

# High Vacuum Flange Valve

# VHE/VHD Series



## Product Features

The high vacuum bellows valve is connected to the vacuum control system. After the equipment is evacuated through the high vacuum bellows valve, it is backfilled with air or inert gas. The flow of air or inert gas is then controlled by the opening and closing of the pilot cylinder of the bellows valve.

## Technical Specifications

| Technical Specifications          | 16                                                                                           | 25    | 40     | 50     | 63     | 80     | 100    |
|-----------------------------------|----------------------------------------------------------------------------------------------|-------|--------|--------|--------|--------|--------|
| Valve Type                        | NC Type, Double-Acting Type                                                                  |       |        |        |        |        |        |
| Valve Sealing Method              | Bellows Seal                                                                                 |       |        |        |        |        |        |
| Shaft Sealing Method              | O-Ring Seal                                                                                  |       |        |        |        |        |        |
| Control Port Connection Port Size | M5                                                                                           |       | Rc1/8" |        |        |        |        |
| Operating Fluid                   | Air, Inert Gas, Vacuum                                                                       |       |        |        |        |        |        |
| Operating Temperature             | 0°C-60°C                                                                                     |       |        |        |        |        |        |
| Operating Pressure                | 1.3x10 <sup>-6</sup> ~ 1×10 <sup>5</sup> pa                                                  |       |        |        |        |        |        |
| Pilot Control Pressure            | 0.4 ~ 0.7MPa                                                                                 |       |        |        |        |        |        |
| Internal Leakage                  | 1.3×10 <sup>-10</sup> Pa · m³/s(He)                                                          |       |        |        |        |        |        |
| External Leakage                  | 1.3×10 <sup>-11</sup> Pa · m³/s(He)                                                          |       |        |        |        |        |        |
| Conductance                       | 5L/S                                                                                         | 14L/S | 45L/S  | 80L/S  | 160L/S | 200L/S | 250L/S |
| Copper-Free                       | Copper-Free                                                                                  |       |        |        |        |        |        |
| Main Materials                    | Cylinder Body, Valve Body: Aluminum Alloy AL6063-T5, Bellows: SUS316L, Sealing Material: FKM |       |        |        |        |        |        |
| Weight                            | 0.26kg                                                                                       | 0.6kg | 1.27kg | 1.96kg | 3.54kg | 5.58kg | 7.15kg |

## Model Designation Method

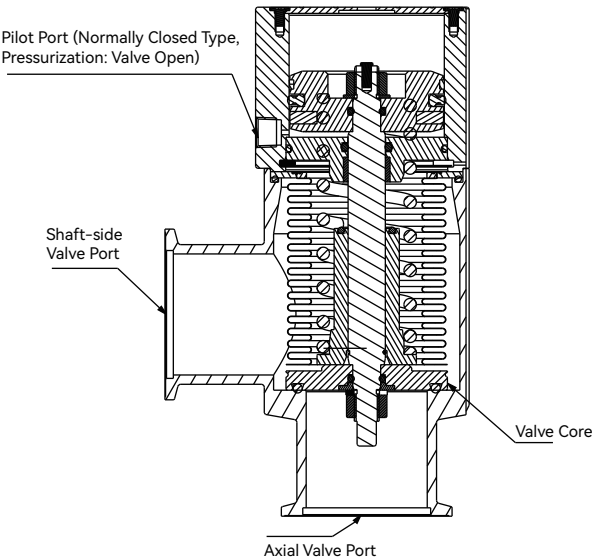
|                                                             |                                         |                              |               |   |                                                         |   |                                   |                                                         |
|-------------------------------------------------------------|-----------------------------------------|------------------------------|---------------|---|---------------------------------------------------------|---|-----------------------------------|---------------------------------------------------------|
| <b>VHE</b><br>①                                             | <b>16</b><br>②                          | <b>1</b><br>③                | <b>S</b><br>④ | — | <b>M9N</b><br>⑤                                         | — | <b>2</b><br>⑥                     | <b>E</b><br>⑦                                           |
| ① Series Number                                             | ② Flange Size                           | ③ Type                       | ④ Magnet      |   | ⑤ Sensor Model                                          |   | ⑥ Sensor Quantity                 | ⑦ Solenoid Valve                                        |
| VHE (Bellows Flanger Valve)<br>VHD (Standard Flanger Valve) | 16<br>25<br>40<br>50<br>63<br>80<br>100 | 1:NC Type<br>2:Double Acting | S:With Magnet |   | Blank: Without Switch<br>M9N (A)(L)(C)<br>M9B (A)(L)(C) |   | Blank: None<br>1:1 pcs<br>2:2 pcs | Blank: Without Solenoid Valve<br>E: With Solenoid Valve |

