

# MD3™ Series Modular Filter Regulator Lubricator



• *Manufacturers of Premium Pneumatic Controls since 1921* •



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*If you need products or specifications not shown within this bulletin, please contact ROSS® for more information or visit ROSS' website at [www.rosscontrols.com](http://www.rosscontrols.com).*

For additional information consult your ROSS distributor or call ROSS Technical Services in the U.S.A. at 1-888-TEK-ROSS (835-7677).

## Modular Filters

- 5, 20, or 40 micron filter elements
- 98% free water removal efficiency

## Modular Coalescing Filters

- 0.3 or 0.01 micron filter elements
- 99.98% particulate material removal of free oils and solid contaminants 0.3 microns and larger

## Modular Oil Vapor Removal (Adsorbing) Filters

- Removes all vapor that cannot be removed by a coalescent filter

## Modular Clean Air Package

- Filter, coalescing filter, and oil vapor removal (adsorbing) filter combination

## Modular Regulators

- Modular or in-line mounting
- Diaphragm type

## Modular Integral Filter/Regulators

- Filter and regulator combined in one unit

## Modular Lubricator

- Introduces atomized oil into the air line to lubricate downstream mechanisms

## Modular Integral Filter/Regulator Plus Lubricator

- Filter regulator, and lubricator combination (2 units side by side)

## Modular Filter-Regulator-Lubricators

- Filter, regulator, and lubricator combination (3 units side by side)

# Modular Filters

Port Sizes: 1/4, 3/8, 1/2 – Flow to 92 scfm

MD3™ Series

## HOW TO ORDER

(Select options (in red) to configure your model number.)



**MD3 50P B M C 4 2 A**

**BOWL SIZE**  
**50P** - Plastic Bowl 5.1-oz (151-ml)  
**50M** - Metal Bowl 6-oz (177-ml)

**FILTER ELEMENT TYPE**  
**A** - 40 µm sintered bronze  
**B** - 5 µm polyethylene  
**E** - 5 µm sintered bronze  
**F** - 20 µm sintered bronze

**PIPE SIZE**  
**2** - 1/4 NPTF  
**3** - 3/8 NPTF  
**4** - 1/2 NPTF  
**B** - 1/4 BSPP  
**C** - 3/8 BSPP  
**D** - 1/2 BSPP

**GAUGE**  
**A** - No Gauge (without gauge port)  
**S** - Small differential gauge

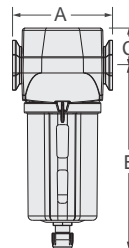
**CAP COLOR**  
**2** - Gold  
**G** - Gray  
**Y** - Yellow  
**R** - Red  
**B** - Blue

**BOWL DRAIN**  
**M** - Manual Drain  
**F** - Float Drain  
**E** - Electronic Drain  
**H** - Automatic External Drain  
**L** - Less Drain Fitting (1/4 NPT female instead)

**ISO Filter Symbols**

Bowl Type	Dimensions inches (mm)				Weight lb (kg)
	A	B*	C	Depth	
Plastic	3.0 (76.2)	5.54 (140.6)	1.12 (28.3)	2.51 (63.8)	1.29 (0.59)
Metal	5.0 (127)	6.42 (163.1)	1.12 (28.3)	2.76 (70.1)	1.41 (0.64)

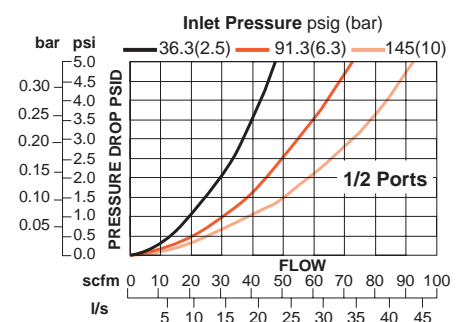
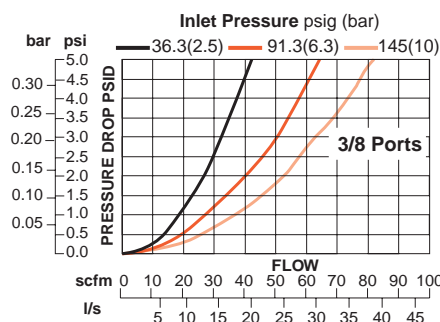
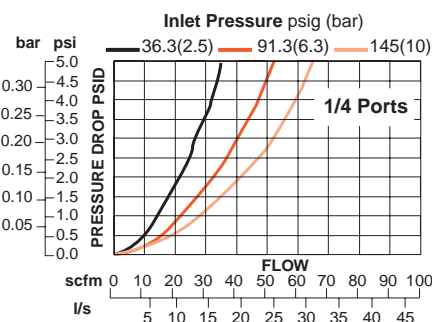
\* With small differential gauge, add 1.21 (31) to dimension C.  
 Bowl removal clearance: add 3.1 (79).



REPLACEMENT FILTER ELEMENTS*		
Element Rating	Element Material	Part Number
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

\* For plastic and metal bowl types.

## FLOW CHARTS (5-µm element)



Accessories not included with the product, see pages 12 -13 for accessories.

## STANDARD SPECIFICATIONS (for products on this page):

**Construction:** Sintered or fiber.

**Ambient/Media Temperature:** Plastic bowl: 40° to 125°F (4° to 52°C).  
 Metal bowl: 40° to 175°F (4° to 79°C).

**Fluid Media:** Compressed air.

**Inlet Pressure:** Plastic bowl & Manual drain: 0-150 psig (0-10 bar).  
 Plastic bowl & Float drain: 30-150 psig (2-10 bar).  
 Metal bowl & Manual drain: 0-250 psig (0-17 bar).  
 Metal bowl & Float drain: 30-200 psig (2-14 bar).

**Filter Element:** 5-µm-rated polyethylene; 5-µm, 20-µm or 40-µm-rated sintered bronze.

**Body:** Die-cast zinc.

**Bowl:** 5.1-ounce (151-ml) capacity polycarbonate plastic with nylon shatterguard; 6.0 ounce (177-ml) aluminum bowl with clear nylon sight glass.

**Seals:** Nitrile

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



# Modular Coalescing Filters

Port Sizes: 1/4, 3/8, 1/2 – Flow to 125 scfm

MD3™ Series

## HOW TO ORDER

(Select options (in red) to configure your model number.)

