



We're everywhere you need us to be!



Precision Instrumentation	
Features and Benefits	
Precision Regulator	
High Flow Precision Regulator	
Electropneumatic Transducer	
Economy Miniature Electropneumatic Transducer	
Miniature Electropneumatic Transducer	
Ratio Relay Volume Booster	
Instrument Air Regulator	
Replacement and Repair Kits	







#### 1. Precision Regulator

• Standard or High Relief

#### 2. High Flow Precision Regulator

- 880 Series Regulator
- 881 Series Precision High Flow Exhaust Relief Regulator

#### 3. Electropneumatic Transducer

- I/P or E/P Versions
- Magnet Coil Technology

#### 4. Miniature Electropneumatic Transducer

- I/P or E/P Versions
- R84 Series Magnet Coil Technology
- R85 Series Piezo Electric Technology

#### 5. Ratio Relay Volume Booster

- Precision Air Pilot Regulation
- 1:1 or 1:6 Ratios Available

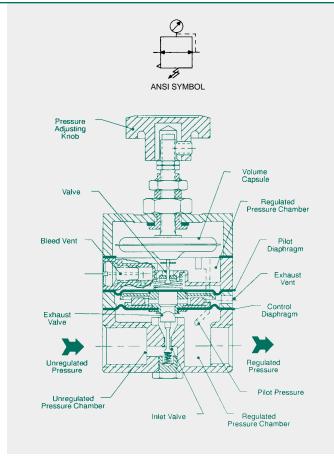
#### 6. Instrument Air Regulator

• Precision Regulator with Integral 5 Micron Filtration









#### Precision Regulator

#### R80/82 Series

#### Application

The 80 and 82 Series regulators are high-precision, multi-stage pressure regulators. The highest degree of regulation and repeatability are achievable by reacting to downstream pressure fluctuations as small as 0.01 PSIG (.07 kPa). Action occurs as downstream pressure is piloted to the control chamber to act on a finely tuned stainless steel volume capsule. A continuous bleed of less than 0.08 SCFM (.15 m3/hr) adjusts the pilot diaphragm causing appropriate movement of the supply valve or relief valve. Relief flows of up to 10 SCFM can be achieved through the large exhaust port located in the control diaphragm. Exhaust is achieved through the exhaust vents located in the side of the body.

#### Recommended Uses

- Air Gauging
- Gas Mixing
- Web Tensioning
- Roll Loading
- Air Hoists

#### **Specifications**

Flow Capacity: 14 SCFM (25m3/hr)

Exhaust Capacity: Model 80 - 2 SCFM (3.4 m3/hr) Model 82 - 10 SCFM (17.0 m3/hr)

Wodel 82 - 10 SCFW (

Sensitivity: .125 inches (3.2 mm) water Pilot Bleed Rate: .08 SCFM (.15 m3/hr)

Supply Pressure Variation: Less than .005 PSI (.03 kPa)@25 PSI vari-

ance

Maximum Supply Pressure: 150 PSIG (1050 kPa)

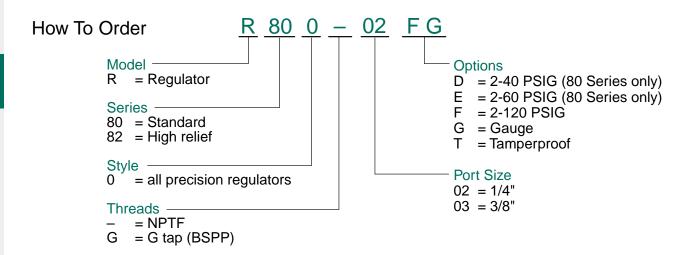
Weight: 1.4 lbs (.64 kg)

#### Materials of Construction

Body: Die Cast Zinc Diaphragms: Buna - N

Volume Capsule: Stainless Steel

Knob: Phenolic Plastic



#### NEED MORE PARTS AND INFORMATION?

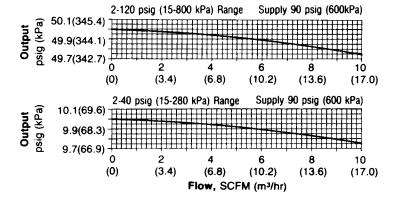
• See page 18 for information on ordering replacement parts.





