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The 627 Series self-operated pressure reducing regulators (figure 1) are for low and high pressure systems. These regulators can be used with natural gas, air, or a variety of other gases. Performance characteristics vary according to construction (see the Specifications table).

Features

- **Internal Relief Valve**—Type 627R and 627MR regulators have an internal relief valve, which in many cases eliminates the usual requirement for an external relief valve, thereby reducing equipment and maintenance costs. Refer to the Specifications table for capacity data.

- **Type 627R and 627MR Travel Stop**—The internal relief valve still works if the disk or linkage fails. The pusher post (figure 2) contacts the travel stop of the lever retainer and, as the diaphragm continues to rise, it opens the relief valve.

- **Relief Operation Indicator**—A rubber cap (figure 3) slipped on the vent assembly pops off when the relief valve opens, indicating the relief valve has opened since the last inspection.

- **Easy to Maintain**—Trim parts can be replaced without removing the regulator body from the pipeline. A two-bolt connection between the body and diaphragm casing simplifies disassembly for maintenance.

- **Installation Adaptability**—The diaphragm case and/or regulator body can be rotated in any of four positions to allow regulator installation in locations with limited space (figure 10). The regulator may be installed in any position without affecting operation as long as the spring case vent is protected from the elements.

- **Application Versatility**—The different 627 Series constructions can be used as farm tap regulators, regulator-relief valves, monitoring regulators, or high-pressure industrial regulators.

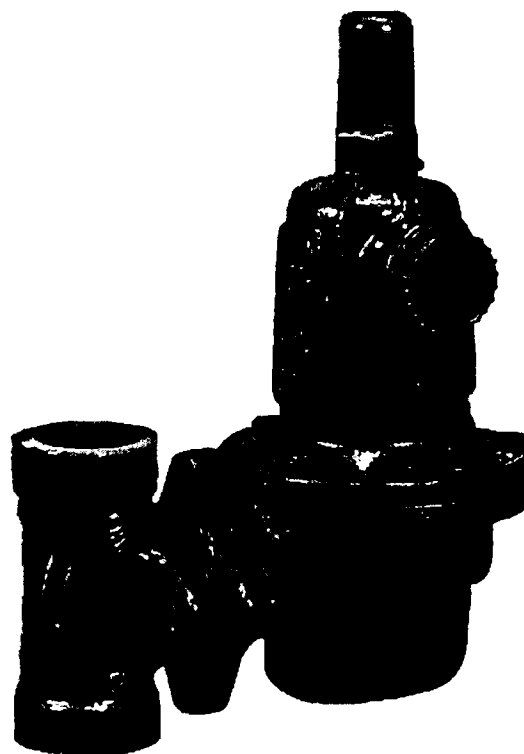

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Figure 1. Typical 627 Series Self-Operated Pressure Reducing Regulator

- **Tamper-Resistant**—An adjusting screw locknut and protective cap (figure 4) is standard on all 627 Series regulators to discourage tampering with the pressure setting.

- **Wide Range of Flow Capabilities**—A selection of body sizes and port diameters is available to satisfy various flow requirements.

- **Tight Shutoff Capability**—A flat-faced disk of nitrile or nylon provides excellent shutoff capability.

Specifications

Available Constructions

Type 627: Self-operated pressure reducing regulator equipped with a pitot tube for greater regulated capacities (figure 4)

Type 627R: Type 627 with internal relief and open throat (figure 5)

Type 627H: Type 627 with a diaphragm limiter to deliver a higher outlet pressure (figure 7)

Type 627M: Type 627 with a stem seal between the body outlet pressure and diaphragm case. Pressure is measured under the diaphragm through the 1/4-inch NPT downstream control line connection (figure 4)

Type 627MR: Type 627M with internal relief (figure 6)

Type 627HM: Type 627H with a stem seal between the body outlet pressure and diaphragm case. Pressure is measured under the diaphragm through two 1/4-inch NPT downstream control line connections (figure 7)

Body Sizes⁽¹⁾

■ 3/4, ■ 1, or ■ 2-inch

End Connection Styles⁽¹⁾

NPT screwed with 3/4, 1, or 2-inch sizes
ANSI Class 300 and 600 raised face (RF)
flanged with 1 or 2-inch sizes

Maximum Inlet Pressure⁽²⁾ (Body Rating)

■ 2000 psig (138 bar) for screwed steel, ■ 1480 psig (102 bar) for RF flanged steel, or ■ 1000 psig (69 bar) for ductile iron

Maximum Valve Disk Inlet Pressure Rating⁽²⁾

■ 2000 psig (138 bar) for nylon disk, ■ 1000 psig (69 bar) for nitrile disk or ■ 200 psig (14 bar) for fluoroelastomer disk

Maximum Operating Inlet And Outlet Pressure Ranges⁽²⁾

See table 1 for pressures by port and spring range

Maximum Spring And Diaphragm Casing Pressure⁽²⁾

See table 2

Maximum Body Outlet Pressure⁽²⁾ (Type 627M, 627MR, and 627HM Only)

■ 2000 psig (138 bar) for screwed steel, ■ 1480 psig (102 bar) for RF flanged steel, or ■ 1000 psig (69 bar) for ductile iron. (Type 627, 627H, and 627R are limited by maximum diaphragm casing pressure)

Port Diameters

See table 1

Internal Relief Performance

Type 627R: See table 3 and figure 8

Type 627MR: Limited by field-installed control line piping

Regulator Capacities

Type 627, 627M, or 627MR: See table 4

Type 627H or 627HM: See table 5

Type 627R: See table 6

Flow Coefficients

See table 7

Construction Materials

Body: ■ Ductile iron or ■ steel

Spring Case and Diaphragm Case: ■ steel, ■ ductile iron, or ■ die cast aluminum

Seat Ring: ■ Aluminum (standard) or ■ stainless steel

Disk Holder with Valve Disk

2000 psig (138 bar) maximum pressure:

■ aluminum with nylon or,

■ stainless steel with nylon

1000 psig (69 bar) maximum pressure:

■ aluminum with nitrile (standard) or,

■ stainless steel with nitrile

200 psig (14 bar) maximum pressure:

Stainless steel with fluoroelastomer disk

O-Rings and Diaphragm: ■ Nitrile or

■ fluoroelastomer

Relief Indicator

For 627R and 627MR (see figure 3)

Temperature Capabilities⁽²⁾

-20 to 180°F (-29 to 82°C)

Pressure Registration

Type 627, 627H, or 627R: Internal

Type 627M, 627HM, or 627MR: External through 1/4-inch NPT female control line connection in the diaphragm case

De-icer System

See figure 9 and Type 627M De-Icer System Application section

Assembly Positions

See figure 10

Specifications (Continued)

Spring Case Vent Connection

3/4-inch NPT female with removable screened vent assembly

Approximate Weight

With Ductile Iron or Steel Casings: 10 pounds (4.5 kg)

With Aluminum Casings: 6.3 pounds (2.8 kg)

1. End connections threaded to other than ANSI standards can usually be supplied. Consult your Fisher sales office or sales representative.

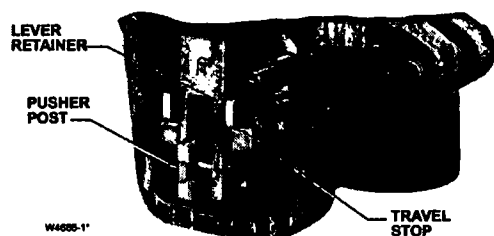


Figure 2. Internal Relief Construction Feature

Product Description

Types 627 and 627H Self-Operated Pressure Reducing Regulators

The Types 627 and 627H regulators provide economical pressure reducing control for a variety of residential, commercial, and industrial applications. The regulator pitot tube located in a high velocity stream provides dynamic boost that compensates for outlet pressure drop (see table 4 or 5).

Internal Relief for Type 627R or 627MR Regulator

The Type 627R internal relief performance values (table 3) were obtained by removing the disk assembly from the regulator, see figure 8. For the Type 627R or 627MR regulator, the internal relief across the diaphragm (figure 5 or 6) provides overpressure protection in many applications. As outlet pressures build up above the start-to-discharge point, the diaphragm moves off the relief valve seat allowing the excess pressure to bleed out through the screened vent.

External Dimensions

See figure 11

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



Figure 3. Relief Indicator

For extra protection, should failure conditions exist which would prevent normal operation of the regulator (for example, disk broken off or disk erosion), the pusher post contacts the lever retainer (figure 2) causing the relief valve assembly to open. Since the diaphragm continues to rise as downstream pressure builds, it opens the relief valve, thereby opening the valve. This internal relief may be adequate for the application.

Downstream Control Line for Type 627M, 627HM, or 627MR Regulator

A Type 627M, 627HM, or 627MR regulator has a blocking throat stem seal with O-rings and a 1/4-inch NPT control line connection in the diaphragm case (figure 6). A regulator with a downstream control line is used for monitoring applications or other applications where other equipment is installed between the regulator and the pressure control point. The stem seal separates the body outlet pressure from the diaphragm case.

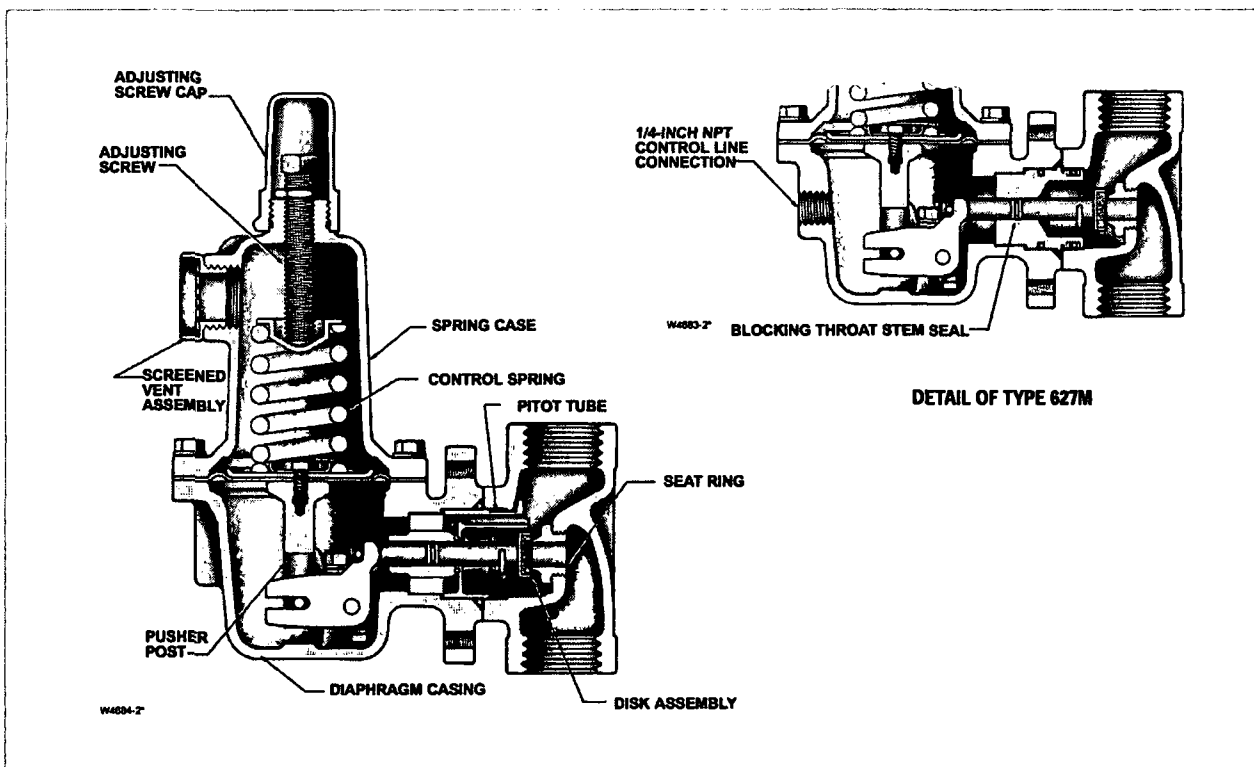


Figure 4. Type 627 and 627M Construction Details

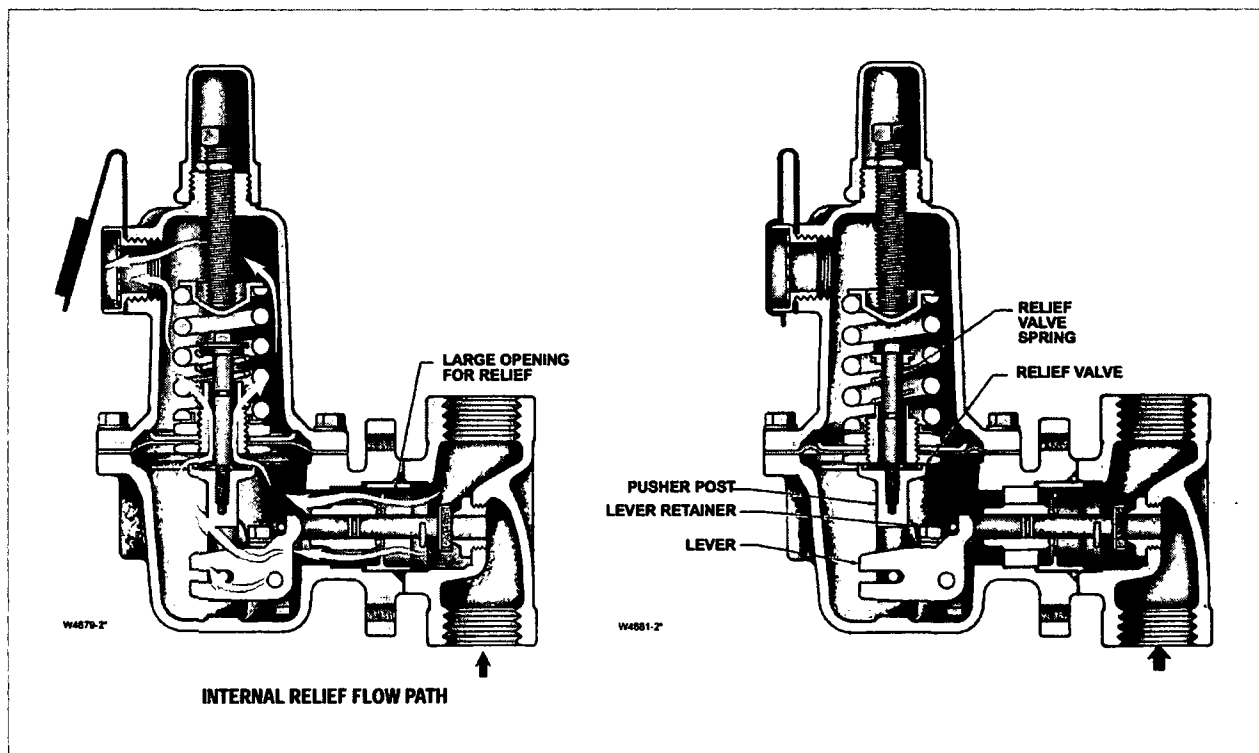


Figure 5. Type 627R Construction Details

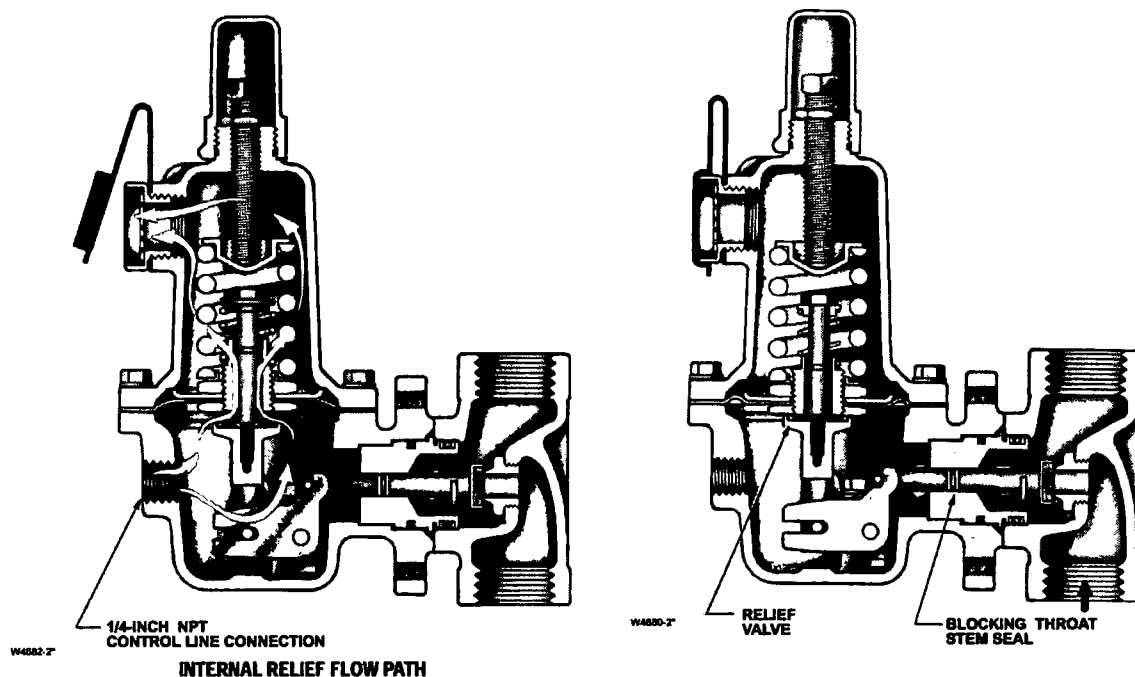


Figure 6. Type 627MR Construction Details

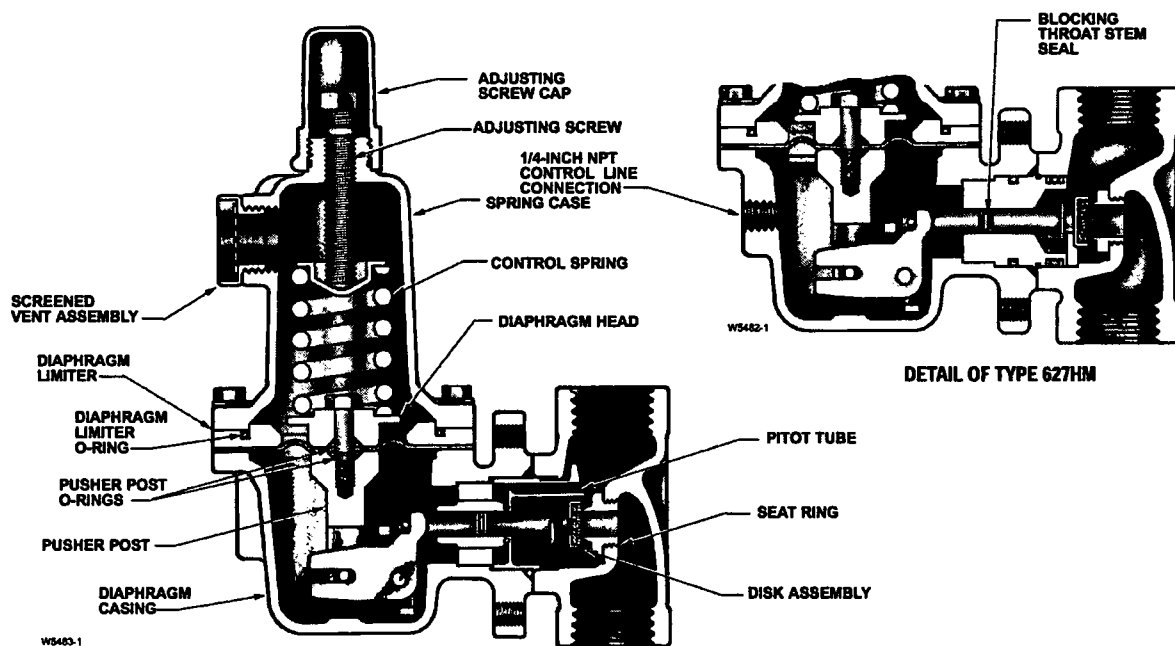


Figure 7. Type 627H and 627HM Construction Details

Table 1. Maximum Inlet Pressures, Differential Pressures and Outlet Pressure Ranges

