

## Pressure relief valves



### Type FRSBV pressure relief valves

Safety pressure relief device with adjustable spring index value for releasing overpressure into the open air.

In compliance with DIN 33821

- Input pressure up to 20 bar (2 000 kPa)
- Tolerates high flow rates
- Internal pulse
- Threaded connection Rp ½"-Rp 1"



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## FRSBV

The FRSBV type safety valve is a safety pressure relief valve (SBV) with an adjustable response pressure. The valve has an internal response pressure tap.



## Applications

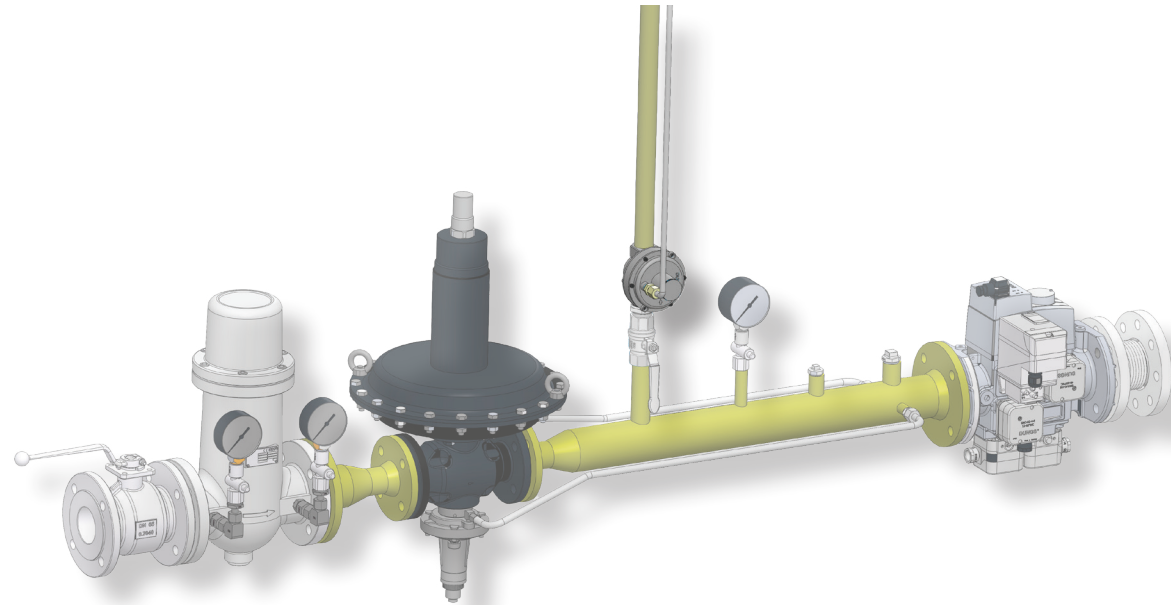
Pressure safety relief valve for gas burners and gas equipment. Also used in gas supply and distribution systems.

It is suitable for gases of gas families 1, 2, 3 and other neutral gases.

## Approval

EC type-examination certificate according to:

- EC Pressure Equipment Directive



### Safety pressure relief valve according to DIN 33821

Type	FRSBV 10005...
Type of gas	Family 1+2+3
Nominal diameters Thread	Connecting threads according to BSP (ISO 228/1) or NPT (B1.20.1) G½" NPT ½"
Max. input pressure	FRSBV 10005... 10 bar (1 000 kPa)
Trigger range	10 mbar to 5 bar (1-500 kPa)
Materials	Housing: Zamak Z-5 Diaphragm housing: Zamak Z-5 Diaphragms: NBR according to EN 549
Ambient temperature	-20 °C to +60 °C



