

**BioClean®**

## Sterile Diaphragm Valves

In line with ASME BPE standard



**KL KINGLAI**

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## Global leader of hygienic materials and equipment

As a leading manufacturer of Sanitary pipes, fittings, valves, pumps, pressure vessels, and other types of equipment, KINGLAI Group is committed to R&D and production of safer, reliable, and Sanitary applied materials and products. Our 30 years of accumulation and experiences enable all-around services for customers, which are well acknowledged in the market.

BioClean is a whole new sub-brand of KINGLAI Group in sterile diaphragm valves and sanitary pumps. The products are widely applied in biopharmacy, water for injection (WFI), personal care, and microelectronic semiconductors. Dedicated itself into more reliable products, Bioclean will promote the progress in environment, science, and health.

## Second-generation sterile diaphragm valve

The hand-wheel position-limit device will enable flexible use of valves. Meanwhile, a clear mark of the closing position of valves can avoid short service life of diaphragms caused by over-tightening.

With abundant and flexible options in accessories and automation components, Bioclean sterile diaphragm valves are an ideal control product. In addition to standard parts, we also provide diversified customized solutions, such as bottom tank valves, multi-path valves, and SAP/GMP valves.



# General Introduction

As one of the most common valves used in pharmaceutical engineering, sterile diaphragm valves are ideal for applications that require zero bacteria breeding as well as high cleaning and sterilization performance. Compared with valve products such as ball valves and butterfly valves, diaphragm valves with static seals use sealing elements free of wearing and a structure without dead angles, thus being more sanitary and durable.

As an ideal choice in bio-pharmaceuticals and other applications with demanding sanitary conditions, Kinglai's BioClean series sterile diaphragm valves comply with ASME BPE Design Standards and CGMP (Current Good Manufacturing Practice), and also have passed 3A Sanitary Standards Certification.



Our sterile diaphragm valves feature completely transparent production process, which is fully traceable from stainless steel base metal to valve diaphragm and gasket. Each valve has passed strict performance tests before delivery to ensure excellent product performance and complete verification from beginning to end.

Kinglai sterile diaphragm valves cover KDV series straight-through diaphragm valves, KDV-T type diaphragm valves, KDV-TU water diaphragm valves, KDV-MU U-type diaphragm valves, KDMP multi-way diaphragm valves, KGMP SAP\GMP diaphragm valves and KTBV bottom diaphragm valves.



## Product Features:



### Advantages of Sealing Technology

30 years' service experience gives Kinglai reliable technical resources and extensive application experience, which allow us to provide you with more reasonable suggestions for the selection of elastic seals to meet the application requirements of various working conditions.

Thanks to continuous and deep cooperation with international manufacturers, the diaphragms of our diaphragm valves boast better thermal stability, ductility, chemical stability and fatigue resistance, thus being more reliable and durable.



### High Compatibility

Kinglai valves can be configured with a variety of connections, including welded type and ferrule type quick disconnect couplings, and are suitable for pipes of all sizes that meet ASME BPE, 3A, ISO, DIN, BS, JIS and other standards, thus ensuring high quality and reliable use anywhere in the pipeline system.



### Strict Sanitary Standards

While complying with ASME BPE Sterile Diaphragm Valve Design Standards, Kinglai's sterile diaphragm valves are manufactured by electrolytic polishing. They satisfy EN 10204 3.1/MTR Traceability Standards, Declaration of Conformity with FDA, USP Class VI Certification and 3A Sanitary Standards Certification, all of which ensure product contamination control.



### Advantages of Valve Body

Kinglai firmly believes that strong and stable manufacturing capability serves as the cornerstone of product quality, while strict inspections and tests ensure service life. Decades of accumulations in manufacturing technologies enable Kinglai to ensure that the surface finish of valves can reach up to 0.375µm (BPE SF4) without any wave. Delicately polished surface is the most direct defence for the valves to prevent bacterial contamination.

# KDV sterile diaphragm valve

## Design and Structure

### Modular Design

With modular structure design, the BioClean series sterile diaphragm valves can meet various demands.

The valves are composed of the following components:

- Controller
- Actuator
- Diaphragm
- Valve body

|            |   |
|------------|---|
| Controller |  Feedback device  Positioner  |
| Actuator   |  Stainless steel  Composite material  Aluminum alloy  Stainless steel  Composite material  Composite material |
| Diaphragm  |  EPDM  EPDM+TFM   |
| Valve body |  Straight-through type  T-type  Multi-way  SAP / GMP  Bottom valve  |

## Optional Configurations



Generally, the BioClean series pneumatic sterile diaphragm valves can be used in conjunction with the feedback device or valve positioner.

As for the BioClean series pneumatic sterile diaphragm valve equipped with valve positioner, the real-time feedback of valve opening can be achieved. Meanwhile, the valve's opening position (travel percentage) can be adjusted via remote PLC control or direct adjustment on the automatic regulator, thus realizing precise control over the valve.

The BioClean series multi-way sterile diaphragm valves allow customized design and processing of valve bodies on request. These valve bodies are made by forging and fine machining. Multi-way diaphragm valves can effectively reduce the overall space of the pipeline system, and are easier to clean and discharge.



### Option

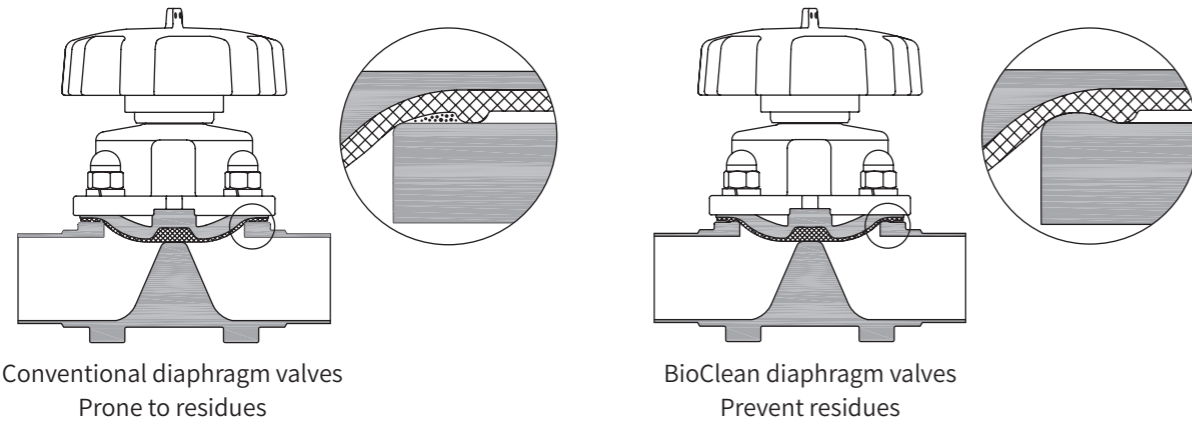
|                                  |  |                               |   |
|----------------------------------|--|-------------------------------|---|
| <b>Standards for connections</b> | DIN, ISO, 3A, BPE  | <b>Material of valve body</b> | 316L  |
| <b>Mode of connections</b>       | Welded type, ferrule type or welded and ferrule type                   | <b>Process of valve body</b>  | Casting or forging                                |
| <b>Size</b>                      | 1/4" - 3"  | <b>Material of seal</b>       | EPDM, EPDM+TFM                                    |
| <b>Form of valve body</b>        | Straight-through type, T-type, multi-way type, SAP\GMP or bottom valve | <b>Polishing</b>              | Electrolytic polishing                            |
| <b>Driver</b>                    | Manual, pneumatic NC (default) or double acting                        | <b>Controller</b>             | Solenoid valve, travel switch or valve positioner |

1. Please contact us for purchase of SAP/GMP diaphragm valves and multi-way diaphragm valves.
2. If the valves with feedback device are to be used in risky areas, please specify the explosive-proof grade.

