

Pressure Regulator RB 1200

- ▶ For residential application
- ▶ Angle or in-line design
- ▶ Integral shutoff valve
- ▶ Internal relief
- ▶ Inlet strainer
- ▶ Adjustable on site

Applications

The RB 1200 regulator is designed for residential and light commercial applications. Its valve design makes it specially adequate for medium pressure service lines where it accommodates large inlet pressure variations while keeping very constant outlet. The RB 1200 offers two connection styles providing flexibility for meter mounting or integration in compact meter boxes.

Description

The RB 1200 regulator is a spring-loaded self operated regulator with internal relief and safety shut-off device. It is fitted an inlet strainer. The safety shut-off valve cuts the gas flow when the outlet pressure exceeds the set pressure (OPSO) or when it drops below the set value (UPSO). It remains closed until the valve is manually reset. Its internal relief valve (SRV) avoids triggering the safety shut-off valve in case of thermal expansion, transient surges of pressure and creep leaks from regulator.

Technical features

Maximum inlet pressure	10 bar
Outlet pressure	13 mbar – 135 mbar
Accuracy & lock-up pressure	Up to AC5 / up to SG10
Operating temperature	-20°C to +60°C
Acceptable gases	Natural gas, propane, butane, air, nitrogen
Safety devices	Standard relief valve Optional built-in safety shut-off valve: - Over-pressure shut-off (OPSO) - Under-pressure shut-off (UPSO)

Sizes & Connections

Sizes	DN 20 combi-body or DN 32 in-line body
Connection	Combi-body: internal thread ISO 7 - Rp 3/4 In-line body: external thread ISO 7 - Rp 1 1/4

Materials

Body/Actuator	Die cast aluminium
Seals	Nitrile
Diaphragms	Nitrile

Option Designations

RB 1210	with SRV
RB 1211	with OPSO and SRV
RB 1212	with OPSO, UPSO and SRV



- ▶ RB 1200 with built-in safety shutoff valve

Operating principle

The pressure reduction takes place between seat and tubular nozzle (1). The valve disc position is controlled by the diaphragm (2) which senses the **outlet pressure** on one side and is loaded by the spring (3) on the other side. spring load is adjustable by the nut (4). The cap (5) can be **sealed** to avoid unauthorized intervention.

By design the tubular nozzle is balanced against inlet pressure differentials.

Safety

The slam shut valve (7) shuts the gas flow of tight in case of **excess** of outlet pressure, which is sensed by the diaphragm (8). The load of the shut-off valve spring (9) is adjustable by the nut (10). The cap (11) can be **sealed** to avoid unauthorized intervention.

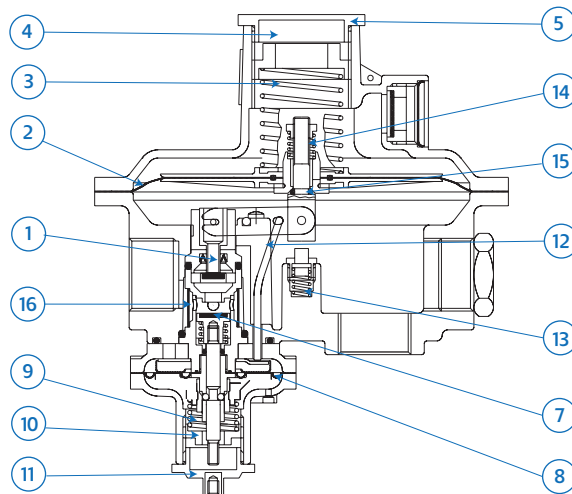
Optionally, the rod (12) actuated by the diaphragm assembly triggers the slam shut valve when **outlet pressure drops** below outlet set such as to overcome the load of spring (13). The set point is factory preset and cannot be adjusted on site.

A **safety relief valve** is integrated in the diaphragm assembly. When the outlet pressure build-up over set point exceeds the load of the spring (14), the diaphragm plate travels while the stem is stopped, thus opens passage between orifice (15) and plug.

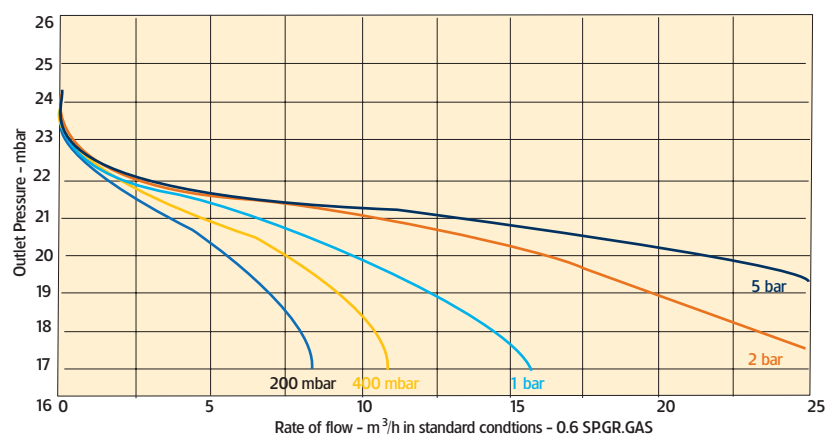
Gas is relieved to atmosphere through the breather tap.

A strainer (16) - 100 μm - protects the regulator on the inlet side.

RB1200 Sectional View



Typical Regulation Curve (22 mbar set point)



Flow Capacity

RB 1200 set at 22 mbar - model with built-in SSV

Inlet Pressure	Capacities (m ³ /h) in standard conditions
200 mbar	7
400 mbar	10.5
1 bar	14
2 bar	20
4 bar	30

Capacities at 4 mbar droop.

Outlet pressure range

Regulator

Spring Code	Spring Characteristics				Spring Range
	d	De	Lo	It	
	mm	mm	mm		
20564241	1.5	30	80	9.5	13 - 20 mbar
20564141	1.6	30	80	9.5	18 - 29 mbar
20564243	1.7	30	80	7.5	27 - 46 mbar
20564142	1.8	30	80	8.5	31 - 52 mbar
20564050	1.8	30	100	10	45 - 60 mbar
20564051	2	30	100	11.5	60 - 85 mbar
20564044	2.2	30	80	9	82 - 135 mbar

Shut-off valve

Over-pressure shut-off springs (OPSO)

Spring Code	Spring Characteristics				Spring Range
	d	De	Lo	It	
	mm	mm	mm		
20561915	0.9	18	25	6.5	30 - 41 mbar
20562018	1	18	25	6.5	38 - 56 mbar
20562015	1	18	30	6.5	55 - 80 mbar
20562020	1.1	18	30	6.5	70 - 120 mbar
20562019	1.2	18	25	5.5	115 - 135 mbar

Under-pressure shut-off springs (UPSO)

The set point of the under-pressure shutoff valve is not adjustable and is preset from factory. The differential pressure between regulator and UPSO set points is indicated in the following table. The level of pressure differential - low, medium, high - can be selected to suit the application.

Reg Spring Code	Differential (mbar)			Reg Spring Code	Differential (mbar)		
	Low	Med	High		Low	Med	High
20564241	8	15	20	20564050	20	25	30
20564141	10	20	25	20564051	40	50	55
20564243	25	35	40	20564044	55	65	70
20564142	20	30	35				

Relief valve

Spring Code	Relief set pressure*
955-203-36	10 mbar over set point

* Other settings on request

Spring characteristics:

d : wire diameter
De : external diameter
Lo : height
It : number of spires

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.

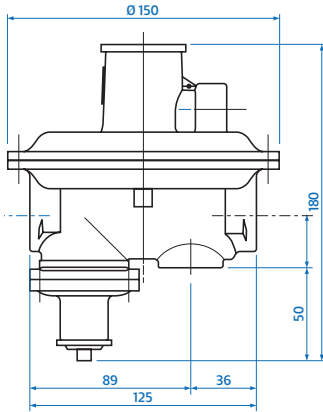
To determine the volumetric flow rate for gases other than natural gas, the values in the capacity tables should be multiplied or calculated using the sizing equations with a correction factor. The table below lists the correction factors for some common gases:

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

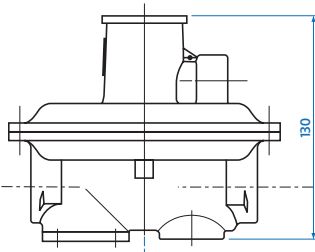
Specific gravity or relative density (air = 1, non-dimensional value)

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:

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



► Mod. 1211-1212 - Weight 1.1 Kg



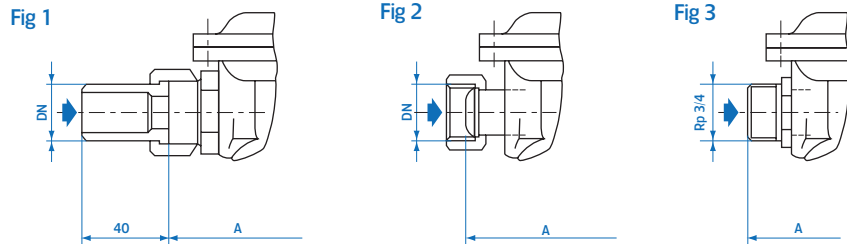
► Mod. 1210 - Weight 1 Kg

Information to be specified when ordering:

- Regulator type code
 - Minimum and maximum inlet pressures
 - Outlet pressure range
 - Outlet pressure setting
 - OPSO setting*
 - UPSO setting*
 - Connection type
- * if requested

Overall Dimensions & Fittings

Various additional fittings are available for inlet and outlet connections as shown below. Other possibilities can be provided on request.



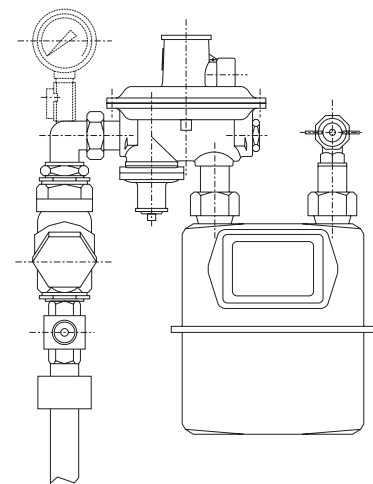
Inlet fitting type	See Fig	A (mm)
Three-pieces coupling be welded on DN 20 pipe	1	104
Three-pieces coupling be welded on DN 25 pipe	1	113
DN 20 sphero-conical coupling	2	110
DN 25 sphero-conical coupling	2	115
External thread ISO Rp-3/4	3	107

Outlet fitting type	
Gas meter union	G 1 1/4
External thread ISO R7	Rp 3/4

Installation

Gas must flow through the valve body in the same direction as the arrow cast on the body. The RB 1200 regulator can be mounted in any position. The set point shall be slightly adjusted when the regulator position makes the loading spring not to be vertical pointing upwards.

When changing the connection style (in-line or angle) ensure there are no leaks and that all connections are tight.



► Typical meter box installation

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 (OPSO) 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
Ambient temperature	-30°C to +60°C (body material)
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	Parallel internal thread according to ISO 228/1 or ISO 7/1



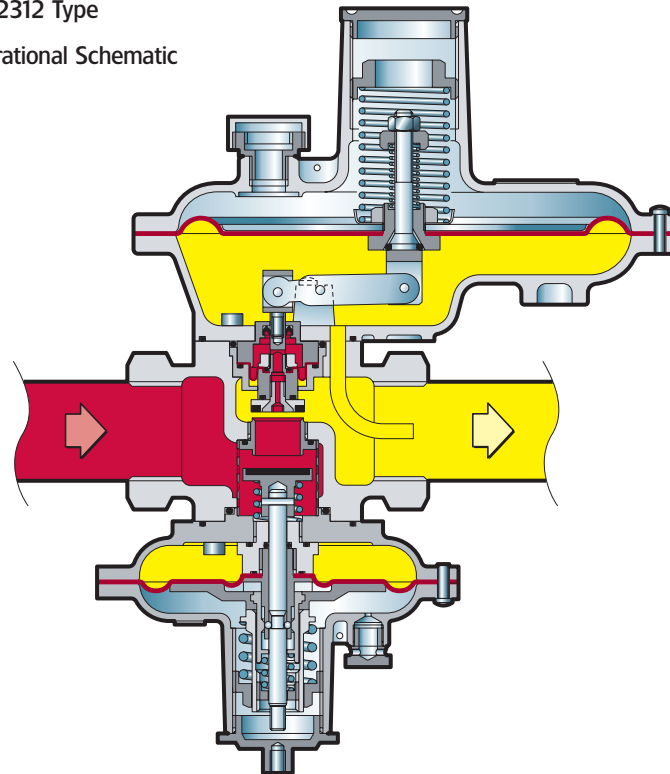
▶ Pressure Regulator RB 2011

Materials

Body	Spheroidal graphite iron EN 1563 grade EN-GJS-400-15
Head	Die cast aluminium
Internal parts	Stainless steel and brass
Seals	Nitrile rubber
Diaphragm	Rubberized fabric

► RBI 2312 Type

Operational Schematic



■ Inlet pressure
■ Outlet pressure

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	Variants
		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.



