



INSTRUMENT VALVES (MANIFOLDS) & TUBE FITTINGS



Precision creates value Technology controls future



Fujian Wide Plus Precision Instruments Co., Ltd

Fujian Wide Plus Precision Instruments Co., Ltd is a wholly-owned subsidiary of China High Precision Automation Group Limited. Established in 1991, it always devotes itself to the research, development and production of precision machineries and industrial automation instruments etc. Its product users cover the fields like spaceflight, military industry, petroleum, petrochemistry and electric power etc.

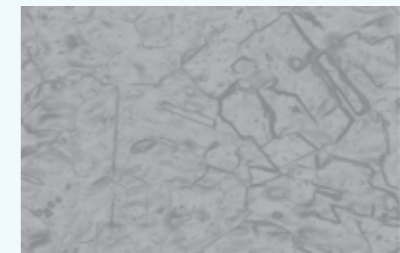
Through years of operating management, the corporation has gathered many multi-disciplinary and high-quality talents, who have accumulated abundant experience in detecting techniques, mechanical skills, materials technology and precision manufacturing technology etc. At the same time, the corporation has established all-around and deep-seated technical cooperative relationships with numerous domestic famous universities and research institutions, such as Shanghai Institute of Process Automation Instrumentation (SIPAI), Tianjin University, South China University of Technology (SCUT), the Chinese People's Liberation Army GAD Engineering Design & Research Institute, Fujian Microelectronic Integrated Circuit Key Laboratory etc, which has formed powerful product development and technological innovative abilities.

In recent years, the corporation has successively invested more than 700 million RMB to purchase over 1000 pieces (or sets) global sophisticated equipments (such as high-precision machining center, digital controlled lathes and grinding machines etc) and the supporting checkout equipments and softwares (such as three-dimensional and roundness measuring equipments etc). Thus, the corporation has built a first-rate high-precision machining production base.

Product advantages and characteristics

Material selection

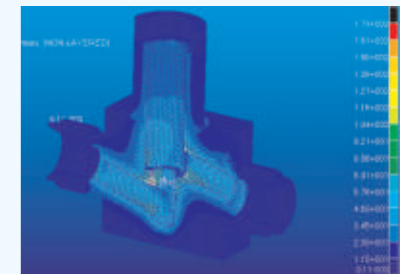
The standard structural materials of CHPAG[®] (China High Precision) brand tube fittings are all 316SS stainless steel. The materials are screened and selected more strictly on the basis of ASTM standard. So their performance indexes, such as intergranular corrosion resistance, pitting resistance and strength etc, are superior to the common 316 stainless steel. The corporation possesses the complete inspection equipments and systems of material composition, strength, corrosion and defects etc. There are strict regulations and incoming inspections on the performance indexes of all materials



Intergranular corrosion

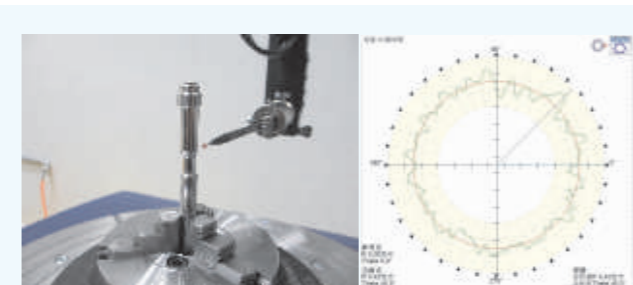
Product design and Test

The structural design of tube fittings has been analyzed and optimized by MSC.Nastran software, which is most authoritative in the international engineering field. The design safety factor is 4:1. While finalizing, all the valves have passed the blasting test (which is 4 times higher than the normal-temperature working pressure) and 2-time static pressure test. Before leaving the factory, each valve has passed the sealing performance test with 7MPa nitrogen pressure.



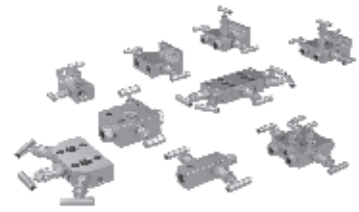
High-precision manufacturing

The manufactured tube fittings are all processed by the high-precision CNC machining equipments so as to ensure the accuracy of the parts and the consistency of different batches. The sophisticated burring treatment process of parts and hardening & anti-corrosion treatment process of key positions together with the strict assembling and testing process ensure that our products have excellent quality and mass stability.



Instrument valves manifold

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- Including two, three and five valves manifolds, which are easy to connect to the pressure and differential pressure transmitters
- There are multiple series (such as V, VL, VB and VR etc) for selection, which can meet various requirements.
- The standard structural materials are all 316 stainless steel.
- The max. working pressure 70MPa (10150psi)
- The highest working temperature 537°C (1000°F)

General needle valve

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- The valve spool is rotation-free structure design, which is convenient for the reliable shutoff and flow regulation.
- 5~11mm aperture, straight-through type and angle type for selection
- The standard structural materials are all 316 stainless steel.
- The max. working temperature 42MPa (6090psi)
- The highest working temperature 343°C (650°F)

Hat type needle valve

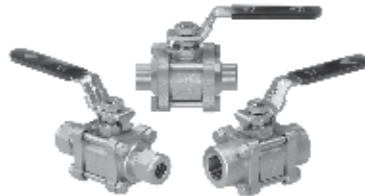
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- Compact type structural design, which applies to panel mounting
- The standard structural materials are all 316 stainless steel.
- Elastic loaded packing seal
- The max. working pressure 42MPa (6090psi)
- The highest working temperature 315°C (600°F)

General ball valve

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- 1/4 circle on and off
- The standard structural materials are all 316 stainless steel.
- Elastic loaded valve seat and valve rod packing
- The max. working pressure 20.6MPa (3000psi)
- The highest working temperature 232°C (450°F)

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Trunnion ball valve

- Compact type structural design, which applies to panel mounting
- The standard structural materials are all 316 stainless steel.
- Elastic loaded valve seat and valve rod packing
- The max. working pressure 70MPa (10150psi)
- The highest working temperature 232°C (450°F)



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Plug valve

- Compact type structural design, 1/4 circle on and off
- The standard structural materials are all 316 stainless steel.
- Replaceable cock elements, one-piece type valve body easy to clean and maintain
- The max. working pressure 20.6MPa (3000psi)
- The highest working temperature 204°C (400°F)



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Bite type tube fittings

- The standard structural materials are all 316 stainless steel.
- Multiple connector types, such as cutting ferrule and NPT thread etc.
- Dual-ferrule structure, which can ensure the reliable sealing after installing and dismantling for several times.



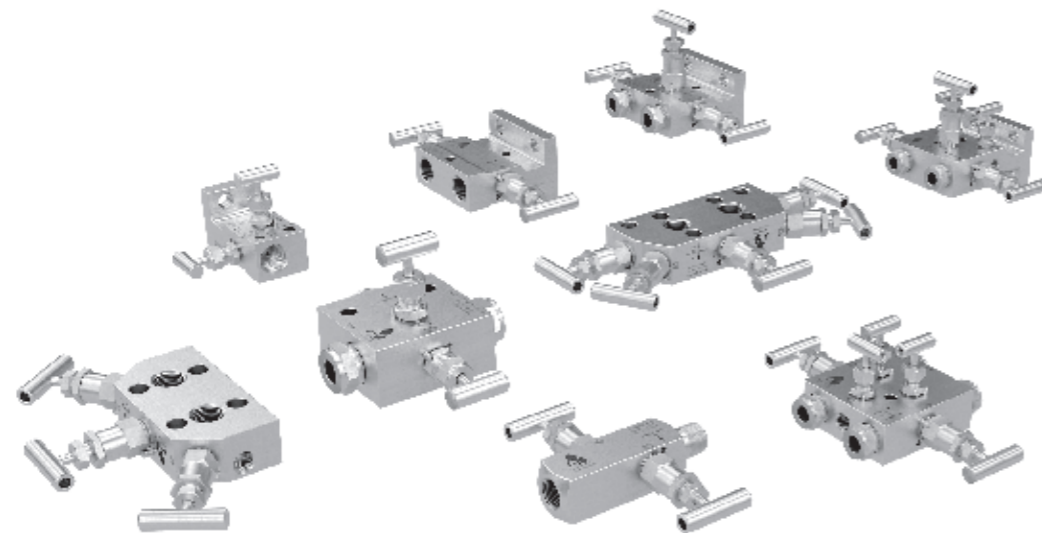
CONTENTS



Instrument valves manifold

V, VR, VL and VB series

Two, three & five valves instrument valves manifold
 Total 316 stainless steel structure
 Max. working pressure 42 Mpa (Vr2 series is 70 MPa)
 The highest permissible working temperature 537°C
 Selectable gland packing



Features of valve bank

The two valves manifold applies to the pressure and liquid level occasions, while the three and five valves manifolds are suitable for the differential pressure occasions. V, VL and VB series are general valve banks. VR series are the valve banks which can be compatible with the Rosemount transmitters.

The normal temperature working pressure of VR2 valve bank is 70MPa, while others are 42MPa. The min. working temperature is -53°C and the max. working temperature is 537°C.

Structural material

- The structure of valve bank is total 316 stainless steel, which has high strength and high corrosion resistance.
- Can be customized according to the requirements of users.
- The design safety factor is 4:1

Structural integrity of valve bank

- The valve body adopts integrated-type structure, which has high overall strength.
- It is equipped with the safety shotpin so as to prevent the falling off of valve deck caused by misoperation or vibration.

Leakproofness

- It adopts metal-against-metal rigidity sealing type between the valve deck and valve body.
- The standard gland packing of valve rod is PTFE (While using under high temperature, it is flexible graphite.)
- The valves uniformly adopt rotation-free spherical metal sealing form.

Internal finish degree

- Internal surface electrochemistry burring treatment

The connector type of valve bank adapting piece

- 12mm ferrule tube connector
- 1/2 in. ferrule tube connector
- 1/2 in. NPT thread
- Flange

Installation

- Direct instrument installation or remote installation, which can be conducted by using NPT thread connectors and bite type tube fittings.
- The sealing element of standard flange is fluorocarbon FKM O-ring.
- The valve bank with flanges includes flange bolts and flange sealing elements.

Test

Before leaving the factory, each set of valve bank has passed the 7MPa nitrogen pressure test. There is no bubble produced in the shell and valve seat within 1min.



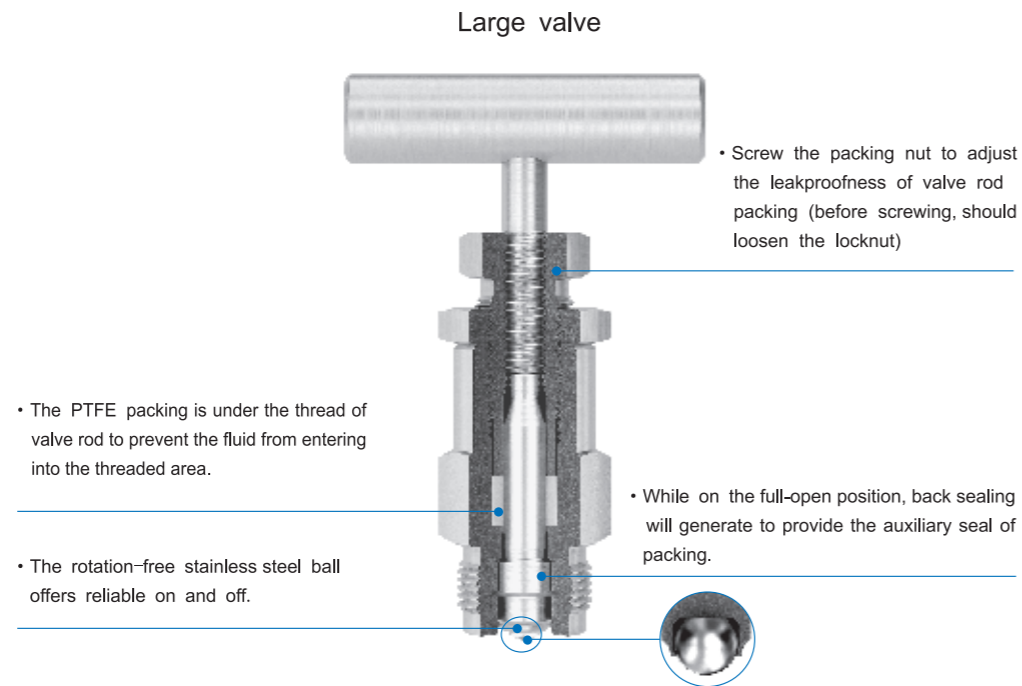
1. The packing nut can be screwed up at any time to prevent the valve leakage.
2. With respect to the valves which haven't been open or closed for a long time, the initial torque will increase.

Valve features

The flow passing the valve bank will be controlled by a series of needle valves. The specific functions of each valve (such as cut-off, discharge or balance pressure) will be determined by its position on the valve bank.

The valves of instrument valves manifold have two sizes: large and small. The small valve applies to the valve port with aperture $\Phi 3.2$, while the large valve applies to the valve port with aperture $\Phi 4.0$. All the valves adopt the rotation-free stainless steel balls as their sealing elements. The valve can realize the back sealing on the max. open position.

The compressing degree of valve rod packing can be adjusted externally. PTFE is the packing of standard configuration and the flexible graphite packing is used in the occasions with high temperature.

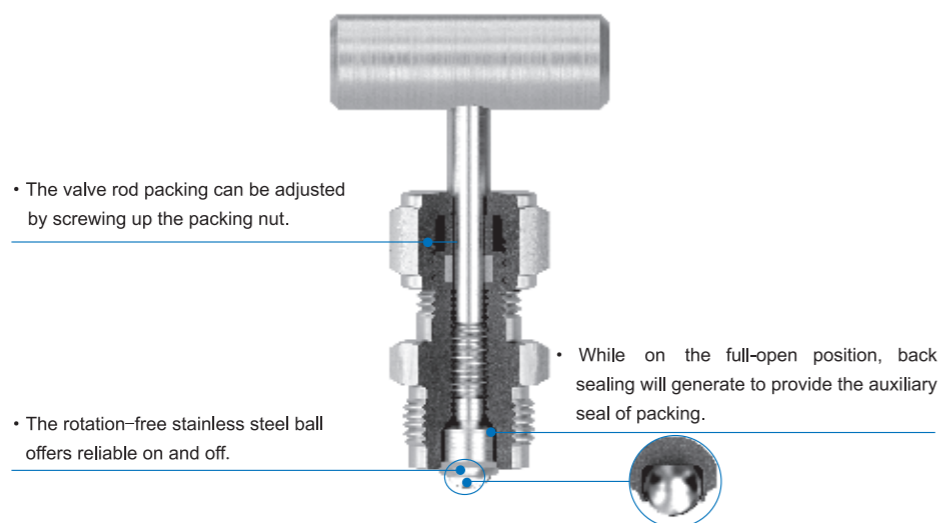


- The PTFE packing is under the thread of valve rod to prevent the fluid from entering into the threaded area.

- The rotation-free stainless steel ball offers reliable on and off.

- While on the full-open position, back sealing will generate to provide the auxiliary seal of packing.

Small valve



- The valve rod packing can be adjusted by screwing up the packing nut.

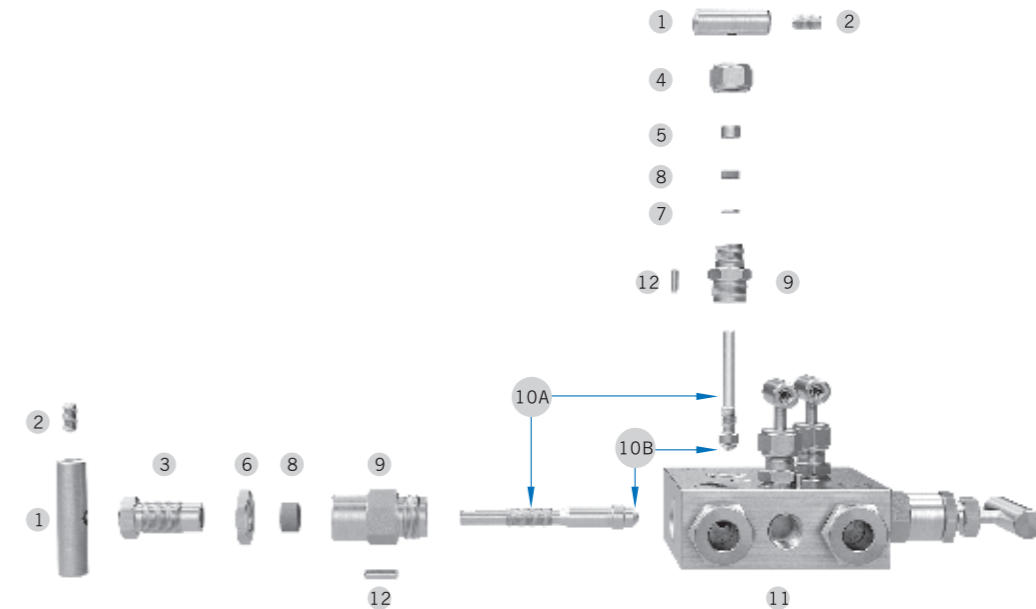
- The rotation-free stainless steel ball offers reliable on and off.

- While on the full-open position, back sealing will generate to provide the auxiliary seal of packing.

Parts details

| Parts details | Materials/ASTM standard | |
|---------------|-------------------------|---------------|
| 1 | Handle | 316 SS / A276 |
| 2 | Set screw | 316 SS / A276 |
| 3 | Packing nut | 316 SS / A276 |
| 4 | Packing nut | 316 SS / A276 |
| 5 | Upper gland | 316 SS / A276 |
| 6 | Locknut | 316 SS / A276 |
| 7 | Support ring | 316 SS / A240 |
| 8 | Packing | PTFE / D1710 |
| 9 | Valve deck | 316 SS / A479 |
| 10A | Valve rod | 316 SS / A479 |

| Parts details | Materials/ASTM standard | |
|---------------|------------------------------------|---|
| 10B | Ball head | 316 SS / A479 |
| 11 | Valve body | 316 SS / A479 |
| 12 | Shotpin | 316 SS / A276 |
| | Flange bolt (Not shown) | 316 SS / A193 |
| | Flange sealing element (Not shown) | Carbon fluoride FKM |
| | Lubricant | Fluidizer, with PTFE & tungsten disulfide |
| | | Hydrocarbon |



Pressure-temperature rated value

| ASME grade | 2500 |
|---|----------------------------|
| Material group | 2.2 |
| Material name | 316 SS |
| Temperature $^{\circ}\text{C}$ ($^{\circ}\text{F}$) | Working pressure Mpa (psi) |
| -53 (-65) to 37 (100) | 42.0(6090) |
| 93(200) | 35.5(5160) |
| 121(250) | 33.8(4910) |
| 148(300) | 32.1(4660) |
| 176(350) | 30.7(4470) |
| 204(400) | 29.4(4280) |
| 232(450) | 28.4(4130) |
| 260(500) | 27.4(3980) |
| 287(550) | 26.6(3870) |

| | |
|-----------|------------|
| 315(600) | 25.9(3760) |
| 343(650) | 25.4(3700) |
| 371(700) | 24.8(3600) |
| 398(750) | 24.2(3520) |
| 426(800) | 23.8(3460) |
| 454(850) | 23.2(3380) |
| 482(900) | 22.5(3280) |
| 510(950) | 22.1(3220) |
| 537(1000) | 20.8(3030) |

Note ①: Working pressure of VR2 series valve bank:
 29 $^{\circ}\text{C}$ (85 $^{\circ}\text{F}$) — 70 MPa (10150psi)
 204 $^{\circ}\text{C}$ (400 $^{\circ}\text{F}$) — 29.4 MPa (4280psi)

Note ②: Selection of packing:
 -53~232 $^{\circ}\text{C}$ (-63~450 $^{\circ}\text{F}$) adopts PTFE packing.
 When the temperature is higher than 232 $^{\circ}\text{C}$ (450 $^{\circ}\text{F}$), adopt flexible graphite packing

Coding rule for item No.


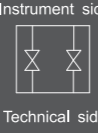
SS - V 3 NB - K 12mm - FL - G
 1 2 3 4 5 6 7 8



| | | | | | | |
|---|----------------------|-----------------------------|---|--|---|-----------------------|
| 1 | Material type | SS — 316 stainless steel | 5 | Connector type | K — Connector of ferrule tube F — NPT internal thread M — NPT external thread | |
| | 2 | Series of valve bank | | V — V series VR — VR series VB — VB series VL — VL series | 6 | Connector size |
| 3 | | Quantity of valves | | 2 — two valves manifold 3 — three valves manifold 5 — five valves manifold | | 7 |
| | 4 | Discharge type | NB — No discharge outlet SB — Single discharge outlet DB — Double discharge outlets | 8 | G | |



For example: SS-V5SB-K12mm-FL

It means V series five valves manifold (double cut-off, double balance and single discharge valve). The material of valve body is 316 stainless steel. The technical end joint is 12mm bite type tube fittings. The instrument end is flange connector.

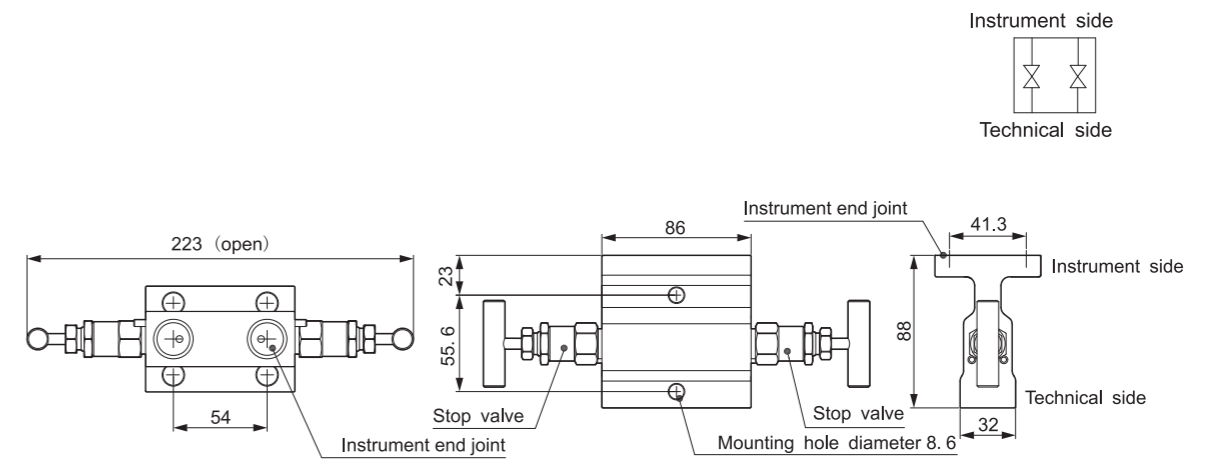
Two valves manifold

| VL series two valves manifold | |
|---|--|
|  | <ul style="list-style-type: none"> Including two parallel stop valves, which can cut off the arbitrary one technical pipeline of the two, no balance and drain valve Designed for the application of liquid level Direct instrument installation Connector type: 1/2 in. NPT internal thread and flange Normal-temperature working pressure 42MPa (6090psi) |
| | <p>Instrument side</p>  <p>Technical side</p> |

| V series two valves manifold | |
|---|--|
|  | <ul style="list-style-type: none"> Including one stop valve and one drain valve Apply to the static pressure cut-off and discharge of transmitter or pressure gauge (test) Direct instrument installation or remote installation Connector type: 1/2 in. and 12mm bite type tube fittings 1/2 in.NPT internal thread and flange Normal-temperature working pressure 42MPa (6090psi) |
| | <p>Instrument side</p>  <p>Technical side</p> |

| VR series two valves manifold | |
|---|--|
|  | <ul style="list-style-type: none"> Including one stop valve and one drain valve Apply to the static pressure cut-off and discharge of transmitter or pressure gauge (test) Direct instrument installation or remote installation Connector type: 1/2 in. and 12mm bite type tube fittings 1/2 in. NPT thread Normal-temperature working pressure 70MPa (10150psi) |
| | <p>Instrument side</p>  <p>Technical side</p> |

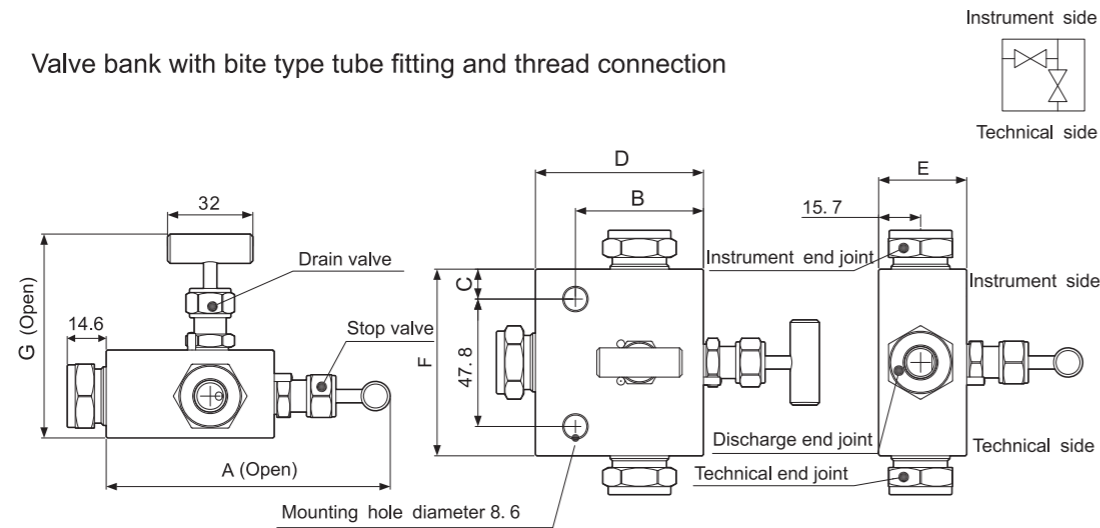
Order information and size for VL series two valves manifold (Size is only for reference.)



