

DV-5 Deluge Valve Aluminium Bronze Diaphragm Style

General Description

The TYCO Aluminum Bronze DV-5 Deluge Valves are available to provide an alternative material of construction to that of the standard nylon coated ductile iron DV-5 Deluge Valve described in Technical Data Sheets TFP1305, TFP1335, and TFP1338. Available in 2 inch to 8 inch (DN50 to DN200) Flange x Flange end connections, Aluminum Bronze DV-5 Deluge Valves are diaphragm type valves designed for vertical or horizontal installation. They are used as automatic water control valves in deluge fire protection systems. The alternate materials of construction are offered for use in corrosive environments where the standard nylon coated ductile iron would not be suitable, i.e. situations where the system is continuously charged with sea water.

The diaphragm style design of the DV-5 Valve allows external resetting, providing for easy resetting of a deluge system without having to open a valve handhole cover to manually reposition a clapper and/or latch mechanism. Simply re-pressurizing the diaphragm chamber resets the valve.



NOTICE

The DV-5 Deluge Valves described herein must be installed and maintained in compliance with this document and with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

VALVE PARTS	
No.	Description Qty.
1	Valve Body 1
2	Diaphragm 1
3	Diaphragm Cover 1
4	Flat Washer, Metric:
	2 Inch (DN50) Valve &
	3 Inch (DN80) Valve,
	M16 4
	4 Inch (DN100) Valve &
	6 Inch (DN150) Valve,
	M16 8
	8 Inch (DN200) Valve,
	M20 8
5	Hex Bolt, Metric:
	2 Inch (DN50) Valve &
	3 Inch (DN80) Valve,
	M16 x 50 mm. 4
	4 Inch (DN100) Valve,
	M16 x 50 mm. 6
	6 Inch (DN150) Valve,
	M16 x 55 mm. 6
	8 Inch (DN200) Valve,
	M20 x 70 mm. 6
6	Hex Nut, Metric:
	4 Inch (DN100) Valve &
	6 Inch (DN150) Valve,
	M16 2
	8 Inch (DN200) Valve,
	M20 2

NOTES:

1. Valve Bodies of 4, 6 and 8 Inch (DN100, DN150 & DN200) valves are equipped with studs and Valve Covers are secured by Hex Nuts and Hex Bolts.
2. V-Ring is attached to Diaphragm of 4, 6 and 8 Inch (DN100, DN150 & DN200) valves at factory. If, during internal valve inspection, V-Ring is discovered to be detached from Diaphragm, be advised that V-Ring is a required valve component and that detachment will not affect normal valve operation or performance. Should V-Ring become detached, reinstall between Diaphragm and Diaphragm Cover concentrically as shown.

NOTE: Do not apply adhesives, lubricants, or other substances to Diaphragm, V-Ring, or Valve Body.

