

Reliable®

Model DDV Diaphragm Deluge Valve

Remote Resetting and
Remote Resetting Pressure Regulating Trims

FM Approved

Product Features

- Valve can be activated and reset remotely
- Pressure regulating trim option allows up to 400 psi (27.6 bar) inlet pressure
- Compact trim with all connections to valve body
- Suitable for horizontal or vertical installation

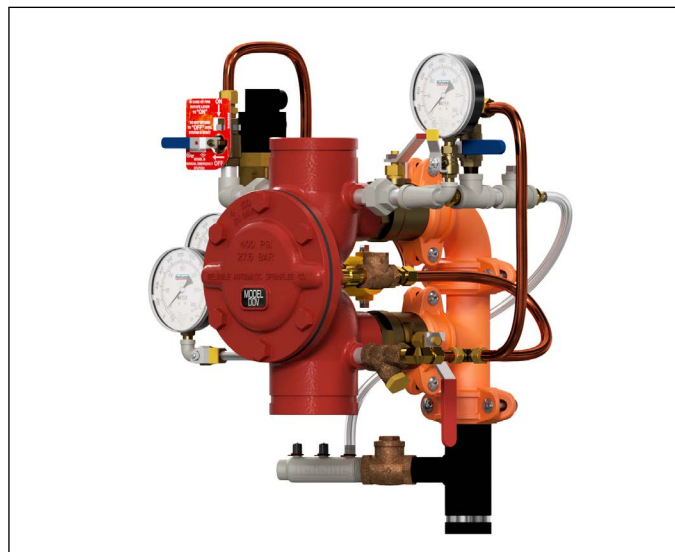
Product Description

The Model DDV deluge valve is an FM Approved diaphragm-type deluge valve available in 1-1/2" (40mm), 2" (50mm), 2-1/2" (65mm), 76mm, 3" (80mm), 4" (100mm), 6" (150mm), and 165mm nominal sizes with multiple end configurations (see Table A).

The valve diaphragm seals against a seat machined in the valve body. Water pressure in the chamber between the diaphragm and the cover presses the diaphragm against the seat to prevent water flow through the valve. The release of water pressure from the chamber allows the diaphragm to deform away from the seat allowing water to flow through the valve.

Maintenance of the valve is simplified because all trim is connected to the valve body, and the diaphragm can be removed without disassembling the trim.

Trim options allow for either remote-resetting (on/off) operation or remote-resetting (on/off) operation with pressure regulation. In both configurations, water flows through the Model DDV valve when the solenoid trim is open. When the solenoid is closed, the Model DDV valve resets and water flow is stopped. The valve is activated by a 4-wire impulse solenoid in the trim. The 4 wires consist of: (1) a positive wire to close the solenoid, (2) a positive wire to open the solenoid, (3) a common neutral wire, and (4) an earth/ground wire. Applying a 24VDC pulse to the positive open wire causes the solenoid valve and diaphragm valve to open. Applying a 24VDC pulse to the positive close wire causes the solenoid valve and diaphragm valve to close.



For Model DDV valves with pressure regulating trim, a pressure regulator included in the trim allows the Model DDV valve to regulate the water pressure downstream of the valve. Water supply input pressures up to 400 psi (27.6 bar) can be regulated by the Model DDV valve to an output pressure of 20 to 200 psi (1.4 to 13.8 bar) for 6" (150mm) and 165mm sizes, and 50 to 200 psi (3.4 to 13.8 bar) for all other sizes.

Both trim options include 300 psi (20.7 bar) water pressure gauges for the incoming water supply and control chamber; in addition, the remote resetting pressure regulating trim includes a 300 psi (20.7 bar) water pressure gauge for adjusting the outlet pressure. Optional 600 psi (41.4 bar) pressure gauges are available. 2-1/2" and larger Model DDV systems with groove end connections may be ordered with or without control valves (water supply valve and upper service valve). Control valves will be Reliable REL-BFG-300 grooved end butterfly valves with integral tamper switches. Plugged outlets are provided for alarm devices which are ordered separately. For convenience, an optional alarm line test valve kit may be installed (see Figure 6).

End Configuration Options

Table A

GR x GR (ANSI/AWWA C606)	Class 150 FLG x FLG (ASME B16.5)	Class 300 FLG x FLG (ASME B16.5)	PN16 FLG x FLG (ISO 7005-2)	BS-E FLG x FLG (BS 10)	NPT THD x THD (ANSI/AMSE B1.20.1)	ISO 7/1 THD x THD
All Sizes	All Sizes (exc. 76 & 165mm)	All Sizes (exc. 76 & 165mm)	All Sizes (exc. 76 & 165mm)	All Sizes (exc. 76 & 165mm)	1-1/2", 2", 2-1/2", & 3" (40, 50, 65, & 80mm)	1-1/2", 2", 2-1/2", & 3" (40, 50, 65, & 80mm)