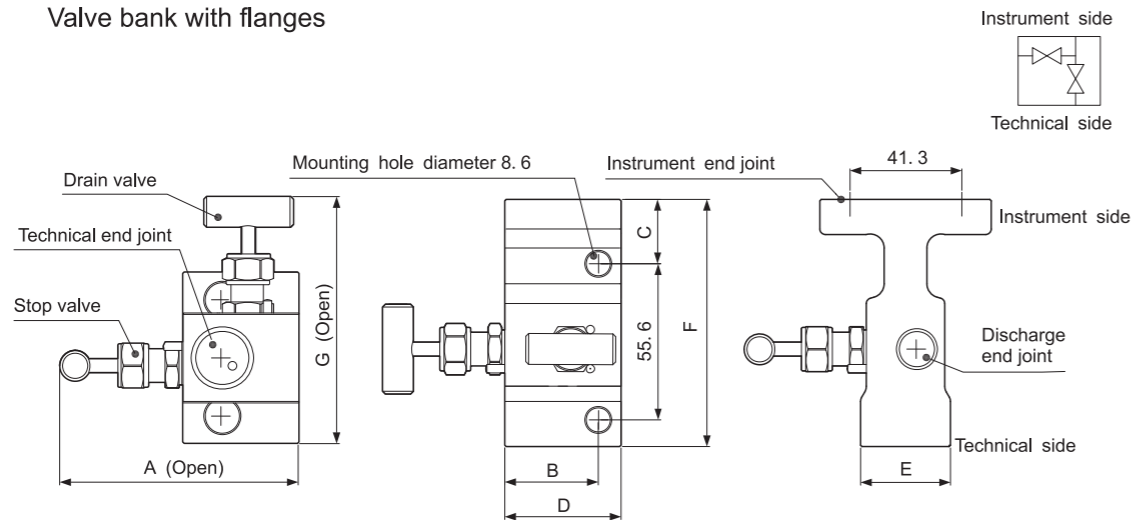
| End joint | | Item No. |
|---------------------------|------------|----------------|
| Technique | Instrument | |
| 1/2in.NPT internal thread | Flange | SS-VL2NB-F8-FL |

Order information and size for V series two valves manifold (Size is only for reference.)

Valve bank with bite type tube fitting and thread connection

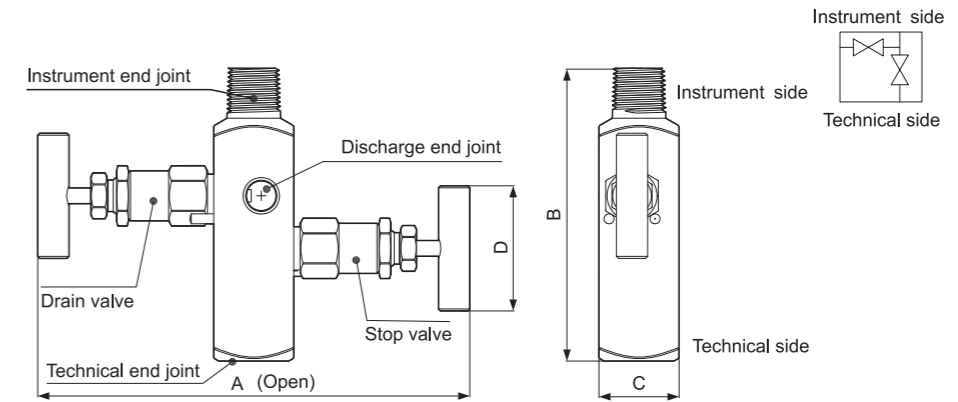


Valve bank with flanges



| End joint | | | Item No. | Size (mm) | | | | | | |
|--------------------------------|------------|---------------------------|------------------|-----------|------|------|------|------|------|------|
| Technique | Instrument | Discharge | | A | B | C | D | E | F | G |
| 1/2in. bite type tube fittings | | | SS-V2SB-K8 | 107 | 48.0 | 11.1 | 63.0 | 33.0 | 70.0 | 76.5 |
| 1/2in. bite type tube fittings | Flange | 1/4in.NPT internal thread | SS-V2SB-K8-FL | 85.0 | 33.0 | 23.0 | 41.4 | 32.0 | 88.0 | 88.0 |
| 12mm bite type tube fittings | | | SS-V2SB-K12mm | 107 | 48.0 | 11.1 | 63.0 | 33.0 | 70.0 | 76.5 |
| 12mm bite type tube fittings | Flange | 1/4in.NPT internal thread | SS-V2SB-K12mm-FL | 85.0 | 33.0 | 23.0 | 41.4 | 32.0 | 88.0 | 88.0 |
| 1/2in. internal thread NPT | | | SS-V2SB-F8 | 97.5 | 42.0 | 7.6 | 54.0 | 33.0 | 63.0 | 76.5 |
| 1/2in.NPT internal thread | Flange | 1/4in.NPT internal thread | SS-V2SB-F8-FL | 85.0 | 33.0 | 23.0 | 41.4 | 32.0 | 88.0 | 88.0 |

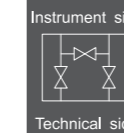
Order information and size for VR series two valves manifold (Size is only for reference.)



| End joint | | | Item No. | Size (mm) | | | |
|--------------------------------|---------------------------|----------------------------|----------------|-----------|------|------|------|
| Technique | Instrument | Discharge | | A | B | C | D |
| 1/2in.NPT internal thread | 1/2in.NPT external thread | 1/4in. NPT internal thread | SS-VR2SB-F8-M8 | 169 | 117 | 32.0 | 50.0 |
| 1/2in.NPT internal thread | 1/2in.NPT internal thread | | SS-VR2SB-F8-F8 | 169 | 95.0 | 32.0 | 50.0 |
| 1/2in. bite type tube fittings | | | SS-VR2SB-K8 | 169 | 95.0 | 32.0 | 50.0 |
| 12mm bite type tube fittings | | | SS-VR2SB-K12mm | 169 | 95.0 | 32.0 | 50.0 |

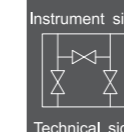
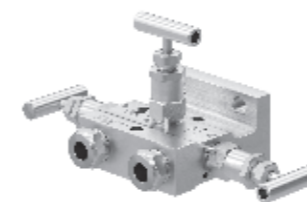
Three valves manifold

VR series three valves manifold



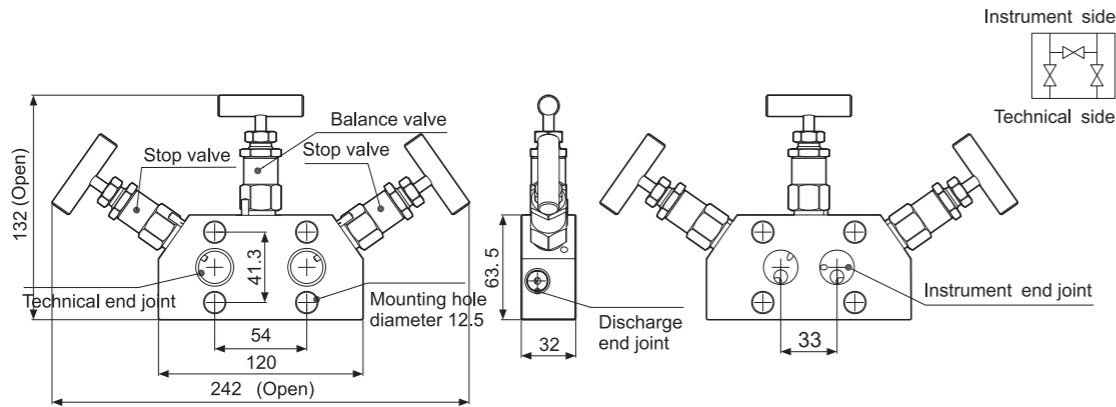
- Including two stop valves and one balance valve, two discharge outlets
- Apply to the cut-off and test (discharge) while using differential pressure transmitter
- Direct instrument installation
- Connector type: 1/2 in. NPT internal thread and coplane flanges
- Normal-temperature working pressure 42MPa (6090psi)

V series three valves manifold



- Including two stop valves and one balance valve
- Apply to the cut-off and test while using differential pressure transmitter
- Direct instrument installation or remote installation
- Connector type: 1/2 in. and 12mm bite type tube fittings, 1/2 in.NPT internal thread and flanges
- Normal-temperature working pressure 42MPa (6090psi)

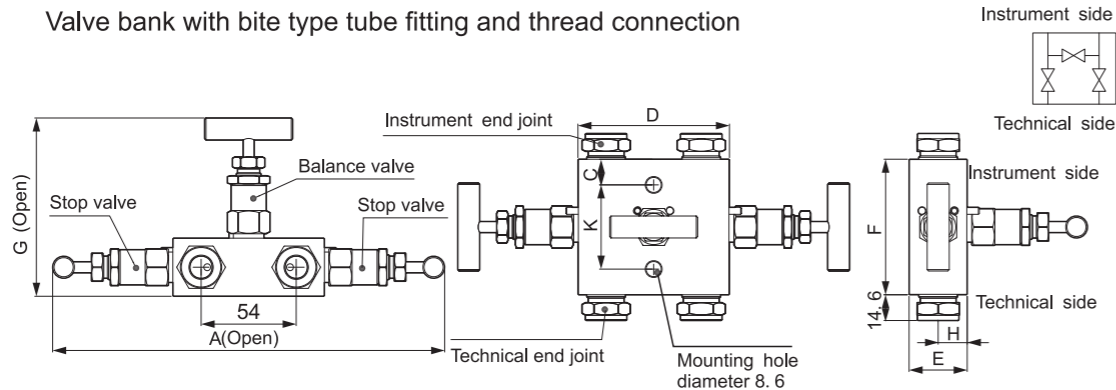
Order information and size for VR series three valves manifold (Size is only for reference.)



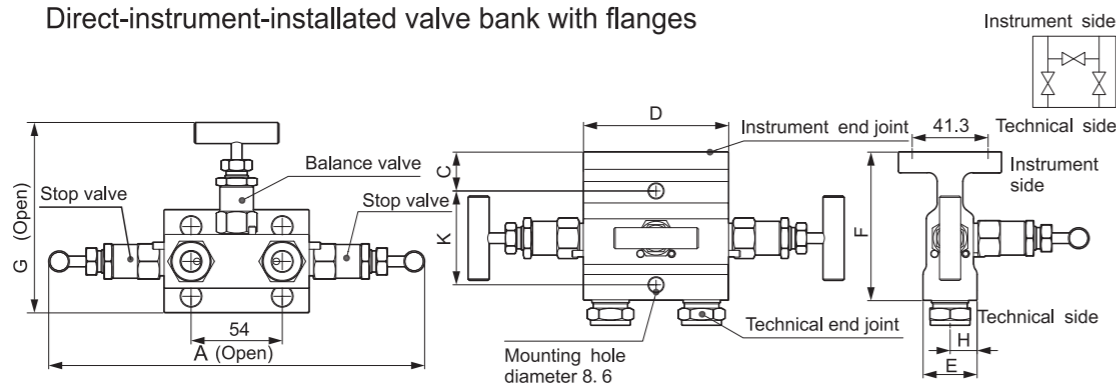
| End joint | | | Item No. |
|---------------------------|----------------|---------------------------|----------------|
| Technique | Instrument | Discharge | |
| 1/2in.NPT internal thread | Coplane flange | 1/4in.NPT internal thread | SS-VR3DB-F8-FL |

Order information and size for V series three valves manifold (Size is only for reference.)

Valve bank with bite type tube fitting and thread connection



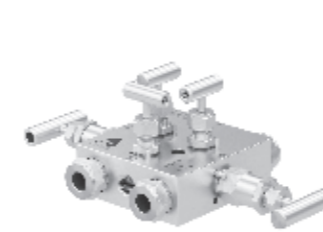
Direct-instrument-installed valve bank with flanges



| End joint | | Item No. | Size (mm) | | | | | | | |
|--------------------------------|------------|------------------|-----------|------|------|------|------|-----|------|------|
| Technique | Instrument | | A | C | D | E | F | G | H | K |
| 1/2in.NPT internal thread | | SS-V3NB-F8 | 223 | 7.6 | 86.0 | 33.0 | 63.0 | 102 | 16.5 | 47.8 |
| 1/2in.NPT internal thread | Flange | SS-V3NB-F8-FL | 223 | 23.0 | 86.0 | 32.0 | 88.0 | 113 | 16.0 | 55.6 |
| 1/2in. bite type tube fittings | | SS-V3NB-K8 | 223 | 14.6 | 86.0 | 33.0 | 77.0 | 102 | 16.5 | 47.8 |
| 1/2in. bite type tube fittings | Flange | SS-V3NB-K8-FL | 223 | 23.0 | 86.0 | 32.0 | 88.0 | 113 | 16.0 | 55.6 |
| 12mm bite type tube fittings | | SS-V3NB-K12mm | 223 | 14.6 | 86.0 | 33.0 | 77.0 | 102 | 16.5 | 47.8 |
| 12mm bite type tube fittings | Flange | SS-V3NB-K12mm-FL | 223 | 23.0 | 86.0 | 32.0 | 88.0 | 113 | 16.0 | 55.6 |

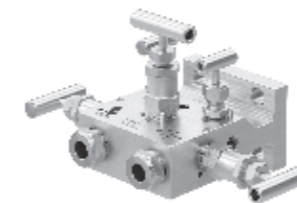
Five valves manifold

V series five valves manifold



- Including two stop valves, two balance valves and one drain valve
- Apply to the differential pressure transmitter, which requires double-balance function
- Direct instrument installation or remote installation
- Connector type: 1/2 in. and 12mm bite type tube fittings, 1/2 in. NPT internal thread and flange
- Normal-temperature working pressure 42MPa (6090psi)

VB series five valves manifold



- Including two stop valves, one balance valve and two drain valves
- Apply to the differential pressure transmitter, which requires double-discharge function
- Direct instrument installation or remote installation
- Connector type: 1/2 in. and 12mm bite type tube fittings, 1/2 in.NPT internal thread and flange
- Normal-temperature working pressure 42MPa (6090psi)

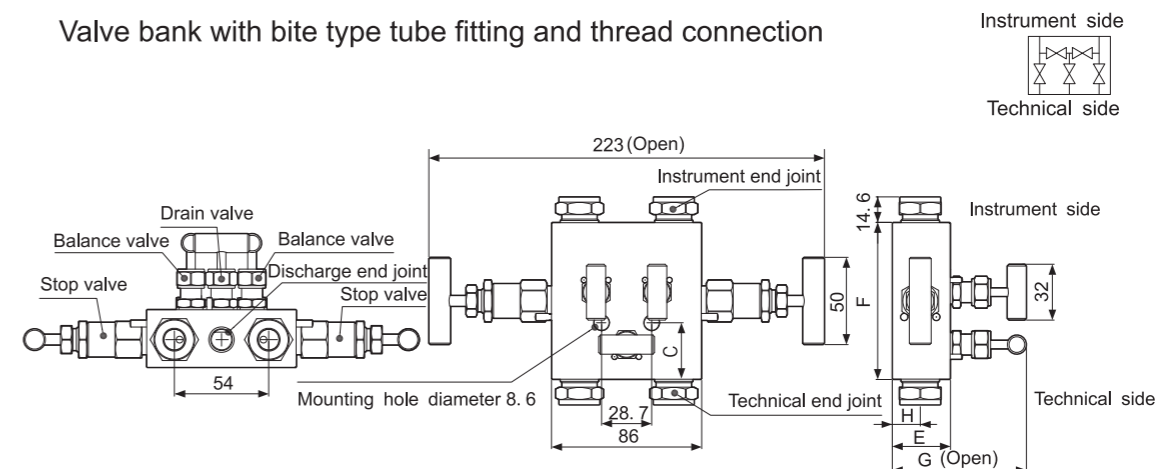
VR series five valves manifold



- Including two stop valves, two drain valves and one balance valve
- Apply to the differential pressure transmitter, which requires double-discharge function
- Direct instrument installation
- Connector type: 1/2 in. NPT internal thread and coplane flange
- Normal-temperature working pressure 42MPa (6090psi)

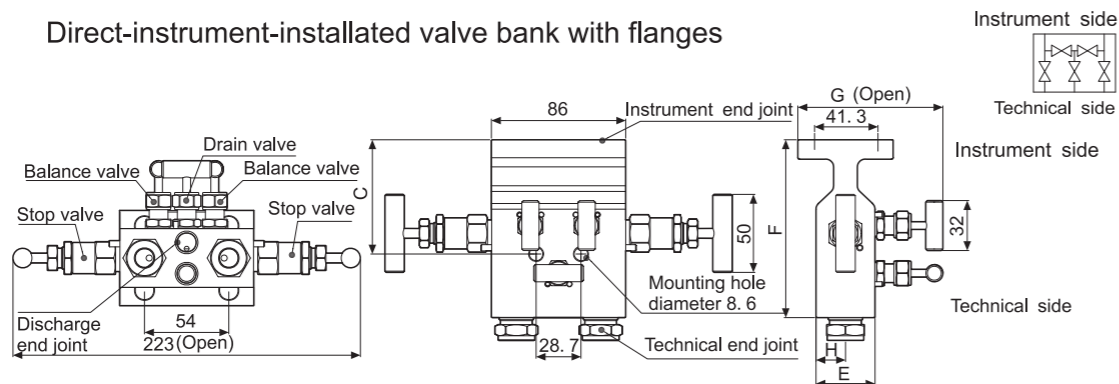
Order information and size for V series five valves manifold (Size is only for reference.)

Valve bank with bite type tube fitting and thread connection



Order information and size for V series five valves manifold (The size is only for reference)

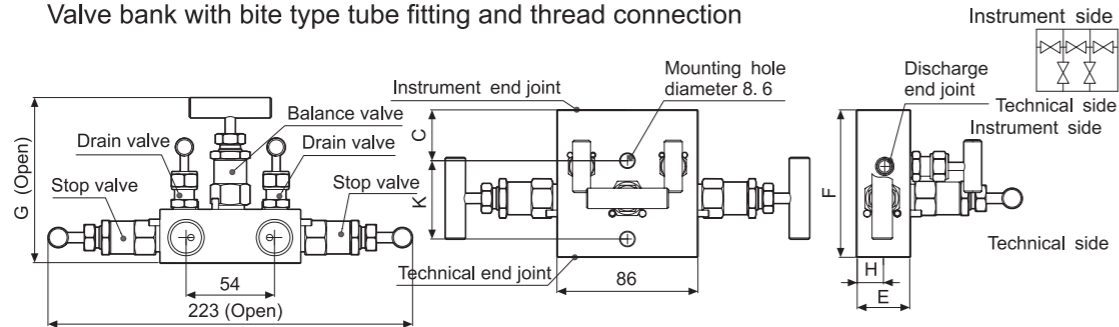
Direct-instrument-installed valve bank with flanges



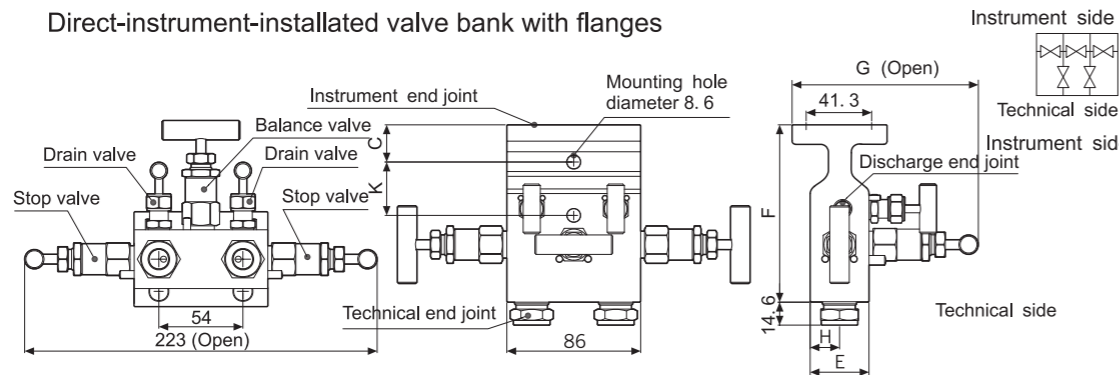
| End joint | | | Item No. | Size (mm) | | | | |
|--------------------------------|------------|----------------------------|------------------|-----------|------|------|------|------|
| Technique | Instrument | Discharge | | C | E | F | G | H |
| 1/2in. bite type tube fittings | Flange | 1/4in. NPT internal thread | SS-V5SB-K8 | 32.5 | 33.0 | 90.0 | 76.5 | 15.8 |
| 1/2in. bite type tube fittings | | | SS-V5SB-K8-FL | 73.2 | 37.8 | 114 | 92.9 | 18.9 |
| 12mm bite type tube fittings | Flange | | SS-V5SB-K12mm | 32.5 | 33.0 | 90.0 | 76.5 | 15.8 |
| 12mm bite type tube fittings | | | SS-V5SB-K12mm-FL | 73.2 | 37.8 | 114 | 92.9 | 18.9 |
| 1/2in. NPT internal thread | Flange | SS-V5SB-F8 | 32.5 | 33.0 | 90.0 | 76.5 | 15.8 | |
| 1/2in. NPT internal thread | | SS-V5SB-F8-FL | 73.2 | 37.8 | 114 | 92.9 | 18.9 | |

Order information and size for VB series five valves manifold (Size is only for reference.)

Valve bank with bite type tube fitting and thread connection

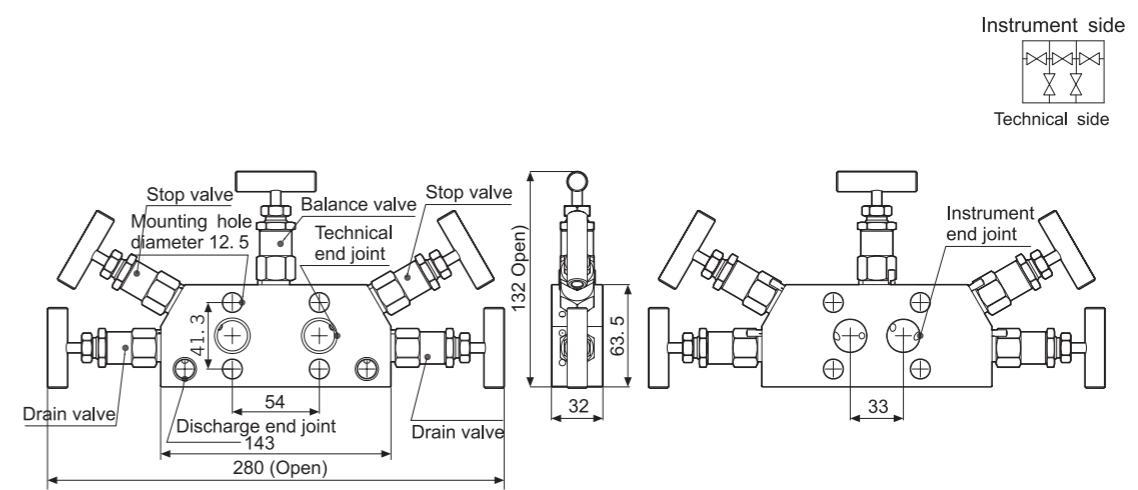


Direct-instrument-installed valve bank with flanges



| End joint | | | Item No. | Size (mm) | | | | | |
|--------------------------------|------------|----------------------------|----------------|-----------|------|------|-----|------|------|
| Technique | Instrument | Discharge | | C | E | F | G | H | K |
| 1/2in. NPT internal thread | Flange | 1/8in. NPT internal thread | SS-VB5DB-F8 | 31.0 | 33.0 | 90.0 | 102 | 15.8 | 47.8 |
| 1/2in. NPT internal thread | | | SS-VB5DB-F8-FL | 24.0 | 37.8 | 114 | 118 | 18.9 | 34.3 |
| 1/2in. bite type tube fittings | Flange | | SS-VB5DB-K8 | 31.0 | 33.0 | 90.0 | 102 | 15.8 | 47.8 |
| 1/2in. bite type tube fittings | | | SS-VB5DB-K8-FL | 24.0 | 37.8 | 114 | 118 | 18.9 | 34.3 |

Order information and size for VR series five valves manifold (Size is only for reference.)

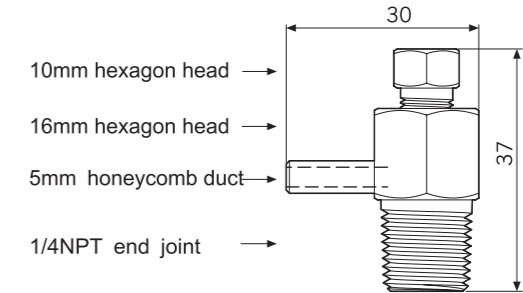


| End joint | | | Item No. |
|----------------------------|----------------|----------------------------|----------------|
| Technique | Instrument | Discharge | |
| 1/2in. NPT internal thread | Coplane flange | 1/4in. NPT internal thread | SS-VR5DB-F8-FL |

Optional accessories

Drain valves are the standard configured accessories of VR5 valve banks and other valve banks with 1/4 NPT discharge outlets can be purchased on selection.

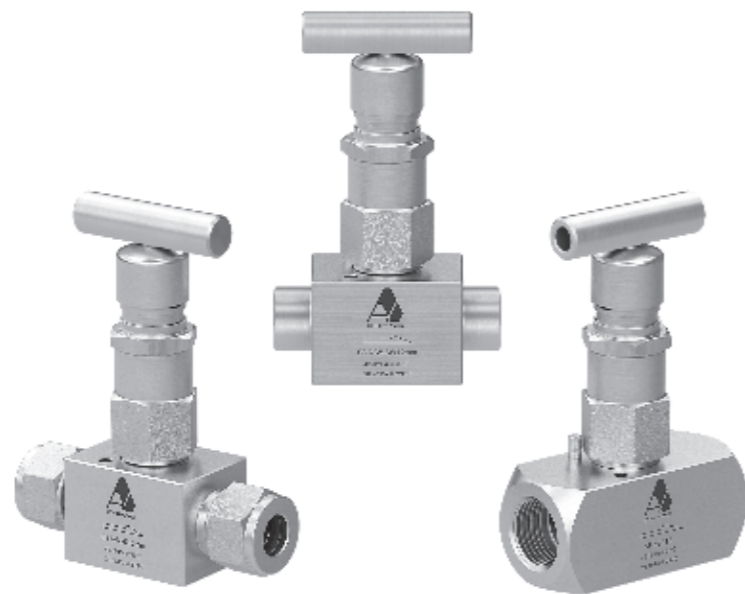
Total 316 stainless steel structure
Item NO. : SS-RM4



Drain valve (Sizes are only for reference.)