► RB 2011

Outlet Pressure Range

Regulator

Spring code	Spring Characteristics				Spring range		
	d	De	Lo	It	2000-2100-2200	2300-2600	2000-2600 TR
	mm	mm	mm	mm	Ø 180 mbar	Ø 180 mbar	Ø 180 mbar
20564241	1.5	30	80	9.5	-	6 - 10	-
20564141	1.6	30	80	9.5	5 - 12	8 - 13	-
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	26 - 39	-
20564044	2.2	30	80	9	20 - 50	36 - 50	-
20564042	2.5	30	80	9	36 - 78	46 - 80	95 - 215
20564043	2.5	30	80	7	70 - 105	80 - 110	180 - 260
20564143	3	30	80	9	75 - 150	100 - 180	260 - 400
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)

*when fitted also
with UPSO spring**

Spring Code	Spring Characteristics				Spring Range		Spring Range	
	d	De	Lo	It	2011-2611	2011-2611 TR	2012-2612	2012-2612 TR
	mm	mm	mm	mm	Ø 120 mbar	Ø 120 mbar	Ø 120 mbar	Ø 120 mbar
20563022	1.5	25	35	5.5	20 - 60	-	28 - 60	-
20563023	1.7	25	35	5.5	30 - 90	90 - 130	40 - 90	90 - 130
20563014	1.9	25	35	5.5	60 - 130	120 - 180	70 - 130	120 - 180
20563124	2.2	25	35	5.5	70 - 220	160 - 330	120 - 220	160 - 330
20563121	2.5	25	35	5.5	150 - 400	300 - 600	220 - 420	300 - 600
20563115	3	25	35	5.5	-	580 - 1000	-	580 - 1000

* the space available for OPSO spring is reduced by the UPSO spring assembly

Under-pressure shut-off springs (UPSO)

Spring code	Spring Characteristics				Spring range	
	d	De	Lo	It	2012-2612	2012-2612 TR
	mm	mm	mm	mm	Ø 120 mbar	Ø 120 mbar
20560522	0.7	10	20	7	4 - 14	-
20560511	0.8	10	20	7	10 - 25	-
20560515	0.8	10	30	10	20 - 27	-
20560518	0.9	10	30	10	37 - 45	-
20560516	1	10	30	10	-	26 - 57
955-201-17	0.9	10.4	28	7	-	13 - 50
20560520	1	10.3	25	7.5	45 - 75	-
20560521	1.3	15	40	9.5	-	60 - 90
20560517	1.2	10	30	10	-	85 - 170
20560519	1.4	10	30	10	-	150 - 300

Relief Valve

The built-in relief valve is set 15 mbar (head 180) or 50 mbar (head 180 TR) above outlet pressure setting.

Other settings on request.

Flow Capacity

RBI 2012 - 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	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

RBI 2112 - 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	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

RBI 2212 - 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	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 or 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:

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

RBI 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

RBI 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 $(P_u/P_d) > 2$ $Q = K_G \cdot P_u/2$
- In non-critical flow conditions: If $(P_u/P_d) \leq 2$ $Q = K_G \sqrt{P_d(P_u - P_d)}$

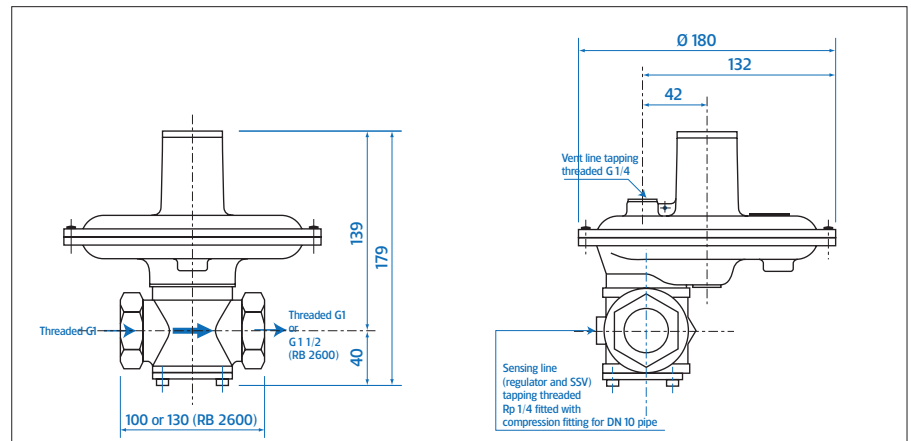
Orifice Size	7 mm	11 mm	13 mm	14 mm
K _G	40	100	140	160

where:

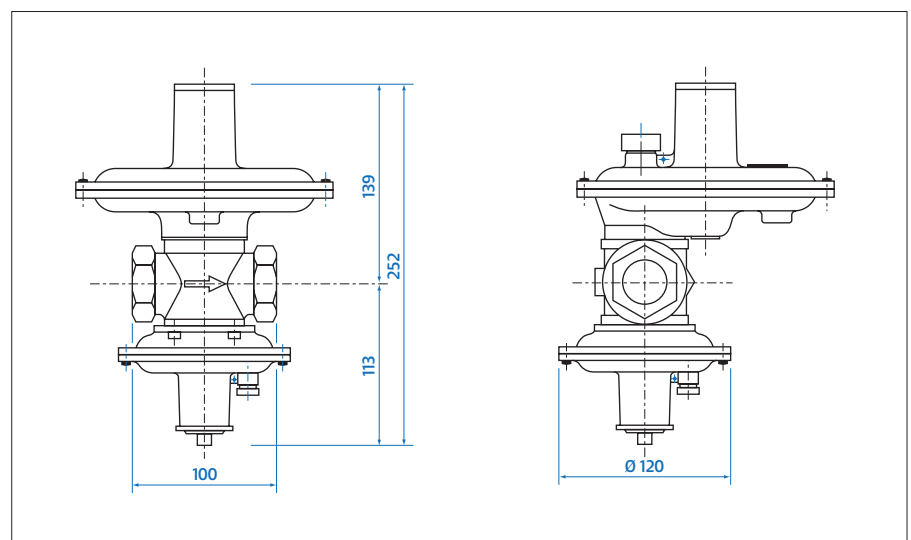
Q = maximum flow capacity (Sm³/h)
 P_u = absolute inlet pressure (bar)
 P_d = absolute outlet pressure (bar)
 K_G = flow coefficient

Overall Dimensions (in mm)

▶ RB 2000
without safety shut-off valve
Weight 2 kg



▶ 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*
 - UPKO 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.

Pressure Regulator RB 3200

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



▶ Pressure Regulator RB 3211

Applications

The RB 3200 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 3200 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 (OPSO) 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	7 mbar – 160 mbar Extended range up to 350 mbar
Accuracy & lock-up pressure	Up to AC5 / up to SG10
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
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)
Sensing line	External

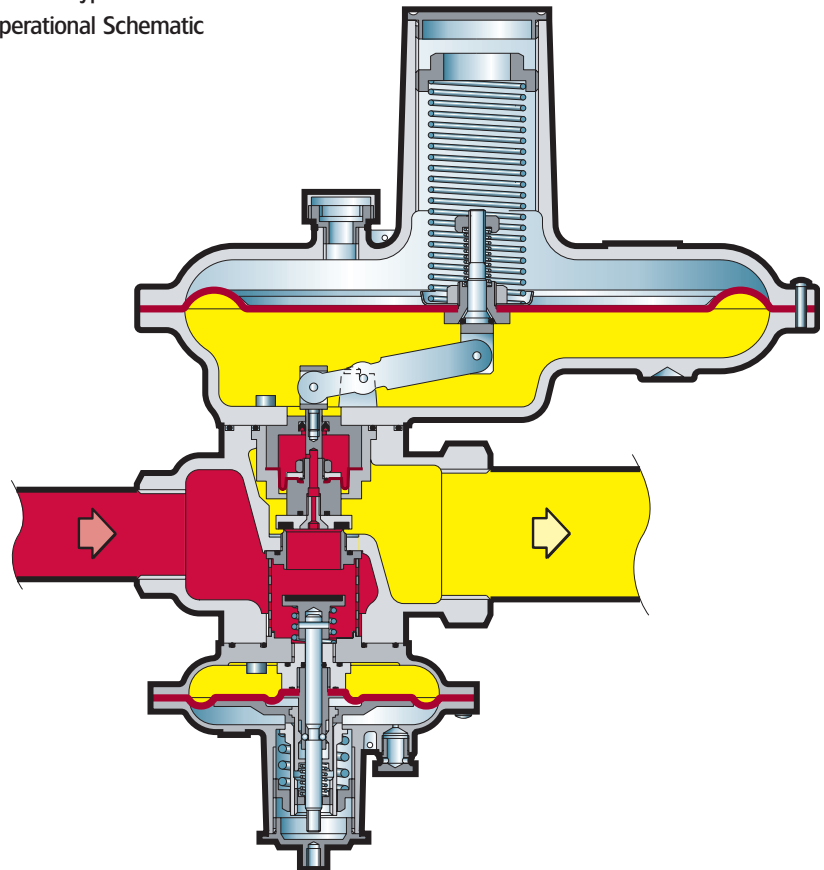
Size and Connections

Size	1" x 1 1/2"
Type	Parallel internal thread according to ISO 228/1 or ISO 7/1

Materials

Body	Spheroidal graphite iron EN 1563 grade EN-GJS-400-15
Head	Die cast aluminium
Internal parts	Stainless steel and brass
Seals	Nitrile rubber
Diaphragm	Rubberized fabric

► RB 3212 type Operational Schematic



■ Inlet pressure
■ Outlet pressure



► RB 3211

Type Designation and Options

To specify the version of the RB 3200 regulator to be ordered, the options and relevant codes should be selected from the table below.

R	B	E	3	2	1	x	x	Options
						0		Relief valve
						1		Relief valve + over-pressure shut-off valve
						2		Relief valve + over-and under-pressure shut-off valve
							TR	Reduced head (see spring selection tables)

Example: RBE 3212 is a 3200 regulator with an external sensing line and an OPSO / UPSO shut-off valve

Flow Capacity

RB 3200 with built-in SSV and external sensing line

Inlet Pressure	Capacities in m ³ /h in standard conditions					
	Outlet pressure setting					
	20 mbar	50 mbar	100 mbar	150 mbar	200 mbar	350 mbar
	<i>Spring</i>	<i>Spring</i>	<i>Spring</i>	<i>Spring</i>	<i>Spring</i>	<i>Spring</i>
	20565168	20565166	20565150	20565151	20565150	20565151
0.14 bar	70	63	38	-		
0.35 bar	120	115	95	95		
0.5 bar	145	140	120	110	62	46
0.7 bar	175	170	150	145	80	70
1 bar	230	210	180	170	105	100
1.5 bar	300	270	230	230	180	170
2 bar	380	330	280	280	260	260
4 bar	680	540	530	530	490	490
7 bar	950	870	850	850	800	800
10 bar	950	870	850	850	850	800

Maximum capacity at 20 % drop

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

▶ The flow capacities of the regulator without a safety shut-off device are approximately 15 % higher.

Fault Capacity

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

- ▶ Sub-critical flow behavior, where $P_u - P_d \leq 0.5 P_u$ $Q = 300 \sqrt{P_d (P_u - P_d)}$
- ▶ Critical flow behavior, where $P_u - P_d > 0.5 P_u$ $Q = 300 P_u / 2$

Installation

- ▶ The RB 3200 regulator can be mounted in any position, horizontal or vertical
- ▶ RB 3200 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.

Information to be specified when ordering:

- Regulator type code
 - Maximum inlet pressure
 - Outlet pressure range
 - Outlet pressure setting
 - OPCO setting*
 - UPCO setting*
- * if requested

Standard conditions:

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

where:

- Q = maximum flow capacity (Sm³/h)
- P_u = absolute inlet pressure (bar)
- P_d = absolute outlet pressure (bar)
- K_G = flow coefficient

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:

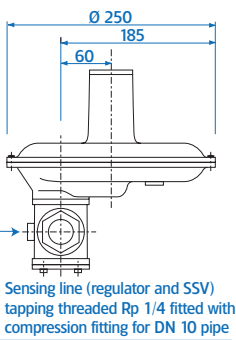
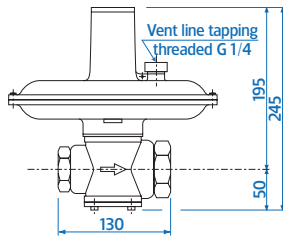
Gas type	Specific gravity	Correction factor
Air	1.00	0.77
Butane	2.01	0.55
Carbon dioxide (dry)	1.52	0.63
Carbon monoxide (dry)	0.97	0.79
Natural gas	0.60	1.00
Nitrogen	0.97	0.79
Propane	1.53	0.63
Propane-Air mix	1.20	0.71

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

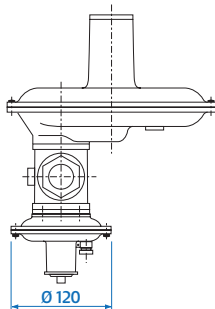
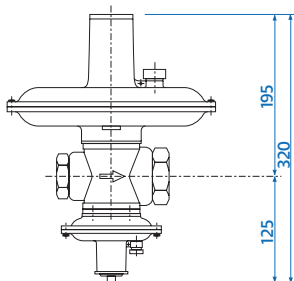
To calculate the correction factor for gases not listed above, the specific gravity (d) of the gas should be taken and used in the following formula:

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

Overall Dimensions (mm)



► Model: 3210 - Weight: 4.5 kg.