Technical Data

Table B

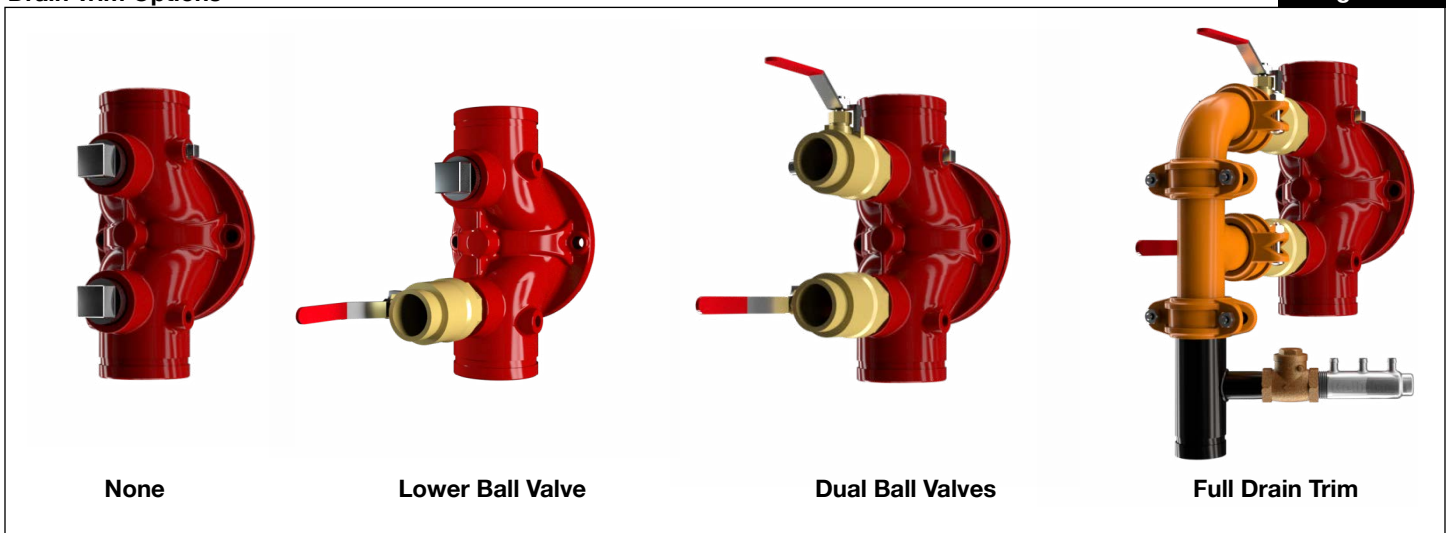
Valve Size	Trim	Maximum Flow gpm (L/min)	Rated Pressure psi (bar)	Valve Output Range psi (bar)	Approvals
1-1/2" (40mm)	Remote Resetting (On/Off)	NA	300 (20.7)	NA	FM
	Remote Resetting (On/Off) Pressure Regulating	225 (1023)	400 (27.6)	50 - 200 (3.4 - 13.7)	
2" (50mm)	Remote Resetting (On/Off)	NA	300 (20.7)	NA	
	Remote Resetting (On/Off) Pressure Regulating	250(1137)	400 (27.6)	50 - 200 (3.4 - 13.7)	
2-1/2" (65mm)	Remote Resetting (On/Off)	NA	300 (20.7)	NA	
	Remote Resetting (On/Off) Pressure Regulating	400 (1514)	400 (27.6)	50 - 200 (3.4 - 13.7)	
76mm	Remote Resetting (On/Off)	NA	300 (20.7)	NA	
3 (80mm)	Remote Resetting (On/Off) Pressure Regulating	400 (1514)	400 (27.6)	50 - 200 (3.4 - 13.7)	
	Remote Resetting (On/Off)	NA	300 (20.7)	NA	
4 (100mm)	Remote Resetting (On/Off) Pressure Regulating	1340 (5072)	400 (27.6)	50 - 200 (3.4 - 13.7)	
	Remote Resetting (On/Off)	NA	300 (20.7)	NA	
6 (150mm) 165mm	Remote Resetting (On/Off)	NA	300 (20.7)	NA	
	Remote Resetting (On/Off) Pressure Regulating	3000 (11350)	400 (27.6)	50 - 200 (3.4 - 13.7)	

Notes for Pressure Regulating Trim:

1. For supply pressures up to 300 psi (20.7 bar), a maximum regulated outlet pressure across the full Valve Output Range can be maintained within +/- 10% for inlet pressures that are at least 35 psi (2.4 bar) greater than the outlet pressure where the nominal water velocity is up to 1,000 feet per minute (5m/s).
2. For supply pressures more than 300 psi (20.7 bar) and up to 400 psi (27.6 bar), a maximum regulated outlet pressure of 100 to 200 psi (6.7 to 13.8 bar) can be maintained within a +/- 10% for inlet pressures that are at least 50 psi (3.4 bar) greater than the outlet pressure where the nominal water velocity is up to 1,000 feet per minute (5m/s).