# KDV sterile diaphragm valve

## Diaphragm

### Design of Diaphragm



Unlike that of conventional diaphragm valves, the bodies of BioClean series sterile diaphragm valves have a tight seal on the inside diameter that reduces the ring clearance between the diaphragm and the valve body. This feature makes the BioClean series diaphragm valves particularly suitable for aseptic process.

### Material of Diaphragm

Two options are provided for the material of diaphragms: EPDM soft artificial rubber and TFM rigid artificial rubber. Single or double diaphragm designs are available.

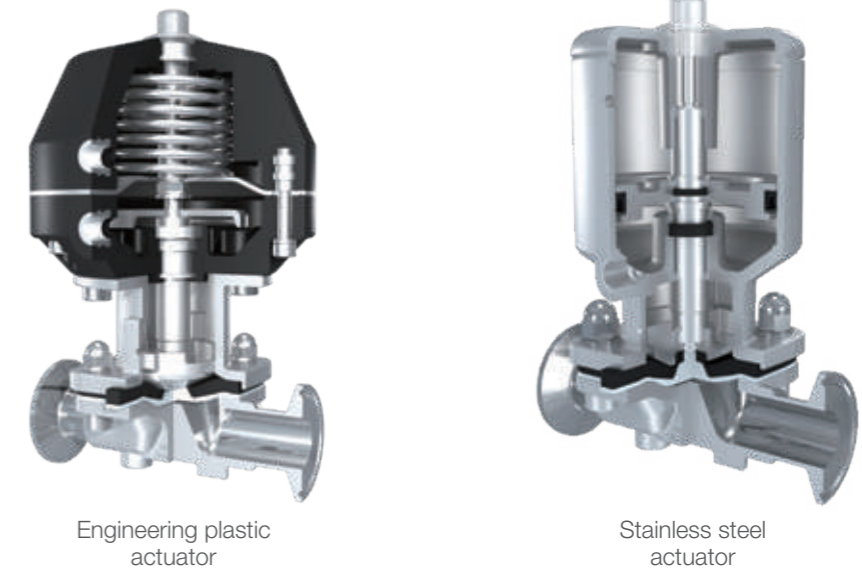
The double diaphragm design allows two diaphragms to work independently, thus reducing the tension caused by different thermal properties. As each application has different working conditions, different requirements are put forward for the diaphragms. In order to select the most suitable diaphragms, the following factors need to be considered: working pressure, application temperature and process fluid. EPDM is suitable for most application conditions, but some high temperature conditions require diaphragms made of TFM materials.



### Certificate of Material

Declaration of Conformity with FDA (CFR 21:177.2600 or 177.1550)  
USP Class VI Certification

## Selection of actuators



The BioClean series sterile diaphragm valves are available with hand wheels or air cylinders made from various materials.

Drive hand wheels or pneumatic actuators made from composite engineering plastics can meet your demands in most general working conditions, while stainless steel actuators are a good choice in case of small installation space, compact valve structure or high cleaning requirements for the outer parts of the valve.

PP, PC, stainless steels and aluminum alloy materials are optional.



| Material | PP     |            | PC         |        | Stainless steel |   | Aluminum alloy |
|----------|--------|------------|------------|--------|-----------------|---|----------------|
|          | Driver | Hand wheel | Hand wheel | Driver | Driver          |   |                |
| 1/4"     |        | ●          |            | ●      |                 |   |                |
| 3/8"     |        | ●          |            | ●      |                 |   |                |
| 1/2"     |        | ●          |            | ●      |                 |   |                |
| 3/4"     |        |            | ●          | ●      |                 |   |                |
| 1.0"     | ●      |            | ●          | ●      |                 |   |                |
| 1 1/2"   | ●      |            | ●          | ●      |                 |   |                |
| 2.0"     | ●      |            | ●          | ●      |                 |   |                |
| 2 1/2"   |        |            |            | ●      |                 | ● |                |
| 3.0"     |        |            |            | ●      |                 | ● |                |

# KDV sterile diaphragm valve

## Valve Body



Kinglai provides all kinds of high quality valve bodies that are widely accepted. Two manufacturing methods are optional, i.e. casting and forging, with strict control of ferrite content and sulfur content.

The diaphragm valve bodies manufactured by casting forming enjoy good cost-effectiveness and the quality materials selected according to American Standards allow better versatility.

The valve bodies produced by forging forming and precision machining boast extremely compact structure and better chemical stability. In terms of surface oxidation resistance and long-term anti-corrosion performance, forged bodies have significant advantages to guarantee the high quality of the products during long-term usage.

| Form of valve body | Cast type | Forged type | Forged block |
|--------------------|-----------|-------------|--------------|
| Two-way valve      | ●         | ●           |              |
| T-type valve       | ●         | ●           | ●            |
| Tandem valve       | ●         | ●           | ●            |
| Multi-way valve    |           |             | ●            |

| Type            | Cast type   | Forged type / Forged block |
|-----------------|-------------|----------------------------|
| Material        | CF3M (316L) | 1.4435 (316L)              |
| Ferrite content | < 15%       | < 0.5%                     |
| Sulfur content  | < 0.04%     | 0.005-0.017%               |

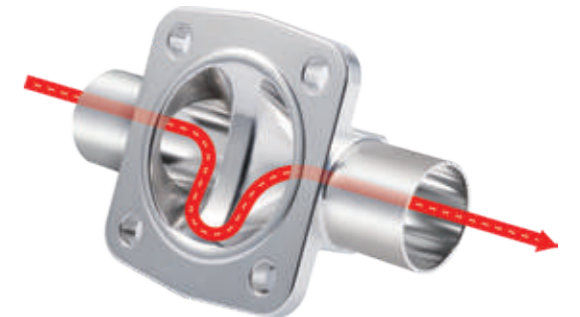
EN 10204 3.1/ MTR Traceability Certificate

## Self-discharge of Valves

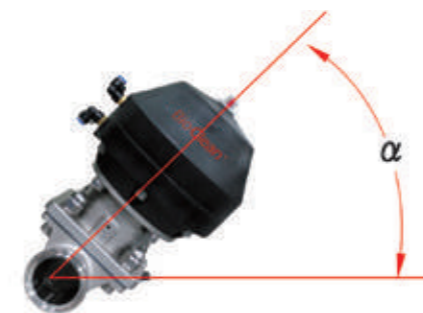
The BioClean series sterile diaphragm valves have excellent self-discharge performance and are capable of maintaining excellent self-discharge capability in both horizontal and vertical mountings. It is necessary for the pipeline designers and users to cooperate to make use of the self-discharge characteristics.

