

# Y690A Series Pressure Reducing Regulators



W7293

TYPE Y690A



W7291

TYPE Y690AH

Figure 1. Y690A Series Direct-Operated Pressure Reducing Regulators

## Introduction

The Y690A Series self-contained, spring-loaded regulators (Figure 1) provide economical pressure reducing control in a variety of commercial and industrial applications. The Y690A Series design is ideally suited to control gas supply to in-plant processing equipment. The rugged casings and sliding pusher post design withstand the full 150 psig (10,3 bar) inlet pressure at both the inlet and outlet connections. The sliding pusher post design prevents damage to internal parts if the downstream pressure exceeds the setpoint. Because these regulators can withstand the full inlet pressure, a downstream or internal relief valve is not required to protect the downstream side of the regulator.

## Features

- **Easy Conversion Between Constructions**—Converts easily from the Type Y690A to the Type Y690AM with two O-rings and one machine screw.
- **Sour Gas Service Capability**—For sour gas applications, the Y690A Series regulators are available in materials that comply with National Association of Corrosion Engineers (NACE) Standards MR0175 and MR0103.
- **Inlet Pressure Equals Outlet Pressure**—Full inlet pressure capability on the downstream side of the regulator.
- **Corrosion Resistance**—Multiple regulator constructions are available in a variety of materials for compatibility with corrosive process gases.
- **Multiple Applications**—The Y690A Series can be used for a wide variety of gases including air, nitrogen, natural gas, sour gas, butane, and propane.



# Bulletin 71.1:Y690A

## Specifications

### Available Configurations

**Type Y690A:** Direct-operated pressure reducing regulator for outlet pressures up to 7-inches w.c. (17 mbar) equipped with a pitot tube.

**Type Y690AH:** Direct-operated pressure reducing regulator for outlet pressures up to 7 psig (483 mbar) equipped with a pitot tube.

**Type Y690AM:** Direct-operated pressure reducing regulator for outlet pressures up to 7-inches w.c. (17 mbar) equipped with a blocked throat and O-ring stem seal. The lower diaphragm casing is tapped 1/2-inch NPT for control line connection.

**Type Y690AHM:** Direct-operated pressure reducing regulator for outlet pressures up to 7 psig (483 mbar) equipped with a blocked throat and O-ring stem seal. The lower diaphragm casing is tapped 1/2-inch NPT for control line connection.

### Body Sizes

3/4 or 1-inch (DN 20 or 25)

### End Connection Styles

See Table 1

### Maximum Allowable Inlet Pressure<sup>(1)</sup>

150 psig (10,3 bar)

### Maximum Operating Inlet Pressure<sup>(1)</sup>

See Table 4

### Maximum Outlet (Casing) Pressure<sup>(1)</sup>

150 psig (10,3 bar)

### Maximum Emergency Outlet Pressure to Avoid Internal Parts Damage<sup>(1)</sup>

150 psig (10,3 bar)

### Pressure Registration

**Types Y690A and Y690AH:** Internal  
**Types Y690AM and Y690AHM:** External

### Outlet Pressure Ranges<sup>(1)</sup>

See Table 5

### Orifice Sizes and Flow and Sizing Coefficients

See Table 2

### Flow Capacities

See Tables 6 and 7

### Construction Materials

See Table 3

### Material Temperature Capabilities<sup>(1)</sup>

**Nitrile (NBR):** -20° to 180°F (-29° to 82°C)

**Fluorocarbon (FKM):**  
 40° to 300°F (4° to 149°C)

**Ethylene propylene (EPDM):**  
 -20° to 275°F (-29° to 135°C)

**Perfluoroelastomer (FFKM):**  
 -20° to 300°F (-29° to 149°C)

### Pressure Setting Adjustment

Adjusting Screw

### Spring Case Connection

1/4-inch NPT

### Diaphragm Case Connection

1/2-inch NPT

### Approximate Weight

19 pounds (8,6 kg)

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

**Table 1. End Connection Styles**

BODY SIZE, INCHES (DN)	END CONNECTION STYLES	
	Ductile Iron	Stainless Steel
3/4 or 1 (20 or 25)	NPT	NPT, CL150 RF, CL300 RF, or PN 16/25/40

**Table 2. Flow and Sizing Coefficients**

ORIFICE SIZE, INCHES (mm)	WIDE-OPEN C <sub>v</sub> FOR RELIEF VALVE SIZING	WIDE-OPEN C <sub>v</sub> FOR RELIEF VALVE SIZING	C <sub>1</sub>	IEC SIZING COEFFICIENTS		
				X <sub>T</sub>	F <sub>D</sub>	F <sub>L</sub>
1/8 (3,2)	12.3	0.35	35	0.78	0.50	0.89
1/4 (6,4)	50	1.43				
3/8 (9,5)	110	3.14				
1/2 (12,7)	200	5.71				
9/16 (14,3)	250	7.14				

**Table 3. Construction Materials**

BODY	DIAPHRAGM CASE	SPRING CASE	TRIM	DIAPHRAGM	DISK
Ductile iron, Stainless steel	Ductile iron or Stainless steel	Ductile iron or Stainless steel	Stainless steel	Nitrile (NBR), Fluorocarbon (FKM), or Polytetrafluoroethylene (PTFE) bonded Nitrile (NBR)	Nitrile (NBR), Fluorocarbon (FKM), Perfluoroelastomer (FFKM), PTFE, or Ethylene propylene (EPDM)

