hasp.(use only with T72E and T72T)<br>Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| T64 | Muffler (T64T)  Muffler (1/8 PTF): MS001A<br>Muffler (R1/8): T40B1800 | |
| | Lockout hasp.<br>Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| T68 | Lockout hasp.<br>Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| T73 | Mufflers (T73T)  Diffuser (10-32 and M5): 54463-01<br>  Muffler (10-32): MS000A<br>Muffler (M5): T40M0500 | |
| | Lockout hasp.<br>Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| T74 | Muffler (T74T)  Muffler (1/8 PTF): MS001A<br>Muffler (R1/8): T40B1800 | |
| | Lockout hasp.<br>Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |

All Dimensions in Inches (mm)

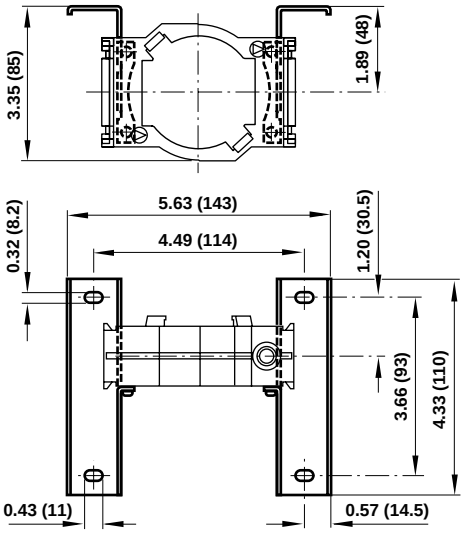
**T72 Bracket** (4224-50)



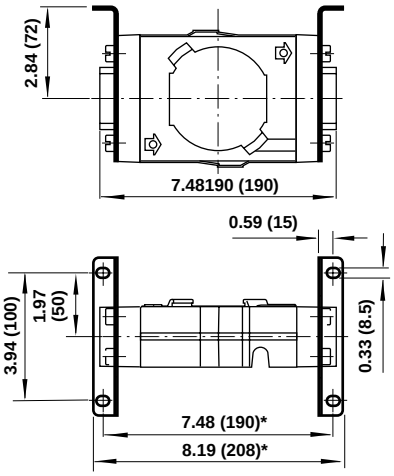
| Product | Accessory | Part No. |
|---|---|---|
| P72 | Mufflers for P72C and P72F  | 1/4 PTF: MB002A<br>R1/4: MB002B |
| | Lockout hasp for P72F.<br>Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| P64F | Wall bracket  | 74504-50 |
| | Muffler  | 1/2 PTF: MB004A<br>R1/2: MB004B |
| | Lockout hasp.<br>Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| P68F | Wall bracket  | 3/4", 1", 1-1/4" Ports: 18-001-978<br>1-1/2" Ports: Not Available |
| | Muffler  | 1" PTF: MB008A<br>R1 : MB008B |
| | Lockout hasp.<br>Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |
| P74 | Wall bracket  | 4324-50 |
| Mufflers for P74C and P74F |  | 1/2 PTF: MB004A<br>R1/2: MB004B |
| | Lockout hasp for P74F and P74C with lockout slide:<br>Allows use of up to 6 padlocks with 5/16" (8mm) diameter shackle.  | 54547-01 |

All Dimensions in Inches (mm)

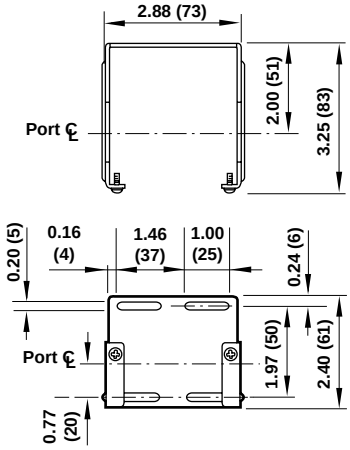
**P64 Bracket**
(74504-50)




**P68 Bracket**
(18-001-978)




**P74 Bracket** (4324-50)



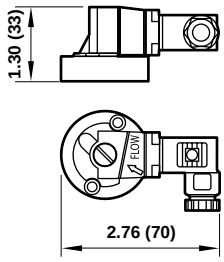
# 4020-51R

## ELECTRICAL SERVICE INDICATOR

- **Switches when the differential pressure across the filter element exceeds the factory set differential pressure**
- **Can replace the standard mechanical Service Indicator on Norgren filters**
- **Can be field installed on Norgren F07, F55, F73G, F73C, F74G, F74C, and F74H filters**

**Note: 17, 18, 64, and 68 Series cannot be field converted. The electrical service indicator must be factory installed. It can be used replace the mechanical service life indicator.**

### Dimensions inches (mm)




### Technical Data

Maximum pressure: 250 psig (17 bar)
Operating temperature*: +14° to +175°F (-10° to +80°C)

* Air supply must be dry enough to avoid ice formation at temperatures below + 35°F (+2°C).

Maximum voltage: 240VAC/DC
Maximum current: 5 Amp
Protection: NEMA 4, IP 65
Contacts: SPDT
Connector: DIN 43650-C
Connector plug: Cable grip for cables 1/4" to 9/32" (6.3 to 7.1 mm) diameter
Switching pressures: Switches when differential pressure rises to between 8 and 12 psid (0.55 and 0.83 bar d). Resets when differential pressure falls below 3 psid (0.21 bar d).
Body material: Nylon 6-GF
Elastomer material: Nitrile

### Ordering Information

| Model | Differential Pressure Factory Setting |
|---|---|
| 4020-51R | 10 psid (0.7 bar d) |

# Watson Smith Series

## Electronic, Air Pressure, Electronic Converters and Manual/Mechanical Regulators for compressed air systems.

Contents



VP10

VP50

VP51

Manostat

P/E & P/I

Type 421

Type 422 & 423

Type 425

# VP10

## Electronic Pressure Regulator

- **Reliable, rugged proportional I/P and E/P converters**
- **Suitable for a wide range of applications**
- **Excellent accuracy**
- **High flow versions**
- **NEMA4 environmental protection in normal operation**

### General Information

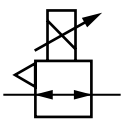
| | Pressure range and input signal options | | | |
|---|---|---|---|---|
| Part Number | Control signal | Output pressure | Calibration | Thread form* |
| VP1001PK100A00 | 0-10 V | 3-15 psi (0.2-1 bar) | PSIG | 1/4" NPT |
| VP1001PK400A00 | 4-20 mA | 3-15 psi (0.2-1 bar) | PSIG | 1/4" NPT |
| VP1002PK100A00 | 0-10 V | 3-30 psi (0.2-2 bar) | PSIG | 1/4" NPT |
| VP1002PK400A00 | 4-20 mA | 3-30 psi (0.2-2 bar) | PSIG | 1/4" NPT |
| VP1004PK100A00 | 0-10 V | 3-60 psi (0.2-4 bar) | PSIG | 1/4" NPT |
| VP1004PK400A00 | 4-20 mA | 3-60 psi (0.2-4 bar) | PSIG | 1/4" NPT |
| VP1006PK101A00 | 0-10 V | 3-90 psi (0.2-6 bar) | PSIG | 1/4" NPT |
| VP1006PK401A00 | 4-20 mA | 3-90 psi (0.2-6 bar) | PSIG | 1/4" NPT |
| VP1008PK101A00 | 0-10 V | 3-120 psi (0.2-8 bar) | PSIG | 1/4" NPT |
| VP1008PK401A00 | 4-20 mA | 3-120 psi (0.2-8 bar) | PSIG | 1/4" NPT |

### Electrical Information

| | |
|---|---|
| Electromagnetic compatibility | This is a passive electromagnetic instrument and is unaffected by interfering high frequency signals |
| Electrical signal | Two wire version 4-20 mA or 0-10 V for 60< PSIG<br>Three wire version requires 12-24 V d.c. supply |
| Connections | 30 mm square connector DIN 43650 provided, mountable in four directions (alternative connections available) |

* Replace PK w/BJ for calibration in Bar and 1/4 ISO G thread form.

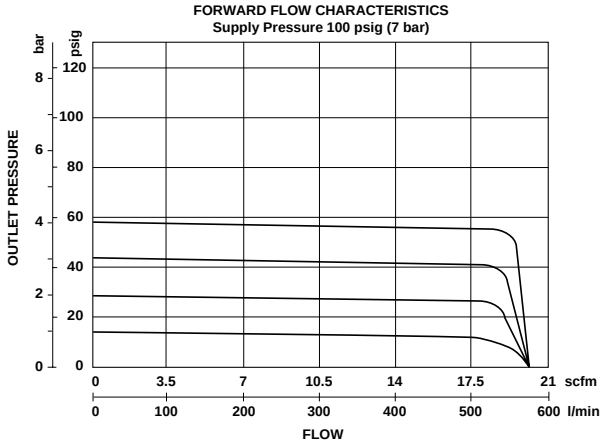
### ISO Symbols

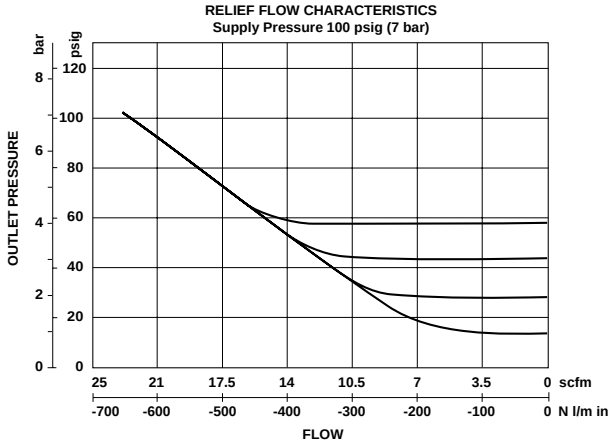


## Technical data

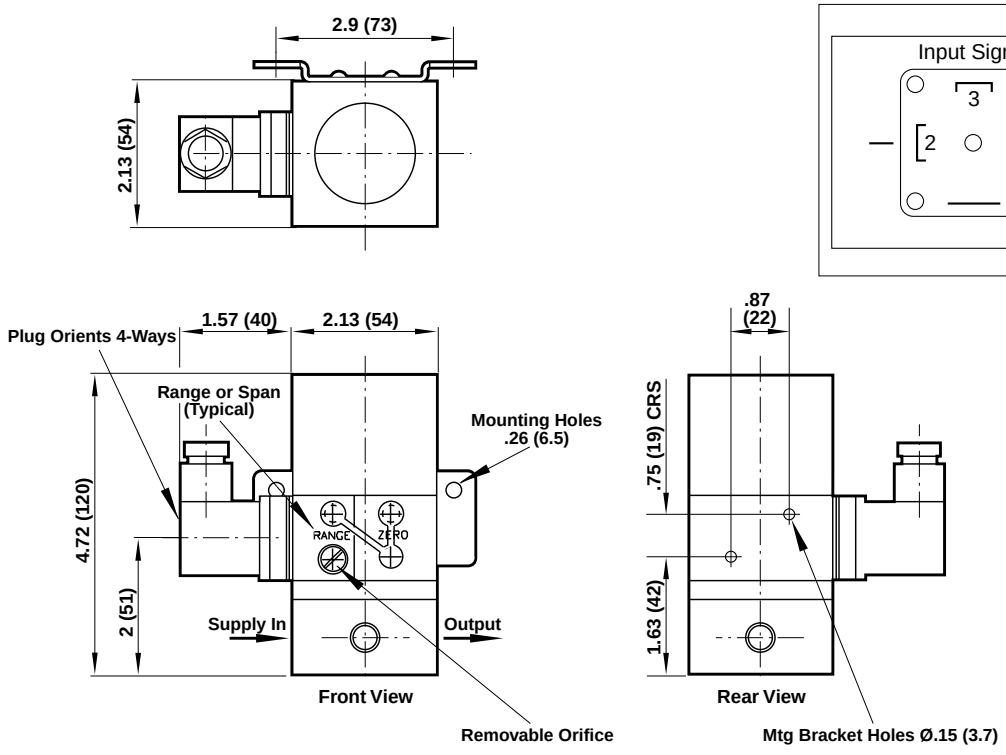
Medium:
Oil free, dry air, filtered to 5 micron
Output pressure:
3-15 psig (0.2-1.0 bar), 3-30 psig (0.2-2.0 bar),
3-60 psig (0.2-4.0 bar), 2-120 psig (0.14-8 bar) three wire version
Flow capacity: Up to 10 scfm (300 l/min)
Air consumption
<60 psig (<4 bar): 0.03 scfm (0.85 l/min) typical
>60 psig (>4 bar): 0.06 scfm (1.75 l/min) typical
Operating pressure:
At least 10 psig (0.7 bar) above maximum required output pressure
Connections: NPT 1/4" or 1/4" ISO G available
Operating temperature: -4° to 160°F (-20°C to 70°C)
Response time
<30 psig (<2 bar): less than 0.5 seconds for 10-90% step change
>30 psig (>2 bar): 2 seconds for 10-90% step change
Total error:
±0.5% of span (typical, independent error includes the combined effect of non-linearity, hysteresis, deadzone and repeatability)
Temperature effect:
Typically 0.1% of span/°F for span and zero over operating range
Supply sensitivity:
>0.025% span output change per % supply pressure change
Failure mode:
Signal falls to bleed pressure when electrical supply fails
Mounting:
Integral surface mounting bracket provided for preferred vertical mounting.
50 mm pipe mounting kit available
Material of construction:
Zinc die-casting passivated and epoxy paint, nitrile diaphragms, stainless steel/nylon flapper nozzle and supply valve
Mass: 3.3 lbs (1500g) approx.

## Typical Performance Characteristics

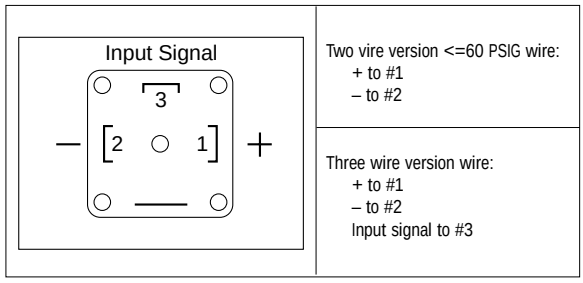



All Dimensions in Inches (mm)




## Connector Wiring



# VP50

**Proportional Pressure Control Valve**

- **Air piloted proportional pressure control valve**
- **Fully user adjustable for a wide range of applications**
- **High speed**
- **Lower power consumption**
- **High flow capacity**
- **Optional manifold mount utilizes the ISO Size 2 subbase**

## Technical Data

Medium: Compressed air, filtered to 40micron, **non-lubricated**

Operation: Proportional, direct acting air piloted spool

Output Pressure: See ALE-25-5

Supply Pressure: 200 psig (14 bar) max

Supply Sensitivity: Better than 0.75% span output change per bar supply pressure change

Flow Capacity: Up to 50 scfm (1400 Nl/min)

Response Time: < 80 mS (from 10-90% of output pressure into a 0.1 litre load)

Air Consumption: < .177 scfm (5 l/min)

Port Size: 1/4 PTF (G1/4)

Total Error: Max. error < ±1% of span (independent error includes the combined effect of non-linearity, hysteresis, deadzone and repeatability)

Operating Temperature: 23° to 120°F (-5° to 50°C)

Temperature Effect: Typically better than 0.03% of span/˚C for span and zero over operating range

Degree of protection: NEMA 4 (IP65) in normal operation

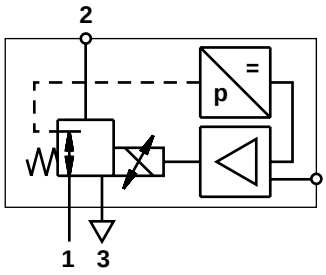
Vibration Immunity: < 3% output shift for 3g 10-2000Hz

Mounting Position: Any screw mounting or manifold mount

Material of Construction: Aluminium body, zinc diecast lid and end cover

Weight: 1.76 lbs. (800g) approx

## Symbol



## General Information

| Part Number* | Pressure Range and Input Signal Options Control Signal | Output Pressure in psig (bar) | Port Size |
|---|---|---|---|
| VP5010PK111H00 | 0-10V | 0-145 ( 0-10) | 1/4" PTF |
| VP5010PK411H00 | 4-20mA | 0-145 ( 0-10) | 1/4" PTF |
| VP5006PK111H00 | 0-10V | 0-90 ( 0-6) | 1/4" PTF |
| VP5006PK411H00 | 4-20mA | 0-90 ( 0-6) | 1/4" PTF |
| VP5002PK111H00 | 0-10V | 0-30 ( 0-2) | 1/4" PTF |
| VP5002PK411H00 | 4-20mA | 0-30 ( 0-2) | 1/4" PTF |

* To specify regulator calibration in BAR use “B” in the 7th position For 1/4" ISO G ports use “J” in the 8th position.

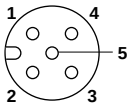
To order the VP50 with interface for manifold mounting, indicate an “X” in the 8th position of the part number.

All units shipped with M12 five pin electrical connector

## Electrical information

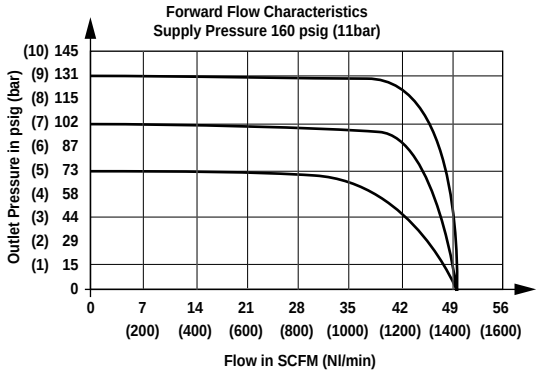
| | |
|---|---|
| Electromagnetic Compatibility | CE marked: conforms to E.C. requirements EN 50081-2 (1994) and EN 50082-2 (1995) |
| Electrical Input Signal | 4-20mA or 0-10V factory set |
| Electrical Power Input | 24V dc ±25% (power consumption < 1W) |
| Output Pressure Feedback Signal | 0-10V full range |
| Connections | DIN 43650 or Brad Harrison connection for feedback output |

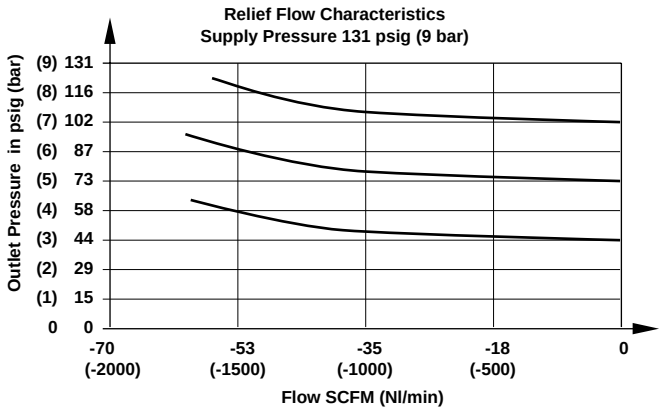
## Instrument pin configuration




1 +24V d.c. supply
2 0-10 full range
3 Control signal (+ve)
4 Common (DC supply, signal and feedback return)
5 Chassis (earth)

## Characteristic Curves



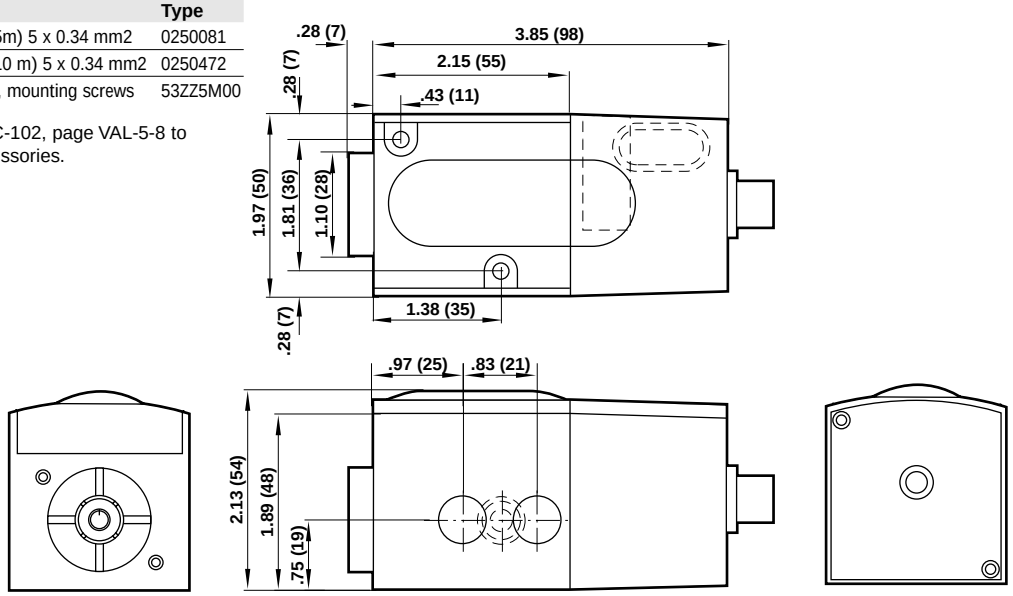




### Accessories

| Designation | Specification | Type |
|---|---|---|
| Connectors with cable | M12 x 1.5 pin; 16 ft (5m) 5 x 0.34 mm2 | 0250081 |
| | M12 x 1.5 pin; 30 ft (10 m) 5 x 0.34 mm2 | 0250472 |
| Manifold Mounting Kit | Interface plate, gasket, mounting screws | 53ZZ5M00 |

**NOTE:** Refer to Norgren Valve catalog APC-102, page VAL-5-8 to select an ISO 2 size base and accessories.

## General Dimensions



# VP51 Series

**Programmable proportional pressure control valve G1/4, 1/4 NPT**

- **Fully programmable with on-board diagnostics**
- **Multi-option language display**
- **Password protection option at first level functionality**
- **Instant LED warning functions**
- **Application specific set-up**
- **Pressure output display; no gauge necessary**
- **High speed response**
- **Optional manifold mount utilizes the ISO Size 2 subbase**


## Technical data

Medium:
Compressed air filtered to 40 µm, **non-lubricated**

Supply pressure: 205 psig (14 bar) max.

Output pressure: 0 - 145 psig (0 - 10)

Supply sensitivity:
<= 50 mbar between 160 and 90 psig (11 and 6 bar) supply

Flow capacity: see chart on ALE-25-7

Response time:
< 100 ms (from 10 to 90% of output pressure into a 0,1 litre load)

Air consumption: < .177 scfm (5 l/min)

Total error: Maximum error ± 1.45 psig (100 mbar) of total span (independent error includes the combined effect of non-linearity, hysteresis, deadzone and repeatability)

Ambient temperature:
-4 to 122°F (-20° to 50°C)

Temperature effect:
Typically .04 psig (3 mbar)/°C for full scale and zero over operating range

Degree of protection:
NEMA 4 in normal operation

Vibration immunity:
<3% output shift for 3 g ~ 10 to 150 Hz

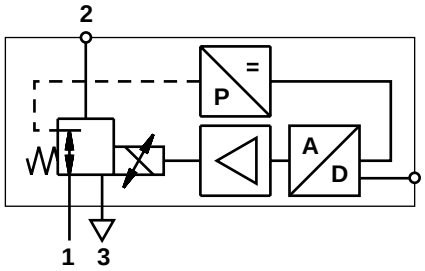
Weight: 1.76 lbs (0.8 kg)

Mounting position: Any screw mounting or ISO 2 subbase manifold mount

## Materials

Body: aluminum

Lid and end cover: zinc diecast




### Electromagnetic compatibility

The valve conforms to the EC requirements EN50081–2 (emission) and EN50082–2 (disturbance noise). For this specification shielded cables have to be used

## General information

| Control signal | Output pressure range psig (bar) | Model | Connection | Output units |
|---|---|---|---|---|
| 0-10 V | 0 to 145 (10) | VP5110PK111H00 | 1/4 NPT | psig |
| 4-20 mA | 0 to 145 (10) | VP5110PK411H00 | 1/4 NPT | psig |
| 0-10 V | 0 to 145 (10) | VP5110BJ111H00 | ISO G 1/4 | bar |
| 4-20 mA | 0 to 145 (10) | VP5110BJ411H00 | ISO G 1/4 | bar |

*To order the VP50 with interface for manifold mounting,indicate “X” in the 8th position of the part number.

All units shipped with M12 five pin electrical connectors with interface for manifold mounting.

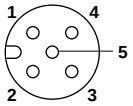
## User functionality options

| Password protection | |
|---|---|
| Display set-up | Display language |
| | Pressure units |
| | Offline set-up |
| | Online set-up |
| Speed set-up | 0 fastest to 7 slowest |
| Monitor set-up | Analogue 0 ... 10 V |
| Monitor output | Hi = P2 > x psi |
| | Hi = P2 OK |
| Local control | Manual control |
| | Max./min. ramp |
| | Max./min. stairs |
| Device database | Read only data: unit specific |
| | Tag number |
| | Help display |
| Factory defaults | Restore factory defaults |

## Electrical information

| | |
|---|---|
| Electromagnetic compatibility | CE marked: conforms to EC requirements EN 50081-2 (1994) and EN 50082-2 (1995) |
| Electrical input signal | 4 ... 20 mA or 0 ... 10 V factory set |
| Electrical power input | 24 V d.c. ±25% (power consumption < 1 W) |
| Output pressure feedback signal | 0 ... 10 V full range. User configurable |
| Connections | Plug connector, 5 pin, M12, female **PL500 01** |

## Instrument pin configuration



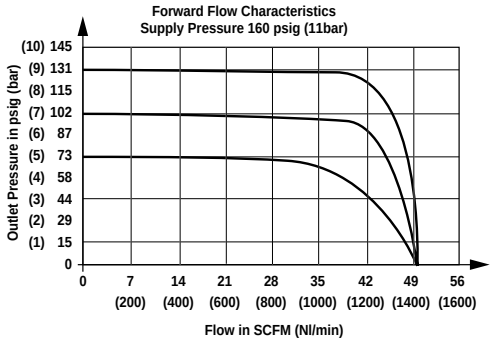

| Pin | Designation | Color* |
|---|---|---|
| 1 | +24V d.c. supply | brown/red |
| 2 | 1 v/bar monitor output | white |
| 3 | Control signal (+ve) | blue |
| 4 | Common (d.c. supply, signal and feedback return) | black |
| 5 | Chassis (earth) | grey/green/yellow |

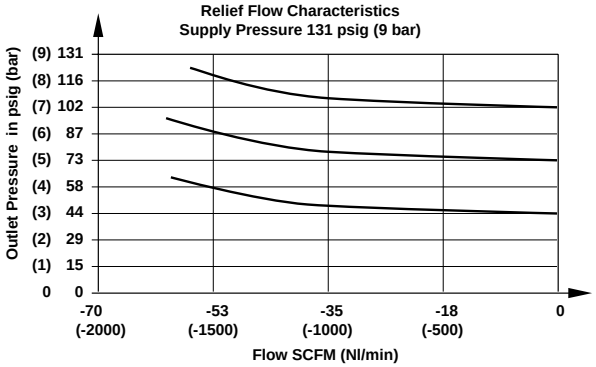
## Accessories

| Designation | Specification | Type |
|---|---|---|
| Connectors with cable | M12 x 1.5 pin; 16 ft (5m) 5 x 0.34 mm2 | 0250081 |
| | M12 x 1.5 pin; 30 ft (10 m) 5 x 0.34 mm2 | 0250472 |
| *Manifold Mounting Kit | Interface plate, gasket, mounting screws | 53ZZ5M00 |

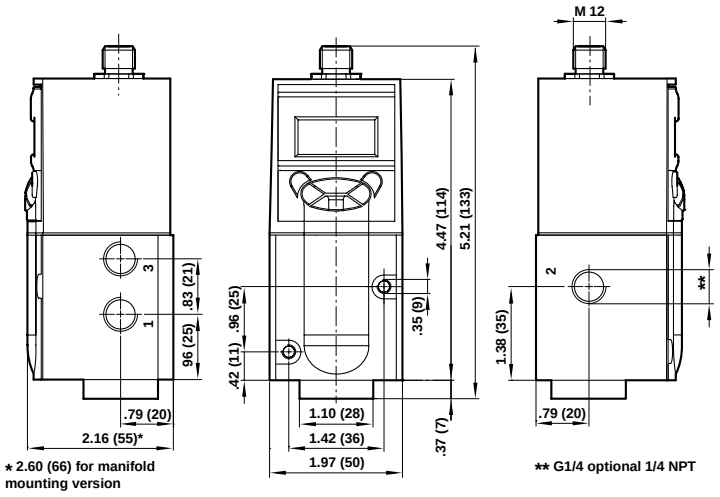
ISO 2 Manifold look to Catalog APC-102, Section ISO*Star Valves

## Characteristic curves




## General dimensions




* 2.60 (66) for manifold mounting version

** G1/4 optional 1/4 NPT

# R-27 Series Manostat

## Precision Air Pressure Regulators

- **High precision pressure regulators**
- **Suitable for dead end or flow applications**
- **Excellent long term stability**
- **Handwheel, lever, plunger or pilot operated**

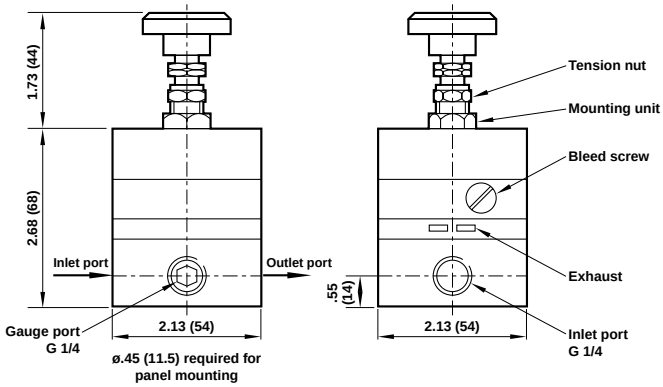
**Ordering Information.**

| Description | Model | Control Type | Output Pressure Range psig (bar) | Air Consumption scfm (l/m) | Weight lbs (kg) |
|---|---|---|---|---|---|
| Standard regulator | 53-1002-00R | Handwheel 2.5-3 turns | 2-25 (.14-2) | .01 (.3) | 1.59 (.72) |
| Standard regulator | 53-1003-00R | Handwheel 2.5-3 turns | 2-60 (.14-4) | .02 (.6) | 1.59 (.72) |
| Standard regulator | 53-1004-00R | Handwheel 2.5-3 turns | 2-120 (.14-8) | .04 (1.2) | 1.59 (.72) |
| Lever operated regulator | 53-1802-00R | Lever control 125° Rotation | 2-25 (.14-2) | .01 (.3) | 1.59 (.72) |
| Lever operated regulator | 53-1803-00R | Lever control 125° Rotation | 2-60 (.14-4) | .02 (.6) | 1.59 (.72) |
| Lever operated regulator | 53-1804-00R | Lever control 125° Rotation | 2-120 (.14-8) | .04 (1.2) | 1.59 (.72) |
| Plunger operated regulator | 53-1404-00R | Plunger travel .065 (1.65) | 2-60 (.14-4) | .02 (.6) | 1.59 (.72) |
| Plunger operated regulator | 53-1604-00R | Plunger travel .065 (1.65) | 2-120 (.14-8) | .04 (1.2) | 1.59 (.72) |
| Pilot operated relay | 53-1904-00R | Pilot pressure signal | 2-120 (.14-8) | .04 (1.2) | 1.59 (.72) |
| Pilot operated relay with manual bias | 53-2204-00R | Pilot pressure signal Handwheel controlled bias | 2-120 (.14-8) bias of up to 30 (2) | .04 (1.2) | 1.59 (.72) |

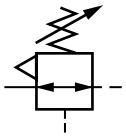
### Technical Data

Medium:
Dry, oil free air filter to 25 microns
Operation:
Two stage servo mechanized regulator with integral precision measuring capsule
Mounting:
Any position. Panel mounting or through mounting holes on the unit (lever, plunger and pilot versions)
Port sizes:
G 1/4
Output pressure ranges:
See individual details overleaf
Supply pressure:
Minimum at least 2.9 psig (0.2 bar) above output pressure.
Maximum 145 psig (10 bar)
Flow capacity:
Up to 10.6 scfm (300 l/m)
Hysteresis and repeatability:
Less than 0.005% setting at midrange
Sensitivity:
Better than 0.3 mbar
Air consumption:
See individual details

### Handwheel Operated

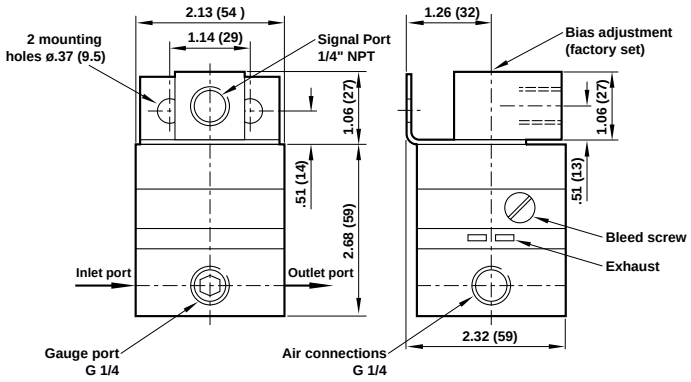



### ISO Symbols

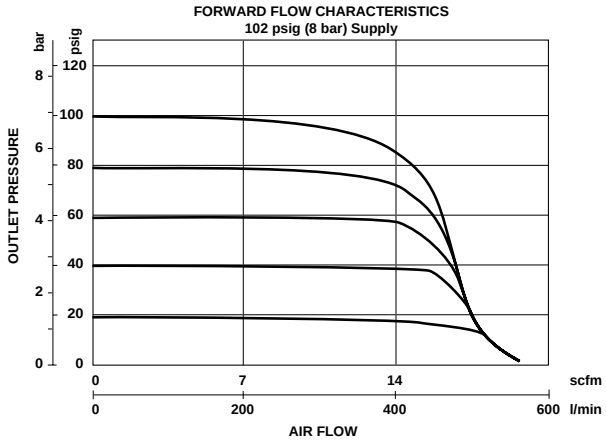


All Dimensions in Inches (mm)

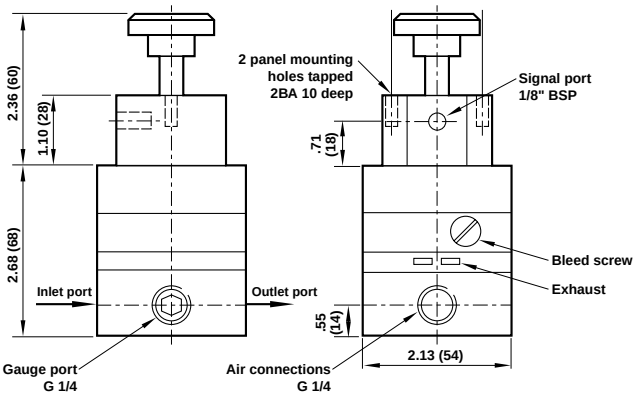
## Pilot Operated

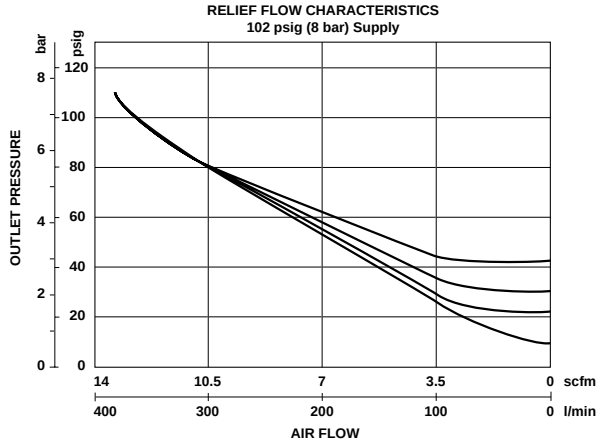



## Typical Performance Characteristics




## Pilot Operated with Bias

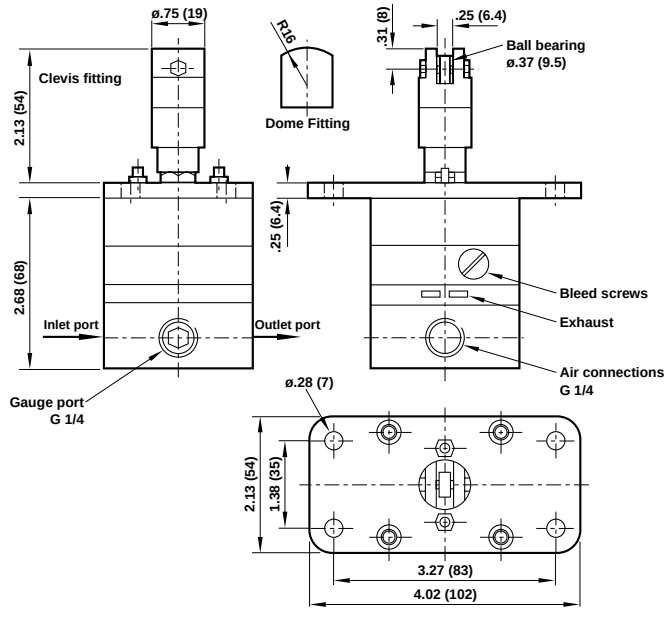


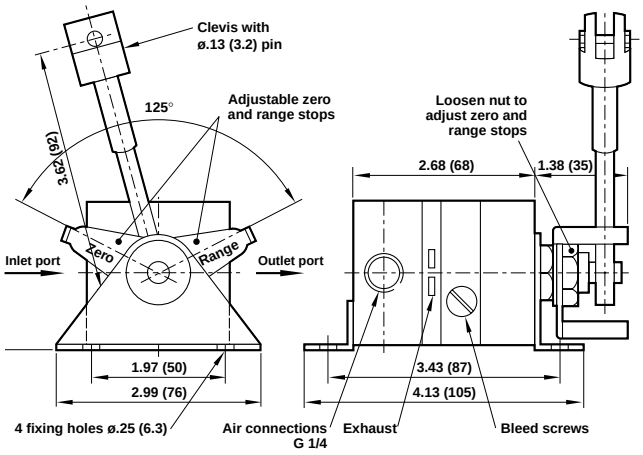

## Diaphragm Repair Kits

| Type | Part number |
|---|---|
| Units up to 25 psig | 53-1000-95R |
| Units up to 60 psig | 53-1000-99R |
| Units up to 120 psig | 53-1000-98R |
| Tamperproof Nut | 53-1000-97R |
| Wall Mounting Bracket | 53-ABR-00700 |

## Plunger Operated




## Lever Operated



# P/I & P/E

## Transmitters & Converter Types 68 & 69

- **These instruments convert pneumatic pressures into electrical signals for use with data loggers, computers and microprocessors**
- **Type 68 is a two-wire pressure/current device**
- **Type 69 a three-wire pressure/voltage type**
- **Both use only non-critical power supplies and can be supplied weatherproof to IP65**


**Ordering Information.**

| P/I Type 68 | | P/E Type 69 | | |
|---|---|---|---|---|
| Standard | Weatherproof | Standard | Weatherproof | Range |
| 536801 00 | 536801 10 | 536901 00 | 536901 11 | 3-15 psig |
| 536815 00 | 536815 10 | 536915 00 | 536915 11 | 0-150 psig |
| 536816 00 | 536816 10 | 536916 00 | 536916 11 | 0-100 psig |
| 536896 00 | 536896 10 | 536996 00 | 536996 11 | 0-200m bar |
| 536893 00 | 536893 10 | 536993 00 | 536993 11 | 0-200m bar |
| 536821 00 | 536821 10 | 536921 00 | 536921 11 | 0.2-1 bar |
| 536833 00 | 536833 10 | 536933 00 | 536933 11 | 0-4 bar |
| 536835 00 | 536835 10 | 536935 00 | 536935 11 | 0-10 bar |
| 536836 00 | 536836 10 | 536936 00 | 536936 11 | 0-7 bar |
| 536837 00 | 536837 10 | 536937 00 | 536937 11 | 0-6 bar |
| 536841 00 | 536841 10 | 536941 00 | 536941 11 | 20-100 kPa |
| 536855 00 | 536855 10 | 536955 00 | 536955 11 | 0-1000 kPa |
| 536856 00 | 536856 10 | 536956 00 | 536956 11 | 0-700 kPa |
| 536886 00 | 536886 10 | 536986 00 | 536986 11 | 0-100 in wg |
| 536888 00 | 536888 10 | 536988 00 | 536988 11 | 0-200 in wg |

**Intrinsically Safe**

| P/I Type 68 | | P/E Type 69 | | |
|---|---|---|---|---|
| Standard | Weatherproof | Standard | Weatherproof | Range |
| 536801 01 | 536801 11 | 536901 01 | 536901 11 | 3-15 psig |
| 536821 01 | 536821 11 | 536921 01 | 536921 11 | 0-150 psig |

NOTE:
1. Intrinsically safe models are available for all standard and weather proof instruments.
2. Other pressure ranges between 50millibar and 10 bar are available to order. Please consult factory for availability.
3. Type 69 P/E models - voltage ranges other than 0-10V are available to special order.
4. All models supplied complete with DIN rail clip and mounting plate.
5. Low pressure models within the ranges 0-25inwg to 0-50in wg. 0-1 psig to 0-2 psig and 0-70mbar to 0-150mbar are also available please ask for further details.
6. A range of models with temperature compensation -4° to 104°F (-20° to 40°C) are available for natural gas applications to special order.

