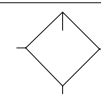


Port Sizes: 1/4, 3/8 & 1/2 – Flow to 110 scfm

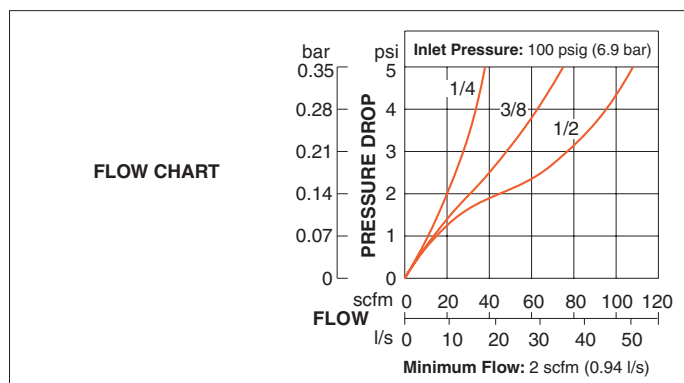
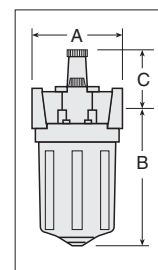
| Port Size | Polycarbonate Bowl | | Metal Bowl | |
|----------------------------|--------------------|------------|--------------|------------|
| | Sight-Feed | | Sight-Feed | |
| | Model Number | | Model Number | |
| | NPTF Threads | G Threads | NPTF Threads | G Threads |
| With Fill Port | | | | |
| 1/4 | 5111B2007 | C5111B2007 | 5112B2007 | C5112B2007 |
| 3/8 | 5111B3007 | C5111B3007 | 5112B3007 | C5112B3007 |
| 1/2 | 5111B4007 | C5111B4007 | 5112B4007 | C5112B4007 |
| With Quick-Fill Cap | | | | |
| 1/4 | 5111B2107 | C5111B2107 | 5112B2107 | C5112B2107 |
| 3/8 | 5111B3107 | C5111B3107 | 5112B3107 | C5112B3107 |
| 1/2 | 5111B4107 | C5111B4107 | 5112B4107 | C5112B4107 |



ISO Symbol
Lubricator



| Port Size | Bowl Type | Bowl Capacity | Dimensions inches (mm) | | | | Weight lb (kg) |
|---------------|---------------|---------------|------------------------|-----------|----------|----------|----------------|
| | | | A | B | C | Depth | |
| 1/4, 3/8, 1/2 | Polycarbonate | 4-oz (120-ml) | 2.7 (68) | 4.1 (103) | 1.8 (46) | 2.4 (60) | 1.06 (0.48) |
| 1/4, 3/8, 1/2 | Zinc | 4-oz (120-ml) | 2.7 (68) | 4.1 (103) | 1.8 (46) | 2.4 (60) | 1.50 (0.68) |



Accessories ordered separately, refer to page E6.3-4.

STANDARD SPECIFICATIONS (for lubricators on this page):

| | | | |
|---------------------|--|-----------------------|--|
| Construction Design | Sight-Feed | Oil Adjustment | External, tamper-resistant |
| Temperature | Ambient/Media: Polycarbonate Bowl: 40° to 125°F (4° to 52°C) Metal Bowl: 40° to 175°F (4° to 80°C) | Construction Material | Body: Zinc Bowl: Polycarbonate bowl with zinc shatterguard, or zinc bowl Sight Dome: Nylon Seals: Nitrile |
| Fluid Media | Compressed air | | |
| Operating Pressure | Polycarbonate Bowl: Maximum 150 psig (10 bar) Metal Bowl: Maximum 200 psig (14 bar) | | |

IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.



Online Version
04/05/19

rosscontrols.com

Mounting Screws for BANTAM Models

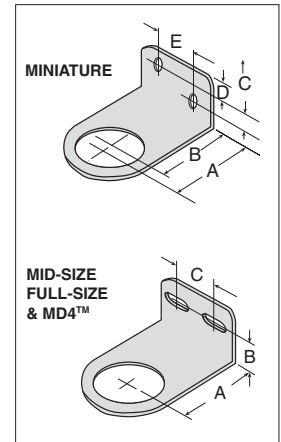
| Usage Models | Kit Number |
|--------------|------------|
| BANTAM | 859K77 |

BANTAM models mounts with long screws that extend through end plates.

Mounting Brackets for Regulators and Integrated Filter/Regulators

Regulators and integrated filter/regulators can be mounted to a surface with a bracket that attaches to the regulator. Brackets and mounting panel nuts can be ordered separately or in a kit which includes both bracket and mounting panel nut.