MD3 **50P** **C** **M** **C** **4** **2** **A**

### BOWL SIZE

- 50P** - Plastic Bowl 5.1-oz (151-ml)
- 50M** - Metal Bowl 6-oz (177-ml)
- 50E** - Extended Metal Bowl 10-oz (295-ml)

### FILTER ELEMENT TYPE

- C** - 0.3 µm Borosilicate glass
- D** - 0.01 µm Borosilicate glass

### BOWL DRAIN

- M** - Manual Drain
- F** - Float Drain
- E** - Electronic Drain
- H** - Automatic External Drain
- L** - Less Drain Fitting (1/4 NPT female instead)

### PIPE SIZE

- 2** - 1/4 NPTF
- 3** - 3/8 NPTF
- 4** - 1/2 NPTF
- B** - 1/4 BSPP
- C** - 3/8 BSPP
- D** - 1/2 BSPP

### GAUGE

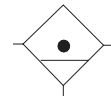
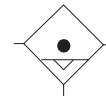
- A** - No Gauge (without gauge port)
- S** - Small differential gauge

### CAP COLOR

- 2** - Gold
- G** - Gray
- Y** - Yellow
- R** - Red
- B** - Blue



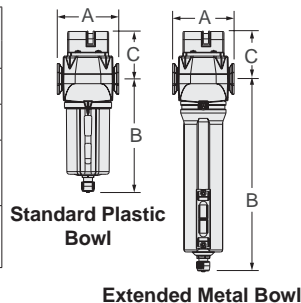
### ISO Filter Symbols



Automatic Drain      Manual Drain

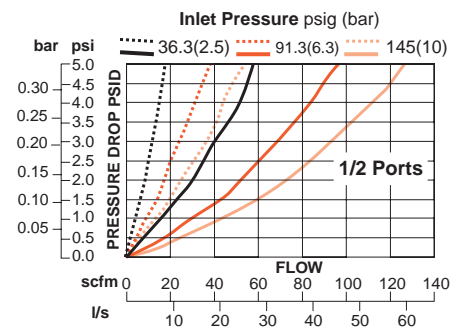
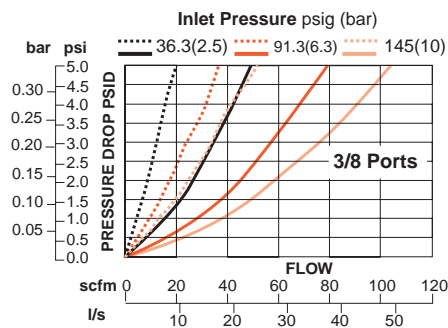
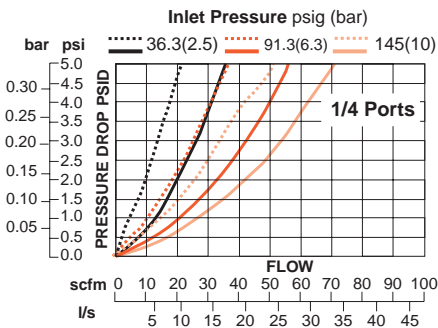
Bowl Type	Dimensions inches (mm)				Weight lb (kg)
	A	B*	C	Depth	
Plastic	3.0 (76.2)	5.54 (140.6)	2.33 (59.3)	2.51 (63.8)	1.30 (0.59)
Metal	3.0 (76.2)	6.42 (163.1)	2.33 (59.3)	2.76 (70.1)	1.41 (0.64)
Extended Metal	3.0 (76.2)	9.51 (241.6)	2.33 (59.3)	2.76 (70.1)	1.54 (0.70)

\* Bowl removal clearance: add 3.1 (79).  
Extended Bowl removal clearance: add 6.1 (155).



REPLACEMENT FILTER ELEMENTS		
Element Rating	Bowl Type	Part Number
0.3-µm	Plastic	R-A60F-23
0.3-µm	Metal	R-A60F-29
0.3-µm	Extended Metal	R-A60F-32
0.01-µm	Plastic	R-A60F-23E8
0.01-µm	Metal	R-A60F-29E8
0.01-µm	Extended Metal	R-A60F-32E8

## FLOW CHARTS (0.3-µm element)



Accessories not included with the product, see pages 12-13 for accessories.

## STANDARD SPECIFICATIONS (for products on this page):

**Ambient/Media Temperature:** Plastic bowl: 40° to 125°F (4° to 52°C).  
Metal bowl: 40° to 175°F (4° to 79°C).

**Fluid Media:** Compressed air.

**Inlet Pressure:** Plastic bowl & Manual drain: 0-150 psig (0-10 bar).  
Plastic bowl & Float drain: 30-150 psig (2-10 bar).  
Metal bowl & Manual drain: 0-250 psig (0-17 bar).  
Metal bowl & Float drain: 30-200 psig (2-14 bar).

**Filter Element:** 0.3-µm, or 0.01-µm (reduces flow by 20%) borosilicate-glass-fiber.

**Body:** Die-cast zinc.

**Bowl:** 5.1-ounce (151-ml) capacity polycarbonate plastic with nylon shatterguard; 6.0 ounce (177-ml) aluminum bowl with clear nylon sight glass; 10-ounce (295-ml) extended aluminum bowl with clear nylon sight glass and higher flow filter element.

**Seals:** Nitrile.

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

# Modular Oil Vapor Removal (Adsorbing) Filters

Port Sizes: 1/4, 3/8, 1/2 – Flow to 125 scfm

MD3™ Series

## HOW TO ORDER

(Select options (in red) to configure your model number.)

MD3 **50P** **C** **4** **2**

### BOWL SIZE

- 50P** - Plastic Bowl 5.1-oz (151-ml)
- 50M** - Metal Bowl 6-oz (177-ml)
- 50E** - Extended Metal Bowl 10-oz (295-ml)

### PIPE SIZE

- 2** - 1/4 NPTF
- 3** - 3/8 NPTF
- 4** - 1/2 NPTF
- B** - 1/4 BSPP
- C** - 3/8 BSPP
- D** - 1/2 BSPP

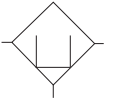
### CAP COLOR

- 2** - Gold
- G** - Gray
- Y** - Yellow
- R** - Red
- B** - Blue



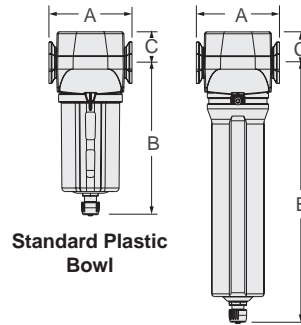
### ISO Filter Symbols

Manual Drain



Bowl	Dimensions inches (mm)				Weight lb (kg)
	A	B*	C	Depth	
Plastic	3.0 (76.2)	5.54 (140.6)	1.12 (28.3)	2.51 (63.8)	1.29(0.59)
Metal	3.0 (76.2)	6.42 (163.1)	1.12 (28.3)	2.76 (70.1)	1.41 (0.64)
Extended Metal	3.0 (76.2)	9.51 (241.6)	1.12 (28.3)	2.76 (70.1)	1.54 (0.70)

\* Bowl removal clearance: add 3.1 (79).  
Extended Bowl removal clearance: add 6.1 (155).

