

GAS PRESSURE REGULATORS AND FILTERS

MAXITROL®

www.maxitrol.com

⚠ WARNING

Service and installation must be performed by a trained/experienced service technician.

All products used with combustible gas **must** be installed and used **strictly** in accordance with the instructions of the Original Equipment Manufacturer (OEM) and with all applicable government codes and regulations, e.g. plumbing, mechanical, and electrical codes and practices. All Maxitrol products should be installed and operated in accordance with Maxitrol Safety Warning Instructions.

Maxitrol is NOT responsible for any errors or omissions in reliance by anyone of any information set forth in this catalog without additional reference to local requirements and applicable ordinances or codes.

The products in this catalogue comply with EU legislation. The technical specifications refer to the CE certification. Additional international approvals and certifications, e.g., CSA and UL, are available upon request.



RZ AND 210Z

ZERO GOVERNOR DESIGN

The RZ and 210Z series are adaptable for air-gas mixing applications. Because of the balanced valve construction, Z-models offer superior performance at an economical price compared with other types of atmospheric regulators.

Maxitrol's RZ and 210Z zero governor model regulators are used for flow control of burners, nozzle mixers, mixing tees and proportional premixers.

Specifications

- **Pipe Sizes:**
 - R400Z(M), R500Z(M), R600Z(M): Rp ¾ to Rp 1 threaded connections according to ISO 7-1/EN10226-1
 - 210DZ, 210EZ, 210GZ: Rp 1 to Rp 3 threaded connections according to ISO 7-1/EN10226-1
 - 210JZ: DN100 flanged connections according to ISO 7005-2, PN 16
- **Housing Material:** Aluminum
- **Internal Components Material:**
 - R400Z(M), R500Z(M), R600Z(M): Steel, aluminum, brass, elastomer
 - 210DZ, 210EZ, 210GZ: Aluminum
 - 210JZ: Aluminum
- **Mounting:** R400Z(M), R500Z(M), R600Z(M) are suitable for multi-positional mounting. Other than upright position will result in a slight difference in outlet pressure. If ball check vent limiting device is installed, mount in an upright position only. 210DZ, 210EZ, 210GZ, 210JZ mount in upright position only. Install with gas flowing as indicated by the arrow on bottom casting.
- **Construction and Design/Certifications:** According to the Gas Appliances Regulation (EU) 2016/426 and EN 88-1
- **Fuel Gases:** Suitable for gases of EN 437
- **Maximum Inlet Pressure:**
 - R400Z(M), R500Z(M), R600Z(M): 10 kPa
 - 210DZ, 210EZ, 210GZ, 210JZ: 36 kPa
- **Ambient Temperature Range:** -15 °C to 80 °C
- **Capacities:** See flow charts, page 21 and 22
- **Model Designations:** Models having a suffix letter, or a combination of suffix letters, listed below indicates the design modifications described.
(M) B.S.P. - PL parallel thread "Rp" - conforms to ISO 7-1/EN10226-1, where pressure tight joints are made on the threads.

Dimensions

Model	Pipe Sizes	Swing Radius	Dimensions			
			A	B	C	D
R400Z(M)...	Rp ¾, Rp ½	60 mm	83 mm	24 mm	51 mm	51 mm
R500Z(M)...	Rp ½, Rp ¾	90 mm	119 mm	30 mm	79 mm	79 mm
R600Z(M)...	Rp ¾, Rp 1	109 mm	144 mm	37 mm	102 mm	98 mm
210DZ(M)...	Rp 1, Rp 1 ¼, Rp 1 ½	138 mm	229 mm	60 mm	152 mm	178 mm
210EZ(M)...	Rp 1 ½, Rp 2	211 mm	286 mm	75 mm	203 mm	232 mm
210GZ(M)...	Rp 2 ½, Rp 3	302 mm	419 mm	116 mm	300 mm	343 mm
210JZ(M)...	DN100	467 mm	616 mm	138 mm	349 mm	457 mm

NOTE: Dimensions are maximums and to be used only as an aid in designing clearance for the regulator. Actual production dimensions may vary somewhat from those shown.