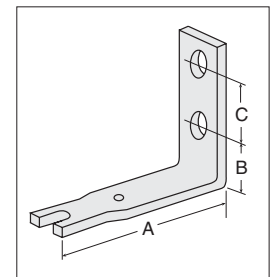
| Usage Models | Model Number | | | Dimensions inches (mm) | | | | | Panel Mounting Hole Diameter |
|-----------------|--------------|---------|-----------|------------------------|------------|-----------|----------|-----------|------------------------------|
| | Kit | Bracket | Panel Nut | A | B | C | D | E | |
| MINIATURE | 873K77 | 872K77 | 874K77 | 1.375 (35) | 1.125 (29) | 0.31 (8) | 0.31 (8) | 0.69 (17) | 1.19 (30) |
| MID-SIZE | 876K77 | 875K77 | 877K77 | 2.38 (60) | 1.00 (25) | 1.50 (38) | – | – | 1.56 (40) |
| MD3™ | R-A127-11 | – | R-127-11 | 2.38 (60) | 1.00 (25) | 1.50 (38) | – | – | 2.06 (52) |
| FULL-SIZE, MD4™ | 879K77 | 878K77 | 880K77 | 2.38 (60) | 1.00 (25) | 1.50 (38) | – | – | 2.06 (52) |



Modular Mounting Brackets for Filters, Regulators, Lubricators, FRL's, or Clean Air Packages

Two L-shaped metal brackets as shown at the right can be used for wall mounting of modular FRLs or Clean Air Packages. A single bracket can be used to mount individual filters or lubricators. Kits include two brackets and four screws for attaching the brackets to the modules.

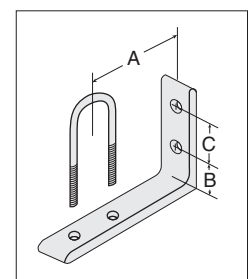
| Usage Models | Kit Number | Dimensions inches (mm) | | | |
|----------------------|------------|------------------------|-----------|-----------|-----------|
| | | A | B | C | D |
| MID-SIZE & FULL-SIZE | 915K77 | 3.0 (76) | 0.88 (22) | 1.00 (25) | 1.20 (31) |



FRLs In-line Mounting Pipe Brackets

Two pipe brackets can be used for wall mounting of FRLs assemblies that use pipe nipples to join the components. The bracket kits listed below include two sets of brackets.

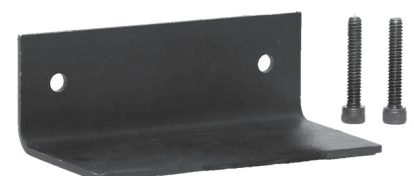
| Nipple Size | Kit Number | Dimensions inches (mm) | | |
|-------------|------------|------------------------|-----------|-----------|
| | | A | B | C |
| 1/4 | 887K77 | 2.72 (28) | 0.50 (13) | 1.00 (25) |
| 3/8 | 888K77 | 2.72 (28) | 0.50 (13) | 1.00 (25) |
| 1/2 | 889K77 | 2.72 (28) | 0.50 (13) | 1.00 (25) |
| 3/4 | 890K77 | 3.69 (94) | 1.13 (29) | 1.25 (32) |
| 1 | 891K77 | 3.69 (94) | 1.13 (29) | 1.25 (32) |



Bracket Assembly Kit for HIGH-RELIEF Pilot Operated Regulator

High-Relief Pilot Operated Regulator with 1/4- thru 1 1/4 inch ports can be mounted to a vertical surface using a bracket assembly kit.

| | |
|------------|-----------|
| Kit Number | R-A37-381 |
|------------|-----------|



IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

MID-SIZE and FULL-SIZE Units

The modular designs of the MID-SIZE and FULL-SIZE series offer maximum flexibility in customizing FRLs assemblies. As shown at the right, connector kits are required to interconnect units. Various port kits (shown below) can be used to connect the assemblies to the inlet and outlet piping. Note that all FRLs components have threaded ports so that conventional pipe fittings may be used where desired.

Female Port Block

Used to connect to piping at inlet or outlet.

| Port Size | Model Number | |
|-----------|--------------|-----------|
| | NPTF Threads | G Threads |
| 1/4 | 897K77 | D897K77 |
| 3/8 | 898K77 | D898K77 |
| 1/2 | 899K77 | D899K77 |
| 3/4 | 900K77 | D900K77 |



Male Port Block

Used to connect modular to non-modular units.

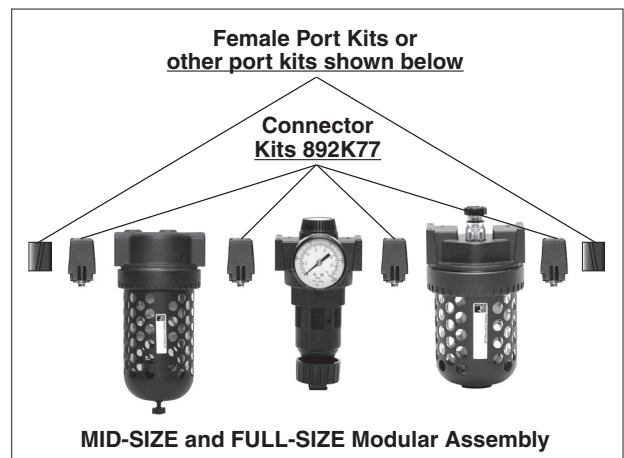
| Port Size | Model Number | |
|-----------|--------------|-----------|
| | NPTF Threads | G Threads |
| 1/4 | 893K77 | D893K77 |
| 3/8 | 894K77 | D894K77 |
| 1/2 | 895K77 | D895K77 |
| 3/4 | 896K77 | D896K77 |