The factors that influence self-discharge:

- Valve dimension and pipeline specification
- Surface finish and treatment method (Ra)
- Discharge direction
- Surface tension and viscosity of medium
- Design inclination angle of pipeline - recommended angle 2~3°

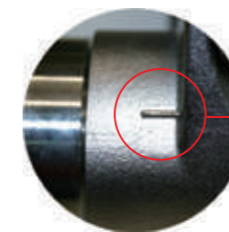


### Self-discharge Mounting



Self-discharge angle

During mounting, the marks at both ends of the valve body shall be set with correct angle to optimize self-discharge performance.



During mounting, this mark shall be horizontal and facing upward.

### Table of self-discharge angles

| Size | 1/4"  | 3/8"  | 1/2" | 3/4" | 1.0"  | 1 1/2" | 2.0"  | 2 1/2" | 3.0" |
|------|-------|-------|------|------|-------|--------|-------|--------|------|
| α    | 32.5° | 23.5° | 21°  | 20°  | 29.2° | 25°    | 18.2° | 27°    | 19°  |

# KDV Sterile diaphragm valve



## Application

KDV Sterile diaphragm valves produced by King Lai can meet the production process with cleanness and sterilization requirements. The product is widely applied in medicine, food and bio-pharmacy, as well as sectors of semiconductors, microelectronics, personal care, water for injection, and other industries.

## Features

- The valves bodies are available in casting and forging, and can meet demands of different customers.
- The specifications are complete, available from DN4 ~ DN80.
- The diaphragm is made of materials with corrosion resistance and in line with the certification of FDA and USP24 class 6.
- The protrusions around the valves body and the prominent part of the diaphragm are closely matched with each other to ensure that the diaphragm can be tightly sealed with the valve body in the open or closed state. Such structure, in line with EHEDG design standards, can achieve zero residual and is easy to clean.
- The normally-closed structure of diaphragm ensures easier manual switching.
- The rotary hand-wheel can achieve protection of excessive closing via the adjustable limit nut, and ensure that the diaphragm has a pre-set closing pressure to optimize the sealing safety and extend the life of the diaphragm.
- The red switching indicator between the hand-wheel and the cover can show the state and degree of openness/closing of the valves.
- The solenoid valves, position feedback or position regulator can be installed on the pneumatic valves at consumer's request to realize automatic control or flow control of the valves.

## Technical Data

| Items              | Details  |
|--------------------|--|
| Actuator           | Manual<br>Pneumatic normally closed (NC) / Double acting (DA)              |
| Control            | Feedback device/ adjustment positioner/ cylindrical position sensor        |
| Body material      | CF3M (316L), 1.4435 (316L)   |
| Diaphragm material | EPDM, EPDM+TFM   |
| Size               | DN4 – DN80   |
| Connections        | Butt-weld, Clamp, Weld/clamp<br>ASME BPE, 3A, ISO, DIN                     |
| Surface finish     | Outer surface sand blasted<br>Inner surface Ra≤0.5µm(SF1), Ra≤0.375µm(SF4) |
| Certifications     | 3A, CE   |

|                             |                     | Size             | DN4~DN50               | DN65/DN80   |
|-----------------------------|---------------------|------------------|------------------------|-------------|
| <b>Working temperature</b>  | EPDM                | Max. pressure    | 10bar                  | 8bar        |
|                             |                     | Max. temperature | -10°C~130°C, 14~212°F  |             |
|                             |                     | SIP              | 150°C, 302°F max.60min |             |
|                             | EPDM+TFM            | Max. pressure    | 6bar, 87psi            | 5bar, 72psi |
|                             |                     | Max. temperature | -10°C~150°C, 14~212°F  |             |
|                             |                     | SIP              | 150°C, 302°F no.limit  |             |
| <b>Pneumatic pressure</b>   | Normally close (NC) | 5-6bar, 72-87psi | 5-7bar, 72-101psi      |             |
|                             | Normally open (NO)  | 5.5bar, 79psi    |                        |             |
|                             | Double action (DA)  | 5.5bar, 79psi    |                        |             |
| <b>Pneumatic connection</b> |                     | G1/8"            | G1/4"                  |             |

If the sterilisation temperatures listed above are applied to the EPDM or TFM diaphragms for longer periods of time, the service life of the diaphragms will be reduced. In these cases, maintenance cycles must be adapted accordingly.

TFM diaphragms can also be used as steam barriers; however, this will reduce their service life. The maintenance cycles must be adapted accordingly.

| Types           | Casting     | Forging, Forged block |
|-----------------|-------------|-----------------------|
| Material        | CF3M (316L) | 1.4435 (316L)         |
| Ferrite         | < 15%       | < 0.5%                |
| Sulfur contents | < 0.04%     | 0.005-0.017%          |

Compliance with EN 10204 3.1/MTR traceability certificate  
 FDA-FDA Declaration of Conformity (CFR 21:177.2600 or 177.1550)  
 Compliance Certificate for USP-USP VI Category



**KDV-M100-1**  
Manual diaphragm valves with welding ends

| Code           | Size | A    | B    | D  | T   | H    | L  |  |
|----------------|------|------|------|----|-----|------|----|--|
| 1558100-000025 | ¼"   | 6.35 | 4.57 | 33 | 4.5 | 58   | 61 |  |
| 1558100-000038 | ⅜"   | 9.53 | 7.75 | 33 | 4.5 | 58   | 61 |  |
| 1558100-000050 | ½"   | 12.7 | 9.4  | 33 | 4.5 | 63.5 | 61 |  |

**KDV-M100-2**  
Manual diaphragm valves with welding ends

| Code           | Size | A    | B    | D   | T    | H     | L   |  |
|----------------|------|------|------|-----|------|-------|-----|--|
| 1558100-000075 | ¾"   | 19.1 | 15.8 | 60  | 6    | 79.5  | 113 |  |
| 1558100-000100 | 1.0" | 25.4 | 22.1 | 90  | 11   | 103.5 | 127 |  |
| 1558100-000150 | 1½"  | 38.1 | 34.8 | 110 | 15.5 | 129.8 | 159 |  |
| 1558100-000200 | 2.0" | 50.8 | 47.5 | 128 | 20.5 | 153   | 190 |  |

**KDV-M100-3**  
Manual diaphragm valves with welding ends

| Code           | Size | A    | B    | D   | T  | H   | L   |  |
|----------------|------|------|------|-----|----|-----|-----|--|
| 1558100-000250 | 2½"  | 63.5 | 60.2 | 200 | 44 | 264 | 250 |  |
| 1558100-000300 | 3"   | 76.2 | 72.9 | 200 | 44 | 269 | 250 |  |

**KDV-M200-1**  
Manual diaphragm valves with weld/clamp ends

| Code           | Size | A    | B    | C    | D  | T   | H    | L  |  |
|----------------|------|------|------|------|----|-----|------|----|--|
| 1558200-000025 | ¼"   | 6.35 | 4.57 | 25   | 33 | 4.5 | 58   | 62 |  |
| 1558200-000038 | ⅜"   | 9.53 | 7.75 | 25   | 33 | 4.5 | 58   | 62 |  |
| 1558200-000050 | ½"   | 12.7 | 9.4  | 25.0 | 33 | 4.5 | 63.5 | 62 |  |

