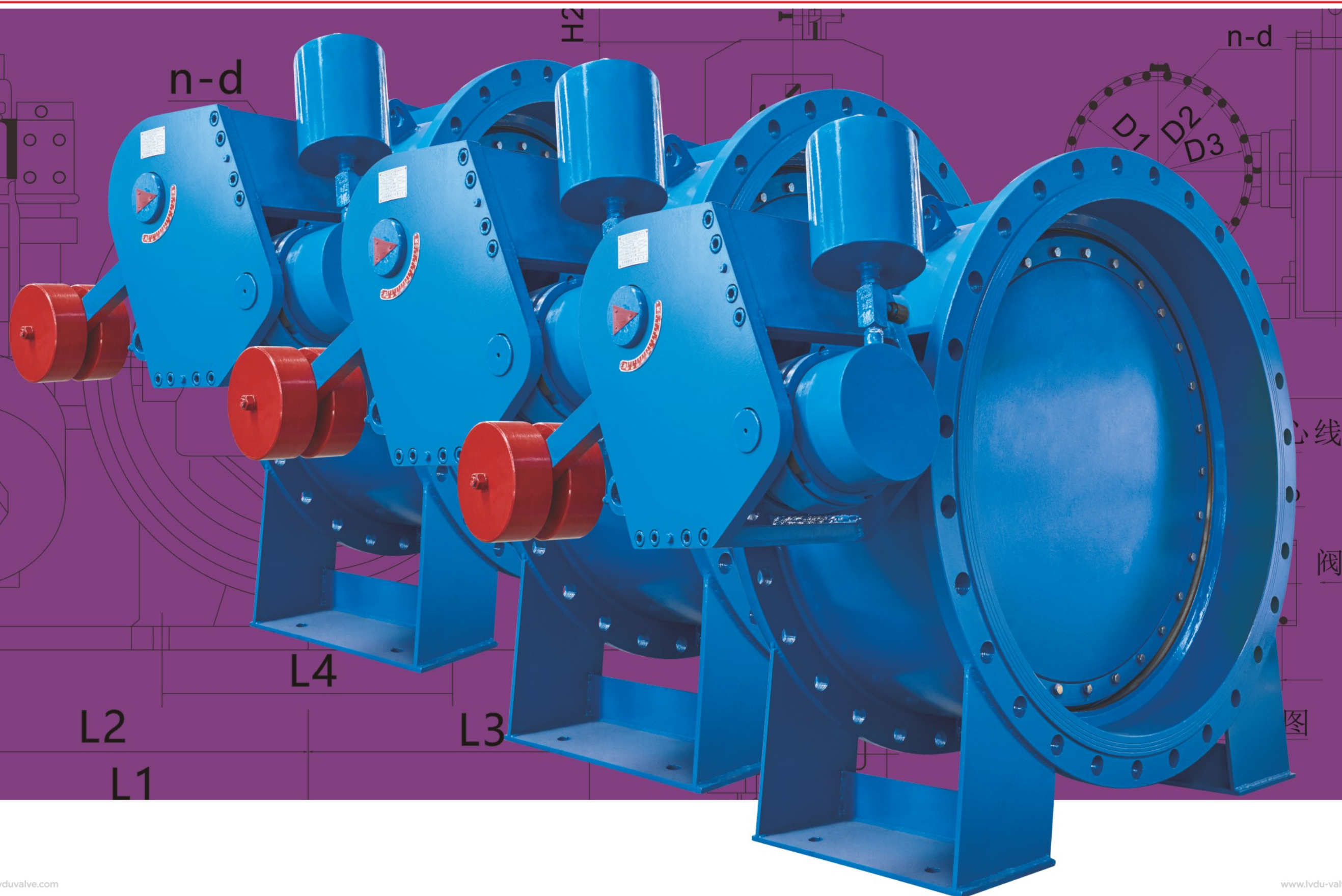


> CHECK VALVE SERIES



Hydraulic Control Check Butterfly Valve

Overview

Our company has long history in the production of hydraulic control check butterfly valves, strong technical force, and rich design, manufacturing, sales and after-sales service capabilities.

After years of research, summary, improvement and absorption of superior performance of similar products at home and abroad, and introduction of multiple latest R&D achievements in electrical, hydraulic, valve and other industries, the product research personnel of our company developed a new generation of highly-intelligent, highly-efficient and highly energy-saving hydraulic control check butterfly valve based on our D741X-10 (16) series heavy-hammer butterfly valve.

This series of hydraulic control check butterfly valves are mainly divided into: Heavy-hammer hydraulic control check butterfly valve and accumulator-type hydraulic check butterfly valve.

This series of products are relatively advanced automatic pipeline control equipment at home and abroad, and are mainly installed at the inlets of water turbines in hydropower stations, as inlet valves. Or they can be installed at water pump outlets of water supply and drainage pump stations of water plant, power plant, iron and steel smelting plant, papermaking, chemical engineering and municipal construction systems, to replace the function of the check valve and gate valve, for cut-off and check.

When operating, through the preset opening and closing program, the pipeline can be switched on and off, and the water hammer can be effectively eliminated under the action of slow closing, so as to achieve reliable cut-off of the pipeline and prevent damage to the pipeline system.

1. Product Characteristics

A. It has complete control functions, high intelligence, and local/remote control.

As an independent system, it can be debugged and controlled locally. It can also be used as a unit of the distributed control system, which is centrally managed by the central computer and realizes linkage operation with water turbine, water pump, bypass valve and other pipeline equipment. It is equipped with manual function. Therefore, it can achieve manual opening and closing when there is no power supply. It also can meet the valve debugging (or regulation) and control requirements under special working conditions.

B. Strong adjustability and good controllability, it can effectively eliminate water hammer and avoid spilling accident.

The electric-hydraulic control system has several points of regulation. The opening and closing program can be set based on different pipeline control requirements. When the opening and closing conditions are guaranteed to be met, the valve can be opened based according to the pre-set time and angle, or be closed according to the fast and slow stages. It also can realize no power closing, effectively eliminate destructive water hammer, prevent the spilling accident of water pump and water turbine, reduce the pressure fluctuation of the pipe network system, and guarantee the safe and reliable operation of equipment.

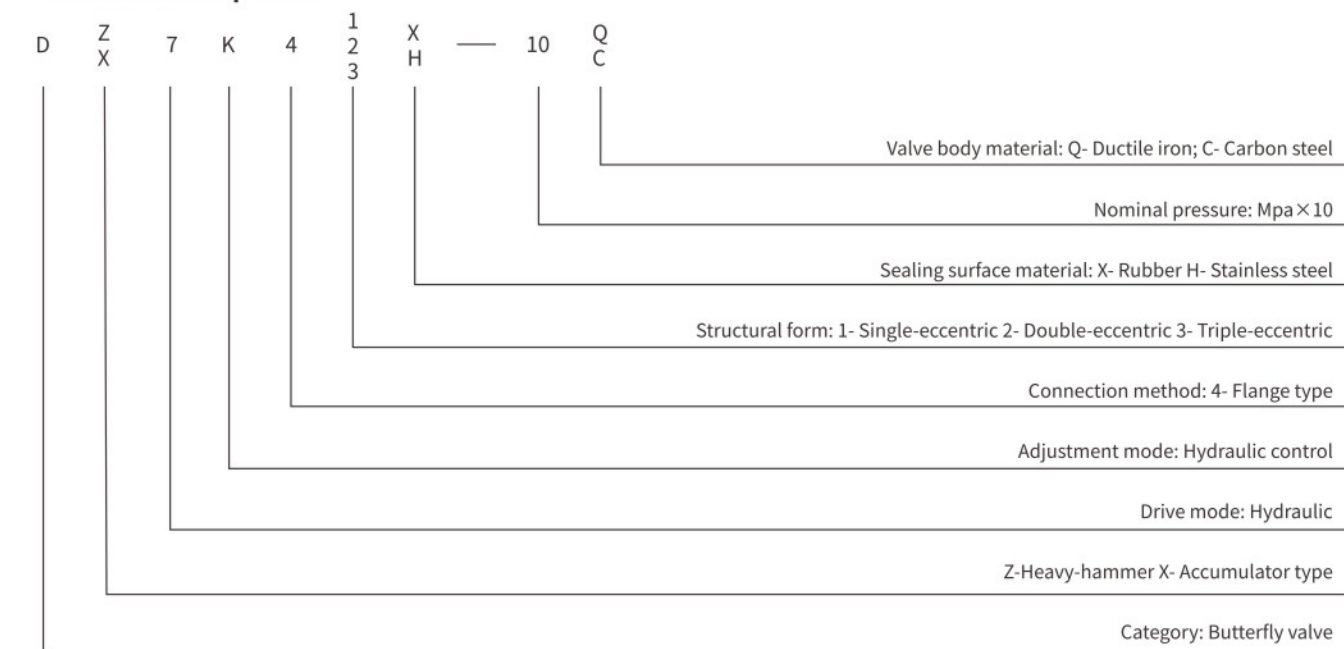
C. Good sealing performance and small flow resistance coefficient.

The sealing pair of the main valve adopts triple-eccentric metal seal or double-eccentric rubber seal structure. It has the characteristics of easy opening and closing, reliable sealing, and good self-closing and self-sealing performance. Medium and small-caliber butterfly plate is designed of streamlined flat plate structure. Large-caliber butterfly plate is designed of truss structure. The flow resistance coefficient of the valve is only 0.1-0.6, far less than that of the check valve (1.7-2.6), with significant energy-saving effect.

D. Replacing two valves with one valve occupies less area.

When the valve is installed at the outlet of the water pump, it can replace the original gate valve and the check valve, playing a role of cut-off and check. Moreover, it integrates the mechanical, electric and hydraulic systems, which reduces the covered area and the capital construction cost.

2. Model Description:



Hydraulic Control Check Butterfly Valve

Product Execution Standard

Product Standard	GB/T14478、GB/T12238、JB/T8527	
Structure Length	GB/T12221	
Driving Device	JB/T5299	
Flange Standard	Gray cast iron flange Nodular cast iron flange	GB/T17241 .6
	Steel flange	GB/T9113
Accumulator Standard	GB/T9112-9124	
Test And Inspection	GB/T2352	
Quality Assurance	GB/T14478、GB/T13927	

Note: According to demands of users, the design and manufacturing can be subject to other foreign and domestic standards, which shall be indicated in the order contract.

