

Tartarini™ M Series to Fisher™ LS200 Series Regulator Transition Management Guide



Figure 1. Typical LS200 Series

Background

The Fisher™ LS200 Series is designed to provide precise, reliable pressure regulation for a wide range of applications. It features a robust design that ensures a steady supply of pressure, regardless of changes to inlet pressure or flow rate. The LS200 Series is also easy to install and maintain with minimal disruption to existing processes.

The new Fisher LS200 Series pressure-reducing natural gas regulator is a balance trim design like the M Series. The LS200 Series offers a number of improvements and upgrades compared to the M Series. The LS200 Series meets or exceeds the M Series in pressure rating, flow, accuracy, ease of maintenance and materials of construction. These improvements have resulted in a marked improvement over the legacy M Series.

Table 1. New and Legacy Products Description

NEW PRODUCT	DESCRIPTION	LEGACY PRODUCT
LS200 Series	Pressure Reducing	Types MF, MBF, MN and MBN DN 50 and DN 50x100

Purpose

The purpose of this document is to ease the transition of the user from the M Series to the new LS200 Series. The transition can be most easily understood through the following categories:

1. **Fit** – Is the installation of this product different?
2. **Form** – Are there any physical changes?
3. **Function** – How is the product different in its operation and performance?

M Series to LS200 Series

Table 2. New and Legacy Products Configuration Description

NEW PRODUCT TYPE	DESCRIPTION	LEGACY PRODUCT TYPE
LS200 Series: Pressure Reducing Natural Gas Regulator		
Type LS200	Direct-operated low pressure regulator for 0.25 to 5 psig / 0.017 to 0.35 bar outlet pressures	Types MF and MN NPS 2 / DN 50
Type LS204*	Direct-operated low pressure regulator for 0.25 to 5 psig / 0.017 to 0.35 bar outlet pressures with integrated Slam-shut	Types MBF, MBN and -M NPS 2 / DN 50
Type LS220	Direct-operated low pressure regulator for 4.35 to 21.75 psig / 0.3 to 1.5 bar outlet pressures	Types MF-AP and MN-AP NPS 2 / DN 50
Type LS224*	Direct-operated low pressure regulator for 4.35 to 21.75 psig / 0.3 to 1.5 bar outlet pressures with integrated Slam-shut	Types MBF-AP, MBN-AP and -M NPS 2 / DN 50
Type LS250	Direct-operated high pressure regulator for 20 to 60 psig / 1.38 to 4.14 bar outlet pressures	Types MF-APA and MN-APA NPS 2 / DN 50
Type LS254*	Direct-operated low pressure regulator for 20 to 60 psig / 1.38 to 4.14 bar outlet pressures with integrated Slam-shut	Types MBF-APA, MBN-APA and -M NPS 2 / DN 50

Table 3A. Pressure Comparison

PRESSURE		TYPE LS200		TYPE LS220		TYPES MN-PST, MBN-PST, MF-PST, MBF-PST AND -M		TYPES MN-AP, MBN-AP, MF-AP, MBF-AP AND -M	
		psig	bar	psig	bar	psig	bar	psig	bar
Maximum Operating Inlet Pressure	Set Pressure < 10 psig / 0.69 bar	N/A	N/A	125	8.6	285	19.6	285	19.6
	Set Pressure > 10 psig / 0.69 bar			300	20.7				
Maximum Emergency Inlet Pressure		300	20.7						
Maximum Operating Outlet Pressure ⁽¹⁾		5.0	0.34	22	1.5	7	0.5	14.5	1.0
Maximum Outlet Pressure over Outlet Pressure Setting (Pressure over Setpoint)		11.6	0.8	29	2.0	7	0.5	14.5	1.0
Maximum Emergency Outlet (Casing) Pressure		66.0 ⁽²⁾	5.6 ⁽²⁾	115 ⁽³⁾	7.9 ⁽³⁾	58	4.0	58	4.0
1. With highest spring range available only. 2. 35 psi / 2.41 bar per PED. 3. 50 psi / 3.45 bar per PED.									

