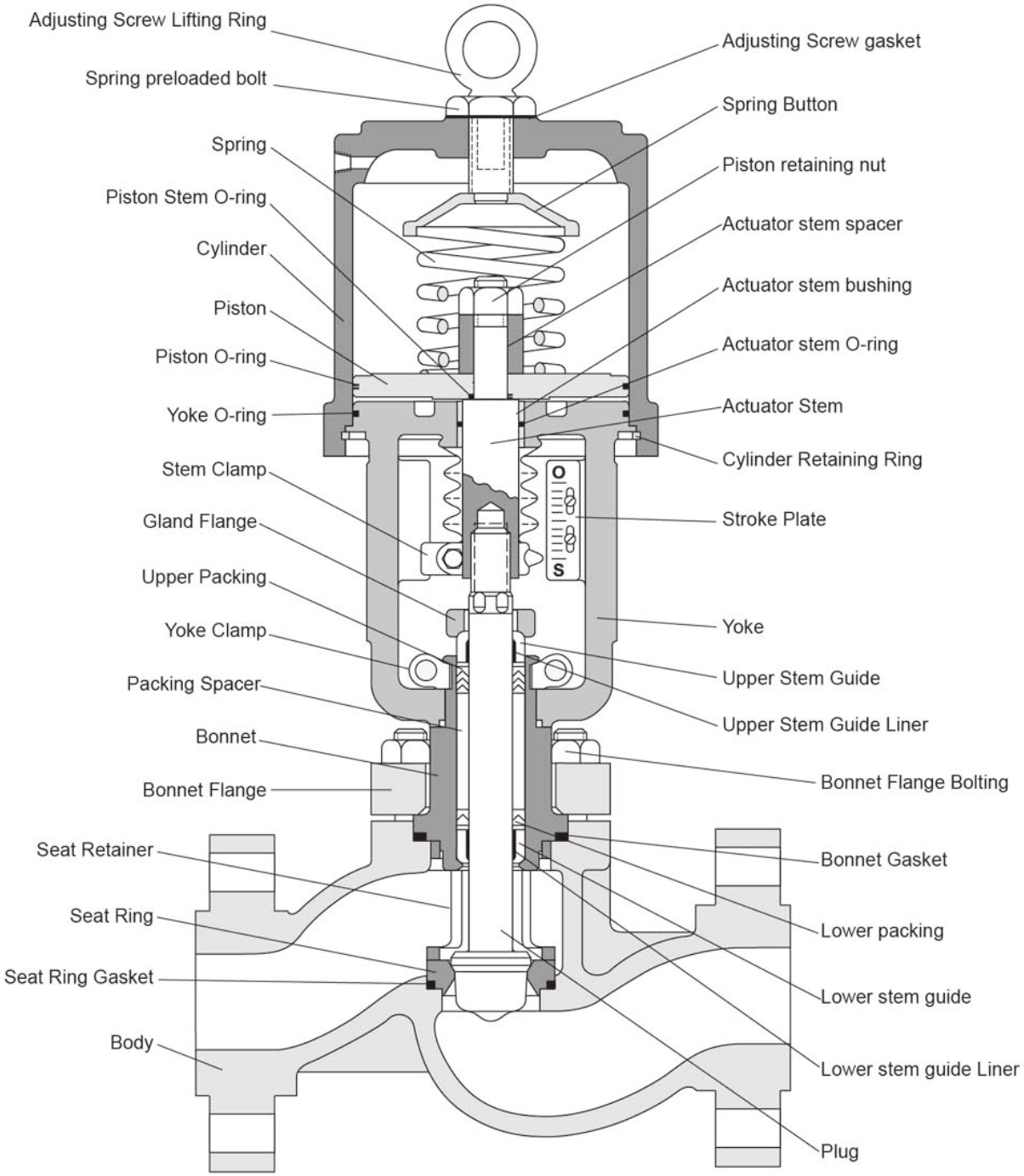
FLOAUTO®

V1000 High Performance Control Valves

FLOAUTO (Shanghai) Control Valves Co., Ltd.

General assembly drawing of V1000 control valves



Structural diagram of V1000 high performance pneumatic control valve

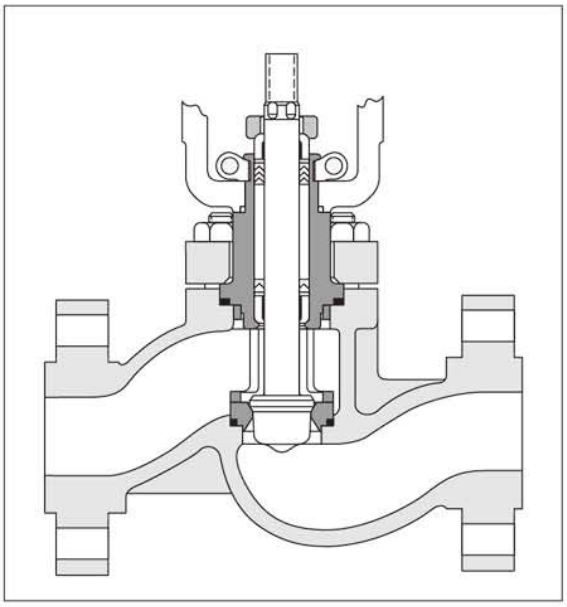
Design Features of V1000 Valves

- The self-aligning snap-in threadless connection seat offers easy disassembly and maintenance, and hard seal of the seat can achieve very small amount of leakage (ANSI CL V/VI).
- The stem and plug use integrated structure, the stem section is 3-5 times that of a traditional diaphragm control valve, and thus even in the case of high temperature, high pressure and high pressure difference, the plug will not fall, and the stem will not bend or crack.
- Two widely-spaced guide design. Even if the medium is susceptible to crystallization and dirt, and is in worse work conditions such as abrasion and high corrosion, the medium will not pose any destructive effect on the guide mechanism, guaranteeing the long-term effective and reliable work of a linear motion valve.
- The integral stem and plug meets anti-blow design of the stem, and achieves the firefighting design of the valve.
- Double packing and the stem design not easily damaged, in which the lower packing plays the role of the scratch medium and protecting the stem, and together with the upper packing, ensures a good seal.
- A single cylinder double-acting actuator with a safety reset spring has a high rigidity strength, big stroke, powerful thrust and fast stroke speed. In case of gas source failure, it is able to achieve the desired position, and the up and lower cavities on the piston contain pure compressed air, especially suitable for occasions where the ambient gas is corrosive.
- A valve of the same specification has a variety of CV values, and replacement of the plugs and seats in pairs can meet the selection of CV values in different loads.
- Replacement of a standard cage with a control cavitation and noise reduction valve cage can be applied to severe working conditions.
- Pneumatic open valve and closed valve can easily pass the installation and commissioning, without the need for additional parts and special tools, and can achieve functional exchange.
- Top-mounted structure design can realize on-line maintenance, which is simple, quick and economic.

Common defects of control valves and our solutions

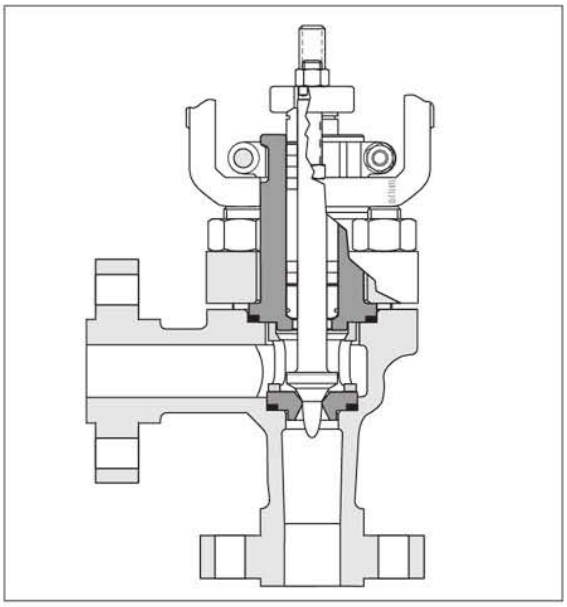
Common defects	Solutions of V1000
Stem bending and cracking, and the plug falling	Integral cast stem and plug, the stem section being 3-5 times that of a diaphragm control valve of the same specification and thus even in the case of “three highs” , the plug not to fall and bend.
Large leakage amount of valves	The self-aligning snap-in threadless connection seat ensures completely natural coincidence of the geometric center lines of the seat, plug and stem, with very small amount of leakage.
Leakage of packing box	The stout stem and double-packing structure make it possible for a valve to be directly used in liquefied chlorine if proper materials selected.
Difficult assembly and disassembly of parts inside the valve during maintenance	Snap-in seat and slotted cage offer very easy assembly and disassembly and very convenient online maintenance.
Due to the corrosive gases in the environment, the actuator diaphragm and spring	Single cylinder and double action mode ensure the internal parts of the actuator are always in clean compressed air.
Ageing and cracking of rubber diaphragms influencing production stability and safety	Abrasion of cylinder piston gasket can only lead to slow speed of the valve, and preventive change and maintenance can be performed.
Difficult maintenance of actuator	The lower spring of the actuator can be removed with a simple tool, so maintenance is very easy.
The guide mechanism in the valve is susceptible to medium status (corrosion, crystallization, particle)	The guide mechanism is outside the valve (a two-top guide) is almost not susceptible to the medium status, ensuring good performance and long service life of the guide mechanism.
The cage valve uses a valve cage guide, and in working conditions of high temperature, the valve cage	Large valve cage, small plug, valve cage not participating in guiding, but the noise reduction and anti-cavitation functions kept completely.
Multiple specifications and types of valves and actuators causing difficult to prepare spare parts	Valves, especially actuators, have little specifications and types, and thus the efficiency of spare parts is high.
Low adjustment accuracy, slow adjustment speed	Used for gas sources of up to 1.0MPa, with high adjustment accuracy and quick adjustment speed.

Body Styles (Flange type)



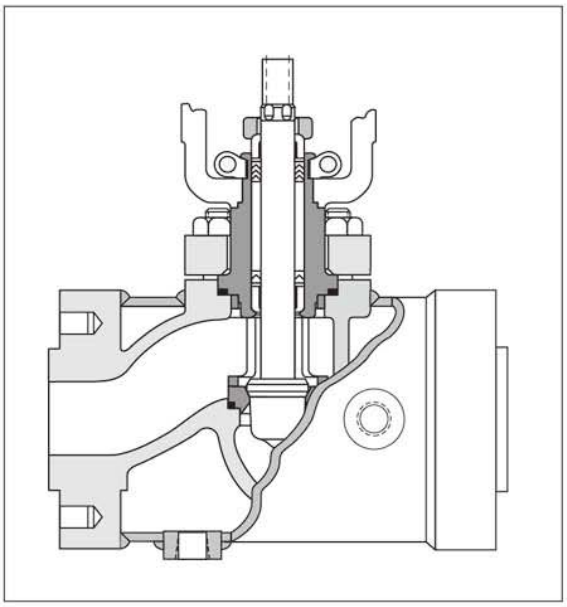
Globe-style Body

The streamlined globe style body of low flow resistance design feature equivalent internal section areas, and can provide large flow rate, little loss of pressure drop, and stable fluid flow. Constant wall thickness of bodies may lower the weight of the body.



Angle-style Body

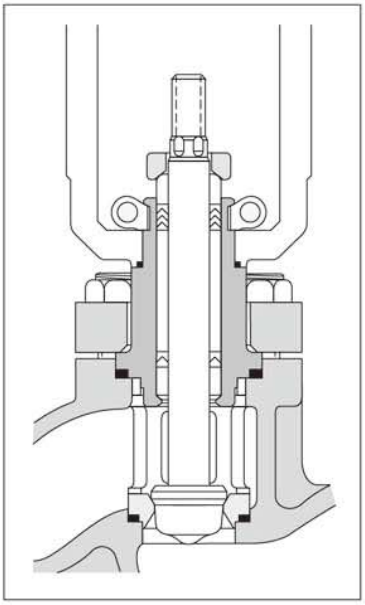
Except that the body is a right angle, other structure of the valve is completely the same as the globe-style body. Simple passage and little resistance of the body can avoid coking, bonding, blockage, etc, and also provide convenience for self-purification and cleaning.