TYPE NUMBER	OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	U.S. UNITS			METRIC UNITS		
		Port Dia., Inches	Maximum Inlet Pressure, Psig	Maximum Differential Pressure, Psid	Port Dia., mm	Maximum Inlet Pressure, Bar	Maximum Differential Pressure, Bar
627 and 627M ⁽³⁾	5 ⁽²⁾ to 20 psig (0.34 to 1.4 bar) 10B3076 X012 (yellow)	3/32	2000 ⁽¹⁾	2000 ⁽¹⁾	2.4	138 ⁽¹⁾	138 ⁽¹⁾
		1/8	1000	1000	3.2	69.0	69.0
		3/16	750	70	4.8	51.7	51.7
		1/4	500	00	6.4	34.5	34.5
		3/8	300	300	9.5	20.7	20.7
		1/2	250	20	12.7	13.8	13.8
	15 to 40 psig (1.0 to 2.8 bar) 10B3077 X012 (green)	3/32	2000 ⁽¹⁾	2000 ⁽¹⁾	2.4	138 ⁽¹⁾	138 ⁽¹⁾
		1/8	1500 ⁽¹⁾	1500 ⁽¹⁾	3.2	103 ⁽¹⁾	103 ⁽¹⁾
		3/16	1000 ⁽¹⁾	1000	4.8	69.0	69.0
		1/4	750	750	6.4	51.7	51.7
		3/8	500	500	9.5	34.5	34.5
		1/2	300	300	12.7	20.7	20.7
	35 to 80 psig (2.4 to 5.5 bar) 10B3078 X012 (blue)	3/32	2000 ⁽¹⁾	2000 ⁽¹⁾	2.4	138 ⁽¹⁾	138 ⁽¹⁾
		1/8	2000 ⁽¹⁾	2000 ⁽¹⁾	3.2	138 ⁽¹⁾	138 ⁽¹⁾
		3/16	1750 ⁽¹⁾	1750 ⁽¹⁾	4.8	121 ⁽¹⁾	121 ⁽¹⁾
		1/4	1500 ⁽¹⁾	1500 ⁽¹⁾	6.4	103 ⁽¹⁾	103 ⁽¹⁾
		3/8	1000	1000	9.5	69.0	69.0
		1/2	750	750	12.7	51.7	51.7
	70 to 150 psig (4.8 to 10.3 bar) 10B3079 X012 (red)	3/32	2000 ⁽¹⁾	2000 ⁽¹⁾	2.4	138 ⁽¹⁾	138 ⁽¹⁾
		1/8	2000 ⁽¹⁾	2000 ⁽¹⁾	3.2	138 ⁽¹⁾	138 ⁽¹⁾
		3/16	2000 ⁽¹⁾	2000 ⁽¹⁾	4.8	138 ⁽¹⁾	138 ⁽¹⁾
		1/4	1750 ⁽¹⁾	1750 ⁽¹⁾	6.4	121 ⁽¹⁾	121 ⁽¹⁾
		3/8	1250 ⁽¹⁾	1250 ⁽¹⁾	9.5	86.2 ⁽¹⁾	86.2 ⁽¹⁾
		1/2	750	750	12.7	51.7	51.7
627R and 627MR	5 ⁽²⁾ to 20 psig (0.34 to 1.4 bar) 10B3076 X012 (yellow)	3/32	2000 ⁽¹⁾	2000 ⁽¹⁾	2.4	138 ⁽¹⁾	138 ⁽¹⁾
		1/8	1000	1000	3.2	69.0	69.0
		3/16	750	750	4.8	51.7	51.7
		1/4	500	500	6.4	34.5	34.5
		3/8	300	300	9.5	20.7	20.7
		1/2	200	200	12.7	13.8	13.8
	15 to 40 psig (1.0 to 2.8 bar) 10B3077 X012 (green)	3/32	2000 ⁽¹⁾	2000 ⁽¹⁾	2.4	138 ⁽¹⁾	138 ⁽¹⁾
		1/8	1500 ⁽¹⁾	1500 ⁽¹⁾	3.2	103 ⁽¹⁾	103 ⁽¹⁾
		3/16	1000	100	4.8	69.0	69.0
		1/4	750	750	6.4	51.7	51.7
		3/8	300	300	9.5	20.7	20.7
		1/2	200	200	12.7	13.8	13.8
	35 to 80 psig (2.4 to 5.5 bar) 10B3078 X012 (blue)	3/32	2000 ⁽¹⁾	2000 ⁽¹⁾	2.4	138 ⁽¹⁾	138 ⁽¹⁾
		1/8	1750 ⁽¹⁾	1750 ⁽¹⁾	3.2	121 ⁽¹⁾	121 ⁽¹⁾
		3/16	1000	1000	4.8	69.0	69.0
		1/4	750	750	6.4	51.7	51.7
		3/8	300	300	9.5	20.7	20.7
		1/2	200	200	12.7	13.8	13.8
	70 to 150 psig (4.8 to 10.3 bar) 10B3079 X012 (red)	3/32	2000 ⁽¹⁾	2000 ⁽¹⁾	2.4	138 ⁽¹⁾	138 ⁽¹⁾
		1/8	1000	1000	3.2	69.0	69.0
		3/16	500	500	4.8	34.5	34.5
		1/4	300	300	6.4	20.7	20.7
		3/8	200	200	9.5	13.8	13.8
		1/2	200	200	12.7	13.8	13.8
627H and 627HM ⁽³⁾	140 to 250 psig (9.7 to 17.2 bar) 10B3078 X012 (blue)	3/32	2000 ⁽¹⁾	2000 ⁽¹⁾	2.4	138 ⁽¹⁾	138 ⁽¹⁾
		1/8	2000 ⁽¹⁾	2000 ⁽¹⁾	3.2	138 ⁽¹⁾	138 ⁽¹⁾
		3/16	1750 ⁽¹⁾	1750 ⁽¹⁾	4.8	121 ⁽¹⁾	121 ⁽¹⁾
		1/4	1500 ⁽¹⁾	1000	6.4	103 ⁽¹⁾	69.0
		3/8	1000	500	9.5	69.0	34.5
		1/2	750	250	12.7	51.7	13.8
	240 to 500 psig (16.5 to 34.5 bar) 10B3079 X012 (red)	3/32	2000	2000 ⁽¹⁾	2.4	138 ⁽¹⁾	138 ⁽¹⁾
		1/8	2000	2000 ⁽¹⁾	3.2	138 ⁽¹⁾	138 ⁽¹⁾
		3/16	1750	1750 ⁽¹⁾	4.8	121 ⁽¹⁾	121 ⁽¹⁾
		1/4	1500	1000	6.4	103 ⁽¹⁾	69.0
		3/8	1000	500	9.5	69.0	34.5
		1/2	750	250	12.7	51.7	13.8

1. For inlet pressure in excess of 1000 psig (69 bar), refer to the maximum body and disk pressure ratings in the specification table.

2. For pressure settings under 10 psig (0.69 bar), inlet pressure should be limited to approximately 100 psig (6.9 bar) so the set point adjustment can be obtained.

3. The unbalance forces change from the wide open monitor mode to an active regulator mode such that the Type 627M or 627HM should have a 3/8-inch (9.5 mm) or larger seat ring when used as a wide open monitor.

Table 2. Maximum Spring and Diaphragm Casing Pressure⁽¹⁾

	SPRING AND DIAPHRAGM CASING STYLE	TYPE 627		TYPE 629R		TYPE 627M		TYPE 627MR		TYPE 627H & 627HM	
		Psig	Bar	Psig	Bar	Psig	Bar	Psig	Bar	Psig	Bar
Maximum pressure to spring and diaphragm casings to prevent leak to atmosphere other than relief action (internal parts damage may occur)	Die Cast Aluminum	250	17.2	250	17.2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	Ductile Iron	250	17.2	250	17.2	250	17.2	250	17.2	N.A.	N.A.
	Steel	250	17.2	250	17.2	250	17.2	250	17.2	800	55.2
Maximum pressure to spring and diaphragm casings to prevent burst of casings during abnormal operation (leak to atmosphere and internal parts damage may occur)	Die Cast Aluminum	375	25.9	375	25.9	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	Ductile Iron	465	32.0	465	32.0	465	32.0	465	32.0	N.A.	N.A.
	Steel	1500	103	1500	103	1500	103	1500	103	1500	103
Maximum diaphragm casing overpressure (above set point) to prevent damage to internal parts	All Styles	60	4.1	120	8.3	60	4.1	120	8.3	120	8.3
1. If the spring case is pressurized, a metal adjusting screw cap is required. Contact the Fisher sales office or Fisher sales representative. <div style="float: right;"> <input type="checkbox"/> Revised casing pressures. </div>											

Overpressure Protection

Like most regulators, 627 Series regulators have outlet pressure ratings that are lower than their inlet pressure ratings. A pressure relieving or pressure limiting device must be provided by the user for the Type 627, 627M, and 627HM regulators if the inlet pressure can exceed the outlet pressure rating, since these regulators do not have internal relief.

Type 627R regulators provide internal relief which limits the total outlet pressure buildup over setpoint. Use table 3 and the following example to determine the maximum inlet pressure allowed to keep the maximum allowable downstream pressure from being exceeded.

Given:

40 psig Desired outlet pressure setting
125 psig Maximum allowable downstream pressure
1/4-inch Port diameter

What is the maximum inlet pressure?

35 to 80 psig Control spring range (first column)
40 psig Outlet pressure setting (second column)
125 psig Maximum allowable downstream pressure (third column)
1/4-inch Port diameter column across from the 125 maximum allowable pressure and the column under 1/4-inch port diameter

From table 3, the maximum inlet pressure for this example is 300 psig.

In many cases the internal relief of the Type 627R offers full capacity overpressure protection. No additional relief capacity is needed if the actual inlet pressure is equal to or

less than the inlet pressure shown under the Maximum Inlet Pressure column heading in table 3.

If the maximum allowable downstream system pressure is less than any of the pressures shown in the third column of table 3, use a separate relief valve or a monitor regulator since the internal relief will not open at pressures lower than shown in the table.

If the actual inlet pressure is higher than the pressure shown, in the Maximum Inlet Pressure column, to protect to the level shown, an additional relief valve is needed to supplement the relief capacity of the 627R internal relief or a full capacity separate relief valve or monitor regulator may be used.

To size a supplemental relief valve to use with the Type 627R:

1. Use the universal sizing equation to calculate the wide open capacity of the regulator port (Q_1) using:

a. Actual inlet pressure, PSIA (P_1)

b. Maximum allowable downstream system pressure (P_2) from table 3, column 3

c. C_g from table 7

2. Use the universal sizing equation to calculate the internal relief flow (Q_2) using:

a. Maximum inlet pressure (P_1) from table 3 columns 4 thru 9 (use the pressure from the table even though the actual pressure will be higher). Remember the equation requires pressures to be converted to PSIA.

b. Maximum allowable downstream system pressure (P_2) from table 3

c. C_g from table 7

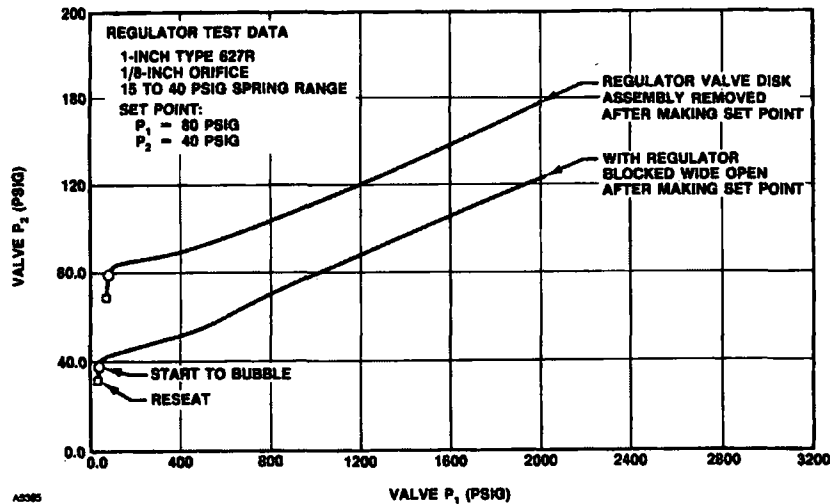


Figure 8. Relief Testing Methods, Outlet vs. Inlet Pressures

3. Calculate supplemental relief capacity:

a. Q supplemental relief = $Q_1 - Q_2$

Example:

10 psig Outlet pressure setting

60 psig Maximum allowable downstream system pressure

300 psig Inlet pressure

1/4-inch Port diameter

Step 1.

$P_1 = 300$ psig

$P_2 = 60$ psig

C_g , 1/4-inch port = 50

$Q_1 = 20,300$ SCFH

Step 2.

$P_1 = 190$ psig

$P_2 = 60$ psig

C_g , 1/4-inch port = 50

$Q_2 = 13,200$ SCFH

Step 3.

Q supplemental relief = $Q_1 - Q_2$

Q supplemental relief = $20,300 - 13,200 = 7,100$ SCFH

Overpressurizing any portion of a regulator or associated equipment may cause personal injury, leakage, or property damage due to bursting of pressure-containing parts or explosion of accumulated gas.

If needed, provide appropriate pressure relieving or pressure limiting devices to ensure that none of the limits in the specifications table is exceeded. Regulator operation within ratings does not prevent the possibility of damage from external sources such as debris in the pipeline.

Refer to the relief sizing coefficients in table 7 and the Capacity Information section to determine the required external relief valve capacity.

Table 3. Type 627R Internal Relief Performance⁽¹⁾

OUTLET PRESSURE RANGE AND CONTROL SPRING INFORMATION	OUTLET PRESSURE SETTING, PSIG	MAXIMUM ALLOWABLE DOWNSTREAM SYSTEM PRESSURE, PSIG	MAXIMUM INLET PRESSURE - PSIG ⁽²⁾						OUTLET PRESSURE SETTING, BAR	MAXIMUM ALLOWABLE DOWNSTREAM SYSTEM PRESSURE, BAR	MAXIMUM INLET PRESSURE - BAR ⁽²⁾					
			Maximum Inlet Pressure To Keep Maximum Allowable Downstream System Pressure From Being Exceeded								Maximum Inlet Pressure To Keep Maximum Allowable Downstream System Pressure From Being Exceeded					
			Port Diameter - Inches								Port Diameter - mm					
			3/32	1/8	3/16	1/4	3/8	1/2			2.4	3.2	4.8	6.4	9.5	12.7
5 to 20 psig ⁽³⁾ (0.34 to 1.4 bar) 10B3076 X012 (yellow)	10	60	1250	740	320	190	95	75	0.69	4.1	86.2	51.0	22.1	13.1	6.6	5.2
		100	2000	1500	620	390	180	130		6.9	138	103	42.7	26.9	12.4	9.0
		125	2000	1900	830	480	220	160		8.6	138	131	57.2	33.1	15.2	11.0
		175	2000	2000	1100	670	320	220		12.1	138	138	75.8	46.2	22.1	15.2
		200	2000	2000	1300	770	360	260		13.8	138	138	89.6	53.1	24.8	17.9
		250	2000	2000	1600	960	450	320		17.2	138	138	110	66.2	31.0	22.1
	15	60	1000	620	260	170	90	70	1.0	4.1	69.0	42.7	17.9	11.7	6.2	4.8
		100	2000	1400	610	370	170	130		6.9	138	96.5	42.1	25.5	11.7	9.0
		125	2000	1900	810	480	220	160		8.6	138	131	55.8	33.1	15.2	11.0
		175	2000	2000	1100	670	320	220		12.1	138	138	75.8	46.2	22.1	15.2
		200	2000	2000	1300	770	360	260		13.8	138	138	89.6	53.1	24.8	17.9
		250	2000	2000	1600	960	450	320		17.2	138	138	110	66.2	31.0	22.1
	20	60	850	490	210	130	80	65	1.4	4.1	58.6	33.8	14.5	9.0	5.5	4.6
		100	2000	1300	600	360	170	120		6.9	138	89.6	41.4	24.8	11.7	8.3
		125	2000	1800	800	480	220	160		8.6	138	124	55.2	33.1	15.2	11.0
		175	2000	2000	1100	670	320	220		12.1	138	138	75.8	46.2	22.1	15.2
		200	2000	2000	1300	770	360	260		13.8	138	138	89.6	53.1	24.8	17.9
		250	2000	2000	1600	960	450	320		17.2	138	138	110	66.2	31.0	22.1
15 to 40 psig (1.0 to 2.8 bar) 10B3077 X012 (green)	15	60	1000	380	210	130	80	65	1.0	4.1	69.0	26.2	14.5	9.0	5.5	4.5
		100	2000	1300	590	350	170	120		6.9	138	89.6	40.7	24.1	11.7	8.3
		125	2000	1800	800	470	220	160		8.6	138	124	55.2	32.4	15.2	11.0
		175	2000	2000	1100	640	320	220		12.1	138	138	75.8	44.1	22.1	15.2
		200	2000	2000	1300	780	370	260		13.8	138	138	89.6	53.8	25.5	17.9
		250	2000	2000	1600	960	450	320		17.2	138	138	110	66.2	31.0	22.1
	20	60	630	200	150	100	70	65	1.4	4.1	43.4	13.8	10.3	6.9	4.8	4.5
		100	2000	1200	550	330	160	120		6.9	138	82.7	37.9	22.8	11.0	8.3
		125	2000	1700	760	450	210	160		8.6	138	117	52.4	31.0	14.5	11.0
		175	2000	2000	1100	630	320	220		12.1	138	138	75.8	43.4	22.1	15.2
		200	2000	2000	1300	770	360	260		13.8	138	138	89.6	53.1	24.8	17.9
		250	2000	2000	1600	960	460	320		17.2	138	138	110	66.2	31.7	22.1
	30	100	2000	950	450	260	140	110	2.1	6.9	138	65.5	31.0	17.9	9.7	7.6
		125	2000	1500	670	400	190	150		8.6	138	103	46.2	27.6	13.1	10.3
		175	2000	2000	1000	610	300	220		12.1	138	138	69.0	42.0	20.7	15.2
		200	2000	2000	1200	760	360	260		13.8	138	138	82.7	52.4	24.8	17.9
		250	2000	2000	1600	970	460	320		17.2	138	138	110	66.9	31.7	22.1
		40	100	1500	700	330	200	120		108	2.8	6.9	103	48.3	22.8	13.8
	125		2000	1300	560	340	180	140	8.6	138		89.6	38.6	23.4	12.4	9.7
	175		2000	1800	1000	550	290	220	12.1	138		124	69.0	37.9	20.0	15.2
	200		2000	2000	1200	730	350	250	13.8	138		138	82.7	50.3	24.1	17.2
	250		2000	2000	1600	970	460	320	17.2	138		138	110	66.9	31.7	22.1

- Continued -

Capacity Information

Natural gas regulating capacities at selected inlet pressures and outlet pressure settings are given in table 4 for the Type 627, in table 5 for the Type 627H, and in table 6 for the Type 627R regulator. Flows are in scfh (60°F and 14.7 psia) of 0.6 specific gravity natural gas at 60°F. To determine the equivalent capacities for other gases, multiply the

table capacity by the following appropriate conversion factor: 0.775 for air, 0.789 for nitrogen, 0.628 for propane, or 0.548 for butane. 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 normal cubic meters per hour at 0°C and 1.01325 bar, multiply scfh by 0.0268.

