

**Double solenoid valve
Control and safety combination valve
Servo pressure controller**

DMV-SE 507/11 - 525/11

DUNGS®
Combustion Controls

7.33



Technical description

The DUNGS multiple actuator DMV-SE... consists of valves and a servo pressure controller integrated in a compact fitting:

- Solenoid valves with a design pressure of up to 500 mbar as per DIN EN 161 Class A Group 2
- Precision outlet pressure adjustment
- Servo pressure control unit as per DIN EN 88 Class A Group 2
- Outlet pressure: 2 - 300 mbar
- External pulse lines for optimal outlet pressure stability or pulse flange
- Flange connections with pipe threads to ISO 7/1 or NPT
- Easy assembly
- Low weight

The modular system permits individual solutions incorporating the valve proving system, mini/maxi pressure switches, pressure limiter.

Higher flow rates are achieved at a low pressure differential despite the double solenoid valve's compact design.

Application

The servo pressure controller facilitates optimal mixture formation in forced air burners and pre-mix burners in combination with mechanical or electronic combined gas-air controllers; this applies to both the modulating and multistage modes. 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-SE CE-0085 AS 0430

EC type test approval as per EC Pressure Equipment Directive:

DMV-SE CE0036

Approvals in other important gas consuming countries.

Functional description

Gas flow

1. If valves V1 and V2 are closed, chamber (a) is subjected to inlet pressure up to the double seat of valve V1.
2. The min. pressure switch is linked to chamber (a) by a hole (option). If the inlet pressure exceeds the nominal value set at the pressure switch, the pressure switch switches through to the automatic gas burner control.
3. Valves V1 and V2 open after they have received a release signal of the automatic gas burner control. Gas flow is released through chambers a, b and c.

Mode of operation of the valve controller combination at valve V1

An inlet pressure-equalised controller is integrated in valve V1 (pressure control unit). Valve stem V1 is linked to the valve plate assembly. When the valve stem opens, it prestresses the compression spring and releases the control unit. When the valve stem closes, the closing forces act directly on the valve plate of the control unit. Valves V1 and V2 are actuated together electrically.

In closed position, valve V3 shuts off the pressure chamber below working diaphragm M from the inlet pressure p_1 inside chamber (a). The valve stem of valve V1 controls valve V3. The pressure below working diaphragm M is determined by a variable flow cross-section D.

The outlet pressure p_{Br} counteracts the force of setting spring E via servo diaphragm S until a force equilibrium occurs.

The opposite side of the servo diaphragm is exposed to ambient pressure p_{amb} .

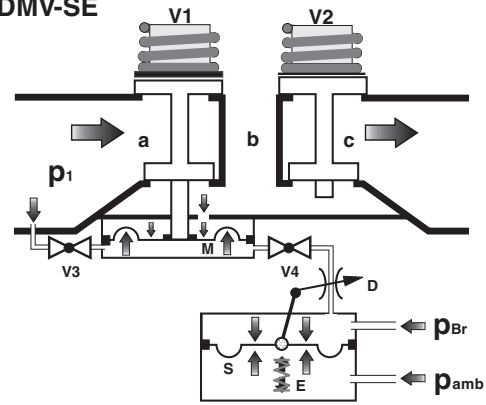
Changes in the force equilibrium lead to a change in the flow cross-section D downstream of valve V4.

The pressure below the working diaphragm changes. Control unit V1 adjusts the valve cross-section to suit the new volumetric flow.

Mode of operation of valve V2

The valve stem of valve V2 is connected to the valve plate assembly. When the valve stem opens, it prestresses the compression spring. Valve V2 opens fully and without delay. Valve V4 is actuated by valve V2. In the closed position, valve V4 shuts off the pressure chamber below working diaphragm M from burner pressure.

