

Pressure Regulator RB 2000

- ▶ **Balanced valve design eliminates inlet pressure effect**
- ▶ **Rugged construction for durability**
- ▶ **Rapid response to load changes**
- ▶ **Integral shutoff valve**
- ▶ **Internal relief**
- ▶ **Inlet strainer**

Applications

The RB 2000 regulator is designed for commercial and small industrial applications, and all installations with continuous consumption or rapid flow rate variations, such as burners, industrial ovens, boilers...

It is suitable for installation in cabinets, as a space saving regulator.

Description

The RB 2000 regulator is a direct-acting, spring-loaded regulator (lever type) with an integrated relief valve and optional safety shut-off device.

The balanced valve ensures constant outlet pressure when the upstream pressure varies. This eliminates changes to the orifice size arising from different inlet pressure ranges. The regulator is equipped with a built-in filter (filtration grade 0.5 mm).

The safety shutoff valve cuts the gas flow when the outlet pressure exceeds the set pressure (UPSO) or when it drops below the set value (UPSO). It remains closed until the valve is manually reset.

The relief valve avoids triggering the safety shutoff valve in case of thermal expansion, transient surges of pressure and creep leaks from regulator. The relief pressure is pre-set from factory.

Technical features

Maximum inlet pressure	10 bar
Outlet pressure	5 mbar – 180 mbar Extended range up to 750 mbar
Accuracy & lock-up pressure	Up to AC5 / up to SG 10
Operating temperature	-20°C to +60°C
Acceptable gases	Natural gas, town gas, propane, butane, air, nitrogen or any non-corrosive gas
Installation	Horizontal or vertical
Safety devices	Standard relief valve Optional built-in safety shut-off valve: - over-pressure shut-off (OPSO) - under-pressure shut-off (UPSO)
Options	Internal or external sensing line Monitor version

Sizes & Connections

Sizes	1" x 1" 1" x 1 1/2 only serie RB 2600
Type	Gas female threaded according to ISO 228/1 or ISO 7/1



▶ **Pressure Regulator RB 2011**

 Inlet pressure
 Outlet pressure



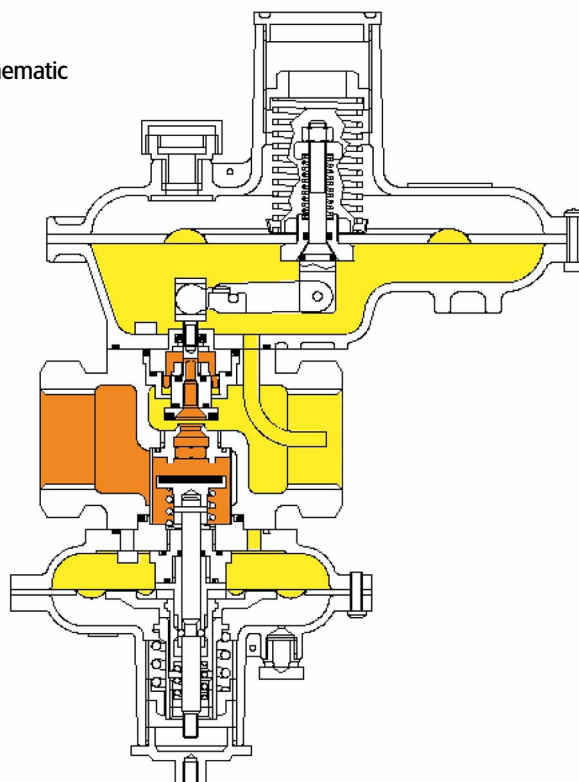
► RB 2011

Materials

Body	Spheroidal graphite iron SFP 500
Head	Die cast aluminium
Internal parts	Stainless steel and brass
Seals	Nitrile rubber
Diaphragm	Rubberized fabric

► RBI 2612 Type

Operational Schematic



Type designation and options

To specify the version of the RB 2000 regulator to be ordered, the options and relevant codes should be selected from the table below..

R	B	X	2	X	1	X	X	X	Vars
		E							External sensing line
		I							Internal sensing line
			0						Orifice (Ø 7 mm)
			1						Orifice (Ø 11 mm)
			2						Orifice (Ø 13 mm)
			3						Orifice (Ø 14 mm)
			6						Orifice (Ø 14 mm)
					0				Relief valve
					1				Relief valve + Over-pressure shut-off valve
					2				Relief valve + Over and low-pressure shut-off valve
						M			Monitor version
							TR		Reduced head (see spring selection tables)

Example : RBE 2312/TR is a 2300 regulator with a balanced valve, an external sensing line, a reduced head and an OPSO / UPSO shut-off valve.