Connector Kit

Used to connect units to one another as well as to any of the ports shown on this page.

| | |
|------------|--------|
| Kit Number | 892K77 |
|------------|--------|



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BANTAM Units

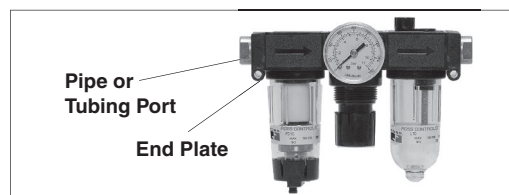
BANTAM modular units use end plates secured with screws to hold the pipe or tubing ports (see below), and also to serve as mounting brackets. Short screws are used to secure the end plates when a single BANTAM unit is used. If two or more units are combined, long screws extend through an end plate and thread into the next unit.

Screw kits required are as follows:

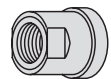
Single Unit: Two short screw kits.

Two-Unit Combination: One each short screw kit and long screw kit.

Three-Unit Combination: Two long screw kits.

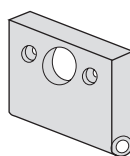


| Pipe Ports | |
|------------|--------------|
| Port Size | Model Number |
| 1/8 NPTF | 862K77 |
| 1/4 NPTF | 863K77 |
| 1/8 BSPP | D864K77 |
| 1/4 BSPP | D865K77 |

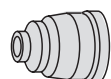


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| Pipe Ports | |
|---|--------------|
| Kit Description | Model Number |
| END PLATE (1) | 857K77 |
| Short Screw (2) | 858K77 |
| Long Screw (2) | 859K77 |
| Small O-Ring (for inlet or mating ports) | 860K77 |
| Large O-Ring (for outlet or mating ports) | 861K77 |



| Tube Ports | |
|------------|--------------|
| Port Size | Model Number |
| 1/4 | 866K77 |
| 3/8 | 867K77 |
| 4 mm | 868K77 |
| 6 mm | 869K77 |
| 8 mm | 870K77 |
| 10 mm | 871K77 |



IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

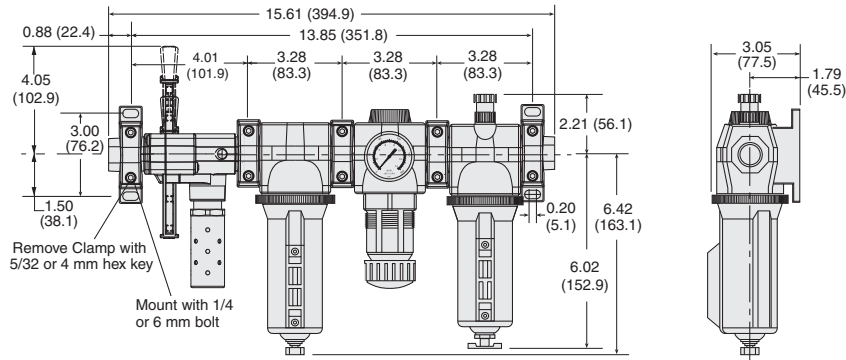
Modular Assemblies

Accessories: Clamp, Brackets, End Ports & Port Blocks

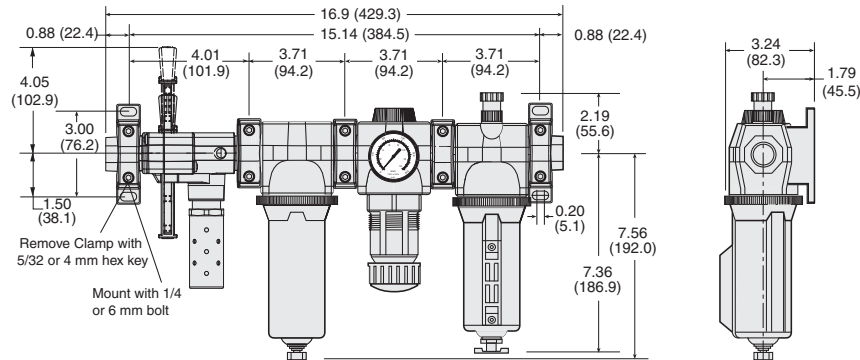
MD Series

Dimensions: inches (mm)

MD3™ Series



MD4™ Series



Mounting Brackets & Clamp for Module Connections

Two brackets are normally used to mount an FRL to a vertical surface. The mounting bracket attaches to the module connecting clamp (see above) with a single screw. Each bracket then employs two bolts (1/4" or 6mm) to connect the assembly to the mounting surface. Specially designed clamps provide a quick and easy assembly or disassembly of MD3™ modules. Two Allen-Head bolts quickly tighten or loosen the clamp using a 5/32 or 4mm hex key. The clamp contains a plate carrying two O-rings to provide positive sealing between modules.



