TECHNICAL DATA

DRY VALVE MODEL VXR

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
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1. DESCRIPTION



The Viking Model VXR Dry Pipe Valve is an externally resettable, latching, differential valve used to separate the water supply from the dry pipe sprinkler system. The valve includes a clapper assembly with a differential air-to-water seat design. The clapper provides a positive mechanical seal for the air/nitrogen pressure in the dry pipe system. The differential design allows an air/nitrogen supply of moderate pressure to control a higher water supply pressure. When the air/nitrogen pressure in the dry pipe system is lowered sufficiently to overcome the pressure differential, the valve opens allowing water to enter the dry pipe system. The clapper is reset using a convenient push rod located on the bottom of the valve body.

The valve is also designed to operate a water motor alarm and/or an electric pressure alarm switch. The Viking Model D-2 Accelerator can be used to speed the operation of the valve on large capacity systems or where faster action is required.

2. LISTINGS AND APPROVALS

cULus Listed: VPZV

FM Approved: Dry Pipe Valves

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

3. TECHNICAL DATA

3.1 Specifications (also refer to Table 1)

Rated to - 250 PSI (17.2 bar) Water Working Pressure.
Factory tested hydrostatically - 500 PSI (34.5 bar) with the clapper open.
Air pressure to water pressure area differential: Approximately 5.75 to 1.
Color - black
Available since 2022.

3.2 Material Specifications

Refer to Figure 2 and Table 2.

Table 1: Ordering Information and Additional Specifications

Nominal Size	Part Number	Note: These part numbers are for the valve only. Refer to the Model VXR Dry System Risers data page for trim.	Friction Loss[1]	CV Factor	Shipping Weight
2½"	24047		11 ft. (3.35 m)	159	26 lbs. (11.8 Kg)
3"	24065		14 ft. (4.27 m)	250	31 lbs. (14.01 Kg)
4"	24068		21 ft. (6.4 m)	409	50 lbs. (22.7 Kg)
6"	24069		29 ft. (8.84 m)	1009	107 lbs. (48.5 Kg)

1. Expressed in equivalent length of Schedule 40 pipe based on Hazen & Williams formula: C = 100.
2. Loose trim packages do not include the dry valve. Refer to the Model VXR System Techincal Data Page for available options.

Figure 1: Valve Takeout Dimensions

Size	A - Inches (mm)
2½"	10⅞ (276)
3"	12⅜ (314)
4"	14⅛ (359)
6"	17 (432)



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3.3 Valve Components, Materials, and Replacement Parts

