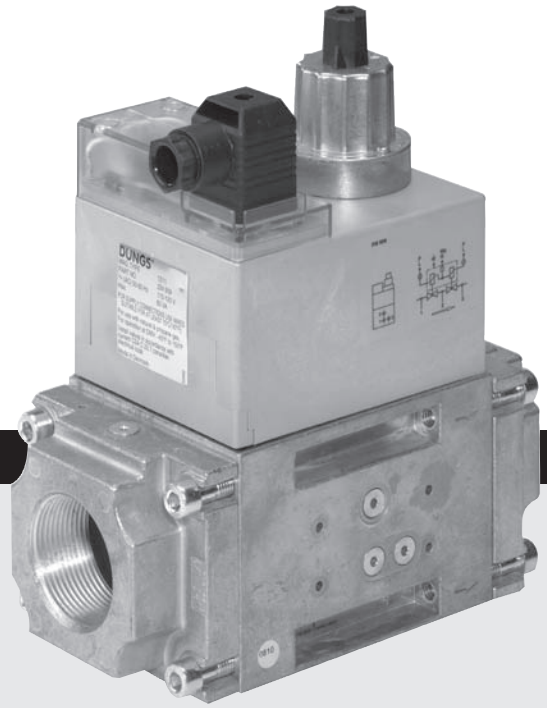
Content



Approvals

UL Recognized Component:
File No. MH16727

CSA:
Certified File No.157406

FM Approved:
Report J.1.1Z6A0.AF

Commonwealth of Massachusetts Approved Product Approval code G1-1107-35

Attention

The installation and maintenance of this product must be done under the supervision of an experienced and trained specialist. Never perform work if gas pressure or power is applied, or in the presence of an open flame.

Check the ratings in the specifications to make sure that they are suitable for your application.

Please read the instruction before installing or operating. Keep the instruction in a safe place. You find the instruction also at www.dungs.com If these instructions are not heeded, the result may be personal injury or damage to property.

On completion of work on the safety valve, perform a leakage and function test.

Any adjustment and application-specific adjustment values must be made in accordance with the appliance-/boiler manufacturers instructions.

This product is intended for installations covered by, but not limited to, the following fuel gas codes and standards: NFPA 54, IFGC (International Fuel Gas Code), or CSA B149.1 (for Canada) or the following equipment codes and standards: CSD-1, UL 795, NFPA 86, NFPA 37, ANSI Z83.4/CSA 3.7, ANSI Z83.18, ANSI Z21.13/CSA 4.9, or CSA B149.3 (for Canada).

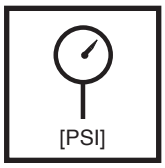
Explanation of symbols

1, 2, 3 ... = Action
• = Instruction

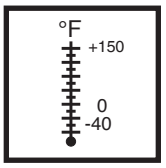
Specification

DMV-D/602 Two normally closed safety shutoff valves in one housing. Fast opening, fast closing. Adjustable max. flow on valve 2.

DMV-DLE/602 Two normally closed safety shutoff valves in one housing. Valve 1 fast opening, fast closing. Valve 2 slow opening, fast closing. Adjustable max. flow and initial lift on valve 2.

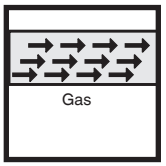


Max. Operating Pressure
MOP = 7 PSI (500 mbar)

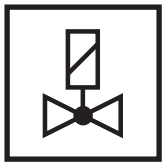


Ambient Temperature
-40 °F ... +150 °F
(-40 °C … +65 °C)

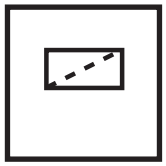
Electrical Ratings
110 - 120 VAC / 50 - 60 Hz;
220 - 240 VAC / 50 - 60 Hz
24 VAC / 50 - 60 Hz; 24 VDC
Operating time
100 % duty cycle
Electrical Connection
DIN-Connector with 1/2" NPT conduit adapter.
Power Consumption with all coils energized
DMV-D(LE) 701: 45 VA
DMV-D(LE) 702: 65 VA
DMV-D(LE) 703: 80 VA



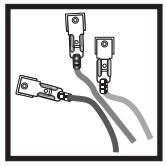
Gases
Dry, natural gas, propane, butane; other noncorrosive gases. A "dry" gas has a dew point lower than +15 °F and its relative humidity is less than 60 %.
Materials in contact with Gas
Housing: Aluminium, Steel, free of nonferrous metals. Sealings on valve seats: NBR-based rubber.