**Safety pressure relief valve according to DIN 33821**



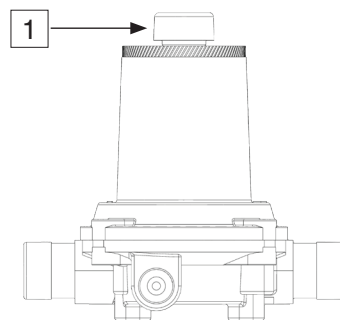
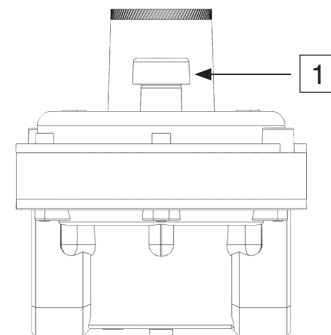
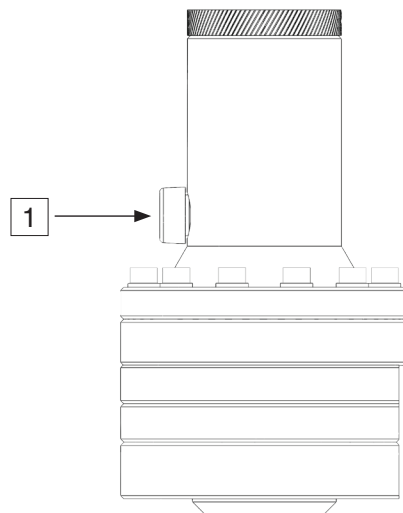
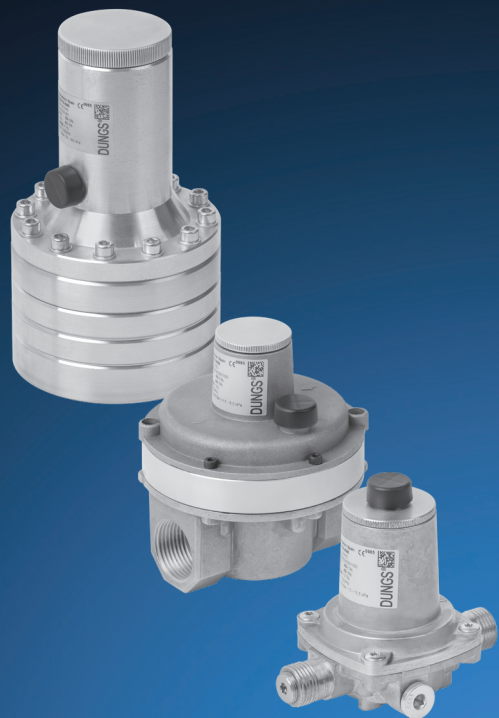
Type	FRSBV 5010...	
Type of gas	Family 1+2+3	
Nominal diameters Thread	Connecting threads according to BSP (ISO 228/1) or NPT (B1.20.1) G1"    NPT 1"	
Max. input pressure	FRSBV 5010... 5 bar (500 kPa)	
Trigger range	32 mbar to 2 bar (3.2-200 kPa)	
Materials	Housing:	Aluminium Al 2521, Al 2011
	Diaphragm housing:	Aluminium Al 2011
	Diaphragms:	NBR according to EN 549
Ambient temperature	-20 °C to +60 °C	



### Safety pressure relief valve according to DIN 33821

Type	FRSBV 10010... / FRSBV 20010...	
Type of gas	Family 1+2+3	
Nominal diameters Thread	Connecting threads according to BSP (ISO 228/1) or NPT (B1.20.1) G1"    NPT 1"	
Max. input pressure	FRSBV 10010... 10 bar (1 000 kPa) / FRSBV 20010... 20 bar (2 000 kPa)	
Trigger range	200 mbar to 8 bar (20-800 kPa)	
Materials	Housing:	Aluminium Al2011 (FRSBV 100...)/steel F-114 (FRSBV 200...)
	Diaphragm housing:	Aluminium Al2011 (FRSBV 100...)/steel F-114 (FRSBV 200...)
	Diaphragms:	NBR according to EN 549
Ambient temperature	-20 °C to +60 °C	

Pressure taps



1 FRSBV vent line connection,  
G¼ ISO 228



**Nomenclature**



Using the FRSBV 100010 HD as an example	<b>FRSBV</b>	<b>100</b>	<b>10</b>	<b>HD</b>	<b>NPT</b>
<b>Type</b>	Pressure relief valve				
<b>MOP</b>	50 ...	5 bar			
	100 ...	10 bar			
	200 ...	20 bar			
<b>Nominal diameter</b>	05	G½"			
	10	G1"			
<b>Pressure range</b>	ND	Low pressure			
	HD	High pressure			
<b>Thread type</b>		With BSP thread			
	NPT	With NPT threads			



