SAV

Safety Shut-off Valve

DUNGS®
Combustion Controls

Safety Shut-off Valve Type SAV

Direct acting shut-off device with
adjustable setpoint springs for over-pressure and under-pressure monitoring

In compliance with EN 14382

- Inlet pressures up to 25 bar (2 500 kPa)
- High flow rate
- Manual reset
- External impulse
- Maintenance-friendly
- Flange connection DN 25 - DN 50
- Threaded connection Rp 1" - Rp 2"

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SAV

Spring-loaded, shut-off valve with adjustable setpoint springs for limitation of the upper and lower pressure downstream. External impulse of the valve downstream pressure.

Application

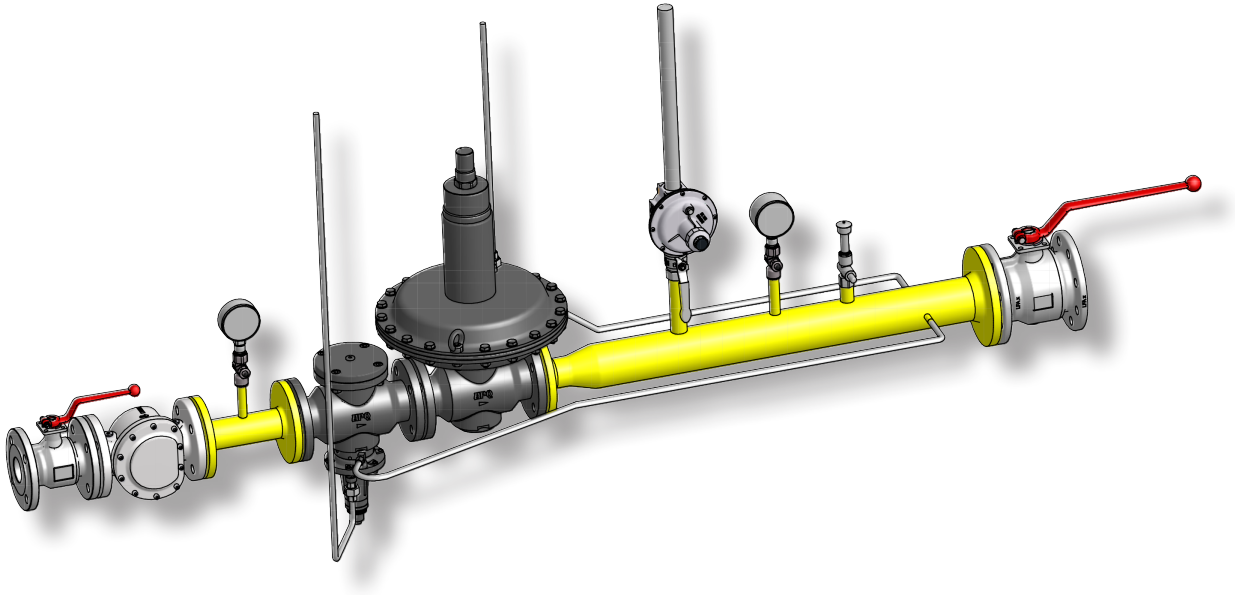
Safety valve closes when over and under pressures occurs in industrial gas burners and gas heating appliances. Also for installation in the municipal and commercial gas supply.

Suitable for gases of gas families 1, 2, 3 and other neutral gases.

Approval

EC type testing certificate as per:

- EC-Pressure Equipment Directive



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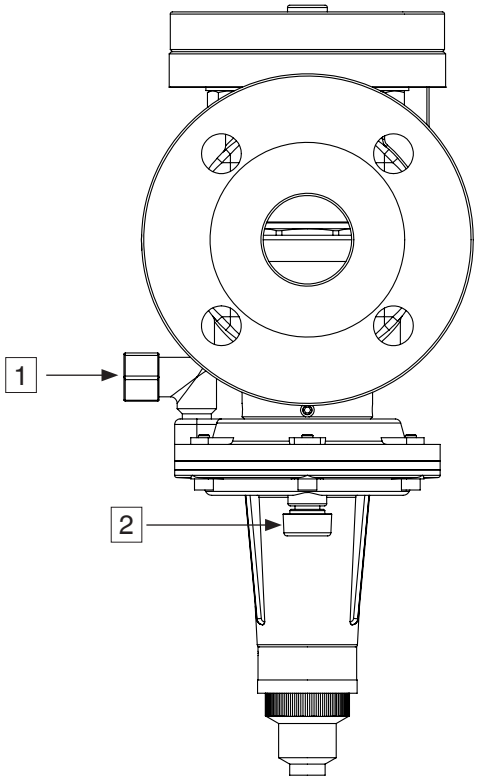
Safety shut-off valve in compliance with EN14382, class A