Globe Jacketed Body

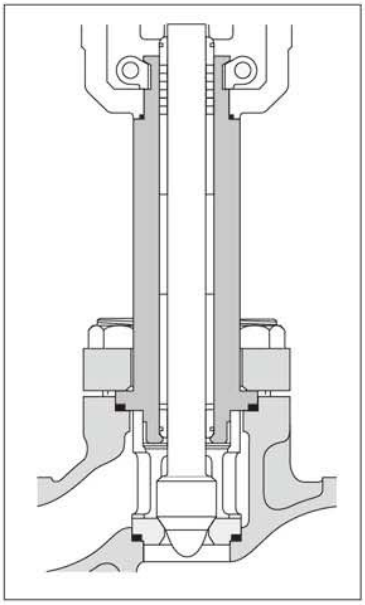
The standard globe jacketed body uses steam for heating and warming, and preventing materials from crystallization and solidification. If the steam jacket is placed on the globe body completely, an oversized blind flange shall be used.

Bonnet Types



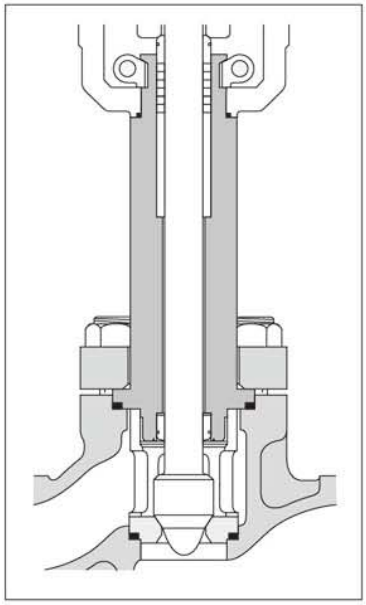
Standard Bonnet

The standard bonnet is usually constructed of the same material as the body and handles temperature from -29℃ to 250℃. The packing is divided into PTFE and expanded graphite.



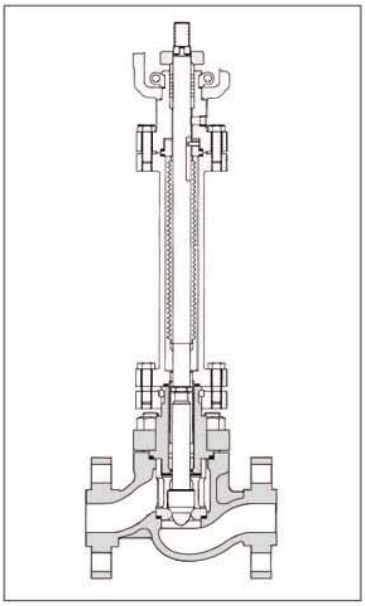
Extended Bonnet

The extended bonnet protects the packing and attachments from excessive heat or cold which may influence the performance of a valve. It is constructed of carbon steel for temperatures from -29℃ to 427℃, and of 304 or 316 stainless steel for -100℃ to 650℃.



Cryogenic Extended Bonnet

The cryogenic extended bonnet permits adjustment of low-temperature media (such as liquid oxygen, fluid nitrogen, etc.), which protects the packing from the service fluid. Usually manufactured from 304 or 316 stainless steel, it handles for temperatures down to -196℃. Standard construction consists of stainless steel bonnet flange and bolting.



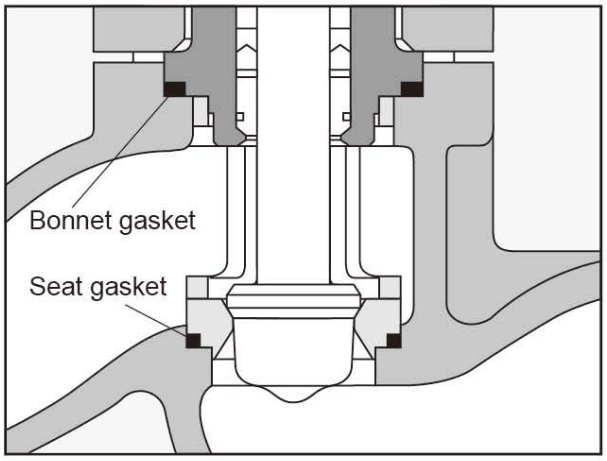
Metal Bellows Seal Bonnet

Within the metal bellows seal bonnet are stainless steel bellows components which separate the media from the outside and ensure up and down movement of the stem. Moreover, on the bonnet, there is still a “V” shaped PTFE packing seal. Once a bellows component is damaged, it, as a second seal, ensures to protect leakage of media from causing wastage or leading to environmental pollution. Whenever the leakage of service fluids to atmosphere needs to be reduced to an absolute minimum, such as highly toxic, precious, volatile and easily penetrable media, the metal bellows seal can be used. It is rated for operation in processes ranging in temperature from -60℃ to 150℃ and nominal pressure ≤ 5MPa, and can also be used in vacuum conditions.

Gaskets

V1000 high-performance control valves use the self-aligning snap-in threadless connection seat. By means of clamping of bonnets, the contact between the bonnet and the body and contact between the seat and the body are of metal with metal, with the clearances between them are filled with gaskets, leading to sealing of the body. The compression level of the bonnet gasket depends on the depth of the step arranged on the gasket of the bonnet, ensuring the flat contact of metal and metal between the bonnet and the body, and also ensuring the perpendicular central alignment of the plug with the seat to reach tight sealing.

When the bonnet is completely installed, its strength is passed to the seat through a retainer of seat to ensure that the seat ring is in a proper position. The machining clearances for the body, the retainer of seat and the seat are very close, so that the seat gaskets can be compressed appropriately to prevent leakage. If the valve is assembled properly, the seat ring of the self-aligning center may fit with the plug well, without the need for grinding.



Gasket

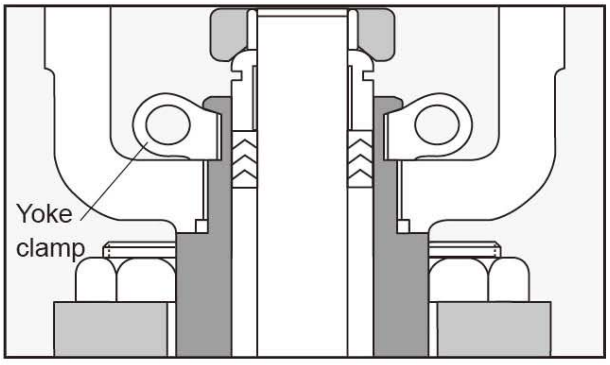
Gasket Specifications

Brief temperature specification	Type	Gasket material	Maxim gasket temperature	Minimum gasket temperature
Low	Flat	PTFE	150℃	-130℃
Middle	Spiral wound	316 stainless steel /soft graphite	500℃	-196℃
High*	Spiral wound	Special alloy/soft graphite	816℃	-196℃

* The use of special gasket design may allow for higher temperatures.

Yoke Clamps

The actuator is usually attached to the V1000 control valve body with two precision cast, stainless steel yoke clamps, although in some cases of large-diameter valves, the actuator is bolted directly to the bonnet. Each clamp has an inclined plane surface which, when bolted together, securely fastens the actuator yoke to the bonnet. Unlike conventional threaded clamps which are susceptible to rust and very difficult to be removed, the design of the stainless steel clamp permits easy removal even under extremely corrosive conditions. Associated bolts and locknuts are also supplied in stainless steel.



Yoke clamp

Packing and Guiding

The packing boxes of V1000 high-performance control valves are deeper than most conventional types, providing the following advantages:

The lower packing set is designed to avoid contact with any part of the stem that has been exposed to the flowing medium and to prevent contaminants from entering the upper packing. There is enough spacing between the upper packing and the lower packing to prevent the part of the stem exposed to the flowing medium from contacting the upper packing. The lower packing is designed to minimize the amount of fluid on the stem.

Bonnets are designed to permit a wide variety of packing configurations, including a double set of packing, without changing bonnets.

Two widely-spaced stem guides, when used with a large plug stem diameter, provide exceptional guiding. The upper stem guide also acts as a packing follower; the lower guide is situated close to the plug for additional guiding support, insuring accurate alignment of plug and seat ring.

Graphite-lined stainless steel guides provide superior guiding over wide temperature ranges and completely eliminate guide/stem galling. A variety of guides are available for various applications, including solid brass, Stellite alloy (tungsten-nickel-cobalt hard alloy) and glass-filled Teflon. Rigid lower guides find their use in high pressure difference, and this can ensure ride guiding to prevent the stem from swing. Limitation on stem swing can prolong the service life of packing.

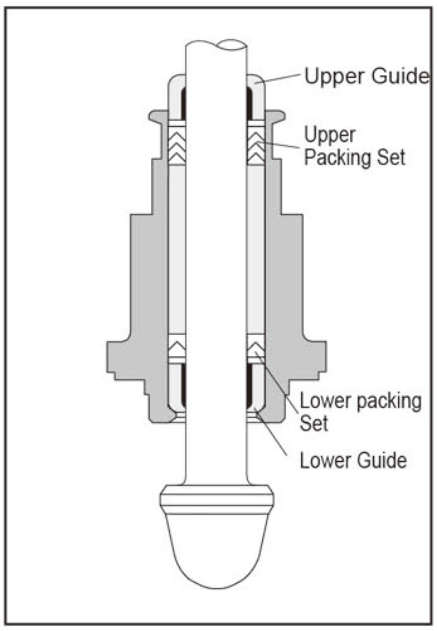
Guides

Standard materials	Max. temperature of lower guide	Max. temperature of upper guide	Min. temperature
316 stainless steel line PTFE	177℃	177℃	-130℃
316 stainless steel line	815℃	815℃	-196℃
Soft graphite line-free 17-4PH	600℃	815℃	-196℃
Line-free stellite alloy	815℃	815℃	-253℃

Packing

Bonnet type	Packing material and type	Service fluid temperature limitation
Standard bonnet	PTFE V type	-29-232℃
	Soft graphite V type	-29-400℃
Extended S type bonnet	PTFE V type	-50-260℃
	Soft graphite V type	-29-650℃
Extended L type bonnet	PTFE V type	-100-315℃
	Soft graphite V type	-29-815℃
Cryogenic extended bonnet	PTFE V type	-196-101℃
	Soft graphite V type	—

Note: In air or oxygen environment, do not use soft graphite packing if temperature is higher than 427℃. When soft graphite is used, an oversized actuator or much heavier spring is required because of increased galling.

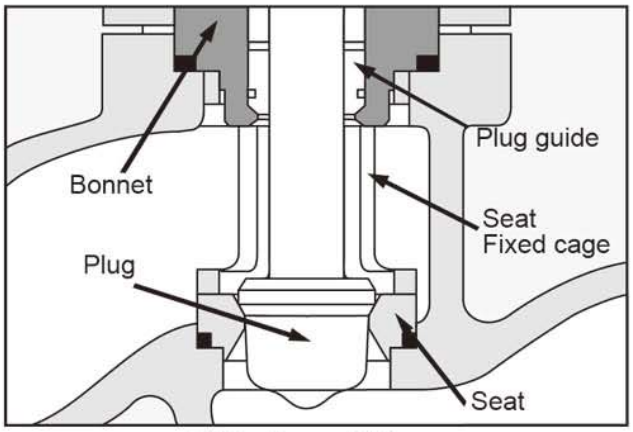


Standard packing structure

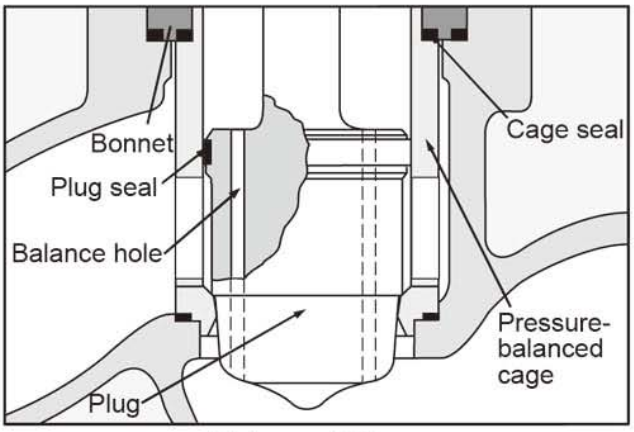
Structural characteristics:

- Two widely-spaced guiding, increasing stability of stem movement;
- Double-layered packing, enhancing the sealing of stem locations, and extending the service life of packing;
- A wide range of packing is designed to meet applications of different conditions;
- Bellows sealing types are designed to ensure absolute sealing.