## Technical Data

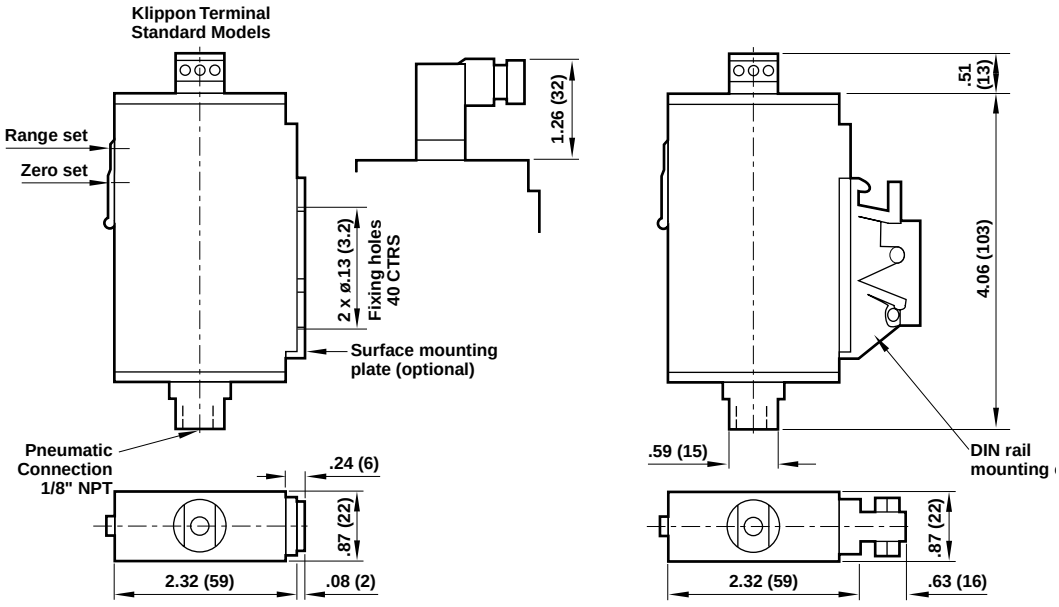
### Pneumatic:

Pressure media:
Dry, non corrosive air or gas. The units are not suitable for continuous liquid exposure
Pressure ranges:
See ordering information Units with Full Scale ranges between 1 psig (70m bar) and 150 psig (10 bar) are available to special order
Over pressure:
At least 100% with negligible calibration error, except for 150 psig models which are 200 psig maximum
Consumption: Nil Ø
Temperature range: 15° to 140°F (-10° to 60°C)

### Electrical:

Maximum Supply
Voltage: 35V for 1 second
Reverse voltage: -50V continuous
Protection: 500V d.c. (components to case)
Type 68 P/I
Supply voltage: 9-30V continuous
Output: 4-20mA
Voltage drop: 9V minute (across unit)
Load resistance: 750 ohm maximum (24V supply)
Type 69 P/E
Supply voltage: 12-30 V continuous
Output: 0-10V Other voltage ranges to special order
Current: 5mA nominal
Load resistance: 2000 ohm minimum
Materials
Casing: Extruded aluminum, zinc diecast end plates
PCB: Epoxy glass fiber
Pneumatic connection: 1/8" NPT
Transducer: Composite construction, mainly nickel, aluminum, Kovar, silicon rubber/gel
Weight: 200g
Finish: Black stove enamel

All Dimensions in Inches (mm)



# Type 421

## Compact Failsafe Rail Mount I/P Converter

- **A rugged, electronic I/P converter designed for high density rail or manifold mounting, at a spacing of only 1" (25mm)**
- **Advanced electronic control using surface mount electronics and a precision pressure transducer and offers excellent performance characteristics**
- **Unlike most I/P converters which use fragile electromechanical pressure control devices, the 421 employs a high sensitivity microminiature Reedex valve for pressure control**
- **Great reliability, long life, freedom from vibration effects, and are significantly less prone to mechanical derangement than older conventional designs**
- **Can be conveniently mounted on DIN rail, or surface mounted, or onto a high density manifold, which eliminates much plumbing**

### Ordering Information

Standard models:
4-20mA input, forward action, Terminal connector

| Outputs | Model Number |
|---|---|
| 0.2-1 bar | 53AB2100 |
| 3-15 psig | 53AB0100 |

Options to special order:
Other pressure ranges
Manifold mounting system

### Certification

All instruments are tested on the Watson Smith ATE system. An individual test certificate is provided at no extra charge.

### Accuracy

Control characteristics*:
Linear, pressure proportional to signal

Maximum error*:
(Combined effect of non-linearity, hysteresis, deadzone & repeatability)
Within ±0.5% span of a terminally based straight line

Hysteresis + resolution*: Less than 0.1% span

Supply pressure effect*: See graph

Temperature effect: (span & zero)
Typically less than 1% FS over compensated range

Long term stability:
Typically <0.5% span per annum

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

## Electrical

Input signal*: 4-20mA two wire
Load*:
Presents a constant voltage drop to the current source of 10V ±0.5V
Start up time*:
Less than 6 seconds
Minimum current failure mode*:
Typically 3mA
Insulation:
Tested to 500V DC
Reverse voltage: -100V DC
Over current:
100mA continuous. 500mA for 1 second; fitted internal fuse 160mA
Rangeability:
More than ±20% on zero and span
Connections:
Two part quick release terminal block with capacity up to 2.5mm cable
Failure mode:
On failure of input signal the output pressure will fall below 0.2 psig (15 mbar)

## Pneumatic

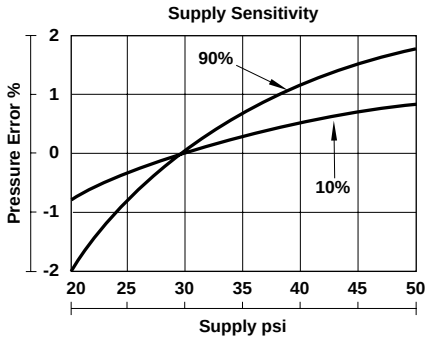
Output signal*: 3-15 psig (0.2-1 bar)
Response time*: See graph
Minimum outlet pressure*: Less than 0.2 psig (15 mbar)
Consumption*: Typically 0.01 scfm (200 cc/min)
Flow capacity: Up to 5 scfm (150 Nl/min)
Output ripple: Less than ±0.5% span at 10 Hz into zero load volume
Media: Oil free, dry air filter to 5 microns
Supply pressure range: 20-50 psig (1.5-3.5 bar)
Preferred range: 25-35 psig (1.7-2.5 bar)
Connections: 1/8" NPT female

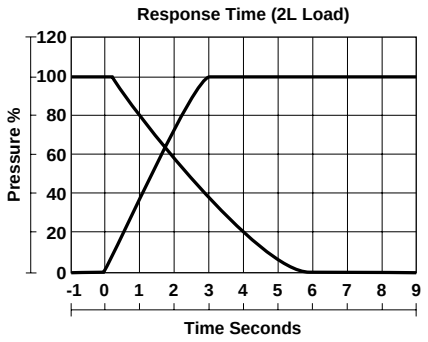
## Environmental & Physical Data

Vibration:
The unit possesses a high degree of immunity
Life:
Designed MTTF greater than 8 years
Electromagnetic compatibility:
RFI protection is incorporated in the instrument
Operating temperature: 15° to 140°F (-10° to 60°C)
Compensated range: 32° to 122°F (0° to 50°C)
IP rating: IP40
Material of construction
Anodized natural aluminum
Mounting:
Any orientation. A rail clip for TS32 (EN50035)/TS35 (EN50022) rail is provided with each instrument, options include surface mounting bracket and a manifold kit for up to 20 converters
Weight: 600gm

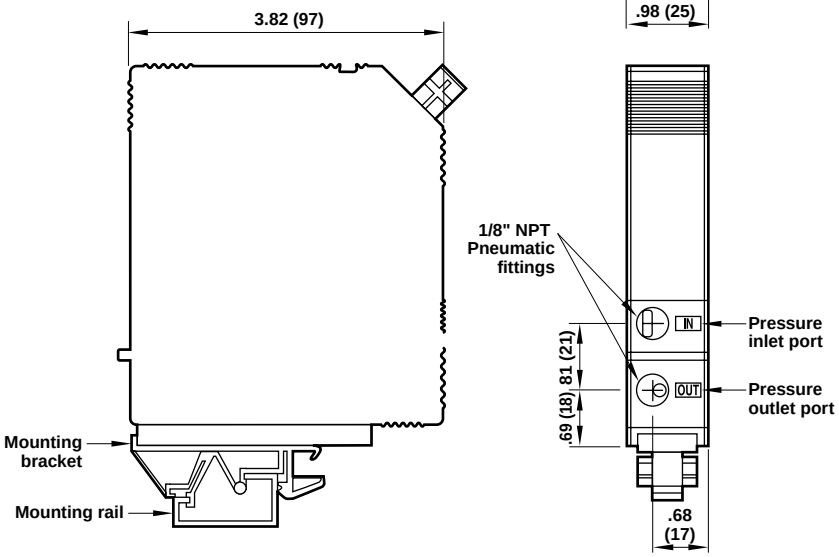
* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

## Typical Performance Characteristics




All Dimensions in Inches (mm)



# Type 422

**Failfreeze Electronic Converter**

- **A major advance in I/P converter design, offering failfreeze in addition to conventional I/P features**
- **Advanced electronic control and a precision pressure transducer to achieve outstanding performance**
- **Intended for field application in which rugged construction, vibration immunity, weatherproofing and reliability are essential, together with the enhanced system safety gained from its failfreeze characteristic**
- **Two wire operation from a 4-20mA control signal with output pressures up to 120 psig (8 bar) as standard**

## Ordering Information

Standard models:
4-20mA input, forward action, DIN connector

| Outputs | Model Number |
|---|---|
| 0.2-1 bar | 53AC2100 |
| 3-15 psig | 53AC0100 |
| 0.2-8 bar | 53AC2400 |
| 3-120 psig | 53AC0400 |

Options to special order:
Other pressure ranges
Conduit entry with flying leads
Type N Certification
50mm pipe mounting bracket
1/8" NPT pneumatic connections
I.S. Certification

## Certification

All instruments are tested on the Watson Smith ATE system. An individual test certificate is provided at no extra charge.

Hazardous area approvals:
The 422 is available with Type NIIT6 approval to BS6941 1988 or Type EEx ia IICT4 approval for intrinsically safe applications

## Accuracy

Control characteristics*:
Linear, pressure proportional to signal

Maximum error*:
(Combined effect of non-linearity, hysteresis, deadzone & repeatability)
±0.5% span of a terminally based straight line (low pressure), 1% (high pressure)

Supply pressure effect*: Negligible

Temperature effect: (span & zero)
Typically less than 1% span over compensated range

Long term stability:
Typically <0.5% span per annum

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

## Electrical

Input signal*: 4-20mA two wire
Load*:
Presents a constant voltage drop to the current source of 5.5-6 Volts
Start up time*:
Less than 6 seconds
Insulation:
Tested to 500V dc
Reverse voltage: -100Vdc
Over current: 30mA
Rangeability:
More than ±20% on zero and span
Connections:
30mm square connector DIN 43650 provided, orientable in four directions
Failure mode:
When input signal falls below 2mA ±0.5mA, the output is held at its previous pressure
Failfreeze drift rate:
±2% setpoint/hour at a constant temperature

## Pneumatic

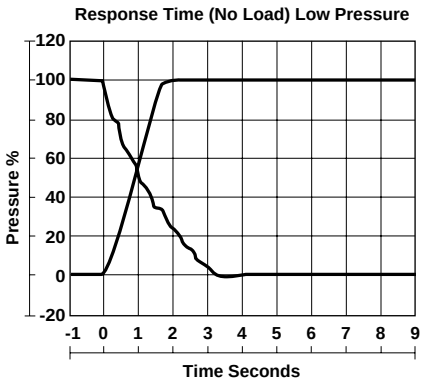
Output signal*:
Low pressure 3-15 psig (0.2-1 bar)
High pressure 3-120 psig (0.2-8 bar)
Response time*: See graph
Minimum outlet pressure*: Less than 2 psig (140 mbar)
Air consumption*:
Low pressure 200cc/min typical
High pressure 400cc/min typical
Flow capacity: Up to 10 scfm (300 Nl/min)
Media: Oil free, dry air filtered to 5 microns
Supply pressure range:
Low pressure 20-100 psig (1.5-7 bar)
High pressure 125-150 psig (8.7-10 bar)
Preferred range (low pressure): 25-35 psig (1.7-2.5 bar)
Connections:
1/4" NPT female (plus two integral 1/4" NPT gauge ports)

## Environmental & Physical Data

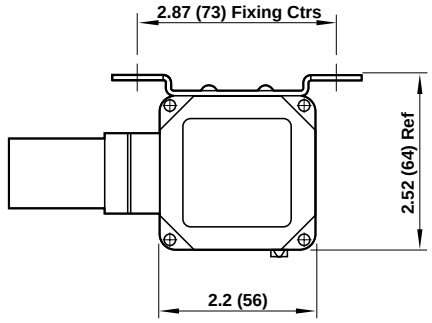
Vibration:
The unit possesses a high degree of immunity
Life:
Better than 1,000,000f.s. cycles
Electromagnetic compatibility:
Emissions more than 20dB below accepted limits (BS800). Instrument immune to conducted transient interference up to 4kV
Operating temperature: -4° to 158°F (-20° to 70°C)
Compensated range: 15° to 140°F (-10° to 60°C)
IP rating: IP65
Material of construction
Zinc diecasting passivated and epoxy painted, Verton glass/nylon cover, Nitrile diaphragms
Mounting:
Integral surface mounting bracket provided for vertical mounting. Operation in any attitude is possible without recalibration
Weight: 800gm

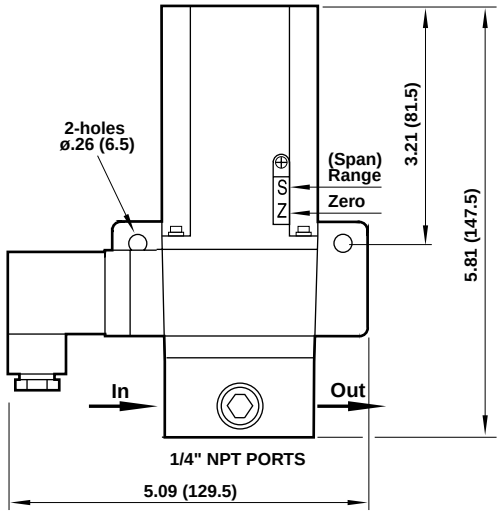
* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

## Typical Performance Characteristics




All Dimensions in Inches (mm)



# Type 423

**Failsafe Electronic I/P Converter**

- **A completely new design of electronic current/ pneumatic converter for field mount process control applications**
- **State-of-art electronics, precision internal pressure measurement, digital pressure control and excellent environmental and vibration characteristics**
- **Rugged high sensitivity Reedex Valve for pressure control**
- **Extreme reliability, freedom from vibration effect and long life, together with very low air consumption and hysteresis.**
- **The pneumatic design off the 423 allows an output capacity of up to 10 scfm, so that no volume booster is necessary for high flow applications such as large valves**

## Ordering Information

Standard models:
4-20mA input, forward action, DIN connector

| Outputs | Model Number |
|---|---|
| 0.2-1 bar | 53AD2100 |
| 3-15 psig | 53AD0100 |

Options to special order:
Other pressure ranges
Conduit entry with flying leads
Type N Certification
Intrinsically Safe certification
50mm pipe mounting bracket
1/8" NPT pneumatic connections

## Certification

All instruments are tested on the Watson Smith ATE system. An individual test certificate is provided at no extra charge.

Hazardous area approvals:
The 423 is available with Type N (Ex N II T6) approval to BS6941 1988 or Intrinsically Safe certified (EEx ia IIC T5) for hazardous area applications

## Accuracy

Control characteristics*:
Linear, pressure proportional to signal

Maximum error*:
(Combined effect of non-linearity, hysteresis, deadzone & repeatability)
Within ±0.5% span of a terminally based straight line

Hysteresis + Resolution*:
Less that 0.1% span

Supply pressure effect*: See graph

Temperature effect: (span & zero)
Typically less than 1% FS over compensated range

Long term stability:
Typically <0.5% span per annum

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

## Electrical

Input signal*: 4-20mA two wire
Load*:
Presents a constant voltage drop to the current source of 10V ±0.5V
Start up time*:
Less than 6 seconds
Minimum current failure mode*: Typically 2mA
Insulation:
Tested to 500V DC
Reverse voltage: -100V
Over current:
100mA Continuous
500mA for 1 second
Rangeability:
More than ±20% on zero and span
Connections:
30 mm square connector DIN 43650 provided, orientable in four directions
Failure mode:
On failure of input signal the output pressure will fall to below 0.2 psig (15 mbar)

## Pneumatic

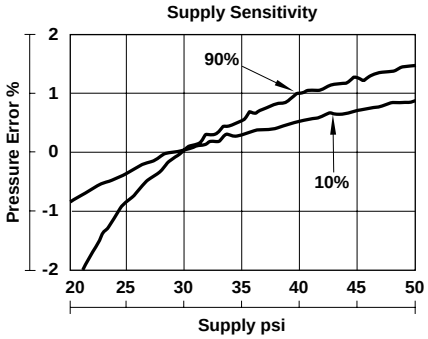
Output signal*: 3-15 psig (0.2-1 bar)
Response time*: See graph
Minimum outlet pressure*: Less than 0.2 psig (15 mbar)
Consumption*: Typically 0.02 scfm (500 cc/min)
Flow capacity: Up to 10 scfm (300 Nl/min)
Output ripple:
Less than ±0.5% span at 10Hz into zero load volume
Media: Oil free, dry air filtered to 5 microns
Supply pressure range: 20-50 psig (1.5-3.5 bar)
Preferred range: 25-35 psig (1.7-2.5 bar)
Connections:
1/4" NPT female (plus two integral 1/4" NPT gauge ports)

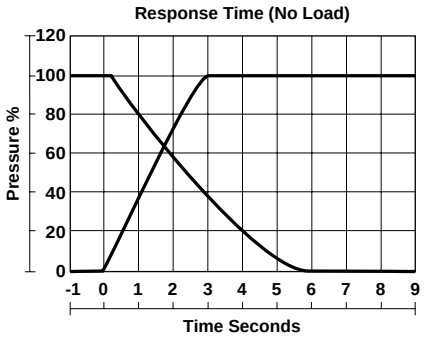
## Environmental & Physical Data

Vibration:
The unit possesses a high degree of immunity
Life:
Better than 1,000,000f.s. cycles
Electromagnetic compatibility:
Emissions more than 20dB below accepted limits (BS800). Instrument immune to conducted transient interference up to 4kV
Operating temperature: -4° to 158°F (-20° to 70°C)
Compensated range: 15° to 140°F (-10° to 60°C)
IP rating: IP65
Material of construction:
Zinc diecasting passivated and epoxy painted, Verton glass/nylon cover, Nitrile diaphragms
Mounting:
Integral surface mounting bracket provided for vertical mounting. Operation in any attitude is possible without recalibration
Weight: 800gm

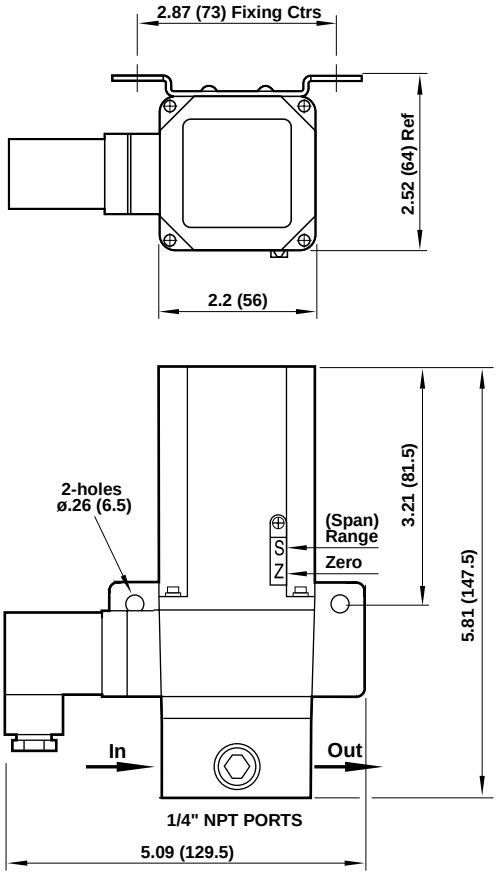
* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

## Typical Performance Characteristics




All Dimensions in Inches (mm)



# Type 425

**Electronic I/P Converter**

- **Designed for service in the most demanding industrial and process control applications, and are normally used to accurately convert a loop control current of 4-20mA to 3-15 psig (0.2-1 bar) pneumatic signal to operate a control valve actuator**
- **The pressure control principle employed uses the well proven Reedex© microminiature solenoid valve avoiding the use of sensitive flapper nozzle electromechanical components.**
- **Internal pressure sensor provides solid state closed loop control ensuring long term accuracy**
- **Advanced electronics and sophisticated control techniques with a rugged weather proof packaging to produce a field mountable I/P converter suitable for use in adverse environmental conditions giving optimum performance and low cost of ownership**


### Product Safety

This product must be installed and operated in conformance with the specific safety instructions contained within the instrument handbook provided with each unit.

### Ordering Information.

| Conduit Entry | Certification | | | | Range |
|---|---|---|---|---|---|
| | FM Explosion Proof | FM Intrinsically Safe | CENELEC IS | Standard | |
| 1/2" NPT | 53-AF01-11 | 53-AF01-21 | 53-AF01-31 | 53-AF01-01 | 4-20mA, 3-15 psi |
| | 53-AF21-21 | 53-AF21-21 | 53-AF21-31 | 53-AF21-01 | 4-20mA, 0.2-1 bar |
| M20 | X | 53-AF01-22 | 53-AF01-32 | 53-AF01-02 | 4-20mA, 3-15 psi |
| | X | 53-AF21-22 | 53-AF21-32 | 53-AF21-02 | 4-20mA, 0.2-1 bar |

### Certification

CENELEC (SIRA)
Intrinsically Safe E Ex ia IIC T4
Certificate number: SCS Ex 94C 2047

Factory Mutual (Pending)

Explosion Proof Class I Division I Groups BCD T6

Intrinsically Safe Class I Division I Groups BCD T4

Copies of certification documents are available on request

Testing:
All units are tested on the Watson Smith ATE System assessed by LQRA to ISO 9001

### Accuracy

Control characteristics*:
Linear, pressure proportional to input signal

Maximum error*:
(Combined effect of non-linearity, hysteresis, deadzone & repeatability)
Within ±0.5% span of a terminally based straight line

Hysteresis + Resolution*:
Less that 0.1% span

Temperature effect: (span & zero)
Typically less than ±1% over compensated range

Supply pressure sensitivity*: (span and zero)
Less than 1% span for 10% supply pressure change

* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

## Electrical

Input signal*: 4-20mA two wire
Load*:
Presents a constant voltage drop to the current source of 6.0V ±0.5V – See note
Start up time*: Less than 6 seconds
Minimum operating current*: Less than 3.5mA
Insulation:
Tested to 500V DC
Current reversal:
No effect within normal 4-20mA range, instrument will not function
Rangeability:
More than ±20% on zero and span
Connections:
Internal terminal block with capacity up to 2.5 mm2 cable
Conduit entry: 1/2" NPT or M20 female
Alternative plug/socket: DIN 43650, 30mm, rating IP65
Failsafe operation*:
On interruption of input signal the output pressure will fall to below 0.2 psig (15mbar)

**Note:** Electronic I/P converters present an approximately constant voltage drop to the control loop, and therefore the loop load cannot be presented as a constant resistance. Electromechanical I/P converters normally behave as a simple resistance load, from which the loop voltage drop can be calculated. For example, a resistave I/P converter with internal resistance 300 ohms would give a loop voltage drop of 6.0V at 20 mA, the same value as the 425 converter.

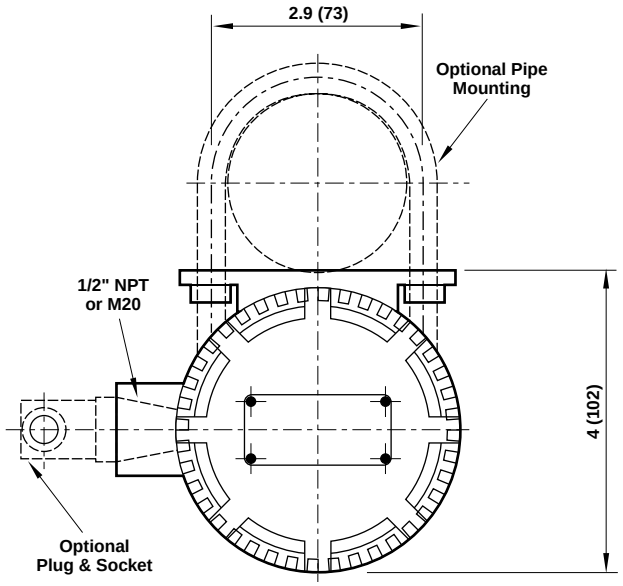
## Pneumatic

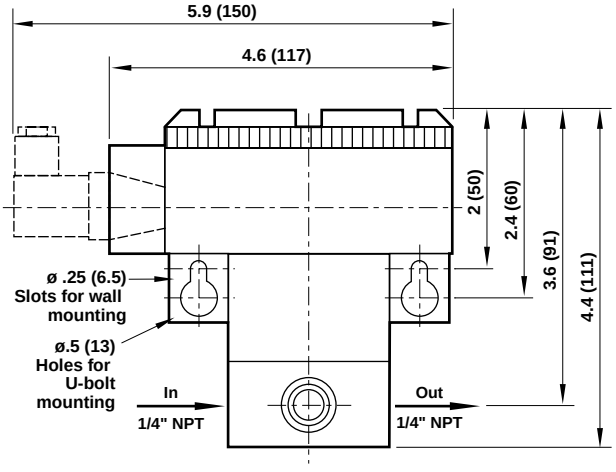
Output signal*: 3-15 psig (0.2-1 bar)
Response time*:
Into load volume up to 5 liters
Upscale 10-90% span, less than 1 sec.
Downscale 90-10% span, less than 6 sec.
Minimum outlet pressure*: Less than 0.2 psig (15 mbar)
Consumption*: Typically 0.01 scfm (350 cc/min)
Flow capacity: Up to 10 scfm (300 Nl/min)
Output ripple:
Less than ±0.5% span at 10Hz into load volume 0.51
Media: Oil free, dry air filtered to 5 microns
Supply pressure range: 18-60 psig (1.3-4 bar)
Preferred range: 25-35 psig (1.7-2.5 bar)
Connections:
1/4" NPT female (plus two integral 1/4" NPT gauge ports)

## Environmental & Physical Data

Vibration:
Less than 1% output pressure change for vibration amplitude 5mm 10-30Hz, 10g 30-500Hz
Electromagnetic compatibility:
RFI protection is incorporated within the instrument, giving full protection up to RF field of 10V/m over the band 30-1000MHz
Operating temperature range: -4° to 158°F (-20° to 70°C)
Compensated temperature range: 15° to 140°F (-10° to 60°C)
Materials of construction
Aluminum and zinc diecastings. Nitrile diaphragms
Paint:
Standard paint finish is black epoxy powder coating. Optional finish for severe or off-shore environments
Weatherproofing:
NEMA 4X, IP66. The unit will operate in any orientation, but must be mounted upright to achieve these environmental ratings
Mounting:
Integral bracket allow for surface or 50mm pipe mounting
Weight: 2.0 lb (0.93kg)

All Dimensions in Inches (mm)




* Parameters marked with * are tested on every unit by computer controlled test equipment. Other parameters are typical.

# Compressed Air Dryers

## Compressor room refrigerated, heated and heatless regenerative dryers and accessories.



**D11** Series Refrigerated Compressed Air Dryers

**D10** Series Air or Water Cooled Refrigerated Compressed Air Dryers

**D50** Series Compact Heatless Regenerative Compressed Air Dryers

**D51** Series Heatless Regenerative Compressed Air Dryers

**Membrane Dryer**

**D60** Series Externally Heated Regenerative Compressed Air Dryers

**D70** Series Blower Purge Regenerative Compressed Air Dryers

**W74D** Excelon® 74 Desiccant Compressed Air Dryers

**F21/61** Main Line Dryers

## Why dry your compressed air?

Because wet air costs you money. Moisture-laden air is not compatible with a clean, efficient, smooth-running system. Understanding how water enters a compressed air system will help illustrate the extent of the problem.

When air is compressed the moisture and impurities contained in the ambient atmosphere are also compressed. This results in a high concentration of moisture and impurities in the receiver. For example, at 75°F ambient temperature and 75% relative humidity, a 100 scfm compressor will take in the equivalent of 18 gallons of water, as vapor in a day.

The elevated temperature of the compressed air contributes to the problem. The higher the air temperature, the greater its capacity for holding water vapor. Conversely, as the air temperature is lowered, its capacity for holding water vapor is decreased. An after-cooler positioned immediately after the compressor will allow some of the moisture to be released as condensate, but does not cool the air sufficiently to remove enough of the water vapor to protect the entire system.

Air line filters installed downstream will satisfactorily remove solid impurities and water in liquid form, but are not able to remove water vapor. As the air cools downstream the water is released, introducing a number of moisture related problems to the system.

## What happens when moisture invades your compressed air system?

Water in a compressed air system attacks lubricants injected into the system to protect air tools and cylinders. This reduces operational efficiency, shortens scheduled maintenance intervals and ultimately results in premature tool failure. Air blow-offs become a quick rinse and painting processes are spoiled because of condensate mixing with the paint spray.

Equally as serious are the long-term effects of water in pneumatic systems. Oxidation of metal piping soon occurs. This threatens the integrity of the system by weakening the walls of the pipe. Rust flakes form, break-off from the walls, and are scattered throughout the piping, introducing an entirely new contaminant to the system.

Water settling in low spots in the line or clinging to pipe walls acts like a magnet collecting solid contaminants and oil droplets. This mixture can solidify on the pipe walls restricting flow, causing additional pressure drop. Oil and water emulsion can form. This is a gummy substance that fouls air motors and causes other moving parts to stick.

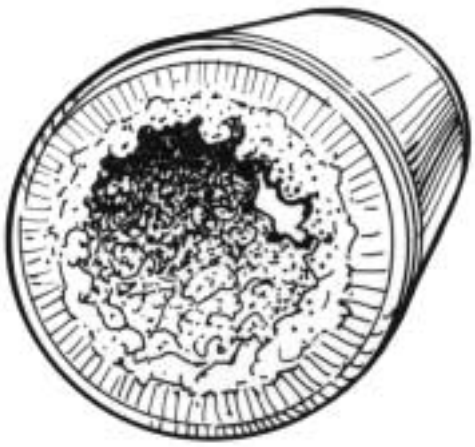
## Did You Know?

*A 100 scfm compressor operating in 75°F temperature and 75% relative humidity ambient conditions will take in the equivalent of 18 gallons of water, as vapor, in a day.*

*The higher the air temperature, the greater its capacity for holding water.*

*Equally as serious are the long-term effects of water in compressed air systems.*

The ultimate result in a system where moisture problems are not addressed is pipe clogged with rust and scale. The cost of a compressed air dryer is an investment in the longevity of the system.



## D11 Refrigerated Dryer Operation

### Refrigerated Compressed Air Dryer Operation

Norgren refrigerated compressed air dryers remove moisture from compressed air systems by lowering the temperature of the compressed air to condense the water vapor. A cool drink on a hot day illustrates this process. Warm, moist air comes in contact with the cold glass causing water droplets to condense from the ambient air and form on the outside of the glass. Refrigerated dryers use a heat exchanger and refrigerant circuit to lower the temperature of the compressed air to initiate condensation. The condensate generated in the heat exchanger is then directed to a moisture separator and drained away.

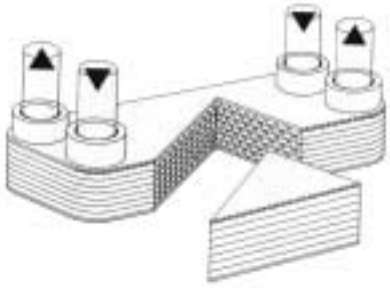
### D11 Heat Exchangers Operation
### 5 through 40 scfm

D11 dryers within this size range are equipped with a spiral tube-in-tube heat exchanger. This design provides maximum heat exchange efficiency with minimum pressure drop. The spiral design generates a helical pattern of air flow against the cooled tube surface to provide maximum heat transfer.


As the water vapor condenses on the spiral tube surface it is directed to the moisture separator at high velocity. The spiral air flow pattern eliminates the sharp angled surfaces that collect contaminants. This provides a continuous cleaning action to retard oil and varnish buildup that can clog exchangers, resulting in pressure loss and reduced efficiency. Note: 30 and 40 scfm dryer operation similar to that shown below with the incorporation of an air-to-air heat exchanger.

### 50 through 200 scfm

D11 dryers within this size range are equipped with a brazed plate heat exchanger. These light-weight, compact, plate-type heat exchangers are noted for their excellent thermal efficiency. Air-to-air and air-to-refrigerant heat exchanges occur within the same unit, eliminating the need for multiple heat exchangers.



Corrugated stainless steel plates brazed with copper alloy into a honeycomb system create counter flow paths in both the air-to-air and air-to-refrigerant sides. Compressed air and refrigerant are securely contained in their separate channels to avoid leakage. The smooth flow path design provides a continuous cleaning action to retard oil and varnish buildup. These heat exchangers can be back-flushed for thorough cleaning when necessary.

### Dryer Comparison

| Dryer Type | Pressure Dew Point | Atmospheric Dew Point | Drying Media Replacement | Power Consumption | Initial Cost | Pre Filters | After Filters | Maintenance Cost |
|---|---|---|---|---|---|---|---|---|
| Refrigerated | 35°F (2°C) | 74°F (23°C) | Nil | For refrigeration motor | Medium | General purpose and coalescing | None | Regular maintenance of refrigeration |
| Regenerative Desiccant | -40°F (-40°C) | -70°F (-57°C) | Infrequent | For drying desicant | High | General purpose and coalescing | 5µ General Purpose Filter | Small |
| Deliquescent | 50°F (10°C) | 5°F (-15°C) | Regularly, minimum 6 months | Nil | Low | General purpose and coalescing | 5µ General Purpose Filter | Recharging container |

# D11 Series Dryers

## D11 Series Refrigerated Compressed Air Dryers

- **Continuous compressor operation adds years to compressor life, and maintains a 35° to 42° (2° to 6°C) pressure dew point per ANSI/B93.45M.**
- **Norgren's D11 Series Dryers offer a wide range of accessories such as gauges, ambient filters, automatic timer drain, and many others to meet changing conditions.**
- **All Norgren dryers are warranted to be free from defects in materials and workmanship for a period of two years from date of manufacture.**
- **Norgren's quality dryer construction is unsurpassed in the industry.**

**Specifications**
Refrigerant: R-134a
Maximum Working Pressure: 250 psig
Maximum Inlet Air Temperature: 120°F
Ambient Temperature Range: 50° to 110°F

**Standard Equipment**
Moisture separator/automatic drain
16" power cord (5 through 75 scfm units)
Electrical terminal block (100 through 200 scfm units)

**Optional Equipment**
On/Off switch
Power on light
High temperature warning light
Refrigerant suction pressure gauge
Refrigerant discharge pressure gauge (100 through 200 scfm units)
6' power cord (5 through 75 scfm units)
Drain tube kit
Inlet air temperature gauge (30 through 200 scfm units)
Outlet air temperature gauge (100 through 200 scfm units)
Inlet air pressure gauge (100 through 200 scfm units)
Outlet air pressure gauge (30 through 200 scfm units)

**Accessories**
Automatic timer drain valve
Bypass valving (5 and 10 scfm units)
Pre-filters
Afterfilters

**Electrical Data for Air Cooled Dryers**

| Model Number | Voltage (volt-ac/hz/phase) |
|---|---|
| D11-1__-0005 thru D11-1__-0150 | 115-60-1/100-50-1 |
| D11-2__-0005 &0010 D11-2__-0040 thru 0200 | 220-60-1/200-50-1 |
| D11-3__-0200 | 230/208-60-3 |
| D11-4__-0200 | 460-60-3 |
| D11-6__-0005 thru D11-6__-0200 | 240/220-50-1 |

**Dryer Flow, Power Ratings, and Weights**

| Nominal Dryer Flow | Model Number | ΔP (psid) | Compressor Hp. | Total Weight lbs. (kg) |
|---|---|---|---|---|
| 5 | D11-___-0005 | 1.0 | 1/6 | 50 (23) |
| 10 | D11-___-0010 | 3.8 | 1/6 | 50 (23) |
| 15 | D11-___-0015 | 0.7 | 1/5 | 53 (24) |
| 20 | D11-___-0020 | 1.0 | 1/5 | 53 (24) |
| 30 | D11-___-0030 | 1.4 | 1/5 | 90 (41) |
| 40 | D11-___-0040 | 2.4 | 1/4 | 90 (41) |
| 50 | D11-___-0050 | 3.5 | 1/4 | 90 (41) |
| 75 | D11-___-0075 | 3.5 | 1/2 | 121 (55) |
| 100 | D11-___-0100 | 2.7 | 1/2 | 130 (59) |
| 130 | D11-___-0130 | 2.8 | 3/4 | 210 (95) |
| 150 | D11-___-0150 | 3.0 | 3/4 | 210 (95) |
| 200 | D11-___-0200 | 4.3 | 1 | 221 (100) |

## Flow Capacity Selection Chart

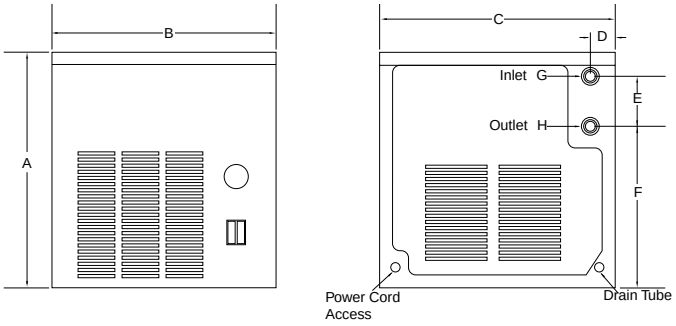
**[scfm (dm3/s) @ 38°F (3°C) Pressure Dew Point, and 100°F (38°C) Ambient Temperature]**

| Model Number* | 90°F (32°C) Inlet Air Temp | | | | 100°F (38°C) Inlet Air Temp. | | | | 110°F (43°C) Inlet Air Temp. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 50 psig | 100 psig | 150 psig | 200 psig | 50 psig | 100 psig | 150 psig | 200 psig | 50 psig | 100 psig | 150 psig | 200 psig |
| D11-___-0005 | 4.40 (2) | 5.50 (3) | 5.94 (3) | 6.16 (3) | 4.00 (2) | 5.00 (2) | 5.40 (3) | 5.60 (3) | 3.56 (2) | 4.45 (2) | 4.80 (2) | 4.98 (2) |
| D11-___-0010 | 8.80 (4) | 11.00 (5) | 11.88 (6) | 12.32 (6) | 8.00 (4) | 10.00 (5) | 10.80 (5) | 11.20 (5) | 7.12 (3) | 8.90 (4) | 9.61 (5) | 9.96 (5) |
| D11-___-0015 | 13.20 (6) | 16.50 (8) | 17.82 (8) | 18.48 (9) | 12.00 (6) | 15.00 (7) | 16.20 (8) | 16.80 (8) | 10.68 (5) | 13.35 (6) | 14.41 (7) | 14.95 (7) |
| D11-___-0020 | 17.60 (8) | 22.00 (10) | 23.76 (11) | 24.64 (12) | 16.00 (8) | 20.00 (9) | 21.60 (10) | 22.40 (11) | 14.24 (7) | 17.80 (8) | 19.22 (9) | 19.93 (9) |
| D11-___-0030 | 26.40 (12) | 33.00 (16) | 35.64 (17) | 36.96 (17) | 24.00 (11) | 30.00 (14) | 32.40 (15) | 33.60 (16) | 21.36 (10) | 26.70 (13) | 28.83 (14) | 29.90 (14) |
| D11-___-0040 | 35.20 (17) | 44.00 (21) | 47.52 (22) | 49.28 (23) | 32.00 (15) | 40.00 (19) | 43.20 (20) | 44.80 (21) | 28.40 (13) | 35.60 (17) | 38.44 (18) | 39.87 (19) |
| D11-___-0050 | 44.00 (21) | 55.00 (26) | 59.40 (28) | 61.60 (29) | 40.00 (19) | 50.00 (24) | 54.00 (25) | 56.00 (26) | 35.60 (17) | 44.50 (21) | 48.06 (23) | 49.84 (23) |
| D11-___-0075 | 66.00 (31) | 82.50 (39) | 89.10 (42) | 92.40 (43) | 60.00 (28) | 75.00 (35) | 81.00 (38) | 84.00 (39) | 53.40 (25) | 66.75 (31) | 72.09 (34) | 74.76 (35) |
| D11-___-0100 | 88.00 (41) | 110.00 (52) | 118.80 (56) | 123.20 (58) | 80.00 (38) | 100.00 (47) | 108.00 (51) | 112.00 (53) | 71.20 (33) | 89.00 (42) | 96.12 (45) | 99.68 (47) |
| D11-___-0130 | 114.40 (54) | 143.00 (67) | 154.44 (73) | 160.16 (75) | 104.00 (49) | 130.00 (61) | 140.40 (66) | 145.60 (68) | 92.56 (44) | 115.70 (54) | 124.95 (59) | 129.58 (61) |
| D11-___-0150 | 132.00 (62) | 165.00 (78) | 178.20 (84) | 184.80 (87) | 120.00 (56) | 150.00 (71) | 162.00 (76) | 168.00 (79) | 106.80 (50) | 133.50 (63) | 144.18 (68) | 149.52 (70) |
| D11-___-0200 | 176.00 (83) | 220.00 (103) | 237.60 (112) | 246.40 (116) | 160.00 (75) | 200.00 (94) | 216.00 (102) | 224.00 (105) | 142.40 (67) | 178.00 (84) | 192.24 (90) | 199.36 (94) |

