OKANO
The Spirit of Manufacturing

Valve size from DN15 to 50

Small size forged valves

for high-temperature and high-pressure applications for thermal power plants

CATALOG
SUP SERIES

Globe valve / Angle valve
Y-globe valve / Lift check valve

OKANO VALVE MFG. CO. LTD.

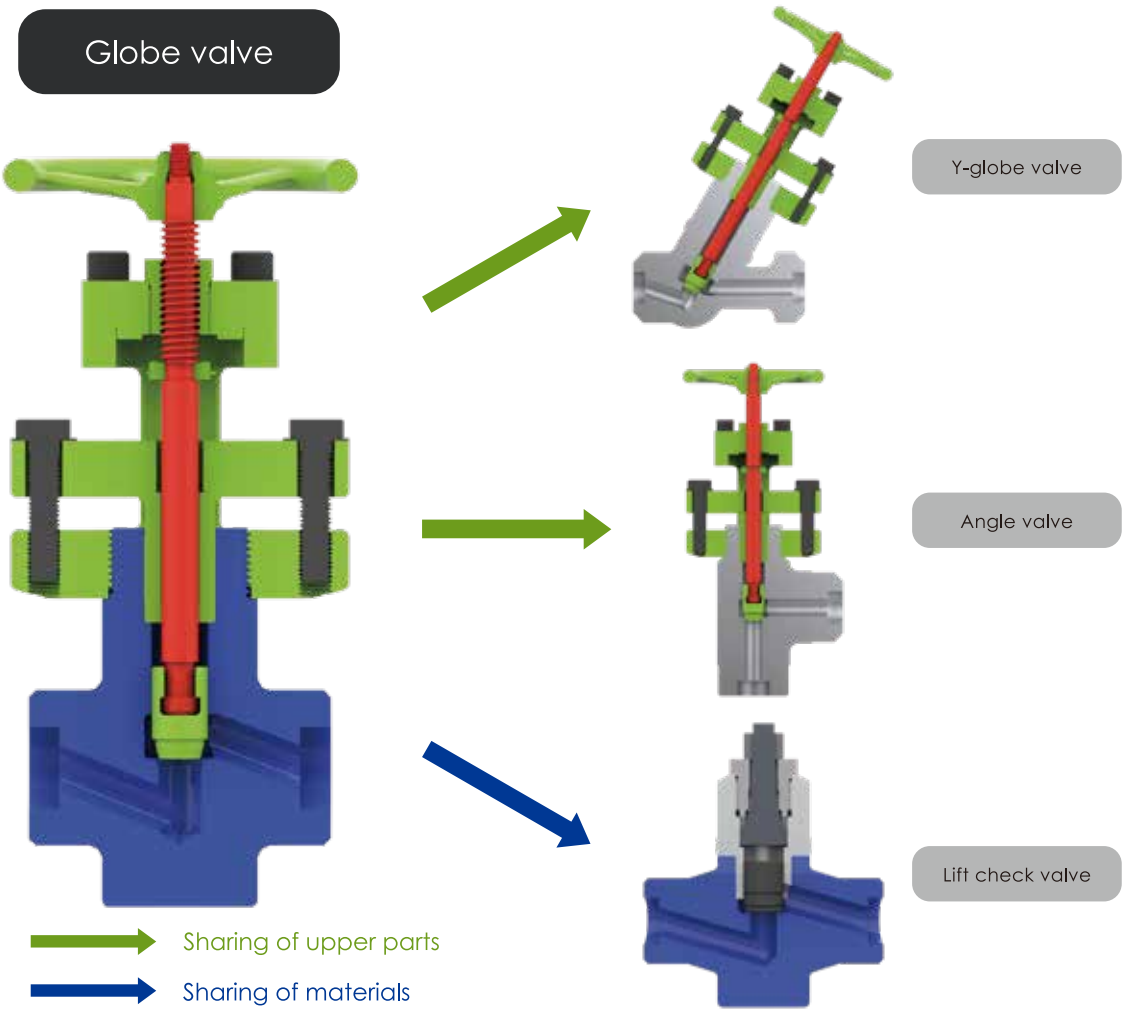
INDEX

SUP Series

This series was named SUP series, the acronym of our design and development concept, "**S**mart," "**U**tility" and "**P**roductive."