Type	SAV 100... IS (integral strength range) / SAV 250... DS (differential strength range)
Type of gas	Family 1+2+3
Nominal diameters Flanges	Connecting flange PN 25 according to EN1092-1or ANSI 150 lbs (B16.5) DN 25 40 50
Nominal diameters threaded	Connecting thread BSP (ISO228/1) or NPT (B1.20.1) G 1" 1 ½" 2"
Max. inlet pressure	SAV 100... 10 bar (1 000 kPa) / SAV 250... 25 bar (2 500 kPa)*
Response time	< 2 s
Lower adjustment range W_{du}	10 mbar up to 3 000 mbar (1-300 kPa)
Upper adjustment range W_{do}	40 mbar up to 5 000 mbar (4-500 kPa)
Materials	Main body housing: cast iron GGG 50 (GJS 400-18 on request) Diaphragm housing: aluminium (steel on request) Diaphragms: NBR
Ambient temperature	-20 °C to +60 °C

*19 bar (1900 kPa) with ANSI 150 flanges



1 External impulse line connection of the SAV, Ermeto screw connection GE 12- ¼ for tubes 12 x 1.5

2 Vent line connection of the SAV, G ¼ ISO 228

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Example SAV 100025 ND	SAV	100	025	ND	ANSI
Type	Safety Shut-off valve				
MOP	**100 …** **10 000 mbar**				
	250 … **25 000 mbar**				
Nominal diameter	10 1"				
	15 1 ½"				
	20 2"				
	025 DN 25				
	040 DN 40				
	050 DN 50				
Pressure range, trip pressure	ND Low pressure				
	MD Medium pressure				
	UHD Ultra high pressure				
Flange type	ANSI with standard PN-25 with ANSI 150 lbs				
	NPT With threads NPT				

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Type	Connection	Version	Order number	Lower switching point		Upper switching point	
				W_{du}	AG	W_{do}	AG
SAV 100025 ND	DN 25	ND	270290	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 100025 MD	DN 25	MD	270291	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 250025 UHD	DN 25	UHD	271122	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5
SAV 100040 ND	DN 40	ND	270293	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 100040 MD	DN 40	MD	270294	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 250040 UHD	DN 40	UHD	271123	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5
SAV 100050 ND	DN 50	ND	270296	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 100050 MD	DN 50	MD	270297	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 250050 UHD	DN 50	UHD	271124	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5
SAV 100025 ND ANSI	1” ANSI150	ND	277797	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 100025 MD ANSI	1” ANSI150	MD	277799	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 250025 UHD ANSI	1” ANSI150	UHD	275186	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5
SAV 100040 ND ANSI	1.1/2” ANSI150	ND	277801	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 100040 MD ANSI	1.1/2” ANSI150	MD	277802	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 250040 UHD ANSI	1.1/2” ANSI150	UHD	275184	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5
SAV 100050 ND ANSI	2” ANSI150	ND	277804	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 100050 MD ANSI	2” ANSI 150	MD	277805	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 250050 UHD ANSI	2” ANSI150	UHD	273855	150-3 000mbar	AG 5	500-5 000 mbar	AG 5