Table 3. Type 627R Internal Relief Performance⁽¹⁾ (Continued)

OUTLET PRESSURE RANGE AND CONTROL SPRING INFORMATION	OUTLET PRESSURE SETTING, PSIG	MAXIMUM ALLOWABLE DOWNSTREAM SYSTEM PRESSURE, PSIG	MAXIMUM INLET PRESSURE - PSIG ⁽²⁾						OUTLET PRESSURE SETTING, BAR	MAXIMUM ALLOWABLE DOWNSTREAM SYSTEM PRESSURE, BAR	MAXIMUM INLET PRESSURE - BAR ⁽²⁾					
			Maximum Inlet Pressure To Keep Maximum Allowable Downstream System Pressure From Being Exceeded								Maximum Inlet Pressure To Keep Maximum Allowable Downstream System Pressure From Being Exceeded					
			Port Diameter - Inches								Port Diameter - mm					
			3/32	1/8	3/16	1/4	3/8	1/2			2.4	3.2	4.8	6.4	9.5	12.7
35 to 80 psig (2.4 to 5.5 bar) 10B3078 X012 (blue)	40	125	2000	1100	500	300	170	140	2.8	8.6	138	75.8	34.5	20.7	11.7	9.7
		150	2000	1600	750	440	230	180		10.3	138	110	51.7	30.3	15.9	12.4
		175	2000	2000	980	580	290	220		12.1	138	138	67.6	40.0	20.0	15.2
		200	2000	2000	1200	720	340	250		13.8	138	138	82.7	49.6	23.4	17.2
		250	2000	2000	1600	940	450	320		17.2	138	138	110	64.8	31.0	22.1
	50	125	1400	820	400	230	150	140	3.4	8.6	96.5	56.5	27.6	15.9	10.3	9.7
		150	2000	1400	650	370	210	170		10.3	138	96.5	44.8	25.5	14.5	11.7
		175	2000	1900	700	530	270	210		12.1	138	131	48.3	36.5	18.6	14.5
		200	2000	2000	1100	670	330	240		13.8	138	138	75.8	46.2	22.8	16.5
		250	2000	2000	1500	920	430	320		17.2	138	138	103	63.4	29.6	22.1
	60	125	900	450	270	190	140	130	4.1	8.6	62.1	31.0	18.6	13.1	9.7	9.0
		150	1700	1100	540	300	190	160		10.3	117	75.8	37.2	20.7	13.1	11.0
		175	2000	1700	780	470	250	200		12.1	138	117	53.8	32.4	17.2	13.8
		200	2000	2000	1000	610	310	230		13.8	138	138	69.0	42.0	21.4	15.9
		250	2000	2000	1400	880	420	310		17.2	138	138	96.5	60.7	29.0	21.4
	70	150	1200	850	430	250	170	160	4.8	10.3	82.7	58.6	29.6	17.2	11.7	11.0
		175	2000	1400	670	400	230	190		12.1	138	96.5	46.2	27.6	15.9	13.1
		200	2000	2000	920	550	280	230		13.8	138	138	63.4	37.9	19.3	15.9
		250	2000	2000	1300	830	400	310		17.2	138	138	89.6	57.2	27.6	21.4
	80	150	800	500	300	200	160	150	5.5	10.3	55.2	34.5	20.7	13.8	11.0	10.3
		175	1500	1200	550	330	210	190		12.1	103	82.7	37.9	22.8	14.5	13.1
		200	2000	1700	800	480	270	220		13.8	138	117	55.2	33.1	18.6	15.2
		250	2000	2000	1200	770	390	300		17.2	138	138	82.7	53.1	28.9	20.7
70 to 150 psig (4.8 to 10.3 bar) 10B3079 X012 (red)	70	175	1900	600	400	260	200	175	4.8	12.1	131	41.4	27.6	17.9	13.8	12.0
		200	2000	1200	630	380	250	210		13.8	138	82.7	43.4	26.2	17.2	14.5
		250	2000	2000	1100	680	360	290		17.2	138	138	75.8	46.9	24.8	20.0
	80	175	1400	250	240	200	190	175	5.5	12.1	96.5	17.2	16.5	13.8	13.1	12.1
		200	2000	960	520	330	240	210		13.8	138	66.2	35.9	22.8	16.5	14.5
		250	2000	2000	1000	620	350	280		17.2	138	138	69.0	42.7	24.1	19.3
	100	200	1500	250	240	230	210	210	6.9	13.8	103	17.2	16.5	15.9	14.5	14.5
		250	2000	1600	770	520	320	270		17.2	138	110	53.1	35.9	22.1	18.6
	125	250	2000	1000	500	390	290	260	8.6	17.2	138	69.0	34.5	26.9	20.0	17.9
	150	250	1200	260	260	260	260	260	10.3	17.2	82.7	17.9	17.9	17.9	17.9	17.9
1. The internal relief performance values are obtained by removing the disk assembly. 2. For inlet pressures in excess of 1000 psig (69 bar), refer to the maximum body and disk pressure ratings in the specification table. 3. For pressure settings under 10 psig (0.69 bar), inlet pressure should be limited to									approximately 100 psig (6.9 bar) so the set point adjustment can be obtained. Shaded areas indicate maximum inlet pressures allowed during system malfunction only. Table 1 gives the maximum inlet pressure for normal regulator operation.							

1. The internal relief performance values are obtained by removing the disk assembly.
2. For inlet pressures in excess of 1000 psig (69 bar), refer to the maximum body and disk pressure ratings in the specification table.
3. For pressure setting under 10 psig (0.69 bar), inlet pressure should be limited to

approximately 100 psig (6.9 bar) so the set point adjustment can be obtained.
Shaded areas indicate maximum inlet pressures allowed during system malfunction only. Table 1 gives the maximum inlet pressure for normal regulator operation.

To determine wide-open flow capacities for relief sizing use the following formula:

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

where:

$C_1 = C_g/C_v$ (see table 7)

C_g = Gas sizing coefficient (see table 7)

G = Gas specific gravity (air = 1.0)

P_1 = Valve inlet pressure, psia

ΔP = Pressure drop across valve, psi

Q = Gas flow rate, scfh

T = Absolute temperature of gas at inlet, degree Rankine

To obtain the published capacities, the inlet and outlet piping should be the same as the regulator size.

Table 4. Type 627, 627M and 627MR Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾

					FOR TYPES 627, 627M, AND 627MR												
OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)		OUTLET PRESSURE SETTING		INLET PRESSURE		3/4 INCH BODY SIZE						1 INCH BODY SIZE					
						Port Diameter, Inches (mm)						Port Diameter, Inches (mm)					
		Psig	Bar	Psig	Bar	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
5 to 20 psig ⁽²⁾ (0.34 to 1.4 bar) 10B3076 X012 (yellow)	5 ⁽³⁾	0.34	10	0.69	170	320	700	1060	1540	1900	170	330	710	1100	1900	2500	
			15	1.0	240	330	810	1300	2150	3350	240	390	890	1600	2500	3350	
			20	1.4	290	460	1140	1800	3050	4350	290	500	1160	2060	3400	4450	
			30	2.1	380	610	1530	2490	3880	6850	380	670	1560	2800	4750	6900	
			60	4.1	640	1170	2550	4240	6270	7370	640	1170	2600	4710	8140	13,700	
			75	5.2	770	1410	3020	5100	6620	7700	770	1410	3150	5710	9790	14,500	
	10	0.69	100	6.9	990	1800	3800	5980	7440	7900	990	1800	4070	7310	12,500	16,000	
			15	1.03	210	320	800	1290	2100	3300	210	375	880	1590	2480	3300	
			20	1.4	280	455	1130	1790	3000	4300	280	490	1150	2050	3380	4410	
			30	2.1	380	610	1530	2480	3860	6830	380	670	1560	2800	4720	6840	
			60	4.1	640	1170	2550	4240	6270	7370	640	1170	2600	4710	8140	13,700	
			75	5.2	770	1410	3020	5100	6620	7700	770	1410	3150	5710	9790	14,500	
			100	6.9	990	1800	3800	5980	7440	7900	990	1800	4070	7310	12,500	16,000	
			150	10.3	1420	2580	5700	7130	8180	8200	1420	2580	5850	10,500	17,000	18,000	
			200	13.8	1850	3370	6970	7250	8200	8300	1850	3370	7630	13,700	18,000	18,500	
			300	20.7	2700	4910	8000	8050	8250		2700	4910	11,200	19,800	20,000		
			500	34.5	4010	8090	8080	8100			4400	8090	15,700	20,000			
			750	51.7	4400	8930	8950				5400	12,000	18,000				
			1000	69.0	4450	10,300					5800	14,000					
			1250	86.2	4540						6300						
			1500	103	4880						6600						
			1750	121	5230						6800						
			2000	138	5900						7600						
	20	1.4	30	2.1	350	620	1400	2490	4360	6290	350	620	1450	2580	4360	6290	
			50	3.4	550	1000	2280	4010	7870	8500	550	1000	2280	4090	7870	14,100	
			60	4.1	640	1170	2640	4680	8340	8940	640	1170	2640	4750	9690	14,500	
			100	6.9	990	1800	3980	7220	11,500	12,600	990	1800	4070	7310	13,900	23,300	
			150	10.3	1420	2580	5850	10,400	12,100	13,100	1420	2580	5850	10,500	17,700	34,200	
			200	13.8	1850	3370	7340	12,000	13,200	13,700	1850	3370	7630	13,700	26,600	39,100	
			300	20.7	2700	4910	11,200	13,000	15,600		2700	4910	11,200	20,100	37,000		
			500	34.5	4400	8090	18,300	15,100			4400	8090	18,300	32,900			
			750	51.7	6600	12,000	14,200				6600	12,000	23,600				
			1000	69.0	7300	14,600					8900	16,000					
			1250	86.2	7500						10,000						
			1500	103	7800						10,400						
			1750	121	8400						12,000						
			2000	138	8600						14,000						
15 to 40 psig (1.0 to 2.8 bar) 10B3077 X012 (green)	40	2.8	60	4.1	610	1090	2530	4350	8140	9420	610	1090	2530	4510	9290	9420	
			75	5.2	760	1370	3080	5510	10,300	13,600	760	1370	3080	5640	10,800	16,500	
			100	6.9	990	1790	4070	7220	13,200	15,300	990	1790	4070	7310	14,700	21,900	
			150	10.3	1420	2580	5850	10,400	17,400	18,200	1420	2580	5850	10,500	20,500	34,500	
			200	13.8	1850	3370	7630	13,500	18,000	18,500	1850	3370	7630	13,700	27,100	46,400	
			300	20.7	2700	4910	11,200	18,500	20,000	20,700	2700	4910	11,200	20,100	40,100	67,100	
			500	34.5	4400	8090	18,300	24,000	27,000		4400	8090	18,300	32,900	63,900		
			750	51.7	6600	12,000	23,000	24,200			6600	12,000	27,200	39,400			
			1000	69.0	8700	16,000	24,400				8700	16,000	36,100				
			1250	86.2	11,000	18,000					11,000	19,000					
			1500	103	12,000	21,000					13,000	22,000					
			1750	121	13,000						15,000						
			2000	138	14,000						17,000						

- Continued -

Table 4. Type 627, 627M and 627MR Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾ (Continued)

					FOR TYPES 627, 627M, AND 627MR											
OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		3/4 INCH BODY SIZE						1 INCH BODY SIZE					
					Port Diameter, Inches (mm)						Port Diameter, Inches (mm)					
	Psig	Bar	Psig	Bar	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
35 to 80 psig (2.4 to 5.5 bar) 10B3078 X012 (blue)	60	4.1	75	5.2	700	1230	2760	4750	8620	15,200	700	1230	2760	4880	8630	16,100
			100	6.9	970	1740	4010	6990	12,800	17,300	970	1740	4010	7000	13,000	19,300
			150	10.3	1420	2580	5850	10,300	18,600	23,000	1420	2580	5850	10,500	18,900	32,800
			200	13.8	1850	3370	7630	13,500	21,600	27,400	1850	3370	7630	13,700	24,000	42,200
			300	20.7	2700	4910	11,200	19,800	26,100	30,100	2700	4910	11,200	20,100	32,500	69,100
			500	34.5	4400	8090	18,300	28,100	28,900	33,400	4400	8090	18,300	32,900	64,000	94,300
			750	51.8	6600	12,000	26,300	30,000	37,000	45,000	6600	12,000	27,200	43,380	66,000	130,000
			1000	69.0	8700	16,000	30,000	31,200	37,400		8700	16,000	36,100	50,300	67,700	
			1250	86.2	11,000	19,000	31,600	34,000			11,000	19,000	45,000	57,000		
			1500	103	13,000	22,000	30,400	36,000			13,000	22,000	54,000	63,000		
			1750	121	15,000	25,000	34,000				15,000	25,000	63,000			
			2000	138	17,000	28,000					17,000	28,000				
	80	5.5	100	5.2	900	1600	3750	6490	12,200	17,300	900	1600	3750	6650	12,200	18,600
			150	10.3	1410	2580	5850	10,200	19,600	25,700	1410	2580	5850	10,500	21,100	33,600
			200	13.8	1850	3370	7630	13,500	25,400	29,300	1850	3370	7630	13,700	28,400	44,100
			300	20.7	2700	4910	11,200	19,800	32,700	33,500	2700	4910	11,200	20,100	43,300	75,400
			500	34.5	4400	8090	18,300	31,900	36,000	36,700	4400	8090	18,300	32,900	71,600	110,000
			750	51.8	6600	12,000	27,200	35,000	44,000	46,000	6600	12,000	27,200	48,900	105,500	135,000
			1000	69.0	8700	16,000	36,100	38,000	56,200		8700	16,000	36,100	64,900	118,000	
			1250	86.2	11,000	19,000	37,000	40,000			11,000	19,000	45,000	80,000		
			1500	103	13,000	22,000	38,000	44,000			13,000	22,000	54,000	96,000		
			1750	121	15,000	25,000	42,000				15,000	25,000	63,000			
			2000	138	17,000	28,000					17,000	28,000				
70 to 150 psig (4.8 to 10.3 bar) 10B3079 X012 (red)	100	6.9	150	10.3	1170	2510	5540	8710	16,000	20,300	1170	2510	5540	8710	16,000	24,000
			200	13.8	1850	3370	7630	12,000	21,300	25,700	1850	3370	7630	12,000	21,300	34,100
			300	20.7	2700	4910	11,200	19,400	30,000	31,700	2700	4910	11,200	19,400	30,100	53,200
			500	34.5	4400	8090	18,300	31,800	39,000	39,200	4400	8090	18,300	31,800	66,500	83,900
			750	51.8	6600	12,000	27,200	39,000	39,200	45,900	6600	12,000	27,200	47,300	95,300	117,000
			1000	69.0	8700	16,000	36,100	40,000	40,500	47,000	8700	16,000	36,100	59,700	100,000	120,000
			1250	86.2	11,000	19,000	39,000	40,500	41,000		11,000	19,000	45,000	72,000	114,000	
			1500	103	13,000	22,000	43,000	44,000			13,000	22,000	54,000	86,000		
			1750	121	15,000	25,000	45,000	47,000			15,000	25,000	63,000	95,000		
			2000	138	17,000	28,000	46,000				17,000	28,000	71,000			
	125	8.6	150	10.3	1250	2340	5340	9130	15,700	20,800	1250	2340	5340	9470	15,700	20,800
			200	13.8	1830	3320	7550	13,160	22,500	28,600	1830	3320	7550	13,400	28,100	32,800
			300	20.7	2700	4910	11,200	19,800	32,700	38,000	2700	4910	11,200	20,100	36,300	52,600
			500	34.5	4400	8090	18,300	32,500	43,800	51,700	4400	8090	18,300	32,900	70,800	109,000
			750	51.8	6600	12,000	27,200	48,300	49,900	71,400	6600	12,000	27,200	48,900	104,000	158,000
			1000	69.0	8700	16,000	36,100	50,000	52,900	72,000	8700	16,000	36,100	64,800	138,000	160,000
			1250	86.2	11,000	19,000	45,000	53,000	58,000		11,000	19,000	45,000	80,000	145,000	
			1500	103	13,000	22,000	51,000	56,000			13,000	22,000	54,000	96,000		
			1750	121	15,000	25,000	52,000	60,000			15,000	25,000	63,000	112,000		
			2000	138	17,000	28,000	53,000				17,000	28,000	71,000			
	150	10.3	200	13.8	1760	3200	7290	12,500	21,400	30,600	1760	3200	7290	12,900	21,400	33,600
			300	20.7	2700	4910	11,200	17,200	34,700	46,000	2700	4910	11,200	17,200	40,100	55,900
			500	34.5	4400	8090	18,300	32,500	48,900	59,700	4400	8090	18,300	32,900	70,300	111,000
750			51.8	6600	12,000	27,200	48,300	59,000	72,000	6600	12,000	27,200	48,900	104,000	160,000	
1000			69.0	8700	16,000	36,100	64,100	81,100	85,000	8700	16,000	36,100	64,800	138,000	162,000	
1250			86.2	11,000	19,000	45,000	68,000	90,000		11,000	19,000	45,000	80,000	150,000		
1500			103	13,000	22,000	54,000	72,000			13,000	22,000	54,000	96,000			
1750			121	15,000	25,000	63,000	77,000			15,000	25,000	63,000	112,000			

- Continued -

Table 4. Type 627, 627M and 627MR Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾ (Continued)

OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		FOR TYPE 627						FOR TYPES 627M, AND 627MR					
					2 INCH BODY SIZE						2 INCH BODY SIZE					
	Psig	Bar	Psig	Bar	Port Diameter, Inches (mm)						Port Diameter, Inches (mm)					
					3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
5 to 20 psig ⁽²⁾ (0.34 to 1.4 bar) 10B3076 X012 (yellow)	5 ⁽³⁾	0.34	10	0.69	170	330	710	1080	1700	2400	170	330	710	1080	1700	2400
			15	1.0	240	390	890	1250	1900	2700	240	390	890	1250	1900	2700
			20	1.4	290	500	1160	1900	2650	3900	290	500	1160	1900	2650	3900
			30	2.1	380	670	1560	2800	3680	6500	380	670	1560	2800	3680	6500
			60	4.1	640	1170	2600	4750	7250	17,800	640	1170	2600	4750	7250	15,000
			75	5.2	770	1410	3150	5700	8060	22,400	770	1410	3150	5700	8060	17,900
			100	6.9	990	1790	4070	7310	16,200	28,700	990	1790	4070	7310	14,600	23,000
	10	0.69	15	1.03	210	375	880	1220	1860	2670	210	375	880	1220	1860	2670
			20	1.4	280	490	1150	1880	2610	3830	280	490	1150	1880	2610	3830
			30	2.1	380	670	1560	2760	3640	6460	380	670	1560	2760	3640	6460
			60	4.1	640	1170	2600	4750	7250	17,800	640	1170	2600	4750	7250	15,000
			75	5.2	770	1410	3150	5700	8060	22,400	770	1410	3150	5700	8060	17,900
			100	6.9	990	1790	4070	7310	16,200	28,700	990	1790	4070	7310	14,600	23,000
			150	10.3	1420	2580	5850	10,500	23,300		1420	2580	5850	10,500	21,000	33,000
			200	13.8	1850	3370	7630	13,700			1850	3370	7630	13,700	27,300	43,000
			300	20.7	2700	4910	11,200				2700	4910	11,200	20,100	40,100	
			500	34.5	4400	8090	18,300				4400	8090	18,300	32,900		
			750	51.7	6600	12,000	27,200				6600	12,000	27,200			
			1000	69.0	8700	16,000					8700	16,000				
			1250	86.2	11,000						11,000					
			1500	103	13,000						13,000					
			1750	121	15,000						15,000					
			2000	138							17,000					
	20	1.4	30	2.1	350	620	1450	2350	4300	6110	350	620	1450	2480	4300	6110
			50	3.4	550	1000	2280	4040	7100	12,800	550	1000	2280	4040	7100	12,800
			60	4.1	640	1170	2640	4750	8400	15,700	640	1170	2640	4750	8400	15,000
			100	6.9	990	1800	4070	7310	16,200	28,700	990	1800	4070	7310	14,600	23,000
			150	10.3	1420	2580	5850	10,500	23,300		1420	2580	5850	10,500	21,000	33,000
			200	13.8	1850	3370	7630	13,700			1850	3370	7630	13,700	27,300	43,000
			300	20.7	2700	4910	11,200	20,100			2700	4910	11,200	20,100	40,100	
			500	34.5	4400	8090	18,300	32,900			4400	8090	18,300	32,900		
			750	51.7	6600	12,000	27,200				6600	12,000	27,200			
			1000	69.0	8700	16,000					8700	16,000				
			1250	86.2	11,000						11,000					
			1500	103	13,000						13,000					
			1750	121	15,000						15,000					
			2000	138							17,000					
15 to 40 psig (1.0 to 2.8 bar) 10B3077 X012 (green)	40	2.8	60	4.1	610	1090	2530	4370	8680	13,300	610	1090	2530	4370	8680	13,300
			75	5.2	760	1370	3080	5540	11,900	19,300	760	1370	3080	5540	10,700	19,300
			100	6.9	990	1800	4070	7310	16,200	25,400	990	1800	4070	7310	14,600	25,400
			150	10.3	1420	2580	5850	10,500	23,300	41,300	1420	2580	5850	10,500	21,000	37,000
			200	13.8	1850	3370	7630	13,700	30,400	53,900	1850	3370	7630	13,700	27,300	48,000
			300	20.7	2700	4910	11,200	20,100	44,600		2700	4910	11,200	20,100	40,100	71,000
			500	34.5	4400	8090	18,300	32,900			4400	8090	18,300	32,900	65,000	
			750	51.7	6600	12,000	27,200				6600	12,000	27,200	48,900		
			1000	69.0	8700	16,000	36,100				8700	16,000	36,100			
			1250	86.2	11,000	19,000					11,000	19,000				
			1500	103	13,000	22,000					13,000	22,000				
			1750	121	15,000						15,000					
			2000	138	17,000						17,000					

- Continued -

Table 4. Type 627, 627M and 627MR Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾ (Continued)

OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		FOR TYPE 627						FOR TYPES 627M, AND 627MR					
					2 INCH BODY SIZE						2 INCH BODY SIZE					
	Psig	Bar	Psig	Bar	Port Diameter, Inches (mm)						Port Diameter, Inches (mm)					
					3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
35 to 80 psig (2.4 to 5.5 bar) 10B3078 X012 (blue)	60	4.1	75	5.2	700	1260	2760	4900	9000	12,300	700	1230	2760	4900	9000	12,300
			100	6.9	970	1740	4010	7000	15,000	20,400	970	1740	4010	7000	15,000	20,400
			150	10.3	1420	2580	5850	10,500	23,300	35,200	1420	2580	5850	10,500	23,300	35,200
			200	13.8	1850	3370	7630	13,700	30,400	53,900	1850	3370	7630	13,700	30,400	48,500
			300	20.7	2700	4910	11,200	20,100	44,600		2700	4910	11,200	20,100	44,600	71,000
			500	34.5	4400	8090	18,300	32,900			4400	8090	18,300	32,900	73,000	116,000
			750	51.8	6600	12,000	27,200			32,000	6600	12,000	27,200	48,900	108,000	172,000
			1000	69.0	8700	16,000	36,100		52,000		8700	16,000	36,100	65,000	144,000	
			1250	86.2	11,000	19,000	45,000				11,000	19,000	45,000	81,000		
			1500	103	13,000	22,000		43,000			13,000	22,000	54,000	97,000		
			1750	121	15,000	25,000	26,000				15,000	25,000	63,000			
			2000	138	17,000	28,000					17,000	28,000				
	80	5.5	100	5.2	900	1630	3750	6400	12,800	20,400	900	1630	3750	6400	12,800	20,400
			150	10.3	1410	2580	5850	10,500	23,300	41,300	1410	2580	5850	10,500	23,300	37,200
			200	13.8	1850	3370	7630	13,700	30,400	53,900	1850	3370	7630	13,700	30,400	48,500
			300	20.7	2700	4910	11,200	20,100	44,600		2700	4910	11,200	20,100	44,600	71,000
			500	34.5	4400	8090	18,300	32,900			4400	8090	18,300	32,900	73,000	116,000
			750	51.8	6600	12,000	27,200	48,900		44,000	6600	12,000	27,200	48,900	108,000	172,000
			1000	69.0	8700	16,000	36,100		63,000		8700	16,000	36,100	65,000	144,000	
			1250	86.2	11,000	19,000	45,000				11,000	19,000	45,000	81,000		
			1500	103	13,000	22,000	54,000	86,000			13,000	22,000	54,000	97,000		
			1750	121	15,000	25,000	63,000				15,000	25,000	63,000			
			2000	138	17,000	28,000					17,000	28,000				

- Continued -

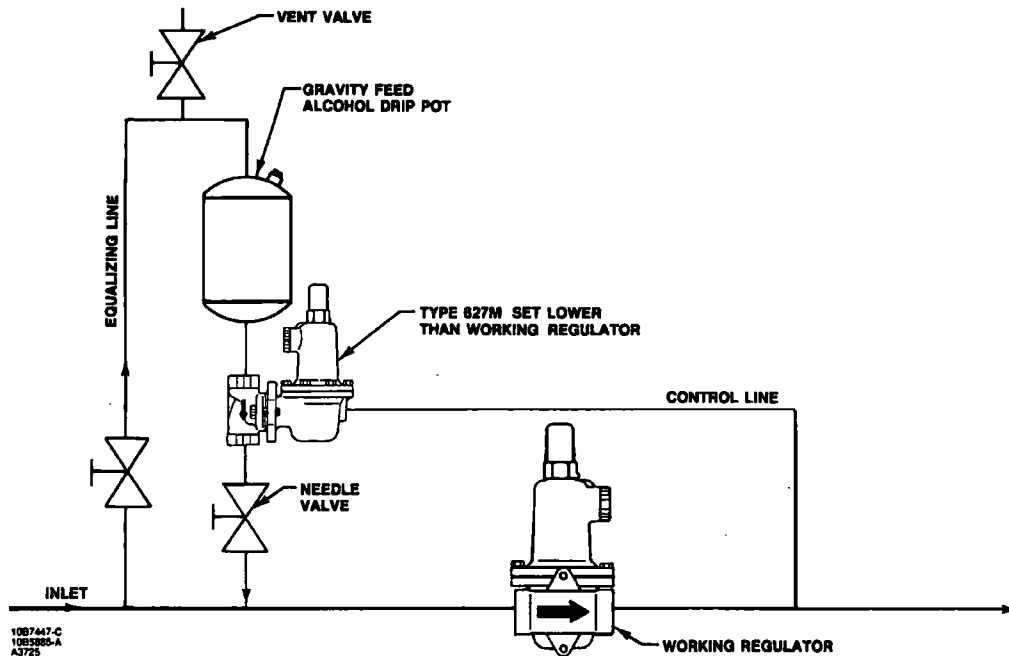


Figure 9. Schematic of De-Icer System

Table 4. Type 627, 627M and 627MR Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾ (Continued)

OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		FOR TYPE 627						FOR TYPES 627M AND 627MR					
					2 INCH BODY SIZE						2 INCH BODY SIZE					
					Port Diameter, Inches (mm)						Port Diameter, Inches (mm)					
	Psig	Bar	Psig	Bar	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
70 to 150 psig (4.8 to 10.3 bar) 10B3079 X012 (red)	100	6.9	150	10.3	1170	2510	5540	8600	16,000	22,000	1170	2510	5540	8600	16,000	22,000
			200	13.8	1850	3370	7630	13,700	22,000	33,000	1850	3370	7630	13,700	22,000	33,000
			300	20.7	2700	4910	11,200	20,100	35,000	65,300	2700	4910	11,200	20,100	35,000	59,000
			500	34.5	4400	8090	18,300	32,900	73,000	129,000	4400	8090	18,300	32,900	73,000	116,000
			750	51.8	6600	12,000	27,200	48,900	108,000		6600	12,000	27,200	48,900	108,000	172,000
			1000	69.0	8700	16,000	36,100	64,800			8700	16,000	36,100	64,800	144,000	
			1250	86.2	11,000	19,000	45,000	80,000			11,000	19,000	45,000	80,000	179,000	
			1500	103	13,000	22,000	54,000	96,000			13,000	22,000	54,000	96,000		
	125	8.6	1750	121	15,000	25,000	63,000	112,000			15,000	25,000	63,000	112,000		
			2000	138	17,000	28,000	71,000				17,000	28,000	71,000			
			150	10.3	1250	2340	5340	8600	16,000	24,000	1250	2340	5340	8600	16,000	24,000
			200	13.8	1830	3320	7550	13,000	24,000	36,000	1830	3320	7550	13,000	24,000	36,000
			300	20.7	2700	4910	11,200	20,100	39,000	65,300	2700	4910	11,200	20,100	39,000	59,000
			500	34.5	4400	8090	18,300	32,900	73,000	129,000	4400	8090	18,300	32,900	73,000	116,000
			750	51.8	6600	12,000	27,200	48,900	108,000		6600	12,000	27,200	48,900	108,000	172,000
			1000	69.0	8700	16,000	36,100	64,800			8700	16,000	36,100	64,800	144,000	
			1250	86.2	11,000	19,000	45,000	80,000			11,000	19,000	45,000	80,000	179,000	
	150	10.3	1500	103	13,000	22,000	54,000	96,000			13,000	22,000	54,000	96,000		
			1750	121	15,000	25,000	63,000	112,000			15,000	25,000	63,000	112,000		
			2000	138	17,000	28,000	71,000				17,000	28,000	71,000			
			200	13.8	1760	3200	7290	13,000	24,000	38,000	1760	3200	7290	13,000	24,000	38,000
			300	20.7	2700	4910	11,200	20,100	44,600	64,200	2700	4910	11,200	20,100	44,600	58,000
			500	34.5	4400	8090	18,300	32,900	73,000	129,000	4400	8090	18,300	32,900	73,000	116,000
			750	51.8	6600	12,000	27,200	48,900	108,000		6600	12,000	27,200	48,900	108,000	172,000
			1000	69.0	8700	16,000	36,100	64,800	144,000		8700	16,000	36,100	64,800	144,000	
			1250	86.2	11,000	19,000	45,000	80,000			11,000	19,000	45,000	80,000	179,000	
			1500	103	13,000	22,000	54,000	96,000			13,000	22,000	54,000	96,000		
			1750	121	15,000	25,000	63,000	112,000			15,000	25,000	63,000	112,000		
			2000	138	17,000	28,000	71,000				17,000	28,000	71,000			

- Capacity is based on 20 percent drop unless otherwise noted below. See capacity information for conversion to equivalent capacities of other gases and/or normal m³/hr.
 - For pressure setting under 10 psig (0.69 bar), inlet pressure should be limited to approximately 100 psig (6.9 bar) so the set point adjustment can be obtained.
 - For 5 psig (0.34 bar) pressure set point the drop is 2 psig (0.14 bar).
- Shaded areas indicate where capacities are based on 25 percent boost if setting is less than 12 psig (0.8 bar), 3 psig (0.2 bar) boost if setting is from 12 to 60 psig

(0.2 to 4 bar), and 5 percent boost if setting is greater than 60 psig (4 bar).
 Shaded area shows where a Type 627MR regulator should not be used because unbalanced forces can cause the internal relief valve to start to discharge during normal operation. Refer to table 1.
 Shaded areas show where maximum operating inlet pressure for a given port diameter is exceeded for Type 627, 627M and 627MR regulators.

Type 627M or 627HM De-Icer System Application

A 627 Series regulator can be used in a de-icer application as shown in figure 9. As the seat ring in the working regulator begins to freeze, ice formation decreases the seat ring port diameter so that the working regulator is unable to supply enough flow to satisfy the downstream demand. When downstream pressure falls below the outlet pressure setting of the Type 627M regulator, the disk of the Type 627M

regulator moves off its seat ring and lets alcohol flow into the main gas line. The alcohol carried to the working regulator by the flow stream helps prevent additional ice formation on the seat ring. Normal flow then resumes, and as pressure in the downstream system is restored, the Type 627M regulator shuts off. This is an economy feature which conserves both the alcohol and the number of manhours required to maintain the alcohol supply. The alcohol is supplied to the working regulator only when icing conditions exist.

Table 5. Type 627H and 627HM Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾

OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		3/4 INCH BODY PORT DIAMETER, INCHES (mm)						1 INCH BODY PORT DIAMETER, INCHES (mm)					
	Psig	Bar	Psig	Bar	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
140 to 250 psig (9.7 to 17.2 bar) 10B3078 X012 (blue)	150	10.3	200	13.8	1760 ⁽²⁾	3200 ⁽²⁾	7290	11,500	21,600	31,000	1760 ⁽²⁾	3200 ⁽²⁾	7290	11,500	21,600	31,000
			250	17.2	2260 ⁽²⁾	4100 ⁽²⁾	9200	15,400	28,600	40,000	2260 ⁽²⁾	4100 ⁽²⁾	9200	15,400	28,600	40,000
			300	20.7	2700	4910	11,200	19,300	31,000	46,000	2700	4910	11,200	19,300	31,000	46,000
			400	27.6	3600	6500	14,800	24,700	40,000	50,000	3600	6500	14,800	25,000	40,000	50,000
			500	34.5	4400	8090	18,300	29,700	51,000		4400	8090	18,300	32,000	51,000	
			750	51.7	6600	12,000	27,200	43,000			6600	12,000	27,200	46,000		
			1000	69.0	8700	16,000	36,100	57,000			8700	16,000	36,100	60,000		
			1250	86.2	11,000	19,000	45,000				11,000	19,000	45,000			
			1500	103	13,000	22,000	54,000				13,000	22,000	54,000			
			1750	121	15,000	25,000	63,000				15,000	25,000	63,000			
			2000	138	17,000	28,000					17,000	28,000				
	200	13.8	250	17.2	2160 ⁽²⁾	3850 ⁽²⁾	8400	15,000	31,000	41,000	2160 ⁽²⁾	3850 ⁽²⁾	8400	15,000	31,000	41,000
			300	20.7	2700 ⁽²⁾	4910 ⁽²⁾	11,200	19,500	36,000	52,000	2700 ⁽²⁾	4910 ⁽²⁾	11,200	19,500	36,000	52,000
			400	27.6	3600	6500	14,800	25,500	52,000	68,000	3600	6500	14,800	26,500	52,000	68,000
			500	34.5	4400	8090	18,300	31,000	61,000		4400	8090	18,300	33,000	61,000	
			750	51.7	6600	12,000	27,200	45,500			6600	12,000	27,200	49,000		
			1000	69.0	8700	16,000	36,100	60,000			8700	16,000	36,100	65,000		
			1250	86.2	11,000	19,000	45,000				11,000	19,000	45,000			
			1500	103	13,000	22,000	54,000				13,000	22,000	54,000			
			1750	121	15,000	25,000	63,000				15,000	25,000	63,000			
			2000	138	17,000	28,000					17,000	28,000				
	250	17.2	300	20.7	2500 ⁽²⁾	4500 ⁽²⁾	9900	18,500	37,000	52,000	2500 ⁽²⁾	4500 ⁽²⁾	9900	18,500	37,000	75,000
			400	27.6	3600 ⁽²⁾	6400 ⁽²⁾	14,300	26,000	55,000	74,000	3600 ⁽²⁾	6400 ⁽²⁾	14,300	26,000	55,000	81,000
			500	34.5	4400	8090	18,300	33,000	64,000	87,000	4400	8090	18,300	33,000	64,000	95,000
			750	51.7	6600	12,000	27,200	49,000	93,000		6600	12,000	27,200	49,000	102,000	
			1000	69.0	8700	16,000	36,100	65,000			8700	16,000	36,100	65,000		
			1250	86.2	11,000	19,000	45,000	81,000			11,000	19,000	45,000	81,000		
			1500	103	13,000	22,000	54,000				13,000	22,000	54,000			
			1750	121	15,000	25,000	63,000				15,000	25,000	63,000			
			2000	138	17,000	28,000	71,000				17,000	28,000	71,000			
240 to 500 psig (16.5 to 34.5 bar) 10B3079 X012 (red)	250	17.2	300	20.7	2500 ⁽²⁾	4500 ⁽²⁾	9300	14,000	25,000	37,000	2500 ⁽²⁾	4500 ⁽²⁾	9300	14,000	25,000	37,000
			400	27.6	3600 ⁽²⁾	6400 ⁽²⁾	14,300	21,400	36,000	49,000	3600 ⁽²⁾	6400 ⁽²⁾	14,300	21,400	36,000	49,000
			500	34.6	4400	8090	18,300	26,300	42,000	62,000	4400	8090	18,300	26,300	42,000	62,000
			750	51.7	6600	12,000	27,200	37,100	57,000		6600	12,000	27,200	37,100	57,000	
			1000	69.0	8700	16,000	36,100	47,400			8700	16,000	36,100	47,400		
			1250	86.2	11,000	19,000	45,000	57,000			11,000	19,000	45,000	57,000		
			1500	103	13,000	22,000	54,000				13,000	22,000	54,000			
			1750	121	15,000	25,000	63,000				15,000	25,000	63,000			
			2000	138	17,000	28,000	71,000				17,000	28,000	71,000			
	300	20.7	350	24.1	2900 ⁽²⁾	5150 ⁽²⁾	11,300	18,400	31,000	45,000	2900 ⁽²⁾	5150 ⁽²⁾	11,300	18,400	31,000	45,000
			400	27.6	3500 ⁽²⁾	6200 ⁽²⁾	13,700	23,400	40,000	52,000	3500 ⁽²⁾	6200 ⁽²⁾	13,700	23,400	40,000	52,000
			500	34.5	4400	8090	18,300	32,000	53,000	67,000	4400	8090	18,300	32,000	53,000	67,000
			750	51.7	6600	12,000	27,200	48,000	80,000		6600	12,000	27,200	48,000	80,000	
			1000	69.0	8700	16,000	36,100	62,000			8700	16,000	36,100	62,000		
			1250	86.2	11,000	19,000	45,000	79,000			11,000	19,000	45,000	79,000		
			1500	103	13,000	22,000	54,000				13,000	22,000	54,000			
			1750	121	15,000	25,000	63,000				15,000	25,000	63,000			
			2000	138	17,000	28,000	71,000				17,000	28,000	71,000			

- Continued -

Table 5. Type 627H and 627HM Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾ (Continued)

OUTLET PRESSURE RANGE AND CONTROL SPRING(COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		3/4 INCH BODY Port Diameter, Inches (mm)						1 INCH BODY Port Diameter, Inches (mm)					
	Psig	Bar	Psig	Bar	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
240 to 500 psig (16.5 to 34.5 bar) 10B3079 X012 (red)	400	27.6	450	31.0	3600 ⁽²⁾	6400 ⁽²⁾	14,000	25,000	47,000	67,000	3600 ⁽²⁾	6400 ⁽²⁾	14,000	25,000	47,000	67,000
			500	34.6	4400 ⁽²⁾	8090 ⁽²⁾	18,300	32,000	54,000	77,000	4400 ⁽²⁾	8090 ⁽²⁾	18,300	32,000	54,000	77,000
			750	51.7	6600	12,000	27,200	49,000	91,000	/	6600	12,000	27,200	49,000	91,000	/
			1000	69.0	8700	16,000	36,100	65,000	/	/	8700	16,000	36,100	65,000	/	/
			1250	86.2	11,000	19,000	45,000	81,000	/	/	11,000	19,000	45,000	81,000	/	/
			1500	103	13,000	22,000	54,000	/	/	/	13,000	22,000	54,000	/	/	/
			1750	121	15,000	25,000	63,000	/	/	/	15,000	25,000	63,000	/	/	/
			2000	138	17,000	28,000	71,000	/	/	/	17,000	28,000	71,000	/	/	/
	500	34.5	550	37.9	4300 ⁽²⁾	7700 ⁽²⁾	16,800	33,000	62,000	90,000	4300 ⁽²⁾	7700 ⁽²⁾	16,800	33,000	62,000	90,000
			600	41.4	4900 ⁽²⁾	8800 ⁽²⁾	19,400	37,000	70,000	104,000	4900 ⁽²⁾	8800 ⁽²⁾	19,400	37,000	70,000	104,000
			750	51.7	6600	12,000	27,200	49,000	88,000	137,000	6600	12,000	27,200	49,000	88,000	140,000
			1000	69.0	8700	16,000	36,100	65,000	130,000	/	8700	16,000	36,100	65,000	130,000	/
			1250	86.2	11,000	19,000	45,000	81,000	/	/	11,000	19,000	45,000	81,000	/	/
			1500	103	13,000	22,000	54,000	97,000	/	/	13,000	22,000	54,000	97,000	/	/
			1750	121	15,000	25,000	63,000	/	/	/	15,000	25,000	63,000	/	/	/
			2000	138	17,000	28,000	71,000	/	/	/	17,000	28,000	71,000	/	/	/

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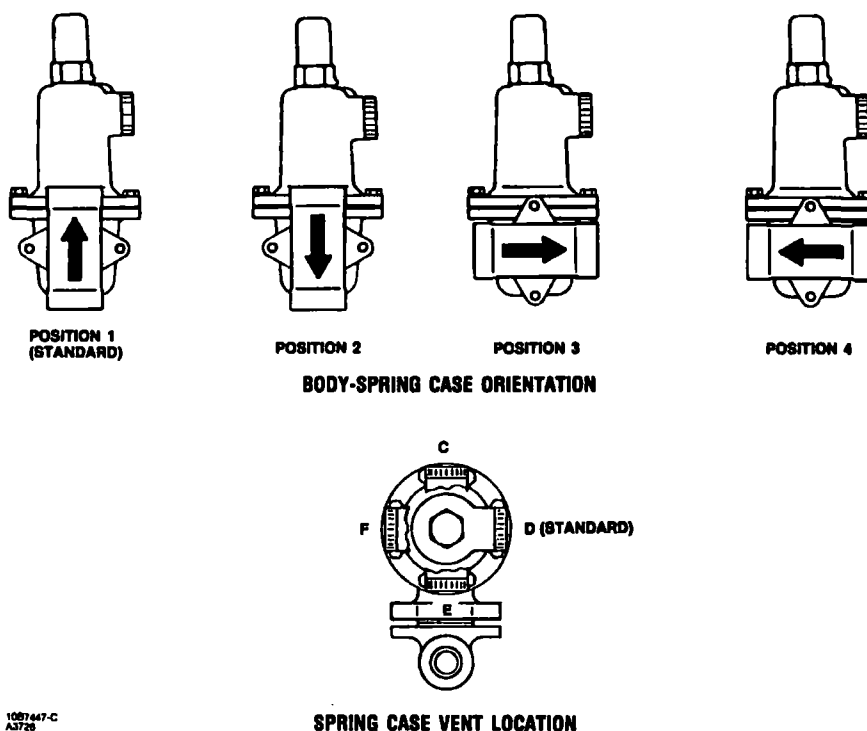



Figure 10. Type 627 Spring Case and Vent Location

Table 5. Type 627H and 627 HM Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾ (Continued)

OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		2 INCH BODY PORT DIAMETER, INCHES (mm)					
	Psig	Bar	Psig	Bar	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
140 to 250 psig (9.7 to 17.2 bar) 10B3078 X012 (blue)	150	10.3	200	13.8	1760 ⁽²⁾	3200 ⁽²⁾	7290	13,700	24,100	31,000
			250	17.2	2260 ⁽²⁾	4100 ⁽²⁾	9200	16,100	28,600	40,000
			300	20.7	2700	4910	11,200	19,300	31,000	46,000
			400	27.6	3600	6500	14,800	25,000	40,000	50,000
			500	34.5	4400	8090	18,300	32,000		
			750	51.7	6600	12,000	27,200	48,000		
			1000	69.0	8700	16,000	36,100	65,000		
			1250	86.2	11,000	19,000	45,000			
			1500	103	13,000	22,000	54,000			
			1750	121	15,000	25,000	63,000			
	2000	138	17,000	28,000						
	200	13.8	250	17.2	2160 ⁽²⁾	3850 ⁽²⁾	8400	16,100	33,000	41,000
			300	20.7	2700 ⁽²⁾	4910 ⁽²⁾	11,200	20,100	36,000	52,000
			400	27.6	3600	6500	14,800	26,500	52,000	68,000
			500	34.5	4400	8090	18,300	33,000	61,000	
			750	51.7	6600	12,000	27,200	49,000		
			1000	69.0	8700	16,000	36,100	65,000		
			1250	86.2	11,000	19,000	45,000			
			1500	103	13,000	22,000	54,000			
			1750	121	15,000	25,000	63,000			
			2000	138	17,000	28,000				
	250	17.2	300	20.7	2500 ⁽²⁾	4500 ⁽²⁾	9900	18,500	37,000	75,000
			400	27.6	3600 ⁽²⁾	6400 ⁽²⁾	14,300	26,000	55,000	81,000
			500	34.5	4400	8090	18,300	33,000	64,000	95,000
			750	51.7	6600	12,000	27,200	49,000	102,000	
			1000	69.0	8700	16,000	36,100	65,000		
			1250	86.2	11,000	19,000	45,000	81,000		
			1500	103	13,000	22,000	54,000			
			1750	121	15,000	25,000	63,000			
			2000	138	17,000	28,000	71,000			
67240 to 500 psig (16.5 to 34.5 bar) 10B3079 X012 (red)			250	17.2	300	20.7	2500 ⁽²⁾	4500 ⁽²⁾	9300	14,000
	400	27.6			3600 ⁽²⁾	6400 ⁽²⁾	14,300	21,400	36,000	49,000
	500	34.6			4400	8090	18,300	26,300	42,000	62,000
	750	51.7			6600	12,000	27,200	37,100	57,000	
	1000	69.0			8700	16,000	36,100	47,400		
	1250	86.2			11,000	19,000	45,000	57,000		
	1500	103			13,000	22,000	54,000			
	1750	121			15,000	25,000	63,000			
	2000	138			17,000	28,000	71,000			
	300	20.7			350	24.1	2900 ⁽²⁾	5150 ⁽²⁾	11,300	18,400
			400	27.6	3500 ⁽²⁾	6200 ⁽²⁾	13,700	23,400	40,000	52,000
			500	34.5	4400	8090	18,300	32,000	53,000	67,000
			750	51.7	6600	12,000	27,200	48,000	80,000	
			1000	69.0	8700	16,000	36,100	62,000		
			1250	86.2	11,000	19,000	45,000	79,000		
			1500	103	13,000	22,000	54,000			
			1750	121	15,000	25,000	63,000			

- Continued -

Table 5. Type 627H and 627HM Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾ (Continued)

OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		2 INCH BODY PORT DIAMETER, INCHES (mm)								
	Psig	Bar	Psig	Bar	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)			
240 to 500 psig (16.5 to 34.5 bar) 10B3079 X012 (red)	400	27.6	450	31.0	3600 ⁽²⁾	6400 ⁽²⁾	14,000	25,000	47,000	67,000			
			500	34.6	4400 ⁽²⁾	8090 ⁽²⁾	18,300	32,000	54,000	77,000			
			750	51.7	6600	12,000	27,200	49,000	91,000				
			1000	69.0	8700	16,000	36,100	65,000					
			1250	86.2	11,000	19,000	45,000	81,000					
			1500	103	13,000	22,000	54,000						
			1750	121	15,000	25,000	63,000						
			2000	138	17,000	28,000	71,000						
	500	34.5	550	37.9	4300 ⁽²⁾	7700 ⁽²⁾	16,800	33,000	62,000	90,000			
			600	41.4	4900 ⁽²⁾	8800 ⁽²⁾	19,400	37,000	70,000	104,000			
			750	51.7	6600	12,000	27,200	49,000	88,000	140,000			
			1000	69.0	8700	16,000	36,100	65,000	130,000				
			1250	86.2	11,000	19,000	45,000	81,000					
			1500	103	13,000	22,000	54,000	97,000					
			1750	121	15,000	25,000	63,000						
			2000	138	17,000	28,000	71,000						
			1. Capacity is based on 20 percent drop. See capacity information for conversion to equivalent capacities of other gases and/or normal m ³ /hr. 2. Small orifices and low pressure drops may cause set point to shift ± 15 psig										
			(1.03 bar)  Shaded areas show where maximum operating inlet pressure for a given port diameter is exceeded for Type 627H and 627HM regulators.										

(1.03 bar)

Shaded areas show where maximum operating inlet pressure for a given port diameter is exceeded for Type 627H and 627HM regulators.

Table 6. Type 627R Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾

OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		3/4 INCH BODY SIZE						1 INCH AND 2 INCH BODY SIZES					
	Psig	Bar	Psig	Bar	Port Diameter, Inches (mm)						Port Diameter, Inches (mm)					
					3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
5 to 20 psig ⁽²⁾ (0.34 to 1.4 bar) 10B3076 X012 (yellow)	5	0.34	10	0.69	170	320	710	1050	1500	1850	170	330	710	1080	2000	2150
			15	1.0	240	330	810	1290	2100	2850	240	390	890	1500	2350	3000
			20	1.4	290	460	1090	1750	2750	3850	290	500	1160	1900	2750	3900
			30	2.1	380	610	1470	2490	3600	4800	380	690	1500	2500	3600	4900
			60	4.1	640	1170	2460	3690	5270	6120	640	1170	2460	3690	5650	6900
			75	5.2	770	1410	2880	4150	5760	6900	770	1410	2880	4150	6450	7490
			100	6.9	990	1690	3540	4790	6200	7600	990	1800	3540	5790	7520	8150
	10	0.69	15	1.03	210	320	800	1290	2100	2820	210	390	840	1480	2300	2930
			20	1.4	280	450	1070	1740	2700	3800	280	500	1100	1880	2700	3830
			30	2.1	380	610	1470	2430	3550	4780	380	690	1500	2460	3550	4840
			60	4.1	640	1170	2460	3690	5270	6120	640	1170	2460	3690	5650	6900
			75	5.2	770	1410	2880	4150	5760	6900	770	1410	2880	4150	6450	7490
			100	6.9	990	1690	3540	4790	6200	7600	990	1800	3540	5790	7520	8150
			150	10.3	1420	2430	4000	5680	6250	7630	1420	2580	4660	5680	9980	10,800
			200	13.8	1850	3070	4200	6200	6380	7680	1850	3370	5620	6360	11,000	12,900
			300	20.7	2700	3970	4270	6250	6500		2700	4880	6890	7780	13,600	
			500	34.5	4010	4240	5640	6520			4400	6720	8570	11,600		
			750	51.7	4400	5120	6400				5400	8850	9000			
			1000	69.0	4450	6220					5800	9500				
			1250	86.2	4540						6300					
			1500	103	4880						6600					
			1750	121	5230						6800					
			2000	138	5900						7600					

-Continued -

Table 6. Type 627R Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾ (Continued)

OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		3/4 INCH BODY SIZE						1 INCH AND 2 INCH BODY SIZES					
	Psig	Bar	Psig	Bar	Port Diameter, Inches (mm)						Port Diameter, Inches (mm)					
					3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
5 to 20 psig ⁽²⁾ (0.69 to 1.4 bar) 10B3076 X012 (yellow)	20	1.4	30	2.1	350	590	1390	2480	4350	4970	350	600	1390	2580	4350	6290
			50	3.4	550	980	2240	4000	7450	8000	550	1000	2250	4090	7600	8000
			60	4.1	640	1170	2610	4680	7800	8900	640	1170	2630	4750	7800	10,600
			100	6.9	990	1800	3980	6700	9750	10,400	990	1800	4070	7310	10,800	13,400
			150	10.3	1420	2580	5600	8790	10,000	10,800	1420	2580	5720	10,300	13,500	14,000
			200	13.8	1850	3370	7050	9000	10,200	10,800	1850	3370	7050	10,500	14,000	14,400
			300	20.7	2700	4910	7300	9500	10,500		2700	4910	9250	10,800	14,900	
			500	34.5	4400	5200	7400	9760			4400	7830	11,800	13,300		
			750	51.7	6600	5360	8870				6600	9000	12,000			
			1000	69.0	7300	6500					8700	9660				
			1250	86.2	7500						10,000					
			1500	103	7800						10,400					
			1750	121	8400						12,000					
			2000	138	8600						14,000					
15 to 40 psig (1.0 to 2.8 bar) 10B3077 X012 (green)	40	2.8	60	4.1	610	1090	2270	4230	8100	9100	610	1090	2430	4510	9200	9400
			75	5.2	760	1370	3080	5330	10,300	11,600	760	1370	3080	5640	10,800	16,300
			100	6.9	990	1790	4070	6840	11,900	13,400	990	1790	4070	7310	13,500	17,600
			150	10.3	1420	2580	5850	9320	13,500	13,800	1420	2580	5850	10,500	18,000	22,200
			200	13.8	1850	3370	7630	11,000	16,300	17,100	1850	3370	7630	11,000	21,400	24,600
			300	20.7	2700	4910	11,200	14,700	17,800		2700	4910	11,200	14,900	24,400	
			500	34.5	4400	8090	14,500	14,800			4400	8090	16,300	21,800		
			750	51.7	6600	10,800	14,800	14,900			6600	12,000	20,200	23,600		
			1000	69.0	8700	13,100	16,300				8700	16,000	23,200			
			1250	86.2	11,000	13,800					11,000	19,000				
			1500	103	12,000	14,000					13,000	21,000				
			1750	121	13,000						15,000					
			2000	138	14,000						17,000					
35 to 80 psig (2.4 to 5.5 bar) 10B3078 X012 (blue)	60	4.1	75	5.2	700	1230	2760	4700	8170	12,600	700	1230	2760	4860	8600	12,800
			100	6.9	970	1740	3910	6690	11,900	14,400	970	1740	3910	7000	12,500	16,700
			150	10.3	1420	2580	5850	9740	15,700	18,700	1420	2580	5850	10,500	16,800	23,000
			200	13.8	1850	3370	7630	12,400	18,400	21,200	1850	3370	7630	13,700	20,900	27,700
			300	20.7	2700	4910	11,200	17,700	20,200		2700	4910	11,200	20,100	28,100	
			500	34.5	4400	8090	18,300	20,000			4400	8090	18,300	28,500		
			750	51.8	6600	12,000	18,900	21,400			6600	12,000	22,800	29,500		
			1000	69.0	8700	16,000	19,000				8700	16,000	26,800			
			1250	86.2	11,000	18,700					11,000	19,000				
			1500	103	13,000	19,000					13,000	22,000				
			1750	121	15,000	20,000					15,000	25,000				
			2000	138	17,000						17,000					
	80	5.5	100	5.2	900	1630	3570	6490	12,000	17,200	900	1630	3570	6650	12,000	17,400
			150	10.3	1410	2580	5750	10,500	18,900	25,000	1410	2580	5750	10,500	20,100	26,000
			200	13.8	1850	3370	7630	13,700	23,000	29,000	1850	3370	7630	13,700	25,100	31,800
			300	20.7	2700	4910	11,200	20,100	26,000		2700	4910	11,200	20,100	32,600	
			500	34.5	4400	8090	18,300	29,000			4400	8090	18,300	30,300		
			750	51.8	6600	12,000	23,100	30,900			6600	12,000	27,200	37,400		
			1000	69.0	8700	16,000	27,400				8700	16,000	33,300			
			1250	86.2	11,000	19,000					11,000	19,000				
			1500	103	13,000	22,000					13,000	22,000				
			1750	121	15,000	25,000					15,000	25,000				
			2000	138	17,000						17,000					

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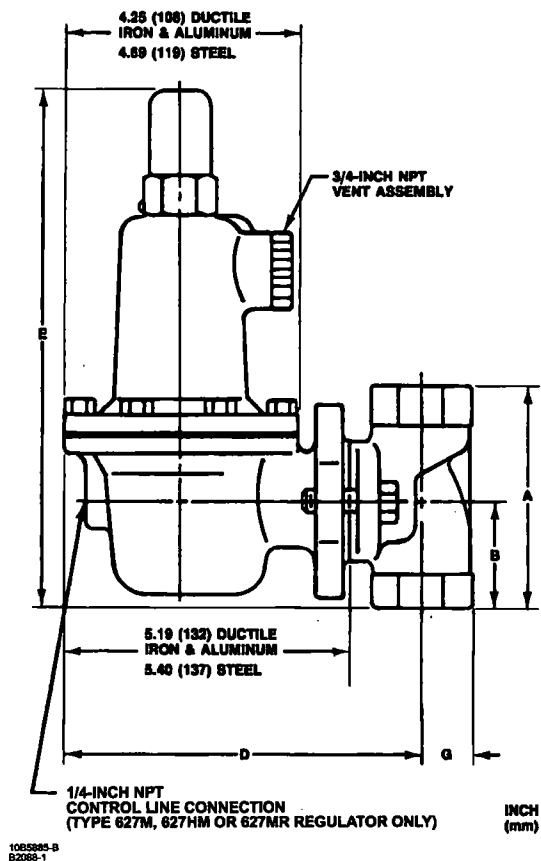
Table 6. Type 627R Regulator Capacities in Scfh of 0.6 Specific Gravity Natural Gas⁽¹⁾ (Continued)

OUTLET PRESSURE RANGE AND CONTROL SPRING (COLOR)	OUTLET PRESSURE SETTING		INLET PRESSURE		3/4 INCH BODY SIZE						1 INCH AND 2 INCH BODY SIZE					
	Psig	Bar	Psig	Bar	Port Diameter, Inches (mm)						Port Diameter, Inches (mm)					
					3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	3/32 (2.4)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
70 to 150 psig (4.8 to 10.3 bar) 10B3079 X012 (red)	100	6.9	150	10.3	1170	2510	5540	8310	15,500	20,300	1170	2510	5540	8310	15,500	20,300
			200	13.8	1850	3370	7630	12,000	20,100	25,700	1850	3370	7630	12,000	20,100	26,700
			300	20.7	2700	4910	11,200	18,200			2700	4910	11,200	18,200		
			500	34.5	4400	8090	18,300				4400	8090	18,300			
			750	51.8	6600	12,000					6600	12,000				
			1000	69.0	8700	16,000					8700	16,000				
			1250	86.2	11,000						11,000					
			1500	103	13,000						13,000					
			1750	121	15,000						15,000					
			2000	138	17,000						17,000					
	125	8.6	150	10.3	1250	2330	5090	9130	15,700	20,800	1250	2330	5090	9470	15,700	20,800
			200	13.8	1830	3320	7360	13,160	22,400	28,600	1830	3320	7360	13,400	23,600	31,300
			300	20.7	2700	4910	11,200	19,700			2700	4910	11,200	19,700		
			500	34.5	4400	8090	18,300				4400	8090	18,300			
			750	51.8	6600	12,000					6600	12,000				
			1000	69.0	8700	16,000					8700	16,000				
			1250	86.2	11,000						11,000					
			1500	103	13,000						13,000					
			1750	121	15,000						15,000					
			2000	138	17,000						17,000					
	150	10.3	200	13.8	1760	3200	7020	12,500	21,400	30,600	1760	3200	7020	12,900	21,400	33,300
			300	20.7	2700	4910	11,200	17,200			2700	4910	11,200	17,200		
			500	34.5	4400	8090	18,300				4400	8090	18,300			
			750	51.8	6600	12,000					6600	12,000				
			1000	69.0	8700	16,000					8700	16,000				
			1250	86.2	11,000						11,000					
			1500	103	13,000						13,000					
			1750	121	15,000						15,000					
			2000	138	17,000						17,000					

1. Capacities are based on 20 percent droop. See capacity information for conversion of equivalent capacities of other gases and/or normal m³/hr.
2. For pressure setting under 10 psig (0.69 bar), inlet pressure should be limited to approximately 100 psig (6.9 bar) so the set point adjustment can be obtained. Shaded areas show where maximum operating inlet pressure for a given port diameter is exceeded for a Type 627R regulator.

Table 7. Flow Coefficients

PORT DIAMETER		3/4-INCH BODY		1-INCH BODY		2-INCH BODY	
Inch	mm	Wide-Open C _g for External Relief Sizing	C ₁	Wide-Open C _g for External Relief Sizing	C ₁	Wide-Open C _g for External Relief Sizing	C ₁
3/32	2.4	6.9	29.2	6.9	28.5	6.9	29.7
1/8	3.2	12.5	29.1	12.5	29.4	12.5	29.2
3/16	4.8	29	28.6	29	31.2	29	28.5
1/4	6.4	50	30.6	50	29.3	52	31.3
3/8	9.5	108	36.1	108	31.6	115	33.9
1/2	12.7	190	39.0	190	35.9	200	39.9



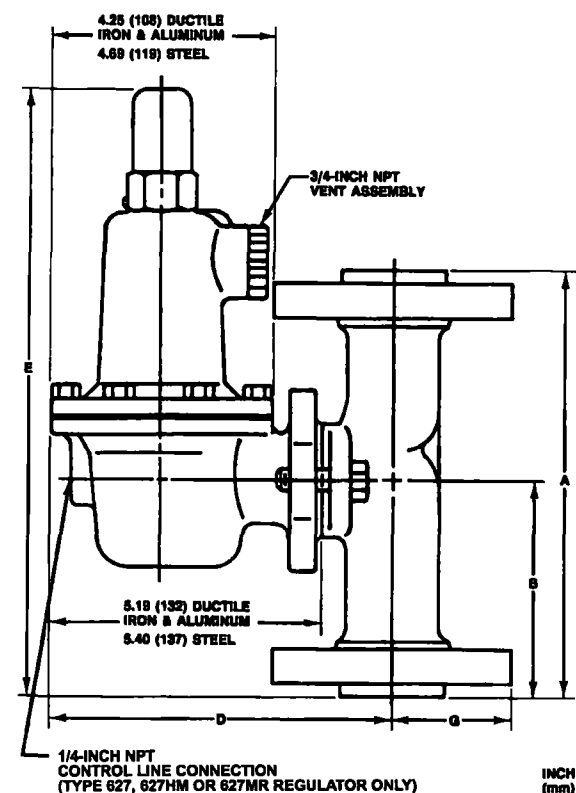
TYPES 627, 627R, 627M, AND 627MR

SCREWED BODY						
US Units						
Body Size, Inches	A	B	D		E	G
			Ductile Iron	Steel		
3/4 and 1	4.06	1.94	6.50	6.75	9.56	1.00
2	5.00	2.50	6.88	7.12	10.12	1.69
Metric Units						
3/4 and 1	103	49	165	172	243	25
2	127	64	175	181	257	43

TYPE 627H OR 627HM

SCREWED BODY					
US Units					
Body Size, Inches	A	B	D	E	G
3/4 and 1	4.06	1.94	6.75	9.88	1.00
2	5.00	2.50	7.12	10.44	1.69
Metric Units					
3/4 and 1	103	49	172	251	25
2	127	64	181	265	43

Figure 11. Dimensions



11B1443-A

**TYPES 627, 627R, 627M, AND 627MR
FLANGED BODY**

US Units									
Body Size, Inches	A		B		D		E		G
	Class		Class		Ductile Iron	Steel	Class		
	300	600	300	600			300	600	
1	7.75	8.25	3.88	4.12	6.50	6.75	11.50	11.75	2.44
2	10.50	11.25	5.25	5.62	6.88	7.12	12.88	13.25	3.25
Metric Units									
1	197	210	99	105	165	172	292	298	62
2	267	286	134	143	175	181	327	337	83

**TYPE 627H OR 627HM
FLANGED BODY**

US Units								
Body Size, Inches	A		B		D	E		G
	Class		Class			Class		
	300	600	300	600		300	600	
1	7.75	8.25	3.88	4.12	6.75	11.82	12.06	2.44
2	10.50	11.25	5.25	5.62	7.12	13.19	13.56	3.25
Metric Units								
1	197	210	99	105	172	300	306	62
2	267	286	134	143	181	335	344	83

Figure 11. Dimensions (Continued)

Ordering Information

Application

When ordering, specify:

1. Type of regulator
2. Body size
3. Body material and trim material
4. Port diameter in inches (millimeters)
5. Control spring range in psig (bar)

Construction

Refer to the specifications and to each referenced table; specify the desired selection whenever there is a choice to be made. The standard assembly position is 1D as shown in figure 10, but an alternate assembly position may be factory-ordered or can be accomplished in the field by unbolting the body or spring case using the instructions in the appropriate section of the instruction manual. For installation dimensions, refer to figure 10.