Bracket, Screw, and Clamp



Module Connecting Clamp





Mounting Bracket

Mounting Brackets & Clamp for Module Connections

| Description | Model Number |
|---------------------------|--------------|
| Bracket and Screw | R-A118-103 |
| Module Connecting Clamp | R-A118-105 |
| Bracket, Screw, and Clamp | R-A118-105M |

Male and Female End Ports

Either male or female end ports can be attached to threaded inlet and outlet lines. This allows all modules of an FRL assembly to be removed easily and quickly without having to unthread the end modules. The end ports are attached to the modules with clamps (see at left). End ports can be included in an assembled FRL or ordered separately by the following model numbers:

| End Ports | | | | |
|-----------|-----------|--------------|---------------|---|
| Type | Port Size | Model Number | | |
| | | NPTF Threads | G Threads | |
| Female | 1/4 | R-118-100-2 | R-118-100-2W |  |
| | 3/8 | R-118-100-3 | R-118-100-3W | |
| | 1/2 | R-118-100-4 | R-118-100-4W | |
| | 3/4 | R-118-100-6 | R-118-100-6W | |
| Male | 1/4 | R-118-109-2F | R-118-109-2FW |  |
| | 3/8 | R-118-109-3F | R-118-109-3FW | |
| | 1/2 | R-118-109-4F | R-118-109-4FW | |
| | 3/4 | R-118-109-6F | R-118-109-6FW | |

Extra Port Blocks

An extra port block can be placed between modules to provide two auxiliary 1/4 NPTF ports. Its mounting position can be rotated to obtain the most convenient operating orientation. If only one auxiliary port is to be used, the unused port must be closed with a pipe plug. (The inlet and outlet are not threaded.)

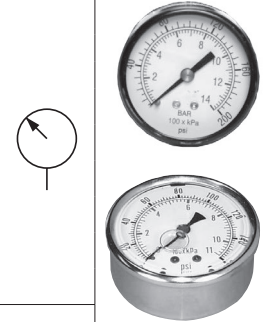
| Port Size | Model Number | |
|-----------|--------------|--------------|
| | NPTF Threads | G Threads |
| 1/4 | R-118-106-2 | R-118-106-2W |
| 3/8 | R-118-106-3 | R-118-106-3W |
| 1/2 | R-118-106-4 | R-118-106-4W |



Analog Pressure Gauges

| Pressure Gauges (Center Back Mounting) | Type/Material | Port Size | Model Number | | Pressure Range psig (bar) | Case Diameter inches (mm) |
|---|---------------|-----------|--------------|-------------|------------------------------|------------------------------|
| | | | Thread | | | |
| | | | NPT | G | | |
| Standard Aluminum | | 1/8 | 5400A1002 | D5400A1002 | 0-160 (0-11) | 1.7 (43) |
| | | 1/4 | 5400A2010 | D5400A2010 | 0-60 (0-4) | 2.0 (51) |
| | | 1/4 | 5400A2011 | D5400A2011 | 0-200 (0-14) | 2.0 (51) |
| | | 1/4 | 5400A2012 | D5400A2012 | 0-300 (0-20) | 2.0 (51) |
| Liquid Filled Stainless Steel | | 1/4 | 5400A2014 | D5400A2014 | 0-160 (0-11) | 2.5 (64) |
| | | 1/4 | 5400A2015* | D5400A2015* | 0-160 (0-11) | 2.0 (51) |

*Green shade between 40-70 psi (2.7-4.8 bar).



Differential Pressure Gauges

| DIFFERENTIAL PRESSURE GAUGE TYPE/SERIES | Small Slide Gauge | Small Slide Gauge | Large Dual Face Gauge | Large Dual Face Gauge with Reed Switch (Normally Open) | Large Dual Face Gauge with Reed Switch (Normally Closed) |
|--|----------------------|-------------------|--------------------------|--|--|
| | R-A60F-28 | R-K103-151 | R-106-35 | R-106-35E | R-106-35EC |
| | | | | | |
| FILTERS | | | | | |
| BANTAM | - | - | - | - | - |
| MINIATURE | - | - | - | - | - |
| MID-SIZE | - | - | - | - | - |
| MD3™ | | - | - | - | - |
| FULL-SIZE | - | - | - | - | - |
| MD4™ | - | | | | |
| HIGH-CAPACITY | - | - | - | - | - |
| COALESCING FILTERS | | | | | |
| BANTAM | - | - | - | - | - |
| MINIATURE | - | - | - | - | - |
| MID-SIZE | | - | - | - | - |
| FULL-SIZE | - | | | | |
| MD3™ | | - | - | - | - |
| MD4™ | - | | | | |
| HIGH-CAPACITY | - | | | | |
| OIL VAPOR REMOVAL (ADSORBING) FILTERS | | | | | |
| MD3™ | - | - | - | - | - |
| MD4™ | - | - | - | - | - |
| CLEAN AIR PACKAGES | | | | | |
| MD3™ | | - | - | - | - |
| MD4™ | - | | | | |

IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

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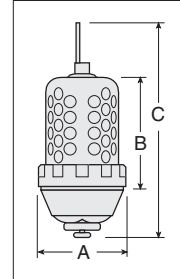
E6

External Automatic Drains

| Pipe Size | Model Number* | |
|-----------|----------------------|------------|
| | Polycarbonate Bowl** | Metal Bowl |
| 1/8 | 5057B1001 | 5058B1001 |
| 1/4* | 5057B2001 | 5058B2001 |

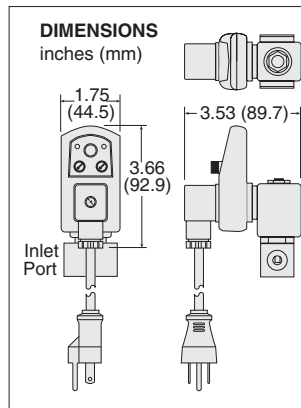
*Use 1/4 size with FULL-SIZE, HIGH-CAPACITY, MD3™ & MD4™ filters.
Use kit 1076K77 to convert standard bowl to accept auto drain unit.
**Available for FULL-SIZE filters only. Polycarbonate bowl includes metal bowl guard.

| Port Size | Dimensions inches (mm) | | | Weight lb (kg) |
|-----------|------------------------|-----------|-----------|----------------|
| | A | B | C | |
| 1/8, 1/4 | 3.5 (89) | 4.2 (107) | 8.3 (211) | 2.6 (1.2) |



Electronically Controlled Drain

| Pipe Size | Voltage | Model Number | |
|-----------|----------------------------|--------------|---------------|
| | | NPTF Threads | G Threads |
| 1/4 | 24 volts DC | R-DED-24V-2 | R-DED-24V-2W |
| 3/8 | 24 volts DC | R-DED-24V-3 | R-DED-24V-3W |
| 1/2 | 24 volts DC | R-DED-24V-4 | R-DED-24V-4W |
| 1/4 | 110-120 volts AC, 50/60 Hz | R-DED-115V-2 | R-DED-115V-2W |
| 3/8 | 110-120 volts AC, 50/60 Hz | R-DED-115V-3 | R-DED-115V-3W |
| 1/2 | 110-120 volts AC, 50/60 Hz | R-DED-115V-4 | R-DED-115V-4W |



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STANDARD SPECIFICATIONS (for electronically controlled drain):

| | | | |
|---------------------|------------------------------------|-----------------------|--|
| Drain Time | Adjustable 0.5 to 10 seconds | Electrical Connection | DIN 43650A, ISO 440/6952 |
| Drain Interval | 0.5 to 45 minutes | Valve Type | 2/2 direct acting, normally closed |
| Current Consumption | Maximum 4 ma | Valve Body | Forged brass; 3/16-inch (4.8 mm) orifice |
| Temperature | Ambient: 35° to 130°F (2° to 54°C) | Maximum Pressure | 230 psig (15.8 bar) |
| | Media: 35° to 190°F (2° to 88°C) | | |

Silencers

| Port Size | Thread Type | Model Number* | | Avg. C _v | Dimensions inches (mm) | | Weight lb (kg) |
|-----------|-------------|---------------|------------|---------------------|------------------------|-----------|----------------|
| | | NPT Threads | R Threads | | Width | Length | |
| 3/8 | Male | 5500A3003 | D5500A3003 | 4.3 | 1.3 (32) | 3.5 (88) | 0.2 (0.1) |
| 3/4 | Male | 5500A5013 | D5500A5013 | 5.1 | 1.3 (32) | 3.6 (92) | 0.2 (0.1) |
| 3/4 | Male | 5500A5003 | D5500A5003 | 11.5 | 2.0 (51) | 5.3 (135) | 0.6 (0.3) |

Flow Media: Filtered air.
Pressure Range: 0 to 290 psig (0 to 20 bar) maximum.



