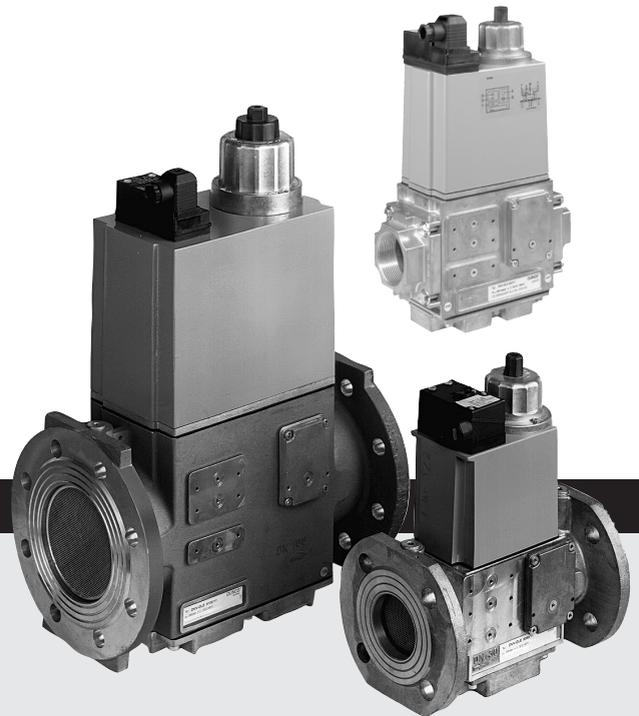


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Approvals



CSA:
 Certified File No.101989



FM Approved: Report 3007653



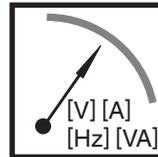
EU Gas Appliance Regulation
 EN 161

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

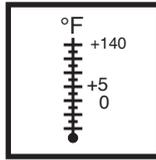
Specification

DMV-D Two normally closed safety shutoff valves in one housing. V1 and V2 are fast opening, fast closing. Adjustable max. flow on V1.

DMV-DLE Two normally closed safety shutoff valves in one housing. V1 fast opening, fast closing. V2 slow opening, fast closing valve. Adjustable max. flow V1 and adjustable initial lift with V2.



Max. Operating Pressure
MOP=7 PSI(500mbar) FM, CE, CSA



Ambient Temperature
+5 °F ... +140 °F
(-15 °C ... +60 °C)



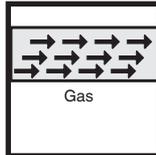
Electrical Ratings Available
110 - 120 VAC / 50 - 60 Hz
220 - 240 VAC / 50 - 60 Hz
24 VDC

Power Consumption with all coils energized (120 VAC & 230 VAC)

DMV-D(LE) 525/11: 110 VA
DMV-D(LE) 5040/11: 90 VA
DMV-D(LE) 5050/11: 90 VA
DMV-D(LE) 5065/11: 110 VA
DMV-D(LE) 5080/11: 110 VA
DMV-D(LE) 5100/11: 135 VA
DMV-D(LE) 5125/11: 200 VA

Power Consumption with all coils energized (24 VDC)

DMV-D(LE) 525/11: 90 VA
DMV-D(LE) 5040/11: 70 VA
DMV-D(LE) 5050/11: 70 VA
DMV-D(LE) 5065/11: 90 VA
DMV-D(LE) 5080/11: 95 VA
DMV-D(LE) 5100/11: 95 VA
DMV-D(LE) 5125/11: 155 VA

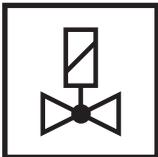


Gases

Dry, natural gas, propane, butane; other noncorrosive gases. Suitable for up to 0.1 % by volume, dry H₂S. 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.