#### Flow Ratings (based on 100 PSIG inlet)

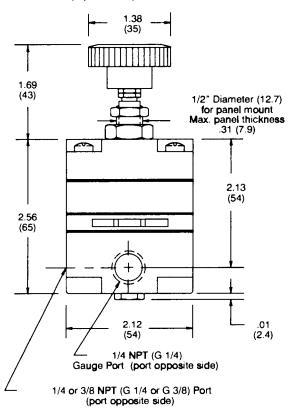




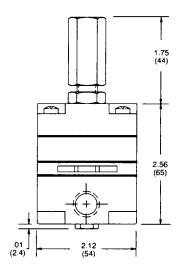
R820-02F pictured

#### **Dimensions**

top dimensions = inches bottom dimensions (in parenthesis) = millimeters

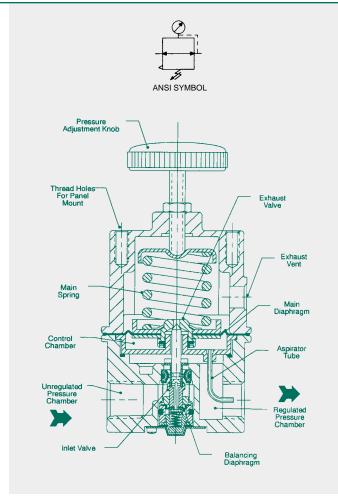


#### **Tamperproof Model**









### High Flow Precision Regulator R88 Series

#### Application

The 880 Series pressure control regulator is designed for high flow and accurate pressure control utilizing a rolling diaphragm to insure a constant output pressure. The 88 model maintains stability even with wide supply pressure variations.

The 881 Series back pressure regulator is a high flow, highly accurate pneumatic relief valve with an adjustable set point. It's primary function is to provide protection against over pressurization in the downstream portion of a pneumatic system. This precision unit is capable of handling flows up to 50 SCFM. A rolling diaphragm provides the sensitivity that causes the unit to vent to atmosphere in response to the slightest upstream changes.

#### Recommended Uses

- Test Equipment
- Roll Loading
- Web Tensioning
- Actuators
- Gas Mixing
- Test Panels
- Clutch and Brake Controls

#### Specifications

Flow Capacity: see flow characteristics (next page)

Exhaust Capacity: 4 SCFM (6.7 m3/hr) Sensitivity: .25 inches (6.33 mm) of water

Total Air Consumption: 1.0 to 12.5 SCFH (.03 to .37 m3/hr), depending on output pressure

Supply Pressure Variation: .1 PSI (.7 kPa) @ 100 PSI (700 kPa) change

Maximum Supply Pressure: 250 PSIG (1750 kPa)

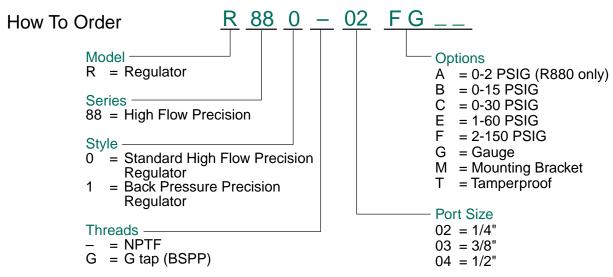
Weight: 1.6 lbs (.74 kg)

#### Materials of Construction

Body: Die Cast Zinc Diaphragms: Buna - N

Volume Capsule: Stainless Steel

Knob: Phanolic Plastic



NEED MORE PARTS AND INFORMATION?

See page 18 for information on ordering replacement parts.



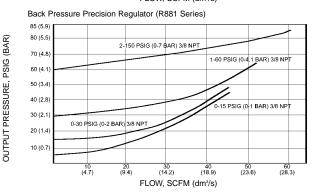


#### Flow Ratings (based on 100 PSIG inlet)



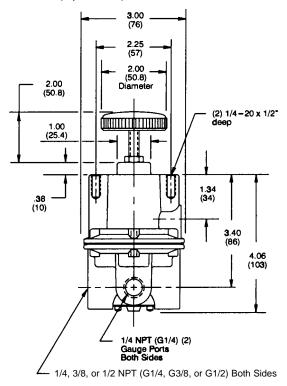
R880-02F pictured

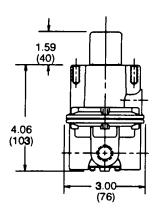
# Standard Precision Regulator (R880 Series) 80 (5.5) 70 (4.8) 90 (6.5) 1-60 PSIG (0.06-4.1 BAR) 1/4 NPT 40 (2.8) 30 (2.1) 40 (2.8) 10 (0.7)



