

Magnetic relief valve VAN

Technical Information · GB

3 Edition 01.13



- Open when de-energized
- Connection flanges for pipes up to DN 50
- Suitable for a maximum inlet pressure of 500 mbar (7 psig)
- Space-saving installation thanks to compact dimensions
- Quick closing, quick opening
- Check indication by blue LED
- Position indicator with visual indicator
- EC type-tested and certified

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Contents

- Magnetic relief valve VAN 1
- Contents 2
- 1 Application 3
 - 1.1 Examples of application 5
 - 1.1.1 Relief valve with two gas solenoid valves and tightness control 5
 - 1.1.2 Relief valve with 2 gas solenoid valves 5
 - 1.1.3 Inert gas atmosphere for annealing processes 5
- 2 Certification 6
 - 2.1 EC type-tested and certified 6
 - 2.2 Approval for Russia 6
- 3 Function 7
 - 3.1 Magnetic relief valve VAN 7
 - 3.2 Magnetic relief valve VAN..S 7
 - 3.3 Animation 8
 - 3.4 Connection diagram 9
 - 3.4.1 VAN with M20 cable gland 9
 - 3.4.2 VAN with plug 9
 - 3.4.3 Position indicator 9
- 4 Replacement possibilities 10
 - 4.1 Search for order number or type 10
- 5 Flow rate 11
 - 5.1 Calculating the nominal size 11
- 6 Selection 12
 - 6.1 Selection table 12
 - 6.1.1 Type code 12
- 7 Project planning information 13
 - 7.1 Installation 13
 - 7.1.1 Relief line for the NAFTA market 14
- 8 Accessories 15
 - 8.1 Exhaust ABG 15
 - 8.1.1 Installation instructions 15
 - 8.1.2 Selection 16

- 8.1.3 Technical data 16
- 8.2 Pipe adapters for VCS 6–9 17
- 8.3 Intermediate elements for VCS 1–3 17
- 9 Technical data 18
 - 9.1 Dimensions 19
 - 9.1.1 VAN with Rp internal thread [mm] 19
 - 9.1.2 VAN with NPT internal thread [inch] 19
- Feedback 20
- Contact 20

1 Application



VAN

The magnetic relief valve VAN is designed to monitor gas valves for tightness used in conjunction with a visual discharge unit. It enables the purging of excess or leakage gas. The magnetic relief valve VAN is open when it is de-energized.



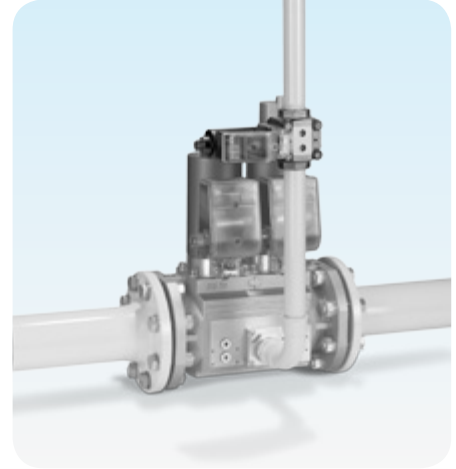
VAN..S



Forging furnace



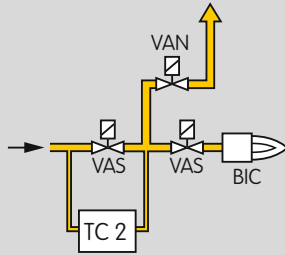
Roller hearth furnace



Magnetic relief valve VAN on the double solenoid valve VCS

1.1 Examples of application

1.1.1 Relief valve with two gas solenoid valves and tightness control

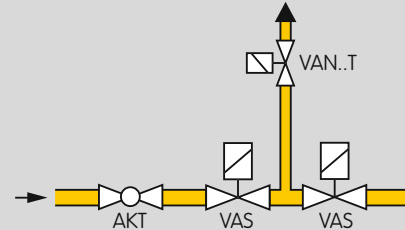


Tightness control TC 2 checks the gas solenoid valves VAS and the magnetic relief valve VAN for tightness.

If the gas solenoid valves and the magnetic relief valve are tight, the tightness control forwards an enable signal to the automatic burner control unit. The pilot valve output of the automatic burner control unit opens the gas solenoid valves VAS simultaneously. The burner starts.