*** For complete D11 product numbering system see ALE-26-30.**

### Ambient Temperature Multipliers

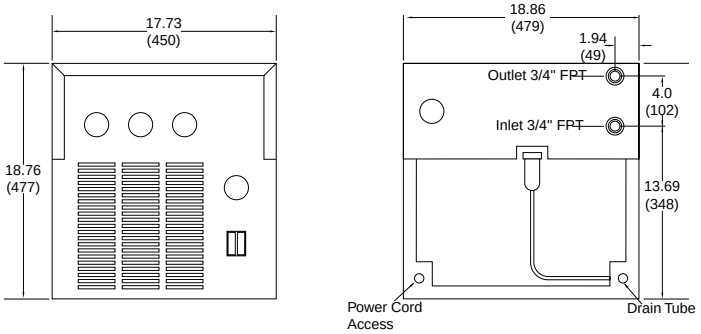
| °F (°C) | Multiply by |
|---|---|
| 60 (16) | 1.34 |
| 70 (21) | 1.27 |
| 80 (27) | 1.19 |
| 90 (32) | 1.10 |
| 100 (38) | 1.00 |
| 110 (43) | 0.89 |




### Dimensions for D11-***-0005 thru D11-***-0020 Refrigerated Air Dryers Inches (mm)

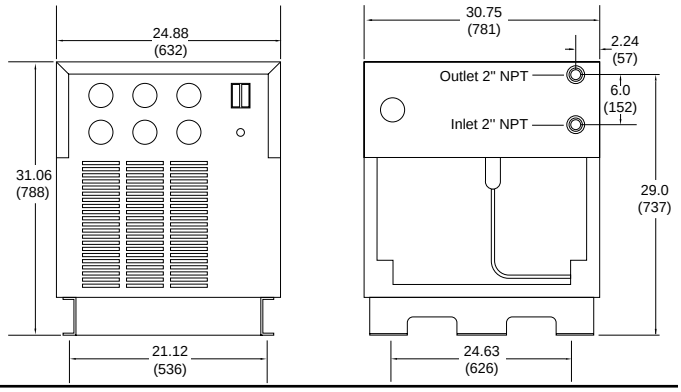
| Dryer Number | A | B | C | D | E | F | G Inlet | H Outlet |
|---|---|---|---|---|---|---|---|---|
| D11-___-0005 thru D11-___-0010 | 14.00 (356) | 15.13 (384) | 12.11 (308) | 1.98 (1250) | 2.0 (51) | 10.38 (264) | 3/8" NPT | 3/8" NPT |
| D11-___-0015 thru D11-___-0020 | 14.00 (356) | 16.00 (406) | 14.88 (378) | 1.98 (50) | 2.00 (51) | 10.38 (264) | 1/2" NPT | 1/2" NPT |

### Dimensions for D11-***-0030 thru D11-***-0100 Refrigerated Air Dryers Inches (mm)




*** D11-XXX-0100 outlet 1" and inlet 1"**

### Dimensions for D11-***-0130 & D11-***-0200 Refrigerated Air Dryers Inches (mm)



# D10 Series Dryers

## Air-Cooled Refrigerated Compressed Air Dryers

- **Refrigerant compressor runs continuously when power is applied to the dryer, providing a nearly constant dew point at all times**
- **High efficiency heat exchangers.**
- **Heat exchangers are modular in design and may be replaced in the field.**
- **Hot gas by-pass valve directs hot refrigerant into the compressor suction line at the exit of the air to refrigerant heat exchanger, permitting constant dew point control down to zero air flow.**
- **Does not need a separate centrifugal type moisture separator.**

**Specifications**
Refrigerant: R-22
Maximum Working Pressure: 150 psig (10 bar)
Maximum Inlet Air Temperature: 120°F (49°C)
Ambient Temperature Range:
50° to 110°F (10° to 43°C)

**Standard Equipment**
Dryer running light
High suction temperature light
ON/OFF switch (control circuit)
Air inlet temperature gauge
Air outlet temperature gauge (600 through 2,000 scfm units)
Air inlet pressure gauge (600 through 2,000 scfm units)
Air outlet pressure gauge
Refrigerant discharge pressure gauge (600 through 2,000 scfm units)
Refrigerant analyzer gauge (suction pressure and temperature)
Automatic timer drain valve
Compressor motor overload protection
Crankcase heater
High/Low refrigerant pressure control
Low ambient fan control

**Optional Equipment**
Six gauge package (250 through 500 scfm units)
Air outlet temperature gauge
Air inlet pressure gauge
Refrigerant discharge pressure gauge
Low or high refrigerant pressure alarm
NEMA 4 and NEMA 12 wiring (excludes compressor and fan motors)
Alarm bell
Hour meter
Ambient air filter
Flow meter
Prefilters
Afterfilters

**Air Inlet and Air Outlet Ports Sizes**

| Model | Porting |
|---|---|
| D10-__0-0250 - 0500 | 2" FPT |
| D10-__0-0600 - 1000 | 3" FPT |
| D10-__0-1250 - 2000 | 4" FPT |
| **Drains** – 1/2" NPT | |

**Electrical Data for Air Cooled Dryers**

| Model Number | Main Power (volt-ac/hz/phase) | Control Power (VAC) |
|---|---|---|
| D10-200-0250 thru D10-200-0325 | 230/208-60-1 | 230 |
| D10-300-0250 thru D10-300-2000 | 230/208-60-3 | 230 |
| D10-400-0250 thru D10-400-2000 | 460-60-3 | 115 |
| D10-500-0400 thru D10-500-2000 | 600/550-60-3 | 115 |
| D10-600-0250 thru D10-600-0325 | 240/220-50-1 | 240 |
| D10-700-0250 thru D10-700-2000 | 240/220-50-3 | 240 |
| D10-800-0250 thru D10-800-2000 | 420/380-50-3 | 115 |

**Dryer Flow, Power Ratings, and Weights**

| Nominal Dryer Flow | Model Number | ΔP (psid) | Compressor Hp. | Total Weight lbs. | (kg) |
|---|---|---|---|---|---|
| 250 | D10-_00-0250 | 0.8 | 1.5 | 650 | (295) |
| 325 | D10-_00-0325 | 1.1 | 2.0 | 675 | (306) |
| 400 | D10-_00-0400 | 1.5 | 3.0 | 700 | (318) |
| 500 | D10-_00-0500 | 2.5 | 3.0 | 725 | (329) |
| 600 | D10-_00-0600 | 1.0 | 3.0 | 1,250 | (567) |
| 800 | D10-_00-0800 | 2.0 | 4.0 | 1,300 | (590) |
| 1000 | D10-_00-1000 | 3.0 | 5.0 | 1,400 | (635) |
| 1250 | D10-_00-1250 | 1.6 | 7.5 | 1,925 | (882) |
| 1500 | D10-_00-1500 | 2.0 | 9.0 | 1,950 | (885) |
| 1750 | D10-_00-1750 | 2.8 | 10.0 | 2,075 | (941) |
| 2000 | D10-_00-2000 | 3.5 | 12.0 | 2,125 | (964) |

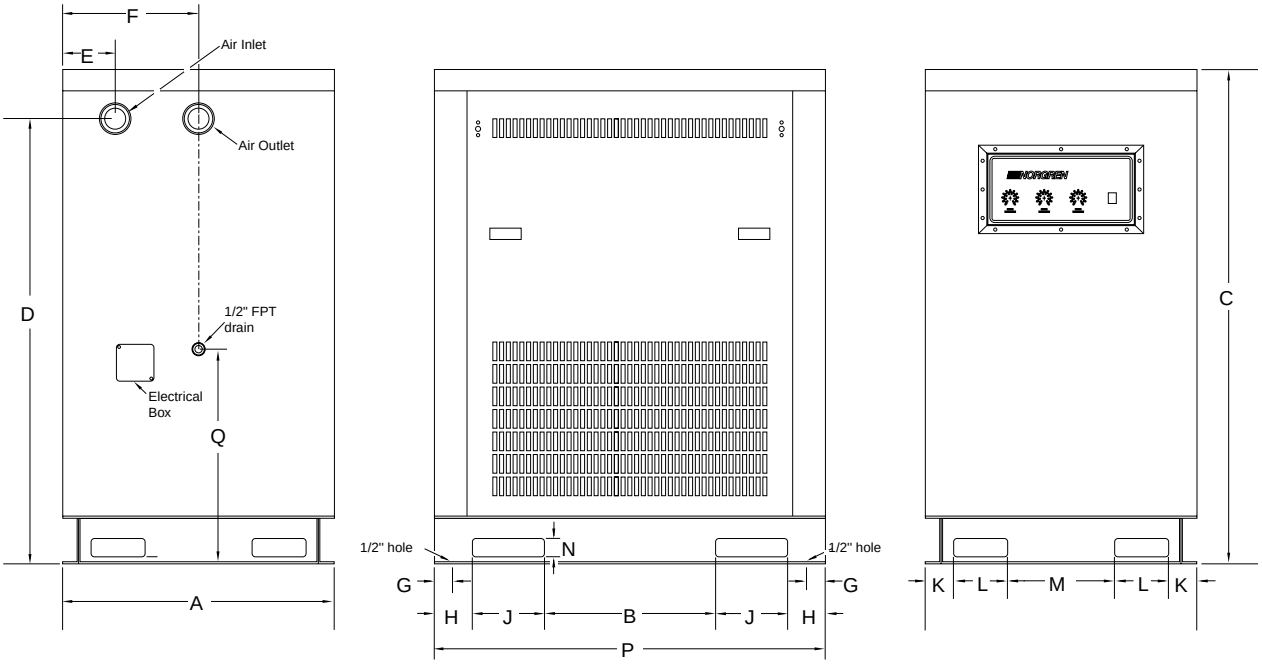
### Ambient Temperature Correction Factor for Air Cooled Dryers

| °F (°C) | Multiply by |
|---|---|
| 60 (16) | 1.34 |
| 70 (21) | 1.27 |
| 80 (27) | 1.19 |
| 90 (32) | 1.10 |
| 100 (38) | 1.00 |
| 110 (43) | 0.89 |

### Flow Capacity Selection Chart
**[scfm (dm3/s) @ 38°F (3°C) Pressure Dew Point, and 100°F (38°C) Ambient Temperature]**

| | 90°F (32°C) Inlet Air Temp | | | 100°F (38°C) Inlet Air Temp | | | 110°F (43°C) Inlet Air Temp | | |
|---|---|---|---|---|---|---|---|---|---|
| Model Number* | 50 psig | 100 psig | 150 psig | 50 psig | 100 psig | 150 psig | 50 psig | 100 psig | 150 psig |
| D10-_00-0250 | 265 (125) | 300 (141) | 330 (155) | 210 (99) | 250 (118) | 275 (129) | 163 (77) | 200 (94) | 220 (103) |
| D10-_00-0325 | 344 (162) | 390 (183) | 429 (202) | 273 (128) | 325 (153) | 358 (168) | 211 (99) | 260 (122) | 286 (134) |
| D10-_00-0400 | 424 (199) | 480 (226) | 528 (248) | 336 (158) | 400 (188) | 440 (207) | 260 (122) | 320 (150) | 352 (165) |
| D10-_00-0500 | 530 (249) | 600 (282) | 660 (310) | 420 (197) | 500 (235) | 550 (259) | 325 (153) | 400 (188) | 440 (207) |
| D10-_00-0600 | 636 (299) | 720 (338) | 792 (372) | 504 (237) | 600 (282) | 660 (310) | 390 (183) | 480 (226) | 528 (248) |
| D10-_00-0800 | 848 (399) | 960 (451) | 1,056 (496) | 672 (316) | 800 (376) | 880 (414) | 520 (244) | 640 (301) | 704 (331) |
| D10-_00-1000 | 1,060 (498) | 1,200 (564) | 1,320 (620) | 840 (395) | 1,000 (470) | 1,100 (517) | 650 (306) | 800 (376) | 880 (414) |
| D10-_00-1250 | 1,325 (623) | 1,500 (705) | 1,650 (776) | 1,050 (494) | 1,250 (588) | 1,375 (646) | 810 (381) | 1000 (470) | 1,100 (517) |
| D10-_00-1500 | 1,590 (748) | 1,800 (846) | 1,980 (931) | 1,260 (592) | 1,500 (705) | 1,650 (776) | 975 (458) | 1,200 (564) | 1,320 (621) |
| D10-_00-1750 | 1,855 (872) | 2,100 (988) | 2,310 (1086) | 1,470 (691) | 1,750 (823) | 1,925 (905) | 1,140 (536) | 1,400 (658) | 1,540 (724) |
| D10-_00-2000 | 2,120 (996) | 2,400 (1128) | 2,640 (1241) | 1,680 (790) | 2,000 (940) | 2,200 (1034) | 1,300 (611) | 1,600 (752) | 1,760 (827) |

*** For complete D10 product numbering system see ALE-26-31.**




### Dimensions for Air-Cooled Dryers
**Inches (mm)**

| Dryer Number | A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D10-_00-0250 thru D10-_00-0500 | 30.00 (762) | 19.00 (483) | 54.50 (1384) | 49.13 (1248) | 5.75 (146) | 15.00 (381) | 2.00 (51) | 4.00 (102) | 8.00 (203) | 3.00 (76) | 6.00 (152) | 12.00 (305) | 2.00 (51) | 43.00 (1092) | 23.63 (600) |
| D10-_00-0600 thru D10-_00-1000 | 33.00 (838) | 24.00 (610) | 69.88 (1775) | 61.63 (1565) | 6.38 (162) | 16.50 (419) | 3.38 (86) | 6.75 (171) | 8.00 (203) | 3.00 (76) | 6.00 (152) | 15.00 (381) | 2.00 (51) | 53.50 (1359) | 31.00 (787) |
| D10-_00-1250 thru D10-_00-2000 | 39.00 (991) | 24.00 (610) | 75.88 (1927) | 66.88 (1699) | 7.50 (191) | 19.50 (495) | 6.25 (159) | 12.50 (318) | 8.00 (203) | 3.00 (76) | 6.00 (152) | 21.00 (533) | 2.00 (51) | 65.00 (1651) | 33.00 (838) |

# D10 Series Dryers

## Water-Cooled Refrigerated Compressed Air Dryers

- **Refrigerant compressor runs continuously when power is applied to the dryer, providing a nearly constant dew point at all times**
- **High efficiency heat exchangers.**
- **Heat exchangers are modular in design and may be replaced in the field.**
- **Hot gas by-pass valve directs hot refrigerant into the compressor suction line at the exit of the air to refrigerant heat exchanger, permitting constant dew point control down to zero air flow.**
- **Does not need a separate centrifugal type moisture separator.**

**Specifications**
Refrigerant: R-22
Maximum Working Pressure: 150 psig (10 bar)
Maximum Inlet Air Temperature: 120°F (49°C)
Ambient Temperature Range:
50° to 110°F (10° to 43°C)

**Standard Equipment**
Dryer running light
High suction temperature light
ON/OFF switch (control circuit)
Air inlet temperature gauge
Air outlet temperature gauge (600 through 2,000 scfm units)
Air inlet pressure gauge (600 through 2,000 scfm units)
Air outlet pressure gauge
Refrigerant discharge pressure gauge (600 through 2,000 scfm units)
Refrigerant analyzer gauge (suction pressure and temperature)
Automatic timer drain valve
Compressor motor overload protection
Crankcase heater
High/Low refrigerant pressure control
Water pressure switch
Water regulating valve

**Optional Equipment**
Six gauge package (400 and 500 scfm units)
Air outlet temperature gauge
Air inlet pressure gauge
Refrigerant discharge pressure gauge
Low or high refrigerant pressure alarm
NEMA 4 and NEMA 12 wiring (excludes compressor and fan motors)
Alarm bell
Hour meter
Prefilters
Afterfilters

**Electrical Data for Water-Cooled Dryers**

| Model Number | Main Power (VAC) | Control Power (VAC) |
|---|---|---|
| D10-301-0400 thru D10-301-2000 | 230/208-60-3 | 230 |
| D10-401-0400 thru D10-401-2000 | 460-60-3 | 115 |
| D10-501-0400 thru D10-501-2000 | 600/550-60-3 | 115 |
| D10-701-0400 thru D10-701-2000 | 240/220-50-3 | 240 |
| D10-801-0400 thru D10-801-2000 | 420/380-50-3 | 100 |

**Dryer Flow, Power Ratings, and Weights**

| Model Number | ΔP (psid) | Compressor Hp. | Total Weight lbs. | (kg) |
|---|---|---|---|---|
| D10-_01-0400 | 1.8 | 2.0 | 700 | (318) |
| D10-_01-0500 | 3.0 | 3.0 | 725 | (329) |
| D10-_01-0600 | 1.1 | 3.0 | 1,250 | (567) |
| D10-_01-0800 | 2.3 | 4.0 | 1,300 | (590) |
| D10-_01-1000 | 3.3 | 5.0 | 1,400 | (635) |
| D10-_01-1250 | 1.6 | 7.5 | 1,925 | (873) |
| D10-_01-1750 | 3.1 | 9.0 | 2,075 | (941) |
| D10-_01-2000 | 3.9 | 10.0 | 2,125 | (964) |

**Air Inlet and Air Outlet Ports Sizes**

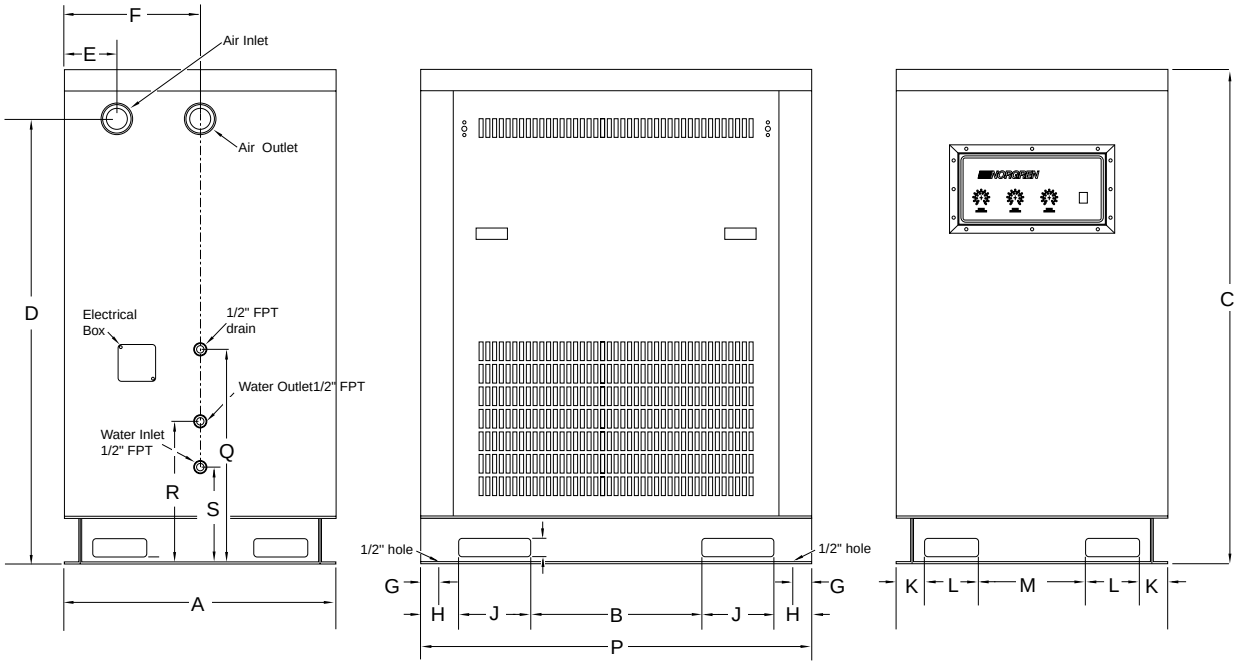
| Model | Porting |
|---|---|
| D10-__1-0400 - 0500 | 2" FPT |
| D10-__1-0600 - 1000 | 3" FPT |
| D10-__1-1200 - 2000 | 4" FPT |
| **Drains** – 1/2" NPT | |
| **Water Inlet and Water Outlet** | |
| D10-__1-0400 - 0500 | 1/2" FPT |
| D10-__1-0600 - 1000 | 1" FPT |

### Flow Capacity Selection Chart

**[scfm (dm3/s) @ 38°F (3°C) Pressure Dew Point, 100°F (38°C) Ambient Temperature, and 85°F Inlet Water Temperature]**

| | 90°F (32°C) Inlet Air Temp | | | 100°F (38°C) Inlet Air Temp | | | 110°F (43°C) Inlet Air Temp | | |
|---|---|---|---|---|---|---|---|---|---|
| **Model Number*** | **50 psig** | **100 psig** | **150 psig** | **50 psig** | **100 psig** | **150 psig** | **50 psig** | **100 psig** | **150 psig** |
| D10-_01-0400 | 461 (217) | 522 (245) | 574 (270) | 365 (172) | 435 (204) | 479 (225) | 283 (133) | 348 (164) | 383 (180) |
| D10-_01-0500 | 583 (274) | 660 (310) | 726 (341) | 462 (217) | 550 (259) | 605 (284) | 358 (168) | 440 (207) | 484 (227) |
| D10-_01-0600 | 662 (311) | 756 (355) | 832 (391) | 529 (249) | 630 (296) | 693 (326) | 410 (193) | 504 (237) | 554 (260) |
| D10-_01-0800 | 901 (423) | 1,020 (479) | 1,122 (527) | 714 (336) | 850 (400) | 935 (439) | 553 (260) | 680 (320) | 748 (352) |
| D10-_01-1000 | 1,113 (523) | 1,260 (592) | 1,386 (651) | 882 (415) | 1,050 (494) | 1,155 (543) | 683 (321) | 840 (395) | 924 (434) |
| D10-_01-1250 | 1,325 (623) | 1,500 (705) | 1,650 (776) | 1,050 (494) | 1,250 (588) | 1,375 (646) | 810 (381) | 1,000 (470) | 1,110 (522) |
| D10-_01-1750 | 1,950 (916) | 2,208 (1038) | 2,430 (1142) | 1,545 (726) | 1,840 (865) | 2,024 (951) | 1,196 (562) | 1,472 (692) | 1,619 (761) |
| D10-_01-2000 | 2,226 (1046) | 2,520 (1184) | 2,772 (1303) | 1,764 (829) | 2,100 (987) | 2,310 (1086) | 1,365 (642) | 1,680 (790) | 1,848 (869) |

*** For complete D10 product numbering system see ALE-26-31.**




### Dimensions for Water-Cooled Dryers

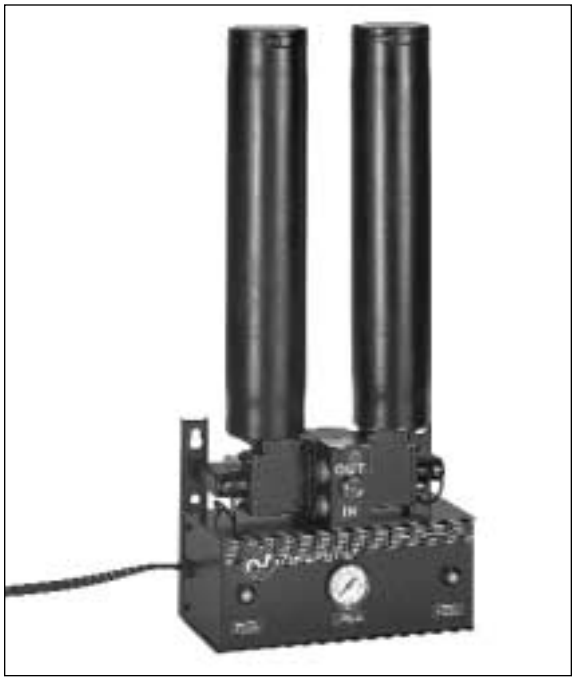
**Inches (mm)**

| Dryer Number | A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D10-_01-0400 thru D10-_01-0500 | 30.00 (762) | 19.00 (483) | 54.50 (1384) | 49.13 (1248) | 5.75 (146) | 15.00 (381) | 2.00 (51) | 4.00 (102) | 8.00 (203) | 3.00 (76) | 6.00 (152) | 12.00 (305) | 2.00 (51) | 43.00 (1092) | 23.63 (600) | 15.63 (397) | 10.63 (270) |
| D10-_01-0600 thru D10-_01-1000 | 33.00 (838) | 24.00 (610) | 69.88 (1775) | 61.63 (1565) | 6.38 (162) | 16.50 (419) | 3.38 (86) | 6.75 (171) | 8.00 (203) | 3.00 (76) | 6.00 (152) | 15.00 (381) | 2.00 (51) | 53.50 (1359) | 31.00 (787) | 14.00 (356) | 10.00 (254) |
| D10-_01-1250 thru D10-_01-2000 | 39.00 (991) | 24.00 (610) | 75.88 (1927) | 66.88 (1699) | 7.50 (191) | 19.50 (495) | 6.25 (159) | 12.50 (318) | 8.00 (203) | 3.00 (76) | 6.00 (152) | 21.00 (533) | 2.00 (51) | 65.00 (1651) | 33.00 (838) | 14.00 (356) | 10.00 (254) |

# D50 Series Dryers

## Compact Heatless Regenerative Compressed Air Dryers

- **The twin desiccant-packed towers alternate operation continuously to provide ultra-dry air for critical applications.**
- **Timer controlled shuttle valves direct the compressed air into the active tower for drying.**
- **Calibrated needle valve adjusts purge flow to actual outlet flow and pressure conditions.**
- **Overlapping cycle times provide constant downstream pressure and dew point.**



**Specifications**
Inlet Air Pressure: 60 to 150 psig (4 to 10 bar)
Ambient Temperature Range: 35° to 110°F (2° to 43°C)
Outlet Pressure Dew point: -40°F (-40°C)
Optional: -66°F (54°C)
Inlet and Outlet ports: 1/2-14 NPTF
Electrical Requirements: 115 v-60 hz -1 ph, 230 v-60 hz-1ph, 240/220 V-50 hz-1 ph, 12 or 24 VDC
Purge Air Consumption for Regeneration: 20%
Power Consumption: 10 Watts
Sound Level:
Running: 56 dBa
Switching: 74 dBa

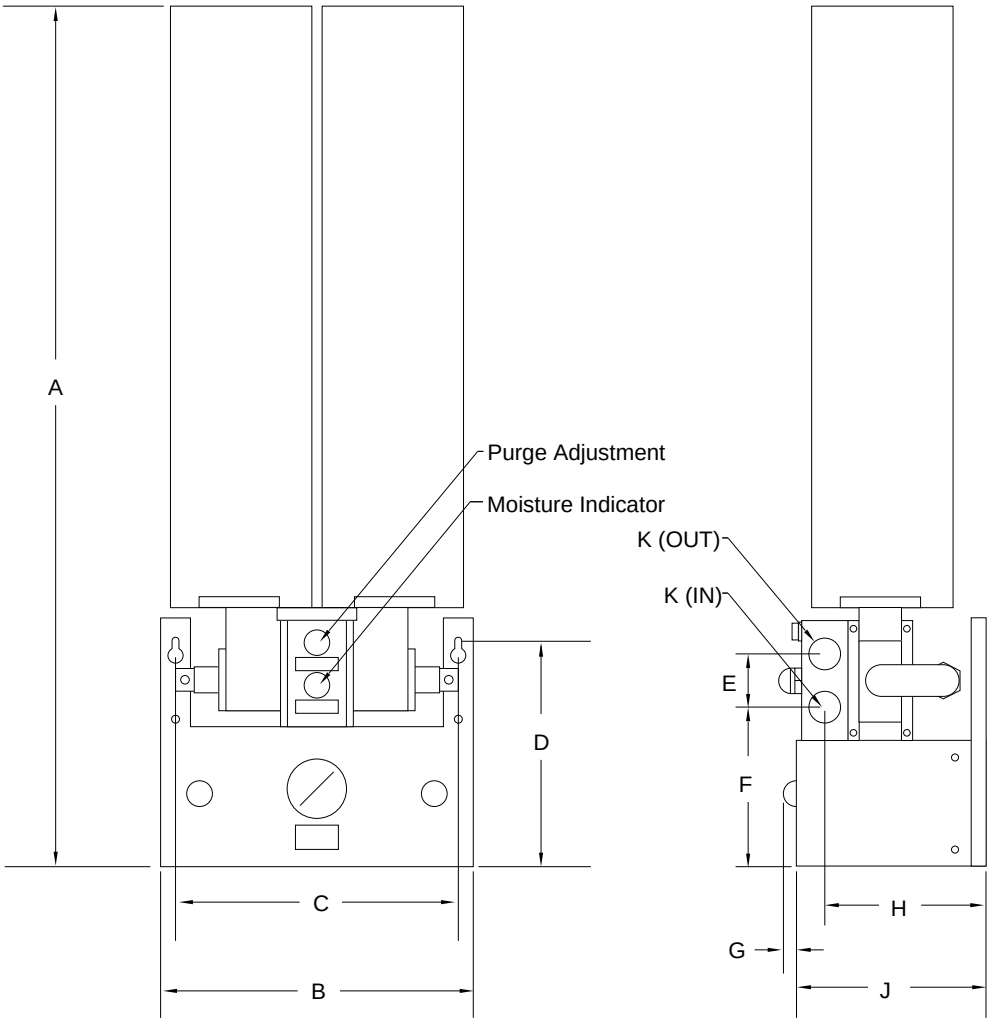
**Materials of Construction**
Tower and Body: Aluminum
Elastomers: Nitrile and Polyurethane
Desiccant: Activated Alumina

**Standard Equipment**
Switching valves
Purge valves
Purge control valve
Purge mufflers
Desiccant packed towers
Electric timer
Six-foot power cord
Moisture indicator (standard unit only)
Inlet pressure gauge (standard unit only)
Tower pressure indicators (standard unit only)
Tower pressure indicator color code:
Green: Tower is at line pressure in drying cycle
Black: Tower is slightly above atmospheric pressure and in regenerative cycle

**Optional Equipment**
-66°F (-54°C) outlet pressure dew point
NEMA 7 rating (hazardous location)
Prefilters (recommended)
Afterfilters (recommended)

**Inlet and Outlet Flow Capacities, and Weights**

| Model Number | Inlet Flow Range (scfm @ 100 psig) | Outlet Flow Range (scfm @ 100 psig) | Total Weight lbs. | (kg) |
|---|---|---|---|---|
| D50-___-0010 | 2 to 10 | 1.5 to 7.7 | 17 | (8) |
| D50-___-0025 | 8 to 25 | 6.1 to 19.3 | 24 | (11) |
| D50-___-0050 | 20 to 50 | 15.2 to 38.5 | 44 | (20) |




**Dimensions for D50 Heatless Regenerative Compressed Air Dryers**
**Inches (mm)**

| Dryer Number* | A | B | C | D | E | F | G | H | J | K |
|---|---|---|---|---|---|---|---|---|---|---|
| D50-___0010 | 18.50 (469.90) | 10.00 (254.00) | 9.00 (228.60) | 7.06 (179.32) | 1.25 (31.75) | 4.90 (124.46) | 0.44 (11.18) | 4.62 (117.35) | 5.25 (133.35) | 1/2 |
| D50-___-0025 | 22.25 (565.15) | 10.00 (254.00) | 9.00 (228.60) | 7.06 (179.32) | 1.25 (31.75) | 4.90 (124.46) | 0.44 (11.18) | 4.62 (117.35) | 5.25 (133.35) | 1/2 |
| D50-___-0050 | 27.70 (703.58) | 10.00 (254.00) | 9.00 (228.60) | 7.06 (179.32) | 1.25 (31.75) | 4.90 (124.46) | 0.44 (11.18) | 4.62 (117.35) | 5.25 (133.35) | 1/2 |

*** For complete D50 product numbering system see ALE-26-32.**

# D51 Series Dryers

## Heatless Regenerative Compressed Air Dryers

- **-40°F pressure dew point ultra-dry air.**
- **Automatic operation**
- **Provides continuous supply of dry air.**
- **Precision timing control.**

**Specifications**
Maximum Working Pressure: 150 psig (10 bar)
Maximum Inlet Air Temperature: 110°F (43°C)
Electrical Requirements: 115 V/60hz/1ph
Dryer Vessel:
ASME Code VIII and latest addenda (200 to 6,250 scfm units)
Purge Air Consumption for Regeneration: 15%

**Standard Equipment**
ON/OFF switch
Tower indicating lights
Purge adjustment valve
Purge control pressure gauge
Purge control valve
Purge exhaust muffler
Tower pressure gauges
Tower pressure relief valves
Check valves
4-way automatic switching valves (25 to 350 scfm units)
Pneumatically actuated switching valves (500 to 6,250 scfm units)
Pilot control valve (500 to 6,250 scfm units)
Pilot control air filter (500 to 6,250 scfm units)
Pilot air switching valve (500 to 6,250 scfm units)
Repressurization valves (200 to 6,250 scfm units)
ASME Coded vessels (200 to 6,250 scfm units)
Activated alumina desiccant (shipped separately)
Desiccant fill and drain ports
Stainless steel air diffuser screens
NEMA 4 enclosure
Solid state timer
Structural steel frame

**Optional Equipment**
Purge saving system
High humidity warning light
Fail-to-switch warning light
Audible alarm (s)
Moisture indicator
Prefilter (recommended)
Afterfilter (recommended)
Dryer by-pass system
Pneumatic controls
High pressure units

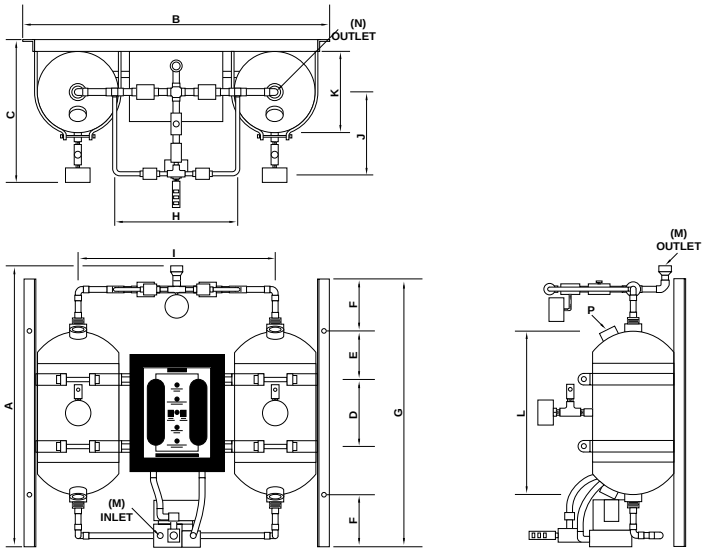
**Dryer Port Size, and Weight**

| Model Number | Inlet/Outlet Ports | Total Weight lbs. (kg) |
|---|---|---|
| D51-100-0025 | 1/2 | 70 (32) |
| D51-100-0035 | 1/2 | 85 (39) |
| D51-100-0050 | 3/4 | 120 (54) |
| D51-100-0070 | 3/4 | 160 (73) |
| D51-100-0100 | 1 | 240 (109) |
| D51-100-0150 | 1 | 265 (120) |
| D51-100-0200 | 1-1/2 | 625 (284) |
| D51-100-0250 | 1-1/2 | 750 (350) |
| D51-100-0350 | 1-1/2 | 875 (397) |
| D51-100-0500 | 2 | 1,350 (612) |
| D51-100-0650 | 2 | 1,600 (726) |
| D51-100-0800 | 2-1/2 | 2,000 (907) |
| D51-100-1000 | 3 | 2,650 (1202) |
| D51-100-1250 | 3 | 3,000 (1361) |
| D51-100-1500 | 3 | 3,500 (1588) |
| D51-100-2000 | 3 | 4,600 (2087) |
| D51-100-2500 | 4 | 5,100 (2313) |
| D51-100-3000 | 4 | 6,500 (2948) |
| D51-100-3500 | 4 | 8,000 (3629) |
| D51-100-4500 | 6 | 10,000 (4536) |
| D51-100-5500 | 6 | 13,000 (5897) |
| D51-100-6250 | 6 | 15,500 (7031) |

**Flow Capacity Selection Chart**
**[scfm (dm3/s) @ -40°F (-40°C) Pressure Dew Point and 100°F (38°C) Ambient Temperature]**

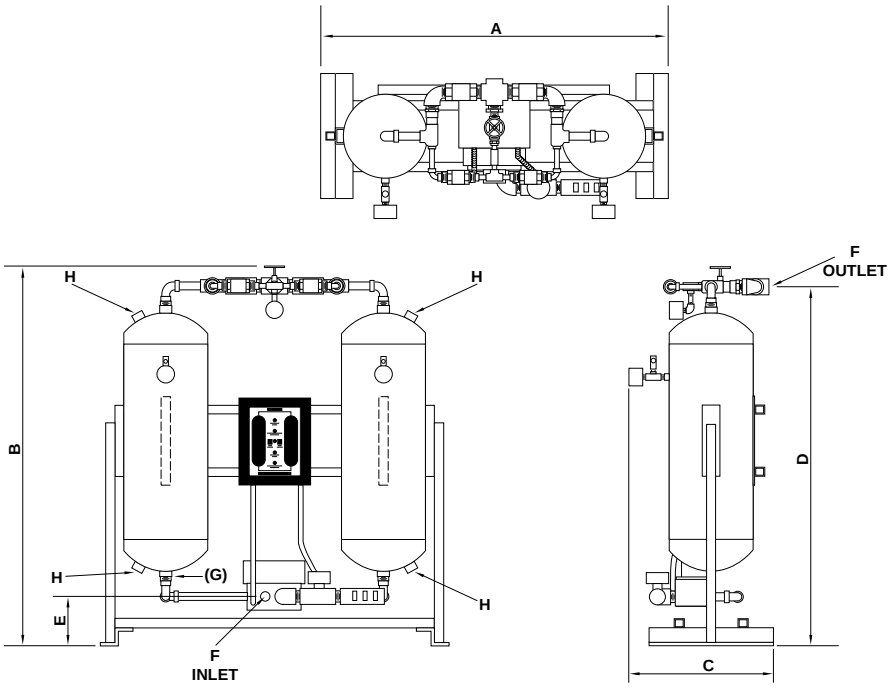
| Model Number* | 75 psig | 100 psig | 125 psig | 150 psig |
|---|---|---|---|---|
| D51-100-0025 | 20 (9) | 25 (12) | 30 (14) | 36 (17) |
| D51-100-0035 | 27 (13) | 35 (16) | 43 (20) | 50 (24) |
| D51-100-0050 | 39 (18) | 50 (24) | 61 (29) | 72 (34) |
| D51-100-0070 | 55 (26) | 70 (33) | 85 (40) | 100 (5) |
| D51-100-0100 | 78 (37) | 100 (47) | 122 (57) | 144 (68) |
| D51-100-0150 | 117 (55) | 150 (71) | 183 (86) | 215 (101) |
| D51-100-0200 | 156 (73) | 200 (94) | 244 (115) | 287 (135) |
| D51-100-0250 | 196 (92) | 250 (118) | 304 (143) | 359 (169) |
| D51-100-0350 | 274 (129) | 350 (165) | 426 (200) | 503 (236) |
| D51-100-0500 | 391 (184) | 500 (235) | 609 (286) | 718 (337) |
| D51-100-0650 | 508 (239) | 650 (306) | 792 (372) | 933 (439) |
| D51-100-0800 | 626 (294) | 800 (376) | 974 (458) | 1,149 (540) |
| D51-10-1000 | 782 (368) | 1,000 (470) | 1,218 (572) | 1,436 (675) |
| D51-100-1250 | 978 (460) | 1,250 (588) | 1,522 (715) | 1,795 (844) |
| D51-100-1500 | 1,173 (551) | 1,500 (705) | 1,827 (859) | 2,154 (1012) |
| D51-100-2000 | 1,564 (735) | 2,000 (940) | 2,436 (1145) | 2,872 (1350) |
| D51-100-2500 | 1,955 (919) | 2,500 (1175) | 3,045 (1431) | 3,590 (1687) |
| D51-100-3000 | 2,346 (1103) | 3,000 (1410) | 3,654 (1717) | 4,308 (2025) |
| D51-100-3500 | 2,740 (1288) | 3,500 (1645) | 4,265 (2005) | 5,025 (2362) |
| D51-100-4500 | 3,520 (1654) | 4,500 (2115) | 5,480 (2576) | 6,460 (3036) |
| D51-100-5500 | 4,300 (2021) | 5,500 (2585) | 6,700 (3149) | 7,900 (3713) |
| D51-100-6250 | 4,885 (2296) | 6,250 (2938) | 7,610 (3577) | 8,980 (4221) |

