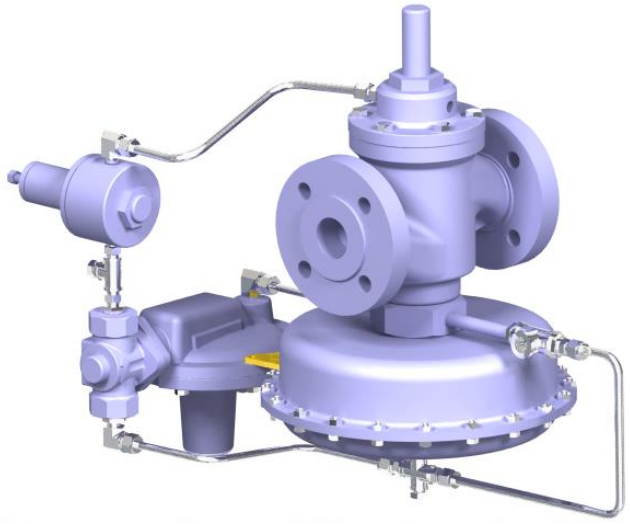
Type BR1197 Low Pressure Gas Blanketing Regulator



Introduction

- ***Pilot Operated pressure control***
- ***Ultrasensitive with milibar control***
- ***Diaphragm sensing mechanism***
- ***Balanced Pressure Mechanism***
- ***External feedback***
- ***High Flow Rate Capacity***

Features

• **Quick-Change Trim Package**—Tested trim packages can be made up and stocked ahead of time for fast replacement.

• **In-Service Travel Inspection**—Standard indicator assembly with protective cover permits periodic inspection of plug travel without removing regulators from service.

• **Easy In-Line Maintenance**—Top-entry design reduces maintenance time and manpower requirements; trim parts can be inspected, cleaned, and replaced without removing the main valve body from the pipeline.

• **Factory-Piped Pilot Supply**—Supply pressure to pilot is supplied from inlet side of the main valve body through tubing furnished with the regulator.

Principle of Operation

The Type **BR1197** Regulator System (figure 1) is pilot operated to respond to a slight decrease in internal tank pressure by throttling open to increase the flow rate of blanketing gas into the vessel. When the vessel's liquid level has been lowered to the desired point and the vapor pressure reestablished, the Type BR1197 Regulator System throttles closed.

The Type BR1197 utilizes a Type **MV326** main valve and actuator and a Type **SR212** sensing pilot. The piloting system uses the high pressure inlet gas, reduced by a Type **FR124** regulator, as loading pressure to operate the main valve. The outlet or vessel pressure is sensed through a control line on the Type **MV326** main valve actuator and the Type **SR212** pilot diaphragm.

When the liquid level is lowered and vessel pressure decreases below the setting of the pilot control spring, the pilot spring force on the pilot diaphragm opens the pilot valve plug, allowing additional loading pressure to the main valve actuator diaphragm. The loading pressure opens the main valve plug to supply the required flow of gas to the vessel.

When downstream demand has been satisfied, outlet pressure tends to increase slightly, acting on the pilot and main valve diaphragms. When the outlet pressure exceeds the pilot control spring setting, the pilot diaphragm moves to close the pilot valve plug. The loading pressure reduces by exhausting downstream through the fixed restriction, allowing the main valve spring to close the main valve plug. The combination of main valve spring force and main valve plug unbalance provides positive shutoff of the valve plug.

