Honeywell

krom schröder

Fine-adjusting valve VMV

Technical Information · GB
3 Edition 12.18

- Precise setting via a slide valve optimized for linear flow
- Tamper-proof thanks to self-locking thread
- Easy installation into a system in conjunction with valVario valves and regulators

EAC CE

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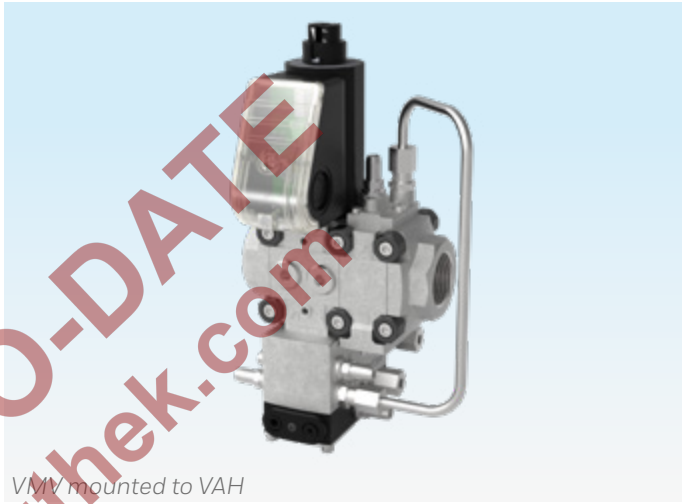
▼ = To be continued

1 Application



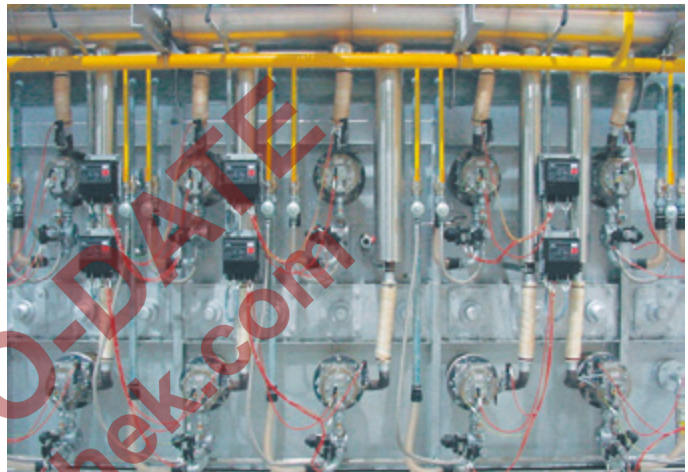
VMV mounted to VAH

Fine-adjusting valve VMV for presetting the gas and air flow rate to gas burners or gas appliances. For use in gas control and safety systems in all sectors of the iron, steel, glass and ceramics industries, and also in commercial heat generation.

It can easily be adapted to different pipes thanks to the selection of various flanges for individual valve sizes. The modular design allows the individual assembly with valVario valves or regulators making it possible to construct space-saving gas systems.