In accordance with the Russian safety regulations PB 12-529-03, installations with a capacity of ≥ 1.2 MW must be fitted with a relief valve and tightness control.

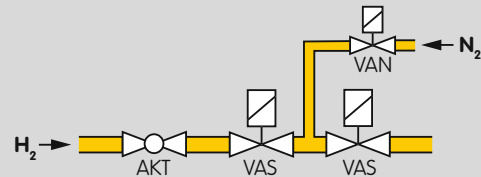
1.1.2 Relief valve with 2 gas solenoid valves



A valve, open when de-energized, is designed to purge gas to a safe venting point.

For the NAFTA market, this applies for capacities of ≥ 117 kW (400,000 BTU/h), see page 14 (Relief line for the NAFTA market).

1.1.3 Inert gas atmosphere for annealing processes



Whenever no hydrogen is needed for the annealing process (e.g. in the case of an annealing bell), the gas solenoid valves VAS and the magnetic relief valve VAN are disconnected from the electrical power supply. The VAN opens. Under high pressure, nitrogen can now get between the two gas solenoid valves VAS. This prevents hydrogen from flowing into the furnace.

2 Certification

2.1 EC type-tested and certified



pursuant to

- Gas Appliances Directive (2009/142/EC) in conjunction with EN 161 and EN 13611

Meets the requirements of the

- Low Voltage Directive (2006/95/EC) in conjunction with the relevant standards,
- EMC Directive (2004/108/EC) in conjunction with EN 55014-1.

2.2 Approval for Russia

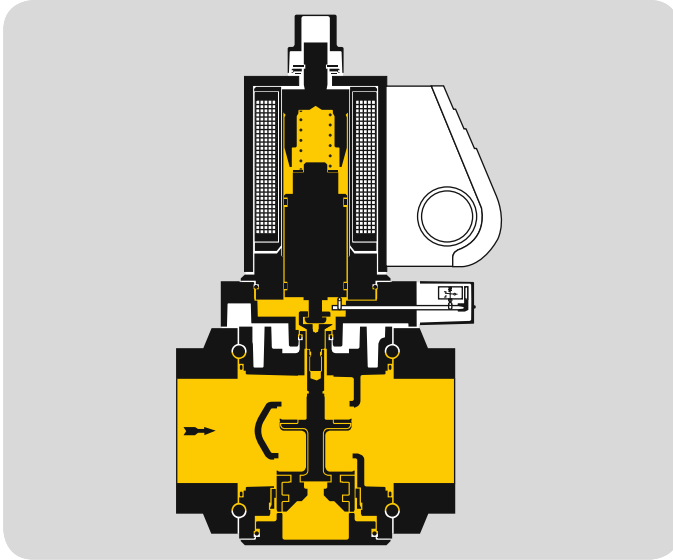


Certified by Gosstandart pursuant to GOST-TR.

Approved by Rostekhnadzor (RTN).

3 Function

3.1 Magnetic relief valve VAN

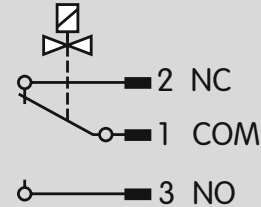


The magnetic relief valve VAN is open when it is de-energized.

Closing: connect the system to the electrical power supply (alternating voltage will be rectified). The blue LED lights up. The coil's magnetic field pulls the armature with the attached valve discs upwards. The magnetic relief valve VAN closes. The double valve seat means that the forces from the inlet pressure are divided almost equally between the two valve seats.

Opening: disconnect the VAN from the electrical power supply. The blue LED goes out. The armature is pressed into its initial position by the closing spring. The magnetic relief valve opens within 1 s.