Main Performance Parameters

Nominal pressure (Mpa)	Sealing test (Mpa)	Strength test (Mpa)	Working temperature (°C)	Applicable medium	The opening and closing time is adjustable(s)	Valve closing angle	
						Fast closing	Slow closing
0.6	0.9	0.66	X≤135 H≤300	Water, oil and other non-corrosive liquid	1.2~60	65°±5	25°±5
1	1.5	1.1					
1.6	2.4	1.76					
2.5	3.75	2.76					

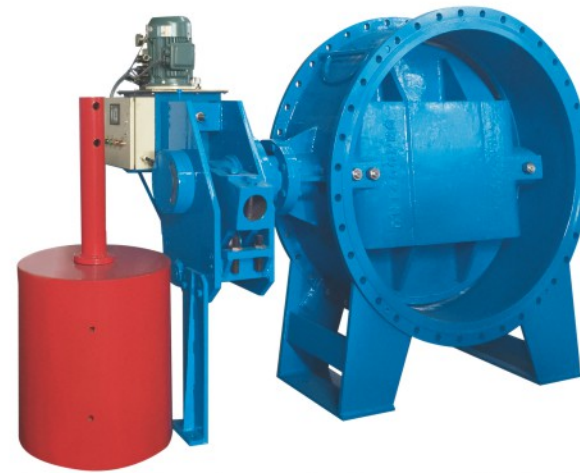
Material Of Primary Member

Name	Material
Valve Body	Carbon steel, nodular cast iron
Butterfly Plate	Carbon steel, nodular cast iron
Valve Shaft	Stainless steel, carbon steel
Valve Body Seal Ring	Stainless steel
Butterfly Plate Seal Ring	Stainless steel, high-quality rubber
Padding	Flexible graphite, V-shaped seal ring

Heavy-hammer Hydraulic Control Check Butterfly Valve

Description Of Features

- 1.The valve can be automatically closed with the potential energy of the heavy hammer.
- 2.Reliable sealing and small flow resistance coefficient.
- 3.Adopt PLC intelligent control system, which can realize text, touch screen and other humanized operation interfaces.
- 4.It can achieve remote and local control.
- 5.The linkage operation with other pipeline equipment can be realized according to the preset program.
- 6.It has fast and slow adjustable closing functions.
- 7It has cut-off and check functions.
- 8.When closed, it can realize slow closing function, to effectively eliminate the harm of water hammer, and protect the safety of water turbine, water pump and pipe network system.



Structural Characteristics

It can be divided into the following types based on the control system: Heavy-hammer locking type (S), heavy-hammer automatic pressure-holding type (B). It mainly consists of valve, drive mechanism, hydraulic pressure station and electric cabinet.

The valve is composed of valve body, butterfly plate, valve shaft, seal assembly and other parts.

The drive mechanism mainly consists of hydraulic cylinder, rocker, side support plate, heavy hammer, leverage, locking cylinder and other connecting and driving parts. It is the main actuator of hydraulic opening and closing of valves.

The hydraulic station includes oil pump unit, manual pump, accumulator, solenoid valve, overflow valve, flow control valve, globe valve, hydraulic manifold block, oil tank and other parts. The valve body adopts horizontal structure.

The valve shaft can be of long or short structure.

In the heavy-hammer automatic pressure-holding system, the accumulator is used to compensate the system pressure.

In the heavy-hammer pressure-holding locking system, the accumulator is used to compensate the system pressure and lock the unlocking of the cylinder.

The drive hydraulic cylinder is equipped with quick closing time regulating valve, slow closing time regulating valve and fast and slow closing angle regulating valves.

The manual pump is used for system debugging and valve opening and closing under special working conditions.

The hydraulic station, electric cabinet and valve can be installed as a whole or separately. Generally, it is overall installed.

The flow control valve is used for the valve opening time regulation.

The control characteristic of the solenoid directional valve of the hydraulic system generally is positive action type.

Namely: The butterfly valve is opened when the solenoid valve is energized and closed when the solenoid valve is deenergized. Otherwise, it is counteractive, i.e., the butterfly valve is opened when the solenoid valve is deenergized and closed when the solenoid valve is energized. The conventional supporting solenoid directional valve is positive action type. If counteractive type is required, it shall be indicated in the order.

For horizontal arrangement, the driving mechanism is generally installed forward. When the field space is limited, reverse installation can also be adopted according to user requirements (that is, the driving device is located on the other side of the valve body, see Figure 1 - Figure 2).

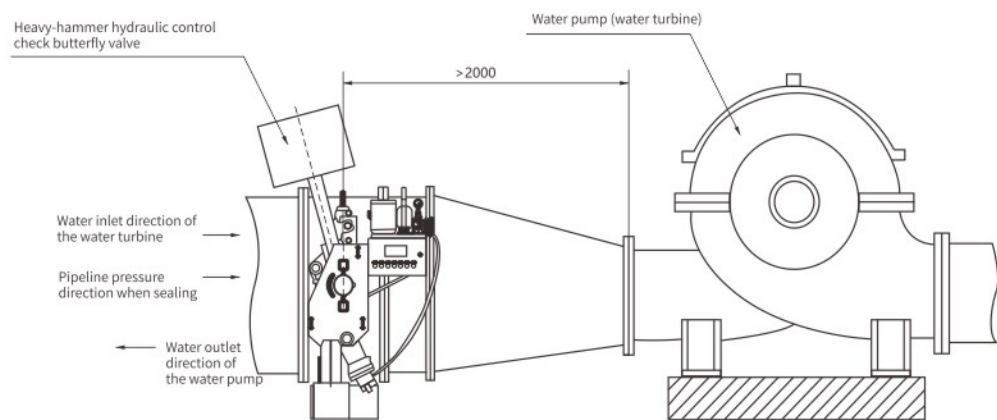


Figure 1 Heavy-hammer hydraulic control check butterfly valve (forward installation)

Heavy-hammer Hydraulic Control Check Butterfly Valve

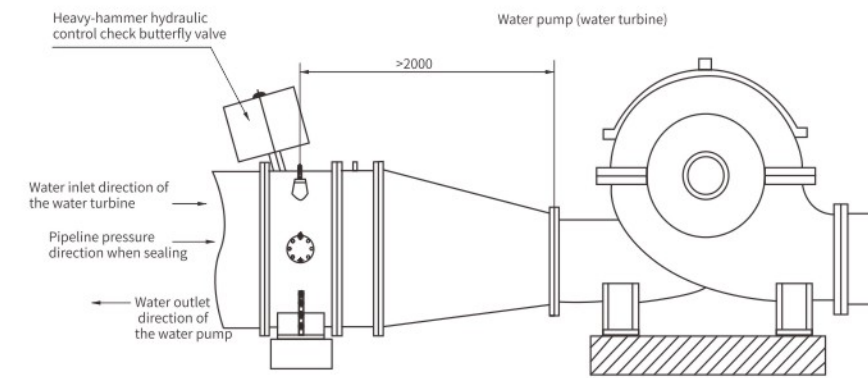


Figure 2 Heavy-hammer hydraulic control check butterfly valve (reverse installation)

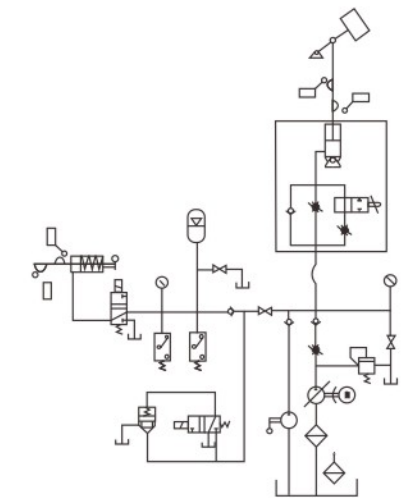


Figure 3 Hydraulic schematic diagram of heavy-hammer hydraulic control check butterfly valve

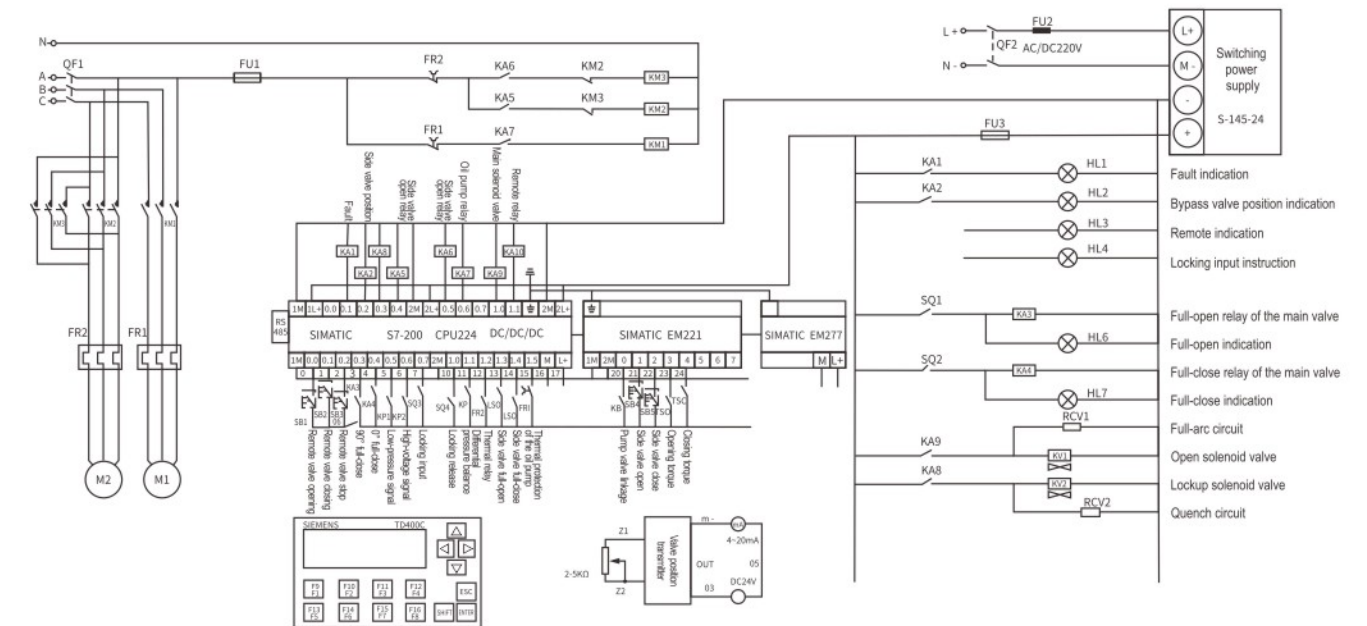


Figure 4 Electrical schematic diagram of heavy-hammer hydraulic control check butterfly valve

