Double solenoid valve
Regulator and safety combination
Infinitely variable floating operation

DUNGS®
Combustion Controls

DMV-VEF 507 - 525

7.35

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Flanges, pressure switches, line sockets, pulse lines and screw unions are **not** contained in the scope of supply

Technical description
The DUNGS double solenoid valve DMV-VEF... integrates dirt trap devices, gas/air ratio controls, valves and pressure switches in a compact fitting:

- Dirt trap device
  DMV-VEF 507-520: pre-filter (microfilter)
  DMV-VEF 525: strainer
- Solenoid valves up to 500 mbar as per DIN EN 161 Class A Group 2
- Sensitive setting of ratio between gas and air pressure
- Servo pressure regulator as per DIN EN 88 Class A Group 2; EN 12067-1
- High flow values with low pressure losses
- Ratio V = p_{Br} / p_L 0.75 : 1 to 3 : 1
- Zero point correction N possible
- External pulse lines, pulse flange
- Interference degree N possible
- Flange connections with tube threads as per ISO 7/1
- Setting time < 1 s (as per EN 12067-1)

The modular kit ensures individual solutions comprising valve proving system, min./max. pressure switches and pressure limiters.

Application
The gas/air ratio control ensures optimal mixture formation in forced air burners and pre-mix burners; this applies to floating and two-step floating operations.
Suitable for gases of gas families 1, 2, 3 and other neutral gaseous media.

Approvals
EC type test approval as per EC Gas Appliance Directive:
DMV-VEF CE-0085 AS 0430
EC type test approval as per EC Pressure Equipment Directive:
DMV-VEF CE0036
Approvals in other important gas consuming countries.

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Functional description

Gas flow

1. If valves V1 and V2 are closed, chamber a is subjected to inlet pressure until double seat of valve V1 is reached.
2. The minimum pressure switch is connected to chamber a through a hole in the filter housing of DMV-VEF. If the inlet pressure exceeds the reference value set on the pressure switch, the latter switches through to the automatic gas burner control.
3. After the automatic gas burner control has been released, valves V1 and V2 open. Gas flow through chambers a, b and c of DMV-VEF is released.

Mode of operation of valve regulator control on valve V1

An inlet pressure-balanced regulator is integrated in valve V1 (pressure regulator).

Plunger V1 is not connected to the valve plate unit. If it opens, the plunger pretensions the pressure switch and releases the valve plate unit. If the valve closes, the plunger acts directly on the valve plate unit.

In closed position, Valve V3 blocks the pressure chamber below working diaphragm M against inlet pressure pe in chamber a.

The pressure below working diaphragm M is defined via a changeable flow cross-section D.

Comparison diaphragms for burner pressure pBr and blower pressure pL are connected to each other using a bar. The ratio V can be set by moving the bearing point.

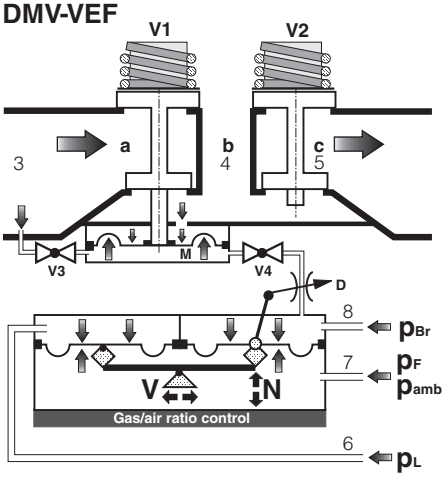
Zero point correction N acts on this bar. The opposite side of the comparison diaphragms must be applied with ambient pressure pamb or combustion chamber pressure pF. The combustion chamber pressure has a reducing effect on the burner pressure at a ratio of V > 1.

Changes resulting from the force balance will lead to a change in the flow cross-section D downstream of valve V4. The pressure below the working diaphragm resets and valve plate unit V1 changes the free cross-section.

Mode of operation of valve V2

The plunger of valve V2 is connected to the valve plate unit. When it is opened, the plunger pretensions the pressure spring. Valve V2 opens completely and without any delay.