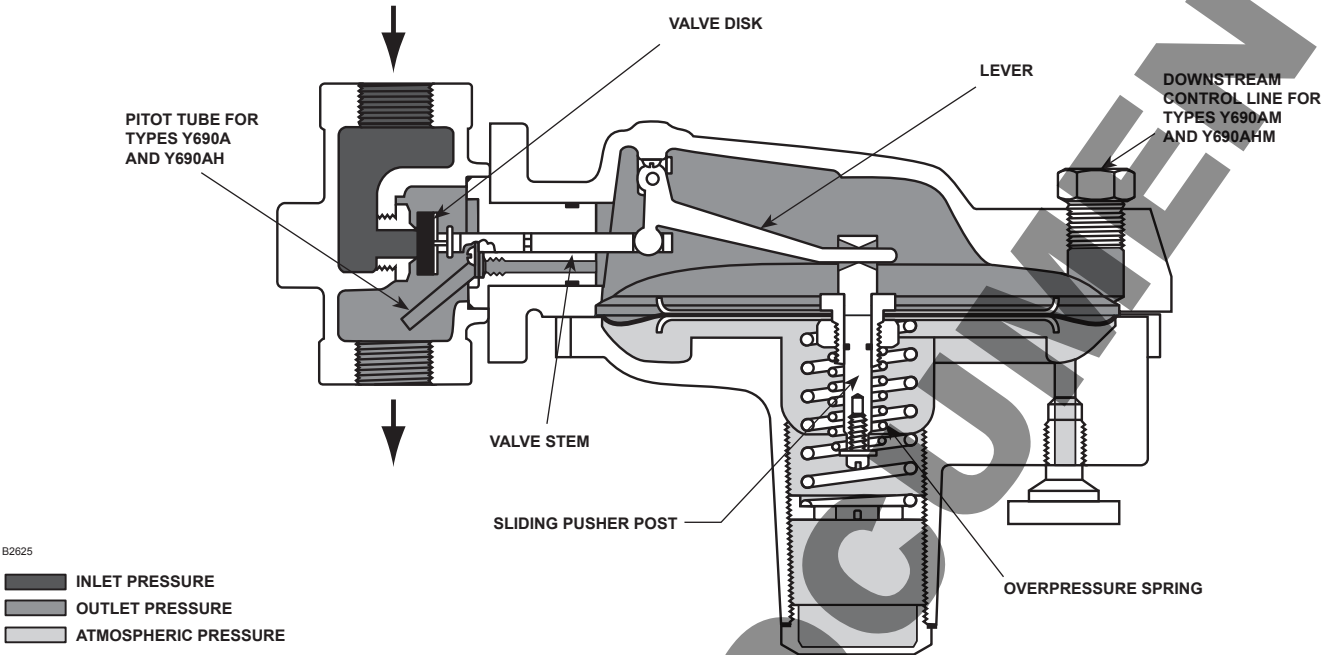


Figure 2. Y690A Series Operational Schematic

**Principle of Operation**

Refer to Figure 2. When downstream demand decreases, the pressure under the diaphragm increases. This pressure overcomes the regulator setting (which is set by a spring). Through the action of the sliding pusher post assembly, lever, and valve stem the valve disk moves closer to the orifice and reduces gas flow. If demand downstream increases, pressure under the diaphragm decreases. Spring force pushes the pusher post assembly downward, the valve disk moves away from the orifice, and the gas flow increases.

pressure ranges of each type. These regulators are available in 3/4 and 1-inch (DN 20 and 25) body sizes with the end connections as shown in Table 1.

**Downstream Control Line**

The Types Y690AM and Y690AHM regulators have a blocked throat stem seal with O-rings and a 1/2-inch threaded NPT control line connection in the diaphragm case. It is used for monitoring applications or other applications where additional equipment is installed between the regulator and the pressure control point. The stem seal separates the body outlet pressure from the diaphragm case.

**Product Description**

**Y690A Series Pressure Reducing Regulators**

Very low-pressure (Types Y690A and Y690AM) and higher-pressure versions (Types Y690AH and Y690AHM) are available for operating inlet pressures to 150 psig (10,3 bar) and outlet pressures settings from 1-inch w.c. to 7 psig (2,5 mbar to 0,5 bar). Refer to Table 5 for outlet

**Sliding Pusher Post**

The diaphragm assembly of the regulator is equipped with a sliding pusher post. During an overpressure situation (outlet pressure above setpoint or lockup pressure), the spring of the sliding pusher post is compressed, allowing the diaphragm head to come to rest on the spring case. This action prevents any damage to internal parts.

Table 4. Maximum Operating Inlet Pressures

ORIFICE SIZE, INCHES (mm)	OUTLET PRESSURE RANGE, PSIG (bar)							
	Types Y690A and Y690AM		Types Y690AH and Y690AHM					
	1 to 2.5-Inches w.c. (2,5 to 6,2 mbar)	2.5 to 7-Inches w.c. (6,2 to 17 mbar)	5 to 10-Inches w.c. (12 to 25 mbar)	7 to 16-Inches w.c. (17 to 40 mbar)	15-Inches w.c. to 1.2 Psig (37 to 83 mbar)	1.2 to 2.5 Psig (83 to 172 mbar)	2.5 to 4.5 Psig (0,17 to 0,31 bar)	4.5 to 7 Psig (0,31 to 0,48 bar)
1/8 (3,2)	150 (10,3)	150 (10,3)	150 (10,3)	150 (10,3)	150 (10,3)	150 (10,3)	150 (10,3)	150 (10,3)
1/4 (6,4)	40 (2,8)	60 (4,1)	75 (5,2)	75 (5,2)	75 (5,2)	150 (10,3)	150 (10,3)	150 (10,3)
3/8 (9,5)	20 (1,4)	20 (1,4)	35 (2,4)	35 (2,4)	35 (2,4)	60 (4,1)	60 (4,1)	60 (4,1)
1/2 (12,7)	10 (0,69)	10 (0,69)	8 (0,55)	8 (0,55)	8 (0,55)	10 (0,69)	12 (0,83)	12 (0,83)
9/16 (14,3)	5 (0,34)	5 (0,34)	5 (0,34)	5 (0,34)	5 (0,34)	6 (0,41)	8 (0,55)	8 (0,55)