Drain Trim Options

Figure 1



Note: 2" grooved version shown; 1-1/4" drain (2-1/2", 76mm, and 3" valves) and 1" drain (1-1/2" and 2" valves) will be threaded.

Model DDV Deluge Valve with Remote Resetting (On/Off) Trim

Technical Specifications

Pressure Rating:

300 psi (20.7 bar)

Material Specifications

Body & Cover: Ductile Iron with Red Oxide Epoxy coating and Urethane external coating

Diaphragm: Fabric reinforced EPDM

Actuator

Burkert Impulse Solenoid Type 5282

PN 6871020250

www.burkert.com/en/type/5282

Protection Class: IP65 with cable plug accessory to DIN EN 175301-803 Form A

End Connections

See Table A, page 2

Installation Orientation

Vertical

Horizontal

Drain Trim Options

See Figure 1, page 2

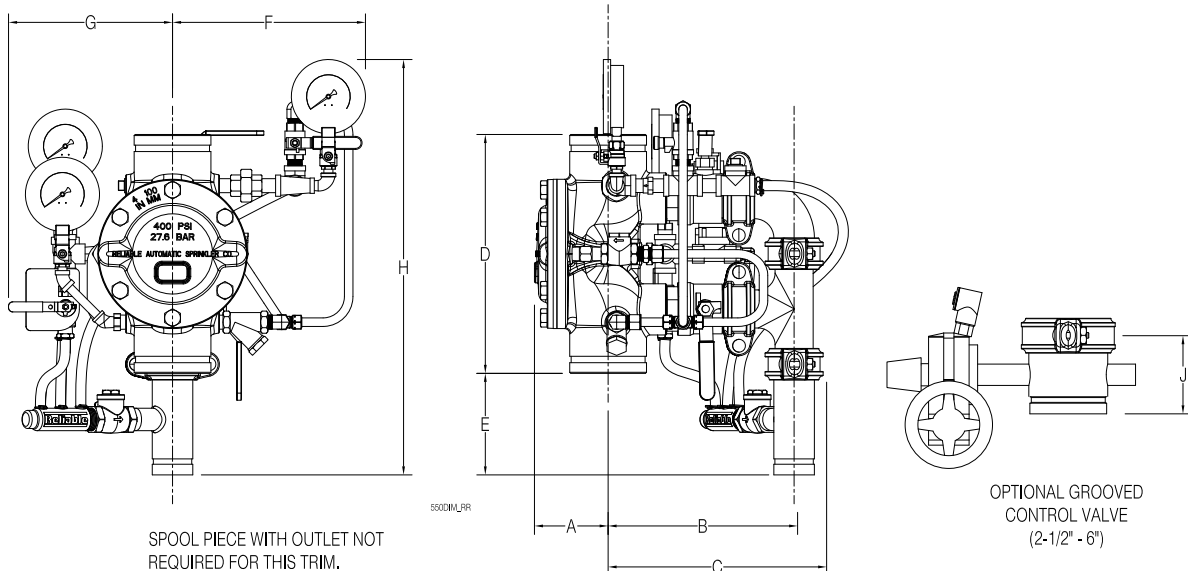
Approvals

FM Approved



Model DDV Deluge Valve with Remote Resetting (On/Off) Dimensions

Figure 2



SPOOL PIECE WITH OUTLET NOT REQUIRED FOR THIS TRIM.

OPTIONAL GROOVED CONTROL VALVE (2-1/2\" - 6\")

Note: 2\" grooved drain shown for 4\", 6\" and 165mm valves. Drain on 2-1/2\", 3\", and 76mm valves is 1-1/4\" threaded with 1-1/4\" tee provided for connection of drain piping. Drain on 1-1/2\" and 2\" valves is 3/4\" threaded with 1\" tee provided for connection of drain piping.

Model DDV Dimensions with Remote Resetting Trim- in. (mm)

Table C

Valve Size	A	B	C	D	E	F	G	H	J
1-1/2\" (40mm)	2-7/8 (71)	9-1/4 (235)	10 (254)	8 (203)	3 (76)	10-1/8 (257)	8-3/8 (213)	16-1/4 (413)	NA
2\" (50mm)	2-7/8 (71)	9-1/4 (235)	10 (254)	8 (203)	3 (76)	10-1/8 (257)	8-3/8 (213)	16-1/4 (413)	NA
2-1/2\" (65mm), 3\" (80mm), & 76mm	3-5/8 (90)	11-3/4 (298)	12-1/2 (318)	11 (279)	3-1/4 (83)	10-7/8 (276)	8-3/4 (222)	18-1/2 (470)	3-3/4 (95)
4\" (100mm)	4-3/8 (110)	11-1/4 (285)	12-7/8 (327)	14 (356)	6 (152)	11-3/8 (289)	9-1/2 (241)	24-1/2 (622)	4-1/2 (114)
6\" (150mm), 165mm	6-1/2 (165)	11-3/4 (298)	13-3/8 (340)	18 (457)	4 (102)	12-7/8 (327)	11-1/2 (292)	24-1/2 (622)	5-1/4 (133)

Note: Control Valves not available with 1-1/2\", 2\", 76mm, and 165mm valves. Dimension J not applicable.

