

# Type 63EG-98HM Pilot-Operated Relief Valve or Backpressure Regulator

## Introduction

The Type 63EG-98HM can be used for gas, liquid, or steam applications. For applications up to 550°F (288°C), the Type 63EG-98HM utilizes high temperature ethylenepropylene (EPR) or Perfluoroelastomer (FFKM) for class VI shutoff. If used in a corrosive service, Perfluoroelastomer (FFKM) and other elastomers are available options that offer superior resistance to heat and most corrosive chemicals.

When using the Type 63EG-98HM with a corrosive liquid, usually water or a water-containing solution, the valve materials must be selected with care. For aqueous solutions, use a stainless steel linear cage or Whisper Trim® III Cage and body flange to ensure valve plug travel on a corrosion-free surface.

The Type 63EG-98HM is not an ASME certified device.

## Features

- **Variety of Construction Materials**—WCC steel and CF8M stainless steel are standard constructions. Alloy 20, Hastelloy® C, and Monel® are available options upon request.
- **Low Build-up Capability**— Minimal build-up pressure is required for main valve to achieve wide-open flow.
- **Chemically Compatible Elastomers**— Perfluoroelastomer (FFKM) is available for corrosive chemical applications.
- **No Assembly Adjustments Required**—Precise machining ensures that the main valve plug shuts off at both the port and upper seals at the same time.
- **Fast Speed of Response**—High gain piloting system for faster response than standard piloting system.
- **Excellent Overpressure Protection**—Superior pump bypass regulator for overpressure protection in pump recirculation applications.

Hastelloy® C is a mark owned by Haynes International, Inc.  
Monel® is a mark owned by Special Metals Corporation



W6866

**Figure 1.** Type 63EG-98HM Pilot-Operated Relief Valve or Backpressure Regulator

- **NACE Availability**—Optional materials available for applications handling sour gases. These constructions comply with recommendations of the NACE International standards MR0175 and/or MR0103.
- **Tight Shutoff**—Elastomer seats for class VI shutoff on high temperature applications to 550°F (288°C).
- **Easily Converted to Differential Control**—The pilot is ready for differential backpressure control with the addition of a sealing washer on the adjusting screw.
- **Labor-Saving Trim**—Main valve body can stay in-line during maintenance. Tested trim packages can be made up and stocked ahead of time for fast replacement.
- **Versatility in Both Liquid and Gas Service**—The pilot exhaust port and standard tapped pilot spring case each come with removable vent for remote piping when necessary. The standard tapped pilot spring case comes with an optional gasketed closing cap that permits pressure loading for remote pneumatic adjustment of the set pressure. For remote upstream registration, the pilot supply tubing may be disconnected at the 1/4 NPT main valve body tapping, and this tapping plugged.



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## Specifications

### Main Valve Body Sizes and End Connection Styles<sup>(1)(2)</sup>

See Table 1

### Maximum Design Pressure<sup>(3)</sup>

600 psig (41,4 bar) or body rating limit, whichever is lower

### Maximum Operating Relief (Inlet) Pressure

#### Including Build-up<sup>(2)(3)</sup>

450 psig (31,0 bar) or body rating limit, whichever is lower

### Maximum Outlet Pressure<sup>(2)(3)</sup>

450 psig (31,0 bar)

### Maximum Differential Pressure<sup>(2)</sup>

400 psig (27,6 bar)

### Port Diameter and Valve Plug Travels

See Table 2

### Relief Set Pressure/Backpressure Control Ranges<sup>(4)</sup>

See Table 3

### Flow Coefficients

See Table 4

### Main Valve IEC Sizing Coefficients

See Table 5

### Differential and Build-up Pressure Requirements<sup>(2)</sup>

See Table 6

### Main Valve Flow Characteristics

Linear (**standard**) or Whisper Trim<sup>®</sup> III Cage (optional)

### Main Valve Flow Direction

In through seat ring and out through cage

### Temperature Capabilities<sup>(2)</sup>

#### Fluorocarbon (FKM):

0° to 300°F (-18° to 149°C) Not acceptable in water or steam in excess of 200°F (93°C)

#### Ethylene propylene (EPDM):

Steel: -20° to 350°F (-29° to 177°C)

Stainless steel: -40° to 350°F (-40° to 177°C)

#### Perfluoroelastomer (FFKM):

Standard: 0° to 450°F (-18° to 232°C)

Optional: 0° to 550°F (-18° to 288°C)