1.1 Examples of application

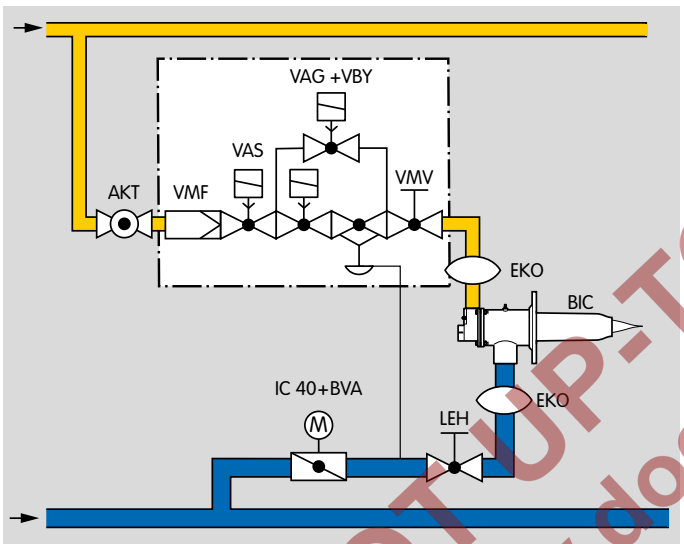
Bogie hearth furnace



Roller hearth furnace

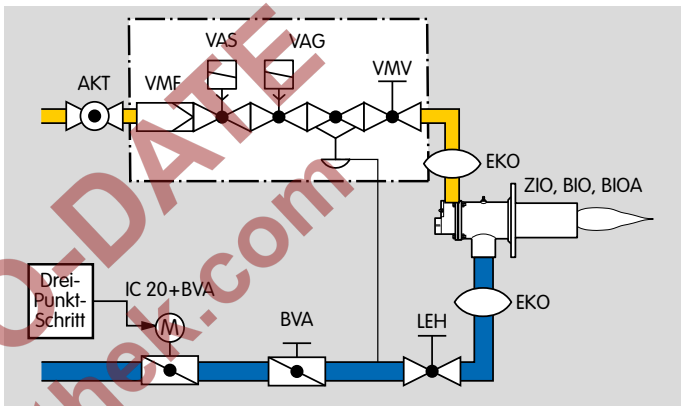
1.2 Examples of application

1.2.1 Staged control with pneumatic ratio control system



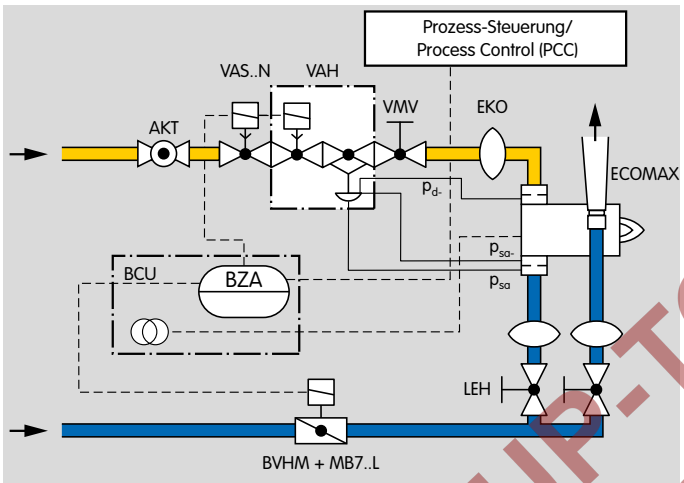
The high output impulse at the burner generated by this type of control produces a uniform temperature distribution and good circulation of the furnace or kiln atmosphere, e.g. in heat treatment furnaces in the iron and non-ferrous metal industries or kilns for heavy clay and fine ceramics. The required lambda value can be set using the fine-adjusting valve VMV and the air adjusting cock LEH.

1.2.2 Continuous control with pneumatic ratio control system



The gas/air mixture is set using the fine-adjusting valve VMV. A constant mixture setting is maintained over a wide control range while at the same time preventing air deficiency. This type of control is used in melting furnaces in the aluminium industry or in regenerative incineration installations in the environment industry, for example.

1.2.3 Continuous control of a self recuperative burner



The air flow rate is measured by a measuring orifice on the burner and the VAH controls the gas flow rate proportionally. The required lambda value can be set using the fine-adjusting valve VMV.

2 Certification

EU certified pursuant to

CE

Meets the requirements of the

– Low Voltage Directive (2014/35/EU),
– EMC Directive (2014/30/EU).

Regulation:

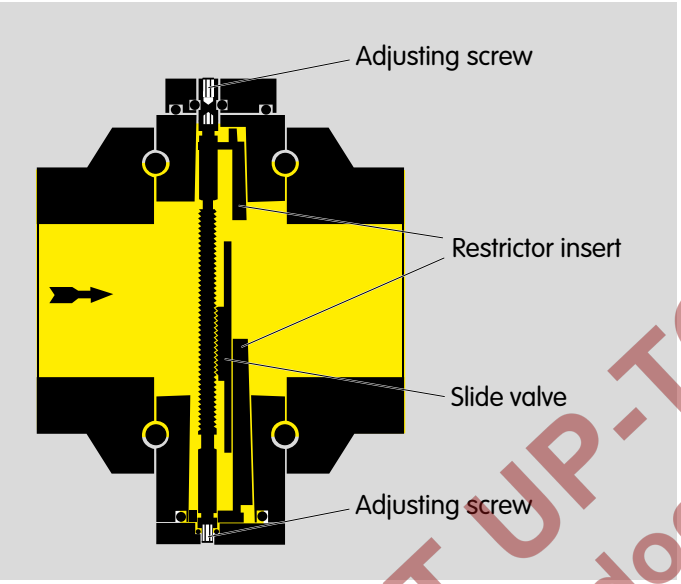
– Gas Appliances Regulation (EU) 2016/426

