



Kim Diaphragm Valves

focus: flow

KDV - Kim Diaphragm Valves Weir Type (WT)



Weir Type WT

Diaphragm Valves

# KDV: A Passion for Perfection



KDV – specialises in the manufacture and distribution of a wide range of industrial valves.



The company's core product group, continues to be the range of Kim Diaphragm Valves, now marketed internationally under the KDV brand.

The expansion of the business over the years has seen exponential growth of the KDV product base, which now includes a wide range of both manually, operated and automated diaphragm valves.

These products incorporate features now demanded by instrumentation and mechanical engineers from a wide range of industries such as:

- Water treatment
- Mining
- Chemicals and
- Manufacturing



Product features such as a range of body materials, linings, diaphragm materials and automated operators enable the KDV diaphragm valve to be one of the most versatile products available on the flow control market.

The success of KDV over the years has been primarily built upon product quality, the ability to have it readily available in the marketplace and the experience of the KDV team supporting customers, consultants, designers and end users.

An international network of dedicated KDV flow control specialists ensure that the correct product is selected and where necessary, individually "tailored" to suit the application.

With the versatility of the KDV diaphragm valve as a cornerstone, the organisation has become a major



supplier to many industries – for both major projects and for ongoing maintenance supply contracts.

The interchangeability of KDV components with other internationally recognised products has provided a steady growth in the key area of supply of spares and assembled valves. KDV support this growth with one of the largest stock holdings of spare parts and accessories for diaphragm valves.

The KDV mantra of "Corrosion & Abrasion Resistant Flow Control" has seen the product range grow to incorporate other PFA/PTFE lined valve types including butterfly valves, check valves, plug valves and ball valves.



These products when combined with a range of lined pipe and fittings allows KDV to provide more than just diaphragm valves; but total flow control solutions for corrosive environments.

A documented quality assurance system in accordance with ISO 9001:2000 underpins KDV's commitment to customer satisfaction.

Around the globe, customers depend on KDV to supply quality products that perform reliably, meet site standards and comply with up to date Occupational Health and Safety (OH&S) requirements.

KDV is more than just a brand. It's a promise of quality product and quality support from people who understand your needs.





# The KDV Diaphragm Valve Advantage



The range of KDV Weir Type (WT) Diaphragm Valves are manufactured in accordance with international standards. Available with a wide range of construction materials and lining options, the quality of KDV Diaphragm Valves helps to deliver the full potential of a simple yet versatile and effective flow control design concept.

Valve bodies, linings and diaphragms in hundreds of different combinations offer tailored solutions to suit almost any corrosive or abrasive fluid. Because the flowing media does not come into contact with the working components of the valve, total service life is dramatically increased.

The combination of inexpensive components, fast, easy inline maintenance and long service life make KDV Diaphragm Valves an attractive solution for many applications.

KDV Diaphragm Valves are used extensively throughout many industries. In fields such as:

- Chemical Processing
- Mining & Mineral Processing
- Power generation
- Water Treatment & Filtration
- Electroplating
- Steel Production
- Food & Beverage
- Paints & Coatings
- Textiles & Leather
- Semiconductors
- Pharmaceuticals
- Sugar
- Pulp & Paper.

This wide industrial use is directly attributable to the advantages that a KDV Diaphragm Valve delivers.

## BENEFITS

- **Low initial cost.**  
Simple design and low manufacturing complexity provide your application with a low cost, low maintenance, high performance solution.
- **Superior performance.**  
"Bubble-tight" shutoff. Individually tested to provide a total seal to ANSI Class VI Standards.
- **Trouble-free operation.**  
A bonnet design, free of packing and glands, removes the need for periodic adjustment and replacement.
- **Excellent throttling characteristics.**  
Reliable flow regulation between 15% to 85% of rated capacity.
- **Easy maintenance.**  
Diaphragm replacement can be performed with the valve "in-line" - reducing plant downtime and maintenance costs.
- **Clean Design.**  
The body contains no internal cavities or crevices that can trap fluids.
- **Self-draining.**  
Installation at the correct angles allow the body to self drain.
- **Omni-positional.**  
Will operate equally well in any position and flow direction.
- **Position indication.**  
See at a glance if a valve is in the open, shut or partially open position.
- **Expandable.**  
A wide choice of bonnets and other accessories are available to refine the performance of a KDV Diaphragm Valve to exactly suit your application.
- **Process Automation.**  
A wide variety of automatic actuators are easily installed with the valve "inline" and without specialist tools.
- **Component interchangeability.**  
Genuine KDV components are interchangeable with other internationally recognised products, reducing spare parts inventory and streamlining maintenance.