Heavy-hammer Hydraulic Control Check Butterfly Valve

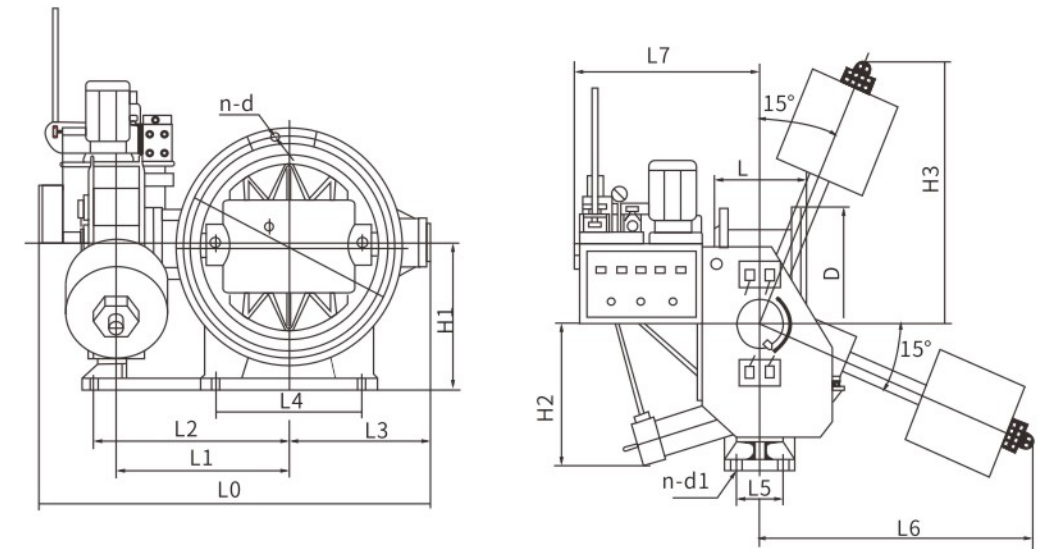
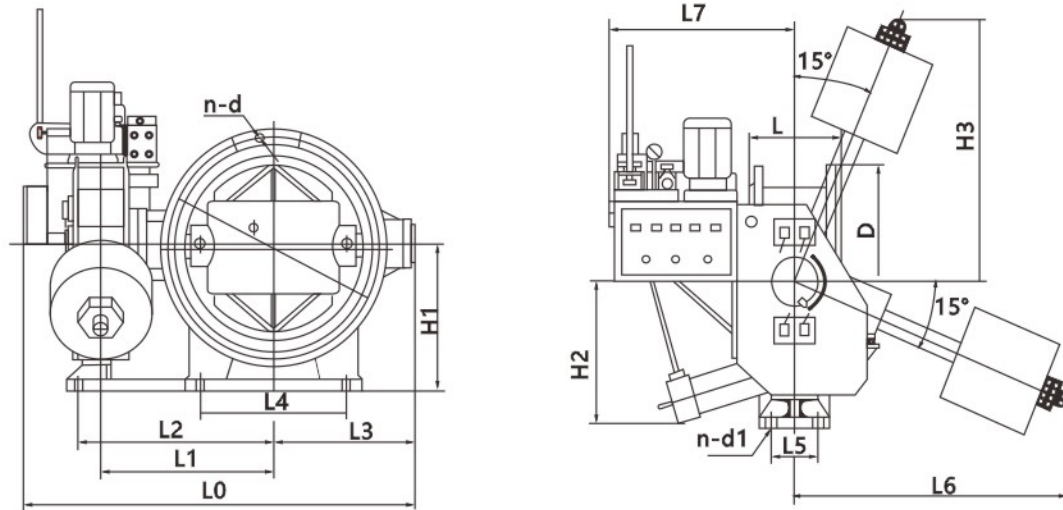
Dz7K42XH-6 10 16

DN400~1000

Heavy-hammer Hydraulic Control Check Butterfly Valve

Dz7K42XH-2.5 6 10

DN1200~2600



DN	mm	in	PN MPa	L	L0	L1	L2	L3	L4	L5	L6	L7	H1	H2	H3	D	Φ	n-d	n-d1	Quality kg
				L	L0	L1	L2	L3	L4	L5	L6	L7	H1	H2	H3	D	Φ	n-d	n-d1	
400	16	1.0	216	1107	527	650	341	420	90	900	995	370	417	900	565	515	16-Φ28	6-Φ26	1155	
		1.6	216	1107	527	650	341	420	90	900	995	370	417	900	580	525	16-Φ31	6-Φ26	1175	
450	18	1.0	222	1143	552	680	352	420	90	900	995	400	417	900	615	565	20-Φ28	6-Φ26	1200	
		1.6	222	1143	552	680	352	420	90	900	995	400	417	900	640	585	20-Φ31	6-Φ26	1280	
500	20	1.0	229	1212	582	710	391	500	100	1100	995	430	417	1100	670	620	20-Φ28	6-Φ26	1310	
		1.6	229	1212	582	710	391	500	100	1100	995	430	417	1100	715	650	20-Φ34	6-Φ26	1410	
600	24	1.0	267	1335	651	780	439	540	110	1100	995	480	417	1100	780	725	20-Φ31	6-Φ30	1800	
		1.6	267	1335	651	780	439	540	110	1100	995	480	417	1100	840	770	20-Φ37	6-Φ30	1920	
700	28	1.0	292	1484	728	850	517	680	120	1100	995	530	417	1100	895	840	24-Φ31	6-Φ30	2240	
		1.6	292	1484	728	850	517	680	120	1100	995	530	417	1100	910	840	24-Φ37	6-Φ30	2360	
900	32	0.6	318	1681	799	940	585	760	145	1445	1080	600	455	1445	975	920	24-Φ31	6-Φ33	2540	
		1.0	318	1681	799	940	585	760	145	1445	1080	600	455	1445	1015	950	24-Φ34	6-Φ33	2565	
		1.6	318	1681	799	940	585	760	145	1445	1080	600	455	1445	1025	950	24-Φ40	6-Φ33	2700	
800	36	1.0	330	1811	864	1000	650	800	150	1445	1080	660	455	1445	1115	1050	28-Φ34	6-Φ33	2780	
		1.6	330	1811	864	1000	650	800	150	1445	1080	660	455	1445	1125	1050	28-Φ40	6-Φ33	2940	
1000	40	0.6	410	1956	929	1060	730	900	180	1445	1080	690	455	1445	1175	1120	28-Φ31	6-Φ36	3560	
		1.0	410	1956	929	1060	730	900	180	1445	1080	720	455	1445	1230	1160	28-Φ37	6-Φ36	3570	
		1.6	410	1956	929	1060	730	900	180	1445	1080	720	455	1445	1255	1170	28-Φ43	6-Φ36	3770	

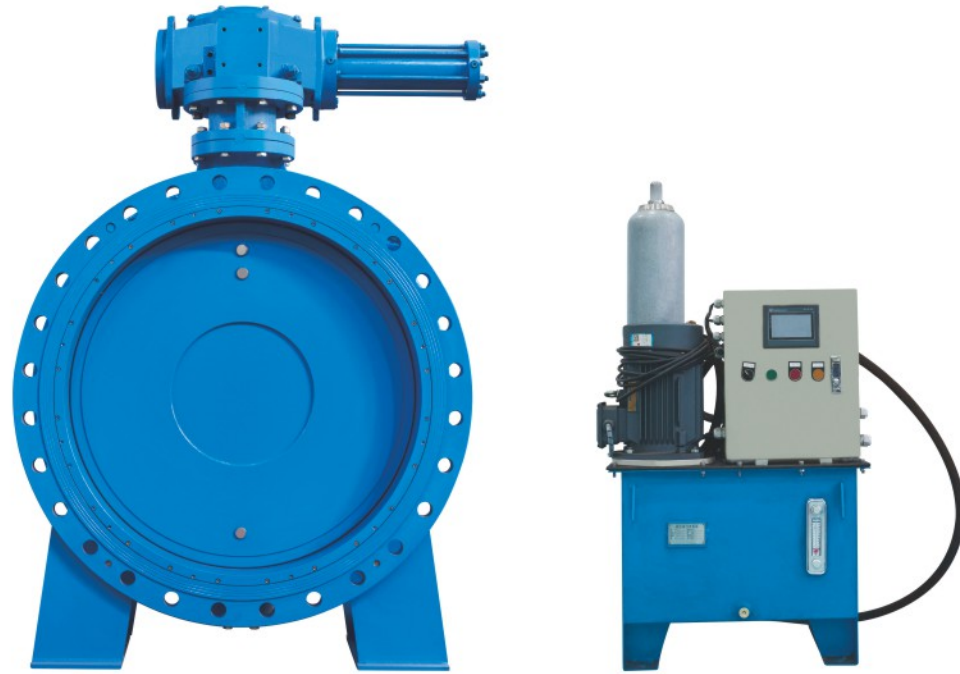
Note: 1. The flange connection dimension in the table is in compliance with GB/17241.6-1998 and GB/T9113.1-2000.
2. The weight in the table is for reference only, which shall be subject to the material object.

DN	mm	in	PN MPa	L	L0	L1	L2	L3	L4	L5	L6	L7	H1	H2	H3	D	Φ	n-d	n-d1	Quality kg
				L	L0	L1	L2	L3	L4	L5	L6	L7	H1	H2	H3	D	Φ	n-d	n-d1	
1200	48	0.6	470	2254	1083	1250	860	1050	200	2010	1150	830	550	2010	1405	1340	32-Φ34	6-Φ39	4050	
		1.0	470	2254	1083	1250	860	1050	200	2010	1150	850	550	2010	1455	1380	32-Φ40	6-Φ39	4265	
1400	56	0.6	530	2554	1230	1390	998	1160	240	2010	1150	930	550	2010	1630	1560	36-Φ37	6-Φ42	4850	
		1.0	530	2554	1230	1390	998	1160	240	2010	1150	950	550	2010	1675	1590	36-Φ43	6-Φ42	5130	
1600	64	0.6	600	2924	1419	1600	1145	1450	300	2290	1360	1035	550	2290	1830	1760	40-Φ37	6-Φ48	6520	
		1.0	600	2924	1419	1600	1145	1490	300	2290	1360	1080	550	2290	1915	1820	40-Φ49	6-Φ48	6760	
1800	72	0.6	670	3147	1527	1710	1260	1600	350	2290	1360	1150	650	2290	2045	1970	44-Φ40	6-Φ48	9580	
		1.0	670	3147	1527	1710	1260	1600	350	2290	1360	1180	650	2290	2115	2020	44-Φ49	6-Φ48	9760	
2000	80	0.6	760	3454	1672	1880	1397	1780	380	2540	1580	1250	650	2540	2265	2180	48-Φ43	6-Φ48	10940	
		1.0	760	3454	1672	1880	1397	1780	380	2540	1580	1280	650	2540	2325	2230	48-Φ49	6-Φ48	11215	
2200	88	0.6	770	3681	1784	1990	1512	1860	400	2540	1580	1360	650	2540	2475	2390	52-Φ43	6-Φ48	12280	
		1.0	770	3681	1784	1990	1512	1860	400	2540	1580	1400	650	2540	2550	2440	52-Φ57	6-Φ48	12600	
2400	96	0.25	780	3955	1905	2110	1615	2040	420	2540	1580	1470	1000	2540	2605	2540	56-Φ34	6-Φ48	15100	
		0.6	780	3955	1905	2110	1615	2040	420	2540	1580	1470	1000	2540	2685	2600	56-Φ43	6-Φ48	15360	
2600	104	0.25	790	4340	2125	2330	1780	2100	450	2540	1580	1580	1000	2540	2805	2740	60-Φ34	6-Φ48	17490	
		0.6	790	4340	2125	2330	1780	2100	450	2540	1580	1580	1000	2540	2905	2810	60-Φ49	6-Φ48	17780	

Note: 1. The flange connection dimension in the table is in compliance with GB/17241.6-1998 and GB/T9113.1-2000.
2. The weight in the table is for reference only, which shall be subject to the material object.