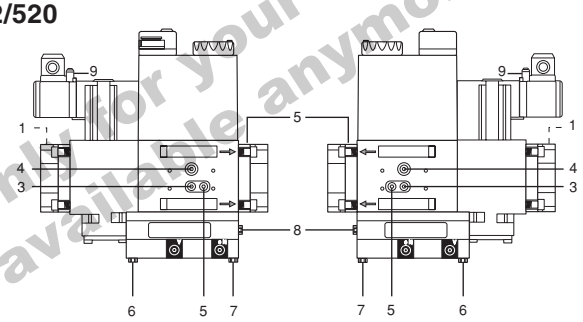
Block diagram of DMV-VEF



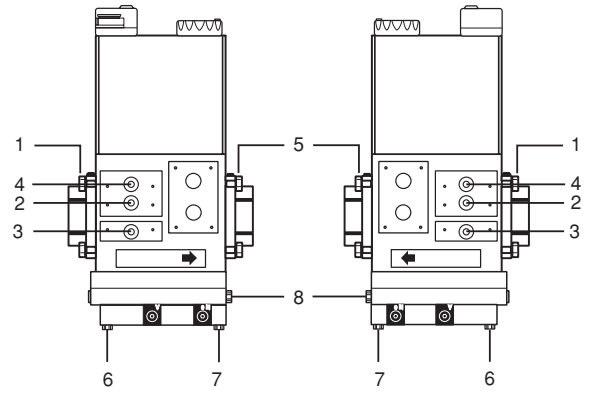
V1	Main valve 1	a, b, c	Pressure chambers in flow direction
V2	Main valve 2		
V3	Control valve 3	p_{Br}	Burner pressure
V4	Control valve 4	p_F	Combustion chamber pressure
		p_{amb}	Ambient pressure
M	Working diaphragm	p_L	Blower pressure
D	Restriction point		
		1, 2, 3, 4, 5	Locking screw G1/8
V	Ratio setting	9	Test nipple
N	Zero point correction	6, 7, 8	Pulse lines pL, pF, pBr

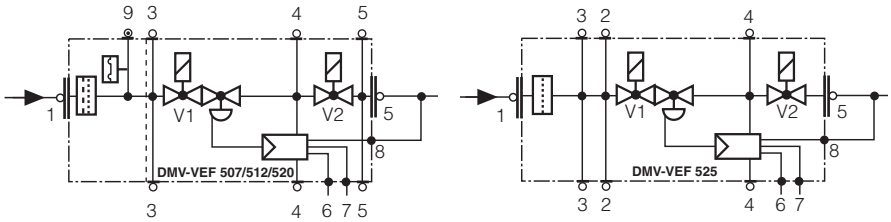
Pressure taps, gas train schematic diagram

DMV-VEF 507/512/520



DMV-VEF 525





Valve V4 is operated by valve V2. When valve V4 is closed, it blocks the chamber below working diaphragm M against burner pressure.

Closing function

If the supply voltage of the solenoid coils is interrupted, the main valves close within < 1 s using the pressure spring.