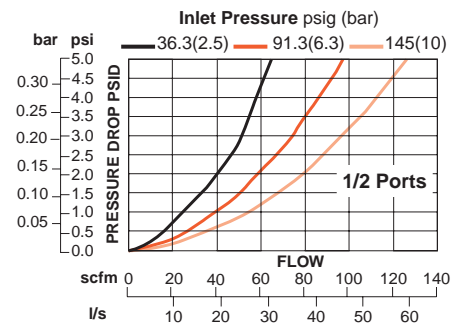
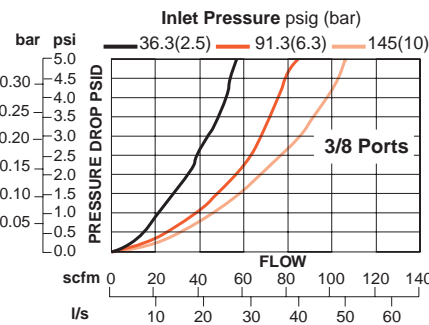
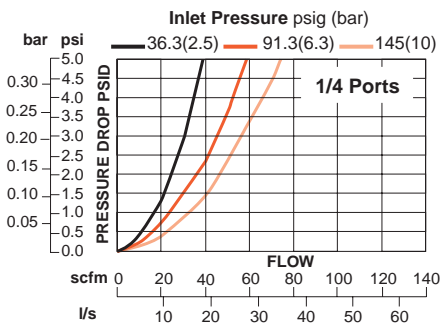


Standard Plastic Bowl

Extended Metal Bowl

REPLACEMENT FILTER ELEMENTS	
Bowl Type	Part Number
Plastic	R-A60F-29E9
Metal	R-A60F-29E9
Extended Metal	R-A60F-32E9

## FLOW CHARTS



Accessories not included with the product, see pages 12-13 for accessories.

## STANDARD SPECIFICATIONS (for products on this page):

**Ambient/Media Temperature:** Plastic bowl: 40° to 125°F (4° to 52°C).  
Metal bowl: 40° to 175°F (4° to 79°C).

**Fluid Media:** Compressed air.

**Inlet Pressure:** Plastic bowl & Manual drain: 0-150 psig (0-10 bar).  
Plastic bowl & Float drain: 30-150 psig (2-10 bar).  
Metal bowl & Manual drain: 0-250 psig (0-17 bar).  
Metal bowl & Float drain: 30-200 psig (2-14 bar).

**Filter Element:** Activated carbon with urethane seals.

**Bowl Drain:** Manual drain.

**Body:** Die-cast zinc.

**Bowl:** 5.1-ounce (151-ml) capacity polycarbonate plastic with nylon shatterguard; 6.0 ounce (177-ml) aluminum bowl with clear nylon sight glass; 10-ounce (295-ml) extended aluminum bowl with clear nylon sight glass and extended flow filter element.

**Seals:** Nitrile.

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



# Modular Clean Air Package

Port Sizes: 1/4, 3/8, 1/2 – Flow to 125 scfm

MD3™ Series

## HOW TO ORDER

(Select options (in red) to configure your model number.)

MD3 CAP 1 A C 1 4 Y A 1

### BOWL SIZE

- 1 - Plastic Bowl 5.1-oz (151-ml)
- 2 - Metal Bowl 6-oz (177-ml)
- 3 - Extended Metal Bowl 10-oz (295-ml)

### COALESCING FILTER ELEMENT TYPE

- A - 0.3 µm Borosilicate glass
- B - 0.01 µm Borosilicate glass

### BOWL DRAIN

- 1 - Manual Drain
- F - Float Drain (plastic with plastic bowl and brass with metal bowl)

### PIPE SIZE

- 2 - 1/4 NPTF
- 3 - 3/8 NPTF
- 4 - 1/2 NPTF
- B - 1/4 BSPP
- C - 3/8 BSPP
- D - 1/2 BSPP

### CAP COLOR

- 2 - Gold
- G - Gray
- Y - Yellow
- R - Red
- B - Blue

### ADD on L-O-X® - Optional

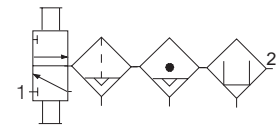
- 1 - L-O-X® on outlet side
- 2 - L-O-X® on the inlet side
- 3 - EEZ-ON® on outlet side
- 4 - EEZ-ON® on inlet side
- Blank - No L-O-X®

### GAUGE

- A - No Gauge (without gauge port)
- S - Small differential gauge

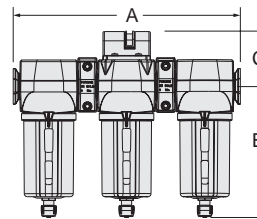


ISO Symbol  
Clean Air Package  
with Lockout

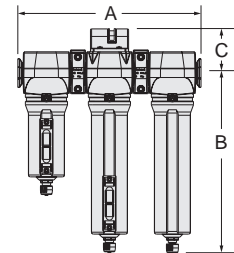


Bowl Type	Dimensions inches (mm)				Weight lb (kg)
	A	B*	C	Depth	
Plastic	9.58 (243.3)	5.54 (140.6)	2.38 (59.3)	2.51 (63.8)	4.3 (2.0)
Metal	9.58 (243.3)	6.42 (163.1)	2.38 (59.3)	2.76 (70.1)	4.6 (2.1)
Extended Metal	9.58 (243.3)	9.51 (241.6)	2.38 (59.3)	2.76 (70.1)	4.9 (2.2)

\* Lockout: With the lockout valve, add 2.3 (58) to dimension A.  
Bowl removal clearance: add 3.1 (79).  
Extended Bowl removal clearance: add 6.1 (155).



Standard Plastic Bowls



Extended Metal Bowls

REPLACEMENT FILTER ELEMENTS		
Element Rating	Element Material	Part Number
5-µm	Polyethylene	R-A60F-03PE5

REPLACEMENT COALESCING ELEMENTS		
Element Rating	Bowl Type	Part Number
0.3-µm	Plastic	R-A60F-23
0.3-µm	Metal	R-A60F-29
0.3-µm	Extended Metal	R-A60F-32
0.01-µm	Plastic	R-A60F-23E8
0.01-µm	Metal	R-A60F-29E8
0.01-µm	Extended Metal	R-A60F-32E8

REPLACEMENT ADSORBING ELEMENTS	
Bowl Type	Part Number
Plastic	R-A60F-29E9
Metal	R-A60F-29E9
Extended Metal	R-A60F-29

### AIR FLOW and CONSTRUCTION DATA

See Flow Charts and Specifications for individual assembly components pages.

Accessories not included with the product, see pages 12-13 for accessories.

## STANDARD SPECIFICATIONS (for products on this page):

**Construction:** Regulator-diaphragm; Lubricator- sight-feed; Lockout-spool.

### Ambient/Media Temperature:

Plastic bowls: 40° to 125°F (4° to 52°C).

Metal bowls: 40° to 175°F (4° to 79°C).

Metal bowl & Float drain: 40° to 175°F (4° to 79°C).

**Fluid Media:** Compressed air.

**Inlet Pressure:** Plastic bowl & Manual drain: 0-150 psig (0-10 bar).

Plastic bowl & Float drain: 30-150 psig (2-10 bar).