Max. Flow Setting (DMV-D & DMV-DLE)

Adjustable on V1:
Valve one: <5 to 35 % of total flow

Initial Lift Adjustment (DMV-DLE) only

Adjustable:
0 to 70 % of total flow; 0 to 35 % of stroke

Opening Time

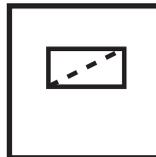
DMV-D: V1 & V2 < 1 s
DMV-DLE: V1 < 1 s; V2 10 to 20 s

Closing Time

V1 & V2 < 1 s

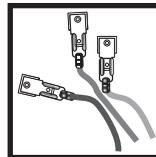
Gas Connection Type

DMV 525/11: 2" NPT threaded flange
DMV 5xxx/11: Raised face flange according to ISO 7005-1



Strainer

23 Mesh, installed in the housing upstream V1



Electrical Connection

DIN-connector (Order No. 210319) required. M20 - 1/2 NPT Adapter (Order No. 240671) required for a conduit connection. Order parts separately.



Enclosure Rating
IP 54/NEMA Type 12

Alterations, Modifications or Repairs

For safety-related components, devices and systems, any liability of DUNGS, i.e. product liability for any kind of consequential damage as well as liability for defects, will cease to exist if alterations, modifications or repairs are made to these safety-related components, devices and systems by unauthorized specialist staff or with spare parts which have not been specially permitted for use in these safety-related components, devices and systems.

Additionally Required Electrical Parts

Description	Order No.
DIN Connector	210319
Conduit Adapter	240671

Mounting

DMV 525/11 Mounting Procedure

1. Remove the 8 bolts that are holding the protective covers on the inlet and outlet of the DMV using a 13 mm wrench.
2. Remove the two protective covers from the DMV-D(LE) body.
3. Verify that the o-rings and the grooves are clean and in good condition. Clean if necessary.
4. Attach the flanges using the bolts supplied.
5. Tighten the bolts in a crisscross pattern.
6. Do not overtighten the bolts. Follow the maximum torque values below.

Recommended Torque for Bolts	Bolt Size	[lb-in]
	M8	130 [lb-in]

7. Install the valve with the gas flow matching the direction indicated by the arrows on the casting.
8. Mount the DMV 525/11 with the solenoid vertical or horizontal with correct orientation of pressure port.
9. Use new, properly reamed and NPT threaded pipe free of chips.
10. Apply good quality pipe sealant, putting a moderate amount on the male threads only. If using LP gas, use pipe sealant rated for use with LP gas.
11. Do not thread pipe too far. DMV 525/11 distortion and/or malfunction may result from excess pipe in the valve body.
12. Apply counter pressure with a parallel jaw wrench **only** to the flats of the DMV 525/11 when installing pipe.
13. Do not overtighten the pipe. Follow the maximum torque values listed.

Recommended Torque for Piping	NPT Pipe	[lb-in]
	2"	1190 [lb-in]

14. After installation is complete, perform a leak test. (see "Valve Leakage Test")

DMV 5.../11 Flanged Mounting Procedure

1. Install the DMV 5.../11 with the gas flow matching the direction indicated by the arrows on the casting.
2. Mount the DMV 5.../11 with the solenoid vertical to horizontal.
3. Insert seal.
4. Insert bolts, tighten in a star pattern to ensure uniform tightness.
5. Do not overtighten bolts. Follow the maximum torque values listed.
6. After installation is complete, perform a leak test. (see "Valve Leakage Test")

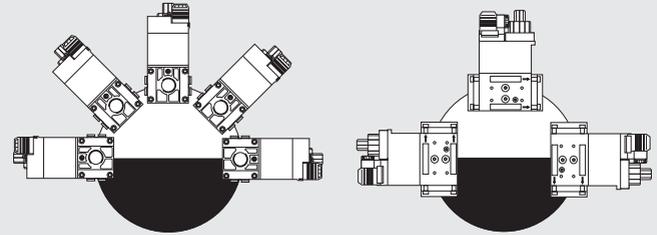
Painting Valve

- 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 volatile organic components (VOC's) must be used. VOC's can damage