E6

IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

Replacements

Filter Elements

FRL's Series

| Category | Series | Bowl Type | Element Rating | Element Material | Model Number |
|------------------------------------|---|----------------|--------------------------|--------------------------|---------------|
| Filters | Bantam & Miniature | Standard | 5-µm | Polyethylene | 933K77 |
| | | | 5-µm | Sintered Bronze | R-KA130-27E5 |
| | | | 20-µm | Sintered Bronze | R-KA130-27E4 |
| | | | 40-µm | Sintered Bronze | R-KA130-27E3 |
| | MID-SIZE | Standard | 5-µm | Polyethylene | 936K77 |
| | MD3™ | Standard | 5-µm | Polyethylene | R-A60F-03PE5 |
| | | | 5-µm | Sintered Bronze | R-A60F-03E5 |
| | | | 20-µm | Sintered Bronze | R-A60F-03E4 |
| | | | 40-µm | Sintered Bronze | R-A60F-03E3 |
| | FULL-SIZE | Standard | 5-µm | Polyethylene | 939K77 |
| | | | 5-µm | Sintered Bronze | R-KA103-03E5 |
| | | | 20-µm | Sintered Bronze | R-KA103-03E4 |
| | | | 40-µm | Sintered Bronze | R-KA103-03E3 |
| | MD4™ | Standard | 5-µm | Polyethylene | R-A115-106PE5 |
| | | | 5-µm | Sintered Bronze | R-A115-106E5 |
| | | | 20-µm | Sintered Bronze | R-A115-106E4 |
| | | | 40-µm | Polyethylene | R-A115-106PE3 |
| | HIGH-CAPACITY Flow to 275 scfm | Standard | 5-µm | Polyethylene | 1010K77 |
| | | | 5-µm | Sintered Bronze | R-KA109-03E5 |
| | | | 20-µm | Sintered Bronze | R-KA109-03E4 |
| 40-µm | | | Sintered Bronze | R-KA109-03E3 | |
| HIGH-CAPACITY Flow to 660 scfm | Standard | 5-µm | Sintered Bronze | 1656K77 | |
| | | 40-µm | Sintered Bronze | R-A114-106E3 | |
| HIGH-CAPACITY Flow to 1000 scfm | Standard | 5-µm | Sintered Bronze | 942K77 | |
| | | 40-µm | Sintered Bronze | 944K77 | |
| Coalescing Filters | Bantam & Miniature | Standard | 0.3-µm | Borosilicate-glass-fiber | 945K77 |
| | | | 0.01-µm | Borosilicate-glass-fiber | R-A-10F-16E8 |
| | MID-SIZE | Standard | 0.3-µm | Borosilicate-glass-fiber | R-A60F-29 |
| | | | 0.3-µm | Borosilicate-glass-fiber | R-A60F-32 |
| | | Extended | 0.01-µm | Borosilicate-glass-fiber | R-A60F-29E8 |
| | | | 0.01-µm | Borosilicate-glass-fiber | R-A60F-32E8 |
| | MD3™ | Polycarbonate | 0.3-µm | Borosilicate-glass-fiber | R-A60F-23 |
| | | Metal | 0.3-µm | Borosilicate-glass-fiber | R-A60F-29 |
| | | Extended Metal | 0.3-µm | Borosilicate-glass-fiber | R-A60F-32 |
| | | Polycarbonate | 0.01-µm | Borosilicate-glass-fiber | R-A60F-23E8 |
| | | Metal | 0.01-µm | Borosilicate-glass-fiber | R-A60F-29E8 |
| | | Extended Metal | 0.01-µm | Borosilicate-glass-fiber | R-A60F-32E8 |
| | FULL-SIZE | Standard | 0.3-µm | Borosilicate-glass-fiber | 947K77 |
| | | | 0.3-µm | Borosilicate-glass-fiber | R-A103-160L |
| | | Extended | 0.01-µm | Borosilicate-glass-fiber | 948K77 |
| | | | 0.01-µm | Borosilicate-glass-fiber | R-A103-160LE8 |
| | MD4™ | Standard | 0.3-µm | Borosilicate-glass-fiber | R-A115-117 |
| | | | 0.3-µm | Borosilicate-glass-fiber | R-A115-118 |
| | | Extended | 0.01-µm | Borosilicate-glass-fiber | R-A115-117E8 |
| | | | 0.01-µm | Borosilicate-glass-fiber | R-A115-118E8 |
| | HIGH-CAPACITY Flow to 220 scfm | Standard | 0.3-µm | Borosilicate-glass-fiber | 949K77 |
| | | | 0.01-µm | Borosilicate-glass-fiber | R-A109-106E8 |
| | HIGH-CAPACITY Flow to 295 & 450 scfm | Standard | 0.3-µm | Borosilicate-glass-fiber | R-A114-112 |
| | | | 0.3-µm | Borosilicate-glass-fiber | R-A114-113 |
| | | Extended | 0.01-µm | Borosilicate-glass-fiber | R-A114-112E8 |
| | | | 0.01-µm | Borosilicate-glass-fiber | R-A114-113E8 |
| | HIGH-CAPACITY Flow to 465 scfm | Standard | 0.3-µm | Borosilicate-glass-fiber | 952K77 |
| | | | 0.3-µm | Borosilicate-glass-fiber | 953K77 |
| | | Extended | 0.01-µm | Borosilicate-glass-fiber | R-A106-24E8 |
| | | | 0.01-µm | Borosilicate-glass-fiber | R-A106-24LE8 |
| HIGH-CAPACITY Flow to 840 scfm | Extended | 0.3-µm | Borosilicate-glass-fiber | 953K77 | |
| | | 0.01-µm | Borosilicate-glass-fiber | R-A106-24E8 | |
| Oil Vapor Removal Filters | MD3™ | Standard | – | Borosilicate-glass-fiber | R-A60F-29E9 |
| | | Extended | – | Borosilicate-glass-fiber | R-A60F-32E9 |
| | MD4™ | Standard | – | Borosilicate-glass-fiber | R-A115-117E9 |
| | | Extended | – | Borosilicate-glass-fiber | R-A115-118E9 |
| Silencers Reclassifiers | Port Size 1/2 | Standard | 20-µm | Sintered Bronze | 940K77 |
| | Port Size 3/4, 1 | | 100-µm | Sintered Bronze | 981K77 |

