INSTALLATION & OPERATION MANUAL

KDV DIAPHRAGM VALVES

Thank you for choosing a KDV Diaphragm Valve.

KDVs industrial valve range is built to the highest standards of design and manufacture. Our AS/NZS ISO 9001:2000 compliant Quality Assurance System covers import, assembly, manufacture, sales, servicing and testing operations – so you can be confident that your product will provide many years of reliable service.

Please ensure that you read this manual thoroughly before attempting to install and operate the product. If you need further assistance or advice please contact your KDV Technical Service Representative.

1. PACKING

1.1 KDV valves and components are prepared for delivery in purpose built cartons using foam packaging system, timber or cardboard supports and plastic bubble wrap to maximise protection from damage in transit caused by movement of an item within the crate or box. All diaphragms are dispatched in individual plastic UV protected bags, including installation and maintenance instructions.

1.2 Where this is not possible, KDV selects suitable packaging materials (cartons, case materials, paper packing), and packs the items to prevent movement, the ingress of moisture or penetration by outside objects.

1.3 Standard methods cannot be nominated for packaging, due to the diversity of requirements to be satisfied. KDV warehouse staff are experienced in preparing packaging for our products.

1.4 Packaging for freight is designed to withstand normal transport treatment and follow Australian freight handling guidelines. Items delivered are either shipped on pallets or skids, or in sturdy cartons or timber crates, as required for safe transport of the product.

2. IDENTIFICATION

2.1 Valves may be tagged with a label (cardboard or metal - according to client instruction) showing a KDV product code and description.

2.2 External surfaces of outer packaging are marked per the client's instruction.

3. STORAGE

3.1 Prior to installation/use, the product should be left in its original packaging, which KDV designs to preserve the item from deterioration in transit and storage.

3.2 Upon receipt, inspect external packaging for obvious damage. Where none is evident, the packaging should be left untouched, until the product is ready to be installed. If damage is found to external packaging, inspect the valve for damage and report any damage to KDV. If only packaging is damaged, perform repairs to external packaging or replace external packaging at your discretion.

3.3 We recommended that packaged products are stored under cover to avoid the effects of rain, sun, fog, mist, hail etc. The product should not be unboxed prior to installation.

3.4 Where possible, no more than two cardboard or timber cartons or crates should be stacked one atop the other.

3.5 Removal from service storage - Store Weir Type valves in the open position and Straight Through Valves almost closed (to leave the diaphragm 'unstressed').

3.6 Spare diaphragms should be stored loosely in their original packaging, away from sunlight and ozone.

4. VALVE INSTALLATION

This manual must be read and understood prior to installation or operation of the product.

Diaphragm Valves can be installed in any convenient position in horizontal, vertical or sloping pipelines.

When installing the valve, leave reasonable access for the operation of the handwheel.

The valve is designed to be closed manually - DO NOT use tools or levers.

If self-draining of the valve is desired in a horizontal pipeline, it can be achieved by drilling the flanges with a 150° angle, or installing the valve in such a way that the valve stem forms a 150° angle with the horizontal.

Use rubber or PTFE gaskets for in-line flange mounting. The material must always be compatible with the line fluid.

When installing the valve, tighten bolts diagonally and evenly, particularly on flanges with glass lining. DO NOT use hard gasket materials on glass-lined bodies.

Valve connection torques to be in line with internationally acepted pipeline assembly procedures and relevant standards.

INSTALLATION CHECK LIST

Before installation the following checks should be performed:

- ☑ Inspect the valve for physical damage
- ☑ Ensure that there is no dirt inside the valve
- ☑ Identify the diaphragm grade and ensure it is suitable for the service
- ☑ Cycle the valve open and closed to ensure proper operation
- ☑ Check body bonnet nut torques in accordance with the chart on page 3

5. LUBRICATION & MAINTENANCE

The spindle and bonnet threads should occasionally be lubricated with a thin layer of adhesive grease. This task should be performed when changing the diaphragm.

With the valve open, remove the handwheel from the spindle and apply a thin layer of adhesive grease to the spindle thread and reassemble the handwheel. Close and open the valve a few times to lubricate the bonnet thread.

NOTE: Use only adhesive grease. DO NOT use oil as this may damage the diaphragm material.

6. DIAPHRAGM REPLACEMENT

6.1 General Information

DN8-DN20 diaphragms are attached to the compressor by a moulded rubber button.

DN25 and larger elastomer diaphragms are attached to the compressor by a moulded-in screwed fitting.

DN15 and larger PTFE backed rubber diaphragms are attached to the compressor by a positive 90 degree bayonet fitting. Twisting the diaphragm a quarter of a turn in either direction and simultaneously pulling it out removes the two piece diaphragm from the compressor.

6.2 Replacement Procedure

a)

Lift the valve bonnet assembly off the body.

Inspect the valve body and bonnet components for signs of wear/damage and replace as required

b)

Turn the handwheel clockwise to partially expose the compressor.

Unscrew the diaphragm from the compressor by turning counter-clockwise.