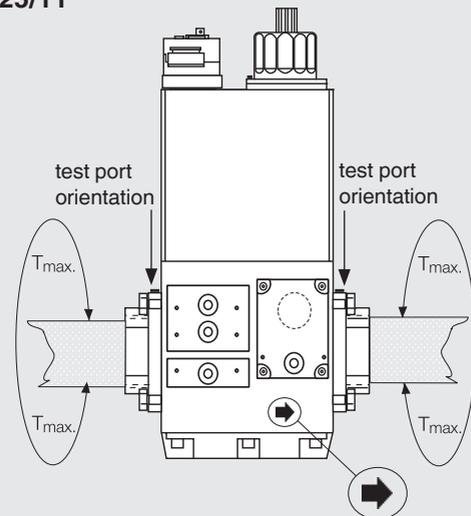
Protection from Radiant Heat

- Radiant heat must be considered as a heat source that could result in an ambient temperature higher than the rating of this valve.

Installation position

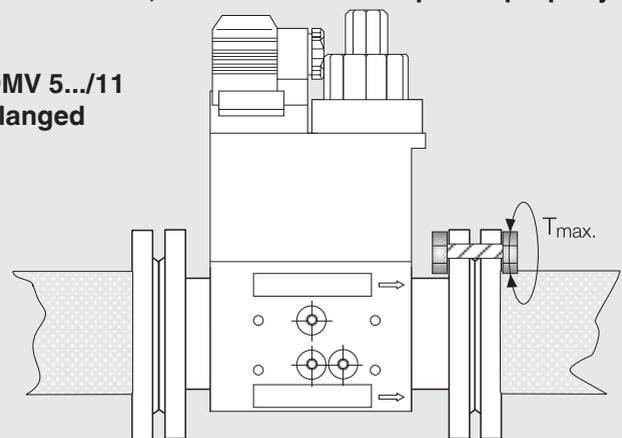


DMV 525/11



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

DMV 5.../11 Flanged



Recommended Torque for Bolts	Bolt	T _{max}
	M16 (DIN 939)	443 [lb-in]

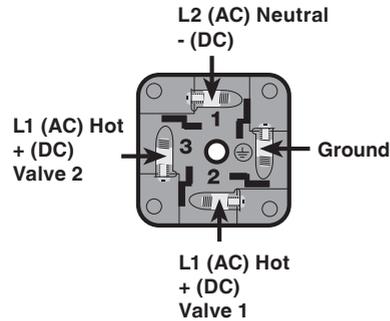
- valve o-rings, resulting in external gas leakage over time.
- During the painting process, use measures that will allow the valve's date code and other labeling information to be legible after the paint is dry

- Provide proper shielding to protect against radiant heat.

Wiring

- Disconnect all power to the valves before wiring to prevent electrical shock and equipment damage.
- Do not exceed the electrical ratings given in the specifications and on the valve.
- Attach a flexible 1/2" NPT conduit to the DIN connector.
- Route the wires through the conduit and the DIN connector.
- Use 14 or 16 gauge wire for at least 75 °C (167 °F).
- Connect the wiring to the appropriate screw terminals in the DIN connector.
- Plug the DIN connector into the AMP terminals on the valve. Fasten the DIN connector with the screw supplied.

