

# 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

*valvario®*



**krom**  
**schroder**

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## 1 Application

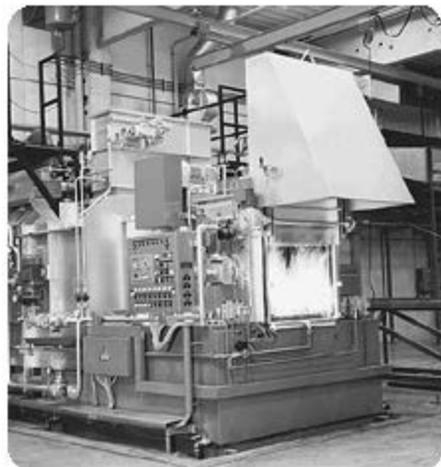


VAN

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*



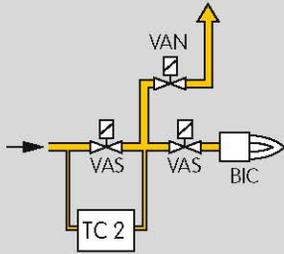
*Roller hearth furnace*



*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

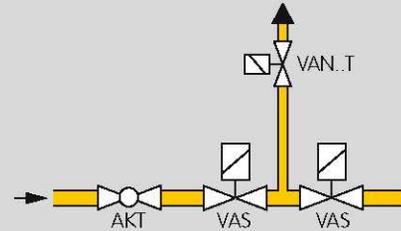


Tightness control TC 2 checks the gas solenoid valves VAS and the magnetic relief valve VAN for tightness.

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  $\geq 1.2$  MW must be fitted with a relief valve and tightness control.

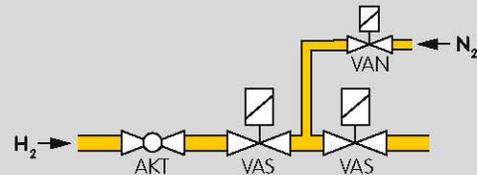
### 1.1.2 Relief valve with 2 gas solenoid valves



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  $\geq 117$  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

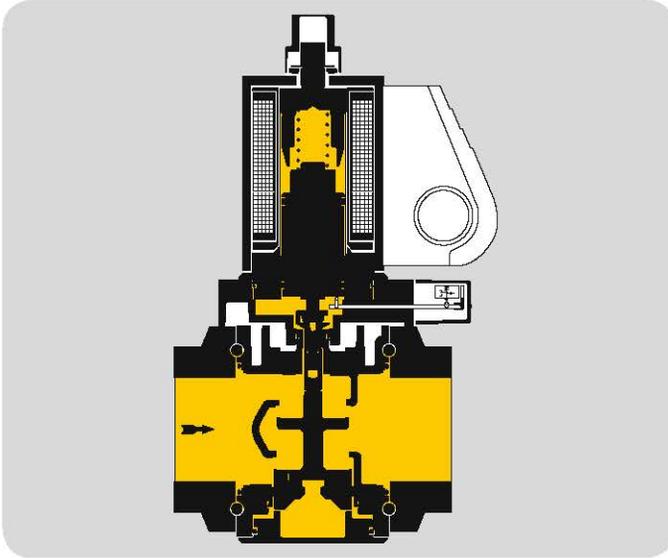


Certified by Gosstandart pursuant to GOST-TR.

Approved by Rostekhnadzor (RTN).

## 3 Function

### 3.1 Magnetic relief valve VAN

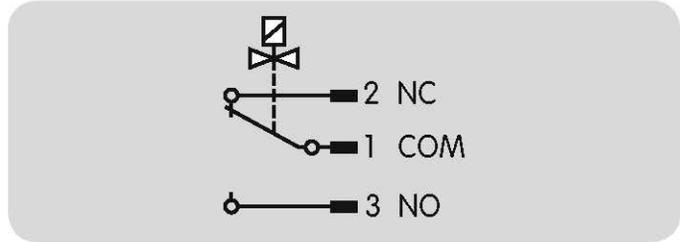


The magnetic relief valve VAN is open when it is de-energized.

