

August 2025

Type EZH Relief or Backpressure Regulator

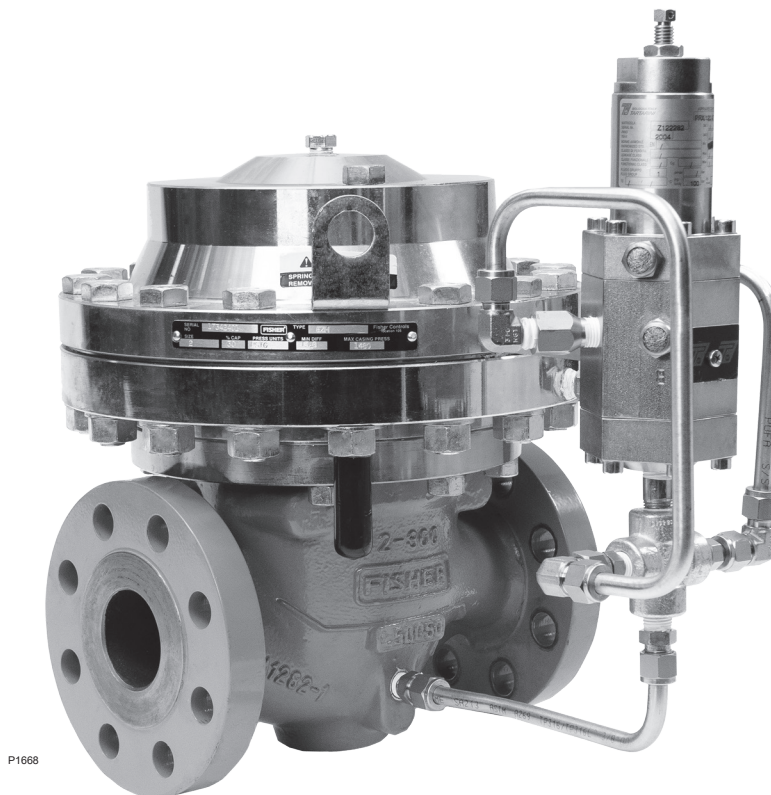


Figure 1. Type EZH Relief Valve or Backpressure Regulator

Features

- **Bubble Tight Shutoff**—A knife-edged metal plug and a soft seat provide bubble tight shutoff
- **Precise Pressure Control**—The PRX Series pilot system provides stable and accurate pressure control.
- **Versatility**—By changing from a relief piloting system to a pressure reducing piloting system, it easily becomes a pressure reducing regulator.
- **Quiet Operation**—The Whisper Trim™ Cage option reduces noise by up to 8 dBA.
- **Travel Indicator**—Simplifies in-service inspection and system troubleshooting.
- **Main Diaphragm**—The main diaphragm is Nitrile (NBR) reinforced with fabric and coated with PVC, which protects and extends the service life in applications with aromatic hydrocarbons.
- **Full Usable Capacity**—Fisher™ brand regulators are laboratory tested. 100% of the published flow capacity can be used with confidence.
- **Disk Design**—The Type EZH offers disks for the main body made from Nitrile (NBR), Fluorocarbon (FKM) and Polyurethane (PU). Polyurethane (PU) provides better abrasion resistance properties and a high durometer rating to extend the working life of the disk in difficult applications such as high pressure drop and low flow.
- **Full Pressure Rating**—The Type EZH has an equal inlet and outlet pressure rating of 1500 psig / 103 bar.

Type EZH

Specifications

Ratings and specifications for the Type EZH are listed in the Specifications section below. Specifications for specific relief valve or backpressure regulator constructions are stamped on a nameplate attached to either the main actuator or the pilot spring case.

Available Configurations

Type EZH: Pilot-operated relief or backpressure regulator for low to high outlet pressure.

An external restriction is required when utilizing the Type PRX/182 with the Type EZH.

