December 1978

912 Series Pressure Regulators

Introduction

912 Series direct-operated, spring-loaded regulators are used in a variety of service and industrial applications. These regulators have limited-capacity internal relief across the diaphragm (figure 2) to help minimize overpressure. Any outlet pressure above the start-to-discharge point of the nonadjustable relief valve spring moves the diaphragm off the relief valve seat, allowing excess pressure to bleed out through the screened spring case vent. Inlet pressure capabilities are the same for all regulators described in this bulletin. However, outlet pressure ranges vary according to construction (see table 1).

Figure 1. *Type 912 Regulator*

Features

- **Accurate, Sensitive Control—**Disc/lever assembly is attached to a roller-style pivot for smoother action. Handwheel construction is available for adjustment of the pressure setting.

- **Versatility—**These regulators are suitable for a variety of gaseous fluids, including natural gas, propane, and air. They often are used to supply loading pressure to other units.

- **Weather and Insect Protection—** "Drip lip" vent helps resist blockage during icing conditions. When the regulator is installed with the vent pointing down, any ice that builds up forms in a protective sheath that helps keep the opening unobstructed. Screen in vent helps prevent foreign material from entering spring case and clogging or otherwise hindering regulator operation.

- **Easy Maintenance—**Diaphragm and disc/lever assembly can be replaced without removing the regulator from the pipeline.

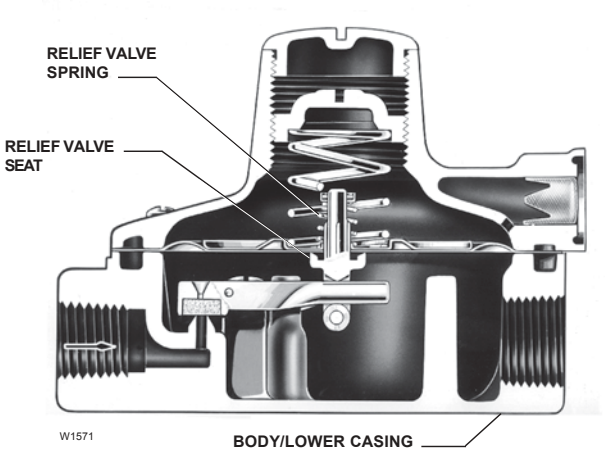

Figure 2. *Type 912 Construction Details (Standard Spring Case Vent Shown)*

D100124X012

Specifications

Available Configurations
See table 1

Body Sizes and End Connection Styles
Inlet: 1/4-inch (DN 6) NPT
Outlet: 1/4 or 3/8-inch (DN 6 or 10) NPT

Maximum Allowable Inlet Pressure
250 psig (17 bar)

Output Pressure Ranges
See table 1

Maximum Allowable Outlet Pressure
Emergency Outlet Pressure: 20 psig (1,4 bar)
Recommended Outlet Pressure to Avoid Internal Part Damage: 3 psi (0,21 bar differential) above outlet pressure setting

Body Port Diameter
0.073 inch (1,8 mm)

Wide-Open C_g for Relief Sizing
4

Typical Regulating Capacities
See figure 3 and table 2, 3, or 4

Internal Relief Performance
Approximate Internal Relief Valve Start-to-Discharge Point: See table 1
Capacity: Adequate only for relieving minor buildup situations such as are caused by chips or dirt blocking the seat partly open; for major malfunctions, external relief is required according to the “Overpressure Protection” section

Temperature Capabilities
–20°F to 160°F (–29°C to 71°C)

Pressure Registration
Internal

Spring Case Vent
Standard Construction: Untapped with removable screen
Optional Construction: 1/8-inch NPT tapped with removable screen
Standard Location
Constructions Without Handwheel: Over body outlet
Handwheel Constructions: Over body inlet

Approximate Weight
1.3 pounds (0,6 kg)

Construction Materials
Body/Lower Casing: Zinc
Spring Case: Zinc
Spring Case Bolting: Plated carbon steel
Disc/Lever Assembly: Nitrile disk with zinc lever, stainless steel lever pin and rod, and plated carbon steel lever screws
Diaphragm: Natural rubber
Diaphragm Plate: Plated steel
Spring Seat: Plated steel
Control and Relief Valve Spring: Plated steel spring wire, except stainless steel spring wire for control spring 1L507937022
Closing Spring (Optional Handwheel Constructions Only): Stainless steel spring wire
Relief Valve Assembly: Brass and zinc
Closing Cap and Adjusting Screw (Constructions Without Handwheel): Plastic Closing Cap and Adjusting Screw
Assembly (Optional Handwheel Constructions Only): Brass, zinc, and steel
Closing Cap Gasket (Optional Tapped-Vent Spring Case Only): Composition
Vent Screen: Monel*

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

Overpressure Protection

Like most regulators, those in the 912 Series have outlet pressure ratings lower than their inlet pressure ratings. Although the internal relief valve provides very limited downstream overpressure protection, complete downstream protection is needed if the actual inlet pressure exceeds the outlet pressure rating.