DIN Connector screw terminal connections



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

Valve Adjustment

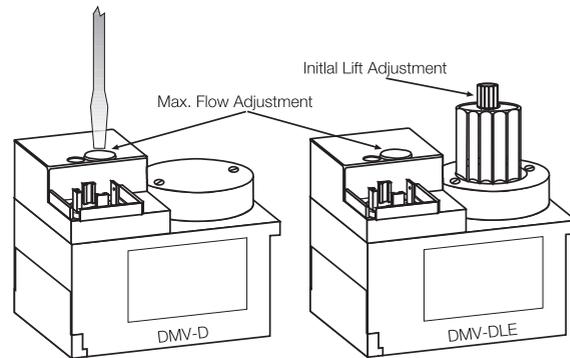
Flow Setting

1. The valve is factory set with the flow adjustment fully open.
2. Locate the flow adjustment on top of valve 2. There are two screws, the holding screw is recessed and has a blue sealing compound on it, while the pan head screw protrudes from the cap. Loosen the pan head screw until you can freely rotate the flow adjustment. Turn clockwise for less gas or counterclockwise for more gas. Check the flow at the burner with an orifice or flow meter.
3. Tighten the pan head screw on the adjustment cap.

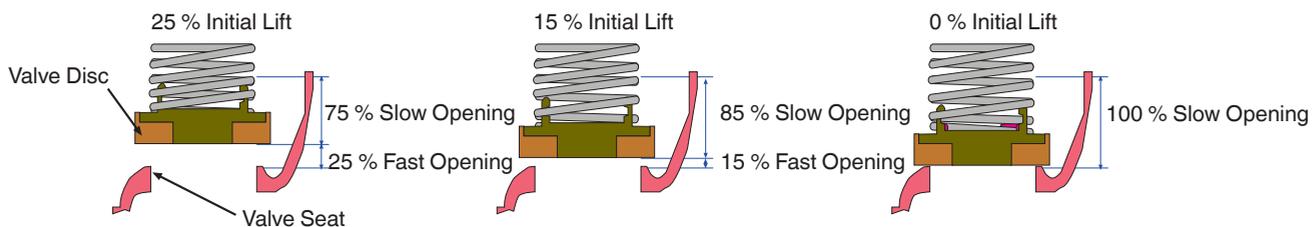
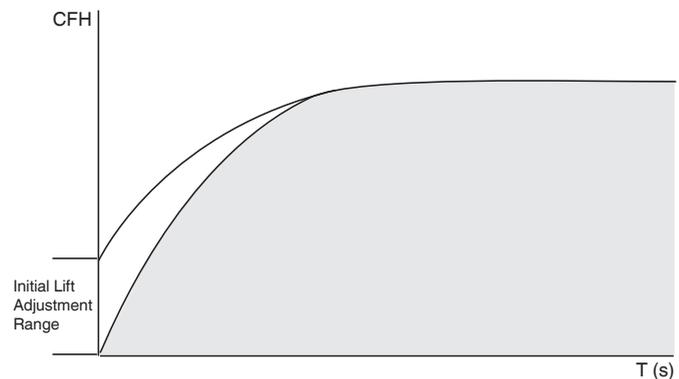
Initial Lift Adjustment (DMV-DLE only)

The initial lift adjustment varies the initial gas flow through the valves 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 35 % of stroke. All DMV-DLE valves are factory set with no initial lift. To adjust the lift proceed as follows:

4. Unscrew the small black cap on top of the silver hydraulic brake to expose the initial lift adjustment knob.
5. The black cap also serves as tool, turn the cap over and insert it on the slot on the adjustment knob.
6. Turn the knob clockwise for a min. initial lift or counterclockwise for a max. initial lift.
7. Once the desired initial fast lift has been achieved, reinstall the black cap.