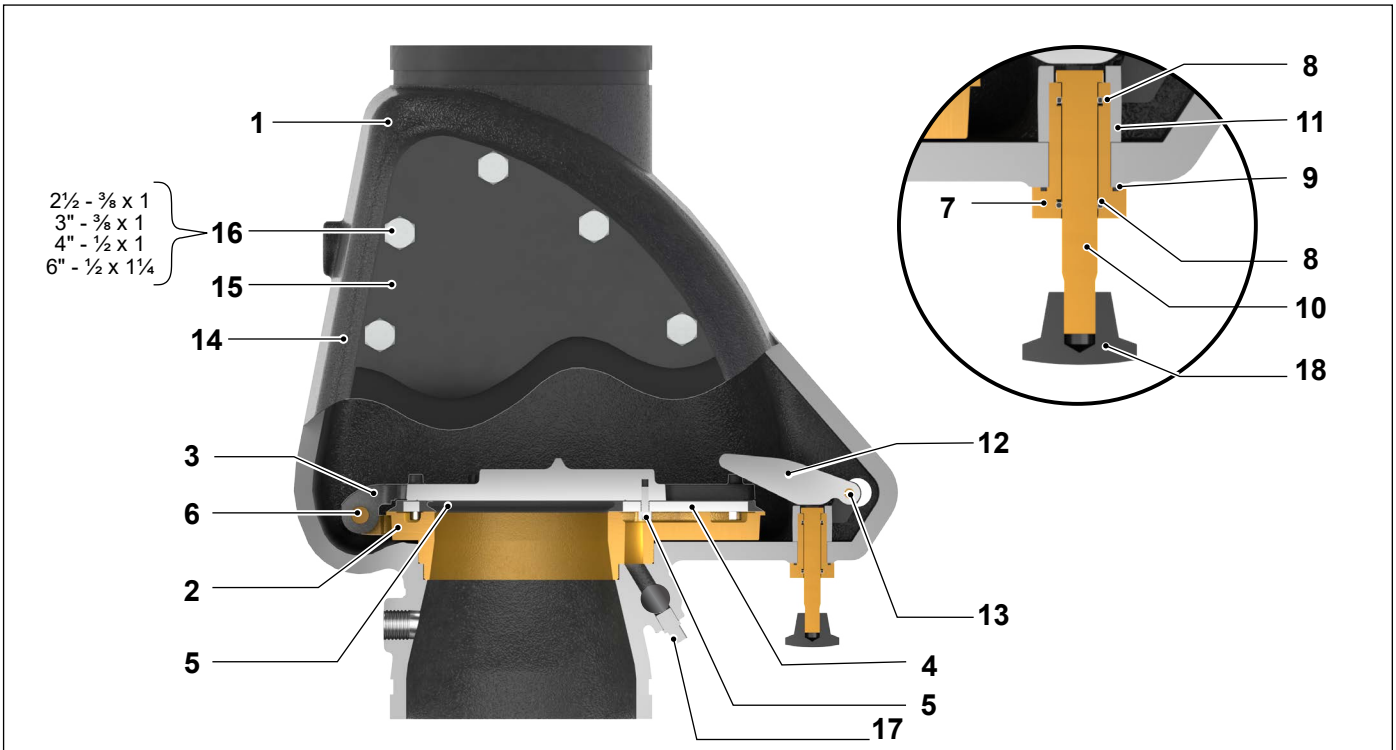


Figure 2: Valve Components (4" Shown)

Table 2 : Valve Components, Materials, and Replacement Parts

Ref	2½”	3”	4”	6”	Description	Material	Required qty.			
							2½”	3”	4”	6”
1	--	--	--	--	Body	Ductile iron 65-45-12	1	1	1	1
2	--	--	--	--	Seat	Brass USN-C84400	1	1	1	1
3	**	**	**	**	Clapper	Ductile iron 65-45-12, PTFE coated	1	1	1	1
4	23956**	24025**	24032**	24029**	Clapper rubber	Rubber (EPDM ASTM D2000) reinforced with Stainless Steel	1	1	1	1
5	**	**	**	**	Screw, #12 X 5/8”	Stainless steel 18-8	4	5	7	14
6	**	**	**	**	Clapper rod	Brass UNS-C36000	1	1	1	1
7	*	*	*	*	Bushing	Brass UNS-C36000	1	1	1	1
8	*	*	*	*	O-ring 2-019	EPDM	1	1	1	1
9	*	*	*	*	O-ring 2-013	EPDM	2	2	2	2
10	*	*	*	*	Push rod	Brass UNS-C36000	1	1	1	1
11	*	*	*	*	Base	Brass USN-C84400	1	1	1	1
12	*	*	*	*	Latch	Brass USN-C84400	1	1	1	1
13	*	*	*	*	Spring pin	Stainless steel 18-8	1	1	1	1
14	23429	23431	23433	23435	Hand hole cover gasket	EPDM ASTM D2000	1	1	1	1
15	--	--	--	--	Hand hole cover	Stainless steel with E-coat	1	1	1	1
16	--	--	--	--	Hex head bolt	Stainless steel 18-8	6	7	6	10
17	--	--	--	--	Plug, 1/4”		1	1	1	1
18	*	*	*	*	Knob	Plastic with brass insert UNC-2B	1	1	1	1
-- Indicates the part is not available for replacement. * or ** See below for replacement kit; each kits includes the parts marked above.										
*	24362	24362	24362	24363	Push Rod/Latch Assembly Kit (includes grease)		1	1	1	1
**	24357	24358	24360	24361	Clapper Assembly Kit		1	1	1	1

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4. INSTALLATION

4.1 Requirements

- For proper operation and approval, the valve must be trimmed in accordance with Viking Model VXR Dry System Risers data page; refer to Form No. F_112320.
- The Model VXR Dry Valve must be installed in the vertical position as shown in Figure 3.
- Air/nitrogen supply to the dry pipe system must be clean, dry, and oil free.
- Automatic air/nitrogen supplies must be regulated, restricted, and from a continuous source. Viking recommends that an air maintenance device be installed on each system equipped with an automatic air/nitrogen supply per the requirements of NFPA 13.
- Never exceed 65 PSI (4.5 bar) pressure in the system piping with the dry valve clapper closed.
- The dry valve must be installed in an area not subject to freezing temperatures or physical damage. If required, provide a valve house (enclosure) with adequate heat around the dry valve and trim. Freezing temperatures and/or excessive pressure will permanently damage the valve.
- When corrosive atmospheres and/or contaminated water supplies are present, it is the owner's responsibility to verify compatibility with the Model VXR Dry Valve and associated equipment.
- Prior to installing the valve, thoroughly flush the water supply piping to verify that no foreign matter is present.