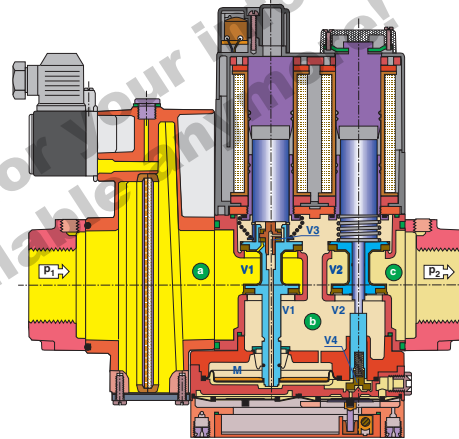
Schematic diagram of DMV-SE



V1	Main valve 1	a, b, c	Pressure chambers in direction of flow
V2	Main valve 2	p_1	Inlet pressure
V3	Control valve 3	p_2	Burner pressure, outlet pressure
V4	Control valve 4	p_{amb}	Ambient pressure
M	Working diaphragm	1, 2, 3, 4	Screw plug G 1/8
D	Restrictor	5, 6	Test nipple (optional)
S	Servo diaphragm	7	Pulse line p_{Br}
E	Setting spring for outlet pressure p_{Br}		

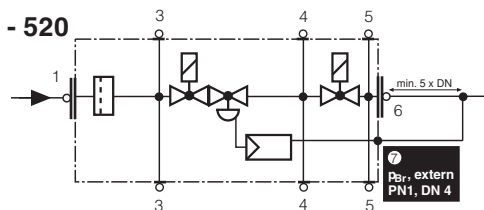
Optional:

Threaded flange with filter and pressure switch.
Please order separately.

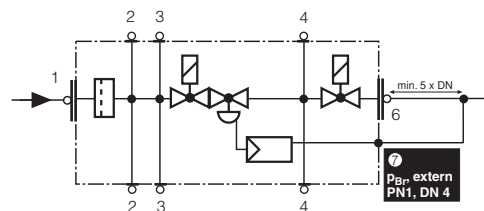


Pressure taps, schematic diagram of gas valve

DMV-SE 507 - 520



DMV-SE 525



Closing function

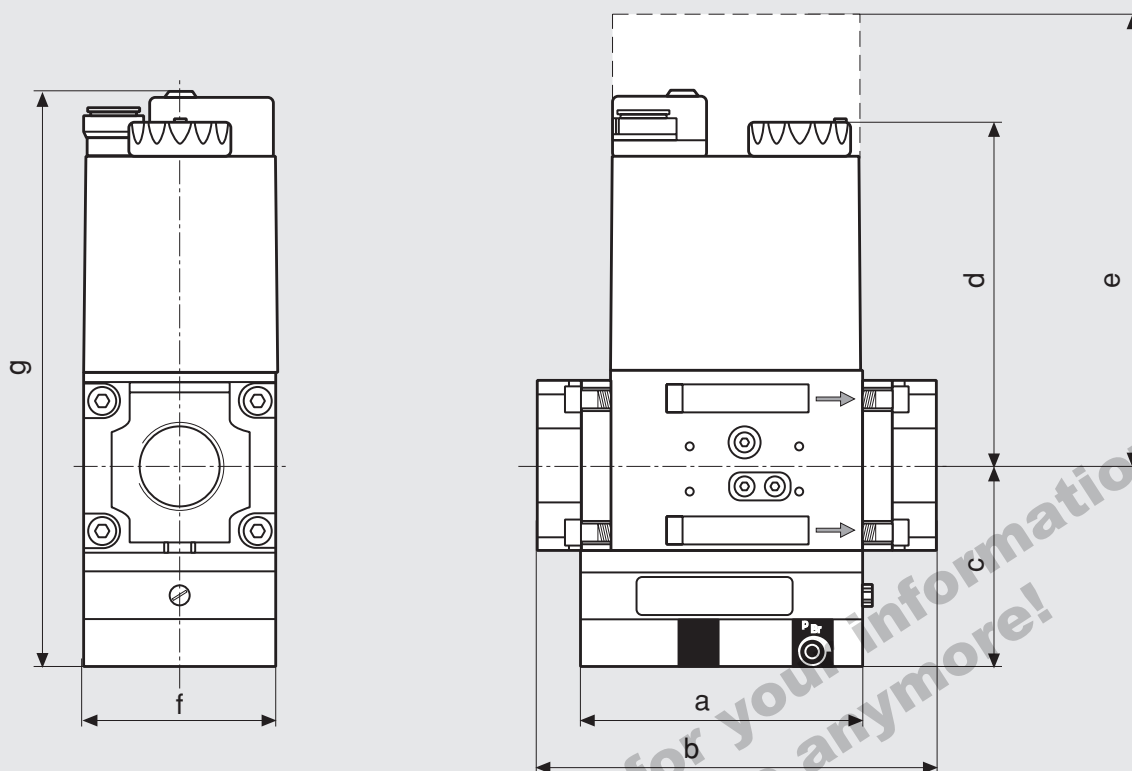
When the power supply to the solenoid coils of main valves V1 and V2 is interrupted, the compression springs close these valves within < 1 s.