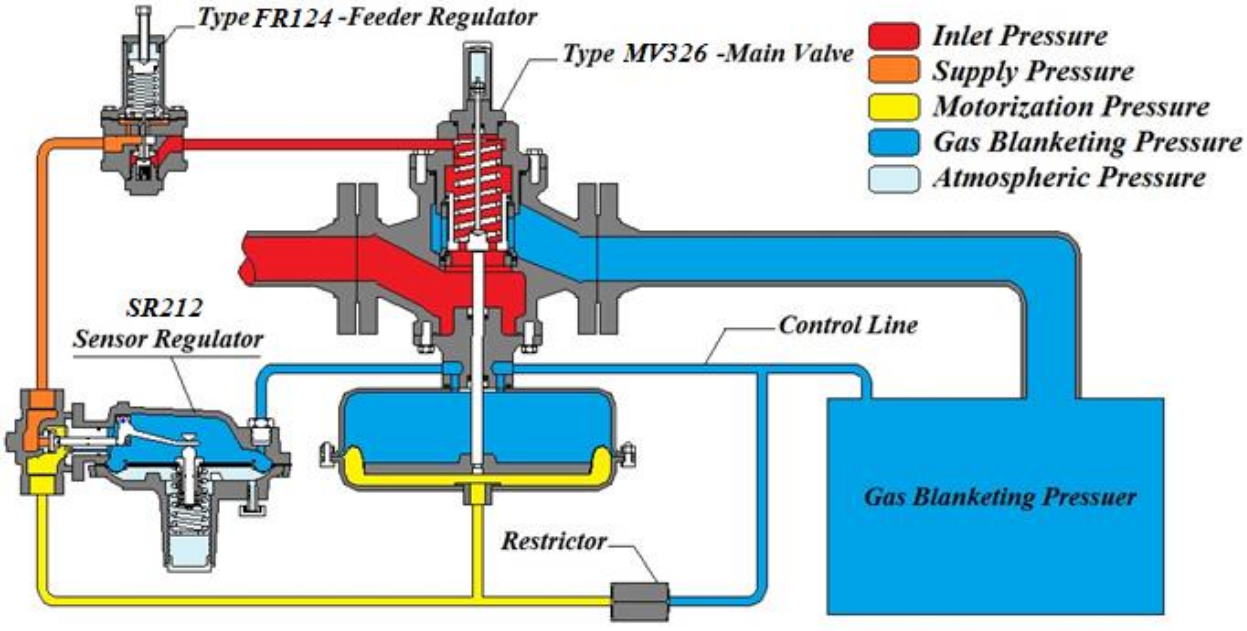


Figure (1) - Different Pressure Zones

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Technical Specification

Maximum Operating Inlet Pressures			20.5 bar
Maximum Outlet (Casing) Pressure			5.2 bar
Outlet Pressure Ranges			2 to 480 milibar
Size& Connection Type			1(25),2(50)
Port Diameter	**Size**	**1(25)**	33.3 mm
		2(50)	60.3 mm
Control Line Connection			3/4 in NPT
Main Valve Flow Characteristic			Linear
Operating Temperature			-25°C to +60°C
Leakage Class			**VI**
Working Medium			Natural/Sour gas, nitrogen, air, propane, butane, Carbon Dioxide
Option			External Sensing-gauge
Material			**Body and Housing:** WCB steel, Stainless Steel optional)
			Diaphragm & O-ring: EPDM, FKM, Viton,FFKM, Nitrile
			Spring: Stainless Steel 302
			Cage: WCB steel, Stainless Steel 316/316L(NACE)
			Other Internal Parts: Stainless Steel 316/316L/304

*Table (1)-Flow Capacities in SCFH of 0.97 Specific Gravity Nitrogen (Nm^3/h)**

INLET PRESSUE PSIG(bar)	OUTLET PRESSUE PSIG(bar)	CAPACITIES IN SCFH (m3/h(n)) OF 0.97 SPECIFIC GRAVITY	
		1-Inch Body	2-Inch Body
30 (2,1)	4 (0,28) or less	27,300 (732)	103,900 (2785)
40 (2,8) 60 (4,1) 80 (5,5)	7 (0,48) or less	33,300 (892) 45,500 (1219) 57,700 (1546)	126,600 (3393) 173,000 (4636) 220,00 (5896)
120 (8,3) 160 (11,0) 200 (13,8)	7 (0,48) or less	82,300 (2206) 107,00 (2868) 131,000 (3511)	312,000 (8362) 406,000 (10 881) 490,000 (13 132)

***Use below conversion factors for other gases**

Gas	Air	Butane	Carbon Dioxide	Methane	Propane
Conversion Factor	1.03	0.71	0.81	1.35	0.81

Sizing Blanketing Systems

When sizing a gas blanketing regulator for a low pressure blanketing application, you must consider the replacement of blanketing gas required for the liquid loss during pump out of the vessel plus the condensation and contraction of the vessel vapors during atmospheric thermal cooling. Follow steps below for rough estimate.