4.2 General Installation Instructions

1. Verify that necessary Trim Charts and Technical Data for the dry valve and associated equipment are available.
2. Remove all plastic thread protectors from the openings of the dry valve.
3. Apply a small amount of pipe-joint compound or tape to the external threads of all pipe required connections. Take care not to allow any compound, tape, or other foreign matter inside any of the nipples or openings of the dry valve or trim components.
4. Install the Model VXR Dry Valve and trim piping according to the current Model VXR Dry Valve Trim Chart provided with the Trim Package and on the Viking website. The Model VXR Dry Valve must be installed in the vertical position.
5. When installing a Viking accelerator in conjunction with the Model VXR Dry Valve, refer to the Accelerator Trim chart and information included on the Viking Model VXR Dry System Risers data page (Form No. F_112320).

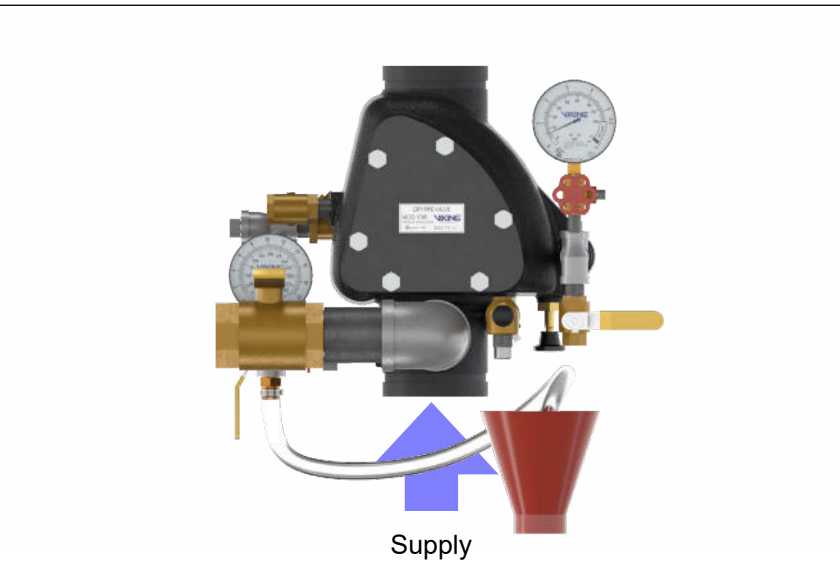


Figure 3: Typical Installation with Trim (4" Shown)

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5. OPERATION

5.1 In the SET condition:

The clapper is closed (A); however, the latch (B) does not hold the clapper closed. System air/nitrogen pressure enters the valve through the main air/nitrogen connection point (C) and forces the clapper assembly down therefore keeping the water from entering the valve.

5.2 In fire conditions:

When a sprinkler operates, the system air/nitrogen pressure is reduced. When system air/nitrogen pressure is reduced to the differential tripping point of the valve, water supply pressure in the inlet chamber forces the clapper open allowing water to flow through the valve. The latch holds the clapper off the seat after activation if water pressure is reduced.

When using the optional accelerator, the accelerator senses the system air/nitrogen pressure drop and activates. Upon tripping, the accelerator allows the system air/nitrogen pressure to enter the dry valve intermediate chamber (not shown). This immediately overcomes the differential causing the clapper to open faster.

The intermediate chamber is normally at atmospheric pressure and is connected to the alarm line. When the valve trips, the intermediate chamber and alarm line are pressurized with system water pressure, activating alarms connected to the dry valve trim.