(for PTFE diaphragms rotate 90 deg only)

6.2 Diaphragm Replacement Procedure (cont.)

c)

Screw the new diaphragm onto the compressor until the thread is fully engaged - then rotate the diaphragm anti-clockwise to align the holes in the bonnet and diaphragm.

d)

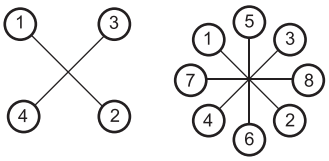
Replace the valve bonnet assembly on the body and close the valve fully by rotating the handwheel clock-wise - then back off one quarter turn (anti clock-wise).

Tighten the bonnet nuts in the order specified below until the diaphragm begins to compress on all sides. Ensure the gap between the bonnet and body faces is uniform.

e)

Tighten the bonnet nuts witha calibrated torque wrench (see torque settings below)

Bonnet Bolt Tightening Sequence



7. BODY/BONNET BOLTING TORQUES FOR VALVES

BODY/BONNET BOLTING TORQUES FOR DIAPHRAGM VALVES LN/LO BONNET ASSEMBLIES & ACTUATED VALVES			
Valve Size	Weir Type Rubber Diaphragm	Weir Tpe PTFE Diaphragm	Straight Through Rubber Diaphragm
mm (inches)	Nm (Lbf.in)	Nm (Lbf.in)	Nm (Lbf.in)
DN15 (½)	8 (70)	10 (89)	N/A
DN20 (¾)	8 (70)	10 (89)	N/A
DN25 (1)	10 (89)	10 (89)	5.5 (48)
DN32 (1¼)	15 (133)	18 (159)	6.5 (58)
DN40 (1½)	15 (133)	18 (159)	8 (70)
DN50 (2)	18 (159)	24 (212)	20 (177)
DN65 (2½)	22 (195)	56 (496)	22 (195)
DN80 (3)	36 (319)	65 (575)	50 (443)
DN100 (4)	27 (239)	67 (593)	27 (239)
DN125 (5)	31 (275)	84 (744)	31 (275)
DN150 (6)	50 (443)	133 (1177)	50 (443)
DN200 (8)	61 (540)	133 (1177)	61 (540)

NOTES:
1) Torque may be exceeded by up to I0%.
2) Bolt tension developed using torque wrenches can vary widely depending on fastener condition, wrench accuracy, degree of lubrication and technique. If fastener yielding or galling is apparent, reduce torque accordingly and replace fasteners.

8. VALVE ASSEMBLY AND ADJUSTMENT FOR WEIR TYPE & STRAIGHT THROUGH TYPE DIAPHRAGM VALVES WITH RISING-HANDWHEL BONNET ASSEMBLY

To mount the bonnet assembly onto the body, follow the instructions in section 6.2. The procedure for the adjustment of the over-closure protection, is as follows :

(a) Screw handwheel onto the stem by turning clockwise until the hole in the stem appears at the bottom of the first handwheel slot. Insert a "long pin" that fits easily into the slot and hold by hand.

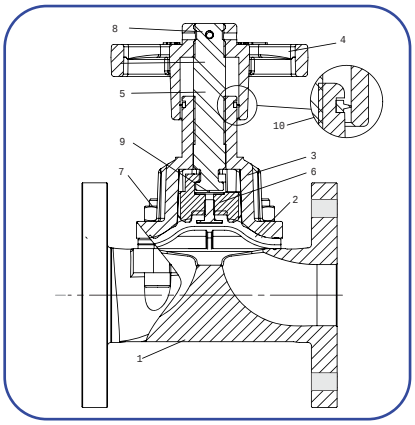
(b) Close valve tightly, pull out "long pin" and then turn the handwheel clockwise until the handwheel bottom touches the bonnet, turn the handwheel slowly counter-clockwise until the next slot coincides with hole in the stem and knock the handwheel roll-pin into place with a suitable punch. The valve should now close fully.

(c) If valve closure is not adequate as a result of incorrect adjustment - or a long service period has resulted in diaphragm or body wear, bring the valve to a closed position, knock out the handwheel pin with a suitable punch, turn the handwheel counter-clockwise until the next slot coincides with the hole in the stern and knock the handwheel pin into place. This will usually be sufficient, but if not, repeat this operation.

9. PARTS DESCRIPTION

9.1 Weir Type Diaphragm Valves

RISING HANDWHEEL

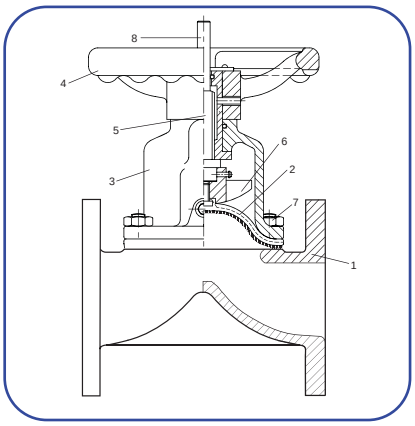


MATERIALS OF CONSTRUCTION

PART	MATERIAL
1 Body	Cast Iron, Cast Ductile Iron
2 Diaphragm	See Below [1]
3 Bonnet Shell	Cast Iron, Cast Ductile Iron
4 Hand Wheel	Cast Iron, Cast Ductile Iron (Coatings and alternative materials on request)
5 Spindle	SS304, SS316
6 Compressor	Cast Iron, Cast Ductile Iron
7 Fasteners	ISO Grade 8.8, Stainless Steel
8 Hand Wheel Pin	Spring Steel
9 Thrust Disc	Delrin
10 Environmental Seal	EPDM Wiper Seal

*Environmental seal bonnet not available on all bonnet sizes.
Ask your KDV sales representative for more information.