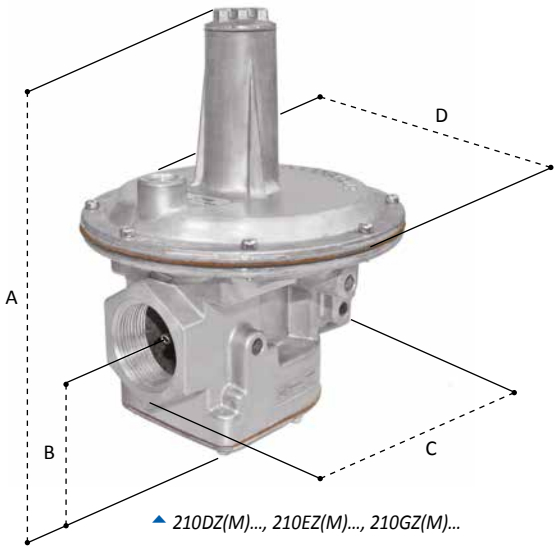
NOTE: NPT thread on request



▲ R400Z(M)..., R500Z(M)..., R600Z(M)...

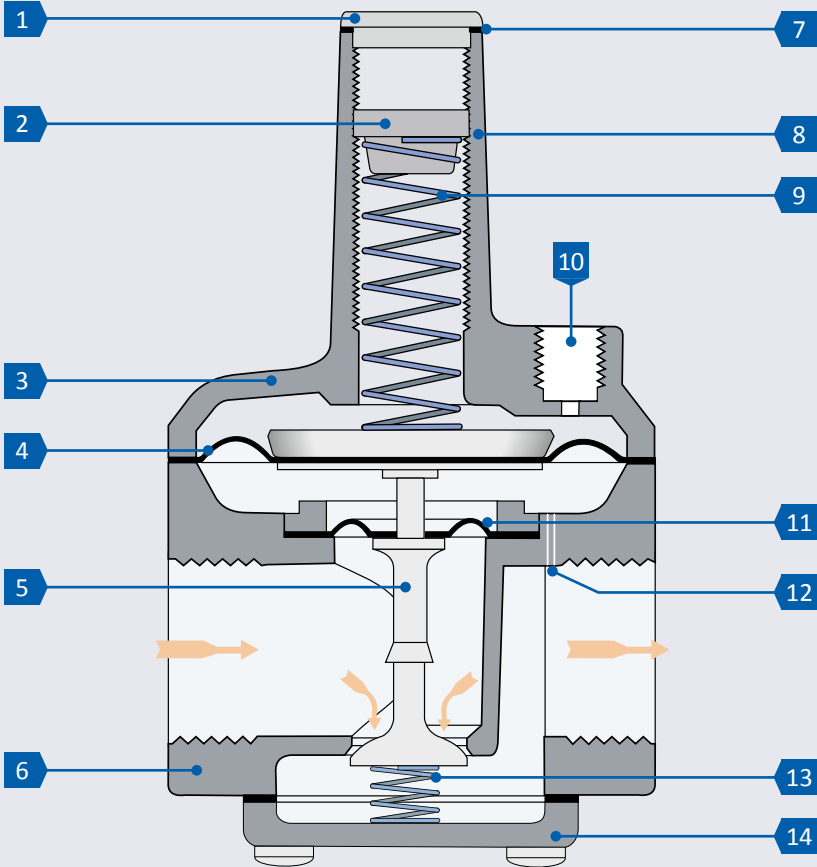


▲ 210JZ(M)...



▲ 210DZ(M)..., 210EZ(M)..., 210GZ(M)...