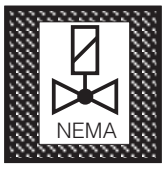
Classification of Valve V1 and V2 Safety Shutoff Valve: UL 429, FM 7400
ANSI Z21.21 • CSA 6.5 C/I Valves
Closing Time (Valve 1 & Valve 2)
< 1 s
Opening Time
DMV-D/602: V1 & V2 < 1 s
DMV-DLE/602: V1< 1 s;
V2 10 to 20 s at 70 °F
Main Flow Setting (DMV-D/602 & DMV-DLE/602)
Adjustable on V2:
<10 to 100 % of total flow
Initial Lift Adjustment (DMV-DLE/602)
Adjustable on V2:
0 to 70 % of total flow



Strainer
23 Mesh, installed in the housing upstream V1



Electrical Connection
DIN-connector (Order No. 210-319) required. M20 - 1/2 NPT Adapter (Order No. 249-671) required for a conduit connection. Order parts separately.



Enclosure Rating
IP 65/NEMA Type 12

Additionally Required Electrical Parts	
Description	**Order No.**
DIN Connector	210-319
Conduit Adapter	249-671

Mounting

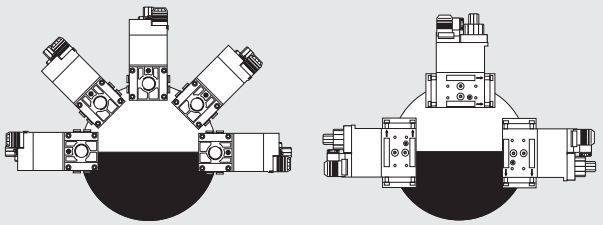
Setup

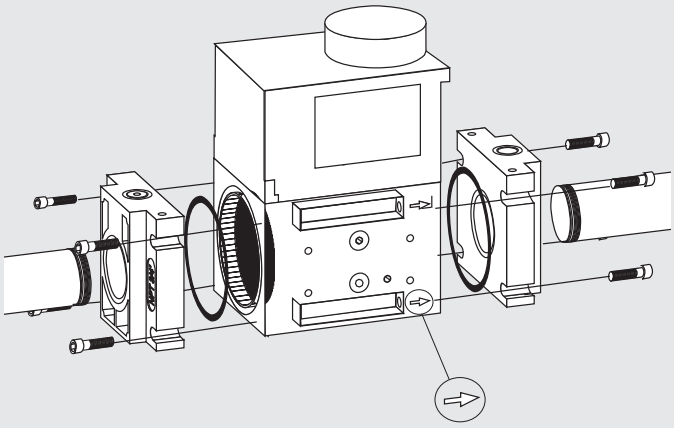
1. Examine the DMV valve for shipping damage.
2. The main gas supply must be shutoff before starting the installation.
3. The inside of the DMVvalve, the flanges, and piping must be clean and free of dirt. Remove all dirt and debris before installing the DMV valve. Failure to remove dirt / debris could result in valve damage or improper performance.

Recommended Procedure to Mount the Flanges

1. Unpack the DMV valve and remove the socket cap head screws.
   For DMV 701: use 5 mm hex wrench for M6 screws
   For DMV 702/703: use 6 mm hex wrench for M8 screws
2. Remove the two white protective plastic covers.
3. Verify the o-rings and the grooves are clean and in good condition.
4. Install the DMV valve with the gas flow matching the direction indicated by the arrows on the casting.
5. Mount the DMV solenoid valve from vertically upright to horizontal.
6. Clean the mounting surface of the flanges.
7. Mount the flanges to the DMV valve.
8. Tighten the screws in a crisscross pattern. See table for recommended torque!