► Models: 3211 / 3212 - Weight: 4.9 kg.

Outlet Pressure Range

Regulator

Spring code	Spring Characteristics				Spring Range	
	d	De	Lo	It	3210/11/12 Ø 250 mbar	3210/11/12 TR Ø 250 mbar
	mm	mm	mm			
20565166	1.8	35	155	10	7 - 12	-
20565168	2.2	35	155	13	14 - 25	-
20565155	2.7	35	120	11	20 - 50	-
20565156	3	35	120	11.5	28 - 70	-
20565150	3,5	35	100	9.5	20 - 110	110-200
20565151	4	35	100	10.75	30 - 160	160-350

Shut-off Valve

Over-pressure shut-off springs (OPSO)

when fitted also
with UPSO spring*

Spring Code	Spring Characteristics				Spring Range		Spring Range	
	d	De	Lo	It	3211 Ø 120 mbar	3211 TR Ø 120 mbar	3212 Ø 120 mbar	3212 TR Ø 120 mbar
	mm	mm	mm	mm				
20563022	1.5	25	35	5.5	20 - 60	-	28 - 60	-
20563023	1.7	25	35	5.5	30 - 90	90 - 130	45 - 90	90 - 130
20563014	1.9	25	35	5.5	60 - 130	120 - 180	70 - 130	120 - 180
20563124	2.2	25	35	5.5	70 - 220	160 - 330	120 - 220	160 - 330
20563121	2.5	25	35	5.5	150 - 400	300 - 500	220 - 400	300 - 500

* the space available for OPSO spring is reduced by the UPSO spring assembly

Under-pressure shut-off springs (UPSO)

Spring code	Spring Characteristics				Spring range	
	d	De	Lo	It	3212 Ø 120 mbar	3212 TR Ø 120 mbar
	mm	mm	mm	mm		
20560522	0,7	10	20	7	4 - 14	-
20560511	0,8	10	20	7	10 - 25	-
20560515	0,8	10	30	10	20 - 27	-
20560518	0,9	10	30	10	37 - 45	-
20560516	1	10	30	10	-	26 - 57
955-201-17	0,9	10,4	28	7	-	13 - 50
20560520	1	10,3	25	7,5	45 - 75	-
20560517	1,2	10	30	10	137 - 144	85 - 170
2056519	1,4	10	30	10	-	150 - 300

Relief Valve

The built-in relief valve is set 10 mbar (head 250) or 50 mbar (head 250 TR) above outlet pressure setting. Other settings on request.

Spring characteristics:

d : wire diameter
De : external diameter
Lo : height
It : number of spires

Gasdruk regelaars Type: 133 & 233

- ▶ Ruime toepassing, door verwisselbare zittingen
- ▶ Kan in alle posities geïnstalleerd worden
- ▶ Door modulaire opbouw kunnen er delen vervangen worden zonder het huis uit de leiding te demonteren.
- ▶ Goedgekeurd door DVGW

Toepassing

De 133 en 233 regelaars zijn ontworpen voor huishoudelijk en industriële toepassing, zoals fabrieken, verwarminginstallaties en overige installaties waar een accurate druk regeling, gemakkelijke instelling en snelle reactietijd benodigd zijn. (branders, industriële ovens, boilers, enz)

Beschrijving

De 133 en 233 regelaars zijn direct werkende, veer gestuurde regelaars met geïntegreerde afslagveiligheid. Door een grote keuze aan zittingen maakt het een goede afstemming mogelijk met de verschillende capaciteiten en inlaat druk. Het toegepaste hefboom mechanisme zorgt voor een exacte uitgangsdruk en korte reactietijd bij variërende capaciteit. Het type 133 en de geflensde versie, type 233 zijn uitgevoerd met een ingebouwd filter element (maaswijdte: 0,5mm).

Technische Specificaties

Maximum toegestane inlaatdruk	8,0 bar
Uitlaatdruk	10 mbar- 0,7 bar
Nauwkeurigheid & sluitdruk	Tot AC5/ Tot SG10
Bedrijf temperatuur	Gas: -20°C tot +60°C
Geschikt voor	Aardgas, propaan, butaan, lucht, stikstof en niet agressieve gassen
Veiligheid	Aangebouwd aan regelaar (Optioneel) - Opso: overdruk beveiliging - Upso: onderdruk beveiliging
Optioneel	Veiligheidsmembraan Afblaas veiligheid

Aansluitingen

Doorlaat	DN25, DN40, DN50
Afmetingen	Zie tabel pagina 3
Flenzen	PN16, ANSI 150
Draadaansluiting	G 3/4", G1", G 1 1/2"

Materiaal

Huis	Nodulair gij GGG40, DIN 1693
Regelunit	Gegoten aluminium GD-AI Si 12, DIN1725
Afslagunit	Messing
Onderdelen	Messing /staal, zink gecoat
Afdichtingen	NBR rubber / Viton
Membraan	NBR rubber/ NBR rubber, verstevigd



▶ Drukregelaar 233

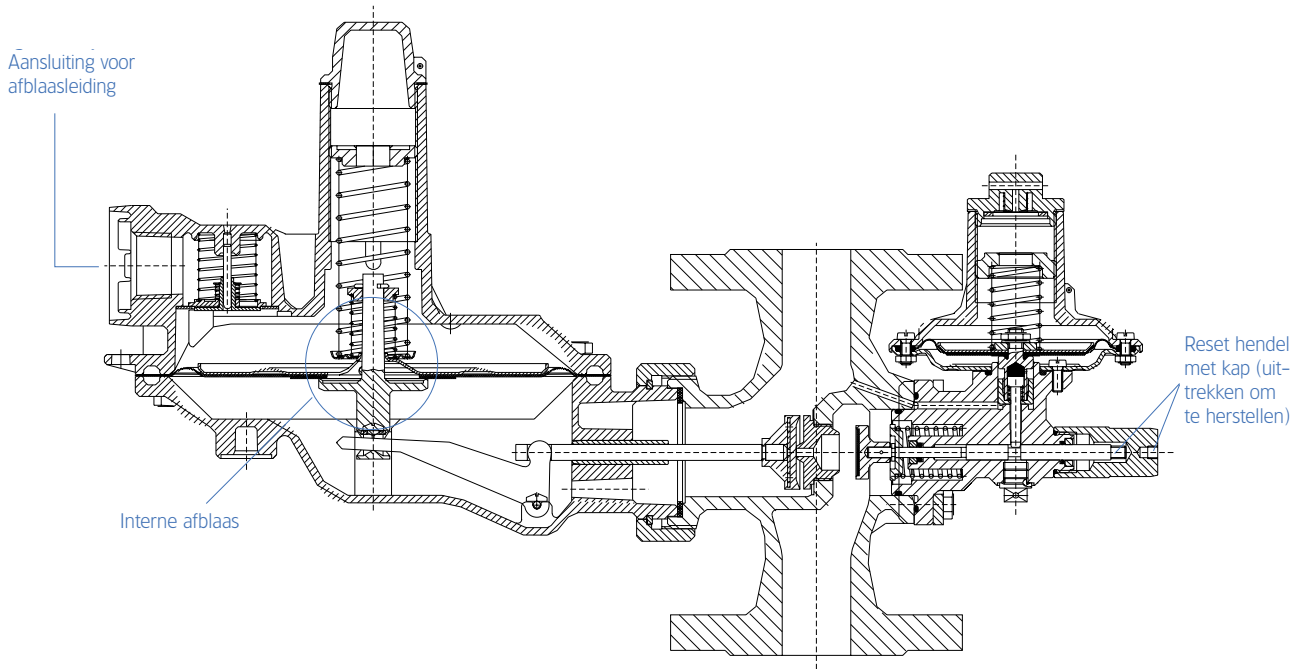


Fig.1: 133 regelaar met afslagveiligheid 033 en interne ontluuchtingsklep

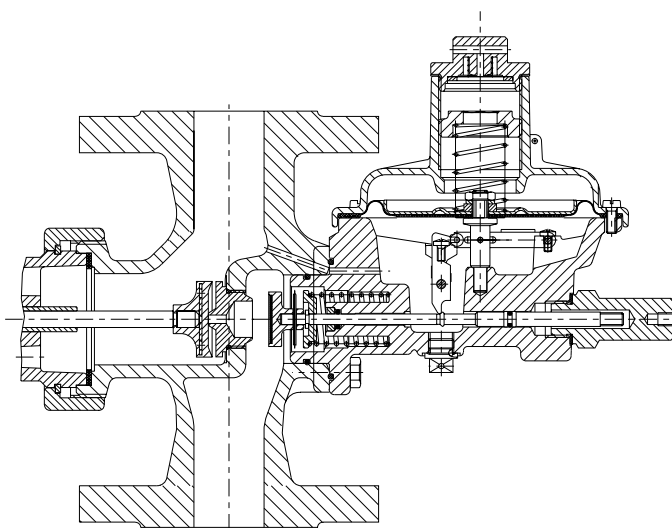


Fig.2: Afslagveiligheid type I

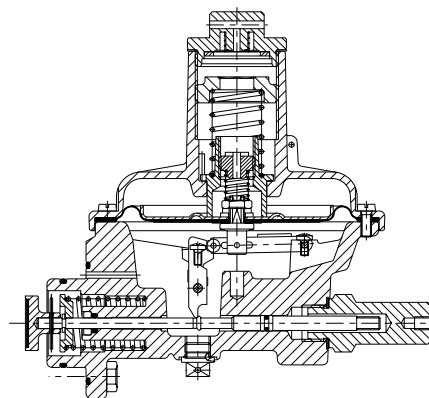


Fig.3: Afslagveiligheid type II

Doorlaat en regeleenheid

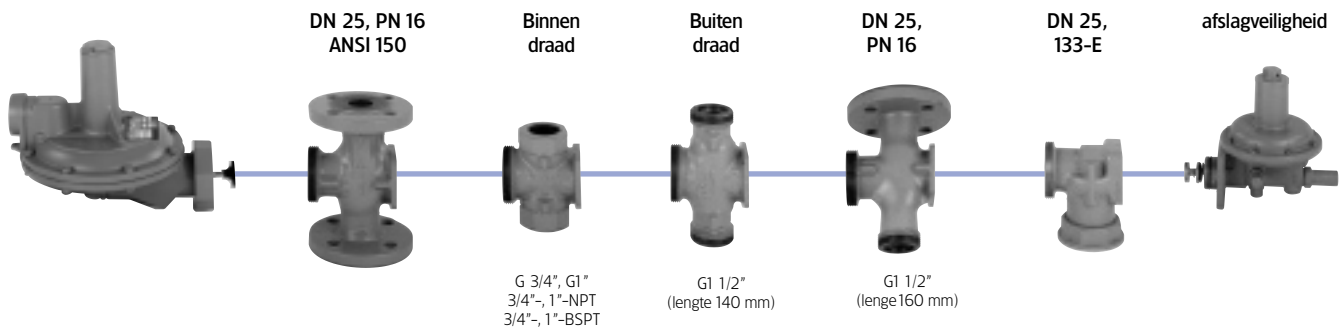
Selecteren van de regeleenheid

Regelaar Type	Type regelunit	Instel bereik (W _h)
133		8 - 210 mbar
	-HP	140 - 420 mbar
233	-12	8 - 210 mbar
	-8	30 - 450 mbar
	-8HP	420 - 700 mbar

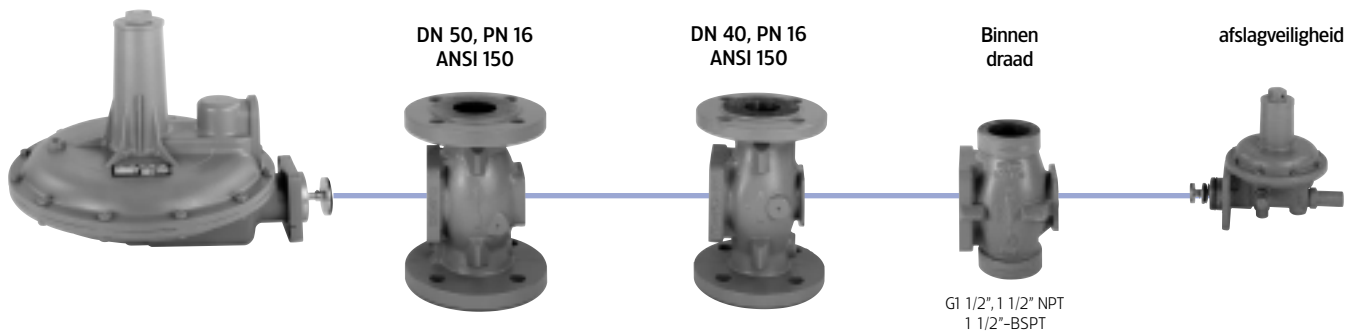
De 133 en 233 regelaar zijn verschilddruk regelaars . De ontwerp druk van de regelaars is lager dan 8 bar, maar niet lager dan de maximum druk welke kan optreden bij een storing.

