

# PRESSURE REGULATORS

Master Pneumatic regulators are made in a wide range of sizes to suit nearly all industrial requirements for pneumatic pressure regulation. Good pressure regulation is essential to the efficient use of pneumatic equipment. A compressor may supply air at 150 psig, but most of the equipment will operate best at lower pressures. A cylinder, for example, may develop sufficient force for its purpose with 50-psig air. Remember that compressed air is costly, so using higher air pressure than necessary is wasteful, and may also shorten the life of the cylinder. A general purpose pressure regulator is the answer for greater economy and efficiency.



Regulators are of two basic designs. Piston design provides highest air flow; diaphragm design provides high sensitivity and quick response. All regulators are self-relieving, but a non-relieving option is available. A pressure gauge is standard, and gauge ports are at the front and the rear of each unit.

In addition there are precision regulators in all port sizes for applications demanding extra precision in the regulation of air pressure, plus regulators for remote, external piloting.

## MODULAR or INLINE MOUNTING

**SENTRY, GUARDSMAN, SERIES 350, SERIES 380,** and **Full-Size VANGUARD** regulators are of modular design. Regulators are connected to filters or lubricators by special modular connectors which seal the faces between units. They may also be inline mounted with pipe nipples. **MINIATURE** and **High-Capacity VANGUARD** regulators are inline mounted only.

## SENTRY REGULATORS

Port sizes 1/8 and 1/4 or fittings for tubing up to 10 mm. Modular units have durable plastic, corrosion-resistant bodies. A non-relieving version can be used with water, oil, and many other liquids.

## GUIDE to REGULATORS and SERVO VALVES

REGULATOR SERIES	MODULAR	PORTS	PAGES
<b>SENTRY †</b>			
General Purpose <b>R10M, R11M</b> models	yes	1/8, 1/4	134-135
Water Pressure <b>R13M, R14M</b> models	yes	1/8, 1/4	196-197
External piloted <b>PR11M</b> models	yes	1/8, 1/4	166-167
<b>MINIATURE</b>			
General Purpose <b>R55M, R56M</b> models	no	1/8, 1/4	136-137
Stainless Steel <b>R56S</b> models	no	1/4	138-139
Precision <b>R57M</b> models	no	1/8, 1/4	158-159
Externally Piloted <b>PR56M</b> models	no	1/8, 1/4	168-169
Water Pressure <b>R53MB, R54MB</b> models	no	1/8, 1/4	198-209
Relief Valves <b>RV56</b> models	no	1/8, 1/4	164-201
CO <sub>2</sub> Miniature relief valve <b>CX</b> models	no	1/8, 1/4	202-203
CO <sub>2</sub> Miniature <b>CX</b> models	no	1/8, 1/4	140-141
High pressure model	no	1/8, 1/4, 3/8	146-147
<b>GUARDSMAN</b>			
General Purpose <b>R60</b> models	yes	1/4, 3/8, 1/2	142-143
<b>GUARDSMAN II</b>			
General Purpose <b>R75</b> models	yes	1/4, 3/8, 1/2	144-145
<b>350 SERIES</b>			
General Purpose <b>R350</b> models	yes	1/4, 3/8, 1/2	148-149
<b>Full-Size VANGUARD</b>			
General Purpose <b>R100</b> models	yes	1/4, 3/8, 1/2, 3/4	150-151
Precision <b>IR100</b> models	yes	1/4, 3/8, 1/2, 3/4	162-163
External Pilot <b>PR100</b> models	yes	1/4, 3/8, 1/2, 3/4	174-175
High relief externally pilot <b>HPR100</b>	no	1/4, 3/8, 1/2, 3/4	178-179
External relief pilot <b>PRH100</b> models	yes	1/4, 3/8, 1/2, 3/4	176-177
<b>Full-Size SERIES 380</b>			
General Purpose <b>R380</b> models	yes	3/8, 1/2, 3/4	152-153
Precision <b>IR380</b> models	yes	3/8, 1/2, 3/4	160-161
External pilot <b>PR380</b> models	yes	3/8, 1/2, 3/4	170-171
External relief pilot <b>PRH380</b> models	no	3/8, 1/2, 3/4	172-173
<b>High-Flow VANGUARD</b>			
General Purpose <b>R180, M</b> models	no	3/4, 1, 1-1/4, 1-1/2	154-157
Precision <b>IR180M</b> models	no	3/4, 1, 1-1/4, 1-1/2	164-165
External Pilot <b>PR180M</b> models	no	3/4, 1, 1-1/4, 1-1/2, 2	180-181
External Pilot <b>R200</b> models	no	1-1/2, 2	186-187
External pilot <b>PR300</b> models	no	3	194-195
High-relief externally pilot <b>HPR180</b>	no	3/4, 1, 1-1/4	184-185
External relief pilot <b>PRH180m</b> models	no	3/4, 1, 1-1/4, 1-1/2	182-183
Electro-Pneumatic Servo Valves	no		204-206