Table 3B. Pressure Comparison (continued)

PRESSURE		TYPE LS250		TYPES MN-APA, MBN-APA, MF-APA, MBF-APA AND -M	
		psig	bar	psig	bar
Maximum Operating Inlet Pressure	> 10 psig / 0.69 bar max outlet pressure	285	19.6	285	19.6
Maximum Emergency Inlet Pressure					
Maximum Operating Outlet Pressure ⁽¹⁾		60	4.1	43.5	3.0
Maximum Outlet Pressure over Outlet Pressure Setting (Pressure over Setpoint)		84	5.8	43.5	3.0
Maximum Emergency Outlet (Casing) Pressure		150	10.3	58	4.0
1. With highest spring range available only.					

M Series to LS200 Series

Table 4. Detailed Comparison of LS200 Series (New Product) and M Series (Legacy Product) Pressure Reducing Regulators

CATEGORY	LS200 SERIES (NEW PRODUCT)		M SERIES DN 50 AND DN 50X100 (LEGACY PRODUCT)	
End Connection Style	NPT		NPT	
	CL125 FF, CL150 RF		CL150 RF	
	PN 16		PN 16	
Body Material	Ductile iron and WCC Steel		WCC Steel	
Actuator Material	S355ML Structural steel		EN 10025-95	
Diaphragm Material	Nylon-reinforced Nitrile (NBR)		Fabric Reinforced Neoprene (CR)	
Disk/Seat Material	Nitrile (NBR) Inside Steel Retainer		Aluminum Disk Holder and Nitrile (NBR)	
Seat Material	EN10088-3		EN 10272 (Optional Low Temperature EN10088-3)	
Trim and Stem Material	S17400 Stainless steel H1075		X30Cr13 Uni EN10088-3	
Body and Orifice Size	Body Size	Orifice Size	Body Size	Orifice Size
	2 in. / DN 50	2.02 in. / 51.3 mm	2 in. / DN 50	2.07 in. / 52.6 mm
	2 x 4 in. / DN 50x100	2.02 in. / 51.3 mm	2 x 4 in. / DN 50x100	2.07 in. / 52.6 mm
Control Pressure Range	Type LS200 Low Pressure Actuator		Types MN-, MBN-, MF-, MBF- and -M	
	0.25 to 0.32 psig / 0.017 to 0.022 bar		0.22 to 0.33 psig / 0.015 to 0.023 bar	
	0.30 to 0.70 psig / 0.02 to 0.05 bar		0.33 to 0.48 psig / 0.023 to 0.033 bar	
	0.60 to 1.28 psig / 0.04 to 0.09 bar		0.48 to 0.80 psig / 0.033 to 0.055 bar	
	1.10 to 2.24 psig / 0.08 to 0.15 bar		0.80 to 1.16 psig / 0.055 to 0.08 bar	
	2 to 5 psig / 0.14 to 0.35 bar		1.16 to 2 psig / 0.08 to 0.14 bar	
	2 to 5 psig / 0.14 to 0.35 bar		2 to 2.9 psig / 0.14 to 0.2 bar	
	Type LS220 Medium Pressure Actuator		Types MN-PST, MBN-PST, MF-PST, MBF-PST and -M	
	2 to 5 psig / 0.14 to 0.35 bar		2.9 to 4.6 psig / 0.2 to 0.32 bar	
	4 to 11 psig / 0.3 to 0.73 bar		4.6 to 5.8 psig / 0.32 to 0.4 bar	
	4 to 11 psig / 0.3 to 0.73 bar		5.8 to 7.25 psig / 0.4 to 0.5 bar	
	5 to 16 psig / 0.33 to 1.08 bar		Types MN-AP, MBN-AP, MF-AP, MBF-AP and -M	
	5 to 16 psig / 0.33 to 1.08 bar		7.25 to 9.4 psig / 0.5 to 0.65 bar	
	5 to 16 psig / 0.33 to 1.08 bar		9.4 to 11.6 psig / 0.65 to 0.8 bar	
	5 to 16 psig / 0.33 to 1.08 bar		11.6 to 14.5 psig / 0.8 to 1 bar	
	8 to 22 psig / 0.57 to 1.5 bar		Types MN-APA, MBN-APA, MF-APA, MBF-APA and -M	
	8 to 22 psig / 0.57 to 1.5 bar		14.5 to 16 psig / 1 to 1.1 bar	
	Type LS250 High Pressure Actuator		16 to 20.3 psig / 1.1 to 1.4 bar	
	20 to 30 psig / 1.38 to 2.09 bar		20.3 to 31.9 psig / 1.4 to 2.2 bar	
	20 to 45 psig / 1.38 to 3.09 bar		31.9 to 43.5 psig / 2.2 to 3 bar	
	25 to 60 psig / 1.72 to 4.14 bar		None	
Temperature Range	-40 to 150°F / -40 to 66°C		14 to 140°F / -10 to 60°C Standard -4 to 140°F / -20 to 60°C Low Temperature Version	
Hydrogen Readiness	25% Blend Ready		Not Available	
	100% Hydrogen in Development		Not Available	
Approximate Weight				
Type LS220	91.5 lbs / 42 kg		121 lbs / 55 kg	
Type LS250	75.3 lbs / 34 kg		121 lbs / 55 kg	
2x4 Body Weight Adder	8.3 lbs / 4 kg		8.3 lbs / 4 kg	
Slam-shut Weight Adder	16.4 lbs / 7.5 kg		8.3 lbs / 4 kg	
Published Flow Capacity (19 bar inlet, 3 bar setpoint, AC5)	655,099 SCFH / 17,550 Nm³/h		220,232 SCFH / 5900 Nm³/h	
Accuracy Class	Accuracy Class AC: Up to 10% Lockup SG: Up to 10% Slam-shut Lockup Class AG: +/-5%		Accuracy Class AC: Up to 10% Lockup SG: Up to 10% Slam-shut Lockup Class AG: +/-5%	
Dimensions	See Figure 4 and Table 5			
Options and Features	Travel Indicator		Travel Indicator	
	Integrated optional slam-shut		Integrated optional slam-shut	
	Bottom entry maintenance standard		Not Applicable	
	Sealed adjusting screw standard		Sealed adjusting screw	
	Field Convertible Slam-shut		Fixed side slam-shut	
Note: Shaded cells indicate differences between the new and legacy product				