[Note] The standard cable length is 2 meters. To order cable lengths of 1m, 3m, or 5m, please add the suffix A, L, or C respectively after the sensor model code.

## Operation Description

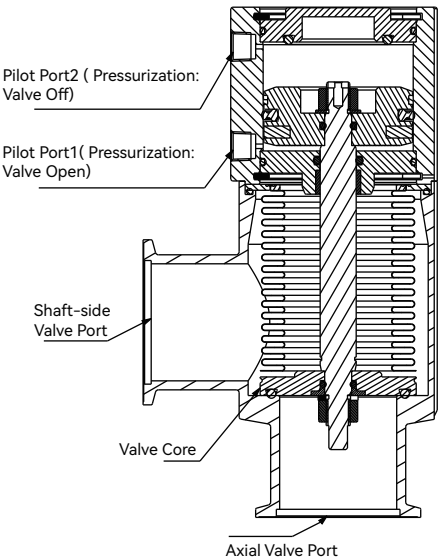
### ►Single-acting

Under normal conditions, the valve disc is in a normally closed state under the action of the compression spring. After the pilot cylinder receives air, the piston drives the piston rod to move downward, thereby opening the valve body.



### ►Double-Acting

When air enters through pilot hole 1, the piston drives the piston rod downward, opening the valve body; when air enters through pilot hole 2, the piston drives the piston rod upward, closing the valve body.