Specifications

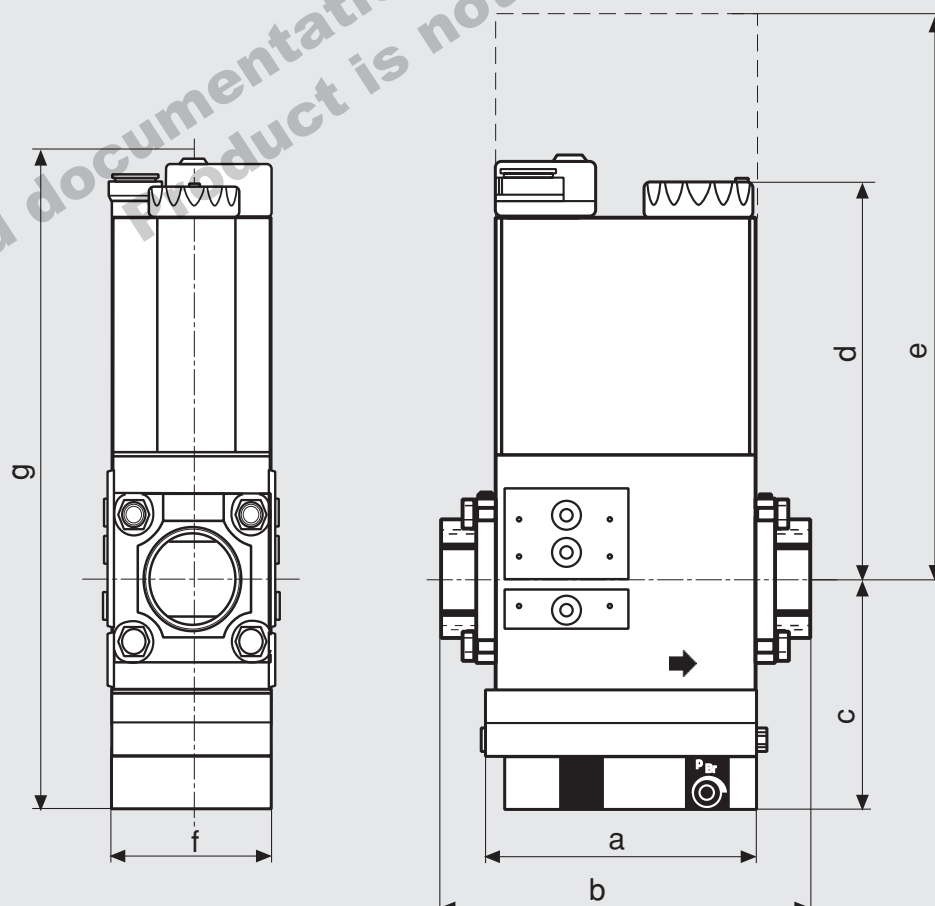
Nominal widths Flanges with tube threads to ISO 7/1 (DIN 2999)	DMV-SE 507 Rp 1/2, 3/4, 1 and their combinations	DMV-SE 512-520 Rp 1, 1 1/4, 1 1/2, 2 and their combinations	DMV-SE 525 Rp 2
Max. operating pressure	500 mbar		
Inlet pressure ranges	S 20, 22, 80, 82:	p_e = 15 - 500 mbar	
	S 300, 302:	p_e = 35 - 500 mbar	
Outlet pressure ranges	S 20, S 22:	p_{Br}: 2 - 20 mbar	
	S 80, S 82:	p_{Br}: 5 - 80 mbar	
	S 300, S 302:	p_{Br}: 30 - 300 mbar	
Media	Gases of gas families 1, 2 and 3 and other neutral gaseous media		
Ambient temperature	-15 °C to +70 °C for S..0, simultaneous opening -15 °C to +60 °C for S..2, separate opening		
Dirt trap device	Sieve A suitable gas filter should be connected upstream. For further information, refer to Datasheets 11.02 “Gas and Air Filters” and 7.40 “Flange-on Filters”		
Pressure switch	Types GW...A5, ÜB...A2 / NB...A2 to DIN EN 1854 may be attached. For further information, refer to Datasheets 5.02 and 5.07 “Pressure Switches for DUNGS Multiple Actuators”		
Servo pressure control section	Inlet pressure-equalised pressure controller, valve V1 shuts off tightly when switched off, as per DIN EN 88 Class A. Servo controller with adjustable burner pressure) Versions for equalised pressure and zero pressure possible		
Solenoid valves V1, V2	Valve as per DIN EN 161 Class A Group 2, fast closing, fast opening		
Test gas connection	G 1/8 DIN ISO 228, on the inlet and outlet flanges, downstream of sieve at both ends, between V1 and V2 at both ends, downstream of V2 (adding on a pressure switch may exclude a test gas connection)		
Pulse line	Connection G 1/8 to DIN ISO 228 for burner pressure (p _{Br} : gas) The pulse line must be made of steel and ≥ PN1, DN4. Condensate from the pulse line must not enter the fittings. It is essential to comply with the instructions given in your Operating and Instruction Manuals. Alternatively: Pulse flange (see page 8)		
Voltage/frequency	230 VAC +15 % +10 %; 50 - 60 Hz Preferred voltages: 110 - 120 VAC, 24 - 28 VDC		
Electrical connections	Plug-and-socket connection as per DIN EN 175301-803		
Output/power consumption	at 230 VAC; +20 °C: please refer to Type survey		
ON period	100 % ED		
Degree of protection	IP 54 as per IEC 529 (EN 60529)		
Radio interference suppression	Degree of interference N		
Materials of gas wetted parts	Housing Diaphragms, seals Solenoid drive	Aluminium die casting NBR basis, Silopren (silicone rubber) Steel, brass, aluminium	
Installation position	Horizontal with solenoid in upright position		

