

LSR Series Direct-Operated Regulators



Figure 1. LSR Series Direct-Operated Regulators

Features

- **Wide Pressure Range Capability with Single Regulator** – Up to 60 psig / 4.1 bar outlet pressure.
- **Suitable for Monitoring Applications** - Pair the LSR Series with pilot operated regulator in a monitor application for spring open and spring closed.
- **Excellent Shock Characteristics and Fast Speed of Response** – Due to two-way stabilizer vent valve, which vents the spring case more rapidly than conventional vents, lag in diaphragm and valve disk movement is minimized.
- **Suitable for Hydrogen Applications** – Contact your local sales channel or Emerson Impact Partner for more details on Hydrogen configurations.
- **Bubble-Tight Shutoff** – Single-port construction, large diaphragm area, light-rate springs along with ideal durometer disk material and seat design provide low lock-up pressures.
- **Change Elastomer Disk without Disassembling the Actuator** – Hex shaped stem allows for disk removal without holding the stem during maintenance. Eliminates the chance of damaging the diaphragms during maintenance.
- **No Seat-to-Seat Adjustment Required** – Balanced single-port design eliminates necessity for seat-to-seat adjustments to achieve bubble-tight shutoff.
- **Easy Access to Trim Parts** – Change the valve disk in 30 minutes or less. Valve seat, disk and cage easily removed with body remaining in line and without disassembly of actuator portion. Disk is accessible from bottom flange.
- **Reusable Pressure Seals** – O-rings used for pressure seals, unlike gaskets, are not ordinarily damaged by disassembling the regulator.
- **Resistance to Piping Stresses** – Steel constructions are available to help resist pipe stresses.

Specifications

The Specifications section lists the specifications for the LSR Series direct-operated regulators. Factory specification is stamped on the nameplate fastened on the regulator at the factory.

Actuator Sizes

475 mm Actuator: Low pressure construction for outlet pressure range of 0.25 to 5 psig / 17.2 to 340 mbar has a maximum operating inlet up to 125 psig / 8.6 bar. The maximum emergency inlet pressure rating is 300 psig / 20.7 bar.

350 mm Actuator: Medium pressure construction for outlet pressure range of 0.34 to 10 psig / 0.02 to 0.69 bar. Maximum operating inlet pressure of 150 psig / 10.3 bar. Medium pressure for outlet range of 10 to 21.75 psig / 0.69 to 1.5 bar has a maximum operating inlet up to 300 psig / 20.7 bar. The maximum emergency inlet pressure rating is 300 psig / 20.7 bar.

255 mm Actuator: High pressure construction for outlet pressure range of 20 to 60 psig / 1.38 to 4.14 bar. The maximum operating inlet pressure is 300 psig / 20.7 bar for set pressure between 20 and 40 psig / 1.38 and 2.76 bar. The maximum operating inlet pressure is 400 psig / 27.6 bar for set pressure between 40 and 66 psig / 2.76 and 4.55 bar with a maximum emergency inlet pressure of 400 psig / 27.6 bar.

Outlet Pressure Ranges⁽¹⁾

See Table 2

Pressure Ratings⁽¹⁾

See Table 2

Maximum Outlet Pressure⁽¹⁾

See Table 3

Wide Open Flow Coefficients

See Table 4

Certifications

DVGW (EN334, EN14382)
Pressure Equipment Directive (PED)
Up to 100% Hydrogen Blend
Hydrogen Construction Available⁽⁴⁾
V9 Certifications

Pressure Registration

External; downstream control line is required

Temperature Capabilities⁽¹⁾⁽²⁾

-20 to 150°F / -29 to 66°C
Lockup and Function Tested to -40°F / -40°C

Control Line Connection

Without Slam-Shut: 1/2 NPT (internal); connection will be positioned directly over body outlet (standard position) or 90 degrees right or left of standard position if specified.

With Slam-Shut: 1/2 NPT (internal) connection right or left directly over slam-shut. Can be selected or changed after shipment.

VSX8 Series Slam-Shut Controller:
1/4 NPT connection

Vent Connection

3/4 NPT (internal) vent assembly

Approximate Weight

Body

2x2: 30.4 lbs / 13.5 kg
2x2 NPT: 24 lbs / 10.9 kg
2x4: 38.7 lbs / 17.55 kg
3x3: 105 lbs / 48 kg
3x6: 130 lbs / 59 kg
Slam-Shut Device: 16.4 lbs / 7.45 kg

475 mm Actuator:

86 lbs / 39 kg (Eye nuts included)

350 mm Actuator:

61.1 lbs / 27.7 kg (Eye nuts included)

255 mm Actuator:

44.9 lbs / 20.35 kg (Eye nuts included)

Construction Materials

Body and Bonnet:

Gray iron, Ductile iron and WCC Steel

Cage: CF3 Stainless steel

Stem: S17400 Stainless steel H1075

Orifice: 304 Stainless steel

Disk: Nitrile (NBR) Inside Steel Retainer

Actuator: S355ML Structural steel

Elastomers: Nitrile (NBR)

Diaphragm: Nylon-reinforced Nitrile (NBR)

Turndown Ratio

1000+:1⁽³⁾

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

2. Using optional restriction collar.

3. The LSR Series has been used beyond 1000:1 Turndown, please contact Sales with specific application questions.

4. Contact your Emerson Impact Partner or the local Emerson sales office for more information.

Table 1. Available Configurations

TYPE NUMBER						OPTION
L	S					
						BODY SIZE
	2					2 x 2, 2 x 4 in. / DN 50 x 50, 50 x 100
	3					3 x 3, 3 x 6 in. / DN 80 x 80, 80 x 150
						OUTLET PRESSURE CONSTRUCTION
	0					Low Pressure Applications (Outlet Pressure: 0.25 to 5 psig / 17 to 340 mbar)
	2					Medium Pressure Applications (Outlet Pressure: 1.5 to 22.4 psig / 0.1 to 1.53 bar)
	5					High Pressure Applications (Outlet Pressure: 8.4 to 64 psig / 0.57 to 4.4 bar)
						OVERPRESSURE PROTECTION
	0					Without Overpressure Protection Module
	4					With Slam-shut Module ⁽¹⁾
Example: Type number LS224: LS200 Series regulator constructed for medium pressure applications, with VSX4 Series slam-shut module and external pressure registration. 1. Reference Instruction Manual D103127X012 for VSX8 Series safety slam-shut module.						

Table 2. LSR Series Outlet Pressure Ranges, Control Springs

TYPE	ACTUATOR DIAMETER SIZE		SPRING RANGE		PART NUMBER	CONTROL SPRING		
	in.	mm	psig	bar		WIRE DIAMETER		COLOR
						in.	mm	
475 mm Actuator ⁽¹⁾	18.7	475	7 to 9 in. w.c.	0.017 to 0.022	ERAA07279A0	0.19	5.0	Light Blue
			8.3 to 19.4 in. w.c.	0.02 to 0.05	ERAA07575A0	0.25	7.0	Yellow
			16.5 in. w.c. to 1.28 psig	0.04 to 0.09	ERAA07577A0	0.25	7.0	Brown
			1.10 to 2.24	0.08 to 0.15	ERAA07585A0	0.31	8.0	Dark Grey
			2.00 to 5.00	0.14 to 0.35	ERAA07589A0	0.41	10.5	Pink
350 mm Actuator ⁽²⁾	13.8	350	10 to 12 in. w.c.	25 to 30 mbar	ERAA07279A0	0.19	5.0	Light Blue
			13.5 in. w.c. to 1.3 psig	0.04 to 0.09	ERAA07575A0	0.25	7.0	Yellow
			23 in. w.c. to 2.4 psig	0.06 to 0.17	ERAA07577A0	0.25	7.0	Brown
			2.00 to 5.10	0.14 to 0.35	ERAA07586A0	0.31	8.0	Light Green
			4.35 to 10.6	0.3 to 0.73	ERAA07589A0	0.41	10.0	Pink
			4.8 to 15.7	0.33 to 1.08	ERAA07592A0	0.44	11.0	Dark Blue
			8.3 to 21.75	0.57 to 1.5	ERAA07283A0	0.50	13.0	Orange
255 mm Actuator ⁽³⁾	10.0	255	20 to 30.3	1.38 to 2.09	ERAA07589A0	0.41	10.0	Pink
			20 to 44.8	1.38 to 3.09	ERAA07592A0	0.44	11.0	Dark Blue
			25 to 66 ⁽⁴⁾	1.72 to 4.55	ERAA07283A0	0.50	13.0	Orange

1. Spring ranges decrease by 0.11 psi / 7.58 mbar when actuator is installed below pipe.

2. Spring ranges decrease by 0.2 psi / 13.8 mbar when actuator is installed below pipe.

3. Spring ranges decrease by 0.4 psi / 27.6 mbar when actuator is installed below pipe.

4. Maximum set point 66 psi / 4.55 bar can be achieved for wide open monitor applications, standard is 60 psi / 4.14 bar maximum set point.

Table 3. Maximum Inlet and Outlet Pressures

PRESSURE		475 MM ACTUATOR		350 MM ACTUATOR		255 MM ACTUATOR	
		psig	bar	psig	bar	psig	bar
Maximum Operating Inlet Pressure for Best Performance	≤5 psig / 345 mbar maximum outlet pressure	125	8.6	150	10.3	400	27.6
	<10 psig / 0.69 bar maximum outlet pressure	----	----				
	>10 psig / 0.69 bar maximum outlet pressure			300	20.7		
Maximum Emergency Inlet Pressure		300	20.7				
Maximum Operating Outlet Pressure ⁽¹⁾		5.0	0.34	22	1.5	66	4.5
Maximum Outlet Pressure Over Setpoint to Avoid Parts Damage		11.6	0.8	29	2.0	84	5.8
Maximum Emergency Outlet (Casing) Pressure		66.0 ⁽²⁾	5.6 ⁽²⁾	115 ⁽³⁾	7.9 ⁽³⁾	150	10.3
Maximum Loading Pressure		5.0	0.34	10	0.69	30	2.1
1. With highest spring range available only. 2. 35 psi / 2.41 bar per PED. 3. 50 psi / 3.45 bar per PED.							