**KDV-M200-2**  
Manual diaphragm valves with welding /clamp ends

| Code           | Size | A    | B    | C    | D   | T    | H     | L   |  |
|----------------|------|------|------|------|-----|------|-------|-----|--|
| 1558200-000075 | ¾"   | 19.1 | 15.8 | 25.0 | 60  | 6    | 79.5  | 115 |  |
| 1558200-000100 | 1.0" | 25.4 | 22.1 | 50.4 | 90  | 11   | 103.5 | 127 |  |
| 1558200-000150 | 1½"  | 38.1 | 34.8 | 50.4 | 110 | 15.5 | 129.8 | 159 |  |
| 1558200-000200 | 2.0" | 50.8 | 47.5 | 63.9 | 128 | 20.5 | 153   | 190 |  |

**KDV-M200-3**  
Manual diaphragm valves with welding /clamp ends

| Code           | Size | A    | B    | C    | D   | T  | H   | L   |  |
|----------------|------|------|------|------|-----|----|-----|-----|--|
| 1558200-000250 | 2½"  | 63.5 | 60.2 | 77.5 | 200 | 44 | 264 | 250 |  |
| 1558200-000300 | 3.0" | 76.2 | 72.9 | 90.9 | 200 | 44 | 269 | 250 |  |

**KDV-M300-1**  
Manual diaphragm valves with clamp ends

| Code           | Size | C  | D  | T   | H    | L  |  |
|----------------|------|----|----|-----|------|----|--|
| 1558300-000025 | 1/4" | 25 | 33 | 4.5 | 58   | 63 |  |
| 1558300-000038 | 3/8" | 25 | 33 | 4.5 | 58   | 63 |  |
| 1558300-000050 | 1/2" | 25 | 33 | 4.5 | 63.5 | 63 |  |

**KDV-M300-2**  
Manual diaphragm valves with clamp ends

| Code           | Size   | C    | D   | T    | H     | L   |  |
|----------------|--------|------|-----|------|-------|-----|--|
| 1558300-000075 | 3/4"   | 25   | 60  | 6    | 79.5  | 117 |  |
| 1558300-000100 | 1.0"   | 50.4 | 90  | 11   | 103.5 | 127 |  |
| 1558300-000150 | 1 1/2" | 50.4 | 110 | 15.5 | 129.8 | 159 |  |
| 1558300-000200 | 2.0"   | 63.9 | 128 | 20.5 | 153   | 190 |  |

**KDV-M300-3**  
Manual diaphragm valves with clamp ends

| Code           | Size   | C    | D   | T  | H   | L   |  |
|----------------|--------|------|-----|----|-----|-----|--|
| 1558300-000250 | 2 1/2" | 77.5 | 200 | 44 | 264 | 250 |  |
| 1558300-000300 | 3.0"   | 90.9 | 200 | 44 | 269 | 250 |  |

**KDV-P120**  
Pneumatic diaphragm valves with Welding ends

| Code           | Size   | A    | B    | D   | H   | L   |  |
|----------------|--------|------|------|-----|-----|-----|--|
| 1558120-000025 | 1/4"   | 6.35 | 4.57 | 45  | 101 | 61  |  |
| 1558120-000038 | 3/8"   | 9.53 | 7.75 | 45  | 101 | 61  |  |
| 1558120-000050 | 1/2"   | 12.7 | 9.4  | 45  | 101 | 61  |  |
| 1558120-000075 | 3/4"   | 19.1 | 15.8 | 60  | 127 | 113 |  |
| 1558120-000100 | 1.0"   | 25.4 | 22.1 | 89  | 162 | 127 |  |
| 1558120-000150 | 1 1/2" | 38.1 | 34.8 | 112 | 193 | 159 |  |
| 1558120-000200 | 2.0"   | 50.8 | 47.5 | 142 | 227 | 190 |  |

Stainless steel actuator has a smaller diameter and easier to install.

**KDV-P160-1**  
Pneumatic diaphragm valves with welding ends (plastic actuator)

| Code           | Size   | A    | B    | D   | H   | L   |  |
|----------------|--------|------|------|-----|-----|-----|--|
| 1558160-000100 | 1.0"   | 25.4 | 22.1 | 128 | 188 | 127 |  |
| 1558160-000150 | 1 1/2" | 38.1 | 34.8 | 164 | 227 | 159 |  |
| 1558160-000200 | 2.0"   | 50.8 | 47.5 | 164 | 227 | 190 |  |

**KDV-P160-2**  
Pneumatic diaphragm valves with welding ends (aluminum actuator)

| Code           | Size   | A    | B    | D   | H     | L   |  |
|----------------|--------|------|------|-----|-------|-----|--|
| 1558160-000250 | 2 1/2" | 63.5 | 60.2 | 193 | 311.6 | 250 |  |
| 1558160-000300 | 3"     | 76.2 | 72.9 | 193 | 311.6 | 250 |  |

**KDV-P220**  
Pneumatic diaphragm valves with welding/clamp ends (Stainless steel actuator)

| Code           | Size | A    | B    | C    | D   | H   | L   |
|----------------|------|------|------|------|-----|-----|-----|
| 1558220-000025 | ¼"   | 6.35 | 4.57 | 25.0 | 45  | 101 | 62  |
| 1558220-000038 | ⅜"   | 9.53 | 7.75 | 25.0 | 45  | 101 | 62  |
| 1558220-000050 | ½"   | 12.7 | 9.4  | 25.0 | 45  | 101 | 62  |
| 1558220-000075 | ¾"   | 19.1 | 15.8 | 25.0 | 60  | 127 | 115 |
| 1558220-000100 | 1.0" | 25.4 | 22.1 | 50.4 | 89  | 162 | 127 |
| 1558220-000150 | 1½"  | 38.1 | 34.8 | 50.4 | 112 | 193 | 159 |
| 1558220-000200 | 2.0" | 50.8 | 47.5 | 63.9 | 142 | 227 | 190 |

Stainless steel actuator has a smaller diameter and easier to install.

**KDV-P260-1**  
Pneumatic diaphragm valves with welding/clamp ends (plastic actuator)

| Code           | Size | A    | B    | C    | D   | H   | L   |
|----------------|------|------|------|------|-----|-----|-----|
| 1558260-000100 | 1.0" | 25.4 | 22.1 | 50.4 | 89  | 188 | 127 |
| 1558260-000150 | 1½"  | 38.1 | 34.8 | 50.4 | 112 | 227 | 159 |
| 1558260-000200 | 2.0" | 50.8 | 47.5 | 63.9 | 142 | 227 | 190 |

**KDV-P260-2**  
Pneumatic diaphragm valves with welding/clamp ends (Aluminum alloy actuator)

| Code           | Size | A    | B    | C    | D   | H     | L   |
|----------------|------|------|------|------|-----|-------|-----|
| 1558260-000250 | 2½"  | 63.5 | 60.2 | 77.5 | 193 | 311.6 | 250 |
| 1558260-000300 | 3"   | 76.2 | 72.9 | 90.9 | 193 | 311.6 | 250 |

**KDV-P320**  
Pneumatic diaphragm valves with Clamp ends (Stainless steel actuator)

| Code           | Size | C    | D   | H   | L   |
|----------------|------|------|-----|-----|-----|
| 1558320-000025 | ¼"   | 25   | 45  | 101 | 63  |
| 1558320-000038 | ⅜"   | 25   | 45  | 101 | 63  |
| 1558320-000050 | ½"   | 25   | 45  | 101 | 63  |
| 1558320-000075 | ¾"   | 25   | 60  | 127 | 117 |
| 1558320-000100 | 1.0" | 50.4 | 89  | 162 | 127 |
| 1558320-000150 | 1½"  | 50.4 | 112 | 193 | 159 |
| 1558320-000200 | 2.0" | 63.9 | 142 | 227 | 190 |

Stainless steel actuator has a smaller diameter and easier to install.