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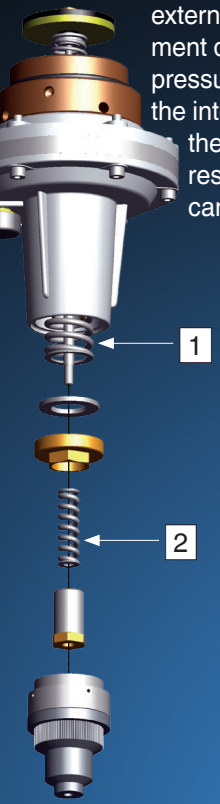
Typ	Anschluß	Aus-führung	Bestell-nummer	Unterer Schaltpunkt		Oberer Schaltpunkt	
				W_{du}	AG	W_{do}	AG
SAV 10010 ND	G 1”	ND	287907	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 10010 MD	G 1”	MD	287908	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 25010 UHD	G 1”	UHD	287909	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5
SAV 10015 ND	G 1.1/2”	ND	287910	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 10015 MD	G 1.1/2”	MD	287911	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 25015 UHD	G 1.1/2”	UHD	287912	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5
SAV 10020 ND	G 2”	ND	287913	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 10020 MD	G 2”	MD	287914	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 25020 UHD	G 2”	UHD	287915	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5
SAV 10010 ND NPT	NPT 1”	ND	287916	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 10010 MD NPT	NPT 1”	MD	287917	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 25010 UHD NPT	NPT 1”	UHD	287918	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5
SAV 10015 ND NPT	NPT 1.1/2”	ND	287919	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 10015 MD NPT	NPT 1.1/2”	MD	287920	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 25015 UHD NPT	NPT 1.1/2”	UHD	287921	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5
SAV 10020 ND NPT	NPT 2”	ND	287922	10-115 mbar	AG 10	40-240 mbar	AG 10
SAV 10020 MD NPT	NPT 2”	MD	287923	35-400 mbar	AG 10	180-800 mbar	AG 10
SAV 25020 UHD NPT	NPT 2”	UHD	287924	150-3 000 mbar	AG 5	500-5 000 mbar	AG 5

Selection of SAV springs

The response pressure results from the force of the installed adjusting spring. The upper response pressure (overpressure) is set on the external **spring 1** of the measurement device. The lower response pressure (vacuum) can be set on the internal **spring 2**. By changing the setpoint springs, different response pressures can be set.



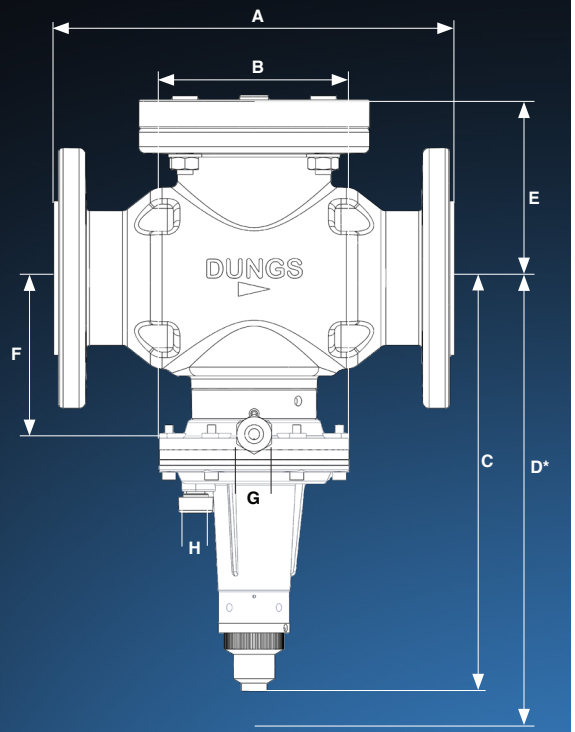
Specific set range, underpressure W_{dsu}

Spring colour	Order number	Wire diameter [mm]	Length [mm]	Diameter [mm]	Setpoint range [mbar]		
					ND	MD	UHD
White	270353	1.2	60	10.0	10-32		
Yellow	270355	1.5	55	12.3	24-40		
Blue	270356	2.0	55	12.3	30-115	35-110	
Black	270357	2.3	55	12.3		50-250	
Purple	270358	2.5	55	12.3		80-400	150-500
Orange	270359	2.8	55	12.3			300-1 000
Silver	270360	3.0	60	15.0			800-1 400
Pink	276126	3.5	60	15.0			1 200-3 000