### Approximate Weights (Including pilot)

See Figure 4

### Pilot Control Line Connection

1/8 NPT

### Pilot Spring Case Connection

1/4 NPT

### Pilot Wide-Open Flow Coefficients

$C_g$ : 98;  $C_v$ : 2.75;  $C_1$ : 35

### 5/64-inch (2,00 mm) Fixed Bleed Restriction Coefficients

$C_g$ : 4.8;  $C_v$ : 0.14

### Construction Materials

#### Type 63EG Main Valve

*Body and Body Flange:* WCC steel (**standard**), CF8M Stainless steel, Hastelloy<sup>®</sup> C, Monel<sup>®</sup>, or Alloy 20 (optional)

*Cage:* 316 Stainless steel (**standard**), 416 SST, Hastelloy<sup>®</sup> C, Monel<sup>®</sup>, or Alloy 20 (optional)

*Seat Ring, and Valve Plug:* 416 Stainless steel (**standard**), 316 Stainless steel, Hastelloy<sup>®</sup> C, Monel<sup>®</sup>, or Alloy 20 (optional)

*Spring:* Zinc-plated steel (**standard**) or Inconel<sup>®</sup> X750 (optional)

*Piston Ring:* Polytetrafluoroethylene (PTFE)

*Pipe Plug:* Steel (**standard**), 316 Stainless steel, Hastelloy<sup>®</sup> C, Monel<sup>®</sup>, or Alloy 20 (optional)

*O-Rings and Seals:* Fluorocarbon (FKM) (**standard**), Ethylene propylene (EPR), or Perfluoroelastomer (FFKM) (optional)

*Gaskets:* Composition (**standard**) or Graphite (optional)

#### Type 98HM

*Body:* WCC steel (**standard**), CF8M Stainless steel, Hastelloy<sup>®</sup> C, Monel<sup>®</sup>, or Alloy 20 (optional)

*Spring Case:* WCC steel (**standard**) or CF8M Stainless steel (optional)

*Spring:* Steel (**standard**), Stainless steel, Inconel<sup>®</sup> X750 (optional)

*Trim:* 416 Stainless steel (**standard**), 316 Stainless steel, Hastelloy<sup>®</sup> C, Monel<sup>®</sup>, or Alloy 20 (optional)

*Diaphragm:* 302 Stainless steel (**standard**), Ethylene propylene (EPR), Hastelloy<sup>®</sup> C, Monel<sup>®</sup>, or Fluorocarbon<sup>(3)</sup> (FKM) (optional)

*Diaphragm Protector:* PTFE (optional)

*Diaphragm Gaskets:* Composition (**standard**) or graphite (optional)

*Seat:* Fluorocarbon (FKM) (**standard**), Ethylene propylene (EPR), or Perfluoroelastomer (FFKM) (optional)

*Adjusting Screw Sealing Washer for Pressure Loaded Pilot:* Fluorocarbon (FKM)