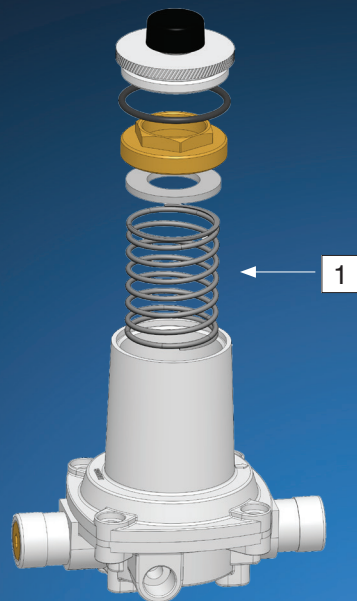
## Adjustment ranges



Type	Threaded connection	Model	Item number	Closing pressure [SG]	Specific adjustment range
FRSBV 10005 ND	G½"	ND	289261	SG 20	10-350 mbar
FRSBV 10005 HD	G½"	HD	289262	SG 10	100-5 000 mbar
FRSBV 5010 ND	G1"	ND	289263	SG 10	32-2 000 mbar
FRSBV 10010 HD	G1"	HD	289264	SG 10	200-8 000 mbar
FRSBV 20010 HD	G1"	HD	289265	SG 10	200-8 000 mbar
FRSBV 10005 ND NPT	NPT ½"	ND	289266	SG 20	10-350 mbar
FRSBV 10005 HD NPT	NPT ½"	HD	289267	SG 10	100-5 000 mbar
FRSBV 5010 ND NPT	NPT 1"	ND	289268	SG 10	32-2 000 mbar
FRSBV 10010 HD NPT	NPT 1"	HD	289269	SG 10	200-8 000 mbar
FRSBV 20010 HD NPT	NPT 1"	HD	289270	SG 10	200-8 000 mbar

## Spring selection

The response pressure results from the force that the movable parts exert on the adjusting spring (1) installed. The full response pressure range can be covered by changing the adjusting springs.

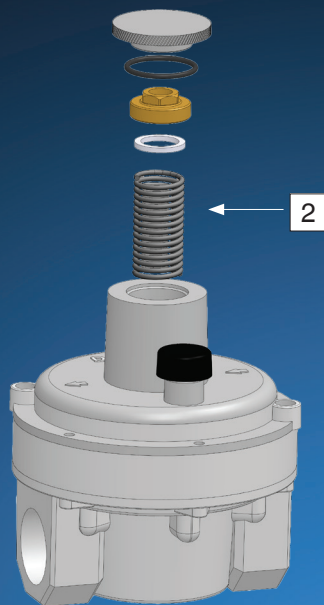


## FRSBV 10005...

Setpoint range for springs FRSBV 10005 ...						
Spring colour	Replacement item number	Wire diameter [mm]	Length [mm]	Diameter [mm]	Setpoint range [mbar]	
					ND	HD
Green	290932	1.8	58	35.8	10-25	100-135
Black	290933	2.0	58	35.8	20-55	130-160
White	290934	2.4	58	35.8	40-120	155-240
Pink	290935	3.0	58	35.8	60-220	220-450
Blue	290936	3.5	58	35.8	150-350	400-1 000
Silver	290937	4.0	58	35.8		800-1 800
Red	290938	4.5	58	35.8		1 200-2 500
Purple	290939	5.5	58	35.8		2 200-5 000

## Spring selection

The response pressure results from the force that the movable parts exert on the adjusting spring (2) installed. The full response pressure range can be covered by changing the adjusting springs.

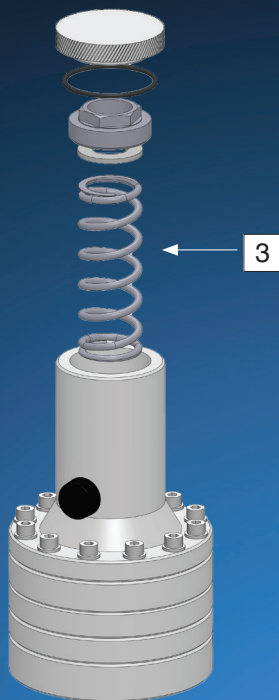


## FRSBV 5010...

Setpoint range for springs FRSBV 5010 ...					
Spring colour	Replacement item number	Wire diameter [mm]	Length [mm]	Diameter [mm]	Setpoint range [mbar]
					ND
Green	290940	1.0	60	20	32-38
Red	290941	1.1	60	20	35-45
Yellow	290942	1.3	60	20	45-65
Black	290943	1.5	60	20	65-95
Purple	290944	1.6	60	20	85-125
Pink	290945	1.8	60	20	125-185
White	290946	2.2	60	20	185-350
Blue	290947	2.5	50	20	350-580
Orange	290948	2.8	50	20	570-900
Brown	290949	3.0	50	20	750-1 300
Silver	290950	3.5	45	20	1 250-1 700
Grey	290951	3.8	45	20	1 600-2 000

