March 2008

Type EZR Pressure Reducing Regulator

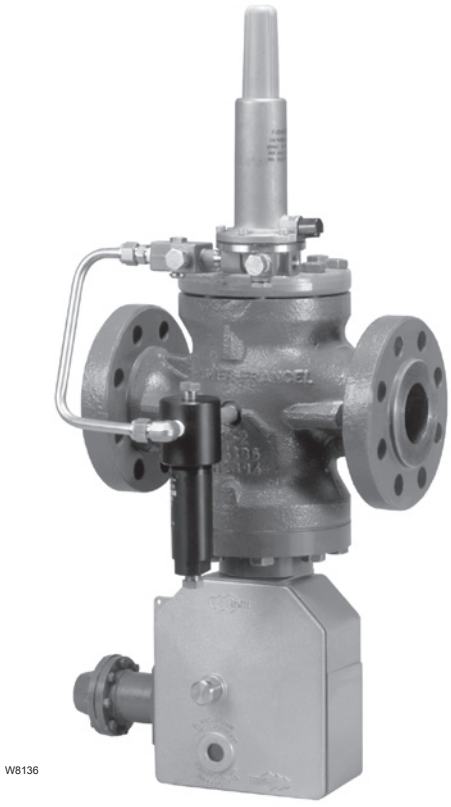
☆ **Robust**

☆ **Quiet Operation**

☆ **Thoroughly Tested**

☆ **Exceptional Design**

☆ **Internally Actuated**



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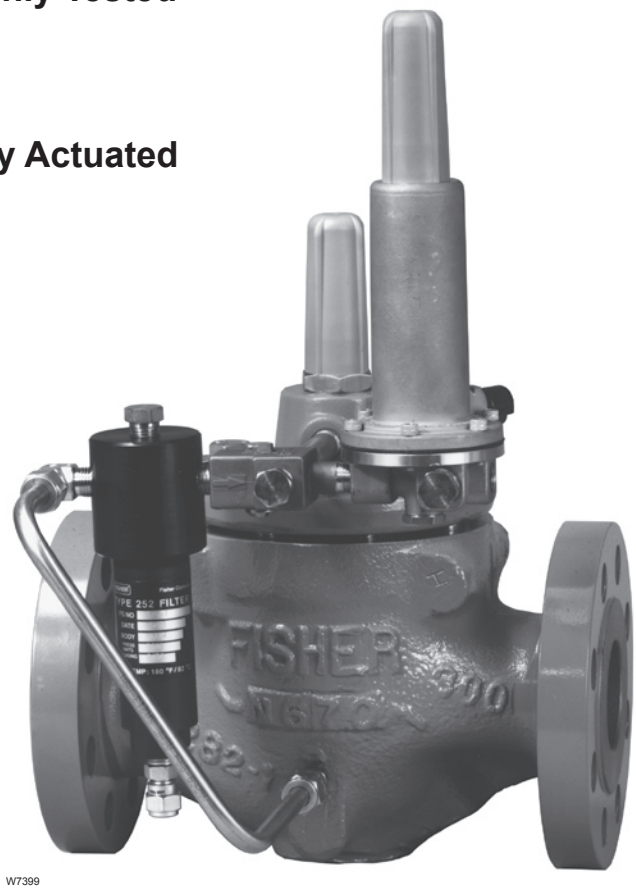
TYPE EZR WITH INTEGRAL SLAM-SHUT DEVICE



W7399

TYPE EZR REGULATOR

☆ **1, 2 x 1, 2, 3, 4, 6, 8-inch (DN 25, 50 x 25, 50, 80, 100, 150, 200) and EW Body Sizes**

D102626X012

Patent Numbers 5,964,446 and 6,102,071
Additional Patents Pending

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EMERSON™
Process Management

Introduction

The Type EZR pilot-operated, pressure reducing regulator is designed for natural gas transmission/distribution systems and industrial/commercial applications. The Type EZR provides smooth, quiet operation, tight shutoff, and long life, even in dirty service. Its internally actuated metal plug eliminates disadvantages associated with boot-style regulators, and the specially engineered flow path deflects debris, protecting the seat from damage and erosion. The Type EZR is used in conjunction with a 161EB or 161AY Series pilot and Type 112 restrictor or with a PRX Series pilot (with integral restrictor). The Type EZR pressure reducing regulator can be converted to a high pressure relief valve or backpressure regulator by simply changing to a relief piloting system (refer to Bulletin 71.4:EZR). An optional inlet strainer prevents large particles from entering the main valve limiting damage to internal parts. A Type 252 pilot supply filter (optional) can be added to keep pipeline debris from entering the pilot. For underpressure and/or overpressure protection, the Type EZR is available with an integral slam-shut device.

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TRIM PACKAGE

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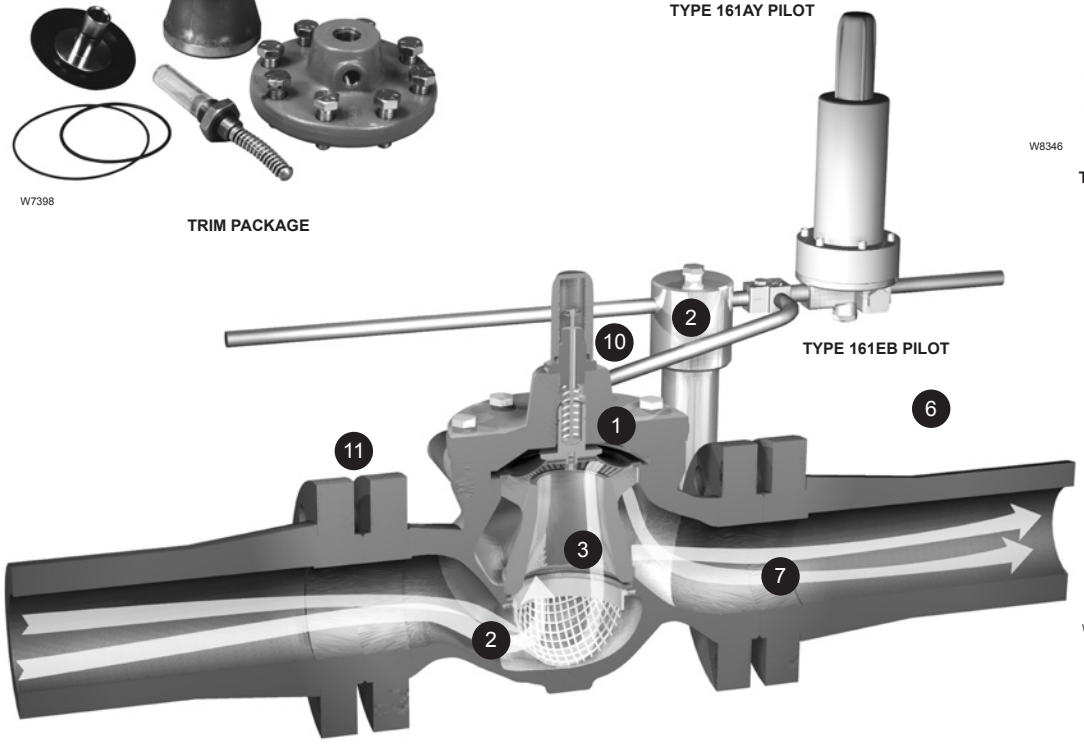
TYPE 161AY PILOT

W8346

TYPE PRX PILOT



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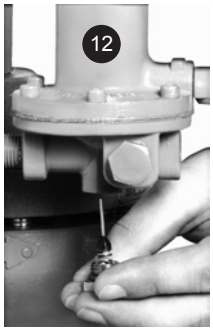
TYPE EZR PRESSURE REDUCING REGULATOR

TYPE 161EB PILOT



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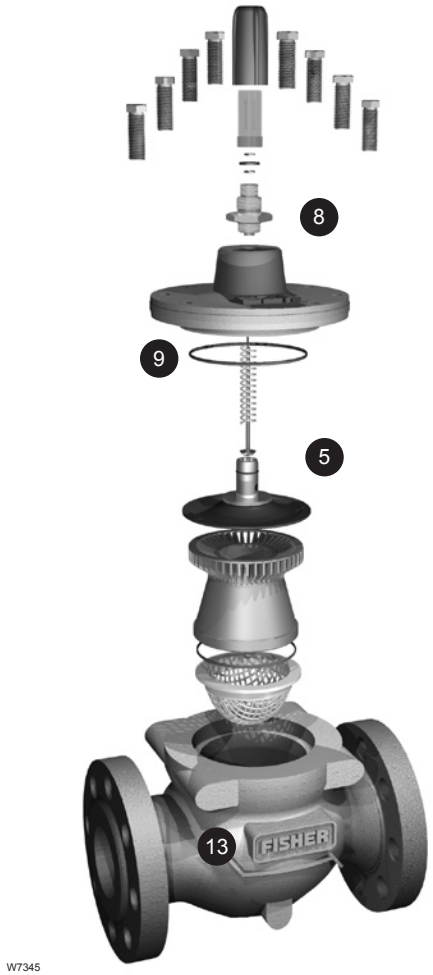
TYPE 161EB
PILOT MAINTENANCE

1 **Tight Shutoff—**The Type EZR uses a diaphragm and metal plug, eliminating the disadvantages of boot-style regulators. When open, the metal plug deflects particles and debris away from the diaphragm. The result is enhanced resistance to particle erosion, which provides excellent shutoff over an extended life. When closed, loading pressure and the main spring push the diaphragm onto the knife-edged seat on the cage.

2 **Debris Protection—**The specially engineered flow path, along with the metal plug, allows flow through the regulator without seat impingement. The addition of an optional inlet strainer prevents large particles from entering the regulator, eliminating damage to internal parts.



An optional Type 252 pilot supply filter collects pipeline debris before it reaches the pilot, reducing the possibility of pilot clogging.

3 **Quiet Operation—**The specially engineered flow path—up through the center of the cage and down through the cage slots—reduces operational noise, making the Type EZR an exceptionally quiet regulator.

4 **High Accuracy—**Multiple outlet pressure ranges and narrow proportional bands offered by the 161EB Series, 161AY Series, and Type PRX/120 pilots provide the Type EZR with tight, accurate control. For applications requiring tighter control, using a Type 161AYM, 161EBM, or PRX/120 pilot will increase the accuracy of the regulator.

5 **Long Life—**The robust design of the Type EZR with its metal plug and specially engineered flow path allows flow through the regulator without seat impingement. The diaphragm design eliminates the possibility of taking a "set", a common problem with boot-style regulators. To prevent damage, the diaphragm is fully supported in both the open and closed positions. These features enable the Type EZR components to work longer with less wear and tear.

6 **Full Usable Capacity—**Fisher® regulators are laboratory tested. 100 percent of the published flow capacity can be used with confidence.

7 **Thorough Laboratory Testing—** Fisher's state-of-the-art flow laboratory allows thorough testing of all new designs. Tests are conducted on Fisher regulators for performance features such as flow, strength, shutoff, material compatibility, and noise.

8 **Easy In-Line Maintenance—**Top-entry design reduces maintenance time. Trim parts can be inspected, cleaned, and replaced without removing the body from the pipeline. No special alignment is required when replacing the diaphragm. The Type EZR incorporates Fisher E-body construction, making it easy to change out existing Fisher E-body regulators and control valves with a Type EZR trim kit.

9 **O-Ring Design—**The Type EZR uses elastomer O-rings instead of gaskets, reducing maintenance and assembly time.

10 **In-Service Travel Indicator—**The optional travel indicator responds to the precise movement of the diaphragm and plug assembly and shows the actual valve position. The travel indicator makes in-service inspection and troubleshooting easy. Also, it can be used for remote alarming and monitoring stem position.

11 **Versatility—**The Type EZR uses the Fisher E-body, making available the standard construction materials and end connections (ANSI and DIN) used by other E-body regulators and control valves. The 161AY Series pilots can handle inlet pressures up to 150 psig (10,3 bar). The 161EB Series pilots can handle inlet pressures up to 1500 psig (103 bar) and outlet pressures from 6-inches w.c. to 700 psig (15 mbar to 48 bar). The Type PRX pilots can handle inlet pressures up to 1480 psig (102 bar) and outlet pressures up to 1160 psig (80 bar).

By changing to a relief piloting system (6358 Series pilots), a Type EZR pressure reducing regulator easily becomes a very effective high volume relief valve or backpressure regulator (refer to Bulletin 71.4:EZR).

12 **Easily Maintained Pilots—**The pilots are designed to allow quick and simple in-line trim inspection and parts replacement.

13 **Powder Paint Coating—**Fisher regulators are powder paint coated providing superior impact, abrasion, and corrosion resistance.

Specifications

Main Valve Body Sizes, End Connection Styles, and Structural Design Ratings[1][2]
See Table 1

Maximum Inlet Pressures and Pressure Drops[1]
Main Valve: See Table 7
Pilots: See Table 3
Restrictor: 1500 psig (103 bar)

Outlet (Control) Pressure Ranges
See Table 2

Main Valve Plug Travel
1, 1-1/4, 2 x 1-inch (DN 25, 32, 50 x 25): 0.37-inch (9 mm)
2-inch (DN 50): 0.68-inch (17 mm)
3-inch (DN 80): 0.98-inch (25 mm)
4-inch (DN 100): 1.19-inch (30 mm)
6-inch (DN 150): 1.5-inch (38 mm)
8-inch (DN 200): 1.75-inch (44 mm)

Minimum and Maximum Differential Pressures[1]
See Tables 4 and 7

Main Valve Flow Direction
Up through the center of the cage and down through the cage slots

Proportional Bands
See Table 2

Regulating Capacities
See Tables 12, 13, and 14

Flow Coefficients
Main Valve: See Tables 8 and 9
Pilots: See Table 10
Restrictor: See Table 11

Pressure Registration
External

Temperature Capabilities[1]
See Table 6

Approximate Weights
See Table 17

Options
- Integral Slam-Shut Device
- Pre-piped Pilot Supply and Pilot Bleed
- Travel Indicator
- Inlet Strainer
- Type 252 Pilot Supply Filter
- Trim Package
- Restricted Capacity Trim
- Pilot Diaphragm for Pressure Loading
- Quick Disconnect Union in Pilot Mounting

Construction Materials

Type EZR Main Valve
Body: Cast iron, WCC steel, or LCC steel
Bonnet: LF2 Steel
Bonnet Bushing: 416 Stainless steel
Cage: 15-5 Stainless steel
Spring: Zinc-plated steel or 17-7 Stainless steel
Top Plug: 17-4 Stainless steel
Bottom Plug: 416 Stainless steel
Inlet Strainer: 316 Stainless steel
Strainer Replacement Shim: 18-8 Stainless steel
Diaphragm: Nitrile (NBR) and Polyester or Fluorocarbon (FKM) and Polyester
O-Rings: Nitrile (NBR) or Fluorocarbon (FKM)
Flanged Locknut: Zinc-plated steel
Backup Rings: Polytetrafluoroethylene™ (PTFE)
Upper Spring Seat: 416 Stainless steel
Indicator Protector and Cover: Plastic
Indicator Stem: 303 Stainless steel
Indicator Fitting: 416 Stainless steel
Travel Indicator Plug: 416 Stainless steel

Restricted Trim
E-Ring: Carbon steel
Restrictor Plate: 416 Stainless steel

161EB Series Pilots
Body: CF8M Stainless steel
Spring Case: CF8M Stainless steel
Body Plug: 303 Stainless steel
Control Spring: Zinc-plated steel
Valve Plug: Nitrile (NBR) or Fluorocarbon (FKM)
Adjusting Screw: Zinc-plated steel
Diaphragm: Nitrile (NBR) or Fluorocarbon (FKM)
Diaphragm Limiter: Stainless steel
O-Rings: Nitrile (NBR) or Fluorocarbon (FKM)

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.
2. Ratings and end connections other than ANSI standards can usually be provided; contact your local Sales Office.

- continued -

Specifications (continued)

161AY Series Pilots
Body: Cast iron
Spring Case and Lower Casing: Ductile iron
Stem Guide: 303 Stainless steel
Control Spring: Zinc-plated steel
Lever Assembly: 303 Stainless steel
Pusher Post: 303 Stainless steel
Diaphragm: Nitrile (NBR) or Fluorocarbon (FKM)
O-Rings: Nitrile (NBR) or Fluorocarbon (FKM)
Orifice: 303 Stainless steel
Disk Assembly: Nitrile (NBR) or Fluorocarbon (FKM)

PRX Series Pilots
Body: Steel, ASTM 105
Trim: Stainless steel
Elastomers: Nitrile (NBR) or Fluorocarbon (FKM)
Seat Material: Polyurethane

Mounting Parts
Pilot Mounting Pipe Nipple: Plated steel
Tubing and Fittings: Stainless steel

Type 112 Restrictor
Body: CF8M Stainless steel
Groove Valve: 416 Stainless steel
Retainer: 416 Stainless steel
Pipe Plug: 316 Stainless steel
O-Rings: Fluorocarbon (FKM)

Type 252 Pilot Supply Filter
Body: Aluminum or Stainless steel
Filter Cartridge: Polyethylene
O-Rings: Nitrile (NBR)
Drain Valve or Pipe Plug: 316 Stainless steel

Slam-Shut Device
Mechanism Box: Aluminum alloy
First and Second Stage Mechanism: Steel
Diaphragm: Nitrile (NBR)
Bellows: 316 Stainless steel

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.
2. Ratings and end connections other than ANSI standards can usually be provided; contact your local Sales Office.

Table 1. *Main Valve Body Sizes, End Connection Styles, and Body Ratings*

MAIN VALVE BODY SIZE	MAIN VALVE BODY MATERIAL	END CONNECTION STYLES(1)	STRUCTURAL DESIGN RATING(2)
2 x 1, 2, 3, 4, and 6-inch (DN 50 x 25, 50, 80, 100, and 150)	Cast iron	NPT (2 x 1 and 2-inch only)	400 psig (27,6 bar)
		CL125 FF	200 psig (13,8 bar)
		CL250 RF	500 psig (34,5 bar)
1, 1-1/4(3), 2 x 1, 2, 3, 4, 6 x 4(4), 8 x 4(4), 6, 8 x 6(4), and 12 x 6-inch(4) (DN 25, 32, 50 x 25, 50, 80, 100, 150 x 100, 200 x 100, 150, 200 x 150, and 300 x 150)	WCC Steel	NPT or SWE (1, 2 x 1, and 2-inch only) (DN 25, 50 x 25, and 50 only)	1480 psig (102 bar)
		CL150 RF	285 psig (19,7 bar)
		CL300 RF	740 psig (51,0 bar)
		CL600 RF or BWE	1480 psig (102 bar)
8-inch (DN 200)	LCC Steel	CL150 RF	285 psig (19,7 bar)
		CL300 RF	740 psig (51,0 bar)
		CL600 RF	1480 psig (102 bar)

1. Ratings and end connections for other than ANSI standard can usually be provided. Contact your local Sales Office for assistance.
2. See Tables 3, 5, 6, and 7 for diaphragm materials and additional pressure ratings.
3. Available in steel NPT only.
4. 6 x 4, 8 x 4, 8 x 6, 12 x 6-inch (DN 150 x 100, 200 x 100, 200 x 150, 300 x 150) Types EZR and 399 bodies are not the same as the EW valve bodies and are not interchangeable.

Pilot Type Descriptions

Type 161AY—Low-pressure pilot with an outlet pressure range from 6-inches w.c. to 7 psig (15 mbar to 0,48 bar). Pilot bleeds (exhausts) downstream through the sense (control) line.

Type 161AYM—The monitor version of the Type 161AY pilot. The pilot bleed (exhaust) is isolated from the sense (control) line. This pilot is used in monitoring systems requiring an isolated pilot bleed (exhaust).

Type 161EB—High accuracy pilot with an outlet pressure range from 5 to 350 psig (0,34 to 24,1 bar). Pilot bleeds (exhausts) downstream through the sense (control) line.

Type 161EBM—The monitor version of the Type 161EB pilot. The pilot bleed (exhaust) is isolated from the sense (control) line. This pilot is used in monitoring systems requiring an isolated pilot bleed (exhaust).

Type PRX/120—Outlet pressure range of 7.3 to 609 psig (0,5 to 42 bar). The Type PRX/120 can be used as the pilot on single stage pressure reducing regulators or as the monitor pilot or as the working pilot in wide-open monitor systems. The Type PRX has a double diaphragm which provides increased accuracy and sensitivity, an integral restrictor adjustment to allow adjustable opening and closing speeds, and a damper adjustment to allow adjustments to make for inlet pressure variability and loading pressure oscillations.

Type PRX/120-AP—Outlet pressure range of 435 to 1160 psig (30 to 80 bar). The Type PRX/120-AP can be used as the pilot on single stage pressure reducing regulators or as the monitor pilot or as the working pilot in wide-open monitor systems.

Type PRX/125 (Monitor Pilot Only)—Identical to the Type PRX/120 except the restriction screw is removed. The Type PRX/125 can only be used as the monitor override pilot on working monitor applications. Always order with Type PRX-120 in working monitor applications.

Type PRX/125-AP (Monitor Pilot Only)—Identical to the Type PRX/120-AP except the restriction screw is removed. The Type PRX/125-AP can only be used as the monitor override pilot on working monitor applications. Always order with Type PRX-120 in working monitor applications.

Pilot Selection Considerations

When selecting pilots to use with the Type EZR:

Use the 161 Series pilots for applications where normal flow is typically 5% and greater of maximum rated flow. The accuracy and control of the 161 Series pilots can be increased using the series' monitor pilots (M).

When the potential for low flow (< 5% of maximum rated flow) for extended periods exists due to the regulator being oversized or operational constraints the Type PRX pilot is recommended.