Accumulator Type Hydraulic Control Check Butterfly Valve

Dx7k42X/H



Description Of Features

- 1.The valve is automatically closed based on the energy in the accumulator.
- 2.Reliable sealing and small flow resistance coefficient.
- 3.Adopt PLC intelligent control system, which can realize text, touch screen and other humanized operation interfaces.
- 4.It can achieve remote and local control.
- 5.The linkage operation with other pipeline equipment can be realized according to the preset program.
- 6.It has fast and slow adjustable closing functions.
- 7.It has cut-off and check functions.
- 8.When closed, it can realize slow closing function, to effectively eliminate the harm of water hammer, and protect the safety of water turbine, water pump and pipe network system.

Structural Characteristics

It is divided into ordinary accumulator type (X) and accumulator locking type (XS) based on the control system. It mainly consists of valve, drive mechanism, hydraulic pressure station and electric cabinet. The valve is composed of valve body, butterfly plate, valve shaft, seal assembly and other parts. The drive mechanism mainly consists of hydraulic cylinder, rocker, side support plate, heavy hammer, leverage, locking cylinder and other connecting and driving parts. It is the main actuator of hydraulic opening and closing of valves. The hydraulic station includes oil pump unit, manual pump, accumulator, solenoid valve, overflow valve, flow control valve, globe valve, hydraulic manifold block, oil tank and other parts. The manual pump is used for system debugging and valve opening and closing under special working conditions. The flow control valve is used for the valve opening time regulation. The drive hydraulic cylinder is equipped with quick closing time regulating valve, slow closing time regulating valve and fast and slow closing angle regulating valves. In the system, two accumulators are backup to each other and provide the main power source for valve opening and closing. The valve shaft can be of long or short structure. Generally, the horizontal arrangement is adopted. The vertical arrangement also can be adopted according to the requirements of users. The hydraulic station, electric cabinet and valve body can be installed as a whole, or separately. When vertical arrangement is adopted, it is separate installation. The control characteristic of the solenoid directional valve of the hydraulic system generally is positive action type. Namely: The butterfly valve is opened when the solenoid valve is energized and closed when the solenoid valve is deenergized. Otherwise, it is counteractive, i.e., the butterfly valve is opened when the solenoid valve is deenergized and closed when the solenoid valve is energized. The conventional supporting solenoid directional valve is positive action type. If counteractive type is required, it shall be indicated in the order.

For horizontal arrangement, the driving mechanism is generally installed forward. When the field space is limited, reverse installation can also be adopted according to user requirements (that is, the driving device is located on the other side of the valve body, see Figure 7 - Figure 8).

Accumulator Type Hydraulic Control Check Butterfly Valve

Dx7k42X/H

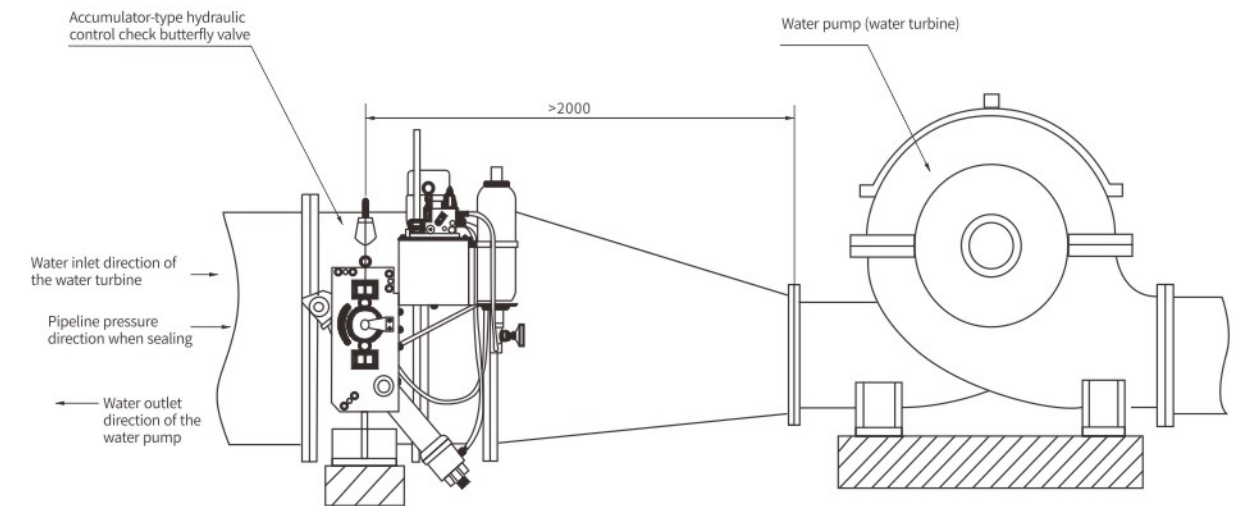


Figure 7 Accumulator type hydraulic control check butterfly valve (forward installation)

Materials Of Main Parts

Nominal Pressure (Mpa)	Sealing test (Mpa)	Strength test (Mpa)	Working temperature (°C)	Applicable medium	The opening and closing time is adjustable	Valve closing angle	
						Fast closing	Slow closing
0.25	0.275	0.375	X ≤ 135 H ≤ 300	Water, oil and other non-corrosive liquid	1.2-60	70° ± 5	20° ± 5
0.6	0.66	0.9					
1	1.1	1.5					
1.6	1.76	2.4					

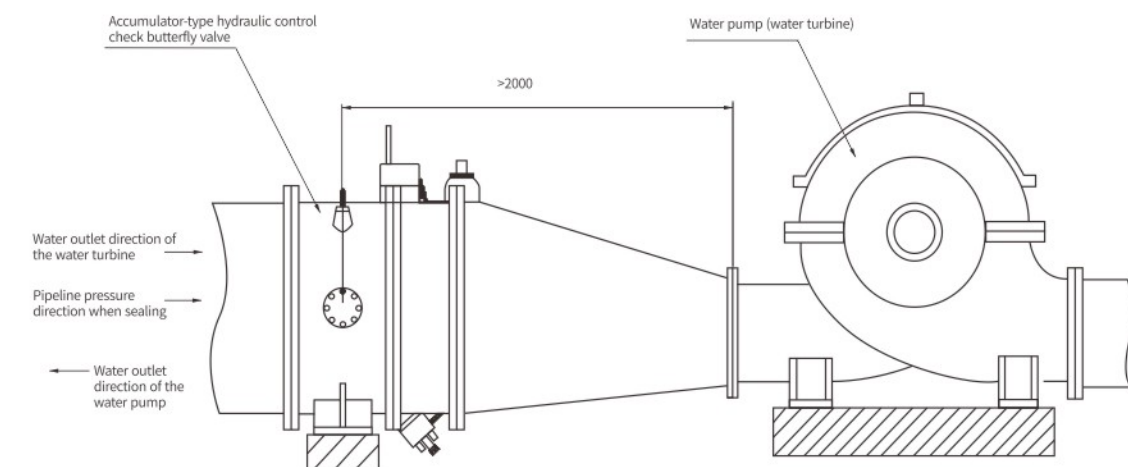


Figure 8 Accumulator type hydraulic control check butterfly valve (reverse installation)

Accumulator Type Hydraulic Control Check Butterfly Valve

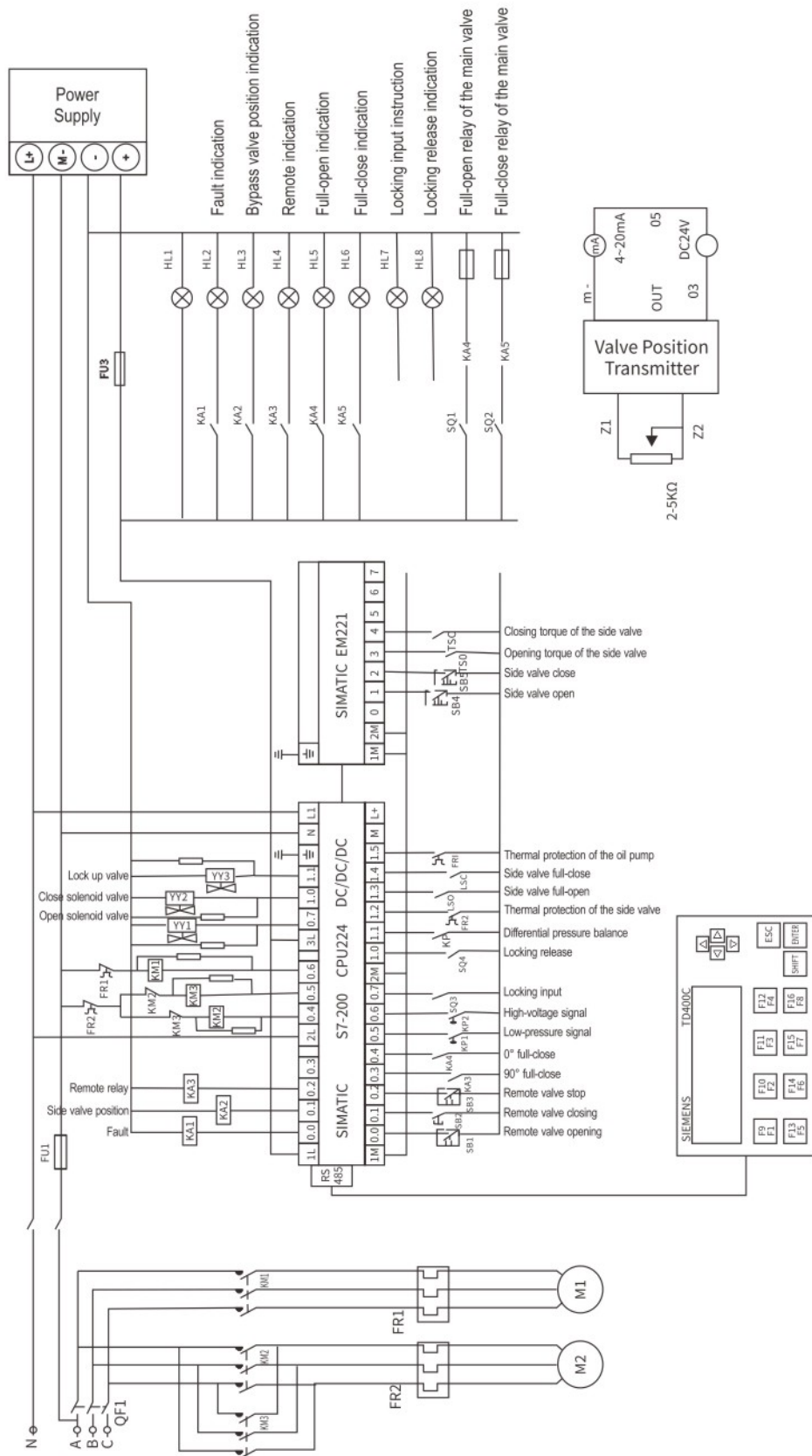
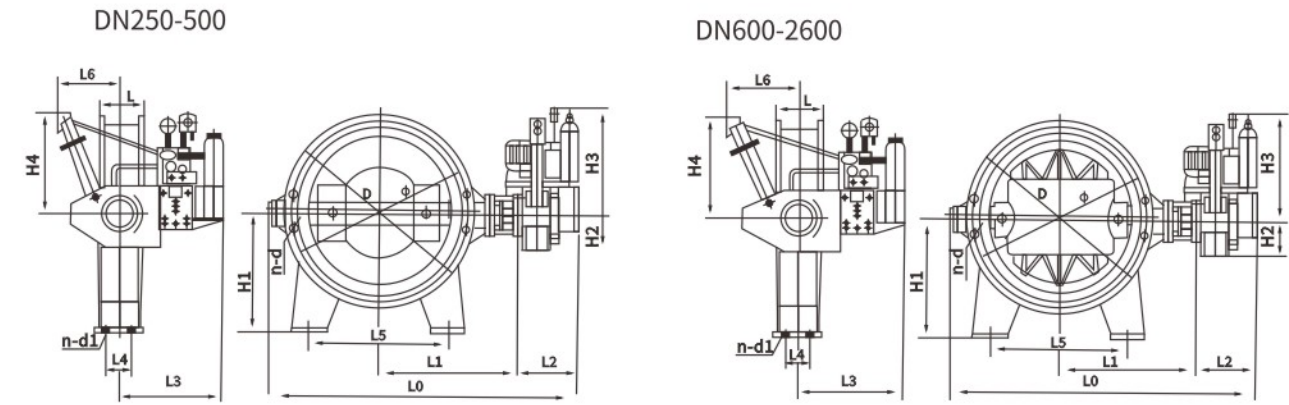