Eurasian Customs Union

EAC

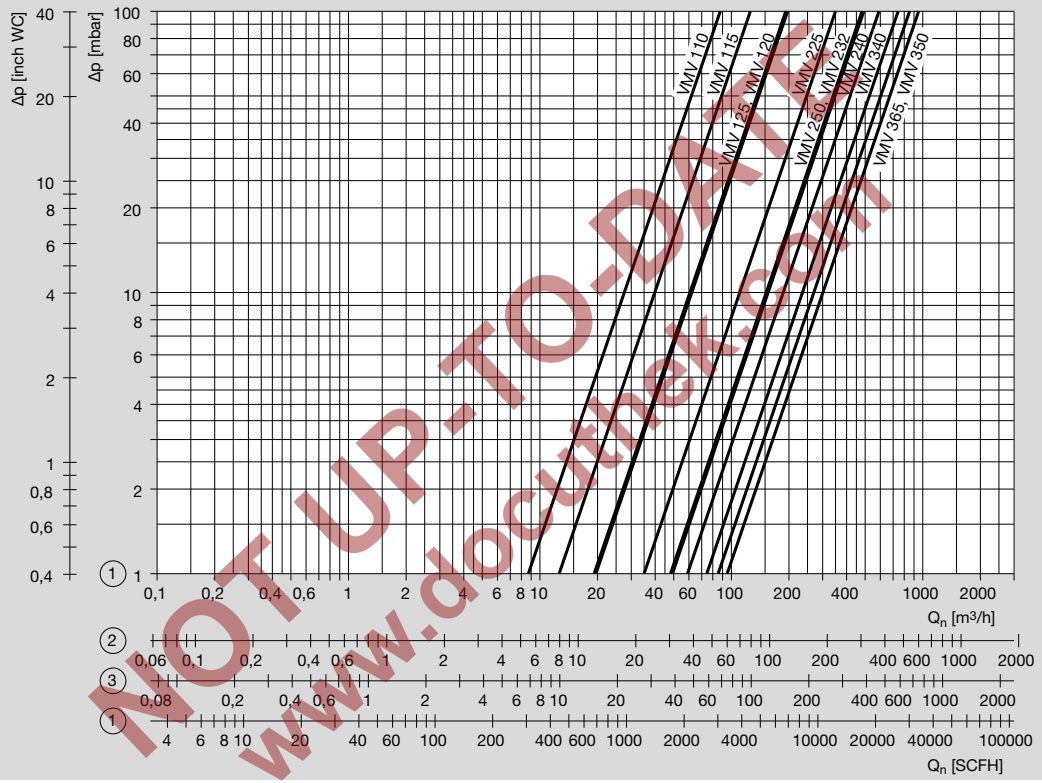
The product VMV meets the technical specifications of the Eurasian Customs Union.

3 Function



There is a restrictor insert with an adjusting screw and a slide valve in the housing of the VMV. The restrictor insert features an opening specially designed for linear flow which is opened and closed by the slide valve. A circumferential sealing ring on the restrictor insert reduces the leakage flow. The slide valve can be exactly positioned from two sides using the adjusting screw, thus enabling the release of the required flow rate.

4 Flow rate



① = natural gas, dv = 0.62, ② = LPG, dv = 1.56,

③ = air, dv = 1.00

The characteristic curves are measured at 15°C (59°F) with a measurement set-up in accordance with the standards EN 13611/EN 161.

This involves measuring the pressure 5 x DN upstream and downstream of the unit under test. The pressure drop of the pipe is also measured but is not compensated for.

Max. flow rate when 100% open.

For calculating the nominal size, see www.adlatus.org

4.1 k_V value

The size and nominal flange diameter are determined using the flow rate diagram or by calculation using the k_v value.