3.2 Magnetic relief valve VAN..S



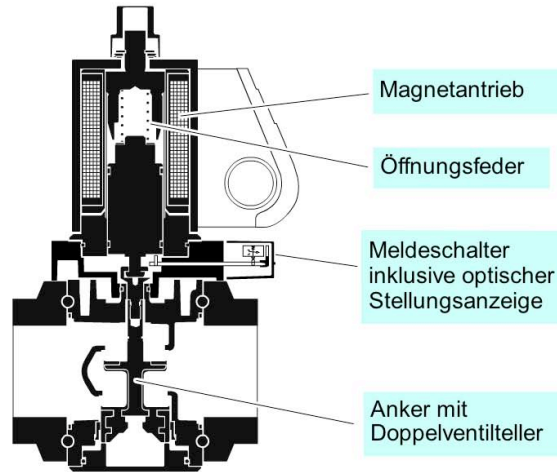
The magnetic relief valve VAN..S is open when it is de-energized.

Closing: when the magnetic relief valve is closed, the position indicator is operated. The visual position indicator is activated. The "closed" signal is marked in red. The double valve seat closes to shut off the volume of gas.

Opening: the magnetic relief valve is disconnected from the voltage supply and the opening spring forces the double valve disc open. The position indicator switches. The visual position indicator is white for "open".

The actuator cannot be rotated on magnetic relief valves VAN..S with position indicator and visual indicator.

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3.3 Animation

The interactive animation shows the function of the magnetic relief valve VAN.

Click on the picture. The animation can be controlled using the control bar at the bottom of the window (as on a DVD player).

To play the animation, you will need Adobe Reader 7 or a newer version. If you do not have Adobe Reader on your system, you

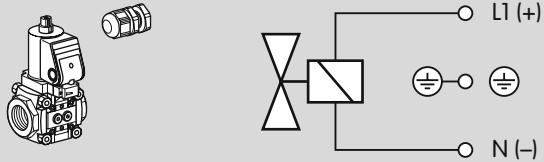
can download it from the Internet. Go to www.adobe.com, click on "Get Adobe Reader" and follow the instructions.

If the animation does not start to play, you can download it from the document library (DOCUTHEK) as an independent application.

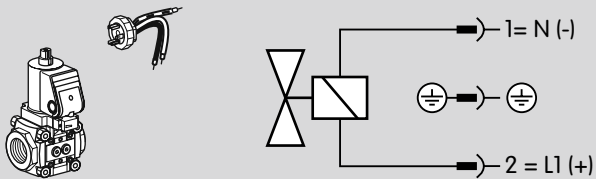
3.4 Connection diagram

Wiring to EN 60204-1.

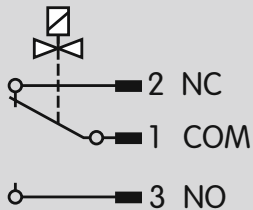
3.4.1 VAN with M20 cable gland



3.4.2 VAN with plug



3.4.3 Position indicator



4 Replacement possibilities

Type				Type
VAN	Magnetic relief valve			VAN
15	DN 15		Size 1 DN 15	115
20	DN 20		Size 1 DN 20	120
25	DN 25		Size 1 DN 25	125
40/32	DN 40	32 mm (1.26") internally	Size 2 DN 32	232
T	T-product			T
R	Rp internal thread			R
N	NPT internal thread			N
02	p _U max.: 200 mbar (2 psig)			●
10	1000 mbar (14.5 psig)			–
N	Quick opening			N
K	Mains voltage: 24 V DC			K
Q	120 V AC			Q
W	230 V AC			W
3	Terminal connection box, IP 54			3
6	Terminal box with 3-pin standard socket, IP 54			○
6L	Terminal box with 3-pin standard socket, with lamp, IP 54			–
1	Screw plug at the inlet			●
CPS	Position indicator			S
VAN 20R02NW3CPS		Example	Example	VAN 120RNW3S