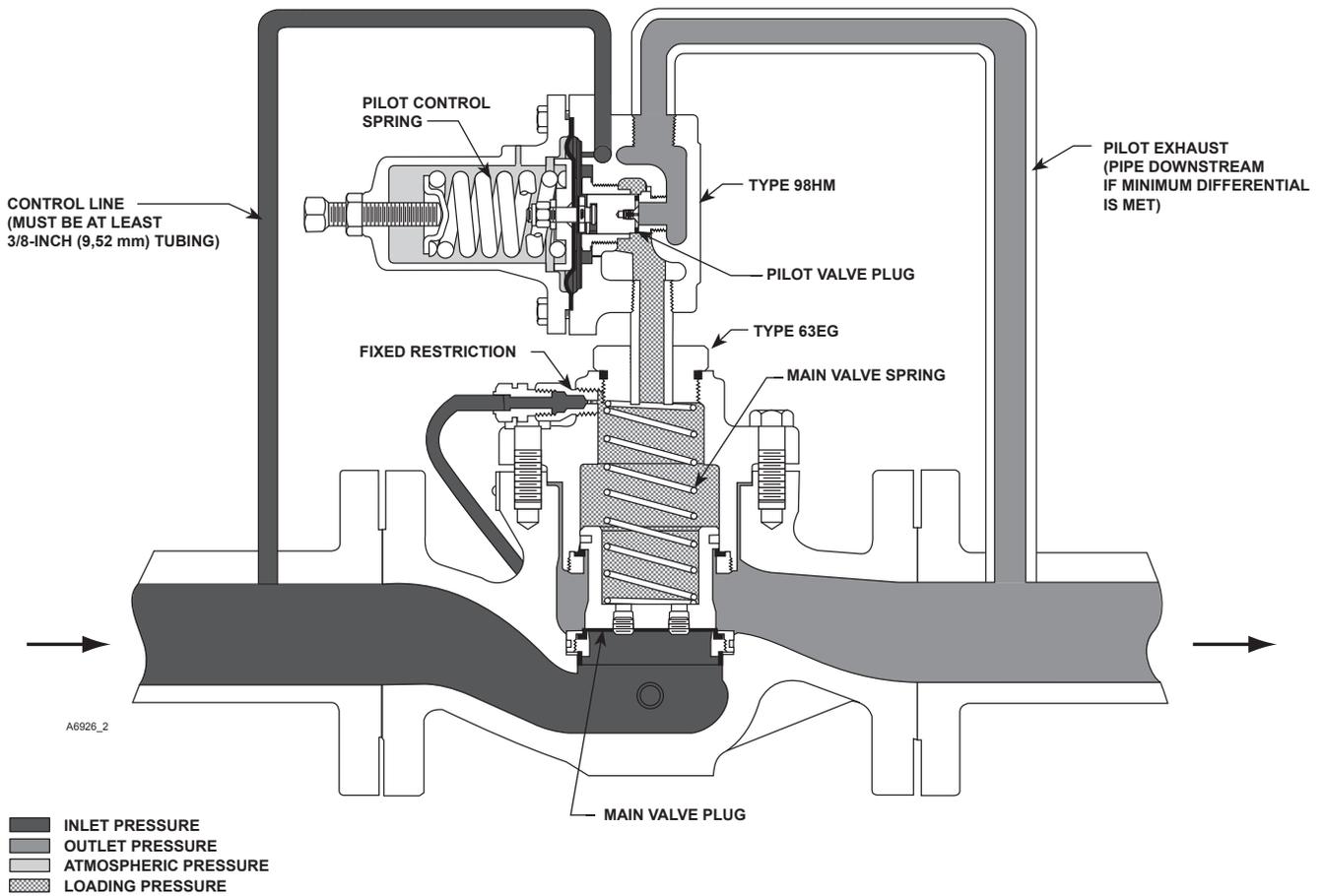
#### Mounting Parts

*Restrictor:* Steel (**standard**), 316 stainless steel, or Monel<sup>®</sup> (optional)

*Tube:* Stainless steel (**standard**) or Monel<sup>®</sup> (optional)

*Fittings:* Steel (**standard**), 316 Stainless steel, or Monel<sup>®</sup> (optional)

1. Other ratings and end connections can usually be supplied; consult the local Sales Office.  
2. The pressure/temperature limits in this bulletin and any applicable standard limitation should not be exceeded.  
3. Fluorocarbon (FKM) diaphragm is limited to 300 psig (20,7 bar).  
4. Set pressure is defined as the pressure at which the pilot Start-to-discharge.  
Inconel<sup>®</sup> and Monel<sup>®</sup> are marks owned by Special Metals Corporation.



NOTE: ON AN ACTUAL TYPE 63EG-98HM, THE PILOT SPRING CASE POINTS DOWNSTREAM.

Figure 2. Operational Schematic

## Principle of Operation

As long as inlet pressure remains below set pressure, the pilot control spring keeps the pilot valve plug closed. This pressure provides the loading pressure that helps the main valve spring keep the main valve plug tightly shut off.

An inlet pressure rise above the set pressure overcomes the pilot control spring and opens the pilot valve plug. Loading pressure bleeds out the pilot exhaust faster than it can be replaced through the restriction. This permits inlet pressure to unbalance the main valve plug and open the main valve. As inlet pressure drops back to set pressure, the pilot control spring closes the pilot valve plug. Loading pressure again builds up to close the main valve plug.

## Example Sizing Problem:

To have a pump recirculation of oil and hold backpressure. The pump capacity is 180 GPM (681 l/min), the oil has a specific gravity (G) of 1.00, and the temperature is ambient.

$$P_1 \text{ (Inlet Pressure)} = 25 \text{ psig (1,7 bar)}$$

$$P_2 \text{ (Outlet Pressure)} = 15 \text{ psig (1,0 bar)}$$

$$Q \text{ (Flow)} = 180 \text{ GPM (681 l/min)}$$

$$\text{Calculated } C_v = 57$$

The differential pressure ( $P_1 - P_2$ ) is 10 psig (0,69 bar). From Table 4, it is determined that NPS 2 (DN 50) main valve has the needed capacity. The pilot exhaust is piped

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**Table 1. Body Sizes and End Connection Styles**

MAIN VALVE BODY SIZE, NPS (DN)	END CONNECTION STYLES
2 (50)	NPT, ASME CL150 RF, CL300 RF, CL600 RF, or PN 16/25/40 flanged
3, 4, 6 (80, 100, 150)	ASME CL150 RF, CL300 RF, CL600 RF, or PN 16/25/40 flanged
8 x 6 (200 x 150)	ASME CL150 RF, CL300 RF, and CL600 RF flanged