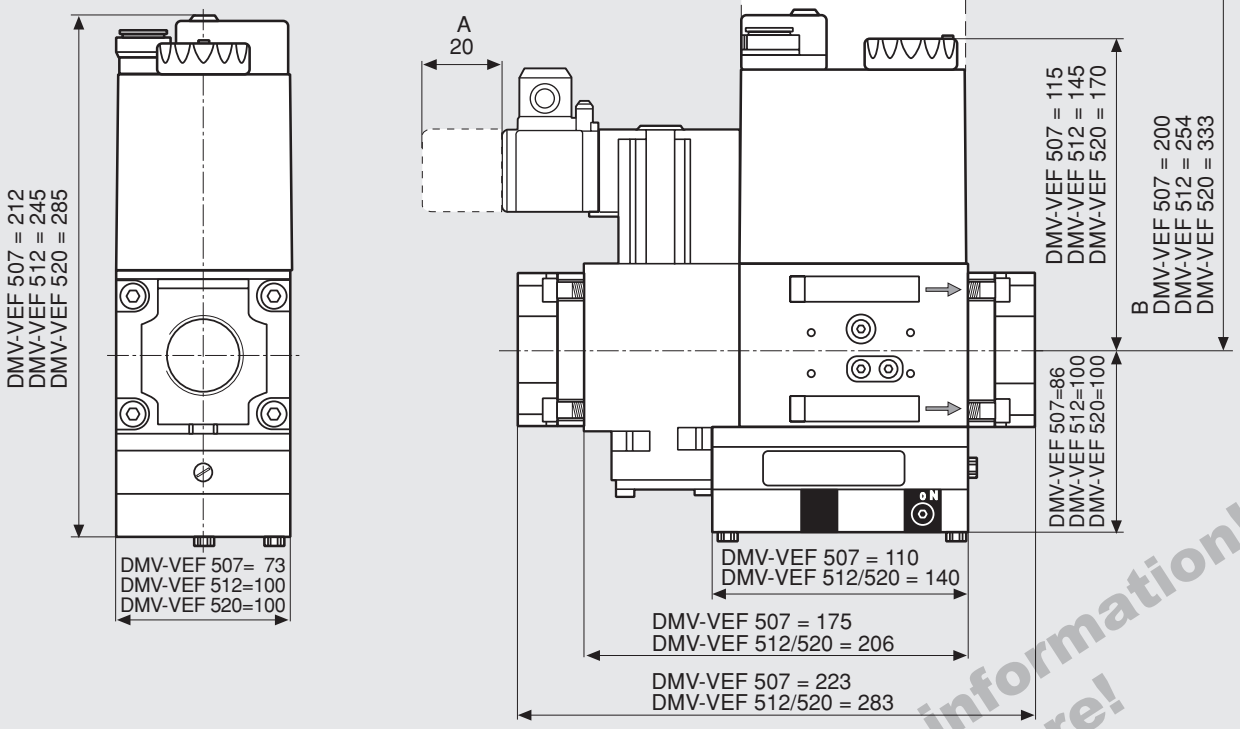
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Specifications