Users across a wide range of industries have discovered the benefits of KDV Diaphragm Valves.



In North America, KDV Weir Type Diaphragm Valves are used in chemical and water treatment industries for their low maintenance and easy availability.



# Diaphragm Valve Components



All KDV handwheels are designed for functional use and comfortable handling.

Bonnet is painted bright yellow under handle skirt to provide clear indication of valve position from any angle.

Precision machined from stainless steel provides long term corrosion resistance.

Conforms to contours of diaphragm for support during opening and closing.

Flexible membrane provides positive closure and isolates bonnet components from fluid stream.

Unique bonnet design provides overclosure protection for the diaphragm in the closed position. These two metal surfaces will seat and prevent overcompression of the diaphragm.

Bonnet self-drains when mounted at slight angle.

The interior's smooth contours provide unrestricted flow and minimum pressure loss.

In Asia, KDV Weir Type Diaphragm Valves are used in water, chemical and steel making industries for their ability to withstand corrosive solutions.

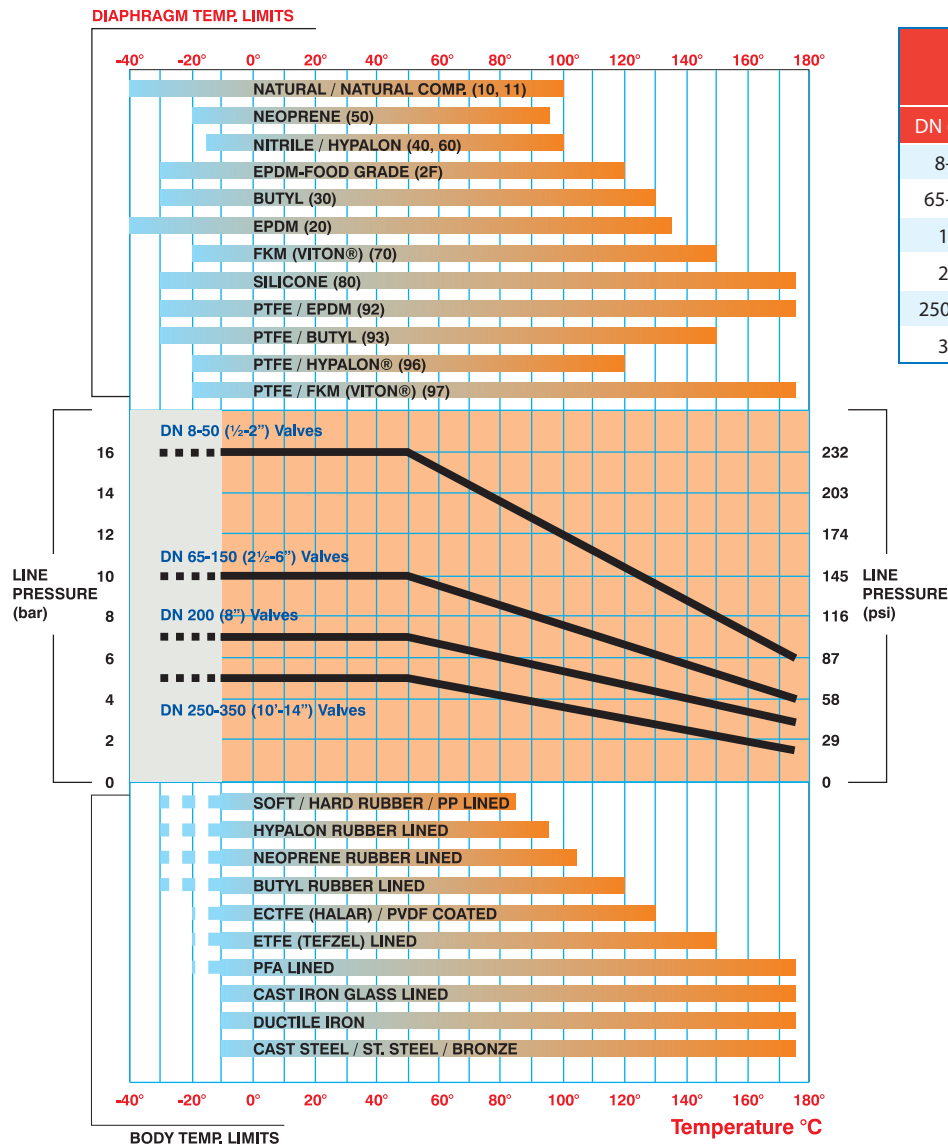


# Working Pressure and Temperature



Higher temperatures will lower the physical properties of the various diaphragm materials, requiring a decrease in working pressure and possibly adversely affecting diaphragm life. Valve body material is also a key consideration for both low and high temperature applications.

## For Valves with elastomeric diaphragms

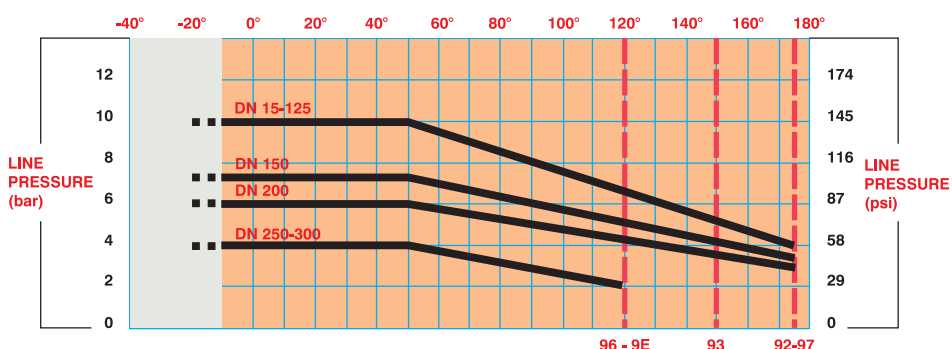


## Maximum recommended working pressure

| Valve Size |           | Pressure with Elastomer Diaphragm |     | Pressure with PTFE Diaphragm |     |
|------------|-----------|-----------------------------------|-----|------------------------------|-----|