Outlet Pressure Range

Regulator

Spring Code	Spring Characteristics				Spring Range		
	d	De	Lo	It	2000 - 2100 - 2200 (Ø 180)	2000/TR - 2600/TR (Ø 180/TR)	2300 - 2600 (Ø 180)
20564241	1.5	30	80	9.5	•	•	6 - 10
20564141	1.6	30	80	9.5	5 - 12	•	8 - 3
20564142	1.8	30	80	8.5	8 - 18	•	13 - 25
20564050	1.8	30	100	10	15 - 25	•	20 - 28
20564051	2	30	100	11.5	22 - 33	47 - 78	26 - 39
20564044	2.2	30	80	9	20 - 50	54 - 115	36 - 50
20564042	2.5	30	80	9	36 - 78	95 - 215	46 - 80
20564143	3	30	80	9	75 - 150	260 - 400	100 - 180
20564144	3.5	30	80	9	•	450 - 750	

Spring characteristics:

d : wire diameter

De : external diameter

Lo : height

It : nber of spires

Shut-off valve

Over-pressure shut-off springs (OPSO)

Spring Code	Spring Characteristics				Spring Range	
	d mm	De mm	Lo mm	It	2011 - 2611 (Ø 120)	2012 - 2612 (Ø 120)
20563022	1.5	25	35	5.5	20 - 40	28 - 60
20563023	1.7	25	35	5.5	30 - 70	40 - 100
20563014	1.9	25	35	5.5	60 - 160	60 - 140
20563124	2.2	25	35	5.5	70 - 240	130 - 260
20563121	2.5	25	35	5.5	80 - 350	220 - 350

Under-pressure shut-off springs (UPSO)

Spring code	Spring Characteristics				Spring range
	d (mm)	De (mm)	Lo (mm)	It	Reg 2012 - 2612 (Ø 120)
20560522	0.7	10	20	7	4 - 14 mbar
20560511	0.8	10	20	7	10 - 25 mbar
20560515	0.8	10	30	10	20 - 35 mbar
20560518	0.9	10	30	10	32 - 45 mbar

Relief Valve

The built-in relief valve is set 15 mbar above outlet pressure setting.
Other settings on request.

Flow Capacity

RBE 2012 - 1" x 1" (with SSV)

Inlet Pressure	Capacities in m³/h in standard conditions				
	Outlet pressure setting				
	20 mbar	50 mbar	100 mbar	300 mbar	400 mbar
0.35 bar	25	20	15	-	-
0.5 bar	35	28	22	20	-
0.7 bar	35	30	24	22	18
1 bar	35	27	25	22	20
1.5 bar	32	28	25	23	23
2 bar	30	30	28	25	22
4 bar	30	32	30	26	25
5 bar	28	28	26	25	25
8 bar	25	24	22	22	20
10 bar	25	25	24	20	20

RBE 2112 - 1" x 1" (with SSV)

Inlet Pressure	Capacities in m³/h in standard conditions				
	Outlet pressure setting				
	20 mbar	50 mbar	100 mbar	300 mbar	400 mbar
0.35 bar	30	25	20	-	-
0.5 bar	40	30	25	22	-
0.7 bar	40	32	30	26	22
1 bar	45	60	68	55	45
1.5 bar	45	56	65	65	41
2 bar	40	36	32	28	27
4 bar	38	35	32	30	27
5 bar	35	38	35	32	30
8 bar	35	36	36	34	34
10 bar	35	37	35	33	33

RBE 2212 - 1" x 1" (with SSV)

Inlet Pressure	Capacities in m³/h in standard conditions				
	Outlet pressure setting				
	20 mbar	50 mbar	100 mbar	300 mbar	400 mbar
0.35 bar	35	30	28	-	-
0.5 bar	45	35	32	30	-
0.7 bar	55	42	38	35	32
1 bar	60	48	48	46	45
1.5 bar	60	52	50	48	45
2 bar	58	58	55	52	50
4 bar	60	60	58	55	55
5 bar	65	64	64	62	60
8 bar	65	65	63	62	60
10 bar	65	64	62	62	60

Standard conditions:

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

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, the values in the capacity tables should be multiplied or calculated using the sizing equations with a correction factor.

The table below lists the 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)

To calculate the correction factor for gases not listed above, the specific gravity (d) of the gas should be taken and used in the following formula:

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

RBE 2312 - 1" x 1" (with SSV)

Inlet Pressure	Capacities in m ³ /h in standard conditions				
	Outlet pressure setting				
	20 mbar	50 mbar	100 mbar	300 mbar	400 mbar
0.35 bar	35	36	32	-	-
0.5 bar	65	60	62	65	-
0.7 bar	65	62	60	55	55
1 bar	65	65	70	60	53
1.5 bar	65	64	64	65	61
2 bar	75	80	90	85	70
4 bar	70	68	65	62	59
5 bar	68	70	65	63	60
8 bar	65	65	60	58	55
10 bar	65	62	55	52	50

RBE 2612 - 1" x 1 1/2" (with SSV)

Inlet Pressure	Capacities in m ³ /h in standard conditions				
	Outlet pressure setting				
	20 mbar	50 mbar	100 mbar	300 mbar	400 mbar
0.35 bar	38	35	30	-	-
0.5 bar	65	60	55	52	-
0.7 bar	70	68	65	63	60
1 bar	110	110	117	95	87
1.5 bar	110	105	105	115	110
2 bar	105	104	130	120	110
4 bar	80	80	78	80	75
5 bar	75	80	78	75	75
8 bar	72	70	65	60	58
10 bar	70	65	62	60	55

Maximum capacities at 10 % drop.