General needle valve

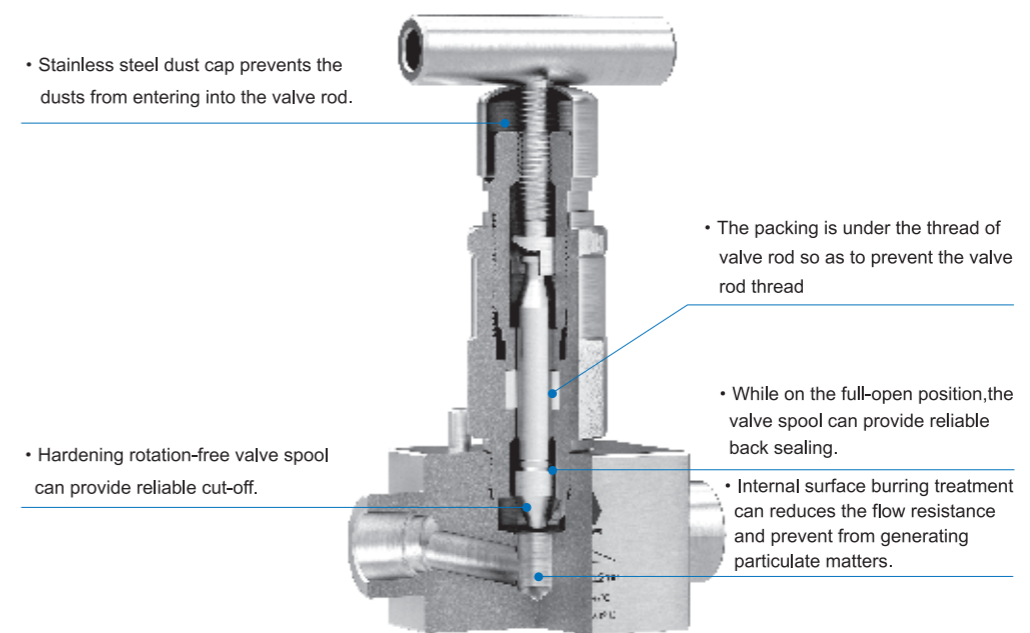
| |
|---|
| Total 316 stainless steel structure |
| Max. working pressure 42MPa (6090psi) |
| The highest permissible temperature 343°C (650°F) |
| Flow coefficient: 0.45~2.25 |
| Aperture: 5mm~11mm |



Features

This series needle valve is used to cut off and regulate the flow. Hardening rotation-free valve spool structure can reduce the packing abrasion so as to ensure the reliable cut-off of flow and stability of regulation and thus prolong the service life.

- Provide straight-through type and angle type
- Normal-temperature working pressure 42MPa (6090psi)
- Total 316 stainless steel structure
- While using PTFE packing, the highest working temperature is 232°C(450°F)
- While using graphite packing, the highest temperature is 343°C(650°F)



Test

Before leaving the factory, each needle valve has passed the 7MPa nitrogen pressure test. There is no bubble produced in the shell and the valve seats within 1min.

1. The packing can be adjusted at any time to prevent the valve leakage.

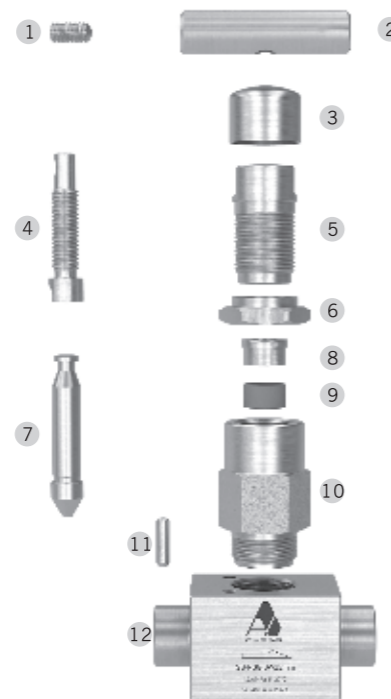
2. With respect to the valves which haven't been open or closed for a long time, the initial torque will increase.



Parts details

| Parts details | | Materials/ASTM standard | Parts details | | Materials/ASTM standard |
|---------------|-------------|-------------------------|---------------|---------------|-------------------------|
| 1 | Set screw | 316 SS / A276 | 7 | Valve spool | 316 SS / A479 |
| 2 | Handle | 316 SS / A276 | 8 | Packing gland | 316 SS / A276 |
| 3 | Dust cap | 316 SS / A240 | 9 | Packing | PTFE or graphite |
| 4 | Valve rod | 316 SS / A276 | 10 | Valve deck | 316 SS / A479 |
| 5 | Packing nut | 316 SS / A276 | 11 | Shotpin | 316 SS / A276 |
| 6 | Locknut | 316 SS / A276 | 12 | Valve body | 316 SS / A479 |

Note: Other structural materials can be customized.



Pressure-temperature rated value

| Temperature °C (°F) | Packing materials | |
|---------------------|----------------------------|-------------|
| | PTFE | Graphite |
| | Working pressure MPa (psi) | |
| -28(-20) to 37(100) | 42.0 (6090) | 42.0 (6090) |
| 93(200) | 35.5 (5160) | 35.5 (5160) |
| 148(300) | 32.2 (4680) | 32.2 (4680) |
| 204(400) | 29.3 (4260) | 29.3 (4260) |
| 232(450) | 28.3 (4110) | 28.3 (4110) |
| 260(500) | - | 27.2 (3960) |
| 315(600) | - | 26.0 (3780) |
| 343(650) | - | 25.2 (3660) |

Coding rule for item No.

SS – NG 5 – M 8 – F8 – A – G
 1 2 3 4 5 6 7 8

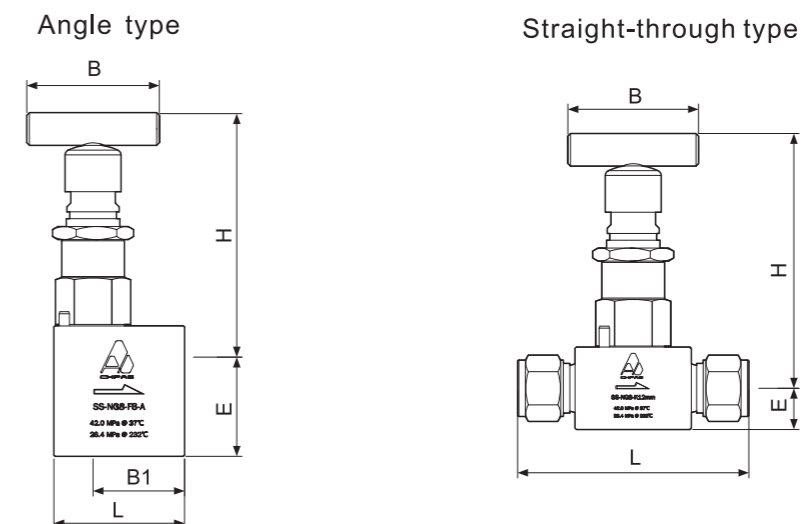
| | | | |
|---|--|---|--|
| 1 | Material type SS — 316 stainless steel | 5 | The size of the first connector (upstream) British system: size value (Unit: in. ×16) For example: 1/2×16=8, 1/2in.NPT internal thread is indicated by F8 Metric system: size value (Unit: mm) +“mm” |
| 2 | Needle valve type NG — General type | 6 | The size of the second connector (downstream) As per the first connector: if this section of codes are the same with that of the first connector, they will be omitted. |
| 3 | Aperture size 5 — Aperture 5mm 8 — Aperture 8mm 11 — Aperture 11mm | 7 | Circulation type A — Angle type Bite type tube fittings No indication — Straight-through type |
| 4 | The form of the first connector (upstream) K — Bite type tube fittings F — NPT internal thread M — NPT external thread SW — socket weld | 8 | Packing type G — Graphite packing No indication — PTFE packing |

For example: SS-NG8-M8-F8-G

It means straight-through type general needle valve, whose material is 316 SS and aperture is 8mm. The first connector (up stream) is 1/2 in. NPT external thread. The second connector (down stream) is 1/2 in. NPT internal thread. The packing is flexible graphite.

Order info & size

The H showed in the figure is the size of full-open state. (The sizes are only for reference.)



General needle valve

- Features
- Test
- Parts details
- Pressure-temperature rated value
- Coding rule for item No.
- Order info & size

| Angle type | | | | | | | | | |
|---------------------|--------|------|---------------|-------------|-----------|------|------|----|------|
| Connector | | Cv | Aperture (mm) | Item No. | Size (mm) | | | | |
| Form | Size | | | | B | E | H | L | B1 |
| NPT internal thread | 1/4in. | 0.55 | 5 | SS-NG5-F4-A | 50 | 21.5 | 81 | 38 | 25.5 |
| | 3/8in. | | | 28 | | 44.5 | | 32 | |
| | 1/2in. | | | 31 | | 84.5 | | 51 | 33.5 |
| | 1/2in. | 1.60 | 8 | SS-NG8-F8-A | 50 | 31 | 98.5 | 51 | 35 |
| | 3/4in. | | | 40.5 | | 101 | 63.5 | 38 | |
| | 1 in. | | | 108 | | 70 | 44.5 | | |

| Straight-through type | | | | | | | | | |
|--------------------------|--|--------|-----------------|-----------------|--------------|------|------|------|------|
| Connector | | Cv | Aperture (mm) | Item No. | Size (mm) | | | | |
| Form | Size | | | | B | E | H | L | |
| NPT internal thread | 1/4in. | 0.45 | 5 | SS-NG5-F4 | 50 | 13 | 81 | 54 | 57 |
| | 3/8in. | | | SS-NG5-F6 | | | | | |
| | 1/2in. | 0.45 | 5 | SS-NG5-F8 | 50 | 16 | 84.5 | 67 | |
| | | 1.2 | 8 | SS-NG8-F8 | 50 | | 98.5 | 70 | |
| | 3/4in. | 1.2 | 8 | SS-NG8-F12 | 50 | 19 | 101 | 76 | |
| | | 2.25 | 11 | SS-NG11-F12 | 76 | 22.5 | 133 | 82.5 | |
| | | 1.2 | 8 | SS-NG8-F16 | 50 | 25.5 | 108 | 89 | |
| | | 2.25 | 11 | SS-NG11-F16 | 76 | | 136 | 102 | |
| | NPT external thread /NPT internal thread | 1/4in. | 0.45 | 5 | SS-NG5-M4-F4 | 50 | 13 | 81 | 60.5 |
| | | 3/8in. | | | SS-NG5-M6-F6 | | | | |
| | | 1/2in. | 0.45 | 5 | SS-NG5-M8-F8 | 50 | 16 | 84.5 | 70 |
| | | | 1.2 | 8 | SS-NG8-M8-F8 | 50 | | 98.5 | 76 |
| 3/4in. | | 1.2 | 8 | SS-NG8-M12-F12 | 50 | 19 | 101 | 79.5 | |
| | | 2.25 | 11 | SS-NG11-M12-F12 | 76 | 22.5 | 133 | 89 | |
| | 1.2 | 8 | SS-NG8-M16-F16 | 50 | 25.5 | 108 | 89 | | |
| | 2.25 | 11 | SS-NG11-M16-F16 | 76 | | 136 | 102 | | |
| Bite type tube fittings | 6mm | 0.45 | 5 | SS-NG5-K6mm | 50 | 13 | 81 | 75.5 | |
| | 8mm | | | SS-NG5-K8mm | | | | | 66 |
| | 10mm | | | SS-NG5-K10mm | | | | | |
| | 12mm | 0.45 | 5 | SS-NG5-K12mm | 50 | 13 | 81 | 77 | |
| | | 1.2 | 8 | SS-NG8-K12mm | 50 | | 98 | 87 | |
| | 14mm | 1.2 | 8 | SS-NG8-K14mm | 50 | 16 | 98 | 87 | |
| | | 2.25 | 11 | SS-NG11-K14mm | 76 | | 22.5 | 133 | 121 |
| | 16mm | 1.2 | 8 | SS-NG8-K16mm | 50 | 16 | 98 | 92 | |
| | | 2.25 | 11 | SS-NG11-K16mm | 76 | | 22.5 | 133 | 114 |
| | 18mm | 2.25 | 11 | SS-NG11-K18mm | 76 | 22.5 | 133 | 108 | |
| SS-NG11-K25mm | | | | | | | | | |
| Ferrule tube Socket weld | 6mm | 0.45 | 5 | SS-NG5-SW6mm | 50 | 13 | 81 | 60.5 | |
| | 8mm | | | SS-NG5-SW8mm | | | | | 51 |
| | 10mm | | | SS-NG5-SW10mm | | | | | |
| | 12mm | 0.45 | 5 | SS-NG5-SW12mm | 50 | 13 | 81 | 57 | |
| | | 1.2 | 8 | SS-NG8-SW12mm | 50 | | 98 | 67 | |
| | 14mm | 1.2 | 8 | SS-NG8-SW14mm | 50 | 16 | 98 | 67 | |
| | | 2.25 | 11 | SS-NG11-SW14mm | 76 | | 22.5 | 133 | 95.5 |
| | 16mm | 1.2 | 8 | SS-NG8-SW16mm | 50 | 16 | 98 | 67 | |
| | | 2.25 | 11 | SS-NG11-SW16mm | 76 | | 22.5 | 133 | 89 |
| | 18mm | 2.25 | 11 | SS-NG11-SW18mm | 76 | 22.5 | 133 | 82.5 | |
| SS-NG11-SW25mm | | | | | | | | | |

Hat type needle valve

NIP & NI series

Total 316 stainless steel structure
 Max. working pressure 42MPa (6090psi)
 The highest permissible temperature 315°C (600°F)
 Flow coefficient: 0.09~1.8
 Aperture: 2.0mm~9.5mm



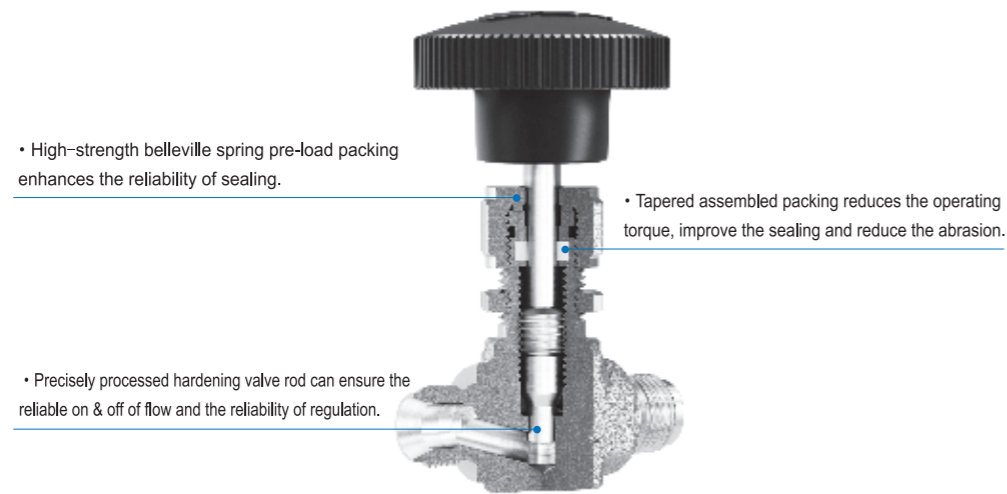
Hat type needle valve

- Features
- Test
- Parts details
- Pressure-temperature rated value
- Coding rule for item No.
- Order info & size

Features

The hat-type needle valve has solid forging valve body, which is delicate in structural design, reliable in operation. It can apply to the flow regulation and cut-off in diverse occasions.

- Compact structure
- Self-compensating type packing seal structure
- Regulating valve rod and V-shape valve rod for selection
- Panel mounting
- Various connector forms for selection



Test

Before leaving the factory, each needle valve has passed the 7MPa nitrogen pressure test. There is no bubble produced in the shell and the valve seats within 1min.

1. The packing can be adjusted at any time to prevent the valve leakage.
2. With respect to the valves which haven't been open or closed for a long time, the initial torque will increase.

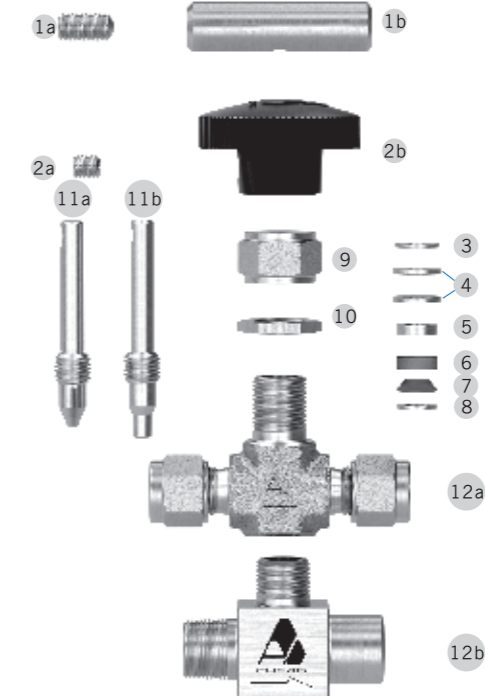


Parts details

| Parts details | Series | Materials /ASTM standard |
|--------------------|--------|--------------------------|
| 1a Stop screw | All | 316 SS / A276 |
| 1b Bar-type handle | | 316 SS / A276 |
| 2a Stop screw | All | 316 SS / A276 |
| 2b Rounded handle | | Phenolic resin |
| 3 Gland | All | 316 SS / A240 |
| 4 Spring | All | S17700 / A693 |
| 5 Packing gland | All | 316 SS / A240 |
| 6 Upper packing | All | PFA / D3307 |

| Parts details | Series | Materials /ASTM standard |
|------------------------------------|------------|--------------------------|
| 7 Lower packing | All | PFA / D3307 |
| 8 Support ring | All | 316 SS / A240 |
| 9 Packing nut | All | 316 SS / A276 |
| 10 Panel nut | NIP series | 316 SS / A276 |
| 11a V-shape valve rod | All | 316 SS / A276 |
| 11b Regulating valve rod | NIP series | |
| 12a Valve body with panel mounting | NIP series | 316 SS / A479 |
| 12b Valve body with panel mounting | NI series | 316 SS / A479 |

Note: Other structural materials can be customized.



Pressure-temperature rated value

| Temperature °C(°F) | Packing materials | |
|---------------------|------------------------------|-------------|
| | PFA (standard configuration) | PEEK |
| | Working pressure MPa (psi) | |
| -54(-65) to 37(100) | 42.0 (6090) | 42.0 (6090) |
| 93(200) | 35.5 (5160) | 35.5 (5160) |
| 148(300) | 32.1 (4660) | 32.1 (4660) |
| 204(400) | 29.4 (4280) | 29.4 (4280) |
| 232(450) | 28.4 (4130) | 28.4 (4130) |
| 260(500) | - | 27.4 (3980) |
| 315(600) | - | 25.9 (3760) |

Coding rule for item No.

SS – NIP 6 R - M 4 - K6 - A - SH - P
 1 2 3 4 5 6 7 8 9 10

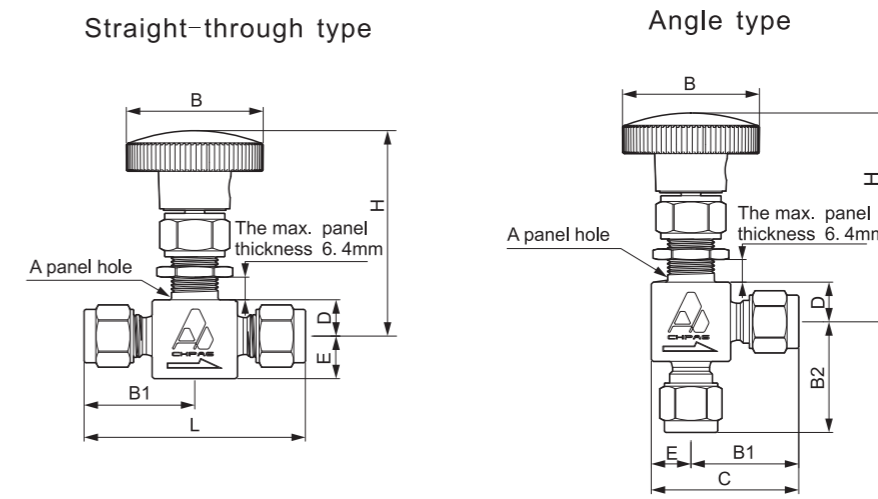
| | | | |
|----------|--|-----------|--|
| 1 | Material type SS — 316 stainless steel | 6 | The size of the first connector (upstream) British system: size value (Unit: in. ×16 For example: 1/2×16=8, 1/2in.NPT internal thread is indicated by F8. Metric system: size value (Unit: mm) + "mm" |
| 2 | Needle valve series NIP — Integral type needle valve, with panel mounting NI — integral type needle valve, without panel mounting | 7 | The size of the second connector (downstream) As per the first connector. If this section of codes are the same with that of the first connector, they can be omitted. |
| 3 | Aperture size series 2 — Aperture 2mm 3 — Aperture 3.2mm 4 — Aperture 4.4mm 6 — Aperture 6.4mm 9 — Aperture 9.5mm | 8 | Circulation type A — Angle type No indication — Straight-through type |
| 4 | Valve rod type R — Regulating valve rod V — V-shape valve rod | 9 | Handle type SH — Bar-type handle No indication — Rounded handle |
| 5 | The form of the first connector (upstream) K — Bite type tube fittings F — NPT internal thread M — NPT external thread | 10 | Packing material P — PEEK No indication — PFA |

For example: SS-NIP6R-M4-K6

It means straight-through hat type needle valve, whose material is 316 SS and has panel mounting. Its aperture is 6.4mm. It adopts regulating valve rod. The first connector (upstream) is 1/4 in. NPT external thread and the second connector (downstream) is 3/8 in. bite type tube fitting. The handle is rounded handle and the packing is PFA.

Order info & size (The H shown in the figure is the size of full-open state. The sizes are only for reference.)

NIP series

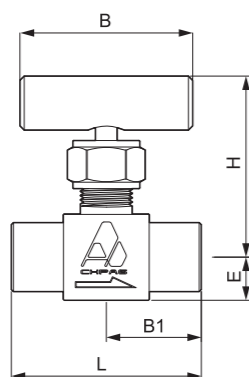


| Form | Connector | | | Item No. ① | Size (mm) | | | | | | | | |
|--|---------------------------|---------|----------------|----------------|-------------|------|------|------|-----|----|------|------|------|
| | Size | Cv | Aperture (mm) | | L | B1 | B2 | C | D | E | B | A | H |
| Bite type tube fittings | 6mm | 0.37 | 4.4 | SS-NIP4R-K6mm | 57 | 28.5 | 28.4 | 38.5 | 11 | 10 | 35 | 13 | 62 |
| | 8mm | | | SS-NIP4R-K8mm | 59.5 | 30 | 30 | 39 | 11 | 10 | 35 | 13 | 63.5 |
| | 10mm | 0.73 | 6.4 | SS-NIP6R-K10mm | 66 | 33 | 33 | 46 | 14 | 13 | 50 | 19 | 75.5 |
| | 12mm | 1.8 | 6.4 | SS-NIP6R-K12mm | 71 | 35.5 | 35.5 | 48.5 | 14 | 13 | 50 | 19 | 75.5 |
| | 12mm | 1.8 | 9.5 | SS-NIP9R-K12mm | 96.5 | 48.5 | 48.5 | 67.5 | 19 | 19 | 76 | 23 | 99.5 |
| | 18mm | | | SS-NIP9R-K18mm | | 48.5 | 48.5 | 67.5 | 19 | 19 | 76 | | 99.5 |
| | 1/4in. | 0.37 | 4.4 | SS-NIP4R-K4 | 57.5 | 29.5 | 29.5 | 38.5 | 11 | 10 | 35 | 13 | 63.5 |
| | 3/8in. | 0.73 | 6.4 | SS-NIP6R-K6 | 65.5 | 33 | 33 | 45.5 | 14 | 13 | 48 | 19 | 75.5 |
| | 1/2in. | 0.73 | 6.4 | SS-NIP6R-K8 | 71 | 35.5 | 35.5 | 48.5 | 14 | 13 | 48 | 19 | 75.5 |
| | 1/2in. | 1.8 | 9.5 | SS-NIP9R-K8 | 96.5 | 48.5 | 48.5 | 67.5 | 19 | 19 | 76 | 23 | 99.5 |
| | 3/4in. | | | SS-NIP9R-K12 | | 48.5 | 48.5 | 67.5 | 19 | 19 | 76 | | 99.5 |
| | NPT internal thread | 1/8 in. | 0.09 | 2 | SS-NIP2R-F2 | 48 | 24 | 24 | 32 | 11 | 8 | 25.5 | 13 |
| 1/8 in. | | 0.37 | 4.4 | SS-NIP4R-F2 | 41 | 20.5 | 20.5 | 30 | 11 | 10 | 35 | 13 | 63.5 |
| 1/4 in. | | 0.73 | 6.4 | SS-NIP6R-F4 | 54 | 27 | 27 | 39.5 | 14 | 13 | 48 | 19 | 75.5 |
| 3/8 in. | | 1.8 | 9.5 | SS-NIP9R-F6 | 76 | 38 | 38 | 57 | 19 | 19 | 76 | 23 | 98.5 |
| 1/2 in. | | | SS-NIP9R-F8 | 38 | | 38 | 57 | 19 | 19 | 76 | | 98.5 | |
| NPT external thread | 1/8 in. | 0.09 | 2 | SS-NIP2R-M2 | 38 | 19 | 19 | 27 | 11 | 8 | 25.5 | 13 | 58 |
| | 1/8 in. | 0.37 | 4.4 | SS-NIP4R-M2 | 41 | 20.5 | 20.5 | 30 | 11 | 10 | 35 | 13 | 63.5 |
| | 1/4 in. | | | SS-NIP4R-M4 | 50 | 25 | 25 | 34.5 | 11 | 10 | 35 | | 63.5 |
| | 3/8 in. | 0.73 | 6.4 | SS-NIP6R-M6 | 62.5 | 29.5 | 29.5 | 41 | 14 | 13 | 48 | 19 | 75.5 |
| NPT external thread/bite type tube fittings | 1/2 in. | 1.8 | 9.5 | SS-NIP9R-M8 | 76 | 38 | 38 | 57 | 19 | 19 | 76 | 23 | 98.5 |
| | 1/4 in. | 0.37 | 4.4 | SS-NIP4R-M4-K4 | 49.5 | 29 | 25 | 38.5 | 11 | 10 | 35 | 13 | 63.5 |
| | 1/4 in. | 0.73 | 6.4 | SS-NIP6R-M4-K6 | 61.5 | 33 | 28.5 | 45.5 | 14 | 13 | 48 | 19 | 75.5 |
| | 3/8 in. | | | SS-NIP6R-M6-K6 | | | | | | | | | |
| 3/8 in. | 0.73 | 6.4 | SS-NIP6R-M6-K8 | 64 | 35.5 | 28.5 | 48.5 | 14 | 113 | 48 | 19 | 75.5 | |
| NPT external thread/ NPT internal thread | 1/4 in. | 0.73 | 6.4 | SS-NIP6R-M4-F4 | 55.5 | 27 | 28.5 | 39.5 | 14 | 13 | 48 | 19 | 75.5 |
| | 1/2 in. | 1.8 | 9.5 | SS-NIP9R-M8-F8 | 76 | 38 | 38 | 57 | 19 | 19 | 76 | 23 | 98.5 |

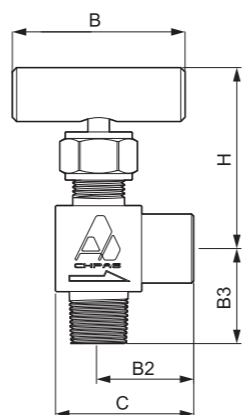
Note ①: if it is angle type, add "-A" behind the item No.