Doorlaat afmetingen

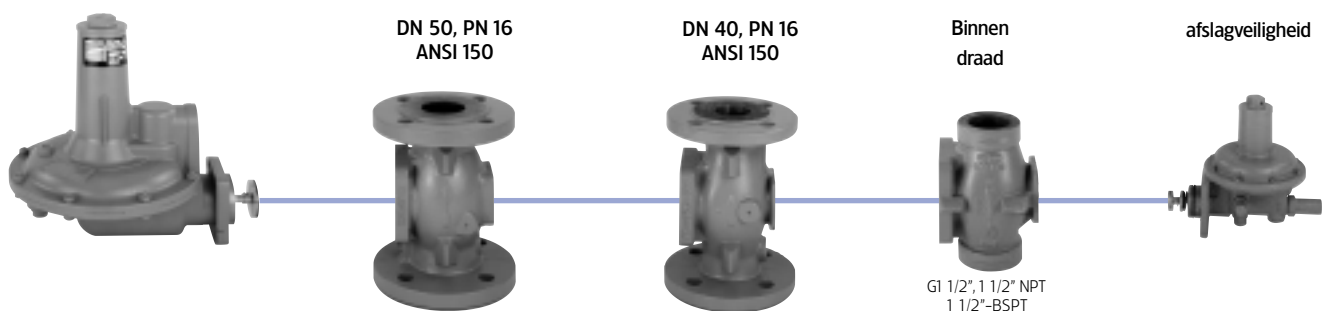
Type 133

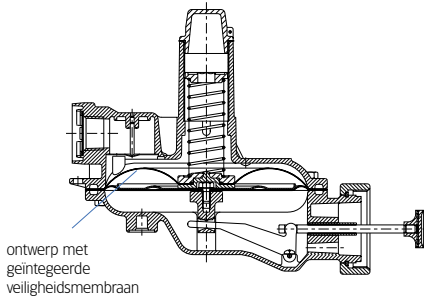


Type 233-12



Type 233-8





ontwerp met geïntegreerde veiligheidsmembraan

Speciale opties

► **Gasgebrek beveiliging:** Deze beveiliging is beschikbaar voor de regelaar, type 133-77(0) en vervangt de UPSO veiligheid. Als de uitlaatdruk inzakt (50% van de ingestelde waarde), zal de gasgebrek beveiliging worden aangesproken en de klep dichtgaan. Dit zorgt ervoor dat de gasstroom onderbroken wordt. Via een lekkkanaal blijft er een verbinding bestaan met de uitlaatzijde. Wanneer er geen gasafname is zal de druk via dit lekkkanaal weer opgebouwd worden. Als de druk hoog genoeg is zal de klep weer open gaan. De uitlaatdruk kan onbedoeld inzakken, doordat de inlaatdruk inzakt of doordat de afname hoger is dan de maximale capaciteit van de regelaar.

De gasgebrekbeveiliging kan niet toegepast worden bij een inlaatdruk hoger dan 1 bar.

► **Veiligheidsmembraan:** Deze optie biedt bescherming bij een scheur of een lek in het hoofdmembraan. Het veiligheidsmembraan beperkt de doorstroom naar de afblaas opening tot een 30 liter per uur. Als er een groot lek in het hoofdmembraan zit, zal de uitlaatdruk met 50% stijgen, hierdoor wordt de overdrukbeveiliging (OPSO) aangesproken.

Een veiligheidsmembraan kan niet toegepast worden bij een inlaatdruk hoger dan 1 bar.

► **Externe stuurleidingen:** Regelaars, type 133 en 233 zijn voorzien van een interne stuurleiding. Dit zorgt voor het optimaal functioneren van de regelaar. Echter externe stuurleidingen worden aangeraden bij een ingangsdruk hoger dan 4 bar. De interne stuurleiding zal

Afblaas instelling:

Met de standaard afblaasveer zal deze op 30 mbar boven de uitgangsdruk afblazen. Met een nauwkeurigheid van 10%.

Selecteren van de afslagveiligheid

Type	Max. druk	Functie	Bereik	
			W _{ho}	W _{hu}
033	Verschil druk	OPSO (overdruk)	40 mbar to 0.45 bar	-
I	Verschil druk	OPSO (overdruk)	20 mbar to 1.0 bar	-
II	Verschil druk	OPSO (overdruk) & UPSO (onderdruk)	20 mbar to 1.0 bar	8 to 50 mbar

Opmerking : De OPSO en UPSO worden separaat ingesteld.

Temperatuur beveiliging: (brand beveiliging)

Elke afslagveiligheid is voorzien van een temperatuur "zekering". Deze zorgt ervoor dat de klep van de beveiliging dicht gaat bij een hoge temperatuur (tussen 180 en 200°C).

DVGW aanbeveling m.b.t. veiligheid: De regelaars type 133 & 233 zijn gekeurd door de Duitse keuringsinstantie DVGW. De keuring is gerelateerd aan de Duitse regelgeving en condities voor veiligheid en gas installaties.

► Inlaatdruk onder de 6 bar

► OPSO en UPSO afslagveiligheden zijn benodigd wanneer de inlaatdruk boven de 4 bar komt.



► Druk regelaar type:133

Bereik uitlaatdruk

Regelaar

Type regelaar	Veer code	Veer kleur	Veer bereik
133-770 met gasgebrek beveiliging	955-200-08	rood	9 - 15 mbar
	955-200-09	blauw	14 - 20 mbar
DN25	955-201-06	zilver	18 - 26 mbar
	955-202-98	geel	24 - 40 mbar
	955-200-11	oranje	38 - 53 mbar
	955-200-08	rood	8 - 16 mbar
133	955-200-09	blauw	12 - 20 mbar
	955-200-10	groen	15 - 35 mbar
	955-200-11	oranje	30 - 70 mbar
	955-200-12	zwart-wit	50 - 140 mbar
	955-200-83	zilver	100 - 210 mbar
	955-200-84	zwart	140 - 420 mbar
133 HP	955-200-84	zwart	140 - 420 mbar
233-12	955-200-13	rood	8 - 16 mbar
	955-200-14	blauw	12 - 20 mbar
	955-200-15	groen	15 - 35 mbar
	955-200-16	oranje	30 - 70 mbar
	955-200-17	zwart	70 - 140 mbar
	955-200-18	metaal/blank	100 - 210 mbar
	955-200-18	metaal/blank	100 - 210 mbar
233-8	955-200-15	groen	30 - 70 mbar
	955-200-16	oranje	70 - 140 mbar
	955-200-17	zwart	140 - 300 mbar
	955-200-18	metaal/blank	210 - 450 mbar
233-8 HP	955-200-69	zilver+metaal/blank duo veer	420 - 700 mbar
	955-200-18		

Regelklasse (AC), sluitgroep (SG) en
statische/ dynamische sluitzone (SZ) :

- ▶ 8 - 20 mbar: **AC 20 / SG 30**
- ▶ 20 - 50 mbar: **AC 10 / SG 20**
- ▶ 50 - 700 mbar: **AC 5 / SG 10**

Bereik uitlaatdruk (vervolg)

Afslag veiligheid

SSV 033

Overdruk beveiliging (OPSO)	Veer code	Veer kleur	Veer bereik
	955-200-22	rood	40 – 70 mbar
	955-200-23	blauw	50 – 150 mbar
	955-200-24	groen	140 – 450 mbar

Nauwkeurigheid klasse (AG):

- ▶ OPSO: AG 10
- ▶ Minimaal verschil tussen instelling van de regelaar en afslagveiligheid (ΔP_w): OPSO dient 20 mbar hoger ingesteld te worden dan de regelaar.

SSV I en II

SSV I en II	Veer code	Veer kleur	Veer bereik
Overdruk afslagveiligheid (OPSO)	955-200-22	rood	20 – 60 mbar
	955-200-23	blauw	50 – 120 mbar
	955-200-24	groen	100 – 400 mbar
	955-200-52	bruin	300 – 600 mbar
	955-202-42	zilver	400 – 1000 mbar

SSV II	Veer code	Veerkleur	Veer bereik
Onderdruk afslagveiligheid(UPSO)	955-200-32	rood	8 – 50 mbar

Nauwkeurigheid klasse (AG):

- ▶ OPSO:
 - 20 – 400 mbar: AG 10
 - 0.4 – 1 bar: AG 5
- ▶ UPSO:
 - 8 – 20 mbar: AG 30
 - 20 – 50 mbar: AG 10
- ▶ Minimaal instel verschil tussen de regelaar en de veiligheid (ΔP_w):
 - 14 mbar t.o.v. de UPSO
 - 20 mbar t.o.v. de OPSO

Capaciteit

Regelaar Type 133, DN 25

Uitlaat Druk	Inlaat Druk (bar)	Capaciteit bij standaard condities (m ³ /h)					
		zitting					
		12.5 mm (1/2")	10 mm (3/8")	8 mm (5/16")	6.3 mm (1/4")	4.7 mm (3/16")	3 mm (1/8")
20 mbar	0.1 bar	24	17	16	9	■	■
	0.3 bar	40	36	29	22	12	6
	0.5 bar	48	46	40	30	17	8
	1.0 bar	61	56	53	41	25	12
	1.5 bar	■	63	61	56	33	14
	2.0 bar	■	64	63	57	38	18
	3.0 bar	■	■	■	59	51	24
	4.0 bar	■	■	■	64	52	31
	5.0 bar	■	■	■	■	53	35
	6.0 bar	■	■	■	■	54	40
8.0 bar	■	■	■	■	60	50	
50 mbar	0.1 bar	14	13	11	■	■	■
	0.3 bar	31	29	22	16	12	4
	0.5 bar	44	42	37	24	15	8
	1.0 bar	58	52	46	40	24	11
	1.5 bar	■	59	57	54	30	14
	2.0 bar	■	61	60	56	35	16
	3.0 bar	■	■	■	60	48	22
	4.0 bar	■	■	■	65	53	27
	5.0 bar	■	■	■	■	54	30
	6.0 bar	■	■	■	■	56	36
8.0 bar	■	■	■	■	66	50	
100 mbar	0.2 bar	22	18	14	12	8	3
	0.3 bar	33	28	18	16	11	4
	0.5 bar	50	35	28	24	12	8
	1.0 bar	60	52	48	39	23	12
	1.5 bar	■	58	56	52	29	13
	2.0 bar	■	60	59	55	34	16
	3.0 bar	■	■	■	60	48	21
	4.0 bar	■	■	■	63	52	25
	5.0 bar	■	■	■	■	60	31
	6.0 bar	■	■	■	■	65	35
8.0 bar	■	■	■	■	70	50	
140 mbar	0.1 bar	■	■	■	■	■	■
	0.3 bar	18	15	12	10	7	3
	0.5 bar	25	21	17	14	10	6
	1.0 bar	44	36	29	22	17	10
	1.5 bar	■	46	38	28	24	13
	2.0 bar	■	53	43	35	29	16
	3.0 bar	■	■	56	47	39	22
	4.0 bar	■	■	■	59	49	26
	5.0 bar	■	■	■	■	55	31
	6.0 bar	■	■	■	■	65	35
8.0 bar	■	■	■	■	79	46	

De capaciteiten welke **dik** gedrukt zijn, voldoen niet aan de opgegeven nauwkeurigheid.

Het is niet toegestaan de orifice te gebruiken als in de tabel een ■ geplaatst is.

Standaard condities zijn:

- Absolute druk 1.013 bar
- Temperatuur van 15°C

Correctie factor van toepassing bij andere gassen dan natuurlijk aardgas:

De capaciteiten zijn opgegeven voor een gas met een dichtheid van 0,6.

Om capaciteit te bepalen van de regelaar bij gassen met andere dichtheid, zal de capaciteit welke aangegeven is in de tabel vermenigvuldigd of gedeeld worden met de correctie factoren uit de tabel.

De tabel hieronder geeft de correctiefactor voor een aantal bekende gassoorten.

Gas soort	Relatieve dichtheid	Correctie factor
Lucht	1.00	0.77
Butaan	2.01	0.55
Koolstof dioxide	1.52	0.63
Koolstof monoxide	0.97	0.79
Aardgas	0.60	1.00
Stikstof	0.97	0.79
Propaan	1.53	0.63
Propaan-lucht mengsel	1.20	0.71

Voor de gassen welke niet hierboven staan vermeld, zal de correctie factor bekend dienen te worden. De relatieve dichtheid (d) dient ingevuld te worden in onderstaande formule.

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

Capaciteit

Regelaar Type 133, DN 25

De capaciteiten welke **dik** gedrukt zijn, voldoen niet aan de opgegeven nauwkeurigheid.

Het is niet toegestaan de zitting te gebruiken als in de tabel een ■ geplaatst is.