► The values given are those for appropriately sized pipe work.

► The flow capacity of the regulator without a safety shut-off device is 5 % higher.

Wide-open flow coefficient

The wide-open flow capacity can be calculated using the following formula:

- In critical flow conditions: If $(P_e/P_a) > 2$ $Q = K_G \sqrt{P_e/2}$
- In non-critical flow conditions: If $(P_e/P_a) \leq 2$ $Q = K_G \sqrt{P_a(P_e - P_a)}$

Orifice Size	7 mm	11 mm	13 mm	14 mm
K_G	40	100	140	160

where:

Q = maximum flow capacity (Sm³/h)

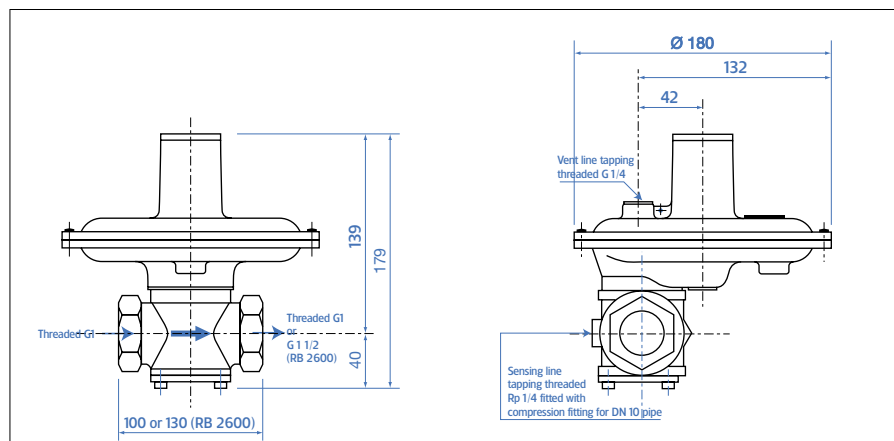
P_e = absolute inlet pressure (bar)

P_a = absolute outlet pressure (bar)

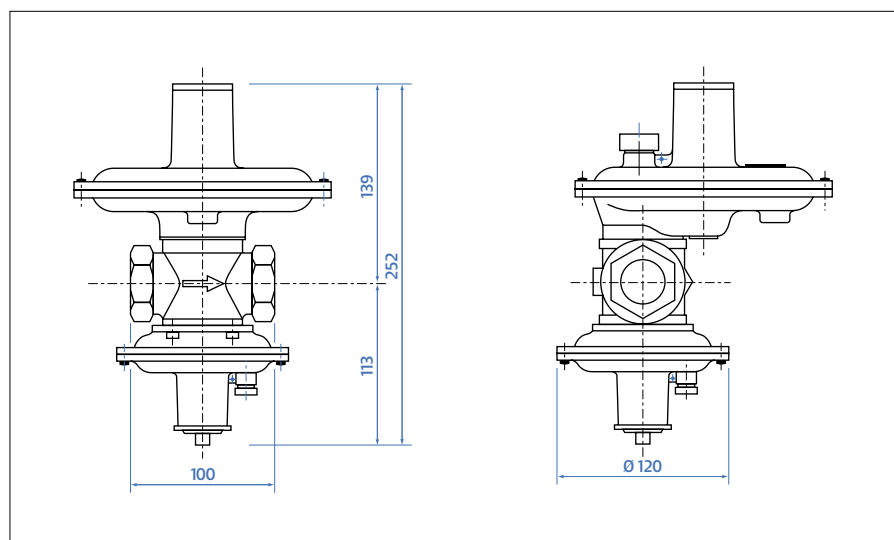
K_G = flow coefficient

► **RB 2000**
without safety shut-off valve
Weight 2 kg

Overall Dimensions (in mm)



► **RB 2000**
with safety shut-off valve
Weight 2.5 kg



Information to be specified when ordering:

- Regulator type code
- Minimum and maximum inlet pressures
- Outlet pressure range
- Outlet pressure setting
- Maximum flow rate

- OPCO setting*
- UPCO setting*

* (if requested)

Installation

- The RB 2000 regulator can be mounted in any position, horizontal or vertical
- RB 2000 can be used as monitor regulator, upstream to an active regulator. The external sensing line shall then be connected downstream to the regulator to be controlled.

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