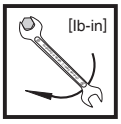
Installation position





Do not overtighten the screws.
Follow the maximum torque values below.

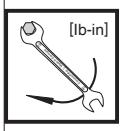
If the flow is not in the same direction of the arrows, the valves will not operate properly.



Recommended Torque System Accessories	M6	M8	Screw Size
	62 lb-in	134 lb-in	[lb-in]

Recommended Piping Procedure

- Use new, properly reamed and threaded pipe free of chips.
- Apply good quality pipe sealant, putting a moderate amount on the male threads only. If pipe sealant lodges on the valve seat, it will prevent proper operation. If using LP gas, use pipe sealant rated for use with LP gas.
- Do not thread pipe too far. Valve distortion and/or malfunction may result from excess pipe in the valve body.
- Apply counter pressure only a parallel jaw wrench only to the flats on the flange when connecting to pipe.
- Do not overtighten the pipe. Follow the maximum torque values listed below.



Recommended Torque for Piping	1/2”	3/4”	1”	1 1/4”	1 1/2”	2”	NPT pipe
	375	560	750	875	940	1190	[lb-in]

• On completion of work on the DMV valve, perform a leakage test. (See “Valve Leakage Test”)

Painting Valve

- It is not recommended that this valve be painted. Painting covers date codes and other labels that identify this valve.
- If the valve needs to be painted, a paint free of volitile organic componants (VOC’s) must be used. VOC’s can damage valve o-rings, resulting in external gas leakage over time.
- During the painting process, use measures that will allow the valve’s date code and other labeling information to be legible after the paint is dry.
- damage valve o-rings, resulting in external gas leakage over time.
- During the painting process, use measures that will allow the valve’s date code and other labeling information to be legible after the paint is dry.

Protection from Radiant Heat

- Radiant heat must be considered as a heat source that could result in an ambient temperature higher than the rating of this valve.
- Provide propor shielding to protect against radiant heat.

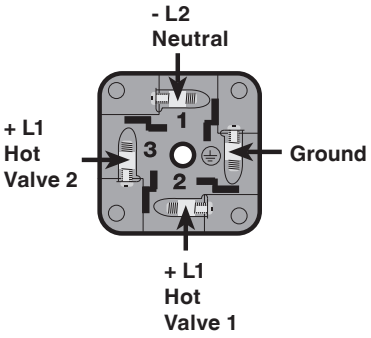
Wiring

Wiring Procedure

- Disconnect all power to the valves before wiring to prevent electrical shock and equipment damage.
- Attach flexible 1/2" NPT conduit to the DIN connector.
- Route 14 or 16 guage wire rated for at least 75 ˚C (167 ˚F) through the conduit and the DIN connnector.
- Install a conduit plug at some point in the conduit run between the DIN connector and closest panel that contains sparking contacts or other sparking devices (see NFPA 86 requirements).
- Connect the wiring to the appropriate screw terminals in the DIN connector.
- Plug the DIN connector onto the terminals. Fasten the DIN connector with the screw supplied.

All wiring must comply with local electrical codes, ordinances and regulations.

DIN Connector
screw terminal connections

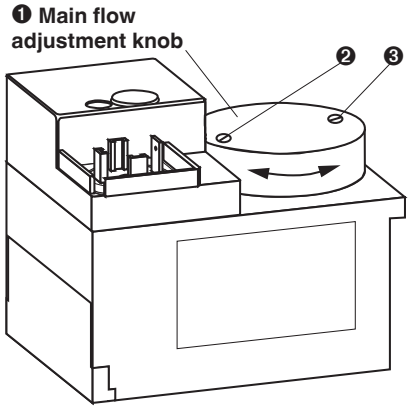


Valve Adjustment

Flow Setting

- The valves are factory set with the flow adjustment fully open.
- **CAUTION**: Make sure the flow of gas does not create a hazard.