Uitlaat Druk instelling	Inlaat Druk (bar)	Capaciteit bij standaard condities (m ³ /h)					
		zitting					
		12.5 mm (1/2")	10 mm (3/8")	8 mm (5/16")	6.3 mm (1/4")	4.7 mm (3/16")	3 mm (1/8")
300 mbar	0.5	18	15	11	8	6	■
	1.0	35	29	23	16	13	9
	1.5	■	38	33	25	18	12
	2.0	■	46	40	33	25	15
	3.0	■	■	53	43	38	21
	4.0	■	■	66	51	46	26
	5.0	■	■	■	■	55	31
	6.0	■	■	■	■	65	35
	8.0	■	■	■	■	79	42
400 mbar	0.7	26	22	17	12	10	6
	1.0	33	28	21	17	12	8
	1.5	■	37	31	26	16	10
	2.0	■	44	38	31	23	12
	3.0	■	■	50	41	36	18
	4.0	■	■	64	49	44	24
	5.0	■	■	■	■	53	29
	6.0	■	■	■	■	63	33
	8.0	■	■	■	■	77	40

Capaciteit

Regelaar Type 133-E, DN 25

Uitlaat Druk	Inlaat Druk (bar)	Capaciteit bij standaard condities(m ³ /h)					
		zitting					
		12.5 mm (1/2")	10 mm (3/8")	8 mm (5/16")	6.3 mm (1/4")	4.7 mm (3/16")	3 mm (1/8")
20 mbar	0.1 bar	16	15	12	11	7	3
	0.3 bar	27	26	18	14	12	6
	0.5 bar	32	28	19	17	15	8
	1.0 bar	38	37	20	20	19	11
50 mbar	0.1 bar	■	■	■	■	■	■
	0.3 bar	20	16	12	10	7	5
	0.5 bar	24	20	14	12	10	6
	1.0 bar	29	26	17	16	14	10
100 mbar	0.1 bar	■	■	■	■	■	■
	0.3 bar	21	18	12	10	9	4
	0.5 bar	28	23	16	12	10	6
	1.0 bar	40	38	23	19	16	10

Het is niet toegestaan de zitting te gebruiken als in de tabel een ■ geplaatst is.

Regelaar Type 133, DN 25 met gasgebrek beveiliging

uitlaat Druk	Inlaat Druk	Capaciteit bij standaard condities (m ³ /h)
		zitting Ø 12,5 mm
20 mbar	0.1 bar	13
	0.3 bar	20
	0.5 bar	25
	1.0 bar	32
50 mbar	0.15 bar	14
	0.3 bar	22
	0.5 bar	27
	1.0 bar	34

Capaciteit

Regelaar Type 233-12, DN 40

De capaciteiten welke **dik** gedrukt zijn, voldoen niet aan de opgegeven nauwkeurigheid.

Het is niet toegestaan de zitting te gebruiken als in de tabel een ■ geplaatst is.

Uitlaat Druk	Inlaat Druk (bar)	Capaciteit bij standaard condities (m ³ /h) zitting en hoek van de klepzitting				
		25 mm	20 mm	12.5 mm	10 mm	6.3 mm
		(1") 30°	(3.4") 10°	(1/2") 10°	(3/8") 10°	(1/4") 10°
20 mbar	0.1	75	58	40	24	12
	0.3	142	114	82	48	23
	0.5	188	149	110	64	32
	1.0	250	208	158	98	47
	1.5	280	241	195	125	57
	2.0	■	260	215	147	68
	3.0	■	300	266	190	92
	4.0	■	310	300	210	113
	5.0	■	■	300	210	113
	6.0	■	■	300	250	130
8.0	■	■	■	250	160	
50 mbar	0.1	51	43	26	20	■
	0.3	125	95	62	43	21
	0.5	169	130	88	58	29
	1.0	250	190	140	95	46
	1.5	286	228	180	120	57
	2.0	■	254	210	140	68
	3.0	■	295	250	190	90
	4.0	■	315	280	220	110
	5.0	■	■	300	230	122
	6.0	■	■	300	250	130
8.0	■	■	■	250	160	
100 mbar	0.2	73	52	38	25	15
	0.3	110	81	54	36	20
	0.5	160	119	79	53	30
	1.0	237	183	136	90	44
	1.5	266	221	168	119	57
	2.0	■	258	204	142	65
	3.0	■	290	248	191	87
	4.0	■	319	277	230	109
	5.0	■	■	300	240	124
	6.0	■	■	300	250	130
8.0	■	■	■	250	160	
200 mbar	0.4	140	107	70	45	22
	0.5	175	134	90	56	27
	1.0	304	224	156	98	43
	1.5	355	272	207	127	57
	2.0	■	291	230	142	64
	3.0	■	350	287	190	86
	4.0	■	376	310	230	110
	5.0	■	■	320	250	125
	6.0	■	■	330	260	130
	8.0	■	■	■	260	160

Capaciteit

Regelaar Type 233-8, DN 40

uitlaat Druk	Inlaat Druk (bar)	Capaciteit bij standaard condities(in m ³ /h) zitting en hoek van de klepzitting				
		25 mm (1") 30°	20 mm (3.4") 10°	12.5 mm (1/2") 10°	10 mm (3/8") 10°	6.3 mm (1/4") 10°
50 mbar	0.2	75	56	30	19	14
	0.3	105	78	47	30	18
	0.5	142	115	68	46	26
	1.0	235	189	132	90	46
	1.5	262	223	166	118	55
	2.0	■	255	200	147	68
	3.0	■	■	243	190	90
	4.0	■	■	278	232	112
	5.0	■	■	293	254	126
	6.0	■	■	304	270	138
100 mbar	0.3	93	73	41	26	18
	0.5	136	106	65	42	26
	1.0	220	170	114	79	41
	1.5	261	205	149	102	55
	2.0	■	236	180	126	66
	3.0	■	■	231	186	87
	4.0	■	■	263	225	109
	5.0	■	■	285	248	128
	6.0	■	■	300	275	146
	8.0	■	■	■	■	178
200 mbar	0.4	124	96	63	42	23
	0.5	148	118	79	52	27
	1.0	260	198	127	90	46
	1.5	298	252	152	117	58
	2.0	■	296	190	143	70
	3.0	■	■	266	197	89
	4.0	■	■	300	240	112
	5.0	■	■	312	256	131
	6.0	■	■	324	279	146
	8.0	■	■	■	■	178
400 mbar	0.7	152	126	86	61	32
	1.0	220	175	118	80	46
	1.5	277	214	142	107	54
	2.0	■	256	172	130	66
	3.0	■	■	223	167	86
	4.0	■	■	241	176	108
	5.0	■	■	266	206	127
	6.0	■	■	281	217	142
8.0	■	■	■	■	172	

De capaciteiten welke **dik** gedrukt zijn, voldoen niet aan de opgegeven nauwkeurigheid.

Het is niet toegestaan de zitting te gebruiken als in de tabel een ■ geplaatst is.

Capaciteit

Regelaar Type 233-12, DN 50

De capaciteiten welke **dik** gedrukt zijn, voldoen niet aan de opgegeven nauwkeurigheid.

Het is niet toegestaan de zitting te gebruiken als in de tabel een ■ geplaatst is.

Uitlaat Druk	Inlaat Druk (bar)	Capaciteit in standaard condities (m ³ /h)					
		zitting en hoek van de klepzitting					
		25 mm (1") 30°	20 mm (3/4") 30°	20 mm (3/4") 10°	12.5 mm (1/2") 10°	10 mm (3/8") 10°	6.3 mm (1/4") 10°
20 mbar	0.1	97	74	66	41	25	12
	0.3	214	180	142	79	50	23
	0.5	288	250	187	119	69	30
	1.0	385	360	267	182	106	46
	1.5	425	400	292	230	128	57
	2.0	■	410	317	255	153	68
	3.0	■	■	362	324	205	86
	4.0	■	■	394	340	240	105
	5.0	■	■	■	350	264	118
	6.0	■	■	■	362	288	130
50 mbar	0.1	66	52	45	31	20	■
	0.3	165	130	110	65	43	22
	0.5	245	200	157	97	60	29
	1.0	387	320	240	163	98	45
	1.5	421	390	287	219	127	55
	2.0	■	410	317	255	152	66
	3.0	■	■	365	312	205	89
	4.0	■	■	394	340	240	110
	5.0	■	■	■	350	264	123
	6.0	■	■	■	362	288	214
100 mbar	0.2	95	65	60	40	30	14
	0.3	160	117	105	65	44	21
	0.5	241	178	155	97	62	29
	1.0	380	307	260	162	98	45
	1.5	446	379	326	216	126	57
	2.0	■	410	376	255	153	69
	3.0	■	■	420	320	205	91
	4.0	■	■	430	375	240	110
	5.0	■	■	■	390	270	125
	6.0	■	■	■	405	300	140
200 mbar	0.4	165	125	110	70	45	25
	0.5	204	150	133	83	55	30
	1.0	320	248	221	149	97	45
	1.5	371	310	267	198	126	57
	2.0	■	360	305	230	152	71
	3.0	■	■	360	200	205	91
	4.0	■	■	400	320	240	110
	5.0	■	■	■	330	265	125
	6.0	■	■	■	350	300	140
	8.0	■	■	■	■	310	160

Capaciteit

Regelaar Type 233-8, DN 50

Uitlaat Druk	Inlaat Druk (bar)	Capaciteit in standaard condities (m ³ /h)					
		zitting en hoek van de klepzitting					
		25 mm (1")	20 mm (3/4")	20 mm (3/4")	12.5 mm (1/2")	10 mm (3/8")	6.3 mm (1/4")
		30°	30°	10°	10°	10°	10°
50 mbar	0.2	75	60	48	34	22	14
	0.3	122	83	71	52	33	20
	0.5	187	148	117	74	49	28
	1.0	321	266	208	151	104	45
	1.5	352	320	240	190	129	55
	2.0	■	370	270	231	155	66
	3.0	■	■	■	300	208	94
	4.0	■	■	■	340	236	117
	5.0	■	■	■	349	259	130
	6.0	■	■	■	358	281	141
8.0	■	■	■	■	■	168	
100 mbar	0.3	94	78	75	45	28	20
	0.5	137	116	108	70	42	28
	1.0	293	241	189	122	83	46
	2.0	342	401	270	208	134	66
	3.0	■	■	■	281	189	92
	4.0	■	■	■	317	237	113
	5.0	■	■	■	340	251	131
	6.0	■	■	■	356	270	146
8.0	■	■	■	■	■	172	
200 mbar	0.4	115	95	88	55	38	22
	0.5	154	120	116	69	48	27
	1.0	293	241	198	127	93	45
	1.5	363	343	252	181	121	57
	2.0	■	414	296	228	147	69
	3.0	■	■	■	304	199	95
	4.0	■	■	■	350	231	117
	5.0	■	■	■	378	262	139
	6.0	■	■	■	392	284	150
	8.0	■	■	■	■	■	181
400 mbar	0.7	160	123	110	81	62	29
	1.0	221	165	153	113	82	40
	1.5	294	216	191	142	110	54
	2.0	■	274	231	170	128	66
	3.0	■	■	■	226	167	91
	4.0	■	■	■	252	200	112
	5.0	■	■	■	278	232	133
	6.0	■	■	■	295	255	150
8.0	■	■	■	■	■	183	

De capaciteiten welke **dik** gedrukt zijn, voldoen niet aan de opgegeven nauwkeurigheid.

Het is niet toegestaan de zitting te gebruiken als in de tabel een ■ geplaatst is.