Concept

We standardized the structure of all valves as much as possible, to improve the productivity.
By doing so, we have succeeded in sharing main components and minimized the disadvantages of valves made to order, which enables us to deliver products of optimal quality at an optimal timing and at an optimal price.



Basic specifications

Valve standards

When manufacturing valves, it is necessary to select standards and regulations to be applied, and materials, manufacturing, tests, inspection, etc. prescribed by them.

Standard/regulation	Remarks
ASME B16.34	• Standard by American Society of Mechanical Engineers: VALVES-FLANGED, THREADED, WELDING END
JEAC3706	• Japan Electric Association Code : regulations on pressure piping and valves.
Rules and Regulations for Ships	• If you have requirements related to the Rules and Regulations for Ships, please contact us.
Other	• If you have other requirements, please contact us.

Material standards

With regard to industrial materials, chemical components and mechanical properties are prescribed by respective material standards. Standard materials prescribed by applicable valve standards are used for pressure retaining components and important parts of valves.

Standard/regulation	Remarks
ASTM	• Standard by American Society of Testing Materials.
ASME	• Standard by American Society of Mechanical Engineers.
JIS	• Japanese Industrial Standard.
Other	• If you have other requirements, please contact us.

Valve types

①Globe valve

②Angle valve

③Y-globe valve

④Lift check valve

Valve size/Pressure rating class

Pressure rating class \ Valve size	DN15	DN20	DN25	DN40	DN50
1500	○	○	○	○	○
2500	○	○	○	○	○
4500	○	○	○	○	○

(Note) The specifications for valves whose pressure rating class is 900 or less are the same as those for valves whose pressure rating class is 1500.

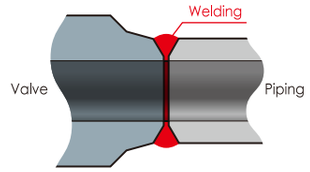
Body materials

Material group	ASTM	ASME
Carbon steel	ASTM A105M	ASME SA105M
2.5Cr-1Mo steel	ASTM A182M F22	ASME SA182M F22
9Cr-1Mo-V steel	ASTM A182M F91	ASME SA182M F91
18Cr-8 Ni steel	ASTM A182M F304	ASME SA182M F304
18Cr-9 Ni-2 Mo steel	ASTM A182M F316	ASME SA182M F316

Connection

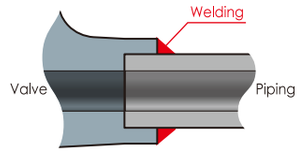
Methods for connecting valves with piping are described. Since the connection part inevitably has a higher risk of fluid leakage, select optimum connection methods in accordance with valve operating conditions such as a fluid, pressure, and temperature will be selected.

BW
(Butt Welding-end)



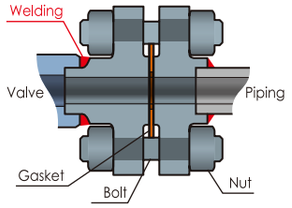
With this connection method, grooves are provided for the valve and piping, and the end surfaces are butted and welded. This connection method is excellent in reliability and durability against leakage. However, it requires advanced welding technique and the cost is high, and once they are connected, it is not easily detached. This connection method is mainly selected for high-temperature and high-pressure valves.

SW
(Socket Welding-end)



With this connection method, the valve end surface is made socket form and the end surface of piping is inserted and welded. This method does not reguire advanced welding technique compared to BW. However, because the valve end surface becomes large, this method is not appropriate for large size valves. It is selected for small size valves.

FL
(Flange-end)



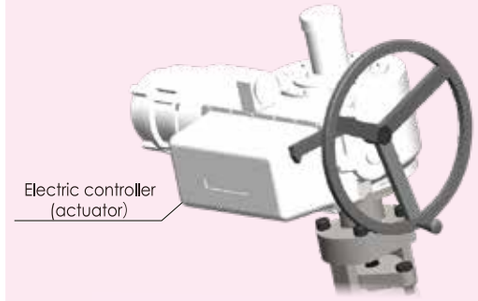
With this connection method, flanges are provided for end surfaces of the valve and piping and they are connected using bolts and nuts. Because of the balance between reliability against leakage and attachment/detachment performance, generally this method is most widely used. However, as the temperature and pressure of piping increase, the flange size expands therefore measures against weight are required.