| DN (mm)    | INCH      | Bar                               | psi | Bar                          | psi |
| 8-50       | 1/4 - 2   | 16                                | 232 | 10                           | 145 |
| 65-125     | 2 1/2 - 5 | 10                                | 145 | 10                           | 145 |
| 150        | 6         | 10                                | 145 | 7                            | 101 |
| 200        | 8         | 7                                 | 102 | 6                            | 87  |
| 250-300    | 10        | 5                                 | 72  | 4                            | 58  |
| 350        | 14        | 5                                 | 72  | n/a                          | n/a |



## For Valves with PTFE diaphragms (type 90)





# Body Selection

The flexibility of body selection in KDV Weir Type Diaphragm Valves can be seen in the table below. With a wide range of base body materials including cast/ductile iron and SS, solid plastics, elastomeric linings, injection moulded plastic linings, fluoro-polymer coatings and other specialty coatings, our range enables our valves to be optimised to suit many corrosive and abrasive environments.

The majority of body materials can be lined with our coatings, elastomer and injection moulded plastic linings. The selection of the best body material to suit an application is made based on such variables as: media type, temperature and pressure; frequency of thermal cycling, percentage of

solids, particle size profile, required end connections and size.

It is necessary to consider many other variables before finalising a selection. These include:

- Service chemical(s)
- Concentration
- Percentage solids and particle size profile
- Velocity of service
- Proximity of valve to pipe-work direction changes
- Working temperature – minimum/normal/maximum
- Working pressure – minimum/normal/maximum
- Frequency of operation (throttling requirements)