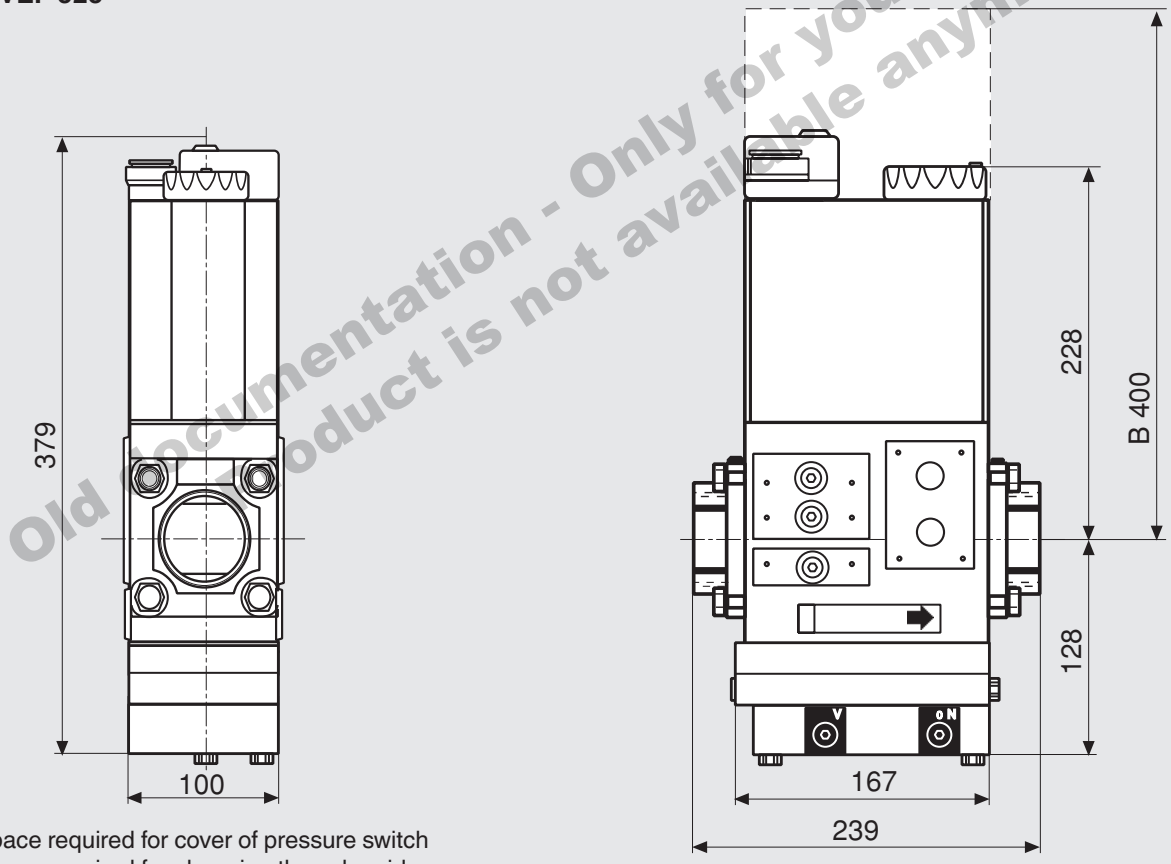
Nominal widths Flanges with tube thread as per ISO 7/1 (DIN 2999)	DMV-VEF 507, DMV-VEF 512, DMV-VEF 520 Rp 1/2, 3/4, 1, 1 1/4, 1 1/2, 2 and their combinations	DMV-VEF 525 Rp 2
Max. operating pressure **Inlet pressure ranges** **Command range** **Burner pressure range**	**500 mbar** **DMV-…VEF S10 p_e: 5 mbar bis 100 mbar** **DMV-…VEF S30 p_e: 100 mbar bis 360 mbar** **p_L: 0,4 to 100 mbar** **p_{Br}: 0,5 to 100 mbar**	
Media	Gases of gas families 1, 2, 3 and other neutral gaseous media	
Ambient temperature	-15°C to +70°C (in liquid gas systems, do not operate DMV-VEF below 0°C. Only suitable for gaseous liquid gas, liquid hydrocarbons destroy sealing materials)	
Dirt trap device	A suitable gas filter must be installed upstream for protection. Pre-filter with microfilter, for DMV-VEF 507/512/520. Use DMV-VEF 525 gas filter, e.g. type GF 520/1. See datasheet “Pre-filter No. 226 594”	
Pressure switches	Types GW A5, GW A2, NB A2, ÜBA2 can be installed as per EN 1854. For further information, refer to datasheet GW A2 No. 213 372 or datasheet GW A5 No. 225 756.	
Servo pressure regulator	Pressure regulator has a balanced supply, leakproof cover through valve V1 on switchoff, as per DIN EN 88 Class A and EN 12067-1. Gas/air ratio control with adjustable ratio V as well as zero point correction N and combustion chamber connection	
Ratio setting range V	Ratio V = p_{Br} / p_L 0.75 : 1 to 3 : 1, other ratios on request	
Zero point correction N	possible	
Solenoid valve V1 Solenoid valve V2	Valve as per DIN EN 161 Class A Group 2, fast closing, fast opening Valve as per DIN EN 161 Class A Group 2, fast closing, fast opening	
Test connection	G1/8 DIN ISO 228, at inlet and outlet flanges, on both sides downstream of dirt trap, on both sides between valves (pressure switch mounting can partly exclude test connection)	
Burner pressure monitor pBr	Downstream of valve V2, pressure switch can be mounted on adapter at DMV-VEF 507/512/20	
Pulse and connection lines	Connection G1/8 as per DIN ISO 228 for burner pressure (pBr; GAS), blower pressure (pL; AIR), combustion chamber pressure (pF; combustion, atmosphere) **Pulse and connection lines must be made of steel and ≥ PN1, DN4. Condensate of pulse and connection lines may not enter fitting. It is compulsory to comply with the operating and mounting instructions.**	
Voltage/frequency	DMV-VEF 507-525: ~ (AC) 50 - 60 Hz, 230 V, -15% +10 % Preferred voltages: 110 – 120 VAC, 48 VDC, 24 – 28 VDC	
Electrical connection	Plug connection as per DIN EN 175 301-803	
Performance rating/current consumption Switch-on duration Degree of protection/radio interference suppression	See type overview 100 % ED IP 54 as per IEC 529 (EN 60529)/interference degree N	
Materials of parts in contact with gas	Housing Diaphragms, seals Solenoid drive	Aluminium diecasting NBR basis, siloprene (silicon caoutchouc) Steel, brass, aluminium
Installation position	Vertical with vertical solenoid	

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Dimensions
DMV-VEF 507/512/520



DMV-VEF 525



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A = Space required for cover of pressure switch
B = Space required for changing the solenoid