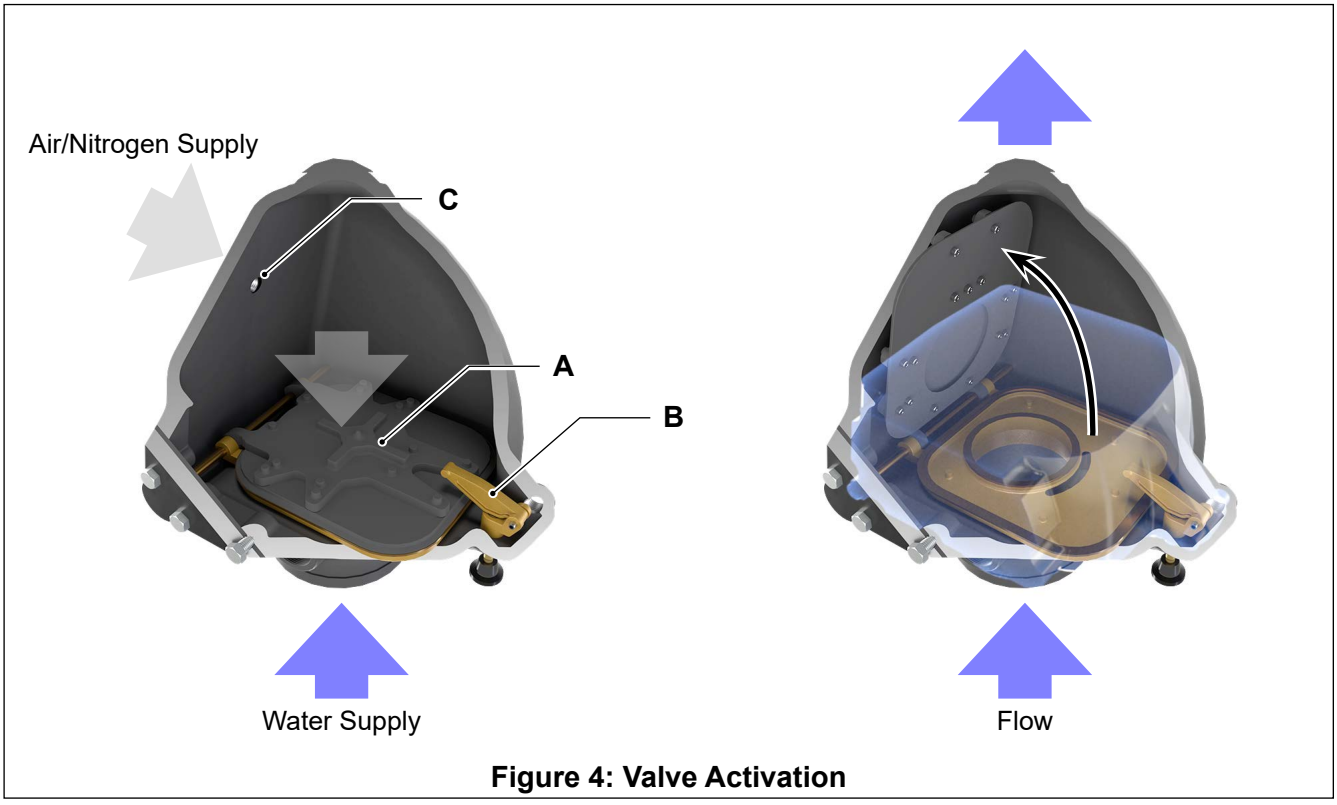


Figure 4: Valve Activation

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5.3 Resetting the Valve

NOTICE

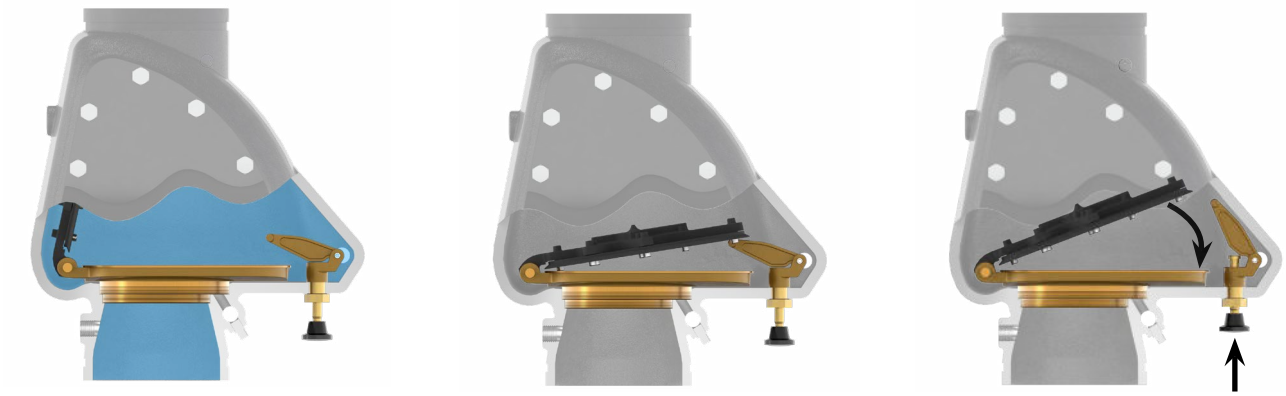
The following covers the necessary information for resetting the valve after it has been tripped. In system activation scenarios, refer to the procedures on the VXR Dry System Risers technical data page Form No. F_112320.