Table 2. *Outlet (Control) Pressure Ranges and Typical Proportional Bands*

PILOT TYPE	OUTLET (CONTROL) PRESSURE RANGE	PROPORTIONAL BAND[1][3]	PILOT CONTROL SPRING INFORMATION			
			Part Numbers	Color Code	Wire Diameter, Inches (cm)	Free Length, Inches (cm)
161AY or 161AYM	6 to 15-inches w.c. (15 to 37 mbar)	1-inch w.c. (3 mbar)[2]	1B653927022	Olive drab	0.105 (0,267)	3.75 (9,53)
	0.5 to 1.2 psig (0,034 to 0,083 bar)	1-inch w.c. (3 mbar)[2]	1B537027052	Yellow	0.114 (0,290)	4.31 (10,95)
	1.2 to 2.5 psig (0,083 to 0,173 bar)	0.5 psig (0,035 bar)[2]	1B537127022	Light green	0.156 (0,396)	4.13 (10,49)
	2.5 to 4.5 psig (0,173 to 0,31 bar)	0.5 psig (0,035 bar)[2]	1B537227022	Light blue	0.187 (0,475)	3.94 (10,01)
	4.5 to 7 psig (0,31 to 0,48 bar)	0.5 psig (0,035 bar)[2]	1B537327052	Black	0.218 (0,554)	4.13 (10,49)
161EB or 161EBM	5 to 15 psig (0,35 to 1,03 bar)	0.5 psig (0,035 bar)[2]	17B1260X012	White	0.120 (0,305)	3.75 (9,53)
	10 to 40 psig (0,69 to 2,76 bar)	0.5 psig (0,035 bar)[2]	17B1262X012	Yellow	0.148 (0,376)	3.75 (9,53)
	30 to 75 psig (2,07 to 5,17 bar)	0.6 psig (0,041 bar)[2]	17B1259X012	Black	0.187 (0,475)	4.00 (10,16)
	70 to 140 psig (4,83 to 9,65 bar)	1.3 psig (0,09 bar)[2]	17B1261X012	Green	0.225 (0,572)	3.70 (9,40)
	130 to 200 psig (8,96 to 13,8 bar)	1.5 psig (0,1 bar)[2]	17B1263X012	Blue	0.262 (0,665)	3.85 (9,78)
	200 to 350 psig (13,8 to 24,1 bar)	3 psig (0,21 bar)[2]	17B1264X012	Red	0.294 (0,747)	4.22 (10,72)
PRX/120 PRX/125	7.3 to 16 psig (0,5 to 1,1 bar)	1.0 psig (0,069 bar)	GD25525X012	White	0.098 (0,250)	2.165 (5,5)
	14.5 to 26 psig (1 to 1,8 bar)		GD25524X012	Yellow	0.110 (0,280)	
	23 to 44 psig (1,6 to 3 bar)		GD25523X012	Green	0.126 (0,320)	
	41 to 80 psig (2,8 to 5,5 bar)		GD25518X012	Blue	0.138 (0,350)	
	73 to 123 psig (5 to 8,5 bar)		GD25522X012	Black	0.157 (0,400)	
	116 to 210 psig (8 to 14,5 bar)		GD25521X012	Silver	0.177 (0,450)	2.165 (5,5)
	203 to 334 psig (14 to 23 bar)		GD25520X012	Gold	0.197 (0,500)	2.008 (5,1)
	319 to 435 psig (22 to 30 bar)		GD25586X012	Aluminum	0.236 (0,600)	2.008 (5,1)
PRX/120-AP PRX/125-AP	435 to 1160 psig (30 to 80 bar)		GD27379X012	Clear	0.335 (0,850)	3.937 (10,0)

1. Proportional band includes outlet pressure drop plus hysteresis (friction), but does not include lockup.
2. Proportional band was determined with a pressure drop ranging from 50 to 150 psig (3,45 to 10,3 bar). Approximately double the proportional band if the pressure drop is less than 50 psig (3,45 bar).
3. With Type 112 restrictor set on 2. With Type PRX restrictor turn the restrictor screw one turn counterclockwise from fully seated.

Table 3. *Pilot Pressure Ratings*

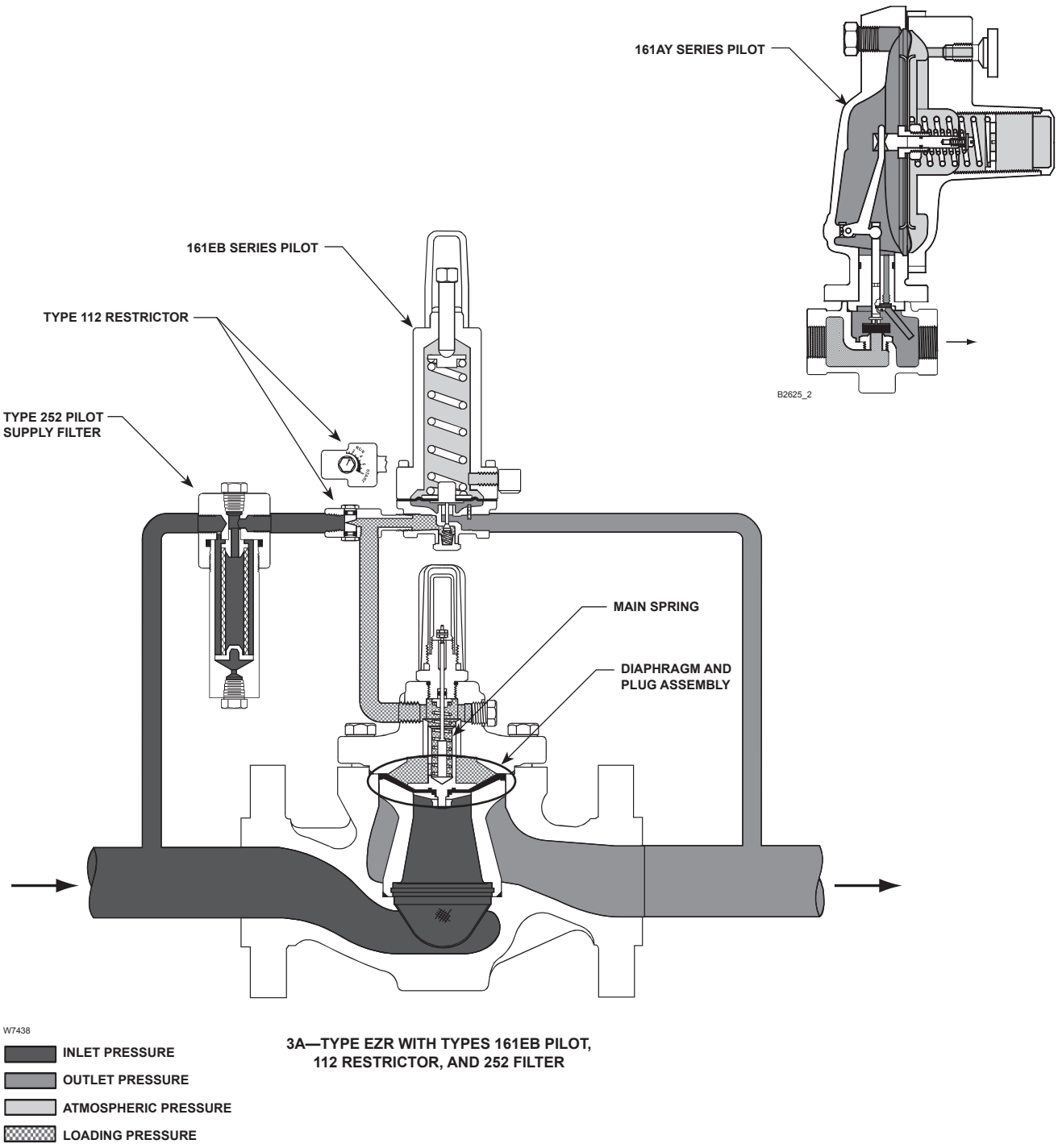
TYPE	MAXIMUM INLET PRESSURE, PSIG (bar)	MAXIMUM EMERGENCY OUTLET PRESSURE OR MAXIMUM EMERGENCY SENSE PRESSURE(1), PSIG (bar)	MAXIMUM OUTLET PRESSURE, PSIG (bar)	MAXIMUM BLEED (EXHAUST) PRESSURE FOR MONITOR PILOTS, PSIG (bar)	MAXIMUM SENSE (CONTROL) PRESSURE FOR MONITOR PILOTS, PSIG (bar)
161AY	150 (10,3)	150 (10,3)	150 (10,3)	- - - -	- - - -
161EB	1500 (103)	1200 (82,7)	750 (51,7)		
161AYM	150 (10,3)	150 (10,3)	- - - -	150 (10,3)	150 (10,3)
161EBM	1500 (103)	1200 (82,7)		1500 (103)	750 (51,7)
PRX Series	1480 (102)	1480 (102)	1480 (102)	1480 (102)	1480 (102)

1. Maximum pressure to prevent the casings from bursting during abnormal operation (leaking to atmosphere and internal parts damage might occur).

Table 4. *Main Valve Minimum Differential Pressures(1)*

MAIN VALVE BODY SIZE, INCH (DN)	MAIN SPRING PART NUMBER AND COLOR	DIAPHRAGM MATERIAL	MINIMUM DIFFERENTIAL, PERCENT OF CAGE CAPACITY, PSID (bar d)					
			FOR 90% CAPACITY			FOR 100% CAPACITY		
			100% Trim	60% Trim	30% Trim	100% Trim	60% Trim	30% Trim
1, 1-1/4 (25, 32)	19B2400X012, Light Blue	17E68 and 17E88	24 (1,7)	29 (2,0)	31 (2,2)	24 (1,7)	31 (2,2)	40 (2,8)
	GE12727X012, Black	17E97	35 (2,5)	38 (2,7)	42 (2,9)	35 (2,5)	39 (2,7)	52 (3,6)
		17E68 and 17E88	30 (2,1)	35 (2,4)	39 (2,7)	30 (2,1)	36 (2,5)	52 (3,6)
	19B2401X012, Black with White Stripe(3)	17E88 and 17E97	43 (3,0)	50 (3,4)	56 (3,9)	43 (3,0)	53 (3,7)	68 (4,7)
2 x 1 (50 x 25)	19B2400X012, Light Blue	17E68 and 17E88	24 (1,7)	29 (2,0)	31 (2,2)	24 (1,7)	31 (2,2)	40 (2,8)
	19B2401X012, Black with White Stripe	17E97	43 (3,0)	50 (3,4)	56 (3,9)	43 (3,0)	53 (3,7)	68 (4,7)
		17E68 and 17E88	43 (3,0)	50 (3,4)	56 (3,9)	43 (3,0)	53 (3,7)	68 (4,7)
	GE12501X012, Red Stripe(3)	17E88 and 17E97	68 (4,7)	73 (5,0)	88 (6,1)	72 (5,0)	81 (5,6)	102 (7,0)
2 (50)	19B0951X012, Yellow(2)	17E68 and 17E88	12 (0,8)	15 (1,0)	15 (1,0)	12 (0,8)	25 (1,7)	20 (1,4)
	18B2126X012, Green	17E97	24 (1,7)	25 (1,7)	26 (1,8)	24 (1,7)	30 (2,1)	37 (2,6)
		17E68 and 17E88	18 (1,2)	20 (1,4)	22 (1,5)	19 (1,3)	26 (1,8)	28 (1,9)
	18B5955X012, Red(3) GE05504X012, Purple(3)	17E88 and 17E97	29 (2,0)	29 (2,0)	31 (2,1)	31 (2,1)	35 (2,4)	43 (3,03
3 (80)	T14184T0012, Yellow(2)	17E68 and 17E88	16 (1,1)	19 (1,3)	24 (1,7)	23 (1,6)	23 (1,6)	29 (2,0)
	19B0781X012, Light Blue	17E97	23 (1,6)	23 (1,6)	23 (1,6)	23 (1,6)	23 (1,6)	25 (1,7)
		17E68 and 17E88	21 (1,5)	22 (1,5)	28 (1,9)	28 (1,9)	28 (1,9)	33 (2,3)
	19B0782X012, Black(3)	17E88 and 17E97	32 (2,2)	33 (2,3)	43 (3,0)	38 (2,6)	38 (2,6)	50 (3,4)
4, 6 x 4, and, 8 x 4 (100, 150 x 100, and 200 x 100)	T14184T0012, Yellow(2)	17E68 and 17E88	10 (0,7)	12 (0,8)	14 (1,0)	25 (1,7)	25 (1,7)	25 (1,7)
	18B8501X012, Green	17E97	16 (1,1)	17 (1,2)	21 (1,5)	34 (2,3)	34 (2,3)	34 (2,3)
		17E68 and 17E88	16 (1,1)	17 (1,2)	20 (1,4)	30 (2,1)	30 (2,1)	30 (2,1)
	18B8502X012, Red(3)	17E88 and 17E97	21 (1,5)	24 (1,7)	26 (1,8)	40 (2,8)	40 (2,8)	40 (2,8)
6, 8 x 6, and 12 x 6 (150, 200 x 150, and 300 x 150)	19B0364X012, Yellow(2)	17E97	10 (0,7)	11 (0,8)	14 (1,0)	12 (0,8)	16 (1,1)	16 (1,1)
		17E88	10 (0,7)	13 (0,9)	13 (0,9)	12 (0,8)	21 (1,5)	21 (1,5)
	19B0366X012, Green	17E97	14 (1,0)	22 (1,5)	22 (1,5)	19 (1,3)	29 (2,0)	29 (2,0)
		17E88	17 (1,2)	21 (1,5)	21 (1,5)	20 (1,4)	36 (2,5)	36 (2,5)
	19B0365X012, Red(3)	17E88 and 17E97	23 (1,6)	29 (2,0)	29 (2,0)	30 (2,1)	41 (2,8)	41 (2,8)
8 (200)	GE09393X012, Yellow(2)	17E97	16 (1,1)	- - - -	- - - -	19 (1,3)	- - - -	- - - -
	GE09396X012, Green		20 (1,4)			23 (1,6)		
	GE09397X012, Red(3)		26 (1,8)			30 (2,1)		

1. See Table 1 for structural design ratings, Table 3 for pilot ratings, and Table 7 for maximum pressure ratings.
2. The white and yellow springs are only recommended for inlet pressures under 100 psig (6,9 bar).
3. The red, black, purple, red stripe, and black with white stripe springs are only recommended for applications where the maximum inlet pressure can exceed 500 psig (34,5 bar).



3A—TYPE EZR WITH TYPES 161EB PILOT, 112 RESTRICTOR, AND 252 FILTER

Figure 3. *Principle of Operation Schematic*

Additional details on how to set up the pilots for various flow rates is provided in the Type EZR Instruction Manual. If you have questions on which pilot to use for your application contact your local Sales Office.

Optional Pilot Supply Filter

The Type 252 pilot supply filter prevents pipeline debris from entering the pilot, a primary cause of pilot clogging. The aluminum body is rated for 2150 psig (148 bar) and the stainless steel body for 2750 psig (190 bar). Both are

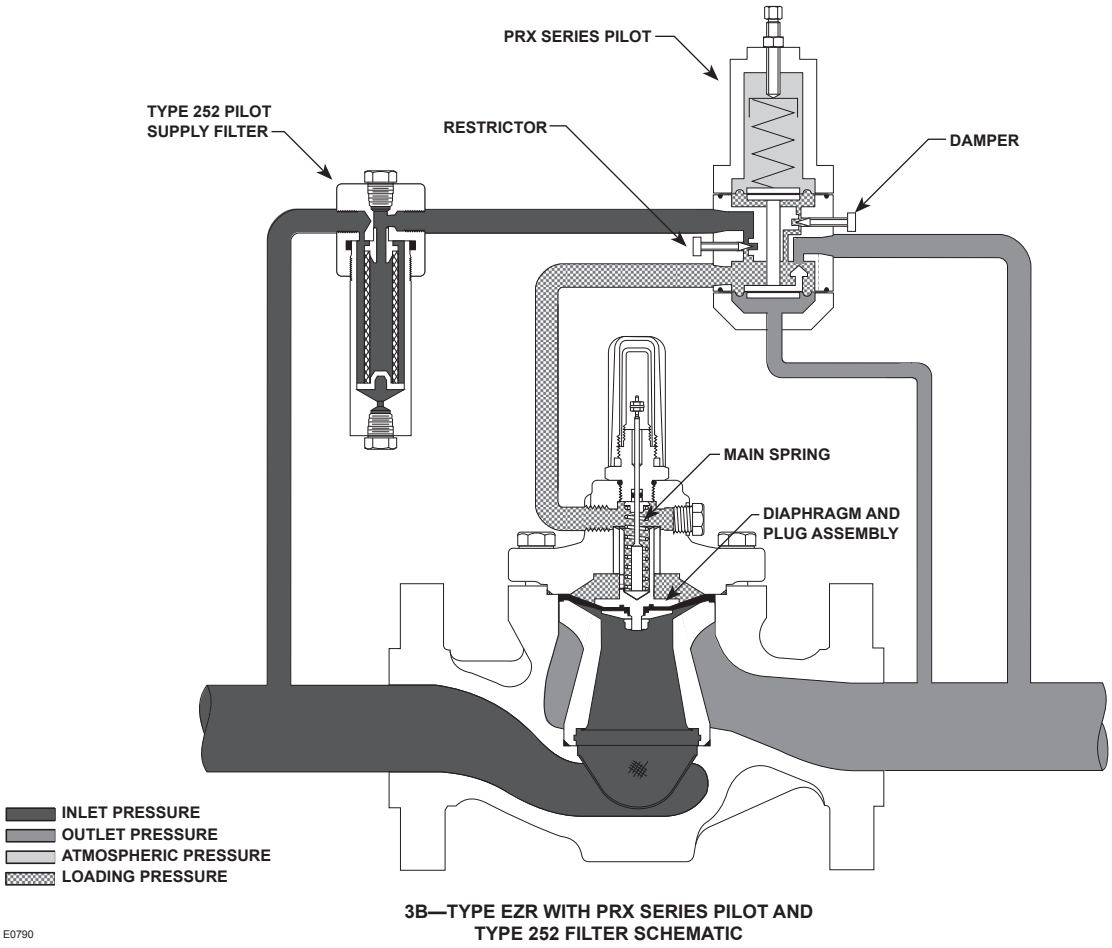


Figure 3. *Principle of Operation Schematic (continued)*

available in standard or extended length with a pipe plug or a drain valve. When the upstream system is free of debris, the Type EZR may be installed without a filter.

Principle of Operation

As long as the outlet (control) pressure is above the outlet pressure setting, the pilot valve plug or disk remains closed (Figure 3). Force from the main spring, in addition to inlet pressure bleeding through the restrictor (the restrictor is integral in the PRX Series pilots), provide downward loading pressure to keep the main valve diaphragm and plug assembly tightly shutoff.

When the outlet pressure decreases below the pilot outlet pressure setting, the pilot plug or disk assembly opens. Loading pressure bleeds downstream through the pilot faster than it can be replaced through the supply line. This reduces loading pressure on top of the main valve diaphragm and plug assembly and lets the unbalanced force between inlet and loading pressure overcome the main spring force to open the Type EZR diaphragm and plug assembly.

Table 5. *Diaphragm Imprint Codes*

STYLE		MATERIAL		DIAPHRAGM MATERIALS
Imprint	Ink Mark	Imprint	Ink Mark	
2	130	2	17E68	17E68 - Nitrile (NBR) (low temperature)
		4	17E88	17E88 - Fluorocarbon (FKM) (high aromatic hydrocarbon content resistance)
		5	17E97	17E97 - Nitrile (NBR) (high-pressure and/or erosion resistance)

As the outlet pressure rises toward the outlet pressure setting, it compresses the pilot diaphragm against the pilot control spring and lets the pilot valve plug or disk close. Loading pressure begins building on the Type EZR diaphragm and plug assembly. The loading pressure, along with force from the main spring, pushes the diaphragm and plug assembly onto the knife edged seat, producing tight shutoff.

Figure 4. *Type EZR with RegFlo™ Type RF100 Instrument*

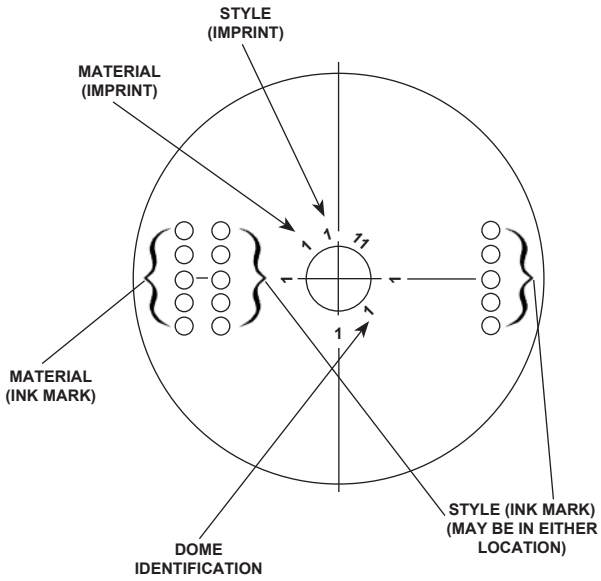


Figure 5. *Diaphragm Markings*

Introducing RegFlo™ Instruments

The main function of RegFlo is the acquisition and storage of pressure and flow data from the regulator installation. It also provides alarm and diagnostic functions relative to pressure, travel, and flow. For more information, contact your local Sales Office.