Body Sizes, End Connection Styles and Pressure Ratings⁽¹⁾

See Table 1

Maximum Allowable Pressures⁽¹⁾

Inlet Pressure: 1500 psig / 103 bar

Outlet (Casing) Pressure: 1500 psig / 103 bar

Emergency Casing Pressure: 1500 psig / 103 bar

Minimum Buildup Pressure

Main Valve: 1500 psid / 103 bar d

Pilot (*Between loading pressure in pilot and loading sense pressure*): 1233 psid / 85.0 bar d

Minimum Differential Pressures

See Table 3

Relief Set Pressure Ranges

See Table 2

Flow and Sizing Coefficients

See Tables 5 and 6

Flow Capacities

See Table 7

Pilot and Filter-Regulator Flow Coefficients

Type PRX Pilot: C_g : 10.5; C_v : 0.36; C_f : 29

Pressure Registration

External

Pilot Connections

1/4 NPT

Temperature Capabilities⁽¹⁾

Nitrile (NBR) Version:

-20 to 180°F / -29 to 82°C

Fluorocarbon (FKM) Version:

0 to 180°F / -18 to 82°C⁽²⁾

Polyurethane (PU) Version:

NPS 1, 2, 6, 8, 12 x 6 / DN 25, 50, 150, 200, 300 x 150 Sizes:

-22 to 180°F / -30 to 82°C

NPS 3 to 4 / DN 80 to 100 Sizes:

-4 to 180°F / -20 to 82°C

Option

Travel Indicator

Whisper Trim™ Cage

Construction Materials

Main Valve

Main Valve Body:

Type EZH: WCC Steel

Intermediate Flange and Actuator Casings:

Steel, ASTM A350 LF2

Diaphragm Plates: Steel, ASTM A105

Diaphragm: Nitrile (NBR) with PVC coating

O-rings: Fluorocarbon (FKM)

Disk: Nitrile (NBR), Fluorocarbon (FKM) or Polyurethane (PU)

PRX Series Pilots

Body: Steel, ASTM 105

Trim: Stainless Steel

Elastomers: Nitrile (NBR) or Fluorocarbon (FKM)

Disk: Polyurethane (PU) or Fluorocarbon (FKM)

Approximate Weights

See Table 9

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.