Before resetting the valve, verify that:

- The water supply control valve is closed.
- The system is drained.
- There is no water pressure showing on the system water supply pressure gauge.
- If applicable, all alarms have been silenced.
- There is no pressure showing on the system air/nitrogen supply pressure gauge.
- Any sprinklers or broken pipes have been repaired.
- If applicable, there is no air/nitrogen pressure in the accelerator. If necessary, bleed any residual pressure.

NOTE: Pressing upward on the push rod may cause residual pressurized air/nitrogen to escape.

To reset the valve, press upward on the push rod. The clapper will fall back onto the seat. Sealing will occur upon system reset (air/nitrogen and water pressure must be established). Refer to the Model VXR System Risers technical data page Form No. F_112320 for more information.



Water flowing
Clapper is held open

Clapper ready for reset.

Press push rod upwards then pull the handle downward.

Figure 5: Resetting the Valve

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6. INSPECTIONS AND MAINTENANCE

⚠ WARNING

Any system maintenance that involves placing a control valve or detection system out of service may eliminate the fire protection capabilities of that system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected areas.

NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition.

It is imperative that the valve is inspected and tested on a regular basis in accordance with NFPA 25. Refer to current Viking Technical Data describing individual components and the Model VXR Dry System Riser.

The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies, corrosive atmospheres, as well as the condition of the air/nitrogen supply to the system. For minimum maintenance and inspection requirements, refer to NFPA 25. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

6.1 Inspection

1. Check pressure gauges located on the supply side and system side of the dry valve. Verify that the proper ratio of air/nitrogen pressure to water supply pressure is being maintained (refer to Form No. F_112320 - Table 3).
2. Verify that the intermediate chamber of the dry valve is free of water or pressurized air/nitrogen by pushing the drip check plunger. No water or pressurized air/nitrogen should be present.
3. If equipped with a Viking Model D-2 accelerator, check the air/nitrogen pressure gauge located on the top of the accelerator. Air/nitrogen pressure in the upper chamber of the accelerator should equal the pneumatic pressure maintained in the system.

   NOTE: Standard tolerance allowance in pressure gauge calibration may result in a slight variation when pressure readings from any two gauges are compared. A difference in pressures other than slight variation due to gauge calibration tolerance may indicate maintenance is required. Refer to Technical Data for the accelerator used.
4. Verify that the water supply main control valve is open and all trim valves are in their normal operating position.
5. Check for signs of mechanical damage and/or corrosive activity. If detected, perform maintenance as required or, if necessary, replace the device.
6. Verify that dry valve and trim are adequately heated and protected from freezing and physical damage.

Table 3 : Fastener Specifications (Refer to Figure 2)

Item	Description	Valve Size			
		2½"	3"	4"	6"
5	Clapper rubber screws	#12 X ½	#12 X ½	#12 X ⅝	#12 X ⅝
Maximum torque value Ft-lb (Nm)		**5 (6.8)**	**5 (6.8)**	**5 (6.8)**	**5 (6.8)**
16	Cover bolts (Hex head)	⅜ X 1	⅜ X 1	½ X 1	½ X 1¼
Maximum torque value Ft-lb (Nm)		**20 (27.1)**	**20 (27.1)**	**50 (67.8)**	**50 (67.8)**

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6.2 MAINTENANCE

⚠ WARNING Risk of injury or death.

Prior to servicing internal operating parts of the dry valve, take the following precautions.
a. Close the water supply main control valve, placing the system out of service.
b. Open the main drain located on the inlet of the dry valve.
c. Close the air/nitrogen supply to the dry system piping.
d. Relieve all pressure from the dry system piping. If the system has operated, open all auxiliary drains and the system test valve to allow the system to drain completely.

Replacing the Clapper Plate

Tools needed:

- 3/8" or 1/2" wrench (see Figure 2)
- 5/32" Allen wrench

1. Loosen and remove bolts (16) and remove hand-hole cover and gasket (15 and 14).
2. Press upwards on the push-rod. The clapper will drop against the seat.