*** For complete D51 product numbering system see ALE-26-33.**



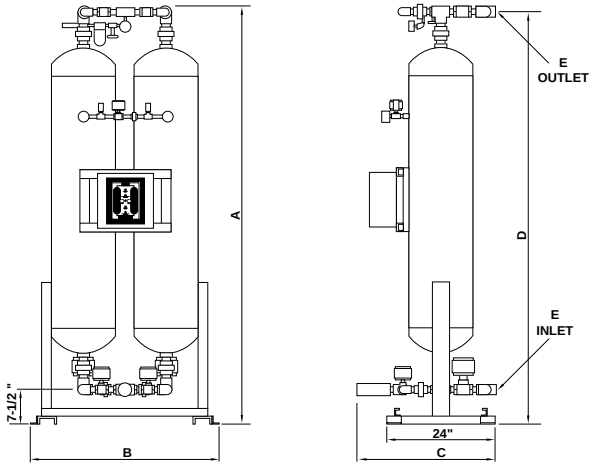

**Dimensions for D51-100-0025 thru D51-100-0070 Compressed Air Dryers**
**Inches (mm)**

| Dryer Number | A | B | C | D | E | F | G | H | I | J | K | L | M | N | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D51-100-0025 | 24.50 (622) | 26.50 (673) | 12.75 (324) | 5.38 (137) | 4.69 (119) | 1.00 (25) | 23.00 (584) | 11.75 (292) | 17.00 (432) | 7.50 (191) | 7.00 (178) | 14.00 (356) | .50 (13) | .75 (19) | .75 (19) |
| D51-100-0035 | 29.0 (737) | 26.50 (673) | 12.75 (324) | 7.38 (187) | 5.81 (148) | 1.00 (25) | 23.00 (584) | 11.75 (292) | 17.00 (432) | 7.50 (191) | 7.0 (178) | 19.00 (482) | .50 (13) | .75 (19) | .75 (19) |
| D51-100-0050 | 35.50 (902) | 30.50 (775) | 17.00 (432) | 7.88 (200) | 5.56 (141) | 2.00 (51) | 25.00 (635) | 20.50 (521) | 20.50 (521) | 10.00 (254) | 8.00 (203) | 21.00 (533) | .75 (19) | .75 (19) | .75 (19) |
| D51-100-0070 | 41.00 (1041) | 30.50 (775) | 17.00 (432) | 11.13 (283) | 6.69 (170) | 2.00 (51) | 30.50 (170) | 20.50 (521) | 20.50 (521) | 10.00 (254) | 8.00 (203) | 26.50 (673) | .75 (19) | .75 (19) | .75 (19) |



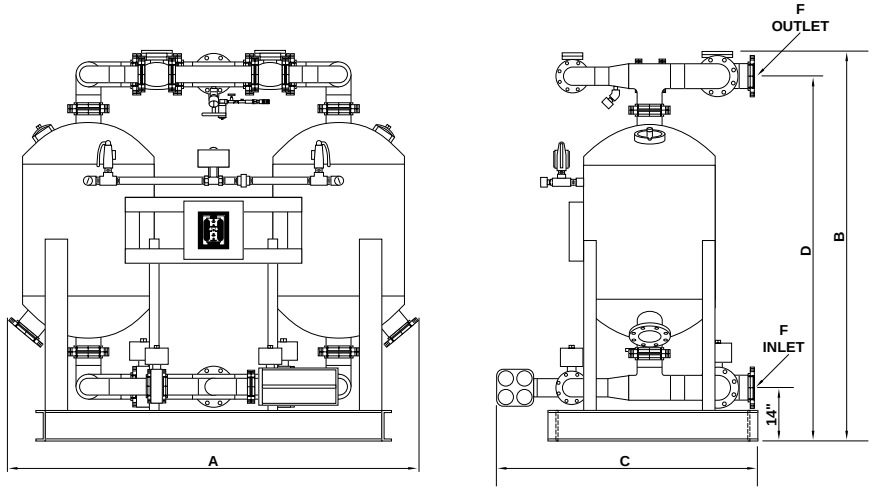

**Dimensions for D51-100-100 thru D51-100-150 Compressed Air Dryers**
**Inches (mm)**

| Dryer Number | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| D51-100-100 | 34.00 (866) | 46.00 (1168) | 17.00 (432) | 45.00 (1143) | 6.00 (152) | 1.00 (25) | 1.00 (25) | 1.00 (25) |
| D51-100-150 | 41.50 (1054) | 39.00 (991) | 17.00 (432) | 36.00 (914) | 6.00 (152) | 1.00 (25) | 1.00 (25) | 1.00 (25) |




**Dimensions for D51-100-200 thru D51-100-650 Compressed Air Dryers**
**Inches (mm)**

| Dryer Number | A | B | C | D | E |
|---|---|---|---|---|---|
| D51-100-200 | 65.00 (1651) | 34.00 (1156) | 35.00 (889) | 61.00 (1549) | 1.50 (38) |
| D51-100-250 | 79.00 (2007) | 34.00 (1156) | 35.00 (889) | 75.00 (1905) | 1.50 (38) |
| D51-100-350 | 65.00 (1651) | 38.00 (965) | 35.00 (889) | 62.00 (1575) | 1.50 (38) |
| D51-100-500 | 95.00 (2413) | 38.00 (965) | 27.00 (686) | 91.00 (2311) | 2.00 (51) |
| D51-100-650 | 94.00 (2388) | 42.00 (1067) | 29.00 (7366) | 90.00 (2286) | 2.00 (51) |




**Dimensions for D51-100-0800 thru D51-100-6250 Compressed Air Dryers**
**Inches (mm)**

| Dryer Number | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| D51-100-0800 | 51.00 (1295) | 100.00 (2540) | 40.00 (1016) | 96.00 (2438) | 2.50 (64) | 2.5 (64) |
| D51-100-1000 | 54.50 (1384) | 102.00 (2591) | 40.00 (1016) | 98.00 (2489) | 3.00 (76) | 3.00 (76) |
| D51-100-1250 | 68.00 (1727) | 109.00 (2769) | 40.00 (1016) | 105.00 (2667) | 3.00 (76) | 3.00 (76) |
| D51-100-1500 | 72.00 (1829) | 94.00 (2388) | 42.00 (1067) | 89.00 (2261) | 3.00 (76) | 3.00 (76) |
| D51-100-2000 | 66.00 (1676) | 111.00 (2819) | 42.00 (1067) | 107.00 (2718) | 3.00 (76) | 3.00 (76) |
| D51-100-2500 | 78.00 (1981) | 116.00 (2946) | 55.00 (1397) | 111.00 (2819) | 4.00 (102) | 4.00 (102) |
| D51-100-3000 | 99.00 (2515) | 113.00 (2870) | 57.50 (1461) | 108.00 (2743) | 4.00 (102) | 4.00 (102) |
| D51-100-3500 | 99.00 (2515) | 117.00 (2972) | 58.00 (1473) | 112.00 (2845) | 4.00 (102) | 4.00 (102) |
| D51-100-4500 | 105.00 (2667) | 136.00 (3454) | 58.00 (1473) | 130.00 (3302) | 6.00 (152) | 6.00 (152) |
| D51-100-5500 | 105.00 (2667) | 125.00 (3175) | 58.00 (1473) | 119.00 (3023) | 6.00 (152) | 6.00 (152) |
| D51-100-6250 | 116.00 (2946) | 138.00 (3505) | 58.00 (1473) | 132.00 (3353) | 6.00 (152) | 6.00 (152) |

# D60 Series Dryers

## D60 Series Externally Heated Regenerative Compressed Air Dryers

- **Delivers -40°pressure dew point**
- **Provides continuous supply of dry air**
- **Operates automatically with flexible controls**
- **Reduces purge air requirements**


**Specifications**
Maximum Working Pressure: 150 psig
Maximum Inlet Air Temperature: 110°F
Electrical Requirements: 460v/60 hz 3ph (control circuit 115v/60 hz/1ph)
Dry Vessel: ASME Code, Section VIII and latest addenda
Exterior Finish: Industrial enamel
Purge Air Consumption for Regeneration: 7%

**Standard Equipment**
On/Off switch
Dryer running light
Purge adjustment valve
Purge cooling valve
Purge control pressure gauge
Purge control valve
Purge exhaust mufflers
Tower pressure gauges
Tower pressure relief valves
Electric heater
Heater high temperature control
Check valves
Pneumatically actuated switching valves
Pilot control valve
Pilot control air filter
Pilot air switching valves
Regeneration valve
ASME Coded vessels
Jacketed insulation
Activated alumina desiccant (shipped separately)
Desiccant fill and drain ports
Stainless steel air diffuser screens
NEMA 1 enclosure
Programmable logic controller
460-3-60 main power circuit
115-1-60 control circuit
Structural steel frame

**Optional Equipment**
Automatic logic functions
Purge saving system
High humidity warning light
Fail-to-switch warning light
Purge exhaust temperature control
Audible alarm(s)
Tower indicating lights
NEMA 4 or 12 rating
Visual moisture indicator
Prefilter (recommended)
Afterfilter (recommended)
Dryer bypass system
Steam to air heat exchanger
Molecular sieve and silica gel desiccants

**Weights and Heater Specifications**

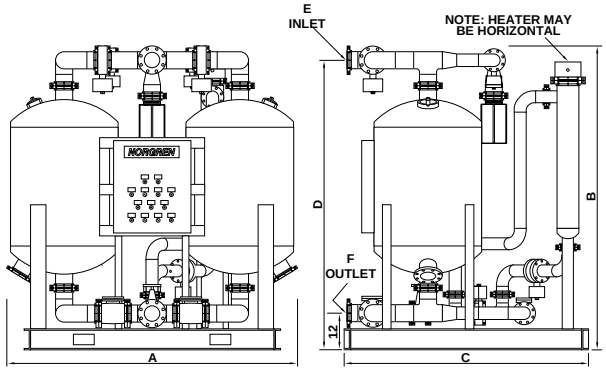
| Model Number | Weight lbs | (kg) | Heater KW |
|---|---|---|---|
| D60-400-0100 | 700 | (318) | 1 |
| D60-400-0175 | 825 | (374) | 1-1/2 |
| D60-400-0250 | 900 | (408) | 2 |
| D60-400-0350 | 1,500 | (680) | 2-1/2 |
| D60-400-0500 | 2,400 | (1,089) | 4 |
| D60-400-0700 | 2,900 | (1,315) | 5 |
| D60-400-0850 | 3,350 | (1,520) | 6 |
| D60-400-1000 | 3,800 | (1,724) | 8 |
| D60-400-1350 | 5,000 | (2,268) | 10 |
| D60-400-1700 | 5,500 | (2,495) | 12 |
| D60-400-2100 | 7,200 | (3,266) | 15 |
| D60-400-2400 | 8,750 | (3,969) | 17 |
| D60-400-3100 | 11,000 | (4,990) | 25 |
| D60-400-3800 | 14,200 | (6,441) | 33 |
| D60-400-4300 | 16,300 | (7,393) | 33 |
| D60-400-5000 | 17,600 | (7,983) | 42 |
| D60-400-6250 | 20,200 | (9,163) | 50 |

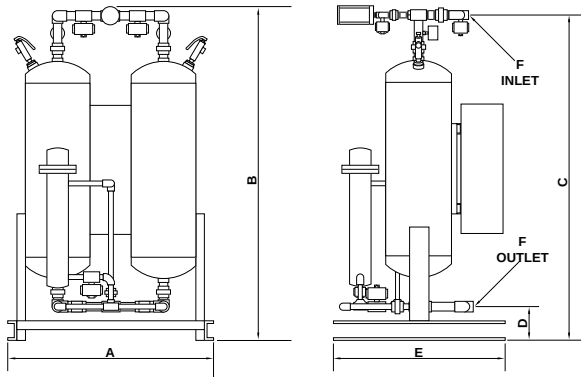
# D60 Series Externally Heated Regenerative Compressed Air Dryers

### Flow Capacity Selection Chart
**[scfm (dm3/s) @ 100°F (38°C) inlet temperature and -40°F (-40°C) pressure dew point]**

| Model Number* | 75 psig | 100 psig | 125 psig | 150 psig |
|---|---|---|---|---|
| D60-400-0100 | 78 (37) | 100 (47) | 122 (57) | 144 (68) |
| D60-400-0175 | 137 (64) | 175 (82) | 213 (100) | 252 (85) |
| D60-400-0250 | 196 (92) | 250 (118) | 304 (143) | 359 (169) |
| D60-400-0350 | 274 (129) | 350 (165) | 426 (200) | 503 (236) |
| D60-400-0500 | 391 (184) | 500 (235) | 609 (286) | 718 (337) |
| D60-400-0700 | 547 (257) | 700 (329) | 853 (401) | 1,005 (472) |
| D60-400-0850 | 665 (313) | 850 (400) | 1,035 (486) | 1,220 (573) |
| D60-400-1000 | 782 (368) | 1,000 (470) | 1,218 (572) | 1,436 (675) |
| D60-400-1350 | 1,056 (496) | 1,350 (635) | 1,644 (773) | 1,938 (911) |
| D60-400-1700 | 1,329 (625) | 1,700 (799) | 2,071 (973) | 2,441 (1147) |
| D60-400-2100 | 1,642 (772) | 2,100 (987) | 2,558 (1202) | 3,016 (1418) |
| D60-400-2400 | 1,877 (882) | 2,400 (1128) | 2,923 (1374) | 3,446 (1620) |
| D60-400-3100 | 2,424 (1139) | 3,100 (1457) | 3,776 (1775) | 4,451 (2092) |
| D60-400-3800 | 2,972 (1397) | 3,800 (1786) | 4,628 (2175) | 5,456 (2564) |
| D60-400-4300 | 3,363 (1581) | 4,300 (2021) | 5,237 (2461) | 6,175 (2902) |
| D60-400-5000 | 3,910 (1838) | 5,000 (2350) | 6,090 (2862) | 7,180 (3375) |
| D60-400-6250 | 4,888 (2297) | 6,250 (2938) | 7,612 (3578) | 8,975 (4218) |

*** For complete D60 product numbering system see ALE-26-34.**




### Dimensions for D60-400-0100 thru D60-400-0500 Externally Heated Regenerative Compressed Air Dryers
**inches (mm)**

| Dryer Number | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| D60-400-0100 | 36.00 (914) | 77.50 (1969) | 68.00 (1727) | 6.00 (152) | 34.00 (864) | 1.00 (25) |
| D60-400-0175 | 40.00 (1016) | 82.00 (2083) | 72.00 (1829) | 7.00 (178) | 38.00 (965) | 1.50 (38) |
| D60-400-0250 | 42.00 (1067) | 71.00 (1803) | 61.00 (1549) | 7.00 (178) | 43.00 (1092) | 1.50 (38) |
| D60-400-0350 | 42.00 (1067) | 86.00 (2184) | 85.00 (2159) | 7.00 (178) | 43.00 (1092) | 1.50 (38) |
| D60-400-0500 | 50.00 (1270) | 97.00 (2464) | 95.00 (2413) | 10.00 (254) | 44.00 (1118) | 2.00 (51) |

### Dimensions for D60-400-0700 thru D60-400-6250 Externally Heated Regenerative Compressed Air Dryers
**inches (mm)**

| Dryer Number | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| D60-400-700 | 44.00 (1118) | 109.00 (2769) | 48.00 (1219) | 105.00 (2667) | 2.00 (51) | 2.00 (51) |
| D60-400-850 | 50.00 (1270) | 111.00 (2819) | 50.00 (1270) | 106.00 (2692) | 2.50 (64) | 2.50 (64) |
| D60-400-1000 | 71.00 (1803) | 93.00 (2362) | 61.00 (1549) | 89.00 (2261) | 3.00 (76) | 3.00 (76) |
| D60-400-1350 | 71.00 (1803) | 110.00 (2794) | 61.00 (1549) | 106.00 (2692) | 3.00 (76) | 3.00 (76) |
| D60-400-1700 | 78.00 (1981) | 100.00 (2540) | 61.00 (1549) | 96.00 (2438) | 3.00 (76) | 3.00 (76) |
| D60-400-2100 | 95.00 (2413) | 97.50 (2477) | 70.00 (1778) | 93.50 (2375) | 3.00 (76) | 3.00 (76) |
| D60-400-2400 | 99.00 (2515) | 114.00 (2896) | 67.00 (1702) | 109.00 (2769) | 4.00 (102) | 4.00 (102) |
| D60-400-3100 | 105.00 (2667) | 112.00 (2845) | 67.00 (1702) | 107.00 (2718) | 4.00 (102) | 4.00 (102) |
| D60-400-3800 | 105.00 (2667) | 120.00 (3048) | 67.00 (1702) | 115.00 (2921) | 4.00 (102) | 4.00 (102) |
| D60-400-4300 | 116.00 (2946) | 120.00 (3048) | 85.00 (2159) | 114.00 (2896) | 6.00 (152) | 6.00 (152) |
| D60-400-5000 | 116.00 (2946) | 127.00 (3226) | 85.00 (2159) | 121.00 (3073) | 6.00 (152) | 6.00 (152) |
| D60-400-5500 | 122.00 (3099) | 113.00 (2870) | 85.00 (2159) | 107.00 (2718) | 6.00 (152) | 6.00 (152) |
| D60-400-6250 | 122.00 (3099) | 121.00 (3073) | 85.00 (2159) | 115.00 (2921) | 6.00 (152) | 6.00 (152) |

# D70 Series Dryers

## D70 Series Blower Purge Regenerative Compressed Air Dryers

- **Delivers -40°pressure dew point**
- **Provides continuous supply of dry air**
- **Operates automatically with flexible controls**
- **Reduces purge air requirements**


**Specifications**
Maximum Working Pressure: 150 psig
Maximum Inlet Air Temperature: 110°F
Electrical Requirements: 460v/60 hz 3ph (control circuit 115v/60 hz/1ph)
Dry Vessel: ASME Code, Section VIII and latest addenda
Exterior Finish: Industrial enamel
Purge Air Consumption for Regeneration: Less than 5%

**Standard Equipment**
On/Off switch
Dryer running light
Purge adjustment valve
Purge cooling valve
Purge control pressure gauge
Purge control valve
Purge exhaust mufflers
Tower pressure gauges
Tower pressure relief valves
Blower
Blower intake filter
Electric heater
Heater high temperature control
Check valves
Pneumatically actuated switching valves
Pilot control valve
Pilot control air filter
Pilot air switching valves
Regeneration valve
ASME Coded vessels
Jacketed insulation
Activated alumina desiccant (shipped separately)
Desiccant fill and drain ports
Stainless steel air diffuser screens
NEMA 1 enclosure
Programmable logic controller
460-3-60 main power circuit
115-1-60 control circuit
Structural steel frame

**Optional Equipment**
Automatic logic functions
Purge saving system
High humidity warning light
Fail-to-switch warning light
Purge exhaust temperature control
Audible alarm(s)
Tower indicating lights
NEMA 4 or 12 rating
Visual moisture indicator
Prefilter (recommended)
Afterfilter (recommended)
Dryer bypass system
Steam to air heat exchanger
Molecular sieve and silica gel desiccants

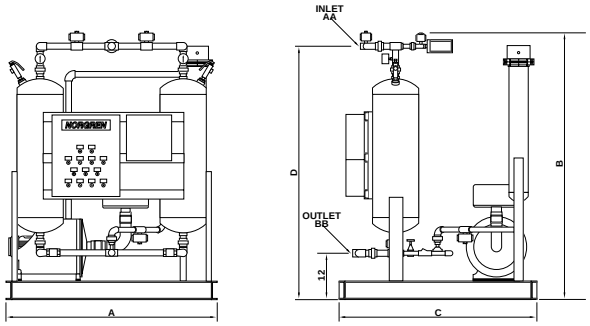
**Weights and Heater Specifications**

| Model Number | Weight lbs. | (kg) | Blower HP | Heater KW |
|---|---|---|---|---|
| D70-400-0250 | 1,200 | (544) | 3 | 4 |
| D70-400-0350 | 1,500 | (680) | 3 | 5 |
| D70-400-0500 | 2,400 | (1,089) | 5 | 8 |
| D70-400-0700 | 2,900 | (1,315) | 5 | 10 |
| D70-400-1000 | 3,800 | (1,724) | 10 | 12 |
| D70-400-1350 | 5,000 | (2,268) | 10 | 17 |
| D70-400-1700 | 5,500 | (5,495) | 15 | 25 |
| D70-400-2400 | 8,750 | (3,969) | 15 | 33 |
| D70-400-3100 | 11,000 | (4,990) | 15 | 42 |
| D70-400-3800 | 14,200 | (6,441) | 20 | 50 |
| D70-400-4300 | 16,300 | (7,394) | 20 | 58 |
| D70-400-5000 | 17,700 | (8,029) | 25 | 67 |
| D70-400-6250 | 20,200 | (9,163) | 30 | 87 |

### Flow Capacity Selection Chart
**[scfm (dm3/s) @ 100°F (38°C) inlet temperature, and -40°F (-40°C) pressure dew point]**

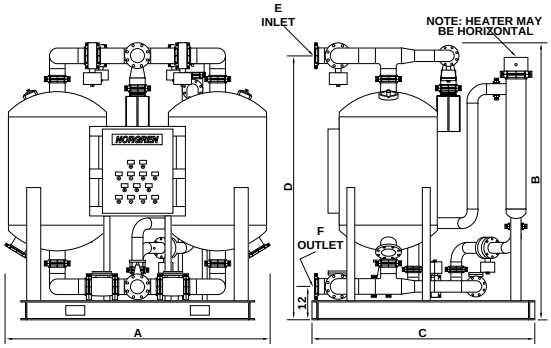
| Model Number* | 75 psig | 100 psig | 125 psig | 150 psig |
|---|---|---|---|---|
| D70-400-0250 | 196 (92) | 250 (118) | 304 (143) | 359 (169) |
| D70-400-0350 | 274 (129) | 350 (165) | 426 (200) | 503 (236) |
| D70-400-0500 | 391 (184) | 500 (235) | 609 (286) | 718 (337) |
| D70-400-0700 | 547 (257) | 700 (329) | 853 (401) | 1,005 (472) |
| D70-400-0850 | 665 (313) | 850 (400) | 1035 (487) | 1220 (574) |
| D70-400-1000 | 782 (368) | 1,000 (470) | 1,218 (572) | 1,436 (675) |
| D70-400-1350 | 1,056 (496) | 1,350 (635) | 1,644 (773) | 1,938 (911) |
| D70-400-1700 | 1,329 (625) | 1,700 (799) | 2,071 (973) | 2,441 (1147) |
| D70-400-2100 | 1642 (773) | 2100 (988) | 2558 (1204) | 3016 (1419) |
| D70-400-2400 | 1,877 (882) | 2,400 (1128) | 2,923 (1374) | 3,446 (1620) |
| D70-400-3100 | 2,424 (1139) | 3,100 (1457) | 3,776 (1775) | 4,451 (2092) |
| D70-400-3800 | 2,972 (1397) | 3,800 (1786) | 4,628 (2175) | 5,456 (2564) |
| D70-400-4300 | 3,363 (1581) | 4,300 (2021) | 5,237 (2461) | 6,175 (2902) |
| D70-400-5000 | 3,910 (1838) | 5,000 (2350) | 6,090 (2862) | 7,180 (3375) |
| D70-400-6250 | 4,888 (2297) | 6,250 (2938) | 7,612 (3578) | 8,975 (4218) |

*** For complete D70 product numbering system see ALE-26-35.**




### Dimensions for D70-400-0100 thru D70-400-0500 Blower Purge Regenerative Compressed Air Dryers
**inches (mm)**

| Dryer Number | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| D70-400-0100 | 64 (1626) | 78 (1981) | 45 (1143) | 68 (1727) | 1 (25) | 1 (25) |
| D70-400-0175 | 68 (1727) | 82 (2083) | 50 (1270) | 72 (1829) | 1.5 (38) | 1.5 (38) |
| D70-400-0250 | 72 (1829) | 71 (1803) | 55 (1397) | 61 (1549) | 1.5 (38) | 1.5 (38) |
| D70-400-0350 | 72 (1829) | 89 (2261) | 55 (1397) | 79 (2007) | 1.5 (38) | 1.5 (38) |
| D70-400-0500 | 78 (1981) | 101 (2565) | 60 (1524) | 90 (2286) | 2 (51) | 2 (51) |




### Dimensions for D70-400-0700 thru D70-400-6250 Blower Purge Regenerative Compressed Air Dryers
**inches (mm)**

| Dryer Number | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| D70-400-0700 | 49 (1245) | 101 (2565) | 62 (1575) | 99 (2515) | 49 (1245) | 2 (51) | 2 (51) |
| D70-400-0850 | 50 (1270) | 111 (2819) | 67 (1702) | 106 (2692) | 50 (1270) | 2.5 (64) | 2.5 (64) |
| D70-400-1000 | 72 (1829) | 99 (2515) | 70 (1778) | 95 (2413) | 72 (1829) | 3 (76) | 3 (76) |
| D70-400-1350 | 72 (1829) | 116 (2946) | 70 (1778) | 112 (2845) | 72 (1829) | 3 (76) | 3 (76) |
| D70-400-1700 | 74 (1880) | 100 (2540) | 75 (1905) | 96 (2438) | 78 (1981) | 3 (76) | 3 (76) |
| D70-400-2100 | 79 (2007) | 98 (2489) | 95 (2413) | 94 (2388) | 91 (2311) | 3 (76) | 3 (76) |
| D70-400-2400 | 88 (2235) | 114 (2896) | 95 (2413) | 109 (2769) | 99 (2515) | 4 (102) | 4 (102) |
| D70-400-3100 | 93 (2362) | 112 (2845) | 95 (2413) | 107 (2718) | 105 (2667) | 4 (102) | 4 (102) |
| D70-400-3800 | 93 (2362) | 120 (3048) | 95 (2413) | 115 (2921) | 105 (2667) | 4 (102) | 4 (102) |
| D70-400-4300 | 100 (2540) | 120 (3048) | 100 (2540) | 114 (2896) | 116 (2946) | 6 (152) | 6 (152) |
| D70-400-5000 | 100 (2540) | 127 (3226) | 100 (2540) | 121 (3073) | 116 (2946) | 6 (152) | 6 (152) |
| D70-400-5500 | 105 (2667) | 113 (2870) | 107 (2718) | 107 (2718) | 122 (3099) | 6 (152) | 6 (152) |
| D70-400-6250 | 105 (2667) | 121 (3073) | 107 (2718) | 115 (2921) | 122 (3099) | 6 (152) | 6 (152) |

# W74D

## Excelon 74 Desiccant Compressed Air Dryer 1/4", 3/8", and 1/2" Port Sizes

- **Excelon Quikclamp™ design provides in-line or modular installation with 72, 73 and 74 Series products.**
- **Helps eliminate condensate at point-of-use.**
- **Replaceable element filters outlet air to help prevent desiccant dust migration down stream.**
- **Desiccant color changes from blue to pink when desiccant replacement is needed.**
- **Transparent or metal bowl available. On models with metal bowl, moisture indicator on top of body indicates condition of desiccant.**
- **Desiccant can be dried and reused or replaced with new packet.**
- **Typical dew point supression of 15°F (-10°C) below inlet ambient pressure dew point.**

**Ordering Information.** Models listed include PTF threads and a closed bottom bowl.

| Port Size | Bowl | Model | Weight lb (kg) |
|---|---|---|---|
| 3/8" | Transparent, 7 fluid ounce (0.2 liter) | W74D-3AN-NPN | 2.00 (0.91) |
| 1/2" | Transparent, 7 fluid ounce (0.2 liter) | W74D-4AN-NPN | 2.00 (0.91) |
| 1/2" | Metal, 1 quart (1 liter) | W74D-4AD-NMN | 4.25 (1.93) |

### Alternative Models

W 7 4 D - ★ ★ ★ - ★ ★ ★

| Port Size | Substitute |
|---|---|
| 1/4" | 2 |
| 3/8" | 3 |
| 1/2" | 4 |

| Threads | Substitute |
|---|---|
| PTF | A |
| ISO Rc taper | B |
| ISO G parallel | G |

| Moisture Indicator * | Substitute |
|---|---|
| No indicator | N |
| With indicator | D |

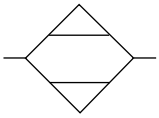
| Flow | Substitute |
|---|---|
| Not applicable | N |

| Bowl | Substitute |
|---|---|
| 1 quart (1 liter) metal | M |
| 7 fluid ounce (0.2 liter) transparent with guard | P |

| Drain | Substitute |
|---|---|
| Closed bottom (no drain) | N |

* Moisture indicator used only with dryers equipped with metal bowl.

### ISO Symbols



# Excelon 74 Desiccant Compressed Air Dryer

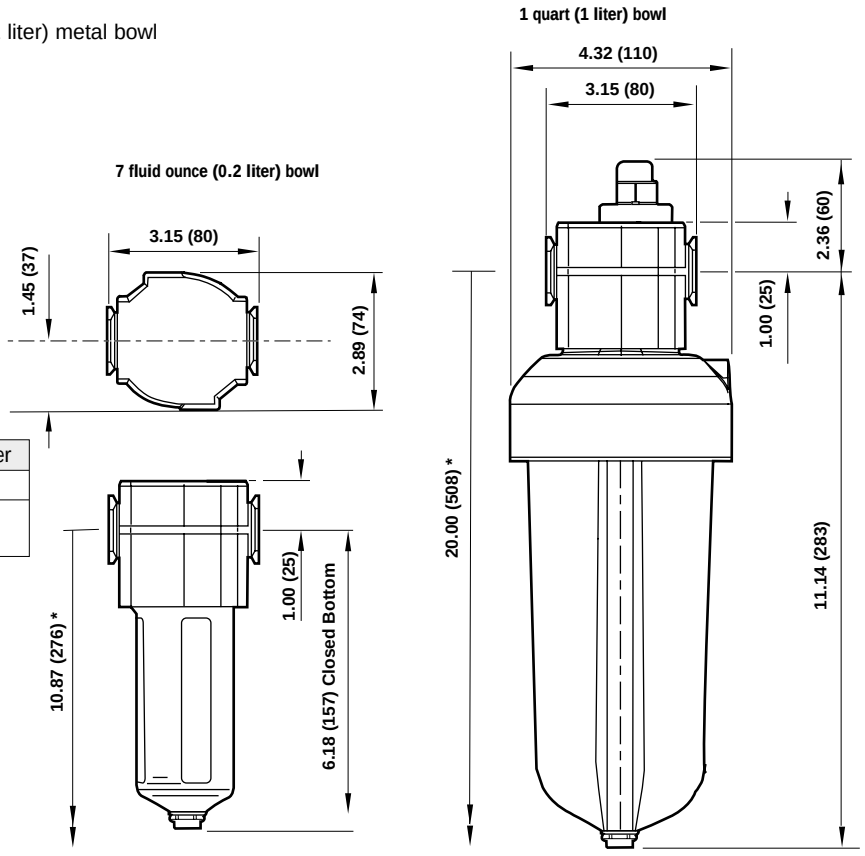
All Dimensions in Inches (mm)

## Technical Data

Fluid: Compressed air
Maximum pressure
Transparent bowl: 150 psig (10 bar)
Metal bowl: 250 psig (17 bar)
Operating temperature*
Transparent bowl: 0° to 125°F (-20° to 50°C)
Metal bowl: 0° to 175°F (-20° to 80°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F( 2°C).
Nominal bowl capacity
Transparent: 0.25 pounds (0.11 kg) desiccant
Metal: 1.25 pounds (0.57 kg) desiccant
Maximum allowable air flow:
7oz transparent bowl 10 scfm (4.72 $dm^3/g$)
1 quart metal bowl 20 scfm (9.49 $dm^3/g$)
Nominal air drying capacity at 100 psig (6.9 bar) inlet pressure and 77°F (25°C)
Transparent bowl: 750 cubic feet (21 cubic meters)
Metal bowl: 6000 cubic feet (170 cubic meters)
Required prefilters: General purpose filter with 5-micron element and an oil removal filter with equivalent pipe size and flow capacity equal to or greater than the desiccant dryer.
Desiccant regeneration: Desiccant can be dried and reused by removing from dryer and heating to 275°F (135°C). Regeneration is complete when desiccant returns to original blue color.
Moisture indicator leakage on models with metal bowl: Air continuously passes thru the moisture indicator and escapes to atmosphere. This is normal and does not indicate a faulty indicator.
Materials
Body: Aluminum
Bowl
Transparent: Polycarbonate with steel bowl guard
Metal: Aluminum
Supply tube assembly: Aluminum/stainless steel screen
Desiccant drying agent: Silica gel
Filter element: Sintered polypropylene
Elastomers: Neoprene and Nitrile
Moisture indicator materials - used only with 1 quart (1 liter) metal bowl
Body: Transparent nylon
Test paper: Cobalt chloride
Elastomers: Nitrile

## Service Kits

| Item | Type | Part Number |
|---|---|---|
| Service kit | Seal and filter element | 4385-710 |
| Desiccant | 5 bags desiccant, 0.25 lb (0.11 kg) in each bag | 4385-700 |




*** Minimum clearance required to remove bowl.**

# F21 / F61

## F21and F61 Mainline Filters

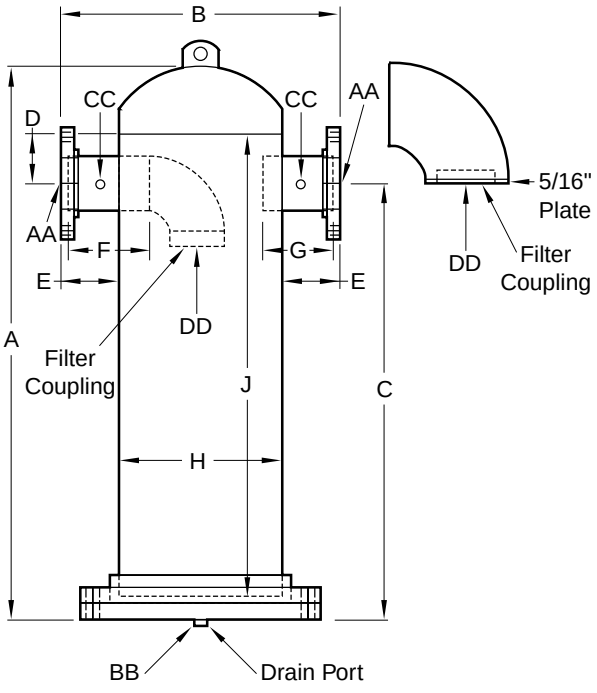
- **High flow mainline system filters**
- **The F21 provides 1 micron particle removal filtration**
- **The F61 provides 0.01 oil coalescing**
- **The F61 features carbon type vapor removal filtration**
- **Optional automatic or timer drains available**

### Technical Data

Maximum Working Pressure: 150 psig (10 bar)
Maximum Inlet Temperature: 150°F (65°C)
Dryer Vessel: ASME Code, Section VIII, and latest addenda (4" and larger units)
Exterior Finish: Industrial enamel
Standard: Manual drain valve, and pressure differential gauge.

| Filter Model No. | Pipe Size | Flow Capacity (scfm | Pressure Drop @ 100 psi Dry (psid) | Pressure Drop @ 100 psi Wet (psid) | Replacement Element Kit P/N |
|---|---|---|---|---|---|
| **1 Micron Prefilters** | | | | | |
| F21-D01 | 2-1/2" (NPT) | 1,035 | 1 | 2 | 21-D-HPC |
| F21-E01 | 3" (NPT) | 1,660 | 1 | 2 | 21-E-JPC |
| F21-G01 | 4" (Flanged) | 3,300 | 1 | 2 | 21-G-LPC |
| F21-J01 | 6" (Flanged) | 5,000 | 1 | 2 | 21-J-MPC |
| F21-J51 | 6" (Flanged) | 7,500 | 1 | 2 | 21-J-KPC |
| F21-L51 | 8" (Flanged) | 10,000 | 1 | 2 | 21-L-KPC |
| **.01 Micron Oil Removal Filters** | | | | | |
| F61-D01 | 2-1/2" (NPT) | 625 | 1 | 3 | 61-D-HTC |
| F61-E01 | 3" (NPT) | 1,000 | 1 | 3 | 61-E-JTC |
| F61-G01 | 4" (Flanged) | 2,000 | 1 | 3 | 61-G-LTC |
| F61-J01 | 6" (Flanged) | 3,000 | 1 | 3 | 61-J-MTC |
| F61-J51 | 6" (Flanged) | 4,000 | 1 | 3 | 61-J-KTC |
| F61-L51 | 8" (Flanged) | 6,000 | 1 | 3 | 61-L-KTC |
| **Vapor Removal Filters** | | | | | |
| F61-C20 | 2" (NPT) | 450 | 1 | n/a | 61-C-GAU |
| F61-D20 | 2-1/2" (NPT) | 625 | 1 | n/a | 61-D-HAU |
| F61-E20 | 3" (Flanged) | 1,000 | 1 | n/a | 61-E-JAU |
| F61-G20 | 4" (Flanged) | 2,000 | 1 | n/a | 61-G-LAU |
| F61-J20 | 6" (Flanged) | 4,500 | 1 | n/a | 61-J-KAU |
| F61-L20 | 8" (Flanged) | 6,000 | 1 | n/a | 61-L-KAU |

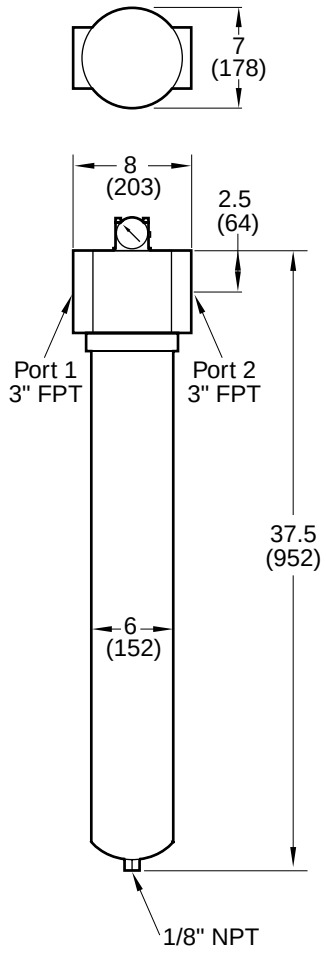
*** For complete F21 and F61 product numbering system see ALE-26-36**

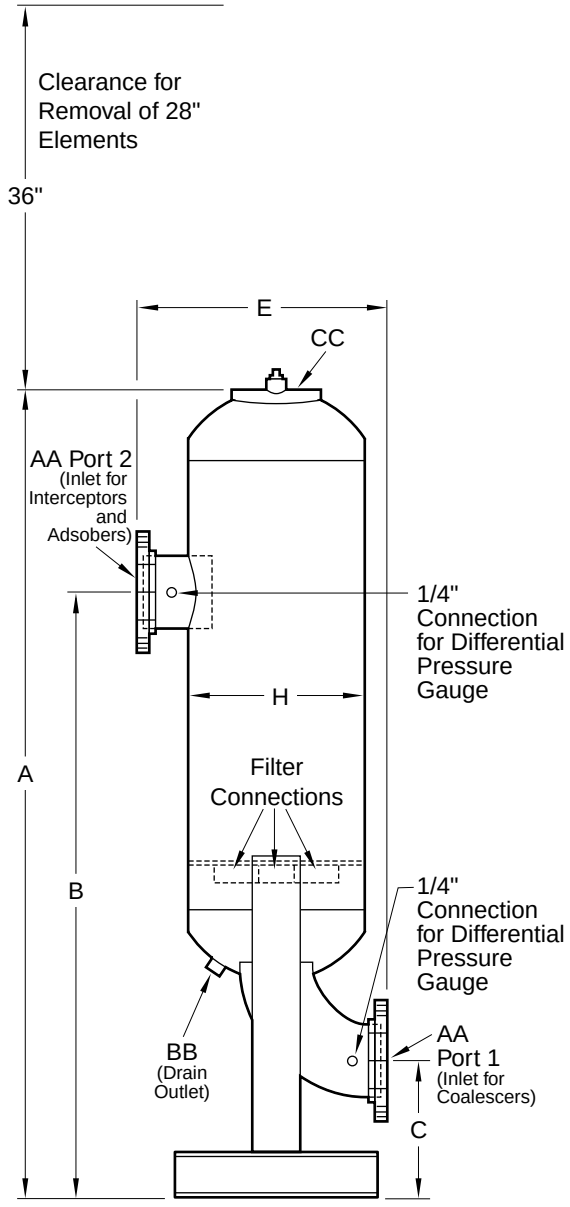



**F21/F61-01 Inches (mm)**

| Model | A | B | C | D | E | F | G | H | J | AA | BB | CC | DD | Wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F21/F61-F01 | 45.13 (1146) | 17.63 (448) | 36.50 (927) | 3.50 (89) | 4.50 (114) | 6.00 (152) | 5.50 (140) | 8.63 (219) | 41.00 (1041) | 3.00 (76) | 0.50 (13) | 0.25 (6) | 3.00 (76) | 175 |
| F21/F61-G01 | 44.38 (1127) | 21.75 (552) | 34.88 (886) | 4.00 (102) | 4.50 (114) | 6.38 (162) | 5.50 (140) | 12.75 (324) | 37.00 (940) | 4.00 (102) | 0.50 (13) | 0.25 (6) | 4.00 (102) | 300 |
| F21/F61-J01 | 56.25 (1429) | 23.75 (603) | 45.75 (1162) | 5.00 (127) | 5.50 (140) | 6.50 (165) | 7.00 (178) | 12.75 (324) | 51.00 (1295) | 6.00 (152) | 0.50 (13) | 0.25 (6) | 4.00 (102) | 350 |

**F21/F61-E01**




**F21/F61-51**
**Inches (mm)**

| Model | A | B | C | D | E | AA | BB | CC | Wt. |
|---|---|---|---|---|---|---|---|---|---|
| F21/F61-J51 | 75.00 (1905) | 55.56 (1411) | 12.63 (321) | 16.00 (406) | 22.00 (559) | 6.00 (152) | 0.50 (13) | 6 x 8 | 415 |
| F21/F61-L51 | 81.00 (2057) | 60.31 (1532) | 12.06 (306) | 20.00 (508) | 27.13 (689) | 8.00 (203) | 0.50 (13) | 11x15 | 670 |

# W07M

## W07M Series Membrane Dryer
## 1/4" Port Size

- **Removes water vapor from compressed air providing condensate-free air at the point of application.**
- **Provides dewpoint suppression up to 80°F (44°C) depending on air flow through the membrane**
- **Dewpoint suppression of 20°F (11°C) below the inlet temperature is suitable for most industrial applications.**
- **Utilizes the latest membrane technology to achieve optimal water vapor removal rates.**
- **W07 available for in-line installation only**
- **Easy installation, no power required**
- **Maintenance free with proper prefiltration**
- **Extremely low pressure drops**

**Ordering Information.** Models listed include NPT threads.

| Port Size | Model | Nominal Flow* scfm ($dm^3/s$) Outlet | Inlet | Differential Pressure ** psid (bar) | Weight lb (kg) |
|---|---|---|---|---|---|
| 1/4 | W07M-2AN-NNA | 2 (1.00) | 2.2 (1.06) | 0.40 (0.028) | 0.88 (0.39) |

* Maximum flow with 20°F (11°C) dewpoint suppression.