**KDV-P360-1**  
Pneumatic diaphragm valves with clamp ends (plastic actuator)

| Code           | Size | C    | D   | H   | L   |
|----------------|------|------|-----|-----|-----|
| 1558360-000100 | 1.0" | 50.4 | 89  | 188 | 127 |
| 1558360-000150 | 1½"  | 50.4 | 112 | 227 | 159 |
| 1558360-000200 | 2.0" | 63.9 | 142 | 227 | 190 |

**KDV-P360-2**  
Pneumatic diaphragm valves with clamp ends (Aluminum alloy actuator)

| Code           | Size | C    | D   | H     | L   |
|----------------|------|------|-----|-------|-----|
| 1558360-000250 | 2½"  | 77.5 | 193 | 311.6 | 250 |
| 1558360-000300 | 3.0" | 90.9 | 193 | 311.6 | 250 |

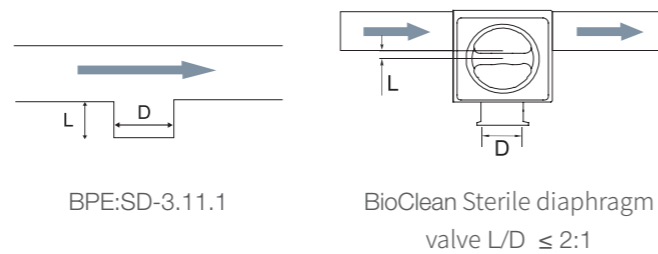
# KDV-T Sterile forging diaphragm valve



Design of valves body:  
Precisely forged blocks

## Features

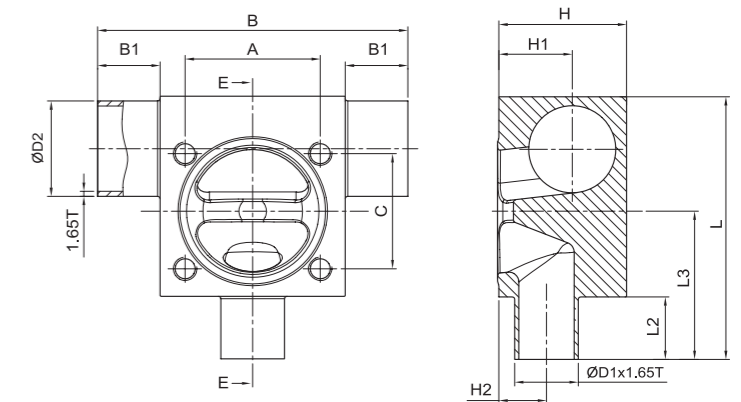
- Compact structure, fully self-drained, and without dead corners.
- In terms of surface oxidation resistance and long-term anti-corrosion performance, forged bodies have significant advantages.
- Integrated and art-of-the-state processing to ensure safe and reliable installation.
- Compact Structure that is Compliant with ASME BPE structural design, thereby avoiding the bacterial breeding hazard caused by the presence of fluid retention zone in the mouth.



## Technical Data

| Items               | Details  |
|---------------------|--|
| Working pressure    | 0-10bar, 145psi (EPDM)<br>0-7bar, 101psi (PTFE)            |
| Working temperature | -10~100°C , SIP max. 150°C                                 |
| Driving structure   | Manual / pneumatic control                                 |
| Body design         | OEM/ODM  |
| Body material       | 1.4435 (316L), forging block                               |
| Surface finish      | External sand blasting<br>Internal surface Ra≤0.375μm(SF4) |
| Connections         | Butt-Weld, Clamp<br>ISO, DIN, ASME BPE, 3A                 |

## KDV-T Sterile forging diaphragm valve



## KDV-T5

| NO.              | D1   | D2   |
|------------------|------|------|
| 1558500-10005002 | 12.7 | 25.4 |
| 1558500-10007502 | 19.1 | 25.4 |
| 1558500-10010002 | 25.4 | 25.4 |
| 1558500-15007502 | 19.1 | 38.1 |
| 1558500-15010002 | 25.4 | 38.1 |
| 1558500-20010002 | 25.4 | 50.8 |
| 1558500-20015002 | 38.1 | 50.8 |

| A    | B     | B1   | C    | D    | H    | H1   | H2   | L     | L1   | L2   | L3   | M   |
|------|-------|------|------|------|------|------|------|-------|------|------|------|-----|
| 22.0 | 82.0  | 25.0 | 22.0 | 6.0  | 35.0 | 20.0 | 8.5  | 66.0  | 15.3 | 20.0 | 36.0 | M4  |
| 44.5 | 114.5 | 25.0 | 39.7 | 10.0 | 38.0 | 23.5 | 19.0 | 93.0  | 17.9 | 25.0 | 55.0 | M6  |
| 54.0 | 124.0 | 25.0 | 46.0 | 10.0 | 38.0 | 23.5 | 19.0 | 93.0  | 17.9 | 25.0 | 59.0 | M8  |
| 39.7 | 100.0 | 25.0 | 44.5 | 8.0  | 48.0 | 27.7 | 12.5 | 97.0  | 23.5 | 25.0 | 53.0 | M6  |
| 54.0 | 124.0 | 25.0 | 46.0 | 10.0 | 51.0 | 29.9 | 19.0 | 105.0 | 25.0 | 25.0 | 59.0 | M8  |
| 54.0 | 134.0 | 30.0 | 46.0 | 10.0 | 64.0 | 36.2 | 19.0 | 118.0 | 32.0 | 25.0 | 59.0 | M8  |
| 70.0 | 162.0 | 30.0 | 65.0 | 10.0 | 66.0 | 39.1 | 26.0 | 133.0 | 34.1 | 25.0 | 71.0 | M10 |

# KDV-T Sterile casting diaphragm valve



### Features

- Compact structure, fully self-drained, and without dead corners.
- Advanced casting technology, the cast body ferrite content is strictly controlled within the standard range.
- Integrated and art-of-the-state processing to ensure safe and reliable installation.
- The size of the main pipe is larger than that of the branches to ensure the circulation of the main pipeline.
- Applicable to high-purity water system, drainages and taps.