$Q_{(n)}$ = Flow rate (standard state) [m^3/h]

k_V = Valve coefficient (see table)

Δp = Pressure loss [bar]

p_a = Outlet pressure (absolute) [bar]

ρ_n = Density [kg/m^3] (air 1.29/natural gas 0.80/propane 2.01/ butane 2.71)

T = Medium temperature (absolute) [K]

$$k_v = \frac{Q_{(n)}}{514} \cdot \sqrt{\frac{\rho_n \cdot T}{\Delta p \cdot p_d}} \qquad Q_{(n)} = 514 \cdot k_v \cdot \sqrt{\frac{\Delta p \cdot p_d}{\rho_n \cdot T}}$$

$$\Delta p = \left(\frac{Q_{(n)}}{514\ k_v}\right)^2 \cdot \frac{\rho_n \cdot T}{p_d}$$

VMV	$k_{V\,max.}$ [m^3/h]
VMV 110	8,0
VMV 115	11,5
VMV 120	18,0
VMV 125	17,6
VMV 225	32,0
VMV 232	45,0
VMV 240	54,0
VMV 250	44,0
VMV 340	68,0
VMV 350	87,0
VMV 365	78,0

Example

We want to find the size and nominal flange diameter for a fine-adjusting valve VMV.

We have the maximum flow rate $\dot{V}_{(n)\,max}$, the outlet pressure p_a and the temperature T for the medium of natural gas.

$Q_{(n)\,max.}$ = 37 m^3/h

p_a = 30 mbar = 0.03 bar ⇒

$p_{a\,absolute}$ = 0.03 bar + 1 bar = 1.03 bar

$\Delta p_{max.}$ = 0.01 bar (desired)

T = 20°C ⇒

$T_{absolute}$ = 20 + 273 K = 293 K

$$k_V = \frac{37}{514} \cdot \sqrt{\frac{0.83 \cdot 293}{0.01 \cdot 1.03}} = 11.1\ m^3/h$$

The fine-adjusting valve with the next higher k_v value is to be selected (see table): VMV 115.

5 Selection

Typ	– [1]	10	15	20	25	32	40	50	65	/10	/15	/20	/25	/32	/40	/50	/65	R	N	F	05	P	M
VMV 1	●	●	●	●	●					●	●	●	●					●	○		●	●	○
VMV 2	●				●	●	●	●					●	●	●	●		●	○	○	●	●	○
VMV 3	●						●	●	●						●	●	●	●	○	○	●	●	○

● = *standard*, ○ = *available*

[1] *Not in conjunction with outlet flange.*

Order example

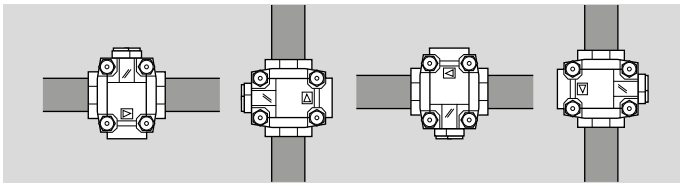
VMV 125/25R05P

5.1 Type code

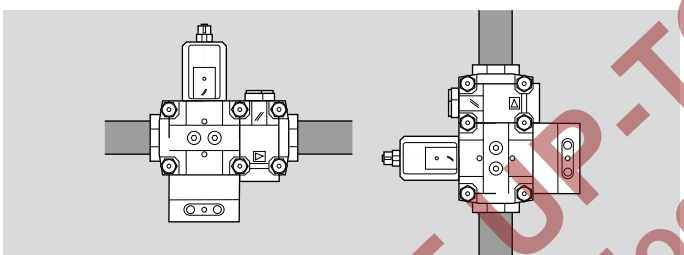
Code	Description
VMV	Fine-adjusting valve
1–3	Size
– 10–65 /10–/65	Without inlet and outlet flange Nominal diameter in DN: Inlet flange Outlet flange
R N F	Rp internal thread NPT internal thread Flange to ISO 7005
05	$p_{u\,max}$ 500 mbar
P M	With screw plugs With pressure test points

6 Project planning information

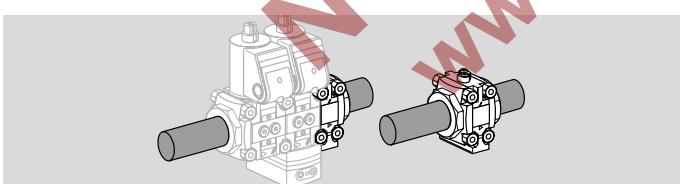
6.1 Installation



Installation position: VMV can be installed as required.