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M Series to LS200 Series

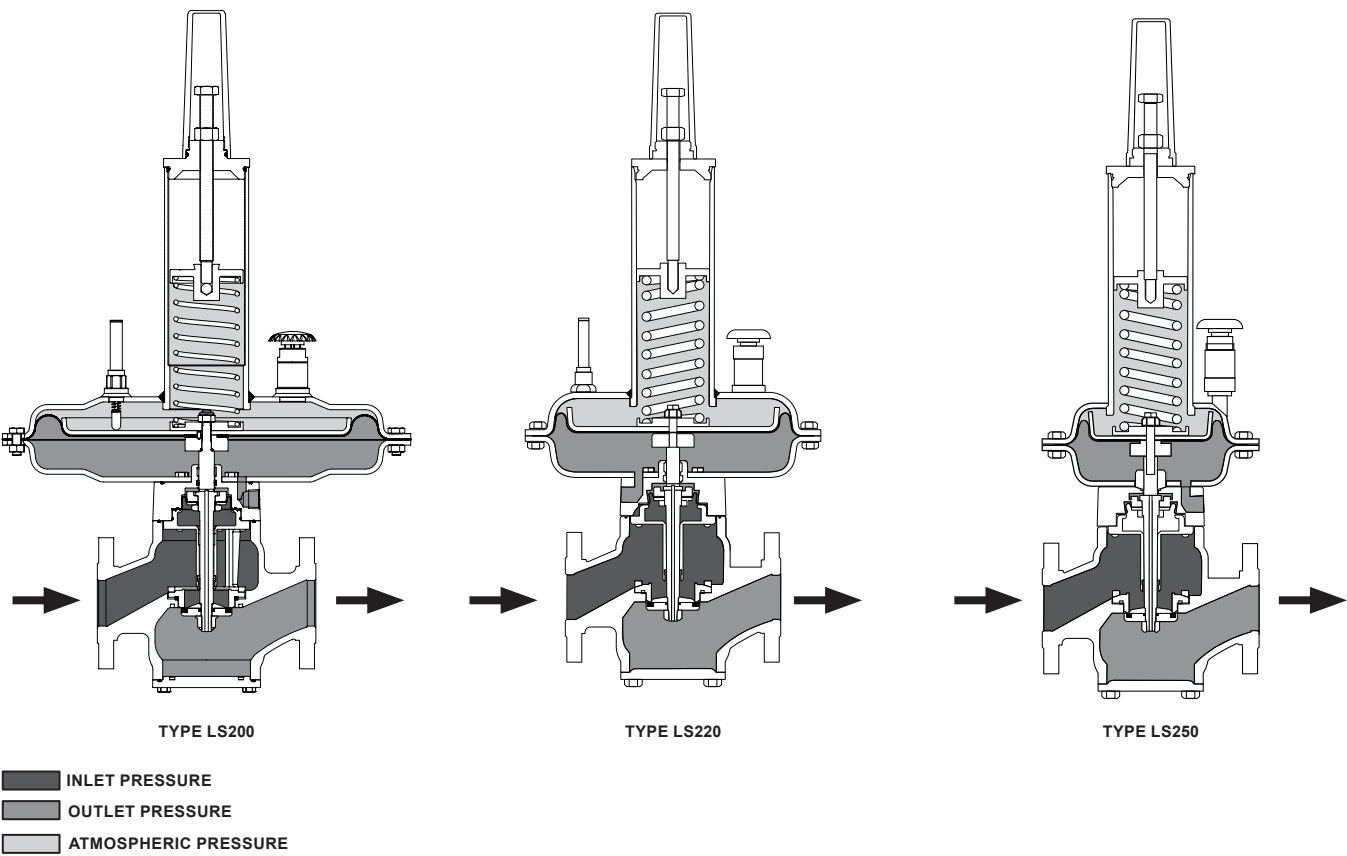


Figure 2. LS200 Series Operational Schematics

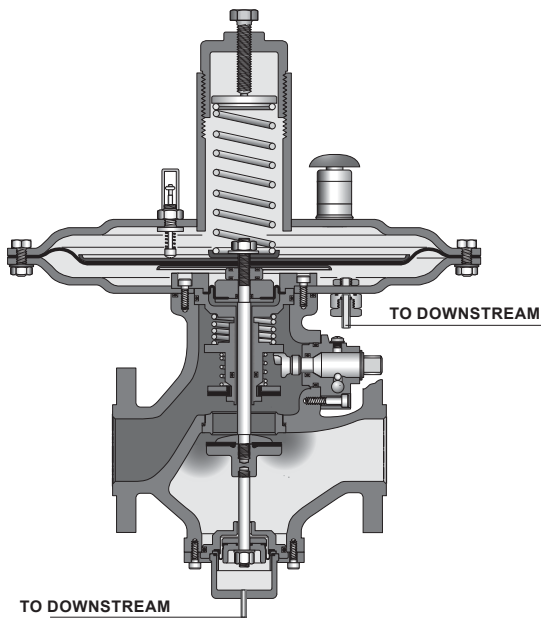


Figure 3. MBF-M Series Operational Schematic

The following is a discussion covering each of these three elements.

Fit

See Table 4. The new and legacy products have the same body sizes and end connections. Expanded outlet option, 4 in. / 102 mm outlet flange allows less pipe above the ground or saves space in a vault by removing a pipe swage downstream. Face-to-face dimensions of flanged connections are the same. The LS200 Series is 2 in. / 50 mm taller than the M Series. (Internal adjusting screw is in development to reduce the height difference to 4 in. / 101 mm.)

Form

The new LS200 Series offers the same configuration options as the legacy M Series. New body material with the same face-to-face dimension of 10 in. / 254 mm. The LS200 Series uses the same or better stainless steel and steel materials to achieve a standard -4°F / -20°C temperature rating. The legacy M Series requires a special option adder to achieve -4°F / -20°C. The actuator widths are highlighted in Table 5, showing the differences. The LS200 Series is also taller, making room for longer springs that allow more travel and flow. The springs were designed around common setpoints for optimal performance. No parts were reused from the M Series. The LS200 Series utilizes a control line for pressure registration, there is no option for internal registration.