RegFlo™ Applications

Flow Estimation

- Gas load forecasting
- System balancing and modeling
- Pipeline inventory estimations

Electronic Pressure Recorder (EPR)

- District regulator stations
- Distribution end points
- Pressure and temperature measurements

System Troubleshooting

- Monitor Regulators - detect failure
- Travel indication and accumulated travel
- System changes
  (for example, 30% load increase over previous year)
- Time stamped record of station operation

Installation (Figures 6 and 7)

The robust design of the Type EZR regulator allows this regulator to be installed indoors or outdoors. When installed outdoors, the Type EZR does not require protective housing. This regulator is designed to withstand the elements and the powder paint coating protects against impacts, abrasions, and corrosion.

When installed indoors, no remote venting is required except on the pilot spring case. This regulator can also be installed in a pit that is subject to flooding by venting the pilot spring case above the maximum possible flood level so the pilot setting can be referenced at atmospheric pressure.

Monitoring Systems

Monitoring regulation is overpressure protection by containment, therefore, there is no relief valve to vent to the atmosphere. When the working regulator fails to control the pressure, a monitor regulator installed in series, which has been sensing the downstream and control pressure, goes into operation to maintain the downstream pressure at a slightly higher than normal

Table 6. *Diaphragm Temperature Capabilities, Erosion Resistance, and Chemical Compatibility*

	17E68 NITRILE (NBR)	17E97 (1) NITRILE (NBR)	17E88 FLUOROCARBON (FKM)
Gas Temperature (for lower temperatures contact your local Sales Office)	-20° to 150°F (-29° to 66°C)	0° to 150°F (-18° to 66°C)	0° to 250°F (-18° to 121°C)(2)
General Applications	Best for cold temperatures.	Best for high pressure conditions, i.e. transmission service or high pressure industrial service. It is also the best for abrasive or erosive service applications.	Best for natural gas having aromatic hydrocarbons. It is also the best for high temperature applications.
Heavy Particle Erosion	Fair	Excellent	Good
Natural Gas With:			
Up to 3% aromatic hydrocarbon content(3)	Good	Excellent	Excellent
3 to 15% aromatic hydrocarbon content(3)	Poor	Good	Excellent
15 to 50% aromatic hydrocarbon content(3)	Not recommended	Poor	Excellent
Up to 3% H_2S (hydrogen sulfide or sour gas)	Good	Good	Good
Up to 3% ketone	Fair	Fair	Fair
Up to 10% alcohol	Good	Good	Fair
Up to 3% synthetic lube	Fair	Fair	Good

1. The 6-inch (DN 150), 17E97 diaphragm will perform in gas temperatures as low as -20°F (-29°C).
2. For differential pressures above 400 psig (27,6 bar) diaphragm temperature is limited to 150°F (66°C).
3. The aromatic hydrocarbon content is based on percent volume.

pressure. During an overpressure situation, monitoring keeps the customer on line. Also, testing is relatively easy and safe. To perform a periodic test on a monitoring regulator, increase the outlet set pressure of the working regulator and watch the outlet pressure to determine if the monitoring regulator takes over at the appropriate outlet pressure.

Wide-Open Monitoring Systems (Figure 7A)

There are two types of wide-open monitoring systems: upstream and downstream. The difference between upstream and downstream monitoring is that the functions of the regulators are reversed. Systems can be changed from upstream to downstream monitoring, and vice-versa, by simply reversing the setpoints of the two regulators. The decision to use either an upstream or downstream monitoring system is largely a matter of personal preference or company policy.

In normal operation of a wide-open configuration, the working regulator controls the system's outlet pressure. With a higher outlet pressure setting, the monitor regulator senses a pressure lower than its setpoint and tries to increase outlet pressure by going wide-open. If the working regulator fails, the monitoring regulator assumes control and holds the outlet pressure at its outlet pressure setting.

In a wide-open monitoring system, use a Type EZR with a Type 161AYM, 161EBM, PRX/120 or PRX/120-AP pilot as the upstream regulator and a Type EZR with the appropriate 161AY, 161EB, PRX/120 or PRX/120-AP Series pilot as the downstream regulator. In this configuration, the lockup pressure of the system is the lockup pressure of the working regulator, not the higher outlet pressure setting of the monitor regulator.

Working Monitoring Regulators (Figure 7B)

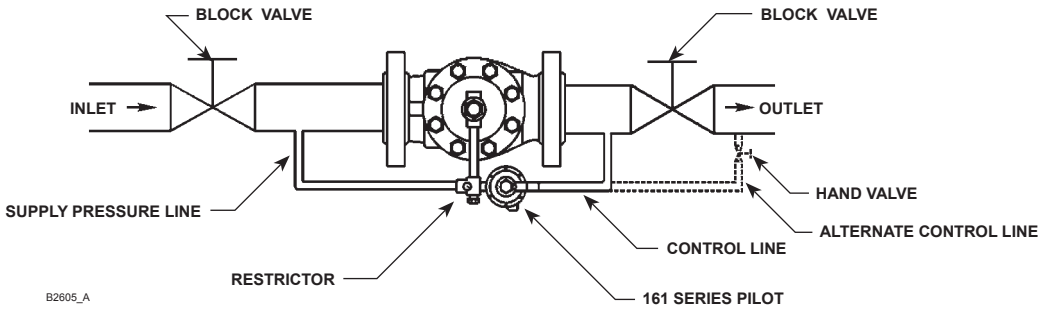
In a working monitoring system, the upstream regulator requires two pilots and it is always the monitoring regulator. The additional pilot permits the monitoring regulator to act as a series regulator to control an intermediate pressure during normal operation. In this way, both units are always operating and can be easily checked for proper operation.

In normal operation, the working regulator controls the outlet pressure of the system. The monitoring regulator's working pilot controls the intermediate pressure and the monitoring pilot senses the system's outlet pressure. If the working regulator fails, the monitoring pilot will sense the increase in outlet pressure and take control.

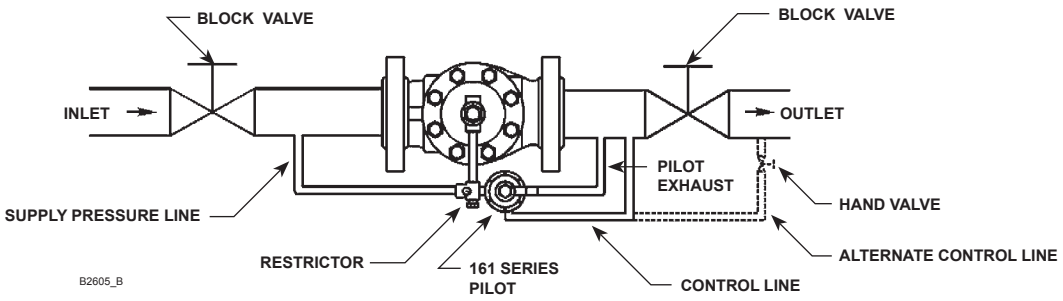
For PRX Series pilots (Figure 7D), the working pilot is Type PRX-120 or PRX-120AP; the monitor pilot is Type PRX-125 or PRX-125AP.

Note

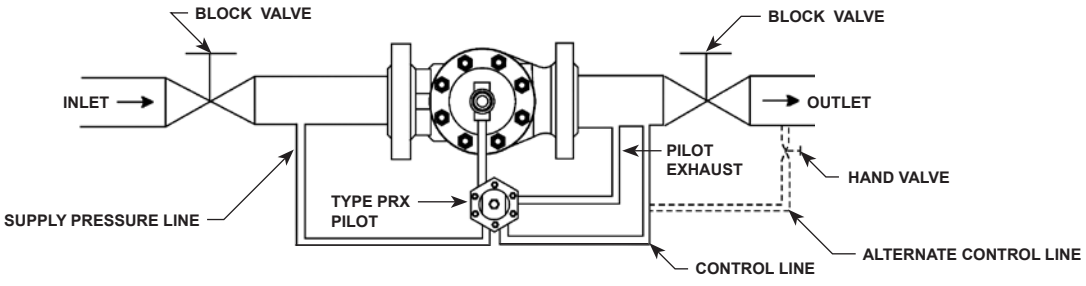
The working regulator must be rated for the maximum allowable operating pressure of the system because this will



***6A**—161 Series Single Pilot Installation with Pilot Exhaust into Control Line*

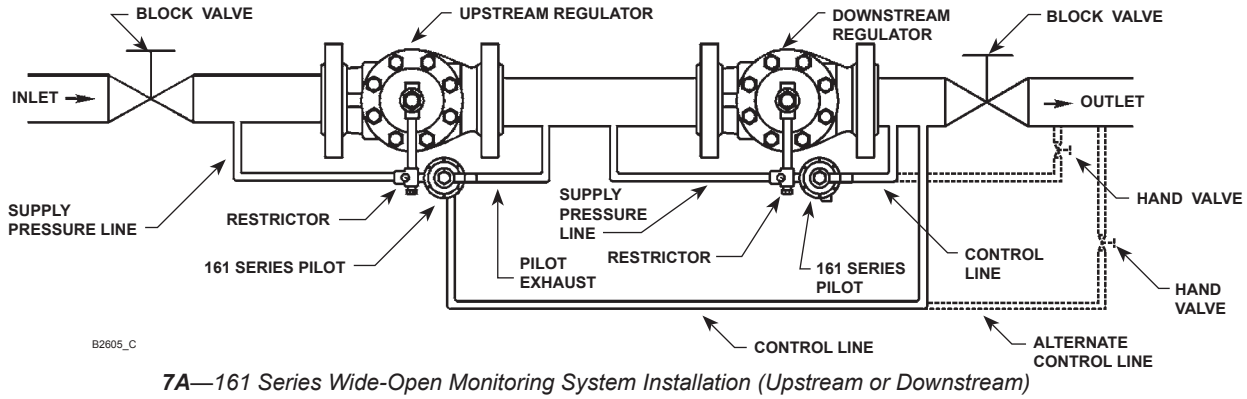


***6B**—161 Series Single Pilot Installation with Separate Pilot Exhaust Line*

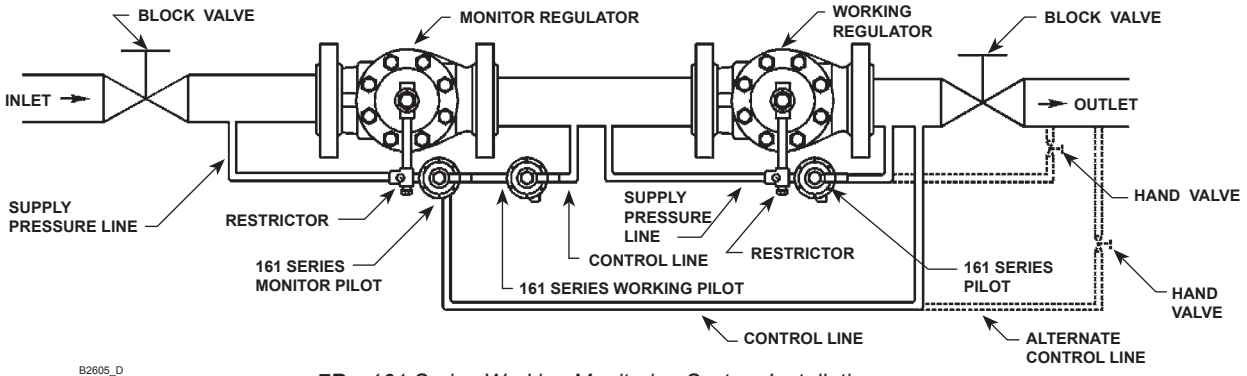


***6C**—Type PRX Single-Pilot Installation with Separate Pilot Exhaust Line*

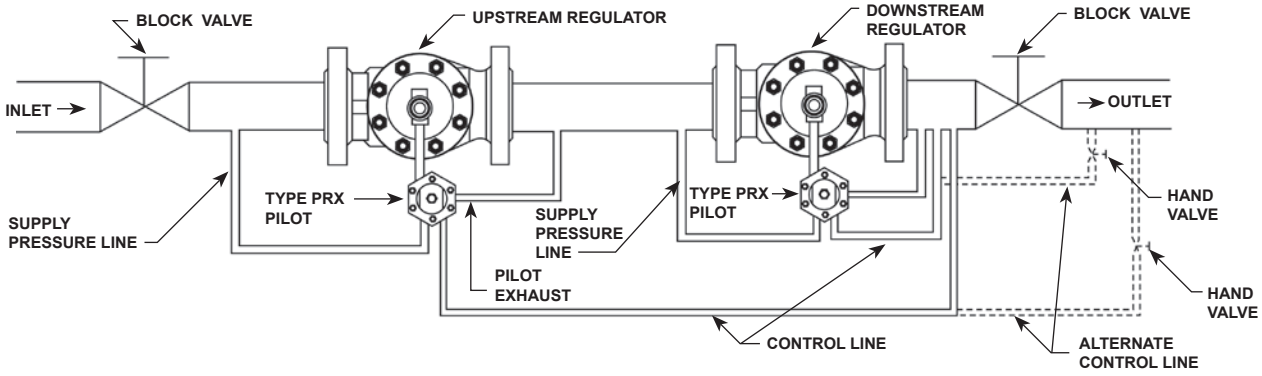
***Figure 6.** Typical Type EZR Single Installation Schematics*



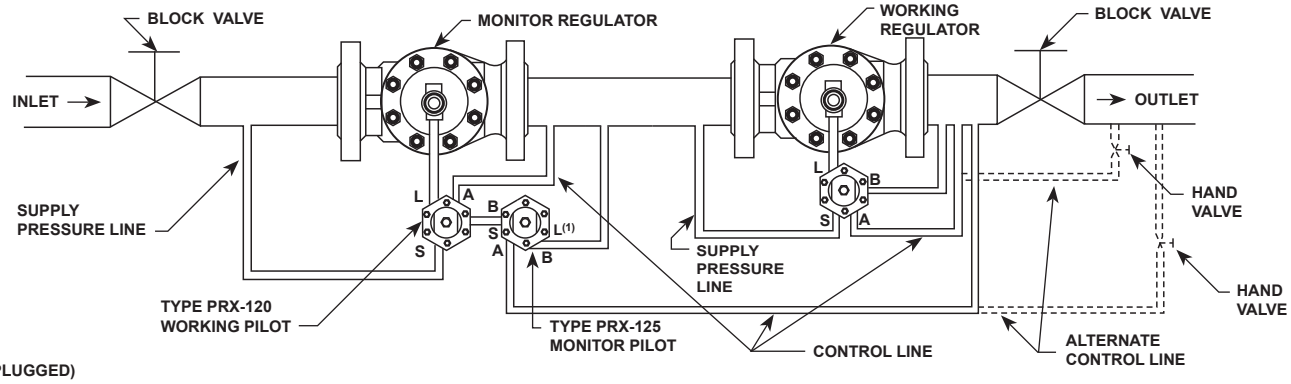
7A—161 Series Wide-Open Monitoring System Installation (Upstream or Downstream)



7B—161 Series Working Monitoring System Installation



7C—Type PRX Wide-Open Monitoring System Installation (Upstream or Downstream)



1. (PLUGGED)

7D—Type PRX Working Monitor System Installation

Figure 7. *Typical Type EZR Monitoring System Installation Schematics*

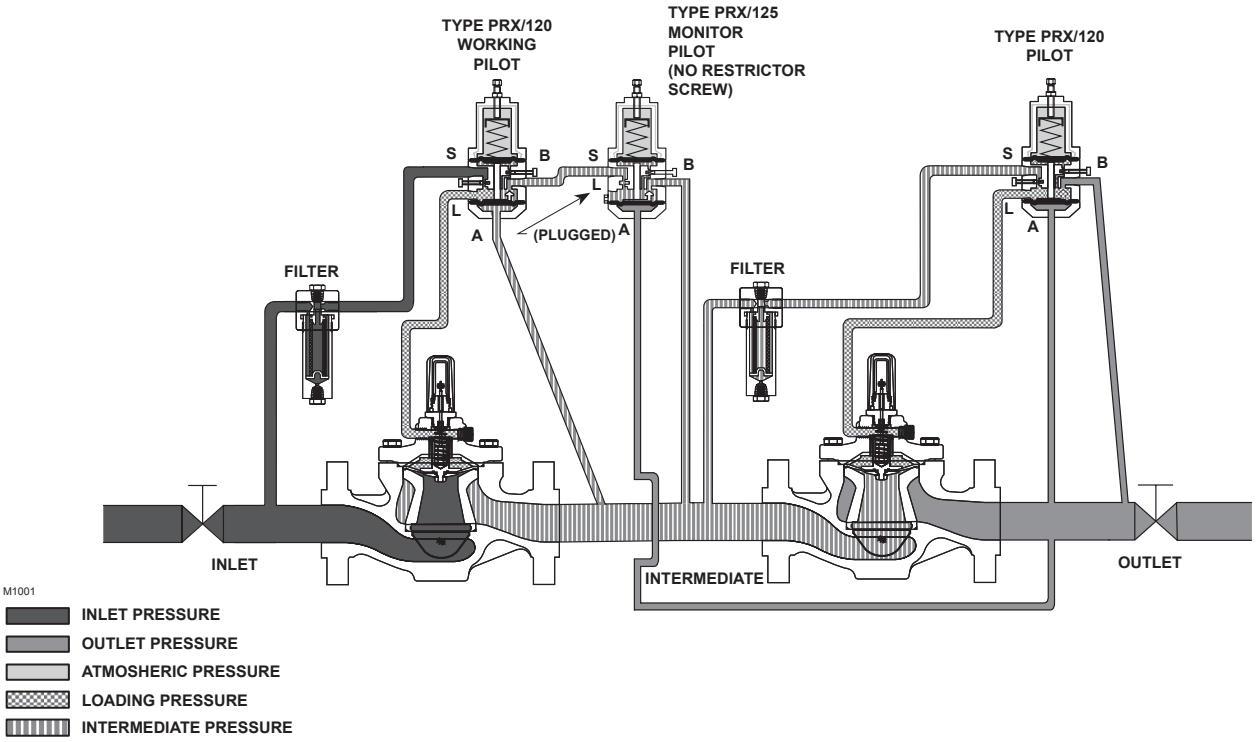


Figure 8. *Type EZR-PRX-PRX Working Monitor Schematic*

be its inlet pressure if the monitoring regulator fails. Also, the outlet pressure rating of the monitoring pilot, and any other components that are exposed to the intermediate pressure must be rated for full inlet pressure.

Working monitor installations require a Type EZR main valve with a 161AY or 161EB Series working pilot and a Type 161AYM or 161EBM monitoring pilot for the upstream regulator and a Type EZR with the appropriate 161AY or 161EB Series pilot for the downstream regulator.

Working monitor installations require a Type EZR main valve with a Type PRX/120 or PRX/120-AP working pilot and a Type PRX/125 or PRX/125-AP monitoring pilot for the upstream regulator and a Type EZR with the appropriate Type PRX/120 or PRX/120-AP pilot for the downstream regulator.

Capacity Information

Note

Flow capacities are laboratory verified; therefore, regulators may be sized for 100% flow published capacities. It is not necessary to reduce published capacities.

Tables 12,13, and 14 show the natural gas regulating capacities of the Type EZR regulator at selected inlet pressures and outlet pressure settings. Flows are in thousands of SCFH at 60°F and 14.7 psia (and in thousands of Nm^3/h at 0°C and 1,01325 bar) of 0.6 specific gravity natural gas.

To determine equivalent capacities for air, propane, butane, or nitrogen, multiply the capacity by the following appropriate conversion factor: 0.775 for air, 0.628 for propane, 0.548 for butane, or 0.789 for nitrogen. For gases of other specific gravities, multiply the given capacity by 0.775, and divide by the square root of the appropriate specific gravity.

To find approximate regulating capacities at pressure settings not given in Tables 12, 13, and 14 or to find wide-open flow capacities for relief sizing at any inlet pressure, perform one of the following procedures. Then, if necessary, convert using the factors provided above.