**Table 2. Port Diameters and Valve Plug Travels**

BODY SIZE, NPS (DN)	PORT DIAMETER, INCHES (mm)	VALVE PLUG TRAVEL, INCHES (mm)
2 (50)	2-3/8 (60)	1-1/8 (29)
3 (80)	3-3/8 (86)	1-1/2 (38)
4 (100)	4-3/8 (111)	2 (51)
6 (150)	7-3/16 (183)	2 (51)
8 x 6 (200 x 150)	7-3/16 (183)	2 (51)

**Table 3. Relief Set Pressure or Backpressure Control Ranges**

SPRING RANGE	PART NUMBER	COLOR	SPRING FREE LENGTH	SPRING WIRE DIAMETER
15 to 35 psig (1,0 to 2,4 bar)	1E395627022	Yellow	2.50-inches (63,5 mm)	0.207-inch (5,26 mm)
25 to 75 psig (1,7 to 5,2 bar)	1D7455T0012	Green	2.50-inches (63,5 mm)	0.234-inch (5,94 mm)
70 to 140 psig (4,8 to 9,7 bar)	1E395727192	Red	2.44-inches (62,0 mm)	0.283-inch (7,19 mm)
130 to 200 psig (9,0 to 13,8 bar)	1L380027142	Blue	2.25-inches (57,1 mm)	0.331-inch (8,41 mm)
100 to 375 psig (6,9 to 25,9 bar)	14B9942X022	Unpainted	2.50-inches (63,5 mm)	0.375-inch (9,53 mm)

downstream of the valve. With the pipeline size equaling the valve body size, and using a linear cage, the  $C_v$  is equal to 63.3 as shown in Table 4. Since the differential pressure is less than 40 psig (2,8 bar), Table 5 verifies that the yellow main valve spring can be used. To maintain the best accuracy, always use the lightest spring rate available. The pressure build-up to a wide-open state is 7 psi (0,48 bar) over setpoint. The setpoint on a relief valve or backpressure regulator is defined as when the pilot begins to bubble or open. Since the setpoint is 25 psig (1,7 bar) and the build-up required to fully open the regulator is 7 psi (0,48 bar), the total upstream pressure would be at 32 psig (2,2 bar). The differential pressure between  $P_1 - P_2$ , 32 - 15 psig (2,2 - 1,0 bar), is 17 psi (1,2 bar).

However, the next consideration is making sure there is enough differential pressure between  $P_1$  and  $P_2$  to fully open the main valve. This minimum differential is determined by the valve plug area and the main valve spring. The smaller the valve plug area (i.e. body size) and the heavier the spring rate (i.e. red spring), the larger the differential requirements. In Table 5 the yellow main valve spring for NPS 2 (DN 50) body requires a differential pressure of 22 psi (1,5 bar) to fully open the main valve. Since it was calculated that 17 psi (1,2 bar) differential pressure is available to open the main valve, the minimum differential pressure can be subtracted from the calculated available differential pressure. In this case that would be 22 - 17 = 5 psig (1,5 - 1,2 = 0,34 bar). Therefore, the inlet pressure would build-up an additional 5 psig (0,34 bar) in order to fully open the main valve. This will bring the inlet pressure to a total of 37 psig (2,6 bar), 32 + 5 = 37 psig (2,2 + 0,35 = 2,6 bar).

If the pilot were exhausting to atmosphere, the available differential pressure would be calculated at 25 psig (1,7 bar) setpoint + 7 psi (0,48 bar) build-up required less the pilot exhaust pressure 0 psig (0 bar). After calculating the available differential pressure of 32 - 0 = 32 psig (2,2 - 0 = 2,2 bar) ( $P_1 - P_2$ ). With the minimum differential required to open the main valve at 22 psi (1,5 bar), there is

enough differential pressure to open the main valve without further build-up.

The  $C_v$  can be recalculated using the formula below based on the higher differential pressure between the inlet and outlet of the main valve. With a 32 psig (2,2 bar) inlet and a 10 psig (0,69 bar) outlet pressure, the required  $C_v$  of 38.3 is less than that based upon our original 10 psi (0,69 bar) differential pressure. This might be helpful in determining regulator size with near capacity limits.

$$C_v = Q \sqrt{\frac{G}{\Delta P}}$$

## Water and Steam Backpressure Relief

In water and steam applications, a stainless steel body flange (bonnet) and cage ensure that the valve plug will travel on a corrosion-free surface. The cage supplied in standard stainless steel constructions is a Whisper Trim® Cage style. Please note flow coefficients for capacity information.