Metal bowl & Manual drain: 0-250 psig (0-17 bar).

Metal bowl & Float drain: 30-200 psig (2-14 bar).

**Filter Element:** 5-µm-rated polyethylene.

**Coalescing Filter Element:** 0.3-µm, or 0.01-µm (reduces flow by 20%) borosilicate-glass-fiber.

**Adsorbing Filter Element:** Activated carbon with urethane seals.

### Bowl Drain:

Filter and Coalescing Filter: Internal float drain; manual drain.

Adsorber Filter: Manual drain only.

**Body:** Die-cast zinc.

**Bowl:** 5.1-ounce (151-ml) capacity polycarbonate plastic with nylon shatterguard; 6.0 ounce (177-ml) aluminum bowl with clear nylon sight glass; 10-ounce (295-ml) extended aluminum bowl with clear nylon sight glass and higher flow filter element (for coalescing and adsorber filter only).

**Seals:** Nitrile

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

# Modular Regulators

Port Sizes: 1/4, 3/8, 1/2 – Flow to 120 scfm

MD3™ Series

## HOW TO ORDER

(Select options (in red) to configure your model number.)

MD3 **52K** **A** **R** **C** **4** **2** **A**

### ADJUSTMENT TYPE

- 52K** - Knob
- 52T** - Tee Handle
- 52L** - Locking Knob

### ADJUSTMENT RANGE

- A** - 0-200 psig (0-13.8 bar)
- B** - 0-150 psig (0-10.3 bar)
- C** - 0-100 psig (0-6.9 bar)
- D** - 0-50 psig (0-3.4 bar)

### PIPE SIZE

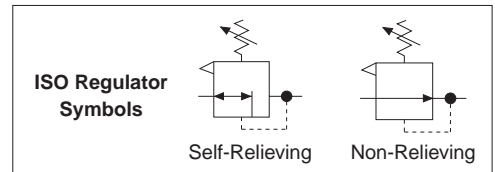
- 2** - 1/4 NPTF
- 3** - 3/8 NPTF
- 4** - 1/2 NPTF
- B** - 1/4 BSPP
- C** - 3/8 BSPP
- D** - 1/2 BSPP

### GAUGE

- A** - No Gauge
- B** - With Gauge 0-200 psig (0-13.8 bar)
- C** - With Gauge 0-60 psig (0-4.1 bar)
- D** - No Gauge, With Panel Mount Nut
- E** - With Panel Mount Nut & Gauge 0-200 psig (0-13.8 bar)
- F** - With Panel Mount Nut & Gauge 0-60 psig (0-4.1 bar)

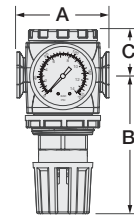
### FLOW OPTIONS

- R** - Reverse Flow
- S** - Standard Flow

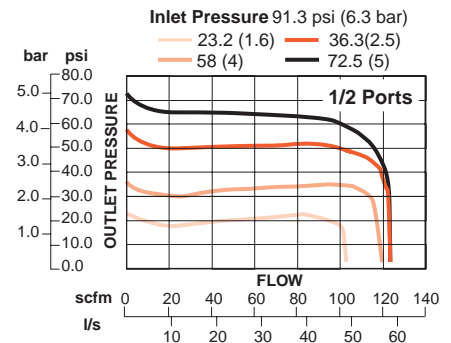
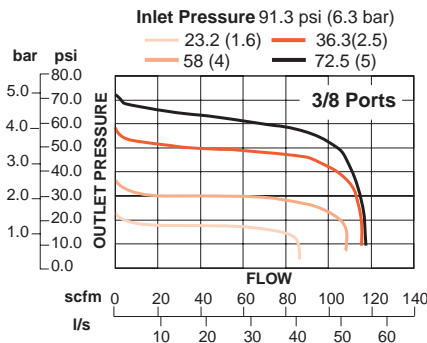
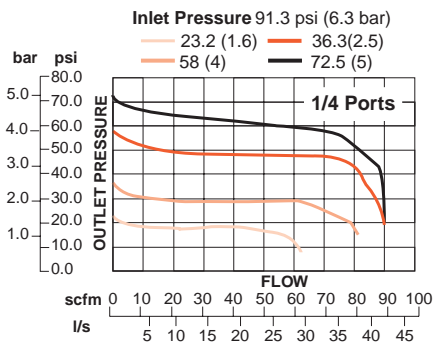


Dimensions inches (mm)				Weight lb (kg)
A	B*	C	Depth	
3.0 (76.2)	4.52 (114.9)	1.46 (37)	2.51 (63.8)	1.9 (0.86)

Dome removal clearance: add 0.575 (14.6).  
 Cap removal clearance: add 0.750 (19.1).  
 Dimensions above reflect less gauge.



## FLOW CHARTS



Accessories not included with the product, see pages 12-13 for accessories.

## STANDARD SPECIFICATIONS (for products on this page):

**Construction:** Diaphragm.

**Ambient/Media Temperature:** 40° to 175°F (4° to 79°C).

**Fluid Media:** Compressed Air.

**Inlet Pressure:** 300 psig (21 bar) maximum.

**Outlet Pressure:** Adjustable up to 200 psig (13.8 bar); optional adjusting springs.

**Optional Pressure Adjustment Locking Key:** Removable.

**Pressure Gauge:** 0-200 psig (0-13.8 bar) or 0-60 psig (0-4.1 bar); 1/4-NPT gauge ports front and rear.

**Panel Mounting:** 2-1/16 inch (52 mm) hole required.

**Self-relieving:** Non-relieving optional.

**Body:** Zinc.

**Dome:** Nylon.

**Knob:** Acetal.

**Seals:** Nitrile.

**Valve:** Brass.

**Valve Cap:** Nylon.

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



# Modular Integral Filter/Regulators

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

MD3™ Series

## HOW TO ORDER

(Select options (in red) to configure your model number.)