#### **Dimensions**

top dimensions = inches bottom dimensions (in parenthesis) = millimeters

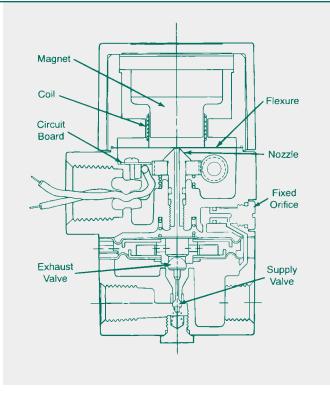












#### Electropneumatic Transducer I/P, E/P R83 Series

#### Application

The Electropneumatic Transducer (I/P, E/P) converts a current or voltage input signal to a linearly proportional pneumatic output pressure. This versatile instrument is designed for control applications that require a high degree of reliability and repeatability at an economical cost. These units are used for applications that require the operation of valve actuators, pneumatic valve positioners, damper and louver actuators, final control elements, relays, air cylinders, web tensioners, clutches, and brakes.

#### Features

- Integral volume booster
- Compact size
- Low air consumption
- Field reversible
- Flexible zero and span adjustments
- · Standard process inputs
- Split ranging
- FM NEMA 4x

**Specifications** 

High Output Range Low Output Range (up to 30 PSIG) (up to 120 PSIG)

Min./Max. Supply Pressure: minimum 3 PSIG (21 kPa) minimum 5 PSIG (35 kPa) above maximum output above maximum output maximum 100 PSIG (700 kPa) maximum 150 PSIG (1050 kPa)

Supply Pressure Sensitivity: < +/- .1% of span per PSIG < +/- .004% of span per 1.0 PSIG

(< +/- .15% of span per 10 kPa) (7 kPa)

Terminal Based Linearity: < +/- 1.5% of span typ., +/- 2.0% max < +/- .75% of span

Repeatability: < .5% of span < .5% of span Hysteresis: < 1.0% of span < .5% of span

Response Time: dependent on pressure range, dependent on pressure range, typically less than .25 sec. for typically less than .25 sec. for

> 3 - 15 PSIG units 3 - 15 PSIG units

Flow Rate: 4.5 SCFM (7.6 m3/hr ANR) 20 SCFM (34 m3/hr ANR)

at 25 PSIG (175 kPa) supply at 150 PSIG (1050 kPa) supply 12 SCFM (20 m3/hr ANR) at 100 PSIG (700 kPa) supply

2.0 SCFM (3.4 m3/hr) 2.0 SCFM (3.4 m3/hr) Relief Capacity:

at 5 PSIG (35 kPa) above set point at 5 PSIG (35 kPa)

Maximum Air Consumption: .03 SCFM (.07 m3/hr) typical .05 SCFM (.14 m3/hr) typical

oil free, clean dry air filtered to Media: oil free, clean dry air filtered to

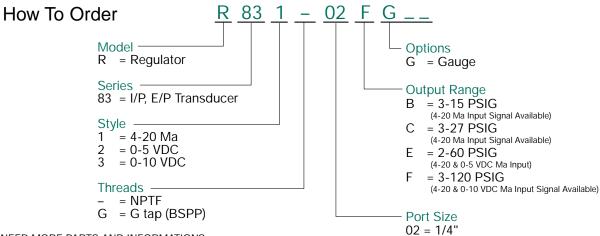
0.3 micron 0.3 micron

Temp. Range (operating): -20°F to 140°F (-30°C to 60°C) -20°F to 140°F (-30°C to 60°C)

NOTE: This unit, as is, is a Class 1, Division 2 hazardous location item (non-incendive). With the proper barrier it is a Class 1,2,3; Division 1; Groups C,D,E,F,G item (applies only to 4-20 Ma I/P).







#### NEED MORE PARTS AND INFORMATION?

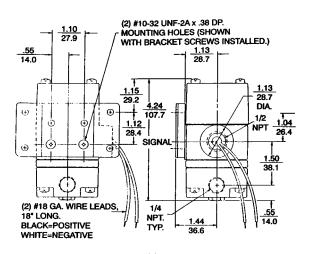
• See page 18 for information on ordering replacement parts.