## Spring selection

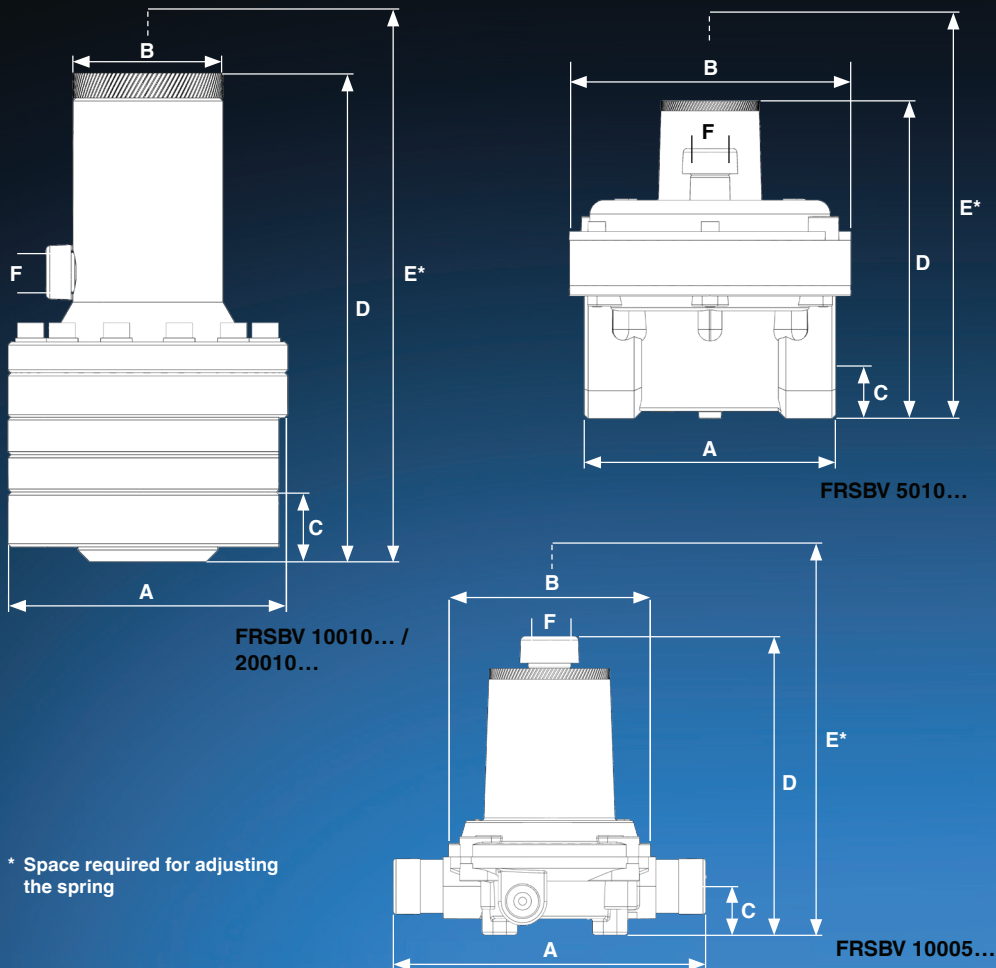
The response pressure results from the force that the movable parts exert on the adjusting spring (3) installed. The full response pressure range can be covered by changing the adjusting springs.