NI series

Straight-through type



Angle type



Hat type needle valve

Features

Test

Parts details

Pressure-temperature rated value

Coding rule for item No.

Order info & size

| Form | Connector | | | Item No.① | Size (mm) | | | | | | | |
|---|-----------|------|---------------|----------------|-----------|------|------|------|------|------|------|------|
| | Size | Cv | Aperture (mm) | | L | B1 | B2 | B3 | C | E | B | H |
| Bite type tube fittings | 1/4 in. | 0.21 | 3.2 | SS-NI3V-K4 | 62.5 | 31 | 29 | 29.5 | 40 | 11 | 44.5 | 42 |
| | 3/8 in. | 0.73 | 6.4 | SS-NI6V-K6 | 78 | 39 | - | - | - | 17 | 63.5 | 59 |
| | 1/2 in. | - | - | SS-NI6V-K8 | 84 | 42 | - | - | - | 17 | 63.5 | 59 |
| NPT internal thread | 1/4 in. | 0.21 | 3.2 | SS-NI3V-F4 | 48 | 24 | 25.5 | 36.5 | 11 | 44.5 | 42 | |
| | 3/8 in. | 0.73 | 6.4 | SS-NI6V-F6 | 63.5 | 32 | - | - | - | 17 | 63.5 | 59 |
| | 1/2 in. | - | - | SS-NI6V-F8 | - | - | 36 | 52.5 | - | - | - | - |
| NPT external thread | 1/4 in. | - | - | SS-NI3V-M4 | 49.5 | 24.5 | - | - | - | 11 | - | - |
| NPT external thread/ bite type tube fittings | 1/4 in. | 0.21 | 3.2 | SS-NI3V-M4-K4 | - | - | 29 | 25.5 | 40 | - | 44.5 | 42 |
| | 1/4 in. | - | - | SS-NI3V-M4-F4 | 48.5 | 24 | 25.5 | 26 | 36.5 | 11 | - | - |
| NPT external thread/ NPT internal thread | 3/8 in. | - | - | SS-NI6V-M6-F6 | 63.5 | 32 | 36 | 31 | 52.5 | - | - | - |
| | 1/2 in. | 0.73 | 6.4 | SS-NI6V-M8-F8 | 65 | 32 | 36 | - | - | 17 | 63.5 | 58.7 |
| | 3/4 in. | - | - | - | - | - | - | - | - | - | - | - |
| | 1/2 in. | - | - | SS-NI6V-M12-F8 | 63.5 | 32 | - | - | - | - | - | - |

Note ①: if it is angle type, add "-A" behind the item No.

General ball valve

Total 316 stainless steel structure
 Max. working pressure 20.6MPa (3000psi)
 The highest permissible temperature 232°C (450°F)
 1/4 circle on and off
 The on and off positions can be locked
 1/8 to 1 in. and 6 to 25mm aperture
 Compensation valve seat design,
 elastic loaded and tapered assembled packing

General ball valve

Structural features

Test

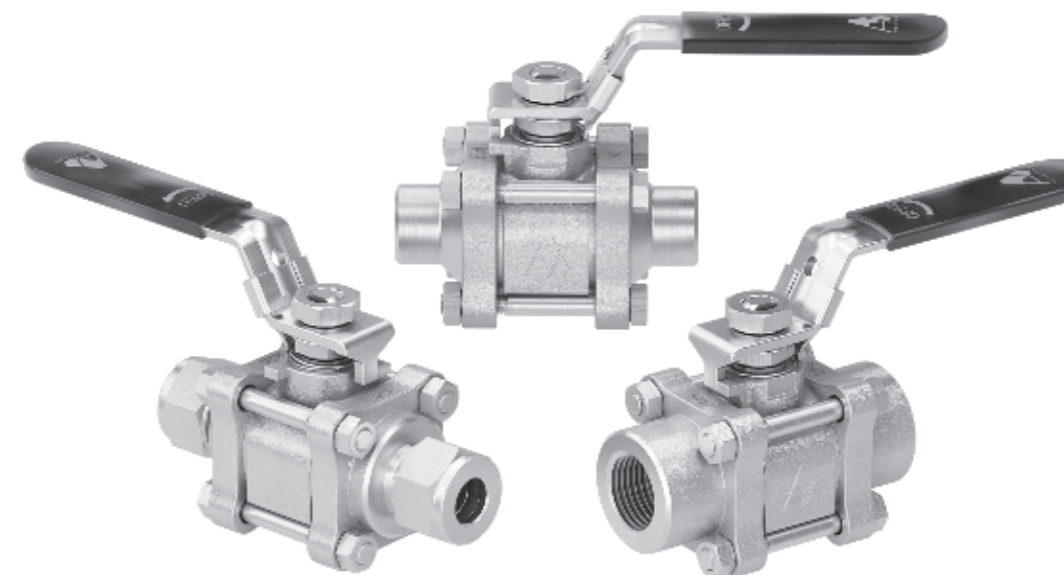
Parts details

Pressure-temperature rated value

Applicable range

Coding rule for item No.

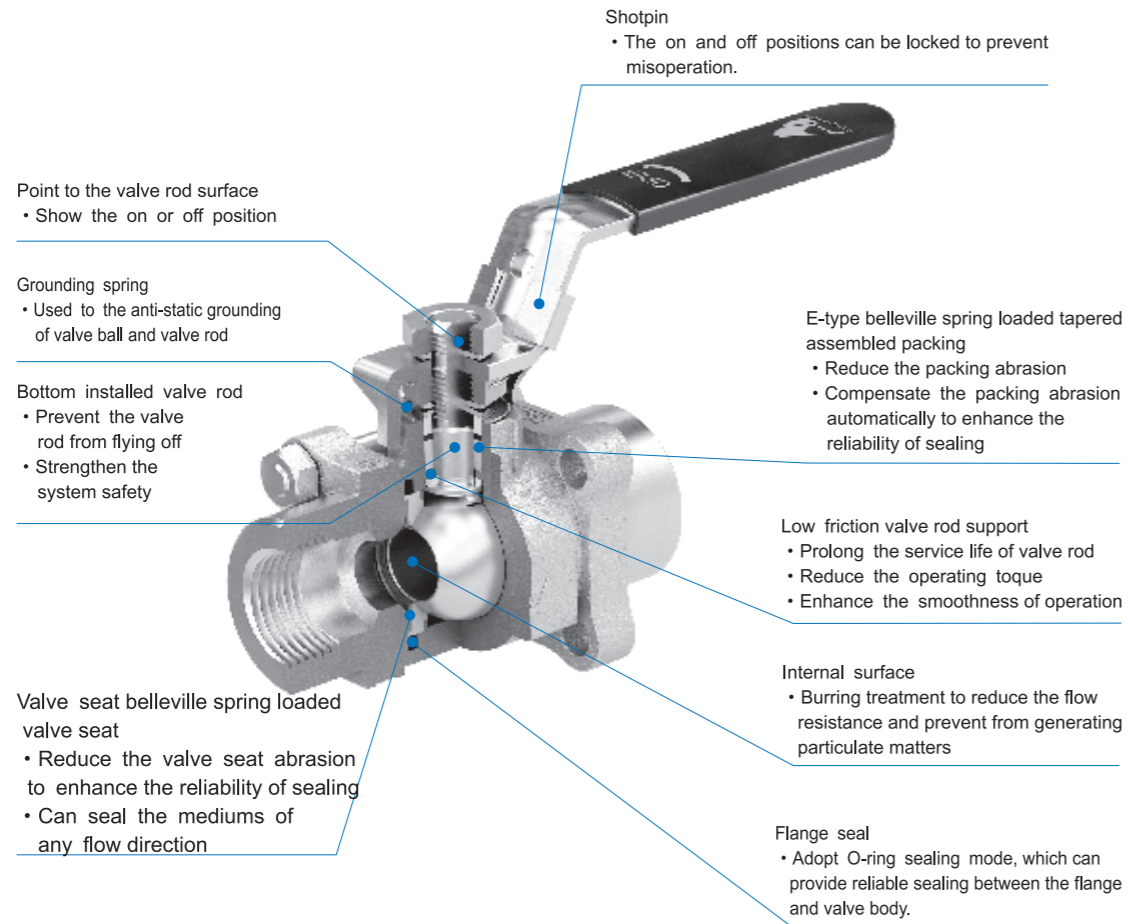
Order info & size



Structural features

The general ball valve is small in size and compact in structure, which can apply to the occasions with limited space. The valve body can be divided and has outstanding universality and interchangeability, which is easy to replace the vulnerable parts so as to reduce the cost of maintenance. The standard structural material is 316SS. The users can also use other materials according to the usage occasions.

The compensation valve seat ensures that the ball valve has reliable sealing. Under low pressure, the sealing is obtained by valve seat belleville spring loading on the valve seat. Under high pressure, the valve ball will move to the downstream under the action of medium pressure to make the downstream valve seat bend and strengthen the sealing. The upstream valve seat will, at the same time, keep sealing under the effects of valve seat belleville spring.



Test

Before leaving the factory, each general ball valve has passed the 7MPa nitrogen pressure test. There is no bubble producing in the shell and valve seats within 1min.

1. The general ball valve is designed to work in the full-open or full-closing position. It is not suggested to apply to the flow regulation occasions.

2. In the application periods of ball valve, the packing may need to be adjusted.

The adjusting methods are:



a. Loosen and take down the valve rod nut 1, E-type belleville spring 2, handle 2 and grounding spring 6 by a wrench.

b. Properly screw up the valve rod nut 7 by a wrench, then install the grounding spring 6, handle 3, E-type belleville spring 2 and valve rod nut 1.

c. Screw up the valve rod nut 1 by a wrench.

Note: The figures behind the parts do mean the serial No. of part in the parts details table. For example, valve rod nut 1 means the valve rod nut whose serial No. in the parts details table is 1.

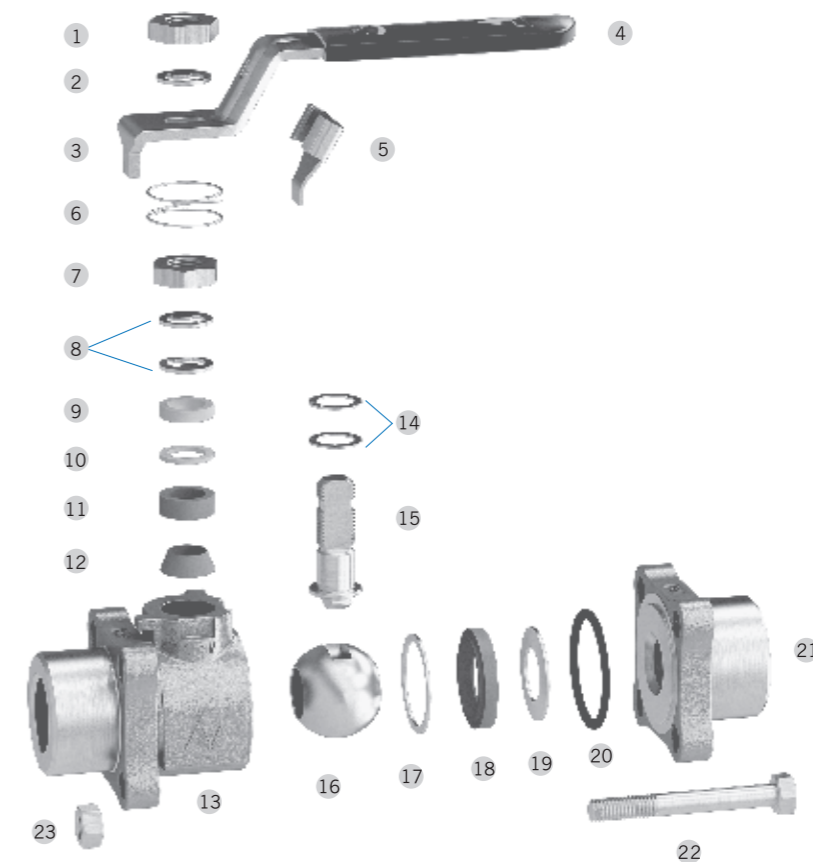
Parts details

| Parts details | Material/ASTM standard |
|----------------------------|--------------------------------|
| 1 Valve rod nut | 316 SS |
| 2 E-type belleville spring | Hardening 316 SS / A240 |
| 3 Handle | 316 SS / A240 |
| 4 Handle sleeve | Polyvinyl chloride (PVC) |
| 5 Shotpin | 316 SS / A240 |
| 6 Grounding spring | 302 SS / A313 |
| 7 Valve rod nut | 316 SS |
| 8 E-type belleville spring | Hardening 316 SS / A240 |
| 9 Sealing gland | Coat PTFE 316 SS / B783 |
| 10 Packing support | PEEK |
| 11 Upper packing | Strengthened PTFE ^② |
| 12 Lower packing | Strengthened PTFE ^② |

| Parts details | Material/ASTM standard |
|---------------------------------|-----------------------------------|
| 13 Valve body | CF3M / A351 |
| 14 Valve rod support | Hardening 316 SS / A240 |
| 15 Valve rod | 316 SS / A479 |
| 16 Valve ball | 316 SS / A479 |
| 17 Support ring | 316 SS / A240 |
| 18 Valve seat | Strengthened PTFE ^② |
| 19 Valve seat belleville spring | Hardening 316 SS / A240 |
| 20 Flange seal ring | Carbon fluorine FKM ^② |
| 21 Flange | CF3M / A351 |
| 22 Valve body fastener | 316 SS |
| 23 Valve body hex nut | 316 SS |
| Lubricant | Silicone grease or PTFE lubricant |

Note ①: Other selectable structural materials include Alloy 400, Alloy C-276, Alloy 20, Alloy 600 and Ti etc.

Note ②: With respect to other selectable sealing materials, please refer to "Applicable range".



Pressure-temperature rated value

The pressure-temperature rated value is based on the 316SS structural material and fluorocarbon FKM flange seal ring. With respect to the ball valve with replaced structural material, the rated value may be changed.

Strengthened PTFE valve seat

| | | |
|---------------------|---------------------------|--|
| Type of flow | On-off (two-way) | |
| Aperture series | 2, 3, 5 | |
| Temperature °C(°F) | Working pressure MPa(psi) | |
| -28(-20) to 37(100) | 15.1(2200) | |
| 93(200) | 10.3(1500) | |
| 148(300) | 5.5(800) | |
| 232(450) | 0.68(100) | |

PEEK valve seat

| | | |
|---------------------|---------------------------|------------|
| Type of flow | On-off (two-way) | |
| Aperture series | 2 | 3, 5 |
| Temperature °C(°F) | Working pressure MPa(psi) | |
| -28(-20) to 37(100) | 20.6(3000) | 17.2(2500) |
| 93(200) | 12.8(1870) | 10.7(1560) |
| 148(300) | 11.0(1600) | 9.0(1310) |
| 232(450) | 5.5(800) | 5.5(800) |

Protogenetic PTFE valve seat

| | | |
|---------------------|---------------------------|--|
| Type of flow | On-off (two-way) | |
| Aperture series | 2, 3, 5 | |
| Temperature °C(°F) | Working pressure MPa(psi) | |
| -28(-20) to 37(100) | 10.3(1500) | |
| 93(200) | 10.3(1500) | |
| 148(300) | 5.5(800) | |
| 232(450) | 0.68(100) | |

Polyethylene valve seat

| | | |
|---------------------|---------------------------|------------|
| Type of flow | On-off (two-way) | |
| Aperture series | 2 | 3, 5 |
| Temperature °C(°F) | Working pressure MPa(psi) | |
| -28(-20) to 37(100) | 20.6(3000) | 17.2(2500) |
| 121(250) | 1.7(250) | 1.7(250) |

Applicable range

Flange sealing material

| | |
|-------------------------|------------------------|
| Flange sealing material | Temperature °C(°F) |
| Fluorocarbon FKM | -26 to 232(-14 to 450) |
| Nitrile rubber | -28 to 121(-20 to 250) |
| Buna C | -53 to 121(-65 to 250) |
| Ethylene-propylene | -28 to 121(-20 to 250) |
| Chloroprene rubber | -28 to 121(-20 to 250) |

Valve seat material

| | |
|---------------------|---|
| Valve seat material | Forbidden range |
| Strengthened PTFE | Cannot be used steam, heatproof or chlorine-resistant valves. |
| PEEK | Not provided for the fire-resistant, heatproof, chlorine-resistant or all-welded series, but it can be used in the steam series valves. |
| UHMWPE | Cannot be used in the steam, fire-resistant, heatproof or chlorine-resistant series valves. |
| Protogenetic PTFE | Cannot be used in the steam, fire-resistant, or heatproof series valves, but can be used in the chlorine-resistant series valves. |

Coding rule for item No.

SS – BG 2 – T – BW 4 T10 – B
 1 2 3 4 5 6 7 8

| | |
|---|--|
| 1 | Material type SS — 316 stainless steel |
|---|--|

| | |
|---|---|
| 2 | Ball valve series BG — General ball valve |
|---|---|

| | |
|---|---|
| 3 | Aperture size 2 — Aperture size: 4.8mm, 6.4mm, 7.1mm 3 — Aperture size: 9.5mm, 10.3mm, 13.1mm 5 — Aperture size: 20.9mm, 22.2mm |
|---|---|

| | |
|---|--|
| 4 | Valve seat type T — Strengthened PTFE P — PEEK U — UHMWPE V — Protogenetic PTFE |
|---|--|

| | |
|---|---|
| 5 | Connector type Encode according to the order of "Coding for upstream connector type & size" - "Coding for downstream connector type & size". If the upstream and downstream connectors types and sizes are the same, the type and size of downstream connector can be omitted. K — Bite type tube fittings SW — Socket weld BW — Butt welding end joint F — NPT internal thread |
|---|---|

| | |
|---|--|
| 6 | Connector size British system: size value (Unit: in ×16) For example: 1/2×16=8, 1/2in.NPT internal thread is indicated by F8 Metric system: size value (Unit: mm) + "mm" |
|---|--|

| | |
|---|--|
| 7 | Wall thickness of connector With respect to the ball valve of butt welding end joint, the size of wall thickness should be increased, while it is unnecessary for the end joints of other types. The code of wall thickness is indicated by letter "T" and wall thickness specification. For instance, the thickness of SCH10S series is indicated by "T10". |
|---|--|

| | |
|---|---|
| 8 | Accessories & codes of special requirements Several code segments can be added according to the specific conditions. It is not necessary to mark this code segment for standard configuration. For instance, when the flange sealing material is not standard fluorocarbon FKM, this code segment should be marked. The codes for other flange sealing materials are: B — Nitrile rubber BC — Buna C E — Ethylene-propylene N — Chloroprene rubber |
|---|---|

For example: SS-BG3-T-BW8T10-B

It means the general ball valve with strengthened PTFE valve seat, whose valve body material is 316SS and aperture is 13.1mm. The upstream and downstream connectors are 1/2 in., butt welding end joint (the specification of tube wall thickness is SCH10S series (tube wall thickness is 2.11 mm). The flange sealing material is nitrile rubber.



Not all the flange sealing and valve seat materials combination can be provided.

General ball valve

Structural features

Test

Parts details

Pressure-temperature rated value

Applicable range

Coding rule for item No.

Order info & size

General ball valve

Structural features

Test

Parts details

Pressure-temperature rated value

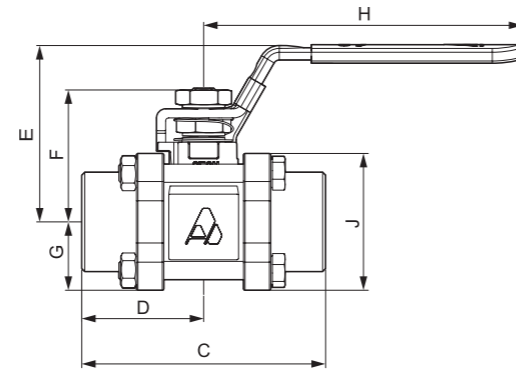
Applicable range

Coding rule for item No.

Order info & size

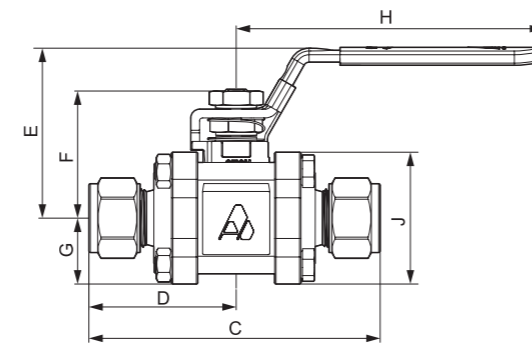
Order info & size

NPT internal end joint (The sizes are only for reference)



| End joint size | Cv | Aperture (mm) | Item No. | Size (mm) | | | | | | |
|----------------|-----|---------------|--------------|-----------|------|------|------|------|------|------|
| | | | | C | D | E | F | G | H | J |
| 1/8in. | 3.8 | 7.1 | SS-BG2-T-F2 | 62.0 | 31.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 1/4in. | 3.8 | 7.1 | SS-BG2-T-F4 | 62.0 | 31.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 3/8in. | 12 | 13.1 | SS-BG3-T-F6 | 81.0 | 40.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 |
| 1/2in. | 12 | 13.1 | SS-BG3-T-F8 | 81.0 | 40.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 |
| 3/4in. | 31 | 22.2 | SS-BG5-T-F12 | 92.0 | 46.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 |
| 1in. | 38 | 22.2 | SS-BG5-T-F16 | 92.0 | 46.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 |

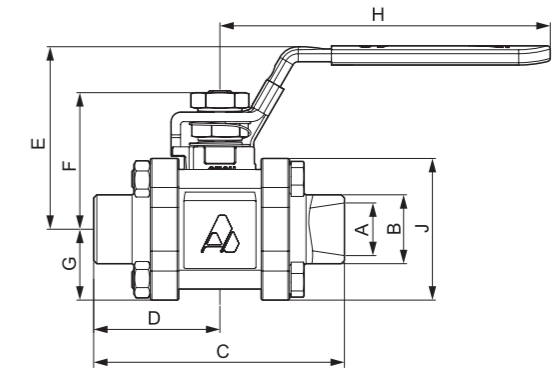
Bite type tube fitting end joint (The sizes are only for reference)



| End joint size | Cv | Aperture (mm) | Item No. | Size (mm) | | | | | | |
|----------------|------|---------------|----------------|-----------|------|------|------|------|------|------|
| | | | | C | D | E | F | G | H | J |
| 1/4 in. | 1.2 | 4.8 | SS-BG2-T-K4 | 76.0 | 38.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 3/8 in. | 3.8 | 7.1 | SS-BG2-T-K6 | 76.0 | 38.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 1/2 in. | 7.5 | 10.3 | SS-BG3-T-K8 | 101 | 50.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 |
| 3/4 in. | 13.6 | 13.1 | SS-BG3-T-K12 | 101 | 50.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 |
| 1 in. | 40 | 22.2 | SS-BG5-T-K16 | 136 | 68.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 |
| 6mm | 1.2 | 4.8 | SS-BG2-T-K6mm | 76.0 | 38.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 8mm | 2.5 | 6.4 | SS-BG2-T-K8mm | 76.0 | 38.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 10mm | 3.8 | 7.1 | SS-BG2-T-K10mm | 76.0 | 38.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 12mm | 7.5 | 9.5 | SS-BG3-T-K12mm | 101 | 50.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 |
| 18mm | 13.6 | 13.1 | SS-BG3-T-K18mm | 101 | 50.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 |
| 25mm | 40 | 22.2 | SS-BG5-T-K25mm | 136 | 68.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 |

Butt welding end joint (The sizes are only for reference.)

The butt welding end joint accords with the ASME B16.25 standard. While welding the valve and the pipeline, note not to make the temperature of internal sealing elements exceed 140°C (If necessary, the cooling treatment should be conducted between the weld joint and the sealing element while welding.).