Overpressuring any portion of these regulators may cause leakage, damage to regulator parts, or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas. Provide appropriate overpressure protection devices to ensure that none of the limits in the “Specifications” or table 1 will be exceeded.

Regulator operation with normal operating limits does not preclude the possibility of damage from external sources or from debris in the gas line. A regulator should be inspected for damage after any overpressure condition.

Table 1. *Outlet Pressure Range Data*

OUTLET PRESSURE RANGE	APPROXIMATE POINT ABOVE OUTLET PRESSURE SETTING AT WHICH INTERNAL RELIEF STARTS TO DISCHARGE	CONTROL SPRING SELECTION	
		Part Number	Color Code
3 to 7-inches w.c. (7 to 17 mbar)	5 to 21-inches w.c. (12 to 52 mbar)	1B784327222	Red
5 to 10-inches w.c. (12 to 25 mbar)	8 to 30-inches w.c. (20 to 75 mbar)	1B784427222	Orange
9.25 to 13-inches w.c. (23 to 32 mbar)	16 to 39-inches w.c. (40 to 97 mbar)	1L507937022	Unpainted
10-inches w.c. to 1 psig (25 to 69 mbar)	17-inches w.c. to 3 psig (42 to 210 mbar)	1B784527222	Blue
0.5 to 2.7 psig (35 to 186 mbar)	0.7 to 6.8 psig (0,05 to 0,47 bar)	1B784627222	Yellow
2.7 to 5 psig (186 to 340 mbar)	3.8 to 12.5 psig (0,26 to 0,86 bar)	1B784727222	Green

Table 2. *Capacities for Type 912 and 912H Regulators without Handwheel*

TYPE NUMBER	OUTLET PRESSURE SETTING	OUTLET PRESSURE RANGE	SPRING PART NUMBER	OFFSET	CAPACITY IN SCFH ($m^3/h(n)$) OF 0.6 SPECIFIC GRAVITY NATURAL GAS								
					Inlet Pressure, Psig (Bar)								
					5 (0,34)	10 (0,69)	25 (1,7)	50 (3,4)	75 (5,2)	100 (6,9)	150 (10)	200 (14)	250 (17)
912	5-inches w.c. (12 mbar)	3 to 7-inches w.c. (7 to 17 mbar)	1B784327222	1-inch w.c. (2,5 mbar)	50 (1,34)	65 (1,74)	75 (2,01)	100 (2,68)	- - -	- - -	- - -	- - -	- - -
	7-inches w.c. (17 mbar)	5 to 10-inches w.c. (12 to 25 mbar)	1B784427222	1-inch w.c. (2,5 mbar)	- - -	75 (2,01)	112 (3,0)	155 (4,15)	155 (4,15)	155 (4,15)	155 (4,15)	155 (4,15)	- - -
	11-inches w.c. (27 mbar)	9-1/4 to 13-inches w.c. (23 to 32 mbar)	1L507937022	1-inch w.c. (2,5 mbar)	- - -	75 (2,01)	140 (3,75)	155 (4,15)	155 (4,15)	155 (4,15)	155 (4,15)	155 (4,15)	155 (4,15)
	15-inches w.c. (38 mbar)	10-inches w.c. to 1 psig (25 to 69 mbar)	1B784527222	2-inches w.c. (5 mbar)	- - -	68 (1,82)	100 (2,68)	135 (3,62)	150 (4,02)	160 (4,29)	190 (5,09)	200 (5,36)	200 (5,36)
912H	1 psig (69 mbar)	0.5 to 2.7 psig (35 to 186 mbar)	1B784627222	10%	- - -	40 (1,07)	40 (1,07)	85 (2,28)	90 (2,41)	100 (2,68)	155 (4,15)	160 (4,29)	185 (4,96)
				20%	- - -	55 (1,47)	100 (2,68)	135 (3,62)	155 (4,15)	185 (4,96)	240 (6,43)	285 (7,64)	300 (8,04)
	2 psig (140 mbar)	0.5 to 2.7 psig (35 to 186 mbar)	1B784627222	10%	- - -	50 (1,34)	85 (2,28)	105 (2,81)	130 (3,48)	145 (3,89)	200 (5,36)	260 (6,97)	300 (8,04)
				20%	- - -	70 (1,88)	120 (3,22)	180 (4,82)	240 (6,43)	300 (8,04)	400 (10,7)	450 (12,1)	500 (13,4)
	5 psig (340 mbar)	2.7 to 5 psig (186 to 340 mbar)	1B784727222	10%	- - -	68 (1,82)	85 (2,28)	135 (3,62)	170 (4,56)	200 (5,36)	325 (8,71)	400 (10,7)	500 (13,4)
				20%	- - -	75 (2,01)	135 (3,62)	200 (5,36)	280 (7,50)	360 (9,65)	560 (15,0)	685 (18,4)	750 (20,1)