2. Type PRX Fluorocarbon (FKM) elastomer is limited to 0°F / -18°C.

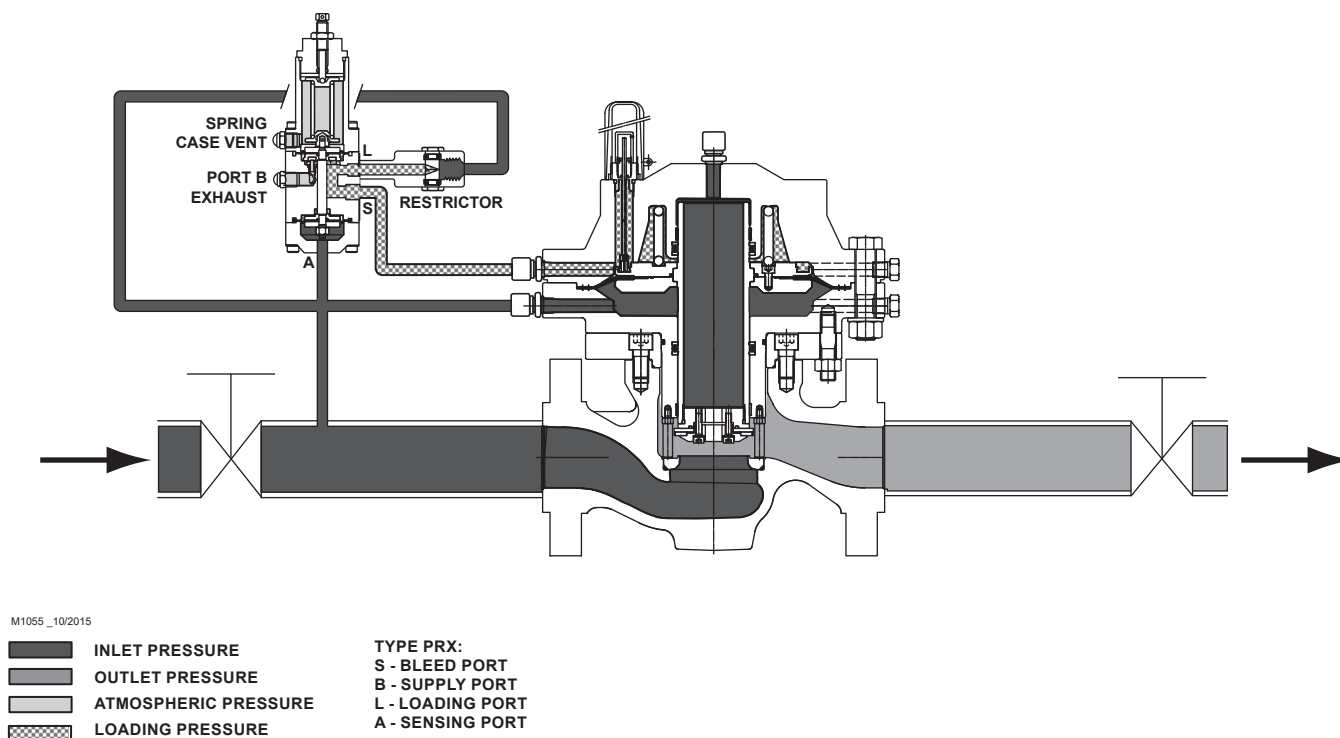


Figure 2. Type EZH with Type PRX/182 Pilot

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

MAIN VALVE BODY SIZE		MAIN VALVE BODY MATERIAL	END CONNECTION STYLE	STRUCTURAL DESIGN RATING	
NPS	DN			psig	bar
1 and 2	25 and 50	LCC or WCC Steel	NPT or SWE	1500	103
1, 2, 3, 4, 6, 12 x 6 and 8	25, 50, 80, 100, 150, 300 x 150 and 200	WCC Steel	CL150 RF	290	20.0
			CL300 RF	750	51.7
			CL600 RF or BWE	1500	103

Introduction

Type EZH is an accurate pilot-operated, pressure-balanced, soft-seated relief valve or backpressure regulator. It is designed for use in high pressure natural gas transmission/city gate stations, large capacity distribution systems and power plant feeds. It provides smooth and reliable operation, tight shutoff and long life.

Pilot Descriptions

The Type EZH relief valve or backpressure regulator include a Type PRX/182 pilot mounted on the EZH Series main valves for relief valve or backpressure regulator applications. PRX Series pressure reducing pilots have the ability to handle a wide range of setpoints from 29 to 1160 psig / 2.0 to 80.0 bar.

Principle of Operation

A pressure relief valve is a throttling pressure control device that opens and closes to ensure the downstream pressure does not rise above a predetermined pressure. Fisher™ relief valves cannot be used as ASME safety relief valves. A backpressure regulator is a device that controls and responds to changes in the upstream pressure. It functions the same as a relief valve in that it opens on increasing upstream pressure.

As long as the inlet pressure is below the set pressure, the pilot control spring keeps the pilot valve plug closed. Inlet pressure passes through the restrictor and registers as loading pressure on the main valve diaphragm chamber. Force from the main spring, in addition to pilot loading pressure, provide loading pressure to keep the main valve diaphragm and plug assembly tightly shut off. When the inlet pressure rises above the set pressure, the pressure on the pilot diaphragm overcomes the pilot control spring and opens the pilot valve plug. The pilot then exhausts the loading pressure from the main valve diaphragm chamber. The pilot continuously exhausts gas when the inlet pressure is above the set pressure. The inlet pressure unbalance overcomes the main spring force and opens the diaphragm and plug assembly.

As the inlet pressure drops below the set pressure, the pilot control spring closes the pilot valve plug and the exhaust to atmosphere stops. Force from the main spring, along with pilot loading pressure, pushes the diaphragm and plug assembly onto the knife-edged seat, producing tight shutoff.

Capacity Information

Note

EZH Series flow capacities are laboratory verified; therefore, it may be sized for 100% flow using published capacities as shown. It is not necessary to reduce published capacities.

Table 7 show the natural gas regulating capacities of the Type EZH relief or backpressure regulator at selected inlet pressures and outlet pressure settings. Flows are in thousands of SCFH at 60°F and 14.7 psia (or in thousands of Nm³/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. Then, if capacity is desired in Nm³/h at 0°C and 1.01325 bar, multiply SCFH by 0.0268.

To find approximate regulating capacities at pressure settings not given in Table 7 or to find wide-open flow capacities for relief sizing at any inlet pressure, perform one of the following procedures. Then convert using the factors provided above, if necessary.