† Also available with quick-connect tube fittings up to 10 mm.

## MINIATURE REGULATORS

Port sizes 1/8, 1/4. Aluminum-bodied units for inline mounting. Same performance characteristics as the **SENTRY** models. Brass or stainless steel bodies, and water pressure models are also available.

**PRECISION MINIATURE** regulators are available to provide outstanding pressure control at relatively low cost. A large diaphragm area gives high sensitivity, and a small valve seat gives greater precision and little variation in outlet pressure from fluctuations in supply pressure. With an inlet pressure of 100 psig (7 bar), repeatability is within 1/4 psig. Regulated pressure range is 0–60 psig (0–4.1 bar). Optional springs allow other pressure ranges.

## GUARDSMAN REGULATORS

Port sizes 1/4, 3/8, 1/2. Modular units in a balanced-valve, piston design with very quick response for fast-cycling valves and cylinders. Two sub-series: **R60** models with durable plastic dome, and **R75** models with high-strength metal dome for more severe environments. Regulation performance is essentially the same.

## SERIES 350, SERIES 380 and VANGUARD REGULATORS

Port sizes 1/4 to 3/4. Modular units with diaphragm design for sensitivity and accurate pressure regulation. An adjustment-locking key to prevent tampering is standard.

Full-Size **VANGUARD SERIES 350**, and **SERIES 380 PRECISION** regulators are also available. They are of diaphragm design, and were developed to give superior torque control with pneumatic tools. However, they are well suited to many other applications because of their ability to regulate very high air flows with great precision. They will hold regulated pressure within 3 psig (0.2 bar), and repeatability is within 0.5 psig (0.034 bar). For torque control and applications that cannot tolerate over-pressurization, regulated pressure can be limited to 85 psig (5.9 bar). Air from a constant bleed, which is important to the precision of these units, is normally inaudible.

## HIGH-FLOW VANGUARD REGULATORS

Port sizes 3/4 to 1-1/2. Inline mounting and piston design are featured in these high-air-flow models. An adjustment-locking key to prevent tampering is standard.

**PRECISION** High-Capacity regulators are also available. They are of diaphragm design, and have essentially the same precise operating characteristics as the Full-Size **VANGUARD** precision regulators described above. Their larger port sizes, however, make them the choice for very high-air-flow applications.

## EXTERNALLY PILOTED REGULATORS

Regulators operated with external pilots are as precise as the external pilot regulators used. A 1/4" R55M pilot regulator (or R57M precision model) provides an accurately controlled air spring for excellent regulation. The pilot control regulator can be installed at a distance from the main regulator for convenience in making adjustments.



Full-Size **VANGUARD PRH100** modular external relief piloted regulators use a diaphragm design for high sensitivity. They provide air flows up to 160 scfm (94 l/s) in applications where low pressure drop and/or remote adjusting are desired.

**High-Flow PR180 VANGUARD** external piloted regulators and **High-Flow PRH180 VANGUARD** external relief piloted regulators are of diaphragm design, and provide air flows up to 600 scfm (284 l/s).