LSR Series

Table 4. Wide Open Flow Coefficients

Type	Size in. / DN	FLOW COEFFICIENTS		
		C _g	C _i	C _v
Without Slam-shut	2 x 2 / 50 x 50	2083	33	72
	2 x 4 / 50 x 100	2461	29	74
With Slam-shut	2 x 2 / 50 x 50	2001	28	71
	2 x 4 / 50 x 100	2304	34	67
Without Slam-shut	3 x 3 / 80 x 80	4260	24	189
	3 x 6 / 80 x 150	4290	21	216
With Slam-shut	3 x 3 / 80 x 80	4240	28	160
	3 x 6 / 80 x 150	4280	26	175

Note: Multiply restricted trim % value by the C_g for the restricted C_g value.

Table 5. Regulating Flow Coefficients (± 10% Droop)

UNIT INFORMATION			FLOW COEFFICIENTS			
Regulator	Body	Type	C _g	C _i	C _v	X _t
LS200 Series	2x2	Without Slam-shut	1928	28	69	0.49
	2x4		2244	32	70	0.67
	2x2	With Slam-shut	1847	27	68	0.47
	2x4		2145	33	65	0.70

Table 6. Pressure Ranges and Body Pressure-Temperature Ratings

TYPE	OUTLET RANGE		BODY MATERIAL	END CONNECTION	TEMPERATURE RANGE		MAX OPERATING INLET		MAX BODY PRESSURE RATING	
	psig	bar			°F	°C	psig	bar	psig	bar
LS200 and LS204	0.25 to 5	0.08 to 0.3	Ductile iron	PN 16	-20 to 100	-29 to 38	125	8.6	232	16
					-20 to 150	-29 to 66			249	17.2
				CL150 RF	-20 to 100	-29 to 38			242	16.7
					-20 to 150	-29 to 66			232	16
			Steel	PN 16	-20 to 100	-29 to 38			285	19.7
					-20 to 150	-29 to 66			271	18.7
				CL150 RF	-20 to 100	-29 to 38			400	27.6
					-20 to 150	-29 to 66			285	19.7
				CL300 RF	-20 to 100	-29 to 38			271	18.7
					-20 to 150	-29 to 66			175	12.1
				NPT	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				
			Cast iron	CL125 FF	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				
				NPT	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				
LS220 and LS224	0.34 to 10	0.02 to 0.69	Ductile iron	PN 16	-20 to 100	-29 to 38	150	10.3	232	16
					-20 to 150	-29 to 66			249	17.2
				CL150 RF	-20 to 100	-29 to 38			242	16.7
					-20 to 150	-29 to 66			232	16
			Steel	PN 16	-20 to 100	-29 to 38			285	19.7
					-20 to 150	-29 to 66			271	18.7
				CL150 RF	-20 to 100	-29 to 38			400	27.6
					-20 to 150	-29 to 66			175	12.1
				CL300 RF	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				
				NPT	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				
			Cast iron	CL125 FF	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				
				NPT	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				
	10 to 21.7	0.69 to 1.5	Ductile iron	PN 16	-20 to 100	-29 to 38	232	16	232	16
					-20 to 150	-29 to 66	249	17.2	249	17.2
				CL150 RF	-20 to 100	-29 to 38	242	16.7	242	16.7
					-20 to 150	-29 to 66	232	16	232	16
			Steel	PN 16	-20 to 100	-29 to 38	285	19.7	285	19.7
					-20 to 150	-29 to 66	271	18.7	271	18.7
				CL150 RF	-20 to 100	-29 to 38	300	20.7	400	27.6
					-20 to 150	-29 to 66	285	19.7	285	19.7
				CL300 RF	-20 to 100	-29 to 38	271	18.7	271	18.7
					-20 to 150	-29 to 66	175	12.1	175	12.1
				NPT	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				
LS250 and LS254	20 to 60	1.37 to 4.13	Ductile iron	PN 16	-20 to 100	-29 to 38	232	16	232	16
					-20 to 150	-29 to 66	249	17.2	249	17.2
				CL150 RF	-20 to 100	-29 to 38	242	16.7	242	16.7
					-20 to 150	-29 to 66	232	16	232	16
			Steel	PN 16	-20 to 100	-29 to 38	285	19.7	285	19.7
					-20 to 150	-29 to 66	271	18.7	271	18.7
				CL150 RF	-20 to 100	-29 to 38	400	27.6	400	27.6
					-20 to 150	-29 to 66	285	19.7	285	19.7
				CL300 RF	-20 to 100	-29 to 38	271	18.7	271	18.7
					-20 to 150	-29 to 66	175	12.1	175	12.1
				NPT	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				
			Cast iron	CL125 FF	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				
				NPT	-20 to 100	-29 to 38				
					-20 to 150	-29 to 66				

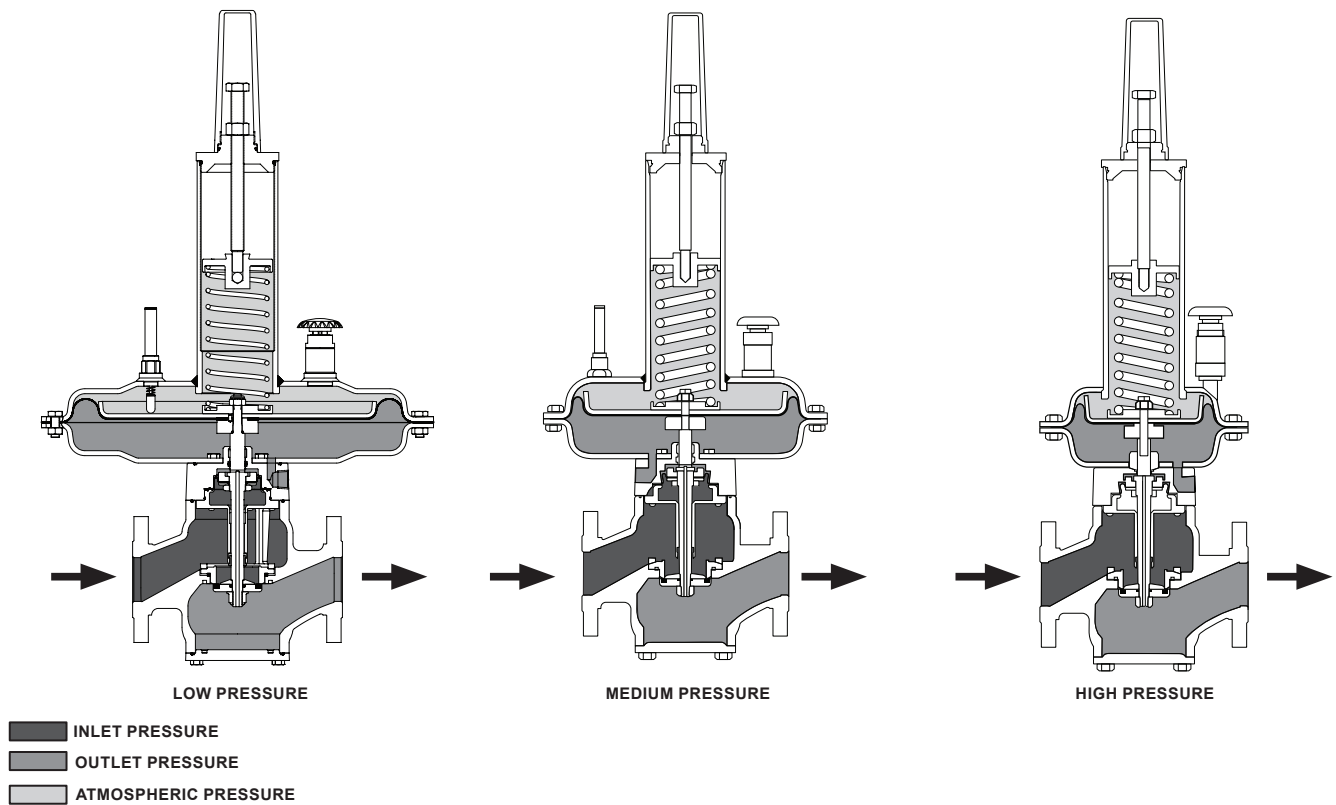


Figure 2. LSR Series Regulator Operational Schematic

Introduction

Description

The LSR Series direct-operated gas regulators are primarily designed for low pressure natural gas distribution systems, industrial and commercial applications supplying gas to furnaces, burners and other appliances. The Type LS200 balanced port design enables the regulator to provide accurate control of gas pressure for maximum combustion efficiency despite varying inlet pressure conditions. The single port construction provides bubble-tight shutoff. An external downstream control line is required for the operation of the regulator. Refer to Table 2 for outlet pressure ranges of each type. LSR Series regulators are available in a 2 and 3 in. / DN 50 and 80 body size with either NPT or flanged end connections.

An optional restriction collar can be installed if wide-open capacity is too high for applications using a relief valve as overpressure protection. The collar reduces wide-open capacity to 40%, 60% or 78% of wide open capacity. 78% is sized for replacing the legacy Type 133HP 100% units without needing to resize the relief valve.

Principle of Operation

In the LSR Series, downstream pressure is registered under the diaphragm via the external control line and is used as the operating medium. Increased demand lowers the downstream pressure and allows the spring to move the diaphragm and stem assembly down, opening the valve disk and supplying more gas to the downstream system. Decreased demand increases the downstream pressure and moves the diaphragm and stem assembly up, closing the valve disk and decreasing the gas supply to the downstream system.