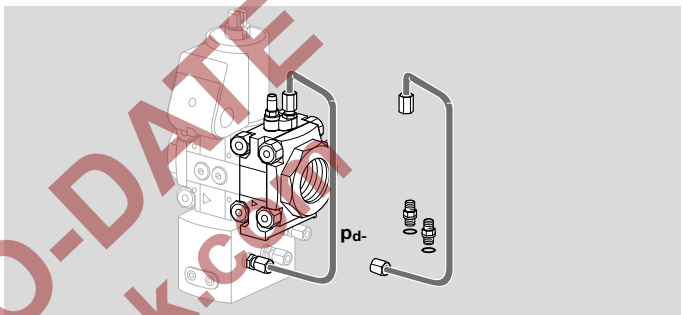


When fitting to pressure regulator VAD, VAG or VAV, the base plate must be facing the same direction as the regulator body.



Installation position when using valVario controls: VMV can be installed upstream or downstream of the valVario control or can be fitted as a standalone device in the pipe, as required.

6.2 VAH and VMV with prefabricated impulse line

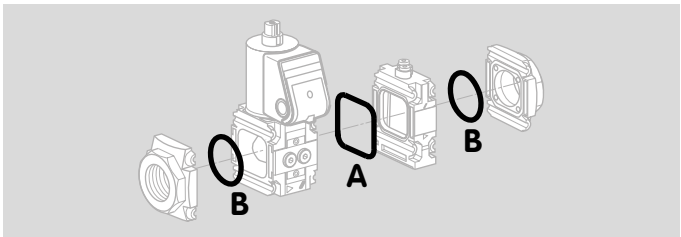


Fine-adjusting valve VMV can be installed on the flow rate regulator VAH for fine adjustment of the gas flow rate.

The gas control line for gas outlet pressure pd- is available with 2 ⅛" compression fittings, see page 13 (Gas control line).

7 Accessories

7.1 Seal set VA 1 – 3



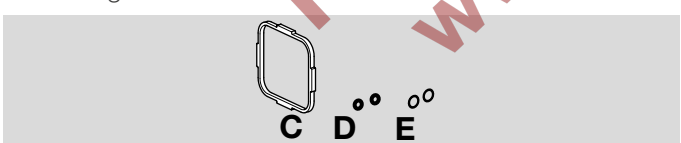
The seal set VA is available for retrofitting the VMV to a valVario control.

Seal set for size 1: Order No. 74921988,
seal set for size 2: Order No. 74921989,
seal set for size 3: Order No. 74921990.

Scope of delivery:

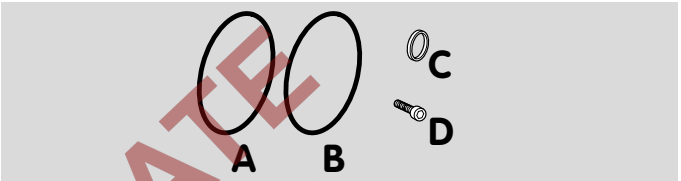
A 1 x double block seal,
B 2 x shaped rings (VA 1) for flange or
2 x O-rings (VA 2 – 3) for flange.

The following components are not necessary when mounting the VMV:



C 1 x retaining frame,
D 2 x O-rings (pressure switch),
E 2 x sealing rings (flat sealing), 2 x profiled sealing rings

7.2 Seal set VMO/VMV

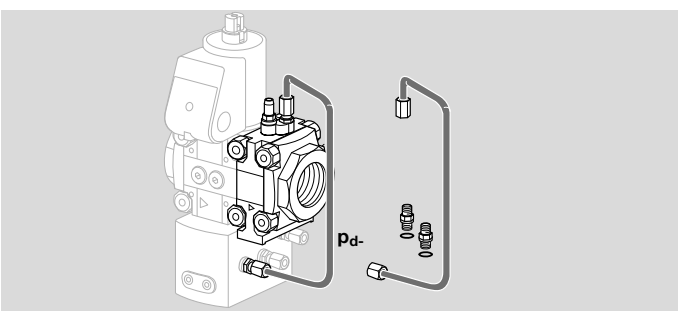


Seal set VMO/VMV 1 /B: 74924936,
seal set VMO/VMV 2 /B: 74924937,
seal set VMO/VMV 3 /B: 74926024.