Operation

The operation methods for opening/closing valves are described. An optimum operation method is selected depending on the operating force required for valve opening/closing, opening/closing frequency, installation environment, and so on.

HO With the hand operated method, the handle is operated manually. This method is selected when operating force for valve opening/closing is small, when opening/closing frequency is low, when it is easy to access the valve, and so on.

MO With the motor operated method, a valve is operated using motor operation by an electric controller. This method is selected when operating force for valve opening/closing is large, when opening/closing frequency is high, when it is difficult to access the valve, and so on.

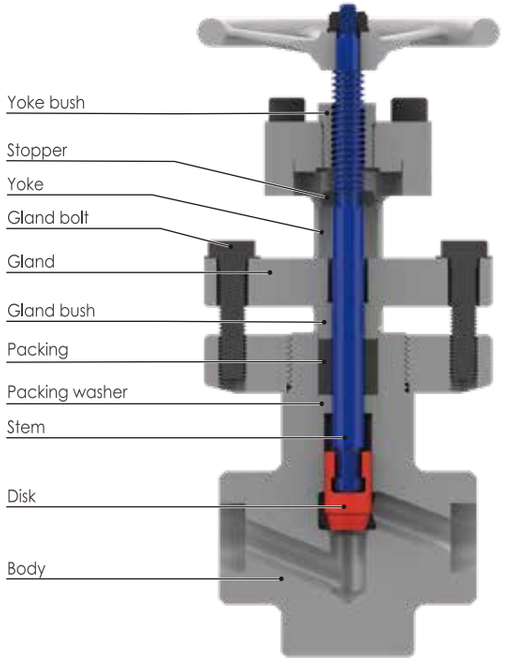


Globe valve

It is called globe valve because the body shape looks like a globe.
The disk operates vertically against the seat to shut off fluid.
It is a shut-off valve and can also be used as a flow regulating valve by adjusting the opening degree.

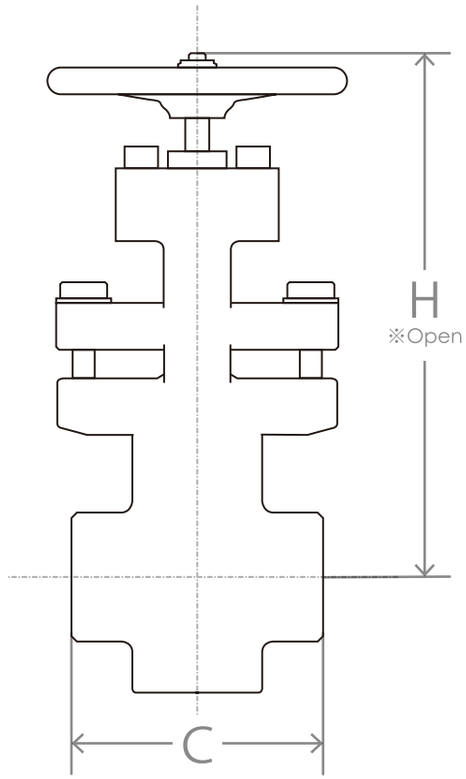
Characteristics

- Due to the structure, it is relatively easy to shut off fluids.
- It causes large pressure loss.
- It requires large operating force and is not suitable for large size valves.