General Operation

Under normal conditions the solenoid valve is closed maintaining hydraulic pressure in the diaphragm chamber. The captured hydraulic pressure holds the diaphragm against the valve seat. When the solenoid valve is opened by an electrical signal, or the Manual Emergency Release Valve on the trim is opened, pressure is released from the diaphragm chamber allowing water to flow through the Model DDV valve. To remotely reset the Model DDV valve, the status of the solenoid valve must be changed from open to closed by input of the proper signal from the release control system.

Setup Procedure

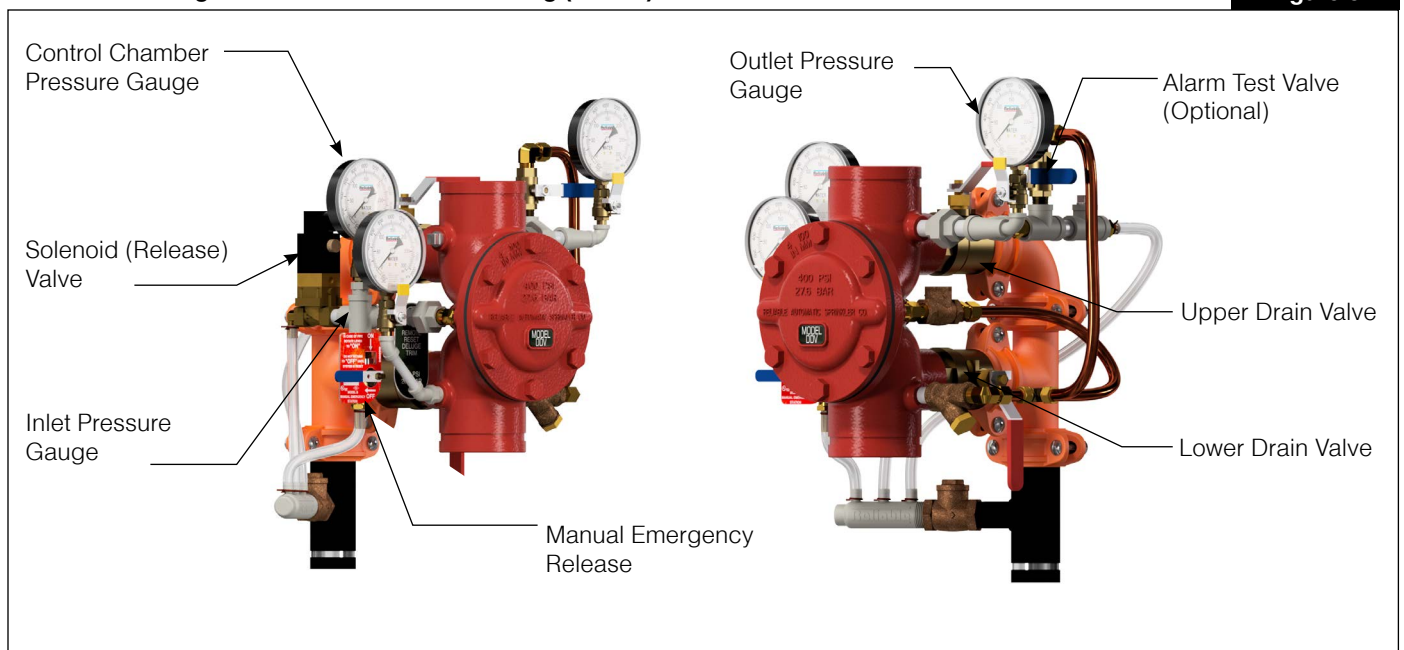
1. Ensure that the Manual Emergency Release Valve, Solenoid Valve, Lower Drain Valve, and Alarm Test Valve are closed.
2. Ensure that the Upper Drain Valve is open.
3. Partially open the Lower Drain Valve.
4. Slightly open the main water control valve.
5. Once water begins to flow through the Lower Drain Valve, slowly close Lower Drain Valve. Confirm water pressure on the Inlet Pressure Gauge.
6. Observe if water leaks through the Upper Drain Valve. If no leak occurs, the deluge valve diaphragm is sealed. Fully close the Upper Drain Valve.
7. Slowly open the main water control valve. Verify that the main water control valve is fully open and properly monitored.
8. Secure the handle of the Manual Emergency Release Valve in the closed position with the provided cable ties.
9. Fully reset fire alarm panel to clear any active signals.
10. Notify the proper authorities, building occupants, and those responsible for monitoring the system that the system has been placed into service.

