ROSS CONTROLS®

INTEGRATED FILTER/REGULATORS

www.rosscontrols.com

INTEGRATED FILTER/REGULATORS – KEY FEATURES

- Filter and Pressure Regulator combined into a single module to provide the compactness needed where space is limited
- All sizes have essentially the same operating characteristics as their corresponding individual filters and regulators
- All Filter/Regulator include internal automatic filter drain or manual drain options
- Pressure gauge included
- Regulator function is self relieving, and includes front and rear gauge ports
- 5-, 20-, 40-micron filter elements available (see table below)
- Metal or high strength polycarbonate bowl
- Modular or inline mounting
- MD3™ and MD4™ series can be modularly connected to a L-O-X® Lockout Valve
- Stainless steel Filter/Regulator and L-O-X® Lockout Valve combination available

INTEGRATED FILTER/REGULATOR TYPE/SERIES	AVAILABLE PORT SIZES					FLOW	FILTRATION			BOWLS & DRAINS OPTIONS				REGULATOR TYPE		OPTIONS		Page
	1/8	1/4	3/8	1/2	3/4	MAX FLOW (scfm)	5 µ	20 µ	40 µ	POLYCARBONATE BOWL	METAL BOWL	AUTOMATIC DRAIN	MANUAL DRAIN	PISTON	DIAPHRAM	SELF RELIEVING	NON RELIEVING	
BANTAM	■	■				24	■			■	■	■	■	■	■	■	■	E3.3
MINIATURE	■	■				24	■			■	■	■	■	■	■	■	■	E3.4
MID-SIZE		■	■	■		105				■	■	■	■	■		■	■	E3.5
MD3™		■	■	■		110	■	■	■	■	■	■	■		■	■	■	E3.6
FULL-SIZE		■	■	■	■	180	■			■	■	■	■		■	■	■	E3.7
MD4™			■	■	■	230	■		■	■	■	■	■		■	■	■	E3.8
STAINLESS STEEL with L-O-X® LOCKOUT VALVE																		
		■		■	■													E3.9

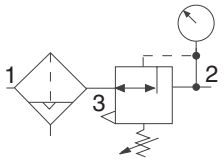
Port Sizes: 1/8 & 1/4 – Flow to 24 scfm

Port Size	Model Numbers			
	Automatic Drain		Manual Drain	
	Polycarbonate Bowl	Metal Bowl	Polycarbonate Bowl	Metal Bowl
With THREADED PORTS (Piston Type): *				
1/8	5D01C0110	5D01C0210	5D01C0310	5D01C0410
1/4	5D02C0110	5D02C0210	5D02C0310	5D02C0410
With Quick-Connect TUBE FITTINGS (Piston Type):				
1/4	5D03C0110	5D03C0210	5D03C0310	5D03C0410
3/8	5D04C0110	5D04C0210	5D04C0310	5D04C0410
4mm	5D05C0110	5D05C0210	5D05C0310	5D05C0410
6mm	5D06C0110	5D06C0210	5D06C0310	5D06C0410
8mm	5D07C0110	5D07C0210	5D07C0310	5D07C0410
10mm	5D08C0110	5D08C0210	5D08C0310	5D08C0410
With Quick-Connect TUBE FITTINGS (Diaphragm Type):				
1/4	5D03C0120	5D03C0220	5D03C0320	5D03C0410
3/8	5D04C0120	5D04C0220	5D04C0320	5D04C0420
4mm	5D05C0120	5D05C0220	5D05C0320	5D05C0420
6mm	5D06C0120	5D06C0220	5D06C0320	5D06C0420
8mm	5D07C0120	5D07C0220	5D07C0320	5D07C0420
10mm	5D08C0120	5D08C0220	5D08C0320	5D08C0420

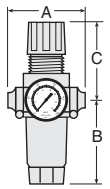
* NPT port threads. For BSPP threads add a "C" prefix to the model number e.g., C5D01C0110.

ISO Symbol
Filter/Regulator

Automatic Drain
Self-relieving



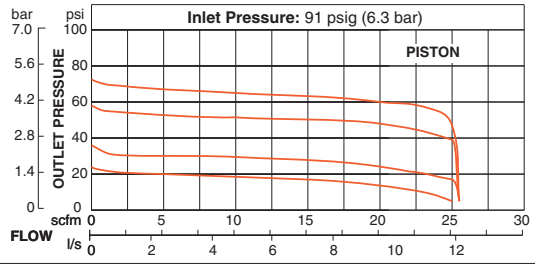
Port Size	Bowl Capacity	Dimensions inches (mm)				Weight † lb (kg)
		A	B**	C	Depth †	
No Port	2-oz (60-ml)	1.7 (43)	3.6 (92)	2.6 (67)	1.8 (45)	0.31 (0.15)
1/8, 1/4	2-oz (60-ml)	3.0 (76)	3.6 (92)	2.6 (67)	1.8 (45)	0.53 (0.24)
Models below have quick-connect tube fittings.						
1/4, 4, 6 mm	2-oz (60-ml)	3.4 (86)	3.6 (92)	2.6 (67)	1.8 (45)	0.51 (0.23)
3/8, 10 mm	2-oz (60-ml)	3.9 (99)	3.6 (92)	2.6 (67)	1.8 (45)	0.51 (0.23)
8 mm	2-oz (60-ml)	3.1 (79)	3.6 (92)	2.6 (67)	1.8 (45)	0.51 (0.23)

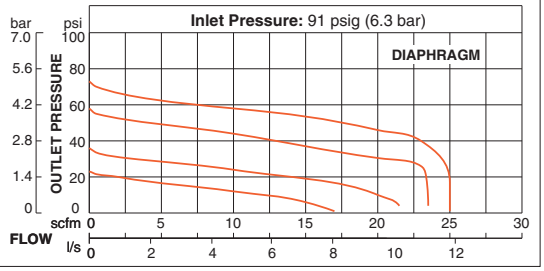


** Dimension for polycarbonate filter bowl; metal bowl is 3.8 (97). † Less gauge.

REPLACEMENT FILTER ELEMENTS		
Element Rating	Element Material	Model Number
5-µm	Polyethylene	933K77