For critical pressure drops (absolute outlet pressure equal to or less than one-half of absolute inlet pressure), use the following formula:

$$Q = (P_1)(C_g)(1.29)$$

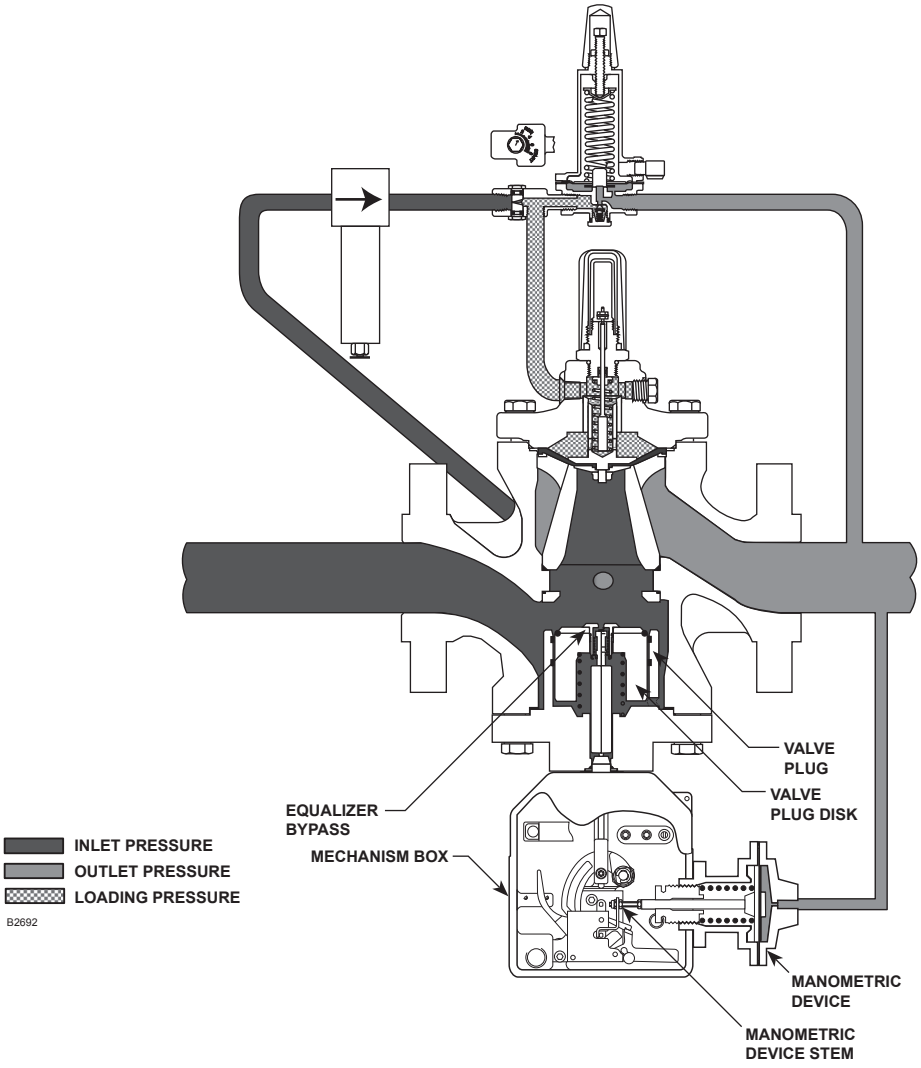


Figure 9. *Optional Slam-Shut Device*

For pressure drops lower than critical (absolute outlet pressure greater than one-half of absolute inlet pressure).

$$Q = \sqrt{\frac{520}{GT}}\ C_g P_1 SIN \left(\frac{3417}{C_1} \sqrt{\frac{\triangle P}{P_1}} \right) DEG$$

where,

Q = gas flow rate, SCFH
P_1 = absolute inlet pressure, psia (P_1 gauge + 14.7)
C_g = regulating or wide-open gas sizing coefficient from Table 8 or 9
G = gas specific gravity of the gas
T = absolute temperature of gas at inlet, °Rankine
C_1 = flow coefficient
$\triangle P$ = pressure drop across the regulator, psi

Then, if capacity is desired in normal cubic meters per hour at 0°C and 1,01325 bar, multiply SCFH by 0.0268.

Slam-Shut Device Principle of Operation

The optional slam-shut device can provide either overpressure or overpressure and underpressure protection by completely shutting off the flow of gas to the downstream system. The slam-shut has a mechanism box and a manometric device. The manometric device is a spring and diaphragm actuator. Its movement activates the detection stage of the mechanism box. The shutoff is a two stage process, the detection stage and the power stage. This separation between detection stage and power stage provides maximum precision, alleviating many false trips caused by environmental vibrations. The slam-shut device includes a bypass valve that will allow pressure to be equalized when resetting the device. Once the slam-shut device has been tripped, it must be manually reset. For more information about the Type EZR with a slam-shut device, contact your local Sales Office.

Table 7. *Main Valve Maximum Pressure Ratings, Diaphragm Selection Information, and Main Spring Selection(1)*

BODY SIZE, INCHES (DN)	DIAPHRAGM MATERIAL	MAXIMUM OPERATING INLET PRESSURE(4), PSIG (bar)	MAXIMUM OPERATING DIFFERENTIAL PRESSURE(4), PSID (bar d)	MAXIMUM EMERGENCY INLET AND DIFFERENTIAL PRESSURE, PSID (bar d)	MAIN SPRING COLOR	DIAPHRAGM STYLE
1, 1-1/4 (25, 32)	17E68 Nitrile (NBR) Low temperature	100 (6,9)	100 (6,9)	100 (6,9)	Light Blue	130
		460 (31,7)	400 (27,6)	460 (31,7)	Black	
	17E97 Nitrile (NBR) High-pressure and/or erosion resistance	500 (34,5)	500 (34,5)	1050 (72,4)	Black	
		1050 (72,4)	800 (55,2)	1050 (72,4)	Black with White Stripe(2)	
	17E88 Fluorocarbon (FKM) High aromatic hydrocarbon content resistance	100 (6,9)	100 (6,9)	100 (6,9)	Light Blue	
		500 (34,5)	500 (34,5)(3)	750 (51,7)	Black	
		750 (51,7)	500 (34,5)(3)	750 (51,7)	Black with White Stripe(2)	
2 x 1 (50 x 25)	17E68 Nitrile (NBR) Low temperature	100 (6,9)	100 (6,9)	100 (6,9)	Light Blue	
		360 (24,8)	300 (20,7)	360 (24,8)	Black with White Stripe	
	17E97 Nitrile (NBR) High-pressure and/or erosion resistance	500 (34,5)	500 (34,5)	500 (34,5)	Black with White Stripe	
		1050 (72,4)	800 (55,2)	1050 (72,4)	Red Stripe(2)	
	17E88 Fluorocarbon (FKM) High aromatic hydrocarbon content resistance	100 (6,9)	100 (6,9)	100 (6,9)	Light Blue	
		750 (51,7)	500 (34,5)(3)	750 (51,7)	Black with White Stripe	
2 (50)	17E68 Nitrile (NBR) Low temperature	100 (6,9)	100 (6,9)	100 (6,9)	Yellow	
		460 (31,7)	400 (27,6)	460 (31,7)	Green	
	17E97 Nitrile (NBR) High-pressure and/or erosion resistance	500 (34,5)	500 (34,5)	1050 (72,4)	Green	
		1050 (72,4)	800 (55,2)	1050 (72,4)	Red or Purple(2)	
	17E88 Fluorocarbon (FKM) High aromatic hydrocarbon content resistance	100 (6,9)	100 (6,9)	100 (6,9)	Yellow	
		500 (34,5)	500 (34,5)(3)	750 (51,7)	Green	
		750 (51,7)	500 (34,5)(3)	750 (51,7)	Red or Purple(2)	
3 (80)	17E68 Nitrile (NBR) Low temperature	100 (6,9)	100 (6,9)	100 (6,9)	Yellow	
		360 (24,8)	300 (20,7)	500 (34,5)	Light Blue	
	17E97 Nitrile (NBR) High-pressure and/or erosion resistance	500 (34,5)	500 (34,5)	1050 (72,4)	Light Blue	
		1050 (72,4)	800 (55,2)	1050 (72,4)	Black(2)	
	17E88 Fluorocarbon (FKM) High aromatic hydrocarbon content resistance	100 (6,9)	100 (6,9)	100 (6,9)	Yellow	
		500 (34,5)	500 (34,5)(3)	750 (51,7)	Light Blue	
		750 (51,7)	500 (34,5)(3)	750 (51,7)	Black(2)	
4, 6 x 4, 8 x 4 (100, 150 x 100, 200 x 100)	17E68 Nitrile (NBR) Low temperature	100 (6,9)	100 (6,9)	100 (6,9)	Yellow	
		360 (24,8)	300 (20,7)	500 (34,5)	Green	
	17E97 Nitrile (NBR) High-pressure and/or erosion resistance	500 (34,5)	500 (34,5)	1050 (72,4)	Green	
		1050 (72,4)	800 (55,2)	1050 (72,4)	Red(2)	
	17E88 Fluorocarbon (FKM) High aromatic hydrocarbon content resistance	100 (6,9)	100 (6,9)	100 (6,9)	Yellow	
		500 (34,5)	500 (34,5)(3)	750 (51,7)	Green	
		750 (51,7)	500 (34,5)(3)	750 (51,7)	Red(2)	
6, 8 x 6, and 12 x 6 (150, 200 x 150 and 300 x 150)	17E97 Nitrile (NBR) High-pressure and/or erosion resistance	100 (6,9)	100 (6,9)	100 (6,9)	Yellow	
		500 (34,5)	500 (34,5)	1050 (72,4)	Green	
		1050 (72,4)	800 (55,2)	1050 (72,4)	Red(2)	
	17E88 Fluorocarbon (FKM) High aromatic hydrocarbon content resistance	100 (6,9)	100 (6,9)	100 (6,9)	Yellow	
		500 (34,5)	500 (34,5)(3)	750 (51,7)	Green	
		750 (51,7)	500 (34,5)(3)	750 (51,7)	Red(2)	
8 (200)	17E97 Nitrile (NBR) High-pressure and/or erosion resistance	100 (6,9)	100 (6,9)	100 (6,9)	Yellow	
		500 (34,5)	500 (34,5)	1050 (72,4)	Green	
		1050 (72,4)	800 (55,2)	1050 (72,4)	Red(2)	

1. See Table 1 for main valve structural design ratings and Table 3 for pilot ratings.
2. The red, black, purple, red stripe, and black with white stripe springs are only recommended for applications where the maximum inlet pressure can exceed 500 psig (34,5 bar).
3. For differential pressures above 400 psid (27,6 bar d) diaphragm temperatures are limited to 150°F (66°C).
4. These are recommendations that provide the best regulator performance for a typical application. Please contact your local Sales Office for further information if a deviation from the standard recommendations are required.

Table 8. *Main Valve* ***Regulating*** *Flow Coefficients[1] for Type EZR With or Without Slam-Shut Device*

MAIN VALVE BODY SIZE, INCHES (DN)	CAGE STYLE, PERCENT OF CAPACITY	LINE SIZE EQUALS BODY SIZE PIPING						2:1 LINE SIZE TO BODY SIZE PIPING					
		With Inlet Strainer			Without Inlet Strainer			With Inlet Strainer			Without Inlet Strainer		
		C_g	C_v	C_1	C_g	C_v	C_1	C_g	C_v	C_1	C_g	C_v	C_1
1 (25)	100%	494	14.8	33.4	494	15.3	32.4	481	14.4	33.4	478	14.6	32.7
	60%	290	10.1	28.7	282	9.8	28.9	286	9.9	29.0	275	9.5	28.9
	30%	145	5.0	28.8	141	4.9	28.7	144	5.0	28.6	139	4.9	28.5
1-1/4 (32)	100%	572	17.0	33.7	573	16.5	34.6	547	16.1	34.1	550	15.9	34.7
	60%	283	10.5	26.9	291	10.8	26.9	293	10.9	26.7	303	11.3	26.9
	30%	145	5.5	26.3	149	5.6	26.4	142	5.4	26.1	147	5.6	26.3
2 x 1 (50 x 25)	100%	650	18.4	35.3	650	18.4	35.3	648	18.2	35.6	645	18.2	35.4
	60%	294	10.9	27.0	294	10.9	27.0	294	10.9	27.0	294	10.9	27.0
	30%	145	5.1	28.3	145	5.1	28.2	145	5.1	28.3	145	5.1	28.4
2 (50)	100%	1890	50.8	37.2	1970	54.6	36.1	1800	50.4	35.7	1840	53.0	34.7
	60%	1040	35.6	29.2	1050	36.3	28.9	1020	35.9	28.4	1020	35.9	28.4
	30%	570	21.4	26.6	570	21.4	26.6	560	21.5	26.0	560	21.5	26.0
3 (80)	100%	3550	91.4	38.8	3720	99.9	37.2	3390	90.6	37.4	3510	97.1	36.1
	60%	2000	70.3	28.5	2000	70.3	28.5	1970	67.5	29.2	1970	68.3	28.8
	30%	980	38.0	25.8	980	38.0	25.8	970	36.9	26.3	970	36.9	26.3
4 (100)	100%	5690	147	38.7	5830	154	37.9	5540	145	38.2	5640	151	37.4
	60%	3360	124	27.1	3360	124	27.1	3300	122	27.0	3300	121	27.3
	30%	1710	66.5	25.7	1710	66.5	25.7	1690	66.3	25.5	1690	66.8	25.3
6 x 4 (150 x 100)	100%	6150	159	38.7	6290	166	37.9	6142	161	38.2	6242	167	37.4
	60%	3790	140	27.1	3810	141	27.1	3930	146	27.0	3890	143	27.3
	30%	1900	74	25.7	1910	74	25.7	1970	77	25.5	1950	77	25.3
8 x 4 (200 x 100)	100%	6030	156	38.7	6170	163	37.9	5934	155	38.2	6034	161	37.4
	60%	3640	134	27.1	3700	137	27.1	3720	138	27.0	3730	137	27.3
	30%	1830	71	25.8	1860	72	25.8	1870	73	25.6	1880	74	25.3
6 (150)	100%	11600	325	35.7	12000	337	35.6	11200	314	35.7	11700	329	35.6
	60%	7120	239	29.8	7200	241	29.9	7150	240	29.8	7230	242	29.9
	30%	3560	135	26.4	3560	134	26.6	3570	135	26.4	3590	135	26.6
8 x 6 (200 x 150)	100%	13400	376	35.7	13700	385	35.6	12940	363	35.7	13360	376	35.6
	60%	8250	277	29.8	8290	277	29.9	8280	278	29.8	8320	279	29.9
	30%	4150	157	26.4	4150	156	26.6	4160	157	26.4	4180	157	26.6
12 x 6 (300 x 150)	100%	13600	381	35.7	13700	385	35.6	13130	368	35.7	13360	376	35.6
	60%	8210	276	29.8	8220	275	29.9	8240	277	29.8	8250	276	29.9
	30%	4110	155	26.4	4110	155	26.6	4120	156	26.4	4140	156	26.6
8 (200)	100%	19700	505	39	20100	517	38.9	19500	503	38.8	19700	509	38.7

1. K_m for the 1-inch (DN 25) body size at 100% capacity is 0.88, the 2-inch (DN 50) is 0.92, the 3-inch (DN 80) is 0.94, the 4-inch (DN 100) is 0.84, and the 6-inch (DN 150) is 0.82.

Table 9. *Main Valve* ***Wide-Open*** *Flow Coefficients for Type EZR With or Without Slam-Shut Device*

MAIN VALVE BODY SIZE, INCHES (DN)	CAGE STYLE, PERCENT OF CAPACITY	LINE SIZE EQUALS BODY SIZE PIPING						2:1 LINE SIZE TO BODY SIZE PIPING					
		With Inlet Strainer			Without Inlet Strainer			With Inlet Strainer			Without Inlet Strainer		
		C_g	C_v	C_1	C_g	C_v	C_1	C_g	C_v	C_1	C_g	C_v	C_1
1 (25)	100%	509	15.2	33.5	509	15.7	32.5	495	14.8	33.5	493	15.0	32.9
	60%	299	10.4	28.7	291	10.1	28.8	295	10.1	29.0	284	9.8	28.9
	30%	149	5.2	28.8	145	5.1	28.7	148	5.2	28.6	143	5.0	28.5
1-1/4 (32)	100%	590	17.5	33.7	590	17.0	34.6	564	16.5	34.1	566	16.3	34.7
	60%	291	10.8	26.9	299	11.2	26.9	301	11.3	26.7	312	11.6	26.9
	30%	149	5.7	26.3	154	5.8	26.4	146	5.6	26.1	151	5.8	26.3
2 x 1 (50 x 25)	100%	670	19.0	35.3	670	19.0	35.3	667	18.7	35.6	664	18.7	35.4
	60%	303	11.2	27.0	303	11.2	27.0	303	11.2	27.0	303	11.2	27.0
	30%	149	5.3	28.3	149	5.3	28.2	149	5.3	28.3	149	5.3	28.4
2 (50)	100%	1950	52.4	37.2	2030	56.2	36.1	1850	51.8	35.7	1900	54.6	34.7
	60%	1070	36.6	29.2	1080	37.4	28.9	1050	37.0	28.4	1050	37.0	28.4
	30%	590	22.2	26.6	590	22.2	26.6	580	22.3	26.0	580	22.3	26.0
3 (80)	100%	3660	94.1	38.8	3830	102.9	37.2	3490	93.3	37.4	3620	100.2	36.1
	60%	2060	72.4	28.5	2060	72.4	28.5	2030	69.5	29.2	2030	70.0	28.8
	30%	1010	39.1	25.8	1010	39.1	25.8	1000	38.0	26.3	1000	38.0	26.3
4 (100)	100%	5860	151	38.7	6000	158	37.9	5710	149	38.2	5810	155	37.4
	60%	3460	128	27.1	3460	128	27.1	3400	125	27.3	3400	125	27.3
	30%	1760	68.5	25.7	1770	68.2	26.0	1740	68.2	25.5	1740	68.8	25.3
6 x 4 (150 x 100)	100%	6250	162	38.7	6390	169	37.9	6131	161	38.2	6231	167	37.4
	60%	3850	142	27.1	3870	143	27.1	3920	144	27.3	3880	142	27.3
	30%	1940	75	25.7	1940	75	26.0	1970	77	25.5	1950	77	25.3
8 x 4 (200 x 100)	100%	6100	158	38.7	6240	165	37.9	5930	155	38.2	6030	161	37.4
	60%	3680	136	27.1	3750	138	27.1	3720	136	27.3	3720	136	27.3
	30%	1850	72	25.8	1880	72	26.1	1870	73	25.6	1880	74	25.3
6 (150)	100%	11950	335	35.7	12360	348	35.5	11540	323	35.7	12,050	339	35.5
	60%	7330	246	29.8	7420	248	29.9	7360	247	29.8	7,450	249	29.9
	30%	3670	139	26.5	3670	138	26.6	3680	139	26.5	3,700	139	26.6
8 x 6 (200 x 150)	100%	13800	386	35.7	14110	397	35.5	13330	373	35.7	13,760	387	35.6
	60%	8490	285	29.8	8540	286	29.9	8520	286	29.8	8,570	287	29.9
	30%	4280	162	26.5	4280	161	26.6	4290	162	26.5	4,310	162	26.6
12 x 6 (300 x 150)	100%	14010	392	35.7	14110	397	35.5	13530	379	35.7	13,760	387	35.6
	60%	8450	284	29.8	8470	283	29.9	8480	285	29.8	8,500	284	29.9
	30%	4240	160	26.5	4240	159	26.6	4250	160	26.5	4,270	160	26.6
8 (200)	100%	20300	520	39.0	20700	533	38.8	20100	518	38.8	20300	524	38.7

Table 10. *Pilot Flow Coefficients*

161AY SERIES				161EB SERIES				TYPE PRX		
Orifice Size	**C_g**	**C_v**	**C_1**	**Orifice Size**	**C_g**	**C_v**	**C_1**	**C_g**	**C_v**	**C_1**
3/32-inch (2,38 mm) 1/8-inch (3,18 mm) 1/4-inch (6,35 mm)	6.9 12.3 50	0.20 0.35 1.43	35 35 35	1/8-inch (3,18 mm)	8.5	0.28	30.4	10.5	0.36	29

Table 11. *Restrictor Flow Coefficients*

SET ON START		SET ON RUN		C_1
C_g	**C_v**	**C_g**	**C_v**	
6	0.17	1	0.03	35

Table 12. *Capacities for Type EZR with Type 161AY or 161AYM Pilot*

INLET PRESSURE, PSIG (bar)	OUTLET PRESSURE, PSIG (bar)	CAPACITIES IN THOUSANDS OF SCFH (Nm³/h) OF 0.6 SPECIFIC GRAVITY NATURAL GAS USING 1:1 LINE SIZE TO BODY SIZE PIPING WITHOUT INLET STRAINER						
		1-Inch (DN 25)	**1-1/4-Inch (DN 32)**	**2-Inch (DN 50)**	**3-Inch (DN 80)**	**4-Inch (DN 100)**	**6-Inch (DN 150)**	**8-Inch (DN 200)**
25 (1,7)	up to 2.5 (up to 0,17) 3 (0,21) 5 (0,35) 7 (0,48)	- - - -	- - - -	101 (2,71) 95 (2,55) 93 (2,49) - - - -	191 (5,12) 177 (4,74) 173 (4,64) - - - -	299 (8,01) 275 (7,38) 268 (7,18) 260 (6,97)	586 (15,7) 583 (15,6) 571 (15,3) 556 (14,9)	941 (25,2) 936 (25,1) 912 (24,4) 884 (23,7)
30 (2,1)	up to 4.5 (up to 0,31) 7 (0,48)	28.0 (0,75) - - - -	35.9 (0,96) 35.1 (0,94)	114 (3,06) 105 (2,81)	215 (5,76) 196 (5,25)	336 (9,01) 304 (8,15)	660 (17,7) 646 (17,3)	1062 (28,5) 1033 (27,7)
35 (2,4)	up to 6 (up to 0,41) 7 (0,48)	31.3 (0,84) 31.1 (0,83)	40.1 (1,08) 39.8 (1,07)	126 (3,38) 119 (3,19)	239 (6,41) 223 (5,98)	374 (10,0) 346 (9,27)	738 (19,7) 732 (19,6)	1187 (31,8) 1177 (31,5)
40 (2,8) 45 (3,1) 50 (3,4) 55 (3,8)	up to 7 (up to 0,48)	34.5 (0,93) 37.9 (1,02) 41.2 (1,10) 44.4 (1,19)	44.4 (1,19) 48.9 (1,31) 53.3 (1,43) 57.7 (1,55)	139 (3,73) 152 (4,07) 164 (4,40) 177 (4,74)	262 (7,02) 286 (7,67) 310 (8,31) 334 (8,95)	411 (11,0) 449 (12,0) 487 (13,1) 524 (14,0)	817 (21,9) 900 (24,1) 981 (26,3) 1062 (28,5)	1317 (35,3) 1455 (39,0) 1592 (42,7) 1727 (46,3)
60 (4,1) 65 (4,5) 70 (4,8) 75 (5,2)	up to 7 (up to 0,48)	47.6 (1,28) 50.8 (1,36) 54.0 (1,45) 57.2 (1,53)	62.0 (1,66) 66.3 (1,78) 70.6 (1,89) 74.9 (2,01)	190 (5,09) 203 (5,45) 215 (5,76) 228 (6,12)	358 (9,59) 382 (10,2) 406 (10,9) 430 (11,5)	562 (15,1) 599 (16,1) 637 (17,1) 675 (18,1)	1143 (30,6) 1223 (32,8) 1302 (34,9) 1381 (37,0)	1862 (49,9) 1996 (53,5) 2129 (57,1) 2261 (60,6)
80 (5,5) 90 (6,2) 100 (6,9) 125 (8,6) 150 10,3)	up to 7 (up to 0,48)	60.3 (1,62) 66.6 (1,79) 72.9 (1,95) 88.4 (2,37) 104 (2,79)	79.2 (2,12) 87.7 (2,35) 96.1 (2,58) 117 (3,14) 138 (3,70)	241 (6,46) 253 (6,79) 266 (7,13) 355 (9,51) 419 (11,2)	454 (12,2) 478 (12,8) 502 (13,5) 670 (18,0) 790 (21,2)	712 (19,1) 750 (20,1) 787 (21,1) 1051 (28,2) 1239 (33,2)	1460 (39,1) 1617 (43,3) 1773 (47,5) 2163 (58,0) 2551 (68,4)	2394 (64,2) 2658 (71,2) 2920 (78,3) 3575 (95,8) 4227 (113)