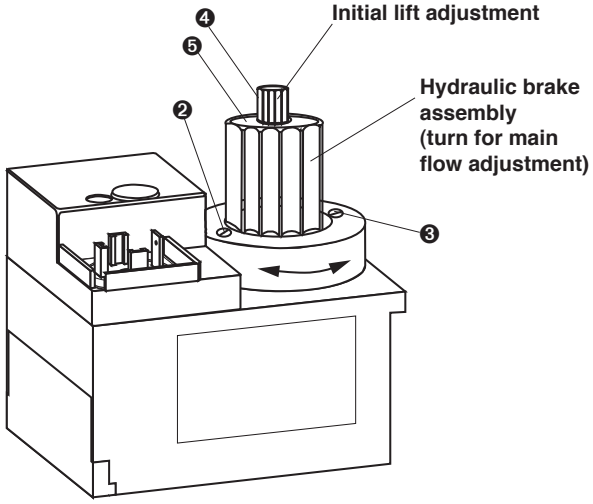
1. Locate the flow adjustment knob on top of valve 2 on the DMV-D/602 (❶ black knob) DMV-DLE/602 (base of the hydraulic brake). There are two screws ❷, ❸ the holding screw is recessed and has a blue sealing compound on it, while the pan head screw ❷ protrudes from the cap.
2. Loosen the pan head screw ❷ until you can freely rotate the flow adjustment ❶.
3. Turn clockwise for less gas or counterclockwise for more gas.
4. Check the flow at the burner with an orifice or flow meter.
5. Tighten the pan head screw ❷ on the adjustment cap ❶.



Initial Lift Adjustment (DMV-DLE/602 only)

The initial lift adjustment varies the initial gas flow through the valve as the valve seat begins to open. This adjustment can vary the initial flow between 0 % and 70 % of the total gas flow; 0 to 25 % of stroke. All DMV-DLE/6 valves are factory set with no initial lift. To adjust the lift proceed as follows:

1. Unscrew the small black cap ❹ on top of the flow adjustment cap to expose the initial lift adjustment knob.
2. The black cap ❹ also serves as tool; turn the cap over and insert it on the slot on the adjustment knob.
3. Turn the knob ❺ clockwise for a min. initial lift or counterclockwise for a max. initial lift.
4. Once the desired initial fast lift has been achieved, reinstall the black cap ❹.

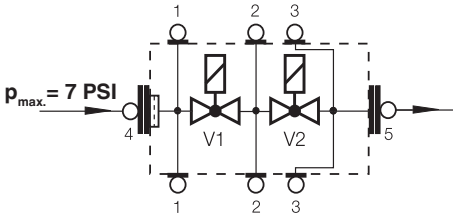


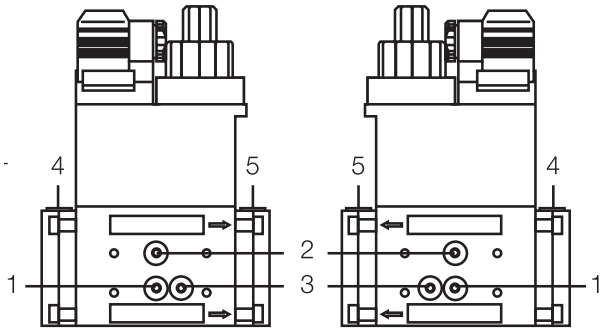
Do not adjust or remove any screws or bolts which are sealed with a Red or Blue colored compound. Doing so will void all approvals and warranties.

Test Ports

Test Ports

The G ⅛ ISO 228 taps are available on both sides upstream V1, between V1 and V2, downstream V2, and on both flanges. The G ⅛ test nipple (P/N 219-008) can be screwed in any of these pressure tap ports.





Rated Capacity

	Capacity in CFH at pressure drop of 1 inch water column; natural gas, sp.gr.= 0.64					
	1/2”	**3/4”**	**1”**	**1 1/4”**	**1 1/2”**	**2”**
DMV D(LE) 701/602	345	429	457	-	-	-
DMV-D(LE) 702/602	-	-	1065	1277	1368	1430
DMV-D(LE) 703/602	-	-	1230	1532	1698	1795

Pulse Fired Applications

When using these valves on pulse fired applications, the following apply:

- Before installing the valve, the inside of all gas piping upstream to the nearest filter shall be cleaned and that filter shall have an insert with mesh no larger than 50 micron.
- The valve shall be installed in the upright position.
- The valve shall be applied within all of its ratings. The type of gas, the ambient temperature and the cycle rate of the valve are critical.
- The valve shall be leak tested at least annually.
- After the cycle life has been exceeded, the valve shall be immediately replaced.