FLOW CHARTS





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

STANDARD SPECIFICATIONS (for products on this page):

Construction: Filter – fiber; Regulator – Piston.
Ambient/Media Temperature:
Polycarbonate bowl: 40° to 125°F (4° to 52°C).
Metal bowl: 40° to 150°F (4° to 66°C).
Fluid Media: Compressed air.
Inlet Pressure - Automatic drain model:
Polycarbonate bowl: Up to 150 psig (up to 10 bar).
Metal bowl: Up to 200 psig (up to 14 bar).
Inlet Pressure - Manual drain model:
Polycarbonate bowl: 0 to 150 psig (0 to 10 bar).
Metal bowl: 0 to 200 psig (0 to 14 bar).
Outlet Pressure: Adjustable up to 100 psig (7 bar).
Pressure Gauge: 0 to 160 psig (0 to 11 bar); 1/8 NPT gauge ports front and rear.
Panel Mounting: 1-3/16 inch (30 mm) hole required.
Filter Element: 5-micron rated polyethylene.
Body, Dome and Knob: Acetal.
Bowl: Polycarbonate or aluminum bowl.
Seals: Nitrile.

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

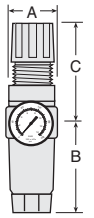
Port Sizes: 1/8 & 1/4 – Flow to 24 scfm

Port Size	Regulator Type	Model Numbers*			
		Automatic Drain		Manual Drain	
		Polycarbonate Bowl	Metal Bowl	Polycarbonate Bowl	Metal Bowl
1/8	Piston	5321C1032	5322C1031	5321C1002	5322C1001
	Diaphragm	5321C1042	5322C1041	5321C1022	5322C1021
1/4	Piston	5321C2032	5322C2031	5321C2002	5322C2001
	Diaphragm	5321C2042	5322C2041	5321C2022	5322C2021

* NPT port threads. For BSPP threads add a "C" prefix to the model number e.g.,C5321C1032.

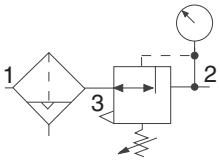
Port Size	Bowl Type	Bowl Capacity	Dimensions inches (mm)				Weight † lb (kg)
			A	B	C	Depth †	
1/8, 1/4	Polycarbonate	2-oz (60-ml)	1.6 (41)	3.6 (92)	2.6 (65)	1.6 (41)	0.53 (0.24)
1/8, 1/4	Aluminum	2-oz (60-ml)	1.6 (41)	4.3 (109)	2.6 (65)	1.6 (41)	0.53 (0.24)

† Less gauge.



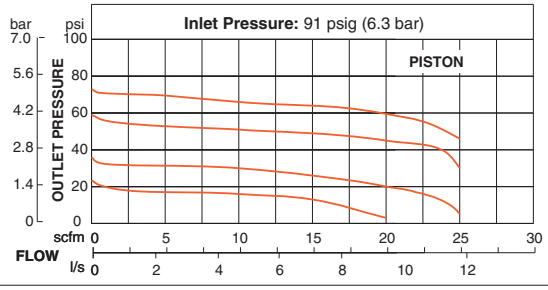
ISO Symbol
Filter/Regulator

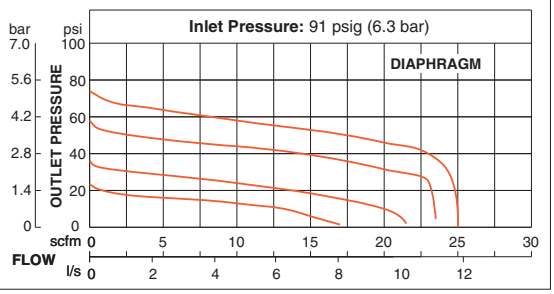
Automatic Drain
Self-relieving



REPLACEMENT FILTER ELEMENTS		
Element Rating	Element Material	Model Number
5-µm	Polyethylene	933K77

FLOW CHARTS





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

STANDARD SPECIFICATIONS (for products on this page):

Construction: Filter – fiber; Regulator – Piston.
Ambient/Media Temperature:
Polycarbonate bowl: 40° to 125°F (4° to 52°C).
Metal bowl: 40° to 150°F (4° to 66°C).
Fluid Media: Compressed air.
Inlet Pressure - Automatic drain model:
Polycarbonate bowl: Up to 150 psig (up to 10 bar).
Metal bowl: Up to 200 psig (up to 14 bar).
Inlet Pressure - Manual drain model:
Polycarbonate bowl: 0 to 150 psig (0 to 10 bar).
Metal bowl: 0 to 200 psig (0 to 14 bar).
Outlet Pressure: Adjustable up to 100 psig (7 bar).
Pressure Gauge: 0 to 160 psig (0 to 11 bar); 1/8 NPT gauge ports front and rear.
Panel Mounting: 1-3/16 inch (30 mm) hole required.
Filter Drain: Internal automatic drain; optional manual drain.
Filter Element: 5-micron rated polyethylene.
Body: Aluminum.
Bowl: Polycarbonate or aluminum.
Dome and Knob: Acetal.
Seals: Nitrile.

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

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Port Sizes: 1/4, 3/8 & 1/2 – Flow to 105 scfm

Port Size	Model Numbers*			
	Automatic Drain		Manual Drain	
	Polycarbonate bowl	Metal Bowl	Polycarbonate bowl	Metal Bowl
1/4	5321B2052	5322B2051	5321B2062	5322B2061
3/8	5321B3052	5322B3051	5321B3062	5322B3061
1/2	5321B4052	5322B4051	5321B4062	5322B4061

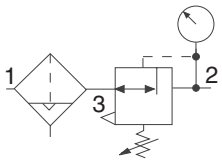
* NPT port threads. For BSPP threads add a "C" prefix to the model number e.g., C5321B2052.