## Application Guidelines

For high cycling applications and/or fast on and off loads, such as solenoid valves, and temperatures of 300°F (149°C) or less, fluorocarbon (FKM) diaphragms are recommended. A PTFE protector comes standard with fluorocarbon (FKM) diaphragms to prevent chemical attack.

If the application is above 300°F (149°C) and high cycling and/or fast on and off loads occur, a needle valve can be installed on the sense line to buffer the load on the diaphragm.

For high viscosity fluids, the manufacturer will supply a needle valve that can be used to replace the fixed restriction which allows the regulator gain to be adjusted. The build-up may vary from those shown in Table 5. The fixed restriction maintains the proportional gain of the regulator to the published values relating to build-up.

## Installation

Not all codes or regulations will permit these units to be used as final overpressure protection devices.

On the Type 63EG relief valve, normal pressure drop assists shutoff. Therefore, leakage may result during any reverse pressure drop condition.

These valves may be installed in any position desired as long as the flow through the main valve complies with the flow arrow on the body. Pilot exhaust must be piped downstream of the relief valve plug or to a drain.

For safety during shutdown, vent valves will be required immediately upstream and downstream of the main valve on backpressure or bypass installations.

## Universal NACE Compliance

Optional materials are available for applications handling sour gases. These constructions comply with the recommendations of NACE International sour service standards.

The manufacturing processes and materials used by Emerson assure that all products specified for sour gas service comply with the chemical, physical, and metallurgical requirements of NACE MR0175 and/or NACE MR0103. Customers have the responsibility to specify correct materials. Environmental limitations may apply and shall be determined by the user.

**Table 4. Flow Coefficients at Maximum Rated Travels**

BODY SIZES, NPS (DN)	PIPING STYLE													
	Line Size Equals Body Size							K <sub>m</sub>	2:1 Line Size to Body Size					
	Linear Cage			Whisper Trim® III Cage			Linear Cage			Whisper Trim® III Cage			K <sub>m</sub>	
	C <sub>g</sub>	C <sub>v</sub>	C <sub>1</sub>	C <sub>g</sub>	C <sub>v</sub>	C <sub>1</sub>	C <sub>g</sub>		C <sub>v</sub>	C <sub>1</sub>	C <sub>g</sub>	C <sub>v</sub>		C <sub>1</sub>
2 (50)	2280	63.3	36.0	1970	54.7	36.0	0.71	2050	59.6	34.4	1830	52.2	35.0	0.71
3 (80)	4630	132	35.1	3760	107	35.0	0.71	4410	128	34.4	3630	106	34.2	0.71
4 (100)	7320	202	36.2	6280	180	34.8	0.71	6940	198	35.0	6020	171	35.2	0.71
6 (150)	12,900	397	32.5	9450	295	32.0	0.71	12,100	381	31.7	9240	291	31.7	0.71
8 x 6 (200 x 150)	17,800	556	32.0	10,500	300	35.0	0.71	17,100	534	32.0	10,270	293	35.0	0.71

**Table 5. IEC Sizing Coefficients**

BODY SIZES, NPS (DN)	X <sub>T</sub>	F <sub>D</sub>	F <sub>L</sub>
2 (50)	0.82	0.35	0.84
3 (80)	0.78	0.30	0.84
4 (100)	0.83	0.28	0.84
6 or 8 x 6 (150 or 200 x 150)	0.67	0.28	0.84