# Bulletin 71.1:Y690A

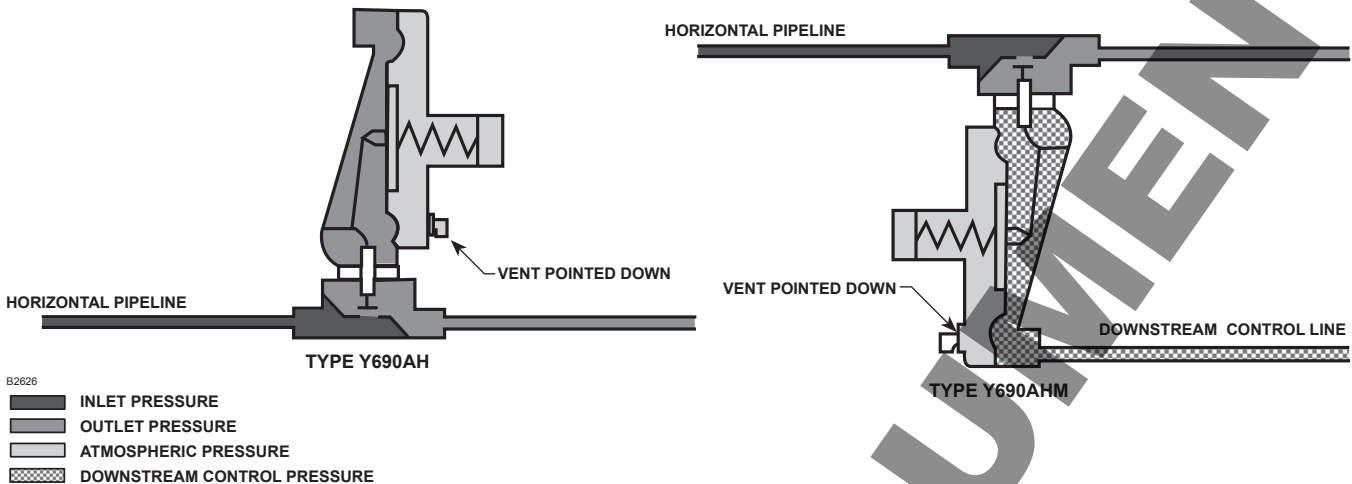


Figure 3. Types Y690AH and Y690AHM Actuator Casing Drainage Schematic

Table 5. Outlet Pressures and Spring Part Numbers

TYPES	OUTLET CONTROL PRESSURE RANGES	SPRING PART NUMBER	SPRING COLOR	SPRING WIRE DIAMETER, INCHES (mm)	SPRING FREE LENGTH, INCHES (mm)
Y690A and Y690AM	1 to 2.5-inches w.c. (2 to 6 mbar)	1B558527052 <sup>(1)(2)</sup>	Orange	0.072 (1,8)	3.78 (96,0)
	2.5 to 7-inches w.c. (6 to 17 mbar)	1B653827052 <sup>(1)</sup>	Red	0.085 (2,2)	3.63 (92,2)
Y690AH and Y690AHM	5 to 10-inches w.c. (12 to 25 mbar)	1B653827052	Red	0.085 (2,2)	3.63 (92,2)
	7 to 16-inches w.c. (17 to 40 mbar)	1B653927022	Unpainted	0.105 (2,7)	3.75 (95,2)
	15-inches w.c. to 1.2 psig (37 to 83 mbar)	1B537027052	Yellow	0.114 (2,9)	4.31 (109)
	1.2 to 2.5 psig (83 to 172 mbar)	1B537127022	Light green	0.156 (4,0)	4.06 (103)
	2.5 to 4.5 psig (0,17 to 0,31 bar)	1B537227022	Light blue	0.187 (4,8)	3.94 (100)
	4.5 to 7 psig (0,31 to 0,48 bar)	1B537327052	Black	0.218 (5,5)	3.98 (101)

1. To achieve the published outlet pressure range the spring case must be installed pointing down.  
 2. Do not use Fluorocarbon (FKM) diaphragm with this spring at diaphragm temperatures lower than 60°F (16°C).

## Installation

Y690A Series regulators may be installed in any orientation as long as flow through the body matches the direction of the arrow cast on the body. Normal installation is with the spring case barrel vertical above or below the diaphragm case. However, when using a Type Y690A or Y690AM regulator, for proper operation to achieve the published capacities, the spring case barrel should be installed pointed down. For actuator casing drainage of the Types Y690AH and Y690AHM, regulators should be installed as shown in Figure 3. When exposed to the weather, the spring case vent should be pointed downward to allow condensate to drain. On indoor installations, the vent should be piped outdoors if used in hazardous gas service. External dimensions and connections are shown in Figure 4.

## Capacity Information

Tables 6 and 7 give the regulating capacities of the Y690A Series regulators at selected inlet pressures and outlet pressure settings. Flows are in SCFH (60°F and 14.7 psia) of 1.0 specific gravity air. For gases of other

specific gravities, divide the given capacity by the square root of the appropriate specific gravity of the gas required. Then, if capacity is desired in normal cubic meters per hour at 0°C and 1,01325 bar, multiply SCFH by 0.0268. To determine wide-open flow capacities for relief sizing, use the following formula:

$$Q = \sqrt{\frac{520}{GT}} C_g P_1 \text{Sin} \left[ \frac{3417}{C_1} \sqrt{\frac{\Delta P}{P_1}} \right] \text{Deg}$$

where,

- $C_g$  = gas sizing coefficient from Table 2
- $C_1$  =  $C_g / C_v$ , or 35 from Table 2
- $G$  = gas specific gravity (air = 1.0)
- $P_{1abs}$  = inlet pressure, psia (add 14.7 psi to gauge inlet pressure to obtain absolute inlet pressure)
- $Q$  = flow rate, SCFH
- $T$  = absolute temperature in °Rankine of gas at inlet