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 (67)	4.6 (116)	3.3 (83)	2.4 (60)	1.44 (0.65)
1/4, 3/8, 1/2	Zinc	4-oz (120-ml)	2.7 (67)	4.9 (123)	3.3 (83)	2.4 (60)	1.50 (0.68)

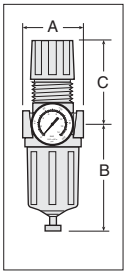
** Bowl removal clearance: add 3.1 (79). *** Dome removal clearance: add 0.63 (16).
† Less gauge.

ISO Symbol
Filter/Regulator

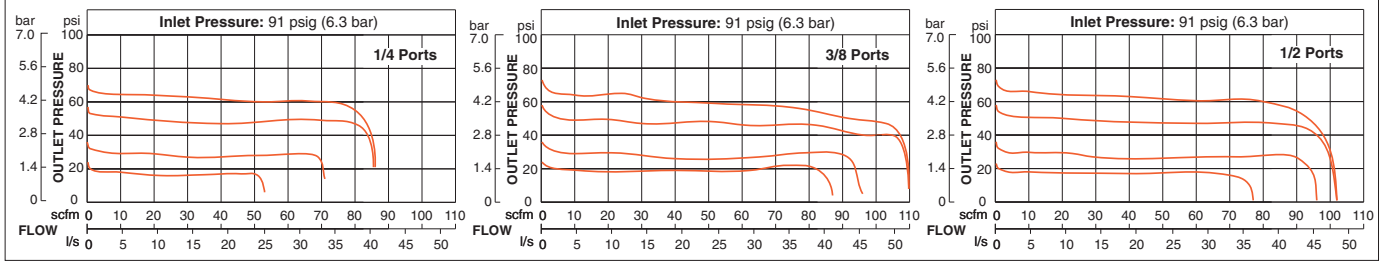
Automatic Drain
Self-relieving



REPLACEMENT FILTER ELEMENTS		
Element Rating	Element Material	Model Number
5-µm	Polyethylene	936K77



FLOW CHARTS



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

STANDARD SPECIFICATIONS (for products on this page):

Construction: Filter – fiber; Regulator – Piston.
Ambient/Media Temperature:
Polycarbonate bowl: 40° to 125°F (4° to 52°C).
Metal Bowl: 40° to 175°F (4° to 80°C).
Fluid Media: Compressed air.
Inlet Pressure - Automatic drain model:
Polycarbonate bowl: Up to 150 psig (up to 10 bar).
Metal bowl: Up to 200 psig (up to 14 bar).
Inlet Pressure - Manual drain model:
Polycarbonate bowl: 0 to 150 psig (0 to 10 bar).
Metal bowl: 0 to 200 psig (0 to 14 bar).
Outlet Pressure: Adjustable up to 100 psig (7 bar).
Pressure Gauge: 0 to 200 psig (0 to 14 bar); 1/4 NPT gauge ports front and rear.
Filter Drain: Internal automatic drain or manual drain.
Panel Mounting: 1-9/16 inch (40 mm) hole required.
Filter Element: 5-micron rated polyethylene.
Body: Zinc.
Bowl: Polycarbonate with zinc shatterguard, or zinc bowl.
Dome and Knob: Acetal.
Seals: Nitrile.

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

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

HOW TO ORDER

(Choose your options (in red) to configure your valve model number.)

MD3	53P	B	M	C	2	A	A	1

BOWL SIZE

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

FILTER ELEMENT TYPE

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

BOWL DRAIN

Manual Drain	**M**
Float Drain	F
Less Drain Fitting (1/4 NPT female instead)	L

PIPE SIZE

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

ADJUSTMENT RANGE

0-200 psig (0-14 bar)*	**A**
0-150 psig (0-10 bar)	B
0-100 psig (0-6.9 bar)	C
0-50 psig (0-3.4 bar)	D
Reverse Flow 0-200 psig (0-14 bar)	F
Reverse Flow 0-150 psig (0-10.3 bar)	G
Reverse Flow 0-100 psig (0-6.9 bar)	H
Reverse Flow 0-50 psig (0-3.4 bar)	J

*Must be ordered with metal bowl.

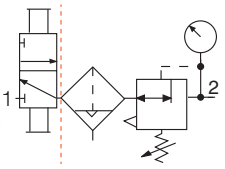
GAUGE

Without Gauge	**A**
Gauge 0-200 psig (0-14 bar)	B
Gauge 0-60 psig (0-4 bar)	C
Without Gauge, with Panel Mount Nut	D
Gauge 0-200 psig (0-13 bar), with Panel Mount Nut	E
Gauge 0-60 psig (0-4 bar), with Panel Mount Nut	F

Lockout Valve

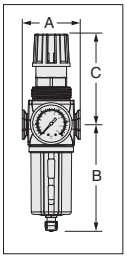
L-O-X® on outlet side	**1**
L-O-X® on the inlet side (must also choose Reverse Flow)	2
L-O-X® with EEZ-ON® on outlet side	3
L-O-X® with EEZ-ON® on inlet side (must also choose Reverse Flow)	4
Without Valve - Leave Blank	

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



Bowl Type	Dimensions inches (mm)				Weight lb (kg)
	A	B*	C	Depth	
Polycarbonate	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.