Off-balanced Plugs and Balanced Plugs



Off-balanced Plugs



Balanced Plugs

Off-balanced Plugs

The off-balanced plug is designed to avoid the difficulties associated with screwed-in seats and cage-guiding. Since the seat is not screwed in but clamped into the body by the bonnet and seat retainer, removal of the seat is easy even under extremely corrosive conditions.

Unlike cage-guided plugs that easily gall and stick, plugs are stout and double-stem guided, avoiding contact between the seat retainer and plug. The seat retainer can guide fluids, buffer fluid pressure, protect the plug and the seat against damage from fluid erosion, flash evaporation and cavitation, also reducing noise. The flow characteristic is determined by the plug contour, rather than by the opening in the retainer, therefore it has the advantages of a single-seat valve and a cage valve.

Balanced Plugs

For very high pressure difference, a balanced plug is used to reduce the thrust necessary to stroke the plug by reducing the plug off-balance area. Because the balanced plug fits closely to the retainer, this plug should only be used in generally clean services.

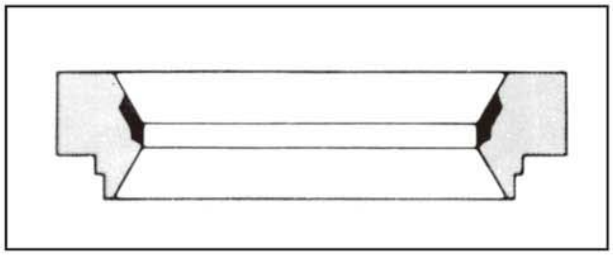
Flow direction is over the plug for fail-open and under the plug for fail-closed. The seal area less the stem area is designed to be slightly larger than the seat area, thus the plug is off-balanced to close for flow under the seat and off-balanced to open for flow over the seat. The balanced plug cannot reach the same seal class as the off-balanced plug.

Metal Seats

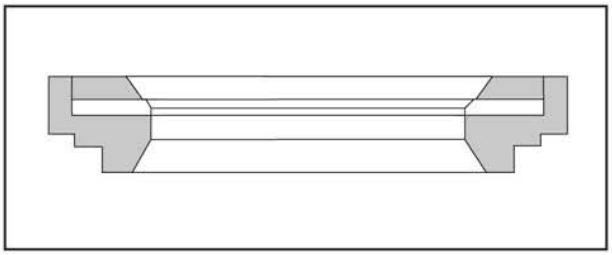
V1000 control valves are divided into hard sealing and soft sealing in terms of mutual sealing form of plugs and seats. Hard sealing refers hard contact of all mutual sealing locations of plugs and seats, i.e. stainless steel is in contact with stainless steel, leakage class is Class IV (ANSI B16.104, 1976), and leakage Class V also provides a selection standard. Hard sealing is applicable to conditions where liquid media and temperatures are higher or the requirements for leakage are not very strict. All V1000 control valves are seat leak tested after assembly and generally are substantially lower in leakage than called for by this class. This exceptional seat tightness is obtained by aligning the seat with the plug during assembly.

Soft Seat Rings

The soft seat refers to that the plug is constructed of stainless steel, and its design consists of an reinforced PTFE soft seat ring sandwiched between two stainless steel pieces; the contact between the plug and the seat is the contact between hard and soft. Leakage amount can reach air-tightness seal, i.e. Class VI in ANSI standard, and the seat is applicable to general gas and working conditions where the requirements for leakage is relatively strict, with the maximum service temperature of 150℃. The soft seat is interchangeable with the hard seat for a given pressure rating and valve size. The design of V1000 control valve seat is also featured by one stainless retaining ring on the seat ring. Its role is to protect the seat ring, and after excess compression and failure of long term compression of the seat ring, it equals to a metal seat.



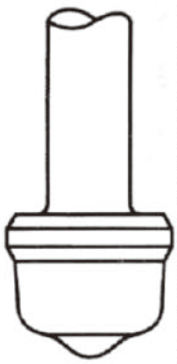
Metal seat



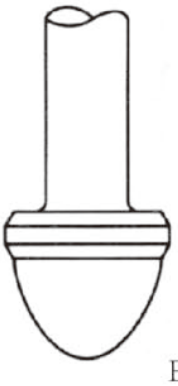
Soft seat

Flow Characteristics and Plug Types

The flow characteristics of a control valve depend on the curve shape of a plug head. The plugs fall into Equal Percent, linear and quick open.
A plug is easily to change from one type to another type. For a valve with a given size and pressure class, all types of seat rings and plugs are exchangeable. The circulation ability of multiple plugs can be selected only through replacement of plugs and seats. Across different pressure levels many par are interchangeable (ANSI CLASS 150 to 600, 900 and 1500), and a standard through plug provides a maximum Cv value. When a large valve diameter with less Cv value, necking-down plugs of multiple models may be provided. For the purpose of realizing different flow characteristics, you can select Equal Percent, linear and quick open flow characteristics simply by replacement of plugs.

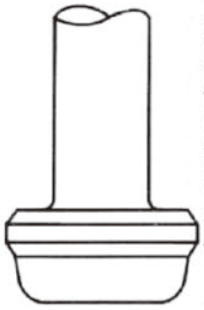


Equal Percent is the characteristic most commonly used in process control. The change in flow per unit of valve stroke is directly proportional to the flow occurring just before the change is made. Most control loops will use plugs of equal percentage flow characteristics when the overall system pressure drop is large relative to that across the valve.



The linear flow characteristic, also called straight-line flow characteristic, produces equal changes in flow per unit of valve stroke. Linear plugs are used on those systems where the valve pressure drop is a major portion of the total system pressure drop.

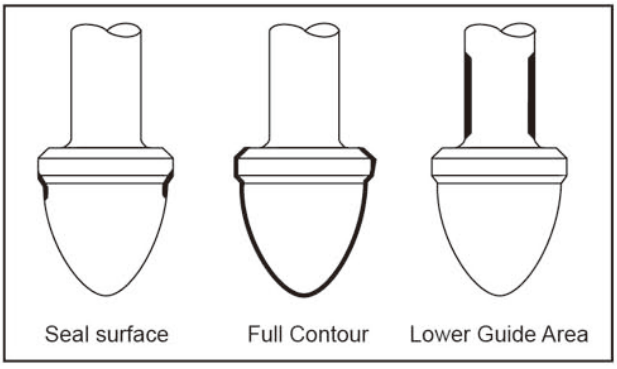
Equal Percent



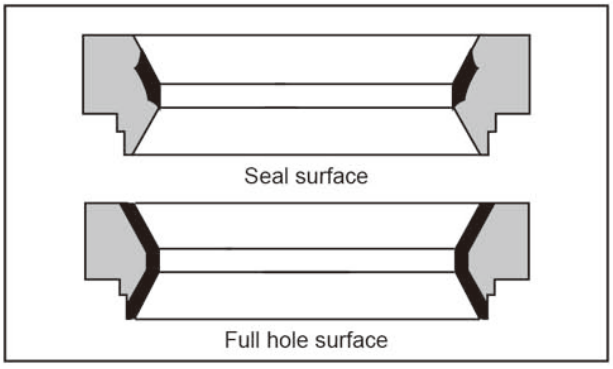
Quick open plugs are used for on-off service and are primarily designed to produce maximum flow quickly. (Most power generation plants use linear plugs in lieu of quick plugs to reduce water hammer)

Hardened plugs and seats

For a valve of small diameter, standard plugs and seat rings are constructed of 416 stainless steel and receive surface hardness treatment. Plug heads of Stellite and stems of 306 and 316 stainless steel are used as a kind of selective plug. For a valve of large diameter, Stellite alloy may be used as its surface covering layer. While having very high hardness, this material also possesses better anti-corrosion. As a rule, hardened plugs are suitable for applications where the medium is stem and high pressure difference.



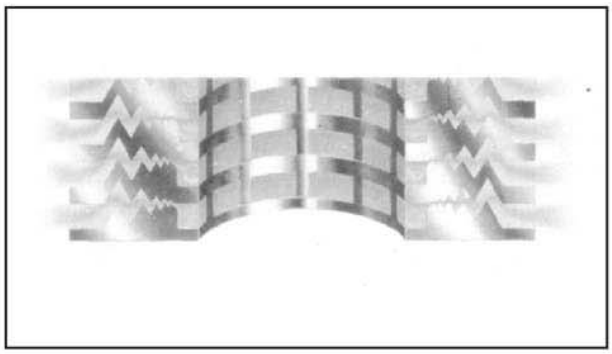
Hard Facing Variations-Plug （Stellite alloy overlaying）



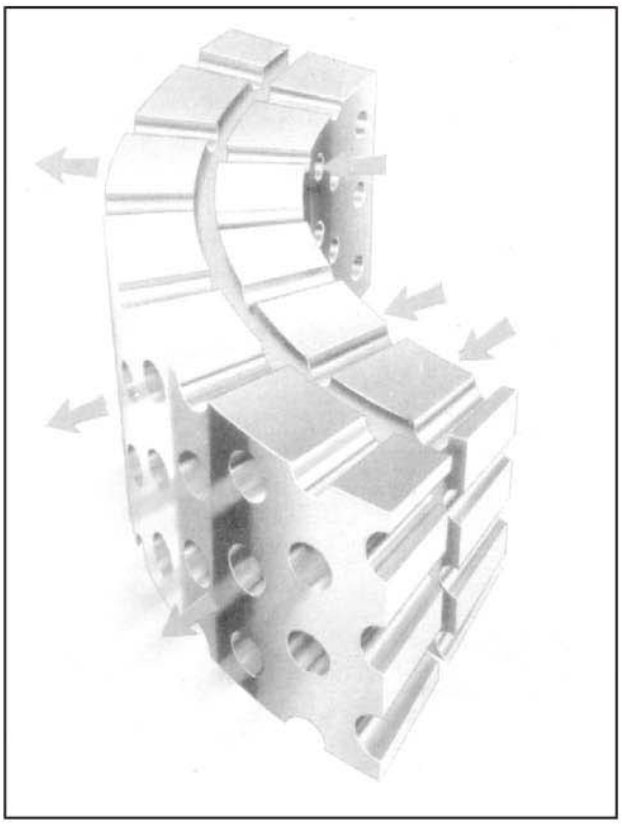
Hard Facing Variations-Seat (Stellite alloy overlaying)

Cages in Severe Service

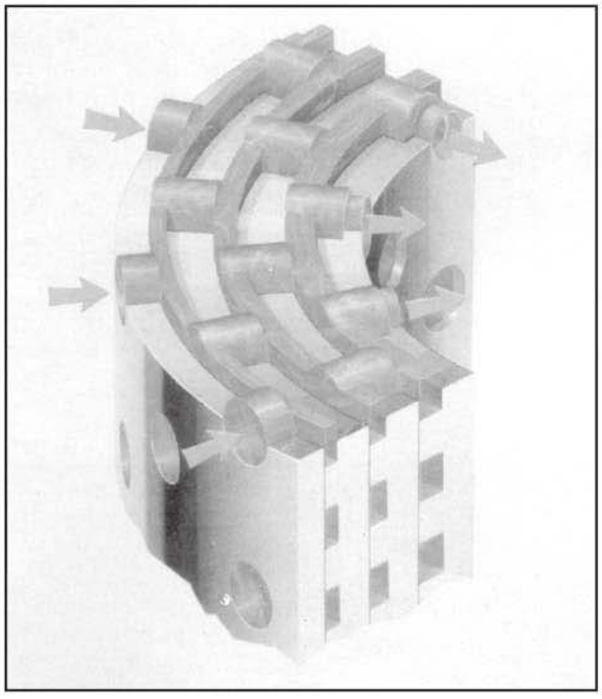
Cages in severe service: tiger tooth type, noise reduction type, cavitation removal type and cavitation control type cages, for most high-temperature, high-pressure and high pressure difference power generation control valves. They can significantly reduce cavitation, reduce noise, and extend the service life of control valves, this characteristic indicating the extensive applications of V1000 products.



