![Itron logo]

RB 1700 - 3/4"

Commercial & Industrial Regulator

The RB 1700 regulator is designed for commercial applications, 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.

KEY BENEFITS

» High flow accuracy
» Easy maintenance
» Rugged construction for durability
» Balanced valve design eliminates inlet pressure effect
» EN 334 compliant

DESCRIPTION

The RB 1700 model is a direct-acting, spring-loaded regulator with an optional built-in safety shut-off device. Its balanced valve design ensures constant outlet pressure when the upstream pressure varies. An optional built-in shut-off valve offers protection against over-pressure and over-and under-pressure. Its bypass system eases the shut-off valve relatching.
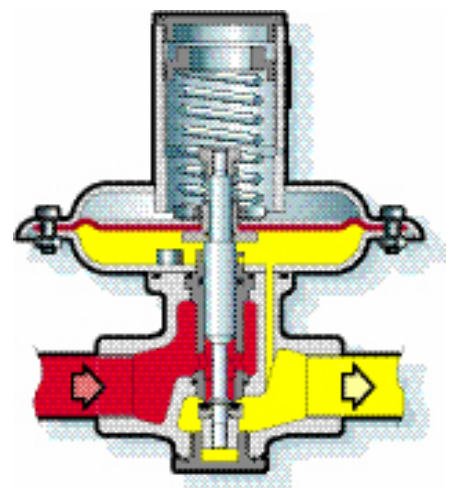
Operational Diagram

Accuracy class (AC), lock-up pressure class (SG) and lock-up pressure zone:

» RB 172x   0.1 - 0.4 bar   AC 20 / SG 30
» RB 172x   0.4 - 1.3 bar   AC 10 / SG 20
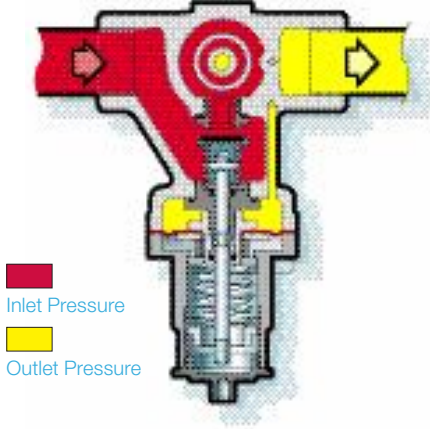» RB 173x   0.5 - 2.5 bar   AC 10 / SG 20

The typical lock-up pressure zone is:

$$\frac{Qmin, Pu}{Qmax, Pu} = \frac{2.5}{100}$$

Technical Features

Inlet pressure	19 bar
Outlet pressure	0.1 bar - 4.8 bar
Accuracy & lock-up pressure	Up to AC 10 / up to SG 20
Operating temperature	-20°C to +60°C
Ambient temperature	-30°C to +60°C (body material)
Acceptable gases	Natural gas, town gas, propane, butane, air, nitrogen or any non-corrosive gas
Safety devices	Optional built-in safety shut-off valve: over-pressure shut-off (OPSO) and under-pressure shut-off (UPSO)

Sizes & Connections

Body sizes	3/4"
Connections	Parallel internal thread according to ISO 7-1, ISO 228-1 or NPT

Materials

Body	Spheroidal graphite cast iron EN 1563 grade EN-GJS-400-15
Head	Pressed steel UNI EN 10025
Internal parts	Stainless steel and brass
Seals	Nitrile rubber
Diaphragm	Synthetic rubber with fabric reinforcement

🟥 Inlet Pressure   🟨 Outlet Pressure

knowledge to **shape your future**

Inlet Pressure
Outlet Pressure

SAFETY SHUT-OFF VALVE

The RB 1700 Series regulators can be fitted with a safety shut-off valve for over-pressure (OPSO) or combined under-and over-pressure (UPSO/OPSO) protection.

The SSV trip pressure can easily be adjusted independently of the regulator set point. The closing plug of the SSV controller is used as a pulling tool to relatch the valve.

A built-in bypass, for balancing pressure before relatching the safety shut-off valve, is operated by pulling the valve stem.

Accuracy class (AG)

» 0.3 - 5.7 bar   AG 10

Minimum difference between regulator and SSV settings (ΔP_W):

» 15%, of set point

OUTLET PRESSURE RANGE

Regulator 3/4"

| Spring Code | Spring Characteristic | | | | Spring Range | |
	d (mm)	De (mm)	Lo (mm)	Lt	1720 - 1721 - 1722 (Ø165)	1730 - 1731 - 1732 (Ø90)
20565141	3.5	35	80	8	0.12 - 0.40 bar	•
20565142	4	35	80	8	0.21 - 0.65 bar	•
20565143	4.5	35	80	8	0.34 - 0.92 bar	•
20565144	5	35	80	8	0.55 - 1.32 bar	•
20565127	3.5	35	50	6	•	0.50 - 0.85 bar
20565128	4	35	50	6	•	0.80 - 1.30 bar
20565129	4.5	35	50	6	•	1.20 - 2.30 bar
20565130	4.5	35	60	6.5	•	2.00 - 3.30 bar
20565131	5	35	60	6.5	•	2.00 - 4.80 bar