** Differential pressure at 100 psig (7 bar) inlet pressure at stated flows.

### Alternative Models

W ★ ★ M - ★ ★ N - N ★ ★

| Threads | Substitute |
|---|---|
| NPT | A |
| ISO G parallel | G |

### How to Size a Membrane Dryer

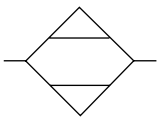
I. Enter the application requirements below:

- Maximum air flow required: _____
- Inlet pressure: _____
- Dewpoint suppression required:* _____

2. Select a chart by matching the maximum air flow required to the flow range in the chart title.
3. Follow the appropriate inlet pressure curve downward until it crosses the maximum air flow required. Trace a horizontal line to the *DEWPOINT SUPPRESSION* axis and note the degrees of suppression. Degrees Of Suppression: _____
4. If the degrees of suppression is less than the application requirement, check the membrane dryer with the next higher flow range. The inlet pressure of the smaller membrane dryer may also be increased to provide greater suppression.
5. If the degrees of suppression is greater than the application requirement, check the membrane dryer with next smaller maximum flow.

* Typically, a dewpoint suppression of 20°F (11°C) below the inlet temperature provides dry air suitable for most industrial applications.

### ISO Symbol

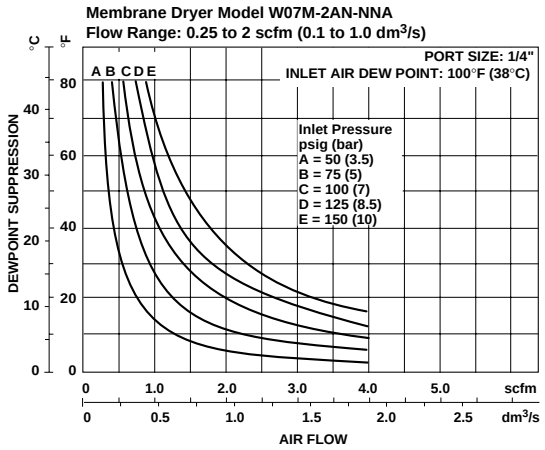


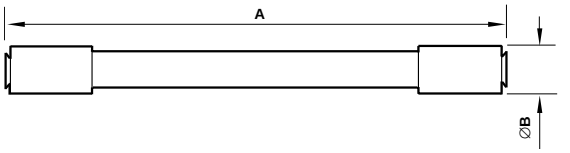
## Technical Data

Fluid: Compressed air, prefiltered to 0.01 micron and oil free (ISO 8573-1, 1.7.2 ) with noncycling supply.
Maximum pressure: 150 psig (10 bar)
Operating temperature: 0° to 175°F (-20° to 80°C)*
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Nominal flow at 100 psig (7 bar) inlet pressure, 100°F (38°C) inlet temperature, and a dew point suppression of 20°F (11°C). Flow demand affects dew point suppression.
Model W07M-2AN-NNA: 2 scfm (1.00 dm³/s)
Materials
Body and end caps: Anodized aluminum
Membrane: Polymeric materials

**NOTE -** Required prefiltration: General purpose filter (5 micron element) and an oil removal filter (0.01 micron particle removal) with equivalent pipe size and flow capacity equal to or greater than the membrane air dryer, (automatic drains advised).

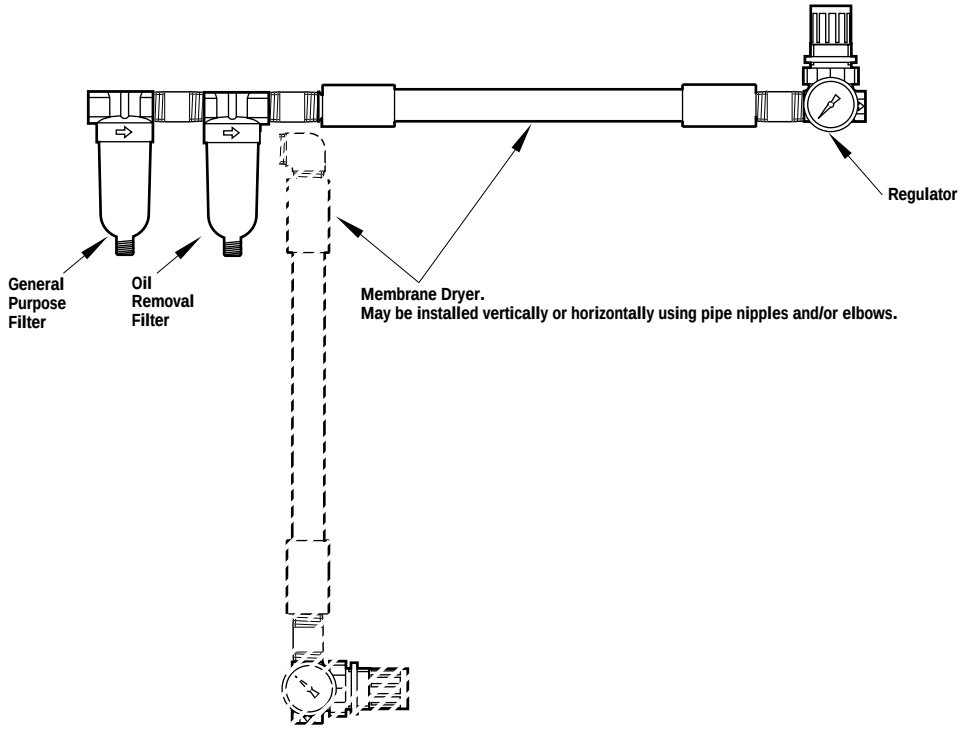
## Typical Dew Point Suppression Characteristics




| Model | Dimension A | Diameter B |
|---|---|---|
| W07M-2AN-NNA | 16.0 (406) | 1.18 (30) |

**Typical Installation.** W07 installation uses pipe fittings in conjunction with Miniature 07 Series products



# W72

## W72M Series Membrane Dryer
## 1/4" Port Size

- **Removes water vapor from compressed air providing condensate-free air at the point of application.**
- **Provides dewpoint suppression up to 80°F (44°C) depending on air flow through the membrane**
- **Dewpoint suppression of 20°F (11°C) or below the inlet temperature is suitable for most industrial applications.**
- **Utilizes the latest membrane technology to achieve optimal water vapor removal rates.**
- **W72 utilizes the Excelon Quikclamp™ design to provide in-line or modular installation with 72, 73 and 74 Series products.**
- **Easy installation, no power required**
- **Maintenance free with proper prefiltration**
- **Extremely low pressure drops**

**Ordering Information.** Models listed include ISO G parallel threads.

| Port Size | Model | Nominal Flow* scfm ($dm^3/s$) Outlet | Inlet | Differential Pressure ** psid (bar) | Weight lb (kg) |
|---|---|---|---|---|---|
| 1/4 | W72M-2AN-NNB | 5 (2.40) | 5.6 (2.65) | 0.32 (0.023) | 1.80 (0.82) |
| 1/4 | W72M-2AN-NNC | 10 (4.75) | 11.2 (5.27) | 0.90 (0.062) | 1.86 (0.84) |

* Maximum flow with 20°F (11°C) dewpoint suppression.

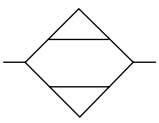
** Differential pressure at 100 psig (7 bar) inlet pressure at stated flows.

### Alternative Models

W ★ ★ M - ★ ★ N - N ★ ★

| Threads | Substitute |
|---|---|
| NPT | A |
| ISO G parallel | G |

### ISO Symbol



### How to Size a Membrane Dryer

I. Enter the application requirements below:

- Maximum air flow required: _____
- Inlet pressure: _____
- Dewpoint suppression required:* _____

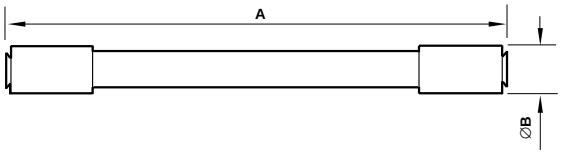
2. Select a chart by matching the maximum air flow required to the flow range in the chart title.
3. Follow the appropriate inlet pressure curve downward until it crosses the maximum air flow required. Trace a horizontal line to the *DEWPOINT SUPPRESSION* axis and note the degrees of suppression. Degrees Of Suppression: _____
4. If the degrees of suppression is less than the application requirement, check the membrane dryer with the next higher flow range. The inlet pressure of the smaller membrane dryer may also be increased to provide greater suppression.
5. If the degrees of suppression is greater than the application requirement, check the membrane dryer with next smaller maximum flow.

* Typically, a dewpoint suppression of 20°F (11°C) below the inlet temperature provides dry air suitable for most industrial applications.

## Technical Data

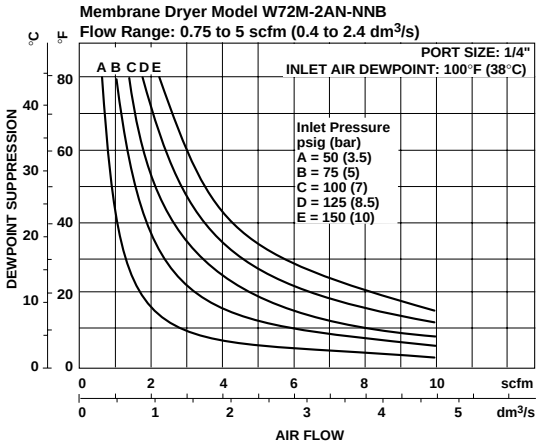
Fluid: Compressed air, prefiltered to 0.01 micron and oil free (ISO 8573-1, 1.7.2 ) with noncycling supply.
Maximum pressure: 150 psig (10 bar)
Operating temperature: 0 to 175°F (-20 to 80°C)*
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Nominal flow at 7 bar (100 psig) inlet pressure, 100°F (38°C) inlet temperature, and a dew point suppression of 20°F (11°C). Flow demand affects dew point suppression.
Model W72M-2AN-NNB: 5 scfm (2.40 dm³/s)
Model W72M-2AN-NNC: 10 scfm (4.75 dm³/s)
Materials
Body and end caps: Anodized aluminum
Membrane: Polymeric materials

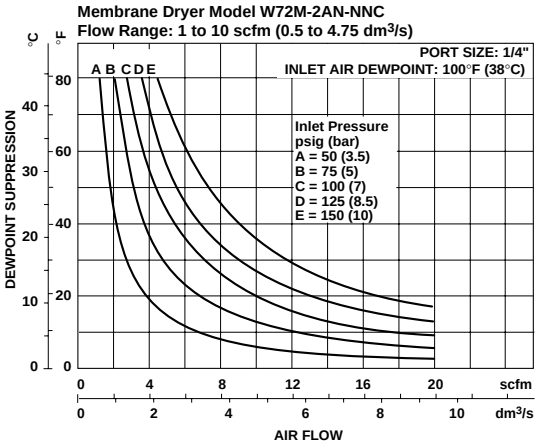
**NOTE -** Required prefiltration: General purpose filter (5 micron element) and an oil removal filter (0.01 micron particle removal) with equivalent pipe size and flow capacity equal to or greater than the membrane air dryer, (automatic drains advised).



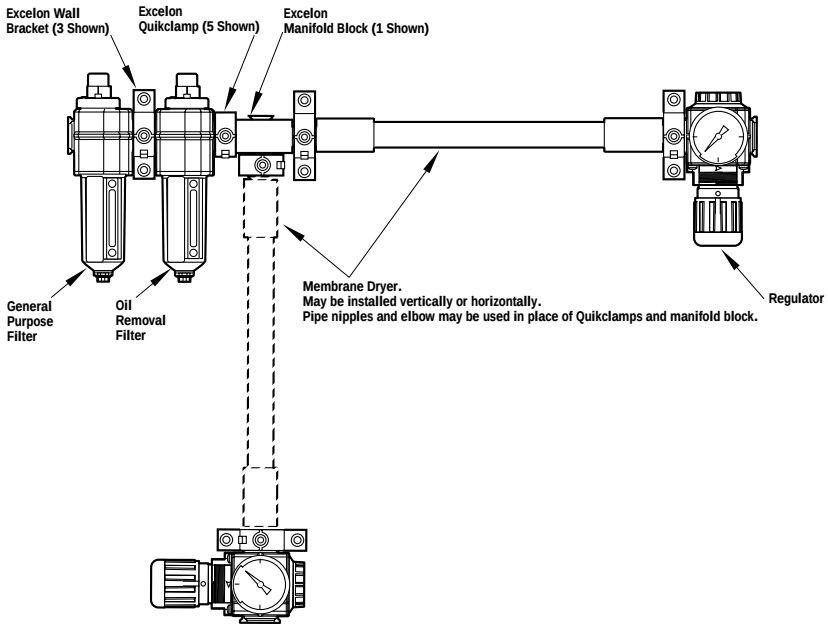

| Model | Dimension A | Diameter B |
|---|---|---|
| W72M-2AN-NNB | 18.0 (457) | 1.74 (44) |
| W72M-2AN-NNC | 19.0 (483) | 1.74 (44) |

## Typical Dew Point Suppression Characteristics




**Typical Installation.** W72 membrane dryer shown with Excelon products, Quikclamps and manifold block.



# W74M

**W74 Series Membrane Dryer**
**1/2" Port Size**

- **Removes water vapor from compressed air providing condensate-free air at the point of application.**
- **Provides dewpoint suppression up to 80°F (44°C) depending on air flow through the membrane**
- **Dewpoint suppression of 20°F (11°C) below the inlet temperature is suitable for most industrial applications.**
- **Utilizes the latest membrane technology to achieve optimal water vapor removal rates.**
- **W74 utilizes the Excelon Quikclamp™ design to provide in-line or modular installation with 72, 73 and 74 Series products.**
- **Easy installation, no power required**
- **Maintenance free with proper prefiltration**
- **Extremely low pressure drops**

**Ordering Information.** Models listed include ISO G parallel threads.

| Port Size | Model | Nominal Flow* scfm ($dm^3/s$) Outlet | Inlet | Differential Pressure ** psid (bar) | Weight lb (kg) |
|---|---|---|---|---|---|
| 1/2 | W74M-4AN-NND | 20 (9.50) | 22.2 (10.47) | 0.65 (.045) | 3.53 (1.60) |
| 1/2 | W74M-4AN-NNE | 30 (14.20) | 33.4 (15.76) | 1.35 (.093) | 3.94 (1.79) |

* Maximum flow with 20°F (11°C) dewpoint suppression.

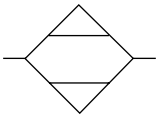
** Differential pressure at 100 psig (7 bar) inlet pressure at stated flows.

**Alternative Models**

W ★ ★ M - ★ ★ N - N ★ ★

| Threads | Substitute |
|---|---|
| NPT | A |
| ISO G parallel | G |

**ISO Symbol**



**How to Size a Membrane Dryer**

I. Enter the application requirements below:

- Maximum air flow required: _____
- Inlet pressure: _____
- Dewpoint suppression required:* _____

2. Select a chart by matching the maximum air flow required to the flow range in the chart title.

3. Follow the appropriate inlet pressure curve downward until it crosses the maximum air flow required. Trace a horizontal line to the *DEWPOINT SUPPRESSION* axis and note the degrees of suppression. Degrees Of Suppression: _____

4. If the degrees of suppression is less than the application requirement, check the membrane dryer with the next higher flow range. The inlet pressure of the smaller membrane dryer may also be increased to provide greater suppression.

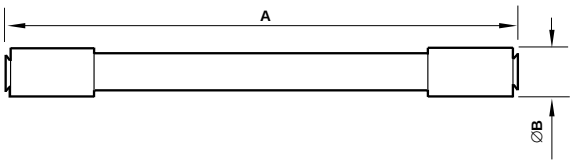
5. If the degrees of suppression is greater than the application requirement, check the membrane dryer with next smaller maximum flow.

* Typically, a dewpoint suppression of 20°F (11°C) below the inlet temperature provides dry air suitable for most industrial applications.

## Technical Data

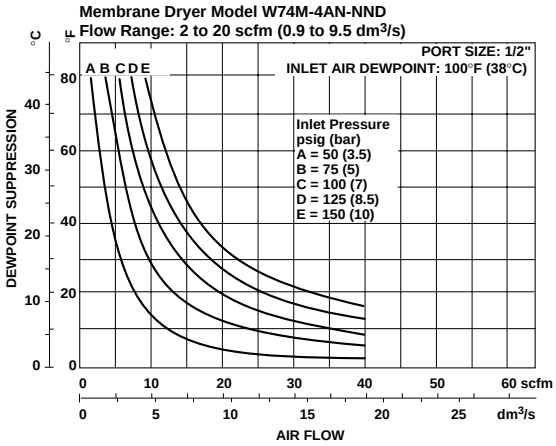
Fluid: Compressed air, prefiltered to 0,01 micron and oil free (ISO 8573-1, 1.7.2 ) with noncycling supply.
Maximum pressure: 150 psig (10 bar)
Operating temperature: 0 to 175°F (-20 to 80°C)*
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).
Nominal flow at 100 psig (7 bar) inlet pressure,100°F ( 38°C) inlet temperature, and a dew point suppression of 20°F (11°C). Flow demand affects dew point suppression.
Model W74M-4AN-NND: 20 scfm (9.50 $dm^3/s$)
Model W74M-4AN-NNE: 30 scfm (14.20 $dm^3/s$)
Materials
Body and end caps: Anodized aluminum
Membrane: Polymeric materials

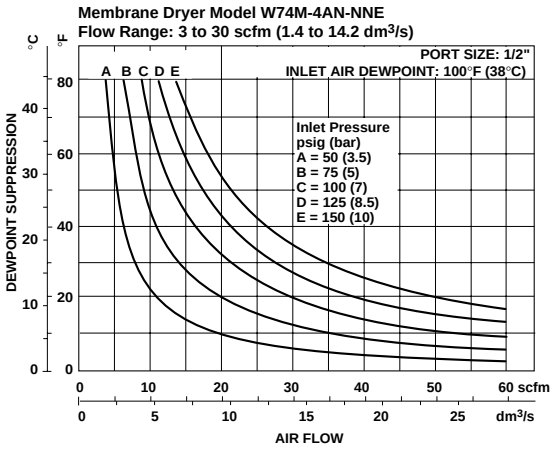
**NOTE -** Required prefiltration: General purpose filter (5 micron element) and an oil removal filter (0.01 micron particle removal) with equivalent pipe size and flow capacity equal to or greater than the membrane air dryer, (automatic drains advised).



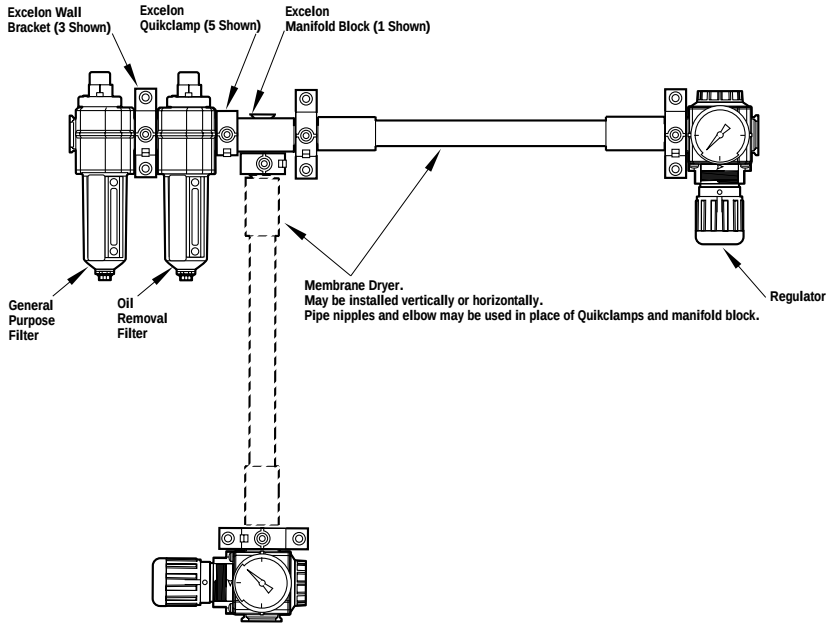

| Model | Dimension A | Diameter B |
|---|---|---|
| W74M-4AN-NND | 21.0 (533) | 2.49 (63) |
| W74M-4AN-NNE | 26.0 (660) | 2.49 (63) |

## Typical Dew Point Suppression Characteristics




**Typical Installation.** W74 membrane dryer shown with Excelon products, Quikclamps and manifold block.



# D11 Series Product Numbering System

| Sample Model Number | D | 1 | 1 | - | 1 | 0 | 0 | - | 0 | 0 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Position | 1 | 2 | 3 | - | 4 | 5 | 6 | - | 7 | 8 | 9 | 10 |

**1 Unit**

D = Compressed Air Dryer

**2 3 Series**

11 Series = Refrigerated, R134a

**4 Voltage**

1 = 115-60 Hz-1/110-50 Hz-1 (5 thru 150 scfm units)
2 = 230/220-60 Hz-1/200-50 Hz-1 (5 & 10, 40 thru 200 scfm units)
3 = 230/208-60 Hz-3 (200 scfm only)
4 = 460-60 Hz-3 (200 scfm only)
6 = 240/220-50 Hz-1 (5 thru 200 scfm units)

**5 Accessory Package**

0 = (5 thru 100 scfm units)
16" power cord
(130 thru 200 scfm units)
On/Off switch, power on and high temperature indicator lights, drain tube, panel mounted refrigerant suction pressure gauge, and electrical terminal block

1 = (5 thru 20 scfm units)
Panel mounted refrigerant suction pressure gauge, drain tube kit and 16" power cord

2 = (5 thru 100 scfm units)
Panel mounted refrigerant suction pressure gauge, 6' power cord, on/off switch, power on and high temperature indicator lights and drain tube kit

3 = (30 thru 100 scfm units)
Panel mounted refrigerant suction pressure gauge, 6' power cord, on/off switch, power on and high temperature indicator lights, outlet air pressure gauge, inlet air temperature gauge, and drain tube kit
(130 thru 200 scfm units)
Panel mounted refrigerant suction pressure gauge, electrical terminal block, on/off switch, power on and high temperature indicator lights, outlet air pressure gauge, inlet air temperature gauge and drain tube kit

4 = (130 thru 200 scfm units)
Panel mounted refrigerant suction pressure gauge, refrigerant discharge pressure gauge, electrical terminal block, on/off switch, power on and high temperature indicator lights, outlet air pressure gauge, inlet air temperature gauge, outlet air temperature gauge, inlet air pressure gauge and drain tube kit

**6 Cabinet Options**

0 = No side panels
1 = Side panels
2 = Ambient filter with no side panels
3 = Ambient filter with side panels

**7 8 9 10 Size**

0005 = 5 scfm
0010 = 10 scfm
0015 = 15 scfm
0020 = 20 scfm
0030 = 30 scfm
0040 = 40 scfm
0050 = 50 scfm
0075 = 75 scfm
0100 = 100 scfm
0130 = 130 scfm
0150 = 150 scfm
0200 = 200 scfm

# D10 Series Product Numbering System

Sample Model Number → D 1 0 - 2 0 0 - 0 2 5 0

Position → 1 2 3 - 4 5 6 - 7 8 9 10

**1 Unit**

D = Compressed Air Dryer

**2 3 Series**

10 Series = Refrigerated, R22

**4 Voltage**

2 = 230/208-60 Hz-1
3 = 230/208-60 Hz-3
4 = 460-60 Hz-3
5 = 600/550-60 Hz-3
6 = 240/220-50 Hz-1
7 = 240/220-50 Hz-3
8 = 420/380-50 Hz-3

**5 Accessory Package**

0 = (250 thru 500 scfm units)
On/Off switch (control circuit), power on light, refrigerant suction pressure gauge, air inlet temperature gauge and air outlet pressure gauge
(600 scfm and larger units)
On/off switch (control circuit), power on light, refrigerant suction pressure gauge, refrigerant discharge pressure gauge, air inlet and outlet temperature gauges, and air inlet and outlet pressure gauges

1 = (250 thru 500 scfm units)
On/off switch (control circuit),power on light, refrigerant suction pressure gauge, refrigerant discharge pressure gauge, air inlet and outlet pressure gauges, and air inlet and outlet temperature gauges

2 = On/off switch (control circuit),power on light, refrigerant suction pressure gauge, refrigerant discharge pressure gauge, air inlet and outlet pressure gauges, air inlet and outlet temperature gauges, and alarm bell

3 = On/off switch (control circuit),power on light, refrigerant suction pressure gauge, refrigerant discharge pressure gauge, air inlet and outlet pressure gauges, and air inlet and outlet temperature gauges,and flow meter

4 = On/off switch (control circuit),power on light, refrigerant suction pressure gauge, refrigerant discharge pressure gauge, air inlet and outlet pressure gauges, air inlet and outlet temperature gauges, alarm bell and flow meter

**6 Options**

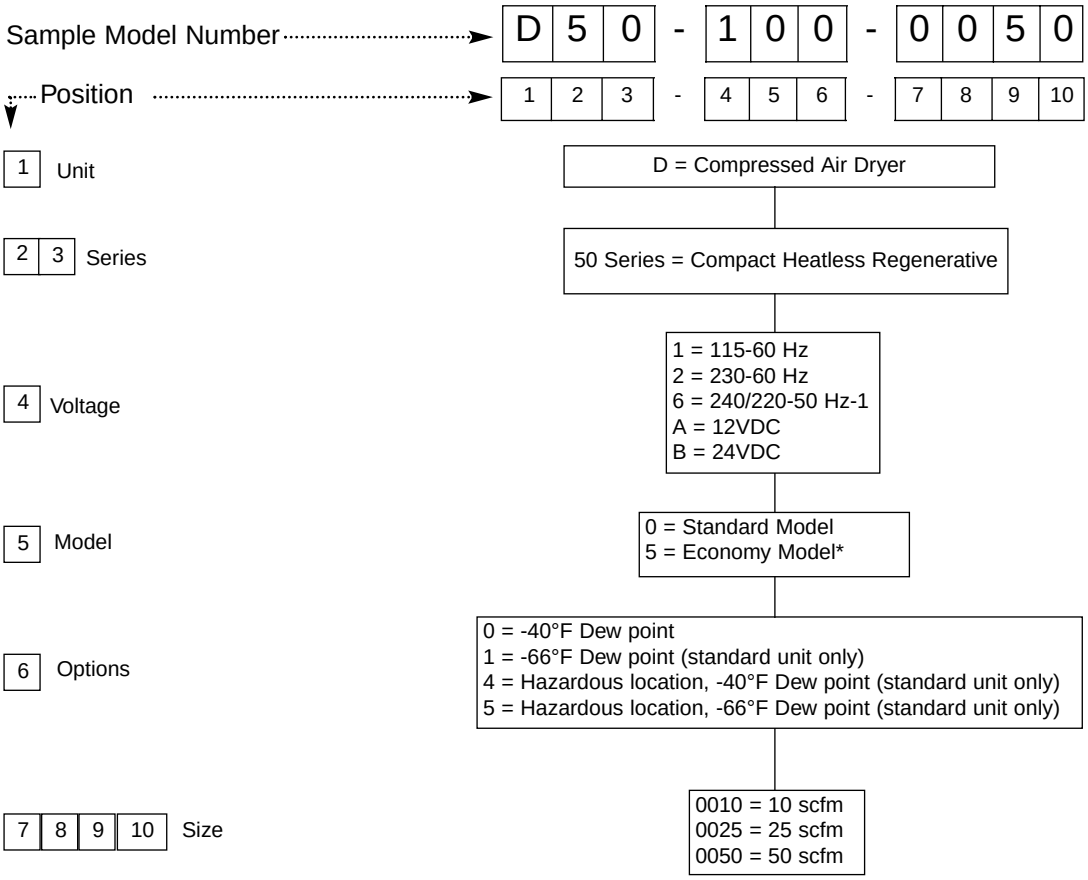
0 = Air-cooled
1 = Water-cooled
2 = Air-cooled with ambient filters

**7 8 9 10 Size**

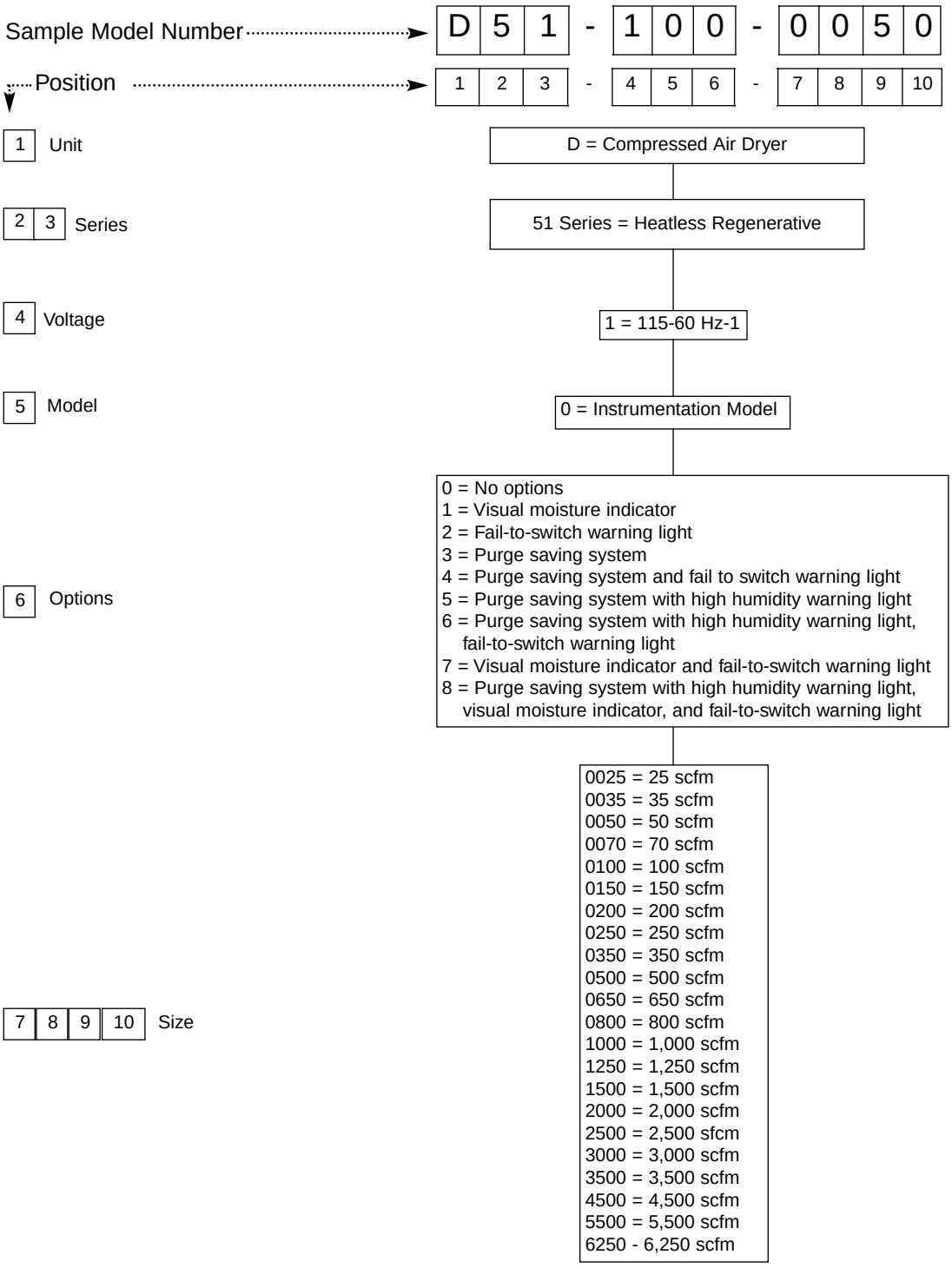
0250 = 250 scfm
0325 = 325 scfm
0400 = 400 scfm
0500 = 500 scfm
0600 = 600 scfm
0800 = 800 scfm
1000 = 1000 scfm
1250 = 1250 scfm
1500 = 1500 scfm*
1750 = 1750 scfm
2000 = 2000 scfm
2500 = 2500 scfm
3200 = 3200 scfm
4000 = 4000 scfm
5000 = 5000 scfm
6250 = 6250 scfm
7500 = 7500 scfm

* Not available as a water-cooled unit

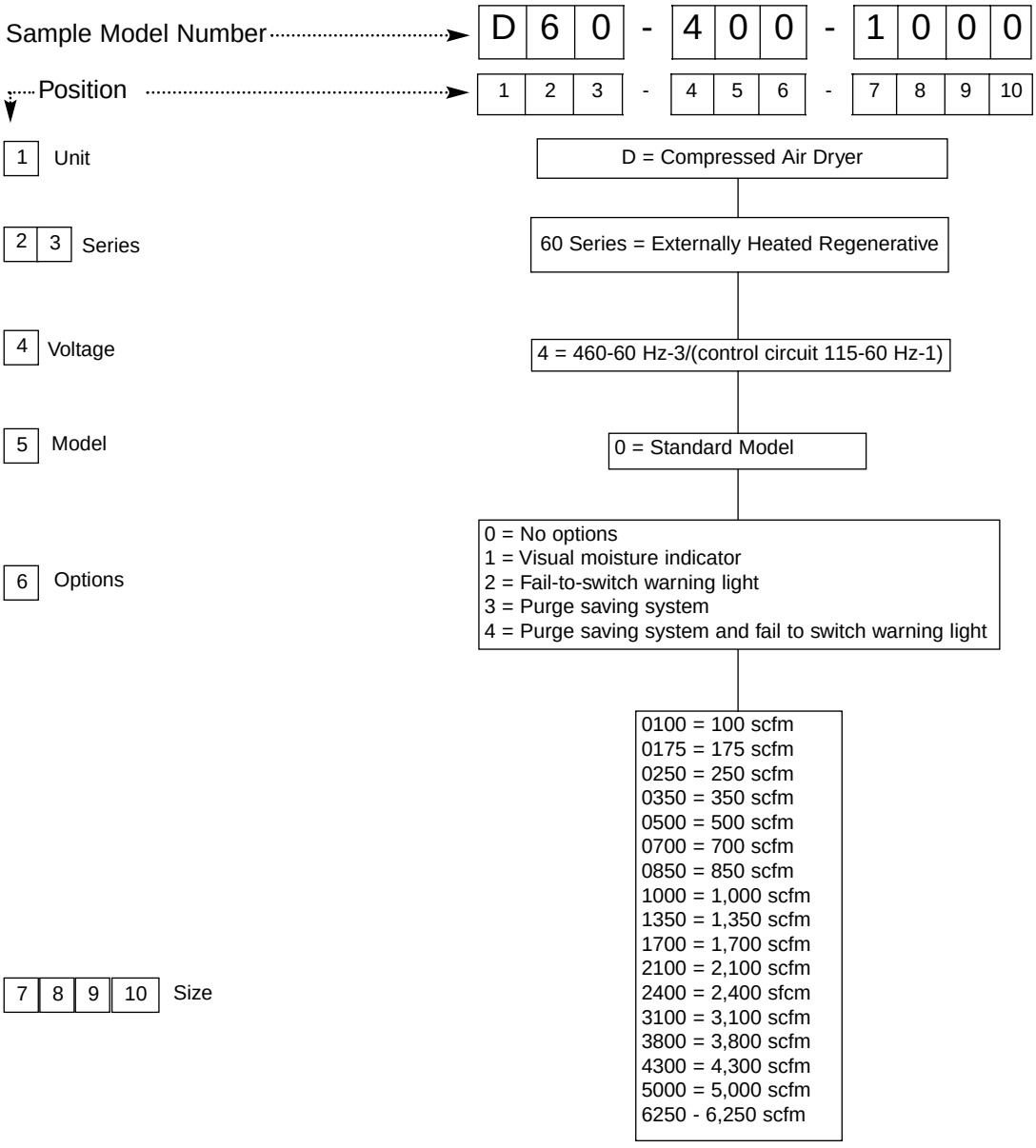
# D50 Series Product Numbering System

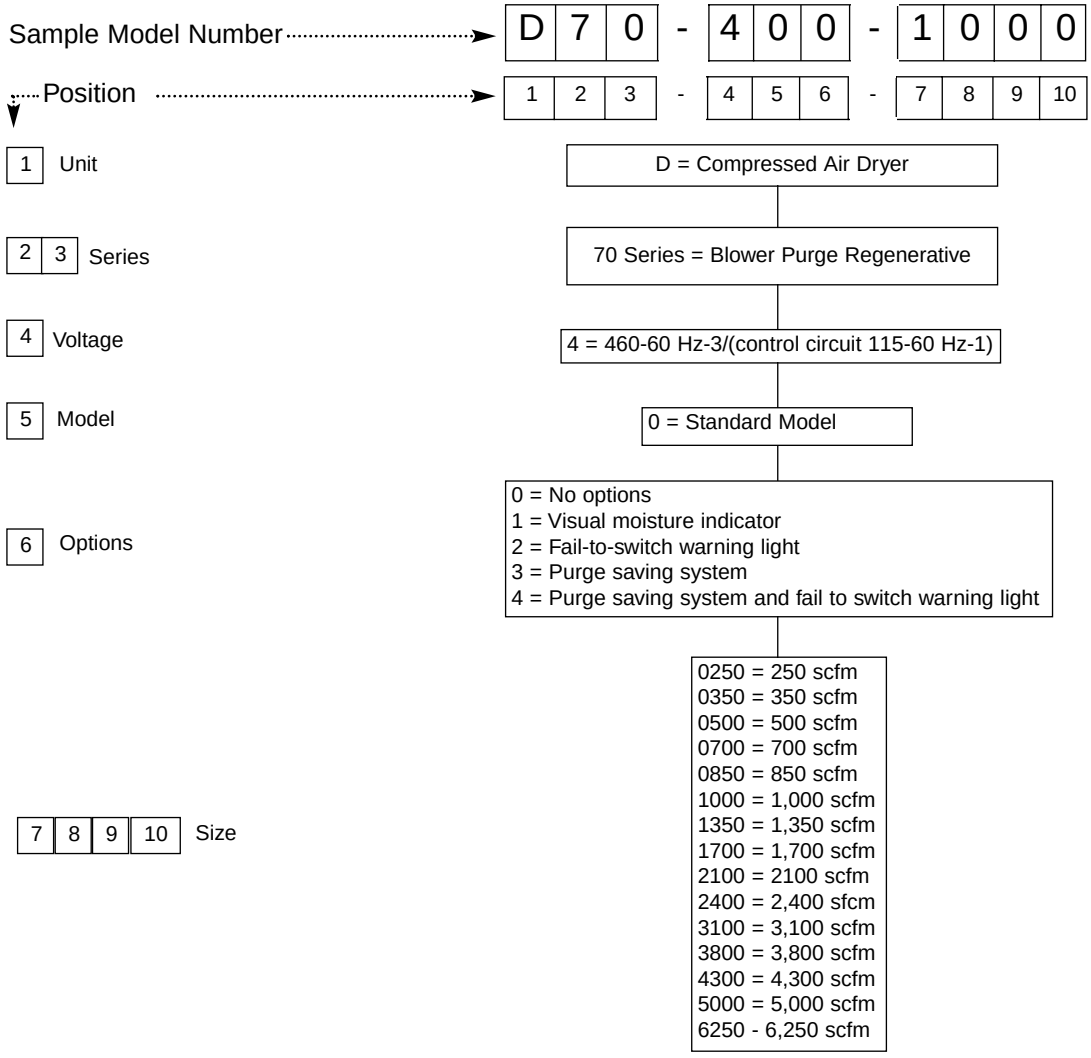


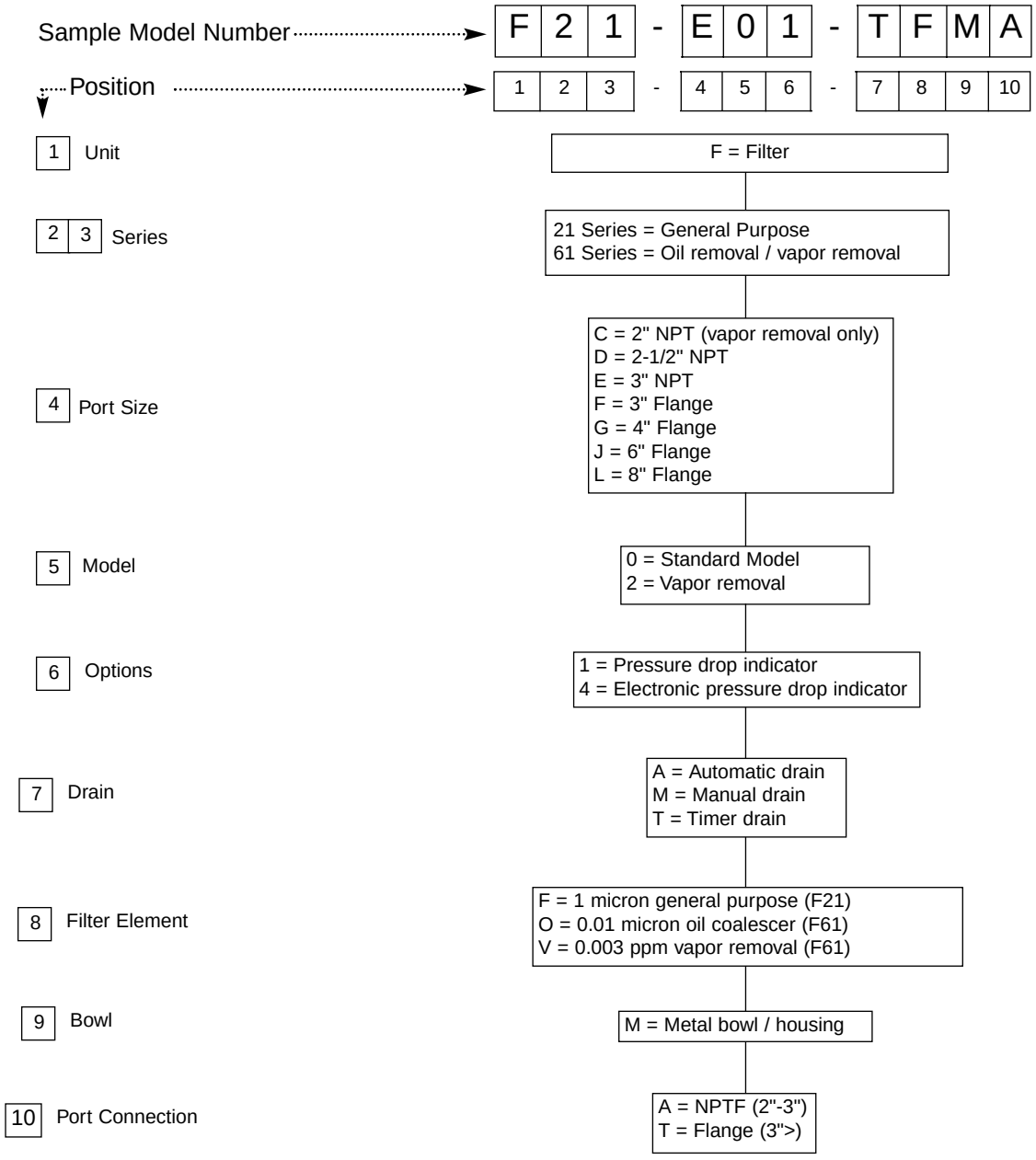

* Economy model can only be ordered with option 0 in the 6th position of model code