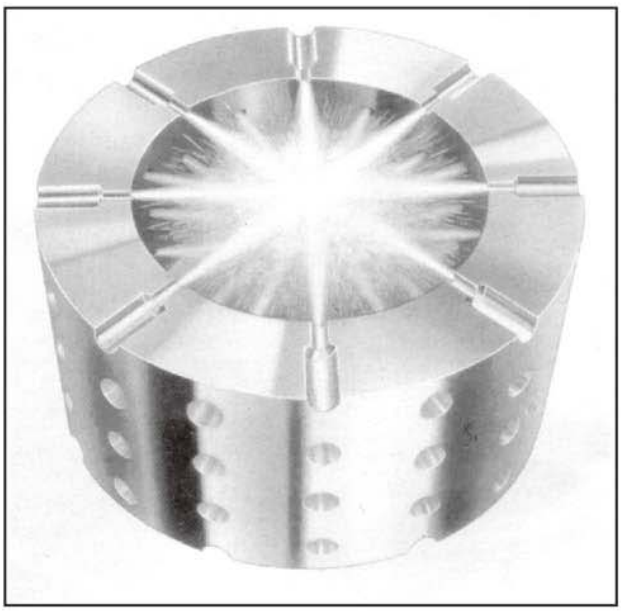
The tiger tooth cage can eliminate the cavitation of the liquid medium and significantly reduce the noise to the greatest extent of 30dBA.



The noise reduction cage is a more economic selction for reduction of gas noise, with the noise reduced by 20dBA to the greatest extent.



The cavitation removal cage is used for liquids to prevent cavitation and damage and noise brought about by cavitation.

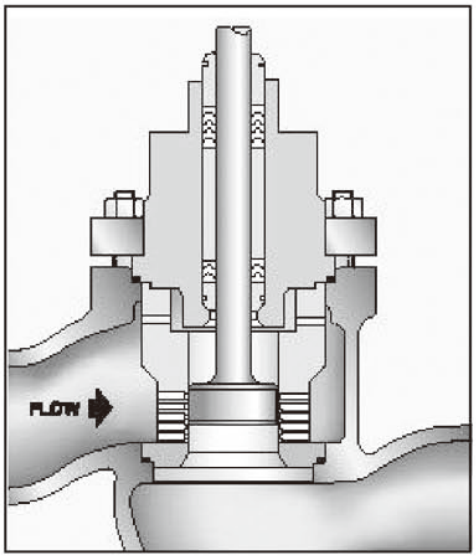


The cavitation control cage can reduce the damage caused by cavitation, where liquid medium has lower pressure.

Cavitation Control Cages

The cavitation control cage controls the area and degree of liquid medium cavitation to keep the bursting of bubbles away from a metal surface to effectively eliminate damage to trims by cavitation. According to its working principle, a special valve cage is utilized, on the cage wall there are many opposed small round holes, the flow direction of the cavitation control valve is of flow OFF type. When the plug leaves the seat, pairs of small holes are opened, the medium flows into the opposed holes,and bunches of bubbles ejected from the holes are colliding with each other in the center of the cage,enabling the bubbles to burst in the middle of the cage, reducing the damage to the trims. This cage is also interchangeable with a common cage, and its design is very simple and understandable, no special tool required for assembly and disassembly.

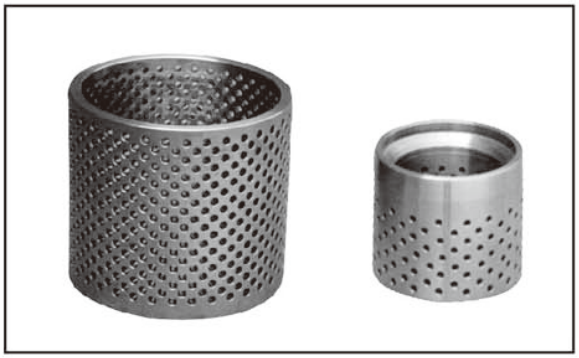
Cavitation control cage



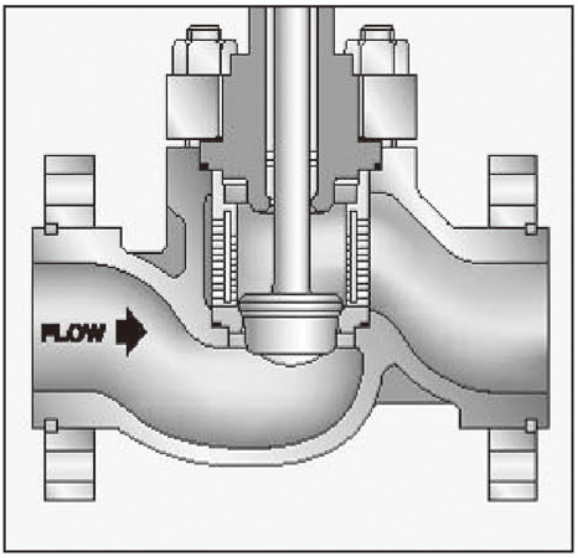
Cavitation control control valve

Noise Reduction Cage

The noise reduction cage solves the problem of noise in the valve by effectively reducing pressure drop and by controlling the turbulent flow brought into the downstream pipes. It is mainly designed to reduce the noise from compressed fluids such as steam, air and natural gas. To adapt for “throttling” , "diffusion" and "expansion" of gas, the basic structure of a noise reduction cage is a drum body with round holes, which is able to withstand the high impact. When a medium flows through the noise reduction cage, shrinking and expansion take place suddenly, pressure drop is equalized in the cage, therefore pressure drop not only appears on the throttling points between the plug and the seat, and also on each noise reduction layer. The design of layer-by-layer pressure reduction avoids the high speed of flowing medium, and enough number of layers is designed to keep a low flow rate to realize gradual reduction of pressure, thus dropping the noise. Because of its interchangeability with a common cage, it can also provide convenient disassembly or maintenance, and both a pressure-balanced plug and an off-balanced plug can use a noise reduction cage.



One-layered and two-layered noise reduction cage



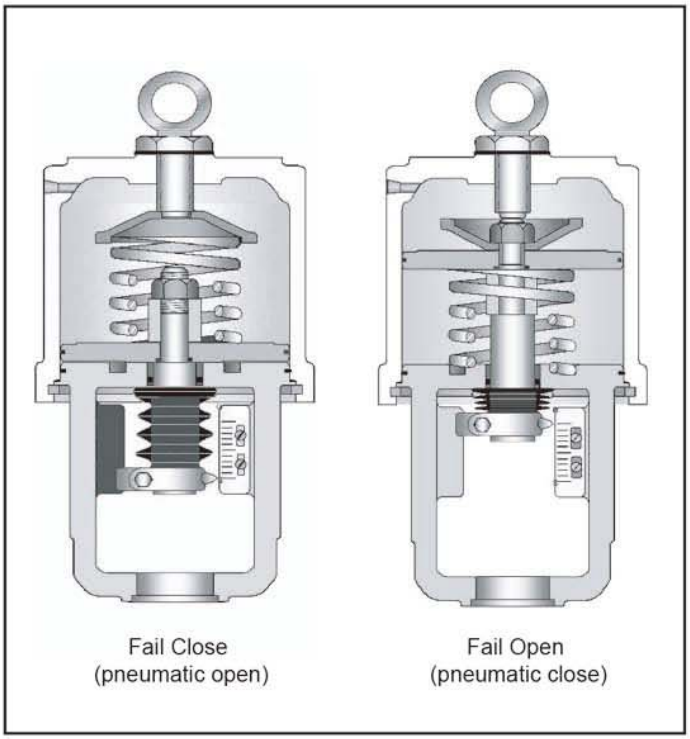
Noise reduction control valve

Double-acting Cylindered Actuator with Safety Reset Spring

The double-acting cylindered actuator with safety reset spring is an updated product designed to overcome the weak point of the pneumatic diaphragm actuator with more springs. It withstands a gas source with high pressure, has big thrust and quick stroke speed, and is stout and durable. It is equipped with a double-acting valve positioner. The upper part and lower part of the cylinder simultaneously receive pure compressed air, do not exchange gas with corrosive atmosphere, and never corrode, with a long service life. In normal work, it acts as a double-acting cylindered actuator, and in case of failure of a gas source, the spring can reset the plug safely to close or open the valve. It also has the advantages that a double-acting actuator has large output strength and a single-acting actuator resets automatically.

The cylinder and the piston use anti-corrosive anodized die-casting aluminum alloy, the smooth surface of inner wall of the cylinder ensures long service life, tough soft cast iron yoke can withstand high impact, and the exposed piston stems and stem clamps use stainless steel.

The cylinder and the yoke are connected by a rectangular spring snap ring, and by means of two screwdrivers, they can be disassembled easily. Pneumatic open and pneumatic close can be easily replaced on site, without addition of spare parts.



Standard actuator

Structure Features:

The spring cylindered actuator is designed by following the principle of general design of standardization, simple structure and easy maintenance.

For all actuators, the acting ways of sites can be changed without addition of any spare part.

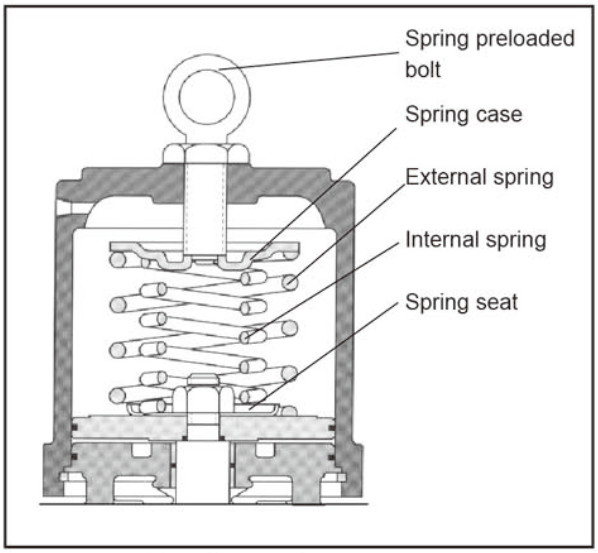
Actuators of four specifications are designed to meet the applications of a wide range of valves and different pressure differences to reduce the requirements for spare parts.

The spring cylindered actuator is featured by small size, light weight, large thrust, good rigidity, quick stroke speed, little spare parts and no accidents. On site, it can receive the air supply pressure of 0.3-1.0MPa, and is one of the pneumatic actuators with excellent performance.