MD3 **53P** **B** **M** **C** **2** **A** **A** **1**

### BOWL SIZE

**53P** - Plastic Bowl 5.1-oz (151-ml)  
**53M** - Metal Bowl 6-oz (177-ml)

### FILTER ELEMENT TYPE

**A** - 40 µm bronze  
**B** - 5 µm polyethylene  
**E** - 5 µm bronze  
**F** - 20 µm bronze

### BOWL DRAIN

**M** - Manual Drain  
**F** - Float Drain  
**E** - Electronic Drain  
**H** - Automatic External Drain  
**L** - Less Drain Fitting  
 (1/4 NPT female instead)

### ADJUSTMENT RANGE

**A** - 0-200 psig (0-13.8 bar)  
**B** - 0-150 psig (0-10 bar)  
**C** - 0-100 psig (0-6.9 bar)  
**D** - 0-50 psig (0-3.4 bar)  
**F** - Reverse Flow 0-200 psig (0-13.8 bar)  
**G** - Reverse Flow 0-150 psig (0-10.3 bar)  
**H** - Reverse Flow 0-100 psig (0-6.9 bar)  
**J** - Reverse Flow 0-50 psig (0-3.4 bar)

### PIPE SIZE

**2** - 1/4 NPTF  
**3** - 3/8 NPTF  
**4** - 1/2 NPTF  
**B** - 1/4 BSPP  
**C** - 3/8 BSPP  
**D** - 1/2 BSPP

### ADD on L-O-X® - Optional

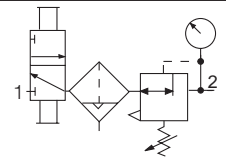
**1** - L-O-X® on outlet side  
**2** - L-O-X® on the inlet side  
 (must also choose Reverse Flow)  
**3** - EEZ-ON® on outlet side  
**4** - EEZ-ON® on inlet side  
 (must also choose Reverse Flow)  
 Blank - No L-O-X®

### GAUGE

**A** - No Gauge  
**B** - With Gauge 0-200 psig (0-13.8 bar)  
**C** - With Gauge 0-60 psig (0-4.1 bar)  
**D** - No Gauge, With Panel Mount Nut  
**E** - With Panel Mount Nut & Gauge 0-200 psig (0-13.8 bar)  
**F** - With Panel Mount Nut & Gauge 0-60 psig (0-4.1 bar)

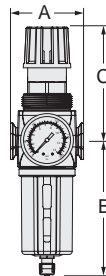


ISO Filter/Regulator Symbol  
 Automatic Drain, Self-relieving  
 with Lockout



Bowl Type	Dimensions inches (mm)				Weight lb (kg)
	A	B*	C	Depth	
Plastic	3.0 (76.2)	5.54 (140.6)	4.68 (119)	2.51 (63.8)	1.98 (0.90)
Metal	3.0 (76.2)	6.42 (163.1)	4.68 (119)	2.76 (70.1)	2.17 (0.99)

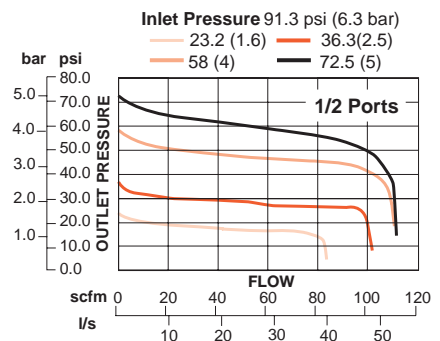
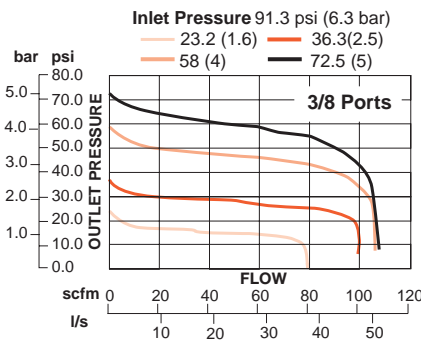
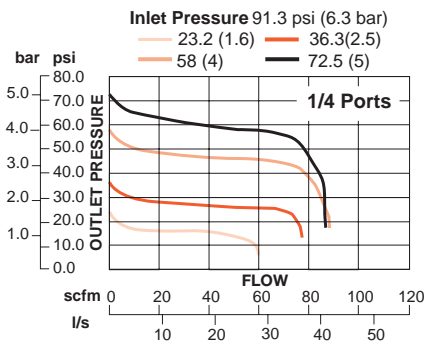
**Lockout:** With the lockout valve, add 2.3 (58) to dimension A.  
 \* Bowl (standard) removal clearance: add 3.1 (79)  
 \* Bowl (extended) removal clearance: add 6.1 (155)  
 Dimensions above reflect less gauge.



REPLACEMENT FILTER ELEMENTS*		
Element Rating	Element Material	Part Number
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

\* For plastic and metal bowl types.

## FLOW CHARTS (0.5-µm element)



Accessories not included with the product, see pages 12-13 for accessories.

## STANDARD SPECIFICATIONS (for products on this page):

**Construction:** Regulator-diaphragm; Lockout-spool.

**Ambient/Media Temperature:** Plastic bowl: 40° to 125°F (4° to 52°C).  
 Metal bowl: 40° to 175°F (4° to 79°C).

**Fluid Media:** Compressed air.

**Inlet Pressure:** Plastic bowl & Manual drain: 0-150 psig (0-10 bar).  
 Plastic bowl & Float drain: 30-150 psig (2-10 bar).  
 Metal bowl & Manual drain: 0-250 psig (0-17 bar).  
 Metal bowl & Float drain: 30-200 psig (2-14 bar).

**Outlet Pressure:** Adjustable up to 200 psig (13.8 bar); optional adjusting springs.

**Optional Pressure Adjustment Locking Key:** Removable.

**Pressure Gauge:** 0-200 psig (0-13.8 bar) or 0-60 psig (0-4.1 bar); 1/4-NPT gauge ports front and rear.

**Panel Mounting:** 2-1/16-inch (52-mm) hole required.

**Filter Element:** 5-µm-rated polyethylene; 5-µm, 20-µm or 40-µm-rated sintered bronze.

**Body:** Zinc.

**Dome:** Nylon.

**Bowl:** 5.1-Ounce (151-ml) polycarbonate plastic with nylon shatterguard; 6.0-Ounce (177-ml) aluminum bowl with clear nylon sight glass.

**Seals:** Nitrile. **Valve:** Brass.

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



# Modular Lubricators

Port Sizes: 1/4, 3/8, 1/2 – Flow to 150 scfm

MD3™ Series

## HOW TO ORDER

(Select options (in red) to configure your model number.)

MD3 **51P** **Q** **C** **2** **2**



### BOWL SIZE

- 51P** - Plastic Bowl 5.1-oz (151-ml)
- 51M** - Metal Bowl 6-oz (177-ml)
- 51E** - Extended Metal Bowl 10-oz (295-ml)

### LUBRICATOR FILL TYPE

- Q** - Quick Fill Cap
- S** - Fill Port

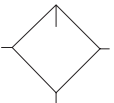
### PIPE SIZE

- 2** - 1/4 NPTF
- 3** - 3/8 NPTF
- 4** - 1/2 NPTF
- B** - 1/4 BSPP
- C** - 3/8 BSPP
- D** - 1/2 BSPP

### CAP COLOR

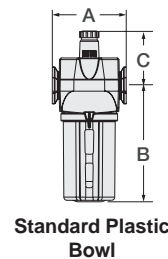
- 2** - Gold
- G** - Gray
- Y** - Yellow
- R** - Red
- B** - Blue

ISO Lubricator Symbols

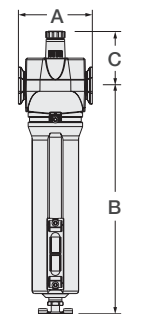


Bowl Type	Dimensions inches (mm)				Weight lb (kg)
	A	B*	C	Depth	
Plastic	3.0 (76.2)	4.72 (119.9)	2.21 (56.1)	2.51 (63.8)	1.30 (0.59)
Metal	3.0 (76.2)	6.02 (152.9)	2.21 (56.1)	2.76 (70.1)	1.42 (0.64)
Extended Metal	3.0 (76.2)	9.37 (238)	2.21 (56.1)	2.76 (70.1)	1.54 (0.70)

\* Bowl removal clearance: add 3.1 (79).  
Extended Bowl removal clearance: add 6.1 (155).