**High-Flow R200 VANGUARD** Regulators provide air flows up to 1000 scfm (474 l/s). For fast response, good sensitivity, and long service life they employ a piston traveling in a hard-anodized, Teflon-impregnated, metal cylinder. A high-flow, self-relieving valve is built into the main regulator.

## RELIEF VALVES

Relief valves are set for a desired maximum system pressure, and inserted in a tee downstream of regulated pressure to prevent over-pressurization of the system beyond the relief valve setting. Relief valves are adjustable from 1 to 125 psig (0.07 to 8.6 bar). Optional springs are available for other pressure ranges. If pressure exceeds the relief valve setting it will dump system air to atmosphere or to a valve to provide a warning signal.



Port sizes 1/8 and 1/4. A pressure gauge is standard equipment.

## ELECTRO-PNEUMATIC SERVO VALVES



Electro-pneumatic servo valves employ the latest in closed loop control technology. Flow rate is typically one scfm, but when used with a volume booster a flow rate in excess of 1,000 scfm can be achieved.

# MINIATURE Precision Regulators

# R57M Models Port Sizes: 1/8, 1/4



Model Shown: R57M-2G

- ◆ Inline mounting.
- ◆ Diaphragm-type design.
- ◆ Self-relieving; non-relieving optional.
- ◆ Pressure gauge.
- ◆ NPTF port threads; optional BSPP threads.
- ◆ Repeatability  $\pm 0.25$  psig (0.017 bar)

## SPECIFICATIONS

**Ambient/Media Temperature:**

40° to 125°F (4° to 52°C).

**Body:** Aluminum.

**Dome:** Aluminum.

**Fluid Media:** Compressed air.

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

**Outlet Pressure:** Adjustable up to 50 psig (3.4 bar).  
Adjustable up to 60 psig (4.14 bar) with optional springs.  
With inlet pressure of 100 psig (7 bar) repeatability is within 0.25 psig

**Pressure Gauge:** 0 to 160 psig (11 bar); 1/8 NPT gauge ports front and rear.

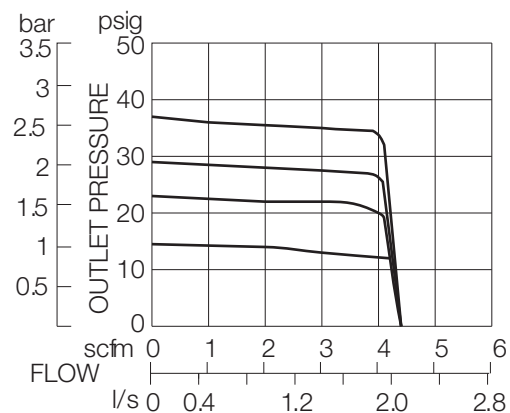
**Panel Mounting:** 1-3/16 inch (30 mm) hole required.

**Seals:** Nitrile.

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

## FLOW CHART

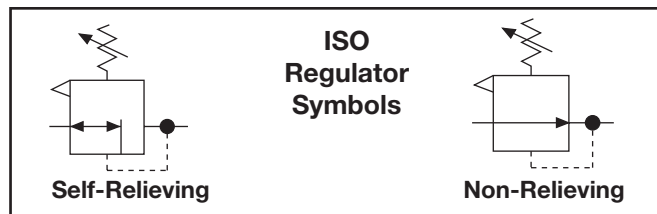
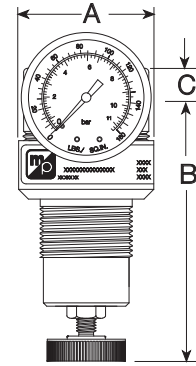
Inlet Pressure: 91 psig (6.3 bar)



## DIMENSIONS inches (mm)

A	B	C	Depth †	Weight †
				lb (kg)
1.8 (44)	3.4 (86)	0.4 (10)	1.8 (44)	0.38 (0.16)

† Less gauge.