- continued -

Table 12. *Capacities for Type EZR with Type 161AY or 161AYM Pilot (continued)*

INLET PRESSURE, PSIG (bar)	OUTLET PRESSURE, PSIG (bar)	CAPACITIES IN THOUSANDS OF SCFH (Nm³/h) OF 0.6 SPECIFIC GRAVITY NATURAL GAS USING 1:1 LINE SIZE TO BODY SIZE PIPING WITHOUT INLET STRAINER				
		2 x 1-Inch (DN 50 x 25)	**6 x 4-Inch (DN 150 x 100)**	**8 x 4-Inch (DN 200 x 100)**	**8 x 6-Inch (DN 200 x 150)**	**12 x 6-Inch (DN 300 x 150)**
25 (1,7)	up to 2.5 (up to 0,17) 3 (0,21) 5 (0,35) 7 (0,48)	- - - -	299 (8,0) 297 (7,96) 290 (7,77) 281 (7,53)	294 (7,88) 292 (7,83) 285 (7,64) 277 (7,42)	669 (17,9) 666 (17,8) 652 (17,5) 634 (17,0)	669 (17,9) 666 (17,8) 652 (17,5) 634 (17,0)
30 (2,1)	up to 4.5 (up to 0,31) 7 (0,48)	35.9 (0,96) - - - -	337 (9,03) 328 (8,79)	331 (8,87) 323 (8,66)	754 (20,2) 737 (19,8)	754 (20,2) 737 (19,8)
35 (2,4)	up to 6 (up to 0,41) 7 (0,48)	40.1 (1,08) 39.8 (1,07)	376 (10,1) 374 (10,0)	370 (9,92) 367 (9,84)	842 (22,6) 836 (22,4)	842 (22,6) 836 (22,4)
40 (2,8) 45 (3,1) 50 (3,4) 55 (3,8)	up to 7 (up to 0,48)	44.4 (1,19) 48.9 (1,31) 53.3 (1,43) 57.7 (1,55)	417 (11,2) 461 (12,4) 504 (13,5) 546 (14,6)	411 (11,0) 454 (12,2) 496 (13,3) 537 (14,4)	933 (25,0) 1027 (27,5) 1120 (30,0) 1213 (32,5)	933 (25,0) 1027 (27,5) 1120 (30,0) 1213 (32,5)
60 (4,1) 65 (4,5) 70 (4,8) 75 (5,2)	up to 7 (up to 0,48)	62.0 (1,66) 66.3 (1,78) 70.6 (1,89) 74.9 (2,01)	588 (15,8) 630 (16,9) 672 (18,0) 714 (19,1)	579 (15,5) 620 (16,6) 661 (17,7) 702 (18,8)	1304 (34,9) 1396 (37,4) 1486 (39,8) 1577 (42,3)	1304 (34,9) 1396 (37,4) 1486 (39,8) 1577 (42,3)
80 (5,5) 90 (6,2) 100 (6,9) 125 (8,6) 150 (10,3)	up to 7 (up to 0,48)	79.2 (2,12) 87.7 (2,35) 96.1 (2,58) 117 (3,14) 138 (3,70)	755 (20,2) 838 (22,5) 920 (24,7) 1126 (30,2) 1330 (35,7)	743 (19,9) 825 (22,1) 906 (24,3) 1108 (29,7) 1309 (35,1)	1667 (44,7) 1846 (49,5) 2025 (54,3) 2470 (66,2) 2913 (78,1)	1667 (44,7) 1846 (49,5) 2025 (54,3) 2470 (66,2) 2913 (78,1)

Table 13. *Capacities for Type EZR with Type 161EB, 161EBM or PRX Pilot*

INLET PRESSURE, PSIG (bar)	OUTLET PRESSURE, PSIG (bar)	CAPACITIES IN THOUSANDS OF SCFH (Nm³/h) OF 0.6 SPECIFIC GRAVITY NATURAL GAS USING 1:1 LINE SIZE TO BODY SIZE PIPING WITHOUT INLET STRAINER						
		1-Inch (DN 25)	1-1/4-Inch (DN 32)	2-inch (DN 50)	3-inch (DN 80)	4-inch (DN 100)	6-inch (DN 150)	8-inch (DN 200)
30 (2,07)	5 (0,35)	28 (0,75)	32 (0,86)	107 (2,87)	200 (5,37)	310 (8,31)	658 (17,6)	1056 (28,3)
	10 (0,69)	- - - -	- - - -	101 (2,71)	188 (5,04)	292 (7,83)	623 (16,7)	991 (26,6)
40 (2,76)	up to 8 (up to 0,55)	34 (0,91)	39 (1,04)	139 (3,73)	262 (7,02)	411 (11,0)	812 (21,8)	1307 (35,0)
	15 (1,03)	33 (0,88)	37 (0,99)	125 (3,35)	232 (6,22)	360 (9,65)	767 (20,6)	1221 (32,7)
	20 (1,38)	- - - -	- - - -	117 (3,14)	216 (5,79)	335 (8,98)	719 (19,3)	1134 (30,4)
50 (3,45)	up to 12 (up to 0,83)	41 (1,10)	46 (1,23)	164 (4,40)	310 (8,31)	487 (13,1)	961 (25,8)	1548 (41,5)
	15 (1,03)	40 (1,07)	46 (1,23)	154 (4,13)	287 (7,70)	446 (12,0)	945 (25,3)	1516 (40,6)
	25 (1,72)	38 (1,02)	42 (1,13)	141 (3,78)	261 (7,00)	404 (10,8)	865 (23,2)	1368 (36,7)
	30 (2,07)	- - - -	- - - -	131 (3,51)	242 (6,49)	373 (10,0)	804 (21,5)	1263 (33,8)
60 (4,14)	up to 16 (up to 1,10)	47 (1,26)	54 (1,45)	190 (5,09)	358 (9,59)	562 (15,1)	1111 (29,8)	1788 (47,9)
	25 (1,72)	45 (1,21)	51 (1,37)	172 (4,61)	319 (8,55)	495 (13,3)	1055 (28,3)	1680 (45,0)
	35 (2,41)	42 (1,13)	46 (1,23)	155 (4,15)	287 (7,69)	444 (11,9)	954 (25,6)	1501 (40,2)
	40 (2,76)	- - - -	- - - -	143 (3,83)	264 (7,08)	409 (11,0)	882 (23,6)	1380 (37,0)
75 (5,17)	up to 22 (up to 1,52)	57 (1,53)	64 (1,72)	228 (6,12)	430 (11,5)	675 (18,1)	1334 (35,8)	2149 (57,6)
	35 (2,41)	54 (1,45)	61 (1,64)	203 (5,44)	378 (10,1)	585 (15,7)	1250 (33,5)	1986 (53,2)
	50 (3,45)	47 (1,27)	52 (1,39)	175 (4,69)	322 (8,64)	498 (13,3)	1075 (28,8)	1684 (45,1)
	55 (3,79)	- - - -	- - - -	160 (4,29)	296 (7,93)	456 (12,2)	988 (26,5)	1541 (41,3)
100 (6,90)	up to 32 (up to 2,21)	72 (1,94)	82 (2,20)	291 (7,80)	550 (14,7)	863 (23,1)	1707 (45,7)	2750 (73,7)
	60 (4,14)	65 (1,74)	72 (1,93)	241 (6,46)	447 (12,0)	691 (18,5)	1485 (39,8)	2340 (62,7)
	75 (5,17)	55 (1,47)	61 (1,64)	203 (5,45)	375 (10,1)	578 (15,5)	1252 (33,6)	1952 (52,3)
	80 (5,52)	- - - -	- - - -	186 (4,99)	342 (9,17)	527 (14,1)	1144 (30,7)	1777 (47,6)
125 (8,62)	up to 43 (up to 2,97)	88 (2,36)	100 (2,69)	355 (9,51)	670 (18,0)	1051 (28,2)	2076 (55,6)	3342 (89,6)
	60 (4,14)	85 (2,28)	95 (2,55)	321 (8,60)	595 (15,9)	923 (24,7)	1969 (52,8)	3134 (84,0)
	90 (6,21)	71 (1,90)	79 (2,12)	261 (7,00)	482 (12,9)	745 (20,0)	1609 (43,1)	2515 (67,4)
	105 (7,24)	- - - -	- - - -	208 (5,57)	382 (10,2)	589 (15,8)	1282 (34,4)	1985 (53,2)
150 (10,3)	up to 52 (up to 3,59)	104 (2,79)	118 (3,16)	419 (11,2)	790 (21,2)	1239 (33,2)	2453 (65,7)	3953 (106)
	60 (4,14)	103 (2,76)	117 (3,14)	393 (10,5)	732 (19,6)	1137 (30,5)	2412 (64,6)	3868 (104)
	95 (6,55)	92 (2,47)	102 (2,74)	342 (9,17)	632 (16,9)	977 (26,2)	2102 (56,3)	3308 (88,7)
	130 (8,96)	- - - -	- - - -	228 (6,12)	419 (11,2)	646 (17,3)	1406 (37,7)	2175 (58,3)
200 (13,8)	up to 73 (up to 5,03)	135 (3,62)	154 (4,13)	546 (14,6)	1030 (27,6)	1615 (43,3)	3194 (85,6)	5145 (138)
	110 (7,58)	127 (3,40)	143 (3,83)	479 (12,8)	887 (23,8)	1375 (36,9)	2941 (78,8)	4662 (125)
	150 (10,34)	106 (2,84)	117 (3,14)	390 (10,5)	720 (19,3)	1112 (29,8)	2406 (64,5)	3753 (101)
	180 (12,41)	- - - -	- - - -	264 (7,08)	484 (13,0)	746 (20,0)	1628 (43,6)	2511 (67,3)
300 (20,7)	up to 115 (up to 7,93)	198 (5,31)	226 (6,06)	800 (21,4)	1510 (40,5)	2367 (63,4)	4677 (125)	7531 (202)
	170 (11,72)	186 (4,98)	208 (5,57)	698 (18,7)	1295 (34,7)	2006 (53,8)	4292 (115)	6801 (182)
	225 (15,51)	157 (4,21)	174 (4,66)	577 (15,5)	1065 (28,5)	1645 (44,1)	3557 (95,3)	5553 (149)
	280 (19,31)	- - - -	- - - -	324 (8,68)	594 (15,9)	914 (24,5)	1998 (53,5)	3076 (82,4)
400 (27,6)	up to 155 (up to 10,69)	261 (7,00)	298 (7,99)	1054 (28,2)	1990 (53,3)	3119 (83,6)	6169 (165)	9936 (266)
	200 (13,79)	253 (6,78)	286 (7,67)	961 (25,8)	1785 (47,8)	2769 (74,2)	5899 (158)	9405 (252)
	250 (17,24)	237 (6,35)	264 (7,08)	883 (23,7)	1635 (43,8)	2530 (67,8)	5432 (146)	8568 (230)
	300 (20,68)	208 (5,57)	230 (6,16)	764 (20,5)	1410 (37,8)	2177 (58,3)	4709 (126)	7352 (197)
	350 (24,13)	158 (4,23)	173 (4,64)	572 (15,3)	1052 (28,2)	1621 (43,4)	3530 (94,6)	5458 (146)
500 (34,5)	up to 196 (up to 13,51)	324 (8,68)	369 (9,89)	1308 (35,1)	2470 (66,2)	3871 (104)	7656 (205)	12 331 (330)
	250 (17,24)	315 (8,44)	355 (9,51)	1195 (32,0)	2220 (59,5)	3444 (92,3)	7334 (197)	11 697 (313)
	300 (20,68)	299 (8,01)	335 (8,98)	1121 (30,0)	2078 (55,7)	3217 (86,2)	6894 (185)	10 900 (292)
	350 (24,13)	275 (7,37)	305 (8,17)	1018 (27,3)	1881 (50,4)	2907 (77,9)	6268 (168)	9827 (263)
600 (41,4)	up to 237 (up to 16,34)	387 (10,4)	441 (11,8)	1562 (41,9)	2950 (79,1)	4623 (124)	9143 (245)	14 726 (395)
	250 (17,24)	386 (10,3)	438 (11,7)	1481 (39,7)	2760 (74,0)	4287 (115)	9079 (243)	14 593 (391)
	300 (20,68)	376 (10,1)	424 (11,4)	1428 (38,3)	2655 (71,2)	4119 (111)	8770 (235)	13 989 (375)
	350 (24,13)	362 (9,70)	405 (10,9)	1358 (36,4)	2517 (67,5)	3899 (104)	8346 (224)	13 217 (354)
700 (48,3)	up to 278 (up to 19,17)	450 (12,1)	513 (13,7)	1816 (48,7)	3430 (91,9)	5375 (144)	10 630 (285)	17 121 (459)
	300 (20,68)	447 (11,9)	508 (13,6)	1715 (46,0)	3196 (85,7)	4964 (133)	10 519 (282)	16 892 (453)
	350 (24,13)	438 (11,7)	494 (13,2)	1662 (44,5)	3090 (82,8)	4793 (128)	10 205 (273)	16 282 (436)
800 (55,2)	up to 350 (up to 24,13)	509 (13,6)	578 (15,5)	2070 (55,5)	3910 (105)	6127 (164)	11 958 (320)	19 189 (514)
900 (62,1)	up to 350 (up to 24,13)	577 (15,5)	658 (17,6)	2325 (62,3)	4389 (118)	6879 (184)	13 651 (366)	22 008 (590)
1000 (68,9)	up to 350 (up to 24,13)	644 (17,3)	737 (19,8)	2579 (69,1)	4869 (130)	7631 (205)	15 306 (410)	24 771 (664)
1050 (72,4)	up to 350 (up to 24,13)	677 (18,1)	776 (20,8)	2706 (72,5)	5109 (137)	8007 (215)	16 124 (432)	26 138 (700)

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Table 13. *Capacities for Type EZR with Type 161EB, 161EBM or PRX Pilot (continued)*

INLET PRESSURE, PSIG (bar)	OUTLET PRESSURE, PSIG (bar)	CAPACITIES IN THOUSANDS OF SCFH (Nm³/h) OF 0.6 SPECIFIC GRAVITY NATURAL GAS USING 1:1 LINE SIZE TO BODY SIZE PIPING WITHOUT INLET STRAINER				
		2 x 1-Inch (DN 50 x 25)	6 x 4-Inch (DN 150 x 100)	8 x 4-Inch (DN 200 x 100)	8 x 6-Inch (DN 200x 150)	12 x 6-Inch (DN 300 x 150)
30 (2,07)	5 (0,35)	36 (0,96)	335 (8,98)	330 (8,84)	751 (20,1)	751 (20,1)
	10 (0,69)	- - - -	315 (8,44)	310 (8,31)	712 (19,1)	712 (19,1)
40 (2,76)	up to 8 (up to 0,55)	44 (1,18)	415 (11,1)	408 (10,9)	927 (24,8)	927 (24,8)
	15 (1,03)	42 (1,13)	388 (10,4)	382 (10,2)	876 (23,5)	876 (23,5)
	20 (1,38)	- - - -	362 (9,70)	356 (9,54)	821 (22,0)	821 (22,0)
50 (3,45)	up to 12 (up to 0,83)	52 (1,39)	491 (13,2)	483 (12,9)	1098 (29,4)	1098 (29,4)
	15 (1,03)	51 (1,37)	481 (12,9)	473 (12,7)	1079 (28,9)	1079 (28,9)
	25 (1,72)	47 (1,26)	436 (11,7)	429 (11,5)	988 (26,5)	988 (26,5)
	30 (2,07)	- - - -	403 (10,8)	397 (10,6)	918 (24,6)	918 (24,6)
60 (4,14)	up to 16 (up to 1,10)	60 (1,61)	567 (15,2)	558 (15,0)	1268 (34,0)	1268 (34,0)
	25 (1,72)	57 (1,53)	534 (14,3)	526 (14,1)	1204 (32,3)	1204 (32,3)
	35 (2,41)	52 (1,39)	479 (12,8)	471 (12,6)	1089 (29,2)	1089 (29,2)
	40 (2,76)	- - - -	441 (11,8)	434 (11,6)	1007 (27,0)	1007 (27,0)
75 (5,17)	up to 22 (up to 1,52)	73 (1,96)	681 (18,3)	671 (18,0)	1523 (40,8)	1523 (40,8)
	35 (2,41)	68 (1,82)	632 (16,9)	622 (16,7)	1427 (38,2)	1427 (38,2)
	50 (3,45)	59 (1,58)	538 (14,4)	529 (14,2)	1227 (32,9)	1227 (32,9)
	55 (3,79)	- - - -	493 (13,2)	485 (13,0)	1128 (30,2)	1128 (30,2)
100 (6,90)	up to 32 (up to 2,21)	93 (2,49)	872 (23,4)	858 (23,0)	1949 (52,2)	1949 (52,2)
	60 (4,14)	81 (2,17)	746 (20,0)	734 (19,7)	1695 (45,4)	1695 (45,4)
	75 (5,17)	68 (1,82)	624 (16,7)	614 (16,5)	1430 (38,3)	1430 (38,3)
	80 (5,52)	- - - -	569 (15,2)	560 (15,0)	1306 (35,0)	1306 (35,0)
125 (8,62)	up to 43 (up to 2,97)	113 (3,03)	1060 (28,4)	1043 (28,0)	2370 (63,5)	2370 (63,5)
	60 (4,14)	107 (2,87)	997 (26,7)	981 (26,3)	2248 (60,2)	2248 (60,2)
	90 (6,21)	88 (2,36)	804 (21,5)	791 (21,2)	1837 (49,2)	1837 (49,2)
	105 (7,24)	- - - -	636 (17,0)	626 (16,8)	1463 (39,2)	1463 (39,2)
150 (10,3)	up to 52 (up to 3,59)	133 (3,56)	1253 (33,6)	1233 (33,0)	2801 (75,1)	2801 (75,1)
	60 (4,14)	131 (3,51)	1228 (32,9)	1208 (32,4)	2754 (73,8)	2754 (73,8)
	95 (6,55)	114 (3,06)	1055 (28,3)	1039 (27,8)	2400 (64,3)	2400 (64,3)
	130 (8,96)	- - - -	697 (18,7)	686 (18,4)	1606 (43,0)	1606 (43,0)
200 (13,8)	up to 73 (up to 5,03)	174 (4,66)	1631 (43,7)	1605 (43,0)	3647 (97,7)	3647 (97,7)
	110 (7,58)	160 (4,29)	1485 (39,8)	1461 (39,2)	3357 (90,0)	3357 (90,0)
	150 (10,34)	131 (3,51)	1200 (32,2)	1181 (31,7)	2746 (73,6)	2746 (73,6)
	180 (12,41)	- - - -	806 (21,6)	793 (21,2)	1858 (49,8)	1858 (49,8)
300 (20,7)	up to 115 (up to 7,93)	254 (6,81)	2388 (64,0)	2350 (63,0)	5339 (143)	5339 (143)
	170 (11,72)	234 (6,27)	2166 (58,0)	2132 (57,1)	4900 (131)	4900 (131)
	225 (15,51)	194 (5,20)	1776 (47,6)	1747 (46,8)	4061 (109)	4061 (109)
	280 (19,31)	- - - -	987 (26,5)	972 (26,0)	2281 (61,1)	2281 (61,1)
400 (27,6)	up to 155 (up to 10,69)	335 (8,98)	3150 (84,4)	3100 (83,1)	7043 (189)	7043 (189)
	200 (13,79)	321 (8,60)	2990 (80,1)	2943 (78,9)	6734 (180)	6734 (180)
	250 (17,24)	296 (7,93)	2732 (73,2)	2689 (72,1)	6202 (166)	6202 (166)
	300 (20,68)	257 (6,89)	2351 (63,0)	2313 (62,0)	5376 (144)	5376 (144)
	350 (24,13)	193 (5,17)	1750 (46,9)	1722 (46,2)	4030 (108)	4030 (108)
500 (34,5)	up to 196 (up to 13,51)	416 (11,1)	3910 (105)	3847 (103)	8740 (234)	8740 (234)
	250 (17,24)	399 (10,7)	3719 (99,7)	3659 (98,1)	8373 (224)	8373 (224)
	300 (20,68)	375 (10,1)	3473 (93,1)	3418 (91,6)	7870 (211)	7870 (211)
	350 (24,13)	342 (9,17)	3139 (84,1)	3089 (82,8)	7156 (192)	7156 (192)
600 (41,4)	up to 237 (up to 16,34)	497 (13,3)	4669 (125)	4595 (123)	10 438 (280)	10 438 (280)
	250 (17,24)	493 (13,2)	4629 (124)	4556 (122)	10 365 (278)	10 365 (278)
	300 (20,68)	477 (12,8)	4447 (119)	4376 (117)	10 012 (268)	10 012 (268)
	350 (24,13)	454 (12,2)	4210 (113)	4143 (111)	9528 (255)	9528 (255)
700 (48,3)	up to 278 (up to 19,17)	578 (15,5)	5428 (145)	5342 (143)	12 136 (325)	12 136 (325)
	300 (20,68)	572 (15,3)	5360 (144)	5275 (141)	12 009 (322)	12 009 (322)
	350 (24,13)	555 (14,9)	5175 (139)	5093 (136)	11 650 (312)	11 650 (312)
800 (55,2)	up to 350 (up to 24,13)	650 (17,4)	6090 (163)	5993 (161)	13 652 (366)	13 652 (366)
900 (62,1)	up to 350 (up to 24,13)	742 (19,9)	6976 (187)	6865 (184)	15 584 (418)	15 584 (418)
1000 (68,9)	up to 350 (up to 24,13)	831 (22,3)	7844 (210)	7719 (207)	17 474 (468)	17 474 (468)
1050 (72,4)	up to 350 (up to 24,13)	875 (23,5)	8273 (222)	8141 (218)	18 408 (493)	18 408 (493)