   NOTE: Consider covering the opening of the waterway while performing maintenance to prevent anything from dropping inside; a piece of cardboard will suffice.
3. To remove the clapper assembly, pull out the clapper rod (6). The clapper assembly will be free and may need to be rotated in order to remove it from the valve body.
4. Inspect the rubber (4) for signs of wear such as cracking, cuts, or excessively deep grooves where the rubber contacts the seat. If necessary, replace the rubber.
5. To remove the clapper rubber (4) from the clapper (3), remove all of the screws (5).
6. Align the new clapper rubber (4) so that the recessed circular area will face towards the waterway inside the valve when installed.

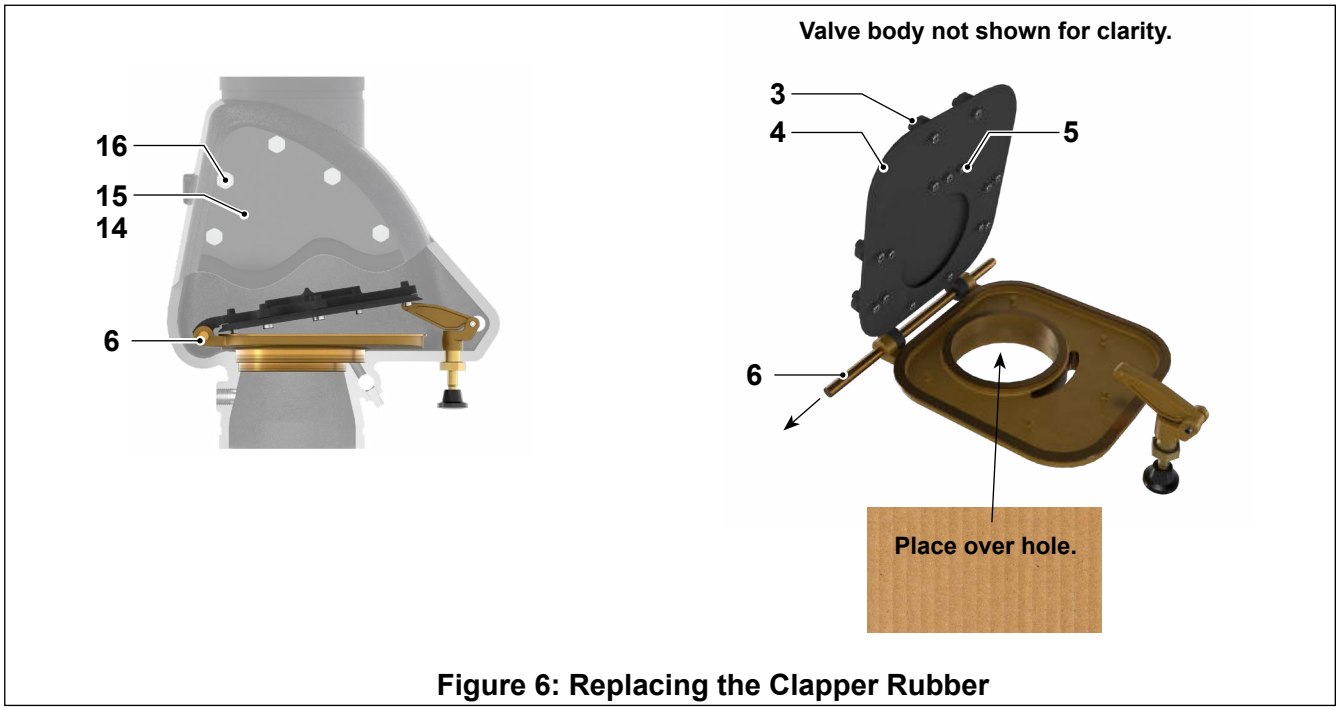


Figure 6: Replacing the Clapper Rubber

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7. Install and hand-tighten all the screws.
8. Tighten the screws in the specific pattern shown in Figure 7. Refer to Table 3 for torque specifications for the screws.
9. Reinstall the clapper (3) into the valve and insert the clapper rod (6).

   NOTE: The tapered end must be inserted first.
10. Remove any cardboard coverings or extraneous materials from the inside of the valve.
11. Install a new gasket (14) and replace the cover (15), and bolts (16). Refer to Table 3 for torque specifications for the cover bolts.