| MATERIAL           |                                       | END CONNECTION                                                  | SIZE AVAILABLE |          | TEMP.         |
|--------------------|---------------------------------------|-----------------------------------------------------------------|----------------|----------|---------------|
|                    |                                       |                                                                 | inch           | mm       | °C            |
| UNLINED BODY       | Cast Iron                             | Screwed                                                         | 1/4" - 3"      | 8 - 80   | -10 to 175°   |
|                    |                                       | Flanged                                                         | 1/2" - 14"     | 15 - 350 | -10 to 175°   |
|                    | Ductile Iron                          | Screwed                                                         | 1/2" - 3"      | 15 - 80  | -10 to 175°   |
|                    |                                       | Flanged                                                         | 1/2" - 14"     | 15 - 350 | -10 to 175°   |
|                    | Cast Steel                            | Screwed                                                         | 1/2" - 3"      | 15 - 80  | -30 to 175°   |
|                    |                                       | Flanged                                                         | 1/2" - 14"     | 15 - 350 | -30 to 175°   |
|                    | Cast St Steel                         | Screwed                                                         | 1/2" - 3"      | 15 - 80  | -30 to 175°   |
|                    |                                       | Socket Weld                                                     | 1/2" - 3"      | 15 - 80  | -30 to 175°   |
|                    | Bronze                                | Butt Weld                                                       | 1/2" - 3"      | 15 - 80  | -30 to 175°   |
|                    |                                       | Flanged                                                         | 1/2" - 14"     | 15 - 350 | -30 to 175°   |
|                    |                                       | Screwed                                                         | 1/2" - 2"      | 15 - 50  | -30 to 175°   |
|                    |                                       | Flanged                                                         | 1/2" - 6"      | 15 - 150 | -30 to 175°   |
| RUBBER LINED BODY  | Soft Rubber                           | Flanged                                                         | 1/2" - 14"     | 15 - 350 | -10 to 85°    |
|                    | Hard Rubber                           | Flanged                                                         | 1/2" - 14"     | 15 - 350 | -10 to 85°    |
|                    | Butyl Rubber                          | Flanged                                                         | 1/2" - 14"     | 15 - 350 | -10 to 110°   |
|                    | Neoprene<br>Polychloroprene           | Flanged                                                         | 1/2" - 14"     | 15 - 350 | -10 to 105°   |
|                    | EPDM                                  | Flanged                                                         | 1/2" - 14"     | 15 - 350 | -10 to 110°   |
|                    | Hypalon®<br>Chlorosulpho-<br>nated PE | Flanged                                                         | 1/2" - 14"     | 15 - 350 | -10 to 95°    |
| PLASTIC LINED BODY | ETFE (Tefzel®)                        | Flanged                                                         | 1/2" - 8"      | 15 - 200 | -10 to 149°   |
|                    | PFA                                   | Flanged                                                         | 1/2" - 8"      | 15 - 200 | -10 to 175°   |
|                    | PVDF                                  | Flanged                                                         | 1/2" - 8"      | 15 - 200 | -10 to 140°   |
|                    | PP                                    | Flanged                                                         | 1/2" - 8"      | 15 - 150 | -10 to 95°    |
| COATED BODY        | GLASS                                 | Flanged                                                         | 1/2" - 8"      | 15 - 200 | 175°          |
|                    | ECTFE (Halar®)                        | Flanged                                                         | 1/2" - 14"     | 15 - 350 | 120°          |
|                    | ETFE                                  | Flanged                                                         | 1/2" - 14"     | 15 - 350 | 130°          |
|                    | PVDF                                  | Flanged                                                         | 1/2" - 14"     | 15 - 350 | 130°          |
|                    | FBE                                   | Flanged                                                         | 1/2" - 8"      | 15 - 200 | 90°           |
|                    | NYLON                                 | Flanged                                                         | 1/2" - 14"     | 15 - 350 | 80°           |
| HYGIENIC VALVE     | FORGED                                | Butt Weld                                                       | 1/2" - 3"      | 15 - 80  | -10 to 175°   |
|                    | ST STEEL                              | Tri Clamp                                                       | 1/2" - 3"      | 15 - 80  | -10 to 175°   |
| SOLID PLASTIC      | UPVC, PP, CPVC,<br>ABS, PVDF          | Spigot/Screwed/Union<br>Solvent Cement and<br>Screwed / Flanged | 1/2" - 6"      | 15 - 150 | Onapplication |

\* Maximum Continuous Service Temperature  
(Refer also to Specific Chemical resistance guide for media information and Pressure/Temperature chart on page 5.)