Table 14. *Capacities for Type EZR with PRX Series*

INLET PRESSURE, PSIG (bar)	OUTLET PRESSURE, PSIG (bar)[1]	CAPACITIES IN THOUSANDS OF SCFH (Nm³/h) OF 0.6 SPECIFIC GRAVITY NATURAL GAS USING 1:1 LINE SIZE TO BODY SIZE PIPING WITHOUT INLET STRAINER						
		1-Inch (DN 25)	1-1/4-Inch (DN 32)	2-Inch (DN 50)	3-inch (DN 80)	4-Inch (DN 100)	6-inch (DN 150)	8-inch (DN 200)
300 (21)	250 (17)	134 (3,59)	148 (3,97)	489 (13,1)	901 (24,1)	1389 (37,2)	3019 (80,9)	4682 (125)
	280 (19)	- - - -	- - - -	324 (8,68)	594 (15,9)	914 (24,5)	1998 (53,5)	3076 (82,4)
400 (28)	250 (17)	237 (6,35)	264 (7,08)	883 (23,7)	1635 (43,8)	2530 (67,8)	5432 (146)	8568 (230)
	300 (21)	208 (5,57)	230 (6,16)	764 (20,5)	1410 (37,8)	2177 (58,3)	4709 (126)	7352 (197)
	350 (24)	158 (4,23)	173 (4,64)	572 (15,3)	1052 (28,2)	1621 (43,4)	3530 (94,6)	5458 (146)
	380 (26)	- - - -	- - - -	374 (10,0)	686 (18,4)	1056 (28,3)	2311 (61,9)	3552 (95,2)
500 (34)	250 (17)	315 (8,44)	355 (9,51)	1195 (32,0)	2220 (59,5)	3444 (92,3)	7334 (197)	11 697 (313)
	300 (21)	299 (8,01)	335 (8,98)	1121 (30,0)	2078 (55,7)	3217 (86,2)	6894 (185)	10 900 (292)
	350 (24)	275 (7,37)	305 (8,17)	1018 (27,3)	1881 (50,4)	2907 (77,9)	6268 (168)	9827 (263)
	400 (28)	238 (6,38)	262 (7,02)	871 (23,3)	1604 (43,0)	2475 (66,3)	5367 (144)	8348 (224)
	450 (31)	178 (4,77)	195 (5,23)	644 (17,3)	1183 (31,7)	1823 (48,9)	3977 (107)	6137 (164)
	480 (33)	- - - -	- - - -	418 (11,2)	768 (20,6)	1182 (31,7)	2586 (69,3)	3972 (106)
600 (41)	250 (17)	386 (10,3)	438 (11,7)	1481 (39,7)	2760 (74,0)	4287 (115)	9079 (243)	14 593 (391)
	300 (21)	376 (10,1)	424 (11,4)	1428 (38,3)	2655 (71,2)	4119 (110)	8770 (235)	13 989 (375)
	400 (28)	340 (9,11)	378 (10,1)	1264 (33,9)	2337 (62,6)	3614 (96,9)	7777 (208)	12 229 (328)
	500 (34)	265 (7,10)	291 (7,80)	966 (25,9)	1777 (47,6)	2741 (73,5)	5956 (160)	9240 (248)
	550 (38)	196 (5,25)	215 (5,80)	709 (19,0)	1302 (34,9)	2006 (53,8)	4379 (117)	6749 (181)
	580 (40)	- - - -	- - - -	459 (12,3)	841 (22,5)	1295 (34,7)	2834 (76,0)	4352 (117)
700 (48)	250 (17)	453 (12,1)	518 (13,9)	1755 (47,0)	3278 (87,9)	5099 (134)	10 751 (288)	17 381 (466)
	300 (21)	447 (11,9)	508 (13,6)	1715 (46,0)	3196 (85,7)	4964 (133)	10 519 (282)	16 892 (453)
	400 (28)	424 (11,4)	475 (12,7)	1594 (42,7)	2956 (79,2)	4579 (123)	9793 (262)	15 526 (416)
	500 (34)	377 (10,1)	418 (11,2)	1393 (37,3)	2572 (68,9)	3975 (107)	8577 (230)	13 435 (360)
	600 (41)	290 (7,77)	318 (8,52)	1052 (28,2)	1936 (51,9)	2984 (80,0)	6493 (174)	10 055 (269)
800 (55)	up to 300 (up to 21)	515 (13,8)	588 (15,8)	2070 (55,5)	3910 (105)	6127 (164)	12 202 (327)	19 697 (528)
	400 (28)	499 (13,4)	563 (15,1)	1896 (50,8)	3525 (94,5)	5468 (147)	11 640 (312)	18 574 (498)
	500 (34)	467 (12,5)	522 (14,0)	1745 (46,8)	3231 (86,6)	5001 (134)	10 732 (288)	16 938 (454)
	600 (41)	411 (11,0)	454 (12,2)	1512 (40,5)	2789 (74,7)	4308 (115)	9314 (250)	14 547 (390)
	700 (48)	312 (8,36)	342 (9,17)	1133 (30,4)	2082 (55,8)	3209 (86,0)	6990 (187)	10 809 (290)
900 (62)	up to 350 (up to 24)	577 (15,5)	658 (17,6)	2325 (62,3)	4389 (118)	6879 (184)	13 651 (366)	22 008 (590)
	400 (28)	571 (15,3)	647 (17,3)	2184 (58,5)	4067 (109)	6316 (169)	13 396 (359)	21 486 (576)
	500 (34)	547 (14,7)	615 (16,5)	2064 (55,3)	3830 (103)	5935 (159)	12 679 (340)	20 133 (540)
	600 (41)	507 (13,6)	565 (15,1)	1886 (50,5)	3487 (93,5)	5394 (145)	11 604 (311)	18 250 (489)
	700 (48)	442 (11,8)	488 (13,1)	1622 (43,5)	2991 (80,2)	4617 (124)	10 000 (268)	15 584 (418)
1000 (69)	up to 400 (up to 28)	639 (17,1)	728 (19,5)	2579 (69,1)	4869 (130)	7631 (205)	15 096 (405)	24 316 (652)
	500 (34)	622 (16,7)	702 (18,8)	2364 (63,4)	4394 (118)	6817 (183)	14 510 (389)	23 158 (621)
	600 (41)	592 (15,9)	663 (17,8)	2220 (59,5)	4115 (110)	6372 (171)	13 650 (366)	21 592 (579)
	700 (48)	545 (14,6)	605 (16,2)	2017 (54,1)	3727 (99,9)	5762 (154)	12 420 (333)	19 480 (522)
1050 (72)	up to 400 (up to 28)	673 (18,0)	768 (20,6)	2706 (72,5)	5109 (137)	8007 (215)	15 932 (427)	25 710 (689)
	500 (34)	658 (17,6)	745 (20,0)	2509 (67,4)	4668 (125)	7245 (194)	15 398 (413)	24 627 (660)
	600 (41)	632 (16,9)	709 (19,0)	2379 (63,8)	4412 (118)	6826 (183)	14 618 (392)	23 181 (621)
	700 (48)	591 (15,8)	658 (17,6)	2196 (58,9)	4063 (109)	6283 (168)	13 517 (362)	21 261 (570)
	900 (62)	432 (11,6)	474 (12,7)	1572 (42,2)	2892 (77,6)	4459 (120)	9694 (260)	15 024 (403)

1. For outlet pressures above 435 psig (30 bar), use Type PRX-AP pilot rather than Type PRX.

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Table 14. *Capacities for Type EZR with PRX Series (continued)*

INLET PRESSURE, PSIG (bar)	OUTLET PRESSURE, PSIG (bar)[1]	CAPACITIES IN THOUSANDS OF SCFH (Nm³/h) OF 0.6 SPECIFIC GRAVITY NATURAL GAS USING 1:1 LINE SIZE TO BODY SIZE PIPING WITHOUT INLET STRAINER				
		2 x 1-Inch (DN 50 x 25)	6 x 4-Inch (DN 150 x 100)	8 x 4-Inch (DN 200 x 100)	8 x 6-Inch (DN 200 x 150)	12 x 6-Inch (DN 300 x 150)
300 (21)	250 (17)	165 (4,42)	1500 (40,2)	1476 (39,6)	3447 (92,4)	3447 (92,4)
	280 (19)	- - - -	987 (26,5)	972 (26,0)	2281 (61,1)	2281 (61,1)
400 (28)	250 (17)	296 (7,93)	2732 (73,2)	2689 (72,1)	6202 (166)	6202 (166)
	300 (21)	257 (6,89)	2351 (63,0)	2313 (62,0)	5376 (144)	5376 (144)
	350 (24)	193 (5,17)	1750 (46,9)	1722 (46,2)	4030 (108)	4030 (108)
	380 (26)	- - - -	1141 (30,6)	1123 (30,1)	2638 (70,7)	2638 (70,7)
500 (34)	250 (17)	399 (10,7)	3719 (99,7)	3659 (98,1)	8373 (224)	8373 (224)
	300 (21)	375 (10,1)	3473 (93,1)	3418 (91,6)	7870 (211)	7870 (211)
	350 (24)	342 (9,17)	3139 (84,1)	3089 (82,8)	7156 (192)	7156 (192)
	400 (28)	293 (7,85)	2672 (71,6)	2630 (70,5)	6128 (164)	6128 (164)
	450 (31)	217 (5,82)	1969 (52,8)	1937 (51,9)	4540 (122)	4540 (122)
	480 (33)	- - - -	1276 (34,2)	1256 (33,7)	2952 (79,1)	2952 (79,1)
600 (41)	250 (17)	493 (13,2)	4629 (124)	4556 (122)	10 365 (278)	10 365 (278)
	300 (21)	477 (12,8)	4447 (119)	4376 (117)	10 012 (268)	10 012 (268)
	400 (28)	424 (11,4)	3903 (105)	3841 (103)	8879 (238)	8879 (238)
	500 (34)	325 (8,71)	2960 (79,3)	2913 (78,1)	6800 (182)	6800 (182)
	550 (38)	239 (6,41)	2166 (58,0)	2131 (57,1)	4999 (134)	4999 (134)
	580 (40)	- - - -	1398 (37,5)	1376 (37,0)	3236 (86,7)	3236 (86,7)
700 (48)	250 (17)	584 (15,6)	5505 (148)	5418 (145)	12 274 (329)	12 274 (329)
	300 (21)	572 (15,3)	5360 (144)	5275 (141)	12 009 (322)	12 009 (322)
	400 (28)	533 (14,3)	4944 (132)	4865 (130)	11 180 (300)	11 180 (300)
	500 (34)	467 (12,5)	4292 (115)	4224 (113)	9793 (262)	9793 (262)
	600 (41)	354 (9,49)	3222 (86,4)	3171 (85,0)	7413 (199)	7413 (199)
800 (55)	up to 300 (up to 21)	663 (17,8)	6241 (167)	6142 (165)	13 931 (373)	13 931 (373)
	400 (28)	633 (17,0)	5904 (158)	5810 (156)	13 289 (356)	13 289 (356)
	500 (34)	584 (15,7)	5400 (145)	5314 (142)	12 253 (328)	12 253 (328)
	600 (41)	508 (13,6)	4651 (125)	4577 (123)	10 634 (285)	10 634 (285)
	700 (48)	381 (10,2)	3465 (92,9)	3410 (91,4)	7980 (214)	7980 (214)
900 (62)	up to 350 (up to 24)	742 (19,9)	6976 (187)	6865 (184)	15 584 (418)	15 584 (418)
	400 (28)	728 (19,5)	6820 (183)	6711 (180)	15 294 (410)	15 294 (410)
	500 (34)	690 (18,5)	6408 (172)	6306 (169)	14 475 (388)	14 475 (388)
	600 (41)	632 (16,9)	5824 (156)	5731 (154)	13 247 (355)	13 247 (355)
	700 (48)	545 (14,6)	4985 (134)	4906 (131)	11 416 (306)	11 416 (306)
1000 (69)	up to 400 (up to 28)	820 (22,0)	7709 (207)	7587 (203)	17 235 (462)	17 235 (462)
	500 (34)	789 (21,1)	7361 (197)	7243 (194)	16 566 (444)	16 566 (444)
	600 (41)	743 (19,9)	6880 (184)	6770 (181)	15 584 (418)	15 584 (418)
	700 (48)	677 (18,1)	6221 (167)	6122 (164)	14 179 (380)	14 179 (380)
1050 (72)	up to 400 (up to 28)	866 (23,2)	8147 (218)	8018 (215)	18 189 (487)	18 189 (487)
	500 (34)	837 (22,4)	7823 (210)	7699 (206)	17 579 (471)	17 579 (471)
	600 (41)	796 (21,3)	7381 (198)	7263 (195)	16 688 (447)	16 688 (447)
	700 (48)	736 (19,7)	6784 (182)	6677 (179)	15 432 (414)	15 432 (414)
	900 (62)	529 (14,2)	4811 (129)	4719 (127)	11 068 (297)	11 068 (297)

1. For outlet pressures above 435 psig (30 bar), use Type PRX-AP pilot rather than Type PRX.

Table 15. *Manometric Device Specifications*[1]

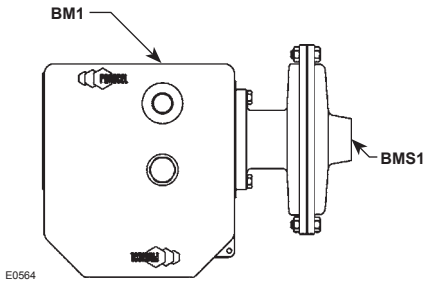
SPRING RANGE, PSIG (bar)	SPRING COLOR	SPRING PART NUMBER	MAXIMUM SENSING INLET PRESSURE, PSIG (bar)	MANOMETRIC SENSING DEVICE TYPE	MANOMETRIC SENSING DEVICE STYLE	SETPOINT TOLERANCE, PSIG (bar)[1]	MAXIMUM DIFFERENCE BETWEEN OVERPRESSURE AND UNDERPRESSURE, PSIG (bar)[2]
4.02 to 14.1-inches w.c. (10 to 35 mbar)	Purple	T14232T0012	75 (5)	162	Diaphragm	0.058 (0,004)	0.145 (0,010)
9.97 to 33.2-inches w.c. (25 to 80 mbar)	Orange	T14233T0012				0.073 (0,005)	0.363 (0,025)
18-inches w.c. (45 mbar to 2.0 psig to 0,140 bar)	Red	T14234T0012				0.145 (0,010)	0.725 (0,050)
1.0 to 3.5 (0,070 to 0,240)	Yellow	T14235T0012				0.203 (0,014)	0.870 (0,060)
1.7 to 5.6 (0,115 to 0,380)	Green	T14236T0012				0.261 (0,018)	2.18 (0,150)
2 to 11 (0,140 to 0,750)	Gray	T14238T0012				0.725 (0,050)	5.08 (0,350)
4 to 19 (0,250 to 1,3)	Brown	T14239T0012				1.16 (0,080)	8.70 (0,600)
7 to 33 (0,450 to 2,3)	Black	T14240T0012				2.47 (0,170)	16.0 (1,10)
15 to 75 (1,0 to 5,1)	Blue	T14237T0012	235 (16)	71		5.08 (0,350)	36.3 (2,50)
31 to 161 (2,1 to 11,0)	Brown	T14239T0012				10.2 (0,700)	79.8 (5,50)
59 to 235 (4,0 to 16,0)	Black	T14240T0012				23.2 (1,60)	145 (10,0)
235 to 323 (16,0 to 22,0)	Brown	T14239T0012	1470 (100)	27	Piston	43.5 (3,00)	Requires use of a BMS1 and a BMS2
323 to 588 (22,0 to 40,0)	Black	T14240T0012				94.3 (6,50)	
588 to 808 (40,0 to 55,0)	Brown	T14239T0012	1470 (100)	17		102 (7,00)	
808 to 1470 (55,0 to 100,0)	Black	T14240T0012				174 (12,0)	
81 to 323 (5,5 to 22,0)	Brown	T14239T0012	514 (35)	236	Bellows	14.5 (1,00)	145 (10,0)
122 to 514 (8,3 to 35,0)	Black	T14240T0012				36.3 (2,50)	290 (20,0)
257 to 1058 (17,5 to 72,0)	Gray	T14238T0012	1058 (72)	315		72.5 (5,00)	479 (33,0)

1. Minimum suggested difference between slam-shut set pressure and normal operating pressure of the system.
2. Maximum difference between overpressure and underpressure when using one manometric device (BMS1) with tripping hook. For underpressure and overpressure points greater than this maximum number, use a second manometric device (BMS2) for underpressure protection.

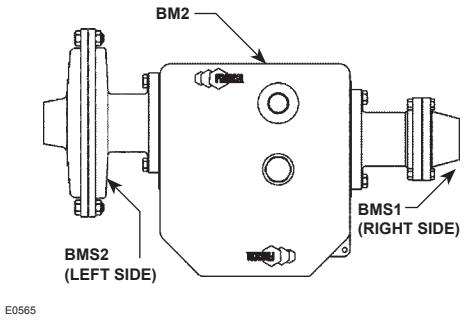
Table 16. *Applications and Construction Guide (See Figure 10)*

APPLICATION	MECHANISM BOX REQUIRED		MANOMETRIC SENSING DEVICE REQUIRED	
	BM1	BM2	BMS1	BMS2
Overpressure Shutoff (OPSO)	Yes	No	Yes	No
Underpressure Shutoff (UPSO)				
Overpressure Shutoff (OPSO) and Underpressure Shutoff (UPSO)			Yes[1]	
Overpressure Shutoff (OPSO) and Underpressure Shutoff (UPSO)	No	Yes	Yes[2]	Yes
Overpressure Shutoff (OPSO), Overpressure Shutoff (OPSO) and Underpressure Shutoff (UPSO)			Yes[2]	Yes[1]

1. When using one manometric sensing device (BMS1 or BMS2) for both overpressure and underpressure shutoff, make sure that the difference between set pressures falls within the maximum range shown in Table 15.
2. When using two manometric sensing devices (BMS1 and a BMS2), the BMS1 can only be used for high trip.