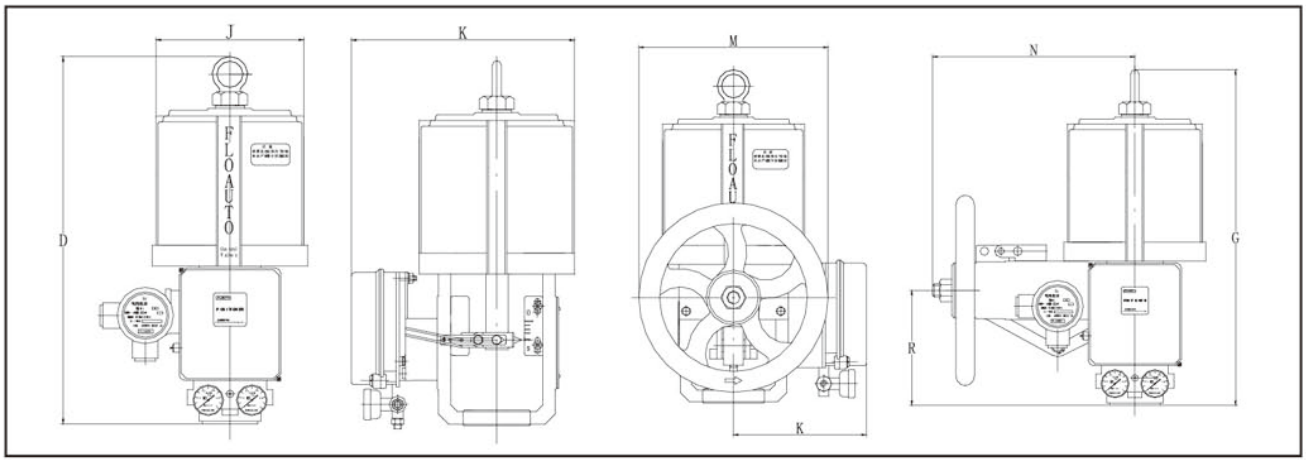
A side-mounted or top-mounted handwheel mechanism can be assembled as required. In case of emergency, manual operation may be used. The handwheel mechanism uses angular contact bearings of high durability and low abrasion, enabling to generate large thrust with very small torque.

Double-spring Mechanism

Since the spring cylindered actuator is designed into double-acting form, the spring does not work for positioning in the actuator in normal working, and only drives safe resetting in case of air supply failure. Therefore, this actuator is designed into three types: single spring, double spring and heavy spring. Only in a quick open actuator, double spring and heavy spring actuators are configured. It applies to high temperature, high pressure and high pressure difference. To change a standard actuator into a double-spring mechanism, only five parts need to be added: one new actuator stem, one spring case, one internal spring, one external spring and one spring seat. For a valve equipped with a spring actuator, its acting mode cannot be changed on site, and gas source pressure of minimum 0.4MPa is required to compress the spring.



Double-spring actuator



Dimensions and weight of actuator

Unit: mm

Actuator	Valve diameter(mm)		Yoke hole diameter (mm)	Cylinder diameter (mm)	Cylinder area (cm^2)	Max. stroke (mm)	D	G	J	K	M	N	R	Weight (kg) (with positioner)
	PN 16.40.64.100	PN 160.250												
C15	20-50	20-25	50	140	154	38	373	454	165	190	230	238	185	10/18
C30-1	20-50	20-25		197	305	75	478	555	232					27/37
C30-2	80-150	40-50	66				535	650		222	305	322	262	31/44
C60-1	80-150	40-80		280	615	100	660	735	318					75/90
C60-2	200-300	100-200	86				686	892		264	610	495	386	106/130
C120-1	80-150	100-200	66	394	1212	100	676	892	445					147/178
C120-2	200-300	–	86				702	919		274				
C240-2B	150-300	150–300	86	380	2424	100	940	1153	465	274	610	538	386	308/343
C240-2C	350-450	350–450	120											
C380-2D	350–500	350–500	120	494	3833	200	1340	1900	640	290	610	400	–	876/956

Note: In the column of weight, the figure above the slash means the weight of a standard actuator, and the figure below the slash means the weight of actuator with side-mounted handwheel.

Major Technical Parameters

Valve diameter	mm	20	25	40	50	80	100	150	200	250	300	350	400	450	500
	Inch	3/4	1	11/2	2	3	4	6	8	10	12	14	16	18	20
Pressure class	PN(MPa)	1.6, 4.0, 6.4, 10, 16, 25													
	ANSI	150、300、600、900、1500、2500													
Flow characteristics		Linear, Equal Percent, quick-open													
Adjustable range		50:1													
Actuator		Spring double-acting cylindered actuator										air source pressure	0.3-1.0MPa		
Acting mode		Pneumatic open (fail closed); Pneumatic closed (fail open)													
Positioner		EP9000 double-acting electric valve positioner (intrinsic safety type, flameproof type)													
Work temperature		Standard: metal seat -29 - 250℃; soft seat -29 - 150℃ extended; metal seat – 100-29℃;250 - 650℃													
		Cryogenic extended: metal seat -196 - -100℃; soft seat -100-30℃; bellows type: -29 - 350℃													
Performance indictors	Basic error	±1.5%(with positioner)													
	Return difference	1.5%(with positioner)													
	Dead zone	0.6%(with positioner)													
Leakage	Metal seat	Adjustment type: Class IV (10^{-4} X valve rated Cv value), Class V (optional); cut-off type: Class V (10^{-6} X valve rated Cv value),													
	Soft seat	Class VI (the number of bubbles to be measured)													
Flange connection standard		ANSI 150,300,600,900,1500 flange types (FR, RJ) follow the regulations in ANSI B16.5-1981 PN16,25,40,64,100,160,250 flange types (RF, MF, RJ) follow the regulations in JB/T79-94, HG20592-2009													
Ambient temperature		−40~+80℃													

Note: executive standard for technical performance indictors: ANSI B16.104-1976 and GB/T4213-2008 (pneumatic control valves)

Major Spare Parts

Part name	Material
Body	WCB,WC6,CF8(304),CF8M(316), CF3M(316L), Monel, Hastelloy
Plug, seat	304,316,316L,440C,17-4PH,304,316+Stellite, Monel, Hastelloy
Cage	304,316,17-4PH
Packing	PTFE V type packing, soft graphite packing
Packing gland	CF8
Cylinder, stem clamp	CF8
Cylinder, piston	Cast, high strength light aluminum alloy + anodized treatment
Yoke	Soft cast iron

Material Hardness and Performance

Plug Material	Hardness Rockwell (HRc)	Corrosion Resistance
304 S.S.	8	Excellent
316 S.S.	8	Excellent
416 S.S.	40	Fair
Stellite	44	Good to Excellent
440C S.S.	56	Fair
17-4PH	40	Excellent

Part Identification

Each major part of V1000 control valve such as the body, plug and seat, has an identification code and a material number, and after several years of use, a user can also purchase spare parts according to it. For example, at the hexagonal plane, you can ascertain the spare part number, material and flow characteristic of the plug.

Body, trim material combination and service temperature range, allowable leakage amount of seat Carbon steel body (WCB/WC6)

Body material		WCB、WC6						
Plug material		304	304	304	304	304	304	304
Plug treatment		—	—	—	—	Overlaying STL	Overlaying STL	—
Seat material		304	304	304	PTFE	304	304	304
Seat treatment		—	—	—	—	Overlaying STL	Overlaying STL	—
Bonnet type		Standard type	Standard type	Standard type	Standard type	Medium temperature type	High temperature type	Metal bellows
Bonnet/seat gasket		PTFE	Graphite	Graphite	PTFE	Graphite	Graphite	PTFE or Graphite
Packing		PTFE	PTFE	Graphite	PTFE	Graphite	Graphite	PTFE or Graphite
Allowable leakage of sat	ANSI	IV	IV	IV	VI	IV	IV	IV
	CVX	0.01%	0.01%	0.01%	Bubble class	0.01%	0.01%	0.01%
Service temperature		-29℃~+150℃	+150℃~+200℃	+200℃~+250℃	-29℃~+150℃	+250℃~+350℃	+350℃~+450℃	-29℃~+350℃

Stainless steel body (CF8/CF8M)

Body material		CF8、CF8M								
Plug material		316	316	316	316	316	316	316	316	316
Plug treatment		—	—	—	Overlaying STL	Overlaying STL	Overlaying STL	Overlaying STL	—	-
Seat material		316	316	316	316	316	316	316	PTFE	316
Seat treatment		—	—	—	Overlaying STL	Overlaying STL	Overlaying STL	Overlaying STL	—	-
Bonnet type		Standard type	Standard type	Standard type	Medium temperature type	High temperature type	Low temperature type	Cryogenic type	Standard type	Metal bellows
Bonnet/seat gasket		PTFE	Graphite	Graphite	Graphite	Graphite	PTFE	Reinforced PTFE	PTFE	PTFE or Graphite
Packing		PTFE	PTFE	Graphite	Graphite	Graphite	PTFE	Reinforced PTFE	PTFE	PTFE or Graphite
Allowable leakage of sat	ANSI	IV	IV	IV	IV	IV	IV	IV	VI	IV
	CVX	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	Bubble class	0.01%
Service temperature		-29℃~+150℃	+150℃~+200℃	+200℃~+250℃	+250℃~+350℃	+350℃~+650℃	-29℃~+101℃	-196℃~-100℃	-29℃~+150℃	-29℃~+350℃

Note: The above body, trim and specific material combination can be adjusted according to use condition.

Use temperature of body material . pressure range ANSI

UNIT: MPa G

Temperature ℃	150#			300#			600#		
	WCB	CF8	CF8M	WCB	CF8	CF8M	WCB	CF8	CF8M
-196～38	—	1.90	1.90	—	4.95	4.95	—	9.91	9.92
-45～38	—	1.90	1.90	—	4.95	4.95	—	9.91	9.92
-5～38	1.96	1.90	1.90	5.10	4.95	4.95	10.20	9.91	9.92
50	1.92	1.84	1.84	5.00	4.77	4.80	10.01	9.56	9.62
100	1.76	1.56	1.61	4.63	4.08	4.21	9.27	8.17	8.43
150	1.57	1.39	1.47	4.51	3.62	3.85	9.04	7.26	7.69
200	1.40	1.25	1.37	4.38	3.27	3.56	8.75	6.54	7.12
250	1.20	1.16	1.20	4.16	3.04	3.34	8.33	6.10	6.67
300	1.01	1.01	1.01	3.87	2.91	3.15	7.74	5.80	6.32
350	0.84	0.84	0.84	3.69	2.81	3.03	7.38	5.60	6.07
375	0.73	0.73	0.73	3.64	2.77	2.96	7.28	5.54	5.93
400	0.64	0.64	0.64	3.44	2.74	2.91	6.89	5.48	5.81
425	0.55	0.55	0.55	2.88	2.71	2.87	5.74	5.42	5.72
450	0.47	0.47	0.47	1.99	2.68	2.81	4.00	5.37	5.61
475	0.37	0.37	0.37	1.35	2.65	2.73	2.70	5.30	5.46
500	0.28	0.28	0.28	0.88	2.60	2.67	1.75	5.20	5.37
525	0.18	0.18	0.18	0.51	2.19	2.57	1.03	4.77	5.15
538	0.13	0.15	0.15	0.34	2.18	2.53	0.72	4.55	5.06

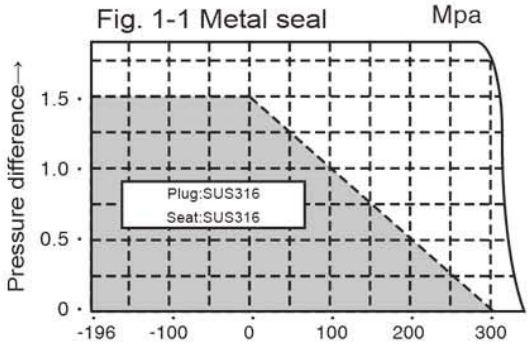
JB/T79-94

UNIT: MPa G

Temperature ℃	PN1.6	PN4.0	PN6.3	PN10	Temperature ℃	PN1.6	PN4.0	PN6.3	PN10
	ZG230-450					ZG0Cr18Ni9			
-5～200	1.60	4.00	6.30	10.00	-45～200	1.60	4.00	6.30	10.00
～250	1.40	3.50	5.40	9.00	～300	1.40	3.50	5.40	9.00
～300	1.20	3.00	4.80	7.50	～400	1.20	3.00	4.80	7.50
～350	1.10	2.60	4.00	6.60	～480	1.10	2.60	4.00	6.60
～400	0.90	2.30	3.70	5.80	～520	0.90	2.30	3.70	5.80
～425	0.80	2.00	3.20	5.00	～560	0.80	2.00	3.20	5.00
～435	0.70	1.80	2.80	4.50	—	—	—	—	—
～445	0.62	1.60	2.50	4.20	—	—	—	—	—
～455	0.57	1.40	2.30	3.60	—	—	—	—	—