Specific set range, overpressure W_{dso}

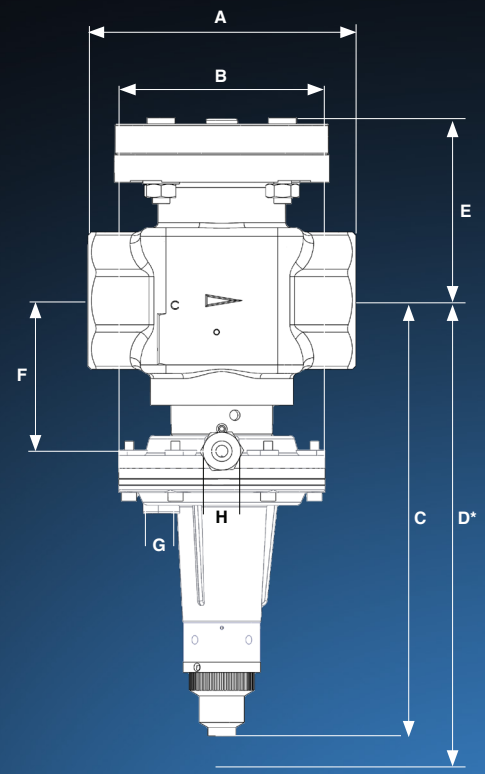
Spring colour	Order number	Wire diameter [mm]	Length [mm]	Diameter [mm]	Setpoint range [mbar]		
					ND	MD	UHD
Silver	270361	2.2	60	30.0	40-130		
Green	270366	2.5	60	30.0	60-190	180-290	
Red	270367	2.7	60	30.0	90-240	230-370	
Yellow	270368	3.2	60	30.0		300-500	
Blue	270369	3.5	60	30.0		400-800	500-1 000
Black	270370	3.7	60	30.0			700-1 300
Purple	270371	4.0	60	30.0			1 000-1 800
Orange	270372	4.5	60	30.0			1 300-2 500
Pink	270373	4.8	60	30.0			1 800-3 500
White	271115	5.0	60	30.0			2 500-5 000

Installation dimensions SAV flanged



* Space required for unlocking

Type	Order number		p máx. [bar / kPa]	DN	Dimensions [mm]								Weight [kg]
	DIN	ANSI			A	B	C	D	E	F	G	H	
SAV 100025 ND	270290	277797	10 / 1 000	25	184	120	240	490	83	78	12 x 1,5	G ¼	7,6
SAV 100025 MD	270291	277799	10 / 1 000	25	184	120	237	487	83	78	12 x 1,5	G ¼	7,6
SAV 250025 UHD	271122	275186	25 / 2 500	25	184	120	244	494	83	78	12 x 1,5	G ¼	7,6
SAV 100040 ND	270293	277801	10 / 1 000	40	223	120	251	501	106	90	12 x 1,5	G ¼	13,3
SAV 100040 MD	270294	277802	10 / 1 000	40	223	120	247	497	106	90	12 x 1,5	G ¼	13,3
SAV 250040 UHD	271123	275184	25 / 2 500	40	223	120	255	505	106	90	12 x 1,5	G ¼	13,3
SAV 100050 ND	270296	277804	10 / 1 000	50	254	120	260	510	116	99	12 x 1,5	G ¼	16,0
SAV 100050 MD	270297	277805	10 / 1 000	50	254	120	256	506	116	99	12 x 1,5	G ¼	16,0
SAV 250050 UHD	271124	273855	25 / 2 500	50	254	120	264	514	116	99	12 x 1,5	G ¼	16,0