E

Lubricants, Polycarbonate Bowl Cautions

Compatible Lubricants

Although air line lubrication is not required for most ROSS valves, other mechanisms in the system may need such lubrication. When a lubricator is used, it should be supplied only with oils which are compatible with the materials used in the valves for seals and poppets. Generally speaking, these are petroleum base oils with oxidation inhibitors, and aniline point between 180°F (82°C) and 220°F (104°C) and an ISO 32, or lighter, viscosity. Oils with phosphate type additives, such as zinc dithiophosphate, must be avoided because they can harm polyurethane valve components. The best oils to use in pneumatic systems are those specifically compounded for air line lubricator service.

Cautions on the Use of Polycarbonate Bowls

Use Only with Compressed Air. Filters and lubricators with polycarbonate bowls are specifically designed for compressed air service, and their use with any other fluid (liquid or gas) is a misapplication. The use with or injection of certain hazardous fluids in the system (e.g., alcohol or liquefied petroleum gas) could be harmful to the polycarbonate bowl or result in a combustible condition or hazardous leakage. Before using with a fluid other than air, or for nonindustrial applications, or for life support systems, consult ROSS.

Use Metal Bowl Guard When Supplied. A metal bowl guard is supplied with all but the smallest bowls, and must always be used to minimize danger from fragmentation in the event of failure of a polycarbonate bowl.

Avoid Harmful Substances. Some compressor oils, chemical cleaners, solvents, paints, and fumes will attack polycarbonate bowls and can cause bowl failure. Do not use with or near these materials. When a bowl becomes dirty, replace the bowl or wipe it with a clean dry cloth. Immediately replace any polycarbonate bowl which is crazed, cracked, or deteriorated.

Substances HARMFUL to Polycarbonate Bowls

| | | | |
|--------------------------------|-------------------------|----------------------------------|-------------------------|
| Acetaldehyde | Carbon disulfide | Ethylene dichloride | Phosphorous trichloride |
| Acetic acid | Carbon tetrachloride | Ethylene glycol | Propionic acid |
| Acetone | Caustic potash solution | Formic acid | Pyridine |
| Acrylonitrile | Caustic soda solution | Freon (refrigerant & propellant) | Sodium hydroxide |
| Ammonia | Chlorobenzene | Gasoline (high aromatic) | Sodium sulfide |
| Ammonium fluoride | Chloroform | Hydrazine | Styrene |
| Ammonium hydroxide | Cresol | Hydrochloric acid | Sulfuric acid |
| Ammonium sulfide | Cyclohexanol | Lacquer thinner | Sulfural chloride |
| Anaerobic adhesives & sealants | Cyclohexanone | Methyl alcohol | Tetrahydronaphthalene |
| Antifreeze | Cyclohexene | Methylene chloride | Thiophene |
| Benzene | Dimethyl formamide | Methylene salicylate | Toluene |
| Benzoic acid | Dioxane | Milk of lime (CaOH) | Turpentine |
| Benzyl alcohol | Ethane tetrachloride | Nitric acid | Xylene |
| Brake fluids | Ethyl acetate | Nitrobenzene | Perchloroethylene |
| Bromobenzene | Ethyl ether | Nitrocellulose lacquer | |
| Butyric acid | Ethylamine | Phenol | |
| Carbolic acid | Ethylene chlorohydrin | Phosphorous hydroxyl chloride | |

Trade Names of Substances HARMFUL to Polycarbonate Bowls

- Atlas Perma-Guard • Buna N • Cellulube #150 & #220 • Crylex #5 cement • Eastman 910 • Garlock 98403 (polyurethane)
- Haskel 568-023 • Hilgard Company's hil phene • Houghton & Co. oil 1120, 1130, 1055 • Houtosafe 1000 • Kano Kroil
- Keystone penetrating oil #2 • Loctite 271, 290, 601 • Loctite Teflon sealant • Marvel Mystery Oil • Minn. Rubber 366Y
- National Compound N11 Nylock VC-3 • Parco 1306 Neoprene • Permabond 910 • Petron PD287 • Prestone • Pydraul AC
- Sears Regular Motor Oil • Sinclair oil "Lily White" • Stauffer Chemical FYRQUEL 150 • Stillman SR 269-75 (polyurethane)
- Stillman SR 513-70 (neoprene) • Tannergas • Telar • Tenneco anderol 495 & 500 oils • Titon • Vibra-tite • Zerex