Valve Leakage Test

This leak test procedure tests the external sealing and valve seat sealing capabilities of the DMV automatic safety shutoff valve. Only qualified personnel should perform this test.

It is required that this test be done on the initial system startup, and then repeated at least annually. Possibly more often depending on the application, environmental parameters, and the requirements of the authority having jurisdiction.

Setup

This test requires the following:

A) Test nipples installed in the downstream pressure tap port of each automatic safety shutoff valve to make the required 1/4" hose connection in step 4.

B) A transparent glass of water filled at least 1 inch from the bottom.

C) A proper leak test tube. An aluminum or copper 1/4" rigid tube with a 45˚ cut at the end that is then connected to a 1/4" flexible hose of some convenient length provides for a more accurate leakage measurement.
However, a 45˚ cut at the end of the 1/4" flexible hose will suffice, but it will not likely be as accurate as the rigid tube.

D) For detecting external leakages, an all purpose liquid leak detector solution or a soapy water solution is required.

Leak Test Procedure

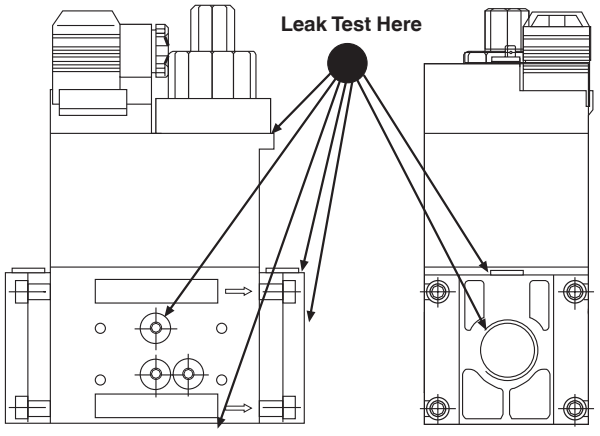
Use the illustration below as a reference.

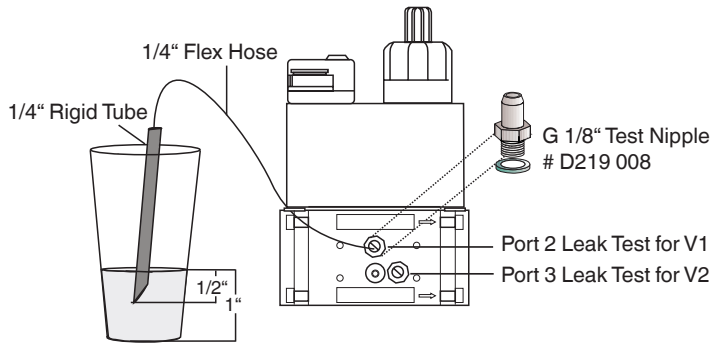
1. With the upstream ball valve open, the downstream ball valve closed and both valves energized, apply an all purpose liquid leak detector solution to the "External Leakage Test Areas" indicated in the illustration below, to any accessories mounted to the safety valve, and to all gas piping and gas components downstream the equipment isolation valve, and the inlet and outlet gas piping of the automatic safety shutoff valve. The presence of bubbles indicates a leak, which needs to be rectified before proceeding.
2. Then, de-energize the burner system and verify that both automatic safety shutoff valves are closed.
3. Close the upstream and downstream manual ball valve.
4. Using a screwdriver, slowly open the V1 test nipple (port 2) by turning it counter clockwise to depressurize the volume between the two valves, and connect the 1/4" flexible hose to the test nipple.
5. Slowly open the upstream manual ball valve, and then provide for some time to allow potential leakage to charge the test chamber before measuring the valve seat leakage.
6. Immerse the 1/4 in. tube vertically 1/2 in. (12.7 mm) below the water surface. If bubbles emerge from the ¼" tube and after the leakage rate has stabilized, count the number of bubbles appearing during a 10 second period. (See chart below for allowable leakage rates.)
7. Repeat the same procedure for valve V2 (port 3). (Energize terminal 2 on the DIN connector to open valve 1)

