RB1700 Series Commercial Regulator

Advanced Metering and Regulation Technology at Work

ACTARIS metering systems

Pressure Regulator RB 1700

Benefits

- -Accurate regulation
- -Fast response
- -Easy maintenance
- -Compact size
- -Wide Range of outlet pressure
- -Horizontal or Vertical mounting

Description

The RB 1700 is a direct-acting, spring-loaded regulator

The balanced valve design ensures a constant outlet pressure when the upstream pressure varies. This eliminates the need for orifice size changes arising from the different inlet pressure ranges.

Applications

The RB 1700 regulator is designed for commercial applications: industrial boilers and furnaces, appliance pressure regulation, secondary regulation of plant distribution piping, and all installations with continuous consumption and rapid flow rate variations, such as burners, industrial ovens, boilers, etc.

Suitable for installation in cabinets, as a space saving regulator.

Model Designations

R	X	X	1	7	X	X		Options
	B							Balanced Valve Design
		E						External Registration
					1			Low pressure (7” w.c. – 3.0 psig):
					2			Medium pressure (1.7 - 13.0 psig)
					3			High pressure (7.3 – 36.0 psig)
						0		No safety devices
							1-1/2”	1-1/2” body - Orifice Size: 1-1/8”

Example: RBE1720 with 1-1/2” body is a 1700 series regulator with balanced valve, an External Control line, and 1-1/2” NPT Valve body connection

Principle of Operation (See Operating Schematic below)

The RB1700 employs a direct-acting spring-loaded design that allows for extremely fast response as well as reliable closure during no-load conditions.

Increasing Load Condition:

As downstream demand increases, the downstream pressure begins to fall, which, in turn causes the sensing line pressure and the pressure under the main diaphragm to decrease. When the pressure under the main diaphragm drops, the spring force is able to move the diaphragm downward and, thus, the main valve further open to meet the increased demand.

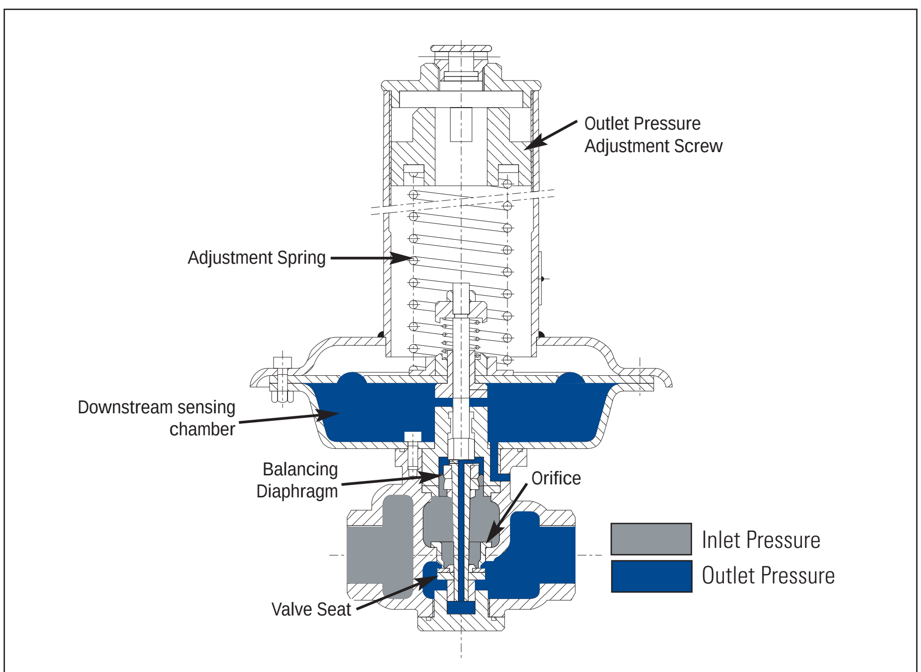
Decreasing Load Condition:

As the downsteam load is decreased, the pressure begins to rise in the sensing line and under the main diaphragm. The pressure under the main diaphragm overcomes the spring force and moves the diaphragm upward. This allows the valve to move closer to the orifice face and decrease the flow through the valve until it matches the downsteam demand.

No Load (lock-up) Condition:

As the downsteam load is shut-off, the pressure begins to rise in the sensing line and under the main diaphragm. The pressure under the main diaphragm overcomes the spring force and moves the diaphragm upward. The pressure rises enough to push the rubber valve seat again the stainless steel orifice, forming a positive seal during no-load conditions.