Sample Model Number
D 5 1 - 1 0 0 - 0 0 5 0
Position
1 2 3 - 4 5 6 - 7 8 9 10
1 Unit
D = Compressed Air Dryer
2 3 Series
51 Series = Heatless Regenerative
4 Voltage
1 = 115-60 Hz-1
5 Model
0 = Instrumentation Model
6 Options
0 = No options
1 = Visual moisture indicator
2 = Fail-to-switch warning light
3 = Purge saving system
4 = Purge saving system and fail to switch warning light
5 = Purge saving system with high humidity warning light
6 = Purge saving system with high humidity warning light, fail-to-switch warning light
7 = Visual moisture indicator and fail-to-switch warning light
8 = Purge saving system with high humidity warning light, visual moisture indicator, and fail-to-switch warning light
7 8 9 10 Size
0025 = 25 scfm
0035 = 35 scfm
0050 = 50 scfm
0070 = 70 scfm
0100 = 100 scfm
0150 = 150 scfm
0200 = 200 scfm
0250 = 250 scfm
0350 = 350 scfm
0500 = 500 scfm
0650 = 650 scfm
0800 = 800 scfm
1000 = 1,000 scfm
1250 = 1,250 scfm
1500 = 1,500 scfm
2000 = 2,000 scfm
2500 = 2,500 sfcm
3000 = 3,000 scfm
3500 = 3,500 scfm
4500 = 4,500 scfm
5500 = 5,500 scfm
6250 - 6,250 scfm

# D60 Series Product Numbering System




Sample Model Number
D 7 0 - 4 0 0 - 1 0 0 0
Position
1 2 3 - 4 5 6 - 7 8 9 10
1 Unit
D = Compressed Air Dryer
2 3 Series
70 Series = Blower Purge Regenerative
4 Voltage
4 = 460-60 Hz-3/(control circuit 115-60 Hz-1)
5 Model
0 = Standard Model
6 Options
0 = No options
1 = Visual moisture indicator
2 = Fail-to-switch warning light
3 = Purge saving system
4 = Purge saving system and fail to switch warning light
7 8 9 10 Size
0250 = 250 scfm
0350 = 350 scfm
0500 = 500 scfm
0700 = 700 scfm
0850 = 850 scfm
1000 = 1,000 scfm
1350 = 1,350 scfm
1700 = 1,700 scfm
2100 = 2100 scfm
2400 = 2,400 sfcm
3100 = 3,100 scfm
3800 = 3,800 scfm
4300 = 4,300 scfm
5000 = 5,000 scfm
6250 - 6,250 scfm


Sample Model Number
F 2 1 - E 0 1 - T F M A
Position
1 2 3 - 4 5 6 - 7 8 9 10
1 Unit
F = Filter
2 3 Series
21 Series = General Purpose
61 Series = Oil removal / vapor removal
4 Port Size
C = 2" NPT (vapor removal only)
D = 2-1/2" NPT
E = 3" NPT
F = 3" Flange
G = 4" Flange
J = 6" Flange
L = 8" Flange
5 Model
0 = Standard Model
2 = Vapor removal
6 Options
1 = Pressure drop indicator
4 = Electronic pressure drop indicator
7 Drain
A = Automatic drain
M = Manual drain
T = Timer drain
8 Filter Element
F = 1 micron general purpose (F21)
O = 0.01 micron oil coalescer (F61)
V = 0.003 ppm vapor removal (F61)
9 Bowl
M = Metal bowl / housing
10 Port Connection
A = NPTF (2"-3")
T = Flange (3">)

## Selecting a Refrigerated Air Dryer

**Identify the following operational conditions:**

1. Air flow requirement of your system in scfm: _____
   - For dryers servicing a complete air system, multiply the compressor horsepower by four to obtain an approximation of the compressor flow capacity in scfm.
   - For dryers servicing a branch line, determine the maximum flow for that branch.
2. Dryer inlet air pressure in psig: _____ 100 psig*
   - Best results are obtained with a high inlet air pressure. Do not exceed the maximum inlet air pressure listed under **Specifications**.
3. Dryer inlet air temperature in °F: _____ 100 psig*
   - Bests results are obtained with a low inlet air temperature. Do not exceed maximum temperature listed under **Specifications**.
4. Ambient air temperature at dryer in °F: _____ 100 psig*
   - Ambient temperature must be within the range listed under **Specifications**.
5. Minimum temperature to which downstream piping will be exposed in °F: _____
   Pressure dewpoint required in °F: _____
   - The lowest downstream temperature determines dewpoint requirement. A 35°F pressure dewpoint is the lowest practical dewpoint for refrigerant dryers. In some cases a 50°F pressure dewpoint may be acceptable, resulting in greater flow capacity and cost savings. The dewpoint chosen should be approximately 10°F (6°C) below the lowest downstream temperature.
6. Power requirements: Volts _____ Cycle _____ Phase _____
7. Air or water-cooled model: _____
   - Use water-cooled model (available in 400 scfm size and larger) when ambient temperature is above 110°F (43°C).

If your dryer operational conditions for Items **2**, **3**, and **4** are the same as the number in the shaded box* on the same line you need only determine which nominal capacity will meet your pressure dewpoint requirement, Item **5**. See **Flow Specifications** ALE-26-38.

Operational conditions other than Standard Operating Conditions*, require use of the Dryer Sizing Formula to determine the appropriate dryer size for the application.

*Standard Operating Conditions, per ANSI/B93.45M, are used to obtain the nominal flow rating for Norgren dryers. These conditions are fully detailed under **Flow Specifications** ALE-26-38.

### Converting cfm at stated Pressure to scfm

Q = Air flow in CFM at stated P pressure
P - Pressure in psig
$P_A$ = P pressure converted to pressure in psia
$Q_A$ = Flow in scfm

$$Q_A = Q \left[\frac{PA}{14.7\ psia}\right]$$

**Example:**

Flow = 23 cfm at 125 psig (at 500' above sea level)
$P_A$ = 125 psig /14.4** = 139.4
**See correction table at right for atmospheric pressure for your elevation

$$Q_A = 23\ cfm \left[\frac{139.4\ psia}{14.7\ psia}\right]\ QA = 218.10\ scfm\ or\ 218\ scfm$$

### Finding Pressure Drops for Non-standard Flows

Use the following formula to find the approximate pressure drop for flows not listed in the flow specifications table

$$\Delta P \approx \left[\frac{QR}{Q_S}\right]^2 \times \frac{114.7\ psia}{P} \times \Delta P_S$$

Where:
$\Delta P$ = Calculated pressure drop
$Q_R$ = Actual flow
$Q_S$ = Air flow at 35°F pressure dew point rating
P = Actual supply pressure in psia
$\Delta P_S$ = Pressure drop at rated conditions and flow

## Dryer Sizing

If conditions are other than standard operating conditions*, use the following formula to determine dryer air flow rating ($Q_R$) required for your system. ( $Q_R$ = _____ scfm)

$$Q_R = Q_A(K1)(K2)$$

Where:
$Q_R$ = Air flow rating required for dryer
$Q_A$ = Actual flow requirement – Item **1**
K1 = Correction factor for inlet temperature and operating pressure (Chart 1)
K2 = Correction factor for ambient temperature (Chart 2)

**Example**

Given the following conditions, determine the dryer air flow rating required.

1. Air flow requirement of system: 120 scfm
2. Dryer inlet air pressure: 150 psig
3. Dryer inlet air temperature: 80°F
4. Ambient air temperature at dryer: 110°F
5. Minimum downstream temperature: 50°F
6. Power requirements: 115V, 60 cycle, 1 phase
7. Air or water cooled: Air

**Solution**

$$Q_R = Q_A\ (K1)(K2)$$
$$Q_R = 120\ scfm \times .62\ (Chart\ 1) \times 1.11\ (Chart\ 2)$$
$$Q_R = 82.6\ scfm$$

A 100 scfm D11 dryer will fit this application.

**Chart 1. Inlet Temperature F° vs. Inlet Pressure Correction Factor**

| Pressure psig | 60° | 80° | 100° | 120° | 130° |
|---|---|---|---|---|---|
| | Correction Factors K1 | | | | |
| 50 | 0.43 | 0.77 | 1.20 | 1.80 | 2.23 |
| 75 | 0.39 | 0.70 | 1.07 | 1.56 | 1.89 |
| 100 | 0.37 | 0.66 | 1.00 | 1.43 | 1.71 |
| 125 | 0.36 | 0.63 | 0.95 | 1.34 | 1.60 |
| 150 | 0.35 | 0.62 | 0.92 | 1.28 | 1.51 |
| 175 | 0.35 | 0.60 | 0.90 | 1.24 | 1.46 |
| 200 | 0.34 | 0.60 | 0.88 | 1.21 | 1.41 |

**Chart 2 Ambient Correction Factor For 35°F (2°C) Pressure Dewpoint**

| Ambient Temperature | Correction Factor K2 |
|---|---|
| 60°F | 0.66 |
| 70°F | 0.73 |
| 80°F | 0.81 |
| 90°F | 0.90 |
| 100°F | 1.00 |
| 110°F | 1.11 |

**Atmospheric Pressure at Selected Altitudes**

| Alt. above sea level ft | Atmospheric Pressure (psi) |
|---|---|
| 0 | 14.7 |
| 500 | 14.4 |
| 1500 | 14.2 |
| 2000 | 13.9 |
| 2500 | 13.4 |
| 3000 | 13.1 |
| 3500 | 12.9 |
| 4000 | 12.7 |
| 4500 | 12.5 |
| 5000 | 12.2 |

# Refrigerated Dryer Specifications

**D11 Series Specifications**

Refrigerant: R134a
Maximum Inlet Air Pressure: 250 psig (17.3 bar)
Maximum Inlet Air Temp: 130°F (54°C)
Maximum Ambient Temp: 110°F (43°C)
Minimum Ambient Temp: 5 thru 20 scfm: 50°F (10°C), 30 thru 200 scfm: 40°F (4°C).

**D11 Flow Specifications**

Air Flow Rating† at 100 psig (6.9 bar)
Outlet Dewpoint in scfm (dm3/s)

| Nominal Capacity | For Outlet Pressure Dew Point of: 35°F to 42°F (2°C to 5°C) | 50° (10°C) | Typical Pressure Drop* (∆P) psig (bar) |
|---|---|---|---|
| 5 | 5 (2.4) | 10 (4.7) | 1.0 (0.07) |
| 10 scfm | 10 (4.7) | 15 (7.1) | 3.8 (0.26) |
| 15 scfm | 15 (7.1) | 19 (9.0) | 0.7 (0.05) |
| 20 scfm | 20 (9.4) | 24 (11.3) | 1.03 (0.07) |
| 30 scfm | 30 (14.2) | 37 (17.5) | 1.4 (0.10) |
| 40 scfm | 40 (18.9) | 50 (23.6) | 2.4 (0.17) |
| 50 scfm | 50 (23.6) | 68 (32.0) | 3.5 (0.24) |
| 75 scfm | 75 (35.4) | 96 (45.3) | 3.5 (0.24) |
| 100 scfm | 100 (47.2) | 125 (59.0) | 2.7 (0.19) |
| 130 scfm | 130 (61.4) | 163 (76.9) | 2.8 (0.19) |
| 150 scfm | 150 (70.8) | 188 (88.7) | 3.0 (0.21) |
| 200 scfm | 200 (94.4) | 250 (118.0)** | 4.3 (0.30) |
| 250 scfm | 150 (118.0) | 313 (147.7)* | 4.4 (0.30) |
| 325 scfm | 325 (153.0) | 400 (192.0)** | 4.3 (0.30) |

† Air flow ratings are determined at the conditions listed below. The test procedures used for all dryers for 60 Hz service comply with ANSI/B93.45M.

*Typical pressure drops listed are at air flow rating conditions for 35°F out pressure dewpoint. For flow rating conditions for 50°F outlet pressure dewpoint, pressure drops will be higher.

** At 7.3 psid

**D11 Standard Operating Conditions**

Condition

| | |
|---|---|
| Electrical Input | 60 Hz |
| Inlet Air Pressure | 100 psig (6.9 bar) |
| Inlet Air Temp | 100°F (38°C) |
| Ambient Air Temp | 100°F (38°C) |

For 50 Hz operation apply the following conditions to achieve the above stated Air Flow Ratings

Condition

| | |
|---|---|
| Electrical Input | 50 Hz |
| Inlet Air Pressure | 100 psig (6.9 bar) |
| Inlet AIr Temp | 90°F (32°C) |
| Ambient Air Temp | 85°F (29°C) |

**D10 Series Specifications**

Refrigerant: R22
Maximum Inlet Air Pressure: 150 psig (10.3 bar)
Maximum Inlet Air Temp: 120°F (49°C)
Maximum Ambient Temp: 110°F (43°C)
Minimum Ambient Temp: 40°F (4°C)

**D10 Flow Specifications**

Air Flow Rating† at 100 psig (6.9 bar)
Outlet Dewpoint in scfm (dm3/s)

| Nominal Capacity | For Outlet Pressure Dew Point of: 35°F to 42°F (2°C to 5°C) | 50°F (10°C) | Typical Pressure Drop* (∆P) psig (bar) |
|---|---|---|---|
| 400 scfm | 400 (189) | 500 (236) | 1.5 (0.104) |
| 500 scfm | 500 (236) | 620 (293) | 2.4 (0.166) |
| 600 scfm | 600 (283) | 750 (354) | 1.1 (0.076) |
| 800 scfm | 800 (378) | 1000 (472) | 2.0 (0.138) |
| 1000 scfm | 1000 (472) | 1250 (590) | 3.7 (0.255) |
| 1200 scfm | 1200 (566) | 1450 (684) | 1.6 (0.110) |
| 1400 scfm | 1400 (661) | 1700 (802) | 2.0 (0.138) |
| 1600 scfm | 1600 (755) | 1900 (897) | 2.5 (0.173) |
| 1800 scfm | 1800 (850) | 2150 (1015) | 3.0 (0.207) |
| 2000 scfm | 2000 (944) | 2400 (1133) | 3.6 (0.248) |

† Air flow ratings are determined at the conditions listed below. The test procedures used for all dryers for 60 Hz service comply with ANSI/B93.45M.

*Typical pressure drops listed are at air flow rating conditions for 35°F out pressure dewpoint. For flow rating conditions for 50°F outlet pressure dewpoint, pressure drops will be higher.

Section 27

# Norgren Pneumatic Smart FRL

# Air preparation assemblies with system diagnostics

**Air preparation assemblies capable of monitoring their own performance advising of any problems via a Fieldbus link**

**Can help reduce energy, maintenance and purchasing costs**

**Can help minimize downtimes and 'end of line' product rejection**

**Can increase productivity**

## Technical data

Fluid:
Compressed air

Maximum operating pressure:
150 psig (10 bar) standard
250 psig (17 bar) optional

Ambient temperature:
0° to +150°F (-20°C to +65°C)
Air supply must be dry enough to avoid ice formation at temperatures below 36°F (2°C)

Fieldbus protocol:
AS-i

Configuration:
3 inputs
1 output

Mounting:
Modular within either Excelon 73 or 74 series

## Materials

Casing: ABS

Membrane keypad: plastic

Connections: steel

Gaskets: nitrile

## Ordering information

1. Consider the functions and feedback you require.
2. Consider the modular product family best suited to your application -
   - Excelon 73
   - Excelon 74
3. Consult the 'Order Tables' on page ALE-29-4 to specify your complete assembly
   - Indicate your product requirements in the boxes provided
4. Fax your enquiry or order through to your local Norgren sales outlet

## A 'smart frl' can perform the following functions -

- Can advise when filter element replacement is necessary
- Can advise when replenishment of lubricant is necessary
- Can advise of excessive or insufficient line pressures via an integral pressure 'window'
- Can operate an external device, e.g. a soft start/dump valve
- Can advise when your next scheduled maintenance is due
- Can record the highest and lowest line pressures seen
- Can record and advise the duration of service
- Can display pressure data in one of four units – psi, bar, Mpa or $kg/cm^2$
- Can display data in one of five languages - English, French, German, Spanish or Italian

## What can a 'smart frl' help you to do?

| | How? | Which can result in ... |
|---|---|---|
| Reduce your energy costs | Highlight excessive pressure drops<br>Highlight potential losses due to friction<br>Highlight excessive line pressure | Increased compressed air generation costs |
| Reduce your purchasing costs | Highlight frictional losses<br>Highlight excessive line pressure | Excessive wear of moving parts/components |
| Prolong the life of products downstream of your FRL | Highlight frictional losses<br>Highlight excessive line pressure | Excessive wear of moving parts/components |
| Minimize your product rejection rate | Highlight excessive pressure drops<br>Highlight potential losses due to friction<br>Highlight insufficient line pressure<br>Highlight excessive line pressure | Insufficient actuator force<br>Sluggish or erratic actuator movement<br>Insufficient actuator force<br>Excessive actuator force |
| Minimize the risk to an operator's health | Highlight excessive pressure drops | Oil carryover |
| Minimize your downtimes | Prolong the life of products downstream of your FRL<br>Highlight problems prior to a 'critical' point being reached | |
| Increase productivity | Minimise downtimes<br>Minimise product rejection rates | |

## Order Table

Consider the functions you require and specify an assembly to suit. Optional port sizes are available - please refer to the individual product sections in our 'Pneumatics' catalogue for further details.

### Excelon 73 & 74

| Component | Product family | Description | Model | |
|---|---|---|---|---|
| smart module | Excelon 73 & 74 | For 145 psi (10 bar) maximum pressure | A74G-NNE-1NN | ❑ |
| | | For 247 psi (17 bar) maximum pressure | A74G-NNF-1NN | ❑ |
| General purpose filter* | Excelon 73 | 40 µm element; transparent polycarbonate bowl 3/8 NPT | F73G-3AE-AT3 | ❑ |
| | | 40 µm element; metal bowl 3/8 NPT | F73G-3AE-AD3 | ❑ |
| | Excelon 74 | 40 µm element; guarded polycarbonate bowl 1/2 NPT | F74G-4AE-AP3 | ❑ |
| | | 40 µm element; metal bowl 1/2 NPT | F74G-4AE-AD3 | ❑ |
| Oil removal filter* | Excelon 73 | Transparent polycarbonate bowl 3/8 NPT | F73C-3AE-AT0 | ❑ |
| | | Metal bowl 3/8 NPT | F73C-3AE-AD0 | ❑ |
| | Excelon 74 | Guarded polycarbonate bowl 1/2 NPT | F74H-4AE-AP0 | ❑ |
| | | Metal bowl 1/2 NPT | F74H-4AE-AD0 | ❑ |
| Pressure regulator | Excelon 73 | Relieving; 4-145 psi (0.3-10 bar) pressure adjustment range 3/8 NPT | R73G-3AK-RMN | ❑ |
| | | Relieving; 10-247 psi (0.7-17 bar) pressure adjustment range 3/8 NPT | R73G-3AT-RSN | ❑ |
| | Excelon 74 | Relieving; 4-145 psi (0.3-10 bar) pressure adjustment range 1/2 NPT | R74G-4AK-RMN | ❑ |
| | | Relieving; 10-247 psi (0.7-17 bar) pressure adjustment range 1/2 NPT | R74G-4AT-RSN | ❑ |
| Lubricator* | Excelon 73 | Micro-fog; 0.1 qt (0.1 liter) transparent polycarbonate bowl 3/8 NPT | L73M-3AP-ETL | ❑ |
| | | Micro-fog; 0.1 qt (0.1 liter) metal bowl 3/8 NPT | L73M-3AP-EDL | ❑ |
| | Excelon 74 | Micro-fog; 0.2 qt (0.2 liter) guarded polycarbonate bowl 1/2 NPT | L74M-4AP-EPL | ❑ |
| | | Micro-fog; 0.2 qt (0.2 liter) metal bowl 1/2 NPT | L74M-4AP-EDL | ❑ |
| Soft start/dump valve | Excelon 73 & 74 | Solenoid operated; 24V dc no plug & cable gland 3/8 NPT | P74F-3AC-PFN | ❑ |
| | | Solenoid operated; 24V dc with plug & cable gland 3/8 NPT | P74F-3AC-PFA | ❑ |
| | | Solenoid operated; 24V dc no plug & cable gland 1/2 NPT | P74F-4AC-PFN | ❑ |
| | | Solenoid operated; 24V dc with plug & cable gland 1/2 NPT | P74F-4AC-PFA | ❑ |

* All filters are fitted with electrical service life indicators and full automatic drains; all lubricators are fitted with lubricant liquid level switches.

### Excelon accessories and connectors

| Component | Product family | Description | Model | |
|---|---|---|---|---|
| Shut-off valve | Excelon 73 | 3/8; 3 port / 2 position | T73T-3AA-P1N | ❑ |
| | Excelon 74 | 1/2; 3 port / 2 position | T74T-4AA-P1N | ❑ |
| Adjustable pressure switch | Excelon 73 & 74 | Adjustable from 28 to 140 psi (2 to 10 bar); 3 x 1/4 auxiliary air outlets | 4346-52 | ❑ |
| Porting block | Excelon 73 & 74 | 3 x 1/4 NPT auxiliary air outlets | 4316-50 | ❑ |
| Tamper resistant cover | Excelon 73 | Tamper resistant cover and seal wire | 4455-51 | ❑ |
| | Excelon 74 | Tamper resistant cover | 4355-50 | ❑ |
| | | Seal wire | 2117-01 | ❑ |
| To join two Excelon products or accessories together | Excelon 73 & 74 | Quikclamp | 4314-51 | ❑ |
| | | Quikclamp with wall mount bracket | 4314-52 | ❑ |
| If your assembly features a pressure switch or smart module at the end, this adapter will provide a threaded end connection | Excelon 73 & 74 | Quikmount pipe adapter 1/4 NPT | 4315-01 | ❑ |
| | | Quikmount pipe adapter 3/8 NPT | 4315-02 | ❑ |
| | | Quikmount pipe adapter 1/2 NPT | 4315-03 | ❑ |
| | | Quikmount pipe adapter 3/4 NPT | 4315-04 | ❑ |

All Dimensions in Inches (mm)

## Model codes

A★4G-NN★-★NN

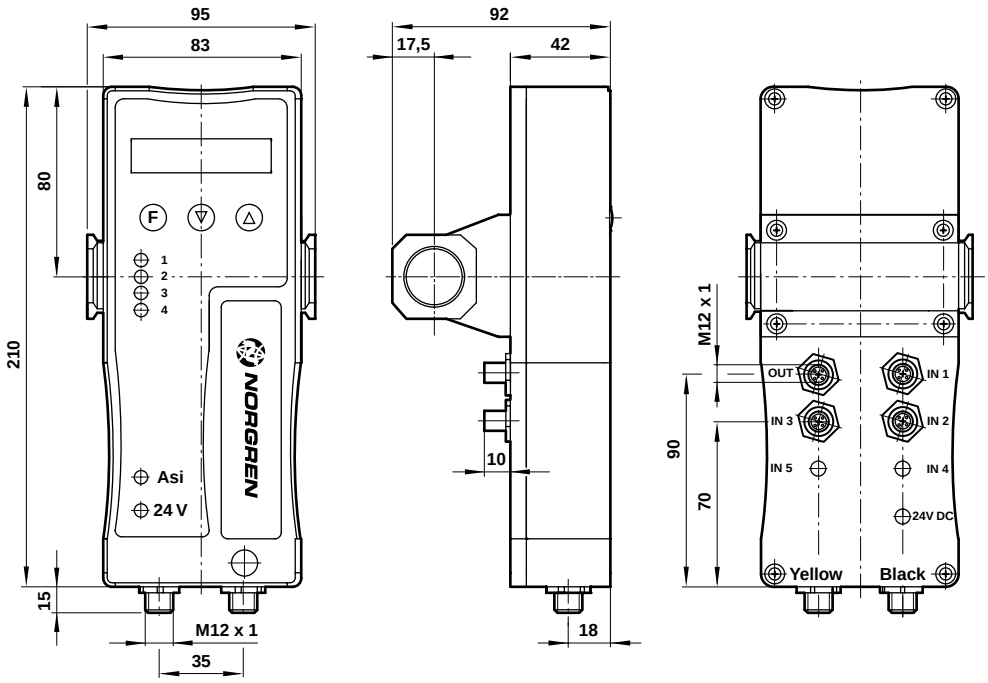
| Series | Substitute |
|---|---|
| Excelon 73 or 74 | 7 |

| Protocol Substitute* | |
|---|---|
| AS-i | 1 |

*Contact our technical service for other Protocols.

| Type | Substitute |
|---|---|
| Excelon 73 or 74, 145 psi (10 bar), nitrile | E |
| Excelon 73 or 74, 247 psi (17 bar), nitrile | F |
| Excelon 73 or 74, 145 psi (10 bar), viton | G |
| Excelon 73 or 74, 247 psi (17 bar), viton | H |

## 'Smart' module dimensions



## Section 28

# Accessories

Contents



**Diaphragm Amplifier**

**Rotowink Indicators**

**Differential Pressure Indicators**

**Pressure Switch**

**Boostermites**

**Miniature Inline Restrictiors**

**Miniature Inline Filters**

**Pneumatic Mufflers**

# Diaphragm Amplifiers

- **Miniature pneumatic interface amplifiers**
- **Sense very low pneumatic signals**
- **Provide on/off control of a high pressure air supply**
- **Low and ultra-low pressure models**
- **Used with non-contact sensors to amplify outputs to a usable level**
- **Serves as an output device in miniature pneumatic circuits**

**Operation:**
Supply pressure travels through an orifice and is vented to atmosphere. When a control signal is applied, it energizes a diaphragm, compressing a spring and cutting off the vent passage. Pressure is now directed from the supply to outlet port, providing an amplified signal.
When the control signal is removed, the spring returns the diaphragm to its non-energized position, and the supply signal is once again vented to atmosphere.

Ordering Information
To order, quote appropriate product number from the tables on the following pages, e.g.
5DA-010-D0A for control of systems where actuation is required above a 4" H2O signal with the output resetting to off when the control signal falls below 1" H2O.

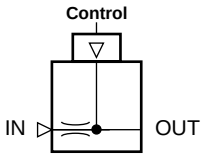
**Specifications**

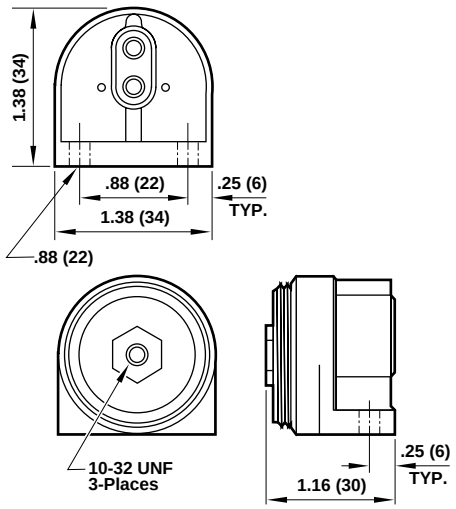
Fluid: Compressed air, nitrogen, or inert gases
Max. Control Pressure: 5 psig (.3 bar)
Inlet Pressure
Minimum: 0 psig (0 bar)
Maximum: 125 psig (8.6 bar)
Temperature Range: 35° to 150°F (2° to 66°C)
Equivalent Orifice Size: 0.014" (.36 mm)
Cycle Rate: 25 Hz
Ports: 10-32 UNF

**Materials of Construction**

Body: Noryl
End Cap: Polycarbonate
Spring: Stainless steel
Diaphragm: Buna-N

**Pneumatic Symbol**




| Part Number | Port Thread | Positive On/Off Actuation Points | |
|---|---|---|---|
| | | ON - when control signal is more than: | OFF - when control signal is less than: |
| 5DA-010-D0A | 10-32 UNF | 4" H2O (10 mbar) | 1" H2O (2.5 mbar) |
| 5DA-011-D0A | 10-32 UNF | 10" H2O (25 mbar) | 5" H2O (12.5 mbar) |

Furnished with three adapters for use with 1/16" ID flexible tubing.

## Rotowink Indicators

- **Visual indication of system status**
- **Indicate presence or absence of pressure**
- **Large (13/16") or small (7/16") lens**
- **Choice of connections**
- **Contrasting, fluorescent indicator colors**

**Operation**

Pressure applied to an internal piston/diaphragm assembly compresses a spring, moving a linkage which rotates the colored indicator ball. When full actuation pressure is reached, the indicator ball rotates fully, changing the indicator color.

When the pressure signal is removed, the internal spring returns the indicator ball to its non-actuated color/position.

Ordering Information

To order, quote appropriate product number from the tables on the following pages, e.g. 5VS-401-00 for 1/8 NPT female connection, black/red indication, and 10 psig actuation pressure.

**Specifications**

Fluid: Compressed air, nitrogen, or inert gases
Air Consumption: None
Working Pressure: See order chart FIT-9-9.
Temperature Range: 35° to 150°F (2° to 66°C)

**Materials of Construction**

Body:
5VS-1XX-XXX - Acetal
5VS-4XX-XXX - Polyphenylene
5VS-2XX-XXX - Acetal

End Plug:
5VS-1XX-XXX - Acetal
5VS-4XX-XXX - Aluminum

Piston: Acetal
Elastomer: Buna-N
Lens: Acrylic

**Options**

Special versions of the Rotowink are available, please consult factory with specific requirements and quantities.

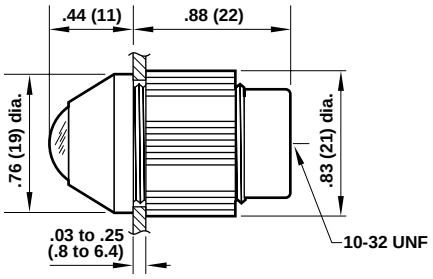
## Rotowink Indicators

All Dimensions in Inches (mm)

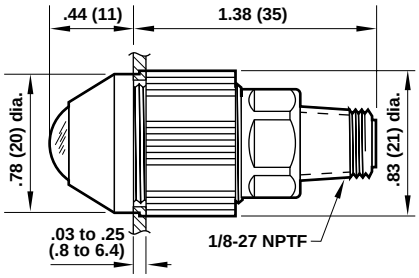
| Colors (Standard combinations listed. Other combinations available.) | | | Operating Pressure Ranges | |
|---|---|---|---|---|
| | | 1 to 15 psig (.07 to 1 bar) | 10 to 125 psig (.7 to 8.6 bar) | 15 to 150 psig (1 to 10.3 bar) |
| | | NPT or UNF Thread Port | | |
| Normal | Actuated | 10-32 UNF* (Female) | 1/8 NPTF (Female) | 1/8 NPTF (Male) |
| | | Part Numbers | | |
| Black | Red | 5VS-101-000 | 5VS-401-000 | 5VS-201-000 |
| Black | Green | 5VS-102-000 | 5VS-402-000 | 5VS-202-000 |
| Black | Yellow | 5VS-103-000 | 5VS-403-000 | 5VS-203-000 |
| Red | Green | 5VS-112-000 | 5VS-412-000 | 5VS-212-000 |
| Green | Red | 5VS-121-000 | 5VS-421-000 | 5VS-221-000 |
| Specifications | | | | |
| Maximum Pressure - psig (bar) | | 15 (1) | 125 (8.6) | 150 (10.3) |
| Actuation Pressure - psig (bar) | | 1 (.07) | 10 (.7) | 15 (1) |
| Deactuation Pressure - psig (bar) | | 15" H2O (38 mbar) | 2 (.14) | 2 (.14) |
| Mounting Hole Ø - in. (mm) | | .72 (18.3) | 1.22 (31.0) | .72 (18.3) |

*Furnished with an adapter for use with 1/16" ID flexible tubing.

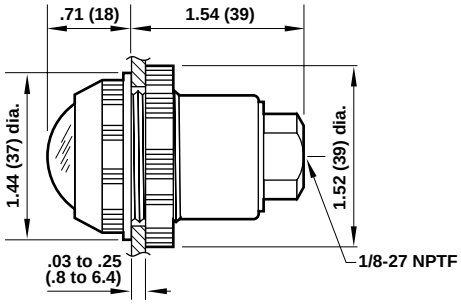
**5VS-1XX Series**




**5VS-2XX Series**

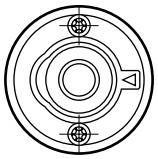


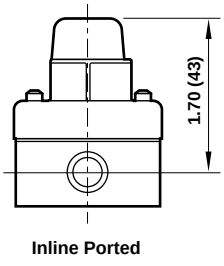

**5VS-4XX Series**



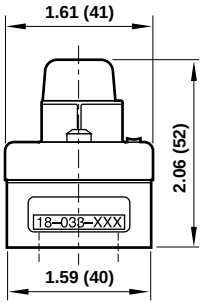
## Differential Pressure Indicators

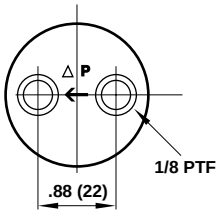
- **Visual indication of differential pressure levels**
- **Full 360° visibility of RED/GREEN pressure indicator**
- **Light weight construction**
- **1/8 NPT (female) connections**
- **In-line or bottom porting**






Inline Ported




**Specifications**

Fluid: Compressed air, nitrogen or inert gases
Max. Inlet Pressure: 250 psig (17.2 bar)
Temperature Range: 0° to 175°F (-18° to 79°C)
Max. Differential Pressure: 15 psid (1 bar d)
Ports: 1/8 NPT (female)

**Materials of Construction**

Indicator Body: Transparent nylon
Adapter Body: Aluminum
Internal Parts: Acetal
Spring: Stainless steel
Elastomers: Nitrile

| Part Number | Port Location | Differential Range | Indicator Color Code - (ΔP range) GREEN | GREEN/RED | RED |
|---|---|---|---|---|---|
| 18-033-104 | In-line | 0 to 5 psid | less than 0.5 psid | between 0.5 and 4.5 psi | greater than 4.5 psid |
| 18-033-105 | Bottom | (0 to 0.35 bar d) | (0.04 bar d) | (0.04 and 0.31 bar d) | (0.31 bar d) |
| 18-033-101 | In-line | 0 to 10 psid | less than 4 psid | between 4 and 10 psid | greater than 10 psid |
| 18-033-102 | Bottom | (0 to 0.7 bar d) | (0.3 bar d) | (0.3 and 0.7 bar d) | (0.7 bar d) |

NORGREN

# Pressure Switch

- **Integrates pneumatic and electrical systems**
- **Low actuation pressure**
- **Panel mountable**
- **Single-pole Double-throw operation**
- **May be wired Normally-open or Normally-closed**

**Operation:**

Signal pressure extends a diaphragm which contacts and actuates an electrical micro-switch.

**Specifications**

Fluid: Compressed air, nitrogen, or inert gases
Max. Working Pressure: 15 psig (1 bar)
Actuation Pressure: 1 psig (.07 bar)
Temperature Range: 35° to 150°F (2° to 66°C)
Electrical Rating: 5 Amps 125/250 Vac
Air Consumption: 0
Panel Mounting Hole: Ø1-7/32" (31 mm)
Panel Thickness: 0.03 to 0.25" (.8 to 6.4 mm)
Connections
Pneumatic: 10-32 UNF
Electrical: 0.093 female spade (3x)

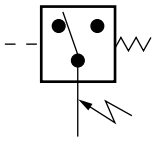
**Materials of Construction**

Body and Locknut: Aluminum
Switch Carrier: Noryl
Diaphragm: Polyurethane
Diaphragm Plate: Nylon

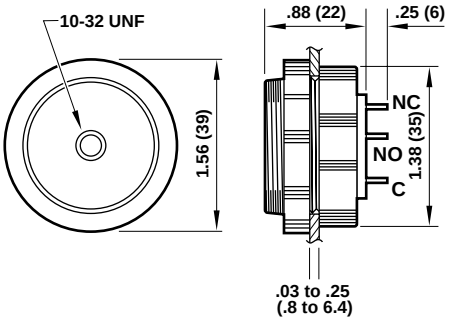
Order Number - **5FE-010-000**

Crimp type, insulated, male spade electrical terminals for 18-22 gauge wire are furnished with each switch.