Type	Rp	Opening time	$P_{max.}$ [VA]	$I_{max.}$ [A] ~(AC) 220 V …240V	Weight [kg]
DMV-VEF 507	Rp 3/4	< 1 s	46	0,21	3,5
DMV-VEF 512	Rp 1 1/2	< 1 s	62	0,29	6,7
DMV-VEF 520	Rp 2	< 1 s	80	0,37	7,9
DMV-VEF 525	Rp 2	< 1 s	100	0,46	12,6

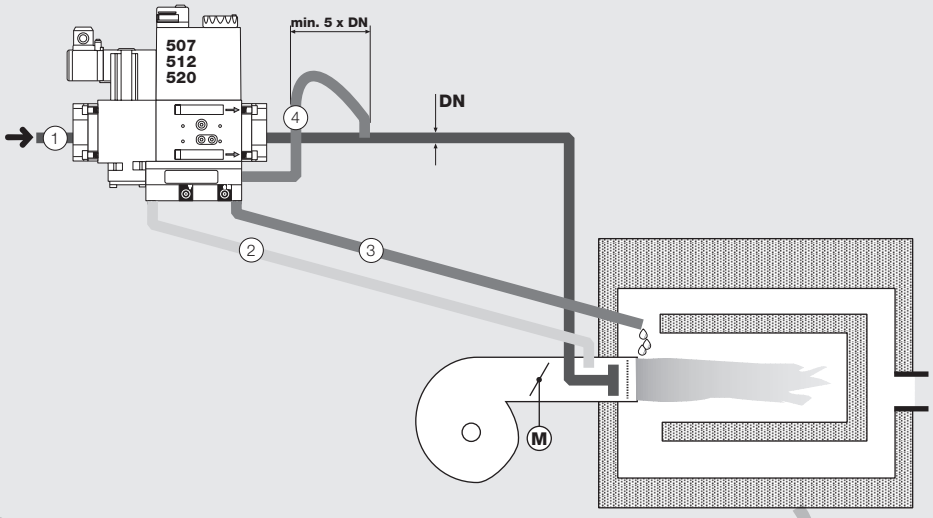
Installation of pulse lines

1 p_e: gas inlet pressure
S10: 5 - 100 mbar
S30: 100 - 360 mbar

2 p_L: blower pressure, air
0,4 - 100 mbar

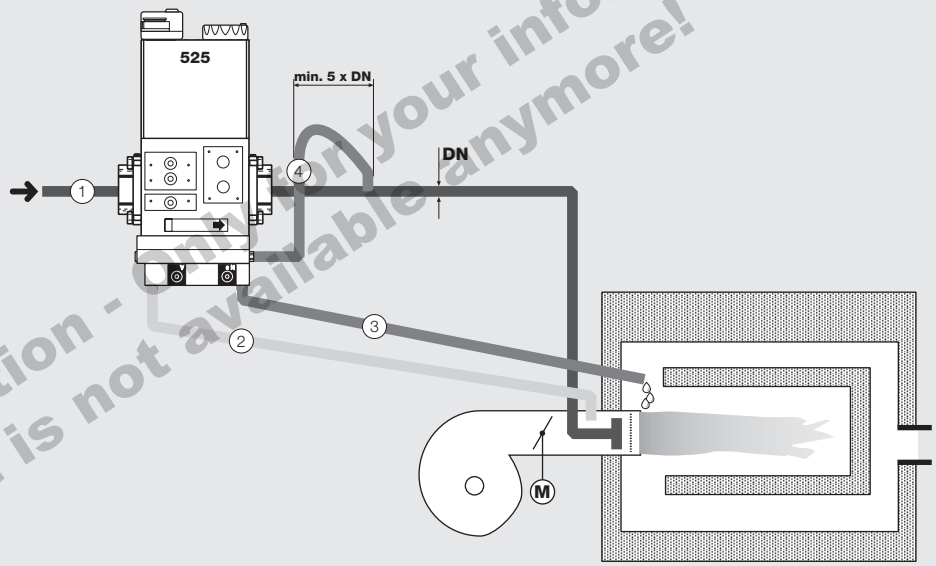
3 p_F: firing chamber pressure
-20 mbar … +50 mbar
or atmosphere
Δp_L max. = p_L - p_F = 100 mbar
Δp_{Br} max. = p_{Br} - p_F = 100 mbar

4 p_{Br}: burner pressure, gas
0,5 - 100 mbar



Pulse flange set
Pulse line ④ can be replaced by a pulse flange. The pulse flange ensures an internal pulse tap p_{Br} in connection with the outlet flange.