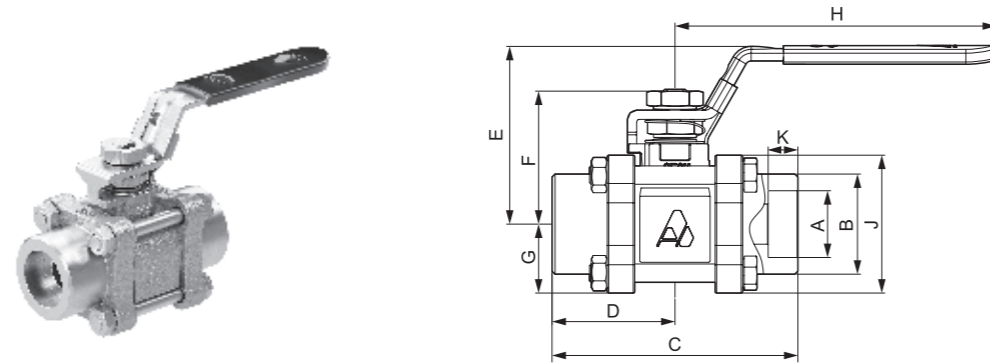
| Connector size | Cv | Aperture (mm) | Item No. | Size (mm) | | | | | | | | |
|---|------|---------------|------------------|-----------|------|------|------|------|------|------|------|------|
| | | | | A | B | C | D | E | F | G | H | J |
| Tube wall thickness specification SCH10S series | | | | | | | | | | | | |
| 1/4 in. | 1.2 | 4.8 | SS-BG2-T-BW4T10 | 10.4 | 13.7 | 62.0 | 31.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 1/2 in. | 15 | 13.1 | SS-BG3-T-BW8T10 | 17.1 | 21.3 | 81.0 | 40.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 |
| 3/4 in. | 36 | 22.2 | SS-BG5-T-BW12T10 | 22.5 | 26.7 | 92.0 | 46.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 |
| 1 in. | 40 | 22.2 | SS-BG5-T-BW16T10 | 27.9 | 33.4 | 92.0 | 46.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 |
| Tube wall thickness specification SCH40S series | | | | | | | | | | | | |
| 1/4 in. | 1.2 | 4.8 | SS-BG2-T-BW4T40 | 9.2 | 13.7 | 62.0 | 31.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 1/2 in. | 15 | 13.1 | SS-BG3-T-BW8T40 | 15.8 | 21.3 | 81.0 | 40.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 |
| 3/4 in. | 36 | 20.9 | SS-BG5-T-BW12T40 | 20.9 | 26.7 | 92.0 | 46.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 |
| 1 in. | 90 | 22.2 | SS-BG5-T-BW16T40 | 26.6 | 33.4 | 92.0 | 46.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 |
| Tube wall thickness specification SCH80S series | | | | | | | | | | | | |
| 1/4 in. | 1.2 | 4.8 | SS-BG2-T-BW4T80 | 7.7 | 13.7 | 62.0 | 31.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 3/8 in. | 3.8 | 7.1 | SS-BG2-T-BW6T80 | 10.7 | 17.1 | 62.0 | 31.0 | 41.5 | 32.0 | 17.5 | 58.0 | 35.0 |
| 1/2 in. | 6.8 | 13.1 | SS-BG3-T-BW8T80 | 13.9 | 21.3 | 81.0 | 40.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 |
| 3/4 in. | 13.6 | 13.1 | SS-BG3-T-BW12T80 | 18.8 | 26.7 | 81.0 | 40.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 |
| 1 in. | 40 | 22.2 | SS-BG5-T-BW16T80 | 23.9 | 33.4 | 92.0 | 46.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 |

Appendix: Specification Table for Stainless Steel Tube Wall Thickness (Selected from ASME B36.19-2004)

| Pipe aperture (in.) | Wall thickness of stainless steel tube (mm) | | |
|----------------------|---|--------|--------|
| | SCH10S | SCH40S | SCH80S |
| 1/4 | 1.65 | 2.24 | 3.02 |
| 3/8 | 1.65 | 2.31 | 3.20 |
| 1/2 | 2.11 | 2.77 | 3.73 |
| 3/4 | 2.11 | 2.87 | 3.91 |
| 1 | 2.77 | 3.38 | 4.55 |

Socket weld end joint (The sizes are only for reference.)

The nominal tube socket diameter and depth accord with the ASME B16.11 standard. While welding the valve and the tube, note not to let the temperature of internal sealing elements exceed 140°C (if necessary, cooling treatment should be conducted between the welded joint and the sealing element while welding.)



| Connector size | Cv | Aperture (mm) | Item No. | Size (mm) | | | | | | | | | |
|----------------|----|---------------|---------------|-----------|------|------|------|------|------|------|-----|------|------|
| | | | | A | B | C | D | E | F | G | H | J | K |
| 1/2in. | 15 | 13.1 | SS-BG3-T-SW8 | 21.8 | 32.7 | 81.0 | 40.5 | 58.5 | 44.0 | 22.5 | 105 | 45.0 | 12.7 |
| 3/4in. | 36 | 22.2 | SS-BG5-T-SW12 | 27.2 | 42.2 | 92.0 | 46.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 | 12.7 |
| 1in. | 42 | 22.2 | SS-BG5-T-SW16 | 33.9 | 45.3 | 92.0 | 46.0 | 75.0 | 64.0 | 32.0 | 152 | 64.0 | 12.7 |

Trunnion ball valve

BT & BTH series

Total 316 stainless steel structure
 Max. working pressure 70 MPa (10150 psi)
 The max. permissible temperature 232°C (450°F)
 Connector type:
 1/8 to 1/2in. and 6 to 12mm bite type tube fittings
 NPT internal thread connector



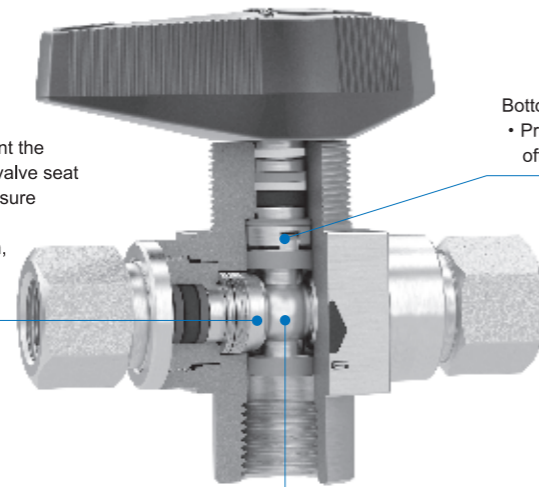
- General ball valve**
- Structural features
- Test
- Parts details
- Pressure-temperature rated value
- Applicable range
- Coding rule for item No.
- Order info & size**

- Trunnion ball valve**
- Structural features
- Technical parameters
- Test
- Data on flows
- Pressure-temperature rated value
- Parts details
- Coding rule for item No.
- Order info & size

Structural features

Trunnion ball valve is a fixed-axis type ball valve. The trunnion ball is installed from the bottom of valve body. There is a bearing between the trunnion and valve body. While opening and closing, the trunnion ball will rotate around the trunnion axis to realize the cut-off or switch of flow. The medium pressure is undertaken by the trunnion bearing, which can bear max. 70MPa working pressure.

- Compact structure
- Low operating torque
- With panel mounting
- Full-aperture design
- High working pressure
- 2-channel or 3-channel flow path



Belleville spring loaded valve seat

- Realize dynamic sealing to prevent the leakage caused by the abrasion valve seat and the fluctuation of system pressure
- Reduce the operating torque
- Reduce the valve seat abrasion, which may be caused by pressure jumps.

Bottom installed valve rod

- Prevent the valve rod from flying off to enhance the system safety.

Precisely processed trunnion ball

- Wear resistance
- Reliable sealing
- Reduce the operating torque

Technical parameters

| Valve seat material | Temperature rated value °C(°F) | Pressure rated value MPa(psi) while at 37°C(100°F) | Flow coefficient (Cv) |
|-------------------------|--------------------------------|--|---|
| BT series | | | |
| PCTFE, reinforced nylon | -17 121 0 250 | 42.0(6090) | Two-way valve—1.0 to 1.6, up to the connector form; Three-way valve—0.75 |
| PEEK | -17 232 0 450 | 42.0(6090) | |
| PTFE | -17 232 0 450 | 10.3(1500) | |
| BTH series | | | |
| PEEK | -17 232 0 450 | 42.0~70.0 (6090~10150) Up to the connector form | Two-way valve—1.0 to 1.6, up to the connector form; Three-way valve—0.75 |

Test

Before leaving the factory, each trunnion ball valve has passed the 7MPa nitrogen pressure test. There is no bubble producing in the shell and valve seats within 1min.

1. The ball valve is designed to apply to full-open or full-closing position.
2. With respect to the valve which hasn't been open or closed for a long time, the initial torque will increase.

Data on flows (20°C)

| Pressure drop relative to atmosphere (Δp) KPa(psi) | Air mass flow std L/min | | Water flow L/min | |
|--|--------------------------------|-----------------------------------|--------------------------------|-----------------------------------|
| | Two-way (Aperture 4.7mm,Cv1.2) | Three-way (Aperture 4.7mm,Cv0.75) | Two-way (Aperture 4.7mm,Cv1.2) | Three-way (Aperture 4.7mm,Cv0.75) |
| 69(10) | 390 | 220 | 14 | 9.0 |
| 340(50) | 1000 | 650 | 32 | 20 |
| 690(100) | 1800 | 1100 | 45 | 28 |

| Pressure drop relative to atmosphere (Δp) KPa(psi) | Air mass flow std L/min | | Water flow L/min | |
|--|--------------------------------|-----------------------------------|--------------------------------|-----------------------------------|
| | Two-way (Aperture 4.7mm,Cv1.2) | Three-way (Aperture 4.7mm,Cv0.75) | Two-way (Aperture 4.7mm,Cv1.2) | Three-way (Aperture 4.7mm,Cv0.75) |
| 1030(150) | 2600 | 1600 | 56 | 34 |
| 4200(600) | 9600 | 5900 | 100 | 68 |
| 6900(1000) | 16100 | 9900 | 140 | 90 |

Pressure-temperature rated value

Pressure-temperature rated value of BT series valve

Based on the listed valve seat material, fluorocarbon FKM, O-ring and PTFE check ring

| Valve seat material | PCTFE, nylon | PTFE | PEEK |
|---------------------|---------------------------|------------|------------|
| Temperature °C(°F) | Working pressure MPa(psi) | | |
| -17(0) to 37(100) | 42.0(6090) | 10.3(1500) | 42.0(6090) |
| 121(250) | 6.89(1000) | 4.3(625) | 28.2(4100) |
| 148(300) | - | 3.44(500) | 22.0(3200) |
| 232(450) | - | 0.86(125) | 3.44(500) |

Pressure-temperature rated value of BTH series valve

Based on the listed PEEK valve seat material, fluorocarbon FKM, O-ring and PTFE check ring

| Valve seat material | 316SS | | | | |
|---------------------|---------------------------|------------|------------|------------|------------|
| End joint | F2, F4, K4, K6mm | K10mm | K6, K8mm | K8 | K12mm |
| Temperature °C(°F) | Working pressure MPa(psi) | | | | |
| -17(0) to 37(100) | 70.0(10150) | 57.8(8400) | 51.6(7500) | 46.1(6700) | 45.4(6600) |
| 93(200) | 34.4(5000) | 34.4(5000) | 34.4(5000) | 34.4(5000) | 34.4(5000) |
| 148(300) | 22.0(3200) | 22.0(3200) | 22.0(3200) | 22.0(3200) | 22.0(3200) |
| 232(450) | 3.44(500) | 3.44(500) | 3.44(500) | 3.44(500) | 3.44(500) |

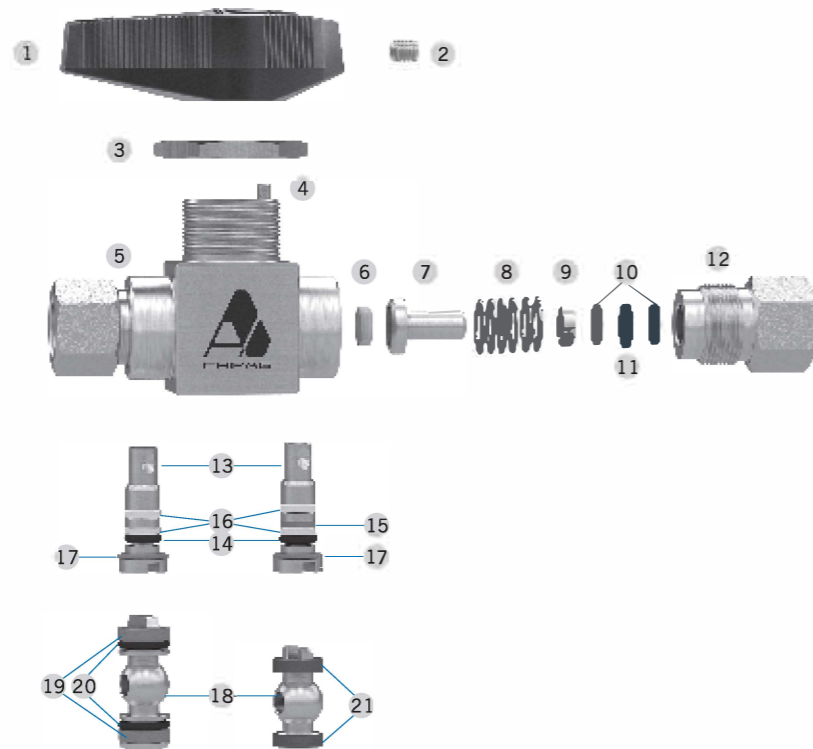
Parts details

BT series

| Parts details | Material/ASTM standard | |
|----------------------------------|--|-----------|
| | Two-way | Three-way |
| 1 Handle | Phenolic resin with brass insertion piece | |
| 2 Set screw | 316 SS / A276 | |
| 3 Extra-thin nut | 316 SS / B783 | |
| 4 Shotpin | 316 SS / A276 | |
| 5 Valve body | 316 SS/A479 | |
| 6 Valve seat | PCTFE/AMS 3650, PTFE / D1710, Strengthened nylon or PEEK | |
| 7 Valve seat bracket | 316 SS / A479 | |
| 8 Valve seat spring | Alloy X-750 / AMS 5542 | |
| 9 Valve seat bracket guider | 316 SS / A276 | |
| 10 Valve seat bracket check ring | PTFE / D1710 | |

| Parts details | Material/ASTM standard | |
|------------------------------|------------------------|-----------|
| | Two-way | Three-way |
| 11 Valve seat bracket O ring | Fluorocarbon FKM | |
| 12 End joint | 316 SS / A479 | |
| 13 Valve rod | 316 SS / A479 | |
| 14 Valve rod O ring | Fluorocarbon FKM | |
| 15 Valve rod support ring | - | PEEK |
| 16 Valve rod check ring | PTFE / D1710 | |
| 17 Valve rod bearing | PEEK | |
| 18 Trunnion ball | 316SS / A479 | |
| 19 Trunnion bearing | PEEK | - |
| 20 Trunnion O-ring | Fluorocarbon FKM | - |
| 21 Trunnion bearing | - | PEEK |

Note: Other structural materials can be customized.

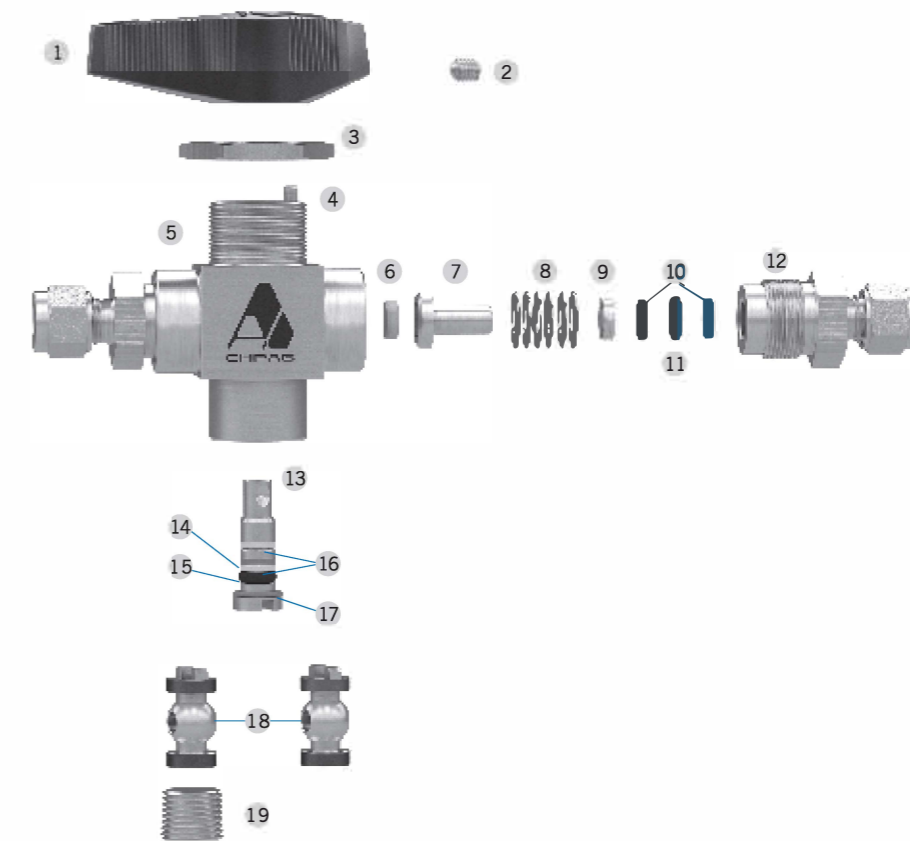


BTH series

| Parts details | Material/ASTM standard | |
|----------------------------------|---|-----------|
| | Two-way | Three-way |
| 1 Handle | Phenolic resin with brass insertion piece | |
| 2 Set screw | 316 SS / A276 | |
| 3 Extra-thin nut | 316 SS / B783 | |
| 4 Shotpin | 316 SS / A276 | |
| 5 Valve body | 316 SS / A479 | |
| 6 Valve seat | PEEK | |
| 7 Valve seat bracket | 316 SS / A479 | |
| 8 Valve seat spring | Alloy X-750 / AMS 5542 | |
| 9 Valve seat bracket guider | 316 SS / A276 | |
| 10 Valve seat bracket check ring | PTFE / D1710 | |

| Parts details | Material/ASTM standard | |
|--------------------------------------|------------------------|-----------|
| | Two-way | Three-way |
| 11 Valve seat bracket O ring | Fluorocarbon FKM | |
| 12 End joint | 316 SS / A479 | |
| 13 Valve rod | 316 SS / A479 | |
| 14 Valve rod support ring | PEEK | |
| 15 Valve rod O ring | Fluorocarbon FKM | |
| 16 Valve rod check ring | PTFE / D1710 | |
| 17 Valve rod bearing | PEEK | |
| 18 Trunnion ball | 316 SS / A479 | |
| 19 Plug (only used in two-way valve) | 316 SS / A479 | - |

Note: Other structural materials can be customized.



Coding rule for item No.

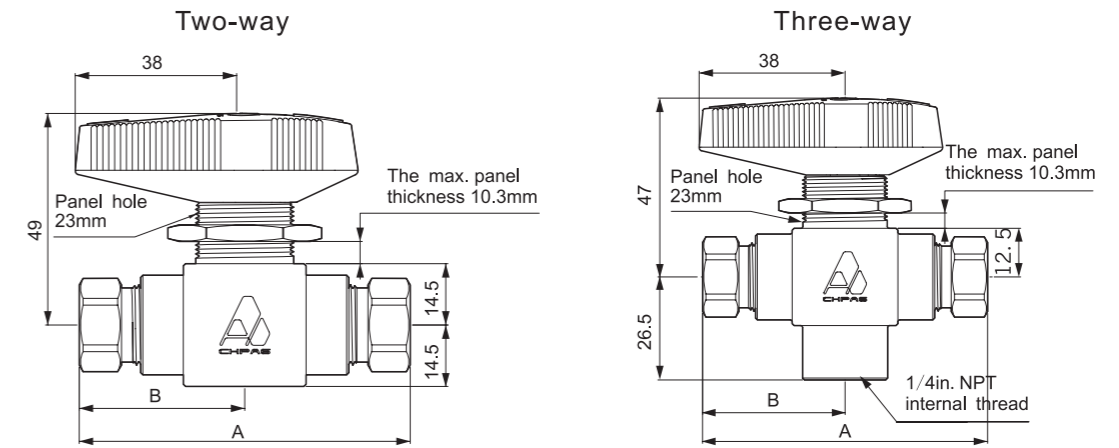
1 SS – **2** BT3 – **3** E – **4** K **5** 6mm

| | | | | | |
|----------|-----------------------------------|--|----------|-----------------------|--|
| 1 | Material type | SS — 316 stainless steel | 4 | Connector type | K — Bite type tube fittings F — NPT internal thread |
| | Trunnion ball valve series | BT2 — BT series two-way valve BT3 — BT series three-way valve BTH2 — BTH series two-way valve BTH3 — BTH series three-way valve | | 5 | connector size |
| 3 | Valve seat material | E — PCTFE N — Strengthened nylon T — PTFE P — PEEK | | | |

For example: SS - BT3 - E - K6mm
It means BT series three-way trunnion ball valve, whose structural material is 316SS. The valve seat material is PCTFE and the connector type is 6mm bite type tube fittings.

Order info & size

The displayed sizes are the specifications when screwing up the nuts of bite type tube fitting (The sizes are only for reference.)



| Connector | | Cv | Item No. | | Size (mm) | |
|--|----------------|------|------------------------|-------------------------|-----------|------|
| Type | Size | | BT SERIES ^① | BTH SERIES ^① | A | B |
| Two-way valve, aperture 4.7mm | | | | | | |
| NPT internal thread | 1/8in. | 1.2 | SS-BT2-E-F2 | SS-BTH2-P-F2 | 74.5 | 37 |
| | 1/4in. | 1.0 | SS-BT2-E-F4 | SS-BTH2-P-F4 | 74.5 | 37 |
| | 1/2in. | 1.2 | SS-BT2-E-F8 | - | 108 | 54 |
| Bite type tube fittings | 1/4in. | 1.6 | SS-BT2-E-K4 | SS-BTH2-P-K4 | 105 | 52.5 |
| | 3/8in. | 1.4 | SS-BT2-E-K6 | SS-BTH2-P-K6 | 112 | 56 |
| | 1/2in. | 1.0 | SS-BT2-E-K8 | SS-BTH2-P-K8 | 117 | 58.5 |
| | 6mm | 1.6 | SS-BT2-E-K6mm | SS-BTH2-P-K6mm | 105 | 52.5 |
| | 8mm | 1.5 | SS-BT2-E-K8mm | SS-BTH2-P-K8mm | 105 | 52.5 |
| | 10mm | 1.3 | SS-BT2-E-K10mm | SS-BTH2-P-K10mm | 112 | 56 |
| Three-way valve, aperture 4.7mm ^② | | | | | | |
| NPT internal thread | 1/8in. | 0.75 | SS-BT3-E-F2 | SS-BTH3-P-F2 | 74.5 | 37 |
| | 1/4in. | | SS-BT3-E-F4 | SS-BTH3-P-F4 | 74.5 | 37 |
| Bite type tube fittings | 1/4in. | | SS-BT3-E-K4 | SS-BTH3-P-K4 | 105 | 52.5 |
| | 3/8in. | | SS-BT3-E-K6 | SS-BTH3-P-K6 | 112 | 56 |
| | 1/2in. | | SS-BT3-E-K8 | SS-BTH3-P-K8 | 117 | 58.5 |
| | 6mm | | SS-BT3-E-K6mm | SS-BTH3-P-K6mm | 105 | 52.5 |
| | 8mm | | SS-BT3-E-K8mm | SS-BTH3-P-K8mm | 105 | 52.5 |
| | 10mm | | SS-BT3-E-K10mm | SS-BTH3-P-K10mm | 112 | 56 |
| 12mm | SS-BT3-E-K12mm | | SS-BTH3-P-K12mm | 117 | 58.5 | |

Note ①: While needing to order the valves of other valve seat materials, please use the corresponding valve seat material to replace E in the item No.

Note ②: The bottom connectors of all the three-way valves 1/4 in. NPT internal thread.

Plug valve

Pt4 & Pt6 series

| |
|---|
| Total 316 stainless steel structure |
| Max. working pressure 20.6 Mpa (3000psi) |
| The highest permissible temperature 204°C (400°F) |
| Connector type: 1/8 to 1/2 in. and 6 to 12 mm |
| Bite type tube fittings or NPT threaded connector |

- Plug valve
- Structural features
- Parts details
- Pressure-temperature rated value
- Test
- Data on flows
- Operation
- Coding rule for item No.
- Order info & size



Structural features

With small torque, 1/4 circle operation, simple structure and compact design, it can be cut off reliably in the forward direction under the rated pressure.

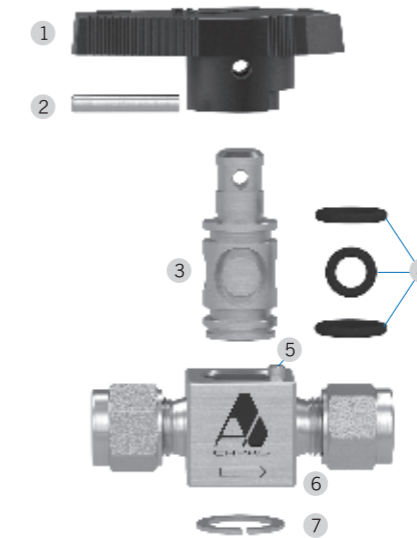
- Straight-through type
- Simple structure, which is easy to clean and maintain
- Replaceable plug elements
- Positive throttling
- One-piece type valve body
- Has O-ring sealing towards atmosphere

Parts details

| Parts details | Material/ASTM standard |
|---------------|---------------------------------|
| 1 Handle | Polyetherimide (PEI) |
| 2 Pin | 316 SS |
| 3 Cock | 316 SS / A479 coated by PTFE |
| 4 O-ring | Fluorocarbon FKM coated by PTFE |

| Parts details | Material/ASTM standard |
|----------------------|------------------------|
| 5 Pin | 316 SS |
| 6 Valve body | 316 SS / A479 |
| 7 Elastic check ring | 632 SS |

Note: Other structural materials can be customized.



Pressure-temperature rated value

| Temperature °C (°F) | Working pressure MPa(psi) |
|---------------------|---------------------------|
| -23(-10) to 37(100) | 20.6(3000) |
| 93(200) | 20.6(3000) |
| 148(300) | 6.9(1000) |
| 204(400) | 6.9(1000) |

Test

Before leaving the factory, each plug valve has passed the 7MPa nitrogen pressure test. There is no bubble producing in the shell within 1min.