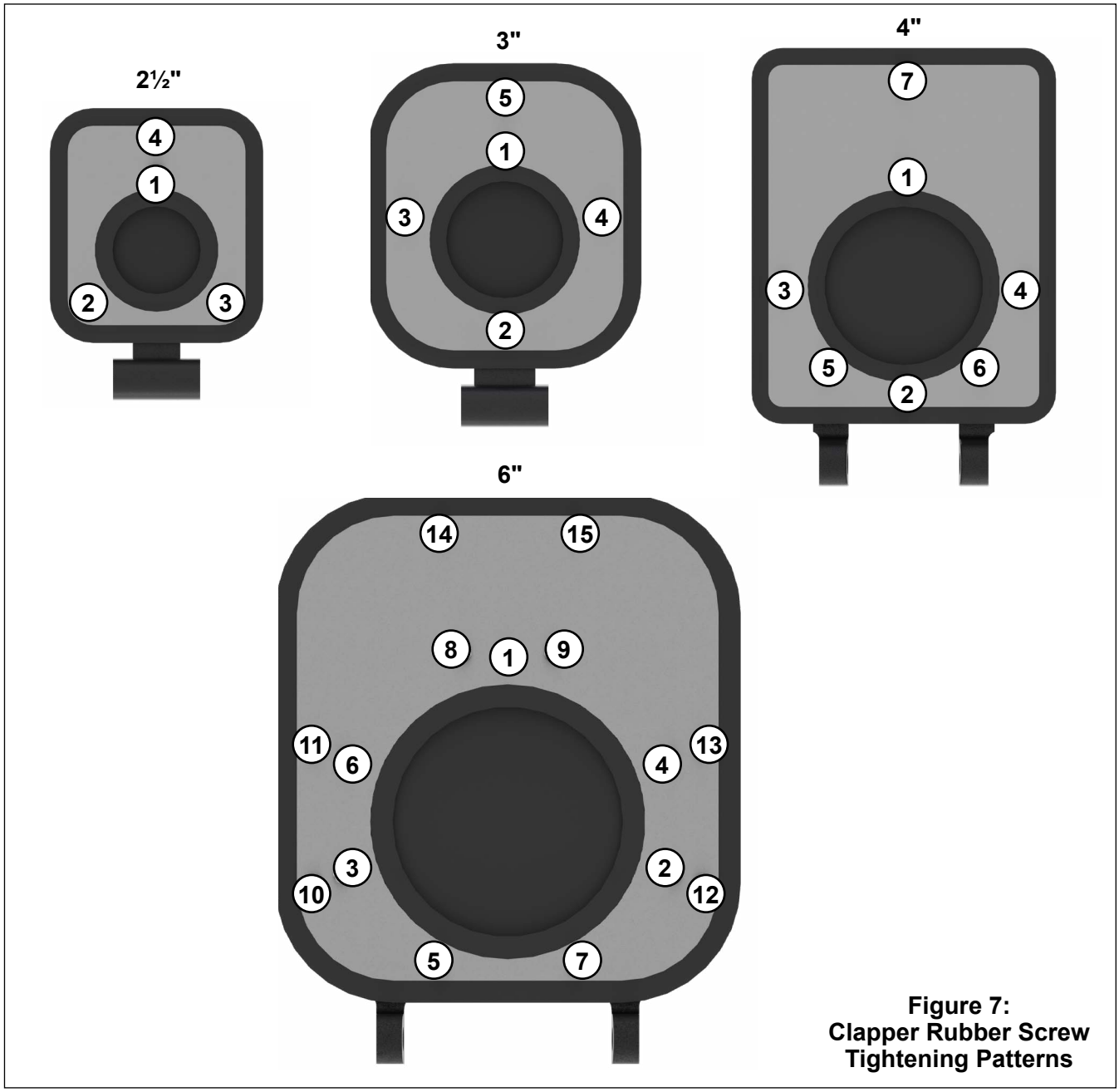


Figure 7:
Clapper Rubber Screw Tightening Patterns

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Replacing the Latch and Inspecting the O-rings

Tools needed:

- 3/8" or 1/2" Wrench (see Figure 2)
- 1" Wrench (used on the bushing)
- Pliers

1. Loosen and remove bolts (16) and remove hand-hole cover and gasket (see Figure 6).
2. Hold the latch assembly (12) in place with one hand, and use the other hand to loosen and remove the bushing (7).
3. Pull the push-rod down and out of the valve body.
4. Carefully remove the latch assembly from the valve body.
5. Using your hands, loosen and remove the knob (18) from the push rod (10).

   NOTE: The knob is secured in place with thread sealant at the factory.
6. Inspect the 3 O-rings (8,9), latch (12), and push-rod (10). Replace if necessary.
7. To remove the latch from the assembly, grasp the head of the pin (13) with pliers and pull.
8. Install the new latch assembly and insert the pin.