1. Determine the gas flow rate required to replace the liquid being pumped out.

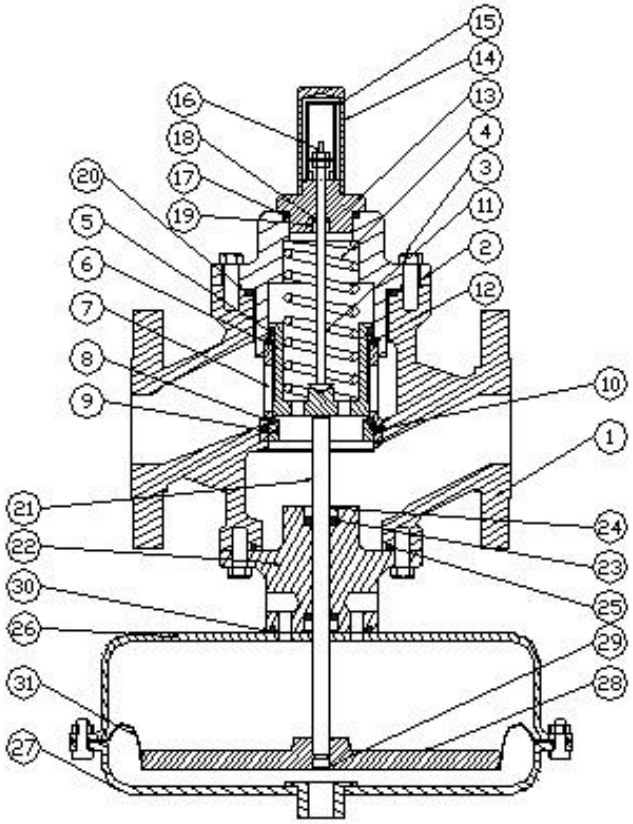
2. Determine the gas flow rate due to "inbreathing" Caused by atmospheric thermal cooling (Thermal inbreathing table below).

3. Add results from steps 1 and 2, then select regulator size, based on total capacity required (above flow capacity table).

Table (2)-Gas Flow Required for Thermal Inbreathing as per API 2000

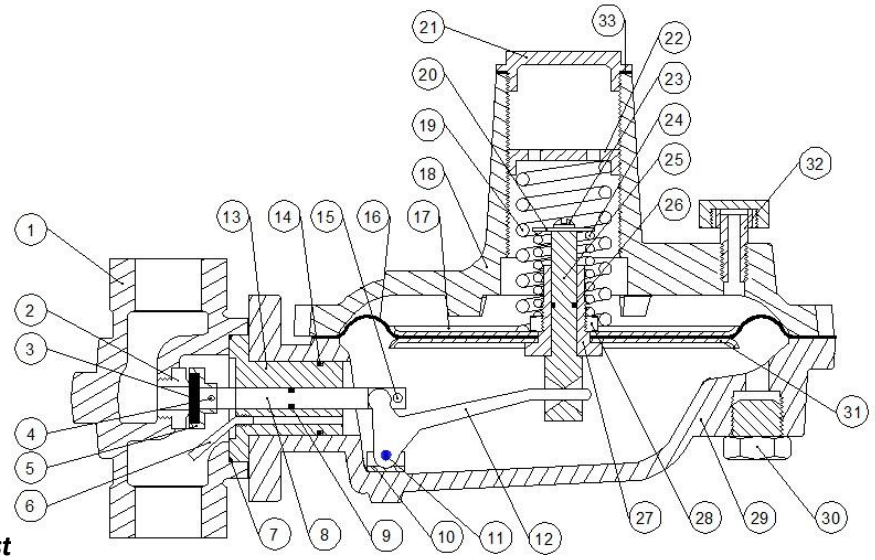
VESSEL CAPACITY m^3	Normal m^3/h AIR FLOW RATE REQUIRED
9.5	1,61
16	2,68
79	1,34
159	26,8
318	53,6
477	80,4
636	107
795	134
1 59	268
2 385	402
3 180	536
3 975	643
4 769	750
5 564	831
6 359	911
7 154	992
7 949	1072
9 539	1179
11 129	1286
12 718	1394
14 308	1501
15 898	1608
19 078	1822
22 257	2010
25 437	2198