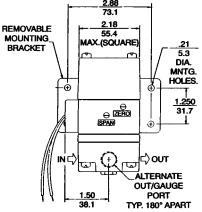
#### **Dimensions**

top dimensions = inches bottom dimensions (in parenthesis) = millimeters

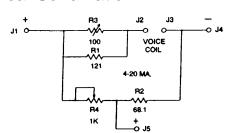


R832-02E pictured





#### **Electrical Schematic**

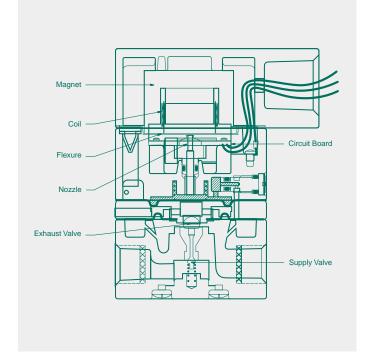


NOTE: FOR 4-20MA AND 10-MA USE J1 AS POSITIVE INPUT.

NOTE: Bracket included with each unit.







## Economy Miniature Electropneumatic Transducer

#### **R84 Series**

#### Application

The R84 Series I/P, E/P transducers are compact electronic pressure regulators that convert an electrical signal (current or voltage) to a proportional pneumatic output. Its compact design and flexible porting make it an ideal choice for space-constrained DIN rail or manifold applications. A NEMA-4X housing with RFI/EMI protection will allow it to be used in demanding industrial environments.

The operating principle of the R84 is based on a rugged, field-tested force-balance design. A coil is suspended in a magnetic field by a flexure. Varying the electrical signal through the coil positions the flexure to a nozzle. This creates a back pressure that acts as a pilot to an integral volume booster. This provides a high flow which increases control speed in critical applications.

#### **Features**

- Compact size
- NEMA-4X housing
- Low air consumption
- High flow capacity
- Accessible external orifice
- Input and output ports on both front and back
- RFI/EMI protection
- External zero and span adjustments
- Field reversible
- Wall, panel, pipe or DIN rail mounting
- No separate power supply required

**Specifications** 

Linearity (independent): > +/- 0.5% of span

Hysteresis and repeatability: >0.5% of span

Port sizes: Pneumatic = 1/4 NPT

Electric = 1/2 NPT

Media: Clean, dry, oil-free, air filtered to 0.3 micron

Mounting: Wall, panel (included), 2" pipe (included) or DIN rail (optional)

Materials: Housing: Chromate treated aluminum with baked paint

Elastomers: Buna-N

Trim: Stainless Steel, brass, zinc plated steel

Weight: 1.3 lbs (.59 KG)

Inputs: 4-20 mA, 0-5V DC, 0-10 V DC

Outputs: 3-15 psig, 3-27 psig, 2-60 psig, 3-120 psig

Air Consumption: 1.8 SCFH (0.05 m3/hr) at mid Range typical

Supply pressure: Outputs up to 30 psi: 100 psig (7 bar) maximum

Outputs to 120 psig: 150 psig (10 bar) maximum

Flow Capacity at mid range: 4.5 SCFM (7.6 m3/hr) at 25 psig (1.7 Bar) supply 12 SCFM (20 m3/hr) at 100 psig (7 Bar) supply

Relief Capacity: 2 SCFM (3.4 m3/hr) at 5 psig (35kPa) above set point

Temperature Range: Operating: -40 to +160 F (-40 to +71 C)

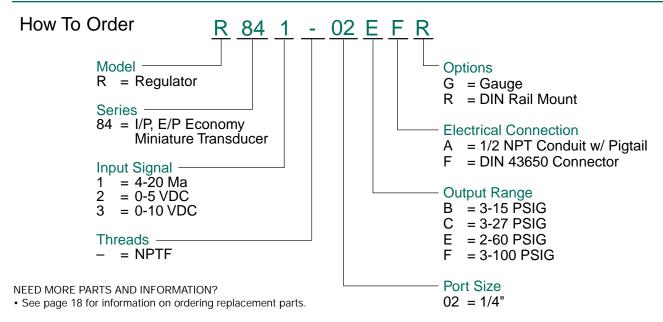
Storage: -40 to +200 F (-40 to + 93 C)