**Table 6. Minimum and Maximum Differential Pressures and Build-up Required for Wide-Open Flow**

BODY SIZE, NPS (DN)	MAIN VALVE SPRING RANGE, SPRING PART NUMBER, AND COLOR	MINIMUM DIFFERENTIAL PRESSURE REQUIRED FOR FULL STROKE <sup>(1)</sup>	BUILD-UP OVER SET PRESSURE REQUIRED FOR FULL STROKE	MAXIMUM DIFFERENTIAL PRESSURE
2 (50)	10 to 40 psig (0,69 to 2,8 bar) 14A6768X012 Yellow	22 psi (1,5 bar)	7 psi (0,48 bar)	40 psi (2,8 bar)
	30 to 125 psig (2,1 to 8,6 bar) 14A6626X012 Green	30 psi (2,1 bar)	9 psi (0,6 bar)	125 psi (8,6 bar)
	85 to 400 psig (5,9 to 27,6 bar) 14A6628X012 Red	90 psi (6,2 bar)	23 psi (1,6 bar)	400 psi (28 bar)
3 (80)	10 to 40 psig (0,69 to 2,8 bar) 14A6771X012 Yellow	19 psi (1,3 bar)	5 psi (0,34 bar)	40 psi (2,8 bar)
	30 to 125 psig (2,1 to 8,6 bar) 14A6629X012 Green	25 psi (1,7 bar)	7 psi (0,48 bar)	125 psi (8,6 bar)
	85 to 400 psig (5,9 to 27,6 bar) 14A6631X012 Red	60 psi (4,1 bar)	17 psi (1,2 bar)	400 psi (28 bar)
4 (100)	10 to 40 psig (0,69 to 2,8 bar) 14A6770X012 Yellow	16 psi (1,1 bar)	4 psi (0,28 bar)	40 psi (2,8 bar)
	30 to 125 psig (2,1 to 8,6 bar) 14A6632X012 Green	20 psi (1,4 bar)	6 psi (0,4 bar)	125 psi (8,6 bar)
	85 to 400 psig (5,9 to 27,6 bar) 14A6634X012 Red	55 psi (3,8 bar)	16 psi (1,1 bar)	400 psi (28 bar)
6, 8 x 6 (150, 200 x 150)	10 to 40 psig (0,69 to 2,8 bar) 15A2253X012 Yellow	16 psi (1,1 bar)	4 psi (0,28 bar)	40 psi (2,8 bar)
	30 to 125 psig (2,1 to 8,6 bar) 14A9686X012 Green	20 psi (1,4 bar)	6 psi (0,4 bar)	125 psi (8,6 bar)
	85 to 400 psig (5,9 to 27,6 bar) 15A2615X012 Red	55 psi (3,8 bar)	16 psi (1,1 bar)	400 psi (28 bar)

1. Minimum differential is defined as the difference between the inlet pressure to the main valve body and the exhaust pressure from the pilot outlet. If the pilot exhaust is piped to the immediate downstream system, the differential is between the inlet and outlet pressure of the backpressure regulator. The pilot exhaust also may be discharged to atmosphere.

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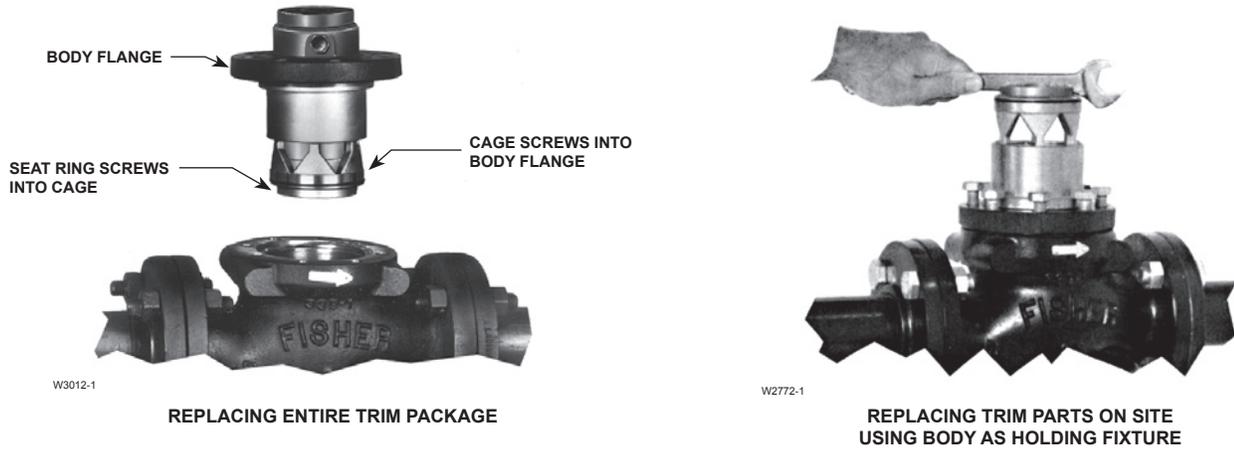
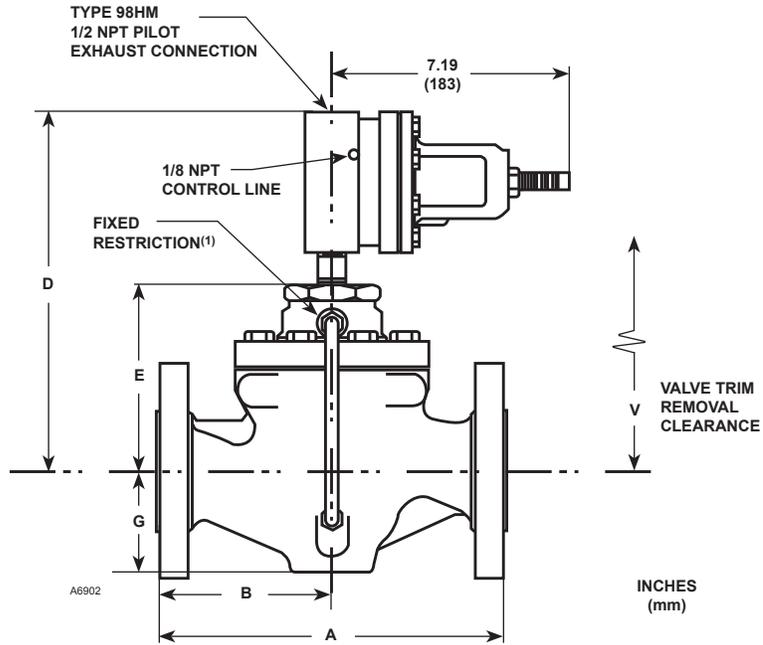