### KDV-T600 (welding & clamp ends)

| NO.            | D    | D1   | D2   | T    | H     | L   |
|----------------|------|------|------|------|-------|-----|
| 1558600-075050 | 25   | 9.4  | 12.7 | 1.65 | 44.5  | 72  |
| 1558600-075075 | 25   | 15.8 | 19.1 | 1.65 | 64.8  | 101 |
| 1558600-100050 | 25   | 9.4  | 25.4 | 1.65 | 51.3  | 82  |
| 1558600-100075 | 25   | 15.8 | 25.4 | 1.65 | 68.5  | 101 |
| 1558600-100100 | 50.4 | 22.1 | 25.4 | 1.65 | 76.9  | 125 |
| 1558600-150050 | 25   | 9.4  | 38.1 | 1.65 | 59.5  | 82  |
| 1558600-150075 | 25   | 15.8 | 38.1 | 1.65 | 75.5  | 101 |
| 1558600-150100 | 50.4 | 22.1 | 38.1 | 1.65 | 84    | 124 |
| 1558600-150150 | 50.4 | 34.8 | 38.1 | 1.65 | 98.1  | 150 |
| 1558600-200050 | 25   | 9.4  | 50.8 | 1.65 | 66.6  | 92  |
| 1558600-200175 | 25   | 15.8 | 50.8 | 1.65 | 82.6  | 111 |
| 1558600-200100 | 50.4 | 22.1 | 50.8 | 1.65 | 92    | 134 |
| 1558600-200150 | 50.4 | 34.8 | 50.8 | 1.65 | 105.1 | 160 |
| 1558600-200200 | 63.9 | 47.5 | 50.8 | 1.65 | 120.3 | 176 |
| 1558600-250050 | 25   | 9.4  | 63.5 | 1.65 | 73.6  | 92  |
| 1558600-250075 | 25   | 15.8 | 63.5 | 1.65 | 89.6  | 111 |
| 1558600-250100 | 50.4 | 22.1 | 63.5 | 1.65 | 98.1  | 135 |
| 1558600-250150 | 50.4 | 34.8 | 63.5 | 1.65 | 112.2 | 160 |

### KDV-T500 (welding & welding ends)

| NO.            | D    | D1   | D2   | T    | H     | L   |
|----------------|------|------|------|------|-------|-----|
| 1558500-075050 | 12.7 | 9.4  | 12.7 | 1.65 | 42.5  | 72  |
| 1558500-075075 | 19.1 | 15.8 | 19.1 | 1.65 | 62.8  | 101 |
| 1558500-100050 | 12.7 | 9.4  | 25.4 | 1.65 | 49.3  | 82  |
| 1558500-100075 | 19.1 | 15.8 | 25.4 | 1.65 | 66.5  | 101 |
| 1558500-100100 | 25.4 | 22.1 | 25.4 | 1.65 | 76.9  | 125 |
| 1558500-150050 | 12.7 | 9.4  | 38.1 | 1.65 | 57.5  | 82  |
| 1558500-150075 | 19.1 | 15.8 | 38.1 | 1.65 | 73.5  | 101 |
| 1558500-150100 | 25.4 | 22.1 | 38.1 | 1.65 | 84    | 124 |
| 1558500-150150 | 38.1 | 34.8 | 38.1 | 1.65 | 98.1  | 150 |
| 1558500-200050 | 12.7 | 9.4  | 50.8 | 1.65 | 64.6  | 92  |
| 1558500-200175 | 19.1 | 15.8 | 50.8 | 1.65 | 80.6  | 111 |
| 1558500-200100 | 25.4 | 22.1 | 50.8 | 1.65 | 92    | 134 |
| 1558500-200150 | 38.1 | 34.8 | 50.8 | 1.65 | 105.1 | 160 |
| 1558500-200200 | 50.8 | 47.5 | 50.8 | 1.65 | 120.3 | 176 |
| 1558500-250050 | 12.7 | 9.4  | 63.5 | 1.65 | 71.6  | 92  |
| 1558500-250075 | 19.1 | 15.8 | 63.5 | 1.65 | 87.6  | 111 |
| 1558500-250100 | 25.4 | 22.1 | 63.5 | 1.65 | 98.1  | 135 |
| 1558500-250150 | 38.1 | 34.8 | 63.5 | 1.65 | 112.2 | 160 |

### KDV-T400 (clamp ends)

| NO.            | D    | D1   | D2   | D3   | H     | L   |
|----------------|------|------|------|------|-------|-----|
| 1558400-075050 | 25   | 9.4  | 9.4  | 25   | 44.5  | 72  |
| 1558400-075075 | 25   | 15.8 | 15.8 | 25   | 64.8  | 101 |
| 1558400-100050 | 25   | 9.4  | 22.1 | 50.4 | 51.3  | 82  |
| 1558400-100075 | 25   | 15.8 | 22.1 | 50.4 | 68.5  | 101 |
| 1558400-100100 | 50.4 | 22.1 | 22.1 | 50.4 | 76.9  | 125 |
| 1558400-150050 | 25   | 9.4  | 34.8 | 50.4 | 59.5  | 82  |
| 1558400-150075 | 25   | 15.8 | 34.8 | 50.4 | 75.5  | 101 |
| 1558400-150100 | 50.4 | 22.1 | 34.8 | 50.4 | 84    | 124 |
| 1558400-150150 | 50.4 | 34.8 | 34.8 | 50.4 | 98.1  | 150 |
| 1558400-200050 | 25   | 9.4  | 47.5 | 63.9 | 66.6  | 92  |
| 1558400-200175 | 25   | 15.8 | 47.5 | 63.9 | 82.6  | 111 |
| 1558400-200100 | 50.4 | 22.1 | 47.5 | 63.9 | 92    | 134 |
| 1558400-200150 | 50.4 | 34.8 | 47.5 | 63.9 | 105.1 | 160 |
| 1558400-200200 | 64   | 47.5 | 47.5 | 63.9 | 120.3 | 176 |
| 1558400-250050 | 25   | 9.4  | 60.2 | 77.5 | 73.6  | 92  |
| 1558400-250075 | 25   | 15.8 | 60.2 | 77.5 | 89.6  | 111 |
| 1558400-250100 | 50.4 | 22.1 | 60.2 | 77.5 | 98.1  | 135 |
| 1558400-250150 | 50.4 | 34.8 | 60.2 | 77.5 | 112.2 | 160 |

# KDV-TU Water point diaphragm valve



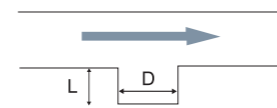
## Application

In the loop for production of purified water (PW) and injection water (WFI), one of the applications is on the tap valves.

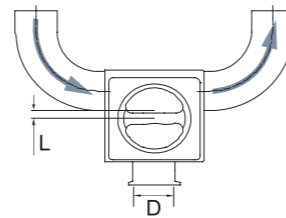
The valve must ensure an absolute safe loop and prevent environmental damage, which will also be worn as a junction point. Therefore this valve must have highest level of security and cleanliness

## Feature

- To avoid the retention of the bacterial at the barrier of U-shaped tee through diaphragm valves, reduce the number of welds and improve the smoothness of the contact surface (MOC) with a minimum length of the horizontal pipe.
- BPE 2012: SD-3.1.2.2, to eliminate the risk of breeding of bacterial at retention area of fluid at discharge port area and ensure that the loop is absolutely safe.