The LS200 Series has a higher outlet pressure rating and simplified control spring selection than the M Series equivalent. This helps improve lead time and simplify stocking.

The LS200 Series design has also removed the need for a monitor device to use the regulator as a wide-open regulator. The regulator performs as well or better than the equivalent Type MBN-M in speed of response and accuracy.

Function

See Tables 4 to 6 for a comparison of the features of the LS200 Series to the legacy M Series. The LS200 Series utilizes the same balance trim design principles as the M Series but with a larger orifice, keeping the primary function the same.

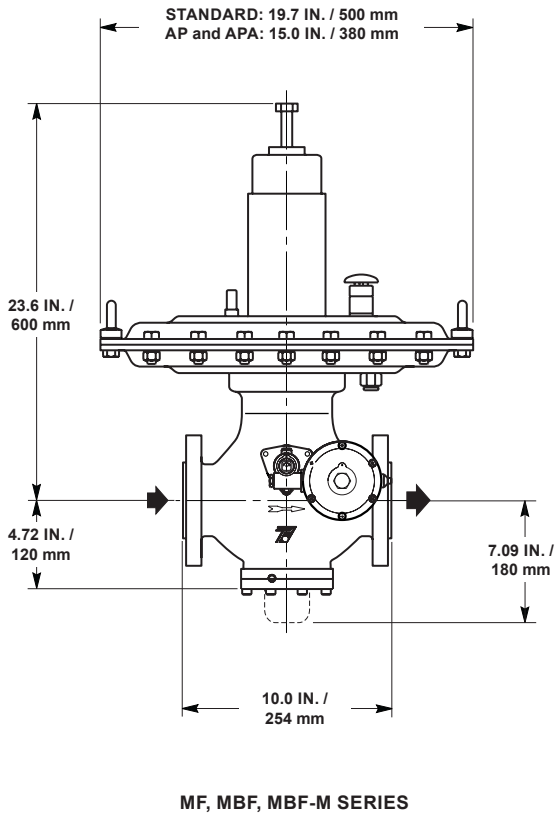
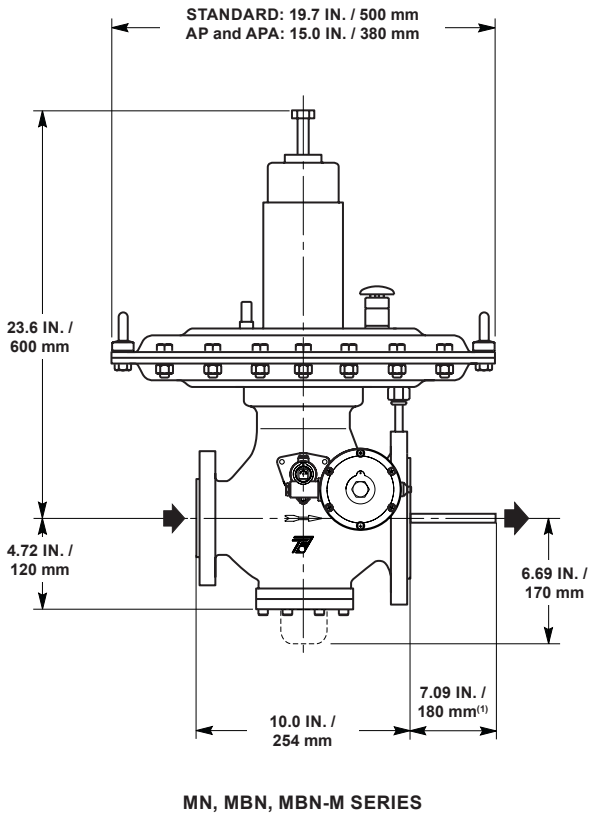
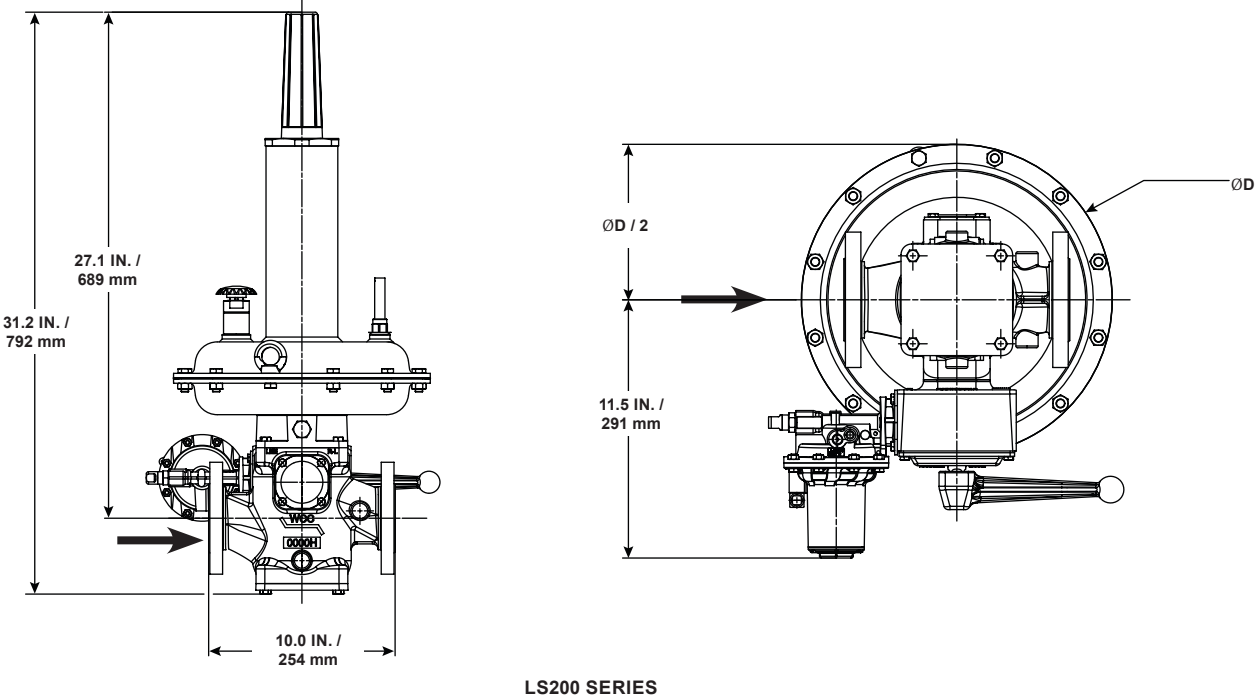
The LS200 Series offers a higher operating outlet pressure, allowing it to operate in more conditions than the M Series. The LS200 Series also offers shorter maintenance times with a new market, hex stem design, allowing for bottom-entry repairs. This allows the pad to be replaced in five minutes. The seat and pad can be replaced without affecting set point, reducing the repair time compared to the M Series.