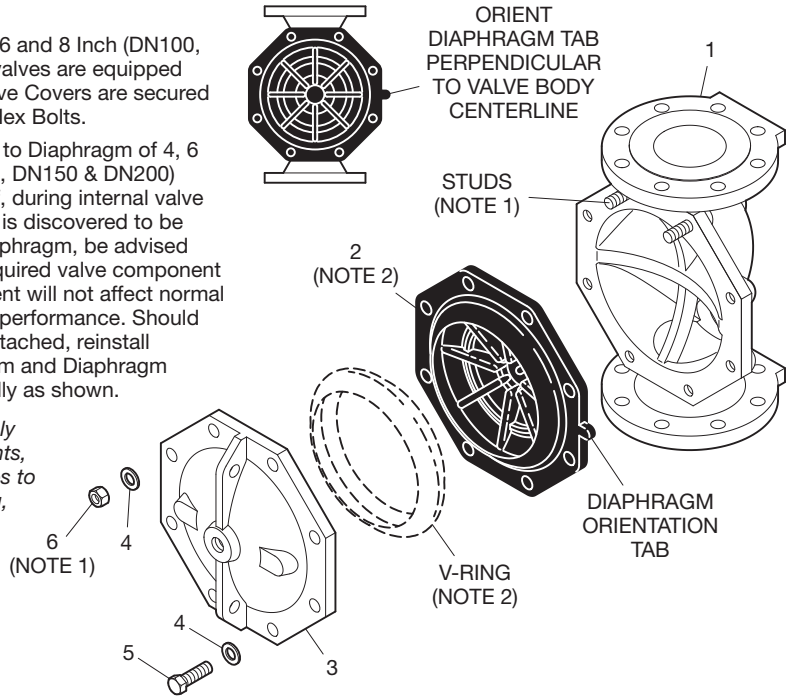


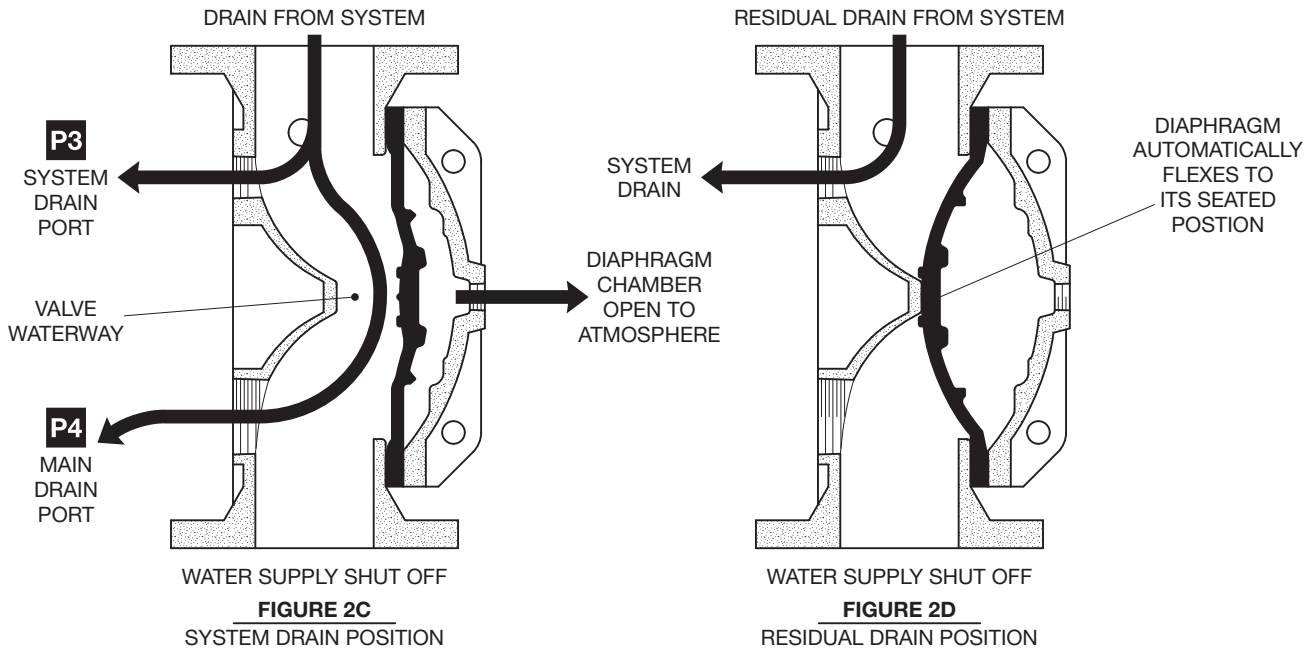
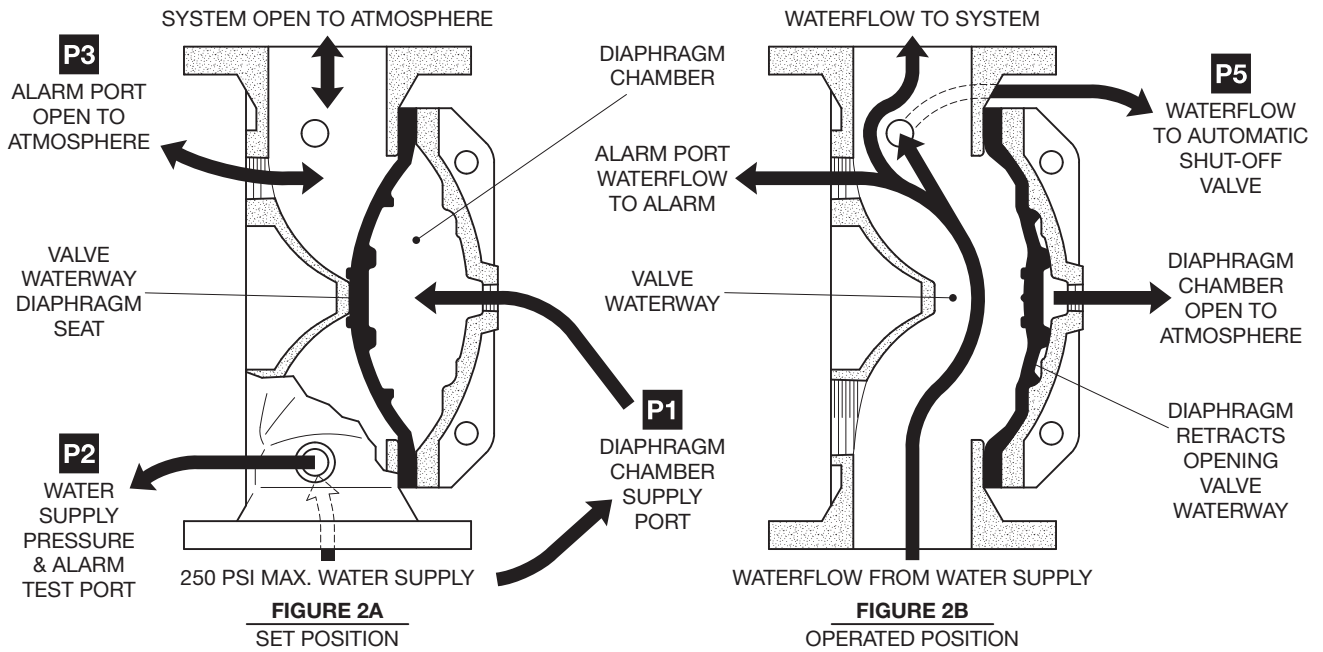
FIGURE 1
ALUMINUM BRONZE DV-5 DELUGE VALVE ASSEMBLY