● = standard, ○ = available

4.1 Search for order number or type

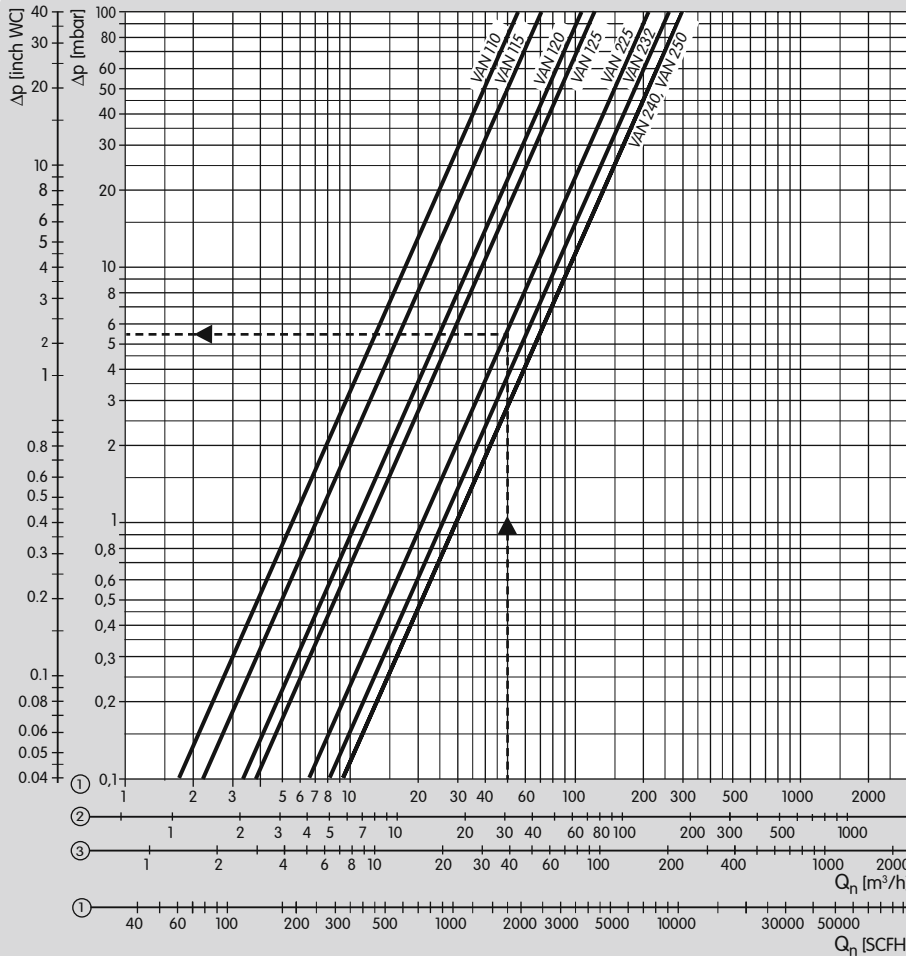
Previous Order No. Previous type designation

Hits:

VAN 15–40/32 is to be replaced by VAN 110–250

New Order No.

New type designation



- ① = Natural gas ($\rho = 0.80 \text{ kg/m}^3$)
- ② = Propane ($\rho = 2.01 \text{ kg/m}^3$)
- ③ = Air ($\rho = 1.29 \text{ kg/m}^3$)

The characteristic flow rate curves have been measured with the specified flanges.

5 Flow rate

Reading instructions: when determining the pressure loss, operating cubic metres must be entered. Then the pressure loss Δp read must be multiplied by the absolute pressure in bar (positive pressure + 1) to account for the change in the medium's density.

Example:

inlet pressure p_u (positive pressure) = 0.3 bar,
gas type: natural gas,
operating flow rate $Q_b = 50 \text{ m}^3/\text{h}$,
 Δp from diagram = 5.5 mbar,
 $\Delta p = 5.5 \text{ mbar} \times (1 + 0.3) = 7.2 \text{ mbar}$ on the magnetic relief valve VAN 225.

5.1 Calculating the nominal size

metric

imperial

Flow rate Q_n

Inlet pressure p_u

Δp_{max}

Medium temperature

Flow rate Q_b

Product

Δp

v

6 Selection

6.1 Selection table

Type	T ¹⁾	10	15	20	25	32	40	50	R	N ¹⁾	/N	K	P	Q	Y	W	S	G	R	L	3	
VAN 1	○	●	●	●	●				●	○	●	●	●	●	●	●	○	○	○	○	●	○ ²⁾ ○ ³⁾
VAN 2	○				●	●	●	●	●	○	●	●	●	●	●	●	○	○	○	○	●	○ ²⁾ ○ ³⁾

● = standard, ○ = available

¹⁾ VAN..T is delivered with NPT thread.

²⁾ Plug with socket.

³⁾ Plug without socket.