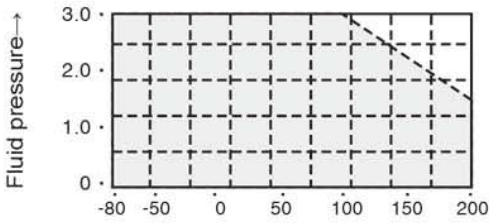
Body material . material for treatment and selection

Fig. 1-1 Metal seal



Fluid temperature 0C --- working temperature of Stellite and pressure difference range

Fig. 1-2 Soft seal (PTFE)



Fluid temperature 0C --- working temperature of soft seat and fluid pressure

Off-balanced Plug Flow Coefficient Cv Value

（Note: type1=linear; type2=Equal Percent; type3=Quick open ）

Valve diameter mm/inch	Seat diameter mm/inch	Stroke mm	PN16-100、ANSI CLASS150-600						PN160-250、ANSI CLASS900-1500					
			(flow closed valve) Cv			(flow open valve) Cv			(flow closed valve) Cv			(flow open valve) Cv		
			type1	type2	type3	type1	type2	type3	type1	type2	type3	type1	type2	type3
20 (3/4)	3.0	15	0.47	0.47	–	0.46	0.46	–	–	–	–	–	–	–
	6.4B	20	1.2	1.3	–	1.2	1.2	–	–	–	–	–	–	–
	6.4A		2.0	2.0	–	1.9	1.9	–	–	–	–	–	–	–
	7.9		3.0	2.9	–	2.8	2.7	–	–	–	–	–	–	–
	9.7		4.3	4.3	–	3.9	3.8	–	–	–	–	–	–	–
	12.7		6.9	6.4	–	6.2	6.0	–	–	–	–	–	–	–
	15.8		9.1	9.1	–	9.0	8.6	–	–	–	–	–	–	–
	18.3		10.1	9.5	7.5	9.2	9.5	7.1	–	–	–	–	–	–
25 (1)	3.0	15	0.49	0.47	–	0.49	0.51	–	0.49	0.57	–	0.47	0.55	–
	6.4B	20	1.2	1.3	–	1.2	1.2	–	1.1	1.1	–	1.1	1.1	–
	6.4A		1.9	1.9	–	1.8	1.8	–	1.9	1.9	–	1.9	1.9	–
	7.9		2.9	2.9	–	2.9	2.8	–	2.9	2.9	–	2.9	2.9	–
	9.7		4.4	4.1	–	4.0	3.9	–	4.1	4.0	–	4.0	3.9	–
	12.7		6.8	6.5	–	6.7	6.5	–	6.5	6.4	–	6.3	6.1	–
	15.8		12	10.2	–	10.2	9.7	–	8.4	8.3	–	8.1	2.9	–
	18.3		15.7	13.4	–	13.0	12.2	–	9.4	9.3	–	9.0	8.9	–
	20.6		17.6	15.5	10.5	15.0	13.4	11	10	9.9	10	9.6	9.4	9.6
40 (11/2)	9.7	20	4.4	3.6	–	4.1	3.7	–	4.3	4.2	–	4.2	4.1	–
	15.8		12	7.9	–	11	10.1	–	11	11	–	11	11	–
	20.6		14.9	12.9	–	13.7	15.9	–	16	16	–	16	16	–
	25.4		21	19	–	21	22	–	21	19	–	20	19	–
	31.8	25	31	27	30	32	30	28	24	23	27	23	22	26
50 (2)	9.7	20	4.4	3.5	–	4.1	3.0	–	4.3	4.3	–	4.2	4.2	–
	15.8		12	8.9	–	11	10	–	12	11	–	11	11	–
	20.6		15.4	13.6	–	15.3	17.4	–	19	18	–	18	18	–
	25.4		23	21	–	22	23	–	26	24	–	25	23	–
	31.8	25	35	31	–	35	30	–	33	30	–	32	29	–
	41.2	38	56	46	50	51	47	48	40	38	45	38	37	43
80 (3)	31.8	25	35	33	–	35	33	–	45	38	–	44	37	–
	41.2	38	57	52	–	52	49	–	68	60	–	66	58	–
	50.8		79	78	–	82	82	–	87	74	–	83	72	–
	66.5	50	116	104	129	114	108	123	105	99	117	100	94	112
100 (4)	41.2	38	59	55	–	53	56	–	77	72	–	75	69	–
	57.1	50	117	104	–	102	98	–	127	106	–	123	102	–
	66.5		137	133	–	134	133	–	152	130	–	146	125	–
	88.9	65	193	179	225	195	195	215	187	175	205	179	167	196
150 (6)	66.5	50	162	141	–	149	130	–	193	156	–	187	151	–
	76.2		196	192	–	182	170	–	237	194	–	228	187	–
	88.9	65	247	230	–	233	224	–	288	254	–	278	244	–
	127	75	453	355	466	433	400	466	381	365	423	364	348	405
200 (8)	66.5	50	173	144	–	166	143	–	205	158	–	199	153	–
	88.9	65	298	250	–	273	245	–	335	276	–	323	267	–
	127	75	575	461	–	481	457	–	514	467	–	493	448	–
	158.8	100	713	606	726	681	691	694	596	571	659	569	546	630
250 (10)	127	75	590	495	–	557	482	–	–	–	–	–	–	–
	158.8	100	729	690	–	702	693	–	–	–	–	–	–	–
	203.2		1056	897	1180	1056	1013	1130	–	–	–	–	–	–
300 (12)	158.8	100	829	770	–	852	750	–	–	–	–	–	–	–
	187.5		947	960	–	983	935	–	–	–	–	–	–	–
	241.3		1470	1310	1670	1400	1410	1590	–	–	–	–	–	–
350 (14)	158.8	100	878	800	–	880	800	–	–	–	–	–	–	–
	203.2		1184	1150	–	1237	1150	–	–	–	–	–	–	–
	279.4		1970	1695	–	1880	1790	–	–	–	–	–	–	–
400(16)	330.2	100	2350	2350	–	2350	2350	–	–	–	–	–	–	–
450(18)	393.7	100	2950	2950	–	2950	2950	–	–	–	–	–	–	–
500(20)	412.8	200	3500	3500	–	3500	3500	–	–	–	–	–	–	–

Balanced Plug Flow Coefficient Cv Value

Note: type1=linear; type2=Equal Percent

Valve diameter mm/inch	Seat diameter mm	Stroke mm	PN16-100、ANSI CLASS150-600				PN160-250、ANSI CLASS900-1500			
			(flow closed valve) Cv		(flow open valve) Cv		(flow closed valve) Cv		(flow open valve) Cv	
			type1	type2	type1	type2	type1	type2	type1	type2
50(2)	31.8	25	32	29	31	28	30	28	29	27
	41.2		37	35	35	34	36	35	35	33
80(3)	31.8	25	40	35	38	34	43	37	42	36
	41.2	38	68	60	65	57	63	56	61	54
	50.8		88	93	84	90	94	83	90	79
	66.5	*38/50	103	103	98	98	101	101	97	97
100(4)	31.8	25	41	40	39	38	43	42	42	41
	57.1		113	116	109	112	95	98	92	94
	66.5	50	148	150	142	144	136	138	131	133
	88.9		167	167	160	160	159	159	152	152
150(6)	76.2	50	225	231	217	223	219	225	212	217
	101.6	65	307	310	295	297	310	312	297	300
	127		339	339	324	324	343	343	327	327
200(8)	88.9	50	320	317	309	306	–	–	–	–
	101.6	65	–	–	–	–	354	354	341	341
	127	75	486	483	466	463	428	426	411	409
	158.8	**75/100	538	538	514	514	546	546	521	521
250(10)	127	75	600	578	579	557	–	–	–	–
	158.8		750	735	726	706	–	–	–	–
	203.2		840	840	810	810	–	–	–	–
300(12)	152.4	100	850	820	820	790	–	–	–	–
	187.5		1060	1040	1020	990	–	–	–	–
	241.3		1200	1200	1150	1140	–	–	–	–
350(14)	158.8	100	920	890	890	860	–	–	–	–
	203.2		1180	1150	1130	1110	–	–	–	–
	279.4		1350	1350	1290	1290	–	–	–	–
400(16)	330.2	100	2200	2200	2200	2200	–	–	–	–
450(18)	393.7	100	2750	2750	2750	2750	–	–	–	–
500(20)	412.8	200	3250	3250	3250	3250	–	–	–	–

Note: * For PN16-100, ANSI 150-600 valves, their stroke is 38mm, and for PN16-250, ANSI 900-1500 valves, their stroke is 50mm.

** For PN16-100, ANSI 150-600 valves, their stroke is 75mm, and for PN16-250, ANSI 900-1500 valves, their stroke is 100mm.

Cavitation Control Cage Flow Coefficient Cv Value (flow closed valve)

(Note: type1=linear; type2=Equal Percent)

Valve diameter mm/inch	Seat diameter mm	Stroke mm	PN16-100、ANSI CLASS150-600				PN160-250、ANSI CLASS900-1500			
			(Off-balanced plug Cv		(Balanced plug Cv		(Off-balanced plug Cv		(Balanced plug Cv	
			type1	type2	type1	type2	type1	type2	type1	type2
25 (1)	19.1F	20	1.5	1.5	–	–	1.5	1.5	–	–
	19.1E		2.5	2.5	–	–	2.5	2.5	–	–
	19.1D		4.0	4.0	–	–	4.0	4.0	–	–
	19.1C		6.0	6.0	–	–	6.0	6.0	–	–
	19.1B		8.0	7.0	–	–	8.0	7.0	–	–
	19.1A	25	9.0	8.0	–	–	9.0	8.0	–	–
40(11/2)	31.8C	20	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	31.8B		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
	31.8A		10	10	10	10	10	10	10	10
	41.2D		12	12	12	12	12	12	12	12
	41.2C	25	16	16	16	16	16	16	16	16
	41.2B		21	21	21	21	21	21	21	21
50(2)	31.8C	20	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	31.8B		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
	31.8A		10	10	10	10	10	10	10	10
	41.2D		12	12	12	12	12	12	12	12
	41.2C	25	16	16	16	16	16	16	16	16
	41.2B		24	24	24	24	24	24	24	24
	41.2A		30	30	30	30	30	30	30	30
80(3)	38.1	20	10	10	10	10	10	10	10	10
	47.8B	25	16	16	16	16	16	16	16	16
	47.8A		28	28	28	28	28	28	28	28
	57.1B	38	44	44	44	44	44	44	44	44
	57.1A		65	55	65	55	65	55	65	55
	63.5	50	90	65	90	65	90	65	90	65
100(4)	47.8B	25	28	28	28	28	28	28	28	28
	47.8A	38	44	44	44	44	44	44	44	44
	76.2B		65	65	65	65	65	65	65	65
	76.2A	50	95	75	95	75	95	75	95	75
	95.3		140	110	140	110	140	110	140	110
150(6)	76.2	38	65	65	65	65	65	65	65	65
	82.6	50	110	110	110	110	110	110	110	110
	120.7B	65	160	140	160	140	160	140	160	140
	120.7A		240	160	240	160	240	160	240	160
200(8)	139.7B	65	240	240	240	240	240	240	240	240
	139.7A	75	330	295	330	295	330	295	330	295
	165.1		500	330	500	330	500	330	500	330
250(10)	139.7	65	200	150	200	150	–	–	–	–
	187.5B	75	300	200	300	200	–	–	–	–
	187.5A		460	300	460	300	–	–	–	–
	212.9		700	460	700	460	–	–	–	–
300(12)	247.7A	100	1380	1000	1350	1000	–	–	–	–
	247.7B		1200	800	1200	800	–	–	–	–
	247.7C		800	600	800	500	–	–	–	–
	247.7D		500	400	500	350	–	–	–	–

Note: The anti-cativation control valve is mainly used for liquid media with higher pressure difference and can significantly control the occurrence of cativation and improve the service life of plugs and seats. This valve is only used for flow closed type.