## Standard Specifications

### Design Standards

- EN13397-2001 (BS5156:1985)
- MSS SP88-1993-(R-01)

### Face to Face Standards

- EN558-1 Series 1(DIN3202-F1)
- EN558-1 Series 7(BS5156)
- MSS SP88-1993-(R-01)

### Testing Standards

- EN12266-2 2002(BS6755 Part 1)

### Material Specifications – Metal Bodies

- Cast Iron (ASTM A126 CI B)
- Ductile Iron (ASTM A395 60-40-18)
- Carbon Steel (ASTM A216 Gr WCB)
- Stainless Steel (ASTM A351 Gr CF8)
- Stainless Steel (ASTM A351 Gr CF8M)
- Stainless Steel (ASTM A351 Gr CF3M)
- Alloy 20 (ASTM A351 Gr CN7M)
- Hastelloy C ASTM A-494 Gr CW-6M
- Bronze ASTM A83600 LG2/4

### Flange Valve Drilling Standards

- ANSI B16.5 Class 125 & 150
- EN1092 PN10/16 (BS4504)
- AS2129-2000 Table D/E (BS10 1962)
- JIS B2220

### Screwed Valve Thread Standards

- ANSI B2.1 NPT
- AS1722.1 Part 1 BSPP

Fluid behaviour differs according variables such as process conditions, temperature, concentration, pressure, nature of the flow, installation & design and site experience and these variables should be taken into account in the application of the above guidelines.

There are many critical services that demand a lined body for maximum chemical or corrosion resistance. KDV Valves offers the above standard linings with many other special linings and coatings available on request. Special linings and coatings

are available to suit specific applications where combinations of corrosion and abrasion occur. Not all linings as above are available in all different face to face standards. We recommend that your selection is confirmed with an engineer from KDV or an authorised KDV distributor.

KDV bodies can be identified by heat number traceability when requested at order and linings are spark tested in accordance with the relevant standards.

| FACE TO FACE DIMENSIONS |                                        |                                                  |                     |           |                 |           |
|-------------------------|----------------------------------------|--------------------------------------------------|---------------------|-----------|-----------------|-----------|
| FLANGED                 |                                        |                                                  |                     | SCREWED   |                 |           |
| DN mm                   | EN558-1 Series 7<br>BS-5156<br>UNLINED | EN558-1 Series 1<br>DN 3202 F-1<br>LINED/UNLINED | MSS-SP88<br>UNLINED | CAST IRON | STAINLESS STEEL | DN-INCHES |
| 8                       | n/a                                    | n/a                                              | n/a                 | 48        | 108             | 0.25      |
| 15                      | 108                                    | 130                                              | 102                 | 64        | 108             | 0.5       |
| 20                      | 117                                    | 150                                              | 140                 | 83        | 117             | .75       |
| 25                      | 127                                    | 160                                              | 140                 | 108       | 127             | 1         |
| 32                      | 146                                    | 180                                              | 165                 | 121       | 146             | 1.25      |
| 40                      | 159                                    | 200                                              | 165                 | 140       | 159             | 1.5       |
| 50                      | 190                                    | 230                                              | 190                 | 165       | 190             | 2         |
| 65                      | 216                                    | 290                                              | 216                 | 203       | 216             | 2.5       |
| 80                      | 254                                    | 310                                              | 254                 | 254       | 254             | 3         |
| 100                     | 305                                    | 350                                              | 318                 | n/a       | 305             | 4         |
| 125                     | 356                                    | 400                                              | 356                 | n/a       | n/a             | 5         |
| 150                     | 406                                    | 480                                              | 406                 | n/a       | n/a             | 6         |
| 200                     | 521                                    | 600                                              | 521                 | n/a       | n/a             | 8         |
| 250                     | 635                                    | 730                                              | 635                 | n/a       | n/a             | 10        |
| 300                     | 749                                    | 850                                              | 749                 | n/a       | n/a             | 12        |
| 350                     | 749                                    | 980                                              | n/a                 | n/a       | n/a             | 14        |

For Rubber Lined Bodies - add to total length (except for EN558-1 Series 1 / DN3202),  
 • 6mm for DN15 - DN80,  
 • 8mm for DN100 - DN200,  
 • 10mm for DN250 - DN350.  
 For plastic Lined bodies - add to total length (except for EN558-1 Series 1/DN3202)  
 • 6mm for DN15 - DN200

• Individual data sheets / GA drawings available on internet site [www.kdvflow.com](http://www.kdvflow.com) or upon request.