## FRSBV 10010... / 20010...

Setpoint range for springs FRSBV 10010 / 20010 ...					
Spring colour	Replacement item number	Wire diameter [mm]	Length [mm]	Diameter [mm]	Setpoint range [mbar]
					HD
Green	290952	3.5	110	35	200-1 000
Red	290953	4.0	100	35	250-1 500
White	290954	4.5	100	35	300-2 000
Yellow	290955	5.0	100	35	500-3 000
Blue	290956	5.5	100	35	750-4 000
Black	290957	6.0	100	35	1 000-8 000

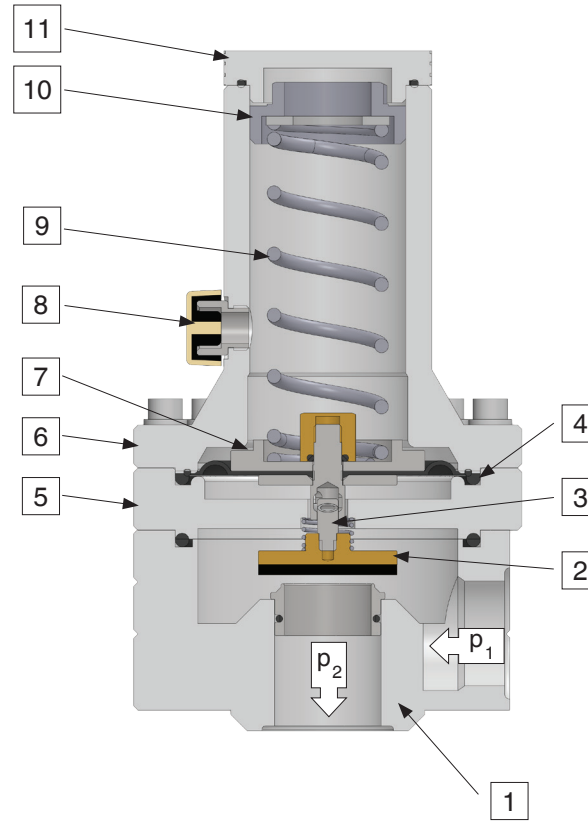
## Dimensions FRSBV



Type	Item number		p <sub>max.</sub> [bar / kPa]	Thread	Dimensions [mm]						Weight [kg]
	BSP	NPT			A	B	C	D	E	F	
FRSBV 10005 ND	289261	289266	10 / 1 000	½"	116	75	18	111	211	G¼"	0.56
FRSBV 10005 HD	289262	289267	10 / 1 000	½"	116	75	18	111	211	G¼"	0.56
FRSBV 5010 ND	289263	289268	5 / 500	1"	100	112	22	127	227	G¼"	0.89
FRSBV 10010 HD	289264	289269	10 / 1 000	1"	112	60	28	197	297	G¼"	2.50
FRSBV 20010 HD	289265	289270	20 / 2 000	1"	112	60	28	197	297	G¼"	6.15

Function

Sectional drawing FRSBV  
Cutaway of the device



- 1 Housing
- 2 Regulating cup
- 3 Push rod
- 4 Working diaphragm
- 5 Intermediate housing
- 6 Upper protective cover
- 7 Upper diaphragm case
- 8 Vent connection
- 9 Adjusting spring
- 10 Adjusting nut
- 11 Protective cap



Combustible gas and gas / air mixtures must not enter the installation space of the adjusting spring.