Forged valve (DN50 or under)

Major specifications



Pressure rating class 1500

Valve size		Dimension〔mm〕		Mass〔kg〕
A	B	C : Face to Face	H : Height	
15	½	128	295	13
20	¾	128	295	13
25	1	128	295	13
40	1½	216	425	34
50	2	216	535	68

Pressure rating class 2500

Valve size		Dimension〔mm〕		Mass〔kg〕
A	B	C : Face to Face	H : Height	
15	½	128	295	13
20	¾	128	295	13
25	1	128	295	13
40	1½	216	425	34
50	2	216	535	68

Pressure rating class 4500

Valve size		Dimension〔mm〕		Mass〔kg〕
A	B	C : Face to Face	H : Height	
15	½	178	295	18
20	¾	178	295	18
25	1	178	295	18
40	1½	216	425	48
50	2	216	535	75

Product information

Pressure rating class	Body materials	DN15		DN20		DN25		DN40		DN50	
		HO	MO	HO	MO	HO	MO	HO	MO	HO	MO
1500	Carbon steel	●	○	●	○	●	○	●	○	●	○
	2.5Cr-1Mo steel	●	○	●	○	●	○	●	○	●	○
	9Cr-1Mo-V steel	○	○	○	○	○	○	○	○	○	○
	18Cr-8 Ni steel	○	○	○	○	○	○	○	○	○	○
	18Cr-9 Ni-2 Mo steel	○	○	○	○	○	○	○	○	○	○
2500	Carbon steel	●	○	●	○	●	○	●	○	●	○
	2.5Cr-1Mo steel	●	○	●	○	●	○	●	○	●	○
	9Cr-1Mo-V steel	○	○	○	○	○	○	○	○	○	○
	18Cr-8 Ni steel	○	○	○	○	○	○	○	○	○	○
	18Cr-9 Ni-2 Mo steel	○	○	○	○	○	○	○	○	○	○
4500	Carbon steel	○	○	○	○	○	○	○	○	○	○
	2.5Cr-1Mo steel	●	○	●	○	●	○	●	○	●	○
	9Cr-1Mo-V steel	○	○	○	○	○	○	○	○	○	○
	18Cr-8 Ni steel	○	○	○	○	○	○	○	○	○	○
	18Cr-9 Ni-2 Mo steel	○	○	○	○	○	○	○	○	○	○

●: Inventory of completed valves ○: Inventory of main components —: Not applicable

*Only SW connection-type valves are in stock.

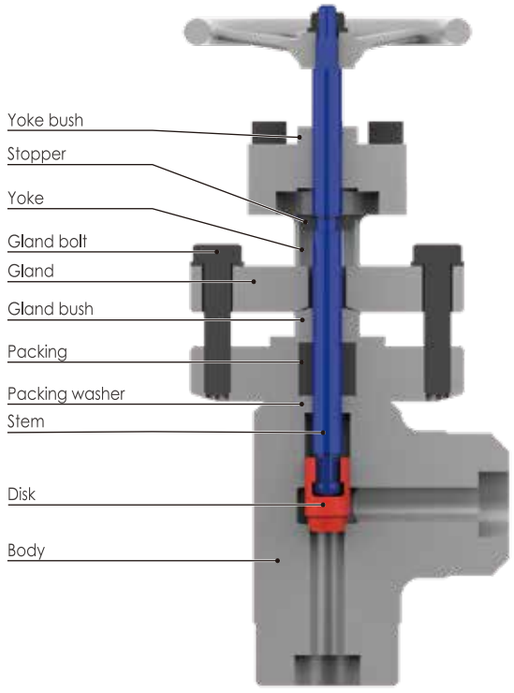
*The specifications for valves whose pressure rating class is 900 or less are the same as those for valves whose pressure rating class is 1500.

Angle valve

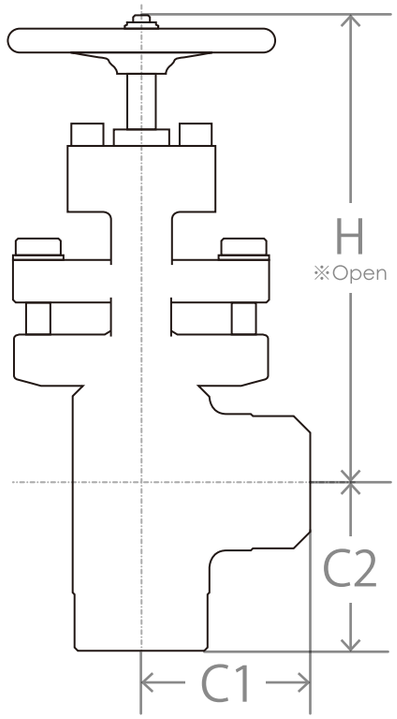
Because it has a structure of the central axes of the flow channel inlet and outlet crossing at right angles, it is called angle valve. Among globe valves, it has a structure that can reduce pressure loss the most. It is used for right-angled piping or as a drain valve.