Table 6. Types Y690A and Y690AM Capacities

BODY SIZE, INCHES (DN)	OUTLET PRESSURE RANGE, PART NUMBER, AND COLOR	OUTLET PRESSURE SETTING	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (Nm <sup>3</sup> /h) OF 0.6 SPECIFIC GRAVITY NATURAL GAS <sup>(1)</sup>				
				Orifice Size, Inches (mm)				
				1/8 (3,2)	1/4 (6,4)	3/8 (9,5)	1/2 (12,7)	9/16 (14,3)
3/4 (20)	1 to 2.5-inches w.c. (2,5 to 6,2 mbar)  1B558527052 Orange	1-inch w.c. (2,5 mbar)	2 (0,14)	155 (4,15)	387 (10,4)	452 (12,1)	593 (15,9)	774 (20,7)
			5 (0,34)	232 (6,22)	529 (14,2)	581 (15,6)	774 (20,7)	903 (24,2)
			10 (0,69)	258 (6,91)	658 (17,6)	684 (18,3)	1032 (27,7)	
			20 (1,4)	361 (9,67)	787 (21,1)	839 (22,5)		
			40 (2,8)	774 (20,7)	1251 (33,5)			
			150 (10,3)	1677 (44,9)				
	2.5-inches w.c. (6,2 mbar)	2 (0,14)	155 (4,15)	452 (12,1)	516 (13,8)	826 (22,1)	993 (26,6)	
		5 (0,34)	258 (6,91)	645 (17,3)	774 (20,7)	1058 (28,4)	1226 (32,9)	
		10 (0,69)	284 (7,61)	851 (22,8)	968 (25,9)	1316 (35,3)		
		20 (1,4)	361 (9,67)	993 (26,6)	1226 (32,9)			
		40 (2,8)	839 (22,5)	1316 (35,3)				
		150 (10,3)	1613 (43,2)					
2.5 to 7-inches w.c. (6,2 to 17 mbar)  1B653827052 Red	2.5-inches w.c. (6,2 mbar)	2 (0,14)	155 (4,15)	258 (6,91)	297 (7,96)	581 (15,6)	632 (16,9)	
		5 (0,34)	232 (6,22)	348 (9,33)	684 (18,3)	774 (20,7)	877 (23,5)	
		10 (0,69)	297 (7,76)	581 (15,6)	903 (24,2)	1045 (28,0)		
		20 (1,4)	323 (8,66)	813 (21,8)	1161 (31,1)			
		40 (2,8)	774 (20,7)	1122 (30,1)				
		150 (10,3)	1561 (41,8)	1613 (43,2)				
	3-inches w.c. (7,5 mbar)	2 (0,14)	142 (3,81)	245 (6,57)	297 (7,96)	542 (14,5)	593 (15,9)	
		5 (0,34)	168 (4,50)	348 (9,33)	645 (17,3)	787 (21,1)	877 (23,5)	
		10 (0,69)	245 (6,57)	581 (15,6)	903 (24,2)	1019 (27,3)		
		20 (1,4)	323 (8,66)	813 (21,8)	1161 (31,1)			
		40 (2,8)	748 (20,0)	1109 (29,7)				
		150 (10,3)	1716 (46,0)	1355 (36,3)				
7-inches w.c. (17 mbar)	2 (0,14)	155 (4,15)	206 (5,52)	245 (6,57)	400 (10,7)	516 (13,8)		
	5 (0,34)	245 (6,57)	284 (7,61)	568 (15,2)	671 (18,0)	774 (20,7)		
	10 (0,69)	258 (6,91)	516 (13,8)	851 (22,8)	980 (26,3)			
	20 (1,4)	284 (7,61)	697 (18,7)	1213 (32,5)				
	40 (2,8)	632 (16,9)	929 (24,9)					
	150 (10,3)	1367 (36,6)	1290 (34,6)					

1. Deviation from setpoint is -1 to 2-inches w.c. (-2,5 to 5 mbar).  
 [Shaded area] - Shaded areas indicate maximum allowable inlet pressure is exceeded.

- continued -

OBSOLETE

# Bulletin 71.1:Y690A

**Table 6. Types Y690A and Y690AM Capacities (continued)**

BODY SIZE, INCHES (DN)	OUTLET PRESSURE RANGE, PART NUMBER, AND COLOR	OUTLET PRESSURE SETTING	INLET PRESSURE, PSIG (bar)	CAPACITIES IN SCFH (Nm <sup>3</sup> /h) OF 0.6 SPECIFIC GRAVITY NATURAL GAS <sup>(1)</sup>				
				Orifice Size, Inches (mm)				
				1/8 (3,2)	1/4 (6,4)	3/8 (9,5)	1/2 (12,7)	9/16 (14,3)
1 (25)	1 to 2.5-inches w.c. (2,5 to 6,2 mbar)  1B558527052 Orange	1-inch w.c. (2,5 mbar)	2 (0,14)	142 (3,81)	400 (10,7)	593 (15,9)	619 (16,6)	1226 (32,9)
			5 (0,34)	245 (6,57)	452 (12,1)	1277 (34,2)	1419 (38,0)	1471 (39,4)
			10 (0,69)	310 (8,31)	1032 (27,7)	1445 (38,7)	1961 (52,6)	
			20 (1,4)	452 (12,1)	1200 (32,2)	1703 (45,6)		
			40 (2,8)	839 (22,5)	1445 (38,7)			
		2.5-inches w.c. (6,2 mbar)	60 (4,1)	1238 (33,2)				
			80 (5,5)	1509 (40,4)				
			100 (6,9)	1677 (44,9)				
			125 (8,6)	1767 (47,4)				
			150 (10,3)	1832 (49,1)				
	2.5 to 7-inches w.c. (6,2 to 17 mbar)  1B653827052 Red	2.5-inches w.c. (6,2 mbar)	2 (0,14)	155 (4,15)	374 (10,0)	439 (11,8)	606 (16,2)	1019 (27,3)
			5 (0,34)	258 (6,91)	452 (12,1)	955 (25,6)	1200 (32,2)	1471 (39,4)
			10 (0,69)	310 (8,31)	955 (25,6)	1213 (32,5)	1600 (42,9)	
			20 (1,4)	452 (12,1)	1161 (31,1)	1613 (43,2)		
			40 (2,8)	774 (20,7)	1587 (42,5)			
		3-inches w.c. (7,5 mbar)	60 (4,1)	1213 (32,5)				
			80 (5,5)	1509 (40,4)				
			100 (6,9)	1677 (44,9)				
			125 (8,6)	1793 (48,1)				
			150 (10,3)	1948 (52,2)				
7-inches w.c. (17 mbar)	2.5-inches w.c. (6,2 mbar)	2 (0,14)	142 (3,81)	168 (4,50)	348 (9,33)	606 (16,2)	813 (21,8)	
		5 (0,34)	232 (6,22)	387 (10,4)	761 (20,4)	980 (26,3)	1109 (29,7)	
		10 (0,69)	335 (8,98)	774 (20,7)	1032 (27,7)	1393 (37,3)		
		20 (1,4)	413 (11,1)	851 (22,8)	1471 (39,4)			
		40 (2,8)	748 (20,0)	1251 (33,5)				
	3-inches w.c. (7,5 mbar)	60 (4,1)	1135 (30,4)	1677 (44,9)				
		80 (5,5)	1303 (34,9)					
		100 (6,9)	1548 (41,5)					
		125 (8,6)	1651 (44,2)					
		150 (10,3)	1806 (48,4)					
7-inches w.c. (17 mbar)	3-inches w.c. (7,5 mbar)	2 (0,14)	129 (3,46)	194 (5,20)	258 (6,91)	568 (15,2)	645 (17,3)	
		5 (0,34)	219 (5,87)	387 (10,4)	722 (19,3)	722 (19,3)	864 (23,2)	
		10 (0,69)	323 (8,66)	684 (18,3)	916 (24,5)	1084 (29,1)		
		20 (1,4)	387 (10,4)	851 (22,8)	1303 (34,9)			
		40 (2,8)	658 (17,6)	1251 (33,5)				
	7-inches w.c. (17 mbar)	60 (4,1)	968 (25,9)	1677 (44,9)				
		80 (5,5)	1290 (34,6)					
		100 (6,9)	1548 (41,5)					
		125 (8,6)	1651 (44,2)					
		150 (10,3)	1806 (48,4)					
7-inches w.c. (17 mbar)	7-inches w.c. (17 mbar)	2 (0,14)	129 (3,46)	194 (5,20)	258 (6,91)	477 (12,8)	503 (13,5)	
		5 (0,34)	219 (5,87)	387 (10,4)	555 (14,9)	684 (18,3)	851 (22,8)	
		10 (0,69)	258 (6,91)	490 (13,1)	748 (20,0)	1071 (28,7)		
		20 (1,4)	361 (9,67)	787 (21,1)	1006 (27,0)			
		40 (2,8)	516 (13,8)	1006 (27,0)				
	7-inches w.c. (17 mbar)	60 (4,1)	735 (19,7)	1677 (44,9)				
		80 (5,5)	839 (22,5)					
		100 (6,9)	968 (25,9)					
		125 (8,6)	1109 (29,7)					
		150 (10,3)	1458 (39,1)					