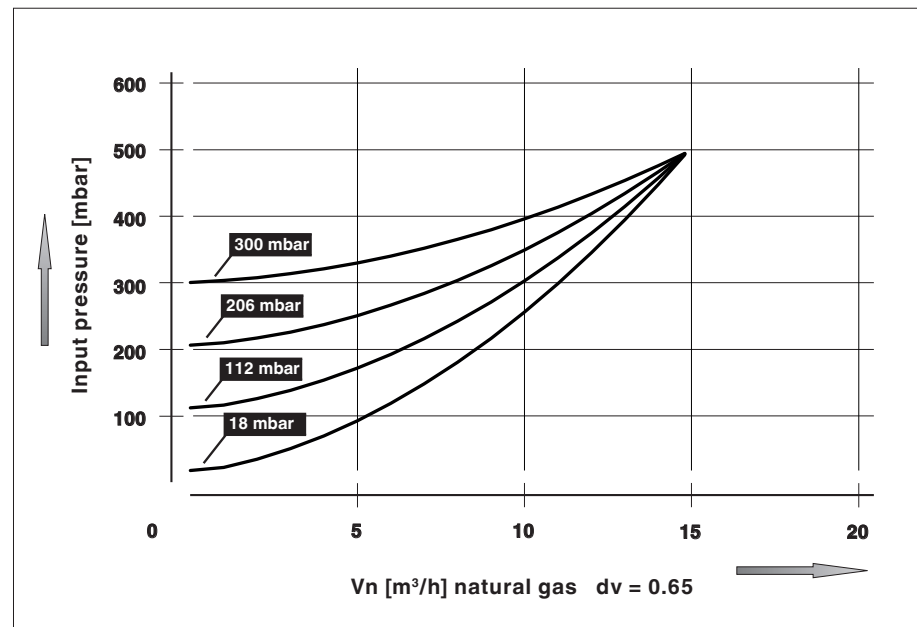
## Device selection

The flow rate that releases the pressure relief valve is subject to the opening pressure and the overpressure in the pipe.