#### Notes:

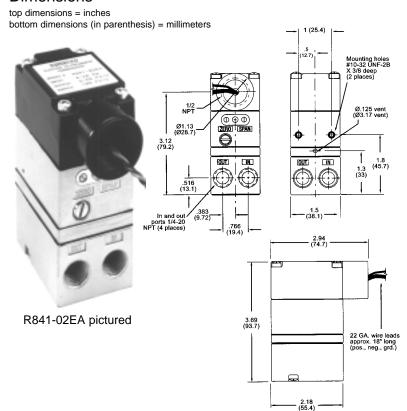
Electrical Connections – For both I/P and E/P models, the 1/2" conduit electrical connections are made to the red (+) and black (-) leads. The green lead is used for case ground. For both I/P and E/P models, the 43650 DIN electrical connections are made to terminal 1 (+) and terminal 2 (-). Terminal 3 is not used. Ground is for case ground.



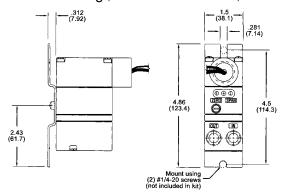




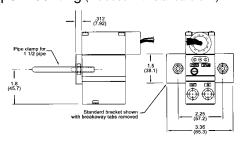
#### **Dimensions**



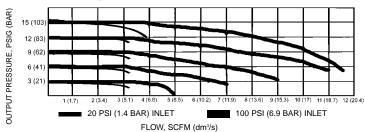
#### Panel Mounting (included with standard unit)

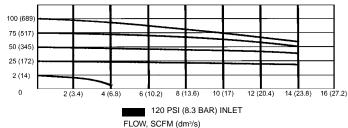


#### Pipe Mounting (included with standard unit)



#### Flow Ratings

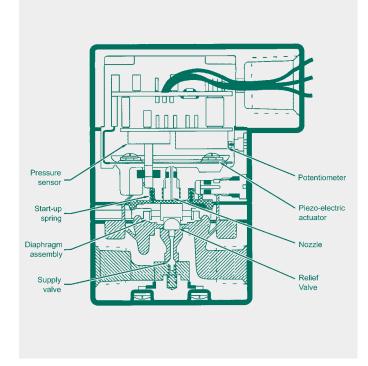












## Miniature Electropneumatic Transducer I/P, E/P R85 Series

#### Application

The R85 Series I/P, E/P transducers are a series of compact electronic pressure regulators that convert an electrical signal (current or voltage) to a proportional pneumatic output. Utilizing internal solid-state feedback circuitry, the R85 provides precise, stable pressure outputs to final control elements. Immunity to the effects of vibration or mounting position, high tolerance to impure air, and low air consumption make this unit ideal for use in demanding applications.

The heart of this unique technology is a bimorph piezo actuator that is encapsulated in a protective skin. This protective skin provides defense against the humidity and contaminant often found in process operating environments.

#### Features

- Reliable in harsh environments
- Low air consumption 3 SCFH typical
- High accuracy +/-0.10% of span
- NEMA-4X (IP65) enclosure
- Vibration/position insensitive
- · Compact size
- Wall, panel (included), pipe (included), or din rail mounting
- Supply pressures up to 100 PSIG
- Built-in volume booster 10 SCFM flow
- Input/output ports on front and back
- · Conduit fitting or din connector
- Split range operation
- Field reversible

**Specifications** 

Mounting:

Port sizes: Pneumatic: 1/4 NPT

Electric: 1/2 NPT

Media: Clean, dry, oil-free, air filtered to 0.3 micron

Wall, Panel (included), 2" pipe (included), or DIN rail (optional)

Materials: Housing: Chromate treated aluminum with baked paint. NEMA-4X (IP65)

Elastomers: Buna-N

Trim: Stainless steel, brass, zinc plated steel

Weight: 13.0 oz (0.4 kg)

Inputs: 4-20mA 0-10 VDC 0-5 VDC

Outputs: 3-15 PSIG 0.21-1.03 BAR 3-27 PSIG 0.21-1.86 BAR 2-60 PSIG 0.14-4.14 BAR 3-100 PSIG 0.21-6.89 BAR

Air consumption: 3.0 SCFH (0.11 m3/hr) at mid-range typical

Supply pressure: 100 PSIG (7.0 BAR) maximum

Note: Supply pressure must be at a minimum of 5 PSIG above maximum output

Flow capacity 4.5 SCFM (7.6 m3/hr) at 25 PSIG (1.7 BAR) supply at mid-range: 12 SCFM (20 m3/hr) at 100 PSIG (7 BAR) supply