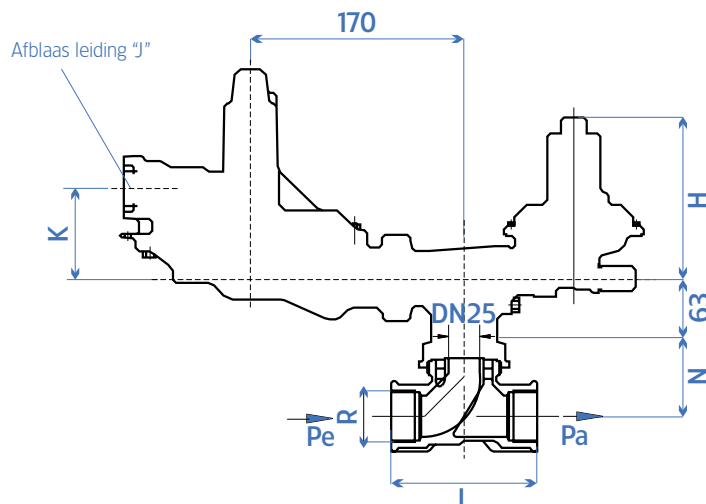
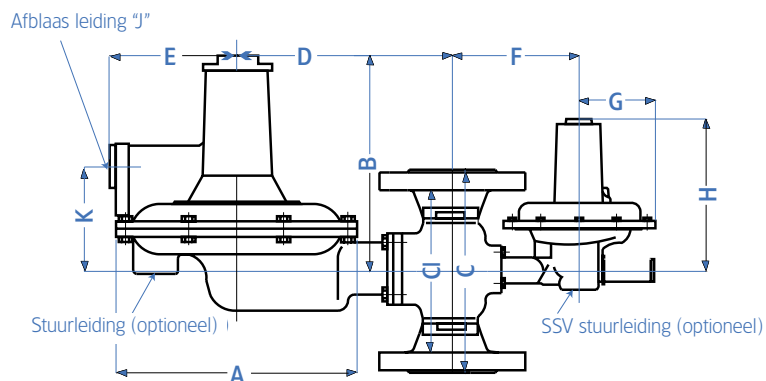
Afmetingen (mm)

Model	Draad	Flens	A	B	C'	C	D	E	F	G	H	J	K	Gewicht in kg		
Type	afmeting												Afblaas aansluiting		(Ca)	
	(1)	(2)											(1)	(2)	(1)	(2)
133-	3/4"/1"	DN 25	190	155	100	160	170	100	100	75	120	Rp 3/4	74	4	6	
233-12	1 1/2"	DN 40	350	250	150	200	265	155	115	75	120	Rp 1	110	11	15	
233-12	•	DN 50	350	250	•	200	265	155	115	75	120	Rp 1	110	•	16	
233-8	1 1/2"	DN 40	260	250	150	200	220	125	115	75	120	Rp 1	105	9	13	
233-8	•	DN 50	260	250	•	200	220	125	115	75	120	Rp 1	105	•	14	

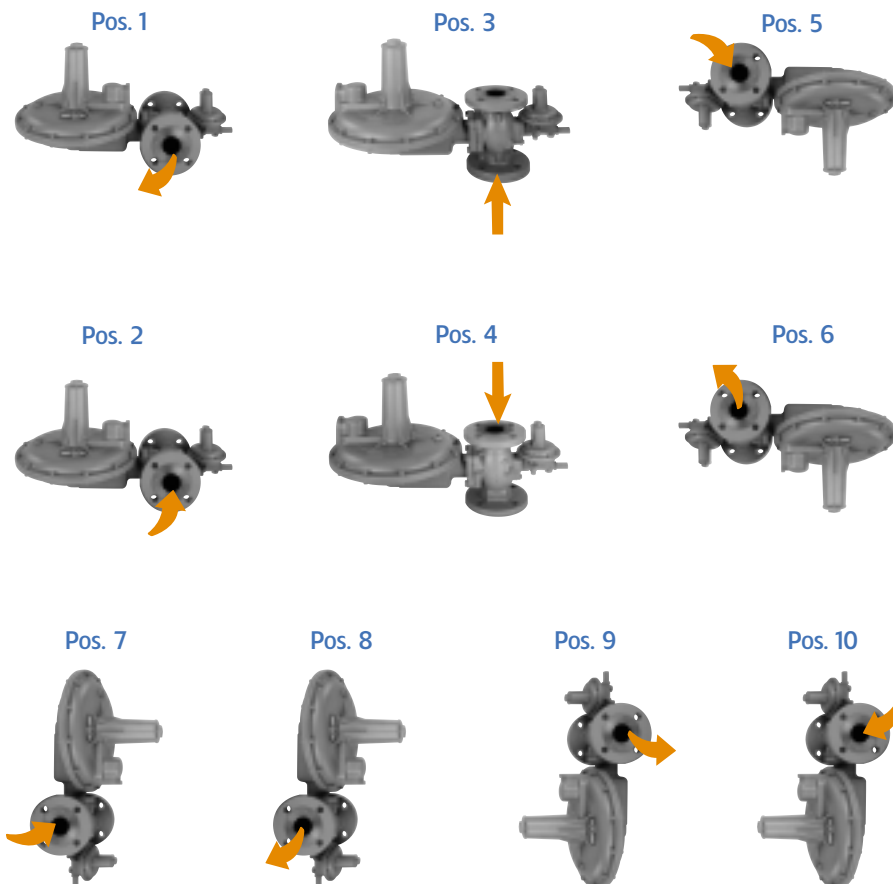
Afmeting, Type 133-E		
R	L	N
Rp 1	110	41
Rp 1 1/2"	140	50

Bij toepassing van externe stuurleidingen (optioneel), wordt de regelaar voorzien van de volgende koppelingen

- Op de regelaar: Ermeto 12,
- Op de SSV: Ermeto 8.



Montage positie



Houdt bij bestelling rekening met de gewenste uitvoering. Indien niet anders aangegeven, worden de regelaars standaard geleverd voor normale omstandigheden (positie 2):

- Regelaar 133-met uitwendige ventilatie opening,
- Regelaar 233-inwendige ventilatie opening.

Pos.3 en Pos.4 zijn niet leverbaar in DN 50 geflensde uitvoering voor de 233, als de 033 SSV is gemonteerd.

Installatie

- ▶ Membraan huis kan in iedere positie (360°) tov het huis gemonteerd worden
- ▶ Voor buiten installatie, plaats de ventilatie opening zodanig dat regen, sneeuw, vocht of andere deeltjes niet in de opening kunnen komen
Opmerking: Actaris adviseert om de ventilatie opening te allen tijde aan de onderzijde van de regelaar te positioneren. Verder moet de ventilatie opening afgewend zijn van dakranden van gebouwen, deuropeningen, luchtinlaten of boven een eventueel sneeuw niveau. De ademopening moet periodiek gecontroleerd worden.
- ▶ Voor binneninstallatie moet de kortste lengte met buiten met de navolgende diameters :
Tot 3 meter DN 20
Tot 5 meter DN 25
Boven de 5 meter tenminste DN 40.
Het einde van de uitlaat pijp moet afgeschermd zodat vuil of vocht niet kunnen binnendringen.
- ▶ De Duitse DVGW staat geen pijpwerk toe bij een binnen installatie, bij een regelaar met een veiligheidsmembraan welke niet boven de 1 bar komt.

Type aansluiting

XX-	XX-	XXX-	XXX-	Varianten
133				Type
233				
	E			Monopijp uitvoering (alleen 133)
		HP		Afmeting klephuis (zie pag. 3)
		8		
		8HP		
		12		
			4	Max. inlaat druk
			6	
			8	
				31 Zonder veiligheid
				32 SRV
				34 Gas lek bescherming*
				36 Gas lek bescherming* en SRV
				Met type I of II SSV
				61 OPSO
				62 OPSO en SRV
				64 OPSO en UPSO
				66 OPSO, UPSO en SRV
				630 OPSO en veiligheid membraan
				650 OPSO, UPSO en veiligheid membraan
				Met type 033 SSV
				71 OPSO
				72 OPSO en SRV
				77 OPSO, gas lek bescherming* en SRV
				730 OPSO en veiligheids membraan
				770 OPSO, gas lek bescherming* en veiligh. membraan

Voorbeeld keuze : 133-4-62, DN 25 or 233-8-4-61, DN 40

*Alleen verkrijgbaar bij de 133 regelaar

Order informatie:

- Regelaar type code
- Afmeting van het huis met aansluiting
- Minimale en maximale inlaat druk
- Range van de uitlaatdruk
- Instelling van de uitlaatdruk
- Instelling OPSO*
- Instelling UPSO*

* (indien gevraagd)

Pressure Regulator RR 16

- ▶ Integral resistance
- ▶ Cartridge type diaphragm and valve assembly for ease of maintenance
- ▶ Wide range of interchangeable orifices
- ▶ Approved by German DVGW



▶ Pressure Regulator RR 16

Applications

The RR 16 regulator is designed for industrial use: gas supply networks, district stations, industries, heating plants, as well as for all installations where accurate pressure control, easy adjustment and fast response times are required, such as for burners, industrial ovens, boilers etc.

Description

The RR 16 regulator is a direct-acting, spring-loaded regulator with an optional integrated safety shutoff device. The balanced valve ensures constant outlet pressure when the upstream pressure varies.

Technical Features

Maximum inlet pressure	16.0 bar
Outlet pressure	10 mbar - 1.1 bar
Accuracy & lock-up pressure	Up to AC5 / up to SG 10
Operating temperature	Gas: -20° C to +60° C Ambient: -30° C to + 60° C
Acceptable gases	Natural gas, propane, butane, air, nitrogen and all non-corrosive gases
Safety devices	Optional built-in safety shutoff valve OPSO: Over-pressure shut-off UPS0: Under-pressure shut-off
Options	Integral silencer Monitor version

Connections

Sizes	DN 25, DN 50, DN 80
Body lengths	See Table page 8
Flanges	PN 16

Materials

Body	Spheroidal graphite cast iron GGG 40, DIN 1693
Actuator	Steel St 37-2, DIN 1652/2 and DIN 17100 (epoxy protected)
SSV Actuator	Brass, steel and aluminium
Internal parts	Steel, zinc-coated / Stainless steel
Seals	NBR rubber / Viton
Diaphragm	NBR rubber / NBR rubber, reinforced fabric

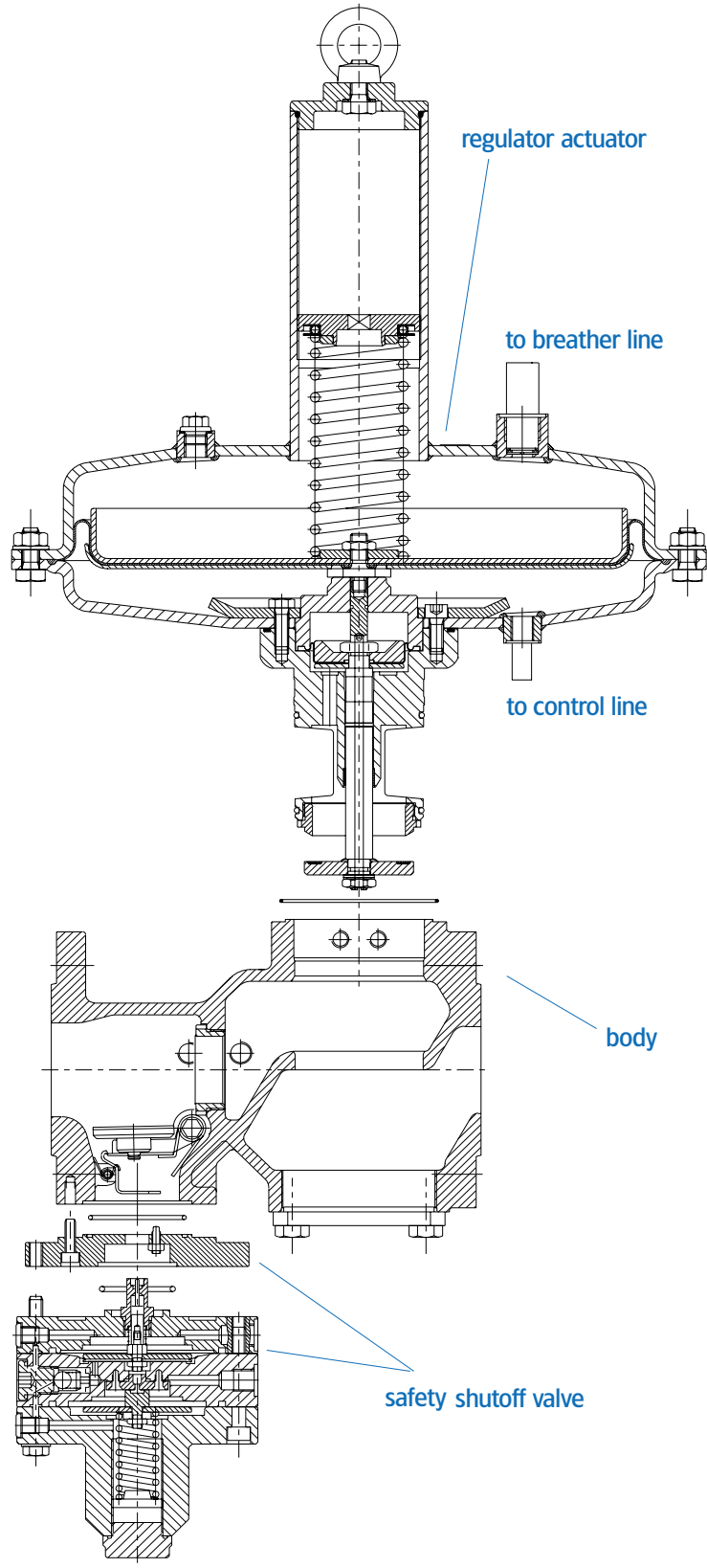


Fig. 1: RR16 regulator with SL-IZ safety shutoff valve - Sectional view

Safety Shutoff Valve

Selecting the SSV

SSV Type	Max. Operating Pressure	Function	Range	
			Who	Whu
SL-IZ	Integral resistance 16 bar	OPSO	35 mbar to 1.7 bar	
033	5 bar	OPSO	40 mbar to 0.45 bar	
022	Integral resistance 16 bar	OPSO and UPSO	40 mbar to 1.7 bar	10 to 220 mbar
SID	Integral resistance 16 bar	OPSO and UPSO with high accuracy trigger	30 bar to 1.7 bar	5 mbar to 1.5 bar

Note that OPSO and UPSO settings are adjustable **separately**.