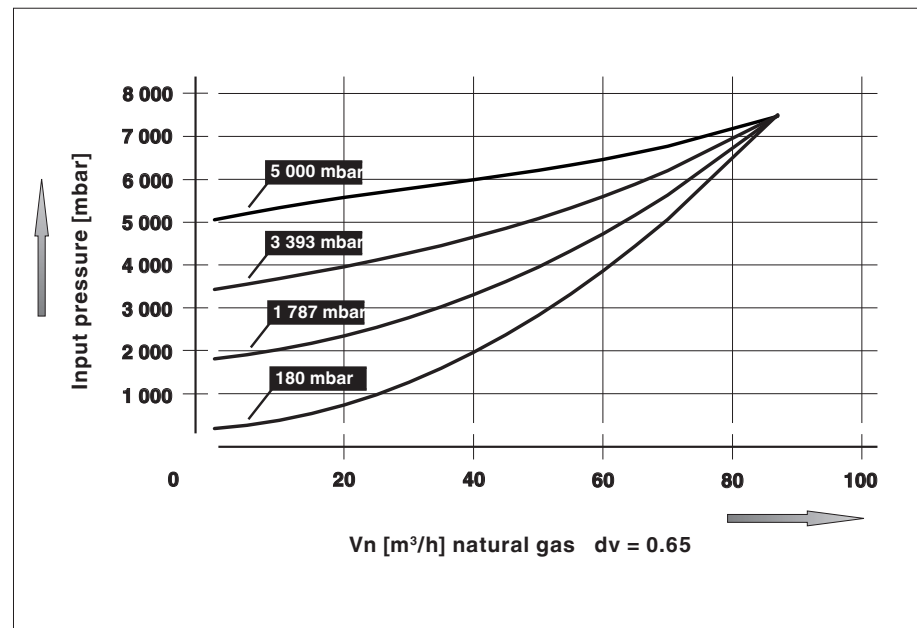
## Flow tables

### FRSBV 10005 ND





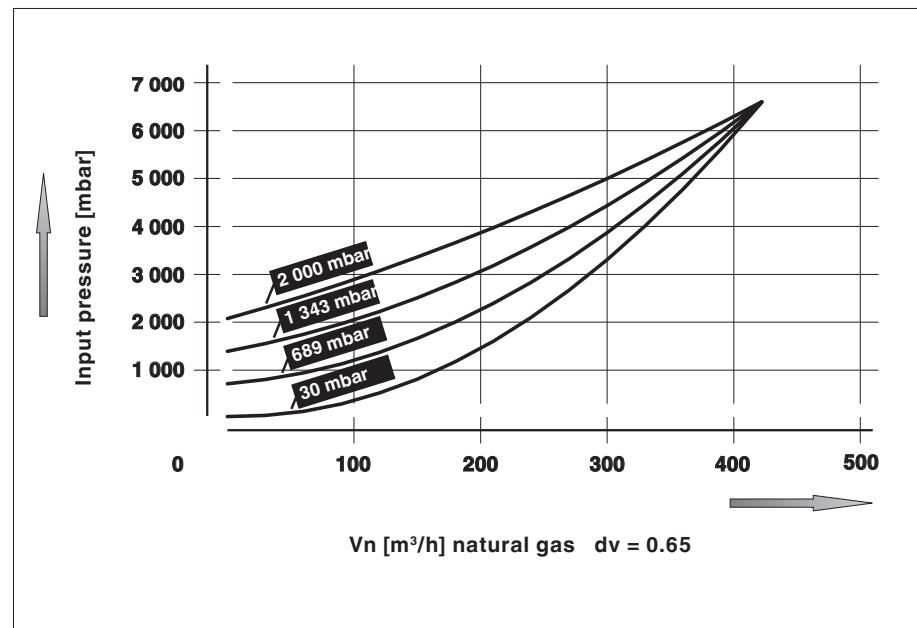
FRSBV 10005 HD



Device selection

Flow tables

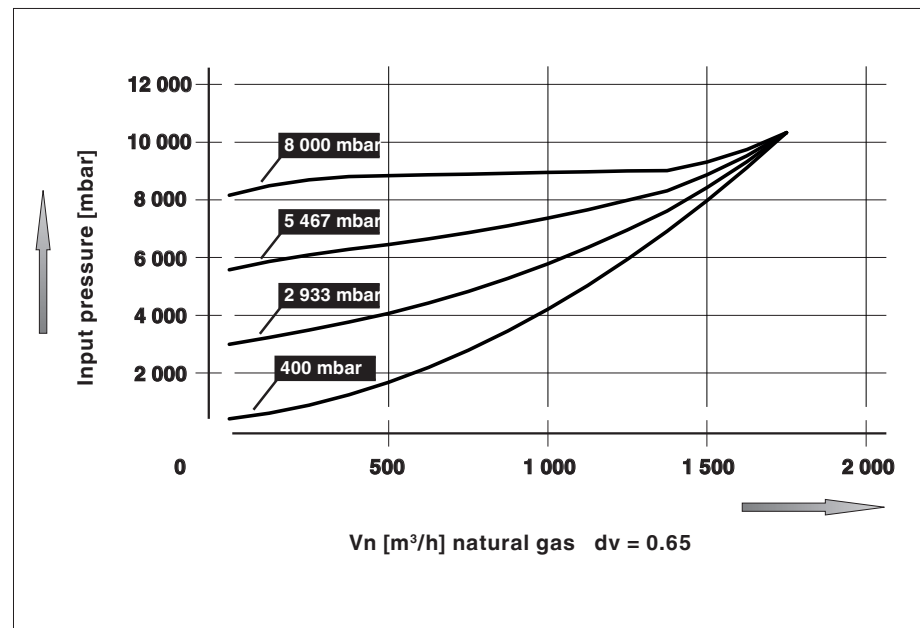
FRSBV 5010 ND



Device selection

Flow tables

FRSBV 10010 HD



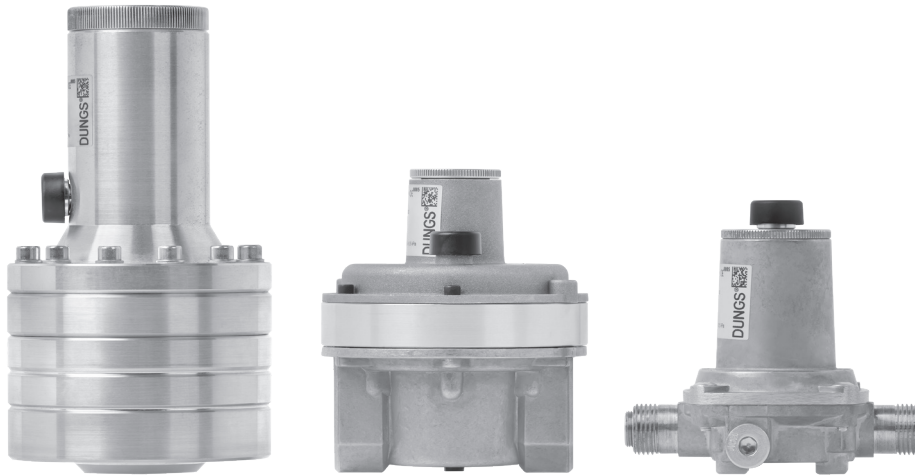
## Calculation of gas types

$$\dot{V}_{\text{gas used}} = \dot{V}_{\text{air}} \times f$$

$$f = \sqrt{\frac{\text{Density of the air}}{\text{Spec. weight of the gas used}}}$$

Type of gas	Spec. weight [kg/m³]	dv	f
Natural gas	0.81	0.65	1.24
City gas	0.58	0.47	1.46
Liquid gas	2.08	1.67	0.77
Air	1.24	1.00	1.00





Subject to technical modifications that are contingent upon technical progress.

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