Boosting System

The LSR Series incorporates a balancing diaphragm and a boosting system. When the regulator is locked up, inlet pressure is registered on the top of the disk and on the bottom of the balancing diaphragm through space between the stem and cage. Also, downstream pressure is registered on the bottom of the disk and on the top of the balancing diaphragm through a passage in the stem.

When the trim is open, gas flows from the inlet over the edge of the disk to the outlet. Under the disk, there is little gas flow. The gas pressure is higher than it is in the flow path where gas velocity tends to lower the pressure. The higher pressure near the disk is registered on the top

of the balancing diaphragm through the space between the stem and the cage.

This pressure registered on the top of the balancing diaphragm aids downward disk travel and compensates for spring and diaphragm effect. This improves regulator rangeability and performance

Installation

The regulator may be installed with actuator above or below the body but is normally installed with the actuator portion above the body portion. Flow through the body must be in the direction indicated by the flow direction arrow cast on the body portion. A downstream control line is required for operation of the regulator.

A remote vent line may be required for some installations. Vent openings must be protected against the entrance of rain, snow, insects or any other foreign material that may plug the vent.

External dimensions are shown in Figure 3.

Integrated Slam-shut

The LSR Series is offered with an integral slam-shut device that will stop gas from flowing if an over pressure or under pressure condition occurs.

The slam-shut design is industry leading with only design allowing choice of which side of the body to install the slam-shut.

The slam-shut measuring element utilizes the VSX8 Series actuator (see VSX8 Series literature for more details and support). The VSX8 Series uses a positive latching mechanism instead of a ball bearing design. The Positive Latch Mechanism reduces false trips related to vibration or external factors. See Figure 4 for more information.

Overpressure Protection

As is the case with most regulators, the LSR Series regulators have outlet pressure ratings that are lower than the inlet pressure ratings. Some type of Overpressure Protection is needed if the actual inlet pressure ever exceeds the outlet pressure rating.

Maximum inlet and outlet pressures for the LSR Series are given in Table 3. All models must be protected against inlet pressure above the maximum emergency inlet pressure. (Refer to Table 3).

Capacity Data

Flow capacities for various inlet pressures and outlet pressure settings are shown in Tables 7 to 15. Capacities are in thousands of Nm³/hr and SCFH at 60°F and 14.7 psia and in Nm³/h at 0°C and 1.01325 bar of 0.6 specific gravity gas. To convert to equivalent

capacities of other gases, multiply the SCFH values shown by the appropriate factor: air - 0.775; propane - 0.628; butane - 0.548; nitrogen - 0.789. For gases of other specific gravities, multiply the given capacity by 0.775 and divide by the square root of the appropriate specific gravity. Then, if capacity is desired in Nm³/h at 0°C and 1.01325 bar, multiply SCFH by 0.0268.

Note

For optimum performance, select the lowest spring range that includes the desired outlet pressure setting. Capacity Data gathered using 4 in. / DN 100 outlet piping.

For restricted-capacity constructions, determine flow capacities for outlet pressure settings of 2 psig / 0.14 bar or less by multiplying the values from Tables 7 to 12 by 40%, 60% or 78% (depending upon which restriction collar is selected). If flow capacities for inlet pressures lower than those shown are required, contact your local Sales Office.

The representative regulating C_g of 2000 may be used for regulator sizing of full capacity constructions only if capacity table data is not available. The representative regulating C_g is an approximation only for pressure drops greater than 5 psig / 0.34 bar, because, at a given offset in controlled pressure, the regulating C_g varies with the spring being used with the pressure drop across the valve. To determine capacity using the flow coefficient C_g, use the appropriate procedure below.

Critical Pressure Drops

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

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

Non-Critical Pressure Drops

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

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

where,

- Q = gas flow rate, SCFH
- P₁ = absolute inlet pressure, psia (P₁ gauge + 14.7)
- C_g = regulating or wide-open gas sizing coefficient
- G = specific gravity of the gas
- T = absolute temperature of gas at inlet, °Rankine
- C₁ = flow coefficient
- ΔP = pressure drop across the regulator, psig

LSR Series

Table 7. Type LS200 Capacity Table with 2 x 2 In. / DN 50 x 50 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾

OUTLET PRESSURE SETTING		INLET PRESSURE		2 x 2 IN. / DN 50 x 50 BODY SIZE, 2 IN. / 50 mm ORIFICE SIZE					
				Droop from Setpoint					
				1 In. w.c. Droop		10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr
7 in. w.c.	0.017	1	0.1	11.9	337				
		2	0.1	18.9	534				
		3	0.2	23.6	667				
		5	0.3	35.3	999				
		10	0.7	48.4	1370				
		20	1.4	74.6	2113				
		30	2.1	101	2861				
		40	2.8	128	3619				
		50	3.4	133	3760				
		60	4.1	138	3907				
		75	5.2	144	4081				
14 in. w.c.	0.034	1	0.1	7.72	219	7.58	215	11.4	324
		2	0.1	11.1	314	9.72	275	18.3	518
		3	0.2	16.1	455	19.5	551	24.7	700
		5	0.3	23.5	666	24.9	706	33	935
		10	0.7	48.6	1375	48.1	1363	54.1	1532
		20	1.4	74.1	2100	74	2096	75.5	2137
		30	2.1	97	2747	96.7	2740	97.2	2754
		40	2.8	125	3552	10.8	306	125	3528
		50	3.4	141	3996	135	3815	144	4073
		60	4.1	156	4405	146	4148	160	4523
		75	5.2	168	4744	117	3312	168	4744
1	0.07	1	0.1	7.05	200	13.8	391	17.9	507
		3	0.2	9.02	255	18.3	519	22.4	634
		10	0.7	25.1	710	42.7	1209	46.4	1314
		20	1.4	83.8	2373	83.8	2373	84.2	2383
		30	2.1	109	3095	109	3085	109	3085
		40	2.8	130	3677	134	3789	134	3789
		50	3.4	159	4505	162	4588	162	4588
		60	4.1	186	5273	187	5289	187	5289
		65	4.5	201	5693	201	5693	201	5693
		75	5.2	221	6258	221	6258	221	6258
		90	6.2	228	6460	228	6459	228	6459
2	0.14	1	0.1	6.74	191	14.9	422	20.3	575
		10	0.7	17.7	502	39.7	1125	49	1389
		20	1.4	23.2	658	63.1	1787	79.6	2254
		30	2.1	29.7	842	84	2379	101	2867
		40	2.8	36.8	1042	102	2902	124	3515
		50	3.4	40.9	1159	111	3143	144	4075
		60	4.1	44.1	1250	127	3594	159	4510
		65	4.5	47.7	1351	131	3700	167	4724
		70	4.8	50.1	1420	139	3928	182	5161
		80	5.5	54.6	1547	151	4289	205	5797
		90	6.2	55.6	1574	153	4343	236	6678
4	0.28	1	0.1	6.49	184	14.8	420	21.9	620
		10	0.7	13.5	383	37.8	1070	51.4	1457
		20	1.4	17.9	508	68.1	1927	84.4	2390
		30	2.1	22.8	646	95.2	2697	110	3106
		40	2.8	33.0	935	123	3490	137	3881
		50	3.4	47.3	1339	148	4188	158	4479
		60	4.1	139	3923	181	5126	187	5301
		75	5.2	171	4855	219	6210	222	6293
		90	6.2	218	6183	254	7200	264	7468
		100	6.9	93.5	2647	262	7416	272	7709
		125	8.6	160	4532	303	8586	303	8586

— Shaded areas indicate that capacity are not available.
 — Shaded areas indicate capacity limited by boost.
 1. 5% Capacity reduction for constructions with the slam-shut.

Table 7. Type LS200 Capacity Table with 2 x 2 In. / DN 50 x 50 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾ (continued)

OUTLET PRESSURE SETTING		INLET PRESSURE		2 x 2 IN. / DN 50 x 50 BODY SIZE, 2 IN. / 50 mm ORIFICE SIZE					
				Droop from Setpoint					
				1 In. w.c. Droop		10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr
5	0.34	10	0.7	9.37	265	36.6	1038	47.6	1347
		20	1.4	15.0	426	74.9	2122	84.4	2389
		30	2.1	20.6	584	102	2878	107	3024
		40	2.8	34.9	988	131	3705	135	3834
		50	3.4	34.2	968	156	4413	160	4535
		60	4.1	47	1330	174	4927	179	5075
		75	5.2	51.8	1467	221	6261	221	6261
		90	6.2	212	5990	256	7240	257	7289
		100	6.9	222	6284	289	8194	291	8231
		125	8.6	334	9447	342	9688	342	9688

1. 5% Capacity reduction for constructions with the slam-shut.