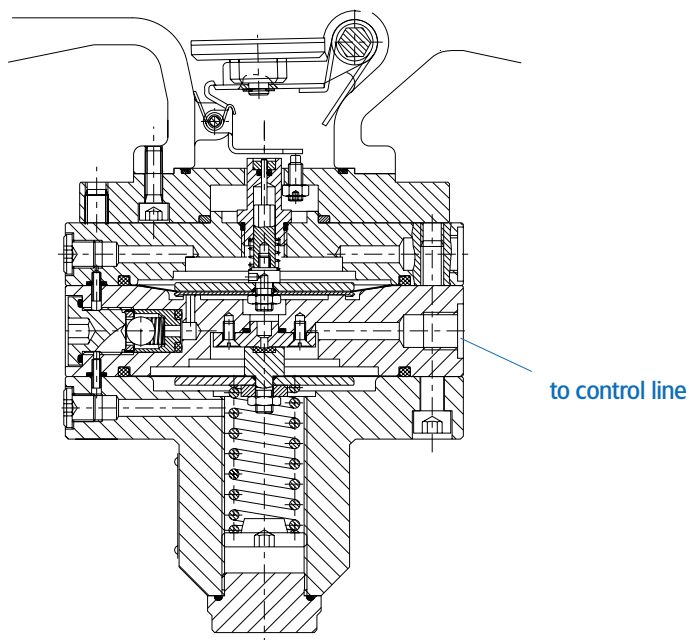


Fig. 2: Type SL-IZ Safety Shutoff Valve - Sectional view

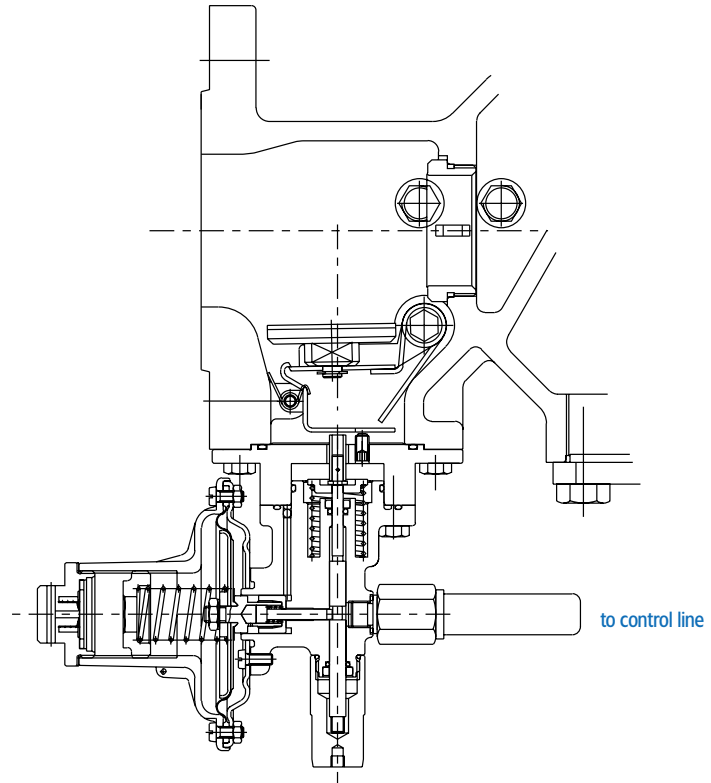


Fig. 3: Type 033 Safety Shutoff Valve - Sectional view

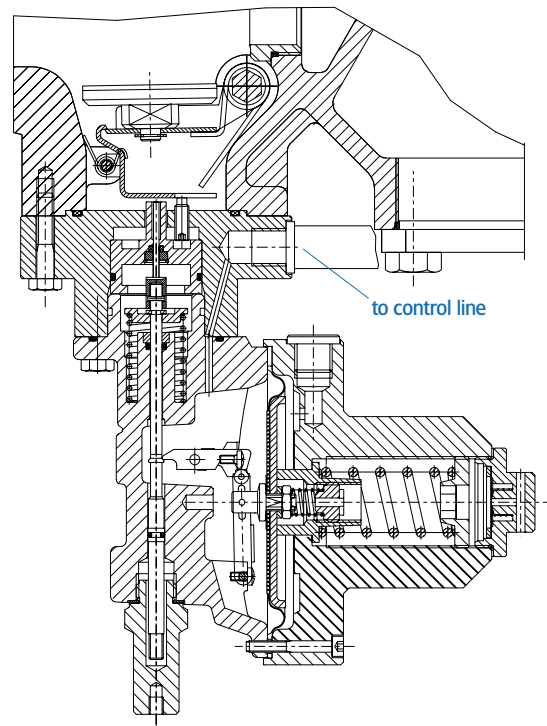


Fig. 4: Type 022 safety shutoff valve - Sectional view

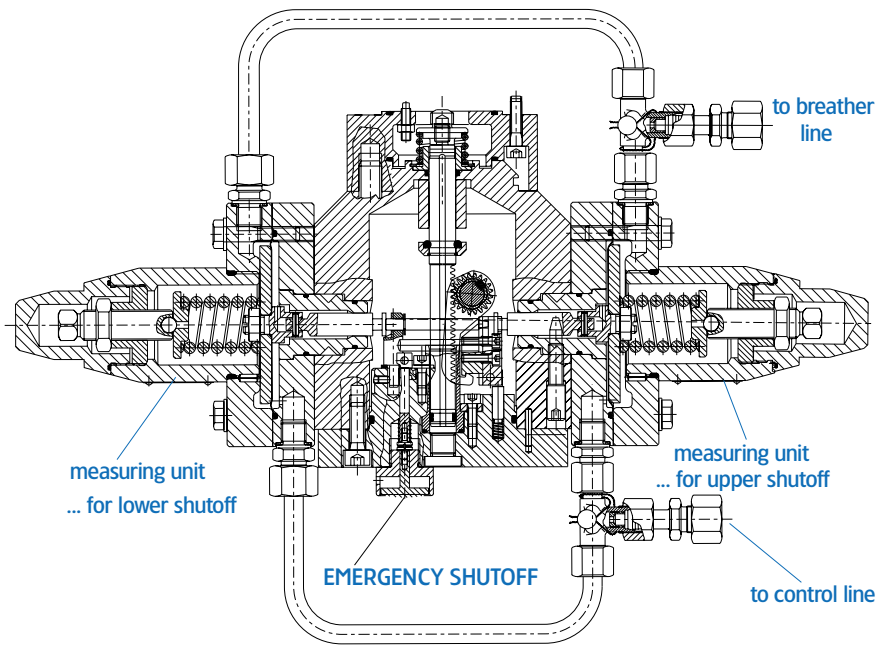


Fig. 5: Type SID Safety shutoff Valve - Sectional view

Note:

- For better accuracy, choose the largest actuator size.
- 8N actuator offers a reduced overall dimension for compact installation.

Outlet Pressure Range

Regulator

Size	Actuator size	Spring code	Spring color	Wire (Ø mm)	Spring range		
DN 25	8N Ø 310	955-202-70	red	3	10 - 25 mbar		
		955-202-77	brown	3.8	20 - 55 mbar		
		955-202-78	blue	4.5	45 - 110 mbar		
		955-202-79	green	5.6	90 - 230 mbar		
		955-202-80	orange	6.3	200 - 330 mbar		
	8H Ø 310	955-202-81	black	7	300 - 450 mbar		
		955-202-82	yellow	9.5	300 - 650 mbar		
		955-202-83	grey	11	600 - 1100 mbar		
		DN 50 & 80 Ø 405	12N	955-202-77	brown	3.8	10 - 25 mbar
			955-202-78	blue	4.5	20 - 55 mbar	
955-202-79	green		5.6	45 - 115 mbar			
955-202-80	orange		6.3	100 - 160 mbar			
955-202-81	black		7	150 - 225 mbar			
8N Ø 310	955-202-79*	green	5.6	90 - 230 mbar			
	955-202-80	orange	6.3	200 - 330 mbar			
	955-202-81	black	7	300 - 450 mbar			
	955-203-73**	red	8.0	130 - 350 mbar			
	8H Ø 310	955-202-82	yellow	9.5	300 - 650 mbar		
955-202-83		grey	11	600 - 1100 mbar			

* When the regulator is fitted with this spring, the accuracy class becomes AC 20 instead of AC 10.

** Special spring

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

- ▶ 10 - 20 mbar: AC 20 / SG 30
- ▶ 20 - 100 mbar: AC 10 / SG 20
- ▶ > 100 mbar: AC 5 / SG 10

The typical lock-up pressure zone is SZ 10. Reduced zone is available on request.

Safety Shutoff Valves

022

Variant	Spring code	Spring color	Wire (Ø mm)	Spring range
Over Pressure Shutoff (OPSO)	955-200-22	red	1.4	20 - 60 mbar
	955-200-23	blue	1.6	50 - 120 mbar
	955-200-24	green	2.6	100 - 450 mbar
	955-203-41	black	3.2	0.35 - 1.0 bar
	955-203-42	yellow	4.0	0.8 - 1.7 bar
Under Pressure Shutoff (UPSO)	955-200-32	red	0.8	10 - 50 mbar
	955-203-51	brown	1.25	40 - 120 mbar
	955-203-52	yellow	1.6	100 - 220 mbar

022 Accuracy Class (AC):

- ▶ OPSO:
 - 40 - 400 mbar: AG 10
 - 0.4 - 1 bar: AG 5
 - 1 - 1.7 bar: AG 2.5
- ▶ UPSO
 - 10 - 20 mbar: AG 30
 - 20 - 220 mbar: AG 20

▶ Minimal difference between regulator and

- SSV settings (ΔP_w):
 - 10 mbar to UPSO
 - 20 mbar to OPSO

Outlet Pressure Range (cont'd)

Safety Shutoff Valves (cont'd)

033

Over Pressure Shutoff (OPSO)	Spring code	Spring color	Wire (Ø mm)	Spring range
	955-200-22	red	1.4	40 - 70 mbar
	955-200-23	blue	1.6	50 - 150 mbar
	955-200-24	green	2.6	140 - 450 mbar

033 Accuracy class (AG):

- ▶ OPSO:
 - AG 10
- ▶ Minimal difference between regulator and SSV settings (ΔP_w):
 - 20 mbar to OPSO

SL-IZN.1 and SL-IZM.1

SL-IZ Type	Spring code	Spring color	Wire (Ø mm)	Spring range
Over Pressure Shutoff (OPSO)				
IZN.1 head	955-202-36	red	1.8	35 - 250 mbar
	955-202-37	green	2.5	200 - 800 mbar
IZM.1 head	955-202-38	yellow	3.6	0.6 - 1.7 bar

SL-IZN.1 Accuracy class (AG):

- ▶ OPSO:
 - 35 - 100 mbar: AG 10
 - 100 - 800 mbar: AG 5
- ▶ Minimal difference between regulator and SSV settings (ΔP_w):
 - 20 mbar to OPSO

SL-IZM.1 Accuracy class (AG):

- ▶ OPSO:
 - AG 5
- ▶ Minimal difference between regulator and SSV settings (ΔP_w):
 - 20 mbar to OPSO

SID

SID Type	Spring code	Spring color	Wire (Ø mm)	Spring range
Overpressure & Underpressure Shutoff				
N head	955-201-65	black	3.2	5 - 110 mbar
	955-201-66	green	4.0	80 - 220 mbar
M head	955-201-65	black	3.2	100 - 250 mbar
	955-201-66	green	4.0	200 - 470 mbar
	955-201-67	brown	5.6	0.45 - 1.5 bar
	955-201-68	black	6.0	1 - 1.7 bar

SID-N head Accuracy class (AG):

- ▶ OPSO:
 - 20 - 40 mbar: AG 10
 - 40 - 220 mbar: AG 5
- UPS0
- 5 - 20 mbar: AG 30
- 20-220 mbar: AG 20
- ▶ Minimal difference between regulator and SSV settings (ΔP_w):
 - 10 mbar to UPS0, 20 mbar to OPSO

SID-M head Accuracy class (AG):

- ▶ OPSO:
 - 10 - 450 mbar: AG10
 - 450 - 1000 mbar: AG 5
 - 1 - 1.7 bar: AG 1
- ▶ UPS0:
 - 100 - 450 mbar: AG 20
 - 0.45 - 1.7 bar: AG 5
- ▶ Minimal difference between regulator and SSV settings (ΔP_w):
 - 10 mbar to UPS0, 20 mbar to OPSO

Standard conditions:

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

Flow Capacity

Flow Coefficient

The RR 16 regulator can be fitted with an orifice of various sizes in order to match the capacity requirements. Large size orifices offer extra-large flow rate possibilities, but are not recommended for high inlet pressures.

Regulator size	Orifice size	Max. Inlet pressure	Flow* coefficient Kg
DN 25	24 mm	16 bar	210
	31 mm**	16 bar	430
DN 50	24 mm	16 bar	450
	31 mm**	16 bar	580
	42 mm**	16 bar	1000
DN 80	54 mm	5 bar	1440
	42 mm	16 bar	1400
	54 mm**	16 bar	2300
	82 mm	4 bar	3440

* The flow coefficient is calculated for a regulator in a fully opened position.

** When using this orifice, the accuracy classes as indicated page 6 are valid if the inlet pressure variation does not exceed 10 bar.