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Pulse lines

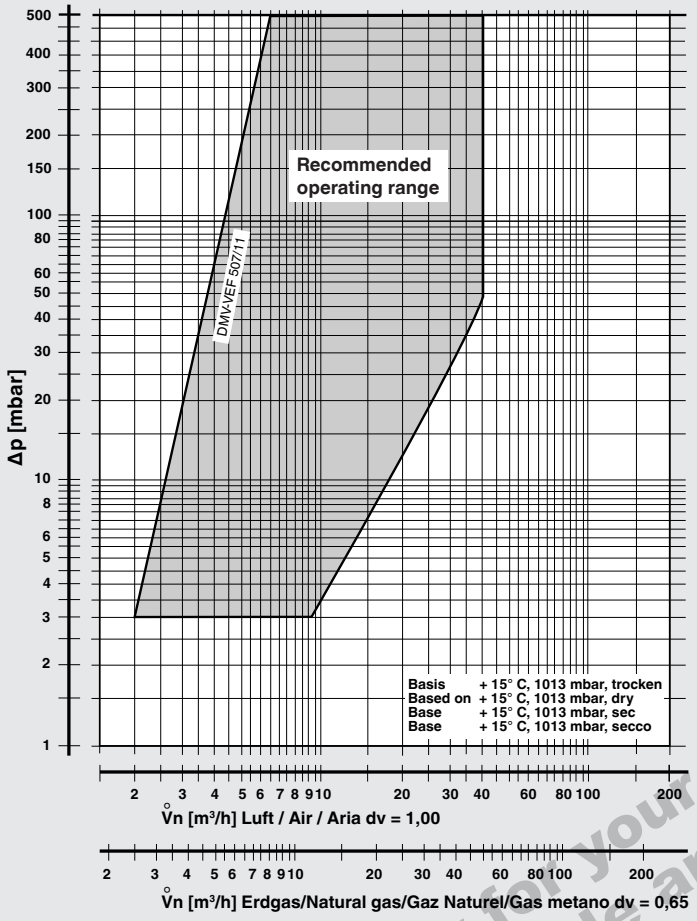
⚠ Pulse lines ②, ③, ④ must be ≥ DN 4 (dia. 4 mm), correspond to PN 1 and made of steel. **Other materials of pulse lines are only permitted as per type test approval together with the burner.**

⚠ Pulse lines must be routed in such a way that **no condensate** can flow into the DMV-VEF.

⚠ Pulse lines must be routed safely against rip-off or deformation. **Keep pulse lines short.**