MECHANISM BOX (BM1) WITH
1 MANOMETRIC SENSING DEVICE (BMS1)



MECHANISM BOX (BM2) WITH
2 MANOMETRIC SENSING DEVICES (BMS1 AND BMS2)

Figure 10. *Types of Installation (Mounting on Horizontal Pipeline Only)*

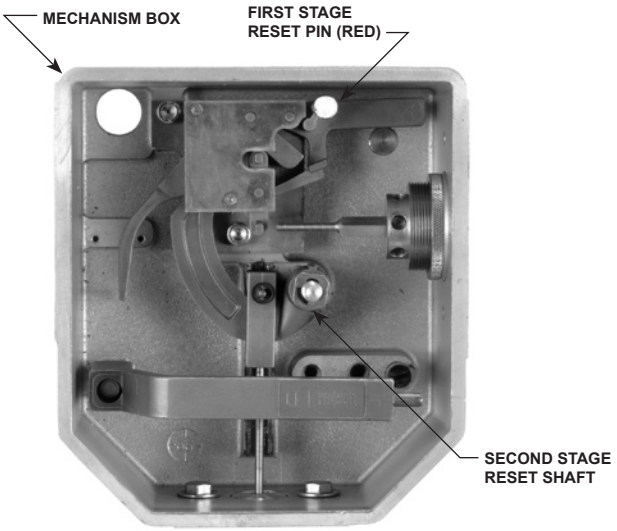


Figure 11. *Slam-Shut Device in Open Position*

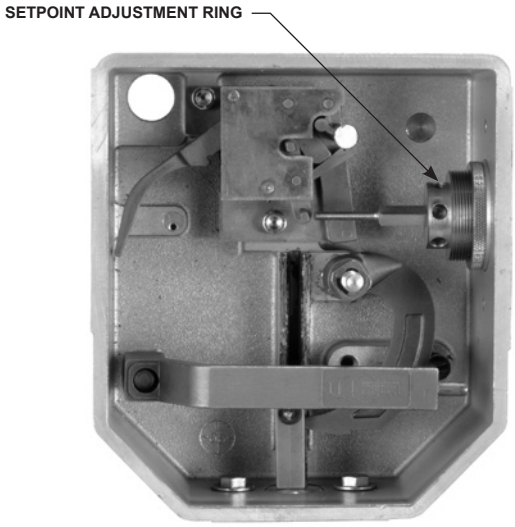
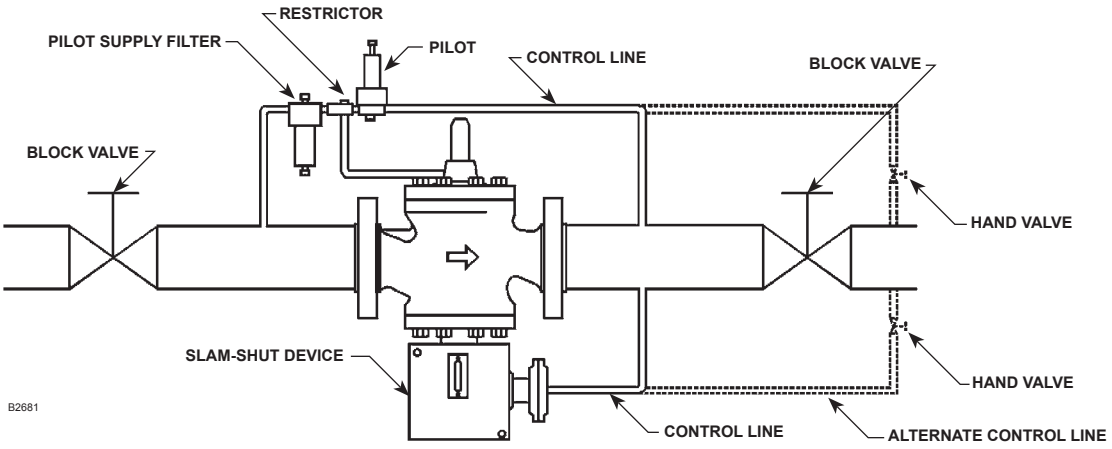


Figure 12. *Slam-Shut Device in Closed Position*

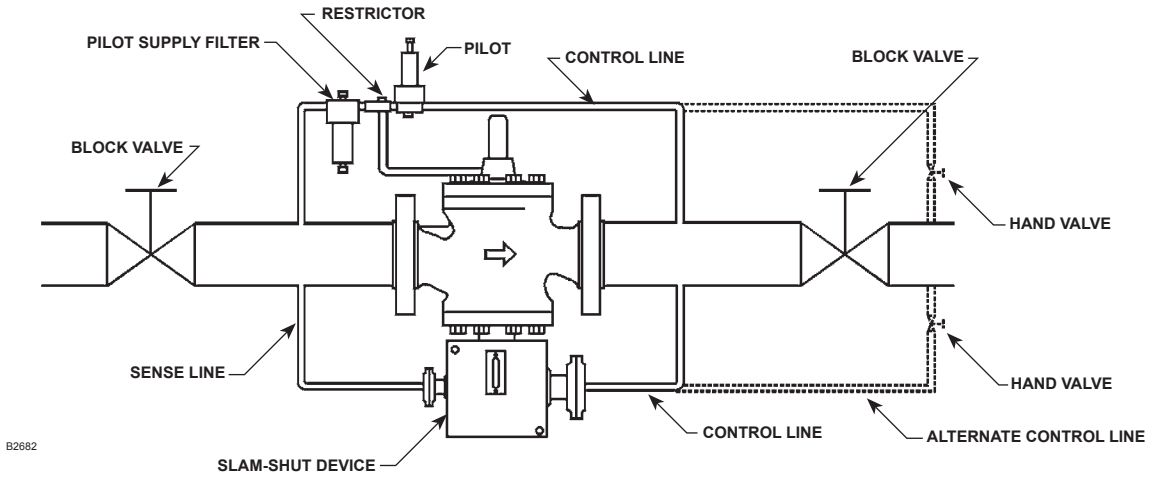
Table 17. *Approximate Weights Including 161EB Series, 161AY Series, PRX Series Pilot and Restrictor*[1][2]

BODY SIZE, INCHES (DN)	CAST IRON MAIN VALVE BODY, POUNDS (kg)			WCC OR LCC STEEL MAIN VALVE BODY, POUNDS (kg)				WITH OPTIONAL SLAM-SHUT, POUNDS (kg)		
	NPT	CL125 FF	CL250 RF	NPT, SWE, or BWE	CL150 RF	CL300 RF	CL600 RF	CL150 RF	CL300 RF	CL600 RF
1, 1-1/4 (25, 32)	- - - -	- - - -	- - - -	22 (10)	24 (11)	28 (13)	32 (15)	44 (20)	46 (21)	49 (22)
2, 2 x 1 (50, 50 x 25)	52 (24)	50 (23)	59 (27)	51 (23)	54 (24)	58 (26)	65 (29)	86 (39)	90 (41)	95 (43)
3 (80)	- - - -	89 (40)	106 (48)	103 (47)	107 (49)	110 (50)	123 (56)	138 (63)	141 (64)	154 (70)
4 (100)		140 (64)	155 (70)	139 (63)	145 (66)	159 (72)	192 (87)	177 (80)	191 (87)	224 (102)
6 x 4 (150 x 100)		- - - -	- - - -	270 (122)	280 (127)	292 (132)	394 (179)	- - - -	- - - -	- - - -
8 x 4 (200 x 100)				390 (177)	461 (209)	515 (234)	600 (272)			
6 (150)		205 (93)	225 (102)	200 (91)	210 (95)	235 (107)	350 (159)	423 (192)	465 (211)	537 (244)
8 x 6 (200 x 150)		- - - -	- - - -	600 (272)	571 (259)	625 (284)	680 (308)	- - - -	- - - -	- - - -
12 x 6 (300 x 150)				1160 (526)	994 (451)	1102 (500)	1590 (721)			
8 (200)				- - - -	635 (288)	685 (310)	790 (358)			

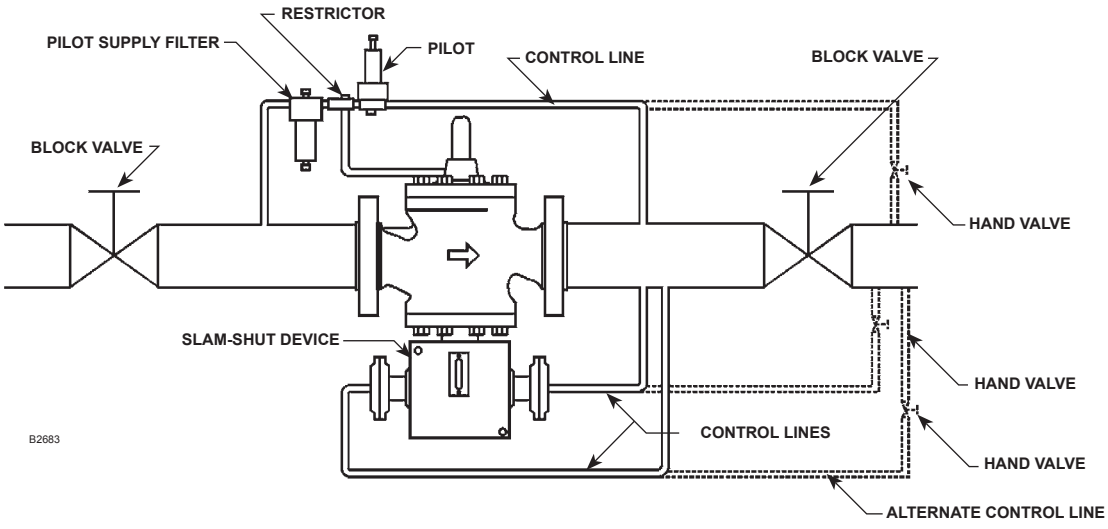
1. Add an additional 15 pounds (6,8 kg) to get the weight with a 161AY Series pilot.
2. Add an additional 5 pounds (2,3 kg) to get the weight of PRX Series pilot.



13A—*Overpressure and Underpressure Shutoff Using One Manometric Device (This Application Might Require Two Manometric Devices As Shown In Figure 13C)*

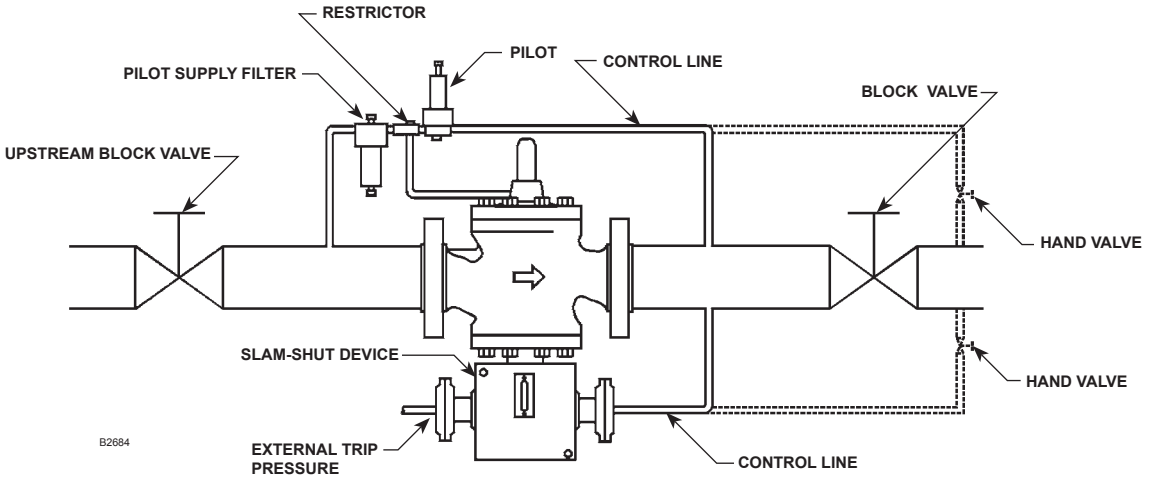


13B—*Minimum and Maximum Upstream and Downstream Pressure*

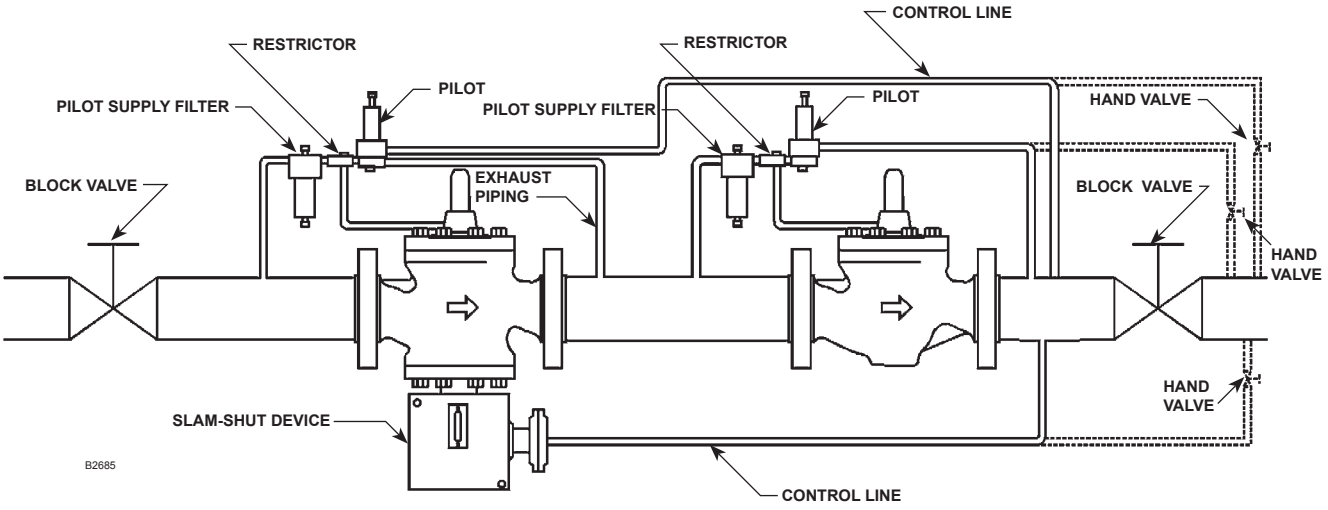


13C—*Overpressure and Underpressure Shutoff Using Separate Manometric Devices*

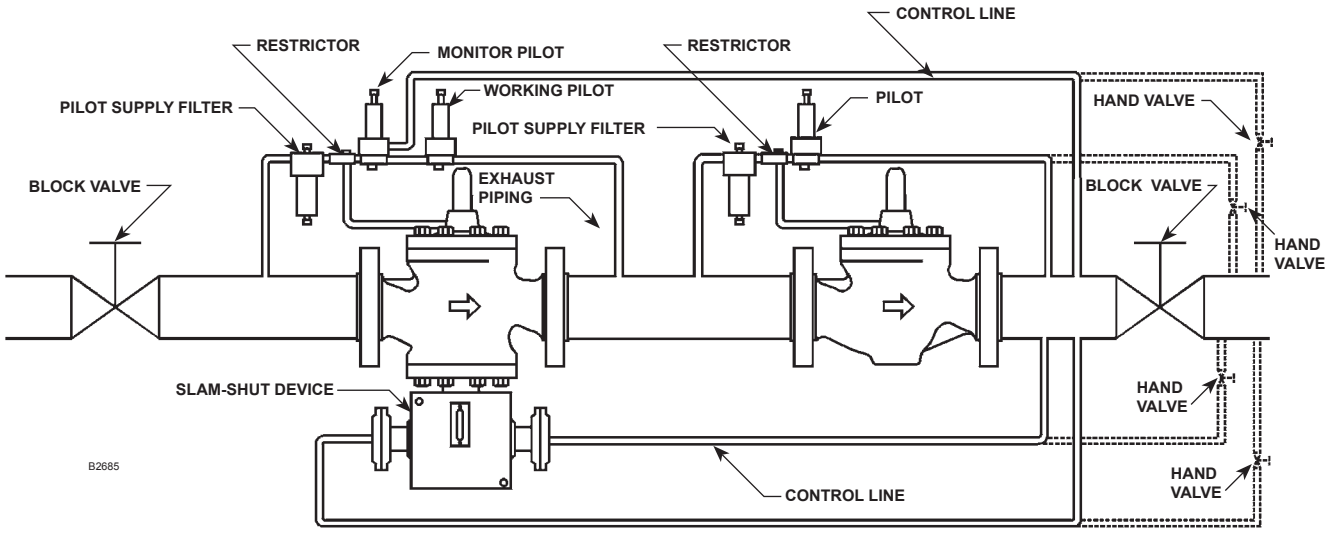
Figure 13. *Type EZR with Optional Slam-Shut Device Installation Schematics*



***13D—**External Signal*

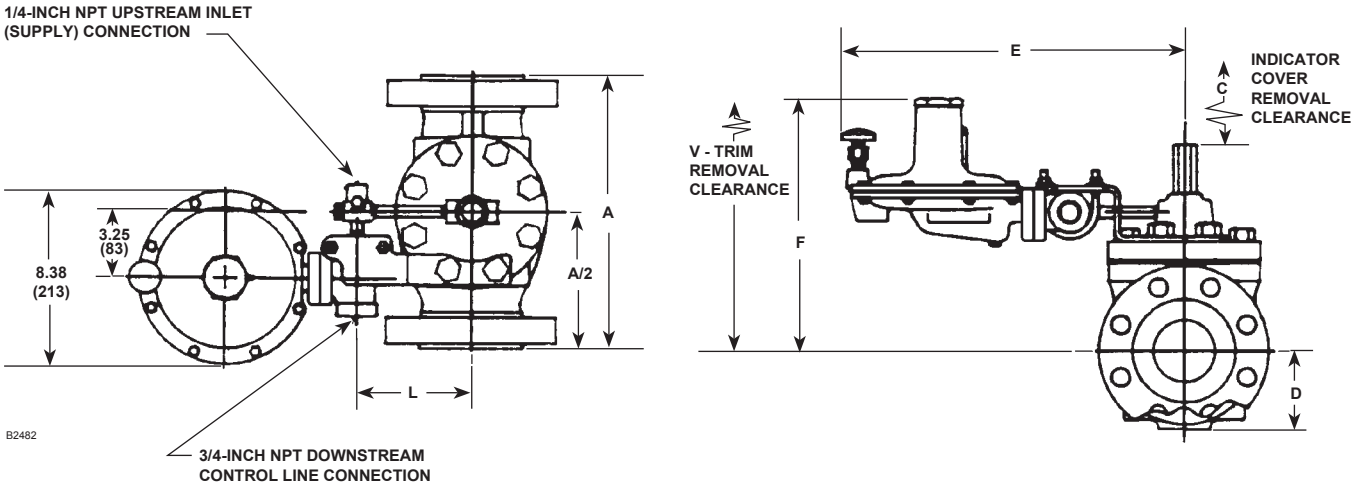


***13E—**Wide-Open Monitoring System with Slam-Shut Device for Overpressure and Underpressure Shutoff Using One Manometric Device (This Application Might Require Two Manometric Devices As Shown In Figure 13F)*

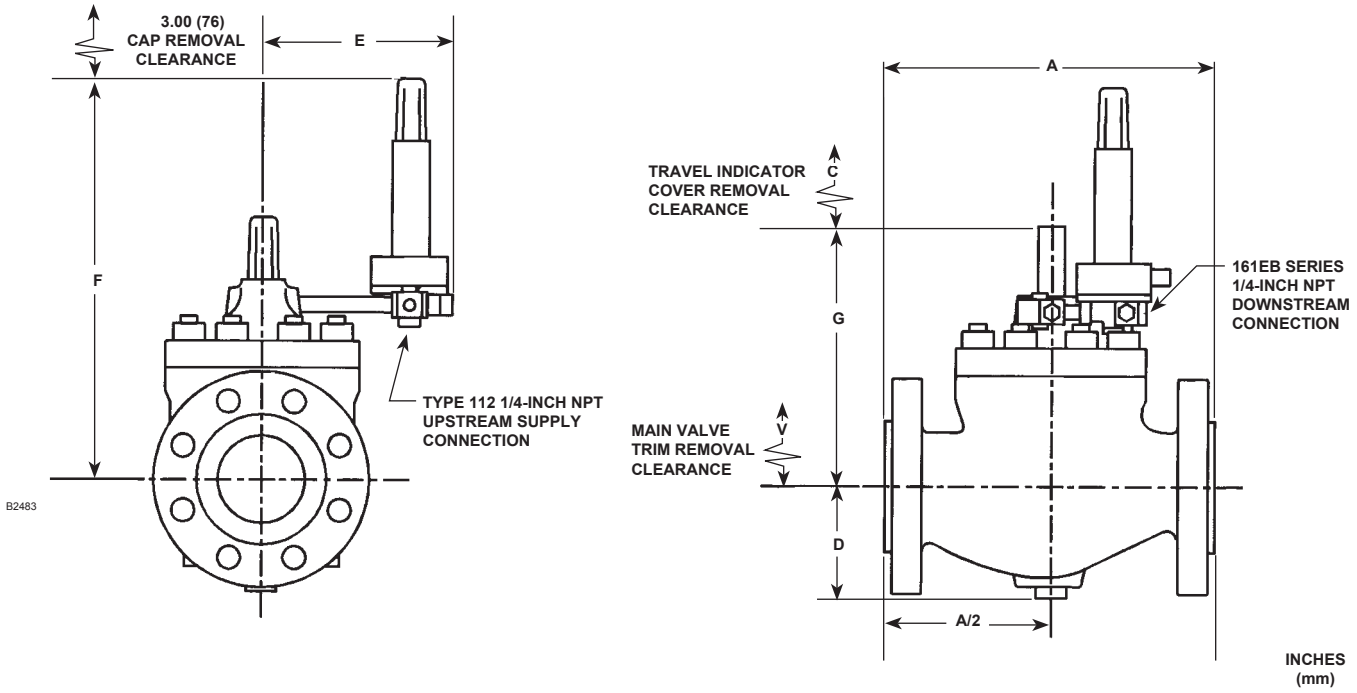


***13F—**Working Monitoring System with Slam-Shut Device for Overpressure and Underpressure Shutoff Using Two Manometric Devices (This Application Might Only Require One Manometric Device As Shown In Figure 13E)*