1. If contraflow occurs, the max. differential pressure should exceed 1MPa (150psi).
2. The throttling of contraflow may damage the O-ring.

Structural features

Parts details

Pressure-temperature rated value

Test

Data on flows

Operation

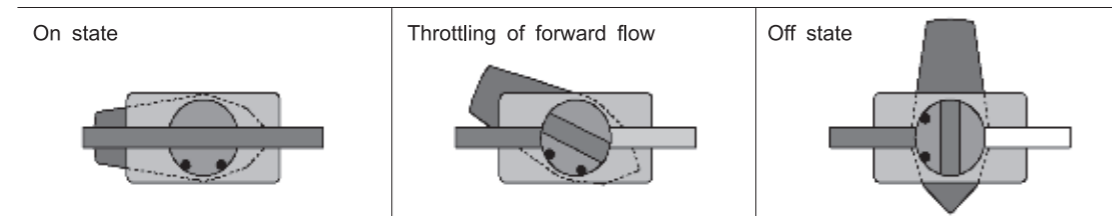
Coding rule for item No.

Order info & size

Data on flows (20°C)

| Connector | | Cv | Series | Pressure drop relative to the atmosphere KPa (psi) | | | | | |
|---|---------|---------|--------|--|--------|---------|-------------------|--------|---------|
| | | | | 6.9 (1) | 34 (5) | 69 (10) | 6.9 (1) | 34 (5) | 69 (10) |
| Inlet/outlet | Size | | | Air mass flow, std L/min | | | Water flow, L/min | | |
| | | | | | | | | | |
| Bite type tube fittings | 1/8 in. | 0.10 | PT4 | 8.4 | 22 | 31 | 0.37 | 0.75 | 1.1 |
| | 1/4 in. | 1.6 | PT4 | 160 | 360 | 500 | 6.0 | 13 | 19 |
| | 3/8 in. | 1.1 | PT4 | 110 | 250 | 330 | 4.1 | 9.4 | 13 |
| | | 6.4 | PT6 | 650 | 1470 | 2030 | 24 | 52 | 75 |
| | 1/2 in. | 4.4 | PT6 | 450 | 990 | 1380 | 16 | 37 | 49 |
| | 6 mm | 1.6 | PT4 | 160 | 360 | 500 | 6.0 | 13 | 19 |
| | 8 mm | 6.4 | PT6 | 650 | 1470 | 2030 | 24 | 52 | 75 |
| 10 mm | | | | | | | | | |
| NPT internal thread | 1/8 in. | 1.2 | PT4 | 120 | 270 | 360 | 4.5 | 10 | 14 |
| | 1/4 in. | 0.9 | PT4 | 93 | 200 | 280 | 3.4 | 7.5 | 10 |
| | | 4.3 | PT6 | 450 | 960 | 1350 | 16 | 36 | 49 |
| NPT external thread | 1/2 in. | 2.7 | PT6 | 280 | 590 | 840 | 10 | 22 | 32 |
| | 1/8 in. | 1.0 | PT4 | 100 | 220 | 310 | 3.7 | 8.3 | 12 |
| | | 1/4 in. | | | | | | | |
| NPT external thread/ bite type tube fittings | 1/2 in. | 2.4 | PT6 | 250 | 530 | 760 | 9.0 | 20 | 28 |
| | 1/4 in. | 0.9 | PT4 | 93 | 200 | 280 | 3.4 | 7.5 | 10 |
| | | 1.0 | PT4 | 100 | 220 | 310 | 3.7 | 8.3 | 12 |
| NPT external thread/ NPT internal thread | 1/4 in. | 1.0 | PT4 | 100 | 220 | 310 | 3.7 | 8.3 | 12 |

Operation



Coding rule for item No.

SS – PT4 – M 4 – K4

| | | |
|---|-------------------------|--|
| 1 | Material type | SS — 316 stainless steel |
| 2 | Series | PT4 — The Cv of this series is less than 2 PT6 — The Cv of this series is more than 2 |
| 3 | Upstream connector type | K — Bite type tube fittings F — NPT internal thread M — NPT external thread |

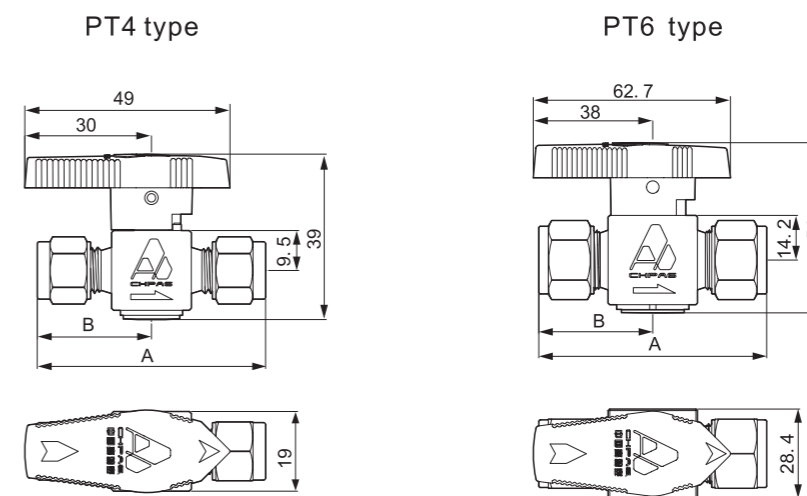
| | | |
|---|-------------------------------------|---|
| 4 | Size of upstream connector | British system > size value (Unit: in ×16) For example: 1/2×16=8, 1/2in.NPT internal thread is indicated by F8 Metric system: size value (Unit: mm) + "mm" |
| 5 | Type & size of downstream connector | If the types and sizes of upstream and downstream connectors are the same, the type and size codes of downstream connector can be omitted. If the upstream and down stream connectors are different, add the type and size of downstream connector according to the coding rule of upstream connector. |

For example: SS - PT4 - M 4 - K4

It means PT4 series plug valve, whose structural material is 316SS. The upstream connector is 1/4 in. external thread and the downstream connector is 1/4 in. bite type tube fittings.

Order info & size

The displayed sizes are the specifications when screwing up the nuts of bite type tube fitting (The sizes are only for reference.)



| Connector | | Item No. | Series | Size (mm) | | |
|---|--------------|--------------|--------|-----------|------|------|
| Upstream/downstream | Size | | | Aperture | A | B |
| Bite type tube fittings | 1/8 in. | SS-PT4-K2 | PT4 | 2.3 | 50.5 | 25 |
| | 1/4 in. | SS-PT4-K4 | PT4 | 4.4 | 55 | 27.5 |
| | 3/8 in. | SS-PT4-K6 | PT4 | 4.4 | 58 | 29 |
| | | SS-PT6-K6 | PT6 | 7.2 | 67.5 | 33.5 |
| | 1/2 in. | SS-PT6-K8 | PT6 | 7.2 | 73 | 36.5 |
| | 6 mm | SS-PT4-K6mm | PT4 | 4.4 | 55 | 27.5 |
| | 8 mm | SS-PT6-K8mm | PT6 | 7.2 | 67.5 | 33.5 |
| 10 mm | SS-PT6-K10mm | PT6 | 7.2 | 68 | 34 | |
| 12 mm | SS-PT6-K12mm | PT6 | 7.2 | 75 | 37.5 | |
| NPT internal thread | 1/8 in. | SS-PT4-F2 | PT4 | 4.4 | 45 | 22.5 |
| | 1/4 in. | SS-PT4-F4 | PT4 | 4.4 | 53 | 26.5 |
| | | SS-PT6-F4 | PT6 | 7.2 | 60.5 | 30 |
| NPT external thread | 1/2 in. | SS-PT6-F8 | PT6 | 7.2 | 73 | 36.5 |
| | 1/8 in. | SS-PT4-M2 | PT4 | 4.4 | 39 | 19.5 |
| | 1/4 in. | SS-PT4-M4 | PT4 | 4.4 | 48 | 24 |
| 1/2 in. | SS-PT6-M8 | PT6 | 7.2 | 67 | 33.5 | |
| NPT external thread/ Bite type tube fittings | 1/4 in. | SS-PT4-M4-K4 | PT4 | 4.4 | 51 | 25.5 |
| NPT internal thread/ NPT external thread | 1/4 in. | SS-PT4-M4-F4 | PT4 | 4.4 | 51 | 25.5 |

Bite type tube fittings

Apply to the ferrule tube of specification from 1/4 to 1 in. and 6 to 25mm
 After the first installation, it has consistent testability
 Easy to dismantle and refasten, the dismantling times are not less than 30 times
 Multiple structural forms

Structural features

- Advanced dual-ferrule structure design
- The assembling torque is small, which is easy to install.
- With reliable leakproofness, which can be dismantled and installed for many times
- Silver plating treatment of ferrule nut
- While installing, the torque will not be transmitted to the ferrule tube.

Excellent performance

- Can be applied to the vacuum and high-pressure system
- Can work under low-temperature state to ensure sealing.
- Keep sealing under the highest permissible working temperature of tube.
- It can be dismantled and installed for more than 30 times.
- Excellent anti-vibration and anti-shock performance



Picture for destructive test

The dual-ferrule tube fittings will not lose efficacy even under the pressure which can make the tube blast.

Dual-ferrule structure design

The dual-ferrule structure separates the sealing function and the grasping function of ferrule tube. According to their corresponding functions, optimization design are conducted on the front and back cutting ferrules.

The front cutting ferrule is used to form the sealing:

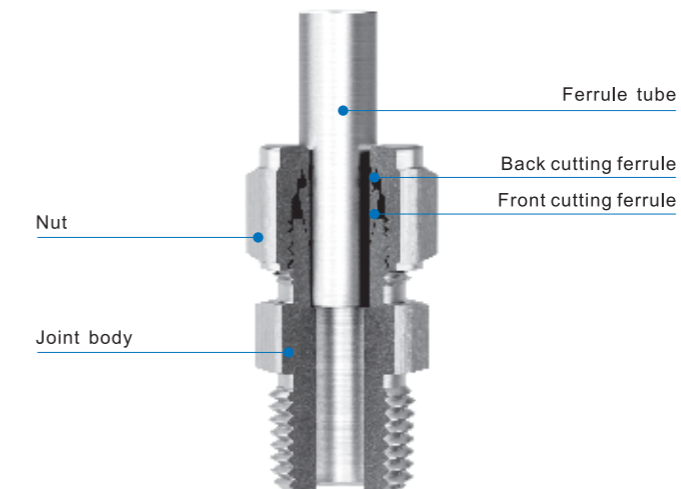
- The sealing with the joint body
- The sealing with the external diameter of ferrule tube

While boosting the front ferrule, the back ferrule will, at the same time, grasp the ferrule tube:

- Boost the front cutting ferrule along the axis
- Exert an effective ferrule-tube chucking force along the radial direction

Working principle

While assembling the tube fittings (shown as in the following figure), screw up the ferrule nut. The ferrule nut will drive the axis of back cutting ferrule to move forward. Then the front cutting ferrule will be pushed into the conical surface of joint by the back cutting ferrule, which will form the primary seal with the ferrule tube; while the back cutting ferrule pushing the front ferrule, it will generate shrinkage strain, which forms a strong grasping force on the ferrule tube. The geometrical shape of back cutting ferrule can help create tightening force in the screwing process of nut, which can cover the axial movements of ferrule nut into the radial extrusion and clamping force of the backing cutting ferrule on the ferrule tube. In this way, the tube connection will be more solid and reliable with smaller assembling torque.



In order to ensure the performance of bite type tube fittings, should use the annealed and polished 316 stainless steel tube to be the ferrule tube. The dimensional tolerance should be less than $\pm 0.12\text{mm}$ and there is no scratch and burr at the joint position.

Bite type tube fittings

Structural features

Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size



Bite type tube fittings

Structural features

Dual-ferrule structure design

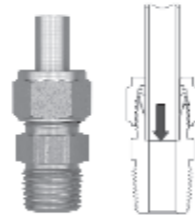

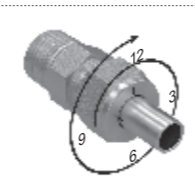


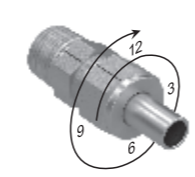
Working principle

Coding rule for item No.

Order info & size

Installation instructions

The installation can be conducted quickly, easily and reliably by using hand tools, such as a wrench etc.

| Installation steps | Methods for the first installation | Graphical representation |
|--------------------|--|---|
| 1 | Insert one end of the ferrule tube into the joint and support the shoulder of joint's inner bore,(before inserting, make sure the insertion end of the ferrule tube is smooth without any burrs); screw up the nut by hands. |  |
| 2 | Mark at the 9 o'clock positions of nut and joint. Note that the marks should be at the same axial direction. |  |
| 3 | Firmly fix the joint body, fasten the nut for one-and-a-quarter circle to make the mark rest on the 12 o'clock position. |  |
| Remounting steps | Remounting methods | Graphical representation |
| 1 | Before dismantling, relieve the pressure of the pipeline. Respectively draw a straight line at the aligned position of ferrule tube's and nut's end faces and the outside surface of ferrule nut and joint body. These marks are used to ensure that, while remounting, the nut can screw up to the right fastening position before dismantling. |  |
| 2 | Insert the dismantled ferrule tube into the joint until the front cutting ferrule sustains the conical surface of the joint body; screw up the nut by hands. |  |
| 3 | According to the marks on the ferrule tube, ferrule nut and joint, screw the ferrule nut to the fastening position marked in Step 1 by using a wrench. At this moment, the resistance will increase obviously. |  |

Matters needing attention

- Don't discharge the system pressure by loosening the collar nut or joint blocking.
- Don't install or fasten the joints when there is pressure in the system.
- Before fastening the nuts, should ensure that the ferrule tube adjoints to the shoulder of bite type tube fitting's body.
- Constantly use the right thread sealant on the thread of the tapered tube.
- Don't use the joint parts (ferrule tube, cutting ferrule, nuts and joint body) of different materials or produced by different manufacturers.
- While installing and dismantling, don't rotate the joint body, but fasten it and rotate the nuts.
- Don't conduct unnecessary disassembly on the joints, which haven't been used.

Coding rule for item No.

SS – FA9 – K 12mm – F 8
 1 2 3 4 5 6

| | | |
|---|------------------------------------|--|
| 1 | Material type | SS — 316 stainless steel |
| | Connector type | FS — Straight joint FST — Straight bulkhead joint CAP — Tube cap JAM — Choke plug FA9 — 90° elbow FA4 — 45° elbow FT — T-junction FTB — Side tube NPT thread T-junction FTS — Straight NPT thread T-junction FQ — Four-way connection |
| 3 | Type of the first connector | K — Bite type tube fittings F — NPT internal thread M — NPT external thread |

| | | |
|---|-------------------------------------|--|
| 4 | Size of the first connector | British system: size value (Unit: in.) × 16 Metric system: size value (Unit: mm) + "mm" For example: "12mm" indicates metric size value 12mm: 1/2×16=8, 1/2in. NPT internal thread is indicated by F8 |
| | Type of the second connector | K — Bite type tube fittings F — NPT internal thread M — NPT external thread |
| 6 | Size of the second connector | British system: size value (Unit: in.) × 16 Metric system: size value (Unit: mm) + "mm" |

For example: SS-FA9-K12mm-F8

It means the 90° elbow of 316 stainless steel. One end is 12mm bite type tube fitting, while the other end is 1/2 NPT internal thread connector.

Note: the connector form can be combined according to the needs of users.

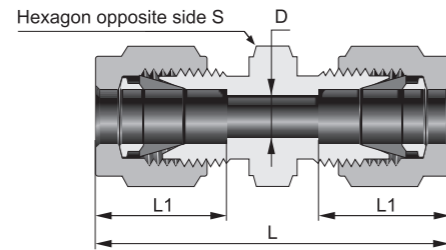
Bite type tube fittings
 Structural features
 Dual-ferrule structure design
 Working principle
 Coding rule for item No.
 Order info & size

Bite type tube fittings
 Structural features
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Order info & size

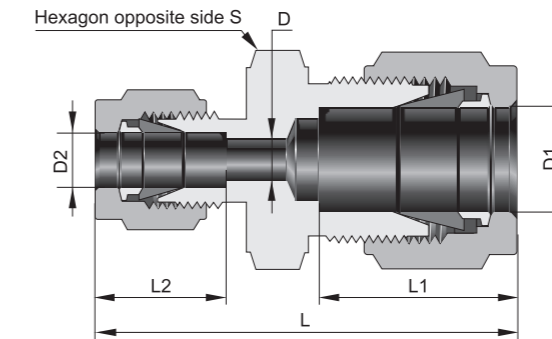
The displayed sizes are the specifications after screwing up the ferrule nut by hands (The sizes are only for reference.)

FS type joint -isometrical straight joint



| Outer diameter (OD) of ferrule tube | Item No. | Size (mm) | | | |
|-------------------------------------|-------------|-----------|------|------|----|
| | | L | L1 | D | S |
| Metric ferrule tube | | | | | |
| 6 | SS-FS-K6mm | 41.0 | 15.5 | 4.8 | 16 |
| 8 | SS-FS-K8mm | 43.0 | 16.0 | 6.4 | 18 |
| 10 | SS-FS-K10mm | 46.0 | 17.0 | 8.0 | 22 |
| 12 | SS-FS-K12mm | 51.0 | 23.0 | 9.5 | 24 |
| 14 | SS-FS-K14mm | 52.0 | 24.5 | 11.5 | 27 |
| 15 | SS-FS-K15mm | 52.0 | 24.5 | 12.0 | 27 |
| 16 | SS-FS-K16mm | 52.0 | 24.5 | 12.5 | 27 |
| 18 | SS-FS-K18mm | 53.5 | 24.5 | 15.0 | 30 |
| 20 | SS-FS-K20mm | 55.0 | 26.0 | 16.0 | 36 |
| 22 | SS-FS-K22mm | 55.0 | 26.0 | 18.0 | 36 |
| 25 | SS-FS-K25mm | 65.0 | 31.5 | 22.0 | 42 |
| Imperial ferrule tube | | | | | |
| 1/4 | SS-FS-K4 | 41.0 | 15.5 | 4.8 | 16 |
| 5/16 | SS-FS-K5 | 43.0 | 16.0 | 6.4 | 18 |
| 3/8 | SS-FS-K6 | 46.0 | 17.0 | 8.0 | 22 |
| 1/2 | SS-FS-K8 | 52.0 | 24.5 | 11.5 | 27 |
| 5/8 | SS-FS-K10 | 52.0 | 24.5 | 12.5 | 27 |
| 3/4 | SS-FS-K12 | 55.0 | 26.0 | 16.0 | 36 |
| 7/8 | SS-FS-K14 | 55.0 | 26.0 | 18.0 | 36 |
| 1 | SS-FS-K16 | 65.0 | 31.5 | 22.0 | 42 |

FS type joint -reducing straight joint



| Ferrule tube OD | | Item No. | Size (mm) | | | | |
|-----------------------|------|-------------------|-----------|------|------|------|----|
| D1 | D2 | | L | L1 | L2 | D | S |
| Metric ferrule tube | | | | | | | |
| 8 | 6 | SS-FS-K8mm-K6mm | 42.5 | 16.5 | 15.5 | 4.8 | 16 |
| 10 | 6 | SS-FS-K10mm-K6mm | 44.5 | 17.5 | 15.5 | 4.8 | 18 |
| | 8 | SS-FS-K10mm-K8mm | 45.5 | | 16.5 | 6.4 | |
| 12 | 6 | SS-FS-K12mm-K6mm | 47.0 | 23.0 | 15.5 | 4.8 | 22 |
| | 8 | SS-FS-K12mm-K8mm | 48.0 | | 16.5 | 6.4 | |
| | 10 | SS-FS-K12mm-K10mm | 49.0 | | 17.5 | 8.0 | |
| 16 | 10 | SS-FS-K16mm-K10mm | 46.0 | 25.0 | 17.5 | 8.0 | 24 |
| | 12 | SS-FS-K16mm-K12mm | 52.0 | | 23.0 | 9.5 | |
| 18 | 12 | SS-FS-K18mm-K12mm | 53.5 | 25.0 | 22.8 | 9.5 | 27 |
| 25 | 18 | SS-FS-K25mm-K18mm | 61.0 | 32.0 | 24.4 | 15.0 | 36 |
| | 20 | SS-FS-K25mm-K20mm | 62.5 | | 26.0 | 16.0 | |
| Imperial ferrule tube | | | | | | | |
| 5/16 | 1/4 | SS-FS-K5-K4 | 42.5 | 16.5 | 15.5 | 4.8 | 16 |
| 3/8 | 1/4 | SS-FS-K6-K4 | 44.5 | 17.5 | 15.5 | 4.8 | 18 |
| | 5/16 | SS-FS-K6-K5 | 45.5 | | 16.5 | 6.4 | |
| 1/2 | 1/4 | SS-FS-K8-K4 | 45.5 | 23.0 | 17.0 | 8.0 | 18 |
| | 3/8 | SS-FS-K8-K6 | 46.0 | | 17.5 | 8.0 | |
| 5/8 | 3/8 | SS-FS-K10-K6 | 46.0 | 25.0 | 17.5 | 8.0 | 24 |
| 1 | 3/4 | SS-FS-K16-K12 | 62.5 | 32.0 | 26.0 | 16.0 | 36 |

Bite type tube fittings

Structural features

Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size

Bite type tube fittings

Structural features

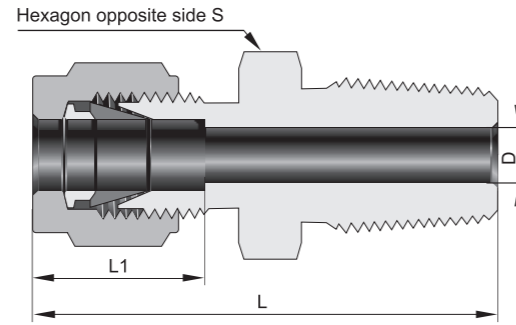
Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size

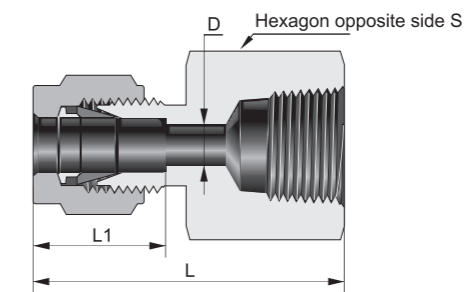
FS type joint -straight NPT external thread



| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | |
|---------------------|----------------|-----------------|-----------|------|------|----|
| | | | L | L1 | D | S |
| Metric ferrule tube | | | | | | |
| 6 | 1/8 | SS-FS-K6mm-M2 | 33.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FS-K6mm-M4 | 38.0 | | | 14 |
| | 3/8 | SS-FS-K6mm-M6 | 38.5 | | | 18 |
| | 1/2 | SS-FS-K6mm-M8 | 45.0 | | | 22 |
| 8 | 1/8 | SS-FS-K8mm-M2 | 34.5 | 16.5 | 6.4 | 17 |
| | 1/4 | SS-FS-K8mm-M4 | 39.0 | | | 17 |
| | 3/8 | SS-FS-K8mm-M6 | 39.5 | | | 19 |
| | 1/2 | SS-FS-K8mm-M8 | 46.0 | | | 22 |
| 10 | 1/8 | SS-FS-K10mm-M2 | 36.5 | 17.5 | 8.0 | 19 |
| | 1/4 | SS-FS-K10mm-M4 | 41.0 | | | 19 |
| | 3/8 | SS-FS-K10mm-M6 | 41.0 | | | 19 |
| | 1/2 | SS-FS-K10mm-M8 | 47.0 | | | 22 |
| | 3/4 | SS-FS-K10mm-M12 | 48.0 | | | 27 |
| 12 | 1/8 | SS-FS-K12mm-M2 | 39.0 | 23.0 | 9.5 | 22 |
| | 1/4 | SS-FS-K12mm-M4 | 43.5 | | | 22 |
| | 3/8 | SS-FS-K12mm-M6 | 43.5 | | | 22 |
| | 1/2 | SS-FS-K12mm-M8 | 49.0 | | | 22 |
| | 3/4 | SS-FS-K12mm-M12 | 50.5 | | | 27 |
| 14 | 1/4 | SS-FS-K14mm-M4 | 44.5 | 24.5 | 11.0 | 24 |
| | 3/8 | SS-FS-K14mm-M6 | 44.5 | | | 24 |
| 15 | 1/2 | SS-FS-K15mm-M8 | 49.0 | 24.5 | 12.0 | 24 |
| | 3/8 | SS-FS-K16mm-M6 | 44.5 | | | 24 |
| 16 | 1/2 | SS-FS-K16mm-M8 | 49.0 | 24.5 | 12.0 | 24 |
| | 3/4 | SS-FS-K16mm-M12 | 50.5 | | | 27 |
| 18 | 1/2 | SS-FS-K18mm-M8 | 50.5 | 24.5 | 15.0 | 27 |
| | 3/4 | SS-FS-K18mm-M12 | 50.5 | | | 27 |
| 20 | 1/2 | SS-FS-K20mm-M8 | 52.5 | 26.0 | 16.0 | 30 |
| | 3/4 | SS-FS-K20mm-M12 | 52.5 | | | 30 |
| 22 | 3/4 | SS-FS-K22mm-M12 | 52.5 | 26.0 | 18.5 | 36 |
| | 1 | SS-FS-K22mm-M16 | 57.5 | | | 36 |
| 25 | 1/2 | SS-FS-K25mm-M8 | 57.5 | 31.5 | 22.0 | 36 |
| | 3/4 | SS-FS-K25mm-M12 | 57.5 | | | 36 |
| | 1 | SS-FS-K25mm-M16 | 62.5 | | | 36 |

| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | |
|-----------------------|----------------|---------------|-----------|------|------|----|
| | | | L | L1 | D | S |
| Imperial ferrule tube | | | | | | |
| 1/4 | 1/8 | SS-FS-K4-M2 | 33.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FS-K4-M4 | 38.0 | | | 14 |
| | 3/8 | SS-FS-K4-M6 | 38.5 | | | 19 |
| | 1/2 | SS-FS-K4-M8 | 45.0 | | | 22 |
| 5/16 | 1/8 | SS-FS-K5-M2 | 34.5 | 16.5 | 6.4 | 17 |
| | 1/4 | SS-FS-K5-M4 | 39.0 | | | 17 |
| | 3/8 | SS-FS-K5-M6 | 39.5 | | | 19 |
| | 1/2 | SS-FS-K5-M8 | 46.0 | | | 22 |
| 3/8 | 1/8 | SS-FS-K6-M2 | 36.5 | 17.5 | 8.0 | 19 |
| | 1/4 | SS-FS-K6-M4 | 41.0 | | | 19 |
| | 3/8 | SS-FS-K6-M6 | 41.0 | | | 19 |
| | 1/2 | SS-FS-K6-M8 | 47.0 | | | 22 |
| | 3/4 | SS-FS-K6-M12 | 48.0 | | | 27 |
| 1/2 | 1/4 | SS-FS-K8-M4 | 44.5 | 24.5 | 11.0 | 24 |
| | 3/8 | SS-FS-K8-M6 | 44.5 | | | 24 |
| | 1/2 | SS-FS-K8-M8 | 49.0 | | | 24 |
| 5/8 | 3/8 | SS-FS-K10-M6 | 44.5 | 24.5 | 12.5 | 24 |
| | 1/2 | SS-FS-K10-M8 | 49.0 | | | 24 |
| | 3/4 | SS-FS-K10-M12 | 50.5 | | | 27 |
| 3/4 | 1/2 | SS-FS-K12-M8 | 52.5 | 26.5 | 16.0 | 30 |
| | 3/4 | SS-FS-K12-M12 | 52.5 | | | 30 |
| 7/8 | 3/4 | SS-FS-K14-M12 | 52.5 | 26.0 | 18.5 | 36 |
| | 1 | SS-FS-K14-M16 | 57.5 | | | 36 |
| 1 | 1/2 | SS-FS-K16-M8 | 57.5 | 31.5 | 22.0 | 36 |
| | 3/4 | SS-FS-K16-M12 | 57.5 | | | 36 |
| | 1 | SS-FS-K16-M16 | 62.5 | | | 36 |