Figure 3. Easy-Maintenance Trim



1. A needle valve can be used in place of the fixed restriction in high viscosity liquids or if instability of process conditions is present.

BODY SIZE, NPS (DN)	DIMENSIONS, INCHES (mm)									APPROXIMATE WEIGHT, POUNDS (kg)
	A					D	E	G	V	
	NPT	CL150 RF	CL300 RF	CL600 RF	PN 16/25/40					
2 (50)	11.25 (286)	10.00 (254)	10.50 (267)	11.25 (286)	10.31 (262)	10.87 (276)	5.62 (143)	3.06 (78)	12.62 (321)	65 (30)
3 (80)	----	11.75 (298)	12.50 (318)	13.25 (337)	12.20 (310)	12.25 (311)	7.00 (178)	3.81 (97)	16.25 (413)	105 (48)
4 (100)	----	13.88 (353)	14.50 (368)	15.50 (394)	13.78 (350)	13.63 (346)	8.38 (213)	5.06 (128)	18.88 (480)	155 (71)
6 (150)	----	17.75 (451)	18.60 (472)	20.00 (508)	18.00 (457)	14.44 (367)	9.19 (233)	5.56 (141)	20.00 (508)	340 (155)
8 x 6 (200 x 150)	----	21.38 (543)	22.38 (569)	----	----	16.00 (406)	10.75 (273)	7.19 (183)	21.56 (548)	630 (286)

Figure 4. Dimensions

## Ordering Information

When ordering, complete the Ordering Guide page. Make sure to include the following:

For a standard installation or to obtain a noise prediction for your installation and service conditions, please complete the Specification Worksheet at the bottom of the Ordering Guide page.

Refer to the Specifications section on page 2. Carefully review each specification; then complete the Ordering Guide on page 7. If not otherwise specified, the pilot is factory set in the middle of the set pressure range.

Always specify the type numbers of other desired equipment as well as the main valve and pilot. Unless otherwise ordered, the standard-gain pilot restriction will be provided.

## Ordering Guide

### Body Size (Select One)

- NPS 2 (DN 50)\*\*\*
- NPS 3 (DN 80)\*\*\*
- NPS 4 (DN 100)\*\*\*
- NPS 6 (DN 150)\*\*\*
- NPS 8 x 6 (DN 200 x 150)\*

### Body Material (Select One)

- WCC Steel\*\*\*
- CF8M Stainless steel\*\*
- Hastelloy® C\*
- Monel®\*
- Alloy 20\*

### End Connection Style (Select One)

- NPT, for NPS 2 only\*\*\*
- CL150 RF\*\*\*
- CL300 RF\*\*\*
- CL600 RF\*\*\*
- PN 16/25/40\* \_\_\_\_\_ specify rating (NPS 8 x 6 (DN 200 x 150) not available)

### Body Flange Material (Select One)

- ENC Coated WCC Steel\*\*\*
- ENC Coated CF8M Stainless steel\*\*
- ENC Coated Hastelloy® C\*
- ENC Coated Monel®\*
- ENC Coated Alloy 20\*
- Other \_\_\_\_\_ specify

### Main Valve Cage Type (Select One)

- Linear\*\*\*
- Whisper Trim® III Cage\*\*

### Main Valve Cage Material (Select One)

- 316 Stainless steel (standard)\*\*\*
- 416 Stainless steel\*\*
- Hastelloy® C\*
- Monel®\*
- Alloy 20\*

### Main Valve Seat Ring and Valve Plug Material

(Select One)

- 416 Stainless steel (standard)\*\*\*
- 316 Stainless steel\*\*
- Hastelloy® C\*
- Monel®\*
- Alloy 20\*

### Main Valve Spring Color (Select One)

- 10 to 40 psig (0,69 to 2,8 bar), Yellow\*\*
- 30 to 125 psig (2,1 to 8,6 bar), Green\*\*\*
- 85 to 400 psig (5,9 to 27,6 bar), Red\*\*\*