Relief Capacity: 2.0 SCFM (3.4 m3/hr)

at 5 PSIG (35 kPa) above set point

Temperature limits: Operating: -40° to +160° F (-40° to +71° C)

Storage: -40° to +200° F (-40° to +93° C)

Loop load,

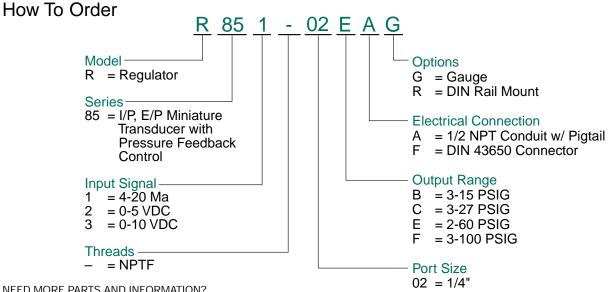
I/P Transducer: 7.5 VDC @ 20mA

Supply Voltage,

E/P Transducer: 7-30 VDC, less than 3mA Signal impedance: 7-30 VDC, less than 3mA



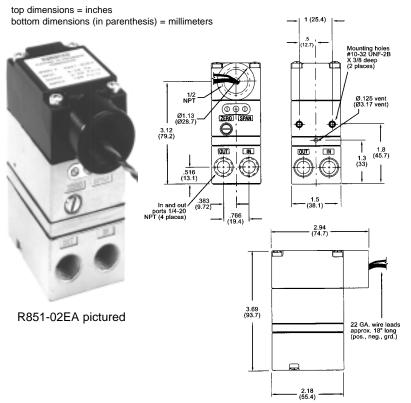




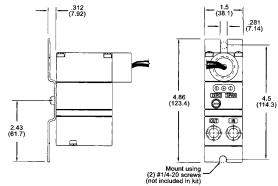
NEED MORE PARTS AND INFORMATION?

· See page 18 for information on ordering replacement parts.

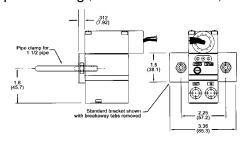
#### **Dimensions**



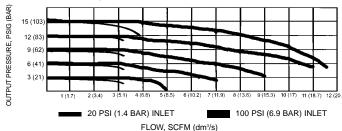
#### Panel Mounting (included with standard unit)

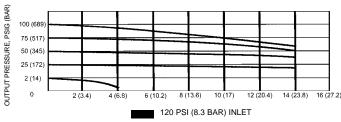


#### Pipe Mounting (included with standard unit)



#### Flow Ratings

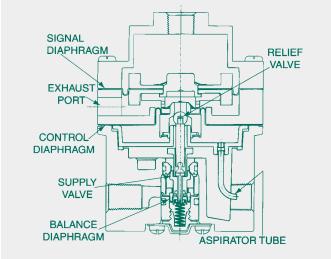












Specifications Ratio:	1:1	1:6
Flow capacity, SCFM (m3/hr) 100 PSIG (700 kPa) supply, 20 PSIG (140 kPa) output:	50 (76.5)	50 (76.5)
Exhaust capacity, SCFM (m3/hr) Downstream 5 PSIG (35 kPa) above set pressure:	15 (25.5)	7.5 (12.8)
Sensitivity, inches water (cm):	.25 (.64)	1.5 (3.8)
Ratio accuracy (%) of output span with 3-15 PSIG (20-105 kPa) signal:	1.0	2.0
Zero error (%) - % of output span with 3-15 PSIG (21-105 kPa) signal:	2.0	3.0
Effect of supply pressure change of 50 PSIG (350 kPa):	.1 PSI	.6 PSI
Maximum supply pressure, PSIG (kPa):	250 (1750)	250 (1750)
Maximum signal pressure, PSIG (kPa):	150 (1034)	25 (172)
Ambient temperature limits, °F (°C):	-40 to 200 (-40 to 93)	-40 to 200 (-40 to 93)

#### Ratio Relay Volume Booster

#### **Applications**

The 87 Series Volume Boosters are used extensively for increased flow capacity, pressure amplification, or remote pressure control applications. This includes web tensioning, roll loading, control valve actuators, I/P volume boosting, cylinder actuation, clutch and brake control, and gas flow control.