Shutdown Procedure

1. Close the main water control valve.
2. Open the Upper Drain Valve and Lower Drain Valve to drain the system.
3. Open all auxiliary drain valves throughout the system, closing them when flow of water has stopped.
4. Inspect and replace any sections of the fire sprinkler system that may have been damaged due to fire.

Model DDV Deluge Valve with Remote Resetting (On/Off) Trim

Figure 3



Model DDV Deluge Valve with Remote Resetting (On/Off) Pressure Regulating Trim

Technical Specifications

Pressure Rating:

400 psi (27.6 bar)

Pressure Output Range:

Reference Table B, page 2

Flow Output Range:

Reference Table B, page 2

Material Specifications

Body & Cover: Ductile Iron with Red Oxide

Epoxy coating and Urethane external coating

Diaphragm: Fabric reinforced EPDM

Actuator

Burkert Impulse Solenoid Type 5282

PN 6871020250

www.burkert.com/en/type/5282

Protection Class: IP65 with cable plug accessory to DIN EN 175301-803 Form A

End Connections

See Table A

Installation Orientation

Vertical

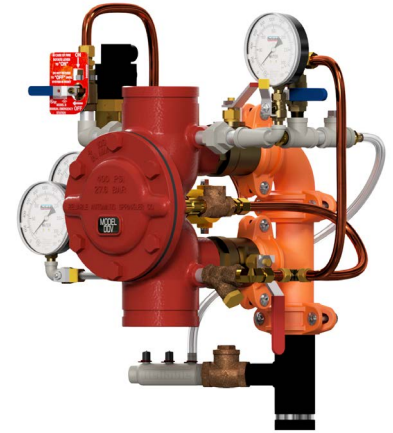
Horizontal

Drain Trim Options

See Figure 1, page 2

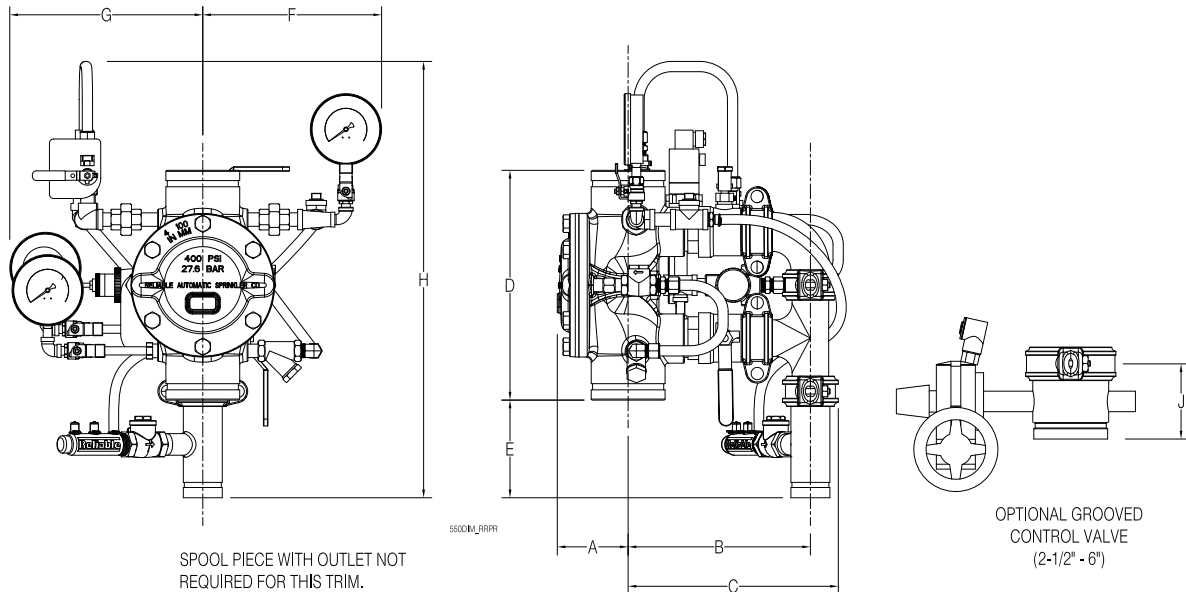
Approvals

FM Approved



Model DDV Deluge Valve with Remote Resetting (On/Off) Pressure Regulating and Dimensions

Figure 4



SPOOL PIECE WITH OUTLET NOT REQUIRED FOR THIS TRIM.

OPTIONAL GROOVED CONTROL VALVE (2-1/2" - 6")

Note: 2" grooved drain shown for 4", 6" and 165mm valves. Drain on 2-1/2", 3", and 76mm valves is 1-1/4" threaded with 1-1/4" tee provided for connection of drain piping. Drain on 1-1/2" and 2" valves is 3/4" threaded with 1" tee provided for connection of drain piping.