Noise Reduction Cage Flow Coefficient Cv Value (flow open valve)

Valve diameter mm/inch	Seat diameter mm	Number of layers of cages	Stroke mm	PN16-100、ANSI CLASS150-600				PN160-250、ANSI CLASS900-1500			
				Off-balanced plug Cv		Balanced plug Cv		Off-balanced plug Cv		Balanced plug Cv	
				Linear	Equal Percent	Linear	Equal Percent	Linear	Equal Percent	Linear	Equal Percent
25 (1)	12.7	2	20	5.1	5.0	–	–	4.6	4.5	–	–
	20.6	1		10.3	10.0	–	–	8.3	8.0	–	–
40(11/2)	25.4	2	20	15.7	15.3	15.7	15.3	14.8	14.3	14.8	14.3
	31.8	1	25	23.7	23.0	23.7	23.0	21.1	20.4	21.1	20.4
50(2)	25.4	2	20	20.5	19.9	20.5	19.9	18	17.4	18	17.4
	41.2	1	38	41.4	40.2	41.4	40.2	32.6	31.6	32.6	31.6
80(3)	31.8	3	25	32	31	32	31	31	30	31	30
	50.8	2	38	63	61	63	61	53	51	53	51
	66.5	1	50	98	95	98	95	84	81	84	81
100(4)	41.2	3	38	55	53	55	53	53	52	53	52
	66.5	2	50	110	107	110	107	92	89	92	89
	88.9	1	65	174	169	174	169	147	142	147	142
150(6)	57.1	4	50	97	94	97	94	90	88	90	88
	76.2	3		157	152	157	152	138	134	138	134
	88.9	2	65	220	215	220	215	190	184	190	184
	127	1	75	380	370	380	370	315	300	315	300
200(8)	50.8	6	38	77	75	77	75	–	–	–	–
	66.5	5	50	123	119	123	119	111	107	111	107
	76.2	4	65	170	165	170	165	156	151	156	151
	101.6	3		275	265	275	265	235	230	235	230
	127	2	75	415	405	415	405	340	330	340	330
	158.8	1	100	630	610	630	610	510	490	510	490
250(10)	66.5	6	50	127	123	127	123	–	–	–	–
	76.2	5	65	176	170	176	170	–	–	–	–
	88.9	4		245	240	245	240	–	–	–	–
	114.3	3	75	385	375	385	375	–	–	–	–
	152.4	2	100	630	610	630	610	–	–	–	–
	203.2	1	150	1010	980	1010	980	–	–	–	–
300(12)	66.5	7	50	125	121	125	121	–	–	–	–
	76.2	6	65	174	169	174	169	–	–	–	–
	101.6	5		280	275	280	275	–	–	–	–
	127	4	100	425	415	425	415	–	–	–	–
	152.4	3		620	600	620	600	–	–	–	–
	187.5	2		930	900	930	900	–	–	–	–
	241.3	1	150	1440	1400	1440	1400	–	–	–	–
350(14)	165.1	2	100	799	773	–	–	–	–	–	–
	187.5	2		1120	1088	–	–	–	–	–	–
	203.2	1		1207	1169	–	–	–	–	–	–
	241.3	1		1796	1761	–	–	–	–	–	–
	254	1		1800	1833	–	–	–	–	–	–
400(16)	127	5	75	445	430	445	430	–	–	–	–
	152.4	4	100	640	620	640	620	–	–	–	–

400(16)	184.2	3	100	920	890	920	890	–	–	–	–
	228.6	2	150	1320	1280	1320	1280	–	–	–	–
	304.8	1	150	2050	2000	2050	2000	–	–	–	–
450(18)	139.7	5	75	550	530	550	530	–	–	–	–
	171.5	4	100	800	780	800	780	–	–	–	–
	209.6	3	150	1150	1120	1150	1120	–	–	–	–
	254	2	150	1600	1550	1600	1550	–	–	–	–
	336.6	1	200	2500	2450	2500	2450	–	–	–	–
500(20)	152.4	5	100	660	640	660	640	–	–	–	–
	190.5	4	100	980	950	980	950	–	–	–	–
	228.6	3	150	1400	1350	1400	1350	–	–	–	–
	279.4	2	150	1950	1890	1950	1890	–	–	–	–
	374.7	1	200	3100	3000	3100	3000	–	–	–	–

Note: The noise reduction control valve is mainly used for liquid media with higher pressure difference and higher noise and can significantly reduce noise and improve the service life of control valves, protecting the environment. This valve is only used for flow open type.

Allowable Pressure Difference (Off-balanced plug)

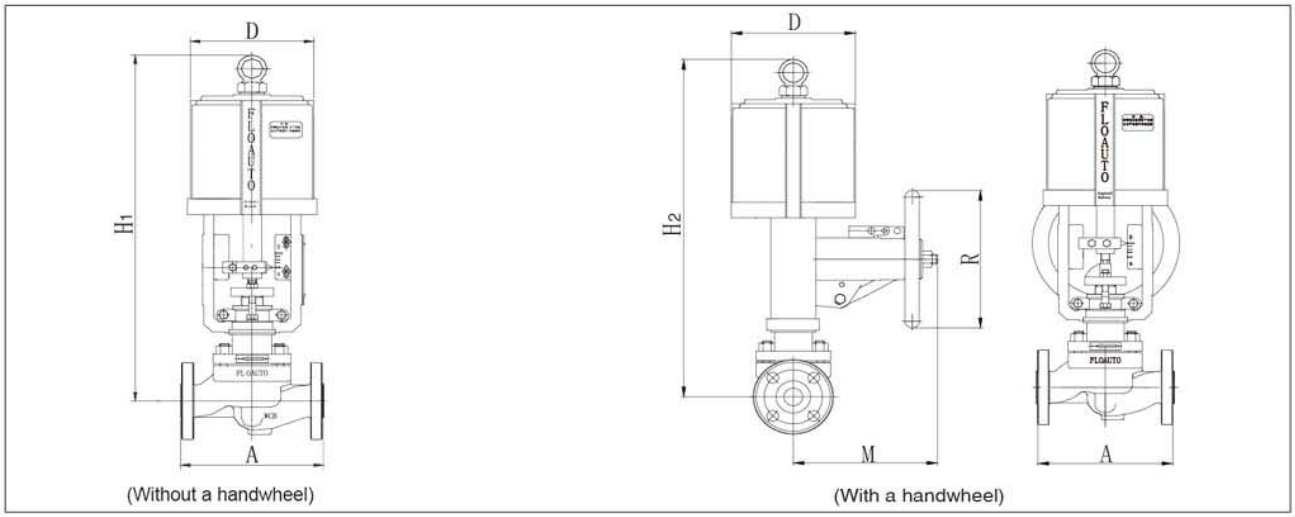
UNIT: MPa

Valve type	Actuator	Air Supply	Allowable pressure(MPa)																					
			Seat diameter(mm)																					
			≤9.7	12.7	15.8	18.3	20.6	25.4	31.8	41.2	50.8	57.1	66.5	76.2	88.9	127	158.8	187.5	203.2	241.3	279.4	330.2	393.7	412.8
Pneumatic open valve Flow closed type	C15	0.35	30.0	18.5	11.8	9.0	6.98	4.59	2.93	1.73	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		0.40	30.0	21.8	13.9	10.2	8.25	5.45	3.47	2.06	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		0.50	40.0	25.1	16.0	11.6	9.51	6.25	3.99	2.33	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		0.70	40.0	35.0	22.4	16.0	13.2	8.71	5.88	3.26	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		1.00	40.0	40.0	32.9	23.6	19.5	15.7	8.18	4.85	_	_	_	_	_	_	_	_	_	_	_	_	_	_
	C30	0.35	_	37.0	23.6	17.9	14.0	9.24	5.85	3.46	2.3	1.80	1.33	1.0	0.73	0.33	_	_	_	_	_	_	_	_
		0.40	_	40.0	27.8	21.1	16.5	10.9	6.85	4.13	2.7	2.15	1.58	1.2	0.88	0.43	_	_	_	_	_	_	_	_
		0.50	_	40.0	36.3	24.3	19.0	12.5	7.98	4.72	3.1	2.46	1.80	1.4	1.00	1.47	_	_	_	_	_	_	_	_
		0.70	_	_	40.0	33.9	26.5	17.5	11.2	6.58	4.3	3.45	2.53	1.9	1.40	1.67	_	_	_	_	_	_	_	_
		1.00	_	_	40.0	40.0	35.9	25.7	22.9	9.71	6.4	5.06	3.72	2.8	2.06	1.00	_	_	_	_	_	_	_	_
	C60	0.35	_	_	_	_	28.0	18.5	11.8	6.98	4.62	3.59	2.66	2.1	1.46	0.73	0.47	0.34	0.30	0.22	_	_	_	_
		0.40	_	_	_	_	33.0	21.8	13.9	8.26	5.45	4.30	3.16	2.4	1.78	0.87	0.55	0.40	0.34	0.25	_	_	_	_
		0.50	_	_	_	_	38.1	25.1	16.0	9.51	6.27	4.92	3.59	2.8	2.00	1.00	0.60	0.46	0.39	0.28	_	_	_	_
		0.70	_	_	_	_	40.0	35.0	22.3	13.2	8.75	6.92	5.05	3.9	2.79	1.40	0.86	0.64	0.55	0.40	_	_	_	_
		1.00	_	_	_	_	40.0	40.0	32.9	19.5	12.9	10.2	7.45	5.7	4.19	2.00	1.20	0.95	0.81	0.58	_	_	_	_
	C120	0.35	_	_	_	_	_	_	_	_	_	_	_	_	3.01	1.48	0.95	0.68	0.57	0.41	_	_	_	_
		0.40	_	_	_	_	_	_	_	_	_	_	_	_	3.55	1.75	1.12	0.80	0.68	0.48	_	_	_	_
		0.50	_	_	_	_	_	_	_	_	_	_	_	_	4.10	2.00	1.29	0.92	0.78	0.55	_	_	_	_
		0.70	_	_	_	_	_	_	_	_	_	_	_	_	5.71	2.80	1.79	1.29	1.09	0.77	_	_	_	_
		1.00	_	_	_	_	_	_	_	_	_	_	_	_	8.41	4.12	2.64	1.90	1.61	1.14	_	_	_	_
	C240	0.4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	1.66	1.41	1.00	0.75	0.54	0.38	0.35
		0.5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	2.11	1.79	1.27	0.95	0.68	0.48	0.44
		0.7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	2.49	2.13	1.51	1.12	0.81	0.57	0.52
	C380	0.4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	2.62	2.23	1.58	1.19	0.85	0.60	0.55
		0.5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	3.33	2.83	2.00	1.50	1.07	0.76	0.69
		0.7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	3.93	3.37	2.39	1.77	1.28	0.90	0.82

Valve type	Actuator	Air Supply	Allowable pressure(MPa)																		
			Seat diameter(mm)																		
			31.8	41.2	50.8	57.1	66.5	76.2	88.9	101.6	127	152.4	158.8	187.5	203.2	241.3	279.4	330.2	393.7	412.8
Pneumatic open valve Flow closed type	C15	0.35	9.5	7.3	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		0.40	11.3	8.6	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		0.50	13.7	10.5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		0.70	17.9	13.6	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		1.00	25.0	19.1	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
	C30	0.35	16.2	12.3	7.0	5.9	5.5	5.2	4.1	_	_	_	_	_	_	_	_	_	_	_
		0.40	19.2	14.7	8.3	7.1	6.5	6.2	4.9	_	_	_	_	_	_	_	_	_	_	_
		0.50	23.2	17.8	10.0	8.6	7.8	7.5	5.9	_	_	_	_	_	_	_	_	_	_	_
		0.70	30.3	23.2	13.1	11.1	10.2	9.9	7.8	_	_	_	_	_	_	_	_	_	_	_
		1.00	42.5	32.4	18.4	15.6	14.3	13.8	10.8	_	_	_	_	_	_	_	_	_	_	_
	C60	0.35	_	24.7	11.9	10.1	9.3	9.0	7.0	6.0	3.6	1.8	2.9	_	_	_	_	_	_	_
		0.40	_	29.4	14.2	12.0	11.0	10.7	8.3	7.1	4.3	2.2	3.5	_	_	_	_	_	_	_
		0.50	_	35.5	17.1	14.5	13.3	13.0	10.1	8.6	5.2	2.6	4.2	_	_	_	_	_	_	_
		0.70	_	46.4	22.4	18.9	17.4	17.0	13.2	11.2	6.7	3.4	5.5	_	_	_	_	_	_	_
		1.00	_	64.9	31.3	26.5	24.3	23.8	18.4	15.7	9.5	4.8	7.6	_	_	_	_	_	_	_