Characteristics

• Pressure loss is the smallest among globe valves.



Major specifications



Pressure rating class 1500

Valve size		Dimension (mm)			Mass (kg)
A	B	C1 : Face to center	C2 : Face to center	H : Height	
15	½	75	75	285	12
20	¾	85	85	285	13
25	1	95	95	285	15
40	1½	125	125	405	30
50	2	170	170	510	62

Pressure rating class 2500

Valve size		Dimension (mm)			Mass (kg)
A	B	C1 : Face to center	C2 : Face to center	H : Height	
15	½	75	75	285	12
20	¾	85	85	285	13
25	1	95	95	285	15
40	1½	125	125	405	30
50	2	170	170	510	62

Pressure rating class 4500

Valve size		Dimension (mm)			Mass (kg)
A	B	C1 : Face to center	C2 : Face to center	H : Height	
15	½	85	85	285	14
20	¾	95	95	285	16
25	1	105	105	285	17
40	1½	140	140	405	38
50	2	170	170	515	71

Product information

Pressure rating class	Body materials	DN15		DN20		DN25		DN40		DN50	
		HO	MO	HO	MO	HO	MO	HO	MO	HO	MO
1500	Carbon steel	○	○	○	○	○	○	○	○	○	○
	2.5Cr-1Mo steel	○	○	○	○	○	○	○	○	○	○
	9Cr-1Mo-V steel	○	○	○	○	○	○	○	○	○	○
	18Cr-8 Ni steel	○	○	○	○	○	○	○	○	○	○
	18Cr-9 Ni-2 Mo steel	○	○	○	○	○	○	○	○	○	○
2500	Carbon steel	○	○	○	○	○	○	○	○	○	○
	2.5Cr-1Mo steel	○	○	○	○	○	○	○	○	○	○
	9Cr-1Mo-V steel	○	○	○	○	○	○	○	○	○	○
	18Cr-8 Ni steel	○	○	○	○	○	○	○	○	○	○
	18Cr-9 Ni-2 Mo steel	○	○	○	○	○	○	○	○	○	○
4500	Carbon steel	○	○	○	○	○	○	○	○	○	○
	2.5Cr-1Mo steel	○	○	○	○	○	○	○	○	○	○
	9Cr-1Mo-V steel	○	○	○	○	○	○	○	○	○	○
	18Cr-8 Ni steel	○	○	○	○	○	○	○	○	○	○
	18Cr-9 Ni-2 Mo steel	○	○	○	○	○	○	○	○	○	○

●: Inventory of completed valves ○: Inventory of main components —: Not applicable

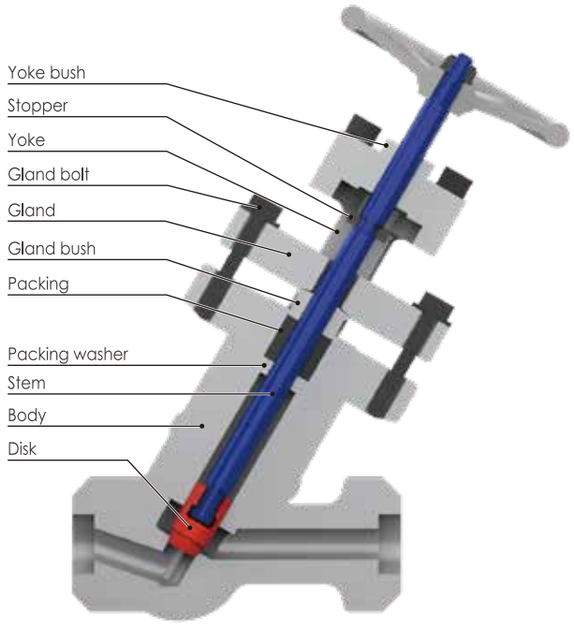
*The specifications for valves whose pressure rating class is 900 or less are the same as those for valves whose pressure rating class is 1500.