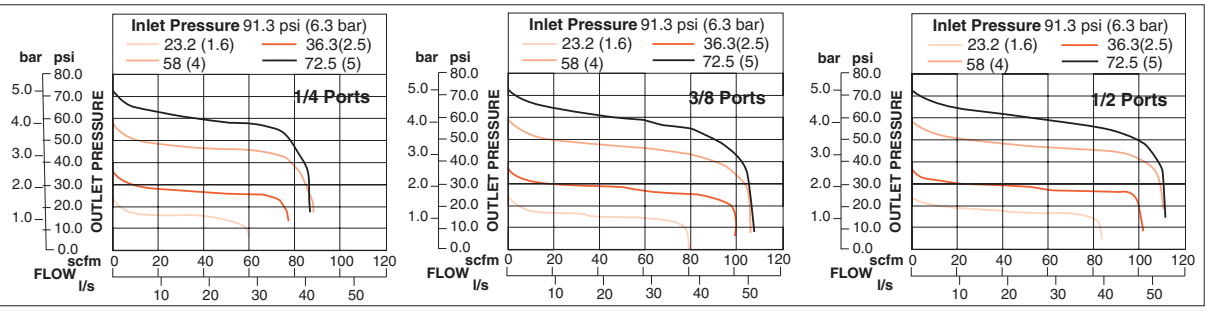


REPLACEMENT FILTER ELEMENTS*

Element Rating	Element Material	Model 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 polycarbonate and metal bowl types.

FLOW CHARTS



Options: External Bowl Drains, refer to page E6.7.
Accessories ordered separately, refer to page E6.3-5.

STANDARD SPECIFICATIONS (for products on this page):

Construction: Regulator-diaphragm.
Ambient/Media Temperature:
Polycarbonate bowl: 40° to 125°F (4° to 52°C).
Metal Bowl: 40° to 175°F (4° to 80°C).
Fluid Media: Compressed air.
Inlet Pressure - Automatic drain model:
Polycarbonate bowl: 30 to 150 psig (2 to 10 bar).
Metal bowl: 30 to 200 psig (2 to 14 bar).
Inlet Pressure - Manual drain model:
Polycarbonate bowl: 0 to 150 psig (0 to 10 bar).
Metal bowl: 0 to 250 psig (0 to 17 bar).
Outlet Pressure: Adjustable up to 200 psig (14 bar).
Pressure Adjustment Locking Key: Removable.
Pressure Gauge: 0 to 200 psig (0 to14 bar) or 0 to 60 psig (0 to 4 bar); 1/4-NPT gauge ports front and rear.
Panel Mounting: 2-1/16 inch (52 mm) hole required.
Body: Zinc.
Dome: Nylon.
Bowl: Polycarbonate with nylon shatterguard, or 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.

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Port Sizes: 1/4, 3/8, 1/2 & 3/4 – Flow to 180 scfm

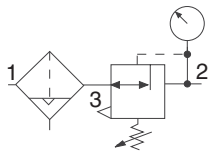
Port Size	Model Numbers *			
	Automatic Drain		Manual Drain	
	Polycarbonate bowl	Metal Bowl	Polycarbonate bowl	Metal Bowl
1/4	5321B2072	5322B2071	5321B2012	5322B2011
3/8	5321B3072	5322B3071	5321B3012	5322B3011
1/2	5321B4072	5322B4071	5321B4012	5322B4011
3/4	5321B5072	5322B5071	5321B5012	5322B5011

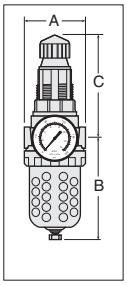
* NPT port threads. For BSPP threads add a "C" prefix to the model number e.g., C5321B2072.

Port Size	Bowl Type	Bowl Capacity	Dimensions inches (mm)				Weight † lb (kg)
			A	B**	C***	Depth †	
1/4, 3/8, 1/2, 3/4	Polycarbonate	8-oz (240-ml)	3.5 (89)	5.8 (146)	5.8 (146)	3.5 (89)	2.50 (1.15)
1/4, 3/8, 1/2, 3/4	Zinc	8-oz (240-ml)	3.5 (89)	6.4 (163)	5.8 (146)	3.5 (89)	2.55 (1.17)

** Bowl removal clearance: add 3.1 (79). *** Dome removal clearance: add 0.63 (16). † Less gauge.

ISO Symbol
Filter/Regulator
Automatic Drain
Self-relieving



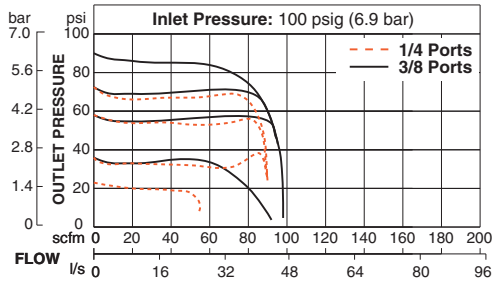


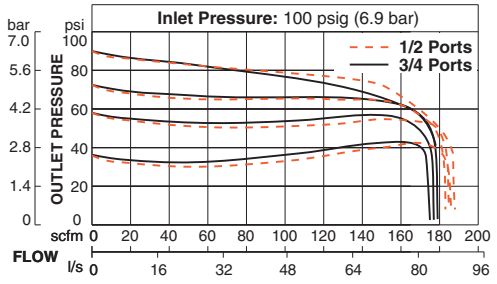
REPLACEMENT FILTER ELEMENTS		
Element Rating	Element Material	Model Number
5-µm	Polyethylene	939K77

E3

E

FLOW CHARTS





Pressure Gauge included.
Options: External Automatic Drain, refer to page E6.7.
Accessories ordered separately, refer to page E6.3-4.

STANDARD SPECIFICATIONS (for products on this page):

Construction: Filter – fiber; Regulator – Piston.
Ambient/Media Temperature:
Polycarbonate bowl: 40° to 125°F (4° to 52°C).
Metal Bowl: 40° to 175°F (4° to 80°C).
Fluid Media: Compressed air.
Inlet Pressure - Automatic drain model:
Polycarbonate bowl: Up to 150 psig (up to 10 bar).
Metal bowl: Up to 200 psig (up to 14 bar).
Inlet Pressure - Manual drain model:
Polycarbonate bowl: 0 to 150 psig (0 to 10 bar).
Metal bowl: 0 to 200 psig (0 to 14 bar).
Outlet Pressure: Adjustable up to 125 psig (9 bar).
Pressure Adjustment Locking Key: Removable.
Pressure Gauge: 0 to 200 psig (0 to 14 bar); 1/4 NPT gauge ports front and rear.
Panel Mounting: 2-1/16 inch (52 mm) hole required.
Filter Element: 5-micron rated polyethylene.
Body: Zinc.
Dome: Nylon.
Knob: Acetal.
Bowl: Polycarbonate with steel shatterguard, or zinc 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.