RB1700 Operating Schematic



Specifications

Construction

Valve body	Ductile Iron
Orifice	Stainless Steel
Valve seat	Brass with vulcanized Buna-N
Valve stem	Stainless Steel
Valve stem bushings	Nylon
"O"-ring Seals	Buna-N Nitrile Rubber
Diaphragm	Buna-N and nylon reinforcing fabric
Adjustment screw	Brass
Diaphragm case	Stamped Steel

Shipping Weight

1 Regulator per box

Weight per box: 35 lbs.

Correction factors for non-natural gas applications

The RB1700 may be used to control gases other than natural gas. To determine the capacity of the RB1700 for gases other than natural gas, it will be necessary to multiply the values within the capacity tables by a correction factor. The table below lists the correction factors for some of the more common gases:

Gas Type	Specific Gravity	Correction Factor (CF)
Air	1.0	0.77
Butane	2.01	0.55
Carbon dioxide (Dry)	1.52	0.63
Carbon monoxide (Dry)	0.97	0.79
Natural gas	0.60	1.00
Nitrogen	0.97	0.79
Propane	1.53	0.63
Propane-air-mix	1.20	0.71

To calculate the correction factor for gases not listed on the table above, it will be necessary to know the specific gravity of the gas and use it in the formula listed below:

Correction Factor (CF) =

$$\sqrt{SG_1/SG_2}$$

Where:

SG_1 = Specific Gravity of the gas in which the capacity is published.

SG_2 = Specific Gravity of the gas to be controlled.

Spring Range Data

Part Number	Spring Color	Model Number RB1710 (14" diaphargm)	RB1720 (8" diaphargm)	RB1730 (8" diaphargm)
20567075	Yellow	6.8 – 9.2" w.c.	---	---
20567076	Red	8.4 – 12.8" w.c.	---	---
20567662	White	10.9 – 21.2" w.c.	---	---
20567663	Purple	0.3 – 1.4 psig	1.9 – 5.3 psig	---
20567664	Orange	1.2 – 3.0 psig	2.9 – 8.7 psig	---
20567665	Brown	---	4.4 – 9.4 psig	7.3 – 14.5 psig
20567666	Green	---	5.8 – 13.0 psig	8.7 – 19.5 psig
20567761	Black	---	---	11.6 – 21.7 psig
20567762	Grey	---	---	16.0 – 36.0 psig

Maximum Inlet Pressure	230 psig
Outlet pressure Range	6.8" w.c. – 36.0 psig
Temperature range	-20°F to +140°F
Acceptable gases	Natural gas, propane, butane, air, nitrogen or any non-corrosive gas
Mounting Position	Horizontal or vertical
Pressure Registration	External (control line required - 1/4" NPT)
Vent Connection	1/4" NPT
Valve Body Sizes	1-1/2" NPT
Orifice Sizes	1-1/8"
Other Available Options	- Seal wire to indicate unapproved tampering

Valve Body Sizes and Flow Coefficients (K-factors)

Inlet	Outlet	Orifice Diameter (inches)	Wide-Open Flow Coefficient (K-Factor)
1-1/2"	1-1/2"	1-1/8"	1120

For wide-open orifice flow calculations use the following equations:

For $P_1/P_2<1.89$ use: $Q=K\sqrt{P_2(P_1 - P_2)}$

For $P_1/P_2>1.89$ use: $Q = KP_1/2$

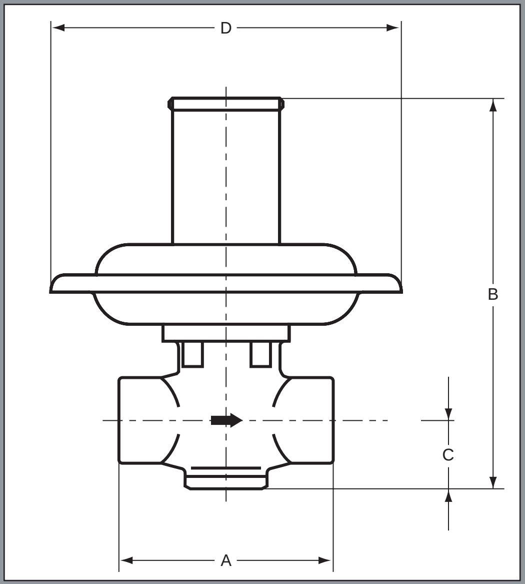
Where: P_1 = absolute inlet pressure (psia)

P_2 = absolute outlet pressure (psia)

Q = flow rate (scfh)

K = orifice coefficient (scfh/psi)

RB1700 Dimensions (in inches)



Dimensions (inches)	Model 1710	1720 1730
A	5.9	5.9
B	15.7	13.8
C	2.4	2.4
D	14.0	8.0
Weight (lbs.)	33	28