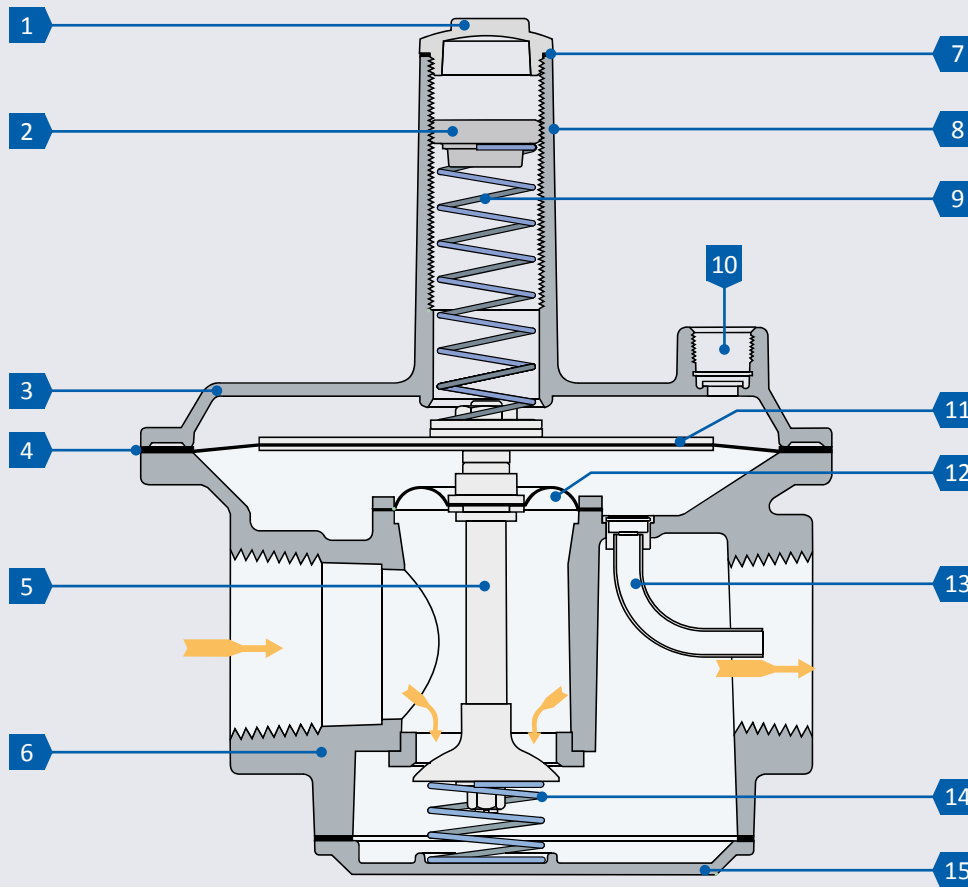
R400Z(M), R500Z(M), R600Z(M)



NOTE: Diagrams are graphical representations only and may differ from actual product.

- 1 Seal Cap
- 2 Adjusting Screw
- 3 Top Housing
- 4 Regulating Diaphragm
- 5 Stem & Valve
- 6 Bottom Housing
- 7 Seal Cap Gasket
- 8 Stack
- 9 Spring
- 10 Vent Connection
- 11 Balancing Diaphragm
- 12 Sensing Hole
- 13 Counter Spring
- 14 Bottom Plate

210DZ, 210EZ, 210GZ, 210JZ



NOTE: Diagrams are graphical representations only and may differ from actual product.

- 1 Seal Cap
- 2 Adjusting Screw
- 3 Top Housing
- 4 Regulating Diaphragm
- 5 Stem & Valve
- 6 Bottom Housing
- 7 Seal Cap Gasket
- 8 Stack
- 9 Spring
- 10 Vent Connection
- 11 Diaphragm Plates
- 12 Balancing Diaphragm
- 13 Sensing Tube
- 14 Counter Spring
- 15 Bottom Plate

SPRING SELECTION

Model	Spring Replacement Number	Spring Code											
		A	B	C	D	E	F	G	H	K	L	M	N
		Outlet Pressure Range (1 kPa = 10 mbar)											
		0.25 – 0.90	0.50 – 1.25	0.50 – 1.50	0.70 – 1.30	0.75 – 2.00	1.00 – 2.00	1.00 – 3.00	1.25 – 3.00	2.50 – 5.50	3.75 – 7.50	5.00 – 10.50	7.00 – 14.00
		Color											
brown	(plated)	green	(plated)	pink	orange	violet	blue	red	yellow	black	label		
RV12...	KIT ...-R1210T	X			X		X	X					
RV20...	KIT ...-R2010	X			X		X	X					
RV47...	KIT ...-R4710	X			X		X	X					
RV48...	KIT ...-R4810	X			X		X		X				
RV52...	KIT ...-R5210	X	X			X		X		X			
RV53...	KIT ...-R5310	X	X			X		X		X	X		
RV61...	KIT ...-R6110	X	X			X			X	X	X		
RV81...	KIT ...-R8110	X	X			X		X		X	X	X	
RV91...	KIT ...-R9110	X	X			X		X		X	X	X	
RV111...	KIT ...-R11110	X	X			X		X		X	X	X	
325-3...	KIT ...-R325C10			X				X		X	X		X
325-5...	KIT ...-R325E10			X				X		X	X		X
325-7...	KIT ...-R8110	X	X			X		X		X	X	X	
R400S...	KIT ...-R400B10	X	X			X		X		X			
R500S...	KIT ...-R5210	X	X			X		X		X			
R600S...	KIT ...-R5310	X	X			X		X		X	X		
210D...	KIT ...-R8110	X	X			X		X		X	X	X	
210E...	KIT ...-R9110	X	X			X		X		X	X	X	
210G...	KIT ...-R11110	X	X			X		X		X	X	X	
210J...	KIT ...-R13110		X			X		X		X	X	X	