Model DDV Dimensions with Remote Resetting Pressure Regulating Trim - in. (mm)

Table D

Valve Size	A	B	C	D	E	F	G	H	J
1-1/2" (40mm)	2-7/8 (71)	9-1/4 (235)	10 (254)	8 (203)	3 (76)	10-1/8 (257)	10-1/2 (267)	16-1/4 (413)	NA
2" (50mm)	2-7/8 (71)	9-1/4 (235)	10 (254)	8 (203)	3 (76)	10-1/8 (257)	10-1/2 (267)	16-1/4 (413)	NA
2-1/2 (65mm), 3 (80mm), & 76mm	3-5/8 (90)	11-3/4 (298)	12-1/2 (318)	11 (279)	3-1/4 (83)	10-7/8 (276)	11-1/4 (286)	18-1/2 (470)	3-3/4 (95)
4 (100mm)	4-3/8 (110)	11-1/4 (285)	12-7/8 (327)	14 (356)	6 (152)	11-3/8 (289)	12 (305)	24-1/2 (622)	4-1/2 (114)
6 (150mm), 165mm	6-1/2 (165)	11-3/4 (298)	13-3/8 (340)	18 (457)	4 (102)	12-7/8 (327)	13-7/8 (353)	24-1/2 (622)	5-1/4 (133)

Note: Control Valves not available with 1-1/2", 2", 76mm, and 165mm valves. Dimension J not applicable.

General Operation

Under normal conditions the solenoid valve is closed maintaining hydraulic pressure in the diaphragm chamber. The captured hydraulic pressure holds the diaphragm against the valve seat. When the solenoid valve is opened by an electrical signal, or the Manual Emergency Release Valve on the trim is opened, pressure is reduced in the diaphragm chamber allowing water to flow through the Model DDV valve. The adjustable pilot valve on the trim decreases and increases pressure in the diaphragm chamber, thereby regulating the outlet pressure. To remotely reset the Model DDV valve, the status of the solenoid valve must be changed from open to closed by input of the proper signal from the release control system.

Setup Procedure

1. Ensure that the Manual Emergency Release Valve, Solenoid Valve, and Lower Drain Valve are closed.
2. If present, verify that the Alarm Line Valve is closed.
3. Ensure that the Upper Drain Valve is open.
4. Partially open the Lower Drain Valve.
5. Slightly open the main valve controlling water supply.
6. Once water begins to flow through the Lower Drain Valve, slowly close Lower Drain Valve. Confirm water pressure on the lower system water pressure gauge.
7. Observe if water leaks through the Upper Drain Valve. If no leak occurs, the deluge valve diaphragm is sealed. Fully close the Upper Drain Valve.
8. Slowly open the Water Control Valve. Verify that the Water Control Valve is fully open and properly monitored.
9. Secure the handle of the Manual Emergency Release Valve in the closed position with the provided cable ties.
10. Fully reset fire alarm panel to clear any active signals.
11. Notify the proper authorities, building occupants, and those responsible for monitoring the system that the system has been placed into service.

Shutdown Procedure

1. Close the main water control valve.
2. Open the Upper Drain Valve and Lower Drain Valve to drain the system.
3. Open all auxiliary drain valves throughout the system, closing them when flow of water has stopped.
4. Inspect and replace any sections of the fire sprinkler system that may have been damaged due to fire.