* Space required for unlocking

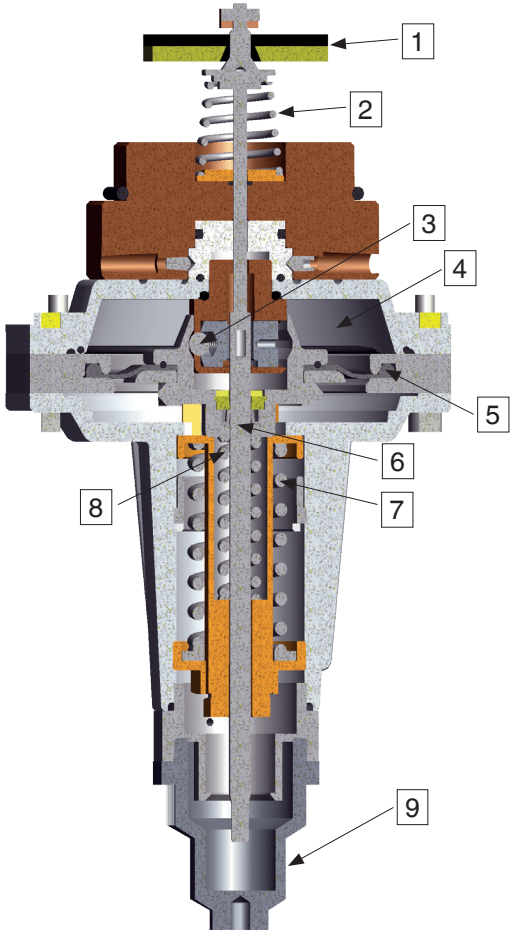
Type	Order number		p máx. [bar / kPa]	Rosca	Dimensions [mm]								Weight [kg]
	G	NPT			A	B	C	D	E	F	G	H	
SAV 10010 ND	287907	287916	10 / 1 000	1”	104	120	238	488	62	77	12 x 1,5	G ¼	4,1
SAV 10010 MD	287908	287917	10 / 1 000	1”	104	120	238	488	62	77	12 x 1,5	G ¼	4,1
SAV 25010 UHD	287909	287918	25 / 2 500	1”	104	120	243	493	62	77	12 x 1,5	G ¼	4,1
SAV 10015 ND	287910	287919	10 / 1 000	1.1/2”	132	120	240	490	62	79	12 x 1,5	G ¼	5,4
SAV 10015 MD	287911	287920	10 / 1 000	1.1/2”	132	120	240	490	62	79	12 x 1,5	G ¼	5,4
SAV 25015 UHD	287912	287921	25 / 2 500	1.1/2”	132	120	245	495	62	79	12 x 1,5	G ¼	5,4
SAV 10020 ND	287913	287922	10 / 1 000	2”	156	120	249	499	106	88	12 x 1,5	G ¼	8,7
SAV 10020 MD	287914	287923	10 / 1 000	2”	156	120	249	499	106	88	12 x 1,5	G ¼	8,7
SAV 25020 UHD	287915	287924	25 / 2 500	2”	156	120	254	504	106	88	12 x 1,5	G ¼	8,7

Information
Gas carrying, impulse lines and connecting lines must be resistant to thermal, chemical and mechanical stresses. They must also be durable and resistant to deformation and cracks.

Any condensate from impulse lines must not flow into closing device (ASE).

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

Sectional drawing SAV
Device in the closed position



Chamber 4 is connected to the outlet pressure via an impulse line. The pressure being monitored acts on the working diaphragm 5. The force of the setpoint springs 7 and 8 acts as counterforce. In case of an unbalance of forces (overpressure or underpressure), the SAV is actuated and the gas supply is blocked.

1	Valve disc
2	Closing spring
3	Ball catch / trigger mechanism
4	Chamber with the pressure to be monitored
5	Working diaphragm
6	Push rod
7	Setpoint spring for pd_o
8	Setpoint spring for pd_u
9	Protective cap

The following flow rate tables can be used to select the device. With required flow at a certain inlet pressure, it can be defined the corresponding pressure drop. Flows are defined in natural gas (ρ=0,81kg/m³) or air (ρ=1,24kg/m³) at a temperature of 15° C. In case of different types of gases, a conversion of the volume flow according to the equation on page 14 is carried out.

Design a straight stabilisation section with the equal diameter.

Impulse connection at a distance of > 5 x DN.