BPE:SD-3.11.1



BioClean diaphragm valve  $L/D \leq 2:1$

## KDV-TU6

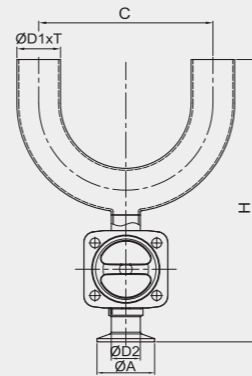
| NO.            | D    | D1   | D2   | T    | C     | H     |  |
|----------------|------|------|------|------|-------|-------|--|
| 1559100-050050 | 25.0 | 9.4  | 12.7 | 1.65 | 109.2 | 120.7 |  |
| 1559100-075075 | 25.0 | 15.8 | 19.1 | 1.65 | 128.2 | 131.7 |  |
| 1559100-100050 | 25.0 | 9.4  | 25.4 | 1.65 | 128.2 | 127.5 |  |
| 1559100-100075 | 25.0 | 15.8 | 25.4 | 1.65 | 147.2 | 150.7 |  |
| 1559100-100100 | 50.4 | 22.1 | 25.4 | 1.65 | 171.2 | 153.1 |  |
| 1559100-150050 | 25.0 | 9.4  | 38.1 | 1.65 | 166.4 | 154.8 |  |
| 1559100-150075 | 25.0 | 15.8 | 38.1 | 1.65 | 185.4 | 188.9 |  |
| 1559100-150100 | 50.4 | 22.1 | 38.1 | 1.65 | 208.4 | 179.3 |  |
| 1559100-150150 | 50.4 | 34.8 | 38.1 | 1.65 | 234.4 | 193.4 |  |
| 1559100-200050 | 25.0 | 9.4  | 50.8 | 1.65 | 204.4 | 187.2 |  |
| 1559100-200075 | 25.0 | 15.8 | 50.8 | 1.65 | 234.4 | 226.9 |  |
| 1559100-200100 | 50.4 | 22.1 | 50.8 | 1.65 | 246.4 | 211.7 |  |
| 1559100-200150 | 50.4 | 34.8 | 50.8 | 1.65 | 272.4 | 225.8 |  |
| 1559100-200200 | 64.0 | 47.5 | 50.8 | 1.65 | 288.4 | 241.0 |  |
| 1559100-250050 | 25.0 | 9.4  | 63.5 | 1.65 | 242.6 | 213.3 |  |
| 1559100-250075 | 25.0 | 15.8 | 63.5 | 1.65 | 261.6 | 265.1 |  |
| 1559100-250100 | 50.4 | 22.1 | 63.5 | 1.65 | 285.6 | 237.8 |  |
| 1559100-250150 | 50.4 | 34.8 | 63.5 | 1.65 | 310.6 | 251.9 |  |

# KDV-MU U-type diaphragm valve

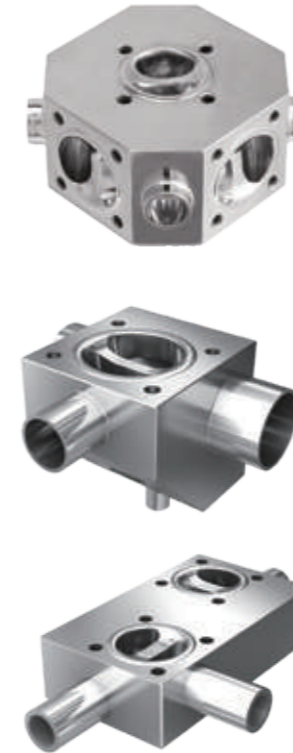


## KDV-MU400

| NO.            | D1   | T    | D2   | A    | C     | H      |
|----------------|------|------|------|------|-------|--------|
| 1559400-075050 | 19.1 | 1.65 | 12.7 | 25   | 114.3 | 139.7  |
| 1559400-075075 | 19.1 | 1.65 | 19.1 | 25   | 114.3 | 179.7  |
| 1559400-100050 | 25.4 | 1.65 | 12.7 | 25   | 76.2  | 142.9  |
| 1559400-100075 | 25.4 | 1.65 | 19.1 | 25   | 76.2  | 182.9  |
| 1559400-100100 | 25.4 | 1.65 | 25.4 | 50.4 | 76.2  | 201.8  |
| 1559400-150050 | 38.1 | 1.65 | 12.7 | 25   | 114.3 | 189.1  |
| 1559400-150075 | 38.1 | 1.65 | 19.1 | 25   | 114.3 | 229.1  |
| 1559400-150100 | 38.1 | 1.65 | 25.4 | 50.4 | 114.3 | 248.4  |
| 1559400-150150 | 38.1 | 1.65 | 38.1 | 50.4 | 114.3 | 286.5  |
| 1559400-200050 | 50.8 | 1.65 | 12.7 | 25   | 152.4 | 208.9  |
| 1559400-200075 | 50.8 | 1.65 | 19.1 | 25   | 152.4 | 248.9  |
| 1559400-200100 | 50.8 | 1.65 | 25.4 | 50.4 | 152.4 | 267.8  |
| 1559400-200150 | 50.8 | 1.65 | 38.1 | 50.4 | 152.4 | 306.2  |
| 1559400-200200 | 50.8 | 1.65 | 50.8 | 64   | 152.4 | 330.2  |
| 1559400-250050 | 63.5 | 1.65 | 12.7 | 25   | 190.5 | 232.85 |
| 1559400-250075 | 63.5 | 1.65 | 19.1 | 25   | 190.5 | 272.85 |
| 1559400-250100 | 63.5 | 1.65 | 25.4 | 50.4 | 190.5 | 293.7  |
| 1559400-250150 | 63.5 | 1.65 | 38.1 | 50.4 | 190.5 | 331.8  |
| 1559400-250200 | 63.5 | 1.65 | 50.8 | 64   | 190.5 | 355.8  |
| 1559400-300050 | 76.3 | 1.65 | 12.7 | 25   | 228.6 | 258.2  |
| 1559400-300075 | 76.3 | 1.65 | 19.1 | 25   | 228.6 | 298.2  |
| 1559400-300100 | 76.3 | 1.65 | 25.4 | 50.4 | 228.6 | 319    |
| 1559400-300150 | 76.3 | 1.65 | 38.1 | 50.4 | 228.6 | 357.1  |
| 1559400-300200 | 76.3 | 1.65 | 50.8 | 64   | 228.6 | 381.1  |



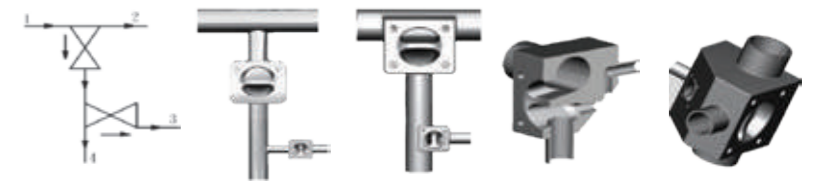
# KDMP Multi-port diaphragm valves



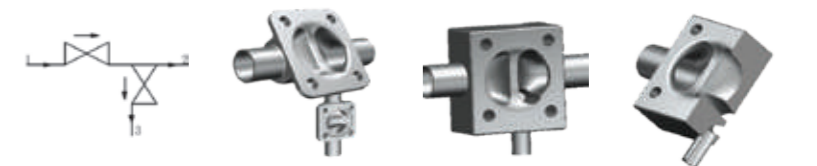
Multi-channel diaphragm valves can save installation space and time, reduce cost, and can be used as a substitute in the valves