After completing the above tests proceed as follows:

8. Verify that the downstream manual ball valve is closed, and both automatic safety shutoff valves are de-energized.
9. Remove the flexible hose, and close all test nipples.
10. With the upstream manual ball valve open, energize both automatic safety shutoff valves.
11. Use soapy water to leak test all test nipples to ensure that there are no leaks.
12. If no leakage is detected, de-energize all automatic safety shutoff valves, and open the downstream manual ball valve.

If leakage values are exceeded, replace valve immediately.

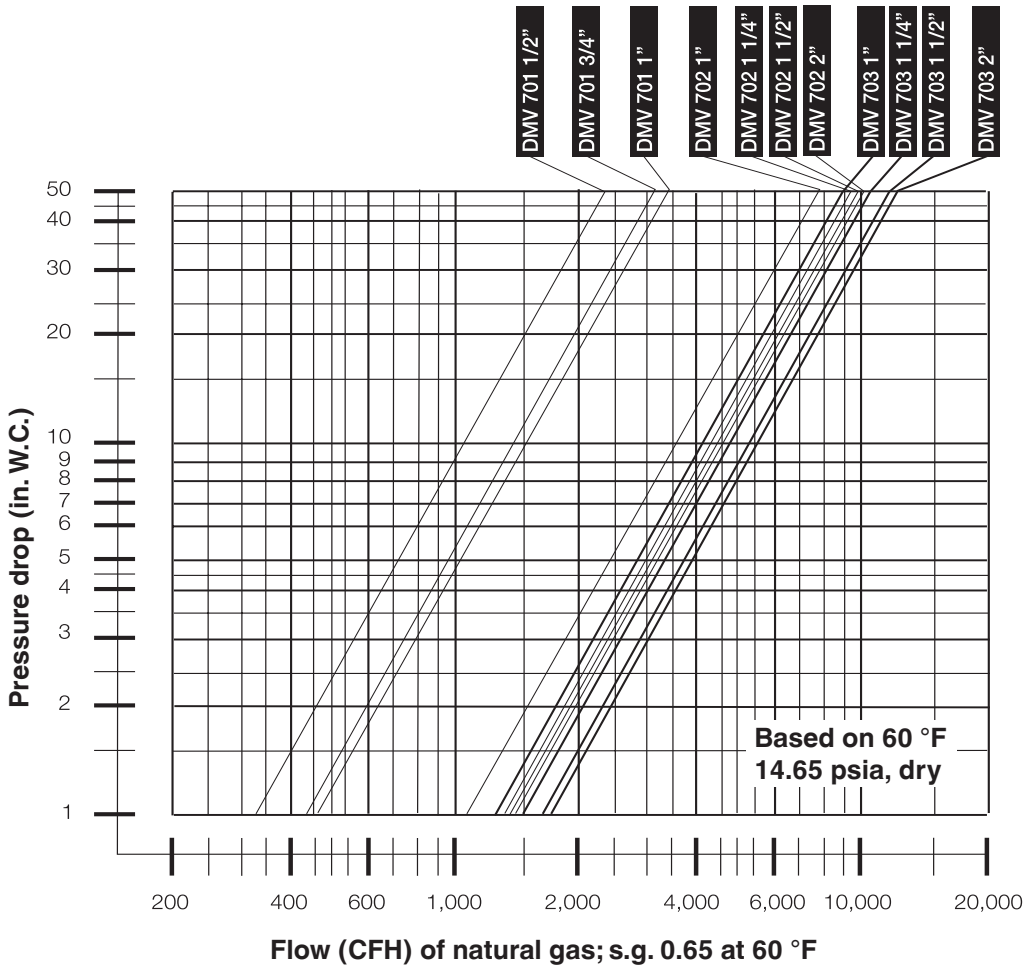




Type	Allowable Valve Seat Leakage* up to 7 PSI inlet	# of Bubbles in 10 s		
		Air	Natural Gas	LP
DMV D(LE) 701/602	239 cc/hr	5	6	4
DMV-D(LE) 702/602	464 cc/hr	9	11	7
DMV-D(LE) 703/602	464 cc/hr	9	11	7