Figure 9 Electrical schematic diagram of accumulator-type hydraulic control check butterfly valve

Accumulator Type Hydraulic Control Check Butterfly Valve Dx7K41XH-6 10



DN	mm	in	L	L0	L1	L2	L3	L4	L5	L6	H1	H2	H3	H4	Φ		n-d-Th		n-d1	Quality
															0.6 MPa	1.0 MPa	0.6MPa	1.0MPa		
250	10	165	1012	380	406	648	-	-	553	250	138	525	263	335	350	12-Φ20-M16	12-Φ23-M20	2-Φ22	520	
300	12	178	1080	410	406	648	-	-	553	280	138	525	263	395	400	12-Φ23-M20	12-Φ23-M20	2-Φ22	562	
350	14	190	1142	443	406	648	-	400	553	300	138	525	263	445	460	12-Φ23-M20	16-Φ23-M20	2-Φ22	653	
400	16	216	1205	480	406	648	90	420	553	340	138	525	263	495	515	16-Φ23-M20	16-Φ28-M24	4-Φ22	838	
450	18	222	1267	518	406	648	90	420	553	370	138	525	263	550	565	16-Φ23-M20	20-Φ28-M24	4-Φ22	914	
500	20	229	1479	580	520	705	100	500	~620	400	240	740	~227	600	620	20-Φ23-M20	20-Φ28-M24	4-Φ26	1097	
600	24	267	1613	657	520	705	110	540	~620	460	240	740	~227	705	725	20-Φ28-M24	20-Φ31-M27	4-Φ26	1320	
700	28	292	1756	730	520	705	120	680	~620	540	240	740	~227	810	840	24-Φ28-M24	24-Φ31-M27	4-Φ26	1817	
800	32	318	1898	810	520	880	145	760	~526	580	320	720	~606	920	950	24-Φ31-M27	24-Φ34-M30	4-Φ26	2323	
900	36	330	1990	925	520	880	150	820	~526	630	320	720	~606	1020	1050	24-Φ31-M27	28-Φ34-M30	4-Φ30	2621	
1000	40	410	2265	990	520	880	180	900	~526	690	320	720	~606	1120	1160	28-Φ31-M27	28-Φ37-M33	4-Φ30	3005	
1200	48	470	2502	1140	520	990	200	1050	922	800	380	770	~330	1340	1380	32-Φ34-M30	32-Φ40-M36	4-Φ39	3780	
1400	56	530	2805	1297	520	990	260	1250	922	900	380	770	~330	1560	1590	36-Φ37-M33	36-Φ43-M39	4-Φ42	4825	
1600	64	600	3100	1429	556	1030	300	1490	1286	1040	450	915	~403	1760	1820	40-Φ37-M33	40-Φ49-M45	4-Φ48	6505	
1800	72	670	3336	1520	556	1030	350	1600	1286	1140	450	915	~403	1970	2020	44-Φ40-M36	44-Φ49-M45	4-Φ48	8985	
2000	80	760	3722	1707	600	1100	380	1780	1520	1240	540	1080	~520	2180	2230	48-Φ43-M39	48-Φ49-M45	4-Φ48	10845	
2200	88	770	3931	1819	600	1100	400	1860	1520	1340	540	1080	~520	2390	2440	52-Φ43-M39	52-Φ57-M52	4-Φ56	12150	
2400	96	780	4205	1940	650	1160	420	2040	1680	1460	620	1160	~640	2600	2650	56-Φ43-M39	56-Φ57-M52	4-Φ56	14655	
2600	104	790	4590	2160	650	1160	450	2100	1680	1560	620	1160	~640	2810	2850	60-Φ49-M45	60-Φ57-M52	4-Φ56	17060	

Note: 1.The flange connection dimension in the table is in compliance with GB17241.6-1998.
2.The weight in the table is for reference only, which shall be subject to the material object.

Complete Set Of Hydraulic Control Check Butterfly Valve Products

Our company has long history in the production of hydraulic control check butterfly valve products, rich experience, and full independent design and manufacturing capabilities. According to the specific working conditions of users, the specially designed, manufactured and suitable complete set of hydraulic control check butterfly valve products can meet your demands multi-directionally.

The complete set of hydraulic control check butterfly valve product has all the characteristics of the hydraulic control check butterfly valve, and also has other characteristics of the automatic control of pipeline, can be effectively combined with the local and remote control systems, and implements highly-intelligent and highly humanized control of pipelines. It further improves the control and protection ability to the equipment, and fully realizes the management concept of "fewer people on duty, no people on duty".

Product standard: GB/T14478 and relevant standards for all components of the product

Nominal pressure (PN): 0.25~4.0MPa

Inside nominal diameter (DN): 500~4000mm

This complete set of products takes heavy-hammer hydraulic control check butterfly valve or accumulator-type hydraulic control check butterfly valve as the main body, and forms a whole with the expansion piece, bypass pipe fittings, bypass electric valve, bypass manual valve, upstream and downstream connecting pipes, air valve and drain valve.

The bypass pipeline is designed and manufactured according to relevant design standards of pipelines or technical requirements of users.

This product is suitable for water turbine inlet of hydro power station.

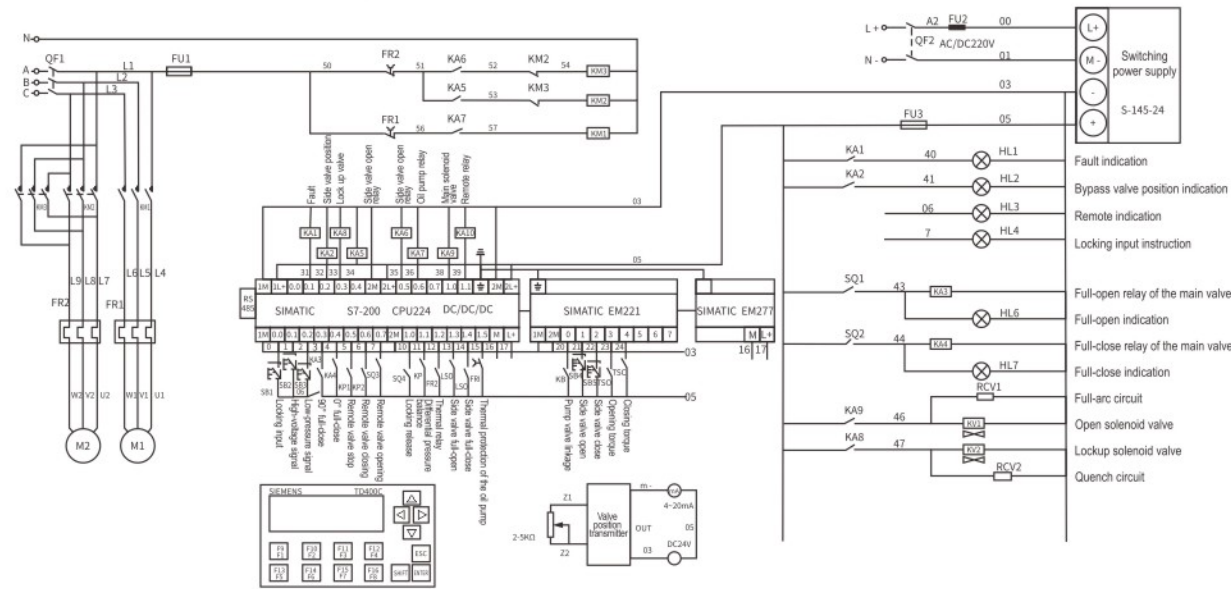
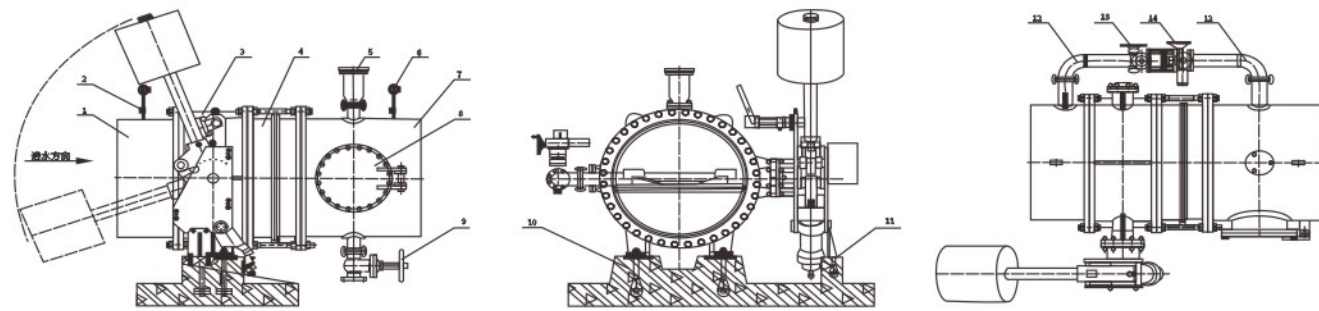