Sizing Equation

For a 0.6 specific gravity gas; the volumetric flow rates (Q) may be calculated using the following equations with an error less than 10%:

- Sub-critical flow behavior,

$$Q = \sqrt{P_a (P_e - P_a)}$$

where $(P_e - P_a) = < 0.5 P_e$

- Critical flow behavior,

$$Q = K_g \frac{P_e}{2}$$

where $(P_e - P_a) = > 0.5 P_e$

Where:

Q: volumetric flow rate in m³/h at standard conditions

P_e: inlet absolute pressure in bar

P_a: outlet absolute pressure in bar

Capacity Tables

Inlet Pressure	Outlet Pressure	Capacities in standard conditions (m ³ /h)									
		Orifice Size									
		Setting (mbar)	DN 25 24 mm	DN 25 31 mm	DN 50 24 mm	DN 50 31 mm	DN 50 42 mm	DN 50 54 mm	DN 80 42 mm	DN 80 54 mm	DN 80 82 mm
100 mbar	20	60	125	130	165	180	360	405	660	900	
	50	48	100	105	135	150	190	325	530	810	
200 mbar	20	91	185	195	250	360	615	610	990	1365	
	50	84	170	180	230	330	460	565	920	1185	
	100	70	145	150	195	250	295	470	770	990	
400 mbar	20	130	270	280	365	610	885	885	1440	2070	
	50	130	260	275	355	590	800	860	1400	1950	
	100	120	250	260	335	560	700	815	1330	1710	
	200	105	210	220	285	400	430	695	1130	1300	
700 mbar	20	175	360	375	485	860	1225	1180	1925	2835	
	50	175	355	375	480	835	1150	1170	1910	2700	
	100	170	350	365	475	810	1070	1150	1880	2380	
	200	165	335	350	450	630	800	1070	1790	2080	
1 bar	400	135	280	290	375	470	590	920	1500	1670	
	20	210	430	450	585	1060	1455	1420	2315	3465	
	50	210	430	450	580	1060	1455	1415	2310	3380	
	100	210	430	450	580	990	1380	1410	2300	3060	
	200	205	425	445	570	800	1035	1390	2265	2790	
	400	190	395	415	535	710	880	1300	2120	2100	
700	150	310	320	415	530	650	1010	1650	1950		

Capacities are indicated for a regulator with an **integral safety shutoff valve**. When a noise abatement device is built into the regulator as well, the values mentioned in the tables - or calculated from the sizing equation should be reduced by 10%.

Flow Capacity (continued)

Inlet Pressure	Outlet Pressure	Capacities in standard conditions (m ³ /h)								
		Orifice Size								
		DN 25		DN 50		DN 50		DN 80		DN 80
Setting (mbar)	24 mm	31 mm	24 mm	31 mm	42 mm	54 mm	42 mm	54 mm	82 mm	
2 bar	20	315	645	675	875	1510	2065	2125	3465	5220
	50	315	645	675	875	1510	2065	2125	3465	5220
	100	315	645	675	875	1490	1980	2125	3465	3690
	200	315	645	675	875	1345	1605	2125	3465	3420
	400	315	645	675	875	1180	1260	2125	3465	3060
	700	315	640	670	865	1015	1185	2105	3430	3060
	1000	300	610	640	820	910	1060	2000	3265	3060
3 bar	20	420	860	900	1000	1900	2600	2830	4615	6480
	50	420	860	900	1165	1900	2600	2830	4615	6480
	100	420	860	900	1165	1900	2600	2830	4615	5100
	200	420	860	900	1165	1900	2140	2830	4615	4900
	400	420	860	900	1165	1600	1605	2830	4615	4250
	700	420	860	900	1165	1410	1530	2830	4615	4250
	1000	420	860	900	1165	1370	1420	2830	4615	4250
4 bar	20	480	900	1130	1100	2230	3060	3535	5765	7650
	50	525	1080	1130	1300	2230	3060	3535	5765	7650
	100	525	1080	1130	1455	2230	3060	3535	5765	5900
	200	525	1080	1130	1700	2230	3060	3535	5765	5500
	400	525	1080	1130	1700	2230	3060	3535	5765	5100
	700	525	1080	1130	1700	2230	3060	3535	5765	5100
	1000	525	1080	1130	1700	2230	3060	3535	5765	5100
7 bar	20	760	1200	1800	2325	3200	■	5650	9250	■
	50	840	1500	1800	2325	3200	■	5650	9215	■
	100	840	1500	1800	2325	3200	■	5650	9215	■
	200	840	1500	1800	2325	3200	■	5650	9215	■
	400	840	1500	1800	2325	3200	■	5650	9215	■
	700	840	1500	1800	2325	3200	■	5650	9215	■
	1000	840	1500	1800	2325	3200	■	5650	9215	■
10 bar	20	860	1200	2480	3195	3980	■	7765	12665	■
	50	1030	1700	2480	3195	3980	■	7765	12665	■
	100	1080	1700	2480	3195	3980	■	7765	12665	■
	200	1155	2370	2480	3195	3980	■	7765	12665	■
	400	1155	2370	2480	3195	3980	■	7765	12665	■
	700	1155	2370	2480	3195	3980	■	7765	12665	■
	1000	1155	2370	2480	3195	3980	■	7765	12665	■
16 bar	20	1210	1700	3000	4935	5360	■	11995	19565	■
	50	1250	2000	3000	4935	5360	■	11995	19565	■
	100	1380	2200	3000	4935	5360	■	11995	19565	■
	200	1500	2500	3000	4935	5360	■	11995	19565	■
	400	1785	3660	3000	4935	5360	■	11995	19565	■
	700	1785	3660	3000	4935	5360	■	11995	19565	■
	1000	1785	3660	3000	4935	5360	■	11995	19565	■

Do not operate orifice in inlet pressure area marked with ■.

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:

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

Note: Flow rates indicated in these tables meet the accuracy of ± 10% of outlet gauge pressure.

Dimensions (in mm)

Regulator

DN	Actuating Drive Body	A	B	C	D	E	I	K	L	M	X	Y
25	8 N	310	180	470	525	95	140	90	47	225	575	660
25	8 H	310	180	550	610	95	140	90		225	660	765
50	8 N	310	250	485	570	95	200	105	71	240	620	680
50	8 H	310	250	570	650	95	200	105		240	700	785
50	12 N	405	250	485	570	95	200	105		240	620	680
80	8 N	310	300	545	645	95	240	165	90	300	720	735
80	8 H	310	300	630	730	95	240	165		300	805	840
80	12 N	405	300	545	645	95	240	165		300	720	735

Safety Shutoff Valve (SSV)

DN	F	F	F	F	F	G	G	H	H	H	H	H	I	J	J	J
	SL-IZ	SID-	SID-	022	033	SL-IZ	022	022	033	SL-IZ	SID-	SID-		SL-IZ	022	033
	N, M	N	M			N, M				N, M	N	M		N, M		
25	240	290	280	252	195	105	88	Ø114	Ø100	Ø140	Ø200	Ø130	140	132	177	140
50	245	290	280	255	195	108	93	Ø114	Ø100	Ø140	Ø200	Ø130	200	135	182	140
80	285	335	325	300	240	151	134	Ø114	Ø100	Ø140	Ø200	Ø130	240	178	223	185

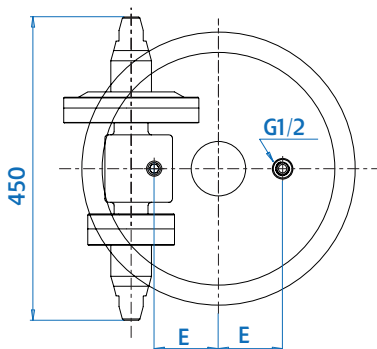


Fig. 7: Type SID Safety Shutoff Valve

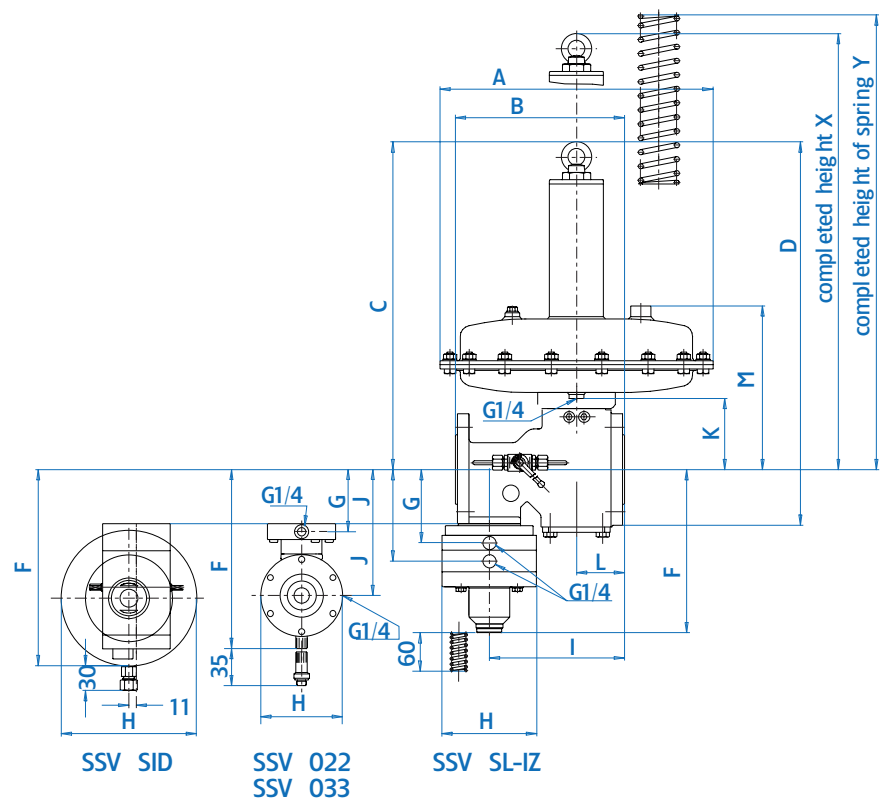


Fig. 6: RR16 Regulator with Safety Shutoff Valve - Dimensions

Weight (in kg)

With SSV...	SL-IZ			SID			O22			
	DN	8N	8H	12N	8N	8H	12N	8N	8H	12N
25	30	36.8	-	36	42.8	-	26.8	33.6	-	
50	35	41.8	45	41	47.8	51	31.8	38.6	41.8	
80	53	59.8	63	59	65.8	69	49.8	56.6	59.8	

Connections

DN	Number of Thread Holes	Thread	Hex Bolt DIN ⁽¹⁾	Hex Nut DIN ⁽¹⁾
			931-5.6	934-5
25	4	M 12	M 12 x 40	M 12
50	4	M 16	M 16 x 60 ⁽²⁾	M 16
80	8	M 16	M 16 x 60 ⁽²⁾	M 16

(1) Bolts and nuts are not supplied with RR16 regulator

(2) Screw bolt DIN 2509

Installation

The following drawing shows a model installation for the RR 16 regulator with an integrated safety shut-off valve, Type SL-IZ. The usual position for installation is horizontal.

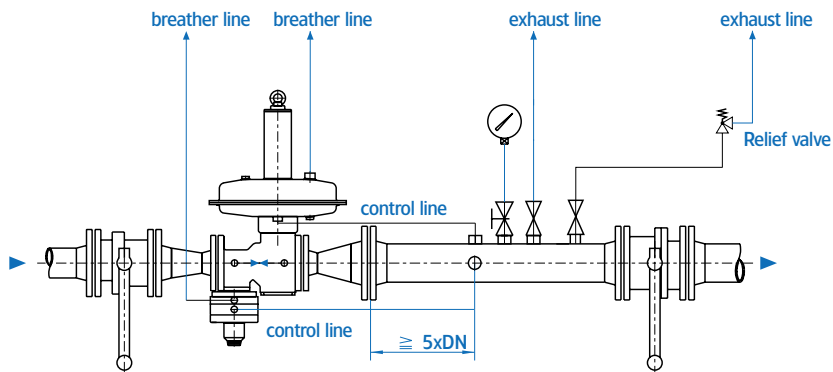


Fig 8: Typical installation

Type Designation

RR16-	XX-	XX-	XXX-	S.-XXX	Variants
	25				DN size
	50				
	80				
		24			Orifice size (DN 25 & DN 50)
		31			(DN 25 & DN 50)
		42			(DN 50 & DN 80)
		54			(DN 50 & DN 80)
		82			(DN 80 only)
			8 N		Actuator size
			8 H		
			12 N		
				SL-IZN.1	SSV (OPSO)
				SL-IZM.1	
				SSV-033	
				SSV-022	SSV (OPSO and UPSO)
				SID-NN	
				SID-NM	
				SID-MM	

Device designation example: **RR16-50-31-12N-SL-IZN.1**

Options

- ▶ **Monitor** application: special balanced stem for regulator installed in upstream monitor position.
- ▶ **Silencer**: noise abatement device around the valve seat to reduce the sound pressure level by around 10 dbA.
- ▶ **Valve travel indicator**

SSV options

- ▶ Valve position **switch**: Ex proximity switch
- ▶ Emergency push-**button**
- ▶ **Remote trigger**: with explosion-proof solenoid valve

Ordering information:

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

* (if requested)