Critical Pressure Drops

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

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

Non-Critical Pressure Drops

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

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

where,

Q = gas flow rate, SCFH

P₁ = absolute inlet pressure, psia (P₁ gauge + 14.7)

C_g = regulating or wide-open gas sizing coefficient

G = gas specific gravity of the gas

T = absolute temperature of gas at inlet, °Rankine

C₁ = flow coefficient

ΔP = pressure drop across the regulator, psi

Table 2. Relief Set Pressure Ranges

PILOT TYPE	RELIEF SET PRESSURE RANGE		PILOT CONTROL INFORMATION							
			Part Number	Color	Wire Diameter		Free Length		Maximum Emergency Pressure	
	psig	bar			In.	mm	In.	mm	psig	bar
PRX/182	29 to 116	2.0 to 8.0	M0255220X12	Black	0.157	4.00	2.16	55	1480	102
	73 to 290	5.0 to 20.0	M0255200X12	Gold	0.217	5.50	2.01	51		
	217 to 609	15.0 to 42.0	M0255190X12	Red	0.256	6.50	1.97	50		
PRX-AP/182	435 to 1160	30.0 to 80.0	M0273790X12	Clear	0.335	8.50	3.94	100	1480	102

Table 3. Minimum Differential Pressures

TYPE	MAIN VALVE BODY SIZE		MINIMUM DIFFERENTIAL			
	NPS	DN	For 90% Capacity		For 100% Capacity	
			psid	bar d	psid	bar d
EZH	1	25	15.2	1.1	15.7	1.1
	2	50	12.0	0.83	13.8	0.95
	3	80	10.6	0.73	12.8	0.88
	4	100	15.8	1.1	16.4	1.1
	6, 8, 12 x 6	150, 200, 300 x 150	----	----	14.0	0.98

Table 4. Relief Set Pressure Build-Up Table

PILOT TYPE	SET PRESSURE CONTROL RANGE, SPRING PART NUMBER AND COLOR, psig / bar	SET PRESSURE ⁽¹⁾		BUILD-UP OVER SET PRESSURE NEEDED TO BEGIN OPENING MAIN VALVE ⁽²⁾		BUILD-UP OVER SET PRESSURE NEEDED TO FULLY OPEN MAIN VALVE ⁽³⁾		PRESSURE DROP BELOW SET PRESSURE NEEDED TO RESEAT PILOT	
		psig	bar	psig	bar	psig	bar	psig	bar
PRX/182	29 to 116 / 2 to 8 M0255220X12 Black	30	2.1	1.7	0.12	3.4	0.23	0.9	0.06
		60	4.1	2.7	0.19	4.7	0.32	0.9	0.06
		80	5.5	2.8	0.19	5.3	0.36	0.9	0.06
		100	6.9	3.8	0.26	6.3	0.43	0.9	0.06
	73 to 290 / 5 to 20 M0255200X12 Gold	75	5.2	3.7	0.25	7.7	0.53	1.9	0.13
		100	6.9	3.7	0.25	9.2	0.63	1.9	0.13
		150	10.3	4.7	0.32	9.8	0.68	1.9	0.13
		200	13.8	5.0	0.34	10.9	0.75	1.9	0.13
	217 to 609 / 14.9 to 41.7 M0255190X12 Red	250	17.2	5.0	0.34	11.5	0.79	1.9	0.13
		225	15.5	5.0	0.34	13.7	0.95	2.5	0.17
		300	20.7	5.1	0.35	14.0	0.97	2.5	0.17
		400	27.6	5.2	0.36	14.5	1.00	2.5	0.17
PRX-AP/182	435 to 1160 / 30 to 80 M0273790X12 Clear	450	31.0	5.4	0.37	14.5	1.00	2.5	0.17
		450	31.0	5.4	0.37	14.9	1.03	2.9	0.20
		500	34.5	5.4	0.37	14.9	1.03	3.2	0.22
		600	41.4	6.2	0.43	14.9	1.03	3.2	0.22
		1050	72.4	6.2	0.43	15.6	1.08	3.2	0.22

1. Set pressure is defined as the pressure at which the pilot starts-to-discharge.
2. Crack point pressure of the main valve of the inlet pressure build-up over the set pressure at which the main valve starts audible flow.
3. Inlet pressure build-up over the set pressure for the main valve to achieve wide-open flow capacity.