Figure 12 Electrical schematic diagram of complete set of hydraulic control check butterfly valve



- 1. Upstream connecting pipe
- 2. Upstream pressure gauge
- 3. Hydraulic control check butterfly valve
- 4. Expansion piece
- 5. Air valve
- 6. Downstream pressure gauge
- 7. Downstream connecting pipe
- 8. Access door
- 9. Drain valve
- 10. Foundation bolt
- 11. Foundation bolt
- 12. Bypass manual valve
- 13. Bypass electric valve
- 14. Bypass pipe fittings

Figure 13 Sketch of complete set of hydraulic control check butterfly valve product

Complete Set Of Hydraulic Control Check Butterfly Valve Products

Installation, Storage And Daily Maintenance

Installation

Before installation, check whether the parameters on the valve nameplate meet the use requirements; clean the inner hole, butterfly plate and check all parts for damage, and whether the connecting bolts of each part are tight.

When the hydraulic control butterfly valve is forward and reversely installed, confirm the relative orientation of the hydraulic drive system and the inlet pipe of the water turbine and the outlet pipe of the water pump according to the directions shown in Figure 1, Figure 2, Figure 5 and Figure 6, respectively, and install the valve at the pump outlet end or water turbine inlet end. The valve center shall be more than 2 meters away from the pump outlet, and be as far as possible, in order to reduce the adverse effect of turbulent flow state at the pump outlet on the valve.

The butterfly valve shall be installed on the foundation horizontally to ensure that the valve shaft is not tilted. The support legs and auxiliary supports of the valve are mainly used to guarantee the smooth installation and operation of the valve. It is not suitable to bear large amount of axial water thrust of the pipe vertical to it. The axial water thrust shall be transferred to the load-bearing foundation through the pipe at the front or rear of the valve.

Storage

When the valve is stored for a long time, it shall be put in a dry place, the channels at two ends shall be closed and the processing surface shall be coated with anti-rust oil. For temporary storage, additional auxiliary supports may be added to the external wall panel to maintain stability. If not to be installed within half a year, the hydraulic system shall be cleaned. And the oil shall be replaced.

This series of valves shall not be stored in open air.

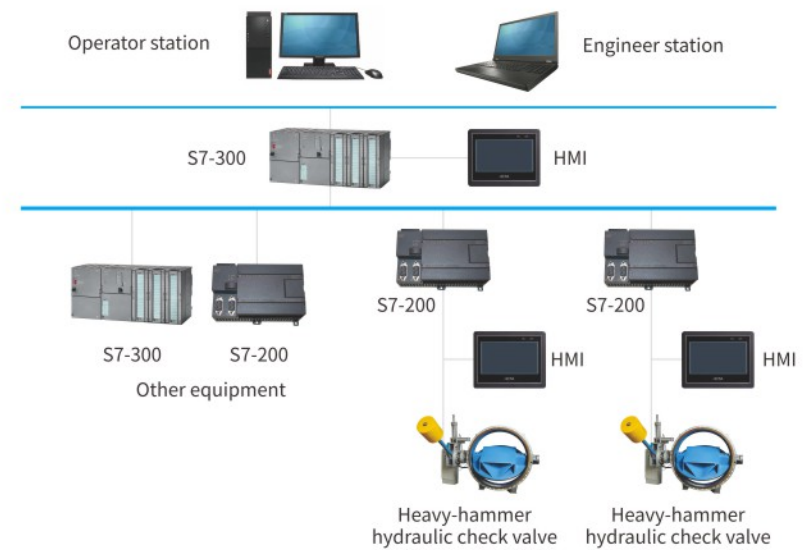
Daily Maintenance

The calibration volume of the oil tank of the hydraulic control system of the butterfly valve is 63 liters. The medium is N46-N68 hydraulic shaft. The oil level shall not be lower than one third above the bottom line of the oil mark. After the hydraulic system is put into use for 3 months, the hydraulic oil shall be filtered once and the oil tank shall be cleaned. Inspection shall be conducted regularly to replace the bad and polluted oil in time. For new oil or filtration, when adding new oil, it shall be added through the oil filter vehicle. The filtering accuracy of oil filter vehicle shall not be less than 20µm. And the hydraulic oil with the same grade shall be used.

The inflation pressure in the energy accumulator shall be inspected regularly. When the inflation pressure is lower than 4MPa, nitrogen shall be filled timely. Inspection of pressure of nitrogen: Shield the automatic pressure-holding function, open the normally closed globe valve to a certain opening and slowly relieve pressure, observe the pressure gauge to show that the pressure slowly decreases. When the pressure drops to a certain value, the pressure gauge indicates a fast drop to zero, indicating that the change value of falling speed is nitrogen pressure.

After the device is put into operation, personnel shall go to the work site to observe the operation situation. In case of oil leakage, indication failure and other abnormal phenomena, they shall be treated timely.

During the debugging and operation of the heavy-hammer hydraulic butterfly valve, no personnel shall pass or stay under the heavy hammer.



Partial schematic diagram of the automatic control system of one hydropower station.

Complete Set Of Hydraulic Control Check Butterfly Valve Products

Installation And Debugging

Installation Precautions

1. Before installation, carefully check whether the operating condition is in compliance with the technical parameters of the valve.
2. Before installation, the dust and sundries in the chamber, seat and the sealing part of the butterfly plate shall be cleaned. Check the fasteners of various parts of the valve for looseness, the opening and closing for abnormality, and the opening and closing positions for accuracy.
3. During installation, the orientation must be checked. The arrow direction on the valve shall be consistent with the medium flow direction.
4. The structural length of the valve is short. When the butterfly plate is opened, the butterfly plate may be $R > 1/2L$ (see the attached figure). The equipment installed after the valve is installed, its position shall not obstruct the normal open of the butterfly plate.
5. If this valve interferes with the flange connecting bolt through hole (do) and the reinforcing rib in the flange seat of valve shaft on the body in some product specifications, the bolt through hole (do) of the product will be changed to corresponding threaded hole (Tho), in order to ensure the strength of the reinforcing rib in the flange seat.
6. In order to avoid damage of the oil cup during transport, empty cups shall be split and boxed for transport. The oil cup shall be installed and oiled before the valve is put into use. See Product Installation Instructions for details of installation and oiling steps.

The Adjustment Test For Slow Closing Performance Of A Close Valve

The necessity of the adjustment test for slow closing performance of an open valve:

Once the check valve is installed on the pipeline system, it becomes one of the fluid components of the complete system. The opening and closing process of the butterfly plate is affected by the transient flow state of the system. In addition, the valve opening property of the valve has reaction to the fluid flow state.

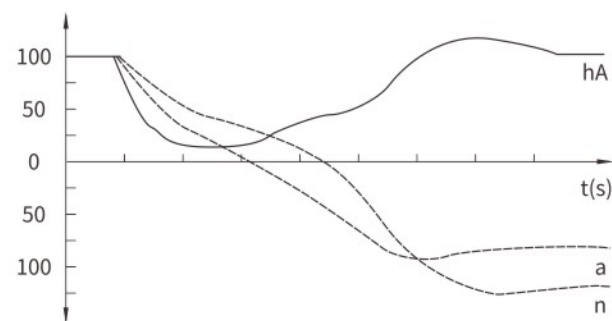
The performance of valve opening with pump stop is an important performance of butterfly check valve. The performance of valve closing without water hammer of the valve is mainly guaranteed with the buffer performance of the cylinder. However, the buffer performance of the cylinder is adjusted by the position change of the throttle lever.

The preliminary no-load adjustment and test on the slow closing performance of the opening and closing of the product according to the use conditions and parameters (The more detailed and accurate the information provided by the user, the more favorable our adjustment and test will be) provided by users (according to this sample: 11, requirements in ① of ordering instruction) when delivery. However, whether such no-load adjustment test truly meets the requirements of industrial actual operating conditions, it is necessary to carry out industrial test verification or re-adjustment to ensure that in the event of "pump stop with valve open (outlet valve)" due to sudden power failure, the occurrence of destructive water hammer shall be prevented to ensure the safety of the pump station.

Valve Closing Test With Pump Stop

For valve closing test with pump stop, a trial test is generally conducted first. And then, a formal test will be conducted. Through the valve closing test with pump stop, if the following can be confirmed:

- (1) The water pump basically does not reverse or the reverse is not serious;
 - (2) There is no obvious crash sound for valve closing;
 - (3) There is no obvious water pressure from water hammer, or the pressure rise of the water hammer is not greater than 1.2 times of the nominal pressure;
- This check valve can meet the requirements of the operating condition of the system. When the user uses this product for the first time, our company will send staff to guide the adjustment test. The specific test scheme shall be determined according to the working condition. (See Product Installation Instructions packed and delivered together with the product for detailed matters needing attention for the operation and maintenance of the product.)



Micro - Resistance Slow Closing Check Valve H47X/H

1. product Introduction

This product is a new anti-water-hammer energy-saving product, with vertical or inclined valve seat, double offset butterfly plate, all-metal sealing pair or wear-resistant rubber sealing pair, overflowing components, channel fluid, oil pressure slow-closing device. It can be closed at fast/slow stages. This product has significant energy-saving effect during operation. When the pump is normal or the pump is stopped due to sudden power failure, it can effectively prevent water backflow and destructive water hammer. The product can be widely used in petrochemical, electric power, metallurgy and urban water supply and drainage pipe systems.

This series of products fill several blanks in the domestic market, and have a number of patent properties.

2. performance Features

1. The butterfly plate is double offset structure. The opening and closing of the valve is reasonable.
2. All-metal sealing pair and wear-resistant rubber sealing pair are adopted, which have long service life and are maintenance-free and replaceable.
3. For the structural elements of valve chamber related to flow resistance characteristics, the principle of fluid mechanics is applied to determine their geometric elements, flow resistance and energy saving.
4. Good close performance of the valve can effectively prevent the occurrence of destructive water hammer.
5. Flexible and unblocking of the opening and closing of the butterfly plate/shaft.
6. The selection of the material of the friction pair, pairing, and the design of the sealing structure form and the installation location can guarantee that the butterfly plate/ valve shaft and other rotatable parts can maintain good rotation performance after long-term use.
7. The design of the products follows the "man-machine" engineering principle: The ease, accuracy and safety of operation of users, and maintenance of good product performance shall be overall considered as a system. For example: The oil cylinder is equipped with a transparent oil cup for quick and accurate understanding of the position. The main precautions for the use of the valve are markedly indicated with a board to be "Directly" displayed to first-line operators, so as to ensure safe operation.
8. The structural length shall be subject to GB1221. If the structural length is short, the weight is light.