Main Valve and Actuator Part List (MV326)



1. Body	**9. Seat Ring**	**17. O-ring**	**25. O-ring**
2. Flange	10. O-ring	18. O-ring	26. Upper Diaphragm Case
3. Screw	11. Stem	19. Bushing	27. Lower Diaphragm Case
4. Spring	12. Upper Seal	20. O-ring	28. Diaphragm Plate
5. O-ring	13. Indicator Fitting	21. Stem	29. Stem Cap Screw
6. Valve Plug	14. Indicator Protector	22. Bonnet	30. O-ring
7. Cage	15. Indicator Scale	23. Stem O-ring	31. Diaphragm
8. O-ring	16. Nut	24. Bushing	

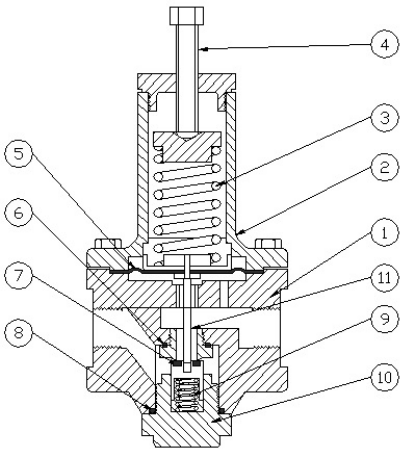
Sensor Regulator Part List (SR212)



Part List

1. Body	9. O-ring	17. Diaphragm Head	25. Pusher Post
2. Orifice	10. Pivot Base	18. Spring Case	26. O-ring
3. Seat	11. Pivot	19. Spring	27. Connector
4. Pivot	12. Lever	20. Spring Holder	28. Nut
5. Disk	13. Guide Insert	21. Closing Cap	29. Lower Diaphragm Casing
6. Tube	14. O-ring	22. Adjusting Screw	30. Plug
7. O-ring	15. Pivot	23. Machine Screw	31. Lower Diaphragm Head
	16. Diaphragm		

Feeder Regulator Part List (FR124)



Part List

1. Body	4. Adjustable screw	7. Seat	10. Lower cap
2. Spring Case	5. Diaphragm	8. O-ring	11. Stem
3. Spring	6. O-ring	9. Spring	

General Dimensions

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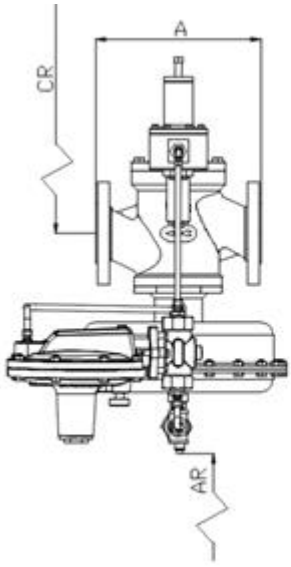

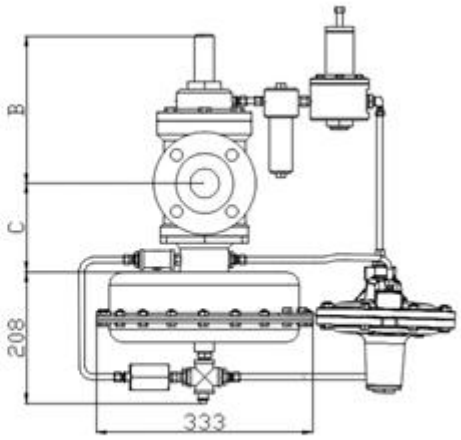

MAIN VALVE BODY SIZE, INCHES (DN)	DIMENSIONS (mm)				
	A	D	G	CR	AR
1 (25) 2 (50)	184 254	98 116	219 232	289 321	76 79

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