Table 5. Type EZH Main Valve with Standard Cage Regulating Flow Coefficients

MAIN VALVE BODY SIZE		LINE SIZE EQUALS BODY SIZE			2:1 LINE SIZE TO BODY SIZE PIPING		
NPS	DN	C _g	C _v	C ₁	C _g	C _v	C ₁
1	25	564	16.3	34.6	544	15.3	35.5
2	50	2278	58.5	38.9	2110	62.9	33.5
3	80	4960	133	37.3	4396	143	30.8
4	100	7250	227	31.9	7170	229	31.3
6	150	14,430	462	31.2	13,600	433	31.4
8	200	26,540	720	36.9	25,270	722	35.0
12 x 6	300 x 150	30,490	815	37.4	----	----	----

Table 6. Type EZH Main Valve with Standard Cage IEC Sizing Coefficients

MAIN VALVE BODY SIZE		LINE SIZE EQUALS BODY SIZE			2:1 LINE SIZE TO BODY SIZE PIPING		
NPS	DN	X _T	F _D	F _L	X _T	F _D	F _L
1	25	0.61	0.61	0.89	0.80	0.59	0.89
2	50	0.73	0.59		0.69	0.61	
3	80	0.88	0.58		0.60	0.60	
4	100	0.63	0.63		0.62	0.63	
6	150	0.62	----	0.89	0.62	----	0.89
8	200	0.86	0.69	0.89	0.77	0.69	0.89
12 x 6	300 x 150	0.88	----	0.89	----	----	0.89