Nominal Valve Size				
2 Inch (DN50)	3 Inch (DN80)	4 Inch (DN100)	6 Inch (DN150)	8 Inch (DN200)
21 lb (9,5 kg)	43 lb (19,5 kg)	90 lb (40,8 kg)	126 lb (57,2 kg)	215 lb (97,5 kg)

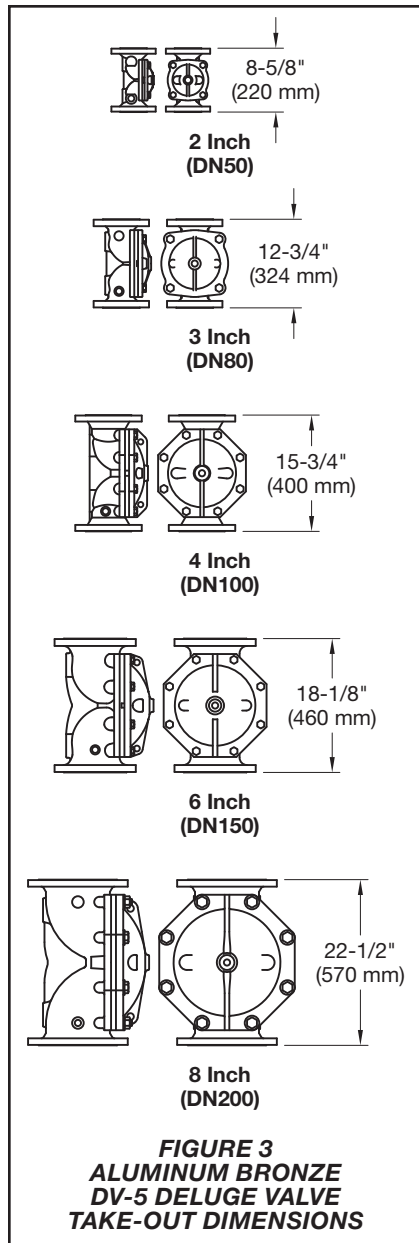
TABLE A
ALUMINUM BRONZE DV-5 DELUGE VALVE NOMINAL WEIGHTS

Port Description	Port	Port Sizes in NPT per ANSI B1.20.1*				
		2 Inch (DN50)	3 Inch (DN80)	4 Inch (DN100)	6 Inch (DN150)	8 Inch (DN200)
Diaphragm Chamber Supply	P1	1/2"	1/2"	1/2"	1/2"	1/2"
Water Supply Pressure & Alarm Test	P2	1/2"	1/2"	1/2"	1/2"	1/2"
Alarm Actuation & System Drain	P3	3/4"	3/4"	1"	1"	1"
Main Drain	P4	3/4"	1-1/4"	2"	2"	2"
Diaphragm Chamber Supply Automatic Shut-Off Valve Actuation	P5	1/2"	1/2"	1/2"	1/2"	1/2"