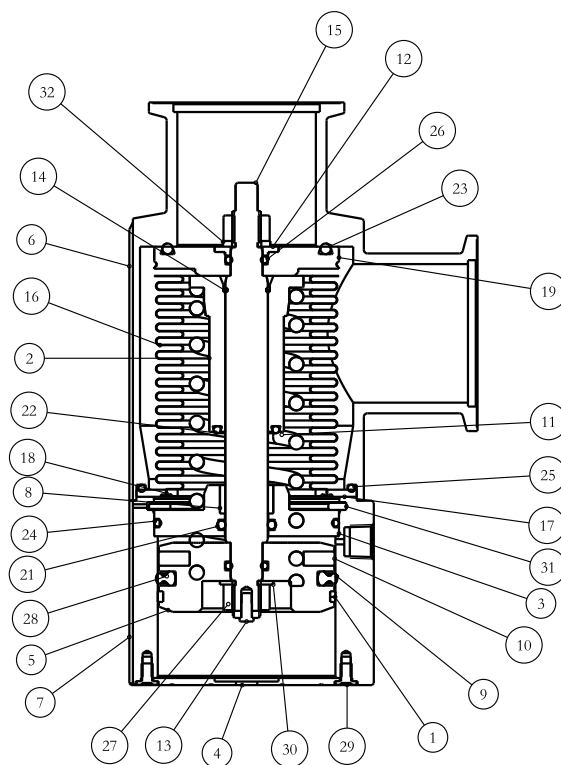
# High Vacuum Flange Valve

## VHE/VHD Series

### Product Structure Diagram

#### ►VHE401S

| Single-Acting Type |                       |                    |     |                        |             |
|--------------------|-----------------------|--------------------|-----|------------------------|-------------|
| No.                | Name                  | Material           | No. | Name                   | Material    |
| 1                  | Wear Ring             | POM                | 18  | Bellows Seal Flange 2  | SUS316L     |
| 2                  | Spring Seat           | SUS420             | 19  | Bellows Valve Disc     | SUS316L     |
| 3                  | Front End Cover       | AL6061-T6          | 20  | Label                  | Matt Silver |
| 4                  | Rear End Cover        | AL6061-T6          | 21  | O-Ring                 | -           |
| 5                  | Piston                | AL6061-T6          | 22  | O-Ring                 | -           |
| 6                  | Valve Body            | AL6063-T5          | 23  | O-Ring                 | -           |
| 7                  | Pilot Cylinder Body   | AL6063-T5          | 24  | O-Ring                 | -           |
| 8                  | Bushing               | HT250              | 25  | O-Ring                 | -           |
| 9                  | Piston Seal           | NBR                | 26  | O-Ring                 | -           |
| 10                 | Rubber Magnet Ring    | NF11               | 27  | All-Metal Hex Lock Nut | -           |
| 11                 | Compression Spring    | SUS304             | 28  | Socket Head Cap Screw  | -           |
| 12                 | Washer                | SUS304             | 29  | Cross Flat Head Screw  | -           |
| 13                 | Indicator             | SUS304             | 30  | Shim                   | -           |
| 14                 | Wire Snap Ring        | SUS304             | 31  | Hole Snap Ring         | -           |
| 15                 | Piston Rod            | SUS304 Hard Chrome | 32  | Spring Washer          | -           |
| 16                 | Bellows               | SUS316L            | 33  | Dust Cover             | -           |
| 17                 | Bellows Seal Flange 1 | SUS316L            |     |                        |             |



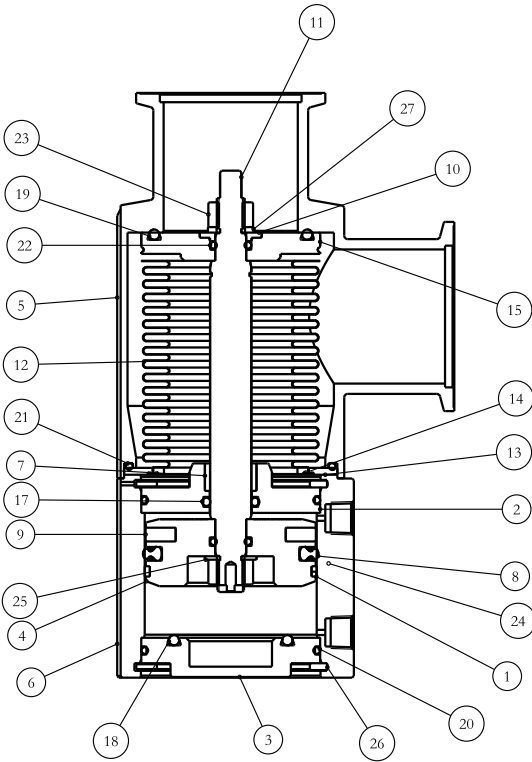
# High Vacuum Flange Valve

# VHE/VHD Series

## Product Structure Diagram

►VHE402S

| Double Acting Type |                       |                               |     |                        |          |
|--------------------|-----------------------|-------------------------------|-----|------------------------|----------|
| No.                | Name                  | Material                      | No. | Name                   | Material |
| 1                  | Wear Ring             | POM                           | 15  | Bellows Valve Disc     | SUS316L  |
| 2                  | Front End Cover       | AL6061-T6                     | 16  | Label                  | Matt     |
| 3                  | Rear End Cover        | AL6061-T6                     | 17  | O-Ring                 | -        |
| 4                  | Piston                | AL6061-T6                     | 18  | O-Ring                 | -        |
| 5                  | Valve Body            | AL6063-T5                     | 19  | O-Ring                 | -        |
| 6                  | Pilot Cylinder Body   | AL6063-T5                     | 20  | O-Ring                 | -        |
| 7                  | Bushing               | HT250                         | 21  | O-Ring                 | -        |
| 8                  | Piston Seal           | NBR                           | 22  | O-Ring                 | -        |
| 9                  | Rubber Magnet Ring    | NF11                          | 23  | All-Metal Hex Lock Nut | -        |
| 10                 | Washer                | SUS304                        | 24  | Socket Head Cap Screw  | -        |
| 11                 | Piston Rod            | SUS304 Hard Chrome Plated Rod | 25  | Shim                   | -        |
| 12                 | Bellows               | SUS316L                       | 26  | Hole Snap Ring         | -        |
| 13                 | Bellows Seal Flange 1 | SUS316L                       | 27  | Spring Washer          | -        |
| 14                 | Bellows Seal Flange 2 | SUS316L                       | 28  | Dust Cover             | -        |