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



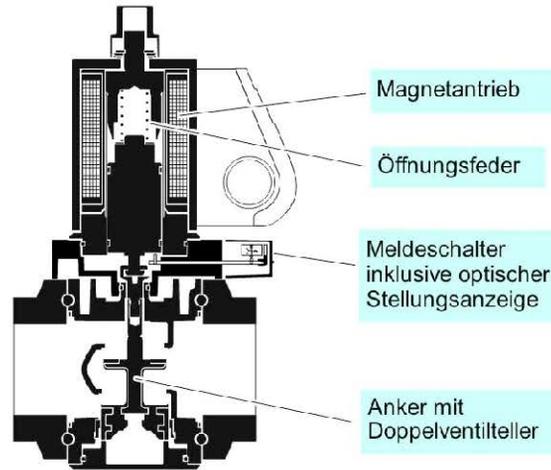
The magnetic relief valve VAN..S is open when it is de-energized.

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.

valVario® VAN Teilebezeichnung

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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

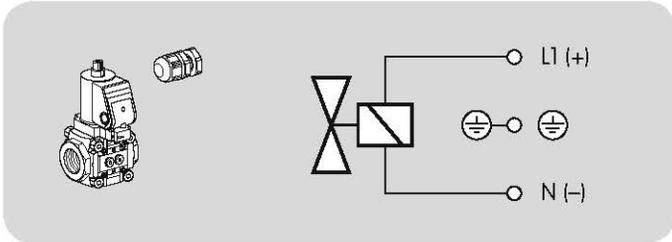
can download it from the Internet. Go to [www.adobe.com](http://www.adobe.com), click on "Get Adobe Reader" and follow the instructions.

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

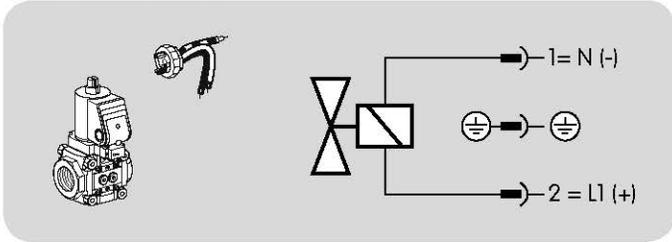
### 3.4 Connection diagram

Wiring to EN 60204-1.