#### **Features**

- High flow capacity allows flows up to 50 SCFM
- Amplified output available in a signal to output pressure ratio of 1:6
- High exhaust capacity large relief provides 15 SCFM flow capacity
- Stable output Venturi aspirator maintains output pressure under varying flow conditions
- Balanced supply valve rolling diaphragm design makes unit immune to supply pressure variation
- Negative bias 4 PSI negative bias option allows "zero" of I/Ps

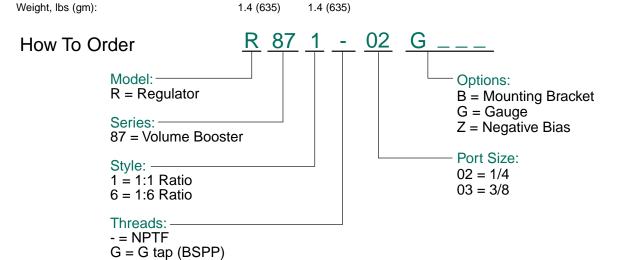
#### Optional Fixed Negative Bias

The 87 Series Volume Booster is available with an optional 4±1 PSIG (30±7 kPa) less than the signal pressure (Z option).

This option allows zero output when utilizing I/P transducers that typically only are capable of providing pressures down to 3 PSI. Note that the negative bias has a tolerance of  $\pm 1$  PSI. This means that actual bias will range from -3 PSI to -5 PSI. Use the zero adjustment of the I/P to reach desired setting.

#### Mounting Bracket

The mounting bracket for the R87 Series Ratio Relay Volume Booster, part number PK88, is included.



NEED MORE PARTS AND INFORMATION?

• See page 18 for information on ordering replacement parts.

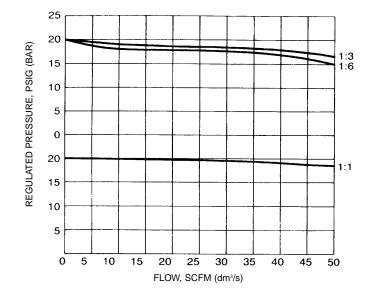




#### Flow Ratings

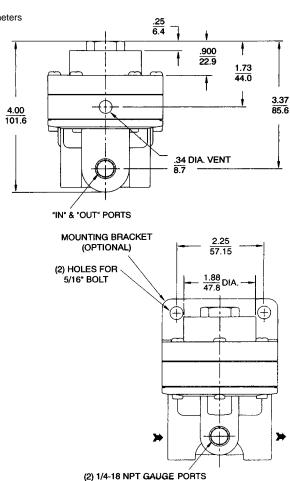


R871-02 pictured



#### **Dimensions**

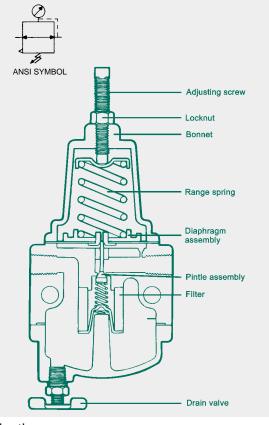
top dimensions = inches bottom dimensions (in parenthesis) = millimeters











#### Instrument Air Regulator

#### **R89 Series**

#### Application

The Instrument Air Regulator is designed to provide clean, accurate air pressure to instruments, valves, and other automatic control equipment. It is used extensively to supply air to pneumatic controllers, transmitters, transducers, valve positioners, air cylinders, and a wide range of pneumatic control systems.

#### **Features**

- Stable output and repeatability
- Corrosion-resistant construction
- 5 micron depth filter
- Self-relieving
- · Low droop at high flow levels
- Tight shut off

#### Materials of Construction

Body: die cast aluminum alloy, irridite, baked epoxy finish

Filter: 5 micron phenolic impregnated cellulose Diaphragms: nitrile elastomer and nylon fabric

Valve Seat Plug: nitrile elastomer

Additional Materials: brass, zinc, plated steel, acetal

#### **Mounting Bracket**

The mounting bracket for the R89 Series Instrument Air Regulator, part number PK89, is available and sold separately.