Dimensions

DMV-SE 507-520/11



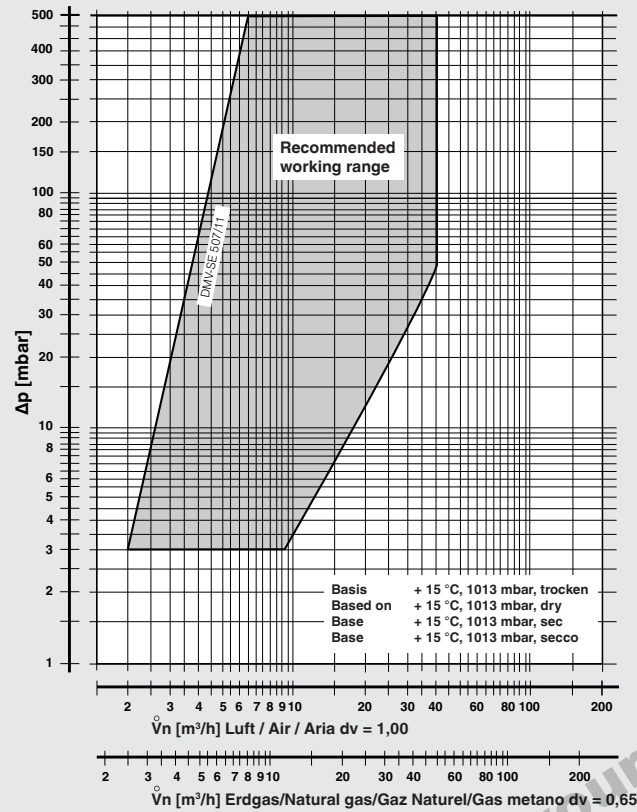
DMV-SE 525/11



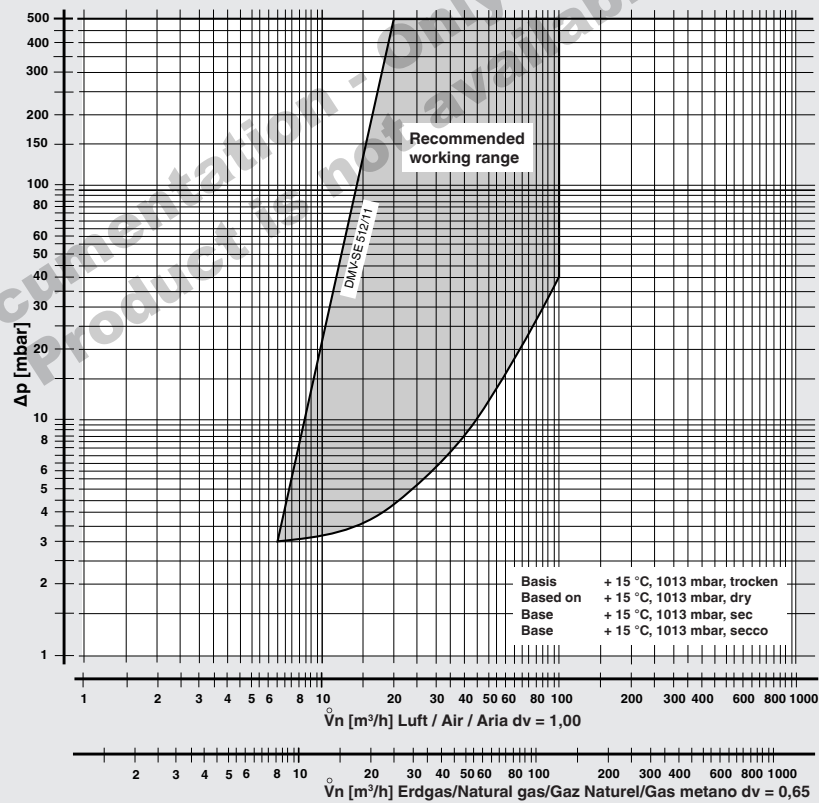
Type	Order.No. 230 VAC	DN Rp	Opening- time	P _{max.} [VA]	Dimensions [mm]							Solenoid Switching		Weight
					a	b	c	d	e	f	g	Nr.	operations/h	[kg]
DMV-SE 507/11 S 20	229 645	1/2 - 11/4	< 1 s	28	110	141	86	127	200	73	212	1105	250	2,5
DMV-SE 507/11 S 22	231 538	1/2 - 11/4	< 1 s	46	110	141	86	127	200	73	212	1111	250	2,5
DMV-SE 507/11 S 80	227 830	1/2 - 11/4	< 1 s	28	110	141	86	127	200	73	212	1105	250	2,5
DMV-SE 507/11 S 82	231 541	1/2 - 11/4	< 1 s	46	110	141	86	127	200	73	212	1111	250	2,5
DMV-SE 507/11 S 300	226 148	1/2 - 11/4	< 1 s	28	110	141	86	127	200	73	212	1105	250	2,5
DMV-SE 507/11 S 302	231 544	1/2 - 11/4	< 1 s	46	110	141	86	127	200	73	212	1111	250	2,5
DMV-SE 512/11 S 20	229 443	1 - 1 1/4	< 1 s	50	140	174	100	145	254	100	245	1205	250	5,1
DMV-SE 512/11 S 22	231 528	1 - 1 1/4	< 1 s	62	140	174	100	145	254	100	245	1211	250	5,1
DMV-SE 512/11 S 80	227 833	1 - 1 1/4	< 1 s	50	140	174	100	145	254	100	245	1205	250	5,1
DMV-SE 512/11 S 82	231 531	1 - 1 1/4	< 1 s	62	140	174	100	145	254	100	245	1211	250	5,1