CAUTIONS, WARNINGS and STANDARD WARRANTY

PRE-INSTALLATION or SERVICE

1. Before servicing a valve or other pneumatic component, be sure that all sources of energy are turned off, the entire pneumatic system is shut off and exhausted, and all power sources are locked out (ref: OSHA 1910.147, EN 1037).
2. All ROSS products, including service kits and parts, should be installed and/or serviced only by persons having training and experience with pneumatic equipment. Because any installation can be tampered with or need servicing after installation, persons responsible for the safety of others or the care of equipment must check every installation on a regular basis and perform all necessary maintenance.
3. All applicable instructions should be read and complied with before using any fluid power system in order to prevent harm to persons or equipment. In addition, overhauled or serviced valves must be functionally tested prior to installation and use. If you have any questions, call your nearest ROSS location listed on the cover of this document.
4. Each ROSS product should be used within its specification limits. In addition, use only ROSS parts to repair ROSS products.

WARNING: *Failure to follow these directions can adversely affect the performance of the product or result in the potential for human injury or damage to property.*

FILTRATION and LUBRICATION

5. Dirt, scale, moisture, etc. are present in virtually every air system. Although some valves are more tolerant of these contaminants than others, best performance will be realized if a filter is installed to clean the air supply, thus preventing contaminants from interfering with the proper performance of the equipment. ROSS recommends a filter with a 5-micron rating for normal applications.
6. All standard ROSS filters and lubricators with polycarbonate plastic bowls are designed for compressed air applications only. Do *not* fail to use the metal bowl guard, where provided, to minimize danger from high pressure fragmentation in the event of bowl failure. Do not expose these products to certain fluids, such as alcohol or liquefied petroleum gas, as they can cause bowls to rupture, creating a combustible condition, hazardous leakage, and the potential for human injury or damage to property. Immediately replace a crazed, cracked, or deteriorated bowl. When bowl gets dirty, replace it or wipe it with a clean dry cloth.

7. Only use lubricants which are compatible with materials used in the valves and other components in the system. Normally, compatible lubricants are petroleum based oils with oxidation inhibitors, an aniline point between 180°F (82°C) and 220°F (104°C), and an ISO 32, or lighter, viscosity. Avoid oils with phosphate type additives which can harm polyurethane components, potentially leading to valve failure which risks human injury, and/or damage to property.

AVOID INTAKE/EXHAUST RESTRICTION

8. Do not restrict the air flow in the supply line. To do so could reduce the pressure of the supply air below the minimum requirements for the valve and thereby cause erratic action.
9. Do not restrict a valve's exhaust port as this can adversely affect its operation. Exhaust silencers must be resistant to clogging and must have flow capacities at least as great as the exhaust capacities of the valves. Contamination of the silencer can result in reduced flow and increased back pressure.

WARNING: *ROSS expressly disclaims all warranties and responsibility for any unsatisfactory performance or injuries caused by the use of the wrong type, wrong size, or an inadequately maintained silencer installed with a ROSS product.*

POWER PRESSES

10. Mechanical power presses and other potentially hazardous machinery using a pneumatically controlled clutch and brake mechanism must use a press control double valve with a monitoring device. A double valve without a self-contained monitoring device should be used only in conjunction with a control system which assures monitoring of the valve. All double valve installations involving hazardous applications should incorporate a monitoring system which inhibits further operation of the valve and machine in the event of a failure within the valve mechanism.

ENERGY ISOLATION/EMERGENCY STOP

11. Per specifications and regulations, ROSS L-O-X® and L-O-X® with EEZ-ON® operation products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

STANDARD WARRANTY

limited to repair or replacement of the product or refund of the purchase price paid solely at the discretion of ROSS and provided such product is returned to ROSS freight prepaid and upon examination by ROSS is found to be defective. This warranty becomes void in the event that product has been subject to misuse, misapplication, improper maintenance, modification or tampering.

THE WARRANTY EXPRESSED ABOVE IS IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES AND ROSS EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED WITH RESPECT TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ROSS MAKES NO WARRANTY WITH RESPECT TO ITS PRODUCTS MEETING THE PROVISIONS OF ANY GOVERNMENTAL OCCUPATIONAL SAFETY AND/OR HEALTH LAWS OR REGULATIONS. IN NO EVENT IS ROSS LIABLE TO PURCHASER, USER, THEIR EMPLOYEES OR OTHERS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM A BREACH OF THE WARRANTY DESCRIBED ABOVE OR THE USE OR MISUSE OF THE PRODUCTS. NO STATEMENT OF ANY REPRESENTATIVE OR EMPLOYEE OF ROSS MAY EXTEND THE LIABILITY OF ROSS AS SET FORTH HEREIN.

All products sold by ROSS CONTROLS are warranted for a one-year period [with the exception of all Filters, Regulators and Lubricators ("FRLs") which are warranted for a period of seven years] from the date of purchase to be free of defects in material and workmanship. ROSS' obligation under this warranty is