Type EZH

Table 7. Capacities for Type EZH with PRX Series Pilot

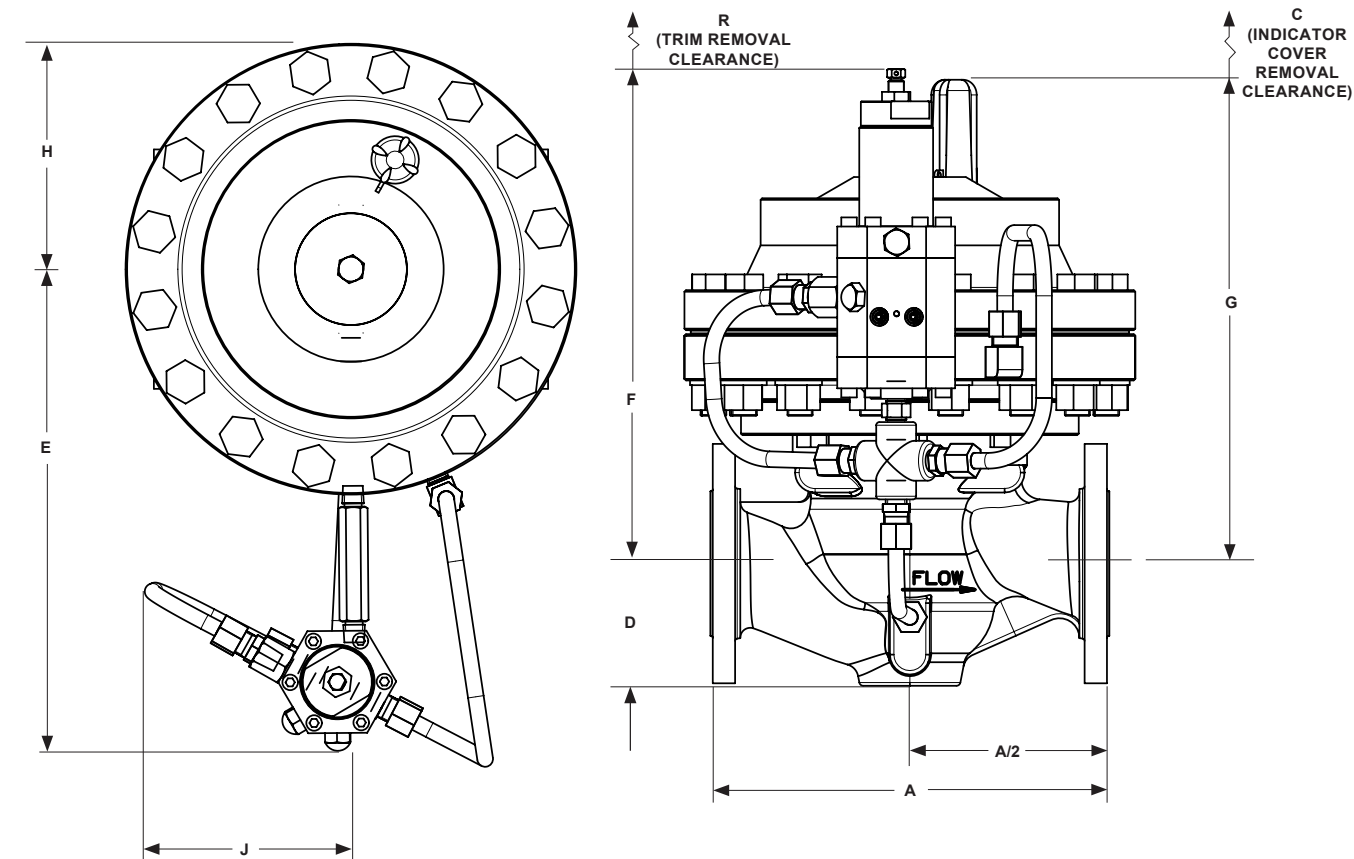
SET PRESSURE RANGE, PILOT SPRING PART NUMBER AND COLOR, psig / bar	SET PRESSURE		CAPACITIES IN THOUSANDS OF SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS													
			NPS 1 / DN 25		NPS 2 / DN 50		NPS 3 / DN 80		NPS 4 / DN 100		NPS 6 / DN 150		NPS 8 / DN 200		NPS 12 x 6 / DN 300 x 150	
	psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
29 to 116 / 2 to 8 M0255220X12 Black	30	2.1	36	0.96	139	3.73	307	8.23	458	12.27	891	23.9	1638	43.9	1881	50.4
	60	4.1	59	1.58	235	6.30	518	13.88	756	20.26	1486	39.8	2732	73.2	3138	84.1
	80	5.5	75	2.01	298	7.99	654	17.53	952	25.51	1872	50.1	3441	92.2	3952	105.9
	100	6.9	91	2.44	363	9.73	795	21.31	1154	30.93	2275	60.9	4183	112.1	4804	128.7
73 to 290 / 5 to 20 M0255200X12 Gold	75	5.2	72	1.93	286	7.66	628	16.83	914	24.50	1793	48.0	3297	88.3	3786	101.4
	100	6.9	91	2.44	366	9.81	801	21.47	1163	31.17	2273	60.9	4179	112.0	4800	128.6
	150	10.3	130	3.48	522	13.99	1141	30.58	1654	44.33	3252	87.1	5979	160.2	6867	184.0
	200	13.8	169	4.53	678	18.17	1482	39.72	2148	57.57	4218	113.0	7754	207.7	8906	238.6
217 to 609 / 14.9 to 41.7 M0255190X12 Red	250	17.2	207	5.55	834	22.35	1822	48.83	2639	70.73	5177	138.7	9519	255.0	10,933	292.9
	225	15.5	189	5.07	762	20.42	1664	44.60	2410	64.59	4698	125.8	8637	231.4	9919	265.7
	300	20.7	246	6.59	992	26.59	2165	58.02	3136	84.04	6139	164.5	11,288	302.4	12,964	347.3
	400	27.6	322	8.63	1298	34.79	2833	75.92	4102	109.93	8061	215.9	14,821	397.0	17,022	456.0
435 to 1160 / 30 to 80 M0273790X12 Clear	450	31.0	360	9.65	1452	38.91	3168	84.90	4588	122.96	9025	241.8	16,592	444.5	19,056	510.5
	450	31.0	360	9.65	1452	38.91	3168	84.90	4588	122.96	9025	241.8	16,592	444.5	19,056	510.5
	500	34.4	398	10.67	1605	43.01	3501	93.83	5071	135.90	9984	267.5	18,357	491.8	21,083	565
	600	41.4	474	12.70	1911	51.21	4167	111.68	6035	161.74	11,919	319.3	21,915	587.1	25,169	674
	1050	72.4	815	21.84	3286	88.06	7164	192.00	10,375	278.05	20,558	550.8	37,798	1012.6	43,411	1163

Table 8. Type EZH Dimensions (See Figure 4)