DMV-SE 512/11 S 300	226 158	1 - 1 1/4	< 1 s	50	140	174	100	145	254	100	245	1205	250	5,1
DMV-SE 512/11 S 302	231 534	1 - 1 1/4	< 1 s	62	140	174	100	145	254	100	245	1211	250	5,1
DMV-SE 520/11 S 20	231 009	11/2 - 2	< 1 s	80	140	201	100	170	333	100	285	1215	250	5,9
DMV-SE 520/11 S 22	231 518	11/2 - 2	< 1 s	80	140	201	100	170	333	100	285	1212	250	5,9
DMV-SE 520/11 S 80	227 836	11/2 - 2	< 1 s	80	140	201	100	170	333	100	285	1215	250	5,9
DMV-SE 520/11 S 82	231 521	11/2 - 2	< 1 s	80	140	201	100	170	333	100	285	1212	250	5,9
DMV-SE 520/11 S 300	226 161	11/2 - 2	< 1 s	80	140	201	100	170	333	100	285	1215	250	5,9
DMV-SE 520/11 S 302	231 524	11/2 - 2	< 1 s	80	140	201	100	170	333	100	285	1212	250	5,9
DMV-SE 525/11 S 20	231 010	2	< 1 s	80	140	201	128	228	400	103	379	1405	250	12,5
DMV-SE 525/11 S 22	231 508	2	< 1 s	100	167	239	128	228	400	103	379	1411	250	12,5
DMV-SE 525/11 S 80	227 839	2	< 1 s	100	167	239	128	228	400	103	379	1405	250	12,5
DMV-SE 525/11 S 82	231 511	2	< 1 s	100	167	239	128	228	400	103	379	1411	250	12,5
DMV-SE 525/11 S 300	226 163	2	< 1 s	100	167	239	128	228	400	103	379	1405	250	12,5
DMV-SE 525/11 S 302	231 514	2	< 1 s	100	167	239	128	228	400	103	379	1411	250	12,5