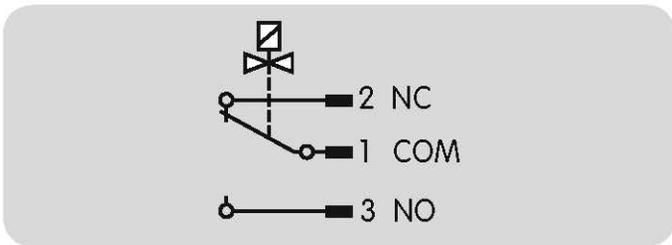
#### 3.4.1 VAN with M20 cable gland



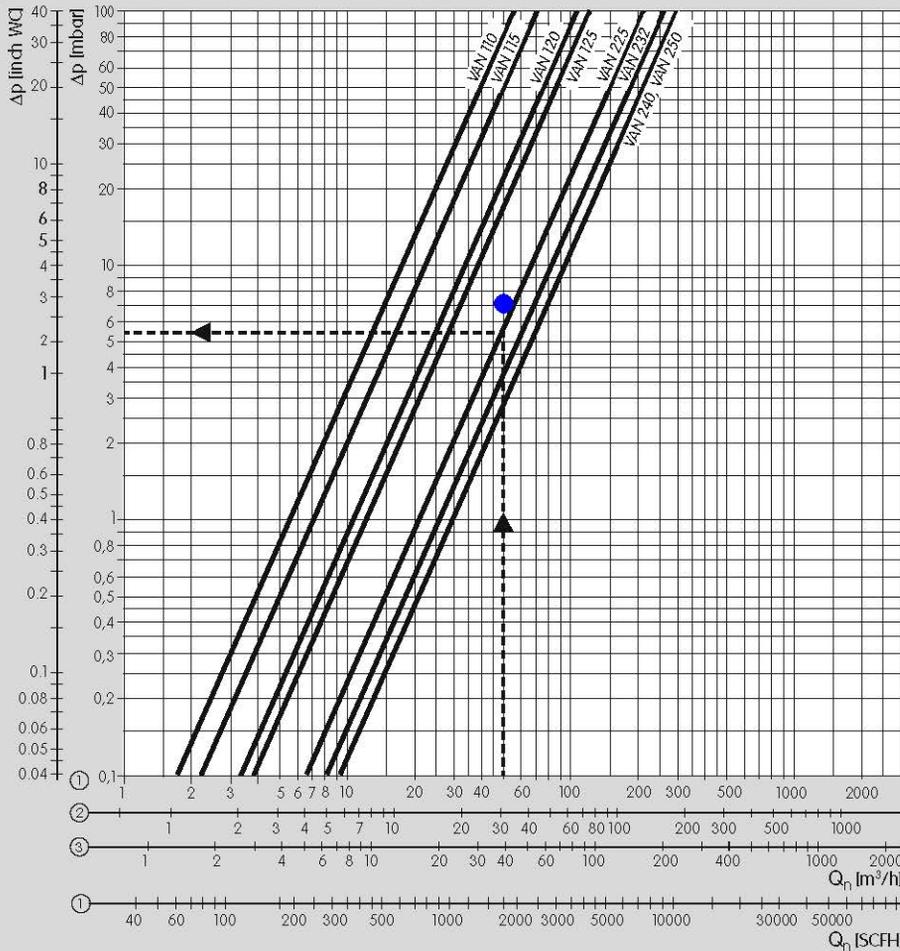
#### 3.4.2 VAN with plug



#### 3.4.3 Position indicator







- 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  $\Delta p$  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  $Q_b = 50 \text{ m}^3/\text{h}$ ,  
 $\Delta p$  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

Natural gas	0.80	kg/m <sup>3</sup>
Flow rate $Q_n$	64.8	m <sup>3</sup> /h
Inlet pressure $p_U$	300	mbar
$\Delta p_{\text{max}}$	10.0	mbar
Medium temperature	0	°C
Flow rate $Q_b$	50.0	m <sup>3</sup> /h

Product	$\Delta p$ [mbar]	$v$ [m/s]
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<b>VAN 225</b>	<b>7,2</b>	<b>22</b>
<b>VAN 232</b>	<b>4,6</b>	<b>13</b>
<b>VAN 240</b>	<b>3,7</b>	<b>10</b>
<b>VAN 250</b>	<b>3,6</b>	<b>6</b>

## 6 Selection

### 6.1 Selection table

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

● = standard, ○ = available

<sup>1)</sup> VAN..T is delivered with NPT thread.

<sup>2)</sup> Plug with socket.

<sup>3)</sup> Plug without socket.

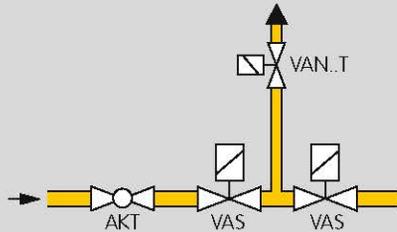
#### Order example

VAN I25R/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

## 7.1.1 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

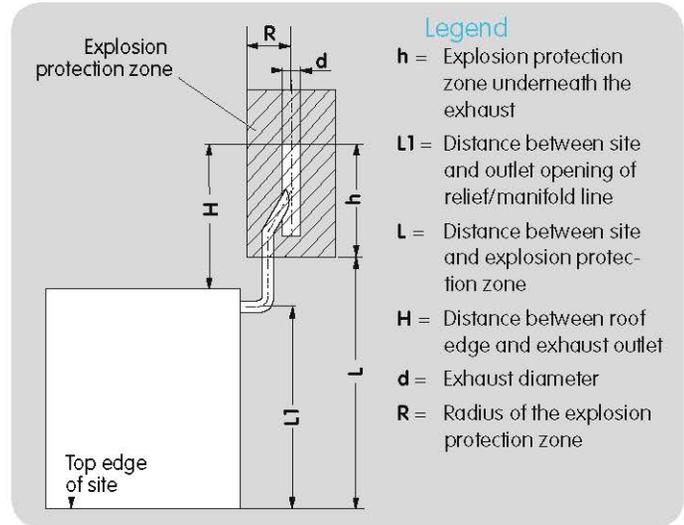
## 8 Accessories

### 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 ( $H = 15 \times d$ ). The outlet openings of the relief or manifold lines should lie  $\geq 1.8$  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 ( $h = 10 \times d$ ) and the distance between the explosion protection zone and the site is  $\geq 2$  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