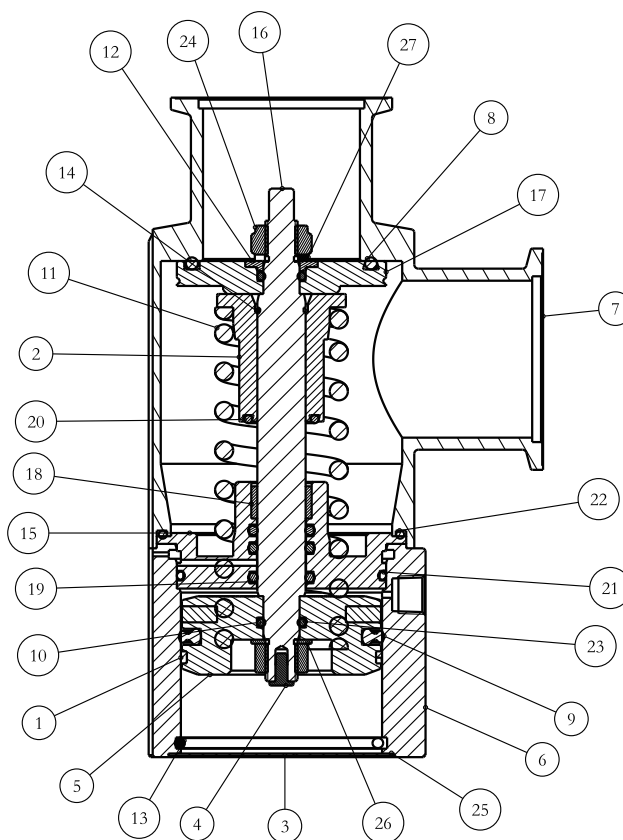
# High Vacuum Flange Valve

## VHE/VHD Series

### Product Structure Diagram

#### ►VHD401

| Single-Acting Type |                      |           |     |                        |             |
|--------------------|----------------------|-----------|-----|------------------------|-------------|
| No.                | Name                 | Material  | No. | Name                   | Material    |
| 1                  | Wear Ring            | POM       | 15  | Connection Flange      | SUS304      |
| 2                  | Spring Seat          | SUS304    | 16  | Piston Rod             | SUS304 Hard |
| 3                  | Rear End Cover       | AL5052-T6 | 17  | Bellows Valve Disc     | SUS316L     |
| 4                  | Indicator            | AL6061-T6 | 18  | Bushing                | SUS440C     |
| 5                  | Piston               | AL6061-T6 | 19  | O-Ring                 | FKM         |
| 6                  | Pilot Cylinder Body  | AL6063-T5 | 20  | O-Ring                 | FKM         |
| 7                  | Valve Body           | AL6063-T5 | 21  | O-Ring                 | FKM         |
| 8                  | Valve Disc Seal      | FKM       | 22  | O-Ring                 | FKM         |
| 9                  | Piston Seal          | NBR       | 23  | O-Ring                 | FKM         |
| 10                 | Rubber Magnet Ring   | NF11      | 24  | All-Metal Hex Lock Nut | SUS304      |
| 11                 | Cylindrical Spring   | SUS304    | 25  | Socket Head Cap Screw  | SUS304      |
| 12                 | Washer               | SUS304    | 26  | Shim                   | SUS304      |
| 13                 | Hole Wire Snap Ring  | SUS304    | 27  | Spring Washer          | SUS304      |
| 14                 | Shaft Wire Snap Ring | SUS304    |     |                        |             |