Y-globe valve

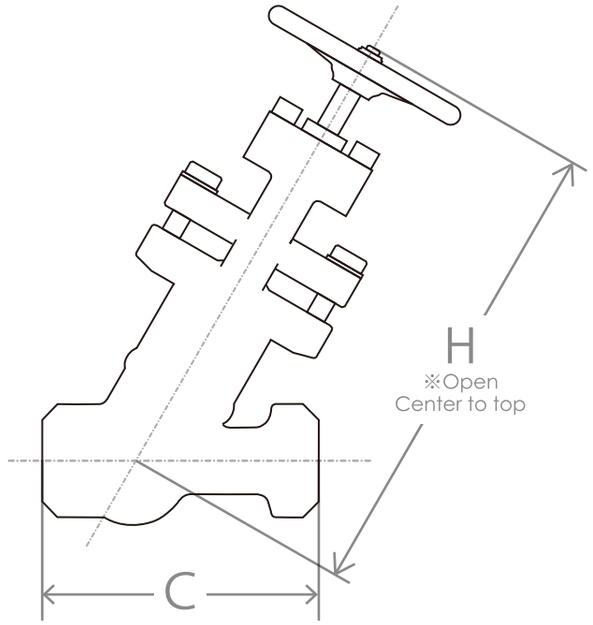
It is called Y- globe valve because it looks like the alphabetic character Y. It has a structure of the upper mechanism being tilted. Because the flow channel is gentler than that of the (standard) globe valve, pressure loss can be reduced.

Characteristics

- The flow path is smoother than that of the standard globe valve.
- Capable of reducing pressure loss.



Major specifications



Pressure rating class 1500

Valve size		Dimension (mm)		Mass (kg)
A	B	C : Face to Face	H : Height	
15	½	190	345	14
20	¾	190	345	14
25	1	190	345	15
40	1½	250	475	34
50	2	340	610	71

Pressure rating class 2500

Valve size		Dimension (mm)		Mass (kg)
A	B	C : Face to Face	H : Height	
15	½	190	345	14
20	¾	190	345	14
25	1	190	345	15
40	1½	250	475	34
50	2	340	610	71

Pressure rating class 4500

Valve size		Dimension (mm)		Mass (kg)
A	B	C : Face to Face	H : Height	
15	½	190	345	17
20	¾	190	345	18
25	1	190	345	18
40	1½	280	500	46
50	2	340	610	86

Product information

Pressure rating class	Body materials	DN15		DN20		DN25		DN40		DN50	
		HO	MO	HO	MO	HO	MO	HO	MO	HO	MO
1500	Carbon steel	○	○	○	○	○	○	○	○	○	○
	2.5Cr-1Mo steel	○	○	○	○	○	○	○	○	○	○
	9Cr-1Mo-V steel	○	○	○	○	○	○	○	○	○	○
	18Cr-8 Ni steel	○	○	○	○	○	○	○	○	○	○
	18Cr-9 Ni-2 Mo steel	○	○	○	○	○	○	○	○	○	○
2500	Carbon steel	○	○	○	○	○	○	○	○	○	○
	2.5Cr-1Mo steel	○	○	○	○	○	○	○	○	○	○
	9Cr-1Mo-V steel	○	○	○	○	○	○	○	○	○	○
	18Cr-8 Ni steel	○	○	○	○	○	○	○	○	○	○
	18Cr-9 Ni-2 Mo steel	○	○	○	○	○	○	○	○	○	○
4500	Carbon steel	○	○	○	○	○	○	○	○	○	○
	2.5Cr-1Mo steel	○	○	○	○	○	○	○	○	○	○
	9Cr-1Mo-V steel	○	○	○	○	○	○	○	○	○	○
	18Cr-8 Ni steel	○	○	○	○	○	○	○	○	○	○
	18Cr-9 Ni-2 Mo steel	○	○	○	○	○	○	○	○	○	○

●: Inventory of completed valves ○: Inventory of main components —: Not applicable