   NOTE: Verify the correct size latch is installed; 6" valves have a larger sized latch.
9. Reassemble the latch and push-rod into the valve.

   NOTE: Verify that the assembly is oriented inside the valve as shown. Installing the latch assembly in any other orientation will prevent proper operation.
10. Hold the assembly in place and hand-tighten the bushing (7).

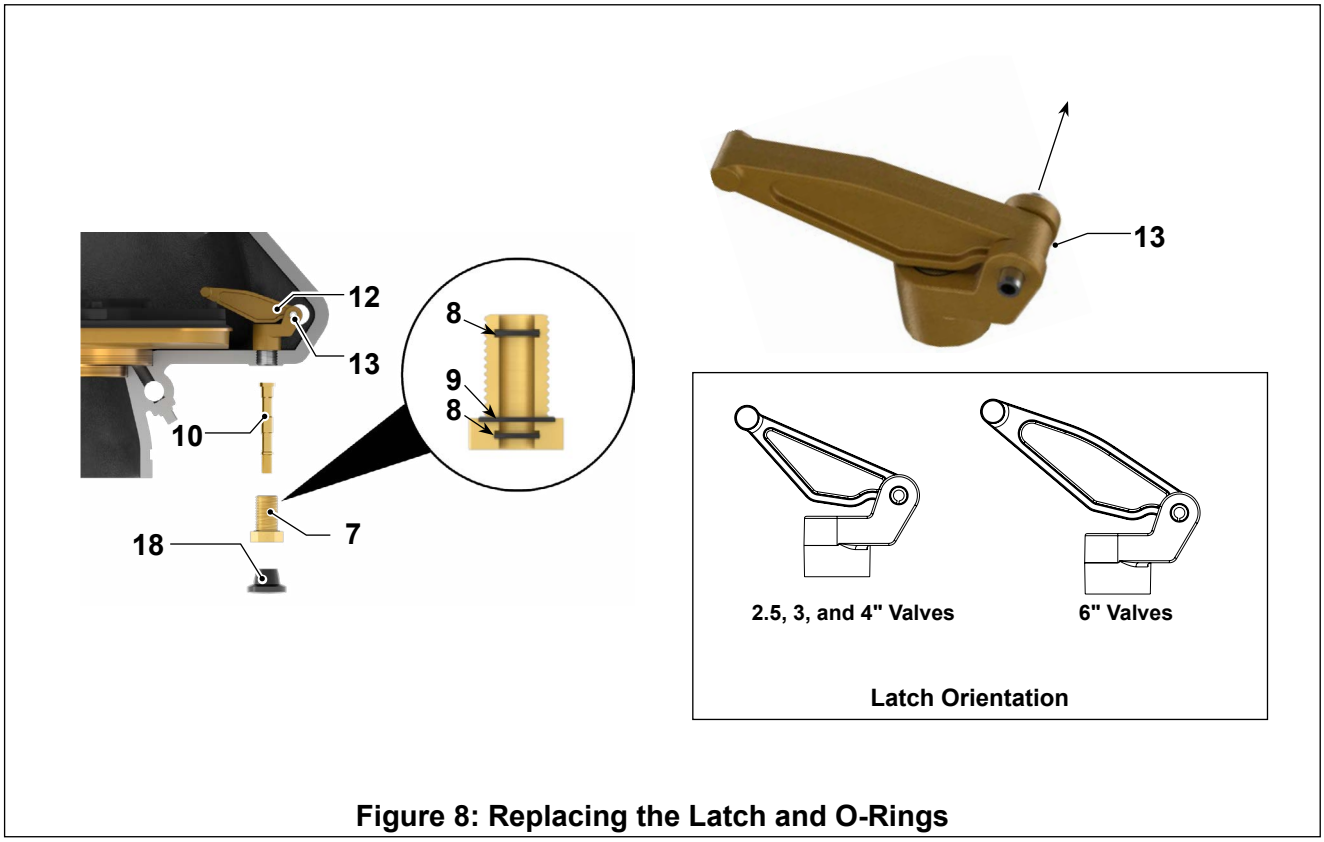


Figure 8: Replacing the Latch and O-Rings

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7. AVAILABILITY

The Viking Model VXR Dry Pipe Valve is available through a network of domestic and international distributors. See the Viking Corporation website for closest distributor or contact The Viking Corporation.

8. GUARANTEES

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.