Table 8. Type LS220 Capacity Table with 2 x 2 In. / DN 50 x 50 Body, 0.6 Specific Gravity Natural Gas (0.5 to 4 psig / 0.034 to 0.28 bar)⁽¹⁾

OUTLET PRESSURE SETTING		INLET PRESSURE		2 x 2 IN. / DN 50 x 50 BODY SIZE, 2 IN. / 50 mm ORIFICE SIZE											
				Droop From Setpoint											
				1 In. w.c. Droop		2 In. w.c. Droop		1% ABS		2% ABS		10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr
14 in. w.c.	0.035	2	0.14	6.2	177	10	282	1.9	53	3.6	101	4	114	9.9	283
		3	0.21	9.7	276	15	439	2.9	83	5.5	158	9.1	260	22.3	638
		5	0.35	13.2	375	21	597	3.9	113	7.5	215	13.1	374	28.7	820
		10	0.7	21.4	611	34	970	8.2	234	11.6	332	22.8	652	47.1	1344
		25	1.7	67.8	1936	86.4	2469	20.3	579	45.6	1304	74.5	2128	90.5	2585
		30	2.1	67.5	1929	96.4	2753	13.8	395	21.2	606	68.7	1962	99.1	2831
		40	2.8	98.1	2803	130	3699	70.2	2005	78.5	2242	100	2866	130	3708
		60	4.1	114	3247	153	4382	92.4	2639	92.6	2644	153	4382	153	4382
		80	5.5	136	3885	152	4334	18.2	519	27	772	134	3825	152	4334
		100	6.9	147	4213	154	4405	16.2	462	26.5	758	149	4266	154	4405
		125	8.6	36.7	1050	158	4503	21.3	610	24.1	689	36.5	1044	158	4503
		150	10.3	71.1	2031	159	4539	17.4	498	18.9	541	56.8	1623	159	4539
1	0.07	3	0.21	7	208	10	279	2	53	4	101	5	152	15	431
		5	0.35	10	283	24	697	5	132	9	251	20	558	34	959
		10	0.7	20.5	584	40.9	1168	8.7	248	13.9	398	44.9	1284	54.8	1567
		25	1.7	80.5	2300	87.2	2492	22.1	632	33.8	967	85.4	2440	98.4	2810
		30	2.1	80.5	2301	95	2715	55.8	1595	80.8	2310	96.2	2749	104	2963
		40	2.8	124	3547	128	3644	84.9	2424	93.4	2668	102	2922	134	3828
		60	4.1	128	3664	142	4045	101	2876	142	4045	106	3017	176	5016
		80	5.5	154	4395	169	4840	118	3372	140	3999	159	4535	169	4836
		100	6.9	155	4417	161	4609	48.2	1379	147	4211	162	4641	172	4918
		125	8.6	165	4724	171	4874	22.3	637	23.7	677	171	4874	180	5149
		150	10.3	49.3	1408	176	5030	20.3	581	20.6	590	177	5070	202	5762
2	0.14	5	0.35	6	184	11	322	5	144	8	240	17	483	33	941
		10	0.7	13.3	379	18.9	539	9.5	271	13.3	379	38.9	1111	53.8	1537
		25	1.7	29	829	46.5	1329	24.1	690	36.8	1052	85.9	2454	95.6	2732
		30	2.1	43.7	1249	78	2228	23.1	660	45	1286	94.1	2688	109	3105
		40	2.8	89.1	2546	96.9	2770	85.9	2455	89.1	2546	111	3183	132	3759
		60	4.1	117	3334	134	3822	116	3320	120	3417	146	4176	185	5297
		80	5.5	148	4238	157	4495	148	4214	148	4238	190	5427	228	6502
		100	6.9	182	5185	202	5767	174	4979	182	5185	216	6183	248	7082
		125	8.6	222	6350	225	6434	192	5497	222	6342	242	6900	253	7221
		150	10.3	183	5218	186	5322	129	3664	129	3664	259	7401	259	7401
4	0.28	10	0.7	9.3	267	10.5	301	9.3	265	10.8	308	33.1	947	52.2	1491
		25	1.7	12.3	351	18.3	524	13.1	374	18.9	539	65.4	1870	92.5	2643
		30	2.1	16.8	481	25.1	718	17	486	22.7	647	78.6	2245	107	3046
		40	2.8	22.7	648	35.2	1004	20.8	593	34.7	992	110	3153	135	3865
		60	4.1	29.1	830	73.2	2090	29.6	846	75.1	2144	125	3556	183	5237
		80	5.5	78.9	2254	91.3	2609	80.3	2294	93.8	2679	174	4974	232	6620
		100	6.9	122	3482	126	3604	97.9	2796	125	3560	189	5392	275	7842
		125	8.6	114	3258	125	3567	53.4	1526	125	3567	199	5688	298	8509
		150	10.3	122	3485	128	3651	68.9	1968	129	3673	213	6094	303	8661

1. 5% Capacity reduction for constructions with the slam-shut.

LSR Series

Table 9. Type LS220 Capacity Table with 2 x 2 In. / DN 50 x 50 Body, 0.6 Specific Gravity Natural Gas (5 to 20 psig / 0.3 to 1.4 bar)⁽¹⁾

OUTLET PRESSURE SETTING		INLET PRESSURE		2 x 2 IN. / DN 50 x 50 BODY SIZE, 2 IN. / 50 mm ORIFICE SIZE							
				Droop from Setpoint							
				1% ABS		2% ABS		10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr
5	0.3	10	0.7	8.71	247	12.5	354	43.8	1240	52.8	1495
		20	1.4	18.0	509	23.3	661	76.2	2157	78.5	2222
		40	2.8	82.3	2332	99.3	2813	107	3018	117	3301
		60	4.1	161	4545	164	4642	169	4786	176	4980
		80	5.5	149	4206	213	6018	220	6241	226	6410
		100	6.9					271	7684	275	7798
		125	8.6					310	8775	314	8887
10	0.7	25	1.7					79.7	2256	98.5	2790
		30	2.1					95.6	2706	113	3210
		40	2.8					128	3634	137	3877
		60	4.1					165	4666	176	4978
		80	5.5					206	5835	213	6035
		100	6.9					227	6431	249	7041
		125	8.6					258	7316	292	8260
		150	10.3					348	9854	379	10,732
		175	12.1					412	11,677	412	11,677
		200	13.8					419	11,869	419	11,869
15	1.0	250	17.2					428	12,108	428	12,108
		285	19.7					433	12,272	433	12,272
		25	1.7					63.3	1793	92.0	2605
		30	2.1					75.9	2148	107	3036
		40	2.8					109	3093	135	3830
		60	4.1					158	4469	169	4779
		80	5.5					176	4985	203	5748
		100	6.9					228	6462	254	7186
		125	8.6					242	6862	281	7959
		150	10.3					344	9753	374	10,596
20	1.4	175	12.1					403	11,417	435	12,324
		200	13.8					487	13,795	487	13,795
		250	17.2					495	14,020	495	14,020
		285	19.7					500	14,165	500	14,165
		25	1.7					57.1	1617	83.1	2353
		30	2.1					71.7	2031	103	2927
		40	2.8					92.0	2606	137	3881
		60	4.1					147	4157	190	5371
		80	5.5					198	5612	242	6865
		100	6.9					242	6859	292	8259
		125	8.6					297	8401	329	9307
		150	10.3					357	10,118	403	11,406
		175	12.1					419	11,877	481	13,616
		200	13.8					483	13,674	540	15,300
		250	17.2					575	16,272	575	16,272
		285	19.7					580	16,438	580	16,438

— Shaded areas indicate that capacity are not available.
1. 5% Capacity reduction for constructions with the slam-shut.

North America Only

Table 10. Type LS250 Capacity Table with 2 x 2 In. / DN 50 x 50 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾

OUTLET PRESSURE SETTING		INLET PRESSURE		2 x 2 IN. / DN 50 x 50 BODY SIZE, 2 IN. / 50 mm ORIFICE SIZE			
				Droop from Setpoint			
				10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr
20	1.4	25	1.7	43.0	1217	72.4	2050
		30	2.1	55.9	1582	97.0	2746
		40	2.8	71.7	2029	125	3537
		60	4.1	101	2854	176	4983
		80	5.5	138	3908	210	5958
		100	6.9	169	4780	241	6837
		125	8.6	202	5711	286	8088
		150	10.3	243	6875	330	9338
		175	12.1	260	7353	350	9900
		200	13.8	296	8394	379	10,743
25	1.7	250	17.2	345	9758	459	12,990
		285	19.7	391	11,082	475	13,454
		30	2.1	54.0	1530	83.9	2375
		40	2.8	78.3	2216	122	3462
		60	4.1	116	3283	176	4974
		80	5.5	148	4189	219	6188
		100	6.9	185	5234	250	7089
		125	8.6	220	6219	273	7722
		150	10.3	254	7183	311	8793
		175	12.1	285	8076	358	10,128
30	2.1	200	13.8	303	8582	414	11,732
		250	17.2	369	10,451	464	13,139
		285	19.7	412	11,670	499	14,119
		40	2.8	59	1670	104	2954
		60	4.1	97.9	2773	162	4598
		80	5.5	133	3754	209	5924
		100	6.9	159	4498	245	6952
		125	8.6	196	5560	273	7721
		150	10.3	230	6502	298	8438
		175	12.1	259	7325	337	9541
40	2.8	200	13.8	288	8165	378	10,698
		250	17.2	344	9739	425	12,041
		285	19.7	392	11,089	455	12,880
		60	4.1	116	3291	168	4753
		80	5.5	149	4226	210	5953
		100	6.9	184	5210	262	7422
		125	8.6	222	6296	317	8986
		150	10.3	256	7239	387	10,964
		175	12.1	289	8196	441	12,502
		200	13.8	323	9150	494	13,975
50	3.4	250	17.2	386	10,917	587	16,619
		285	19.7	439	12,425	624	17,661
		300	20.7	455	12,893	621	17,600
		350	24.1	507	14,367	656	18,567
		400	27.6	551	15,611	663	18,778
		60	4.1	84	2385	153	4331
		80	5.5	135	3815	210	5955
		100	6.9	172	4870	264	7482
		125	8.6	206	5824	319	9041
		150	10.3	243	6871	373	10,548
60	4.1	175	12.1	276	7822	423	11,975
		200	13.8	305	8647	457	12,953
		250	17.2	369	10,441	547	15,477
		285	19.7	418	11,836	592	16,764
		300	20.7	479	13,559	732	20,733
		350	24.1	546	15,467	746	21,139
		400	27.6	617	17,485	808	22,869
		70	4.8	112	3167	170	4828
		80	5.5	139	3923	195	5527
		100	6.9	179	5064	247	6986
60	4.1	125	8.6	223	6302	297	8421
		150	10.3	262	7432	353	10,003
		175	12.1	306	8675	371	10,501
		200	13.8	336	9527	411	11,640
		250	17.2	407	11,532	598	16,938
		285	19.7	447	12,651	672	19,041
		300	20.7	510	14,446	719	20,376
		350	24.1	583	16,504	824	23,340
60	4.1	400	27.6	608	17,213	846	23,958

1. 5% Capacity reduction for constructions with the slam-shut.