* Valves are available with ports threaded per ISO 7-1



**FIGURE 2
ALUMINUM BRONZE DV-5 DELUGE VALVE
SET AND OPEN POSITIONS**



Technical Data

Approvals

The Aluminum Bronze DV-5 Deluge Valves are FM Approved when trimmed per the following Technical Data Sheets:

- **Deluge Systems:**
TFP1310 - Wet Pilot Actuation
TFP1315 - Dry Pilot Actuation
TFP1320 - Electric Actuation
- **Single Interlock Preaction Systems:**
TFP1420 - Electric Actuation
- **Double Interlock Preaction Systems:**
TFP1460 - Electric/Pneumatic
TFP1465 - Electric/Electric
- **European Conformity:**
TFP1335

The Aluminum Bronze, DV-5 Deluge Valves are VdS Approved when trimmed per Technical Data Sheet TFP1338.

Deluge Valve

Components for the 2 to 8 inch (DN50 to DN200), DV-5 Deluge Valves are shown in Figure 1. The DV-5 Valves are for vertical or horizontal installations, and they are rated for use at a maximum service pressure of 250 psi (17,2 bar).

The Aluminum Bronze DV-5 Deluge Valve is provided with custom manufactured flange connections (thickness, outside diameter, bolt circle, bolt holes, raised or flush faced) in accordance with most recognized flange specifications. For example:

- ANSI B16.5 (Class 150)
- ANSI B16.42 (Class 150)
- ISO 7005-2 (PN10)
- ISO 7005-2 (PN16)
- JIS B2210 (10K)
- AS2129 (Table E)

The take-out dimensions are shown in Figure 3.

Threaded port connections of the Aluminum Bronze DV-5 Deluge Valves are available NPT threaded or threaded per ISO 7-1.

Materials Of Construction

NOTICE

The materials of construction for the Aluminum Bronze DV-5 Deluge Valve provide corrosion resistance and are intended to extend the life of the DV-5 Valve when exposed to internal and external corrosive conditions. Although the materials of construction for the Aluminum Bronze DV-5 Deluge Valve are intended to resist corrosion, it is recommended that the end user or other technical expert familiar with conditions at the proposed installation be consulted with respect to the suitability of this coating for a given corrosive condition.

Body

Aluminum Bronze AB2 per BS1400 (UNS C63000).

Handhole Cover

Aluminum Bronze AB2 per BS1400 (UNS C63000).