NOTE: No spring replacement required for zero pressure regulator models.

SIZING A REGULATOR

System Requirements

When sizing a regulator the following must be known:

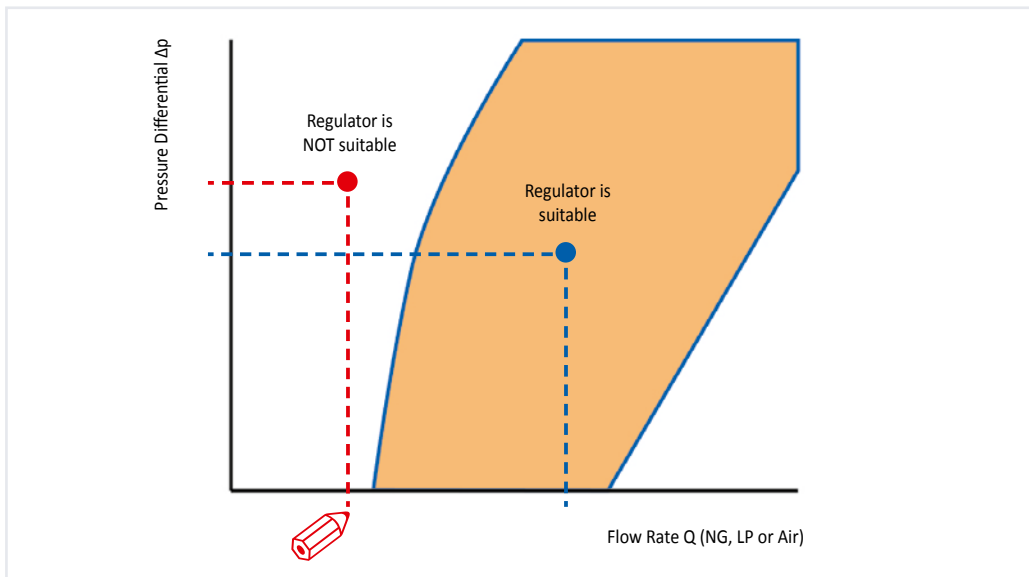
- Fuel Gases
- Available Inlet Pressure
- Desired Outlet Pressure
- Zero Pressure Regulator Application (indicated by model number ending in "Z")
- Will the regulator control main burner and pilot load OR main burner only?
- Required minimum and maximum flow rate in m³/h or kW
- Pipe Size

In most cases, the manifold pipe size has already been selected on the basis of good engineering practice, and the regulator pipe size should conform to this size.

The capacity of any regulator is not an absolute value but will vary with the application depending on the prevailing differential pressure.

HOW TO DETERMINE THE SUITABLE REGULATOR FROM THE FLOW CHART

Draw a horizontal line with the known differential pressure (inlet pressure minus outlet pressure). Next draw a vertical line with the required flow rate (take care to use the axis with the correct fuel gas). The regulator where both lines cross each other within the range of regulation is the suitable regulator.



NOTE: Please contact Maxitrol directly for more information on sizing a regulator.