Scope of delivery:

A 1 x O-ring (base plate),
B 1 x O-ring (restrictor insert),
C 2 x profiled sealing ring,
D 2 x or 4 x set screws.

7.3 Gas control line



Gas control line VAH 1 /B: Order No. 74924458,
gas control line VAH 2 /B: Order No. 74924459,
gas control line VAH 3 /B: Order No. 74926055.

8 Technical data

Types of gas: natural gas, LPG (gaseous), biologically produced methane (max. 0.1 %-by-vol. H_2S) or air; other gases on request.

The gas must be dry in all conditions and must not contain condensate.

Max. inlet pressure p_e: max. 500 mbar (7.25 psig).

Medium and ambient temperatures:

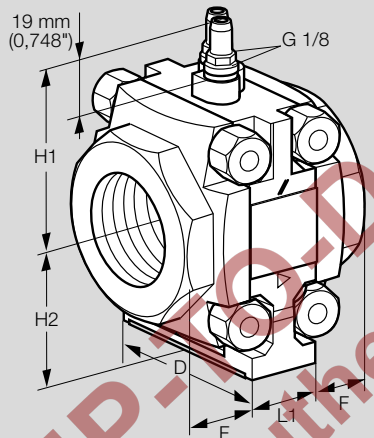
-10 to +60°C (14 to 140°F), no condensation permitted.

Storage temperature: 0 to +40°C (-4 to +104°F).

Housing: aluminium.

Connection flanges with internal thread: Rp to ISO 7-1, NPT to ANSI/ASME: DN 40 and DN 50 to ISO 7005..

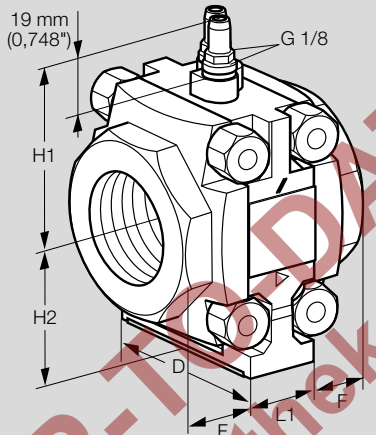
8.1 Dimensions



8.1.1 VMV with Rp internal thread

Type	Connection		Dimensions					Q_{air} with Δp = 1 mbar	$k_{V\,max}$	Weight*
			L1	F	D	H1	H2			
	Rp	DN	mm	mm	mm	mm	mm	m^3/h	m^3/h	kg
VMV 110	3/8	10	30	15	62.7	69.1	44.2	7.0	8.0	0.212
VMV 115	1/2	15	30	15	62.7	69.1	44.2	10.0	11.5	0.212
VMV 120	3/4	20	30	23	62.7	69.1	44.2	15.7	18.0	0.212
VMV 125	1	25	30	23	62.7	69.1	44.2	15.3	17.6	0.212
VMV 225	1	25	34	29	88	82.8	64.6	27.9	32.0	0.460
VMV 232	1¼	32	34	29	88	82.8	64.6	39.2	45.0	0.460
VMV 240	1½	40	34	29	88	82.8	64.6	47.0	54.0	0.460
VMV 250	2	50	34	29	88	82.8	64.6	38.3	44.0	0.460
VMV 340	11/2	40	36	36	106	94.6	77.5	59.2	68.0	1.3
VMV 350	2	50	36	36	106	94.6	77.5	75.8	87.0	1.3
VMV 365	2½	65	36	36	106	94.6	77.5	67.9	78.0	1.3