***Figure 13.** Type EZR with Optional Slam-Shut Device Installation Schematics (continued)*

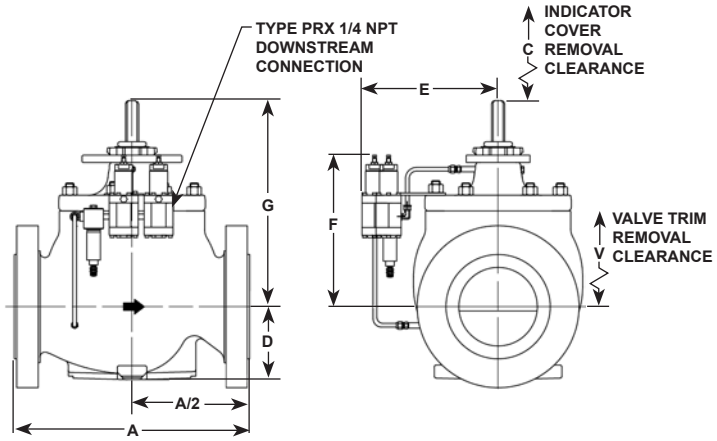


TYPE EZR WITH 161AY SERIES PILOT



TYPE EZR WITH 161EB SERIES PILOT

Figure 14. *Dimensions*

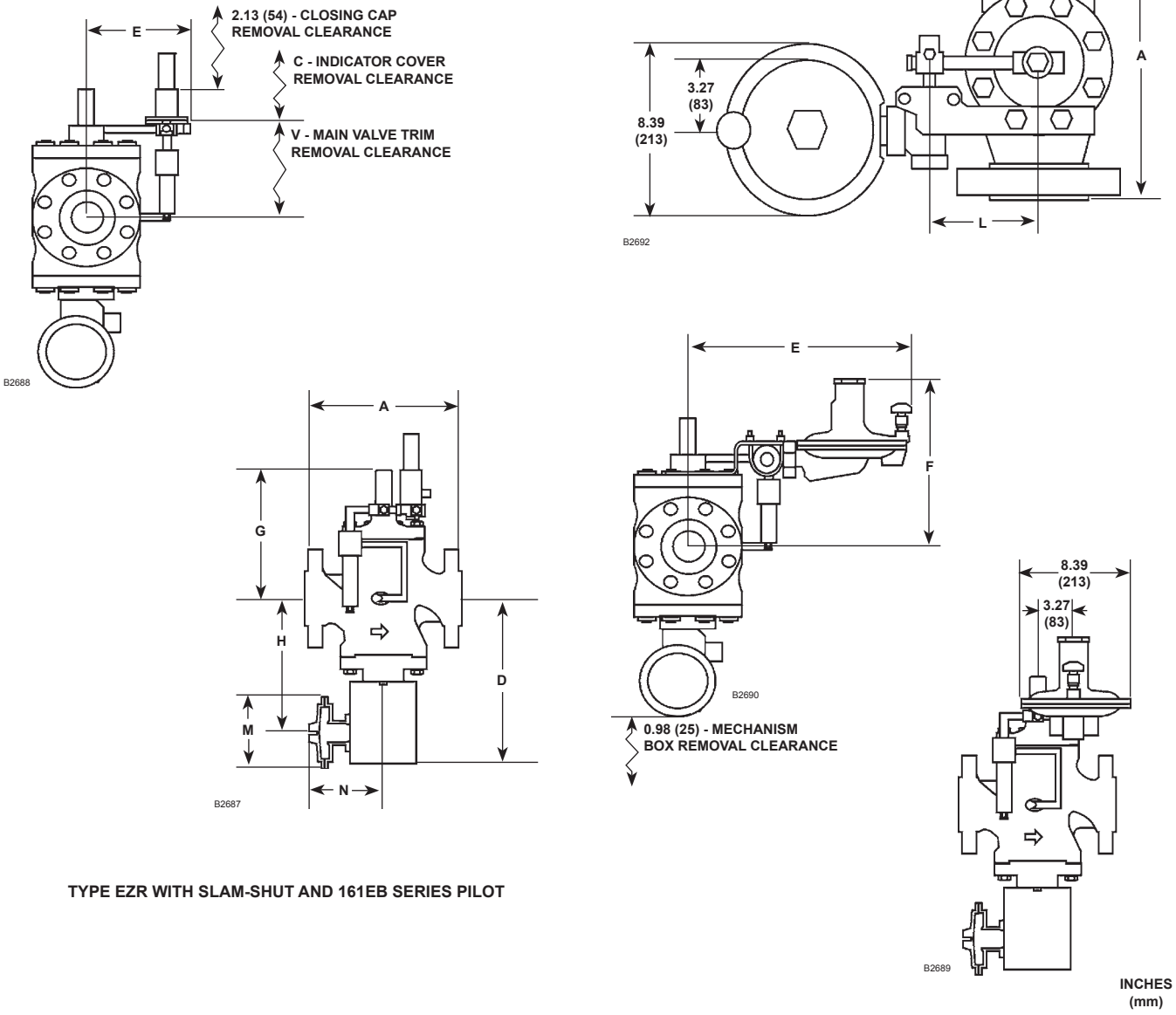


8-INCH (DN 200) TYPE EZR WORKING MONITOR SET

BODY SIZE, INCHES (DN)	DIMENSIONS, INCHES (mm)[1]														
	A				C	D (Max)	E Type 161AY	E Type 161EB	E Type PRX	F Type 161AY	F Type 161EB	F Type PRX	G	L	V
	SWE or NPT	CL125B FF or CL150 RF	CL250B or CL300 RF	CL600 RF or BWE											
1, 1-1/4 (25, 32)	8.3 (210)	7.3 (184)	7.75 (197)	8.3 (210)	2.7 (68)	2.4 (60)	15.7 (399)	6.4 (162)	6.54 (166)	10.1 (257)	13.5 (342)	10.89 (276)	7.4 (189)	6.2 (158)	1.4 (37)
2, 2 x 1 (50, 50 x 25)	11.3 (287)	10.0 (254)	10.5 (267)	11.3 (287)	2.0 (51)	3.1 (79)	15.8 (401)	6.5 (165)	7.20 (183)	10.4 (264)	13.7 (347)	11.13 (283)	9.0 (229)	4.88 (124)	11.0 (279)
3 (80)		11.8 (300)	12.5 (317)	13.3 (338)	3.8 (97)	3.8 (97)	16.3 (414)	7.1 (181)	8.21 (208)	11.5 (292)	15.9 (404)	13.6 (334)	13.3 (338)	5.25 (133)	19.5 (495)
4 (100)		13.9 (353)	14.5 (368)	15.5 (394)	3.8 (97)	5.1 (130)	16.7 (424)	7.4 (187)	8.68 (220)	14.0 (356)	17.3 (439)	14.53 (369)	14.7 (373)	5.40 (137)	20.7 (526)
6 x 4[2] (150 x 100)		17.8 (452)	18.6 (472)	20.0 (508)	3.8 (97)	5.3 (135)	16.7 (424)	7.1 (181)	8.68 (220)	15.3 (387)	17.3 (439)	14.53 (369)	15.9 (404)	6.4 (163)	21.6 (549)
8 x 4[2] (200 x 100)		21.4 (544)	22.4 (569)	24.0 (610)	3.8 (97)	5.9 (150)	16.7 (424)	7.1 (181)	8.68 (220)	15.3 (387)	17.3 (439)	14.53 (369)	16.0 (406)	6.4 (163)	21.6 (549)
6 (150)	- - - -	17.8 (452)	18.6 (472)	20.0 (508)	3.8 (97)	5.5 (140)	19.1 (485)	9.8 (249)	10.6 (269)	15.2 (386)	18.6 (471)	16.49 (419)	15.2 (386)	5.6 (142)	22.8 (579)
8 x 6[2] (200 x 150)		21.4 (544)	22.4 (569)	24.0 (610)	3.8 (97)	7.2 (183)	19.1 (485)	9.8 (249)	10.6 (269)	16.6 (422)	18.6 (471)	16.49 (419)	16.6 (422)	5.6 (142)	25.9 (658)
12 x 6[2] (300 x 150)		29.0 (737)	30.5 (775)	32.3 (820)	3.8 (97)	10.0 (254)	19.1 (485)	9.8 (249)	10.6 (269)	19.3 (490)	18.6 (471)	16.49 (419)	19.3 (490)	5.6 (142)	29.0 (737)
8 (200)		21.9 (558)	22.4 (570)	24.0 (610)	4.5 (114)	8.25 (210)	20.5 (521)	14.5 (368)	13.79 (349)	16.5 (419)	23.5 (597)	15.44 (392)	20.6 (522)	7.5 (190)	27.0 (686)

1. Contact your local Sales Office for DIN flange sizes and standard face-to-face dimensions.
2. Internal dimensions of 6 x 4, 8 x 4, 8 x 6, 12 x 6-inch (DN 150 x 100, 200 x 100, 200 x 150, 300 x 150) Types EZR and 399 bodies are not the same as the EW valve bodies and are not interchangeable.

Figure 14. *Dimensions (continued)*



TYPE EZR WITH SLAM-SHUT AND 161EB SERIES PILOT

TYPE EZR WITH SLAM-SHUT AND 161AY SERIES PILOT

BODY SIZE, INCHES (DN)	DIMENSIONS WITH SLAM-SHUT, INCHES (mm)						
	H	D	M(1)		N		
			Diaphragm	Piston	Diaphragm	Piston	Bellows
1 (25)	9.8 (250)	12 (305)	6.4 (162)	2.8 (71)	6.9 (175)	8.0 (204)	8.8 (223)
2 (50)	10.4 (265)	13 (330)	6.38 (162)	2.80 (71)	6.89 (175)	8.03 (204)	8.78 (223)
3 (80)	11.8 (300)	14.34 (364)					
4 (100)	13.6 (345)	15.64 (397)					
6 (150)	13.0 (330)	16.2 (411)					

1. Type 71 BMS with a diaphragm has an M dimension of 2.80 inches (71 mm).

Figure 14. *Dimensions (continued)*

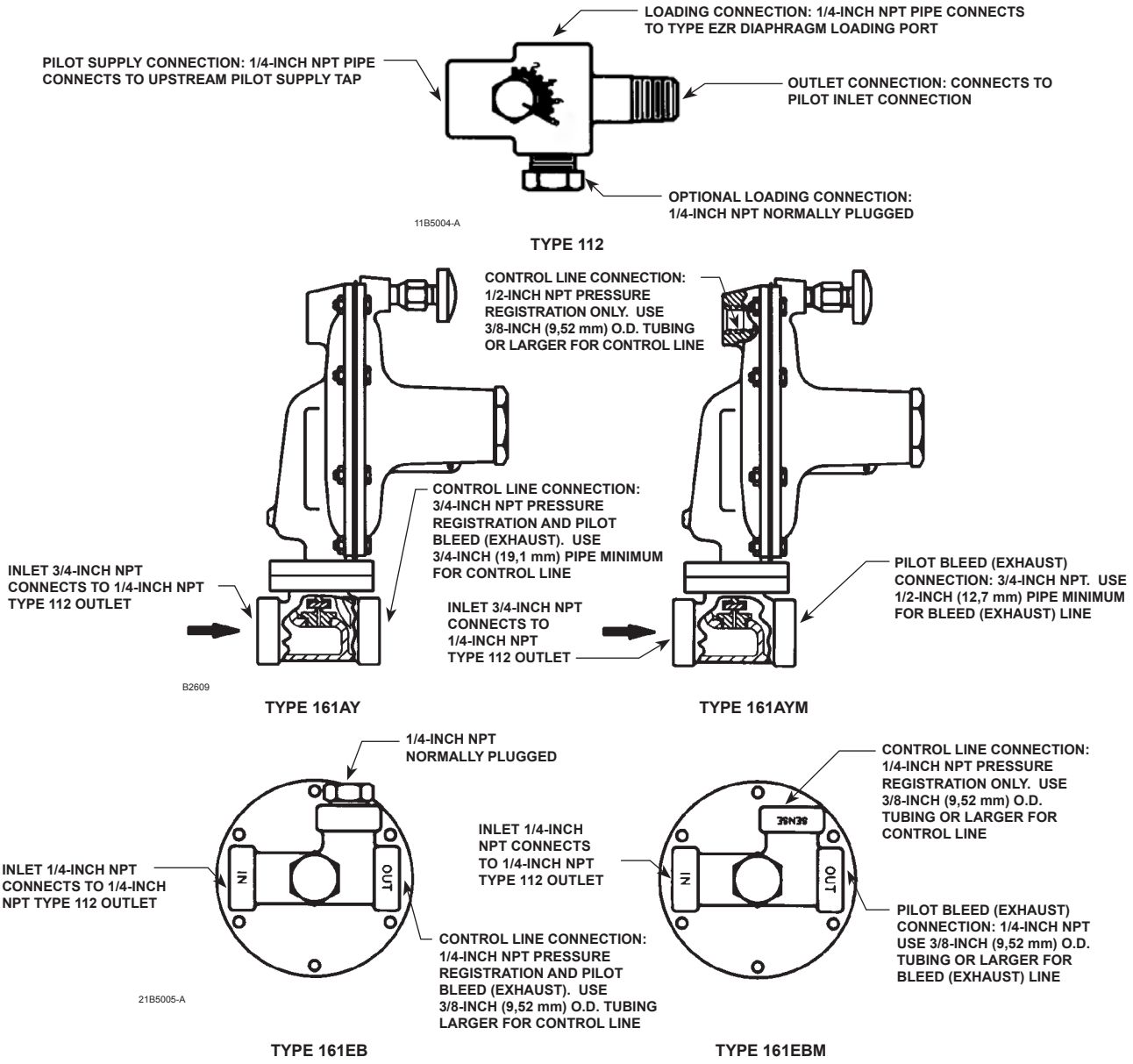


Figure 15. *Pilot Port Function and Connection Sizes*

Ordering Information

The precision slotted cage of the Type EZR regulator offers superior noise attenuation. For a standard installation, as well as to obtain a noise prediction for your installation and service conditions, please complete the specifications worksheet at the bottom of the ordering guide on page 32.

Carefully review each specification, then complete the Ordering Guide on pages 30, 31, and 32. If a pilot setpoint is not requested, the regulator will be factory set at the approximate midrange.

Type EZR Ordering Guide

Body Size (Select)

- ☐ 1-inch (DN 25) (Available in steel only)***
- ☐ 1-1/4-inch (Available in NPT steel only)***
- ☐ 2-inch (DN 50)***
- ☐ 2 x 1-inch (DN 50 x 25)***
- ☐ 3-inch (DN 80)***
- ☐ 4-inch (DN 100)***
- ☐ 6 x 4-inch (DN 150 x 100)***
- ☐ 8 x 4-inch (DN 200 x 100)***
- ☐ 6-inch (DN 150)***
- ☐ 8 x 6-inch (DN 200 x 150)***
- ☐ 12 x 6-inch (DN 300 x 150)***
- ☐ 8-inch (DN 200)***

Type EZR Ordering Guide (continued)

Body Material and End Connection Style (Select One) (8-inch (DN 200) size available only in steel CL150, CL300, or CL600 RF)

Cast Iron Body

- ☐ NPT (Available in 2 or 2 x 1-inch only)***
- ☐ CL125B FF***
- ☐ CL250B RF***

WCC or LCC Steel Body

- ☐ NPT (Available in 1, 1-1/4, 2 x 1, or 2-inch only)***
- ☐ CL150 RF***
- ☐ CL300 RF***
- ☐ CL600 RF***
- ☐ SWE (Available in 1, 2 x 1, or 2-inch (DN 25, 50 x 25, or 50) only)*
- ☐ BWE 40**
- ☐ BWE 80*
- ☐ PN 16/25/40* _____ specify

Main Valve Diaphragm Material (Select One)

- ☐ 17E68 Nitrile (NBR) (low temperature) (Not available on 6 or 8-inch (DN 150 or 200) sizes)***
- ☐ 17E97 Nitrile (NBR) (high-pressure/erosion resistance)***
- ☐ 17E88 Fluorocarbon (FKM) (high aromatic hydrocarbons) (Not available on 6 or 8-inch (DN 150 or 200) sizes)**

Cage, Percent of Full Capacity (Select One)

- ☐ 100 percent (**standard**)***
- ☐ 60 percent (Not available on 8-inch (DN 200) size)***
- ☐ 30 percent (Not available on 8-inch (DN 200) size)***

Main Valve O-Ring Material (Select One)

- ☐ Nitrile (NBR) (**standard**)***
- ☐ Fluorocarbon (FKM)**

Main Valve Main Spring (See Table 7 for Maximum Inlet Rating) (Select One)

1, 1-1/4, or 2 x 1-inch (DN 25, or 50 x 25) Main Valve

- ☐ Light Blue***
- ☐ Black***
- ☐ Black with white stripe***
- ☐ Red***

2-inch (DN 50) Main Valve

- ☐ Yellow***
- ☐ Green***
- ☐ Red***
- ☐ Purple

3-inch (DN 80) Main Valve

- ☐ Yellow***
- ☐ Light Blue***
- ☐ Black***

4-inch (DN 100) Main Valve

- ☐ Yellow***
- ☐ Green***
- ☐ Red***

6-inch (DN 150) Main Valve

- ☐ Yellow***
- ☐ Green***
- ☐ Red***

8-inch (DN 200) Main Valve

- ☐ Yellow***
- ☐ Green***
- ☐ Red***

Travel Indicator (Select One)

- ☐ No (**standard**)***
- ☐ Yes***

Inlet Strainer (Select One)

- ☐ No (**standard**)***
- ☐ Yes***

Inlet Body Tap (Select One)

- ☐ Inlet body tap only (**standard**)***
- ☐ Inlet body tap with pre-piped pilot supply***
- ☐ Inlet/outlet body taps only***
- ☐ Inlet/outlet body taps with pre-piped pilot supply and pilot bleed***

Pilot Diaphragm Material (Select One)

- ☐ Nitrile (NBR) (**standard**)***
- ☐ Fluorocarbon (FKM)**

Pilot O-Ring Material (Select One)

- ☐ Nitrile (NBR) (**standard**)***
- ☐ Fluorocarbon (FKM)***

Pilot Valve Plug Material (Select One)

- ☐ Nitrile (NBR) (**standard**)***
- ☐ Fluorocarbon (FKM)***

Pilot Mounting (Select One)

- ☐ Standard***
- ☐ Quick Disconnect Union**

Pilot Type and Outlet Pressure Range (Select One)

Type 161AY

- ☐ 6 to 15-inches w.c. (15 to 37 mbar)***
- ☐ 0.5 to 1.2 psig (0,034 to 0,083 bar)***
- ☐ 1.2 to 2.5 psig (0,083 to 0,172 bar)***
- ☐ 2.5 to 4.5 psig (0,172 to 0,3 bar)***
- ☐ 4.5 to 7 psig (0,3 to 0,48 bar)***

Pilot Type and Outlet Pressure Range (Select One)

Type 161AYM

- ☐ 6 to 15-inches w.c. (15 to 37 mbar)***
- ☐ 0.5 to 1.2 psig (0,034 to 0,083 bar)***
- ☐ 1.2 to 2.5 psig (0,083 to 0,172 bar)***
- ☐ 2.5 to 4.5 psig (0,172 to 0,3 bar)***
- ☐ 4.5 to 7 psig (0,3 to 0,48 bar)***

Type 161EB

- ☐ 5 to 15 psig (0,34 to 1,0 bar)***
- ☐ 10 to 40 psig (0,69 to 2,8 bar)***
- ☐ 30 to 75 psig (2,1 to 5,2 bar)***
- ☐ 70 to 140 psig (4,8 to 9,7 bar)***
- ☐ 130 to 200 psig (9,0 to 13,8 bar)***
- ☐ 200 to 350 psig (13,8 to 24,1 bar)***

Type 161EBM

- ☐ 5 to 15 psig (0,34 to 1,0 bar)***
- ☐ 10 to 40 psig (0,69 to 2,8 bar)***
- ☐ 30 to 75 psig (2,1 to 5,2 bar)***
- ☐ 70 to 140 psig (4,8 to 9,7 bar)***
- ☐ 130 to 200 psig (9,0 to 13,8 bar)***
- ☐ 200 to 350 psig (13,8 to 24,1 bar)***

Type EZR Ordering Guide (continued)

Type PRX120/125

- ☐ 7.3 to 16 psig (0,5 to 1,1 bar)***
- ☐ 14.5 to 26 psig (1 to 1,8 bar)***
- ☐ 23 to 44 psig (1,6 to 3 bar)***
- ☐ 41 to 80 psig (2,8 to 5,5 bar)***
- ☐ 73 to 123 psig (5 to 8,5 bar)***
- ☐ 116 to 210 psig (8 to 14,5 bar)***
- ☐ 203 to 334 psig (14 to 23 bar)***
- ☐ 319 to 435 psig (22 to 30 bar)***

Type PRX120/125-AP

- ☐ 435 to 1160 psig (30 to 80 bar)***

Type 252 Pilot Supply Filter (Optional)

Material	Length	Drain Valve
☐ Stainless steel***	☐ Standard***	☐ Yes***
☐ Aluminum**	☐ Extended**	☐ No**

Conversion Trim Package (Optional, Not available for 8-inch (DN 200) size)

- ☐ Yes, send one conversion trim package. (If ordering replacement trim package for change-out of existing Fisher® E-body to a Type EZR, be sure to mark selection of the following items on this page: body size, diaphragm material, inlet strainer option, and travel indicator option desired.)

Regulators Quick Order Guide	
* * *	Readily Available for Shipment
* *	Allow Additional Time for Shipment
*	Special Order, Constructed from Non-Stocked Parts. Consult your local Sales Representative for Availability.
Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction.	

Main Valve Replacement Parts Kit (Optional)

- ☐ Yes, send one diaphragm cartridge and O-rings kit to match this order.
- ☐ Yes, send one diaphragm and O-rings kit to match this order.

Pilot Replacement Parts Kit (Optional)

- ☐ Yes, send one replacement kit to match this order.

Slam-Shut Device (Optional)

Contact your local Sales Office for assistance.

Specification Worksheet

Application (Please designate units):

Specific Use _____
Line Size _____
Gas Type and Specific Gravity _____
Gas Temperature _____
Does the Application Require Overpressure Protection?
☐ Yes ☐ No If yes, which is preferred:
☐ Relief Valve ☐ Monitor Regulator ☐ Shutoff Device
Is overpressure protection equipment selection assistance desired? _____

Pressure:

Maximum Inlet Pressure (P_{1max}) _____
Minimum Inlet Pressure (P_{1min}) _____
Downstream Pressure Setting(s) (P_2) _____
Maximum Flow (Q_{max}) _____

Performance Required:

Accuracy Requirements? _____
Need for Extremely Fast Response? _____

Other Requirements: _____

Industrial Regulators
Regulator Division
Emerson Process Management

USA - Headquarters
McKinney, Texas 75070 USA
Tel: 1-800-558-5853
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