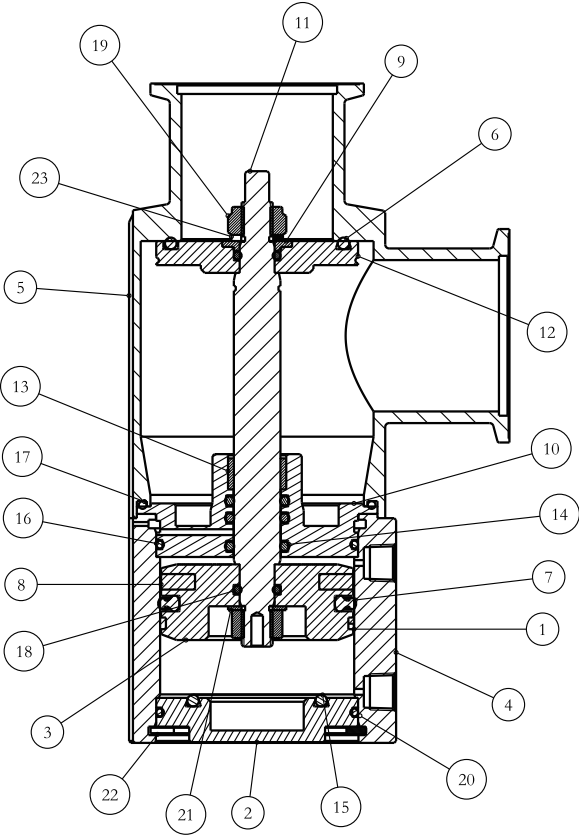
# High Vacuum Flange Valve

# VHE/VHD Series

## Product Structure Diagram

►VHD402

| Double Acting Type |                    |                               |     |                        |          |
|--------------------|--------------------|-------------------------------|-----|------------------------|----------|
| No.                | Name               | Material                      | No. | Name                   | Material |
| 1                  | Wear Ring          | POM                           | 15  | O-Ring                 | FKM      |
| 2                  | Rear End Cover     | AL6061-T6                     | 16  | O-Ring                 | FKM      |
| 3                  | Piston             | AL6061-T6                     | 17  | O-Ring                 | FKM      |
| 4                  | Rear End Cover     | AL6063-T5                     | 18  | O-Ring                 | FKM      |
| 5                  | Valve Body         | AL6063-T5                     | 19  | All-Metal Hex Lock Nut | SUS304   |
| 6                  | Valve Disc Seal    | FKM                           | 20  | Socket Head Cap Screw  | SUS304   |
| 7                  | Piston Seal        | NBR                           | 21  | Shim                   | SUS304   |
| 8                  | Rubber Magnet Ring | NF11                          | 22  | Hole Snap Ring         | SUS304   |
| 9                  | Washer             | SUS304                        | 23  | Spring Washer          | SUS304   |
| 10                 | Connection Flange  | SUS304                        |     |                        |          |
| 11                 | Piston Rod         | SUS304 Hard Chrome Plated Rod |     |                        |          |
| 12                 | Bellows Valve Disc | SUS316L                       |     |                        |          |
| 13                 | Bushing            | SUS440C                       |     |                        |          |
| 14                 | O-Ring             | FKM                           |     |                        |          |