While this information is presented in good faith and believed to be accurate, Fisher Controls does not guarantee satisfactory results from reliance upon such information. *Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding the performance, merchantability, fitness*

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Fisher Controls

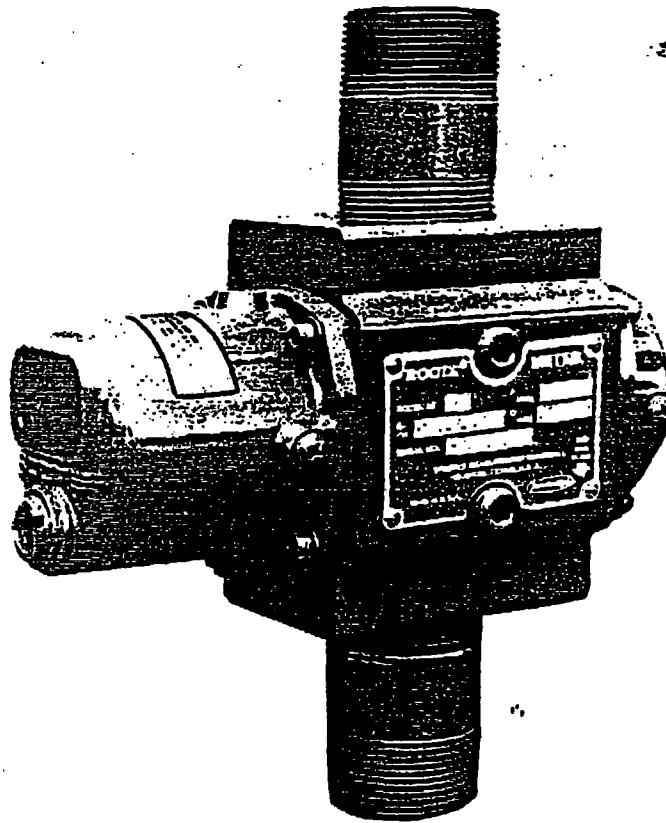
For information, contact Fisher Controls:
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Rochester, Kent, England ME2 2EZ

Sao Paulo 05424 Brazil
Singapore 2158

Rotary Positive Displacement

ROOTS® METERS

Installation, Operation,
Drawings, Parts List



LINE-MOUNTED
MODEL 8C
(800 cfh - 22,6 m³/h)
Aluminum Construction

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WARRANTY

Dresser Measurement (herein referred to as the Company) agrees to supply equipment of good design and of first class material and workmanship. In the event of any defect of material or workmanship, the Company will repair F.O.B. place of manufacture, or furnish without charge place of manufacture similar part or parts which, within one year after their shipment, are proved to have been so defective at the time of shipment, provided the Purchaser gives the Company immediate written notice of such alleged defects. Except as herein provided there are no other warranties, either expressed or implied (including without limitation, the implied warranties of merchantability and fitness for particular purpose) and any such warranties are hereby expressly disclaimed. The Company, except in case of gross or willful negligence, shall not be liable for any damages for cause or reason whatsoever, either direct, indirect, special or consequential, arising out of any contract or from the operation or failure properly to operate any apparatus or equipment sold. No allowance will be made for repair or alterations unless made with the written consent first obtained from the Company. Neither shall the Company be held liable or in any way responsible for work done, apparatus furnished, or repairs made by others. Auxiliary equipment supplied hereunder not manufactured by the Company and so identified by the Company is subject to the warranty of the manufacturer thereof and the Purchaser's recourse shall be limited to such other warranty.



General Offices

DMD DRESSER

MEASUREMENT OPERATION

P. O. Box 42176

Houston, Texas 77242-2176 U.S.A.

Phone: 713-972-5000 Fax: 713-972-5003

In United Kingdom

DRESSER MANUFACTURING DIVISION

WARRINGTON OPERATIONS

29/31 Rufford Court

Hardwick Grange

Warrington, WA1 4RF, England

Phone: 011-44-1925-814545 Fax: 011-44-1925-816128

In Europe

DRESSER INDUSTRIAL PRODUCTS, B.V.

P. O. Box 7163

5980 AD Panningen, Netherlands

Phone: 011-31-77-307.71.22 Fax: 011-31-77-307.64.94

NOTE: Information in this manual is correct as of the date of publication. The manufacturer reserves the right to make design or material changes without notice, and without obligation to make similar changes on equipment of prior manufacture.

Use and Limitations

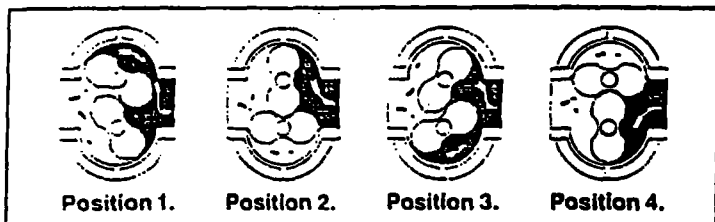
The 8C aluminum meter is a positive displacement, rotary type device for continuously measuring and indicating the volume flow of gas in a pipe line. It is suitable for handling most types of clean common gases, at either constant or widely varying flow rates. It is not suitable for handling liquids, and its operation can be impeded by excessive deposits of dirt or other foreign materials carried in the gas stream. The meter is not suitable for handling oxygen, hydrogen, acetylene or sewage gas because some of the materials of construction are not compatible with these gases. The operating temperature range is from -40°F . to $+140^{\circ}\text{F}$. (-40°C . to $+60^{\circ}\text{C}$.).

General Description

As shown by the diagram in Figure 1, the 8C rotary meter consists basically of two contrarotating impellers of two-lobe or "figure 8" contour, operating within a rigid casing. The casing (or cylinder) is arranged with inlet and outlet gas connections on opposite sides. Impeller contours are mathematically developed and accurately produced and are of such form that a continuous seal without contact can be obtained between the impellers at all positions during rotation. To accomplish this, the correct relative impeller positions are established and maintained by precision grade timing gears. Similar seals also exist between the tips of the impeller lobe and the two semicircular parts of the meter casing. Optimal operating clearances are provided between the flat ends of the impellers and the meter headplates.

As a result of this design, the gas at the inlet side of the meter is always effectively isolated from the gas at the outlet side by the impellers. Consequently, the impellers can be caused to rotate by a very small pressure drop across the meter. The rotation is in the direction indicated in Figure 1, and as each impeller reaches a horizontal position (twice in each revolution) it traps a known specific volume of gas between itself and the adjacent semi-circular portion of the meter casing at position (2) and (4). Thus, in one complete revolution the meter will measure and pass four similar gas volumes, and this total is the DISPLACEMENT of the meter per revolution. The displacement has been very precisely determined both by calculation and by test using a known volume of air or other gas.

OPERATING PRINCIPLE



POSITION 1.—As bottom impeller rotates in a counterclockwise direction toward horizontal position, gas enters space between impeller and cylinder. **POSITION 2.**—At horizontal position, a definite volume of gas is contained in bottom compartment. **POSITION 3.**—As impeller continues to turn, the volume of gas is discharged. **POSITION 4.**—Concurrently, top impeller rotating in opposite direction has closed to its horizontal position, confining another known and equal volume of gas. Process is repeated four times for each complete revolution of impeller shafts. Flow of gas creates the rotation of impellers.

Figure 1

Actual volume measurement—displaced volume—is completely independent of the gas specific gravity, temperature and pressure. Volumetric accuracy of the measuring characteristics is established by the dimensions and machined contours of non-wearing fixed and rotating parts.

A finite maximum flow has been established for this meter model, and flows should not be exceeded in operation. Factors involved are

column based on air at atmospheric pressure.

The major components of the meter are fabricated of aluminum for strength and light weight. All of the aluminum parts are anodized and the measuring chamber and impellers are hard-coat anodized to be highly resistant to corrosion or abrasion from foreign materials.

The connections at the inlet and discharge of the cylinder are $1\frac{1}{2}$ inch NPT male threads.

Maximum working pressure of a rotary meter is limited by casing design. Refer to meter nameplate for this maximum working pressure. (Note: The meter has been static pressure tested at the factory at twice its maximum working pressure). It should not be installed where line pressures can exceed the maximum working pressure. However, line pressure has no significant effect on accuracy of measurement, and the meter may be used satisfactorily on pressures down to a few ounces. Meter capacity ratings, listed in Table 1, are expressed in Standard Cubic Feet (SCF) or Standard Cubic Meters (m^3/h) per hour (at base conditions of 60°F and 14.73 PSIA. Metric base conditions are commonly 15°C and 101.325 kPa). When gas is being measured at a pressure and/or temperature other than Standard, the dial rate in displaced volume is easily converted to standard gas by simple PVT relations. Reference bulletin RM-135.

The unit contains a totalizing counter reading volume at line conditions in 100 cubic feet or cubic meter increments, located inside the pressurized counter end cover.

TABLE 1—METER CAPACITY RATINGS
UP TO 175 PSIG (1200 kPa)

Corrected Capacity in SCFH*

Meter Model	Base Rating 14.73 (PSIA)	Metering Pressure—PSIG									
		1	5	15	25	50	75	100	125	150	175
8C	800	840	1050	1800	2140	3500	4860	6210	7570	8930	10300

*Maximum hourly flow rates in Standard Cubic Feet, corrected for metering pressure and 14.4 PSIA atmosphere to base conditions of 14.73 PSIA and 60°F .

Corrected Capacity in Sm^3/h *

Meter Model	101.325kPa Absolute	Metering Pressure—Gauge									
		15 kPa	50 kPa	100 kPa	200 kPa	400 kPa	500 kPa	700 kPa	860 kPa	1000 kPa	1200 kPa
8C	22.6	26	34	45	67	112	134	179	215	245	290

*Maximum hourly flow rates in Cubic Meters, corrected for metering pressure and 101.325 kPa absolute atmosphere to base conditions of 101.325kPa absolute and 15°C .

RECEIVING, HANDLING & STORAGE

The 8C Meter is a precision type measuring instrument, operating as described in this manual. Although of very rugged construction, it should be given care in handling and storage. It is highly important that a meter not be dropped, or have heavy objects fall on it. Therefore, to realize the maximum service and accuracy built into the meter, it is recommended that the general policies outlined here be followed.

1. Do not accept a shipment that shows evidence of mishandling in transit without making an immediate inspection for damage to the meter. File a claim with the carrier if damage is indicated and notify the nearest District Sales Office.
2. Since damage to internal working parts can exist without obvious external evidence, it is advisable to check all new meters for free rotation soon after arrival. This simple procedure is described under INSTALLATION.

3. When a meter is not to be tested or installed immediately, store it in a dry location and protect it against damage. Use the original shipping container, keeping it horizontal. *Do not put oil in the two end cover sumps. Do not remove covers from meter openings. This is intended to provide a reasonable protection for internal surfaces against atmospheric moisture for about one year.*
4. Should any serious trouble appear during installation or initial operation of a new unit, notify the nearest District Office. Do not attempt repairs or adjustments, since doing so will be a basis for voiding the warranty.
5. When contacting a Sales Office with a problem give meter Bill of Material Number, Model and Serial Number, location and brief outline of the problem. Include gas type, pressure and flow characteristics, as applicable.

INSTALLATION

Reference Figure 2, page 3.

Piping—The 8C ROOTS® Meter may be mounted in either a horizontal or a vertical position, if the gas is clean and dry. The preferred installation is top inlet in a vertical pipe line, gas flow being downward. Although the design of the impellers tends to make the meter inherently self-cleaning, the top inlet mounting also allows gravity to help pass dirt or scale through the meter.

A horizontal pipe line mounting is optional in most instances. Other piping layouts based on established practices and experience may be equally satisfactory.

The bottom inlet is only recommended on installations where all foreign material has been effectively removed from the gas prior to entering the meter.

This meter requires very little space, but there should be sufficient room so that end covers can be removed and the oil level gauges can be viewed for proper filling of the end covers.

A further recommendation is that the meter be installed in a side loop, with a bypass, going straight through. Test tees for transfer proving may be provided. The inlet piping should be completely free of excess pipe dope, dirt, scale, cuttings, and weld spatters. If the top inlet configuration is used, do not locate a lubricated gas inlet valve directly over the meter. Excess valve lubricant or other foreign material falling into the meter may stop or impede its operation.

The piping should be solid and properly aligned. The meter does not require any direct means of support, but the piping on either side should be supported to eliminate any unnecessary piping strains on the meter body. As a final note concerning piping, a meter should preferably be installed so that it is not lower than the discharge pipe runs. Such a condition would cause the meter to become a sump for condensate and foreign material.

Figures 6 and 7, page 4, illustrate piping, materials with sizes, to install the 8C meter when existing 20, 30, and 60 LT meters are being removed. *Note:* Some items are marked N/A (not applicable). Most of the required items should be available through your local dealers. The 8C is supplied with male 1½"-11½" NPT x 3" nipples. Reference dimensional drawing on page 7.

OUNTING & LEVELING

See Reference Drawing DO49848-001, page 8 and 9.

Before mounting the meter, check it for free rotation, after removing inlet and outlet covers. The meter should rotate by only blowing into the inlet side of the cylinder.

Step 1—Top Inlet (reference Figure 3). The meter will have the nameplate and ¼ inch differential plugs on the right side of the cylinder when viewed from the counter end of the meter. The nameplate

flow direction arrow should be pointing downward. Proceed to Step 2.

Side Inlet (reference Figure 4). The meter should have the nameplate and ¼ inch differential pipe plugs on the top. When viewing the counter end of the meter, the proper flow direction is from left to right. Proceed to Step 2.

Bottom inlet (reference Figure 5). *Caution:* Bottom inlet is only recommended on installations where all foreign material has been effectively removed from the gas prior to entering the meter. The meter should have the nameplate and ¼ inch differential pipe plug on the left side of the cylinder when viewing the counter end of the meter. The nameplate flow direction arrow should be pointing upward in the direction of flow or the counter will subtract. The gear end cover (#28) opposite the counter end must be rotated 180° by removing the four cap screws and washers. Hold the cover so it will not move outward, and rotate it 180°. The cap screws with washers should be reinstalled and tightened securely. This rotation of the cover will allow the proper oil level gauge location. Proceed to Step 2.

Step 2—The counter digits should always be right-side-up and horizontal. The counter position should be changed from the vertical or upside-down position by removing the four cap screws and washers on the counter end cover (#22). Hold the cover so it will not move outward and rotate it into the proper reading position as required. Reinstall the cap screws with washers and tighten securely. With the counter in the normal horizontal plane, the oil level gauge will be in the proper position.

Step 3—Make sure the meter inlet is connected to the gas supply line. Set the meter in the piping level within ¼ inch per foot (5mm/m). *Note:* Do not pressurize the meter at this time.

Step 4—The #2 Phillips head recessed seal screw (#410) should be removed from the counter end cover (#22) so that the cover can be filled with oil to the center of the oil level gauge (#40). The oil should be added *slowly* to prevent over-filling. (Reference Lubrication and Table #2). After sufficient oil has been added to locate the oil level in the center of the gauge, replace the Phillips head seal screw and tighten securely.

The gear end cover (#28) should be filled in the same manner. The fill plug (#410) must be removed (located on the side of the cover). The drain plug is at the bottom of the cover. The cover should be filled until the oil level is in the center of the oil level gauge (#40). Replace the fill plug (#410) and tighten securely. Check to verify that the oil is in the center of the oil level gauges at both ends of the meter.

The ¼ inch dry seal pipe plugs (#162) on the nameplate side of the cylinder can be utilized for differential testing. If differential testing is utilized in your maintenance program, two valves can be installed at the two ¼ inch pipe plug location at this time. Use caution and do not get any foreign material in the meter if valves are to be installed.

The bypass valve should be used to pressurize the system.

The meter should be pressurized very slowly to prevent possible overspeed which could damage the meter. (5 PSIG/second or, 35 kPa/second max.).

The installation should be checked for leaks.

Slowly open the downstream valve to start flow through the meter. An oil slinger on the gear end can be viewed through the oil level gauge (#40) to indicate when the impellers start to rotate. Continue to open the valve completely and close the bypass valve slowly. The meter is now ready to measure flow within its rated capacity.

On the English version, the counter indicates correct flow direction when the right digit wheel is rotating downward. One revolution indicates that 10 cubic feet have passed through the meter at line condition. The counter digits are reading in 100 cubic feet. On the metric version, the counter indicates correct flow direction when the digits on the right hand digit wheel are advancing. One revolution represents one cubic meter. See typical "metric" version counter on drawing DO49848-001, page 8.