BODY SIZE, NPS / DN	DIMENSION, IN. / mm											
	A				C	D (Maximum)	E	F	G	H	J	R
	NPT or SWE	CL150 RF	CL300 RF	CL600 RF or BWE								
1 / 25	8.25 / 210	7.25 / 184	7.75 / 197	8.25 / 210	1.50 / 38.1	2.10 / 53	12.3 / 311	13.05 / 331	11.10 / 282	5.10 / 130	8.25 / 210	3.5 / 88.9
2 / 50	11.25 / 286	10.0 / 254	10.50 / 267	11.25 / 286	1.50 / 38.1	3.10 / 79	14 / 356	14.75 / 375	11.30 / 287	6.50 / 165	7.75 / 197	4.5 / 114
3 / 80	----	11.75 / 298	12.50 / 317	13.25 / 337	2.00 / 50.8	3.81 / 97	16 / 406	15.36 / 390	16.75 / 425	8.00 / 203	13.25 / 337	6.0 / 152
4 / 100	----	13.9 / 353	14.5 / 368	15.5 / 394	2.00 / 50.8	5.06 / 129	18.3 / 464	15.85 / 403	16.8 / 427	10.03 / 255	5.5 / 140	7.5 / 191
6 / 150	----	17.75 / 451	18.62 / 473	20 / 508	2.75 / 70	5.31 / 135	17 / 432	19.25 / 489	25 / 635	13 / 330	18 / 457	8.7 / 221
8 / 200	----	21.38 / 543	22.38 / 568	24 / 610	2.75 / 70	8.25 / 210	17 / 432	19.25 / 489	28.5 / 724	13 / 330	18 / 457	8.7 / 221
12 x 6 / 300 x 150	----	29 / 737	30.5 / 775	32.25 / 819	2.75 / 70	10 / 254	17 / 432	19.25 / 489	28.5 / 724	13 / 330	18 / 457	8.7 / 221

Table 9. Approximate Weights

BODY SIZE, NPS / DN	APPROXIMATE SHIPPING WEIGHT, LBS / kg	
	Flanged	NPT, SWE and BWE
1 / 25	87 / 39	77 / 35
2 / 50	150 / 68	136 / 62
3 / 80	410 / 186	390 / 177
4 / 100	514 / 234	433 / 197
6 / 150	1460 / 662	1400 / 635
8 / 200	1875 / 850	1805 / 819
12 x 6 / 300 x 150	2050 / 930	1970 / 894



ERCA04507

Figure 4. Type EZH Dimensions (See Table 8)

Ordering Information

Use the Specifications section on page 2 and carefully review the description to the right of each specification. Use this information to complete the Ordering Guide on

this page. Specify the desired selection wherever there is a choice to be made. Then send the Ordering Guide to your local Sales Office.

Ordering Guide

Body Size (Select One)

- ☐ NPS 1 / DN 25***
- ☐ NPS 2 / DN 50***
- ☐ NPS 3 / DN 80***
- ☐ NPS 4 / DN 100***
- ☐ NPS 6 / DN 150***
- ☐ NPS 8 / DN 200***
- ☐ NPS 12 x 6 / DN 300 x 150***

End Connection Styles (Select One)

Type EZH

WCC Steel

- ☐ NPT (available for NPS 1 and 2 / DN 25 and 50 Body sizes only)***
- ☐ CL150 RF***

- ☐ CL300 RF***
- ☐ CL600 RF***
- ☐ SWE (Available for NPS 1 and 2 / DN 25 and 50 Body Sizes only)**
- ☐ BWE**
- ☐ PN 16/40 (For NPS 1 and 2 / DN 25 and 50 Body Sizes only)**
- ☐ PN 25/40 (For NPS 3 / DN 80 Body Size only)**

- continued -

Type EZH

Ordering Guide (continued)

Main Valve Disk Material (Select One)

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

Pilot Type and Outlet Pressure Range (Select One)

Type PRX/182

- ☐ 29 to 116 psig / 2.0 to 8.0 bar, Black***
- ☐ 73 to 290 psig / 5.0 to 20.0 bar, Gold***
- ☐ 217 to 609 psig / 14.9 to 41.7 bar, Red***

Type PRX/182-AP

- ☐ 435 to 1160 psig / 30 to 80 bar, Clear***

Pilot Elastomer Material (Select One)

- ☐ Nitrile (NBR) / Polyurethane (PU) (standard)***
- ☐ Fluorocarbon (FKM)***

Travel Indicator (Select One)

- ☐ Yes***
- ☐ No***

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

Main Valve Spare Parts Kit (Optional)

- ☐ Yes, send one disk parts kit to match this order.
- ☐ Yes, send one full parts kit to match this order.

Pilot Spare Parts Kit (Optional)

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

Specification Worksheet

Application:

Specific Use _____

Line Size _____

Gas Type and Specific Gravity _____

Gas Temperature _____

Relief Valve Size:

Brand of upstream regulator? _____

Orifice size of the upstream regulator? _____

Wide-open coefficient of the upstream regulator? _____

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? _____

Other Requirements: _____

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