Order example

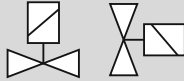
VAN 125R/NWS3

6.1.1 Type code

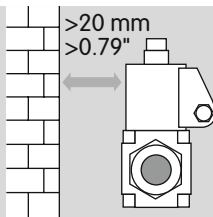
Code	Description
VAN	Magnetic relief valve
1	Size: 1
2	2
T	T-product
10	Nominal diameter [DN]: 10
15	15
20	20
25	25
32	32
40	40
50	50
R	Rp internal thread
N	NPT internal thread
/N	Quick opening, quick closing
K	Mains voltage: 24 V DC
P	100 V AC, 50/60 Hz
Q	120 V AC, 50/60 Hz
Y	200 V AC, 50/60 Hz
W	230 V AC, 50/60 Hz
S	Position indicator: with visual indicator
G	with visual indicator and gold contacts
R	Viewing side: right
L	left
3	Electrical connection: M20 cable gland

7 Project planning information

7.1 Installation

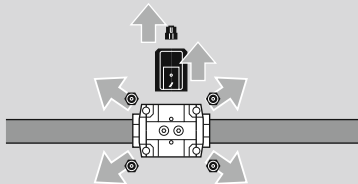


Installation position: black solenoid actuator in the vertical upright position or tilted up to the horizontal, not upside down.

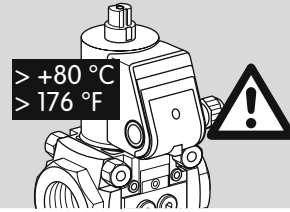


The magnetic relief valve VAN must not be in contact with masonry. Minimum clearance 20 mm (0.79 inches).

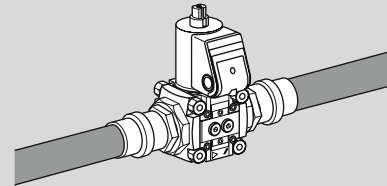
Do not store or install the unit in the open air.



Ensure that there is sufficient space for installation and adjustment.

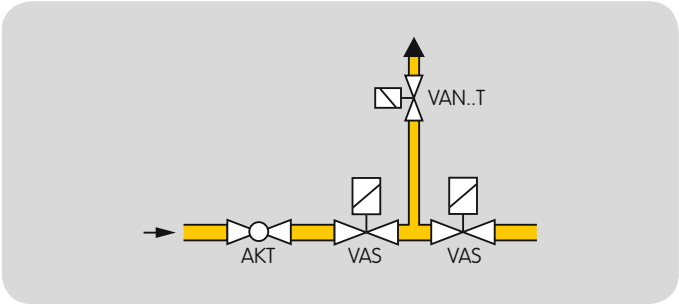


The solenoid body heats up during operation depending on ambient temperature and voltage.



The seals in some gas compression fittings are approved for temperatures of up to 70°C (158°F). This temperature limit will not be exceeded if the ambient temperature is no more than 40°C (104°F).

7.1.1 Relief line for the NAFTA market



A valve, open when de-energized, is compulsory for capacities over 117 kW (400,000 BTU/h) for purging gas to a safe area. The downstream relief lines on the VAN may not be interconnected. They must be designed in accordance with the IRI requirements for gas burners.

IRI requirements for gas burners			
Pipe size for gas supply		Relief line size	
NPT	DN	NPT	DN
< 1½"	< 40	¾"	20
2"	50	1"	25
2½"	65	1¼"	32
3½"	80	1½"	40
4"	100	2"	50
5"	125	2½"	65