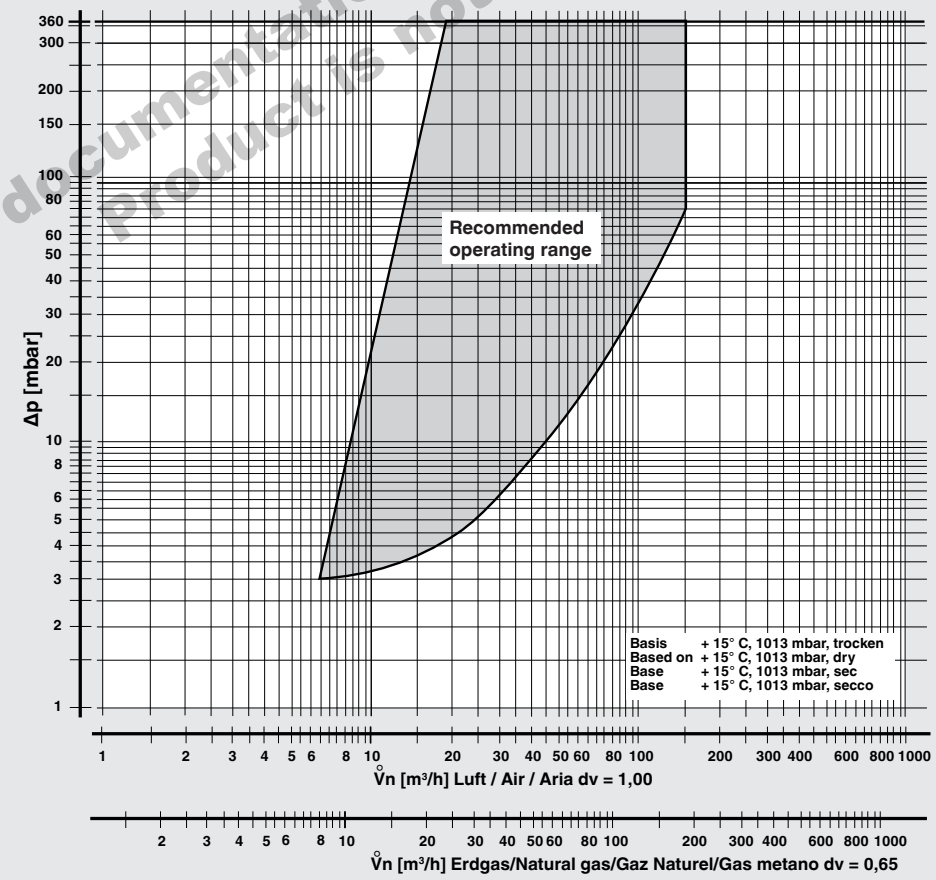
Pulse flange set	Order No.	Ø [mm]	Construction length [mm]
DMV-VEF 507	**227 519**	22	20
DMV-VEF 512/520	**227 517**	43	20
DMV-VEF 512/520	**228 140**	53	20
DMV-VEF 525	**227 518**	55	20