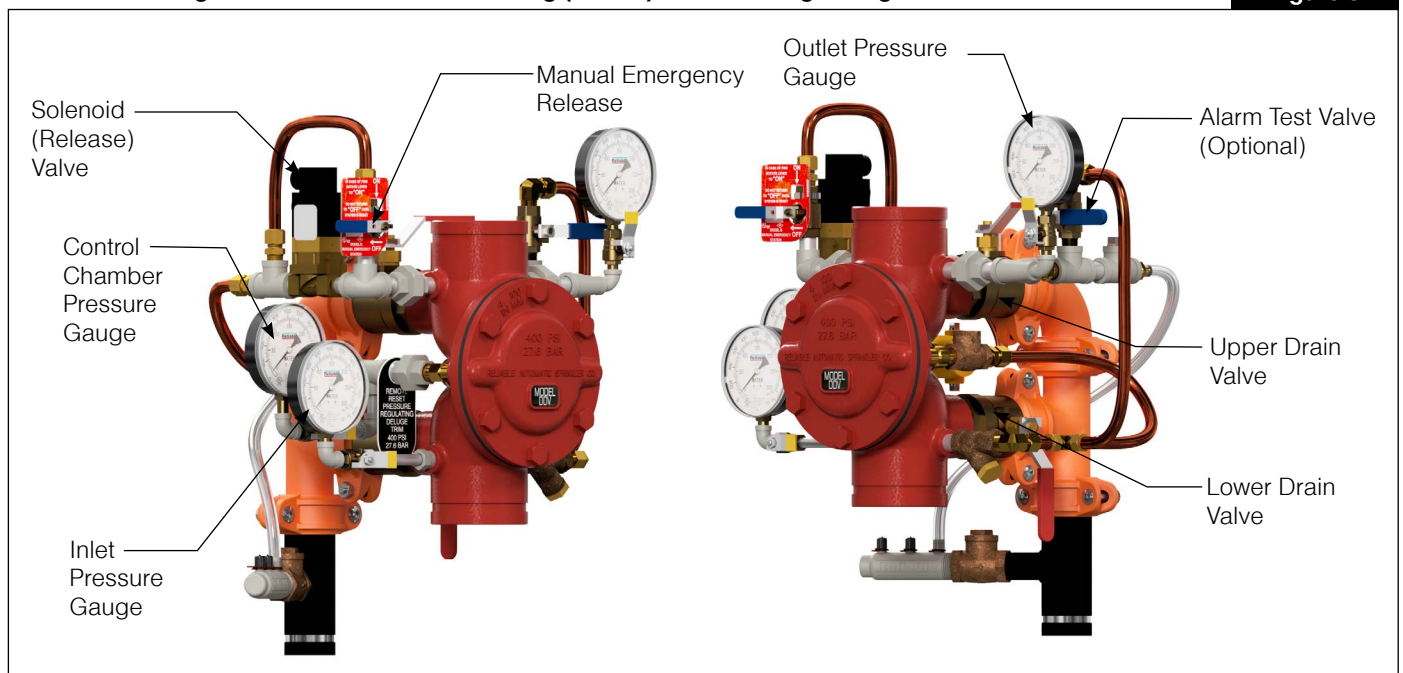
Pressure Adjustment

1. Loosen the lock nut on the adjustment screw.
2. Operate a manual or automatic release to open the Model DDV valve. **Note:** this will allow water to flow into the fire protection system.
3. Turn the adjustment screw clockwise to increase down stream pressure, or counterclockwise to decrease down stream pressure of the Model DDV valve.
4. Adjust in 1/2 turns and allow time for the valve to stabilize at the new set point.
5. When the desired outlet pressure is reached, securely tighten the locknut.
6. Shut down and drain the system.
7. Reset the system in accordance with the setup procedure.

Note: Pressure adjustment cannot be made without flowing water.

Model DDV Deluge Valve with Remote Resetting (On/Off) Pressure Regulating Trim

Figure 5



Model DDV Hydraulic Friction Loss Data

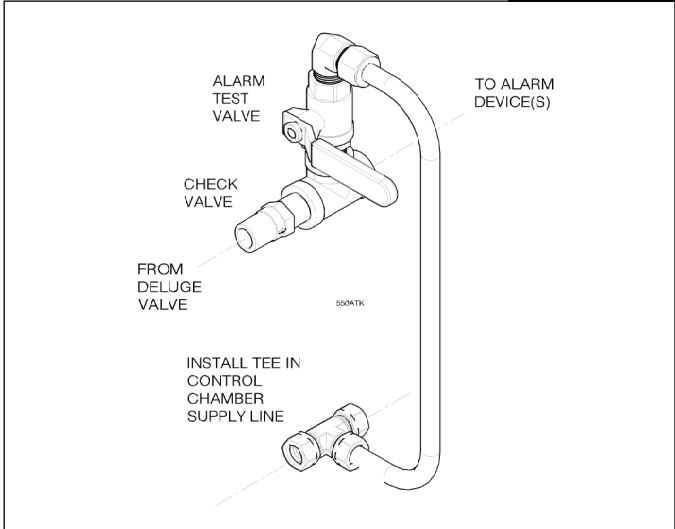
Table E

Valve Size	Cv Flow Coefficient gpm/(psi) ^{1/2}	Kv Flow Coefficient m ³ /h/(bar) ^{1/2}	Approximate Equivalent Length ft (m) C= 120 Sch 40 Steel Pipe	Approximate Equivalent Length ft (m) C= 100 Sch 40 Steel Pipe
1-1/2" (40mm)	81.6	70	4.6	3.3
2" (50mm)	110.5	95	8.8	6.3
2-1/2" (65mm)	144	124	12.9	9.2
76mm, 3" (80mm)	182	157	24.1	17.2
4" (100mm)	393	339	28.6	20.4
6" (150mm), 165mm	815	703	52.2	37.2

Notes: The Cv flow coefficient (amount of flow to generate a 1 psi loss) was used to calculate the approximate equivalent length.

Optional Alarm Line Test Kit

Figure 6



Note: When installed in the control chamber supply line, permits testing of alarm devices without the need to operate the Diaphragm Deluge Valve.

Installation

The Model DDV valve should be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Failure to follow installation instructions and/or revisions to the trim arrangement of the valve may void the warranty and/or listing of the valve. Verify compatibility of the Model DDV valve materials with the water supply and the environment where the valve will be installed prior to installation. Do not apply lubricants, sealants, or other chemicals to the diaphragm or seat. The Model DDV valve must be installed in a location where the temperature is maintained as a minimum of 40°F (4°C). Heat tracing of the valve and trim is not permitted. The solenoid on the trim requires power to open and power to close. Water flow through the Model DDV valve will stop upon closing of the solenoid. Design and installation of the detection and release system must be performed in accordance with applicable NFPA standards and the authority having jurisdiction. At least one electric manual release should be installed near the release control panel to facilitate commissioning and routine testing of the system. Drain should be piped to a location that will avoid damage to property and injury to personnel.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve or detection/control system out of service may eliminate the fire protection that is provided by the fire protection system.