## ORDERING INFORMATION

Change the letters in the sample model number below to specify the regulator you want.

# R57M - 2 Y G W

### PORT SIZE

1/8 NPTF ..... 1  
1/4 NPTF ..... 2

### OPTIONS *(More than one option can be chosen. Add in alphabetical order)*

None..... Leave Blank

Non-relieving ..... A

Springs: (0-50 psig standard)

For optimum performance operating pressure should fall approximately in the middle of the spring range.

0-60 psig (0-4.1 bar) ..... H

0-20 psig (0-1.4 bar) ..... L20

0-10 psig (0-0.7 bar) ..... L10

0-5 psig (0-0.3 bar) ..... L5

No gauge ports ..... NP

Viton seals ..... V

### PORT TYPE

NPTF threads ..... Leave Blank

BSPP threads ..... W

### OPTIONS *(More than one option can be chosen. Add in alphabetical order)*

Delete gauge ..... Leave Blank

0-160 PSI Gauge ..... G

Plastic mounting nut ..... P

Metal mounting nut ..... PN

Hex plastic mounting nut ..... PE

### MOUNTING BRACKETS

See page 356.

# Full-Size SERIES 380 Modular Internally Piloted Precision Regulators

## IR380 Models Port Sizes: 3/8, 1/2, 3/4

### Available Color Caps



Model Shown: IR380-6G



Yellow  
(optional)

Red  
(optional)

Blue  
(optional)

Grey  
(standard)

- ◆ Modular or inline mounting.
- ◆ Self-relieving diaphragm design.
- ◆ Repeatability  $\pm 0.5$  psi (0.034 bar).
- ◆ Easy finger adjustment. No overshoot or undershoot when adjusting.
- ◆ Constant air bleed for high accuracy.
- ◆ Pressure gauge.
- ◆ NPTF port threads; optional BSPP threads.

### SPECIFICATIONS

**Ambient/Media Temperature:**

40° to 125°F (4° to 52°C).

**Body and Dome:** Zinc.

**Bonnet and Knob:** Glass Filled Nylon and Acetal.

**Constant Air Bleed Rate:** 0.18 – 0.33 scfm at 80 psi secondary pressure

**Fluid Media:** Compressed air.

**Inlet Pressure:** 250 psig (17 bar) maximum.

**Outlet Pressure:** Adjustable 15 –200 psig (1– 13.7 bar).

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

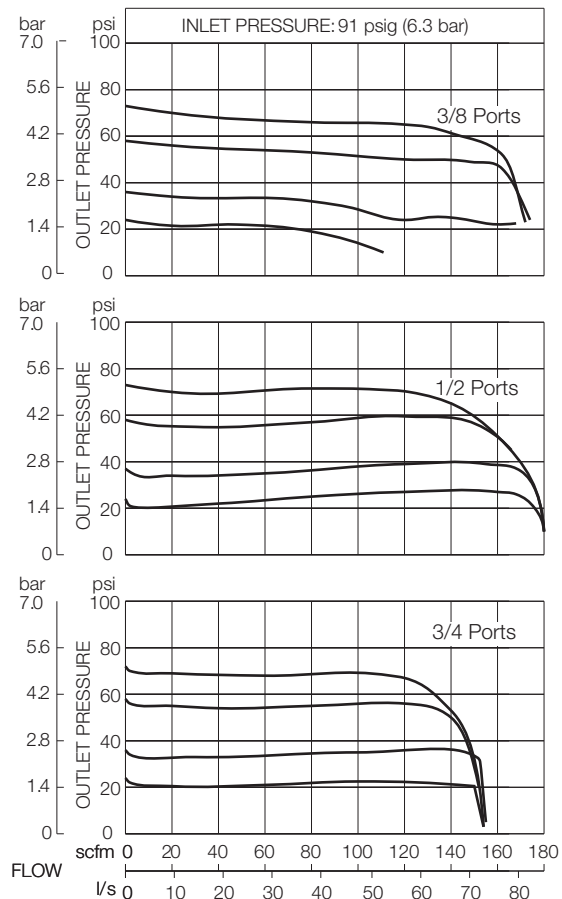
**Panel Mounting:** 1-3/16 (30 mm) hole required.