LSR Series

Table 11. Type LS200 Capacity Table with 2 x 4 In. / DN 50 x 100 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾

OUTLET PRESSURE SETTING		INLET PRESSURE		2 IN. INLET AND 4 IN. OUTLET / DN 50 X 100 BODY SIZE, 2 IN. / 50 mm ORIFICE SIZE					
				Droop from Setpoint					
				1 in. w.c. Droop		10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr
7 in. w.c.	0.017	1	0.1	8	223				
		2	0.1	11	310				
		3	0.2	16	465				
		5	0.3	27	776				
		10	0.7	55	1551				
		20	1.4	110	3102				
		30	2.1	124	3521				
		40	2.8	148	4194				
		50	3.4	154	4353				
		60	4.1	150	4246				
		75	5.2	168	4748				
		90	6.2	173	4903				
		100	6.9	117	3313				
14 in. w.c.	0.034	1	0.1	9	244	9	240	11	325
		2	0.1	11	299	9	262	18	518
		3	0.2	17	481	21	581	25	704
		5	0.3	26	727	27	771	33	942
		10	0.7	56	1577	55	1563	55	1547
		20	1.4	91	2588	91	2583	76	2149
		30	2.1	101	2847	100	2840	97	2757
		40	2.8	118	3346	10	288	125	3532
		50	3.4	146	4142	140	3954	144	4067
		60	4.1	147	4151	138	3908	160	4528
		75	5.2	177	5005	123	3494	167	4737
		90	6.2	197	5587	116	3274	172	4863
		100	6.9	117	3313	87	2464	118	3341
1	0.07	2	0.1	8	223	15	436	18	509
		3	0.2	9	244	17	495	22	634
		10	0.7	26	749	45	1276	47	1321
		20	1.4	92	2592	92	2592	85	2401
		30	2.1	125	3549	125	3538	110	3114
		40	2.8	160	4532	165	4671	135	3812
		50	3.4	165	4669	168	4755	162	4592
		60	4.1	193	5466	194	5482	186	5281
		65	4.5	208	5901	208	5901	201	5685
		75	5.2	204	5789	204	5789	221	6265
		90	6.2	215	6087	215	6086	228	6466
		100	6.9	127	3608	161	4574	156	4432
2	0.14	3	0.2	8	213	17	471	20	573
		10	0.7	17	479	38	1073	49	1395
		20	1.4	25	694	67	1886	80	2255
		30	2.1	32	919	92	2600	102	2884
		40	2.8	42	1195	118	3328	125	3541
		50	3.4	50	1428	137	3874	145	4114
		60	4.1	46	1296	132	3726	160	4536
		65	4.5	45	1273	123	3486	167	4729
		70	4.8	46	1313	128	3634	182	5154
		80	5.5	46	1299	127	3600	204	5786
		90	6.2	52	1483	144	4092	235	6653
		100	6.9	56	1588	225	6386	243	6891
		125	8.6	67	1884	214	6067	254	7200
4	0.28	5	0.3	7	205	17	469	22	623
		10	0.7	13	365	36	1020	51	1457
		20	1.4	19	535	72	2033	85	2404
		30	2.1	25	705	104	2947	110	3129
		40	2.8	38	1072	141	4002	138	3918
		50	3.4	58	1650	182	5162	159	4505
		60	4.1	144	4066	188	5313	187	5307
		75	5.2	162	4574	207	5851	222	6284
		90	6.2	202	5719	235	6660	263	7454
		100	6.9	186	5297	242	6860	272	7694
		125	8.6	134	3804	254	7207	282	8554
5	0.34	10	0.7	10	296	41	1159	55	1554
		20	1.4	14	406	71	2024	85	2419
		30	2.1	22	616	107	3036	128	3628
		40	2.8	38	1080	143	4049	171	4838
		50	3.4	39	1110	179	5061	214	6047
		60	4.1	58	1639	214	6073	216	6125
		75	5.2	54	1520	229	6490	229	6489
		90	6.2	199	5643	241	6822	244	6913
		100	6.9	205	5813	268	7580	271	7681
				280	7930	287	8132	296	8386

— Shaded areas indicate that capacity are not available.— Shaded areas indicate capacity limited by boost.

1. 5% Capacity reduction for constructions with the slam-shut.

North America Only

Table 12. Type LS220 Capacity Table with 2 x 4 In. / DN 50 x 100 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾

OUTLET PRESSURE SETTING		INLET PRESSURE		2 IN. INLET AND 4 IN. OUTLET / DN 50 X 100 BODY SIZE, 2 IN. / 50 mm ORIFICE SIZE							
				Droop from Setpoint							
				1% ABS		2% ABS		10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr	SCFH ('000)	Nm³/hr
5	0.34	10	0.7	9	255	13	368	45	1274	54	1529
		20	1.4	19	538	24	680	79	2237	81	2294
		40	2.8	85	2407	103	2917	110	3115	120	3398
		60	4.1	166	4701	169	4786	174	4927	181	5125
		80	5.5	153	4332	219	6201	227	6428	234	6626
		100	6.9					280	7929	284	8042
		125	8.6					320	9061	324	9175
10	0.69	25	1.7					82	2322	106	3002
		30	2.1					99	2803	122	3455
		40	2.8					132	3738	148	4191
		60	4.1					170	4814	190	5380
		80	5.5					213	6031	230	6513
		100	6.9					234	6626	268	7589
		125	8.6					267	7561	314	8891
		150	10.3					359	10,166	409	11,582
		175	12.1					426	12,063	445	12,601
		200	13.8					433	12,261	452	12,799
15	1.0	250	17.2					441	12,488	461	13,054
		285	19.7					447	12,658	467	13,224
		25	1.7					65	1841	99	2803
		30	2.1					78	2209	116	3285
		40	2.8					113	3200	146	4134
		60	4.1					163	4616	182	5154
		80	5.5					182	5154	219	6201
		100	6.9					236	6683	274	7759
		125	8.6					250	7079	303	8580
		150	10.3					355	10,052	403	11,412
20	1.38	175	12.1					416	11,780	469	13,281
		200	13.8					503	14,243	525	14,866
		250	17.2					511	14,470	534	15,121
		285	19.7					516	14,611	539	15,263
		25	1.7					59	1671	90	2549
		30	2.1					74	2095	111	3143
		40	2.8					95	2690	148	4191
		60	4.1					151	4276	204	5777
		80	5.5					205	5805	261	7391
		100	6.9					250	7079	314	8891
		125	8.6					306	8665	354	10,024
		150	10.3					369	10,449	434	12,290
		175	12.1					433	12,261	518	14,668
		200	13.8					498	14,102	582	16,480
		250	17.2					593	16,792	619	17,528
		285	19.7					599	16,962	626	17,726

— Shaded areas indicate that capacity are not available.
1. 5% Capacity reduction for constructions with the slam-shut.

LSR Series

Table 13. Type LS250 Capacity Table with 2 x 4 In. / DN 50 x 100 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾

OUTLET PRESSURE SETTING		INLET PRESSURE		2 IN. INLET AND 4 IN. OUTLET / DN 50 X 100 BODY SIZE, 2 IN. / 50 mm ORIFICE SIZE			
				Droop from Setpoint			
				10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr
20	1.38	25	1.7	45	1274	80	2265
		30	2.1	58	1642	107	3030
		40	2.8	75	2124	138	3908
		60	4.1	105	2973	194	5493
		80	5.5	144	4078	232	6570
		100	6.9	177	5012	266	7532
		125	8.6	211	5975	315	8920
		150	10.3	254	7192	364	10,307
		175	12.1	272	7702	386	10,930
		200	13.8	310	8778	418	11,836
		250	17.2	360	10,194	506	14,328
25	1.7	285	19.7	409	11,582	524	14,838
		30	2.1	57	1614	90	2549
		40	2.8	82	2322	132	3738
		60	4.1	121	3426	189	5352
		80	5.5	155	4389	236	6683
		100	6.9	193	5465	270	7646
		125	8.6	230	6513	294	8325
		150	10.3	265	7504	335	9486
		175	12.1	298	8438	386	10,930
		200	13.8	317	8976	447	12,658
		250	17.2	386	10,930	500	14,158
30	2.1	285	19.7	431	12,205	538	15,234
		40	2.8	62	1756	114	3228
		60	4.1	103	2917	177	5012
		80	5.5	139	3936	228	6456
		100	6.9	167	4729	267	7561
		125	8.6	206	5833	297	8410
		150	10.3	241	6824	324	9175
		175	12.1	272	7702	367	10,392
		200	13.8	303	8580	411	11,638
		250	17.2	361	10,222	463	13,111
		285	19.7	411	11,638	495	14,017
40	2.8	60	4.1	120	3398	185	5239
		80	5.5	155	4389	231	6541
		100	6.9	191	5409	288	8155
		125	8.6	230	6513	349	9883
		150	10.3	265	7504	426	12,063
		175	12.1	300	8495	486	13,762
		200	13.8	335	9486	543	15,376
		250	17.2	399	11,298	646	18,293
50	3.4	285	19.7	455	12,884	686	19,425
		60	4.1	87	2464	165	4672
		80	5.5	140	3964	227	6428
		100	6.9	178	5040	285	8070
		125	8.6	213	6031	344	9741
		150	10.3	251	7108	402	11,383
		175	12.1	286	8099	456	12,912
		200	13.8	316	8948	493	13,960
60	4.1	250	17.2	382	10,817	589	16,679
		285	19.7	433	12,261	638	18,066
		70	4.8	118	3341	187	5295
		80	5.5	146	4134	214	6060
		100	6.9	188	5324	271	7674
		125	8.6	234	6626	327	9260
		150	10.3	276	7815	388	10,987
		175	12.1	322	9118	407	11,525
		200	13.8	354	10,024	451	12,771
		250	17.2	428	12,120	657	18,604
		285	19.7	470	13,309	738	20,898

1. 5% Capacity reduction for constructions with the slam-shut.