Allowable Pressure Difference (Balanced plug)

	C120	0.35	_	_	_	_	_	_	_	_	_	3.6	5.8	3.9	3.7	2.6	–	–	–	–
		0.40	_	_	_	_	_	_	_	_	_	4.4	7.0	4.7	4.4	4.0	–	–	–	–
		0.50	_	_	_	_	_	_	_	_	_	5.2	8.4	5.7	5.3	3.7	–	–	–	–
		0.70	_	_	_	_	_	_	_	_	_	6.8	11.0	7.4	6.9	4.8	–	–	–	–
		1.00	_	_	_	_	_	_	_	_	_	9.6	15.2	10.3	9.6	6.7	–	–	–	–
	C240	0.4	_	_	_	_	_	_	_	_	_	–	–	17.08	15.06	14.33	14.04	9.68	9.02	8.21
		0.5	_	_	_	_	_	_	_	_	_	–	–	21.67	19.11	18.19	17.83	12.29	11.45	10.41
		0.7	–	–	–	–	–	–	–	–	–	–	–	25.68	22.64	21.54	21.12	14.56	13.56	12.33
	C380	0.4	–	–	–	–	–	–	–	–	–	–	–	26.98	23.79	22.64	22.18	15.29	14.25	12.96
		0.5	–	–	–	–	–	–	–	–	–	–	–	34.24	30.19	28.74	28.17	19.41	18.09	16.46
		0.7	–	–	–	–	–	–	–	–	–	–	–	40.57	35.77	34.03	33.37	23.00	21.42	19.49
Pneumatic open valve Flow closed type	C15	0.35	28.9	16.5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		0.40	34.2	19.5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		0.50	42.5	24.7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		0.70	50.0	38.9	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
		1.00	50.0	43.5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
	C30	0.35	_	31.3	18.7	17.5	11.2	9.8	7.3	5.6	_	_	_	_	_	_	_	_	_	_
		0.40	_	37.0	22.1	20.6	13.3	11.6	8.6	6.6	_	_	_	_	_	_	_	_	_	_
		0.50	_	46.9	28.2	26.3	16.8	14.7	10.9	8.4	_	_	_	_	_	_	_	_	_	_
		0.70	_	50.0	44.6	41.4	26.5	23.2	17.2	13.3	_	_	_	_	_	_	_	_	_	_
		1.00	_	50.0	50.0	50.0	41.8	36.6	27.2	20.9	_	_	_	_	_	_	_	_	_	_
	C60	0.35	_	_	_	33.3	21.3	18.6	13.9	10.6	7.3	5.4	5.2	4.8	_	_	_	_	_	_
		0.40	_	_	_	39.1	25.3	22.0	16.2	12.5	8.7	6.3	6.1	5.7	_	_	_	_	_	_
		0.50	_	_	_	50.0	31.9	27.9	20.7	16.0	10.9	8.0	7.8	7.2	_	_	_	_	_	_
		0.70	_	_	_	50.0	50.0	41.2	32.7	25.3	17.3	12.6	12.3	11.4	_	_	_	_	_	_
		1.00	_	_	_	50.0	50.0	50.0	50.0	39.7	27.3	19.9	19.4	18.0	_	_	_	_	_	_
	C120	0.35	_	_	_	_	_	_	_	_	_	10.3	9.9	9.1	7.8	5.8	–	–	–	–
		0.40	_	_	_	_	_	_	_	_	_	11.9	11.6	10.8	9.3	6.8	–	–	–	–
		0.50	_	_	_	_	_	_	_	_	_	15.2	14.8	13.7	11.7	8.7	–	–	–	–
		0.70	_	_	_	_	_	_	_	_	_	23.9	23.4	21.6	18.5	13.6	–	–	–	–
		1.00	_	_	_	_	_	_	_	_	_	37.8	36.8	34.2	29.2	21.5	–	–	–	–
	C240	0.4	_	_	_	_	_	_	_	_	_	–	–	10.62	10.00	9.76	9.66	6.68	6.44	5.86
		0.5	_	_	_	_	_	_	_	_	_	–	–	15.93	15.00	14.64	14.49	10.03	9.67	8.80
		0.7	–	–	–	–	–	–	–	–	–	–	–	21.24	20.00	19.52	19.32	13.37	12.89	11.7
	C380	0.4	–	–	–	–	–	–	–	–	–	–	–	16.78	15.8	15.42	15.3	10.55	10.18	9.26
		0.5	–	–	–	–	–	–	–	–	–	–	–	25.17	23.7	23.13	22.89	15.85	15.28	13.9
		0.7	–	–	–	–	–	–	–	–	–	–	–	33.56	31.6	30.84	30.53	21.12	20.37	18.53



Dimensions

Unit: mm

Valve diameter mm/inch	Actuator	Standard (without a handwheel) H1			Standard (With a handwheel) H2					D	Clearance Above Actuator Required For Disassembly
		Stand-ard bonnet	Extend-ed Stype bonnet	Extend-ed Ltype bonnet	Stand-ard bonnet	Extend-ed Stype bonnet	Extend-ed Ltype bonnet	M	R		
15/1/2	C15S	481	538	595	567	624	681	244	228	166	64
20/3/4	C15S	481	538	595	567	624	681	244	228	166	64
25/1	C30S-1	582	639	696	668	725	782	244	228	232	102
32/11/4	C15S	546	603	660	632	689	746	244	228	166	64
40/11/2	C15S	546	603	660	632	689	746	244	228	166	64
	C30S-1	647	704	761	733	790	847	244	228	232	102
50/2	C15S	546	603	660	632	689	746	244	228	166	64
	C30S-1	647	704	761	733	790	847	244	228	232	102
	C60S-1	847	904	961	922	979	1036	325	300	232	190
65/21/2	C30S-2	766	836	906	889	959	1029	325	300	318	102
80/3	C30S-2	766	836	906	889	959	1029	325	300	232	114
	C60S-1	952	1022	1092	1027	1097	1167	325	300	318	190
	C120-2A	1036	1106	1176	1305	1375	1445	538	450	445	277
100/4	C30S-2	828	898	968	951	1021	1091	325	300	232	114
	C60S-1	1014	1084	1154	1089	1159	1229	325	300	318	190
	C120S-2A	1077	1147	1217	1346	1416	1486	538	450	445	277
	C240S-2A	1324	1394	1464	1537	1607	1677	538	450	465	350
125/5	C60S-1	1049	1119	1189	1161	1231	1301	325	300	318	190
	C120S-2A	1076	1146	1216	1345	1415	1485	538	450	445	277
150/6	C30S-2	1030	1100	1170	1023	1093	1163	325	300	232	114
	C60S-1	1049	1119	1189	1161	1231	1301	325	300	318	190
	C120S-2A	1076	1146	1216	1345	1415	1485	538	450	445	277
	C240S-2A	1357	1427	1497	1570	1640	1710	538	450	465	350
200/8	C60S-2A	1247	1317	1387	1469	1539	1609	538	450	318	254
	C120S-2A	1274	1344	1414	1487	1557	1627	538	450	445	277
	C240S-2B	1499	1569	1639	1672	1742	1812	538	450	465	350
250/10	C60S-2B	1312	1382	1452	1534	1604	1674	538	450	318	254
	C120S-2B	1324	1384	1452	1552	1622	1692	538	450	445	290
	C240S-2B	1524	1594	1664	1737	1807	1877	538	450	465	350

300/12	C60S–2B	1364	1434	1504	1586	1656	1726	538	450	318	254
	C120S–2B	1391	1461	1531	1604	1674	1744	538	450	445	290
	C240S–2B	1576	1646	1716	1789	1859	1929	538	450	465	350
350/14	C120S–2B	1411	1481	1551	1624	1694	1764	538	450	445	350
	C240S–2B	1596	1666	1736	1809	1879	1949	538	450	465	
400/16	C120S–2B	1476	1546	1616	1689	1759	1829	538	450	445	
	C240S–2B	1661	1731	1801	1874	1944	2014	538	450	465	
450/18	C120S–2C	1615	1685	1755	1828	1898	1968	538	450	445	
	C240S–2B	1800	1870	1940	2013	2083	2153	538	450	465	
500/20	C240–2D	2020	2070	2140	2233	2283	2353	538	450	465	
	C380–2D	2120	2170	2240	2680	2730	2800	–	600	640	

Flange Distance

Valve diameter	A(Globe valve)													
Inch	3/4	1	11/2	2	3	4	6	8	10	12	14	16	18	20
mm	20	25	40	50	80	100	150	200	250	300	350	400	450	500
ANSI150 PN16	184	184	222	254	298	353	451	543	673	737	889	1016	1200	1250
ANSI300 PN40	194	197	235	267	318	368	473	560	708	775	927	1057	1200	1250
ANSI600 PN64 PN100	206	210	251	286	337	394	508	610	752	819	972	1108	1275	1400
ANSI900 PN160	279	279	330	375	441	511	715	915	–	–	–	–	–	–
ANSI1500 PN250	279	279	330	375	460	530	770	972	–	–	–	–	–	–

Overall weight (normal temperature globe valve with a flange, spring cylindered actuator (without a handwheel)

Valve diameter (mm/inch)	Actuator	Weight (kg)								Additional weight of handwheel mechanism	Additional weight of positioner reducing valve
		ANSI150 PN16	ANSI300 PN40	ANSI600 PN64.100	ANSI900 PN160	ANSI1500 PN250	Additional weight of extended S type bonnet	Additional weight of extended L type bonnet	Additional weight of extended cryogenic bonnet		
20/3/4	C15S	28	28	28	46	48	1	2	3	8	3.5
25/1	C30S-1	34	34	34	52	54	1	2	3	10	
40/11/2	C15S	38	39	39	53	56	2	3	5	8	3.6
	C30S-1	44	45	45	59	62	2	3	5	10	
50/2	C15S	41	42	42	56	60	2	3	5	8	3.6
	C30S-1	47	48	48	62	66	2	3	5	10	
80/3	C30S-2	84	86	89	177	186	3	5	7	13	3.8
	C60S-1	95	98	101	189	198	3	5	7	15	
100/4	C30S-2	120	124	128	264	277	4	7	10	13	3.8
	C60S-1	132	136	140	276	289	4	7	10	15	
150/6	C30S-2	177	188	237	462	532	5	8	11	13	4.0
	C60S-1	188	199	248	485	543	5	8	11	15	
	C120-1A	219	220	280	517	574	5	8	11	31	
200/8	C60-2A	271	317	408	531	613	7	11	18	24	4.3
	C120-2A	299	346	438	562	647	7	11	18	31	
250/10	C60-2B	511	577	766	—	—	11	16	30	24	4.6
	C120-2B	539	608	798	—	—	11	16	30	31	
300/12	C60-2B	682	739	867	—	—	15	26	41	24	5.0
	C120-2B	702	772	900	—	—	15	26	41	31	
350/14	C120-2C	1020	1138	1258	—	—	17	32	80	31	5.0
	C240-2C	1240	1358	1478	—	—	17	32	80	35	
400/16	C120-2C	1280	1380	1530	—	—	17	32	80	31	5.0
	C240-2C	1500	1600	1750	—	—	17	32	80	35	
450/18	C120-2C	2030	2130	2380	—	—	17	32	80	31	6.0
	C240-2C	2250	2350	2600	—	—	17	32	80	35	
500/20	C240–2D	4488	4698	5008	—	—	17	32	80	35	6.0
	C380–2D	5056	5266	5576	—	—	17	32	80	80	