*Based on air and test conditions per UL 429 Section 29. (Air or inert gas at a pressure of 1/4 psig and also at a pressure of one and one-half times maximum operating pressure differential, but not less than 1/2 psig. This test shall be applied with the valve installed in its intended position.) Volume of bubble defined in Table 2 of FCI 70-2-1998.

Flow Curve



Pressure Drop for other Gases

To determine the pressure drop when using a gas other than natural gas, use the flow formula below and f value located in the table below to determine the "corrected" flow rate in CFH through the valve for the other gas used. For example, when using propane, divide the volume (CFH) of propane required for the application by the calculated value f (f = 0.66 for propane). Use this "corrected" flow rate and the flow curve on the next page to determine pressure drop for propane.

Determining equivalent flow through valves using another gas

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

$$f = \sqrt{\frac{\text{Density of Natural gas}}{\text{Density of gas used}}}$$

Type of gas	Density [kg/m³]	s.g.	f
Natural gas	0.81	0.65	1.00
Butane	2.39	1.95	0.58
Propane	1.86	1.50	0.66
Air	1.24	1.00	0.80

Accessories & Replacement

Coil for	Magnet Type	Order No. for 120 VAC	Order No. for 24 VAC	Order No. for 24 VDC
DMV-D(LE) 701/602	1111	232-401	238-554	238-829
DMV-D(LE) 702/602	1211	232-402	238-825	238-826
DMV-D(LE) 703/602	1212	232-403	238-822	238-823
Printed Wiring Board	**Magnet Type**			
DMV-D(LE) 701/602	1111	238-803	238-803	238-804
DMV-D(LE) 702/602	1211	238-806	238-806	238-807
DMV-D(LE) 703/602	1212	238-806	238-806	238-807

Accessories/Adapter	Order No.	Description
Electrical DIN Connector (Hirschmann)	210-319	
M20 - ½ NPT Adapter	240-671	
Visual Indicator	217-665A	The indicator mounts to the bottom of the valve and visually displays when the valve is open or closed.
Valve Switch CPI 400	224-253A	Valve switch with visual indication.
1/4" NPT port 1 or port 2 adapter (reduced port)	225-047	
1/2" NPT port 2 pilot gas adapter (reduced port)	225-043	
G 1/8" Test nipple	219-008	
Port 3 pressure switch mounting adapter	214-975	
Hydraulic Brake	240-458	
Max. Flow Adj. Knob	240-457	

Valve Description	Flange	NPT P/N	Rp P/N	O-ring and bolt kit P/N	FRI mounting Kit P/N**	Integral strainer and Filter replacement
DMV-701	1/2"	222-371	222-341	224-093	219-967	230-440
DMV-701	3/4"	222-368	222-342	224-093	219-967	230-440
DMV-701	1"	221-999	222-001	224-093	219-967	230-440
DMV-702 & 703	1"	222-369	222-343	224-094	219-968	230-441
DMV-702 & 703	1 1/4"	222-370	222-344	224-094	219-968	230-441
DMV-702 & 703	1 1/2"	222-003	221-884	224-094	219-968	230-441
DMV-702 & 703	2"	221-997	221-926	224-094	219-968	230-441

*Includes two o-rings and two sets of bolts (one set of four bolts for each flange).

**Includes four bolts and one o-ring.

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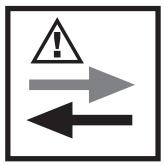
USA CDN

Replacement safety relevant components
Austausch sicherheitsrelevanter Komponenten

DUNGS®
Combustion Controls



It is necessary to replace safety-relevant components after they have reached the end of their useful life.