Table 14. LS300 Series Capacity Table with 3 x 3 In. / DN 80 x 80 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾

OUTLET PRESSURE SETTING		INLET PRESSURE		3 IN. INLET AND 3 IN. OUTLET / DN 80 X 80 BODY SIZE, 3 IN. / 80 mm ORIFICE SIZE			
				Droop from Setpoint			
				10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr
5	0.3	10	0.7	131	3710	149	4220
		20	1.4	168	4760	186	5270
		40	2.8	199	5635	299	8470
		60	4.1	220	6230	376	10,650
		80	5.5	263	7450	371	10,505
		100	6.9	291	8240	379	10,735
		125	8.6	282	7985	387	10,960
10	0.7	25	1.7	136	3850	174	4930
		30	2.1	170	4815	250	7080
		40	2.8	199	5635	304	8610
		60	4.1	237	6710	425	12,035
		80	5.5	269	7620	481	13,620
		100	6.9	304	8610	480	13,595
		125	8.6	359	10,165	489	13,850
		150	10.3	407	11,525	490	13,875
		175	12.1	448	12,685	489	13,850
		200	13.8	488	13,820	488	13,820
		250	17.2	491	13,905	491	13,905
		285	19.7	499	14,130	499	14,130
15	1.0	300	20.7	494	13,990	494	13,990
		25	1.7	156	4420	219	6200
		30	2.1	178	5040	249	7050
		40	2.8	219	6200	292	8270
		60	4.1	265	7505	412	11,670
		80	5.5	264	7475	471	13,340
		100	6.9	312	8835	562	15,915
		125	8.6	383	10,845	561	15,890
		150	10.3	426	12,065	568	16,085
		175	12.1	482	13,650	567	16,055
		200	13.8	565	16,000	579	16,395
		250	17.2	579	16,395	579	16,395
20	1.4	285	19.7	593	16,795	593	16,795
		300	20.7	599	16,965	599	16,965
		25	1.7	161	4560	225	6370
		30	2.1	180	5100	242	6855
		40	2.8	241	6825	302	8555
		60	4.1	261	7390	399	11,300
		80	5.5	323	9145	485	13,735
		100	6.9	372	10,535	597	16,905
		125	8.6	428	12,120	646	18,295
		150	10.3	493	13,960	667	18,890
		175	12.1	523	14,810	664	18,805
		200	13.8	564	15,970	676	19,145
		250	17.2	680	19,260	680	19,260
		285	19.7	681	19,285	681	19,285
		300	20.7	692	19,595	692	19,595

1. 5% Capacity reduction for constructions with the slam-shut.

LSR Series

Table 14. LS300 Series Capacity Table with 3 x 3 In. / DN 80 x 80 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾ (continued)

OUTLET PRESSURE SETTING		INLET PRESSURE		3 IN. INLET AND 3 IN. OUTLET / DN 80 X 80 BODY SIZE, 3 IN. / 80 mm ORIFICE SIZE			
				Droop from Setpoint			
				10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr
20	1.4	25	1.7	134	3795	208	5890
		30	2.1	172	4870	240	6795
		40	2.8	194	5495	286	8100
		60	4.1	227	6430	369	10,450
		80	5.5	281	7960	435	12,320
		100	6.9	317	8975	449	12,715
		125	8.6	380	10,760	533	15,095
		150	10.3	424	12,010	553	15,660
		175	12.1	471	13,340	592	16,765
		200	13.8	495	14,020	628	17,785
		250	17.2	591	16,735	650	18,410
		285	19.7	610	17,275	658	18,635
		300	20.7	524	14,840	698	19,765
25	1.7	30	2.1	156	4420	223	6315
		40	2.8	200	5665	300	8495
		60	4.1	248	7025	403	11,415
		80	5.5	290	8215	531	15,040
		100	6.9	343	9715	579	16,395
		125	8.6	355	10,055	561	15,890
		150	10.3	404	11,440	635	17,985
		175	12.1	447	12,660	636	18,010
		200	13.8	538	15,235	738	20,900
		250	17.2	642	18,180	743	21,040
		285	19.7	683	19,345	766	21,695
		300	20.7	687	19,455	769	21,780
30	2.1	40	2.8	159	4505	274	7760
		60	4.1	221	6260	366	10,365
		80	5.5	263	7450	449	12,715
		100	6.9	295	8355	461	13,055
		125	8.6	341	9655	518	14,670
		150	10.3	383	10,845	558	15,805
		175	12.1	436	12,350	589	16,680
		200	13.8	493	13,960	660	18,690
		250	17.2	620	17,560	808	22,885
		285	19.7	672	19,030	834	23,620
		300	20.7	704	19,935	841	23,815
40	2.8	60	4.1	138	3910	263	7450
		80	5.5	305	8640	525	14,870
		100	6.9	379	10,735	627	17,755
		125	8.6	407	11,525	735	20,815
		150	10.3	506	14,330	896	25,375
		175	12.1	524	14,840	874	24,750
		200	13.8	582	16,480	908	25,715
		250	17.2	690	19,540	989	28,010
		285	19.7	723	20,475	1006	28,490
		300	20.7	811	22,970	919	26,025
		350	24.1	865	24,495	1016	28,775
		400	27.6	992	28,095	992	28,095

1. 5% Capacity reduction for constructions with the slam-shut.

Table 14. LS300 Series Capacity Table with 3 x 3 In. / DN 80 x 80 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾ (continued)

OUTLET PRESSURE SETTING		INLET PRESSURE		3 IN. INLET AND 3 IN. OUTLET / DN 80 X 80 BODY SIZE, 3 IN. / 80 mm ORIFICE SIZE			
				Droop from Setpoint			
				10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr
50	3.4	60	4.1	229	6485	378	10,705
		80	5.5	296	8385	488	13,820
		100	6.9	312	8835	548	15,520
		125	8.6	370	10,480	649	18,380
		150	10.3	475	13,450	806	22,825
		175	12.1	534	15,125	899	25,460
		200	13.8	569	16,115	929	26,310
		250	17.2	677	19,175	1026	29,055
		285	19.7	739	20,930	1050	29,735
		300	20.7	775	21,950	1072	30,360
		350	24.1	879	24,895	1090	30,870
		400	27.6	941	26,650	1195	33,840
60	4.1	70	4.8	239	6770	440	12,460
		80	5.5	317	8975	477	13,510
		100	6.9	404	11,440	625	17,700
		125	8.6	473	13,395	715	20,250
		150	10.3	722	20,445	880	24,920
		175	12.1	593	16,795	982	27,810
		200	13.8	888	25,150	1098	31,095
		250	17.2	754	21,355	1257	35,600
		285	19.7	759	21,495	1300	36,815
		300	20.7	759	21,495	1283	36,335
		350	24.1	964	27,300	1360	38,515
		400	27.6	1008	28,545	1404	39,760
66	4.14	80	5.5	323	9145	518	14,670
		100	6.9	406	11,500	638	18,070
		125	8.6	488	13,820	778	22,035
		150	10.3	535	15,150	914	25,885
		175	12.1	618	17,500	1021	28,915
		200	13.8	640	18,125	1070	30,300
		250	17.2	748	21,185	1267	35,880
		285	19.7	828	23,450	1330	37,665
		300	20.7	815	23,080	1329	37,635
		350	24.1	992	28,095	1458	41,290
		400	27.6	1077	30,500	1513	42,850

1. 5% Capacity reduction for constructions with the slam-shut.

LSR Series

Table 15. LS300 Series Capacity Table with 3 x 6 In. / DN 80 x 150 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾

OUTLET PRESSURE SETTING		INLET PRESSURE		3 IN. INLET AND 6 IN. OUTLET / DN 80 X 150 BODY SIZE, 3 IN. / 80 mm ORIFICE SIZE			
				Droop from Setpoint			
				10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr
5	0.3	10	0.7	102	2891	120	3386
		20	1.4	131	3708	150	4243
		40	2.8	155	4397	241	6820
		60	4.1	208	5888	363	10,278
		80	5.5	248	7036	359	10,158
		100	6.9	307	8687	368	10,415
		125	8.6	328	9278	376	10,649
10	0.7	25	1.7	106	3004	154	4361
		30	2.1	146	4149	221	6272
		40	2.8	172	4871	269	7612
		60	4.1	204	5787	376	10,644
		80	5.5	283	8011	465	13,164
		100	6.9	320	9057	465	13,162
		125	8.6	417	11,798	476	13,469
		150	10.3	502	14,212	518	14,660
		175	12.1	602	17,039	520	14,734
		200	13.8	637	18,033	637	18,033
		250	17.2	640	18,125	640	18,125
		285	19.7	640	18,133	640	18,132
15	1.0	300	20.7	645	18,257	645	18,257
		25	1.7	122	3456	171	4842
		30	2.1	154	4349	215	6084
		40	2.8	189	5356	252	7139
		60	4.1	229	6478	356	10,081
		80	5.5	250	7078	446	12,620
		100	6.9	328	9288	592	16,767
		125	8.6	444	12,586	651	18,433
		150	10.3	525	14,869	700	19,825
		175	12.1	594	16,825	698	19,770
		200	13.8	736	20,851	755	21,375
		250	17.2	755	21,391	755	21,391
20	1.4	285	19.7	761	21,563	761	21,563
		300	20.7	768	21,762	768	21,762
		25	1.7	117	3320	181	5122
		30	2.1	113	3212	204	5776
		40	2.8	137	3867	221	6257
		60	4.1	152	4298	238	6730
		80	5.5	203	5761	296	8392
		100	6.9	221	6253	392	11,095
		125	8.6	273	7726	476	13,480
		150	10.3	417	11,813	655	18,539
		175	12.1	460	13,035	660	18,681
		200	13.8	530	15,016	681	19,284
		250	17.2	682	19,300	704	19,937
		285	19.7	735	20,825	735	20,825
		300	20.7	886	25,096	886	25,096

1. 5% Capacity reduction for constructions with the slam-shut.