3. Working Principle

This series of products are non-power equipment which can be opened and closed automatically with the running state of the water pump.

When the water pump is started, the product automatically opens the valve, rises heavy hammer (some products are not equipped with a heavy hammer), closely close the device to pull put the oil cylinder piston rod. When the pump is running, the product will work stably on the larger opening.

When the pump is stopped normally or accidentally, the product can automatically open the valve by fast stage and slow stage.

Quick closing stage: When the pump is stopped, the butterfly plate rapidly closes the valve for 75 - 85% (adjustable) angle stroke under the dead-load moment, hammer moment and backflow water, to cut off a large amount of backflow water.

Slow closing stage: At the end of the fast close stage, the preset throttling element in the cylinder of the slow closing device to throttle the hydraulic oil cycling in the cylinder, to generate damping and to slowly close the valve; The throttling element is of double-throttling structure. Its throttling area varies with the displacement change of angle stroke of butterfly plate during valve closing, with good slow closing performance.

The throttling element is adjustable and changeable, which can meet the needs of different working conditions.

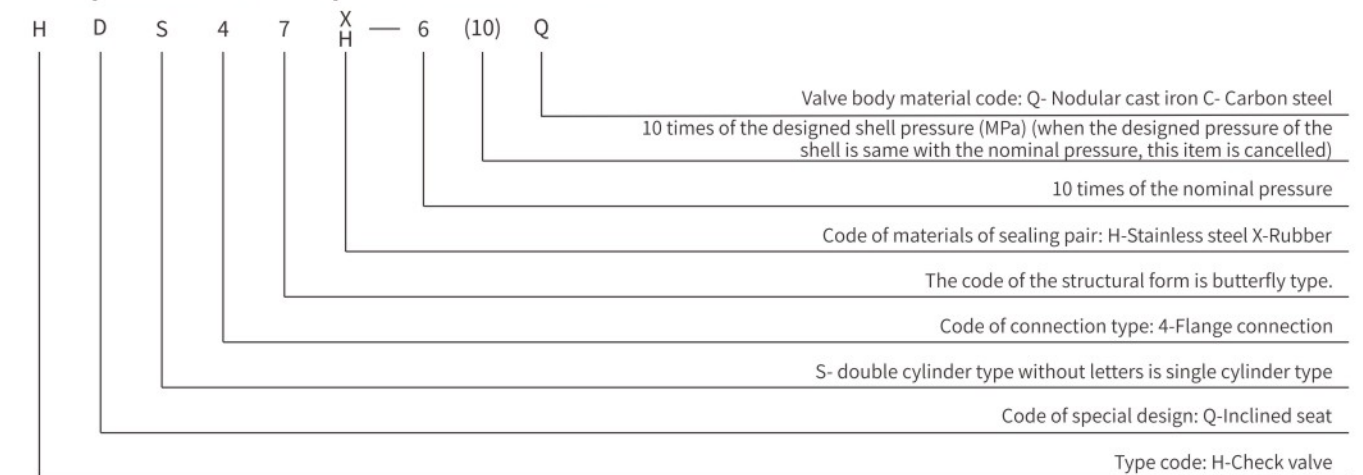
The slow closing device is completely separated from the medium with reliable performance. Larger-diameter products are equipped with double cylinders; Make valve closing more safe and reliable.

After the valve is closed, the sealing performance is good.

4. product Standard And Specification

Design and manufacture	Structure length	Connecting flange	Pressure-temperature grade	Inspection and test
CJ/T282 GB/T12238	GB 12221	GB/T17241.6 GB/T9113	GB 12386 GB/T 9131	GB/T 13927

5. Explanation Of Example Of Product Model



Note: For working conditions of large diameter and low lift, users generally want to determine the nominal pressure of the valve butterfly plate based on the pump lift (considering certain margin). Generally, the designed pressure level with one level or two levels higher is required to the shell. In order to reflect this situation objectively, the shell design pressure is taken into account in this product model compilation, as shown in the example above.

Explanation of other codes of the product: M - buried type, the valve can be buried in the ground, can be installed in the embedded pipe; S-double cylinder. Two cylinders shall be set: t-spring assistant closing; a spring shall be set in the oil cylinder, which accumulate energy when the valve is opened and generate the closing-assistant moment when the valve is closed, to promote the fast closing of the valve; q- submerged. This valve can be submerged in water and is suitable for deep standing water in the switch well.

Indicate the example. The operating condition The pump head of 20m, pipeline interface flange of DN1800, PN=0.60MPa; require double cylinders, spring-assistant closing; the valve body is carbon steel; when ordering, HQ47H_2.5 (6) CDN1800 shall be indicated according to the following form.

Micro - Resistance Slow Closing Check Valve H47X/H

6. product Technical Parameters

Name	参数							
Inside nominal diameter	250,300, 400,500, 600		250,300,400, 500,600,700, 800,900,1000		1200,1400,1600		1800,2000	
Nominal pressure	1.60	2.50	1.00	0.25	0.60	1.00	0.25	0.60
Sealing test pressure	1.80	2.80	1.10	0.28	0.66	1.10	0.28	0.66
Shell design pressure	1.60	2.50	1.00	0.60/1.00		0.60		
Shell test pressure	2.40	3.80	1.50	0.90/1.50		0.90		
Working temperature	-10~120-10~200-10~350							
Applicable medium	Water, oil, air and weak corrosive fluids							
Flow rate of medium	≤4							
Close method of valve	The fast closing and slow closing time at the fast/slow stage is adjustable.							
Structure length	In accordance with GB12221 (PN1.6/2.5 product is the enterprise standard)							

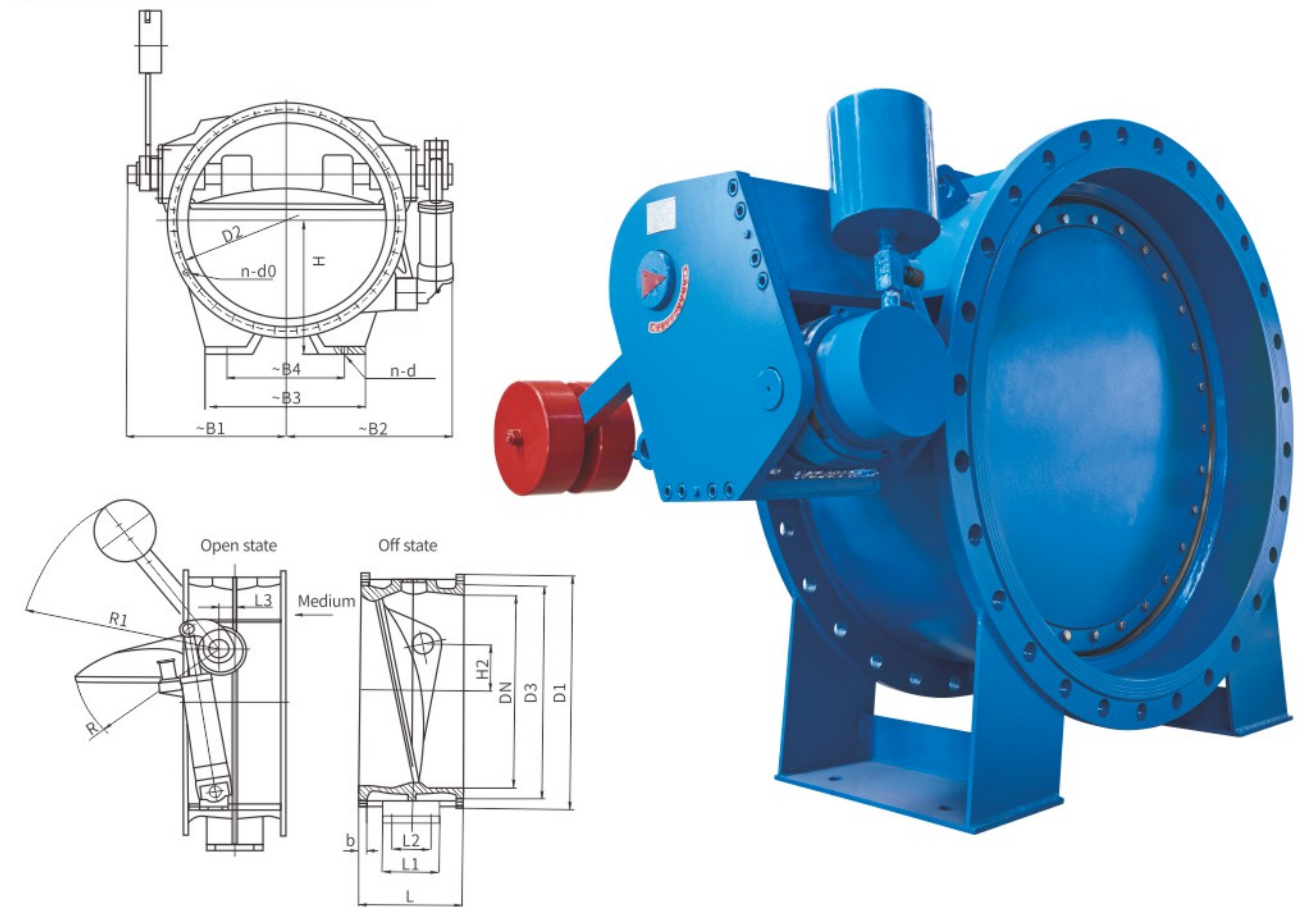
7. Materials Of Main Parts

Name	Valve body	Butterfly plate	Valve shaft	Bearing	Sealing pair	Seal ring	Piston ring of oil cylinder
Material	Nodular cast iron High-quality carbon steel	WCB	2Cr13	Three-layer composite self-lubricating bearing material	Stainless steel Overlaying Stainless steel	Nitrile rubber buna EPDM Fluororubber, etc.	alloy cast iron

If the user needs other materials, it can be negotiated separately.