Maximum flow velocity = 50 m/s

Max. pressure difference Δp = 500 mbar

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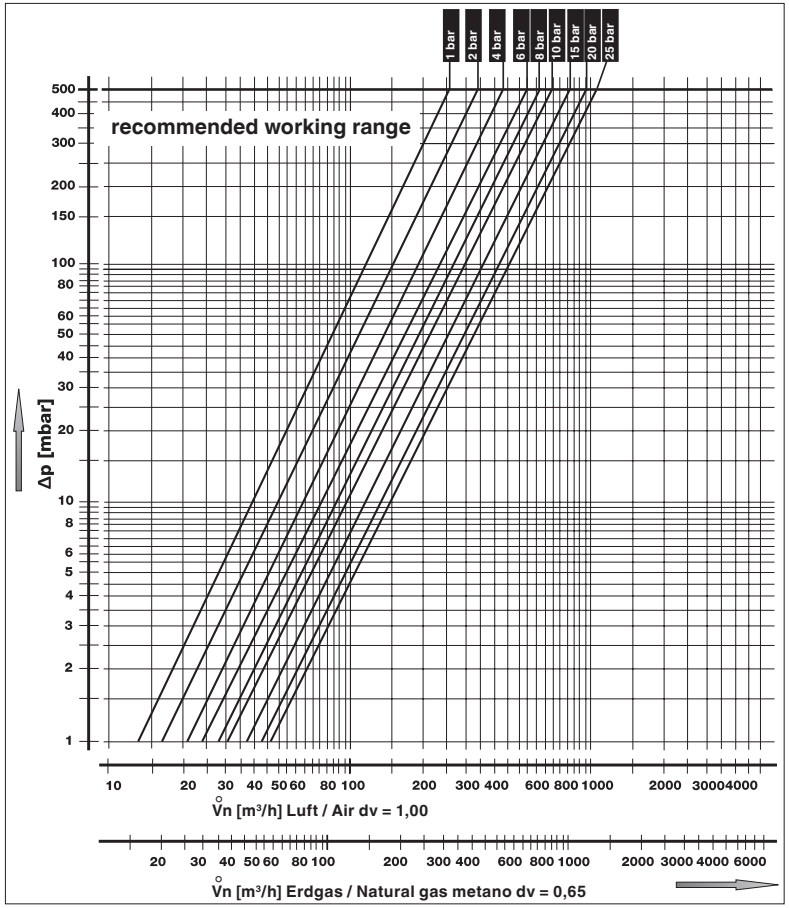
SAV DN 25



Based on + 15° C, 1 013 mbar, dry

max. pressure difference Δp = 500 mbar
max. flow velocity = 50 m/s

Flow diagram

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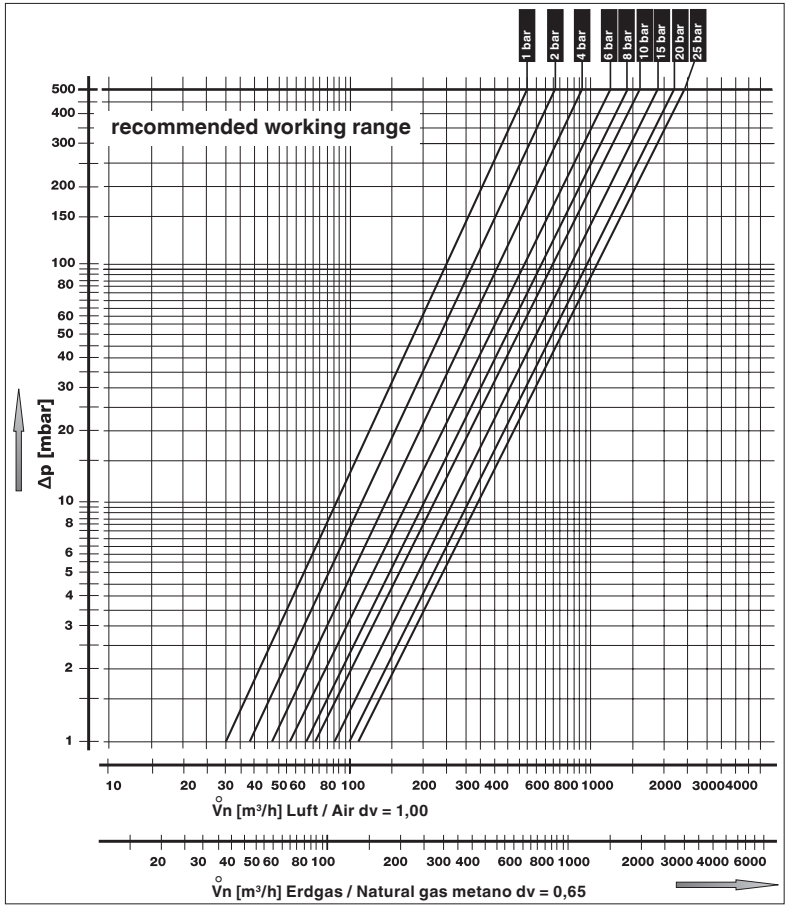
SAV DN 40