Table 15. LS300 Series Capacity Table with 3 x 6 In. / DN 80 x 150 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾ (continued)

OUTLET PRESSURE SETTING		INLET PRESSURE		3 IN. INLET AND 6 IN. OUTLET / DN 80 X 150 BODY SIZE, 3 IN. / 80 mm ORIFICE SIZE			
				Droop from Setpoint			
				10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr
20	1.4	25	1.7	170	4821	207	5864
		30	2.1	226	6414	261	7404
		40	2.8	256	7245	312	8847
		60	4.1	299	8455	402	11,398
		80	5.5	370	10,481	474	13,434
		100	6.9	417	11,812	490	13,864
		125	8.6	499	14,146	581	16,460
		150	10.3	484	13,705	666	18,855
		175	12.1	609	17,254	682	19,306
		200	13.8	641	18,146	723	20,484
		250	17.2	725	20,530	725	20,530
		285	19.7	757	21,440	757	21,440
		300	20.7	678	19,208	803	22,746
25	1.7	30	2.1	187	5294	245	6947
		40	2.8	247	7001	370	10,492
		60	4.1	305	8650	497	14,082
		80	5.5	358	10,134	655	18,554
		100	6.9	423	11,972	715	20,245
		125	8.6	439	12,418	692	19,611
		150	10.3	514	14,545	768	21,753
		175	12.1	565	16,000	804	22,773
		200	13.8	681	19,282	808	22,891
		250	17.2	808	22,891	808	22,891
		285	19.7	864	24,476	864	24,476
		300	20.7	871	24,660	871	24,665
30	2.1	40	2.8	178	5046	268	7579
		60	4.1	248	7013	400	11,330
		80	5.5	295	8348	491	13,913
		100	6.9	330	9356	505	14,295
		125	8.6	382	10,819	567	16,063
		150	10.3	431	12,215	675	19,125
		175	12.1	492	13,937	674	19,080
		200	13.8	556	15,750	755	21,388
		250	17.2	701	19,855	870	24,630
		285	19.7	758	21,475	898	25,438
		300	20.7	795	22,515	906	25,646
40	2.8	60	4.1	256	7252	419	11,855
		80	5.5	318	9005	565	16,013
		100	6.9	395	11,184	649	18,370
		125	8.6	424	12,021	761	21,539
		150	10.3	484	13,699	890	25,197
		175	12.1	538	15,237	904	25,609
		200	13.8	597	16,921	940	26,617
		250	17.2	757	21,452	1060	30,026
		285	19.7	793	22,461	1078	30,541
		300	20.7	890	25,211	985	27,907

1. 5% Capacity reduction for constructions with the slam-shut.

LSR Series

Table 15. LS300 Series Capacity Table with 3 x 6 In. / DN 80 x 150 Body, 0.6 Specific Gravity Natural Gas⁽¹⁾ (continued)

OUTLET PRESSURE SETTING		INLET PRESSURE		3 IN. INLET AND 6 IN. OUTLET / DN 80 X 150 BODY SIZE, 3 IN. / 80 mm ORIFICE SIZE			
				Droop from Setpoint			
				10% Droop		20% Droop	
psig	bar	psig	bar	SCFH ('000)	Nm ³ /hr	SCFH ('000)	Nm ³ /hr
50	3.4	60	4.1	257	7281	424	12,020
		80	5.5	309	8748	509	14,404
		100	6.9	325	9206	572	16,187
		125	8.6	386	10,919	677	19,174
		150	10.3	454	12,869	771	21,840
		175	12.1	548	15,524	923	26,134
		200	13.8	585	16,555	954	27,031
		250	17.2	742	21,027	1126	31,875
		285	19.7	811	22,967	1152	32,614
		300	20.7	850	24,082	1176	33,307
60	4.1	70	4.8	304	8601	452	12,809
		80	5.5	380	10,750	483	13,683
		100	6.9	484	13,715	634	17,941
		125	8.6	566	16,026	725	20,519
		150	10.3	527	14,930	877	24,849
		175	12.1	667	18,882	979	27,736
		200	13.8	907	25,698	1084	30,692
		250	17.2	771	21,824	1241	35,151
		285	19.7	776	21,985	1283	36,348
		300	20.7	775	21,959	1311	37,137
66	4.14	80	5.5	387	10,967	621	17,581
		100	6.9	487	13,784	764	21,645
		125	8.6	585	16,555	931	26,377
		150	10.3	391	11,064	667	18,898
		175	12.1	696	19,702	1149	32,529
		200	13.8	655	18,541	1094	30,973
		250	17.2	764	21,645	1295	36,678
		285	19.7	847	23,977	1360	38,513
		300	20.7	834	23,606	1359	38,476

1. 5% Capacity reduction for constructions with the slam-shut.

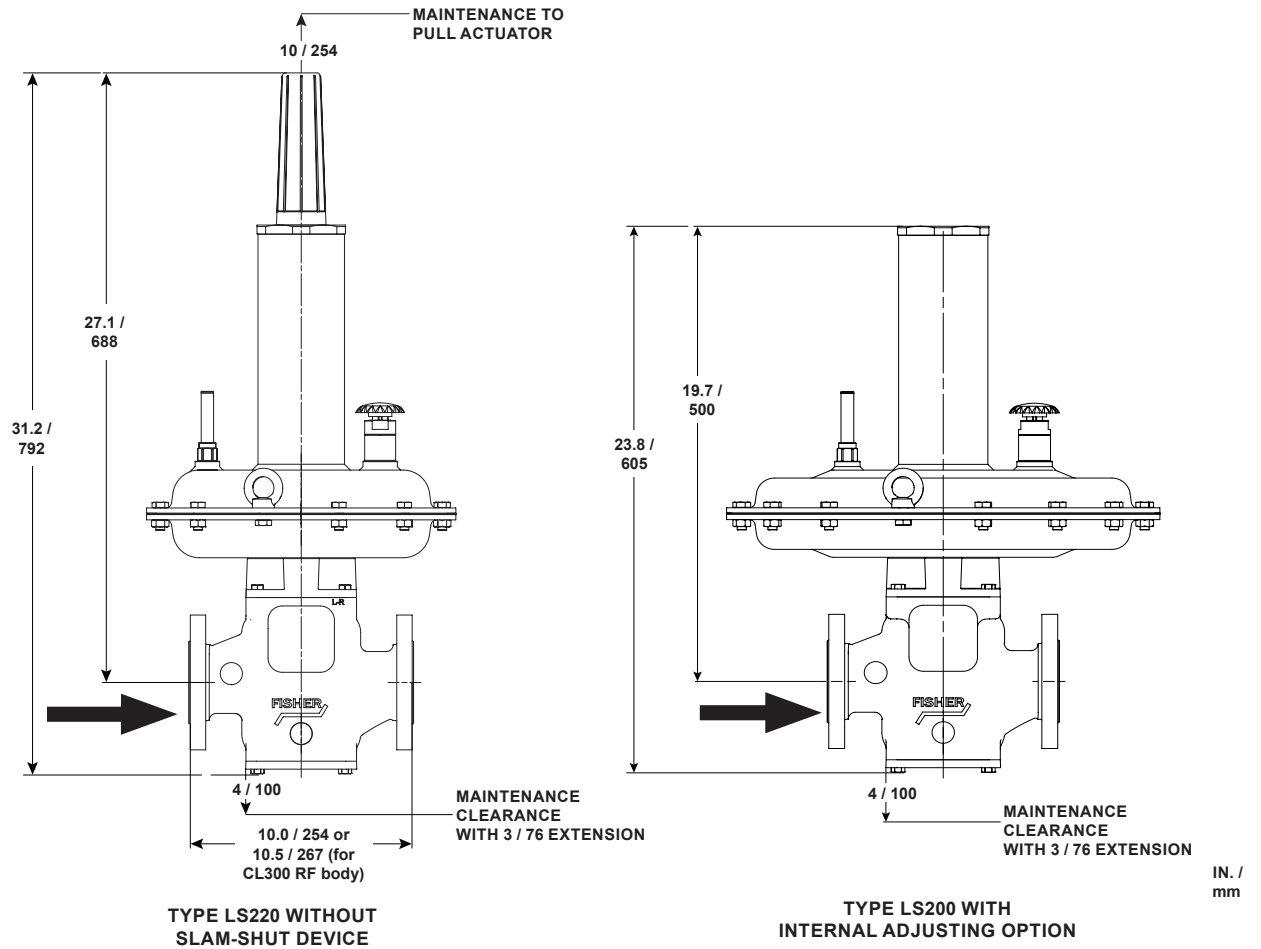
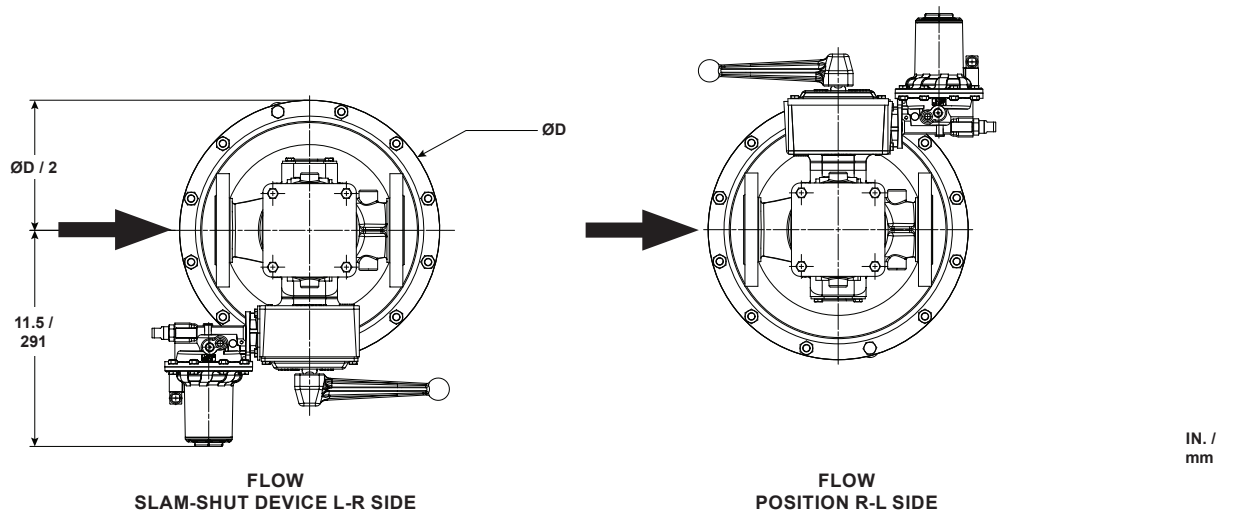