Diaphragm

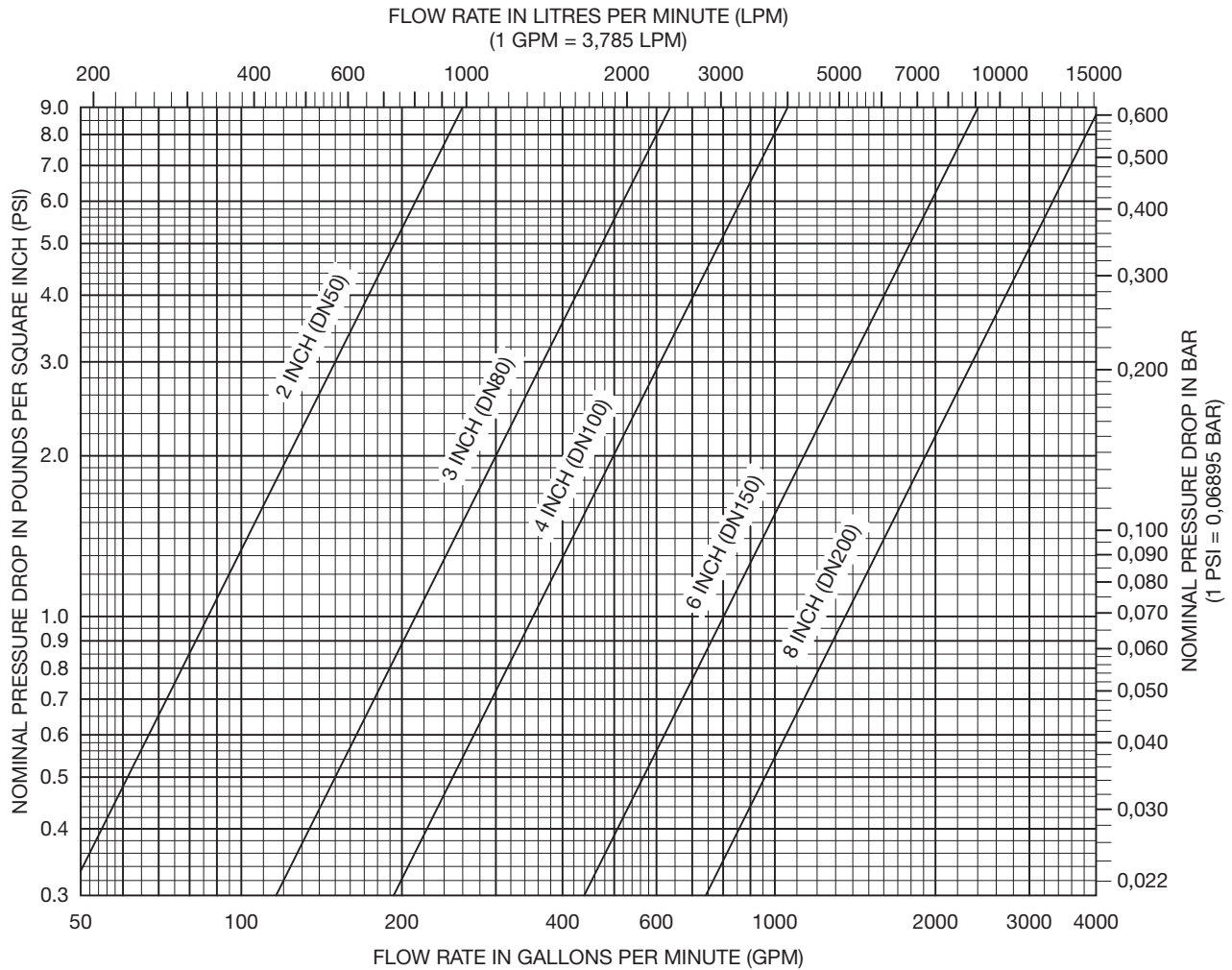
Ethylene propylene diene M-class rubber (EPDM)

Diaphragm Cover Fasteners

Type 316 stainless steel, unless otherwise specified at time of order

Operating Principles

The TYCO Aluminum Bronze DV-5 Deluge Valve is a diaphragm style valve that depends upon water pressure in the Diaphragm Chamber (Ref. Figure 2A) to hold the Diaphragm closed against the water supply pressure. When the DV-5 Valve is set for service, the Diaphragm Chamber is pressurized through the trim connections from the inlet side of the system's main control valve. Opening an actuation device, releases water from the Diaphragm Chamber faster than it can be replenished through an 1/8 inch (3,2 mm) restriction provided in the diaphragm chamber supply connection. This results in a rapid pressure drop in the Diaphragm Chamber and the force differential applied through the Diaphragm to hold the Diaphragm in the set position is reduced below the valve trip point. The water supply pressure then forces the Diaphragm open permitting water to flow into the system piping.



The approximate friction loss, based on the Hazen and Williams formula and expressed in equivalent length of pipe with C=120, is as follows:

- 16 feet of 2 inch Sch. 40 pipe for the 2 inch DV-5 Valve calculated on a typical flow rate of 175 GPM.
- 20 feet of 3 inch Sch. 40 pipe for the 3 inch DV-5 Valve calculated on a typical flow rate of 350 GPM.
- 29 feet of 4 inch Sch. 40 pipe for the 4 inch DV-5 Valve calculated on a typical flow rate of 600 GPM.
- 46 feet of 6 inch Sch. 40 pipe for the 6 inch DV-5 Valve calculated on a typical flow rate of 1500 GPM.
- 72 feet of 8 inch Sch. 30 pipe for the 8 inch DV-5 Valve calculated on a typical flow rate of 2500 GPM.