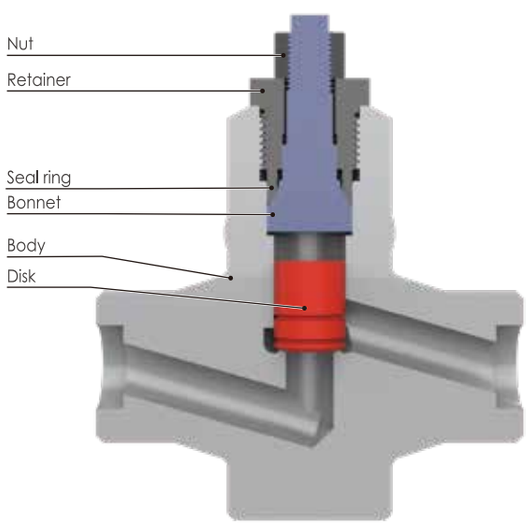
*The specifications for valves whose pressure rating class is 900 or less are the same as those for valves whose pressure rating class is 1500.

Lift check valve

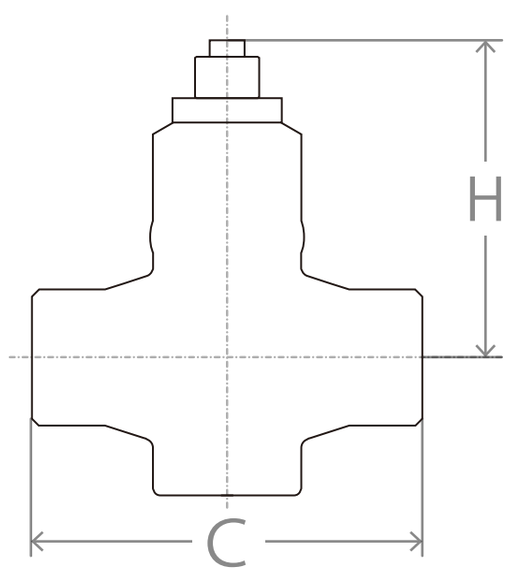
Because the disk is moved up/down (lifted) by a fluid, it is called lift check valve. The disk can be opened by low fluid pressure. However, because the flow channel is S-shaped, pressure loss is greater. It is mainly used for small size valves.

Characteristics

• Automatically shut out only the back-flow of fluid.



Major specifications



Pressure rating class 1500

Valve size		Dimension (mm)		Mass (kg)
A	B	C : Face to Face	H : Height	
15	½	150	125	7
20	¾	170	135	8
25	1	190	145	11
40	1½	250	210	20
50	2	340	240	44

Pressure rating class 2500

Valve size		Dimension (mm)		Mass (kg)
A	B	C : Face to Face	H : Height	
15	½	150	115	7
20	¾	170	135	8
25	1	190	150	12
40	1½	250	210	23
50	2	340	245	47

Pressure rating class 4500

If you have requirements pressure rating class 4500, please contact us.

Product information

Pressure rating class	Body materials	DN15		DN20		DN25		DN40		DN50	
		HO	MO	HO	MO	HO	MO	HO	MO	HO	MO
1500	Carbon steel	○	–	○	–	○	–	○	–	○	–
	2.5Cr-1Mo steel	○	–	○	–	○	–	○	–	○	–
	9Cr-1Mo-V steel	○	–	○	–	○	–	○	–	○	–
	18Cr-8 Ni steel	○	–	○	–	○	–	○	–	○	–
	18Cr-9 Ni-2 Mo steel	○	–	○	–	○	–	○	–	○	–
2500	Carbon steel	○	–	○	–	○	–	○	–	○	–
	2.5Cr-1Mo steel	○	–	○	–	○	–	○	–	○	–
	9Cr-1Mo-V steel	○	–	○	–	○	–	○	–	○	–
	18Cr-8 Ni steel	○	–	○	–	○	–	○	–	○	–
	18Cr-9 Ni-2 Mo steel	○	–	○	–	○	–	○	–	○	–
4500	If you have requirements pressure rating class 4500, please contact us.										

●: Inventory of completed valves ○: Inventory of main components –: Not applicable

*The specifications for valves whose pressure rating class is 900 or less are the same as those for valves whose pressure rating class is 1500.

Options

Function options

Additional product functions are determined in detail to improve operating efficiency of thermal power plants, maintain long-term performance under high-temperature and high-pressure environments.