Unlined  
Body



Glass Lined  
Body



Plastic Lined  
Body



Coated  
Body



Rubber Lined  
Body



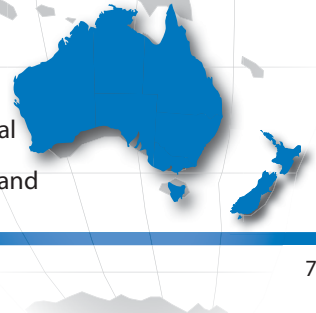
Screwed Type  
Body



SS Butt  
Welded Body



In the Australia and New Zealand, KDV Weir Type Diaphragm Valves are preferred by the mining, mineral processing and fertilizer industries for their ability to control abrasive and corrosive media.



# Diaphragm Selection and Services

| GRADE | MATERIALS                                                     | TEMP      |           | SIZE RANGE |            | TYPICAL SERVICES                                                                           |
|-------|---------------------------------------------------------------|-----------|-----------|------------|------------|--------------------------------------------------------------------------------------------|
|       |                                                               | °C        | °F        | Imperial   | Metric     |                                                                                            |
| 10    | Natural Rubber NR                                             | -40 - 100 | -40 - 212 | 1/4" - 14" | 8 - 350mm  | General Purpose, abrasives, water, diluted minerals acids,                                 |
| 11    | Natural Rubber Composite                                      | -40 - 100 | -40 - 212 | 1/4" - 8"  | 8 - 200mm  | Abrasives, slurry and suspended solids                                                     |
| 20    | EPDM/Black Ethylene Propylene Rubber                          | -40 - 140 | -40 - 284 | 1/4" - 14" | 8 - 350mm  | General Purpose, resistant to temperatures, most corrosive chemicals and abrasive liquids. |
| 22    | EPDM/food grade                                               | -30 - 120 | -22 - 248 | 1/4" - 8"  | 8 - 200mm  | Food and pharmaceuticals                                                                   |
| 30    | Butyl Rubber IIR Chlorobutyl-Isobutylene Isoprene Halogenated | -30 - 130 | -22 - 266 | 1/4" - 14" | 8 - 350mm  | Acids, alkalis, hot water, low pressure steam                                              |
| 40    | Nitrile Rubber NBR Acrylonitrile Butadiene Rubber             | -20 - 100 | -4 - 212  | 1/4" - 14" | 8 - 350mm  | Oils, fats & fuels                                                                         |
| 50    | Neoprene CR Chloroprene Rubber                                | -20 - 100 | -4 - 212  | 1/4" - 14" | 8 - 350mm  | Air, weak chemicals, greases                                                               |
| 60    | Hypalon® CSM Chlorosulfonated Polyethylene                    | -20 - 100 | -4 - 212  | 1/2" - 14" | 15 - 350mm | Concentrated acids & alkalis, chlorine services                                            |
| 70    | FKM/Viton® FPM Fluorinated Elastomer                          | -20 - 150 | -4 - 302  | 1/2" - 8"  | 15 - 200mm | Concentrated sulphuric & other acids, aromatic hydrocarbons, chlorine services             |
| 80    | Silicone                                                      | -30 - 175 | -22 - 347 | 1/2" - 8"  | 15 - 200mm | Moderate oxidizing chemicals, concentrated sodium hydroxide. Recommended for food.         |
| 92    | PTFE/EPDM Backed                                              | -30 - 175 | -22 - 347 | 1/2" - 12" | 15 - 300mm | High Chemical and temperature resistance                                                   |
| 93    | PTFE/Butyl Backed                                             | -30 - 150 | -22 - 300 | 1/2" - 8"  | 15 - 200mm | High Chemical and temperature resistance                                                   |
| 96    | PTFE/Hypalon® Backed                                          | -20 - 120 | -4 - 248  | 1/2" - 8"  | 15 - 200mm | High Chemical and temperature resistance                                                   |
| 97    | PTFE/FKM-Viton® Backed                                        | -20 - 175 | -4 - 347  | 1/2" - 8"  | 15 - 200mm | High Chemical and high temperature resistance                                              |