### Relief Set Pressure/Backpressure Control Range (Select One)

- 15 to 35 psig (1,0 to 2,4 bar), Yellow\*\*\*
- 25 to 75 psig (1,7 to 5,2 bar), Green\*\*\*
- 70 to 140 psig (4,8 to 9,7 bar), Red\*\*\*
- 130 to 200 psig (9,0 to 13,8 bar), Blue\*\*\*
- 100 to 375 psig (6,9 to 25,9 bar), Unpainted\*\*\*

### Main Valve Spring Material (Select One)

- Zinc-plated steel\*\*\*
- Inconel® X750\*\*

### O-Ring and Seal Material (Select One)

- Fluorocarbon (FKM)\*\*\*
- Ethylenepropylene (EPR)\*\*
- Perfluoroelastomer (FFKM)\*

### Gasket Material (Select One)

- Composition\*\*\*
- Graphite\*\*

### Tubing Material (Select One)

- Stainless steel (standard)\*\*\*
- Monel®\*

### Fitting Material (Select One)

- Steel (standard)\*\*\*
- 316 Stainless steel\*\*
- Monel®\*

### Restrictor Material (Select One)

- Steel\*\*\*
- 316 Stainless steel\*\*\*
- Monel®\*

### Pilot Body Material (Select One)

- WCC Steel (standard)\*\*\*
- CF8M Stainless steel\*\*
- Hastelloy® C\*
- Monel®\*
- Alloy 20\*

### Pilot Spring Case (Select One)

- WCC Steel (standard)\*\*\*
- CF8M Stainless steel\*\*

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## Ordering Guide (continued)

### Pilot Diaphragm (Select One)

- 302 Stainless steel (**standard**)\*\*\*
- Fluorocarbon (FKM)\*\*\*
- Ethylenepropylene (EPR)\*\*
- Hastelloy® C\*
- Monel®\*

### PTFE Diaphragm Protector

- Yes

### Pilot Seat (Select One)

- Fluorocarbon (FKM) (**standard**)\*\*\*
- Ethylenepropylene (EPR)\*\*
- Perfluoroelastomer (FFKM)\*

### Pilot Trim (Select One)

- 416 Stainless steel\*\*\*
- 316 Stainless steel\*\*
- Hastelloy® C\*
- Monel®\*
- Alloy 20\*

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.	

### NACE Construction Required (Optional)

- Yes

### Main Valve Replacement Parts Kit (Optional)

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

### Pilot Replacement Parts Kit (Optional)

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

Specification Worksheet	
<b>Application:</b>	
Specific Use	_____
Line Size	_____
Fluid Type	_____
Specific Gravity	_____
Temperature	_____
Is this a Relief or Backpressure Application?	_____
<b>Pressure:</b>	
Maximum Inlet Pressure	_____
Downstream Pressure	_____
Differential Pressure	_____
Relief (Inlet) Set Pressure	_____
Maximum Flow	_____
<b>Accuracy Requirements:</b>	
Less Than or Equal To:	
<input type="checkbox"/> 5%	<input type="checkbox"/> 10% <input type="checkbox"/> 20% <input type="checkbox"/> 40%

### Industrial Regulators

#### Emerson Process Management Regulator Technologies, Inc.

USA - Headquarters  
 McKinney, Texas 75069-1872 USA  
 Tel: 1-800-558-5853  
 Outside U.S. 1-972-548-3574

Asia-Pacific  
 Shanghai, China 201206  
 Tel: +86 21 2892 9000

Europe  
 Bologna, Italy 40013  
 Tel: +39 051 4190611

Middle East and Africa  
 Dubai, United Arab Emirates  
 Tel: +971 4811 8100

### Natural Gas Technologies

#### Emerson Process Management Regulator Technologies, Inc.

USA - Headquarters  
 McKinney, Texas 75069-1872 USA  
 Tel: 1-800-558-5853  
 Outside U.S. 1-972-548-3574

Asia-Pacific  
 Singapore, Singapore 128461  
 Tel: +65 6777 8211

Europe  
 Bologna, Italy 40013  
 Tel: +39 051 4190611  
 Gallardon, France 28320  
 Tel: +33 (0)2 37 33 47 00

### TESCOM

#### Emerson Process Management Tescom Corporation

USA - Headquarters  
 Elk River, Minnesota 55330-2445 USA  
 Tel: 1-763-241-3238

Europe  
 Selmsdorf, Germany 23923  
 Tel: +49 (0) 38823 31 0

For further information visit [www.emersonprocess.com/regulators](http://www.emersonprocess.com/regulators)

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