**Seals:** Nitrile.

**Self-relieving**

**Valve:** Brass.

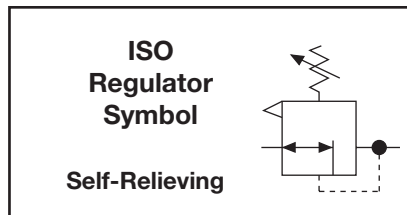
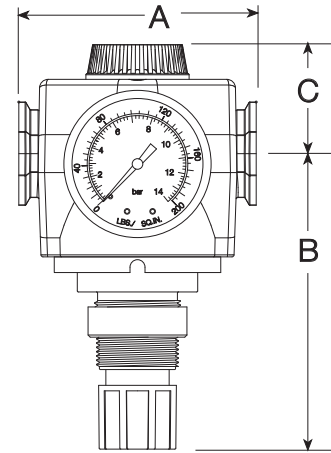
### FLOW CHARTS



**DIMENSIONS** inches (mm)

A	B	C	Depth †	Weight † lb (kg)
3.5 (87)	4.8 (122)	1.6 (41)	2.9 (73)	2.3 (1.0)

† Less gauge.



**ORDERING INFORMATION**

Change the letters in the sample model number below to specify the regulator you want.

**IR380 - 3 Y G W**

**PORT SIZE**

- 3/8 NPTF ..... 3
- 1/2 NPTF ..... 4
- 3/4 NPTF ..... 6

**PORT TYPE**

- NPTF threads ..... Leave Blank
- BSPP threads ..... W

**OPTIONS** (More than one option can be chosen. Add in alphabetical order)

- Delete gauge ..... Leave Blank
- 0-200 PSI Gauge ..... G
- Plastic mounting nut ..... P
- Metal mounting nut ..... PN
- Hex plastic mounting nut ..... PE

**OPTIONS** (More than one option can be chosen. Add in alphabetical order)

- None ..... Leave Blank

**Cap color:** Grey is standard.

- MP yellow ..... C1
- Red ..... C2
- Mid blue ..... C3

**Springs:** (15-200 psig standard)

- For optimum performance operating pressure should fall approximately in the middle of the spring range.
- 15-250 psig (1-17 bar) ..... H
- 15-100 psig (1-7 bar) ..... L

**MOUNTING BRACKETS**

See page 356.



# Full-Size VANGUARD Modular Internally Piloted Precision Regulators

## IR100 Models Port Sizes: 1/4, 3/8, 1/2, 3/4



Model Shown: R100-6G

- ◆ Modular or inline mounting.
- ◆ Self-relieving diaphragm design.
- ◆ Easy finger adjustment. No overshoot or undershoot when adjusting.
- ◆ Constant air bleed for accuracy.
- ◆ Repeatability  $\pm 0.5$  psi ( $\pm 0.034$  bar).
- ◆ Pressure gauge.
- ◆ NPTF port threads; optional BSPP threads.

### SPECIFICATIONS

**Ambient/Media Temperature:**

40° to 125°F (4° to 52°C).

**Body and Dome:** Zinc.

**Bonnet and Knob:** Glass Filled Nyone and Acetal.

**Constant Air Bleed Rate:** 0.18 – 0.33 scfm at 80 psi secondary pressure

**Fluid Media:** Compressed air.

**Inlet Pressure:** 250 psig (17 bar) maximum.

**Outlet Pressure:** Adjustable 15 – 200 psig (1 – 14 bar).

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

**Panel Mounting:** 1-3/16 (30 mm) hole required.

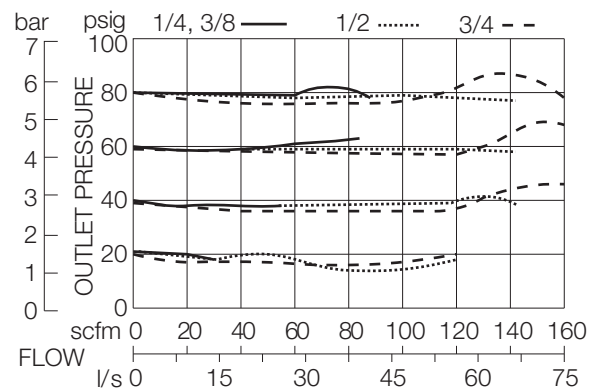
**Seals:** Nitrile.