Characteristics of volumetric flow vs. pressure gradient in the fully stabilised state with sieve; a suitable gas filter should be used

DMV-SE 507/11



DMV-SE 512/11



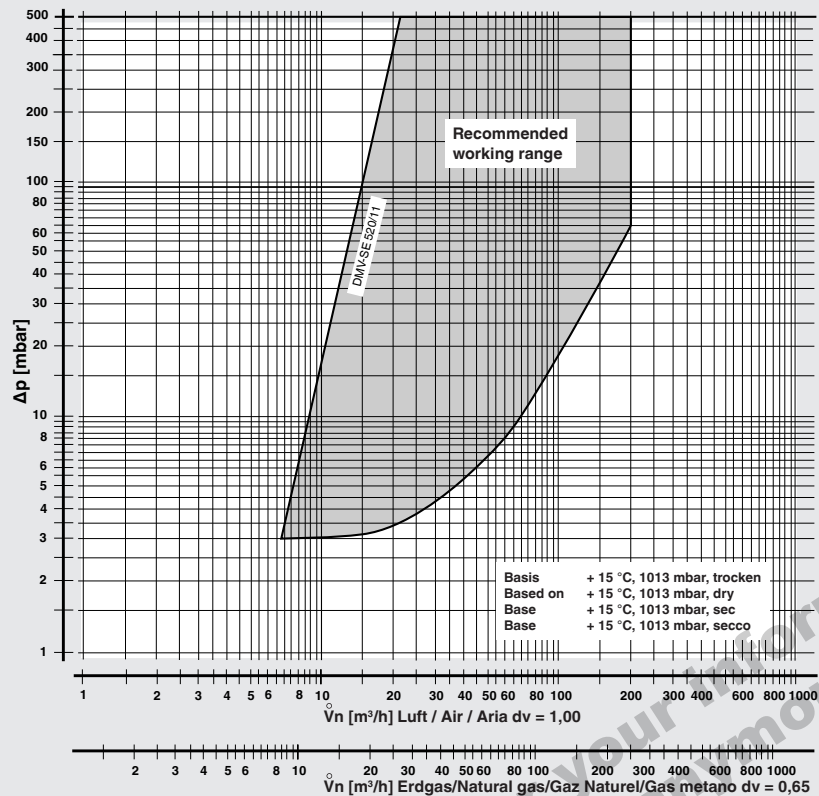
$$f = \sqrt{\frac{\text{density of air}}{\text{density of gas used}}}$$

