

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.



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.

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" |
| Outlet pressure | 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 |

Key Benefits

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

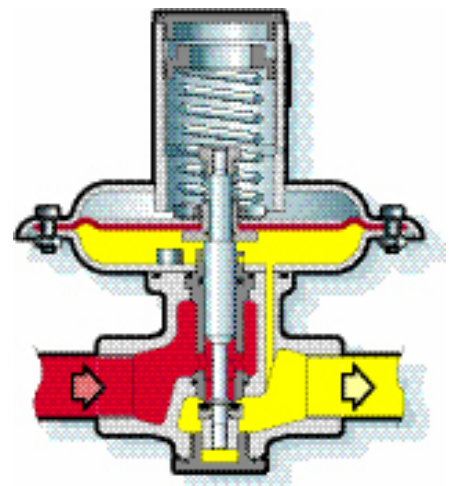
Operational Diagram

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

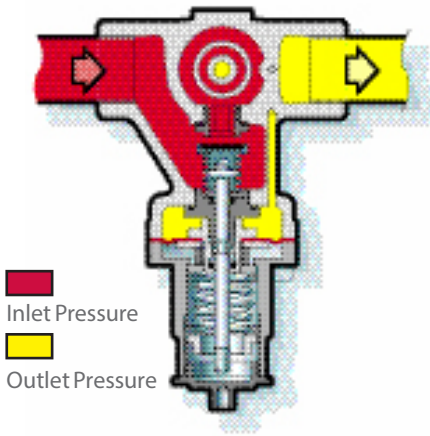
The typical lock-up pressure zone is:

$$\frac{Q_{min, Pu}}{Q_{max, Pu}} = \frac{2.5}{100}$$



■ Inlet Pressure ■ Outlet Pressure

Operational Diagram



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 | 1.00 |
| 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.

$$\text{Correction factor} = \sqrt{\frac{0.6}{d}}$$

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 (ΔPw):

» 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 | |
|-------------|-----------------------|---------|---------|-----|---------------------------------|--|
| | d (mm) | De (mm) | Lo (mm) | Lt | 1721 - 1722 - 1731 - 1732 (Ø60) | |
| 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 | |

Flow Capacity

The following table gives the maximum flow capacity - in m³/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: $Q = KG \sqrt{P_u(P_u - P_d)}$ where $(P_u - P_d) \leq 0.5 P_u$
- » Critical flow behaviour: $Q = KG P_u / 2$ where $(P_u - P_d) > 0.5 P_u$

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

Type Designation

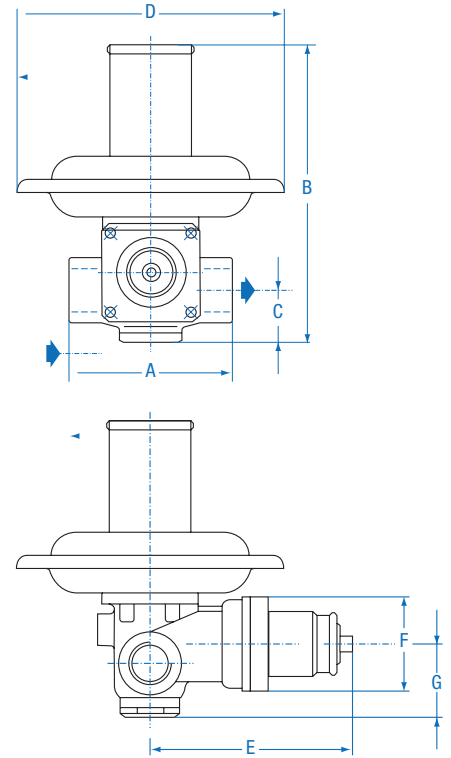
| RBI 17 | X | X | - DN | X | Options |
|--------|---|---|------|------|--|
| | 2 | | | | Medium pressure |
| | 3 | | | | High pressure |
| | | 0 | | | No safety device |
| | | 1 | | | Over-pressure shut-off valve |
| | | 2 | | | Over-and under-pressure shut-off valve |
| | | | | 3/4" | Body size |

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



RB 1700 DN 3/4" Gas

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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