Based on + 15° C, 1 013 mbar, dry

max. pressure difference
Δp = 500 mbar
max. flow velocity
= 50 m/s

Flow diagram

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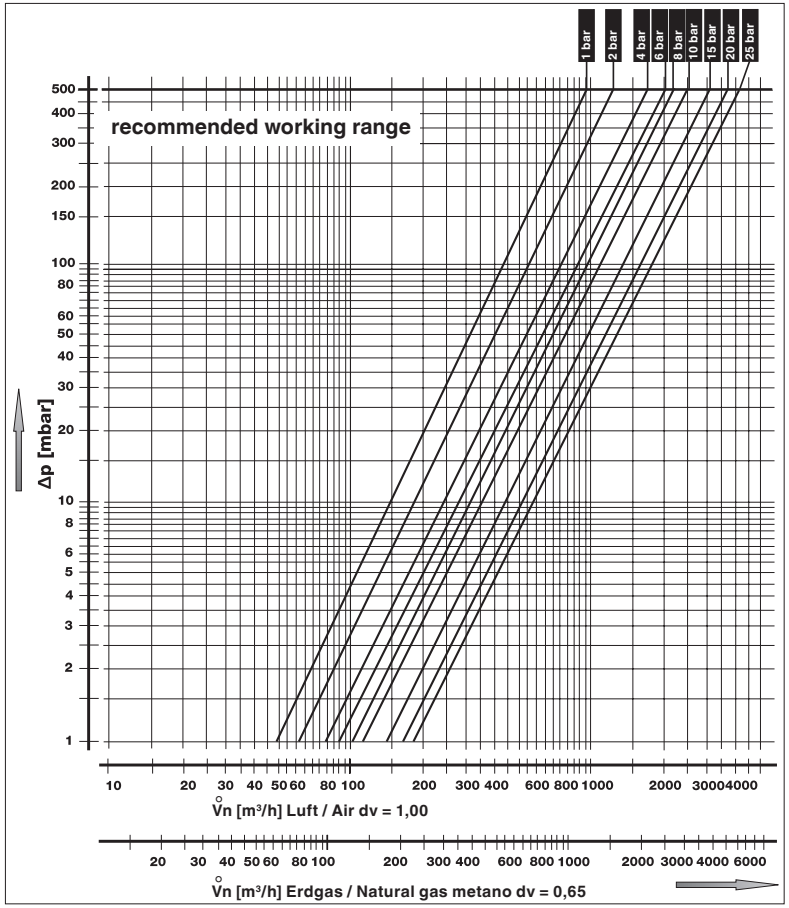
SAV DN 50