1. Deviation from setpoint is -1 to 2-inches w.c (-2,5 to 5 mbar).  
 - Shaded areas indicate maximum allowable inlet pressure is exceeded.



Table 7. Types Y690AH and Y690AHM Capacities

OUTLET PRESSURE RANGE, CONTROL SPRING PART NUMBER, AND COLOR	OFFSET FROM SETPOINT	OUTLET PRESSURE SETTING	INLET PRESSURE, PSIG (bar)	3/4-INCH (DN 20) BODY SIZE					
				Capacities in SCFH (Nm <sup>3</sup> /h) of 0.6 Specific Gravity Natural Gas					
				Orifice Size, Inches (mm)					
				1/8 (3,2)	1/4 (6,4)	3/8 (9,5)	1/2 (12,7)	9/16 (14,3)	
5 to 10-inches w.c. (12 to 25 mbar) 1B653827052 Red	1-inch w.c. (2,5 mbar)	7-inches w.c. (17 mbar)	1 (0,069)	90 (2,41)	232 (6,22)	245 (6,57)	413 (11,1)	439 (11,8)	
			5 (0,34)	219 (5,87)	452 (12,1)	490 (13,1)	516 (13,8)	968 (25,9)	
			8 (0,55)	232 (6,22)	529 (14,2)	542 (14,5)	593 (15,9)		
			20 (1,4)	516 (13,8)	619 (16,6)	645 (17,3)			
			35 (2,4)	658 (17,6)	839 (22,5)	903 (24,2)			
			75 (5,2)	774 (20,7)	955 (25,6)				
7 to 16-inches w.c. (17 to 40 mbar) 1B653927022 Olive drab	1-inch w.c. (2,5 mbar)	11-inches w.c. (27 mbar)	1 (0,069)	90 (2,41)	155 (4,15)	194 (5,20)	232 (6,22)	245 (6,57)	
			5 (0,34)	155 (4,15)	284 (7,61)	348 (9,33)	529 (14,2)	748 (20,0)	
			8 (0,55)	168 (4,50)	426 (11,4)	452 (12,1)	542 (14,5)		
			20 (1,4)	348 (9,33)	593 (15,9)	606 (16,2)			
			35 (2,4)	516 (13,8)	619 (16,6)	645 (17,3)			
			75 (5,2)	645 (17,3)	942 (25,2)				
15-inches w.c. to 1.2 psig (37 to 83 mbar) 1B537027052 Yellow	5.5-inches w.c. (14 mbar)	15-inches w.c. (37 mbar)	2 (0,14)	90 (2,41)	503 (13,5)	903 (24,2)	1097 (29,4)	1148 (30,8)	
			6 (0,41)	245 (6,57)	929 (24,9)	1638 (43,9)	2103 (56,4)		
			10 (0,69)	335 (8,98)	1380 (37,0)	1935 (51,9)			
			30 (2,1)	684 (18,3)	2387 (64,0)	2451 (65,7)			
			60 (4,1)	1161 (31,1)	3483 (93,3)				
			150 (10,3)	2567 (68,8)					
	1.2 psig (83 mbar)	1.2 psig (83 mbar)	1.2 psig (83 mbar)	2 (0,14)	90 (2,41)	413 (11,1)	606 (16,2)	813 (21,8)	697 (18,7)
				6 (0,41)	245 (6,57)	697 (18,7)	1290 (34,6)	1419 (38,0)	
				10 (0,69)	310 (8,31)	1019 (27,3)	1419 (38,0)		
				30 (2,1)	671 (18,0)	2064 (55,3)	2425 (65,0)		
				60 (4,1)	1135 (30,4)	3354 (89,9)			
				150 (10,3)	2477 (66,4)				
1.2 to 2.5 psig (83 to 172 mbar) 1B537127022 Light green	0.2 psig (14 mbar)	1.2 psig (83 mbar)	2 (0,14)	116 (3,11)	219 (5,87)	348 (9,33)	490 (13,1)	516 (13,8)	
			6 (0,41)	181 (4,85)	452 (12,1)	735 (19,7)	851 (22,8)	1071 (28,7)	
			10 (0,69)	194 (5,20)	593 (15,9)	1006 (27,0)	1174 (31,5)		
			30 (2,1)	555 (14,9)	1548 (41,5)	1716 (46,0)			
			60 (4,1)	864 (23,2)	2477 (66,4)	2335 (62,6)			
			150 (10,3)	1987 (53,3)	5108 (137)				
	2.5 psig (172 mbar)	2.5 psig (172 mbar)	2.5 psig (172 mbar)	6 (0,41)	129 (3,46)	258 (6,91)	452 (12,1)	593 (15,9)	684 (18,3)
				10 (0,69)	168 (4,50)	490 (13,1)	568 (15,2)	864 (23,2)	
				30 (2,1)	426 (11,4)	980 (26,3)	1032 (27,7)		
				60 (4,1)	748 (20,0)	1935 (51,9)	2245 (60,2)		
				150 (10,3)	1484 (39,8)	3354 (89,9)			

Shaded areas indicate inlet pressure is too high for orifice size.