Port Sizes: 3/8, 1/2 & 3/4 – Flow to 230 scfm

HOW TO ORDER

(Choose your options (in red) to configure your valve model number.)

MD4	53P	B	A	B	3	B	B	1

BOWL SIZE

Polycarbonate Bowl 9-oz (266-ml)	**53P**
Metal Bowl 9-oz (266-ml)	53M

FILTER ELEMENT TYPE

40 µm sintered bronze	**A**
5 µm polyethylene	B

BOWL DRAIN

Auto Drain	**A**
Manual Drain	**M**

PIPE SIZE

3/8 NPTF	3
1/2 NPTF	4
3/4 NPTF	5
3/8 BSPP	C
1/2 BSPP	D
3/4 BSPP	E

ADJUSTMENT RANGE

0-175 psig (0-12 bar)	**A**
0-125 psig (0-8.6 bar)	B
0-50 psig (0-3.4 bar)	C
0-20 psig (0-1.4 bar)	D
Reverse Flow 0-175 psig (0-12 bar)	F
Reverse Flow 0-125 psig (0-8.6 bar)	G
Reverse Flow 0-50 psig (0-3.4 bar)	H
Reverse Flow 0-20 psig (0-1.4 bar)	J

GAUGE*

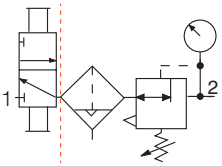
Without Gauge	**A**
Gauge 0-200 psig (0-14 bar)	B
Gauge 0-60 psig (0-4 bar)	C
Without Gauge, with Panel Mount Nut	D
Gauge 0-200 psig (0-14 bar), with Panel Mount Nut	E
Gauge 0-60 psig (0-4 bar), with Panel Mount Nut	F

*1/4 NPT gauge ports front and rear.

Lockout Valve

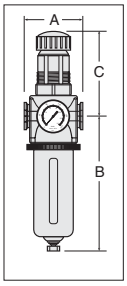
L-O-X® on outlet side	**1**
L-O-X® on the inlet side (must also choose Reverse Flow)	2
L-O-X® with EEZ-ON® on outlet side	3
L-O-X® with EEZ-ON® on inlet side (must also choose Reverse Flow)	4
Without Valve - Leave Blank	

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



Port Size	Bowl Type	Dimensions inches (mm) A	B*	C**	Depth †	Weight † lb (kg)
3/8, 1/2, 3/4	Polycarbonate	3.5 (88)	7.7 (195)	5.4 (137)	2.9 (73)	3.69 (1.68)
3/8, 1/2, 3/4	Aluminum	3.5 (88)	7.6 (193)	5.4 (137)	2.9 (73)	3.69 (1.68)

* Bowl removal clearance: add 3.1 (79).
** Dome removal clearance: add 0.63 (16).
† Less gauge.

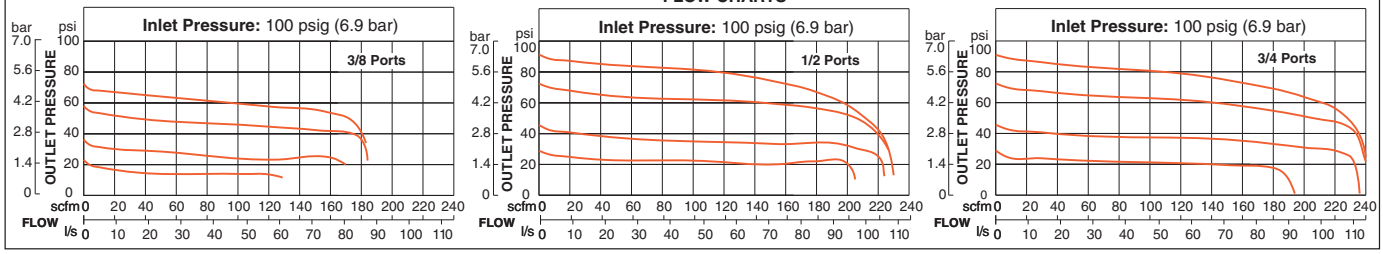


REPLACEMENT FILTER ELEMENTS*

Element Rating	Element Material	Element Number
5-µm	Polyethylene	R-A115-106PE5
40-µm	Sintered Bronze	R-A115-106PE3

* For polycarbonate and metal bowl types.

FLOW CHARTS



Options: External Bowl Drains, refer to page E6.7.
Accessories ordered separately, refer to page E6.3-5.

STANDARD SPECIFICATIONS (for products on this page):

Construction: Filter – fiber; Regulator – Piston.
Ambient/Media Temperature:
Polycarbonate bowl: 40° to 125°F (4° to 52°C).
Metal Bowl: 40° to 175°F (4° to 80°C).
Fluid Media: Compressed air.
Inlet Pressure - Automatic drain model:
Polycarbonate bowl: Up to 150 psig (up to 10 bar).
Metal bowl: Up to 200 psig (up to 14 bar).
Inlet Pressure - Manual drain model:
Polycarbonate bowl: 0 to 150 psig (0 to 10 bar).
Metal bowl: 0 to 200 psig (0 to 14 bar).
Outlet Pressure: Adjustable up to 175 psig (12 bar).
Pressure Adjustment Locking Key: Removable.
Panel Mounting: 2.05 inch (52.1 mm) hole required.
Filter Element: 5-micron rated polyethylene; optional 40-micron.
Body: Zinc.
Bonnet: Nylon; aluminum with optional 0 to 175 psig (0 to 12 bar) spring.
Cap Color: Black.
Bowl: Polycarbonate with steel shatterguard, or 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.