Based on + 15° C, 1 013 mbar, dry

max. pressure difference
Δp = 500 mbar
max. flow velocity
= 50 m/s

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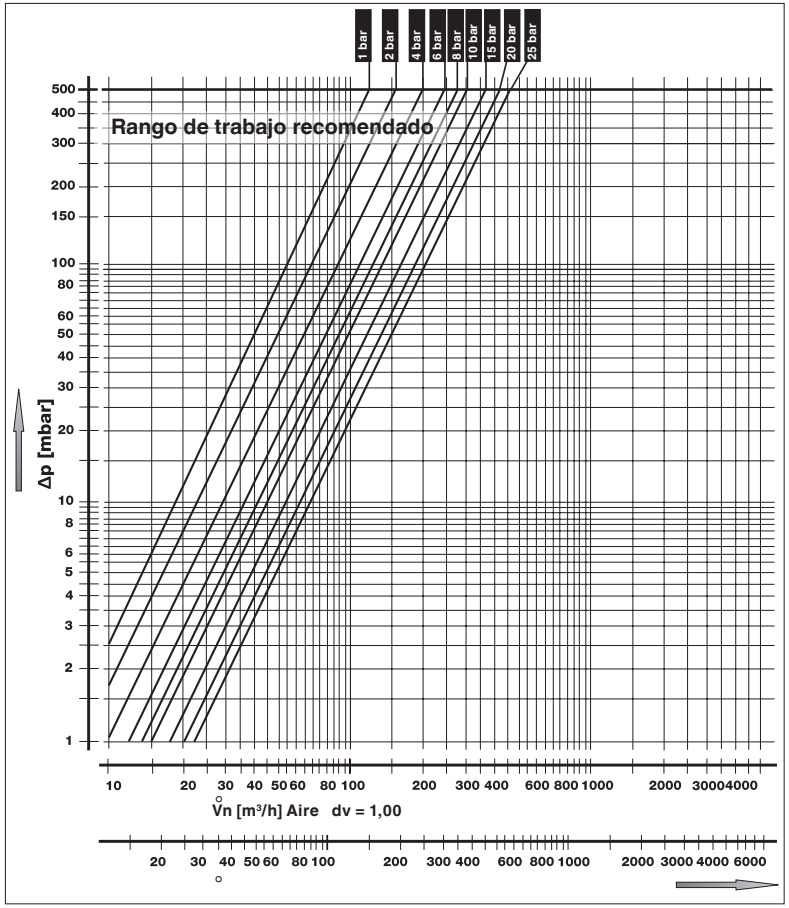
SAV G 1" , SAV G 1.1/2"



Based on + 15° C, 1 013 mbar, dry

max. pressure difference
Δp = 500 mbar
max. flow velocity
= 50 m/s

Flow diagram

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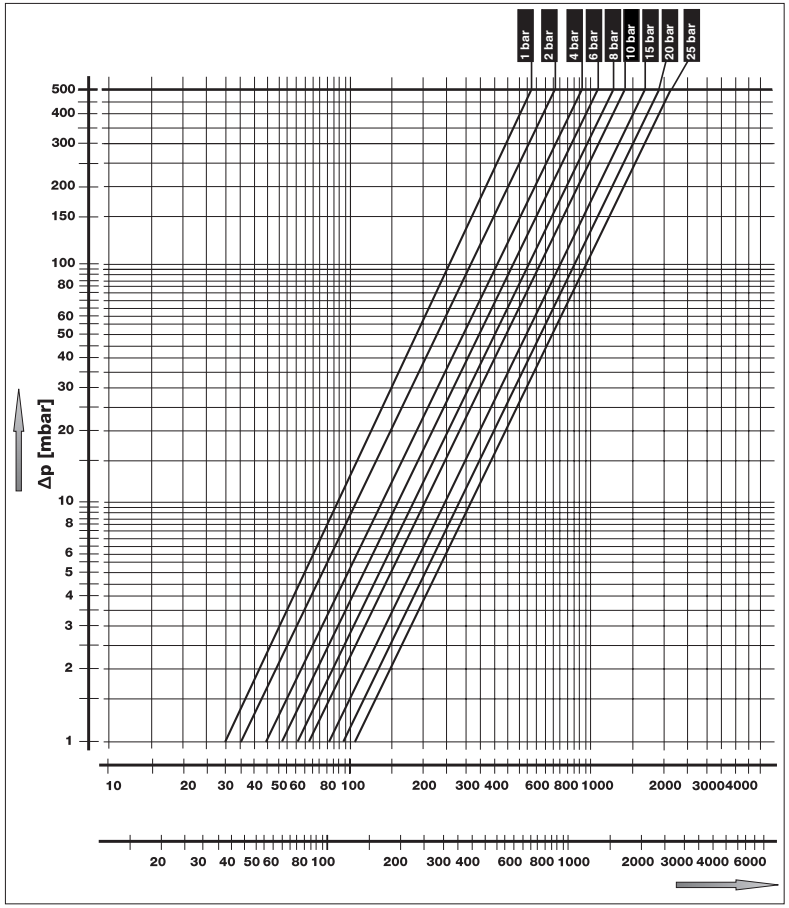
SAV G 2"



Based on + 15° C, 1 013 mbar, dry

max. pressure difference
Δp = 500 mbar
max. flow velocity
= 50 m/s

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

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

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

Subject to technical modification in the interest of technical progress.

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