- Temperature range shown is a guide only. For specific services contact your local KDV distributor.
- Diaphragms at maximum temperatures cannot be used satisfactorily at maximum pressures. See pressure/temperature chart on Page 5.
- Vacuum. Type "W" diaphragm valves are ideally suited for vacuum application. Soft diaphragm material forms a perfect seal around the bonnet flange and across the weir. Standard KDV valves will hold vacuum down to 1 Torr (industrial vacuum).
- Note : 1 Torr = 1 mm (Hg)  
1 Torr = 1.33 millibar
- All elastomeric diaphragms are suitable for vacuum in sizes DN8-80. For sizes DN100 and above diaphragms are manufactured with special reinforcing for vacuum duties. Diaphragms with such reinforcing are identified with a suffix "V" after the material code on the Tab e.g: 3V.



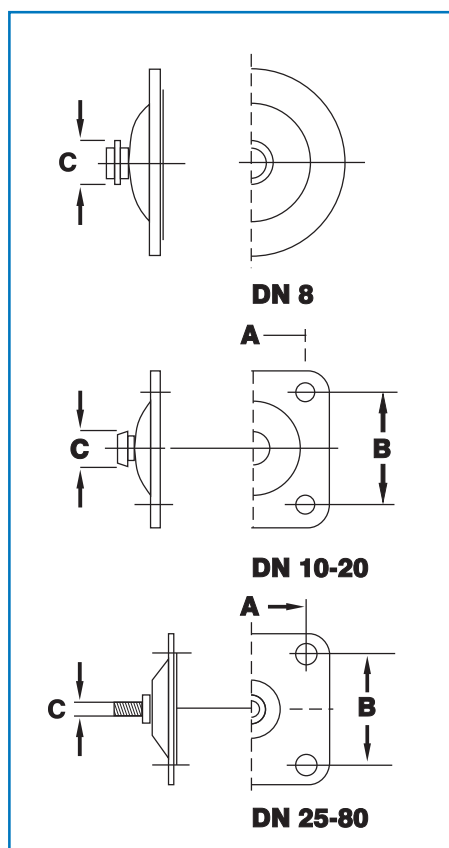
In Europe, Scandinavia and Russia, KDV Weir Type Diaphragm Valves are used in general manufacturing, chemical and power generation industries for their controllability and zero leakage.





# Diaphragm Dimensions

Identification of a valve size can be performed by matching dimensions with those of the diagrams and table below.



| Nominal Size | A   | B   | C      | D   |
|--------------|-----|-----|--------|-----|
| 8            |     |     | 9.5    | 28  |
| 10           | 33  | 37  | 13     |     |
| 15           | 33  | 37  | 13     |     |
| 20           | 40  | 44  | 13     |     |
| 25           | 46  | 54  |        |     |
| 32           | 60  | 67  | 1/4"W  |     |
| 40           | 65  | 70  |        |     |
| 50           | 78  | 83  |        |     |
| 65           | 95  | 102 |        |     |
| 80           | 114 | 127 | 5/16"W |     |
| 100          |     |     |        | 194 |
| 125          |     |     | 3/8"W  | 222 |
| 150          |     |     |        | 273 |
| 200          |     |     |        | 381 |
| 250          |     |     | 7/8"W  | 438 |
| 300          |     |     |        | 508 |
| 350          |     |     |        | 527 |



"Screwed Style" diaphragm



"Bayonet Style" diaphragm



"Button Style" diaphragm

## Diaphragm Styles

Elastomer Diaphragms:

DN8-DN20 "Button Style" - diaphragms are assembled by forcing the diaphragm button against the corresponding recess on the compressor.

DN25 + "Screwed Style" - diaphragms are assembled by screwing the diaphragm stud into the corresponding female thread on the compressor.

Standard PTFE Diaphragms - DN15-200 two piece diaphragms are assembled by rotating the bayonet connection on the diaphragm 90°

PTFE diaphragms also available include - One piece laminated diaphragms DN15-50 and DN250-300 with screwed connection, and two piece with screwed connection DN15-250.