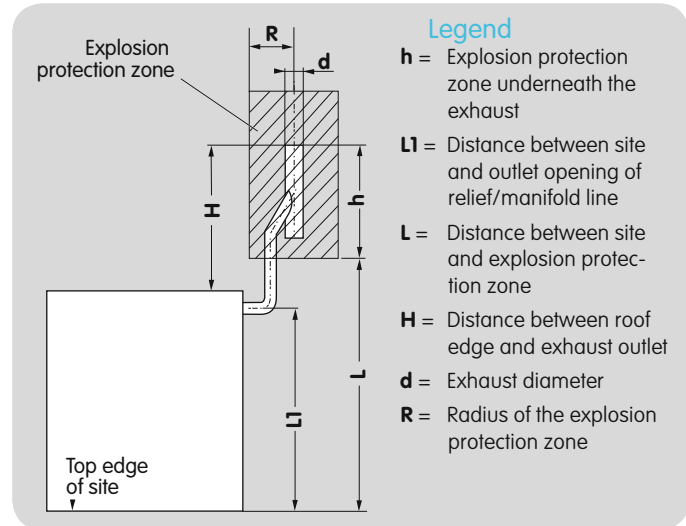
8 Accessories

8.1 Exhaust ABG

Potential explosive areas may be created at the discharge points of relief lines. The exhaust ABG enables the vertical, upwards exhaustion of the gases over the roof edges into the atmosphere. The exhaust ABG may be connected to safety relief valves or manifold lines. It is suitable for pressures on the exhaust outlet of up to 1.5 bar (21.75 psig). The exhaust's outlet openings are fitted with anti-bird grilles.

It is the responsibility of the operator to determine the explosion-hazard areas and to specify and document these zones. Instructions for this can be found in the DVGW note G442, the trade organization rules and regulations, the German Technical Rules for Industrial Safety and Health (TRBS), as well as further relevant publications.

8.1.1 Installation instructions



Install the exhaust ABG so as to guarantee the free flow and jet spreading of the outflowing gas. The exhaust should clearly project out over the roof edge (**H** = 15 × **d**). The outlet openings of the relief or manifold lines should lie ≥ 1.8 m (6 ft) over the top edge of the site (**L1**). The connection pipe for the exhaust ABG can be shortened, where applicable. Here it should be noted that the explosion protection zone underneath the exhaust remains big enough (**h** = 10 × **d**) and the distance between the explosion protection zone and the site is ≥ 2 m (6.6 ft) (**L**).

8.1.2 Selection

Type	/40	/80
ABG 25	●	–
ABG 50	–	●

Order example

ABG 25/40

Type code

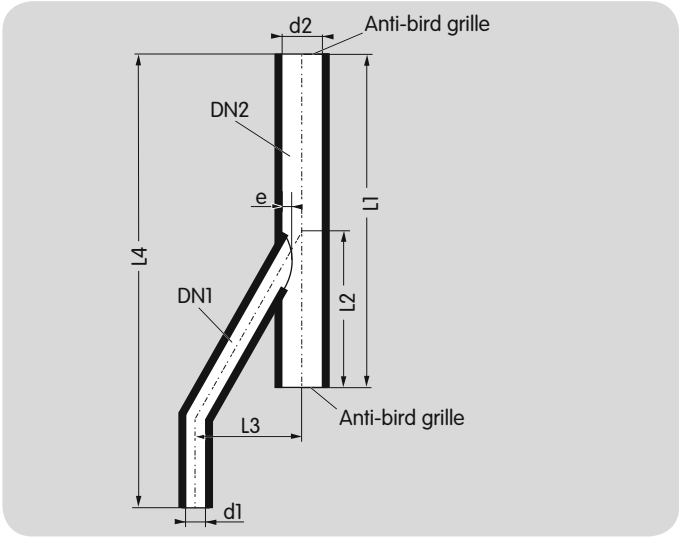
Code	Description
ABG	Exhaust for gas pressure control and measuring systems
Connection pipe nominal diameter [DN]:	
25	25
50	50
Exhaust nominal diameter [DN]:	
/40	40
/80	80

Exhaust ABG 25/40, Order No. 03165011,
Exhaust ABG 50/80, Order No. 03165013.

8.1.3 Technical data

Version: steel welded, hot-galvanized.
Connection pipe length: 1100 mm (43.3 inches).