FS type joint -straight NPT internal thread



| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | |
|---------------------|----------------|---------------|-----------|------|-----|----|
| | | | L | L1 | D | S |
| Metric ferrule tube | | | | | | |
| 6 | 1/8 | SS-FS-K6mm-F2 | 31.5 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FS-K6mm-F4 | 34.0 | | | 19 |
| | 3/8 | SS-FS-K6mm-F6 | 38.0 | | | 22 |
| | 1/2 | SS-FS-K6mm-F8 | 42.5 | | | 27 |
| 8 | 1/8 | SS-FS-K8mm-F2 | 32.5 | 16.5 | 6.4 | 17 |
| | 1/4 | SS-FS-K8mm-F4 | 37.0 | | | 19 |

- Bite type tube fittings**
- Structural features
- Dual-ferrule structure design
- Working principle
- Coding rule for item No.
- Order info & size**

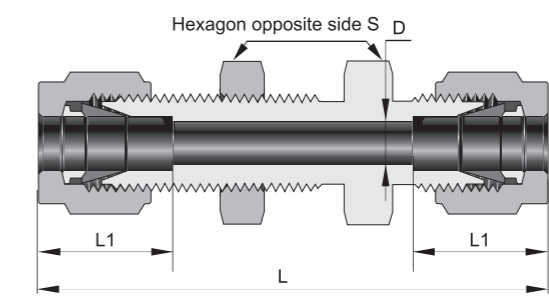
- Bite type tube fittings**
- Structural features
- Dual-ferrule structure design
- Working principle
- Coding rule for item No.
- Order info & size**

| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | |
|-----------------------|----------------|-----------------|-----------|------|------|----|
| | | | L | L1 | D | S |
| Metric ferrule tube | | | | | | |
| 8 | 3/8 | SS-FS-K8mm-F6 | 38.5 | 16.5 | 6.4 | 22 |
| | 1/2 | SS-FS-K8mm-F8 | 43.5 | | | 27 |
| 10 | 1/4 | SS-FS-K10mm-F4 | 38.0 | 17.5 | 8.0 | 19 |
| | 3/8 | SS-FS-K10mm-F6 | 39.5 | | | 22 |
| 12 | 1/2 | SS-FS-K10mm-F8 | 44.5 | 23.0 | 9.5 | 27 |
| | 1/4 | SS-FS-K12mm-F4 | 40.5 | | | 22 |
| 15 | 3/8 | SS-FS-K12mm-F6 | 42.0 | 24.5 | 12.0 | 22 |
| | 1/2 | SS-FS-K12mm-F8 | 47.0 | | | 27 |
| 16 | 1/2 | SS-FS-K15mm-F8 | 47.0 | 26.0 | 16.0 | 27 |
| | 1/2 | SS-FS-K16mm-F8 | 47.0 | | | 30 |
| 20 | 3/4 | SS-FS-K20mm-F12 | 50.0 | 26.0 | 18.5 | 36 |
| | 3/4 | SS-FS-K22mm-F12 | 50.0 | | | 36 |
| 22 | 1 | SS-FS-K22mm-F16 | 58.0 | 31.5 | 22.0 | 41 |
| | 3/4 | SS-FS-K25mm-F12 | 53.5 | | | 36 |
| 25 | 1 | SS-FS-K25mm-F16 | 62.5 | | | 41 |
| | | | | | | |
| Imperial ferrule tube | | | | | | |
| 1/4 | 1/8 | SS-FS-K4-F2 | 31.5 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FS-K4-F4 | 36.0 | | | 19 |
| | 3/8 | SS-FS-K4-F6 | 38.0 | | | 22 |
| | 1/2 | SS-FS-K4-F8 | 42.5 | | | 27 |
| 5/16 | 1/8 | SS-FS-K5-F2 | 32.5 | 16.5 | 6.4 | 17 |
| | 1/4 | SS-FS-K5-F4 | 37.0 | | | 19 |
| | 3/8 | SS-FS-K5-F6 | 38.5 | | | 22 |
| 3/8 | 1/2 | SS-FS-K5-F8 | 43.5 | 17.5 | 8.0 | 27 |
| | 1/4 | SS-FS-K6-F4 | 38.0 | | | 19 |
| | 3/8 | SS-FS-K6-F6 | 39.5 | | | 22 |
| 1/2 | 1/2 | SS-FS-K6-F8 | 44.5 | 24.5 | 12.5 | 27 |
| | 1/4 | SS-FS-K8-F4 | 44.5 | | | 27 |
| 5/8 | 1/2 | SS-FS-K8-F8 | 47.0 | 24.5 | 12.5 | 27 |
| | 1/2 | SS-FS-K10-F8 | 47.0 | | | 27 |
| 3/4 | 1/2 | SS-FS-K12-F8 | 48.0 | 26.0 | 16.0 | 30 |
| | 3/4 | SS-FS-K12-F12 | 50.0 | | | 36 |
| 7/8 | 3/4 | SS-FS-K14-F12 | 50.0 | 26.0 | 18.5 | 36 |
| | 1 | SS-FS-K14-F16 | 58.0 | | | 41 |
| 1 | 3/4 | SS-FS-K16-F12 | 53.5 | 31.5 | 22.0 | 36 |
| | 1 | SS-FS-K16-F16 | 62.5 | | | 41 |

Bite type tube fittings

- Structural features
- Dual-ferrule structure design
- Working principle
- Coding rule for item No.
- Order info & size

FST type joint -bulkhead straight joint

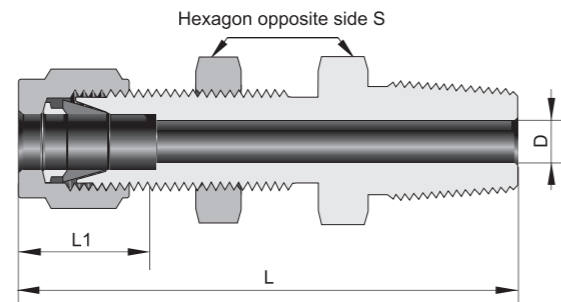


| Ferrule tube OD | Item No. | Size (mm) | | | | | |
|-----------------------|--------------|-----------|------|------|----|--------------------|----------------------|
| | | L | L1 | D | S | Size of panel hole | Max. panel thickness |
| Metric ferrule tube | | | | | | | |
| 6 | SS-FST-K6mm | 58.0 | 15.5 | 4.8 | 16 | 11.5 | 10.0 |
| 8 | SS-FST-K8mm | 61.0 | 16.5 | 6.4 | 18 | 13.0 | 11.0 |
| 10 | SS-FST-K10mm | 64.0 | 17.5 | 8.0 | 22 | 16.5 | |
| 12 | SS-FST-K12mm | 71.0 | 23.0 | 9.5 | 24 | 19.5 | 12.5 |
| 14 | SS-FST-K14mm | 72.5 | 24.5 | 11.0 | 27 | 22.5 | |
| 15 | SS-FST-K15mm | 72.5 | 24.5 | 12.0 | | 23.0 | 16.5 |
| 16 | SS-FST-K16mm | 72.5 | 24.5 | 12.5 | 30 | 26.0 | |
| 18 | SS-FST-K18mm | 79.0 | 24.5 | 15.0 | 36 | 29.0 | 19 |
| 20 | SS-FST-K20mm | 84.5 | 26.0 | 16.0 | 41 | 34.0 | |
| 25 | SS-FST-K25mm | 96.0 | 31.5 | 22.0 | | | |
| Imperial ferrule tube | | | | | | | |
| 1/4 | SS-FST-K4 | 58.0 | 15.5 | 4.8 | 16 | 11.5 | 10.0 |
| 5/16 | SS-FST-K5 | 61.0 | 16.5 | 6.4 | 18 | 13.0 | 11.0 |
| 3/8 | SS-FST-K6 | 64.0 | 17.5 | 8.0 | 22 | 16.5 | |
| 1/2 | SS-FST-K8 | 72.5 | 24.5 | 11.0 | 27 | 22.5 | 12.5 |
| 5/8 | SS-FST-K10 | 72.5 | 24.5 | 12.5 | | 23.0 | |
| 3/4 | SS-FST-K12 | 84.5 | 26.0 | 16.0 | 36 | 29.0 | 19 |
| 1 | SS-FST-K16 | 96.0 | 31.5 | 22.0 | 41 | 34.0 | |

Bite type tube fittings

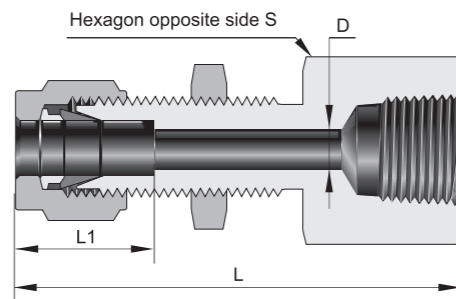
- Structural features
- Dual-ferrule structure design
- Working principle
- Coding rule for item No.
- Order info & size

FST type joint -bulkhead NPT external thread



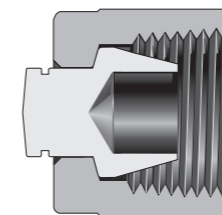
| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | | | |
|-----------------------|----------------|-----------------|-----------|------|------|----|--------------------|----------------------|
| | | | L | L1 | D | S | Size of panel hole | Max. panel thickness |
| Metric ferrule tube | | | | | | | | |
| 6 | 1/8 | SS-FST-K6mm-M2 | 49.5 | 15.5 | 4.8 | 17 | 11.5 | 10.0 |
| | 1/4 | SS-FST-K6mm-M4 | 54.0 | | | | | |
| 12 | 1/2 | SS-FST-K12mm-M8 | 69.0 | 23.0 | 9.5 | 24 | 19.5 | 12.5 |
| Imperial ferrule tube | | | | | | | | |
| 1/4 | 1/8 | SS-FST-K4-M2 | 49.5 | 15.5 | 4.8 | 17 | 11.5 | 10.0 |
| | 1/4 | SS-FST-K4-M4 | 54.0 | | | | | |
| 1/2 | 3/8 | SS-FST-K8-M6 | 63.0 | 23.0 | 10.5 | 24 | 19.5 | 12.7 |
| | 1/2 | SS-FST-K8-M8 | 69.0 | | | | | |

FST type joint -bulkhead NPT internal thread



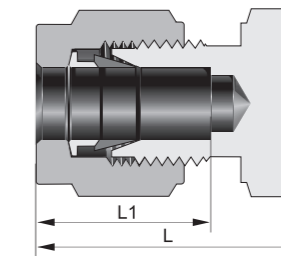
| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | | | |
|-----------------------|----------------|-----------------|-----------|------|------|----|--------------------|-------------------------|
| | | | L | L1 | D | S | Size of panel bore | Max. thickness of panel |
| Metric ferrule tube | | | | | | | | |
| 6 | 1/4 | SS-FST-K6mm-F4 | 52.0 | 15.5 | 4.8 | 19 | 11.5 | 10.0 |
| 12 | 1/2 | SS-FST-K12mm-F8 | 66.5 | 23.0 | 9.5 | 27 | 19.5 | 12.5 |
| Imperial ferrule tube | | | | | | | | |
| 1/4 | 1/4 | SS-FST-K4-F4 | 52.0 | 15.5 | 4.8 | 19 | 11.5 | 10.0 |
| 1/2 | 3/8 | SS-FST-K8-F6 | 62.0 | 23.0 | 10.5 | 24 | 27 | 12.7 |
| | 1/2 | SS-FST-K8-F8 | 66.5 | | | | | |

JAM type joint -choke plug



| Ferrule tube OD | Item No. |
|-----------------------|--------------|
| Metric ferrule tube | |
| 6 | SS-JAM-K6mm |
| 8 | SS-JAM-K8mm |
| 10 | SS-JAM-K10mm |
| 12 | SS-JAM-K12mm |
| 15 | SS-JAM-K15mm |
| 16 | SS-JAM-K16mm |
| 18 | SS-JAM-K18mm |
| 20 | SS-JAM-K20mm |
| 22 | SS-JAM-K22mm |
| 25 | SS-JAM-K25mm |
| Imperial ferrule tube | |
| 1/4 | SS-JAM-K4 |
| 5/16 | SS-JAM-K5 |
| 3/8 | SS-JAM-K6 |
| 1/2 | SS-JAM-K8 |
| 5/8 | SS-JAM-K10 |
| 3/4 | SS-JAM-K12 |
| 7/8 | SS-JAM-K14 |
| 1 | SS-JAM-K16 |

CAP type joint -tube cap



| Ferrule tube OD | Item No. | Size (mm) | |
|-----------------------|--------------|-----------|------|
| | | L | L1 |
| Metric ferrule tube | | | |
| 6 | SS-CAP-K6mm | 23.5 | 15.5 |
| 8 | SS-CAP-K8mm | 24.5 | 16.5 |
| 10 | SS-CAP-K10mm | 27.0 | 17.5 |
| 12 | SS-CAP-K12mm | 31.0 | 23.0 |
| 14 | SS-CAP-K14mm | 31.5 | 24.5 |
| 15 | SS-CAP-K15mm | 31.5 | 24.5 |
| 16 | SS-CAP-K16mm | 31.5 | 24.5 |
| 18 | SS-CAP-K18mm | 32.5 | 24.5 |
| 20 | SS-CAP-K20mm | 35.0 | 26.0 |
| 22 | SS-CAP-K22mm | 35.0 | 26.0 |
| 25 | SS-CAP-K25mm | 41.0 | 31.5 |
| Imperial ferrule tube | | | |
| 1/4 | SS-CAP-K4 | 23.5 | 15.5 |
| 5/16 | SS-CAP-K5 | 24.5 | 16.5 |
| 3/8 | SS-CAP-K6 | 27.0 | 17.5 |
| 1/2 | SS-CAP-K8 | 31.5 | 24.5 |
| 5/8 | SS-CAP-K10 | 31.5 | 24.5 |
| 3/4 | SS-CAP-K12 | 35.0 | 26.0 |
| 7/8 | SS-CAP-K14 | 35.0 | 26.0 |
| 1 | SS-CAP-K16 | 41.0 | 31.5 |

Bite type tube fittings

Structural features

Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size

Bite type tube fittings

Structural features

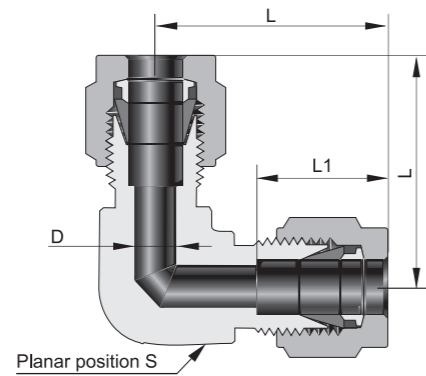
Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size

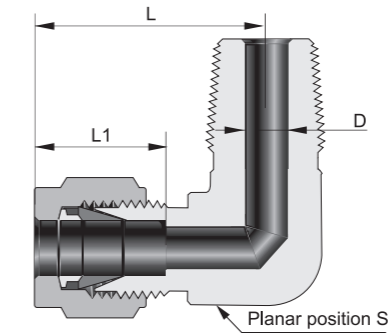
FA9 type joint - isometrical 90° elbow



| Ferrule tube OD | Item No. | Size (mm) | | | |
|-----------------------|--------------|-----------|------|------|----------------|
| | | L | L1 | D | S ^① |
| Metric ferrule tube | | | | | |
| 6 | SS-FA9-K6mm | 27.0 | 15.5 | 4.8 | 14 |
| 8 | SS-FA9-K8mm | 29.0 | 16.5 | 6.4 | 14 |
| 10 | SS-FA9-K10mm | 31.5 | 17.5 | 8.0 | 17 |
| 12 | SS-FA9-K12mm | 36.0 | 23.0 | 9.5 | 22 |
| 14 | SS-FA9-K14mm | 38.0 | 24.5 | 11.0 | 24 |
| 15 | SS-FA9-K15mm | 38.0 | 24.5 | 12.0 | 24 |
| 16 | SS-FA9-K16mm | 38.0 | 24.5 | 12.5 | 24 |
| 18 | SS-FA9-K18mm | 40.0 | 24.5 | 15.0 | 27 |
| 20 | SS-FA9-K20mm | 45.0 | 26.0 | 16.0 | 36 |
| 22 | SS-FA9-K22mm | 45.0 | 26.0 | 18.5 | 36 |
| 25 | SS-FA9-K25mm | 49.5 | 31.5 | 22.0 | 36 |
| Imperial ferrule tube | | | | | |
| 1/4 | SS-FA9-K4 | 27.0 | 15.5 | 4.8 | 14 |
| 5/16 | SS-FA9-K5 | 29.0 | 16.5 | 6.4 | 14 |
| 3/8 | SS-FA9-K6 | 31.5 | 17.5 | 8.0 | 17 |
| 1/2 | SS-FA9-K8 | 38.0 | 24.5 | 11.0 | 24 |
| 5/8 | SS-FA9-K10 | 38.0 | 24.5 | 12.5 | 24 |
| 3/4 | SS-FA9-K12 | 45.0 | 26.0 | 16.0 | 36 |
| 7/8 | SS-FA9-K14 | 45.0 | 26.0 | 18.5 | 36 |
| 1 | SS-FA9-K16 | 49.5 | 31.5 | 22.0 | 36 |

① Planar position S is the thickness of the middle part of the joint.

FA9 type joint - NPT external thread 90° elbow



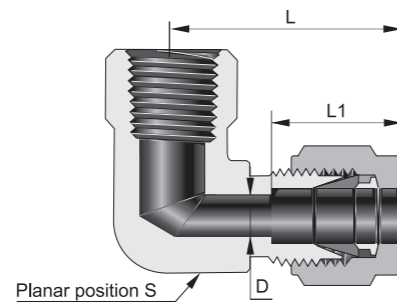
| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | |
|-----------------------|----------------|------------------|-----------|------|------|----|
| | | | L | L1 | D | S |
| Metric ferrule tube | | | | | | |
| 6 | 1/8 | SS-FA9-K6mm-M2 | 27.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FA9-K6mm-M4 | 27.0 | | | 14 |
| | 3/8 | SS-FA9-K6mm-M6 | 30.0 | | | 17 |
| 8 | 1/2 | SS-FA9-K6mm-M8 | 32.0 | 16.5 | 6.4 | 22 |
| | 1/8 | SS-FA9-K8mm-M2 | 29.0 | | | 14 |
| | 1/4 | SS-FA9-K8mm-M4 | 29.0 | | | 14 |
| 10 | 3/8 | SS-FA9-K8mm-M6 | 31.0 | 17.5 | 8.0 | 17 |
| | 1/2 | SS-FA9-K8mm-M8 | 33.0 | | | 22 |
| | 1/8 | SS-FA9-K10mm-M2 | 31.5 | | | 17 |
| 12 | 1/4 | SS-FA9-K10mm-M4 | 31.5 | 23.0 | 9.5 | 17 |
| | 3/8 | SS-FA9-K10mm-M6 | 31.5 | | | 17 |
| | 1/2 | SS-FA9-K10mm-M8 | 33.5 | | | 22 |
| 15 | 1/4 | SS-FA9-K12mm-M4 | 36.0 | 24.5 | 12.0 | 22 |
| | 3/8 | SS-FA9-K12mm-M6 | 36.0 | | | 22 |
| | 1/2 | SS-FA9-K12mm-M8 | 36.0 | | | 22 |
| 16 | 3/4 | SS-FA9-K12mm-M12 | 40.0 | 24.5 | 12.5 | 27 |
| | 1/2 | SS-FA9-K15mm-M8 | 38.0 | | | 24 |
| | 3/8 | SS-FA9-K16mm-M6 | 38.0 | | | 24 |
| 18 | 1/2 | SS-FA9-K16mm-M8 | 38.0 | 24.5 | 15.0 | 24 |
| | 3/4 | SS-FA9-K16mm-M12 | 40.0 | | | 27 |
| | 1/2 | SS-FA9-K18mm-M8 | 40.0 | | | 27 |
| 20 | 3/4 | SS-FA9-K18mm-M12 | 40.0 | 26.0 | 16.0 | 36 |
| | 1/2 | SS-FA9-K20mm-M8 | 45.0 | | | 36 |
| | 3/4 | SS-FA9-K20mm-M12 | 45.0 | | | 36 |
| 22 | 1 | SS-FA9-K22mm-M16 | 45.0 | 26.0 | 18.5 | 36 |
| | 3/4 | SS-FA9-K22mm-M12 | 45.0 | | | 36 |
| | 3/4 | SS-FA9-K22mm-M12 | 45.0 | | | 36 |
| 25 | 1 | SS-FA9-K25mm-M16 | 49.5 | 31.5 | 22.0 | 36 |
| | 3/4 | SS-FA9-K25mm-M12 | 49.5 | | | 36 |
| | 1 | SS-FA9-K25mm-M16 | 49.5 | | | 36 |
| Imperial ferrule tube | | | | | | |
| 1/4 | 1/8 | SS-FA9-K4-M2 | 27.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FA9-K4-M4 | 27.0 | | | 14 |
| | 3/8 | SS-FA9-K4-M6 | 30.0 | | | 17 |
| | 1/2 | SS-FA9-K4-M8 | 32.0 | | | 22 |
| 5/16 | 1/8 | SS-FA9-K5-M2 | 29.0 | 16.5 | 6.4 | 14 |
| | 1/4 | SS-FA9-K5-M4 | 29.0 | | | 14 |

Bite type tube fittings
Structural features
Dual-ferrule structure design
Working principle
Coding rule for item No.
Order info & size

Bite type tube fittings
Structural features
Dual-ferrule structure design
Working principle
Coding rule for item No.
Order info & size

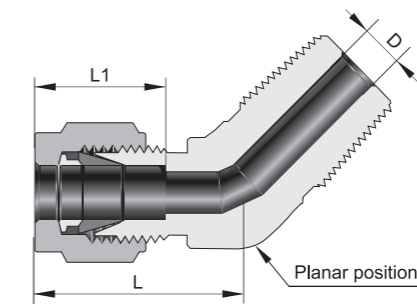
| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | |
|-----------------------|----------------|----------------|-----------|------|------|------|
| | | | L | L1 | D | S |
| Imperial ferrule tube | | | | | | |
| 5/16 | 3/8 | SS-FA9-K5-M6 | 31.0 | 16.5 | 6.4 | 17 |
| | 1/2 | SS-FA9-K5-M8 | 33.0 | | 6.4 | 22 |
| 3/8 | 1/8 | SS-FA9-K6-M2 | 31.5 | 17.5 | 4.8 | 17 |
| | 1/4 | SS-FA9-K6-M4 | 31.5 | | 7.0 | 17 |
| | 1/2 | SS-FA9-K6-M8 | 33.5 | 23.0 | 8.0 | 22 |
| | 1/4 | SS-FA9-K8-M4 | 36.0 | | 9.5 | 20.5 |
| 1/2 | 1/2 | SS-FA9-K8-M8 | 36.0 | 24.5 | 10.5 | 24 |
| | 3/8 | SS-FA9-K10-M6 | 38.0 | | 12.0 | 24 |
| 5/8 | 1/2 | SS-FA9-K10-M8 | 38.0 | 26.0 | 12.5 | 27 |
| | 3/4 | SS-FA9-K10-M12 | 40.0 | | 12.0 | 36 |
| 3/4 | 1/2 | SS-FA9-K12-M8 | 45.0 | 26.0 | 16.0 | 36 |
| | 3/4 | SS-FA9-K12-M12 | 45.0 | | 16.0 | 36 |
| 7/8 | 3/4 | SS-FA9-K14-M12 | 45.0 | 31.5 | 18.5 | 36 |
| | 1 | SS-FA9-K14-M16 | 49.5 | | 16.0 | 36 |
| 1 | 3/4 | SS-FA9-K16-M12 | 49.5 | 22.0 | 22.0 | 36 |
| | 1 | SS-FA9-K16-M16 | | | | |