**Self-relieving**

**Valve:** Brass.

### FLOW CHART

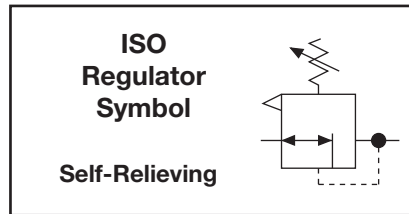
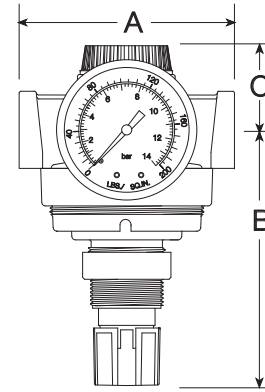
Inlet Pressure: 100 psig (7 bar)



**DIMENSIONS inches (mm)**

A	B	C	Depth †	Weight † lb (kg)
3.5 (89)	4.2 (106)	1.3 (33)	2.8 (71)	2.06 (0.92)

† Less gauge.



**ORDERING INFORMATION**

Change the letters in the sample model number below to specify the regulator you want.

**IR100 - 2 Y G W**

**PORT SIZE**

- 1/4 NPTF.....2
- 3/8 NPTF.....3
- 1/2 NPTF.....4
- 3/4 NPTF.....6

**PORT TYPE**

- NPTF threads ..... Leave Blank
- BSPF threads ..... W

**OPTIONS (More than one option can be chosen. Add in alphabetical order)**

- Delete gauge ..... Leave Blank
- 0-200 PSI Gauge ..... G
- Plastic mounting nut ..... P
- Metal mounting nut ..... PN
- Hex plastic mounting nut ..... PE

**OPTIONS (More than one option can be chosen. Add in alphabetical order)**

- None..... Leave Blank
- 1.75-inch (4.5 cm) diameter ..... B
- adjusting knob with removable locking key.
- Springs: (15-200 psig standard)
- For optimum performance operating pressure should fall approximately in the middle of the spring range.
- 15-250 psig (1-17 bar) ..... H
- 15-100 psig (1-7 bar) ..... L

**MOUNTING BRACKETS**

See page 356.



# High-Flow VANGUARD Internally Piloted Precision Regulators

## IR180M Models Port Sizes: 3/4, 1, 1-1/4, 1-1/2



**Model Shown:**  
IR180M-8G

**Model Shown:**  
IR180M-10G

- ◆ Inline mounting.
- ◆ Diaphragm-type design.
- ◆ Self-relieving.
- ◆ Constant air bleed for accuracy.
- ◆ Repeatability  $\pm 0.5$  psi ( $\pm 0.034$  bar).
- ◆ Pressure gauge.
- ◆ NPTF port threads; optional BSPP threads.

### SPECIFICATIONS

**Ambient/Media Temperature:**

40° to 175°F (4° to 79°C).

**Body:** Aluminum.

**Bonnet and Knob:** Glass Filled Nylon and Acetal.

**Constant Air Bleed Rate:** 0.18 – 0.33 scfm at 80 psi secondary pressure

**Dome:** Zinc.

**Fluid Media:** Compressed air.

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

**Outlet Pressure:**

Adjustable 15 to 200 psig (1 to 14 bar).