- continued -

# Bulletin 71.1:Y690A

Table 7. Types Y690AH and Y690AHM Capacities (continued)

OUTLET PRESSURE RANGE, CONTROL SPRING PART NUMBER, AND COLOR	OFFSET FROM SETPOINT	OUTLET PRESSURE SETTING	INLET PRESSURE, PSIG (bar)	3/4-INCH (DN 20) BODY SIZE				
				Capacities in SCFH (Nm <sup>3</sup> /h) of 0.6 Specific Gravity Natural Gas				
				Orifice Size, Inches (mm)				
				1/8 (3,2)	1/4 (6,4)	3/8 (9,5)	1/2 (12,7)	9/16 (14,3)
2.5 to 4.5 psig (172 to 310 mbar) 1B537227022 Light blue	0.3 psig (21 mbar)	2.5 psig (172 mbar)	4 (0,28)	142 (3,81)	194 (5,20)	310 (8,31)	374 (10,0)	477 (12,8)
			8 (0,55)	142 (3,81)	361 (9,67)	516 (13,8)	710 (19,0)	800 (21,4)
			12 (0,83)	194 (5,20)	490 (13,1)	684 (18,3)	929 (24,9)	
			30 (2,1)	426 (11,4)	903 (24,2)	1109 (29,7)		
			60 (4,1)	658 (17,6)	1729 (46,3)	1832 (49,1)		
		4.5 psig (310 mbar)	8 (0,55)	116 (3,11)	245 (6,57)	400 (10,7)	516 (13,8)	542 (14,5)
			12 (0,83)	155 (4,15)	323 (8,66)	529 (14,2)	722 (19,3)	
			30 (2,1)	297 (7,96)	761 (20,4)	826 (22,1)		
			60 (4,1)	593 (15,9)	1226 (32,9)	1342 (36,0)		
			150 (10,3)	1226 (32,9)	3612 (96,8)			
4.5 to 7 psig (310 to 483 mbar) 1B537327052 Black	0.7 psig (48 mbar)	4.5 psig (310 mbar)	9 (0,62)	194 (5,20)	426 (11,4)	619 (16,6)	929 (24,9)	993 (26,6)
			12 (0,83)	206 (5,52)	555 (14,9)	813 (21,8)	1148 (30,8)	
			30 (2,1)	516 (13,8)	1097 (29,4)	1806 (48,4)		
			60 (4,1)	864 (23,2)	2051 (55,0)	2709 (72,6)		
			150 (10,3)	1961 (52,6)	5044 (135)			
		7 psig (483 mbar)	9 (0,62)	155 (4,15)	271 (7,26)	516 (13,8)	619 (16,6)	658 (17,6)
			12 (0,83)	194 (5,20)	374 (10,0)	645 (17,3)	864 (23,2)	
			30 (2,1)	387 (10,4)	903 (24,2)	1329 (35,6)		
			60 (4,1)	800 (21,4)	1716 (46,0)	2451 (65,7)		
			150 (10,3)	1909 (51,2)	4051 (109)			

1. Indicates capacity limited due to boost.  
 - Shaded areas indicate inlet pressure is too high for orifice size.

Table 7. Types Y690AH and Y690AHM Capacities

OUTLET PRESSURE RANGE, CONTROL SPRING PART NUMBER, AND COLOR	OFFSET FROM SETPOINT	OUTLET PRESSURE SETTING	INLET PRESSURE, PSIG (bar)	1-INCH (DN 25) BODY SIZE				
				Capacities in SCFH (Nm <sup>3</sup> /h) of 0.6 Specific Gravity Natural Gas				
				Orifice Size, Inches (mm)				
				1/8 (3,2)	1/4 (6,4)	3/8 (9,5)	1/2 (12,7)	9/16 (14,3)
5 to 10-inches w.c. (12 to 25 mbar) 1B653827052 Red	1-inch w.c. (2,5 mbar)	7-inches w.c. (17 mbar)	1 (0,069)	90 (2,41)	245 (6,57)	297 (7,96)	413 (11,1)	529 (14,2)
			5 (0,34)	219 (5,87)	452 (12,1)	1135 (30,4)	1896 (50,8)	1922 (51,5)
			8 (0,55)	232 (6,22)	529 (14,2)	2141 (57,4)	2361 (63,3)	
			20 (1,4)	516 (13,8)	1806 (48,4)	1174 (31,5) <sup>(1)</sup>		
			35 (2,4)	710 (19,0)	2296 (61,5) <sup>(1)</sup>	929 (24,9) <sup>(1)</sup>		
			75 (5,2)	1032 (27,7)	1393 (37,3) <sup>(1)</sup>			
			150 (10,3)	1677 (44,9) <sup>(1)</sup>				
7 to 16-inches w.c. (17 to 40 mbar) 1B653927022 Olive drab	1-inch w.c. (2,5 mbar)	11-inches w.c. (27 mbar)	1 (0,069)	90 (2,41)	168 (4,50)	206 (5,52)	232 (6,22)	245 (6,57)
			5 (0,34)	155 (4,15)	310 (8,31)	516 (13,8)	619 (16,6)	1161 (31,1)
			8 (0,55)	168 (4,50)	426 (11,4)	1161 (31,1)	1458 (39,1)	
			20 (1,4)	348 (9,33)	774 (20,7)	1625 (43,6)		
			35 (2,4)	555 (14,9)	1806 (48,4)	1187 (31,8) <sup>(1)</sup>		
			75 (5,2)	1226 (32,9)	1509 (40,4) <sup>(1)</sup>			
150 (10,3)	1742 (46,7)							