Go to the LS200 Series webpage on Emerson.com or Emerson's YouTube page for the maintenance videos.

Conclusion

The LS200 Series is a new direction in the natural gas distribution market. It increases the level of safety available for gas use while offering zero-emission overpressure protection options. The increased flow and improved materials make the LS200 Series more versatile than the M Series while improving ease of maintenance. Please refer to the LS200 Series Bulletin and web page for the complete list of features and additional information.

M Series to LS200 Series



1. For models with internal impulse connection only (DN 25-40-50-65)

Figure 4. Dimensions

M Series to LS200 Series

Table 5. Dimension Comparison

DIMENSION	TYPE LS200		TYPE LS220		TYPES MN, MBN AND -PST		TYPE LS250		TYPES MN, MF, MBN, MBF, -AP AND -APA	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
Middle of Pipe to Top of Closing Cap	23.1	587	27.1	689	23.6	600	27.1	689	23.6	600
Face-to-Face	10	254	10	254	10	254	10	254	10	254
Face-to-Face / 2	5	127	5	127	5	127	5	127	5	127
Actuator Diameter	18.7	475	13.8	350	19.7	500	10	254	15	380
Middle of Pipe to Slam-shut Closing Cap	11.5	292	11.5	292	11.5	292	11.5	292	11.5	292