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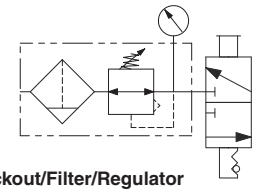
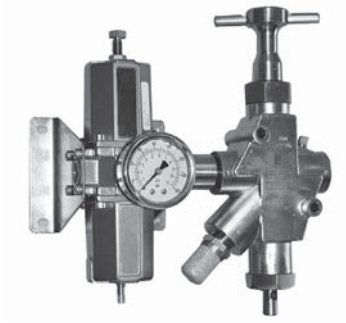
Port Sizes: 1/4, 1/2, 3/4 & 1 – Flow to 17 scfm

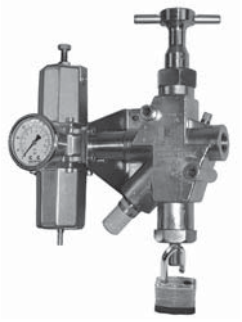
Port Size		Model Number*	C_v	
1-2	3		1-2	2-3
1/4	1/4	RC010-13	2.14	2.08
1/2	1/2	RC011-13	4.4	6.24
3/4	1	RC012-13	5.0	17.0
1	1	RC013-13	8.0	17.0



Lockout/Filter/Regulator ISO Symbol
Lockout, Manual Drain, Self-relieving



Port Size		Avg. C_v		Dimensions (inches/mm)		
1-2	3	1-2	2-3	Length	Width	Depth
1/4	1/4	2.14	2.08	8.9 (226.1)	7.65 (194.4)	5.86 (149)
1/2	1/2	4.4	6.24	10.24 (260)	8.98 (228)	5.94 (151)
3/4	1	5.0	17.0	15.75 (400)	12.24 (311)	6.49 (165)
1	1	8.0	17.0	15.75 (400)	12.24 (311)	6.49 (165)



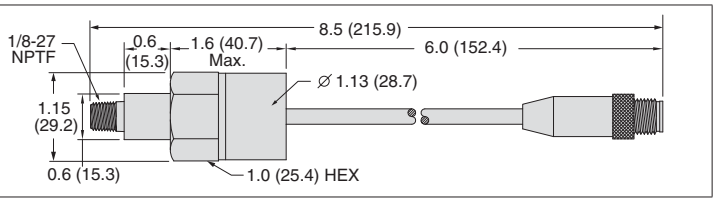
E3

E

ACCESSORIES

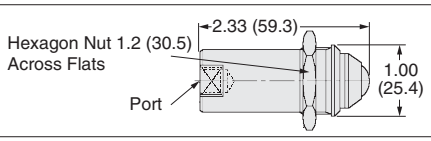
Stainless Steel Pressure Switch

Inlet Port Size	Model Number	Weight lb (kg)
1/8	1162A30	0.23 (.01)



Stainless Steel Visual Indicator

Inlet Port Size	Model Number	Weight lb (kg)
1/8	1155H30	0.22 (0.1)



* NPT threads. For BSPP threads, consult ROSS.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Poppet, 316 Stainless Steel.
Mounting Type: In-Line.
Ambient/Media Temperature: 30° to 175°F (-1° to 80°C).
Note: For lower temperature ratings, consult ROSS.
Flow Media: Filtered air.
Inlet Pressure: 0 to 300 psig (0 to 21 bar).
Secondary Pressure: 7 to 174 psig (0.5 to 12 bar).
Seals: Fluorocarbon (Viton).
Lock Hole Diameter: *Port sizes 1/4 thru 2:* 0.34 inch (8.64 mm).
Length of Hole: *Port size 1/4:* 0.44 in (11.17 mm).
Port size 1/2: 0.47 in (11.93 mm)

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E

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Filter, Regulator, and Lubricator Accessories

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E

CONTENT	Page
Mounting Accessories	E6.3
Modular Assembly Components	E6.4
Clamp, Brackets, End Ports & Port Blocks	E6.5
Pressure Gauges	E6.6
External Drains, Silencers	E6.7

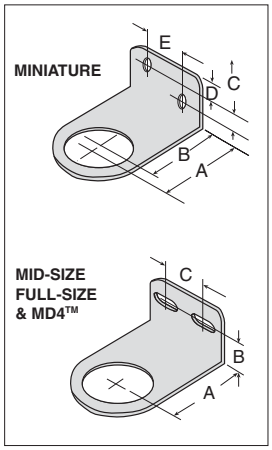
Mounting Screws for BANTAM Models

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

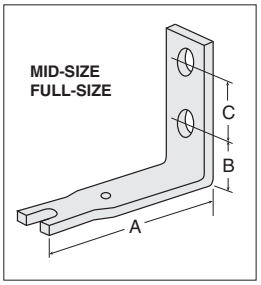
Regulators and integrated filter/regulators can be mounted to a surface with a bracket that attaches to the regulator. Brackets and mounting panel nuts can be ordered separately or in a kit which includes both bracket and mounting panel nut.



Usage Models	Model Number			Dimensions inches (mm)					
	Kit	Bracket	Panel Nut	A	B	C	D	E	Panel Mounting Hole Diameter
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

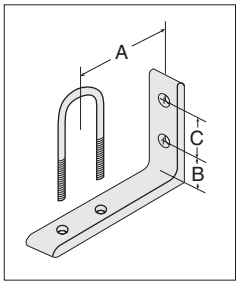
Two L-shaped metal brackets as shown at the right can be used for wall mounting of modular FRLs or Clean Air Packages. A single bracket can be used to mount individual filters or lubricators. Kits include two brackets and four screws for attaching the brackets to the modules.



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 Inline 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 1¼ inch ports can be mounted to a vertical surface using a bracket assembly kit.