1. Indicates capacity limited due to boost.  
 - Shaded areas indicate inlet pressure is too high for orifice size.

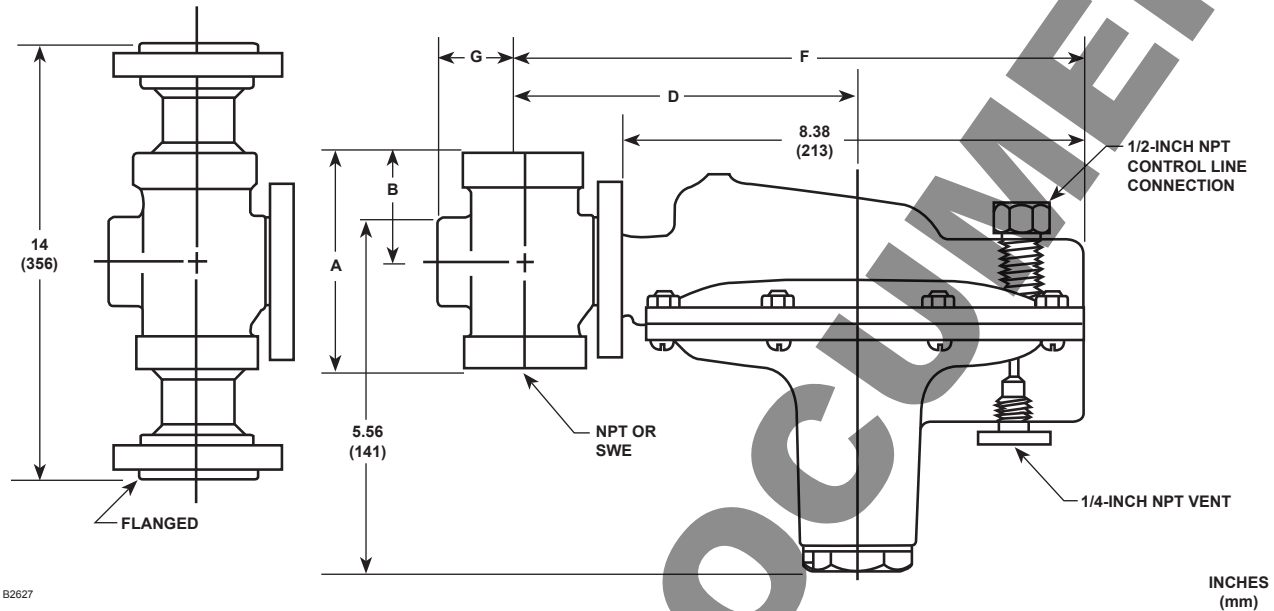
- continued -



Table 7. Types Y690AH and Y690AHM Capacities (continued)

OUTLET PRESSURE RANGE, CONTROL SPRING PART NUMBER, AND COLOR	OFFSET FROM SETPOINT	OUTLET PRESSURE SETTING	INLET PRESSURE, PSIG (bar)	1-INCH (DN 25) BODY SIZE				
				Capacities in SCFH (Nm <sup>3</sup> /h) of 0.6 Specific Gravity Natural Gas				
				Orifice Size, Inches (mm)				
				1/8 (3,2)	1/4 (6,4)	3/8 (9,5)	1/2 (12,7)	9/16 (14,3)
15-inches w.c. to 1.2 psig (37 to 83 mbar) 1B537027052 Yellow	5.5-inches w.c. (14 mbar)	15-inches w.c. (37 mbar)	2 (0,14)	90 (2,41)	503 (13,5)	1097 (29,4)	1161 (31,1)	1445 (38,7)
			6 (0,41)	245 (6,57)	929 (24,9)	2503 (67,1)	2799 (75,0)	
			10 (0,69)	335 (8,98)	1587 (42,5)	3251 (87,1)		
			30 (2,1)	684 (18,3)	2825 (75,7)	5457 (146)		
			60 (4,1)	1161 (31,1)	4618 (124)			
		1.2 psig (83 mbar)	2 (0,14)	90 (2,41)	464 (12,4)	1097 (29,4)	1161 (31,1)	1290 (34,6)
			6 (0,41)	245 (6,57)	697 (18,7)	1548 (41,5)	1664 (44,6)	
			10 (0,69)	323 (8,66)	1019 (27,3)	2670 (71,6)		
			30 (2,1)	671 (18,0)	2554 (68,4)	4592 (123)		
			60 (4,1)	1135 (30,4)	4193 (112)			
1.2 to 2.5 psig (83 to 172 mbar) 1B537127022 Light green	0.2 psig (14 mbar)	1.2 psig (83 mbar)	2 (0,14)	116 (3,11)	232 (6,22)	464 (12,4)	619 (16,6)	658 (17,6)
			6 (0,41)	181 (4,85)	452 (12,1)	1097 (29,4)	877 (23,5)	1084 (29,1)
			10 (0,69)	194 (5,20)	645 (17,3)	1406 (37,7)	1754 (47,0)	
			30 (2,1)	632 (16,9)	1600 (42,9)	4038 (108)		
			60 (4,1)	1006 (27,0)	3599 (96,5)	7688 (206)		
		2.5 psig (172 mbar)	150 (10,3)	2438 (65,3)	3870 (104)			
			6 (0,41)	142 (3,81)	271 (7,26)	658 (17,6)	671 (18,0)	684 (18,3)
			10 (0,69)	181 (4,85)	490 (13,1)	774 (20,7)	864 (23,2)	
			30 (2,1)	568 (15,2)	1032 (27,7)	2296 (61,5)		
			60 (4,1)	851 (22,8)	2516 (67,4)	7366 (197)		
2.5 to 4.5 psig (172 to 310 mbar) 1B537227022 Light blue	0.3 psig (21 mbar)	2.5 psig (172 mbar)	4 (0,28)	142 (3,81)	194 (5,20)	413 (11,1)	426 (11,4)	477 (12,8)
			8 (0,55)	181 (4,85)	361 (9,67)	710 (19,0)	735 (19,7)	903 (24,2)
			12 (0,83)	194 (5,20)	490 (13,1)	929 (24,9)	955 (25,6)	
			30 (2,1)	426 (11,4)	903 (24,2)	1832 (49,1)		
			60 (4,1)	658 (17,6)	1729 (46,3)	4076 (109)		
		4.5 psig (310 mbar)	150 (10,3)	2012 (53,9)	6656 (178)			
			8 (0,55)	116 (3,11)	245 (6,57)	490 (13,1)	516 (13,8)	542 (14,5)
			12 (0,83)	155 (4,15)	323 (8,66)	606 (16,2)	851 (22,8)	
			30 (2,1)	387 (10,4)	761 (20,4)	1355 (36,3)		
			60 (4,1)	632 (16,9)	1226 (32,9)	3096 (83,0)		
4.5 to 7 psig (310 to 483 mbar) 1B537327052 Black	0.7 psig (48 mbar)	4.5 psig (310 mbar)	9 (0,62)	206 (5,52)	426 (11,4)	839 (22,5)	968 (25,9)	1045 (28,0)
			12 (0,83)	232 (6,22)	555 (14,9)	1006 (27,0)	1290 (34,6)	
			30 (2,1)	516 (13,8)	1097 (29,4)	2077 (55,7)		
			60 (4,1)	877 (23,5)	2051 (55,0)	3651 (97,8)		
			150 (10,3)	2064 (55,3)	5999 (161)			
		7 psig (483 mbar)	9 (0,62)	155 (4,15)	271 (7,26)	593 (15,9)	619 (16,6)	658 (17,6)
			12 (0,83)	206 (5,52)	374 (10,0)	774 (20,7)	890 (23,9)	
			30 (2,1)	374 (10,0)	903 (24,2)	1651 (44,2)		
			60 (4,1)	800 (21,4)	1716 (46,0)	2761 (74,0)		
			150 (10,3)	2012 (53,9)	4141 (111)			

Shaded areas indicate inlet pressure is too high for orifice size.