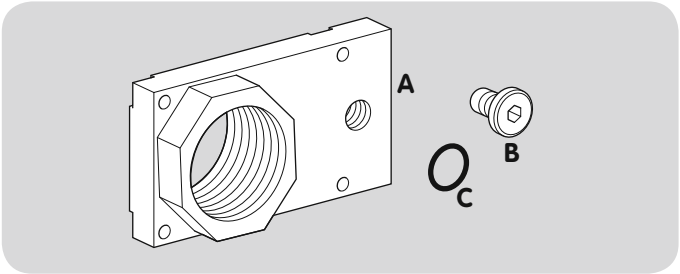
Dimensions



Type	Nominal diameter [DN]		Dimensions [mm]					Dimensions [mm]			
	DN1	DN2	L1	L2	L3	L4	e	d1	Wall thickness	d2	Wall thickness
ABG 25/40	25	40	350	160	130	1100	4.0	33.7	2.6	48.3	2.6
ABG 50/80	50	80	560	250	200	1100	8.0	60.3	2.9	88.9	3.2

8.2 Pipe adapters for VCS 6–9

For the easy installation of the magnetic relief valve onto a double block valve VCS 6 to 9 using a pipeline with an Rp or an NPT thread.

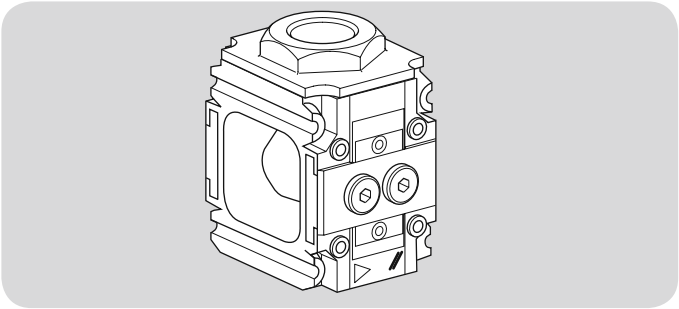


Scope of delivery:
A = pipe adapter,
B = screw plug,
C = sealing ring.

Type	Order No.
Pipe adapter Rp 1" VA 6-9 /B	74923025
Pipe adapter 1 1/2" NPT VA 6-9 /B	74923024

8.3 Intermediate elements for VCS 1–3

For the easy installation of the magnetic relief valve onto a double block valve VCS 1 to 3 using a pipeline with an Rp or an NPT thread.



Type	Order No.
Intermediate element VA1 Rp 1/2" /B	74922374
Intermediate element VA2 Rp 3/4" /B	74922413
Intermediate element VA3 Rp 1" /B	74922414
Intermediate element VA1T 1/2" /B	74922655
Intermediate element VA2T 3/4" /B	74922656
Intermediate element VA3T 1" /B	74922657

9 Technical data

Gas types: natural gas, LPG (gaseous), biologically produced methane (max. 0.1 %-by-vol. H₂S) or air; other gases on request.
The gas must be dry in all temperature conditions and must not contain condensate.

Max. inlet pressure p_{U1} : 500 mbar (7 psig).

Closing time: quick closing: < 1 s.

Ambient temperature: -20 to +50°C (-4 to +122°F), for short periods up to +60°C (140°F),
storage temperature: 0 – 60°C (32 – 140°F),
no condensation permitted.

Safety valve:

Class A Group 2 pursuant to EN 13611 and EN 161.

Mains voltage:

230 V AC, +10/-15%, 50/60 Hz;

200 V AC, +10/-15%, 50/60 Hz;

120 V AC, +10/-15%, 50/60 Hz;

100 V AC, +10/-15%, 50/60 Hz;

24 V DC, ±20%.

Cable gland: M20 x 1.5.

Electrical connection: cable with max. 2.5 mm² (AWG 12) or plug with socket to EN 175301-803.

Power consumption:

Type	24 V DC [W]	100 V AC [W]	120 V AC [W]	200 V AC [W]	230 V AC [W]
VAN 1	29	33	30	33	30
VAN 2	46	53	54	34	53

Enclosure: IP 65.

Duty cycle: 100%.

Power factor of the solenoid coil: $\cos \varphi = 1$.

Switching frequency: any.

Valve housing: aluminium,

Valve seal: NBR.

Connection flanges: Rp to ISO 7-1, NPT to ANSI/ASME.