## Evolution of multi-channel valves

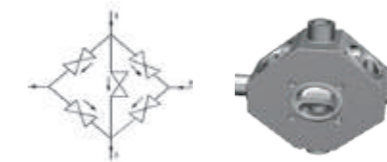
T-valve with sterilizing port



Integrated GMP valve



Chromatography valve



## Technical Data

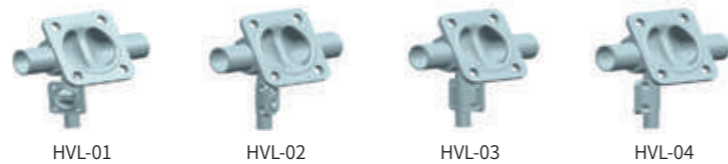
| Items               | Details  |
|---------------------|--|
| Working pressure    | 0-10bar, 145psi (EPDM)<br>0-7bar, 101psi (PTFE)            |
| Working temperature | -10~100°C, SIP max. 150°C                                  |
| Operation           | Manual / pneumatic   |
| Body design         | OEM/ODM  |
| Body material       | 1.4435 (316L), forging block                               |
| Surface finish      | External sand blasting<br>Internal surface Ra≤0.375µm(SF4) |
| Connections         | Butt-Weld, Clamp<br>ISO, DIN, ASME BPE, 3A                 |

# KGMP SAP/GMP diaphragm valves

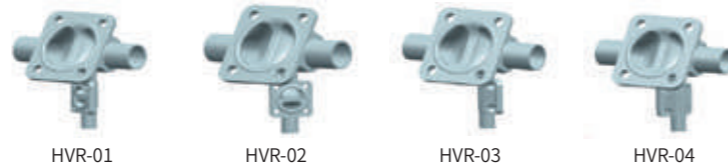


The KGMP / SAP diaphragm valves are available in a variety of angles and positions with forging or casting materials (as shown in the drawing).

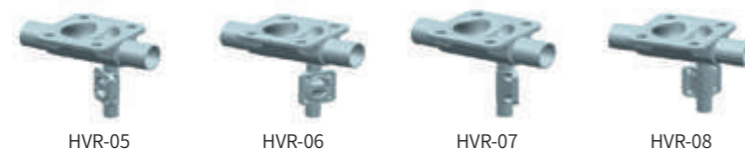
Horizontal installation of the main valve with automatic drainage and vertical installation of the branch valve at the left side.



Horizontal installation of the main valve with automatic drainage and vertical installation of the branch valve at the right side.



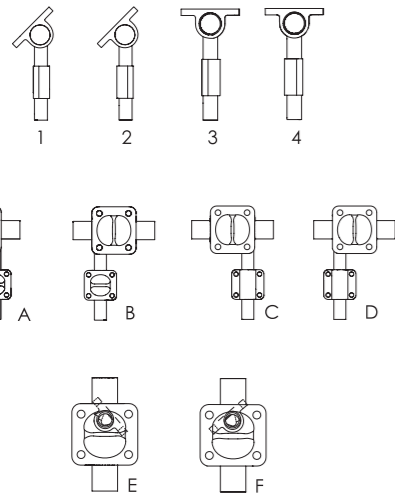
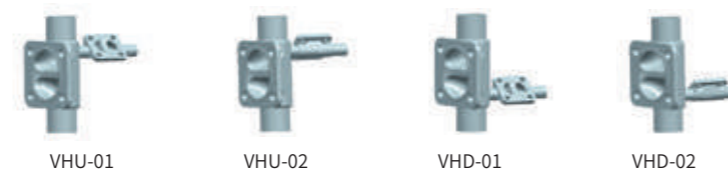
Horizontal installation of the main valve (upwards) and vertical installation of the branch valve at the right (left) side.



Horizontal installation of the main valve with automatic drainage and automatic drainage for the branch vertically installed at the left side.



Vertical installation of the main valve and automatic drainage for the branch horizontally installed



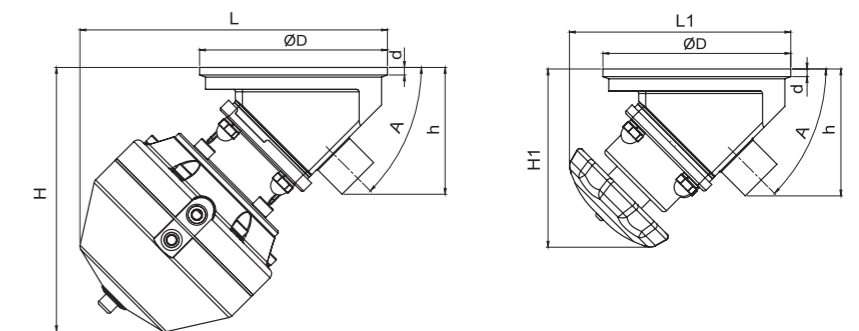
# KTBV Tank outlet valve



King Lai tank outlet valves are mainly used in pharmaceutical, food and beverage industries, and are generally installed at the bottoms of the tanks for sampling and drainage. They can also be integrated for SIP/CIP. KINGLAI's tank outlet valves are evolved on the basis of the diaphragm valves with the sealing weir as close as possible to the tank wall to avoid dead ends at the bottom of the tank.

## Technical Data

| Items               | Details  |
|---------------------|--|
| Working pressure    | 0-10bar, 145psi (EPDM)<br>0-7bar, 101psi (EPDM+PTFE)       |
| Working temperature | -10~100°C , SIP max. 150°C                                 |
| Driving structure   | Manual / pneumatic control                                 |
| Body material       | CF3M (316L), 1.4435 (316L) forging block                   |
| Surface finish      | External sand blasting<br>Internal surface Ra≤0.375μm(SF4) |
| Connections         | Butt-Weld, Clamp<br>ISO, DIN, ASME BPE, 3A                 |



## KTAV

| No             | Size  | A   | D   | H     | H1    | L     | L1    | h     | d   | OD   | T    |
|----------------|-------|-----|-----|-------|-------|-------|-------|-------|-----|------|------|
| 1558700-000050 | 0.5"  | 45° | 50  | 98.1  | 74.9  | 98.6  | 75.5  | 56.3  | 5.9 | 50   | 1.65 |
| 1558700-000075 | 0.75" | 45° | 85  | 131.2 | 100.9 | 141.6 | 111.3 | 74.3  | 2.9 | 85   | 1.65 |
| 1558700-000100 | 1.0"  | 45° | 119 | 175.1 | 122.9 | 206.6 | 154.1 | 82.9  | 6.0 | 25.4 | 1.65 |
| 1558700-000150 | 1.5"  | 45° | 160 | 225.1 | 151.6 | 262   | 207   | 108   | 6.5 | 38.1 | 1.65 |
| 1558700-000200 | 2.0"  | 45° | 180 | 234.3 | 167   | 274   | 274   | 12.7  | 6.5 | 50.8 | 1.65 |
| 1558700-000300 | 3.0"  | 45° | 250 | 344.7 | 270   | 402.4 | 326.1 | 173.5 | 8.5 | 76.2 | 1.65 |