Table 3. *Capacities for Type 912 Regulators with Handwheel*

OUTLET PRESSURE SETTING	OUTLET PRESSURE RANGE	SPRING PART NUMBER	OFFSET	CAPACITY IN SCFH ($m^3/h(n)$) OF 0.6 SPECIFIC GRAVITY NATURAL GAS							
				Inlet Pressure, psig (bar)							
				5 (0,34)	10 (0,69)	25 (1,7)	50 (3,4)	100 (6,9)	150 (10)	200 (14)	250 (17)
14-inches w.c. (34 mbar)	0 to 1psig (0 to 69 mbar)	1C580427222	2-inches w.c. (5 mbar)	40 (1,07)	45 (1,21)	70 (1,88)	90 (2,41)	130 (3,48)	160 (4,29)	175 (4,69)	195 (5,23)
3 psig (210 mbar)	0 to 5 psig (0 to 340 mbar)	1C580527012	10%	- - -	40 (1,07)	60 (1,61)	75 (2,01)	130 (3,48)	195 (5,23)	195 (5,23)	250 (6,70)

Installation

These regulators may be installed in any position; however, the spring case vent should be pointed down on outside installations. If gas escaping through the internal relief valve could constitute a hazard, the spring case with optional tapped vent should be used and piped to a location where escaping gas will not be hazardous. If the vent will be piped to another location, obstruction-free tubing should be used and a screened vent should be installed on the end of the vent pipe. On all installations, the vent or end of the vent pipe must be protected from corrosive chemicals, debris, weather, condensation, or anything else that might clog or enter the spring case.

Regulator dimensions are shown in figure 4.

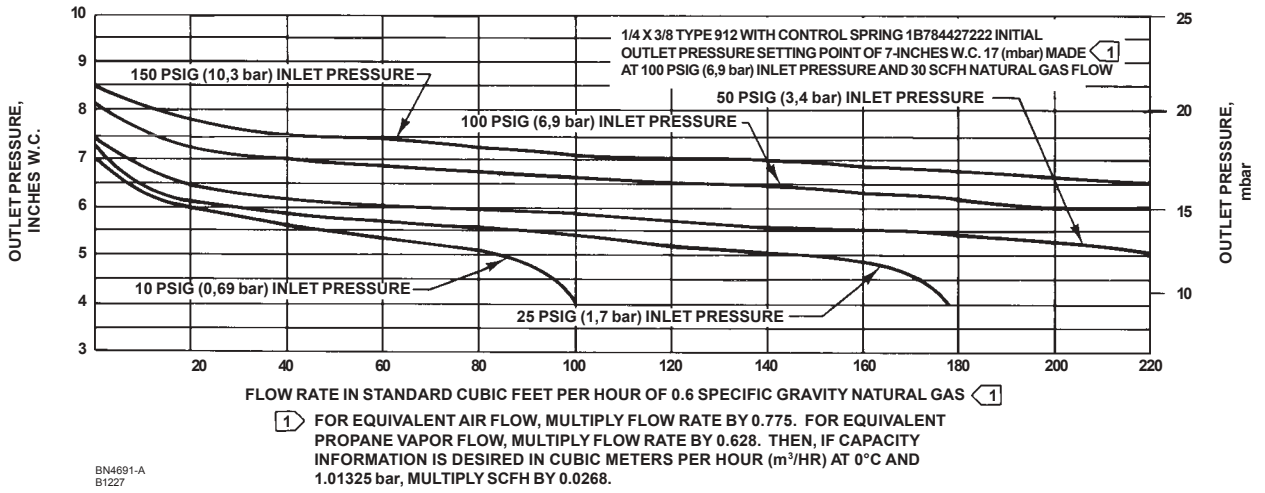

Figure 3. *Typical Performance Curves*

Ordering Information

Application

1. Composition and specific gravity of gas (including chemical analysis if possible)
2. Range of temperatures
3. Flowing inlet pressures (maximum, minimum, nominal), and pressure drops
4. Desired outlet pressure setting or range
5. Range of flow rates (minimum controlled, maximum, normal)
6. Piping size(s)

Construction

Refer to the page 2 “Specifications” 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. For information on UL-listed constructions, contact your Fisher Sales Office or Sales Representative.

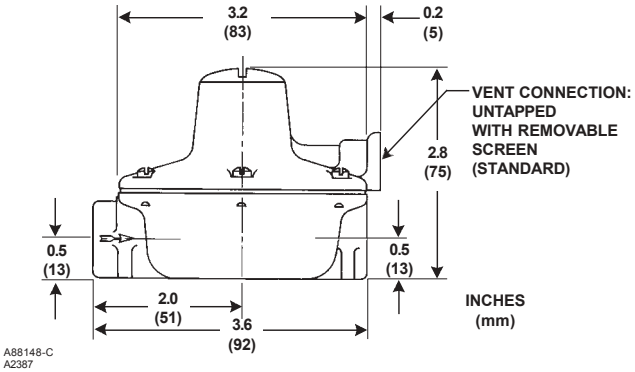

Figure 4. *Dimensions*

For information, contact Fisher:
Marshalltown, Iowa 50158 USA
McKinney, Texas 75070 USA
28320 Gallardon, France
40013 Castel Maggiore (BO), Italy
Sao Paulo 05424 Brazil
Singapore 128461