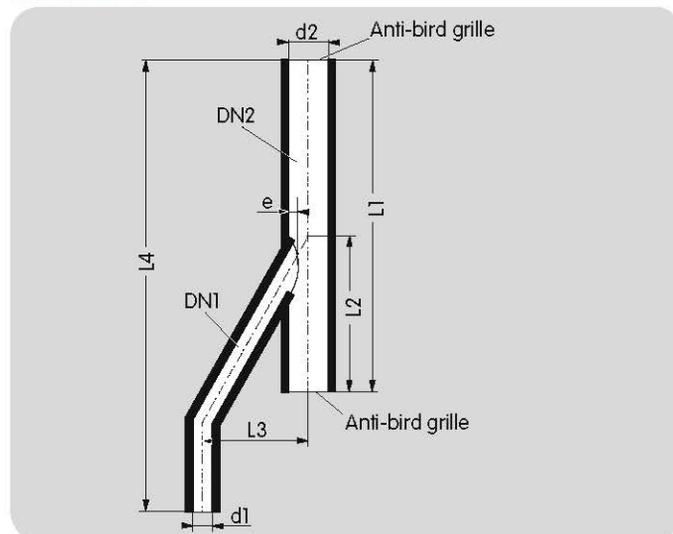
Exhaust ABG 25/40, Order No. 03165011,  
 Exhaust ABG 50/80, Order No. 03165013.

## 8.1.3 Technical data

Version: steel welded, hot-galvanized.

Connection pipe length: 1100 mm (43.3 inches).

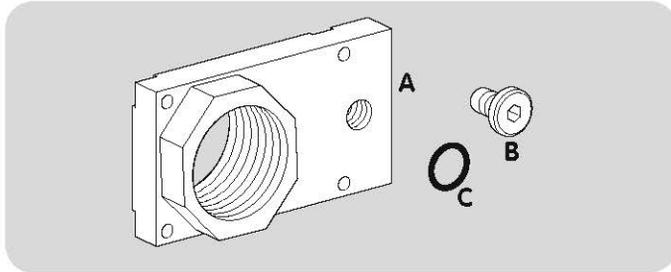
## Dimensions



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

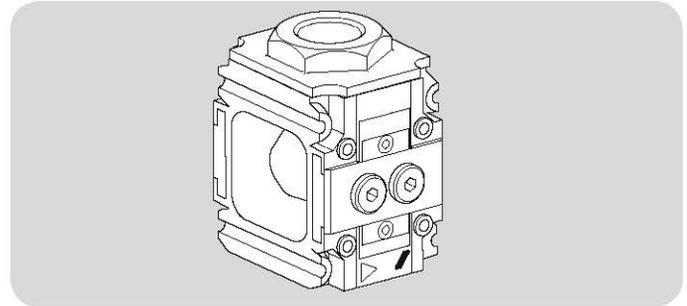
**B** = screw plug,

**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. H<sub>2</sub>S) or air; other gases on request. The gas must be dry in all temperature conditions and must not contain condensate.

Max. inlet pressure  $p_{UI}$ : 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 mm<sup>2</sup> (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:

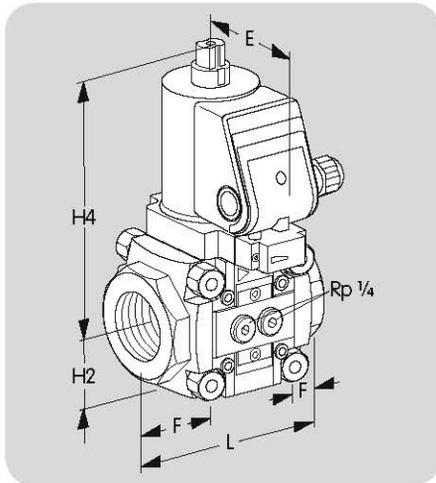
Type	Voltage	Min. current (resistive load)	Max. current (resistive load)
VAN..S	100 – 250 V AC, 50/60 Hz	100 mA	3 A
VAN..G	12 – 48 V AC, 50/60 Hz	2 mA	0.1 A

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	–

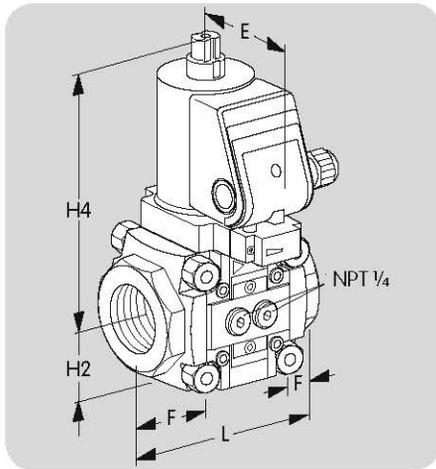
\* Limited to max. 200,000 cycles for heating systems.

## 9.1 Dimensions



### 9.1.1 VAN with Rp internal thread [mm]

Type	Connection		Dimensions					Q air with $\Delta p = 1 \text{ mbar}$ m <sup>3</sup> /h	k <sub>v</sub> max. m <sup>3</sup> /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 <sub>v</sub> 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