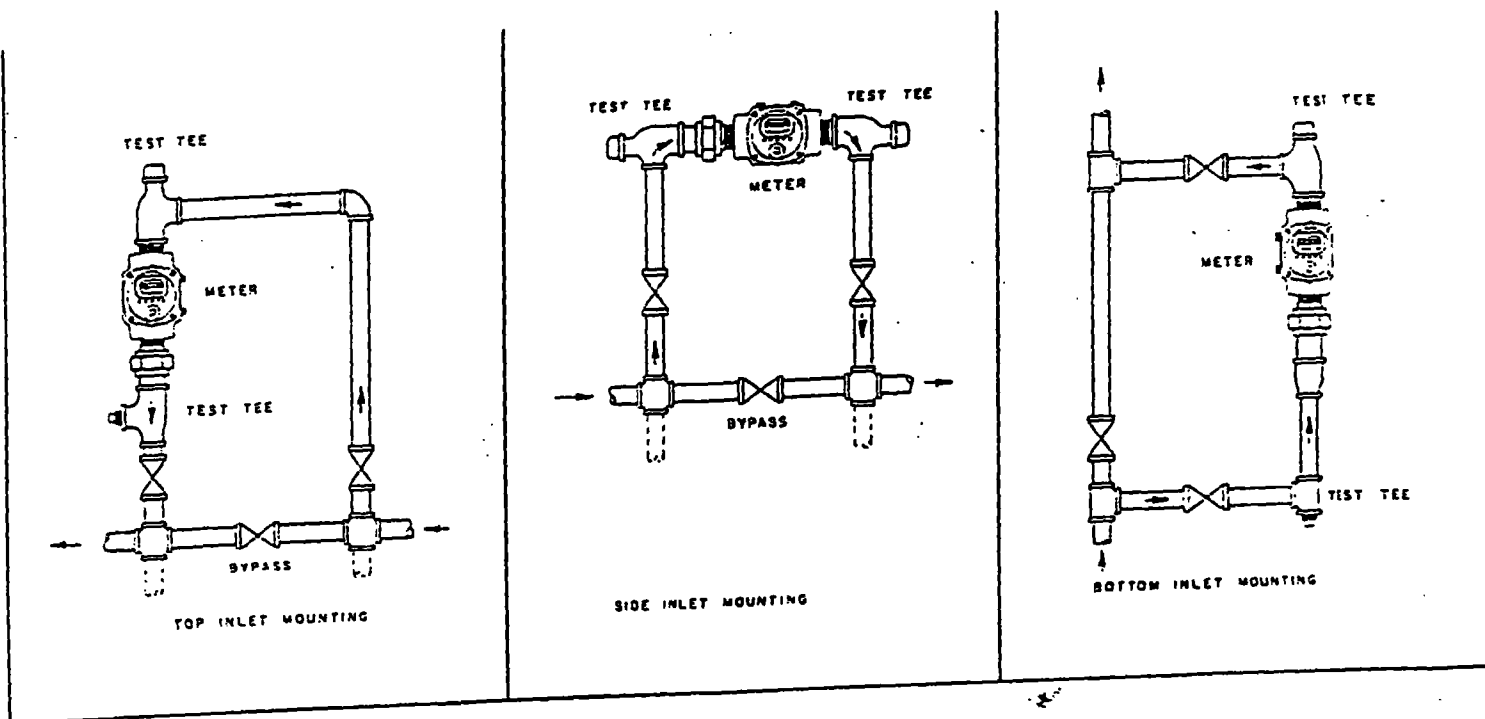


Figure 2—SUGGESTED INSTALLATIONS FOR 8C METER

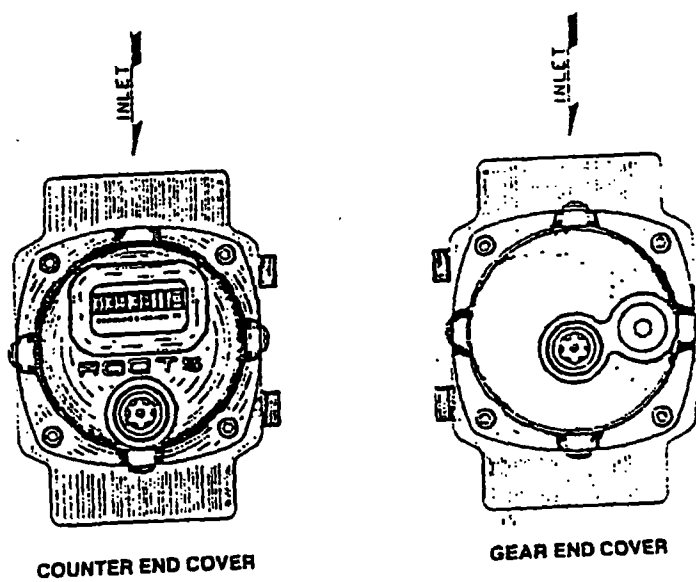


Figure 3—TOP INLET

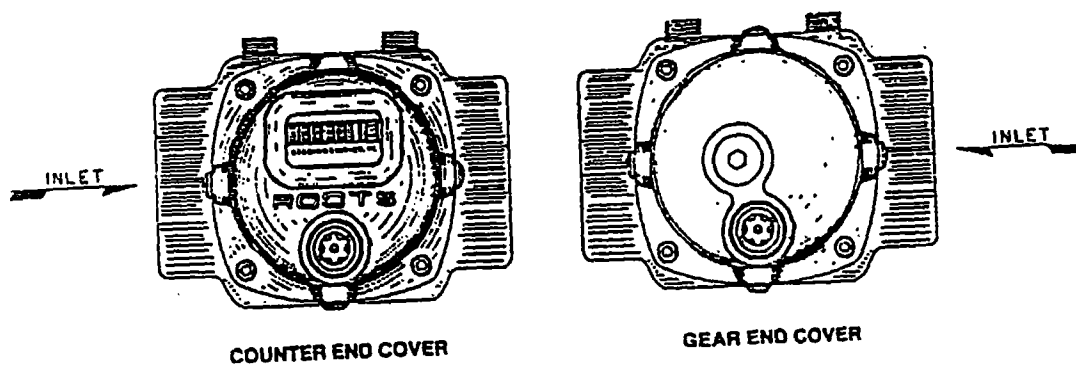
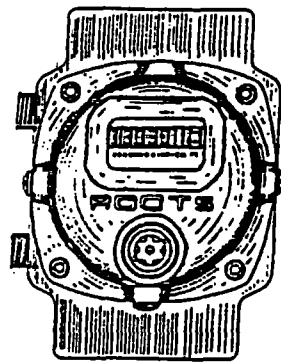
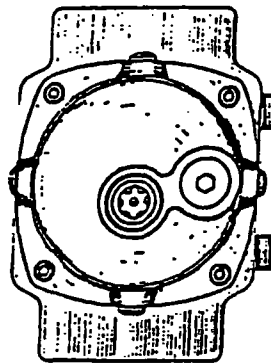


Figure 4—SIDE INLET



INLET

COUNTER END COVER

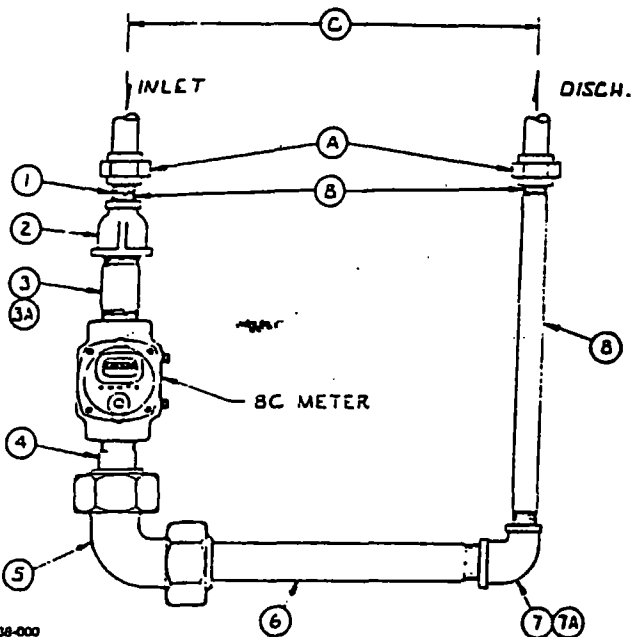


INLET

GEAR END COVER

Figure 5—BOTTOM INLET

PREFERRED INSTALLATION 20, 30 & 60 Lt.
TIN METER REPLACEMENT*



12/79
8050130-000

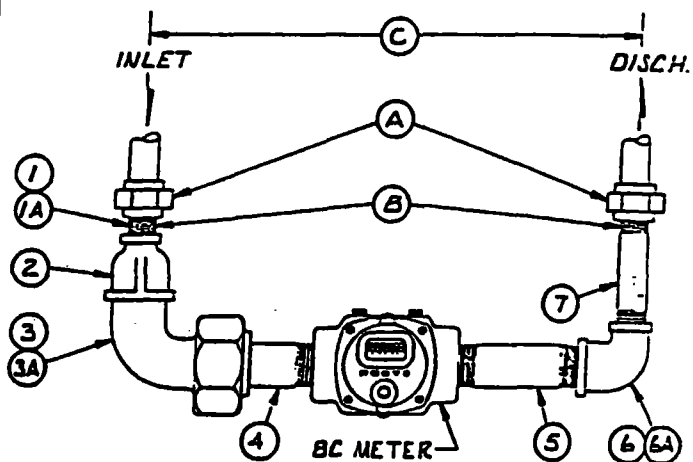
BILL OF MATERIAL

	20LT	30LT	60LT
A Customer Union NPT	1"	1 1/4"	1 1/2"
B Thread Engagement	.683"	.707"	.724"
C \varnothing to \varnothing	16 1/2"	18 1/2"	25 1/2"
1 Std. Close Nipple	1" x 2"	1 1/4" x 2"	N/A
2 Std. Reducer	1 1/2" x 1"	1 1/2" x 1 1/4"	N/A
3 Std. Close Nipple	1 1/2" x 4"	1 1/2" x 4"	N/A
3A Std. Nipple	N/A	N/A	N/A
4 Std. T.O.E. Nipple	1 1/2" x 4"	1 1/2" x 4"	1 1/2" x 4"
5 DMD Style 90 Locking 90° ELL	1 1/2"	1 1/2"	1 1/2"
6 Std. T.O.E. Nipple	1 1/2" x 14"	1 1/2" x 16"	1 1/2" x 22"
7 Std. 90° Reducing ELL	1 1/2" x 1"	1 1/2" x 1 1/4"	N/A
7A Std. 90° ELL	N/A	N/A	N/A
8 Std. Nipple	1" x 15"	1 1/4" x 15"	1 1/2" x 15"

*Top Inlet (Recommended)

Figure 6

TYPICAL INSTALLATION—20, 30 & 60 Lt.
TIN METER REPLACEMENT*



12/79
8050137-000

BILL OF MATERIAL

ITEM	20LT	30LT	60LT
A Customer Union NPT	1"	1 1/4"	1 1/2"
B Thread Engagement	.683"	.707"	.724"
C \varnothing - \varnothing	16 1/2"	18 1/2"	25 1/2"
1 Std. Close Nipple	1" x 2"	1 1/4" x 2"	N/A
1A Std. T.O.E. Nipple	N/A	N/A	1 1/2" x 4"
2 Std. Reducer	1 1/2" x 1"	1 1/2" x 1 1/4"	N/A
3 DMD Style 90 Locking 90° Street ELL	1 1/2"	1 1/2"	N/A
3A DMD Style 90 Locking 90° ELL	N/A	N/A	1 1/2"
4 Std. T.O.E. Nipple	1 1/2" x 5 1/4"	1 1/2" x 5 1/4"	1 1/2" x 5 1/4"
5 Std. Nipple	1 1/2" x 5 1/2"	1 1/2" x 7 1/2"	1 1/2" x 13"
6 Std. 90° Reducer	1 1/2" x 1"	1 1/2" x 1 1/4"	N/A
6A Std. 90° ELL	N/A	N/A	1 1/2"
7 Std. Nipple	1" x 4 1/2"	1 1/4" x 4 1/2"	1 1/2" x 4 1/2"

*Side-Inlet (Optional). Requires clean, dry gas.

Figure 7

General

Timing gears, counter assembly gears, and bearings on both ends of the meter body are continuously lubricated with oil by dip and splash. The oil sumps in each end cover are independent of one another and each must be filled to the proper level. Each end cover is provided with visual type oil level gauges and plugged filling and draining holes. **CAUTION: THESE TWO END COVERS ARE PRESSURIZED DURING OPERATION.** Bleed off the line pressure before removing the plugs.

Oil Type & Grade

Successful operation of this lubricating system depends not only on maintaining the specified oil levels in the sumps, but also on using the correct grade of oil. The total quantity of oil provided is relatively small, as shown in Table 2, and is considerably less when the meter is mounted in a horizontal pipe line than when it is in the vertical position. Because of this small supply and the requirement for distribution to bearings by splash, plus the necessity to eliminate drag in rotating parts, use of an instrument grade oil is required for satisfactory operation.

High quality lubricating oil can be obtained in convenient small quantities from the company. Specify "ROOTS® Versa-Temp Meter Oil" and indicate the meter model number. Versa-Temp Oil is an high grade aircraft hydraulic fluid with excellent thermal and lubricating properties.

Oil Filling

The 8C oil dispenser can be used to add oil to both counter end and gear end covers as indicated on the dispenser. Oil levels at both ends of the meter are to be maintained within $\frac{1}{16}$ inch (1.5mm) of the center of the oil level gauges. Initial filling of the two end cover sumps should be done while the meter is not operating. The oil level may change slightly during operation, but it should not go below the bottom edge of the gauging hole. **Caution:** Do not pressurize or depressurize these meters at a rate exceeding 5 PSI per second (35 kPa/sec.).

TABLE 2—METER OIL CAPACITIES

APPROX. OIL CAPACITY	
GEAR END	CTR. END
TOP INLET 0.54 fl. oz. (16 ml.)	0.41 fl. oz. (12 ml)
SIDE INLET 0.17 fl. oz. (5 ml)	0.41 fl. oz. (12 ml)

Cleaning

Although oil is drained from these meters at the factory, a small quantity will remain on various surfaces and collect in the sumps. When the meters are not kept horizontal during shipment or general handling, the oil in the meter sumps can pass along the impeller shafts and enter the metering chamber. A meter with a depressed accuracy and increased differential pressure may be the result. It is recommended that prior to performance testing or installation each meter be properly filled with oil (do not install the fill plugs) and windmilled for about two minutes at a speed near the maximum rating. This may be achieved by injecting controlled dry compressed air from a nozzle into the open meter inlet connection. During this operation, flushing about 3 ounces (89 ml) of an approved non-toxic and non-flammable solvent through the meter will remove any lubricating oil or dirt which may have entered the metering chamber. Typical solvents are listed in Table 3. **Note:** During the flushing operation (if required) some of the solvents can enter the end covers. The end covers should be drained to remove any of the solvent, prior to installing the meter. Then add oil to the proper level in each end cover after installation.

During in-testing or before installation, a starting differential test may be performed. Connect an inclined water gauge to the two meter pressure

Observe the differential pressures required to start the meter rotating making tests with the impellers starting from six different positions. A reading above .03 inch (.75 mm) W.C. indicates there is either a bind from dirt or the meter needs to be windmilled further and flushed again with solvent.

Following these operations, drain the oil if the meter is to go into storage. The oil may remain if a proof test is to follow, but make sure the meter is not tipped during handling.

TABLE 3—SOLVENTS

Purpose	Solvent
Clean or Flush Meter	Mineral Spirits, Kerosene, Isopropyl Alcohol

CAUTION: Aromatics, Ketones, and Chlorinated Hydrocarbons will damage the plastic windows. Do not use acetone, carbon tetrachloride, paint thinner, etc.

TESTING

General

A differential pressure manometer is an optional meter accessory useful in providing an indication of a meter's operating condition at any time after installation. Pressure taps ($\frac{1}{8}$ inch pipe thread) are provided near the meter inlet and outlet connections for attaching a manometer, which may be supported by adjacent piping if permanently installed. A suitable instrument for this purpose should have an indicating scale range of about 6 inches (150 mm) W.C., should be provided with inlet, outlet and bypass valving, and must be pressure rated for maximum metering pressure. A portable type manometer may be used to check a number of meters periodically.

If a differential pressure manometer is permanently installed at the meter, or is available for temporary connection, a few initial operating tests should now be made. Data from these tests—if recorded and retained—will furnish the simplest and most accurate basis for checking meter condition in the future by comparison with the original "standard" of operation. In addition to the differential manometer, only a stopwatch and pressure gauge are required for the tests.

The differential rate test under the line operating conditions will provide data for the most reliable future checks on general mechanical condition of a meter. This test is based on the principle that as the rotating resistance of a meter increases, more energy is absorbed from the flowing gas in turning the impellers, and the gas will then show an increased pressure drop—or differential—in passing through the meter. It is advisable to establish original differential pressure readings for three or more gas flow rates from about 25% to 100% of meter capacity, along with gas pressure and temperature conditions during the test. For further details, reference bulletin RM-90.

As soon as the test data is completed, the meter may be placed in full service. Check its operation closely during the first hour with particular reference to oil levels, casing temperature, and increase in differential pressure. If possible, make several additional checks during the first day of operation. Thereafter the meter will be able to operate unattended for long periods under normal operating conditions.

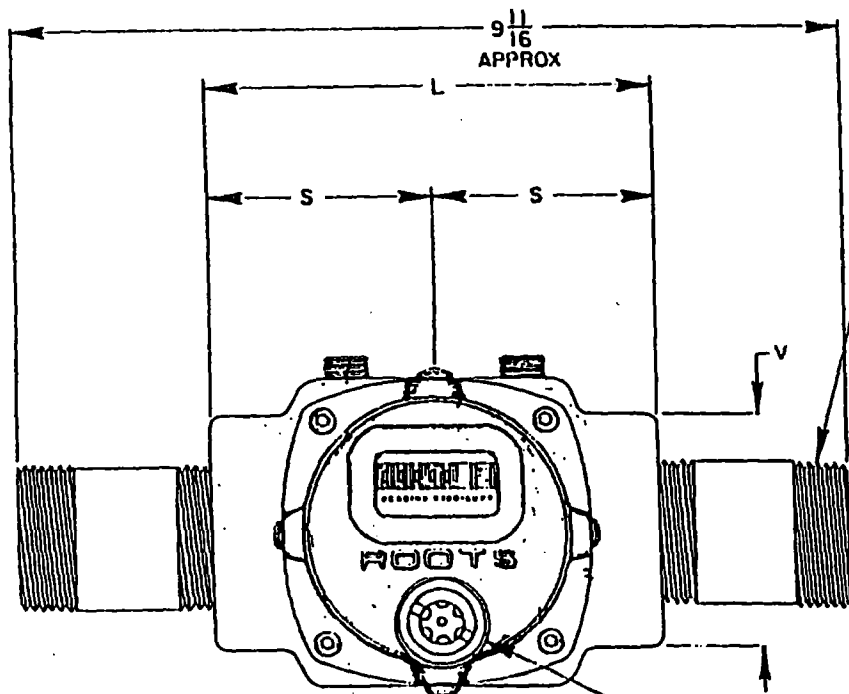
INSPECTION AND MAINTENANCE

ROOTS® Meters are simple in construction and operation. If they are installed properly, operated within their pressure and capacity limitations, and receive the required minimum of care, they can be expected to operate dependably for many years.

Period inspection and maintenance servicing should cover the following important points:

METER W/COUNTER 8C ENGLISH

DIMENSIONS IN INCHES									APPROX. OIL CAPACITY			APPROX. WEIGHT
MODEL	A	D	L	M	N	R	S	V	GEAR END (SIDE INLET)	GEAR END (TOP INLET)	CTR END (SIDE OR TOP)	
8C	8 9/16	3 5/16	4 3/4	3 5/8	4 15/16	1 21/32	2 3/8	2 1/2	17 fl. oz. (5 ml)	54 fl. oz. (16 ml)	41 fl. oz. (12 ml)	6 lbs.

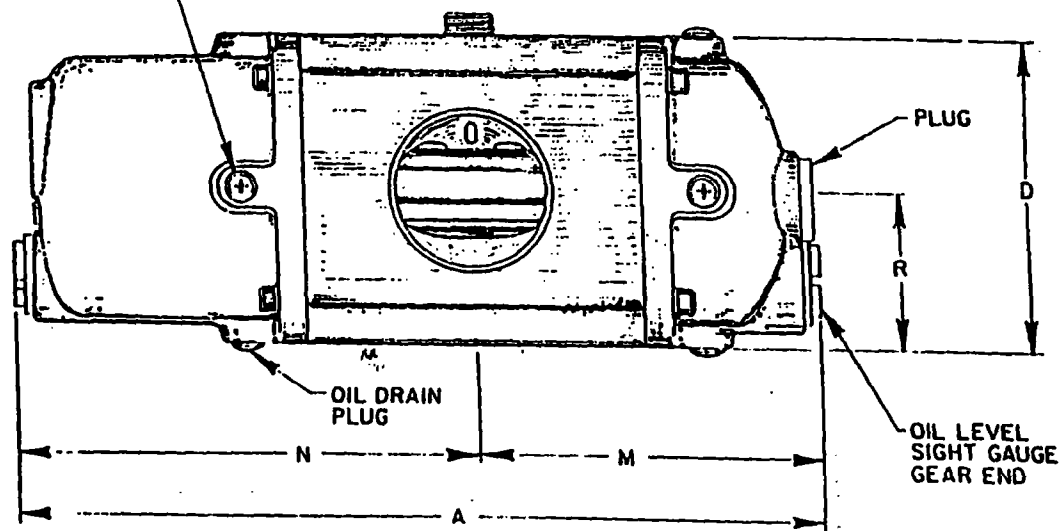


SHOWN IN SIDE INLET POSITION
FOR TOP INLET ROTATE COUNTER END
ASSEMBLY 90° COUNTERCLOCKWISE
AND EXCHANGE PLUG AND OIL LEVEL
SIGHT IN GEAR END

OIL LEVEL
SIGHT GAUGE
COUNTER END

1 1/2 - 11 1/2 NPT

OIL FILL
PLUG



CUSTOMER _____
CUST. ORDER NO. _____ OUR ORDER NO. _____
DATE _____ BY: _____

DREBBER MEASUREMENT DIVISION

OFFICE: 5000 N. W. 111th ST. N.W.