BODY SIZE, INCHES (DN)	A		B		D	F	G
	Ductile Iron	Stainless Steel	Ductile Iron	Stainless Steel	Ductile Iron or Stainless Steel	Ductile Iron or Stainless Steel	Ductile Iron or Stainless Steel
3/4, 1 (20, 25)	4.0 (102)	4.12 (105)	2.12 (53,8)	2.25 (57,2)	6.19 (157)	10.12 (257)	1.53 (38,9)

Figure 4. Dimensions

## Universal NACE Compliance

Optional materials are available for applications handling sour gases. These constructions comply with the recommendations of all National Association of Corrosion Engineers (NACE) sour service standards.

The manufacturing processes and materials used by Fisher® Controls assure that all products specified for sour gas service comply with the chemical, physical, and metallurgical requirements of NACE MR0175/ISO 15156 and/or NACE MR0103. Customers have the responsibility to specify correct materials. Environmental limitations may apply and shall be determined by the user.

## Ordering Information

When ordering, specify:

### Application

1. Type of regulator
2. Body, spring case, diaphragm case, and trim materials
3. Control spring range
4. Orifice size

### Construction

Refer to the Specifications in page 2 and to each referenced table. Specify the desired selection whenever there is a choice to be made. Always be sure to specify the regulator type number.

**Ordering Guide**

**Type (Select One)**

- Y690A (internal registration)\*\*\*
- Y690AH (high pressure with internal registration)\*\*\*
- Y690AM (external registration)\*\*\*
- Y690AHM ((high pressure with external registration)\*\*\*

**Body Size (Select One)**

- 3/4-inch (DN 20)\*\*\*
- 1-inch (DN 25)\*\*\*

**Body Material and End Connection Style (Select One)**

**Ductile Iron Body**

- NPT\*\*\*

**CF8M Stainless Steel**

- NPT\*\*\*
- CL150 RF\*\*
- CL300 RF\*\*
- PN 16/25/40\*\*

**Spring Case Material (Select One)**

- Ductile iron\*\*\*
- CF8M Stainless steel\*\*\*

**Diaphragm Case Material (Select One)**

- Ductile iron\*\*\*
- CF8M Stainless steel\*\*\*

**Trim Material (Select One)**

- 303 Stainless steel\*\*\*
- 316 Stainless steel\*\*

**Diaphragm Material (Select One)**

- Nitrile (NBR) (standard)\*\*\*
- Fluorocarbon (FKM)\*\*
- Nitrile (NBR) with PTFE Protector\*\*

**Disk Material (Select One)**

- Nitrile (NBR) (standard)\*\*\*
- Fluorocarbon (FKM)\*\*\*
- Ethylenepropylene (EPDM)\*\*
- PTFE\*\*
- Perfluoroelastomer (FFKM)\*

**Orifice Size (Optional)**

- 1/8-inch (3,2 mm)\*\*\*
- 1/4-inch (6,4 mm)\*\*\*
- 3/8-inch (9,5 mm)\*\*\*
- 1/2-inch (12,7 mm)\*\*\*
- 9/16-inch (14,3 mm)\*\*\*

**Outlet Pressure Range (Select One)**

**Types Y690A and Y690AM**

- 1 to 2.5-inches w.c. (2 to 6 mbar)\*\*\*
- 2.5 to 7-inches w.c. (6 to 17 mbar)\*\*\*

**Types Y690AH and Y690AHM**

- 5 to 10-inches w.c. (12 to 25 mbar)\*\*\*
- 7 to 16-inches w.c. (17 to 40 mbar)\*\*\*
- 15-inches w.c. to 1.2 psig (37 to 83 mbar)\*\*\*
- 1.2 to 2.5 psig (83 to 172 mbar)\*\*\*
- 2.5 to 4.5 psig (172 mbar to 0,3 bar)\*\*\*
- 4.5 to 7 psig (0,3 to 0,5 bar)\*\*\*

**NACE Required**

- Yes

**Replacement Parts Kit (Optional)**

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

Regulators Quick Order Guide	
***	Standard - Readily Available for Shipment
**	Non-Standard - 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.	

**Specification Worksheet**

**Application:**  
 Specific Use \_\_\_\_\_  
 Line Size \_\_\_\_\_  
 Fluid Type \_\_\_\_\_  
 Specific Gravity \_\_\_\_\_  
 Temperature \_\_\_\_\_  
 Does the Application Require Overpressure Protection?  
 Yes     No

**Pressure:**  
 Maximum Inlet Pressure \_\_\_\_\_  
 Minimum Inlet Pressure \_\_\_\_\_  
 Differential Pressure \_\_\_\_\_  
 Set Pressure \_\_\_\_\_  
 Maximum Flow \_\_\_\_\_

**Accuracy Requirements:**  
 Less Than or Equal To:  
 5%     10%     20%     40%

**Construction Material Requirements (if known):**  
 \_\_\_\_\_  
 \_\_\_\_\_

SOLELY DOCUMENT

**Industrial Regulators  
Regulator Division  
Emerson Process Management**

USA - Headquarters  
McKinney, Texas 75070 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

**Natural Gas Technologies  
Regulator Division  
Emerson Process Management**

USA - Headquarters  
McKinney, Texas 75070  
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  
Regulator Division  
Emerson Process Management**

USA - Headquarters  
Elk River, Minnesota 55330 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)

The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are the property of their prospective owners. Fisher is a mark owned by Fisher Controls, Inc., a business of Emerson Process Management.

*The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.*

Emerson Process Management does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Emerson Process Management product remains solely with the purchaser.