The Reliable Model DDV valve and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. System components shall be tested, operated, cleaned, and inspected at least annually, and parts replaced as required.

Reliable recommends that the diaphragm be replaced every 10 years or more frequently if inspections identify wear warranting more frequent replacement.

Recommended torque for cover plate bolts is as follows:

- 1-1/2" (40 mm) & 2" (50 mm) = 30 (+/- 5) ft-lb
- 2-1/2" (65 mm), 76 mm, & 3" (80 mm) = 50 (+/- 5) ft-lb
- 4" (100 mm) = 70 (+/- 5) ft-lb
- 6" (150 mm) & 165 mm = 130 (+/- 5) ft-lb

Replacement Diaphragm

- 1-1/2" & 2" - PN 95277620
- 2-1/2", 76mm, & 3" - PN 95277630
- 4" - PN 95277640
- 6" & 165mm - 95277660

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Valve Model

- DDV

Valve Size

- 1-1/2" (40mm)
- 2" (50mm)
- 2-1/2" (65mm)
- 76mm
- 3" (80mm)
- 4" (100mm)
- 6" (150mm)
- 165mm

End Configuration

- Grooved, flanged, or threaded (reference Table B)

Operational Trim

- Remote resetting (on/off)
- Remote resetting (on/off) pressure regulating

Drain Trim Options

- None
- Lower Ball Valve
- Dual Ball Valves
- Full Drain Trim (**Note:** Full Drain Trim option will arrive disconnected at the couplings/unions)

Grooved Control Valve Option

- No control valves
- Water supply (lower) control valve only
- Both water supply (lower) and service (upper) control valves

Note: Control valve option is not available on 1-1/2", 2", 76mm, and 165mm systems.

Pressure Gauges

- 300 psi (20.7 bar) (standard)
- 600 psi (41.4 bar) (optional)

Alarm Line Trim

- No alarm line test (standard)
- Alarm line test valve (optional)

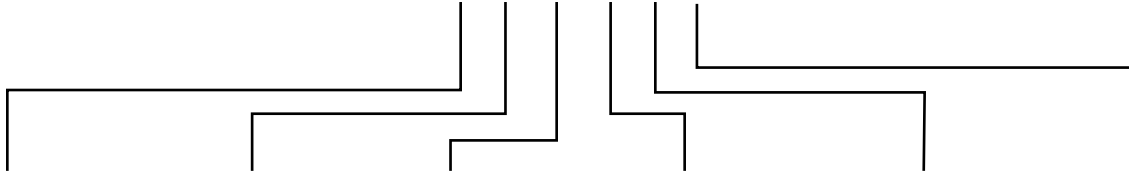
Alarm Pressure Switch

- Potter Electric Model PS10-2 (ordered separately)

Model DDV Ordering Information Part Number

Figure 7

6507 U V W X Y Z



End Connections <u>U</u>	Valve Size <u>V</u>	Trims <u>W</u>	Control Valve* <u>X</u>	Drains <u>Y</u>	Pressure Gauges <u>Z</u>
0 = Red, Groove/Groove	0 = 1-1/2" (40mm) Valve	3 = Remote Resetting	0 = W/O Control Valve	0 = W/ Drain Plugs, W/O Alarm Test	0 = 300# inlet & 300# outlet
1 = Red, Flange/Flange Class 150	2 = 2" (50mm) Valve	7 = Remote Resetting, Pressure Regulating	1 = W/ Control Valve	1 = W/ 1 Drain Valve, W/O Alarm Test	1 = 600# inlet & 300# outlet
2 = Red, Flange/Flange Class 300	1 = 2-1/2" (65mm) Valve		3 = W/ 2 Control Valves	2 = W/ 2 Drain Valves, W/O Alarm Test	
3 = Red, Flange/Flange PNIG	7 = 76mm Valve			3 = W/ Full Drain, W/O Alarm Test	
4 = Red, Flange/Flange BS-E	3 = 3" (80mm) Valve			4 = W/ Drain Plugs, W/ Alarm Test	
5 = Red, Thread/Thread NPT	4 = 4" (100mm) Valve			5 = 1 Drain Valve, W/ Alarm Test	
6 = Red, Thread/Thread ISO 7/1	6 = 6" (150mm) Valve			6 = W/ 2 Drain Valves, W/ Alarm Test	
	5 = 165mm Valve			7 = W/ Full Drain, W/ Alarm Test	

***Note:** Control valves not available for 1-1/2", 2", 76mm, and 165mm systems.