HOUSTON, TEXAS, USA

U/UG

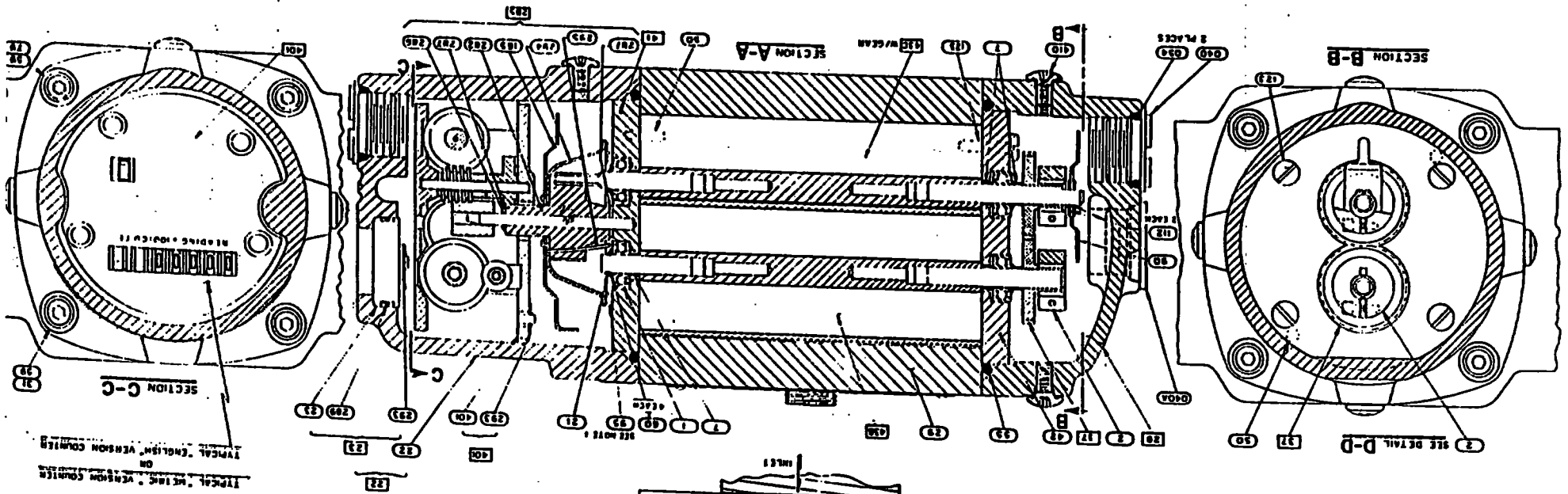
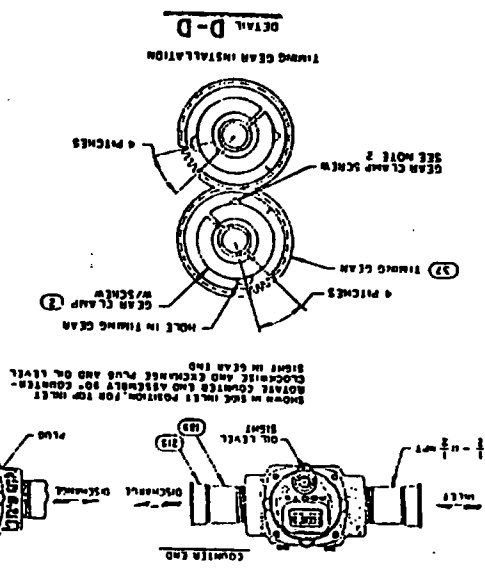
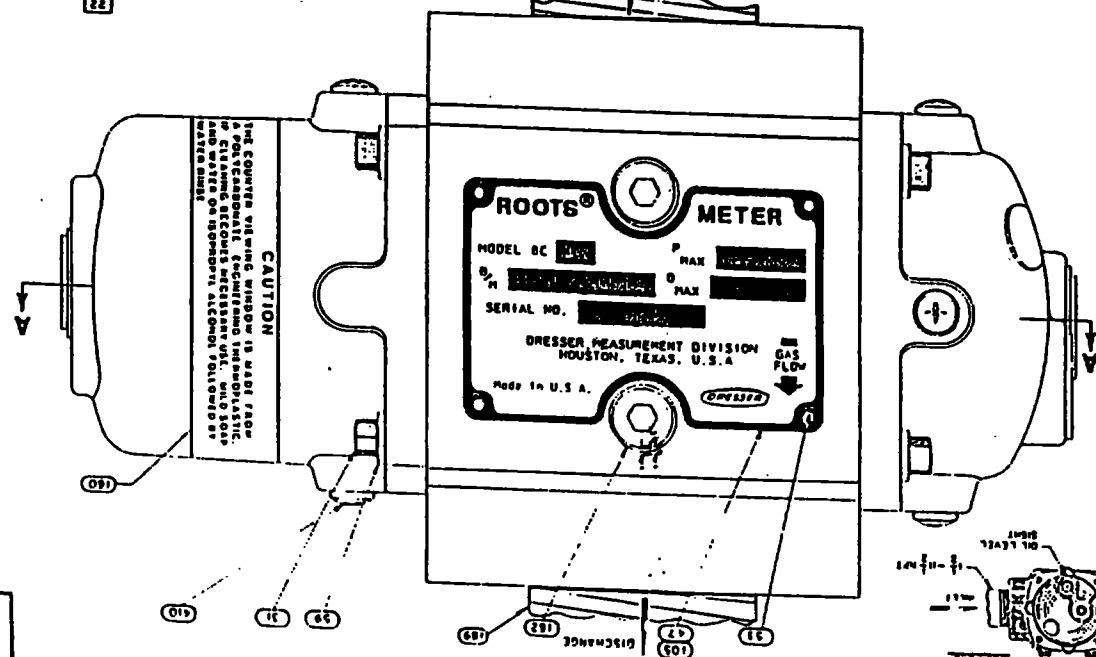
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C049844-00

MODEL 8C ROOTS® METER

NOTE:
1 TORQUE BEARING HOLD-DOWN
SCREWS, ITEM (93), TO 4.0
INCH LBS., 4 PLACES.
2 TORQUE GEAR CLAMP SCREWS,
ITEM (902), TO 10 INCH LBS., 2
PLACES.

□ - PNEU. PAINT
□ - SUB-ASSEMBLY



8C PARTS LIST

ITEM NO.	DESCRIPTION	Max. Qty. Per Meter	Repair Class	Part Number	ITEM NO.	DESCRIPTION	Max. Qty. Per Meter	Repair Class	Part Number
1	Bearing, Main Shaft	4	B	012318-000	90	Slinger, Oil, Gear End	1	C	049189-000
2	Clamp, Gear w/ Screw	2	B	011978-000	95	Screw, Cap (Bearing lock)	4	B	000199-026
7	Spacer, Bearing Placement	6	B	049203-001	105	Plate, Serial Number	1	C	047036-002
21	Ring, Retaining Bowed	2	B	011823-001	112	Ring, Retaining 3/16	2	C	011813-004
22	Cover, Counter End Complete	1	A	See Asm #123	123	Screw, Slotted	8	B	000641-046
23	Window, Counter	1	A	See Asm #123	160	Decal (Caution)	1	C	050771-000
28	Cover, Gear End Complete	1	A	See Asm #128	162	Plug, Pipe, Socket Head	2	C	010506-002
29	Cylinder	1	B	049180-001	165	Slinger, Oil (See Asm #285)	1	A	-
31	Screw, Socket Head	6	C	000141-269	189	Nipple, Pipe - Schd. #40 (1-1/2" x 3")	2	C	046861-001
37	Gears, Asm Timing (matched set)	1	B	049186-000	215	Cap, Plug (O.D. #607)	2	C	011359-017
40	Window, Oil Level (see Asm #22 or #28 Cover)	1	A	See Asm #22 or #28	215	Cap, Plug (I.D. #205)	2	C	011359-007
40	Gauge, Oil Level (3/4-16NF2)	2	C	012270-000	282	Gear, Cluster (See Asm #285)	1	A	See Asm #285
40A	Plug, w/ "O"-Ring (3/4-16NF2)	1	C	012261-006	285	Gear, Cluster, Asm, w/Slinger #165 (Eng.)	1	A	051584-001
41	Headplate, Counter End w/Shaft	1	B	049176-000	285	Gear, Cluster, Asm, w/Slinger #165 (Metric)	1	A	051584-002
42	Headplate, Gear End	1	B	050550-000	286	Ring, Retaining, External (See Asm #285)	1	B	012019-000
43B	Impeller & Shaft Asm (Top)	1	B	049170-001	287	Washer, Cluster Gear (See Asm #285)	3	B	049361-000
43C	Impeller & Shaft w/Gear (Bottom)	1	B	049172-001	289	Seal, "O" Ring (See Asm #22 or #23)	1	B	000568-123
47	Nameplate	1	C	.	293	Ring, Retaining, External (See Asm #22, #23 and #401)	5	A	012020-002
50	Pin, Dowel (incl. w/ #41 & #42)	4	A	000453-084	294	Shield, Oil (See Asm #285)	1	A	See Asm #285
53	Screw, Drive	4	C	000201-005	295	Tube, Capillary (See Asm #285)	1	A	See Asm #285
54	Seal, "O" Ring, Sight Gauge (see No. 40)	2	C	000568-908	401	Counter, English (See Repair Asm #401)	1	A	051506-001
54	"O" Ring Seal, Sight Gauge Asm. (see Asm #33 & #28)	3	A	.	401	Counter, Metric (See Repair Asm #401)	1	A	051506-002
55	Seal, "O" Ring (2-1/2" x 2-3/4" x 1/8")	2	C	000568-230					
59	Washer, Flat	8	C	000301-009					
60	Washer, Flat	4	B	049343-000					
79	Screw, Socket Head (Drilled)	2	C	011951-005					

REPAIR ASSEMBLIES

ASM NO.	Description	Item # And Qty.	Part Number	ASM NO.	Description	Item # And Qty.	Part Number
22	Cover, Counter End	22, 23, 40, 54, 55, 160, 289, 293(5), 410(3)	051152-000	285	Gear, Cluster w/Slinger (English)	165, 282, 285, 286, 287 (2), 291(2), 294, 295	051584-001
23	Window, Counter	23, 289, 293(4)	051147-000	285	Gear, Cluster w/Slinger (Metric)	165, 282, 285, 286, 287 (2), 291(2), 294, 295	051227-002
28	Cover, Gear End	28, 40, 40A, 54, 55, 401(4)	051151-000	401	Counter, Less Cover (English)	293, 401	051506-001
				401	Counter, Less Cover (Metric)	293, 401	051048-021

KIT ASSEMBLIES

ASM NO.	Description	Item # And Qty.	Part Number
401/285	Kit, Counter/Cluster Gear (English)	401, 285	051598-001
401/285	Kit, Counter/Cluster Gear (Metric)	401, 285	051598-002

NOTE: The kit assembly should be ordered for any counter or cluster gear replaced prior to S/N 8823300. The listed parts are for the following Bills of Materials (located on the meter nameplate):

049591-101, 049591-121, 049908-101, 049908-102, 050932-100, 050932-120, 050932-101, 050932-121



Sales and Engineering Offices are located
in principal cities throughout the world

For additional information, consult your Telephone Directory under: METERS - DRESSER ROOTS® GAS METERS,
alternatively, write or call our general offices:

General Offices
DMD DRESSER
MEASUREMENT OPERATION
P.O. Box 42176
Houston, Texas 77242-2176 U.S.A.
Phone: 713-972-5000 Fax: 713-972-5003

In United Kingdom
DRESSER MANUFACTURING DIVISION
WARRINGTON OPERATIONS
29/31 Rufford Court
Hardwick Grange
Warrington, WA1 4RF, England
Phone: 011-44-1925-814545 Fax: 011-44-1925-816128

In Europe
DRESSER INDUSTRIAL PRODUCTS, B.V.
P. O. Box 7163
5980 AD Panningen, Netherlands
Phone: 011-31-77-307.71.22 Fax: 011-31-77-307.64.94

APPLICATION:





Vent lines on oil separators, flow treaters, compressor stations, gas gathering systems.

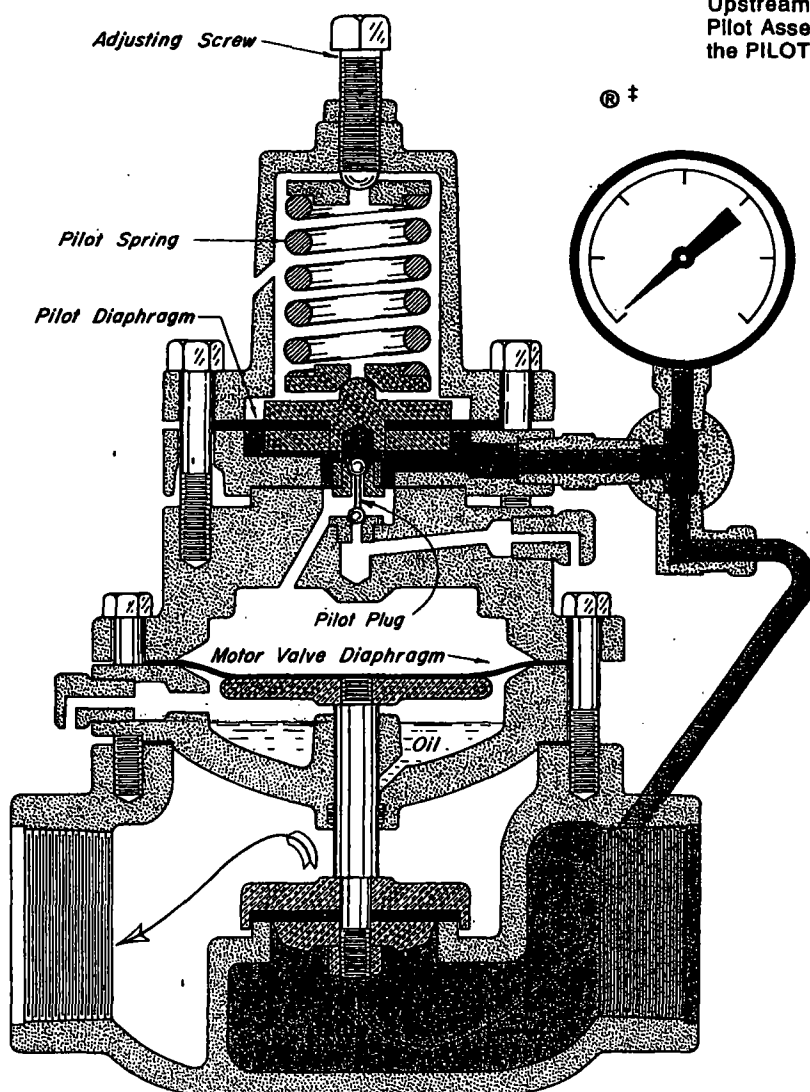
PRESSURE RANGE:

3 psig to 280 psig

CAPACITY:

Refer to Table of Contents.

-  Pilot Assembly
-  Motor Valve Stem Assembly
-  Upstream Pressure
-  Motor Valve Diaphragm Pressure

**OPERATION:**

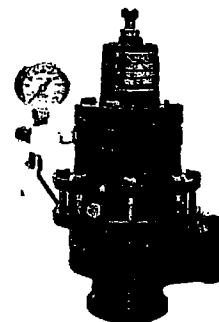
The Pilot Assembly and Motor Valve Stem Assembly (Crosshatched) are the only moving units in the regulator. The PILOT PLUG consists of two stainless balls rigidly connected together. The upper seat for the PILOT PLUG is the Motor Valve Diaphragm Pressure inlet (Red to Yellow). The lower seat for the PILOT PLUG is the pressure vent (Yellow to Atmosphere).

The PILOT SPRING in the bonnet loads the upper side of the Pilot Assembly and is opposed on the underside by Upstream Pressure (Red).

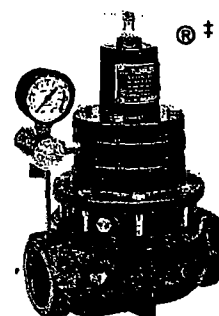
Assume the PILOT SPRING is compressed with the ADJUSTING SCREW for a set pressure greater than the Upstream Pressure (Red). The Pilot Assembly is forced downward by the PILOT SPRING. The lower seat for the PILOT PLUG (Yellow to Atmosphere) is closed and the upper seat for the PILOT PLUG (Red to Yellow) is open. This lets full Upstream Pressure (Red) load the motor valve. The area of the MOTOR VALVE DIAPHRAGM is twice the area of the motor valve seat, assuring a positive shut-off.

As the Upstream Pressure (Red) increases to the set pressure, the Pilot Assembly moves upward against the PILOT SPRING to first close the upper seat (Red to Yellow) and open the pressure vent (Yellow to Atmosphere). As the Motor Valve Diaphragm Pressure (Yellow) is decreased, the Upstream Pressure (Red) acting under the motor valve seat, opens the valve. With relief of Upstream Pressure (Red) through the motor valve, the Pilot Assembly assumes a position in which both seats of the PILOT PLUG are closed.

The non-bleed, three-way valve action of the PILOT PLUG against its seat adjusts the Motor Valve Diaphragm Pressure (Yellow), repositioning the Motor Valve Stem Assembly to accommodate any rate of flow. The rapid but stable repositioning produces a true throttling action.

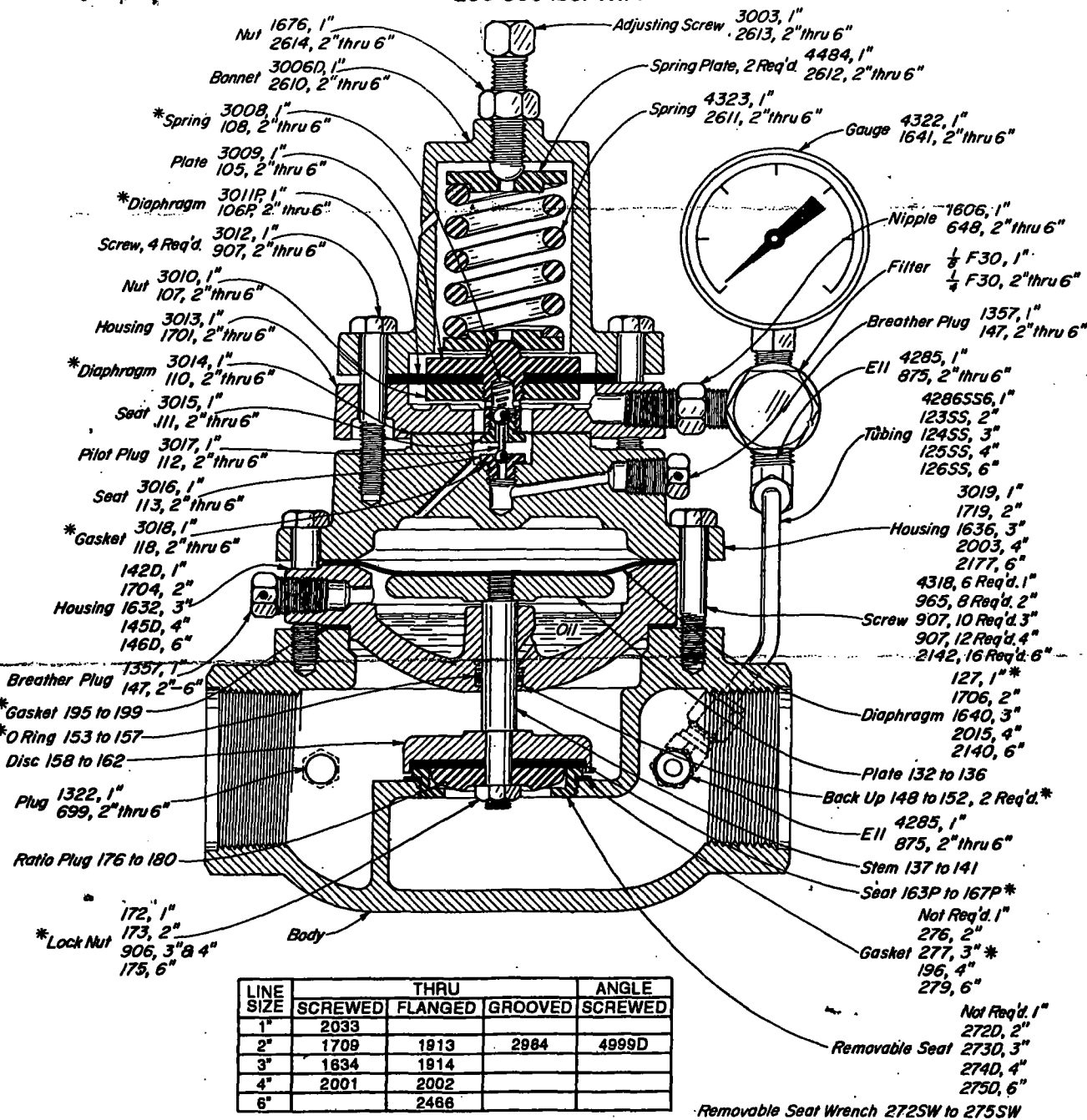


212 SGA BP



212 SGT BP

1", 2", 3", 4" & 6" S/F/GGT/A BP-D
DUCTILE
250-300 lbs. W.P.



THRU VALVES AVAILABLE: DUCTILE IRON

CAT. NO.	SIZE	TYPE	REG. NO.	DES. PRESS.	OPER. PRESS.
AKB	1"	SCRD.	130 SGT BP-D	300	300
AAR	2"	SCRD.	230 SGT BP-D	300	300
AAS	2"	FLGD.	218 FGT BP-D	250	250
AAQ	2"	GRVD.	230 GGT BP-D	300	300
AAT	3"	SCRD.	330 SGT BP-D	300	300
AAU	3"	FLGD.	318 FGT BP-D	250	250
AAW	4"	SCRD.	430 SGT BP-D	300	300
AAX	4"	FLGD.	418 FGT BP-D	250	250
AAY	6"	FLGD.	618 FGT BP-D	250	250

ANGLE VALVES AVAILABLE: DUCTILE IRON

CAT. NO.	SIZE	TYPE	REG. NO.	DES. PRESS.	OPER. PRESS.
ASR	2"	SCRD.	230 SGA BP-D	300	300

Dimensions, refer to Table of Contents.

*These parts are recommended spare parts and are stocked as repair kits. To order repair kit, specify size "r" regulator. Example: "2" 230G Repair Kit."

NOTE: The numbers of a series assigned to a part indicate different line sizes. For example: Seat 163P-1", 164P-2", 165P-3", 166P-4", 167P-6".