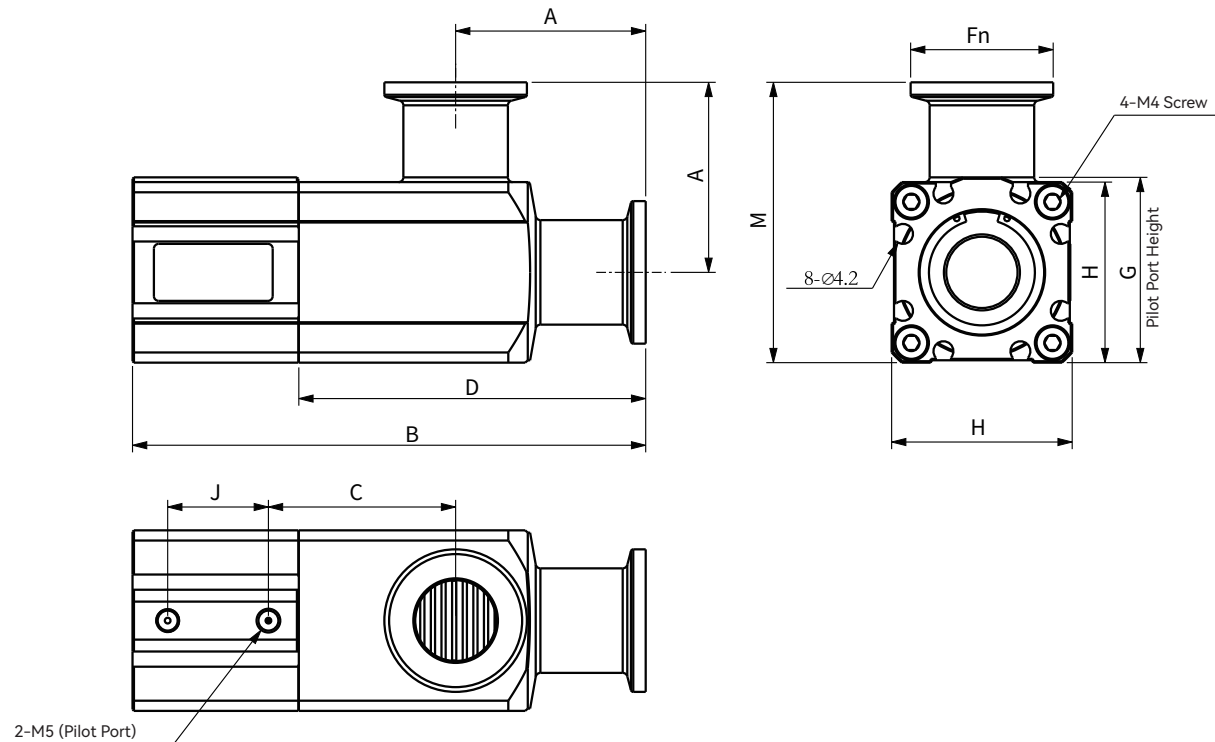


# High Vacuum Flange Valve

## VHE/VHD Series

### Operation Description

#### ► DOUBLE-ACTING



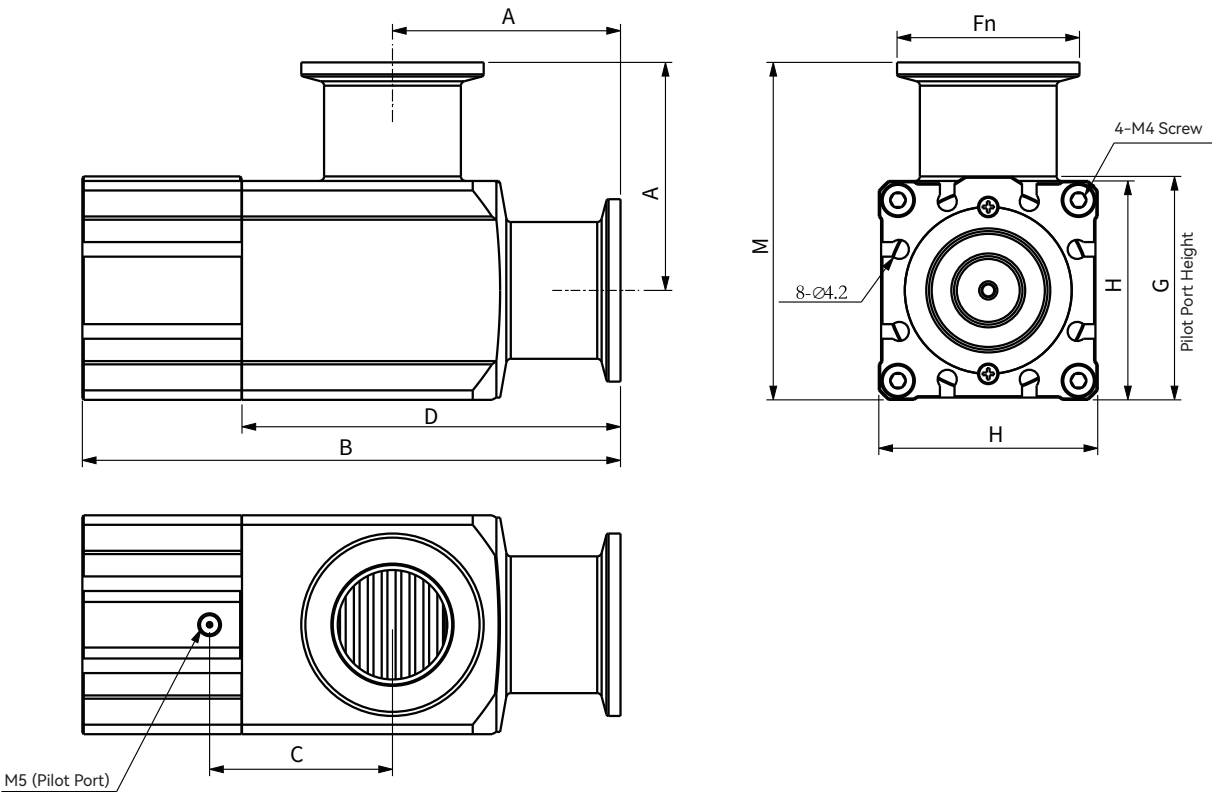
| Model    | A   | B   | C     | D     | E     | Fn  | G     | H   | J    |
|----------|-----|-----|-------|-------|-------|-----|-------|-----|------|
| VHE162S  | 40  | 108 | 39.4  | 73    | 59    | 30  | 39    | 38  | 21.2 |
| VHE252S  | 50  | 121 | 40.1  | 83    | 74    | 40  | 49    | 48  | 22.8 |
| VHE402S  | 65  | 170 | 58.65 | 112   | 98    | 55  | 68.6  | 66  | 33.2 |
| VHE502S  | 70  | 181 | 62.75 | 121   | 109.5 | 75  | 81.5  | 79  | 35.9 |
| VHE632S  | 88  | 206 | 58.6  | 133   | 138   | 87  | 101.5 | 100 | 44.8 |
| VHE802S  | 90  | 248 | 94.4  | 173.7 | 148.5 | 114 | 119.5 | 117 | 51.9 |
| VHE1002S | 108 | 307 | 122   | 217   | 185   | 134 | 157   | 154 | 61.5 |

# High Vacuum Flange Valve

# VHE/VHD Series

## Operation Description

► SINGLE-ACTING



| Model    | A   | B   | C     | D     | E     | Fn  | G     | H   |
|----------|-----|-----|-------|-------|-------|-----|-------|-----|
| VHE161S  | 40  | 105 | 39.4  | 73    | 59    | 30  | 39    | 38  |
| VHE251S  | 50  | 118 | 40.1  | 83    | 74    | 40  | 49    | 48  |
| VHE401S  | 65  | 164 | 58.65 | 112   | 98    | 55  | 68.6  | 66  |
| VHE501S  | 70  | 175 | 62.75 | 121   | 109.5 | 75  | 81.5  | 79  |
| VHE631S  | 88  | 201 | 58.6  | 133   | 138   | 87  | 101.5 | 100 |
| VHE801S  | 90  | 243 | 94.4  | 173.7 | 148.5 | 114 | 119.5 | 117 |
| VHE1001S | 108 | 300 | 122   | 217   | 185   | 134 | 157   | 154 |