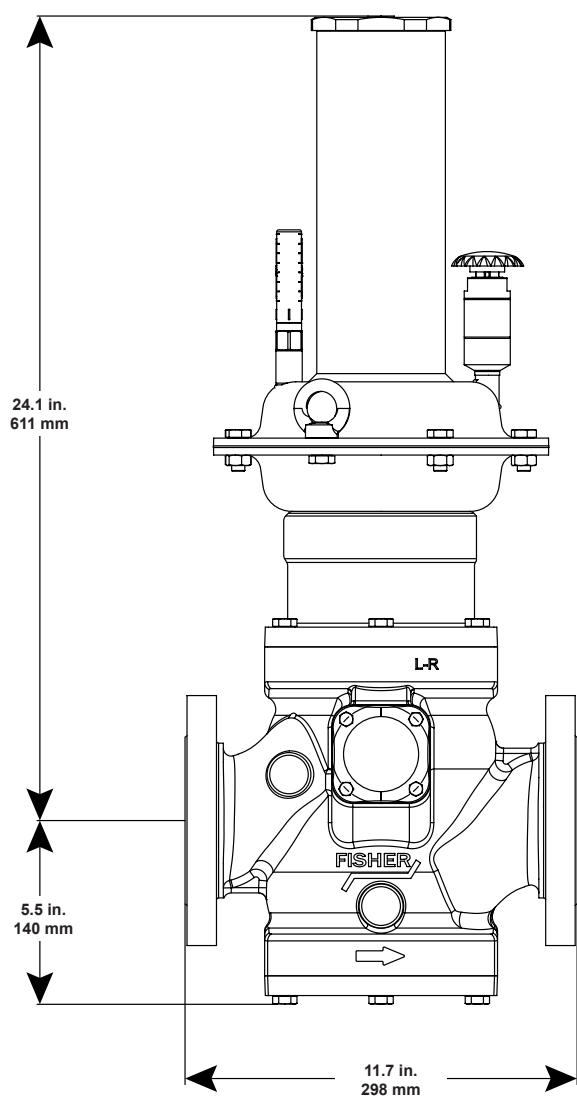
Figure 3. LS200 Series without Slam-Shut Device Dimensions



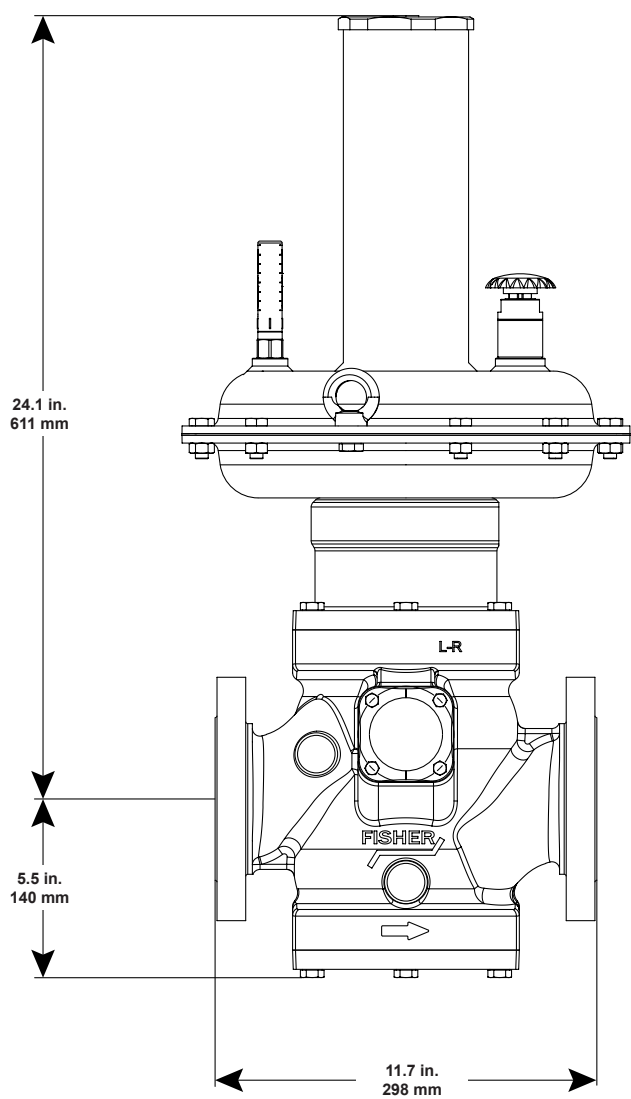
TYPE	DIAMETER	
	In.	mm
LS200	18.7	475
LS220 / LS320	13.8	350
LS250 / LS350	10.0	255

Figure 4. Slam-Shut Device Assembly Positions and Dimensions

LSR Series



LS300 WITH 10 IN. / 255 MM ACTUATOR



LS300 WITH 13.8 IN. / 350 MM ACTUATOR

Figure 5. LS300 Series Dimensions

North America Only

Ordering Information

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

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

Ordering Guide

Actuator (Select One)

- ☐ Low Pressure, 18.7 in. / 455 mm
- ☐ Medium Pressure, 13.8 in. / 350 mm
- ☐ High Pressure, 10.0 in. / 255 mm

Body Material and End Connection Style (Select One)

Ductile Iron

- ☐ PN16
- ☐ CL150 RF
- ☐ PN16 with expanded outlet
- ☐ CL150 RF with expanded outlet

Steel

- ☐ NPT
- ☐ PN16
- ☐ CL150 RF
- ☐ CL300 RF
- ☐ PN16 with expanded outlet
- ☐ CL150 RF with expanded outlet

Outlet Pressure Range (Select One)

Type LS200

- ☐ 0.25 to 0.32 psig / 0.017 to 0.022 bar, Light Blue
- ☐ 0.30 to 0.70 psig / 0.02 to 0.05 bar, Yellow
- ☐ 0.60 to 1.28 psig / 0.04 to 0.09 bar, Brown
- ☐ 1.10 to 2.24 psig / 0.08 to 0.15 bar, Dark Grey
- ☐ 2.0 to 5.0 psig / 0.14 to 0.35 bar, Pink

Type LS220

- ☐ 6 to 12 in. w.c. / 15 to 30 mbar, Light Blue
- ☐ 13.5 in. w.c. to 1.3 psig / 0.04 to 0.09 bar, Yellow
- ☐ 23 in. w.c. to 2.4 psig / 0.06 to 0.17 bar, Brown
- ☐ 4.0 to 5.1 psig / 0.27 to 0.35 bar, Light Green
- ☐ 4.35 to 10.6 psig / 0.3 to 0.73 bar, Pink
- ☐ 4.8 to 15.7 psig / 0.33 to 1.08 bar, Dark Blue
- ☐ 8.3 to 21.75 psig / 0.57 to 1.5 bar, Orange

Type LS250

- ☐ 20 to 30.3 psig / 1.38 to 2.09 bar, Pink
- ☐ 20 to 44.8 psig / 1.38 to 3.09 bar, Dark Blue
- ☐ 25 to 60 psig / 1.72 to 4.14 bar, Orange

Type LS320

- ☐ 4.35 to 5.1 psig / 0.3 to 0.35 barg, Light Green
- ☐ 4.35 to 10.6 psig / 0.3 to 0.73 barg, Pink
- ☐ 4.8 to 15.7 psig / 0.33 to 1.08 barg, Dark Blue
- ☐ 8.3 to 21.75 psig / 0.57 to 1.5 barg, Orange

Type LS350

- ☐ 20 to 30.3 psig / 1.38 to 2.09 barg, Pink
- ☐ 20 to 44.8 psig / 1.38 to 3.09 barg, Dark Blue
- ☐ 25 to 66 psig / 1.72 to 4.55 barg, Orange

Trim, Percent of Full Capacity (Select One)

- ☐ 100% (standard)
- ☐ 78%
- ☐ 60%
- ☐ 40%

Disk/Pad (Select One)

- ☐ Single sided disk
- ☐ Double sided disk

Elastomers

- ☐ Nitrile (NBR) (standard)

Slam-Shut Position (refer to Figure 4) (Select One)

- ☐ L-R
- ☐ R-L
- ☐ L-R with Field Conversion Option
- ☐ R-L with Field Conversion Option

- continued -

Ordering Guide (continued)

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

Specification Worksheet	
Application:	
Specific Use	_____
Line Size	_____
Fluid Type	_____
Specific Gravity	_____
Temperature	_____
Does the Application Require Overpressure Protection?	
☐ Yes	☐ No
Pressure:	
Maximum Inlet Pressure (P_{1max})	_____
Minimum Inlet Pressure (P_{1min})	_____
Downstream Pressure Setting(s) (P_2)	_____
Set Pressure	_____
Maximum Flow (Q_{max})	_____
Accuracy Requirements:	
Less Than or Equal To:	
☐ 5%	☐ 10% ☐ 20% ☐ 40%
Construction Material Requirements (if known):	

North America Only

-  Webadmin.Regulators@emerson.com
-  Facebook.com/EmersonAutomationSolutions
-  Fisher.com
-  LinkedIn.com/emerson-final-control
-  X.com/EMR_automation

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