Kit Number	R-A37-381

E
E6

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	
	NPT Threads	BSPP Threads
1/4	897K77	D897K77
3/8	898K77	D898K77
1/2	899K77	D899K77
3/4	900K77	D900K77

Male Port Block

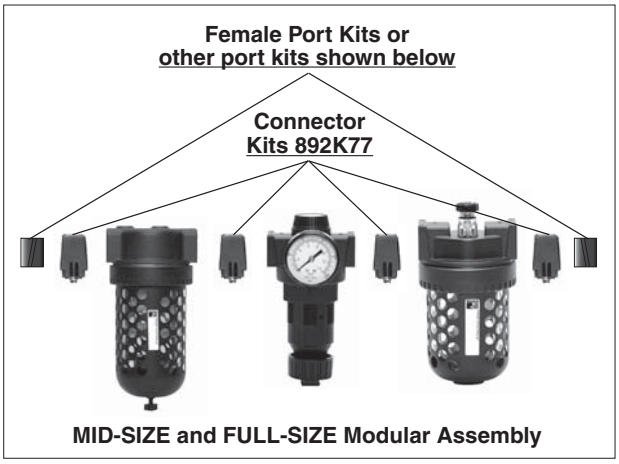
Used to connect modular to non-modular units.

Port Size	Model Number	
	NPT Threads	BSPP 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



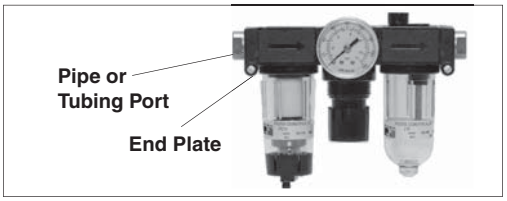
MID-SIZE and FULL-SIZE Modular Assembly

BANTAM Units

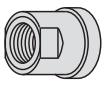
BANTAM modular units use end plates secured with screws to hold the pipe or tubing ports (see below), and also to serve as mounting brackets. Short screws are used to secure the end plates when a single BANTAM unit is used. If two or more units are combined, long screws extend through an end plate and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

Screw kits required are as follows:

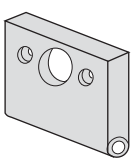
Single Unit: Two short screw kits.
Two-Unit Combination: One each short screw kit and long screw kit.
Three-Unit Combination: Two long screw kits.



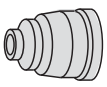
Pipe Ports	
Port Size	Model Number
1/8 NPT	862K77
1/4 NPT	863K77
1/8 BSPP	D864K77
1/4 BSPP	D865K77



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



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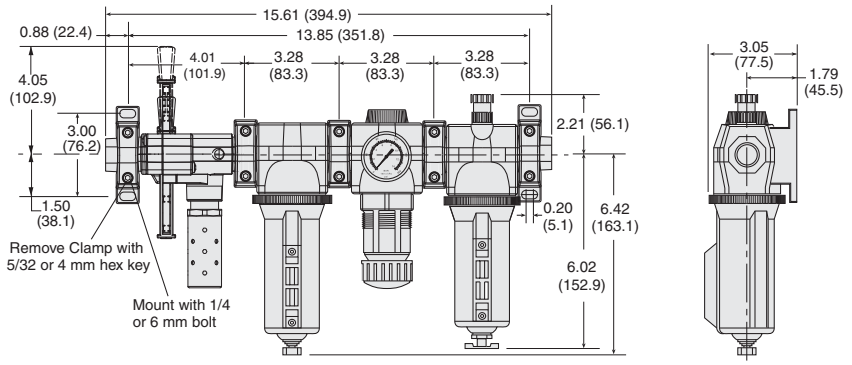
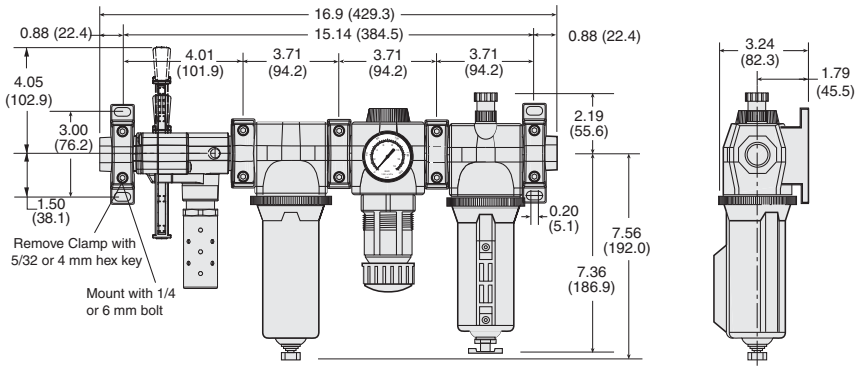
Dimensions: inches (mm)

MD3™ Series



MD4™ Series



Clamp for Module Connections

Specially designed clamps provide a quick and easy assembly or disassembly of MD 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 model number **R-A118-105**.

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

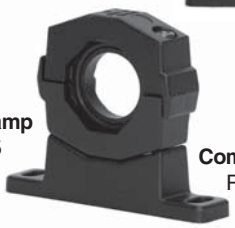
Mounting Brackets

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 model number **R-A118-103**. Combined bracket and clamp (above) can be ordered by model 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 model numbers:

Port Size	Male Part Number*		Port Size	Female Part Number*	
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	Model Number*	
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.

Pressure Gauges

Port Size	Model Number*	Pressure Range psig (bar)	Case Diameter inches (mm)
1/8	5400A1002	0-160 (0-11)	1.5 (38)
1/4	5400A2010	0-60 (0-4)	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)

* Center back mounting; male pipe threads.
** 5400A2014 - Stainless steel case liquid filled.
*** 5400A2015 - Green shade between 40-70 psi (2.7-4.8 bar).

Differential Pressure Gauges

DIFFERENTIAL PRESSURE GAUGE TYPE/SERIES	Small Slide Gauge R-A60F-28	Small Slide Gauge R-K103-151	Large Dual Face Gauge R-106-35	Large Dual Face Gauge with Reed Switch (Normally Open) R-106-35E	Large Dual Face Gauge with Reed Switch (Normally Closed) R-106-35C
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™	–				

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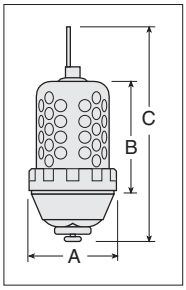
External Automatic Drains

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.