Safety Shut-off Valve

Over Pressure Shut-off Springs (OPSO)

| Spring Code | Spring Characteristic | | | | Spring Range 1721 - 1722 - 1731 - 1732 (Ø60) |
	d (mm)	De (mm)	Lo (mm)	Lt	
20563124	2.2	25	35	5.5	0.30 - 0.60 bar
20563121	2.5	25	35	5	0.50 - 1.10 bar
20563115	3	25	35	5.5	1.10 - 2.10 bar
20563116	3.5	25	35	5.5	2.00 - 4.00 bar
20563119	3.8	25	36.5	5.5	4.00 - 5.70 bar

Under-Pressure Shut-off Springs (UPSO)

20560516	1	10	30	5.5	0.10 - 0.22 bar
20560517	1.2	10	30	5	0.22 - 0.45 bar

Standard conditions:

- Absolute pressure of 1.013 bar
- Temperature of 15°C

Spring characteristics:

d: wire diameter   Lo: height
De: external diameter   Lt: no. of spires

Correction factor for non-natural gas applications:

The flow rates are indicated for a 0.6 specific gravity gas.
To determine the volumetric flow rate for gases other than natural gas, multiply or calculate the values in the capacity tables using the sizing equations with a correction factor.
The table below lists correction factors for some common gases:

Gas type	Specific gravity	Correction factor
Air	1.00	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

Specific gravity or relative density (air = 1, non-dimensional value)

Use the following formula to calculate the correction factor for gases not listed above. In the formula, d is the specific gravity of the gas.

Correction factor $= \sqrt{\dfrac{0.6}{d}}$

FLOW CAPACITY

The following table gives the maximum flow capacity - in m^3/h at standard conditions. More data are available in the leaflet "RB 1700 Capacity Tables".

| Inlet Pressure | Inlet Pressure | | | | | |
	RB 1720 150 mbar	RB 1720 300 mbar	RB 1720 500 mbar	RB 1720 0.8 bar	RB 1720 2 bar	RB 1720 4 bar
250 mbar	9	•	•	•	•	•
500 mbar	17	16	•	•	•	•
700 mbar	20	22	19	•	•	•
1 bar	26	30	30	10	•	•
1.5 bar	32	38	44	20	•	•
3 bar	50	60	70	36	34	•
5 bar	50	70	100	50	60	60
7 bar	50	70	140	70	80	100
≥ 10 bar	50	70	170	95	110	140

In order to limit the noise emission it is recommended not to exceed a gas velocity of 100 m/s at the regulator outlet.

FLOW CAPACITY

For a 0.6 specific gravity gas, the wide-open orifice flow (Q) may be calculated using the following equations:

» Sub-critical flow behaviour: $Q = K_G \sqrt{P_d(P_u - P_d)}$ where $(P_u - P_d) \leq 0.5\, P_u$

» Critical flow behaviour: $Q = K_G\, P_u/2$ where $(P_u - P_d) > 0.5\, P_u$

where:

Q = volumetric flow rate in m³/h at standard conditions
P_u = absolute inlet pressure in bar
P_d = absolute outlet pressure in bar

Wide-open Flow Coefficient KG

90 (without safety shut-off valve)

Overall Dimensions

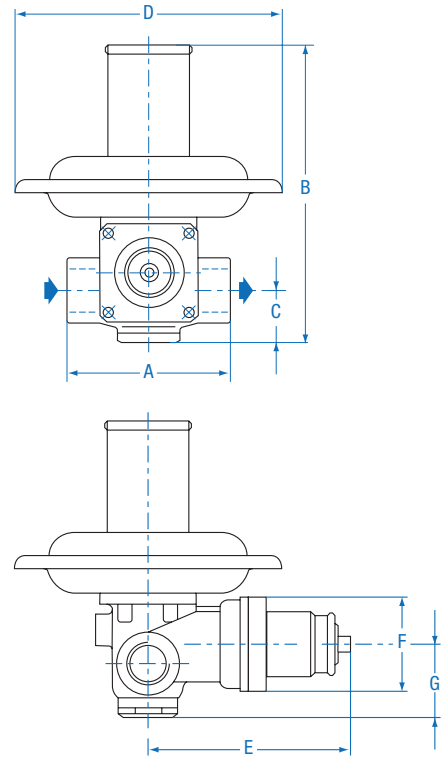| DN	Actuator	A mm	B mm	C mm	D mm	E mm	F mm	G mm	Weight (kg)	with SSV
3/4"	Ø 165	100	185	32	165	130	60	46	3.0	4.0
3/4"	Ø 90	100	175	32	90	130	60	46	2.2	3.2

Vent and Sensing Lines

» Regulator sensing line: internal
» Regulator vent line: G 1/2" as option

» SSV sensing line: internal
» SSV vent line: Rp 1/8

RB 1700 DN 3/4" Gas

Type Designation

R B I 1 7	X	X	- DN	X	Options
	2				Medium pressure
	3				High pressure
		0			No safety device
		1			Over-pressure shut-off valve
		2			Over-and under-pressure shut-off valve
				¾"	Body size

Information to be specified when ordering:

» Regulator type code
» Minimum and maximum inlet pressures
» Outlet pressure range setting
» Outlet pressure setting
» Connection type
  • OPSO setting*
  • UPSO setting*

* (if requested)

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