FA9 type joint - NPT internal thread 90° elbow



| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | |
|-----------------------|----------------|-----------------|-----------|------|------|------|
| | | | L | L1 | D | S |
| Metric ferrule tube | | | | | | |
| 6 | 1/8 | SS-FA9-K6mm-F2 | 27.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FA9-K6mm-F4 | 30.0 | | | 17 |
| | 1/2 | SS-FA9-K6mm-F8 | 35.0 | | | 27 |
| 8 | 1/4 | SS-FA9-K8mm-F4 | 31.0 | 16.5 | 6.4 | 17 |
| | 1/8 | SS-FA9-K10mm-F2 | 31.5 | | | 17 |
| 10 | 1/4 | SS-FA9-K10mm-F4 | 33.5 | 17.5 | 8.0 | 22 |
| | 1/4 | SS-FA9-K12mm-F4 | 36.0 | | | 22 |
| 12 | 1/2 | SS-FA9-K12mm-F8 | 39.0 | 23.0 | 9.5 | 27 |
| | 1/2 | SS-FA9-K16mm-F8 | 39.5 | | | 27 |
| Imperial ferrule tube | | | | | | |
| 1/4 | 1/8 | SS-FA9-K4-F2 | 27.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FA9-K4-F4 | 30.0 | | | 17 |
| | 1/2 | SS-FA9-K4-F8 | 35.0 | | | 27 |
| 5/16 | 1/4 | SS-FA9-K5-F4 | 31.0 | 16.5 | 6.4 | 17 |
| 3/8 | 1/8 | SS-FA9-K6-F2 | 31.5 | 17.5 | 8.0 | 17 |
| | 1/4 | SS-FA9-K6-F4 | 33.5 | | | 22 |
| 1/2 | 3/8 | SS-FA9-K8-F6 | 36.0 | 23.0 | 10.5 | 20.5 |
| | 1/2 | SS-FA9-K8-F8 | 39.0 | | | 25.4 |
| 5/8 | 1/2 | SS-FA9-K10-F8 | 39.5 | 24.5 | 12.5 | 27 |

FA4 type joint - NPT external thread 45° elbow



| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | |
|-----------------------|----------------|------------------|-----------|------|------|----|
| | | | L | L1 | D | S |
| Metric ferrule tube | | | | | | |
| 6 | 1/8 | SS-FA4-K6mm-M2 | 27.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FA4-K6mm-M4 | 27.0 | | | 14 |
| | 3/8 | SS-FA4-K6mm-M6 | 30.0 | | | 17 |
| | 1/2 | SS-FA4-K6mm-M8 | 32.0 | | | 22 |
| 8 | 1/8 | SS-FA4-K8mm-M2 | 29.0 | 16.5 | 6.4 | 14 |
| | 1/4 | SS-FA4-K8mm-M4 | 29.0 | | | 14 |
| | 3/8 | SS-FA4-K8mm-M6 | 31.0 | | | 17 |
| | 1/2 | SS-FA4-K8mm-M8 | 33.0 | | | 22 |
| 10 | 1/8 | SS-FA4-K10mm-M2 | 31.5 | 17.5 | 7.0 | 17 |
| | 1/4 | SS-FA4-K10mm-M4 | 31.5 | | | 17 |
| | 3/8 | SS-FA4-K10mm-M6 | 31.5 | | | 17 |
| | 1/2 | SS-FA4-K10mm-M8 | 33.5 | | | 22 |
| 12 | 1/4 | SS-FA4-K12mm-M4 | 36.0 | 23.0 | 9.5 | 22 |
| | 3/8 | SS-FA4-K12mm-M6 | 36.0 | | | 22 |
| | 1/2 | SS-FA4-K12mm-M8 | 36.0 | | | 22 |
| | 3/4 | SS-FA4-K12mm-M12 | 40.0 | | | 27 |
| 15 | 1/2 | SS-FA4-K15mm-M8 | 38.0 | 24.5 | 12.0 | 24 |
| | 3/8 | SS-FA4-K16mm-M6 | 38.0 | | | 24 |
| 16 | 1/2 | SS-FA4-K16mm-M8 | 38.0 | 24.5 | 12.0 | 24 |
| | 3/4 | SS-FA4-K16mm-M12 | 40.0 | | | 27 |
| | 1/2 | SS-FA4-K18mm-M8 | 40.0 | | | 27 |
| 18 | 3/4 | SS-FA4-K18mm-M12 | 40.0 | 24.5 | 15.0 | 27 |
| | 1/2 | SS-FA4-K20mm-M8 | 45.0 | | | 36 |
| 20 | 3/4 | SS-FA4-K20mm-M12 | 45.0 | 26.0 | 16.0 | 36 |
| | 1/2 | SS-FA4-K22mm-M8 | 45.0 | | | 36 |
| | 3/4 | SS-FA4-K22mm-M12 | 45.0 | | | 36 |
| 22 | 1 | SS-FA4-K22mm-M16 | 45.0 | 26.0 | 18.5 | 36 |
| | 3/4 | SS-FA4-K25mm-M12 | 49.5 | | | 36 |
| | 1 | SS-FA4-K25mm-M16 | 49.5 | | | 36 |
| 25 | 3/4 | SS-FA4-K25mm-M12 | 49.5 | 31.5 | 22.0 | 36 |
| | 1 | SS-FA4-K25mm-M16 | 49.5 | | | 36 |
| Imperial ferrule tube | | | | | | |
| 1/4 | 1/8 | SS-FA4-K4-M2 | 27.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FA4-K4-M4 | 27.0 | | | 14 |
| 3/8 | 1/8 | SS-FA4-K6-M2 | 31.5 | 17.5 | 8.0 | 17 |
| | 1/4 | SS-FA4-K6-M4 | 31.5 | | | 17 |
| | 3/8 | SS-FA4-K6-M6 | 31.5 | | | 17 |
| 1/2 | 3/8 | SS-FA4-K8-M6 | 31.5 | 17.5 | 11.0 | 17 |
| | 1/2 | SS-FA4-K8-M8 | 39.0 | | | 27 |
| 3/4 | 3/4 | SS-FA4-K12-M12 | 45.0 | 26.0 | 16.0 | 36 |
| 1 | 3/4 | SS-FA4-K16-M12 | 49.5 | 31.5 | 22.0 | 36 |
| | 1 | SS-FA4-K16-M16 | 49.5 | | | 36 |

Bite type tube fittings

Structural features

Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size

Bite type tube fittings

Structural features

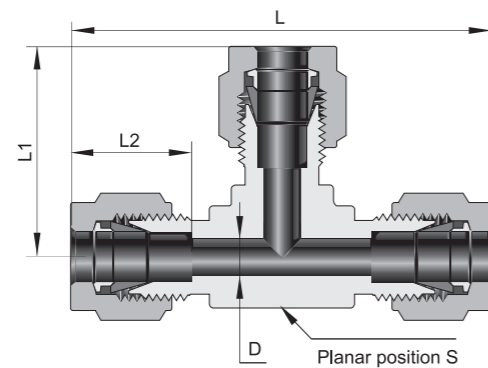
Dual-ferrule structure design

Working principle

Coding rule for item No.

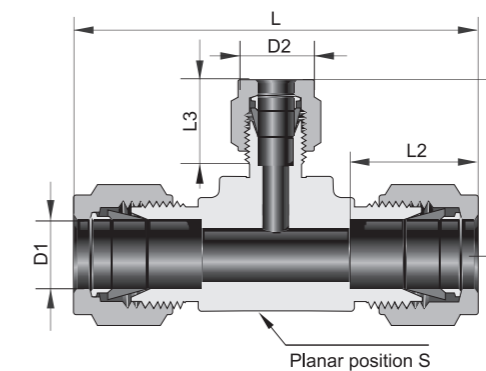
Order info & size

FT type joint -isometrical T-junction



| Ferrule tube OD | Item No. | Size (mm) | | | | |
|-----------------------|-------------|-----------|------|------|------|----|
| | | L | L1 | L2 | D | S |
| Metric ferrule tube | | | | | | |
| 6 | SS-FT-K6mm | 54.0 | 27.0 | 15.5 | 4.8 | 14 |
| 8 | SS-FT-K8mm | 60.0 | 30.0 | 16.5 | 6.4 | 17 |
| 10 | SS-FT-K10mm | 63.0 | 31.5 | 17.5 | 8.0 | 17 |
| 12 | SS-FT-K12mm | 72.0 | 36.0 | 23.0 | 9.5 | 22 |
| 14 | SS-FT-K14mm | 78.0 | 39.0 | 24.5 | 11.0 | 27 |
| 15 | SS-FT-K15mm | 78.0 | 39.0 | 24.5 | 12.0 | 27 |
| 16 | SS-FT-K16mm | 78.0 | 39.0 | 24.5 | 12.5 | 27 |
| 18 | SS-FT-K18mm | 80.0 | 40.0 | 24.5 | 15.0 | 27 |
| 20 | SS-FT-K20mm | 89.5 | 45.0 | 26.0 | 16.0 | 36 |
| 22 | SS-FT-K22mm | 89.5 | 45.0 | 26.0 | 18.5 | 36 |
| 25 | SS-FT-K25mm | 98.5 | 49.5 | 31.5 | 22.0 | 36 |
| Imperial ferrule tube | | | | | | |
| 1/4 | SS-FT-K4 | 54.0 | 27.0 | 15.5 | 4.8 | 14 |
| 5/16 | SS-FT-K5 | 60.0 | 30.0 | 16.5 | 6.4 | 17 |
| 3/8 | SS-FT-K6 | 63.0 | 31.5 | 17.5 | 8.0 | 17 |
| 1/2 | SS-FT-K8 | 78.0 | 39.0 | 24.5 | 11.0 | 27 |
| 5/8 | SS-FT-K10 | 78.0 | 39.0 | 24.5 | 12.5 | 27 |
| 3/4 | SS-FT-K12 | 89.5 | 45.0 | 26.0 | 16.0 | 36 |
| 7/8 | SS-FT-K14 | 89.5 | 45.0 | 26.0 | 18.5 | 36 |
| 1 | SS-FT-K16 | 98.5 | 49.5 | 31.5 | 22.0 | 36 |

FT type joint - reducing T-junction



| Ferrule tube OD | | Item No. | Size (mm) | | | | | |
|-----------------------|-----|-------------------|-----------|------|------|------|-----|------|
| D1 | D2 | | L | L1 | L2 | L3 | D | S |
| Metric ferrule tube | | | | | | | | |
| 8 | 6 | SS-FT-K8mm-K6mm | 60.0 | 29.0 | 16.5 | 15.5 | 4.8 | 17 |
| 10 | | SS-FT-K10mm-K6mm | 63.0 | 30.0 | 17.5 | 15.5 | 4.8 | 17 |
| 12 | | SS-FT-K12mm-K6mm | 72.0 | 32.0 | 23.0 | 15.5 | 4.8 | 22 |
| 15 | 12 | SS-FT-K15mm-K12mm | 78.0 | 39.0 | 24.5 | 23.0 | 9.5 | 27 |
| 16 | | SS-FT-K16mm-K12mm | 78.0 | 39.0 | 24.5 | 23.0 | 9.5 | 27 |
| 18 | | SS-FT-K18mm-K12mm | 80.0 | 39.0 | 24.5 | 23.0 | 9.5 | 27 |
| 22 | | SS-FT-K22mm-K12mm | 89.5 | 45.0 | 26.0 | 23.0 | 9.5 | 36 |
| 25 | | SS-FT-K25mm-K12mm | 98.0 | 45.0 | 31.5 | 23.0 | 9.5 | 36 |
| Imperial ferrule tube | | | | | | | | |
| 5/16 | 1/4 | SS-FT-K5-K4 | 60.0 | 29.0 | 16.5 | 15.5 | 4.8 | 17 |
| 3/8 | | SS-FT-K6-K4 | 63.0 | 30.0 | 17.5 | 15.5 | 4.8 | 17 |
| 1/2 | 1/4 | SS-FT-K8-K4 | 72.0 | 31.8 | 23.0 | 15.2 | 4.8 | 20.6 |
| | 3/8 | SS-FT-K8-K6 | 72.0 | 33.3 | 23.0 | 16.8 | 7.1 | 20.6 |

Bite type tube fittings

Structural features

Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size

Bite type tube fittings

Structural features

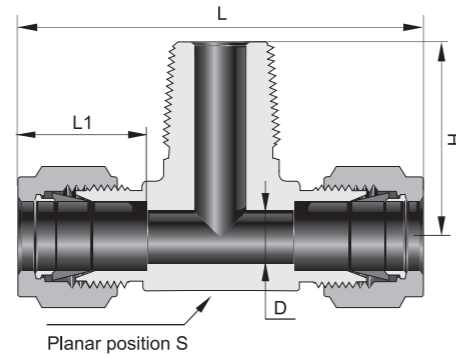
Dual-ferrule structure design

Working principle

Coding rule for item No.

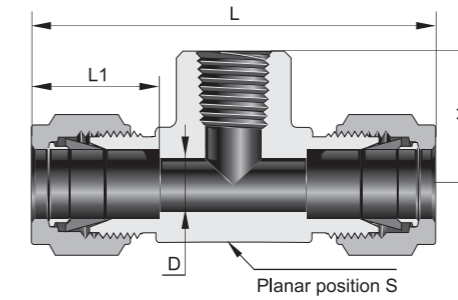
Order info & size

FTB type joint - side-tube NPT external thread T-junction



| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | | |
|-----------------------|----------------|-----------------|-----------|------|------|------|------|
| | | | L | L1 | H | D | S |
| Metric ferrule tube | | | | | | | |
| 6 | 1/8 | SS-FTB-K6mm-M2 | 54.0 | 15.5 | 19.0 | 4.8 | 14 |
| | 1/4 | SS-FTB-K6mm-M4 | | | 23.5 | | |
| 8 | 1/8 | SS-FTB-K8mm-M2 | 60.0 | 16.5 | 21.0 | 4.8 | 17 |
| | 1/4 | SS-FTB-K8mm-M4 | | | 25.5 | | |
| 10 | 1/4 | SS-FTB-K10mm-M4 | 67.0 | 17.5 | 26.5 | 7.0 | 22 |
| 12 | 1/4 | SS-FTB-K12mm-M4 | 72.0 | 23.0 | 28.5 | 7.0 | 22 |
| | 3/8 | SS-FTB-K12mm-M6 | | | 28.5 | | |
| | 1/2 | SS-FTB-K12mm-M8 | | | 33.0 | | |
| 16 | 1/2 | SS-FTB-K16mm-M8 | 78.0 | 24.5 | 36.0 | 12.0 | 27 |
| Imperial ferrule tube | | | | | | | |
| 1/4 | 1/8 | SS-FTB-K4-M2 | 54.0 | 15.5 | 19.0 | 4.8 | 14 |
| | 1/4 | SS-FTB-K4-M4 | | | 23.5 | | |
| 5/16 | 1/8 | SS-FTB-K5-M2 | 60.0 | 16.5 | 21.0 | 4.8 | 17 |
| | 1/4 | SS-FTB-K5-M4 | | | 25.5 | | |
| 3/8 | 1/4 | SS-FTB-K6-M4 | 67.0 | 17.5 | 26.5 | 7.0 | 22 |
| 1/2 | 3/8 | SS-FTB-K8-M6 | 72.0 | 23.0 | 28.2 | 9.5 | 20.6 |
| | 1/2 | SS-FTB-K8-M8 | | | 33.0 | | |
| 5/8 | 1/2 | SS-FTB-K10-M8 | 78.0 | 24.5 | 36.0 | 12.0 | 27 |

FTB type joint - side-tube NPT internal thread T-junction



| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | | |
|-----------------------|----------------|-----------------|-----------|------|------|------|------|
| | | | L | L1 | H | D | S |
| Metric ferrule tube | | | | | | | |
| 6 | 1/8 | SS-FTB-K6mm-F2 | 54.0 | 15.5 | 19.0 | 4.8 | 14 |
| | 1/4 | SS-FTB-K6mm-F4 | 59.5 | | 22.5 | | |
| 8 | 1/8 | SS-FTB-K8mm-F2 | 60.0 | 16.5 | 19.0 | 6.4 | 17 |
| | 1/4 | SS-FTB-K8mm-F4 | 61.5 | | 22.5 | | |
| 10 | 1/4 | SS-FTB-K10mm-F4 | 67.0 | 17.5 | 22.5 | 8.0 | 22 |
| 12 | 1/4 | SS-FTB-K12mm-F4 | 72.0 | 23.0 | 22.5 | 9.5 | 22 |
| | 3/8 | SS-FTB-K12mm-F6 | 72.0 | | 22.5 | | |
| 16 | 1/2 | SS-FTB-K12mm-F8 | 78.0 | 24.5 | 28.5 | 12.5 | 27 |
| | 1/2 | SS-FTB-K16mm-F8 | 78.0 | | 28.5 | | |
| Imperial ferrule tube | | | | | | | |
| 1/4 | 1/8 | SS-FTB-K4-F2 | 54.0 | 15.5 | 19.0 | 4.8 | 14 |
| | 1/4 | SS-FTB-K4-F4 | 59.5 | | 22.5 | | |
| 5/16 | 1/8 | SS-FTB-K5-F2 | 60.0 | 16.5 | 19.0 | 6.4 | 17 |
| | 1/4 | SS-FTB-K5-F4 | 61.5 | | 22.5 | | |
| 3/8 | 1/4 | SS-FTB-K6-F4 | 67.0 | 17.5 | 22.5 | 8.0 | 22 |
| 1/2 | 1/4 | SS-FTB-K8-F4 | 72.0 | 23.0 | 22.5 | 10.4 | 20.6 |
| | 1/2 | SS-FTB-K8-F8 | 78.0 | | 28.5 | | |
| 5/8 | 1/2 | SS-FTB-K10-F8 | 78.0 | 24.5 | 28.5 | 12.5 | 27 |

Bite type tube fittings

Structural features

Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size

Bite type tube fittings

Structural features

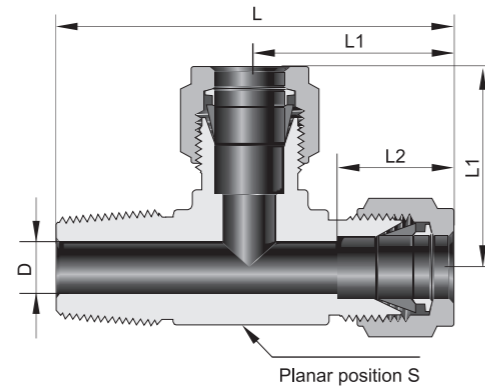
Dual-ferrule structure design

Working principle

Coding rule for item No.

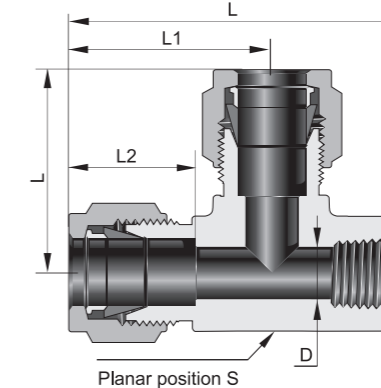
Order info & size

FTS type joint - straight NPT external thread T-junction



| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | | |
|-----------------------|----------------|-----------------|-----------|------|------|------|------|
| | | | L | L1 | L2 | D | S |
| Metric ferrule tube | | | | | | | |
| 6 | 1/8 | SS-FTS-K6mm-M2 | 46.0 | 27.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FTS-K6mm-M4 | 50.5 | 30.0 | 16.5 | 6.4 | 17 |
| 8 | 1/4 | SS-FTS-K8mm-M4 | 55.5 | 36.0 | 23.0 | 7.0 | 22 |
| | 1/2 | SS-FTS-K12mm-M8 | 69.0 | 38.0 | 24.5 | 12.0 | 24 |
| 12 | 1/4 | SS-FTS-K12mm-M4 | 64.5 | 36.0 | 23.0 | 7.0 | 22 |
| | 1/2 | SS-FTS-K12mm-M8 | 69.0 | 38.0 | 24.5 | 12.0 | 24 |
| 16 | 1/4 | SS-FTS-K16mm-M4 | 73.5 | 38.0 | 24.5 | 12.0 | 24 |
| | 1/2 | SS-FTS-K16mm-M8 | 73.5 | 38.0 | 24.5 | 12.0 | 24 |
| Imperial ferrule tube | | | | | | | |
| 1/4 | 1/8 | SS-FTS-K4-M2 | 46.0 | 27.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FTS-K4-M4 | 50.5 | 30.0 | 16.5 | 6.4 | 17 |
| 5/16 | 1/4 | SS-FTS-K5-M4 | 55.5 | 30.0 | 16.5 | 6.4 | 17 |
| | 3/8 | SS-FTS-K8-M6 | 64.2 | 36.0 | 22.8 | 9.6 | 20.6 |
| 1/2 | 1/2 | SS-FTS-K8-M8 | 69 | 36.0 | 22.8 | 10.4 | 20.6 |
| | 1/2 | SS-FTS-K10-M8 | 73.5 | 38.0 | 24.5 | 12.0 | 24 |

FTS type joint - straight NPT internal thread T-junction



| Ferrule tube OD | NPT size (in.) | Item No. | Size (mm) | | | | |
|-----------------------|----------------|-----------------|-----------|------|------|------|------|
| | | | L | L1 | L2 | D | S |
| Metric ferrule tube | | | | | | | |
| 6 | 1/8 | SS-FTS-K6mm-F2 | 46.0 | 27.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FTS-K6mm-F4 | 52.5 | 30.0 | 16.5 | 6.4 | 17 |
| 8 | 1/8 | SS-FTS-K8mm-F2 | 49.0 | 30.0 | 16.5 | 6.4 | 17 |
| | 1/4 | SS-FTS-K8mm-F4 | 53.0 | 31.0 | 16.5 | 6.4 | 17 |
| 10 | 1/4 | SS-FTS-K10mm-F4 | 56.0 | 33.5 | 17.5 | 8.0 | 22 |
| | 1/4 | SS-FTS-K12mm-F4 | 58.5 | 36.0 | 23.0 | 9.5 | 22 |
| 12 | 3/8 | SS-FTS-K12mm-F6 | 58.5 | 36.0 | 23.0 | 10.5 | 22 |
| | 1/2 | SS-FTS-K12mm-F8 | 68.5 | 40.0 | 24.5 | 12.5 | 27 |
| 16 | 1/2 | SS-FTS-K16mm-F8 | 68.5 | 40.0 | 24.5 | 12.5 | 27 |
| | 1/2 | SS-FTS-K16mm-F8 | 68.5 | 40.0 | 24.5 | 12.5 | 27 |
| Imperial ferrule tube | | | | | | | |
| 1/4 | 1/8 | SS-FTS-K4-F2 | 46.0 | 27.0 | 15.5 | 4.8 | 14 |
| | 1/4 | SS-FTS-K4-F4 | 52.5 | 30.0 | 16.5 | 6.4 | 17 |
| 5/16 | 1/8 | SS-FTS-K5-F2 | 49.0 | 30.0 | 16.5 | 6.4 | 17 |
| | 1/4 | SS-FTS-K5-F4 | 53.0 | 31.0 | 16.5 | 6.4 | 17 |
| 3/8 | 1/4 | SS-FTS-K6-F4 | 56.0 | 33.5 | 17.5 | 8.0 | 22 |
| | 3/8 | SS-FTS-K8-F6 | 58.4 | 36.0 | 22.8 | 10.4 | 20.6 |
| 1/2 | 1/2 | SS-FTS-K8-F8 | 68.3 | 40.0 | 24.5 | 12.5 | 27 |
| | 1/2 | SS-FTS-K10-F8 | 68.5 | 40.0 | 24.5 | 12.5 | 27 |

Bite type tube fittings

Structural features

Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size

Bite type tube fittings

Structural features

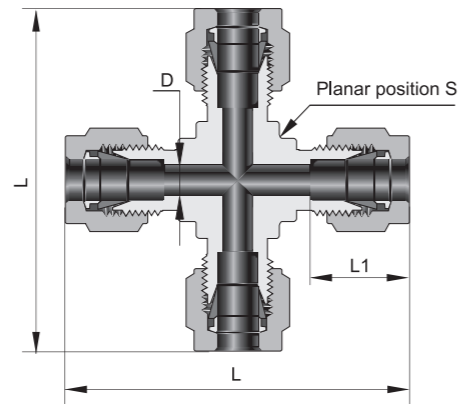
Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size

FQ type joint - four-way connection



Bite type tube fittings

Structural features

Dual-ferrule structure design

Working principle

Coding rule for item No.

Order info & size

| Ferrule tube OD | Item No. | Size (mm) | | | |
|-----------------------|-------------|-----------|------|------|----|
| | | L | L1 | D | S |
| Metric ferrule tube | | | | | |
| 6 | SS-FQ-K6mm | 54.0 | 15.5 | 4.8 | 14 |
| 8 | SS-FQ-K8mm | 60.0 | 16.5 | 6.4 | 17 |
| 10 | SS-FQ-K10mm | 67.0 | 17.5 | 8.0 | 22 |
| 12 | SS-FQ-K12mm | 72.0 | 23.0 | 9.5 | 22 |
| 16 | SS-FQ-K16mm | 74.0 | 24.5 | 12.5 | 24 |
| 18 | SS-FQ-K18mm | 77.0 | 24.5 | 15.0 | 27 |
| 20 | SS-FQ-K20mm | 90.0 | 26.0 | 16.0 | 36 |
| 22 | SS-FQ-K22mm | 90.0 | 26.0 | 18.5 | 36 |
| 25 | SS-FQ-K25mm | 98.5 | 31.5 | 22.0 | 36 |
| Imperial ferrule tube | | | | | |
| 1/4 | SS-FQ-K4 | 54.0 | 15.5 | 4.8 | 14 |
| 5/16 | SS-FQ-K5 | 60.0 | 16.5 | 6.4 | 17 |
| 3/8 | SS-FQ-K6 | 67.0 | 17.5 | 8.0 | 22 |
| 1/2 | SS-FQ-K8 | 72.0 | 23.0 | 10.4 | 20 |
| 5/8 | SS-FQ-K10 | 74.0 | 24.5 | 12.5 | 24 |
| 3/4 | SS-FQ-K12 | 90.0 | 26.0 | 16.0 | 36 |
| 7/8 | SS-FQ-K14 | 90.0 | 26.0 | 18.5 | 36 |
| 1 | SS-FQ-K16 | 98.5 | 31.5 | 22.0 | 36 |