NON-RISING HANDWHEEL



MATERIALS OF CONSTRUCTION

PART	MATERIAL
1 Body	Cast Iron, Cast Ductile Iron
2 Diaphragm	See Below [1]
3 Bonnet Shell	Cast Iron, Cast Ductile Iron, WCB, Stainless Steel
4 Hand Wheel	Cast Iron (Coatings and alternative materials on request)
5 Spindle	SS304, SS316
6 Compressor	Cast Iron, Cast Ductile Iron, WCB, Stainless Steel
7 Fasteners	ISO Grade 8.8, Stainless Steel
8 Visual Indicator	Mild Steel

DIAPHRAGM MATERIALS[1]

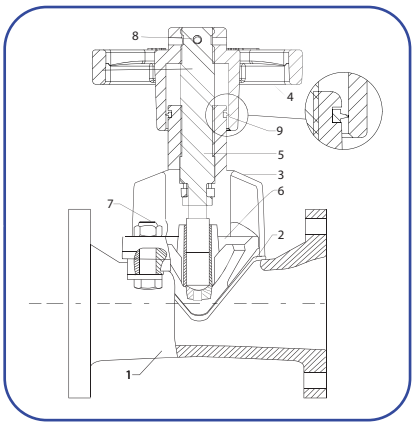
10 - Natural rubber (NR)
20 - EPDM rubber
30 - Butyl rubber (IIR)
40 - Nitrile rubber (NBR)
50 - Neoprene rubber (CR)
60 - Hypalon rubber (CSM)
70 - Viton rubber (FKM/FPM)
92 - PTFE/EPDM backed
93 - PTFE/Butyl backed
96 - PTFE/Hypalon backed
97 - PTFE/Viton backed
98 - PTFE/Silicon backed
9D - TFM/PVDF/EPDM (3 PIECE)
9R - TFM/PVDF/EPDM (3 PIECE with titanium Connector)

NB: Vacuum grade diaphragms available on request

9. PARTS DESCRIPTION (CONT.)

9.2 Straight Through Type Diaphragm Valves

RISING HANDWHEEL

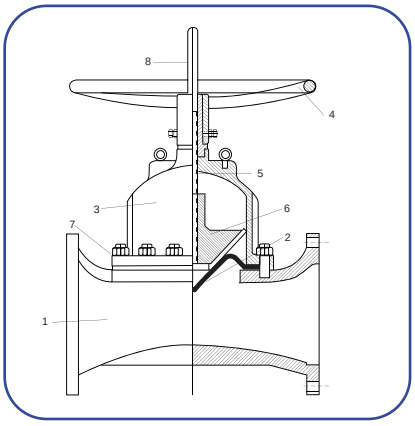


MATERIALS OF CONSTRUCTION

PART	MATERIAL
1 Body	Cast Iron, Cast Ductile Iron
2 Diaphragm	See below [1]
3 Bonnet Shell	Cast Iron, Ductile Iron
4 Hand Wheel	Cast Iron, Ductile Iron
5 Spindle	SS304
6 Compressor	Cast Iron, Ductile Iron
7 Fasteners	ISO Grade 8.8
8 Hand Wheel Pin	Mild Steel
9 Environmental Seal*	EPDM Wiper Seal

*Environmental seal bonnet not available on all bonnet sizes.
Ask your KDV sales representative for more information.

NON-RISING HANDWHEEL



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8 Visual Indicator	Mild Steel

DIAPHRAGM MATERIALS [1]

10 - Natural rubber (NR)
20 - EPDM rubber
30 - Butyl rubber (IIR)
40 - Nitrile rubber (NBR)
50 - Neoprene rubber (CR)
60 - Hypalon rubber (CSM)
70 - Viton rubber (FKM/FPM)

NB: Vacuum grade diaphragms available on request

10. MANUFACTURER'S STATEMENT

10.1 Users are responsible for valve material selection and must be aware of the possibility of deterioration in use and the necessary for periodic inspection.

10.2 The valve is designed for general working conditions. If operation in special working conditions is expected, the process conditions must be stipulated in the contract.

10.3 Under working process conditions, the valve shell temperature may cause burns to human tissue. The user is responsible for the placement of warning notices on any part of the valve that may cause human injury.

10.4 Maintenance of any kind **MUST NOT** be carried out on the valve until the line is completely depressurised (including external welding or coating).

10.5 The valve is not designed for a stipulated life-cycle. The user is responsible for regular inspection, maintenance and repair.

10.6 The valve must be repaired with components made of identical materials.

10.7 The valve is not manufactured to any standard/loading with respect to earth-quake. The manufacturer has no responsibility for any consequences arising from the effects of an earthquake.

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