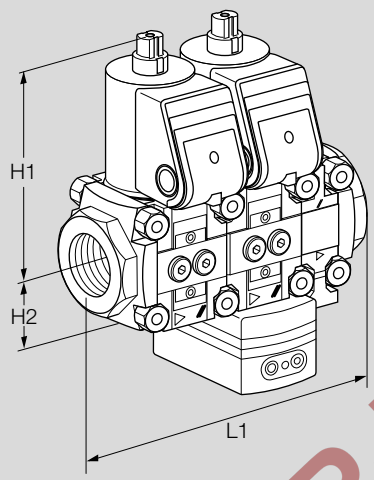
** Without flanges and connection parts.*



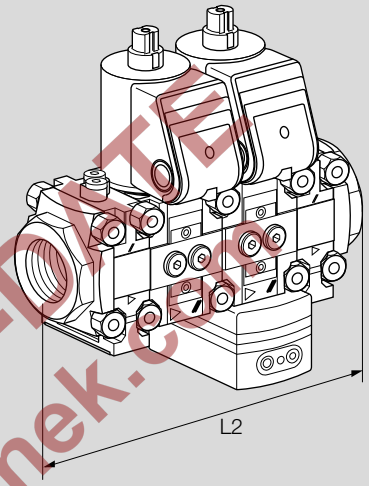
8.1.2 VMV with NPT internal thread

Type	Connection		Dimensions					Q_{air} with Δp = 1 mbar	Weight*
			L1	F	D	H1	H2		
	Rp	DN	mm	mm	mm	mm	mm	m^3/h	kg
VMV 110	3/8	10	1.18	0.59	2.47	2.72	1.74	246	0.47
VMV 115	1/2	15	1.18	0.59	2.47	2.72	1.74	353	0.47
VMV 120	3/4	20	1.18	0.91	2.47	2.72	1.74	552	0.47
VMV 125	1	25	1.18	0.91	2.47	2.72	1.74	540	0.47
VMV 225	1	25	1.34	1.14	3.46	3.26	2.55	982	460
VMV 232	1¼	32	1.34	1.14	3.46	3.26	2.55	1381	1.01
VMV 240	1½	40	1.34	1.14	3.46	3.26	2.55	1657	1.01
VMV 250	2	50	1.34	1.14	3.46	3.26	2.55	1350	1.01
VMV 340	1½	40	1.42	1.42	4.17	3.72	3.05	2087	2.86
VMV 350	2	50	1.42	1.42	4.17	3.72	3.05	2670	2.86
VMV 365	2½	65	1.42	1.42	4.17	3.72	3.05	2394	2.86

** Without flanges and connection parts.*



VCx with VMV



VCx with VMF and VMV

8.1.3 VCx with VMF and VMV

	Baumaße [mm]			
	L1	L2	H1	H2
VMF 110	150	180	143	32
VMF 115	150	180	143	32
VMF 120	166	196	143	32
VMF 125	166	196	143	32
VMF 225	230	264	170	47
VMF 232	230	264	170	47
VMF 240	230	264	170	47
VMF 250	230	264	170	47
VMF 340	274	310	180	59
VMF 350	274	310	180	59
VMF 365	274	310	180	59

	Baumaße [inch]			
	L1	L2	H1	H2
VMF 110	5.9	7.1	5.63	1.26
VMF 115	5.9	7.1	5.63	1.26
VMF 120	6.5	7.7	5.63	1.26
VMF 125	6.5	7.7	5.63	1.26
VMF 225	9.1	10.4	6.69	1.85
VMF 232	9.1	10.4	6.69	1.85
VMF 240	9.1	10.4	6.69	1.85
VMF 250	9.1	10.4	6.69	1.85
VMF 340	10.8	12.2	7.09	2.3
VMF 350	10.8	12.2	7.09	2.3
VMF 365	10.8	12.2	7.09	2.3

9 Maintenance

Check for external tightness at least once per annum, at least twice per annum for operation with biologically produced methane.

Feedback

Finally, we are offering you the opportunity to assess this “Technical Information (TI)” and to give us your opinion, so that we can improve our documents further and suit them to your needs.

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”
- ○ No answer

My scope of functions

- ○ Technical department
- ○ Sales
- ○ No answer

Remarks

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We reserve the right to make technical modifications in the interests of progress.

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