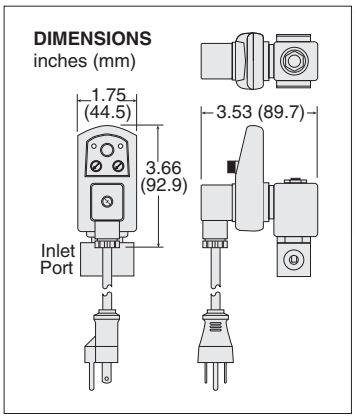
Port Size	Dimensions inches (mm)			Weight lb (kg)
	A	B	C	
1/8, 1/4	3.5 (89)	4.2 (107)	8.3 (211)	2.6 (1.2)



Electronically Controlled Drain

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

** NPT port threads. For BSPP threads, add a "W" suffix to the model number, e.g., R-DED-115V-2W.



STANDARD SPECIFICATIONS (for electronically controlled drain):

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

Silencers

Port Size	Thread Type	Model Number*		Avg. C_v	Dimensions inches (mm)		Weight lb (kg)
		NPT Threads	BSPT Threads		A	B	
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 300 psig (0 to 20.7 bar) maximum.

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

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

E

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

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

E

General Information

Standard Specifications

The standard specifications for the products on each page of this catalog are given on the same page or referenced. For solenoid pilot valves, models with internal pilot supply are listed. Most models are also available for use with external pilot supply or have a built-in pilot supply selector valve.

The products in this catalog are intended for use in industrial pneumatic systems. Most products are adaptable to other uses and conditions not covered by the standard specifications given in this catalog. Weights shown are approximate and are subject to change. Dimensions given, unless otherwise noted, are envelope dimensions (not for mounting). Consult ROSS for further information.

Port Threads

Ports of valves and bases described in this catalog have NPT (ANSI B2.1) threads. Other thread types can be specified by putting an appropriate prefix letter on the model or part number when ordering.

Thread Types by Model Prefix Letter

Pneumatic Port Threads	Prefix Letter	Threaded Electrical Opening
NPT (ANSI B2.1)	None	NPT
ISO 228 - DIN 259 Parallel, BSPP#	**C***	—
ISO 228 - DIN 259 Parallel, BSPP#	**D**	G
ISO 228 - JIS B0203 Tapered#	**J**	ISO
SAE 1926- ISO 11926	**S**	NPT

* Used only for filters, regulators, lubricators.

ISO 228 threads superseds BSPP, G and JIS thread types.

Flow Ratings

Flow ratings are expressed as C_V where C_V = 1 corresponds to a steady state air flow of approximately 32 scfm under the following conditions:

Inlet pressure = 100 psig (6.7 bar)
Pressure drop = 10 psi (0.69 bar)
Air temperature = 68°F (20°C)
Relative humidity = 36%

Note: *Because widely differing test standards are used to measure C_V values, the figures given in this catalog should not be used to compare ROSS valves with those of other makers. The C_V ratings given here are intended only for use with performance charts published by ROSS. The C_V ratings are averages for the various flow paths through the valve and are for steady flow conditions.*

Approvals and Certifications

ROSS products are designed to meet a number of industrial standards, including the Canadian Standards Association (C.S.A.) guidelines.

For more information on specific product approvals, contact your local distributor or ROSS.

Solenoids

All ROSS standard solenoids are rated for continuous duty (unless noted otherwise) and will operate the valve within the air pressure range specified in this catalog.

Explosion-Proof Solenoid Pilot available, for more information consult ROSS.

Voltage & Hertz

When ordering a solenoid valve, also specify the desired solenoid voltage and hertz.

Voltage Types by Model Suffix Letter

Voltage	Suffix Letter
120 volts AC	**Z**
220 volts AC	**Y**
12 volts DC	**H**
24 volts DC	**W**
48 volts DC	**M**
90 volts DC	**K**
110 volts DC	**P**
125 volts DC	**C**

Recommended Solenoid Voltages: 100-110 volts AC, 50 Hz; 100-120 volts AC, 60 Hz; 24 volts DC; 110 volts DC.

In addition, the following voltages are available:

200, 220 volts AC, 50 Hz
200, 240, 480 volts AC, 60 Hz

24, 48, 220 volts AC, 50 Hz
240 volts AC, 60 Hz

200, 220 volts AC, 50 Hz
200, 240 volts AC, 60 Hz.

For example: Model 2773B5001, 120 volts AC, 60 Hz.
Model W6076B2401, 220 volts AC, 50 Hz.

Please note that not all configurations are available for all models.

For additional information or help with voltage configuration, please contact your local distributor or ROSS.

Port Identification

Valve symbols in this catalog conform to the ISO 1219-1:1991 standard of the International Organization for Standardization (ISO) and the SAE J2051 standard of the Society of Automotive Engineers (SAE) respectively.

Information or Technical Assistance

For additional information or application assistance concerning ROSS products, consult ROSS or your local ROSS distributor (see contact information on the back cover).

Order Placement

For order placement, consult ROSS or your local ROSS distributor.

For a current list of countries and local distributors, visit ROSS' website at www.rosscontrols.com.

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

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 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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Full-Service Global Locations

There are ROSS Distributors Throughout the World

To meet your requirements across the globe, ROSS distributors are located throughout the world. Through ROSS or its distributors, guidance is available for the selection of ROSS products, both for those using pneumatic components for the first time and those designing complex pneumatic systems.

Other literature is available for engineering, maintenance, and service requirements. If you need products or specifications not shown here, please contact ROSS or your ROSS distributor. They will be happy to assist you in selecting the best product for your application.

For a current list of countries and local distributors, visit ROSS' website at www.rosscontrols.com.

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