#### **Specifications**

Port Size: 1/4 NPT

Standard Output Pressure: 0 - 120 PSIG (0 - 800 kPa) Maximum Supply Pressure: 250 PSIG (1700 kPa)

Mounting: pipe or integral mounting

Flow Capacity: see flow characteristics (next page)

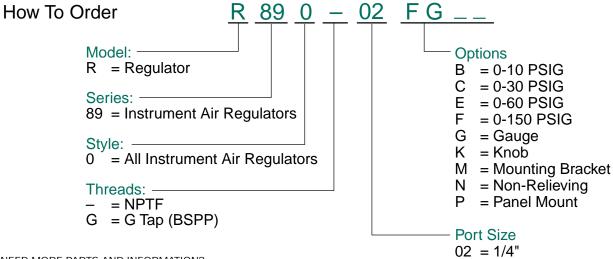
Exhaust Capacity: .1 SCFM (.17 m3/hr) @ 5 PSIG (35 kPa) above set point

Sensitivity: 1" (2.5 cm) of water

Air Consumption: less than 5 SCFH (.17 m3/hr)

Effect of Supply Pressure Variation: less than .2 PSIG (1.4 kPa) @ 25 PSI (170 kPa) change

Weight: 1.6 lbs (.74 kg)



NEED MORE PARTS AND INFORMATION?

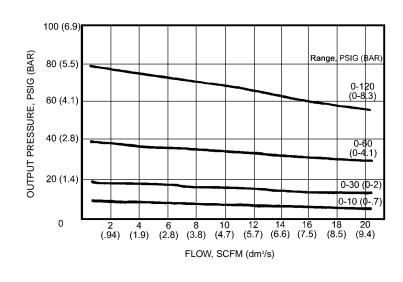
See page 18 for information on ordering replacement parts.





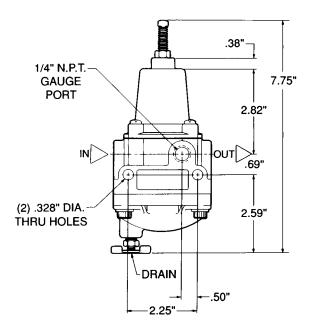
#### Flow Ratings (based on 100 PSIG inlet)

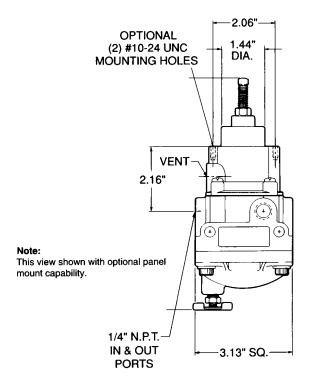




#### **Dimensions**

top dimensions = inches bottom dimensions (in parenthesis) = millimeters











#### Replacement Kits

#### **Precision Regulators**

#### ➤ Precision Regulator Repair Kits

kit # description

RKR800D for 2-40 pressure range models

RKR800E for 2-60 pressure range models

RKR800F for 2-120 pressure range models

RKR820F for 2-120 pressure range models

#### > Replacement Adjustment Knob Kits

kit # description

RP8002 for R800 and R820 models

#### **Electropneumatic Transducers**

#### ➤ Electropneumatic Transducer Repair Kits

kit # description

RKR831BC for 3-15 and 3-27 pressure range models RKR831EF for 2-60 and 3-120 pressure range models

#### **High Flow Precision Regulators**

#### > High Flow Precision Regulator Repair Kits

kit # description

RKR880A for 0-2 pressure range models

RKR880B for 0-15 pressure range models

RKR880C for 0-30 pressure range models

RKR880F for 1-60 pressure range models

RKR880F for 2-150 pressure range models

RKR881 for back pressure regulator

#### > Replacement Adjustment Knob Kits

**kit # description**RP81 for R880 models

#### **Mounting Brackets**

#### > High Flow Precision Regulator Repair Kits

kit # description

 PK80
 80 & 82 Series Bracket

 PK88
 87 & 82 Series Bracket

 PK89
 89 Series Bracket

#### Instrument Air Regulators

#### > Instrument Air Regulator Repair Kits

kit # description RKR89 for all models



World Class Supplier of Pneumatic Components



#### **World Headquarters**

**Numatics Incorporated** 

Phone: 248-887-4111 Fax: 248-887-9190

#### **Numatics - Air Preparation**

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