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LEGEND FOR FLOW CHARTS

- Δp = Pressure Differential in kPa
- Q = Flow Rate in m³/h
- dv = Volumetric Rate of Flow
- f = Friction Factor
- ρ = Density

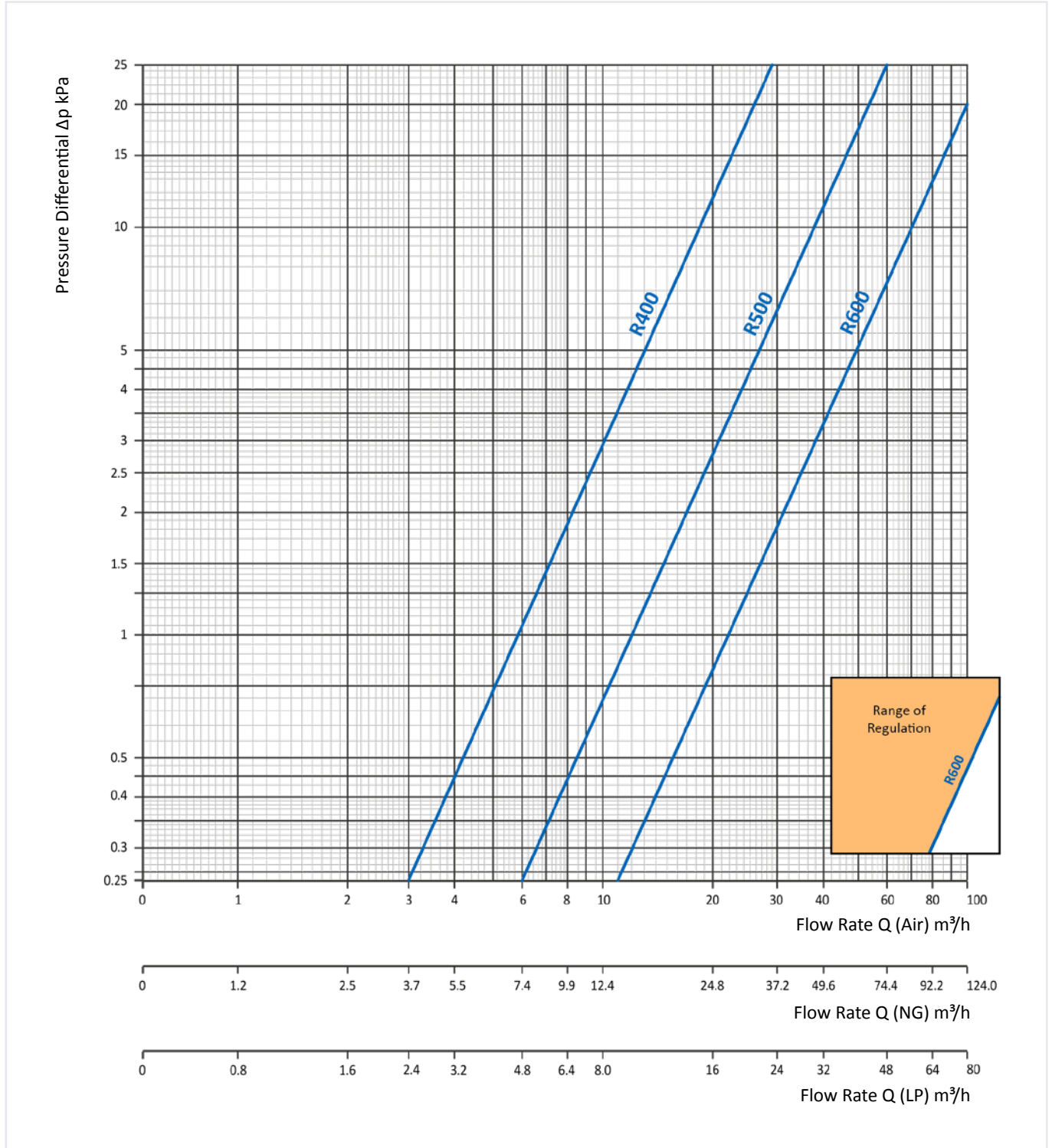
- Pressure Units: 1 kPa = 10 mbar = 10 hPa
- Air: dv = 1.00 f = 1.00
- Natural Gas (NG): dv = 0.64 f = 1.24
- Liquid petroleum gas (LPG): dv = 1.56 f = 0.80