Table 6. Repair Kits

SPARE PART KITS	ACTUATOR TYPE (SIZE)	KEY	KIT PART NUMBER	M SERIES KIT PART NUMBER
Pad Repair Kit	LS200 (single Side)	32, 42, 43, 54	RLS200PADA0	Type MN Standard: M2600170X12 Type MBN Standard: M2600177X12 Type MBN Standard: M2600539X12
	LS200 (double Side) ⁽¹⁾	32, 42, 43, 54	RLS202PADA0	N/A
	LS220/LS250 (single side)	32, 42, 43, 54	RLS2PAD10A0	Type MN-AP/APA: M2600183X12 Type MBN-AP/APA: M2600189X12
	LS220/LS250 (double side)	32, 42, 43, 54	RLS2PAD20A0	N/A
Orifice Kit	All	32, 38, 40, 42, 54	RLS2ORFC0A0	
	All with SSD	32, 38, 40, 42, 54, 203, 206, 207, 223	RLS24ORF0A0	
Balance Port Kit	LS200	15, 20, 23, 24, 28, 32, 33, 42, 47, 54, 57	RLS200BALA0	
	LS204	15, 20, 23, 24, 28, 32, 33, 42, 47, 54, 57, 203, 223	RLS204BALA0	
	LS220/LS250	15, 20, 23, 24, 28, 32, 33, 42, 47, 54, 57	RLS2BALN0A0	
	LS224/LS254	15, 20, 23, 24, 28, 32, 33, 42, 47, 54, 57, 203, 223	RLS2XBALNA0	
Actuator Kit	LS200 (475 mm)	4, 15, 20, 21C, 33, 57	RLS200ACTA0	
	LS220 (350 mm)	4, 15, 20, 21C, 33, 57	RLS220ACTA0	
	LS250 (255 mm)	4, 15, 20, 21C, 33, 57	RLS250ACTA0	
Full Rebuild Kit	LS200 (475 mm)	4, 15, 20, 21C, 23, 24, 25, 28, 32, 33, 36, 38, 40, 42, 43, 47, 54, 56, 57	RLS200REBA0	Type MN: M2200170X12
	LS220 (350 mm)	4, 15, 20, 21C, 23, 24, 25, 28, 32, 33, 36, 38, 40, 42, 43, 47, 54, 56, 57	RLS220REBA0	Type MN-AP: M2200183X12
	LS250 (255 mm)	4, 15, 20, 21C, 23, 24, 25, 28, 32, 33, 36, 38, 40, 42, 43, 47, 54, 56, 57	RLS250REBA0	Type MN-APA: M2200183X12
	LS204 (475 mm) with slam shut device	4, 15, 20, 21C, 23, 24, 25, 28, 32, 33, 36, 38, 40, 42, 43, 47, 54, 56, 57, 203, 204, 206, 207, 209, 216, 218, 219, 221, 223, 227, 229, 21C	RLS204REBA0	Type MBN: M2200177X12 Type MBN-M: M2200268X12 Type MBF: M2200911X12
	LS224 (350 mm) with slam shut device	4, 15, 20, 21C, 23, 24, 25, 28, 32, 33, 36, 38, 40, 42, 43, 47, 54, 56, 57, 203, 204, 206, 207, 209, 216, 218, 219, 221, 223, 227, 229, 21C	RLS224REBA0	Type MBN-AP: M2200189X12 Type MBF-AP: M2200992X12 Type MBF-M AP: M2200953X12
	LS254 (255 mm) with slam shut device	4, 15, 20, 21C, 23, 24, 25, 28, 32, 33, 36, 38, 40, 42, 43, 47, 54, 56, 57, 203, 204, 206, 207, 209, 216, 218, 219, 221, 223, 227, 229, 21C	RLS254REBA0	Type MBN-APA: M2200189X12 Type MBF-APA: M2200992X12 Type MBF-M APA: M2200953X12
Travel Indicator	LS200 and LS220	21	RLS220TVLA0	N/A
	LS250 (255 mm)	21	RLS250TVLA0	
Vent	LS200	58	RLS200VENT0	
	LS220 and LS250	58	RLS20VENTA0	
Slam Shut Device VSX8	All	203	RLS20VSX8A0	

1. Not yet available

M Series to LS200 Series



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