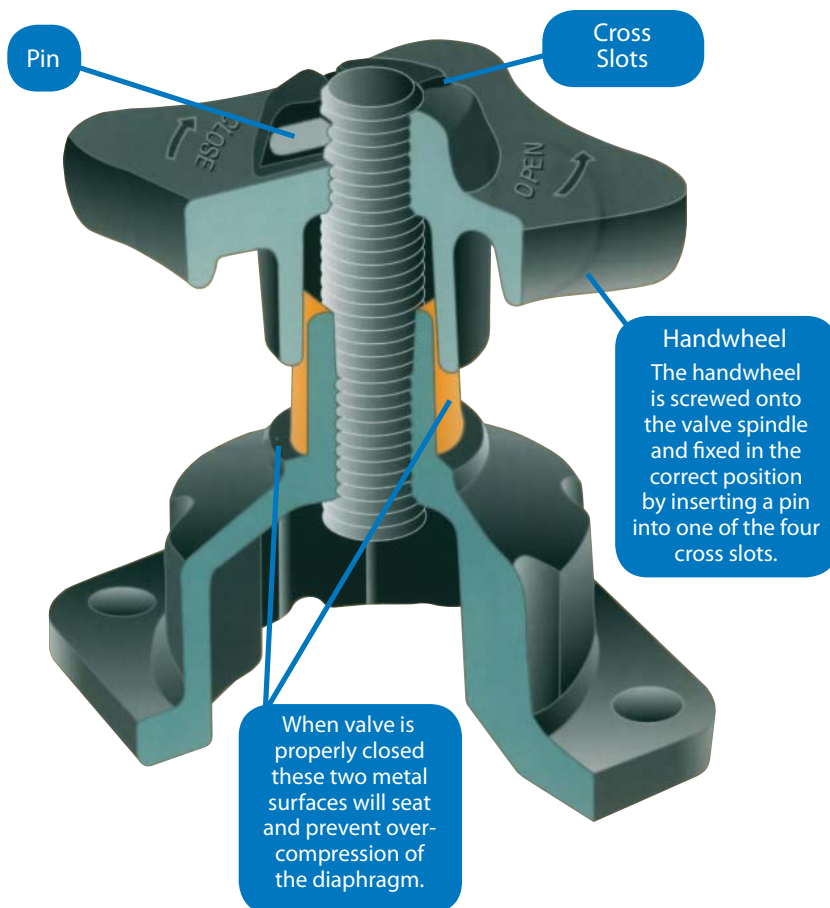
## Assembly of Diaphragms

Screw the threaded stud into the compressor and turn, tightening completely. Rotate back counter-clockwise to align the holes. Bonnet and diaphragm are then ready to be assembled onto the body by tightening the bolts diagonally and evenly. Torque levels for each size can be found in the Installation and Maintenance Manual.



"Screwed Style" diaphragm - DN 150

## KDV<sup>®</sup> OVER-CLOSURE PROTECTED BONNET



Stem sealed handwheel



Non-rising handwheel



Lockable rising handwheel



Lockable rising handwheel



FBE/nylon coated rising handwheel body

### Bonnet/Operator variations

- Chain-wheel adapted bonnet for valves in elevated positions – fitted with chain wheel, guides and chain to suit the “drop” required.
- Extension Spindle for valves in inaccessible positions – can be single straight extension or fitted with single/multiple universal joints and/or fitted with key operation for pit environment.
- Sealed bonnet assembly fitted with FKM O-Ring spindle seals
- Stainless Steel bonnet assemblies in Non Rising handwheel configuration for environmental corrosion applications with OH&S lockout system as an option. Larger sizes fitted with ball thrust bearing on handwheel.
- Plastic bonnets and SS/Plastic bonnets for environmental corrosive/high temperature services.
- Sliding spindle bonnet assemblies to suit adaptation to specific automation systems – cylinders, diaphragm actuators
- Automation systems – KDV actuators in various configurations with many accessories to suit control and automated isolation valve applications using pneumatic or electric actuators.
- Normally Closed/Open and Double Acting diaphragm operated pneumatic actuators in various materials – plastics, cast iron, stainless steel or steel, fitted with accessories such as limit stops, visual position indication, emergency handwheel over-ride device, mechanical or proximity switches, pneumatic and electro pneumatic positioners.

Overclosure adjustment in five easy steps..



Remove handwheel pin.



Turn handwheel anti-clockwise one turn.



Insert a piece of steel wire.



Close valve tightly and remove steel wire.



Turn handwheel clockwise until sleeve seats on bonnet rim and re-insert handwheel pin.



Issued 23/04/2010. Specifications are subject to change without notice.