$$dv = \frac{\rho_{\text{gas}}}{\rho_{\text{air}}}$$

$$f = \sqrt{\frac{\rho_{\text{air}}}{\rho_{\text{gas}}}}$$

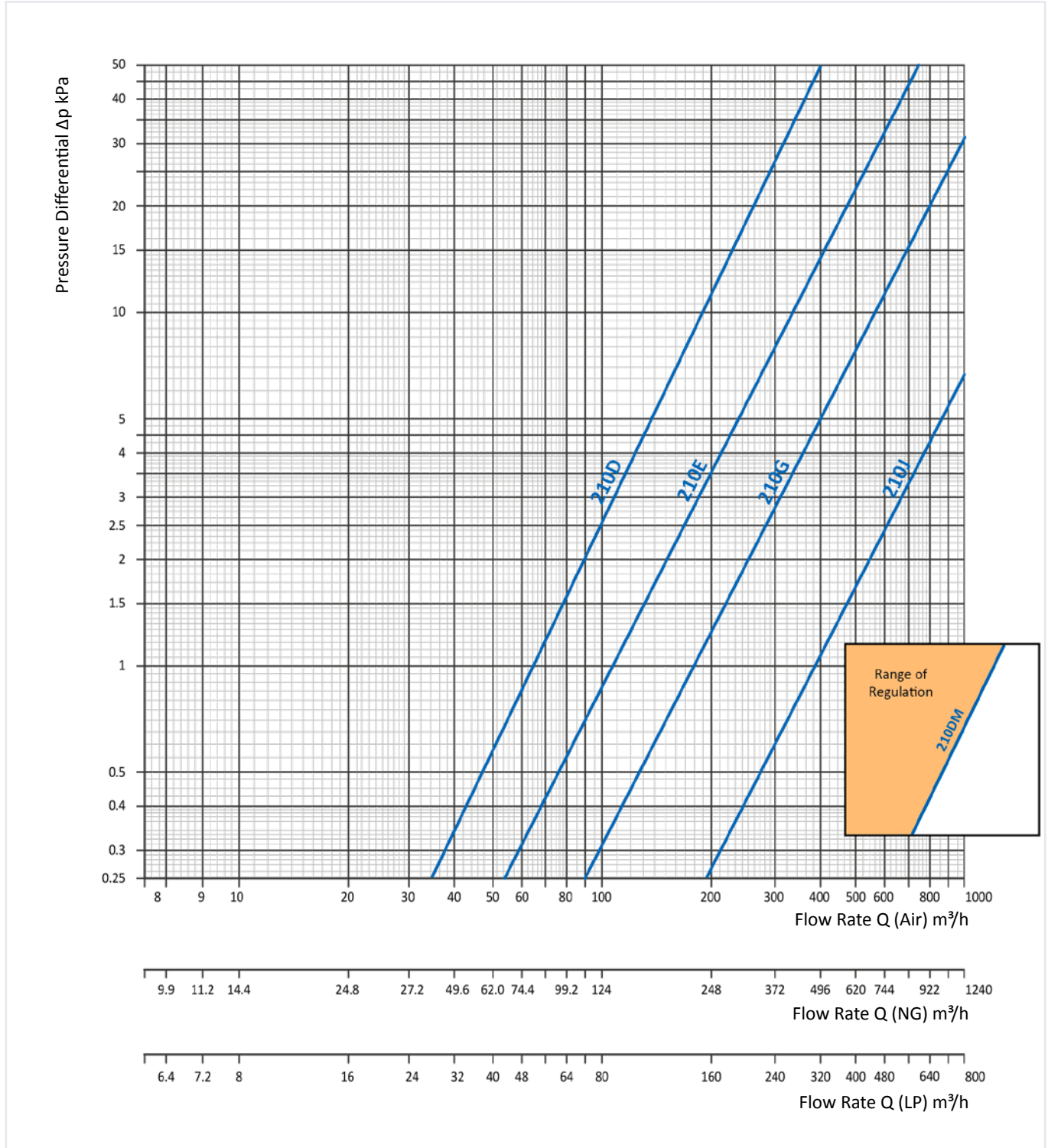
$$\dot{V}_{\text{gas}} = f \cdot \dot{V}_{\text{air}}$$

RS Series Appliance Regulators – Balanced Valve and Zero Governor Design



NOTE: The given flow rates are approximate values. Actual flow rates may vary somewhat from those shown.

210 Series Appliance Regulators – Balanced Valve and Zero Governor Design



NOTE: The given flow rates are approximate values. Actual flow rates may vary somewhat from those shown.

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