**Pneumatic Symbol**



**5FE-010-000**

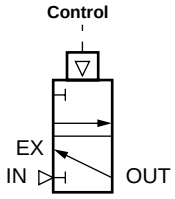


## Boostermites

- **Compact pneumatic power amplifiers**
- **Sense very low pneumatic signals**
- **Provide on/off control of a high pressure air supply**
- **Low and ultra-low pressure models**
- **Inputs (control) from pneumatic sensors, logic devices, instrumentation systems**
- **Provide direct operation of small actuators (cylinders), large air piloted valves, and other small pneumatic devices**
- **Average service life exceeding 100 million cycles**

Ordering Information
To order, quote appropriate product number from the tables on the following pages, e.g. 5BV-011-D0A for operation of pneumatic devices where actuation is required above a 3" H2O signal with the output resetting to off when the control signal falls below 1/2" $H_2O$.

**Pneumatic Symbol**



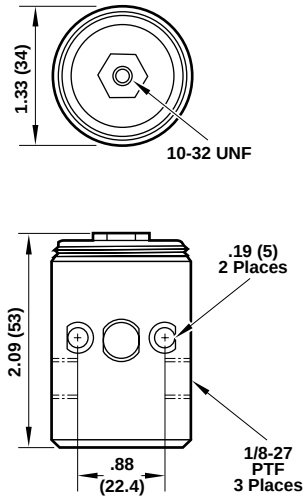

**Operation**
Boostermites are bleed actuated, 2-position, 3-way, 3-port, normally closed poppet valves. Supply pressure travels through an orifice and is vented to atmosphere. When a control signal is applied, it energizes a diaphragm, compressing a spring and cutting off the vent passage. Pressure is now directed from the supply to the poppet piston, which shifts the valve, connecting the inlet to the outlet ports. When the control signal is removed, the spring returns the diaphragm to its non-energized position, and the supply signal is once again vented to atmosphere, and the poppet piston shifts the valve to the non-actuated position.

**Specifications**
Fluid: Filtered (25µ), lubricated or non-lubricated compressed air
Max. Control Pressure: 5 psig (.3 bar)
Inlet Pressure
Minimum: 20 psig (1.4 bar)
Maximum: 125 psig (8.6 bar)
Temperature Range: 35° to 150°F (2° to 66°C)
Equivalent Orifice Size: 0.094" (2.4 mm)
Cycle Rate: 900 cpm
Ports
Control: 10-32 UNF
Main: 1/8 PTF

**Materials of Construction**
Body: Aluminum
Piston Assembly: Aluminum, Acetal
End Caps: Polycarbonate, Nylon
Springs: Stainless steel
Elastomers: Buna-N
Service Kit (includes seals) Part Number: P0150A-01

| Part Number | Port Thread | | Positive On/Off Actuation Points | |
|---|---|---|---|---|
| | Control | Main | ON - when control signal is more than*: | OFF - when control signal is less than: |
| 5BV-011-10A | 10-32 UNF | 1/8 PTF | 3" H2O (7.5 mbar) | 1/2" H2O (1.3 mbar) |
| 5BV-010-10A | 10-32 UNF | 1/8 PTF | 10" H2O (25 mbar) | 5" H2O (12.5 mbar) |

*Variation with attitude change: 1/2" H2O (1.3 mbar)
Furnished with two 1/2" long mounting spacers and a control port adapter for use with 1/16" ID flexible tubing.



## Miniature Inline Restrictors

- **Provide “resistor” function in pneumatic circuits**
- **High precision sapphire orifices**
- **Color coded aluminum body with internal 200 x 200 mesh stainless steel prefilter**
- **10-32 UNF or barbed tube connections**
- **Direct in-line mounting**
- **Signal attenuation and time delay functions in miniature pneumatic circuits**

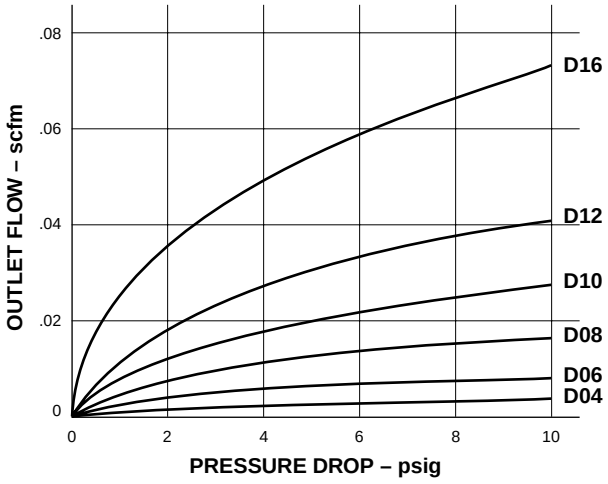
**Pneumatic Symbol**

**Specifications**

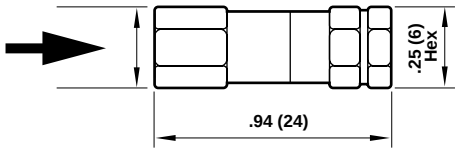
Fluid: Compressed air, nitrogen or inert gases
Maximum Pressure: 125 psig (8.6 bar)
Temperature Range: 35° to 150°F (2° to 66°C)

**Materials of Construction**

Body: Aluminum
Orifice: Sapphire
Screen: Stainless steel




| Part Number | Orifice Inch (mm) | Color Code |
|---|---|---|
| 4LR-010-D04 | 0.004 (.10) | Yellow |
| 4LR-010-D06 | 0.006 (.15) | Brown |
| 4LR-010-D08 | 0.008 (.20) | Red |
| 4LR-010-D10 | 0.010 (.25) | Black |
| 4LR-010-D12 | 0.012 (.30) | Blue |
| 4LR-010-D16 | 0.016 (.40) | Green |



NORGREN

## Miniature Inline Filters

- **25-micron element rating**
- **Connections for 1/8" or 5/32" ID flexible tubing**
- **Direct in-line mounting**
- **Protection against particulate contamination for miniature pneumatic systems**

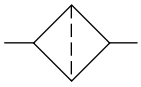
**Specifications**

Fluid: Compressed air, nitrogen or inert gases
Element Rating: 25µ
Maximum Pressure: 60 psig (4.1 bar)
Maximum Temperature: 125°F (52°C)

**Materials of Construction**

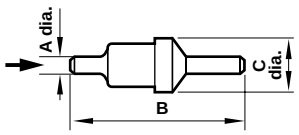
Body: Polypropylene
Element: Sintered Bronze
Elastomers: Buna-N

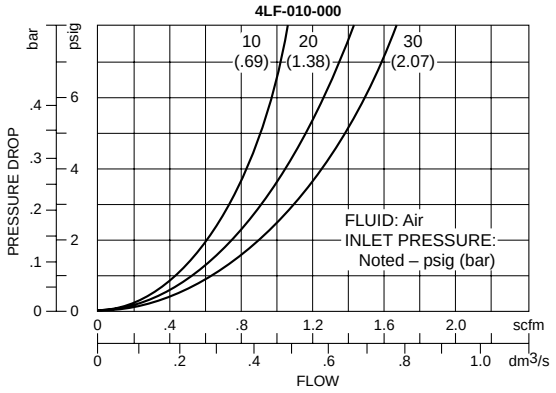
**Pneumatic Symbol**

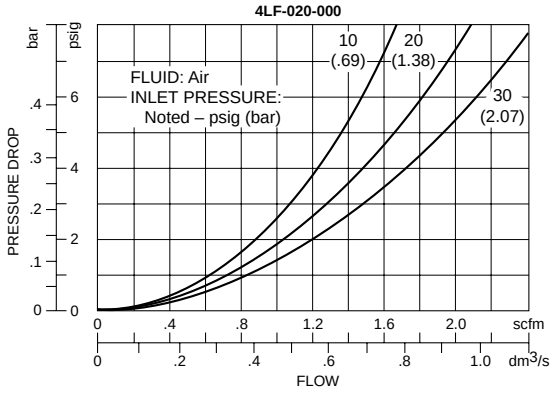


| Part Number | Flexible Tube Connection |
|---|---|
| 4LF-010-000 | 1/8" ID |
| 4LF-020-000 | 5/32" ID |

| Part Number | ØA | ØC | B |
|---|---|---|---|
| 4LF-010-000 | 0.15 (3.8) | 0.64 (6.3) | 1.58 (40.1) |
| 4LF-020-000 | 0.18 (4.6) | 0.64 (16.3) | 1.70 (43.2) |



## Quietaire™ Pneumatic Mufflers

**Heavy-duty shell type**

| Port Size NPT | Part Number (male) | Part Number (female) |
|---|---|---|
| 1/8 | MB001A | MA001A |
| 1/4 | MB002A | MA002A |
| 3/8 | MB003A | MA003A |
| 1/2 | MB004A | MA004A |
| 3/4 | MB006A | MA006A |
| 1 | MB008A | MA008A |

**Standard-duty, sintered bronze**

| Port Size NPT | Part Number |
|---|---|
| 10-32 | MS000A |
| 1/8 | MS001A |
| 1/4 | MS002A |
| 3/8 | MS003A |
| 1/2 | MS004A |
| 3/4 | MS006A |
| 1 | MS008A |

**Standard-duty porous plastic**

| Port Size NPT | Part Number |
|---|---|
| 10-32 UNF | M/S0 |
| 1/8 | C/S1 |
| 1/4 | C/S2 |
| 3/8 | C/S3 |
| 1/2 | C/S4 |
| 3/4 | C/S6 |
| 1 | C/S8 |

**Breather vent sintered bronze**

| Port Size NPT | Part Number |
|---|---|
| 1/8 | MV001A |
| 1/4 | MV002A |
| 3/8 | MV003A |
| 1/2 | MV004A |
| 3/4 | MV006A |
| 1 | MV008A |

**Heavy duty speed control sintered bronze**

| Port Size NPT | Part Number |
|---|---|
| 1/8 | MM001A |
| 1/4 | MM002A |
| 3/8 | MM003A |
| 1/2 | MM004A |

**Standard-duty speed control porous plastic**

| Port Size NPT | Part Number |
|---|---|
| 10-32 UNF | T20M0500 |
| 1/8 | T20A1800 |
| 1/4 | T20A2800 |
| 3/8 | T20A3800 |
| 1/2 | T20A4800 |

For additional sizes, configurations, metric products, and technical specifications request catalog Fittings APC-101.

Section 29

# Appendix

Contents

## Recommended Oils for use with Norgren Lubricators

Oils listed in the following tables may be used in Norgren Lubricators. All oils, however, may not be compatible with the equipment to be lubricated. Contact your lubricant supplier and the builder of the equipment to be lubricated to obtain specific lubricant recommendations.

**Light Duty Tool Lubricants (ISO 3448 Viscosity Grades 10 to 22) for Small Air Tools**

| Manufacturer | Product | ISO 3448 Viscosity Number |
|---|---|---|
| BRITISH PETROLEUM | Energal HLP10 | 10 |
| CASTROL | Hyspin AWS10 | 10 |
| MOBIL | Velocite Oil No. 6 | 10 |
| SHELL | Tellus R10 | 10 |
| TOTAL | Azolla ZS10 | 10 |
| CENTURY | P198 | 15 |
| DUCKHAMS | Zeroflo 15 | 15 |
| ELF | Elfolna 15 | 15 |
| ESSO | Nuto H15 | 15 |
| MOBIL | Velocite Oil No. 8 | 15 |
| ROCOL | MO-4 | 15 |
| MOBIL | Velocite Oil No. 10 | 22 |
| SHELL | Tellus 22 | 22 |

**Heavy Duty Tool Lubricants (ISO 3448 Viscosity Grades 32 to 68) for Standard Air Tools and Cylinders**

| Manufacturer | Product | ISO 3448 Viscosity Number |
|---|---|---|
| BRITISH PETROLEUM | Energal HLP32 | 32 |
| CASTROL | Hyspin AWS32 | 32 |
| CENTURY | PWLA | 32 |
| ELF | Elfolna 32 | 32 |
| ESSO | Nuto H32 | 32 |
| GULF | Harmony 32 | 32 |
| MOBIL | SHC 524 | 32 |
| MOBIL | DTE 24 | 32 |
| MOBIL | DTE Oil Light | 32 |
| MOBIL | Gargoyle Arctic Oil Light | 32 |
| SHELL | Tellus 32 | 32 |
| TEXACO | Rondo 32 | 32 |
| SHELL | Tellus 37 | 37 |
| GULF | Hydrasil 46 | 46 |
| BRITISH PETROLEUM | Energal HLP46 | 46 |
| SHELL | Tellus 46 | 46 |
| TEXACO | Regal Oil R & 046 | 46 |
| ROCOL | MO-10 | 46 |
| BRITISH PETROLEUM | Energal HLP68 | 68 * |

**Low Temperature Applications - For use when temperature remains below 32°F (0°C)**

| Manufacturer | Product | ISO 3448 Viscosity Number |
|---|---|---|
| MOBIL | SHC 624 | 32 |
| DUCKHAMS | Zeroflo 32 | 32 |
| MOBIL | S4C 524 | 32 |

**Antifreeze Lubrication**

| Manufacturer | Product |
|---|---|
| CASTROL | Antifreeze Mist Lubricant |

* For certain applications requiring heavy oil.

## Assembly Greases

The following greases may be used in the reassembly of Norgren Airline Equipment.

**Industrial Compressed Air Applications**

| Manufacturer | Product |
|---|---|
| BRITISH PETROLEUM | Energrease LS2 (non-silicone) |
| DOW CORNING | Molykote BR-2 Plus (non-silicone) |
| CARLETON-STUART | Magnalube G (non-silicone) |
| DOW CORNING | DC44 (silicone) |
| DOW CORNING | DC55 (silicone) |

**Low Temperature Industrial Compressed Air Applications below -20°F (-29°C)**

| Manufacturer | Product |
|---|---|
| KLUBER | Unisilicon L50/2 (silicone) |

**Food and Potable Water Applications**

| Manufacturer | Product |
|---|---|
| DOW CORNING | Molykote 111 (silicone) |

**Activated Carbon**
A filter material (media) used to remove odors and oil vapors from compressed air.

**Aerosol**
A suspension of fine liquid particles in gas, i.e., smoke, fog, and mist

**After Cooler**
A heat exchanger mounted on a compressor outlet to extract the heat of compression.

**Air-Piloted Pressure Regulator**
See Pilot Operated Regulator

**Ambient**
The normal condition of air usually defined by temperature or humidity in the vicinity of the equipment being evaluated.

**Automatic Drain**
A mechanical float used to open and drain excess fluids from a filter bowl (these drains are normally open and use pressure to close)

**Average Flow**
Typical rate of instantaneous flow over a given timeframe (used to determine compressor capacity requirement). See Instantaneous Flow.

**Back Pressure Regulator**
See relief valve

**Balanced Valve, Regulator**
A term used to denote the use of equal pressure on both sides of regulator valve to balance and minimize effect of changing primary pressure.

**Bearing Lubricator**
Micro-Fog lubricator (See Micro-Fog Lubricator) normally used to lubricate machine bearings.

**Beverage Regulator**
Regulator normally used for tank systems, often high-pressure, of inert gases (i.e., CO2) and used in conjunction with beverage dispensing equipment.

**Check Valve**
A device which allow flow in one direction only.

**Coalescing:**
The action causing small oil aerosols to combines through adsorption to form larger, heavier, droplets for removal form the compressed air stream.

**Coalescing Filter**
Filter using coalescing element to remove oil aerosol particles.

**CFM**
Cubic Feet per Minute, a volumetric flow measurement at a specified pressure.

**Cv**
A dimensionless number expressing the flow capability or conductance of a fixed orifice of a pneumatic device

**Constant Bleed**
A method used to reduce or eliminate droop in a regulator to provide higher performance, more precise flow and faster regulation characteristics.

**Creep**
Used to describe increase in secondary pressure (P2) due to a leak from primary pressure (P1).

**Critical Back Pressure Ratio (CBPR)**
CBPR is equal to 53% with compressed air; CBPR is when downstream pressure is less than 53% of the upstream pressure reducing downstream pressure further will not increase flow.

**Dead End Service**
Implies a secondary volume is pressurized, however, under normal circumstances the volume does not flow air but acts as a holding vessel.

**Deliquescent Dryer**
An air dryer utilizing chemicals for purposes of dewpoint suppression by absorbing water from a compressed air stream.

**Delta-P Indicator**
See Service Life Indicator, Pressure Drop indicator

**Desiccant**
A material creating adherence, or adsorption, of water to its surface. Often used in regenerative or desiccant dryers to lower the dewpoint for removal of water from compressed air.

**Dew Point**
The temperature at which moisture begins to condense to liquid at a constant pressure. The temperature at which air is saturated is the dew point and at this point relative humidity is equal to 100%.

**Drip Leg Drain**
A device placed at the low point of a main air distribution system used to removed condensed liquid water from the compressed air stream where water is likely to accumulate.

**Droop**
A term used to describe the initial pressure drop seen in a regulator flow curve (caused by seal impingement).

**Dump Valves**
See Exhaust Valves

**Electronic Regulator**
Electronically controlled regulator used to reduce inlet pressures to a regulated process range output.

**Emulsion**
A mixture of oil and water.

**Excelon**
A Norgren trade name used to describe a modular FRL product using a patented one-piece clamping mechanism called a Quikclamp.

**Exhaust Valves**
Valve used to evacuate downstream air of the valve itself (warning- air can be trapped by other pneumatic devices downstream of the valve).

**Feedback Regulator**
A special pilot regulator designed to sense and control pressure more accurately at a remote point downstream of the pilot operated regulator to provide more consistent pressure control.

**Free Air**
Air at ambient conditions usually measured at a compressor intake (compressors are rated in CFM of Free Air @ Intake).

**Flow**
The rate of air allowed to pass through a device or orifice at a given pressure, usually in SCFM or dm3/sec. Two expressions are commonly associated with flow: instantaneous flow and average flow.

**Flow Curve**
A performance chart showing various flow rates for a specific component at specific pressure settings and pressure drop.

**General Purpose Filter**
Filter used for common liquid extraction and particle removal, normally filtered to 40 or 5 micron particle size.

**General Purpose Regulator**
A common regulator used to provide normal industrial pressure regulation.

**Instantaneous Flow**
Flow rate demanded within a single cycle of a compressed air system (used to size pneumatic components of valves, air preparation, fittings, and conductors)

**Instrument Regulator**
A higher precision regulator used to provide exceptionally close tolerance pressure regulation.

**Integral Filter/Regulator**
A unit combining the function of a filter and regulator into one space-saving unit.

**Integral Pilot Operated Regulator**
A unit combing the integral pilot operated regulator with the main control regulator

**I/P Pressure Converter**
Essentially a precision electronic regulator (see also Electronic Regulator). Also know as E/P, P/I, and P/E converters (I = current, E = voltage, P = pressure).

**Machine Lubricator**
See Micro-Fog or Bearing Lubricator.

**Manual Drain**
A valve that requires manually open and closure to drain liquids from a filter bowl (sometimes used with lubricator bowls).

**Manifolding Regulator**
A regulator with two common P1 ports and two common P2 ports which can be assembled in a single or multiple output fashion for various pressure settings using a solitary inlet air line.

**Manifold Block**
Block used to connect multiple air line products.

**Master Regulator**
A term sometimes used to refer to the controlling regulator of a Pilot Operated Regulator.

**Membrane Dryer**
A variable dewpoint suppression device using hollow fibers which has an affinity for water, whereby moisture-laden air enters into the fibers and the water vapor permeates through the walls to be removed from the air stream.

**Micro-Fog Lubricators**
A Norgren trade name for lubricators designed to atomize oil to an aerosol within the airflow, usually less than 2 microns in size, to provide longer travel distance at a higher consistency of suspended oil in pipes. Typically used with distances up to 50 feet or when more than one tool requires lubrication from a single lubricator.

**Micron**
A measurement of size equal to one-millionth of a meter (.000039 inch).

**NACE**
National Association of Corrosion Engineers specifying standards used to determine corrosion resistance requirements of products.

**Non-Return Valve**
See Check Valve

**Oil-Fog Lubricator**
A Norgren trade name for a lubricator designed to heterogeneously disperse oil mist, having particles size usually larger than 2 microns to small droplets. Typically used for short distances or when only one tool requires lubrication.

**Odor Removal filter**
See Oil Vapor Removal filter.

**Oil Vapor Removal Filter**
Filter utilizing an activated carbon to remove oil vapor. Also used to remove odors from air stream.

**Olympian**
A Norgren trade name to describe European manufactured FRL products utilizing a modular yoke design.

**P1**
See Primary Pressure

**P2**
See Secondary Pressure.

**Pilot Operated or Slave Regulator**
A regulator, which has its outlet pressure, controlled by air pilot pressure instead of a spring. Requires another pressure regulator to control the pilot pressure.

**Porting Block**
Modular device providing a pipe port(s) from a main airflow stream or pneumatic control mechanism.

**Precision Pressure Regulator**
A regulator used to provide the most precise pressure regulation without electrical feedback (usually a constant bleed regulator).

**Pressure Switch**
Devices to monitor pressure and/or provide an output signal in a system.

**Pounds Per Square Inch Absolute (PSIA)**
Pressure including atmospheric pressure. Atmospheric pressure is caused by the weight of the atmosphere pushing down on the earth's surface. (Atmospheric pressure is equal to 14.7 at sea level.)

**Pounds Per Square Inch Gauge (PSIG)**
Pressure related and visual on a gauge, not taking into account atmospheric pressure

**Pounds per Square Inch Drop (PSID)**
The amount of pressure loss, in PSI, incurred by the flow of air through a device (losses usually due to friction and other factors).

**Pressure Reducing Device**
See Regulator, Pressure

**Primary Pressure**
Supply or inlet pressure, P1.

**Prismatic Lens**
A Norgren trade name used to describe a special bowl liquid level indicator, a bowl sight lens.

**Quikclamp**
Norgren trade name used to describe the patented one-piece clamping mechanism for Norgren EXCELON® products

**QuikDrain**
A Norgren trade name for the patented manual 1/4 turn drain for Norgren Bowls.

**Refrigeration Dryer**
An air dryer utilizing refrigeration to cool air for purposes of dewpoint suppression in order condense and remove water from a compressed air stream.

**Regenerative Dryer**
An air dryer utilizing desiccant for purposes of dewpoint suppression by method of adsorption in order to accumulate and remove water from a compressed air stream.

**Regulation Curve**
A performance chart of a regulator used to determine the expected fluctuation of secondary pressure under constant flow with varying primary pressure.

**Regulator, Pressure**
A device used to reduce (regulate) air pressure in a pneumatic system to a desired working level.

**Relief Valve**
A device used to reduce likelihood of over pressurization of a system by relieving air at a given pressure set point.

**Relative Humidity**
The ratio of actual water present in a volume of air, as measured as a percentage of air completely saturated at the same temperature.

**Remote Fill Device**
A device used to fill lubricator bowls from a remote location.

**Reverse Flow Regulator**
A regulator designed to exhaust downstream air with loss of upstream pressure.

**SCFM**
Standard Cubic Feet per Minute, SCFM converts CFM to standard conditions: 14.7 PSIZ, 68oF ambient temperature, and 35% relative humidity (See also CFM).

**Secondary Pressure**
Regulated pressure downstream of a specific device, P2.

**Semi-automatic Drain**
A drain that requires manual operation to drain when pressurized, but opens automatically in the absence of pressure. Sometimes referred to as an overnight drain.

**Service Life Indicator**
Device used to visually or electronically indicate pressure drop (Delta-P), variance in P1 to P2, across a filter used to warn of filter clogging.

**Sight Feed Dome**
The control device adjustment on a lubricator used to increase or decrease oil feed rate.

**Slave regulator**
See Pilot Operated Regulator

**Smooth Start Valve**
A valve allowing slow pressure build-up of a system to an intermediate pressure before permitting a step-up to full line pressure. Used to prevent sudden movement, damage, and potential failure of equipment during start-up.

**Soft Start Valve**
See Smooth Start Valve

**SSU or Viscosity**
Sabolt Universal Seconds, the time in seconds for 60 milliliters of oil to flow through a standard orifice at a given temperature.

**Standard Conditions**
The basis of comparison of ambient conditions, the specification used to convert CFM as ambient conditions for direct comparison @ SCFM. (For compressed air: temperature of 680- 720F, relative humidity of 35%, and atmospheric pressure of 14.7 psia.)

**Terminal Velocity**
In compressed air applications, terminal (critical) velocity is reached when the downstream pressure (P2) is less than 53% of the upstream pressure (P1). See also Critical Back Pressure Ratio.

**Tool Lubricator**
See Oil-Fog Lubricator.

**Unbalanced Valve**
A term used to denote where primary pressure is allowed to act as a closing force across the valve seat area. Changes in primary pressure (P1) can impact the secondary pressure setting (P2).

**Yoke**
A term used to describe the connection or mounting method used in the Olympian Series Product.

IMPROVING THE "BOTTOM LINE" WITH PNEUMATICS.
Clayton W. Fryer, IMI NORGREN, Littleton, Colorado

Abstract:
The cost of compressed air continues to be a very elusive subject in industrial applications. The notion that compressed air is free is a common misconception. Countless attempts at making end users aware of the costs to produce compressed air have largely been ignored. It seems that Operations Managers are concerned with the power consumption of a couple of sixty-watt light bulbs, but couldn't care less about the power required to run a 400 horsepower compressor! Let's put this into perspective, one horsepower equals 745.7 Watts. You can light 4,971 sixty-watt light bulbs with the same power it takes to run a 400 horsepower compressor! Indeed, the single largest electrical appliance in a manufacturing plant may be the compressor motor.

This paper will provide some common sense approaches to determine the cost of compressed air required in a typical pneumatic circuit. It is the discovery of the approach and the requisite considerations that we hope to explore. By clearing up several popular pneumatic myths, we will be able to make better decisions to reduce the cost of compressed air. Compressed air costs are typically hidden in the operating overheads of most companies. **Any overhead cost reduction immediately falls to the bottom line in the form of profit.** The real test of this improved bottom line is determining the additional sales a company must generate to produce a similar profit.

**Real Costs**

Experts in the compressed air field suggest the cost to produce compressed air varies from $.15 to $.40 per 1000 Standard Cubic Feet (SCF) (1), (2), depending on geographical location. In spite of these estimates, a large sector of the user public fails to complete the simple calculations to determine what a machine will require in terms of Standard Cubic Feet per Minute (SCFM) of compressed air, let alone for an entire year or the life of the equipment. In order to improve the bottom line with pneumatics, we must also expose three popular pneumatic myths!

Myth #1: Compressed Air is Free
Myth #2: Pipe Size = Right Size
Myth #3: If a little bit's good, a whole lot's better

**Myth #1: Compressed Air is Free!**

In the past most people wouldn't take the time to determine the cost of the compressed air required by an actuator for a year. It is ironic that hydraulic system designers have to do the calculations in order to determine the size of the power unit required to operate hydraulic cylinders. For far too long, little effort has been made to recognize the similarities between hydraulic and pneumatic systems. Typically, fluid power people have defended the differences between hydraulic and pneumatic systems. By recognizing the similarities, we can design and service the two mediums from similar perspectives, including the need for safety, conservation, component sizing, and cost justification.

There is a developing interest in determining the cost of compressed air in a pneumatic system. We are beginning to see users specify 60 PSIG as the maximum pressure range for a pneumatic system. Pneumatic component manufacturers are somewhat paranoid about discussing the cost of compressed air in fear they might encourage customers to apply a substitute for compressed air. Since compressed air is readily available, affordable, clean, and has less force hazards than hydraulic power, it seems reasonable that compressed air will continue to be applied in the industrial sector.

**Real Common Sense**

To properly apply pneumatic components in a system, the first component to be considered is the actuator. We have seen a large number of cylinders grossly oversized resulting in poor actuator performance, wasted compressed air, and high initial component costs. **Oversizing an actuator by one bore size can result in a fifty percent increase in the cost of compressed air required for the application.** If the cylinder is sized to move more than twice the load at the design pressure, the cylinder speed will be adversely affected, and the cost of compressed air will also increase. Using this simple observation can result in significant savings

If care is taken at this step of the design process, every component upstream of the actuator (valves, conductors, fittings, filters, regulators, and lubricators) will have a better chance of being correctly sized and applied. A good and correct start in the process is essential to having an efficient operating system.

**Real Calculations**

A Cylinder Flow Calculation is required for a number of reasons. It takes into consideration the force required to move the load at the specified pressure, the extend and retract stroke volumes of the cylinder, the cycles per minute, the operating air pressure, and a conversion to Standard Cubic Feet per Minute (SCFM). SCFM is the value used by most pneumatic fluid power manufacturers to apply the correct components in a system. SCFM is also linked to valve sizing using Coefficient of Flow (Cv)

Once the cylinder flow calculation is completed, the designer can determine the correct tubing, fittings, valves, and the Filter, Regulator, and Lubricator (FRL) for the application. In spite of the obvious benefits this information provides, we find few designers attempting these critical calculations.

In a typical circuit (Figure 1.) comprised of a double-acting pneumatic cylinder, a five-port, four-way valve, and two flow

controls, the typical approach to sizing exposes another popular pneumatic myth.

**Myth #2: "Pipesize = Right Size".**

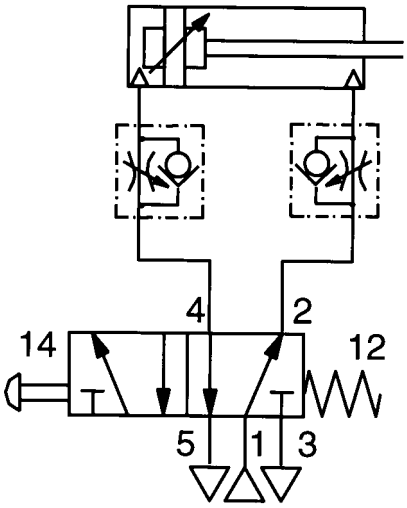



Figure 1. Typical valve/cylinder/flow control circuit

If the cylinder selected had a 1/2" pipe port, most installers would apply 1/2" flow controls, 1/2" pipe and fittings, a 1/2" valve, and quite possibly, a 1/2" FRL! This approach leads to oversized, high priced components and higher long term operating compressed air costs over the life of the equipment. As a result, oversizing components occurs frequently and quickly leads to another popular pneumatic myth.

**Myth #3: If a little bit's good, a whole lot's better!**
**Real Life Example?**

Let's consider the following example. We have a cylinder load that requires 500 pounds of force to move in the extend direction only. The retract stroke has no effective load. We want to move the load twelve inches and be able to do this at 30 cycles per minute, eight hours per day, five days per week, 50 weeks per year. The cylinder will be operated on a horizontal plane. Compressed air pressure is 80 PSIG. Of course, we want this cylinder to move as fast as possible (AFAP)!

**Specifications:**
**Load: 500 pounds**
**Operating Pressure: 80 PSIG**
**Stroke Length: 12 inches**
**Cycle Rate: 30 cycles per minute (CPM)**
**Time to Extend: 1 second**
**Time to retract: 1 second**
**Cylinder Velocity: AFAP**
**Real Solution?**

There are five steps required to accurately calculate a cylinder flow rate (in SCFM). The calculations are necessary to achieve accurate results. After the calculations are completed the system designer has the information needed to make sound, cost effective decisions that include downsizing components and conserving compressed air. (Calculations rounded to two decimal places.)

**Step #1: Size the Cylinder for Max Performance**

This is the stage in sizing a cylinder where we find many designers throwing in a little extra safety factor to cover breakaway forces of a cylinder! (If a little bit's good, a whole lot's better!)

Based on common practice and the orientation of the cylinder, we have found the range of the force multiplier to be between 1.25 to 2.00 times the load (3) being moved, at the specified pressure. This range of values will provide adequate force compensation in the calculations and need not be exceeded.

To size the cylinder for maximum performance (quickest stroke time) we will apply the X2 rule. Multiply the load by two and apply the correct cylinder at the specified pressure. In this case, 500 pounds X 2 = 1,000 pounds. Using the Formula, Force is equal to Pressure times Area (F=PA) we solve for the cross-sectional area we need for the cylinder bore. Written another way to solve for the Area, the formula looks like A=F/P. 1000(80=12.50 in.". 12.50 in." is the cross-sectional area of the bore needed to move our 500 pound load as fast as possible! This is very close to a standard NFPA bore of 4"(12.57 in."). It is IMPORTANT to note here that any larger bore size will move slower at 80 PSIG, and any smaller bore size will also move slower. Use a 4" bore cylinder.

**Step #2: Calculate total volume per cycle**

Total volume per cycle requires some examination of the cylinder we will be applying. We need to recognize that the extend stroke volume will be more than the retract stroke volume on a typical double acting, single-rod, cylinder, due to the volume displacement of the rod.

Since we've selected an NFPA 4" bore cylinder we will apply the standard 1" rod after we've checked to avoid cylinder rod buckling! **Extend Volume** is equal to the bore cross-sectional area times the stroke length. 12.57 in." X 12 in. = **150.84 in.$^3$** **Retract Volume** (compensating for the rod) calculation is (12.57 in.$^2$ - .79 in.$^2$) X 12 in. = 141.36 in.$^3$ **Total volume per cycle is:**
150.84 in.$^3$ + 141.36 in.$^3$ = **292.20 in.$^3$**

For a 5" bore the total volume per cycle is:
235.68 in.“ + 226.20 in.“ = 461.88 in.“ or a 58% increase in the volume of the 4" bore cylinder!

**Step #3: Calculate total volume per minute**

Multiply the total volume per cycle by the number of cycles per minute. 292.20 in.“/cycle X 30 CPM = **8,766 in.$^3$ per minute (CIM)**

**Step #4: Convert CIM to Cubic Feet/Minute (CFM).** (NOTE: this calculation step is often overlooked ) 8,766 in.$^3$ ÷ 1728 in.$^3$ = 5.07 CFM

**Step #5: Convert CFM to SCFM**

This conversion reduces the cylinder flow calculation to the necessary and required terms.
To make this conversion we must recognize the compression ratio of the compressed air being used in the application. Compression ratio is the working pressure expressed in absolute terms and converts compressed air to standard

conditions. (14.7 PSIA, 36% Relative Humidity, and 68º Fahrenheit temperature). In most industrial applications, the ambient temperature and relative humidity can be ignored since these variables have little impact on the calculations.

Our **Compression Ratio** (CR) calculation:
(80 + 14.7) ÷ 14.7 = 6.44

Multiplying the CFM by the CR = SCFM,
**5.07 CFM X 6.44 CR = 32.65 SCFM!**

32.65 SCFM for this application seems fairly harmless until you complete the compressed air cost evaluation.

The cylinder flow calculation provides the necessary information (SCFM) to more accurately determine the correct valve (Cv) and the proper FRL for the system. Without the cylinder flow calculation, sizing the rest of the components in the system will be accomplished empirically, (trial and error approach), or by using Myth #2.

With the cylinder flow calculation complete, we can move on to the real cost of compressed air for the application and sizing the rest of the components in the system.

**Real Horsepower (HP) Requirements**

Most compressor representatives will use a few rules of thumb to determine the compressor capacity required for an application. Depending on the type of compressor used, compressors are typically rated to deliver four to five SCFM per horsepower (rule of thumb). Most compressor representatives will strongly recommend a duty cycle of 50% to 75% (rule of thumb), again depending on the type of compressor. Duty Cycle is the percentage of time the compressor motor is generally running under loaded conditions. **In our application, at 50% duty cycle, and at 4 SCFM/ HP, a 32.65 SCFM application will require an additional compressor capacity of 16.32 HP!** (32.65 SCFM÷4 SCFM/HP)÷50% Duty Cycle = 16.32 HP

**Real Compressed Air Costs!**

If we carry our SCFM calculations out to the number of SCF per year, per shift, pretty soon we are talking about some serious compressed air usage! Consider how many minutes there are in an eight-hour day, five days a week, fifty weeks in a year? (60 minutes/hour X 8 hours/day X 5 days/week X 50 weeks/year) =
**120,000 minutes/year per eight hour shift!** (That's 360,000 minutes/year for three shifts!)

**32.65 SCFM X 120,000 Minutes = 3,918,000 SCF/Year!**
The 5" bore cylinder would require 51.6 SCFM, or 6,196,890 SCF/Year!

If your average cost per 1,000 SCF is only $.25, the cost of compressed air to operate this one 4" bore cylinder for one shift, for the year is an incredible, **$979.50!** [(3,918,000÷ 1,000) X .25]
Obviously, if your cost of compressed air is $.50/1,000 SCF, your annual cost would be **$1,959.00!**

For the 5" bore, air consumption costs jump to $1,549.22 (at $.25/1,000 SCF) and $3,098.45 (at $.50/1,000 SCF). Over a 50% increase for one bore size increase!

**Real Concern**

The cost of compressed air actually used is a major concern for most manufacturing companies. If we could reduce the compressed air consumption in our system by 30%, most Chief Executive Officers, Chief Financial Officers, and plant engineers would leap at the opportunity! Let's consider another approach to our application.

Since our 500 pound load is only being moved in the extend direction, we could consider lowering the air pressure to return the cylinder. For example, say we were able to lower the return pressure from 80 PSIG to 20 PSIG. How would that impact on the total system air consumption?

If you recall from Step #2 above, the retract stroke volume was **141.36 in.$^3$** per cycle, or about 48.4% of the total cycle volume. Without taking you through the additional math, **the compressed air cost for the extend stroke at $.25/1000SCF is (51.6% of $979.50) $505.42/year.**

By changing the pressure on the return stroke to 20 PSIG the compressed air consumption is reduced from 15.8 SCFM to 5.8 SCFM. The impact on the compressed air bill for the retract stroke is a reduction from $474.08/year to $174.03, **a reduction of $300.00 or 30%.**

Even if the price of a 1/2" regulator was $50 you would be able to expect a payback on the cost of the regulator in about two months. That is, IF we use Myth #2: Pipe Size = Right Size, or Myth #3: If a little bit's good, a whole lot's better!

Please keep in mind this example is for only one 4" cylinder. How many cylinders are you applying? What is your cost of compressed air?

When we examine the application even closer, we are able to save even more in initial costs by properly sizing the valve, the fittings, and tubing by the use of Coefficient of Flow (Cv). It is sufficient to say the use of Cv's to size a system is reasonably accurate and provides an element of cushion in most system calculations.

There are other approaches to conserving compressed air in typical applications. If cylinder speed is not important, using a force multiplier between 1.25 and 2.0 times the load will result in smaller cylinders and less air consumption. Applying single-acting cylinders could significantly reduce the long-term cost of compressed air

**Real System Cv?**

Using Cv's we can evaluate the typical circuit (Figure 1.) for potential bottlenecks! Each component in the circuit has a Cv. With some effort it is possible to determine the Cv of the cylinder port, Cv of the flow control (in both the free flow direction as well as the WIDE OPEN controlled flow direction), Cv of the piping/tubing and fittings, and the Cv of the directional control valve. **The System Cv is ALWAYS going to be less than the component with the smallest Cv in the system!** A strong recommendation here is to make the most restrictive component ("the weakest link"!) **(4)** in the system, the most expensive component (usually the directional control valve). This will minimize the initial cost of the components in the system. It is fair to say that a 1/2" directional valve will cost

more than a 1/4" valve. The difference in pipe or tubing cost is marginally different.

**Real Serious Savings?**

With dual pressure savings, you can see the fast payback on applying additional regulators. More impressive savings can be realized by finding the leaks in the compressed air system, and eliminating them! We have seen reports suggesting compressed air losses due to system leaks and artificial demand range from 20% to 45%! **(5)** (Perhaps the high loss due to leaks is why compressor representatives suggest the 50-75% duty cycle for compressors?) Compressed air leaks, left unattended, will continue to grow in size and flow due to the abrasive effect of the air-line contamination and particulate matter continuing to attack the leak orifice. (6) The sooner leaks are discovered and repaired, the less waste there is in power required to produce the compressed air. Less wasted air reduces operating costs, and can justify the expense of a maintenance patrol to quickly repair air leaks.

As you can see in Figure 2., even small diameter leaks can be very expensive.

| Orifice Size | Leak Rate (SCFM) @100 PSIG | Annual Cost @$ .25/1000 SCF |
|---|---|---|
| 1/16" (.0625) | 5.02 | $633 |
| 1/8" (.125) | 20.1 | $2,533 |
| 1/4" (.25) | 80.4 | $10,130 |
| 3/8" (.375) | 180.8 | $22,781 |
| 1/2" (.50) | 321.4 | $40,496 |

Figure 2. Flow & Cost of Leaks per Orifice Size

The values in Figure 2, are based on twenty-four hours per day, seven days per week, fifty weeks (8400 hours).

**Real Maintenance**

After all of this discussion to reduce the operating costs associated with wasting compressed air we must mention another, less obvious, source of waste. Users should regularly check for excess pressure drop across air filters. By applying pressure drop indicators, (also called service life indicators, or delta P indicators) and changing filter elements with greater frequency, you will avoid the escalating cost of the pressure drop across the filter element. Electronic and mechanical pressure drop indicators are commercially available to provide reminders to service the filter elements on a regular basis. Using pressure switches to monitor regulated pressure in the system will avoid surpassing the X2 multiplier, ensure efficient use of compressed air, and provide optimum performance of the system.

In hydraulic systems, a pressure drop across a filter has serious consequences effecting the entire hydraulic power unit adversely. Poor maintenance on hydraulic filters results in catastrophic failures. In hydraulic systems, leaks are quickly repaired due to the obvious hazards and cost associated with hydraulic oil.