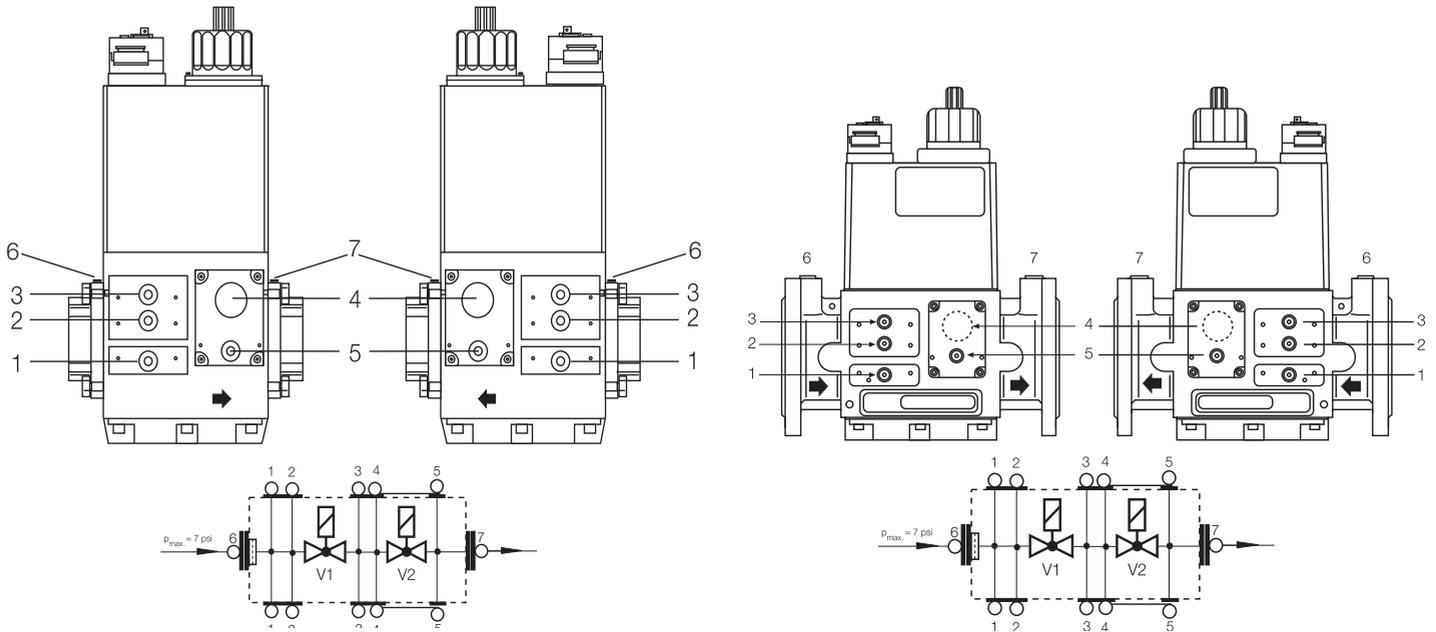
Initial Lift Opening Curve



Side Taps

DMV 525/11 Side Taps

DMV 5.../11 Flanged Side Taps



Side Taps

The taps 1, 2, 3 & 5 are threaded G 1/8 and are available on both sides upstream V1, between V1 and V2, downstream V2, and on both flanges. The G 1/8 test nipple (P/N 219008) can be screwed in any of these pressure tap ports. Taps 6 & 7 are threaded G 1/4. Tap 4 is for pilot adapter (P/N 225043) or for vent line adapter (P/N 243760).

Required Threaded Flanges for DMV 525 Series

Body Size	Size	Order No.			
DMV-D(LE) 525/11	2" NPT	232407			
DMV-D(LE) 525/11	2" Rp	215384			

Required Weld Neck Flanges for DMV 5.../11 Series

Body Size	Flange Description	# of Holes per Flange	* Flange Order No.	Bolt size	**Bolt Order No.	***Gasket Order No.
DMV-D(LE) 5040/11	1 1/2" ISO Flanged	4	227137	M16x55	135930	267463
DMV-D(LE) 5050/11	2" ISO Flanged	4	227138	M16x65	135930	267464
DMV-D(LE) 5065/11	2 1/2" ISO Flanged	4	227139	M16x65	135930	267465
DMV-D(LE) 5065/11	2 1/2" ISO to NPT	4	243690	M16x65	135930	267465
DMV-D(LE) 5080/11	3" ISO Flanged	8	227140	M16x65	135930	267466
DMV-D(LE) 5080/11	3" ISO to NPT	8	243219	M16x65	135930	267466
DMV-D(LE) 5100/11	4" ISO Flanged	8	227141	M16x65	135930	267467
DMV-D(LE) 5125/11	5" ISO Flanged	8	227142	M16x75	148830	267468

*When a control is used alone, one mating flange is needed for each end, for a total of two flanges.