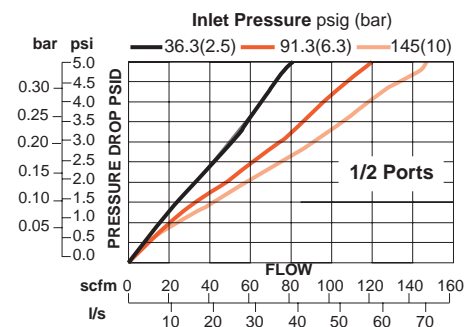
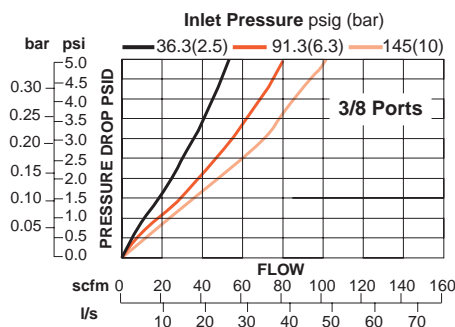
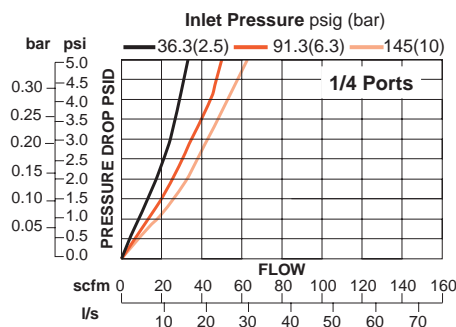


Standard Plastic Bowl



Extended Metal Bowl

## FLOW CHARTS



Accessories not included with the product, see pages 12-13 for accessories.

## STANDARD SPECIFICATIONS (for products on this page):

**Construction:** Sight-Feed.

**Ambient/Media Temperature:**

*Plastic bowl:* 40° to 125°F (4° to 52°C).

*Metal bowl:* 40° to 175°F (4° to 79°C).

**Fluid Media:** Compressed air.

**Inlet Pressure:**

*Plastic bowl:* 150 psig (10 bar) maximum.

*Metal bowl:* 250 psig (17 bar) maximum.

**Oil Adjustment:** External; tamper resistant.

**Body:** Zinc.

**Bowl:** 5.1-ounce (151-ml) capacity polycarbonate plastic with nylon shatterguard; 6.0 ounce (177-ml) aluminum bowl with clear nylon sight glass.

**Seals:** Nitrile.

**Sight-Feed Dome:** Nylon.

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



# Modular Integral Filter/Regulator Plus Lubricator

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

MD3™ Series

## HOW TO ORDER

(Select options (in red) to configure your model number.)

MD3 **53P** **B** **B** **2** **C** **2** **2** **Q** **1**

### BOWL SIZE

- 53P** - Plastic Bowls 5.1-oz (151-ml)
- 53M** - Metal Bowls 6-oz (177-ml)
- 53E** - 6-oz (177-ml) Metal Filter, 10-oz (295-ml) Metal Lubricator
- 53F** - 5.1-oz (151-ml) Plastic Filter, 10-oz (295-ml) Metal Lubricator

### ADJUSTMENT RANGE

- A** - 0-200 psig (0-13.8 bar)
- B** - 0-150 psig (0-10 bar)
- C** - 0-100 psig (0-6.9 bar)
- D** - 0-50 psig (0-3.4 bar)
- F** - Reverse Flow 0-200 psig (0-13.8 bar)
- G** - Reverse Flow 0-150 psig (0-10.3 bar)
- H** - Reverse Flow 0-100 psig (0-6.9 bar)
- J** - Reverse Flow 0-50 psig (0-3.4 bar)

### FILTER ELEMENT TYPE

- A** - 40 µm bronze
- B** - 5 µm polyethylene
- E** - 5 µm bronze
- F** - 20 µm bronze

### PIPE SIZE

- 2** - 1/4 NPTF
- 3** - 3/8 NPTF
- 4** - 1/2 NPTF
- B** - 1/4 BSPP
- C** - 3/8 BSPP
- D** - 1/2 BSPP

### CAP COLOR

- 2** - Gold
- G** - Gray
- Y** - Yellow
- R** - Red
- B** - Blue

### ADD on L-O-X® - Optional

- 1** - L-O-X® on outlet side
- 2** - L-O-X® on the inlet side (must also choose Reverse Flow)
- 3** - EEZ-ON® on outlet side
- 4** - EEZ-ON® on inlet side (must also choose Reverse Flow)
- Blank - No L-O-X®

### LUBRICATOR FILL TYPE

- Q** - Quick Fill Cap
- S** - Fill Port

### BOWL DRAIN

- 2** - Manual Drain
- 0** - Float Drain (plastic with plastic bowl and brass with metal bowl)



### AIR FLOW and CONSTRUCTION DATA

See Flow Charts and Specifications for individual assembly components pages.

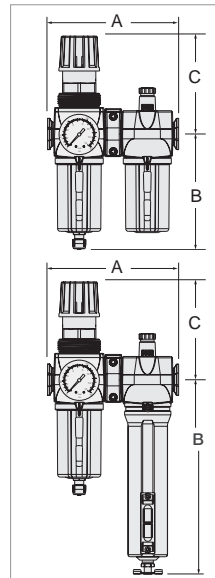
Bowl Type	Dimensions inches (mm)				Weight lb (kg)
	A	B*	C	Depth	
Plastic	6.46 (164.1)	5.54 (140.6)	4.68 (119)	2.90 (73.7)	4.7 (2.1)
Metal	6.46 (164.1)	6.42 (163.1)	4.68 (119)	2.90 (73.7)	5.1 (2.3)
Extended Metal	6.46 (164.1)	9.37 (238)	4.68 (119)	2.90 (73.7)	5.3 (2.4)

**Lockout:** With the lockout valve, add 2.3 (58) to dimension A.

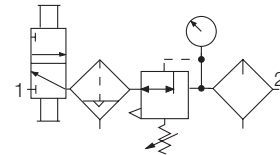
\* Bowl (standard) removal clearance: add 3.1 (79)

\* Bowl (extended) removal clearance: add 6.1 (155)

Dimensions above reflect less gauge.