GRAPH A
ALUMINUM BRONZE DV-5 DELUGE VALVE
NOMINAL PRESSURE LOSS VERSUS FLOW

Installation

NOTICE

Proper operation of the DV-5 Deluge Valves depends upon their trim being installed properly for a given application. Failure to install the appropriate trim may prevent the DV-5 Valve from functioning properly, as well as void listings, approvals, and the manufacturer's warranties.

The DV-5 Valve must be installed in a readily visible and accessible location.

The DV-5 Valve, associated trim, and wet pilot lines must be maintained at a minimum temperature of 40°F (4,4°C).

Heat tracing of the DV-5 Valve or its associated trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits that are capable of preventing proper operation.

Care and Maintenance

The following procedures and inspections must be performed as indicated, in addition to any specific requirements of the NFPA.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection systems must first be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. Contact the installing contractor or product manufacturer with any questions. Any impairment must be immediately corrected.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

NOTICE

When the system is using a water supply that attacks aluminum bronze, internal and external inspection of the DV-5 Valve and Trim is essential. Parts showing any signs of corrosion must be replaced to ensure the integrity of the system.

Nominal Valve Sizes Inches (DN)	Torque lb-ft (N-m)
2 (DN50)	29 (39,32)
3 (DN80)	54 (73,21)
4 (DN100)	65 (88,13)
6 (DN150)	72 (97,62)
8 (DN200)	87 (117,96)

**TABLE B
DIAPHRAGM COVER BOLTS
MAXIMUM TORQUE**

Internal Valve Inspection

Once every five years (assuming a non-corrosive water supply), during the annual operational test procedure (NFPA 25) and prior to the DV-5 Valve being reset, the interior of the DV-5 Valve must be cleaned and inspected for wear and damage. Damaged or worn parts must be replaced. (Replacement of the Diaphragm every ten years is recommended.)

When reinstalling the Diaphragm Cover, complete the following steps to assure the Diaphragm Cover Fasteners (Hex Bolts) are uniformly and securely tightened.

Step 1. Align Diaphragm and Diaphragm Cover in proper orientation with valve body (Ref. Figure 1) and hold in place

Step 2. Assemble Flat Washers onto Hex Bolts

Step 3. Apply LOCTITE No. 242 (or equivalent) to Hex Bolt threads

Step 4. Insert Hex Bolts through Diaphragm Cover and Diaphragm, hand-tighten into valve body

Step 5. Using crossdraw sequence to assure uniformity, wrench-tighten Hex Bolts to appropriate torque values (Ref. Table B)

Step 6. Inspect to assure all Hex Bolts are securely tightened

NOTICE

If the water supply contains chemicals which tend to attack an EPDM rubber, or the five year inspection indicates a build-up of debris within the valve that could affect its proper operation, the frequency of the internal valve inspection procedure must be appropriately increased.

If the system has a water supply that attacks aluminum bronze, the frequency of the internal valve inspection procedure must be appropriately increased. (An annual internal valve inspection for a system having a sea water or brackish water supply is recommended.)

With reference to Figure 1, make certain that the Diaphragm is correctly oriented; otherwise, the DV-5 cannot be properly set.

Under-tightening the Diaphragm Cover Bolts can result in leakage past the valve seat.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability and Part Numbers.

Aluminum Bronze DV-5 Deluge Valve

Specify: (specify size) Aluminum Bronze DV-5 Deluge Valve with flange connections per (specify flange specification) and with (specify NPT or ISO) threaded ports, P/N (specify per local distributor)

NOTE: The Aluminum Bronze DV-5 Deluge Valve is provided with custom manufactured flange connections (thickness, outside diameter, bolt circle, bolt holes, raised or flush faced) in accordance with most recognized flange specifications. For example:

- ANSI B16.5 (Class 150)
- ANSI B16.42 (Class 150)
- ISO 7005-2 (PN10)
- ISO 7005-2 (PN16)
- JIS B2210 (10K)
- AS2129 (Table E)

Replacement Valve Parts

Specify: (description, refer to Figure 1) for use with (specify) size Aluminum Bronze DV-5 Deluge Valve