When one control is bolted to another, such as an FRS to a DMV, one mating flange is needed for each end, for a total of two flanges.

**includes one bolt, one lock washer, and one nut.

***one gasket needed for each flange connection.

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 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.

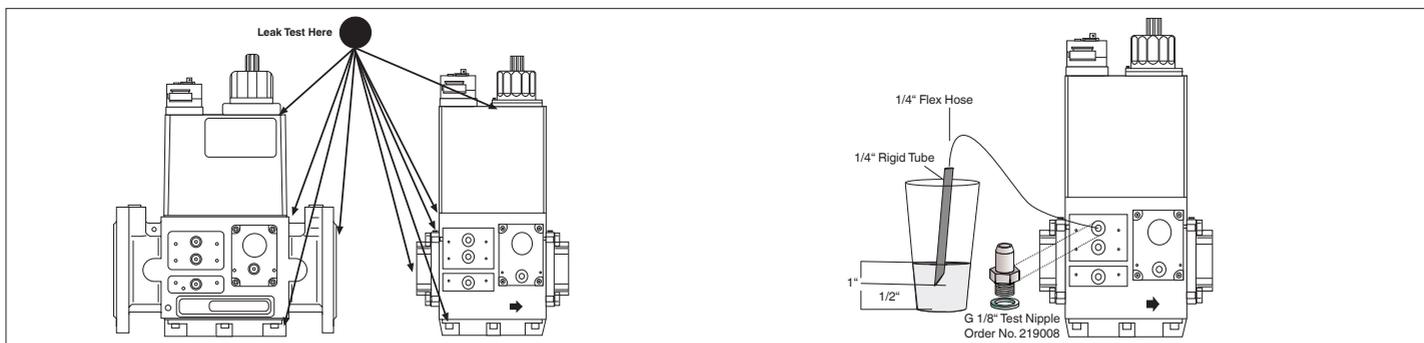
2. Then, de-energize the burner system and verify that both automatic safety shutoff valves are closed.
3. Close the upstream and downstream manual ball valve.
4. Using a screwdriver, slowly open the V1 test nipple (port 3 or port 4) by turning it counter clockwise to depressurize the volume between 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 1/4" 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 5), except that valve #1 needs to be opened. (Energize only 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.