**ISO FRL Symbol**  
Automatic Drain, Self-relieving  
with Lockout



### REPLACEMENT FILTER ELEMENTS\*

Element Rating	Element Material	Part Number
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

\* For plastic and metal bowl types.

*Accessories not included with the product, see pages 12-13 for accessories.*

### STANDARD SPECIFICATIONS (for products on this page):

**Construction:** Regulator - diaphragm; Lubricator - sight-feed; Lockout - spool.

**Ambient/Media Temperature:** *Plastic bowl:* 40° to 125°F (4° to 52°C).  
*Metal bowl:* 40° to 175°F (4° to 79°C).

**Fluid Media:** Compressed air.

**Filter Inlet Pressure:** *Plastic bowl & Manual drain:* 0-150 psig (0-10 bar).

*Plastic bowl & Float drain:* 30-150 psig (2-10 bar).

**Filter Inlet Pressure:** *Metal bowl & Manual drain:* 0-250 psig (0-17 bar).

*Metal bowl & Float drain:* 30-200 psig (2-14 bar).

**Lubricator Inlet Pressure:** *Plastic bowl:* 150 psig (10 bar) maximum.  
*Metal bowl:* 250 psig (17 bar) maximum.

**Outlet Pressure:** Adjustable up to 200 psig (13.8 bar); optional adjusting springs.

**Optional Pressure Adjustment Locking Key:** Removable.

**Pressure Gauge:** 0-200 psig (0-13.8 bar); 1/4 NPT gauge ports front and rear.

**Panel Mounting:** 2-1/16-inch (52-mm) hole required.

**Oil Adjustment:** External; tamper resistant.

**Filter Element:** 5-µm-rated polyethylene; 5-µm, 20-µm or 40-µm-rated sintered bronze.

**Body:** Zinc.

**Dome:** Nylon.

**Bowl:** 5.1-Ounce (151-ml) polycarbonate plastic with nylon shatterguard; 6.0-Ounce (177-ml) aluminum bowl with clear nylon sight glass. Lubricator bowl only; 10-ounce (295-ml) extended aluminum bowl with clear nylon sight glass.

**Seals:** Nitrile.

**Valve:** Brass.

**Sight-Feed Dome:** Nylon.

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

# Modular Filter-Regulator-Lubricators

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

MD3™ Series

## HOW TO ORDER

(Select options (in red) to configure your model number.)

MD3 **53P** **B** **A** **6** **C** **2** **2** **Q** **1**

### BOWL SIZE

- 53P** - Plastic Bowls 5.1-oz (151-ml)
- 53M** - Metal Bowls 6-oz (177-ml)
- 53E** - 6-oz (177-ml) Metal Filter, 10-oz (295-ml) Metal Lubricator
- 53F** - 5.1-oz (151-ml) Plastic Filter, 10-oz (295-ml) Metal Lubricator

### ADJUSTMENT RANGE

- A** - 0-200 psig (0-13.8 bar)
- B** - 0-150 psig (0-10 bar)
- C** - 0-100 psig (0-6.9 bar)
- D** - 0-50 psig (0-3.4 bar)
- F** - Reverse Flow 0-200 psig (0-13.8 bar)
- G** - Reverse Flow 0-150 psig (0-10.3 bar)
- H** - Reverse Flow 0-100 psig (0-6.9 bar)
- J** - Reverse Flow 0-50 psig (0-3.4 bar)

### FILTER ELEMENT TYPE

- A** - 40 µm bronze
- B** - 5 µm polyethylene
- E** - 5 µm bronze
- F** - 20 µm bronze

### PIPE SIZE

- 2** - 1/4 NPTF
- 3** - 3/8 NPTF
- 4** - 1/2 NPTF
- B** - 1/4 BSPP
- C** - 3/8 BSPP
- D** - 1/2 BSPP

### CAP COLOR

- 2** - Gold
- G** - Gray
- Y** - Yellow
- R** - Red
- B** - Blue

### LUBRICATOR FILL TYPE

- Q** - Quick Fill Cap
- S** - Fill Port

### BOWL DRAIN

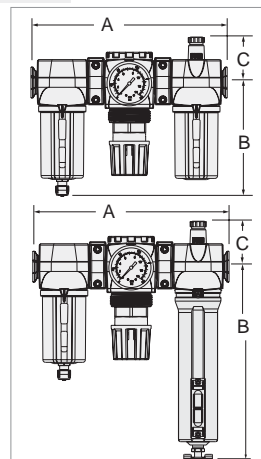
- 6** - Manual Drain
- 7** - Electronic Drain
- 8** - Automatic External Drain
- 9** - Float Drain

### AIR FLOW and CONSTRUCTION DATA

See Flow Charts and Specifications for individual assembly components pages.

Bowl Type	Dimensions inches (mm)				Weight lb (kg)
	A	B*	C	Depth	
Plastic	9.72 (247.4)	5.54 (140.6)	2.21 (56.2)	2.90 (73.7)	6.1 (2.8)
Metal	9.72 (247.4)	6.42 (163.1)	2.21 (56.2)	2.90 (73.7)	6.4 (2.9)
Extended Metal	9.72 (247.4)	9.37 (238)	2.21 (56.2)	2.90 (73.7)	6.6 (3.0)

**Lockout:** With the lockout valve, add 2.3 (58) to dimension A.  
 \* Bowl (standard) removal clearance: add 3.1 (79)  
 \* Bowl (extended) removal clearance: add 6.1 (155)  
 Dimensions above reflect less gauge.

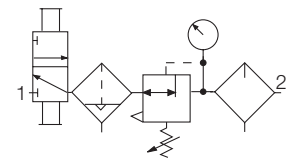


### ADD ON L-O-X® - Optional

- 1** - L-O-X® on outlet side
- 2** - L-O-X® on the inlet side (must also choose Reverse Flow)
- 3** - EEZ-ON® on outlet side
- 4** - EEZ-ON® on inlet side (must also choose Reverse Flow)
- Blank - No L-O-X®

### ISO FRL Symbol

Automatic Drain, Self-relieving with Lockout



### REPLACEMENT FILTER ELEMENTS\*

Element Rating	Element Material	Part Number
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

\* For plastic and metal bowl types.

Accessories not included with the product, see pages 12-13 for accessories.

### STANDARD SPECIFICATIONS (for products on this page):

**Construction:** Regulator - diaphragm; Lubricator - sight-feed; Lockout - spool.

**Ambient/Media Temperature:** Plastic bowl: 40° to 125°F (4° to 52°C). Metal bowl: 40° to 175°F (4° to 79°C).

**Differential Pressure Gauge:** Optional.

**Fluid Media:** Compressed air.

**Filter Inlet Pressure:** Plastic bowl & Manual drain: 0-150 psig (0-10 bar).

Plastic bowl & Float drain: 30-150 psig (2-10 bar).  
 Metal bowl & Manual drain: 0-250 psig (0-17 bar).  
 Metal bowl & Float drain: 30-200 psig (2-14 bar).