List of optional function items

○: Available

Item		Globe valve	Y-globe valve	Angle valve	Lift check valve	Remarks
Countermeasures against high-temperature and thermal atack		○	○	○	○	
Countermeasures against erosion		○	○	○	—	
Countermeasures against external leakage		○	○	○	—	
Countermeasures against vacuum pressure		○	○	○	—	
Operation options	Instructions on the number of operations (frequency)	○	○	○	—	Exclusive option for MO valves
	Instructions on opening/ closing time (speed)	○	○	○	—	Exclusive option for MO valves
Exclusive options for globe valve	Instructions on flow rate (regulation)	○	○	○	—	
Countermeasures against salt damage (rust prevention)		○	○	○	○	
Dust proof		○	○	○	—	
Measures for seating characteristics		—	—	—	○	
Simple options	Opening indicator	○	○	○	—	
	Support lug	○	○	○	—	Exclusive option for MO valves
	Handle lock	○	○	○	—	
	Name plate	○	○	○	○	

* We may recommend the addition of function options based on the presented specifications and contents of specification adjustment, or the customer may be asked to determine the addition directly.
* For function options named as "Countermeasures against ***," please determine whether to adopt them.
* For function options named as "Instructions on ***," the customer is requested to present detailed conditions.
*Please refer to the "Catalog of General high-temperature and high-pressure valves for Thermal Power Plants" for details of optional functions.

Inspection options

Products (components) are inspected based on the standards and OKANO's standard. If there is any special request, it is handled as an option. By avoiding excessive inspection, product procurement costs can be optimized.

List of standard inspection items

◎ : Test/inspection performed in accordance with requirements of standards
○ : Test/inspection performed as OKANO's standard

	Item		Target component	Target part	Implementation period	[ASME B16.34 is applied.] Standard	Special
A	Material inspection	Chemical analysis	Pressure retaining	-	At casting	◎	◎
		Analysis test for controlled minor components		-	At casting		
		Product analysis test		-	After heat treatment		
		Mechanical test		-	After heat treatment	◎	◎
B	Heat treatment		Pressure retaining	-	After casting, after welding	◎	◎
C	Nondestructive examination	Volumetric inspection (RT or UT)	Pressure retaining	Entire volume	After heat treatment		◎ UT
				Pressure-resistant welding part	After welding		◎ RT
			Body	Groove part of inlet/ outlet butt welding	After heat treatment		
		Surface inspection (MT or PT)	Pressure retaining	Exterior surface	After heat treatment		
				All accessible inter of surface			◎
				Pressure-resistant welding part	After welding		◎
				Mechanical processing surface	After machining		
				Repair welding part	After defect removal		
					After repair welding		
			Body	Machining surface of inlet/ outlet welding end	After machining		
D	Welding work inspection		Pressure retaining	Welding part	After welding	◎	◎
E	Dimension inspection	Parts	Pressure retaining	-	After completion of materials	◎	◎
				-	After completion of component	◎	◎
			Body	Groove part of inlet/ outlet butt welding	After machining	◎	◎
		Valve	Assembly	-	After valve assembly	○	○
F	Visual inspection	Parts	Pressure retaining	-		○	○
				-		○	○
		Valve	Assembly	-	After valve assembly	○	○
G	Material verification inspection		Pressure retaining	-		○	○
H	Assembly inspection		Assembly	-	After valve assembly	○	○
I	Shell test	Parts	Pressure retaining	-		◎	◎
		Valve	Assembly	-	After valve assembly	◎	◎
J	Closure test	Valve seat leak inspection	Assembly	-	After valve assembly	◎	◎
		Back seat leak inspection	Assembly	-	After valve assembly		
K	Steam inspection		Assembly	-	After valve assembly		
L	Operating inspection	Valve	Assembly	-	After valve assembly	○	○
		Electrical product test	Auxiliary (electrical item)	-	At the time of acceptance	○	○
M	Shipping inspection	Inspection before shipment	Assembly	-	After completion of valve	○	○
		painting inspection	Assembly	-	After painting	○	○
		Packing inspection	Assembly	-	After packing	○	○

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