Rarely does poor maintenance on a pneumatic filter result in catastrophic failure. However, excessive pressure drop across a pneumatic filter is an ongoing operating cost that is hidden from view. In pneumatic systems, leaks are often ignored until they become so annoying (uncomfortably loud), or they have caused such a significant system pressure drop, that they MUST be repaired!

**Summary**

If you don't care about the cost of compressed air in your plant, don't do the calculations, and you will perpetuate the three pneumatic myths! Consider the similarities between pneumatic and hydraulic systems, rather then the differences.

If increased profits are of interest to you, than you'll find a hidden profit center in the cost-effective use of compressed air. If you reduce your compressed air overhead costs, avoid over - sizing components, and design your systems to operate at an optimum pressure, you can improve system performance, and you will improve the bottom line. The first step to recognizing the potential savings available to you is completing these simple calculations.

With a **little** time and effort you can make a **big** improvement on your bottom line with pneumatics.

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**Determining Proper Air Valve Size**

Most manufacturers catalogs give flow rating $C_V$ for the valve, which was established using proposed National Fluid Power Association (NFPA) standard T3.21.3. The following tables and formulas will enable you to quickly size a valve properly. The traditional, often used, approach of using the valve size equivalent to the port in the cylinder can be very costly. Cylinder speed, not port size, should be the determining factor.

The following $C_V$ calculations are based upon simplified formulas which yield results with acceptable accuracy under the following standard condition:

Air at a temperature of 68°F (20°C)

Absolute downstream or secondary pressure must be 53% of absolute inlet or primary pressure or greater. Below 53%, the air velocity may become sonic and the Cv formula does not apply. To calculate air flow to atmosphere, enter outlet pressure $p_2$ as 53% of absolute $p_2$. Pressure drop $\Delta$ P would be 47% of absolute inlet pressure. These valves have been calculated for a $C_V$ = 1 in Table 3.

Nomenclature

| | | |
|---|---|---|
| B | Pressure drop factor | |
| C | Compression factor | |
| $C_V$ | Flow factor | |
| D | Cylinder Diameter | (IN) |
| F | Cylinder Area | (SQ IN) |
| L | Cylinder Stroke | (IN) |
| $p_1$ | Inlet or Primary Pressure | (PSIG) |
| $p_2$ | Outlet or Secondary Pressure | (PSIG) |
| $\Delta$ P | Pressure differential ($p_1$ - $p_2$) | (PSID) |
| q | Air flow at actual condition | (CFM) |
| Q | Air flow of free air | (SCFM) |
| t | Time to complete one cylinder stroke | (SEC) |
| T | Absolute temperature at operating pressure Deg R = Deg F + 460 | (R°) |

**Valve Sizing for Cylinder Actuation – (Method A)**

$$C_V = \frac{\text{cylinder area (Sq In) (see Table 1) } \mathbf{F} \times \text{cylinder stroke (IN) } \mathbf{L} \times \text{Compression factor (see Table 2) } \mathbf{C}}{\text{Pressure drop factor } \mathbf{B} \times \text{time to complete cylinder stroke (SEC) } \mathbf{t \times 29}}$$

Example:
Cylinder size 4" Dia. x 10" stroke. Time to extend: 2 seconds. Inlet pressure 90 psig. Allowable pressure drop 5 psid. Determine $C_V$.

Solution: Table 1 F = 12.57 sq in
Table 2 C = 7.1
B = 21.6

$$C_V = \frac{12.57 \times 10 \times 7.1}{21.6 \times 2 \times 29} = .7$$

Select a valve that has a $C_V$ factor of .7 or higher. In most cases a 1/4" valve would be sufficient.

It is considered good engineering practice to limit the pressure drop $\Delta$ P to approximately 10% of primary pressure $p_1$. The smaller the allowable pressure drop, the larger the required valve will become.

After the minimum required $C_V$ has been calculated, the proper size valve can be selected from the catalog.

| Bore Size D (in) | Push Bore F (sq in) | Bore Size D (in) | Push Bore F (sq in) |
|---|---|---|---|
| 3/4" | .44 | 4" | 12.57 |
| 1" | .79 | 4-1/2" | 15.90 |
| 1-1/8" | .99 | 5" | 19.64 |
| 1-1/4" | 1.23 | 6" | 28.27 |
| 1-1/2" | 1.77 | 7" | 38.48 |
| 1-3/4" | 2.41 | 8" | 50.27 |
| 2" | 3.14 | 10" | 78.54 |
| 2-1/2" | 4.91 | 12" | 113.10 |
| 3-1/4" | 8.30 | 14" | 153.94 |

Table 1: Cylinder push bore area F for standard size cylinders

| Inlet Pressure (psig) | Compression Factor C | Pressure Drop Factor B for various Pressure Drops $\Delta$ P | | | | |
|---|---|---|---|---|---|---|
| | | 2 psig | 5 psid | 10 psid | 15 psid | 20 psid |
| 10 | 1.7 | 6.5 | | | | |
| 20 | 2.4 | 7.8 | 11.8 | | | |
| 30 | 3.0 | 8.9 | 13.6 | 18.0 | | |
| 40 | 3.7 | 9.9 | 15.3 | 20.5 | 23.6 | |
| 50 | 4.4 | 10.8 | 16.7 | 22.6 | 26.4 | 29.0 |
| 60 | 5.1 | 11.7 | 18.1 | 24.6 | 29.0 | 32.0 |
| 70 | 5.8 | 12.5 | 19.3 | 26.5 | 31.3 | 34.8 |
| 80 | 6.4 | 13.2 | 20.5 | 28.2 | 33.5 | 37.4 |
| 90 | 7.1 | 13.9 | 21.6 | 29.8 | 35.5 | 39.9 |
| 100 | 7.8 | 14.5 | 22.7 | 31.3 | 37.4 | 42.1 |
| 110 | 8.5 | 15.2 | 23.7 | 32.8 | 39.3 | 44.3 |
| 120 | 9.2 | 15.8 | 24.7 | 34.2 | 41.0 | 46.4 |
| 130 | 9.8 | 16.4 | 25.6 | 35.5 | 42.7 | 48.4 |
| 140 | 10.5 | 16.9 | 26.5 | 36.8 | 44.3 | 50.3 |
| 150 | 11.2 | 17.5 | 27.4 | 38.1 | 45.9 | 52.1 |
| 160 | 11.9 | 18.0 | 28.2 | 39.3 | 47.4 | 53.9 |
| 170 | 12.6 | 18.5 | 29.0 | 40.5 | 48.9 | 55.6 |
| 180 | 13.2 | 19.0 | 29.8 | 41.6 | 50.3 | 57.2 |
| 190 | 13.9 | 19.5 | 30.6 | 42.7 | 51.7 | 58.9 |
| 200 | 14.6 | 20.0 | 31.4 | 43.8 | 53.0 | 60.4 |
| 210 | 15.3 | 20.4 | 32.1 | 44.9 | 54.3 | 62.0 |
| 220 | 16.0 | 20.9 | 32.8 | 45.9 | 55.6 | 63.5 |
| 230 | 16.7 | 21.3 | 33.5 | 46.9 | 56.8 | 64.9 |
| 240 | 17.3 | 21.8 | 34.2 | 47.9 | 58.1 | 66.3 |
| 250 | 18.0 | 22.2 | 34.9 | 48.9 | 59.3 | 67.7 |

Table 2: Compression Factor C and pressure drop Factor B.

**Valve Sizing with $C_V$ = 1 Table (Method B)**
(For nomenclature see previous page)

This method can be used if the required air flow is known or has been calculated with the formulas as shown below:

1. $$Q = .0273 \frac{D^2L}{t} \times \frac{p_2 + 14.7}{14.7}$$ (SCFM)

Conversion of CFM to SCFM

2. $$Q = qx \frac{p_2 + 14.7}{14.7} \times \frac{528}{T}$$ (SCFM)

Flow factor Cv (standard conditions)

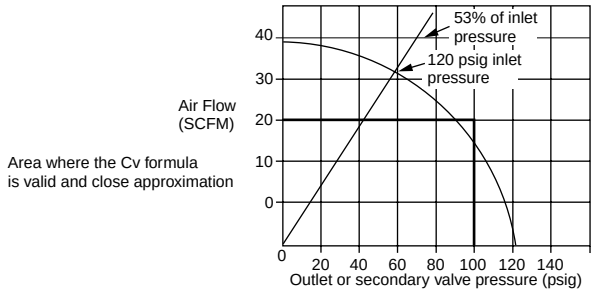
3. $$C_V = \frac{1.024 \times Q}{\sqrt{\Delta P \times (p_2 + 14.7)}}$$ Proposed NFPA Standard T3.21.3

Maximum pressure drop $\Delta$ p across the valve should be less than 10% of inlet pressure $p_1$.

| Inlet Pressure (psig) | Air Flow Q (scfm) for various Pressure drops $\Delta$ P at Cv = 1 | | | | | Air Flow Q (scfm) to atmosphere |
|---|---|---|---|---|---|---|
| | 2 psid | 5 psid | 10 psid | 15 psid | 20 psid | |
| 10 | 6.7 | | | | | 12.0 |
| 20 | 7.9 | 11.9 | | | | 16.9 |
| 30 | 9.0 | 13.8 | 18.2 | | | 21.8 |
| 40 | 9.9 | 15.4 | 20.6 | 23.8 | | 26.6 |
| 50 | 10.8 | 16.9 | 22.8 | 26.7 | 29.2 | 31.5 |
| 60 | 11.6 | 18.2 | 24.8 | 29.2 | 32.3 | 36.4 |
| 70 | 12.3 | 19.5 | 26.7 | 31.6 | 35.1 | 41.2 |
| 80 | 13.0 | 20.7 | 28.4 | 33.8 | 37.7 | 46.1 |
| 90 | 13.7 | 21.8 | 30.0 | 35.8 | 40.2 | 51.0 |
| 100 | 14.4 | 22.9 | 31.6 | 37.8 | 42.5 | 55.9 |
| 110 | 15.0 | 23.9 | 33.1 | 39.6 | 44.7 | 60.7 |
| 120 | 15.6 | 24.9 | 34.5 | 41.4 | 46.8 | 65.6 |
| 130 | 16.1 | 25.8 | 35.8 | 43.1 | 48.8 | 70.5 |
| 140 | 16.7 | 26.7 | 37.1 | 44.7 | 50.7 | 75.3 |
| 150 | 17.2 | 27.6 | 38.4 | 46.3 | 52.5 | 80.2 |
| 160 | 17.7 | 28.4 | 39.6 | 47.8 | 54.3 | 85.1 |
| 170 | 18.2 | 29.3 | 40.8 | 49.3 | 56.0 | 90.0 |
| 180 | 18.7 | 30.1 | 42.0 | 50.7 | 52.7 | 94.8 |
| 190 | 19.2 | 30.9 | 43.1 | 52.1 | 59.4 | 99.7 |
| 200 | 19.6 | 31.6 | 44.2 | 53.4 | 60.9 | 104.6 |
| 210 | 20.1 | 32.4 | 45.2 | 54.8 | 62.5 | 109.4 |
| 220 | 20.5 | 33.1 | 46.3 | 56.1 | 64.0 | 114.3 |
| 230 | 21.0 | 33.8 | 47.3 | 57.3 | 65.5 | 119.2 |
| 240 | 21.4 | 34.5 | 48.3 | 58.6 | 66.9 | 124.0 |
| 250 | 21.8 | 35.2 | 49.3 | 59.8 | 68.3 | 128.9 |

Table 3: Air Flow Q (scfm) for $C_V$ = 1

Flow Curves: How to read them




Example 1: Find air flow Q (scfm) if $C_V$ is known.
$C_V$ (from valve catalog) = 1.8
Primary pressure p1 = 90 psig
Pressure drop across valve $\Delta$ P = 5 psid

Flow through valve from Table 3 for $C_V$ = 1:21.8 scfm

$Q = C_V$ of valve x air flow at $C_V$ = 1 (scfm)

Q = 1.8 x 21.8 = 39.2 scfm

Example 2: Find Cv if air flow Q (scfm) is given.
Primary pressure p1 = 90 psig
Pressure drop $\Delta$ P = 10 psid
Air flow - Q = 60 scfm

Flow through valve from Table 3 for $C_V$ = 1:30 scfm

$$C_V = \frac{\text{Air flow Q (scfm)}}{\text{Air flow at } C_V = 1 \text{ (scfm)}}$$

$$C_V = \frac{60 \text{ scfm}}{30} = 2.0$$

A valve with a $C_V$ of minimum 2 should be selected.

Example 3: Find $C_V$ if air flow Q (scfm) to atmosphere is given (from catalog).
Primary pressure $p_1$ = 90 psig
Air flow to atmosphere Q = 100 scfm

Flow to atmosphere through valve from Table 3 for $C_V$ = 1:51 scfm

$$C_V = \frac{\text{Air flow to atmosphere Q (scfm)}}{\text{Air flow to atmosphere at Cv = 1 (scfm)}}$$

$$C_V = \frac{100}{51} = 2.0$$

Flow given in catalog is equivalent to a valve with $C_V$ = 2. This conversion is often necessary to size a valve properly since some manufacturers do not show the standard $C_V$ to allow a comparison.

Example 4: Find $C_V$ if cylinder size and stroke speed is known, using the formulas 1 and 3.
Primary pressure = 90 psig
Pressure drop across valve 5 psid
Cylinder size 4" dia. x 10" stroke
Time to complete stroke 2 sec.

$$Q = .0273 \frac{4^2 \times 10}{2} \times \frac{85 + 14.7}{14.7} = 14.81 \text{ scfm}$$

$$C_V = \frac{1.024 \times 14.81}{\sqrt{5 \times (85 + 14.7)}} = .7$$

# Conversion Tables

**VOLUME**

| from/to | $cm^3$ | liter | $in^3$ | $ft^3$ | fl oz | pt. | qt. | gal |
|---|---|---|---|---|---|---|---|---|
| $cm^3$ | 1 | .001 | 0.06102 | 3.53 x 10-5 | .03381 | .00211 | 0.106 | 2.64 x -10 |
| liter | 1000 | 1 | 61.02 | 0.03532 | 33.81 | 2.113 | 10.057 | .2642 |
| $in^3$ | 16.39 | 0.01639 | 1 | 5379 x 10-4 | .5541 | .03463 | 0.01732 | .00433 |
| $ft^3$ | 2.83 x 104 | 28.32 | 1728 | 1 | 957.5 | 59.84 | 29.92 | 7.481 |
| fl oz | 29.57 | 0.02957 | 1.805 | 0.00104 | 1 | .06250 | .03125 | .00781 |
| pt | 473.2 | 0.4732 | 28.88 | 0.01671 | 16 | 1 | 0.500 | 0.1250 |
| qt | 946.4 | 0.9463 | 57.75 | 0.03342 | 32 | 2 | 1 | 0.2500 |
| gal (US) | 3785 | 3.785 | 231 | 0.1337 | 128 | 8 | 4 | 1 |

**PRESSURE**

| from/to | mm Hg | in Hg | in $H_2O$ | ft $H_2O$ | atm | $lb/in^2$ | $kg/cm^2$ |
|---|---|---|---|---|---|---|---|
| mm Hg | 1 | 0.03937 | 0.5353 | 0.04460 | .00132 | 0.01934 | .00136 |
| in Hg | 25.40 | 1 | 13.60 | 1.133 | .03342 | 0.4912 | 0.03453 |
| in $H_2O$ | 1.868 | 0.07355 | 1 | 0.08333 | 0.00246 | 0.03613 | 0.00254 |
| ft $H_2O$ | 22.42 | 0.8826 | 12 | 1 | 0.02950 | 0.4335 | 0.03048 |
| atm | 760 | 29392 | 406.8 | 33.9 | 1 | 14.70 | 1.033 |
| $lb/in^2$ | 51.71 | 2.036 | 27.67 | 2.307 | 0.06805 | 1 | 0.07031 |
| $kg/cm^2$ | 735.6 | 28.96 | 393.7 | 32.81 | 0.9678 | 14.22 | 1 |
| bar | 750.0 | 29.53 | 401.32 | 33.46 | 0.98592 | 14.504 | 1.01978 |

**Length**

| from/to | cm | m | km | in | ft. | mile |
|---|---|---|---|---|---|---|
| cm | 1 | 0.01 | 1 x 10-5 | 0.3937 | 0.03281 | 6.21 x 10-6 |
| m | 100 | 1 | 0.001 | 39.37 | 3.281 | 6.21 x 10-4 |
| km | 1 x 105 | 1000 | 1 | 3.94 x 104 | 3281 | 0.6214 |
| in | 2.540 | 0.02540 | 2.54 x 10-5 | 1 | 0.08333 | 1.58 x 10-5 |
| ft | 30.48 | 0.3048 | 3.05 x 10-4 | 12 | 1 | 1.89 x 10-4 |
| mile | 1.61 x 105 | 1609 | 1.609 | 6.34 x 104 | 5280 | 1 |

**ENERGY**

| from/to | BTU | Cal | Joule | Hp. hr. | Kw hr. |
|---|---|---|---|---|---|
| BTU | 1 | 252.0 | 1055 | 3.93 x 10-4 | 2.93 x 10-4 |
| Cal | 0.397 | 1 | 4.186 | 1.56 x 10-5 | 1.16 x 10-5 |
| joule | 9.48 x 10-4 | 0.2389 | 1 | 3.73 x 10-7 | 2.78 x 10-7 |
| Hp hr | 2545 | 6.41 x 105 | 2.68 x 106 | 1 | 0.7457 |
| Kw hr | 3413 | 8.60 x 105 | 3.60 x 106 | 1.341 | 1 |

**AREA**

| from/to | $cm^4$ | $m^2$ | $km^2$ | $in^2$ | $ft^2$ |
|---|---|---|---|---|---|
| $cm^2$ | 1 | 0.0001 | 1 x 10-10 | 0.1550 | 0.00108 |
| $m^2$ | 1 x 104 | 1 | 1 x 10-5 | 1550 | 10.76 |
| $km^2$ | 1 x 1010 | 1x 105 | 1 | 1.55 x 109 | 1.08 x 107 |
| $in^2$ | 6.452 | 6.45 x 10-4 | 6.45 x 10-10 | 1 | 0.00694 |
| $ft^2$ | 929.00 | 0.09290 | 9.29 x 10-8 | 144 | 1 |

**TEMPERATURE CONVERSION**

°C = 5/9 (°F - 32)
°F = 9/5 (°C + 32)
°K = °C + 273.2
°R = °F + 459.7

**WEIGHT**

| from/to | gm | kg | oz | lb |
|---|---|---|---|---|
| gm | 1 | 0.001 | 0.03527 | 0.00220 |
| kg | 1000 | 1 | 35.27 | 2.205 |
| oz | 28.35 | 0.02835 | 1 | 0.06250 |
| lb | 453.6 | 0.4536 | 16 | 1 |

**TEMPERATURE COMPARISON**

-100°C to +300°C

| °C | °F | °C | °F |
|---|---|---|---|
| -100 | -148 | 29 | 84.2 |
| -90 | -130 | 30 | 86.0 |
| -80 | -112 | 31 | 87.8 |
| -70 | -94 | 32 | 89.6 |
| -60 | -76 | 33 | 91.4 |
| -50 | -58 | 34 | 93.2 |
| -40 | -40 | 35 | 95.0 |
| -35 | -31 | 36 | 96.8 |
| -30 | -22 | 37 | 98.6 |
| -25 | -13 | 38 | 100.4 |
| -20 | -4 | 39 | 102.2 |
| -15 | 5 | 40 | 104.0 |
| -10 | 14 | 45 | 113 |
| -5 | 23 | 50 | 122 |
| 0 | 32 | 55 | 131 |
| 1 | 33.8 | 60 | 140 |
| 2 | 35.6 | 65 | 149 |
| 3 | 37.4 | 70 | 158 |
| 4 | 39.2 | 75 | 167 |
| 5 | 41 | 80 | 176 |
| 6 | 42.8 | 85 | 185 |
| 7 | 44.6 | 90 | 194 |
| 8 | 46.4 | 95 | 203 |
| 9 | 48.2 | 100 | 212 |
| 10 | 50 | 110 | 230 |
| 11 | 51.8 | 120 | 248 |
| 12 | 53.6 | 130 | 266 |
| 13 | 55.4 | 140 | 284 |
| 14 | 57.2 | 150 | 302 |
| 15 | 59 | 160 | 320 |
| 16 | 60.8 | 170 | 338 |
| 17 | 62.6 | 180 | 356 |
| 18 | 64.4 | 190 | 374 |
| 19 | 66.2 | 200 | 392 |
| 20 | 68 | 210 | 410 |
| 21 | 69.8 | 220 | 428 |
| 22 | 71.6 | 230 | 446 |
| 23 | 73.4 | 240 | 464 |
| 24 | 75.2 | 250 | 482 |
| 25 | 77 | 260 | 500 |
| 26 | 78.8 | 270 | 518 |
| 27 | 80.6 | 280 | 531 |
| 28 | 82.4 | 290 | 554 |
| | | 300 | 572 |

**M5** A metric machine screw thread (M5 x 0.8) 5 mm in diameter with 0.8 mm between threads. Used on miniature pneumatic products it is nearly identical in size to a 10-32 UNF thread. Port sealing is effected by a thermoplastic washer which creates a static face seal.

**ISO G** Designed to mate with threads conforming to ISO Standard 228/1, a parallel pipe thread available in both male and female forms. ISO G ports feature a flat surface perpendicular to the axis of the port on which a washer incorporated into the male fitting establishes a static face seal, (reference ISO 1179).

ISO G series threads are usually designated in the following manner, with a 1/4 size pipe thread being indicated in this example: G1/4. This format is always used with female threads, however, in some, but not all instances, male threads may include an “A” or “B” suffix following the port size indicating the thread class, (typically “A”). Example: G 1/4A.

In addition to itself, the ISO G thread form will also mate with British Standard Pipe Parallel (BSPP) and Japanese Industrial Standard Parallel per JIS B 0202. As both the BSPP and JIS B 0202 standards do not define an area for the ISO G static seal to engage, some form of thread sealant must be applied to the thread to prevent spiral leakage.

**Note:**

Norgren male ISO G threads have always included a thermoplastic washer to create the static face seal. During 1998/9 this design will be changed to provide an o-ring in an under-cut groove. This improved design will still mate with port forms shown opposite but will provide an improved seal.

**ISO R** Designed to mate with threads conforming to ISO Standard 7/1, a tapered pipe thread available in male form. ISO R ports are similar to NPTF threads, they form a pressure tight joint via an interference fit as they are tightened, (thread sealant is recommended). To insure a pressure tight seal, Pneufit ISO R male pipe threads are supplied with Precote 5 thread sealant.

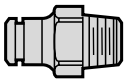
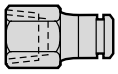
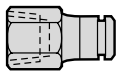
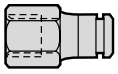
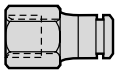
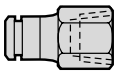
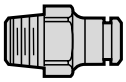
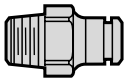
ISO R male series threads are usually designated in the following manner, with a 1/4 size pipe thread being indicated in this example: R 1/4.

ISO R female series threads are usually designated in the same manner, but with a “c” subscript. Example: $R_c$1/4.
In addition to itself, the ISO R thread form will also mate with British Standard Pipe Tapered (BSPT) and Japanese Industrial Standard Tapered Pipe (PT) per JIS B 0203. Some form of thread sealant must be applied to the thread to prevent spiral leakage.

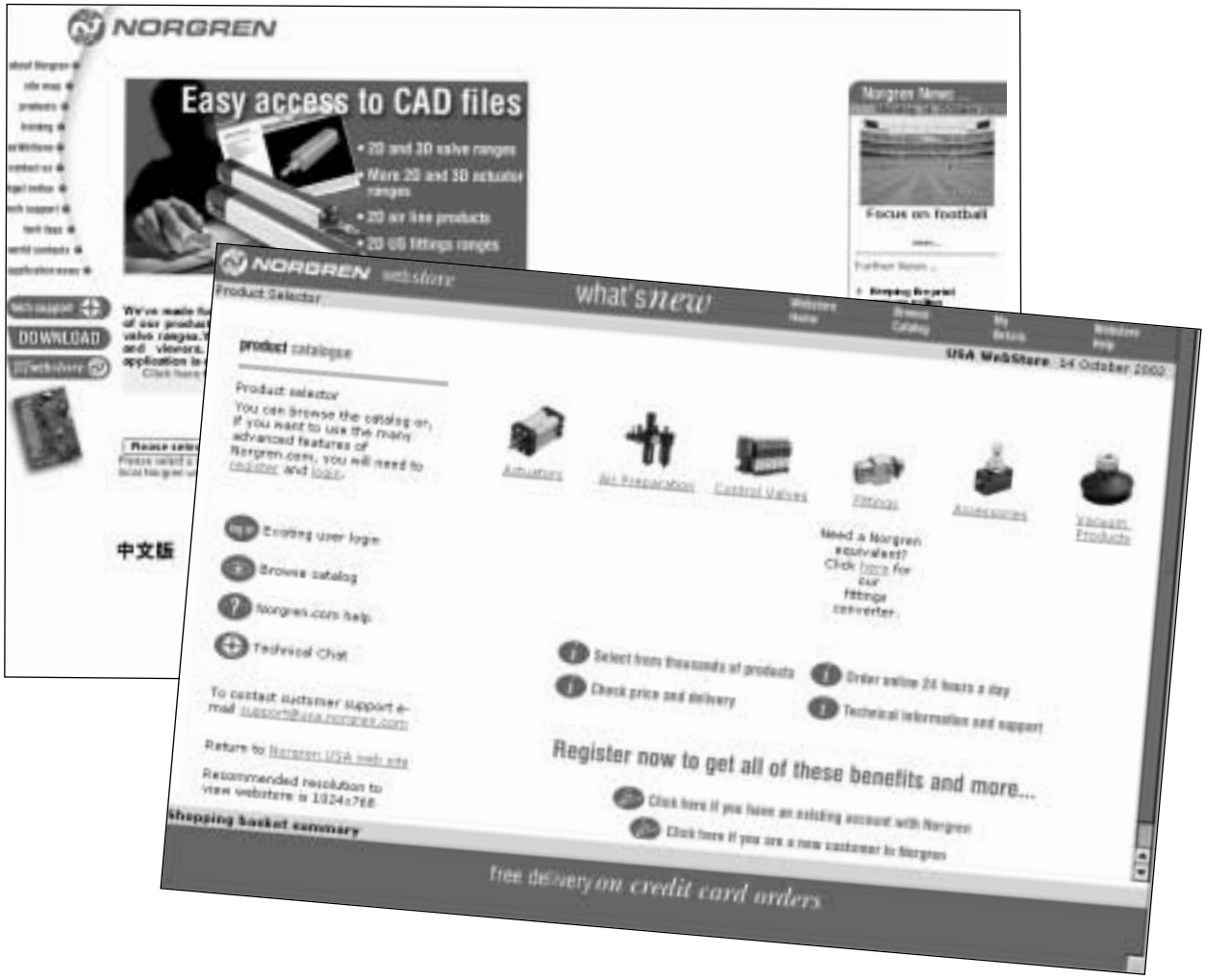
ISO R male threads will also effect a seal with ISO G, BSPP and JIS B 0202. In all cases, some form of thread sealant must be applied to the thread to prevent spiral leakage.

## Thread Forms

| Thread Form | Mates with | Thread Form | Method of Sealing |
|---|---|---|---|
| **M5 (male)** | | M5 (female) | Molded thermoplastic sealing washer effects static face seal |
| **ISO G (male)** | | ISO G (female)<br>BSPP (female)<br>JIS B 0202 (female) | Molded thermoplastic sealing washer effects static face seal |
| **ISO G (female)** | | ISO G (male)<br>BSPP (male)<br>JIS B 0202 (male)<br>ISO R (male)<br>BSPT (male)<br>JIS B 0203 (male) | Molded thermoplastic sealing washer effects static face seal<br>Sealing washer should be used to effect static face seal<br>Thread sealant must be applied to prevent spiral leakage |

| Thread Form | Mates with | Thread Form | Method of Sealing |
|---|---|---|---|
| **ISO R (male)**  |  | ISO $R_C$ (female)  | Thread sealant must be applied to prevent spiral leakage |
| | | BSPT (female)  | |
| | | BSPT (female)  | |
| | | ISO G (female)  | |
| | | BSPP (female)  | |
| | | JIS B 0202 (female)  | |
| **ISO $R_C$ (female)**  |  | ISO R (male)  | Thread sealant must be applied to prevent spiral leakage |
| | | BSPT (male)  | |
| | | JIS B 0203 (male)  | |

# www.norgren.com is your complete source for the latest Norgren product information, technical tips, and other valuable pneumatic information.

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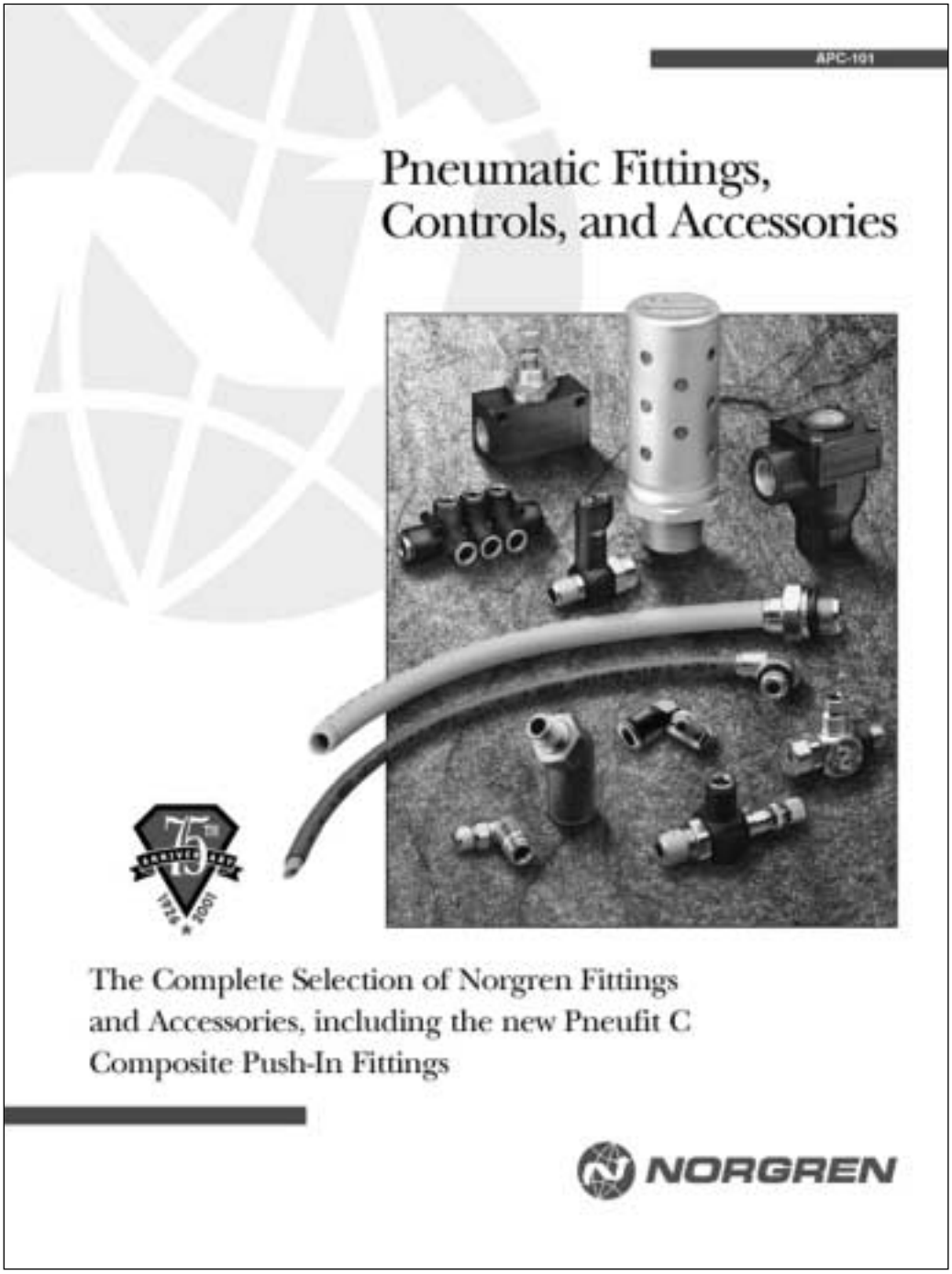
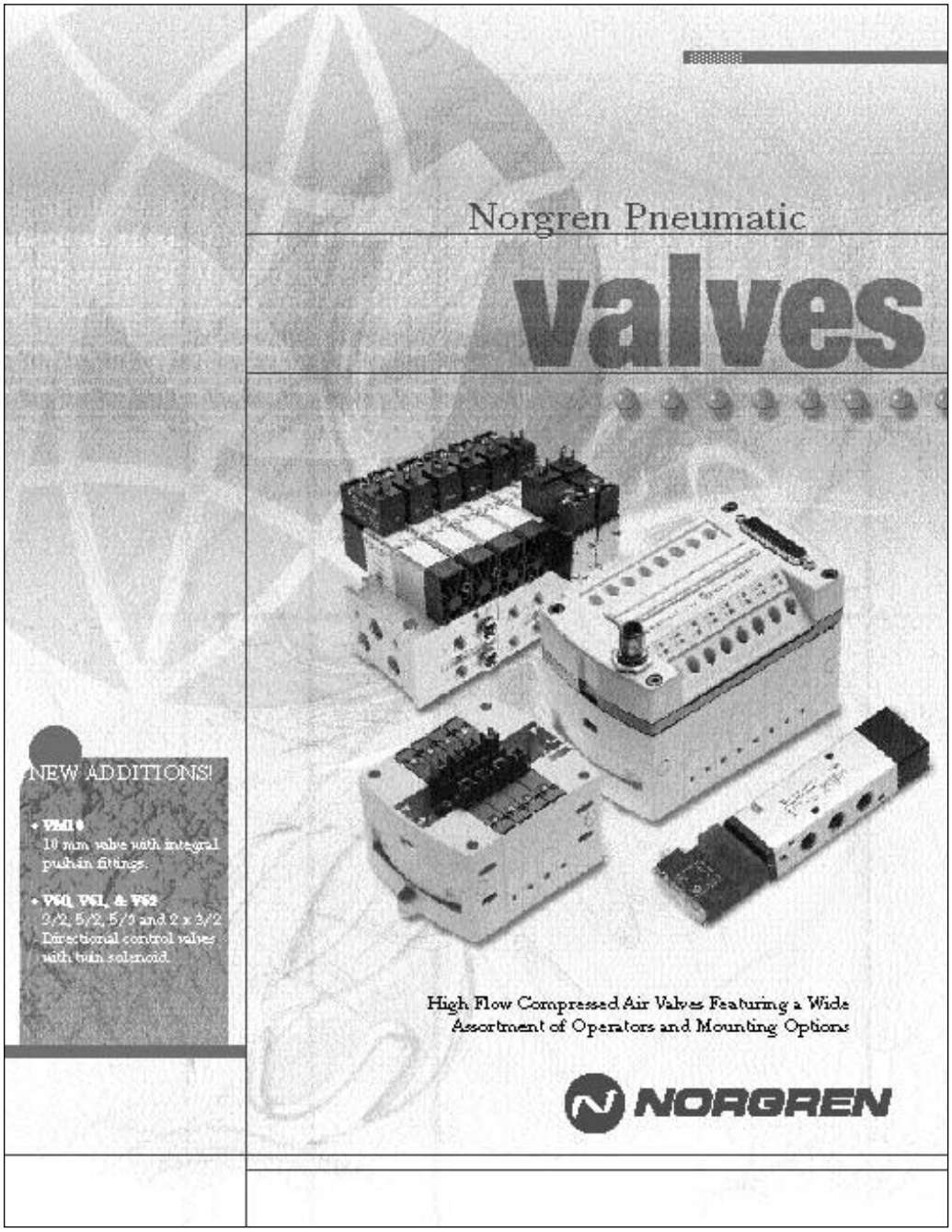


# All Product Catalog APC-102 is your complete guide to Norgren Inline Valves, and Subbase Valves and Accessories. Valves range from Cv of 0.3 to 49.5. Call your local distributor and order Part Number APC-102.



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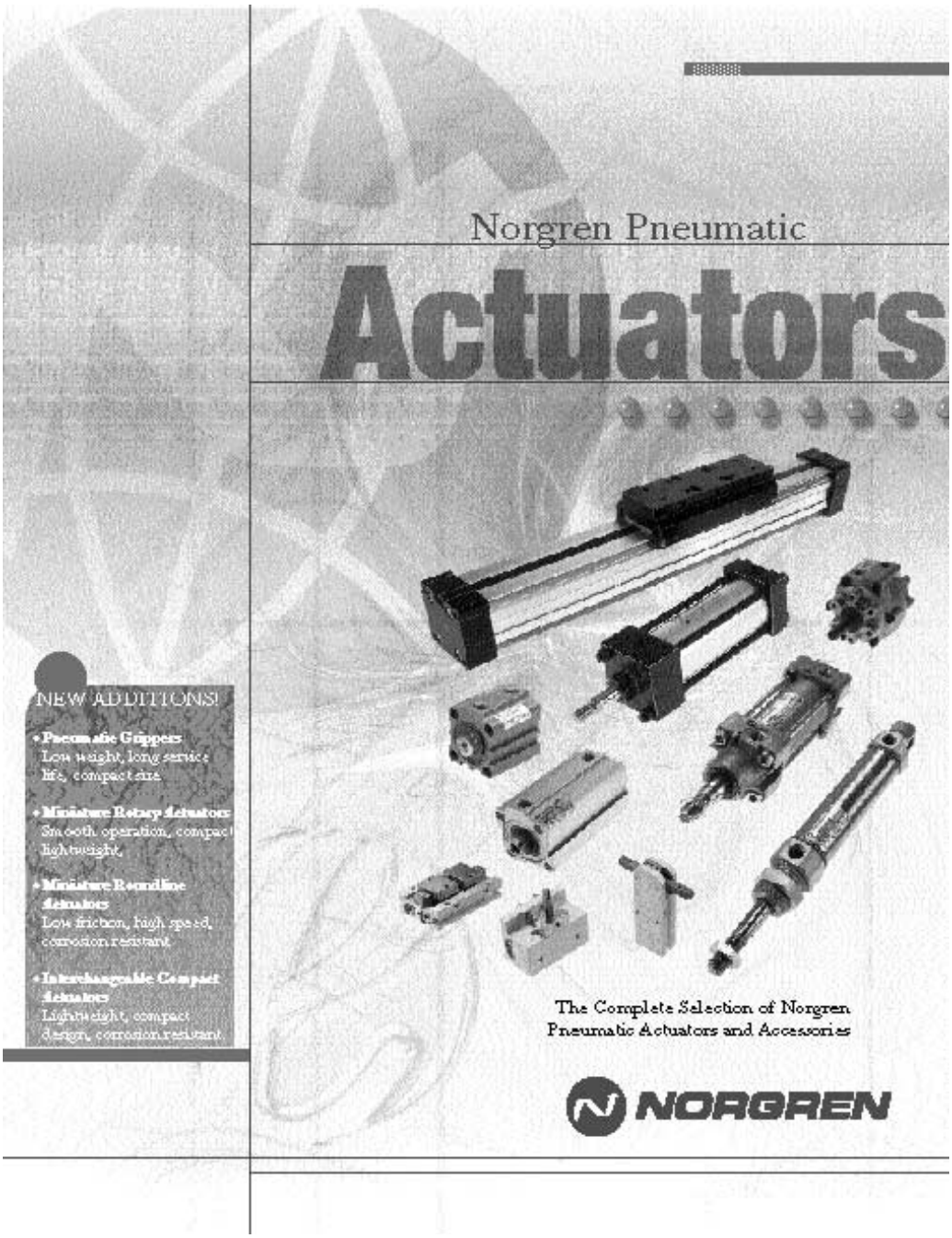

## Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under **Specifications**.

Before using these products with fluids other than those specified, for nonindustrial applications, life-support systems, or other applications not within published specifications, consult Norgren.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure modes. **System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.**

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products. System designers should also provide for all OSHA requirements including Title 29 CFR 1910.147 Lockout/Tagout.

It should be recognized that warnings are valid for any product, regardless of manufacturer, and are not restricted to products manufactured by Norgren. Norgren's reputation for product quality and performance is well established. We feel we have the additional obligation to provide information or warnings to customers to assist them in applying our products in a reasonable and safe manner.

## Warranty

Items sold by Norgren are warranted to be free from defects in materials and workmanship for a period of two years from the date of manufacture, provided said items are used according to Norgren's recommended usages. Norgren's liability is limited to the repair of, refund of purchase price paid for, or replacement in kind of, at Norgren's sole option, any items proved defective, provided the allegedly defective items are returned to Norgren prepaid. The warranties expressed above are in lieu of and exclusive of all other warranties.

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Norgren reserves the right to discontinue manufacture of any product or change product materials, design, or specifications.

## Notes

## Notes

## Notes