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

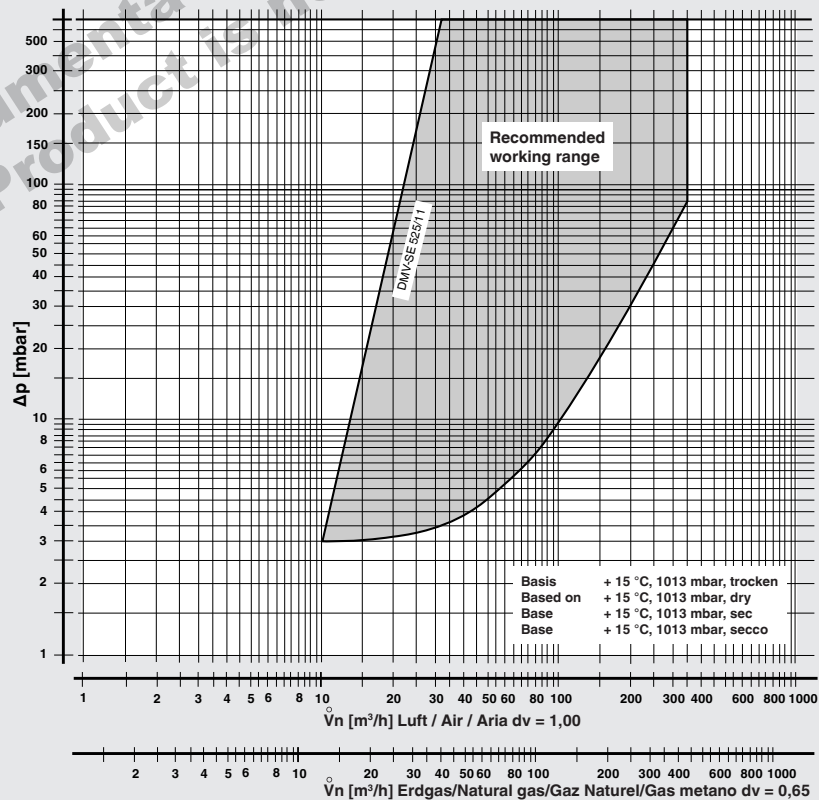
Gas type	Density [kg/m³]	f
Natural gas	0,81	1,24
Town gas	0,58	1,46
Liquid gas	2,08	0,77
Air	1,24	1,00

Characteristics of volumetric flow vs. pressure gradient in the fully stabilised state with sieve; a suitable gas filter should be used

DMV-SE 520/11



DMV-SE 525/11



Double solenoid valve
Control and safety combination
valve
Servo pressure controller

DMV-SE 507/11 - 525/11

DUNGS®
Combustion Controls

Information on system accessories

Further information

Pressure switches

ÜB...A2, NB...A2
GW...A5

Datasheet 5.07
Datasheet 5.02

Gas filter

GF/1 Rp 1/2 - 2
Flange-on filters

Datasheet 11.02
Datasheet 7.40

Valve proving system

VPS 504 S...

Datasheet 8.10

Motorised butterfly valve

DMK Rp 3/4 - 2

Datasheet 11.10

Linear actuator

DML Rp 1 - 2

Datasheet 11.12



The DMV-SE is prepared for direct attachment of DUNGS system accessories and additional devices.

Flange for

Rp/NPT

Order No.

Pulse flange for

Order No.

DMV-SE 507/11

Rp 1/2

222 341

DMV-SE 507/11

Rp 3/4

222 342

DMV-SE 507/11

Rp 1

222 001

DMV-SE 507/11

Rp 1 1/4

231 717

DMV-SE 507/11 ø 22

227 519

DMV-SE 512/11 ø 43

227 517

DMV-SE 520/11 ø 53

280 140

DMV-SE 525/11 ø 55

227 518

DMV-SE 512/520/11

Rp 1

222 343

DMV-SE 512/520/11

Rp 1 1/4

222 344

DMV-SE 512/520/11

Rp 1 1/2

221 884

DMV-SE 512/520/11

Rp 2

221 926

Adapter, set pressure gauge flange G1/2

216 675

Adapter GW A with G1/4

222 982

Adapter p_{Br}

214 975

Adapter GW A o flange

221 630

DMV-SE 507/11

NPT 1/2

222 371

DMV-SE 507/11

NPT 3/4

222 368

DMV-SE 507/11

NPT 1

221 999

DMV-SE 507/11

NPT 1 1/4

231 718



Always order flanges, plug and socket connections and system accessories separately.

DMV-SE 512/520/11

NPT 1

222 369

DMV-SE 512/520/11

NPT 1 1/4

222 370

DMV-SE 512/520/11

NPT 1 1/2

222 003

DMV-SE 512/520/11

NPT 2

221 997

DMV-SE 525/11

Rp 2

215 384

Electrical plug

3 pol + PE

210 319

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

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