**Outlet Pressure:** Adjustable up to 200 psig (13.8 bar); optional adjusting springs.

**Optional Pressure Adjustment Locking Key:** Removable.

**Pressure Gauge:** 0 to 200 psig (14 bar); 1/4-NPT gauge ports front and rear.

**Panel Mounting:** 2-1/16 inch (52 mm) hole required.

**Self-relieving:** Non-relieving optional.

**Oil Adjustment:** External; tamper resistant.

**Filter Element:** 5-µm-rated polyethylene; 5-µm, 20-µm or 40-µm-rated sintered bronze.

**Body:** Zinc. **Dome:** Nylon

**Regulator Dome:** Nylon.

**Knob:** Acetal.

**Bowl:** 5.1-Ounce (151-ml) polycarbonate plastic with nylon shatterguard; 6.0-Ounce (177-ml) aluminum bowl with clear nylon sight glass. Lubricator bowl only; 10-ounce (295-ml) extended aluminum bowl with clear nylon sight glass.

**Seals:** Nitrile.

**Valve:** Brass. **Valve Cap:** Nylon.

**Sight-Feed Dome:** Nylon



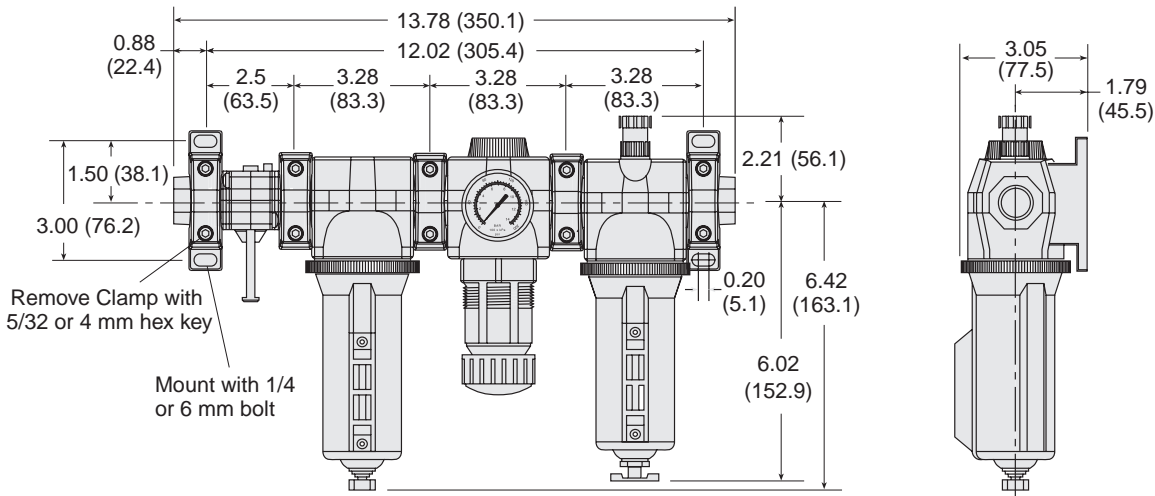
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

# Accessories

## Clamp, Brackets, End Ports and Port Blocks

MD3™ Series

Dimensions: inches (mm)



### Clamp for Module Connections

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.

Order clamp by part number **R-A118-105**.

Combined clamp and bracket (below) can be ordered by part number **R-A118-105M**.

### Mounting Brackets

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.

Order bracket and screw by part number **R-A118-103**.

Combined bracket and clamp (above) can be ordered by part number **R-A118-105M**.



**Module Connecting Clamp**  
Part No. R-A118-105



**Mounting Bracket**  
Part No. R-A118-103



**Combined Clamp & Bracket**  
Part No. 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 part numbers:

Port Size	Male Part Number*	Image	Port Size	Female Part Number*	Image
1/4	R-118-109-2F		1/4	R-118-100-2	
3/8	R-118-109-3F		3/8	R-118-100-3	
1/2	R-118-109-4F		1/2	R-118-100-4	
3/4	R-118-109-6F		3/4	R-118-100-6	

\* For BSPP threads, add a "W" suffix to the model number, e.g., R-118-109-2FW.

### 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	Part Number*	Image
1/4	R-118-106-2	
3/8	R-118-106-3	
1/2	R-118-106-4	

\* For BSPP threads, add a "W" suffix to the model number, e.g., R-118-106-2W.

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

# Accessories

## MUFFL-AIR® Silencers, Pressure Gauges

MD3™ Series

Ports: 1/4 to 1/2  
C<sub>v</sub>: 2.7 to 5.9

### Noise Control Solutions for Air Exhaust

ROSS MUFFL-AIR® silencers substantially reduce exhaust noise levels in the workplace, yet produce little back pressure.

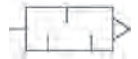
Typical impact noise reduction is in the 20–25 decibel range.

Male Pipe Threads



Port Size	Part Number*	Avg. C <sub>v</sub>	Dimensions inches (mm)		Weight lb (kg)
			Length	Width	
1/4	5500A2003	2.7	0.8 (21)	2.2 (56)	0.1 (0.1)
3/8	5500A3013	3.2	0.8 (21)	2.2 (56)	0.1 (0.1)
3/8	5500A3003	4.9	1.3 (33)	3.8 (96)	0.2 (0.1)
1/2	5500A4003	5.9	1.3 (33)	3.9 (99)	0.2 (0.1)

\* NPT threads. For BSPP threads add a "D" prefix to the model number, e.g., D5500A2003.



### STANDARD SPECIFICATIONS (for products above):

**Pressure Range:** Up to 150 psig (10.3 bar).  
**Temperature:** Up to 160°F (71°C).

**Flow Media:** Filtered air; 5 micron recommended.  
**Port Threads:** Male, NPT, BSPP.

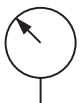
## Pressure Gauges

**Gauges:** Center back mounting; male pipe threads.



Port Size	Part Number	Pressure Range psig(bar)	Case Diameter inches (mm)
1/4	5400A2010	0-60 (0-4.13)	2.0 (51)
1/4	5400A2011	0-200 (0-14)	2.0 (51)
1/4	5400A2012	0-300 (0-20)	2.0 (51)
1/4	5400A2014*	0-160 (0-11)	2.5 (64)
1/4	5400A2015**	0-160 (0-11)	2.0 (51)

\* 5400A2014 - Stainless steel case liquid filled.  
\*\* 5400A2015 - Green shade between 40-70 psi (2.7-4.8 bar).



# 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 Plastic Bowls

**Use Only with Compressed Air.** Filters and lubricators with polycarbonate plastic 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 plastic 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 plastic bowl.

**Avoid Harmful Substances.** Some compressor oils, chemical cleaners, solvents, paints, and fumes will attack plastic 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 plastic bowl which is crazed, cracked, or deteriorated.

## Substances HARMFUL to Polycarbonate Plastic 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 Plastic 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.
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

warranty is 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.

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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





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