Flow diagram DMV-VEF 507 Rp 3/4 with microfilter

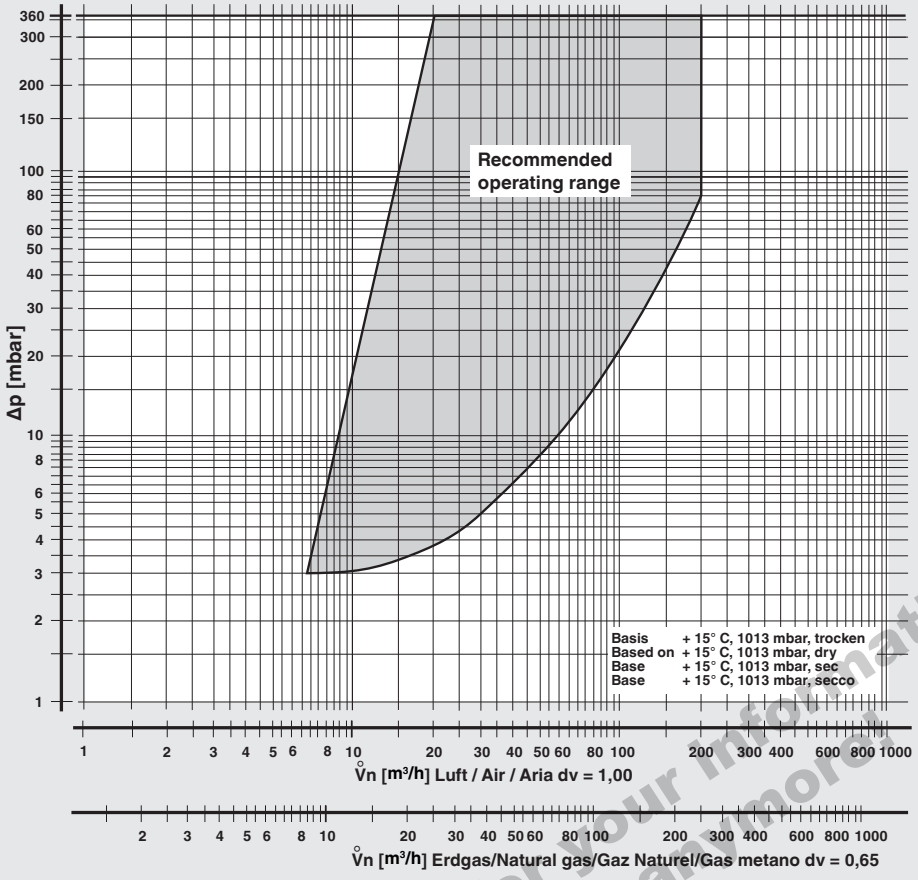


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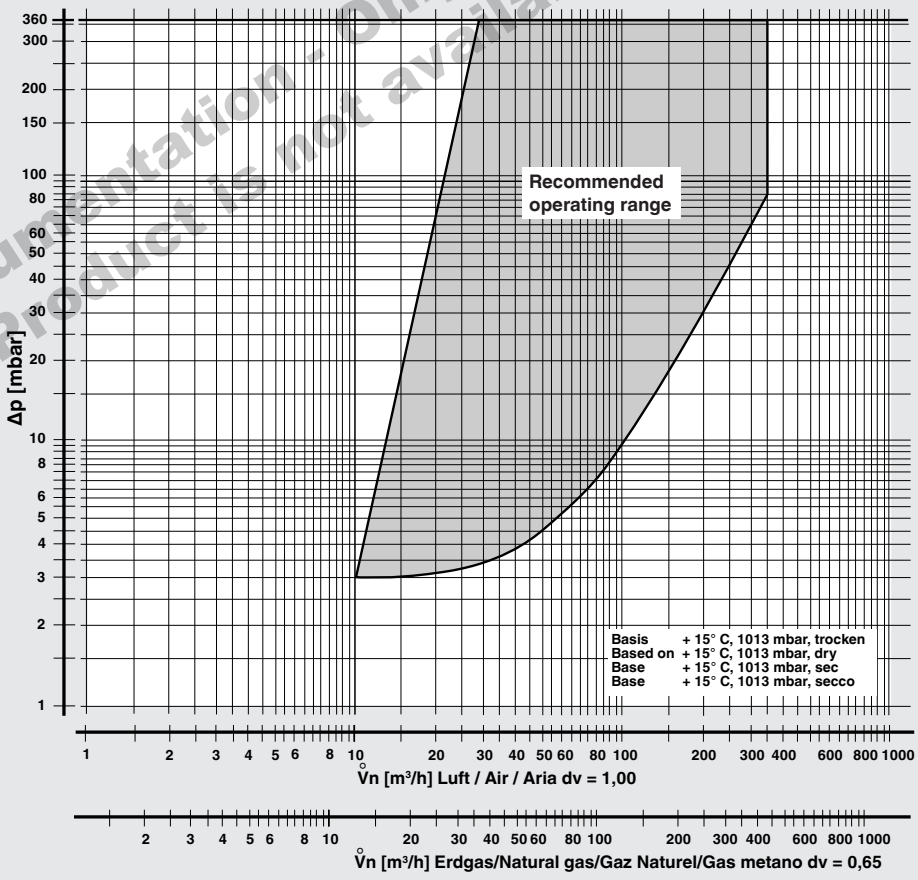
Flow diagram DMV-VEF 512 Rp 1 1/4 with microfilter



Flow diagram DMV-VEF 520 Rp 2 with microfilter



Flow diagram DMV-VEF 525 Rp 2 with strainer



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$$f = \sqrt{\frac{\text{Air tightness}}{\text{Tightness of gas used}}}$$

$$\mathring{V}_{\text{gas used}} = \mathring{V}_{\text{Air}} \times f$$

Gas type	Tightness [kg/m³]	dv	f
Natural gas	0.81	0.65	1.24
Town gas	0.58	0.47	1.46
Liquid gas	2.08	1.67	0.77
Air	1.24	1.00	1.00

Double solenoid valve
Regulator and safety combination
Infinitely variable floating operation

DMV-VEF 507 - 525

Key design characteristics

DUNGS®
Combustion Controls

Key design characteristics DMV-VEF	Application 1	Application 2
Gas Gas type (specific tightness (kg/m3))		
Volume flow V [m³/h] $V_{min.}$ $V_{max.}$		
Inlet pressure p_e [mbar] $p_{e,min.}$ $p_{e,max.}$		
Burner pressure p_{Br} [mbar] at $V_{min.}$ at $V_{max.}$		
Blower pressure p_L [mbar] at $V_{min.}$ at $V_{max.}$		
Combustion chamber pressure p_F [mbar] at $V_{min.}$ at $V_{max.}$		
Regulator range, performance range		
Actuating time of air flow rate restrictor from small load to big load [s]		
Start load [m³/h]		
Company / address		
Name / person responsible		
Phone		

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We reserve the right to make any changes in the interest of technical progress.

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