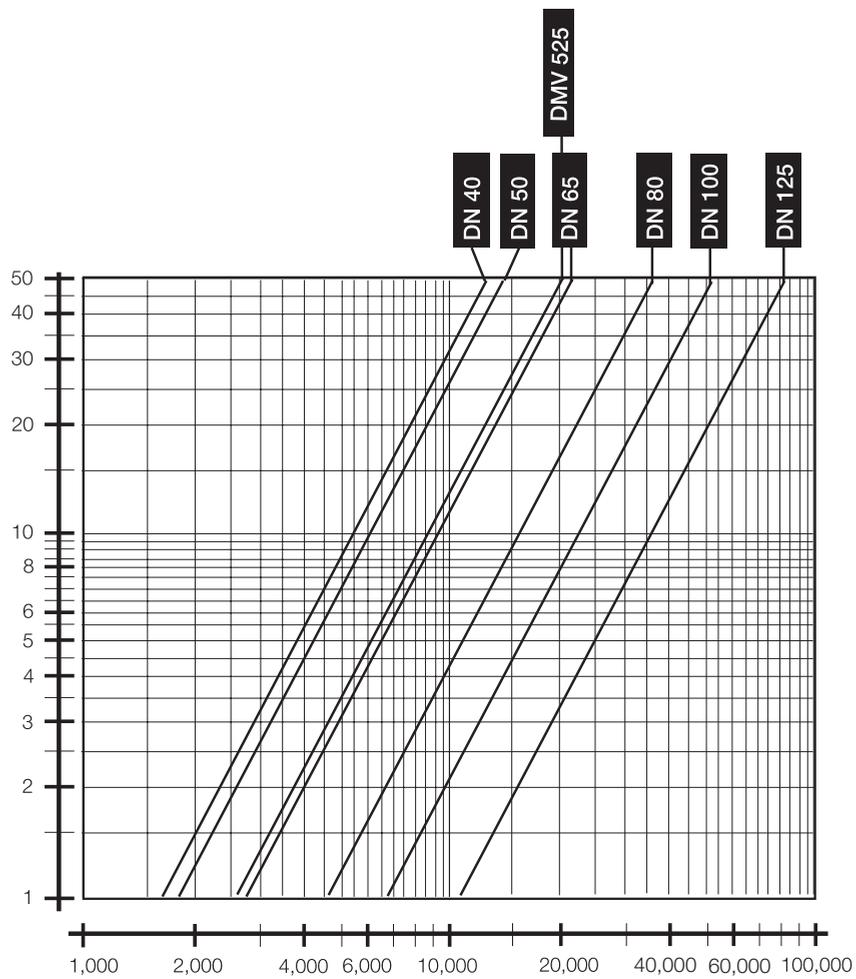


If leakage values are exceeded, replace valve immediately.



Type	Allowable Valve Seat Leakage* up to 7 PSI inlet	# of Bubbles in 10 s		
		Air	Natural Gas	LP
DMV-D(LE) 525/11	464 cc/hr	9	11	7
DMV-D(LE) 5040	464 cc/hr	9	11	7
DMV-D(LE) 5050	464 cc/hr	9	11	7
DMV-D(LE) 5065	633 cc/hr	11	13	10
DMV-D(LE) 5080	790 cc/hr	13	17	11
DMV-D(LE) 5100	934 cc/hr	17	22	15
DMV-D(LE) 5125	1156 cc/hr	22	27	18

*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.



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/m ³]	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 VDC	Order No. for 220 VAC
DMV-D(LE) 525	1411	225168	225170	225167
DMV-D(LE) 5040	1212	225049	225051	225048
DMV-D(LE) 5050	1212	225049	225051	225042
DMV-D(LE) 5065	1411	225168	225170	225167
DMV-D(LE) 5080	1511	225217	225219	225171
DMV-D(LE) 5100	1611	225222	225224	225220
DMV-D(LE) 5125	1711	225226	225228	225225
Printed Wiring Board	Order No. for 120/220 VAC	Order No. for 24 VDC		
DMV-D(LE) 525	266977	266979		
DMV-D(LE) 5040	266977	266979		
DMV-D(LE) 5050	266977	266979		
DMV-D(LE) 5065	266977	266979		
DMV-D(LE) 5080	266977	266979		
DMV-D(LE) 5100	266978	266979		
DMV-D(LE) 5125	266978	266979		
Hydraulic Brake	Order No.			
DMV-D(LE) 525	223158			
DMV-D(LE) 5040	224457			
DMV-D(LE) 5050	224457			
DMV-D(LE) 5065	223158			
DMV-D(LE) 5080	223158			
DMV-D(LE) 5100	223157			
DMV-D(LE) 5125	223157			
Accessories/Adapter	Order No.	Description		
DIN Connector (DUNGS)	210319			
PG 11 - 1/2 NPT Adapter	220566			
M20 - 1/2 NPT Adapter	240671			
Visual Indicator	266949	The indicator mounts to the bottom of the valve and visually displays when the valve is open or closed.		
Valve Switch CPI 400	266968	Valve switch with visual indication.		
DMV-D(LE) 525 gasket for flange	231574			
Vent Line Adapter - 1" NPT	243760			
G 1/8" Test nipple with gasket	219008			
Strainer (DMV 525)	247547			

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