DUNGS recommends replacing such components according to the following table:

Es besteht die Notwendigkeit sicherheitsrelevante Komponenten nach Erreichen ihrer Nutzungsdauer auszutauschen.

DUNGS empfiehlt den Austausch gemäss folgender Tabelle:

Valid only for domestic, residential and industrial* heating applications.

***Not valid for high performance industrial heat process applications. See page 2**

Gültig nur für häusliche Heizungsanlagen

Nicht gültig für Thermprozessanwendungen mit Taktbetrieb

Valve Type Safety relevant component Ventil Typ Sicherheits-relevante Komponente	Recommended replacement after years/cycles: ➔ Depends on the value which will be achieved first Empfohlener Austausch nach Jahren/Schaltspielen: ➔ Je nachdem welcher Wert zuerst erreicht wird		Max. Cycle Rate Max. Schalthäufigkeit
	USEFUL LIFE [Years] DUNGS recommends replacement after: NUTZUNGSDAUER [Jahre] DUNGS empfiehlt den Austausch nach:	USEFUL LIFE [Rated Cycle Life (cycles)] DUNGS recommends replacement after: NUTZUNGSDAUER [Schaltspiele (auf/zu)] DUNGS empfiehlt den Austausch nach:	
DMV-(D)	10 Years 10 Jahre	1,000,000 cycles	500 /h
SV-(D)			
MV(D)/602			
DMV/MV/SV: LE-Ausführungen (mit Hydraulikbremse) DMV/MV/SV: LE-Versions (with hydraulic brake)		500,000 cycles	20 /h
Gasventil *mit* DUNGS-Ventil-prüfsystem Gas valve *with* DUNGS valve proving system	Austausch nach erkanntem Fehler Replacement after error detection		
VPS 504*	10 Years 10 Jahre	250,000 cycles	20 /h
VDK 200*			15 /h
CPI 400		1,000,000 cycles @ 1 A and 120 VAC 100,000 cycles @ 10 A and 120 VAC	1,000 /h
CPI 401			

* Valve proving system values shown are expected lifetime. NFPA 86 does not require replacing if the expected life has been exceeded.

Änderungen, die dem technischen Fortschritt dienen, vorbehalten
We reserve the right to make modifications in the course of technical development.

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USA CDN

Replacement safety relevant components
Austausch sicherheitsrelevanter Komponenten

DUNGS®
Combustion Controls

It is necessary to replace safety-relevant components after they have reached the end of their useful life.

DUNGS recommends replacing such components according to the following table:

Es besteht die Notwendigkeit sicherheitsrelevante Komponenten nach Erreichen ihrer Nutzungsdauer auszutauschen.

DUNGS empfiehlt den Austausch gemäss folgender Tabelle:

Valid for high performance industrial heat process applications!

Valve Type Safety relevant component Ventil Typ Sicherheitsrelevante Komponente	Recommended replacement after years/cycles: ➔ Depends on the value which will be achieved first Empfohlener Austausch nach Jahren/Schaltspielen: ➔ Je nachdem welcher Wert zuerst erreicht wird		Max. Cycle Rate Max. Schalthäufigkeit
	USEFUL LIFE [Years] DUNGS recommends replacement after: NUTZUNGSDAUER [Jahre] DUNGS empfiehlt den Austausch nach:	USEFUL LIFE [Rated Cycle Life (cycles)] DUNGS recommends replacement after: NUTZUNGSDAUER [Schaltspiele (auf/zu)] DUNGS empfiehlt den Austausch nach:	
MV ... /602 **NPT ½ - NPT 2** (**no** main flow adjustment)	3 Years 3 Jahre	3,000,000 cycles	1,000 /h
MVD ... /602 **NPT ½ - NPT 1** (**with** main flow adjustment)			
MVD ... /602 **NPT 1¼ - NPT 3** (**with** main flow adjustment)		1,000,000 cycles	
Conditions	**Clean gas (NG, LNG, LPG): maximum 50 micron gas filter required!** **Dry Gas:** ■ **relative humidity** < 60 % ■ **dew point of the gas** < –14 °F		} "dry"

➔ **Not valid for MV(D).../602 valves delivered before 2011/01**

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