Position indicator contact rating:

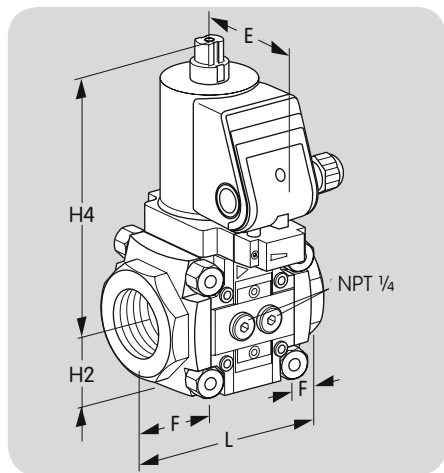
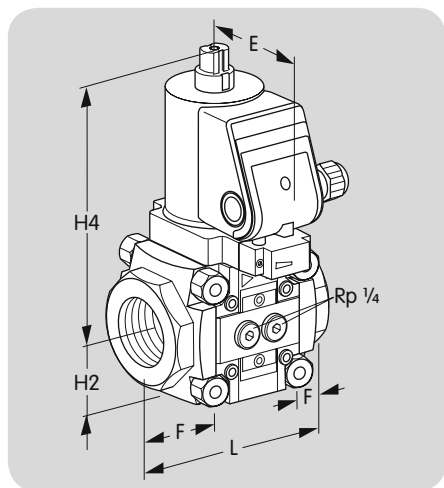
Type	Voltage	Min. current (resistive load)	Max. current (resistive load)
VAN..S	100 – 250 V AC, 50/60 Hz	100 mA	3 A
VAN..G	12 – 48 V AC, 50/60 Hz	2 mA	0.1 A

Switching frequency: 5 x per minute.

Switching current [A]	Switching cycles*	
	$\cos \varphi = 1$	$\cos \varphi = 0.6$
0.1	500,000	500,000
0.5	300,000	250,000
1	200,000	100,000
3	100,000	–

* Limited to max. 200,000 cycles for heating systems.

9.1 Dimensions



9.1.1 VAN with Rp internal thread [mm]

Type	Connection		Dimensions					Q air with $\Delta p = 1 \text{ mbar}$ m ³ /h	k _v max. m ³ /h	Weight kg
	Rp	DN	L mm	E mm	F mm	H2 mm	H4 mm			
VAN 110	3/8	10	75	75	15	34	161	4.4	5.0	1.4
VAN 115	1/2	15	75	75	15	34	161	5.5	6.4	1.4
VAN 120	3/4	20	91	75	23	34	161	8.3	9.6	1.5
VAN 125	1	25	91	75	23	34	161	10.0	10.9	1.4
VAN 225	1	25	127	88	29	52	183	15.5	19.2	3.8
VAN 232	1 1/4	32	127	88	29	52	183	19.5	24.1	3.7
VAN 240	1 1/2	40	127	88	29	52	183	21.0	26.9	3.8
VAN 250	2	50	127	88	29	52	183	22.5	26.9	3.6

9.1.2 VAN with NPT internal thread [inch]

Type	Connection		Dimensions					Q air with $\Delta p = 0.4 \text{ "WC}$ SCFH	c _v max. gal/ min.	Weight lbs
	NPT	DN	L inch	E inch	F inch	H2 inch	H4 inch			
VAN 110	3/8	10	2.95	2.95	0.59	1.34	6.34	155.36	5.81	3.08
VAN 115	1/2	15	2.95	2.95	0.59	1.34	6.34	194.23	7.44	3.08
VAN 120	3/4	20	3.58	2.95	0.91	1.34	6.34	300.17	11.16	3.3
VAN 125	1	25	3.58	2.95	0.91	1.34	6.34	374.34	12.67	3.08
VAN 225	1	25	5.00	3.47	1.14	2.05	7.20	618.01	22.32	8.36
VAN 232	1 1/4	32	5.00	3.47	1.14	2.05	7.20	759.27	28.02	8.14
VAN 240	1 1/2	40	5.00	3.47	1.14	2.05	7.20	829.89	31.27	8.36
VAN 250	2	50	5.00	3.47	1.14	2.05	7.20	868.74	31.27	7.92

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Clarity

Found information quickly
Searched for a long time
Didn't find information
What is missing?
No answer

Comprehension

Coherent
Too complicated
No answer

Scope

Too little
Sufficient
Too wide
No answer



Use

To get to know the product
To choose a product
Planning
To look for information

Navigation

I can find my way around
I got "lost"
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No answer

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