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

**Panel Mounting:** 1-3/16 (30 mm) hole required.

**Seals:** Nitrile.

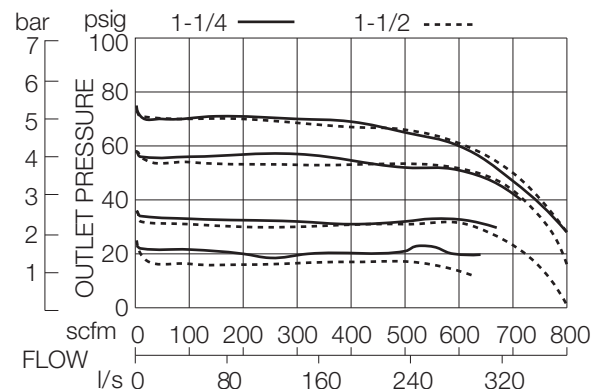
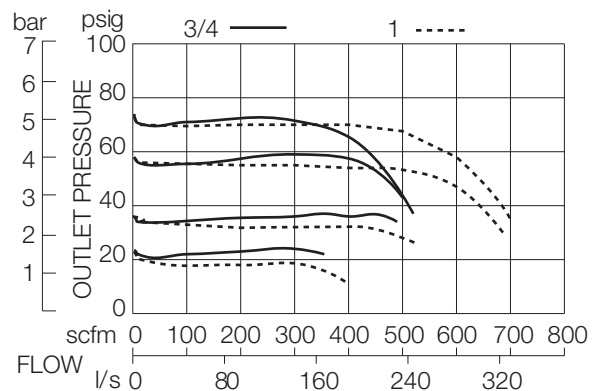
**Self-relieving**

**Valve:** Aluminum.

**Valve Cap:** Nylon.

### FLOW CHART

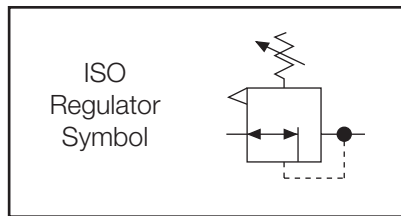
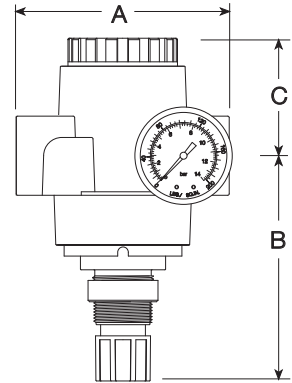
Inlet Pressure: 91 psig (6.3 bar)



**DIMENSIONS** inches (mm)

Ports	A	B	C	Depth †	Weight †
					lb (kg)
3/4 1	4.4 (111)	4.6 (112)	2.4 (62)	2.8 (71)	2.0 (0.91)
1-1/4 1-1/2	4.9 (124)	4.9 (125)	2.1 (54)	2.8 (71)	2.38 (1.08)

† Less gauge.



**ORDERING INFORMATION**

Change the letters in the sample model number below to specify the regulator you want.

**IR180M - 6 Y G W**

**PORT SIZE**

- 3/4 NPTF ..... 6
- 1 NPTF ..... 8
- 1-1/4 NPTF ..... 10
- 1-1/2 NPTF ..... 12

**PORT TYPE**

- NPTF threads ..... Leave Blank
- BSPF threads ..... W

**OPTIONS** (More than one option can be chosen. Add in alphabetical order)

- Delete gauge ..... Leave Blank
- 0-200 PSI Gauge ..... G
- Plastic mounting nut ..... P
- Metal mounting nut ..... PN
- Hex plastic mounting nut ..... PE

**OPTIONS** (More than one option can be chosen. Add in alphabetical order)

- None..... Leave Blank
- 1.75-inch (4.5 cm) diameter..... B
- adjusting knob with removable locking key
- Springs: (15-200 psig standard)
- For optimum performance operating pressure should fall approximately in the middle of the spring range.
- 15-250 psig (1-17 bar) ..... H
- 15-100 psig (1-7 bar) ..... L

**MOUNTING BRACKETS**

See page 356.