Micro - Resistance Slow Closing Check Valve H47X/H

7. Specification of DN250-DN1000

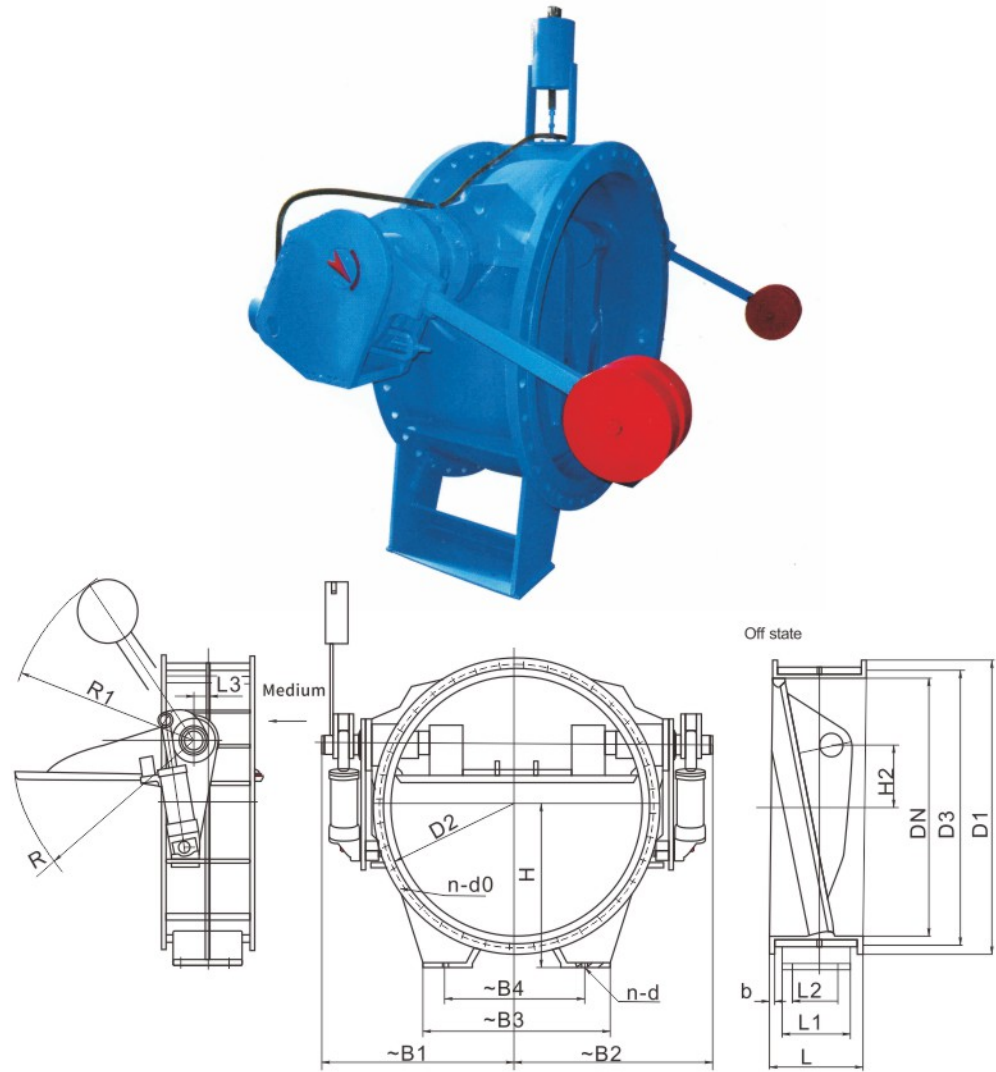


DN	PN	D ₁	D ₂	D ₃	L	b	L ₁	L ₂	L ₃	R	R ₁	H	H ₁	H ₂	B ₁	B ₂	B ₃	B ₄	n-d ₀	n-d	Weight
250	1.0	395	350	319	250	26			5	200		230	390	60	330	405	150		12-23		120
300	1.0	445	400	370	270	26			5	220		255	390	70	355	430	180		12-23		320
400	1.0	565	515	480	310	26			10	280		315	455	95	415	510	250		16-28		400
500	1.0	670	620	582	350	350			10	370		365	450	116	475	550	300		20-28		500
600	1.0	780	725	682	390	390			15	430		420	430	140	525	600	340		20-31		750
700	1.0	895	840	794	430	430			20	490		480	570	165	615	700	400		24-31		900
800	1.0	1015	950	901	470	470	290	190	20	580	820	650		190	735	800	740	560	24-34	4-34	1100
900	1.0	1115	1050	1001	510	510	330	190	30	650	1000	700		210	840	920	440	580	28-34	4-34	1500
1000	1.0	1230	1160	1112	550	550	360	200	40	710	1000	760		240	950	1060	850	650	28-37	4-36	2000

The structural length shall be subject to GB12221 long series
The company reserves the right for no previous notice of the improvement change of some structure size

Micro - Resistance Slow Closing Check Valve H47X/H

Specification of DN1200-DN1600



DN	PN	D1	D2	D3	L	b	L1	L2	L3	R	R1	H	H2	B1	B2	B3	B4	n-d0	n-d	Weight
1200	1.0	1455	1380	1328	630	630	350	240	50	860	1200	855	290	970	1200	900	700	32-40	4-42	3200
1400	1.0	1675	1590	1530	710	710	460	280	60	1000	1300	990	350	1080	1320	1080	780	36-43	4-42	5500
1600	1.0	1915	1820	1750	790	50	540	290	70	1170	1300	1110	400	1350	1350	1280	920	40-49	4-48	5800
1800	0.6	2045	1970	1918	670	36	490	335	100	1300	1300	1130	430	970	1200	1320	1000	44-37	4-42	4500
2000	0.6	2265	2180	2125	760	38	570	415	110	1400	1300	1300	480	1120	1350	1520	1200	48-43	4-42	5500

The DN1600 valve body is made of nodular cast iron. Its structural length shall be subject to GB12221 long series.
The DN1800 and DN2000 valve bodies are made of carbon steel. Its structural length shall be subject to GB12221 short series.
The company reserves the right for no previous notice of the improvement change of some structure size.

Micro - Resistance Slow Closing Check Valve H47X/H

8. Characteristics of valve closing

Quick closing stage: The butterfly plate rapidly closes the valve for 80 - 85% (adjustable) angle stroke under the relevant moment and backflow water, to cut off a large amount of backflow water. **Slow closing stage:** At the end of quick closing stage, the preset throttling element in the cylinder of the slow-closing device shall be used for throttling.

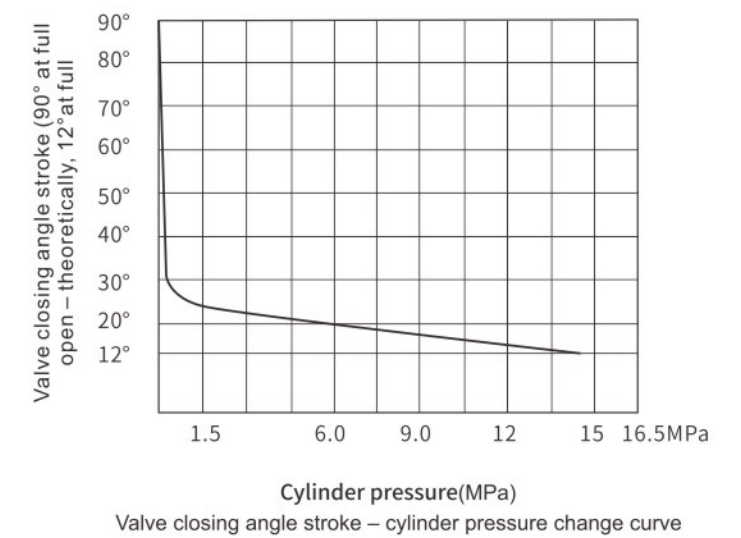
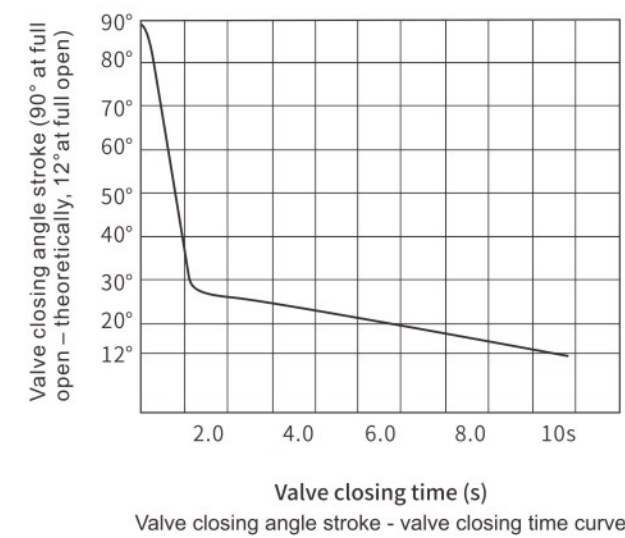
Start slow-closing: The throttling element is of double-throttling structure. Its throttling area varies with the displacement change of angle stroke of butterfly plate during valve closing, with good slow closing performance. The throttling element is adjustable and changeable. It can be adjusted or replaced according to different working conditions

For valve closing characteristics of this series of products, please refer to the following example of valve closing relationship curve:

Diagram on the left: Valve closing angle stroke - valve closing time curve.

Diagram on the right: Valve closing angle stroke - pressure change curve of cylinder of the slow closing device during valve closing

If the valve seat of this series of product is inclined type, the inclination angle is 12°, so that the angle is 12° at full open)

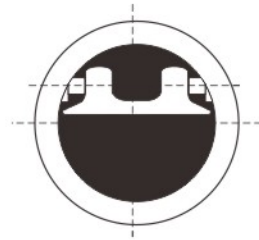


The actual operating conditions are different, the adjustment of the relevant parameters of the closing valve is different, and the relationship of the closed valve correlation curve is also different. The above figure is only an example.

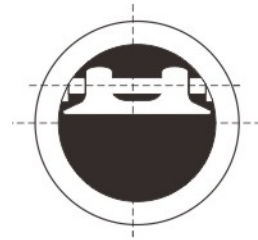
Micro - Resistance Slow Closing Check Valve H47X/H

9. Flow Characteristics And Flow Resistance Characteristics

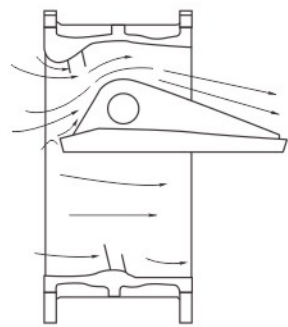
This series of products use the principle of fluid mechanics to reasonably design the flow section of the valve cavity which is related to the flow characteristic and flow resistance characteristic (see the left blueprint below), with large cross section of fluid flow, small flow resistance and energy saving



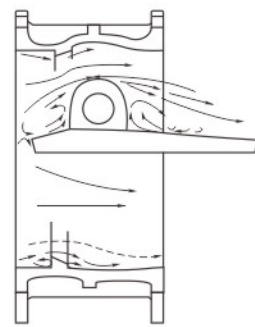
The valve shaft is sectional flow section with good high flow characteristic.



The valve shaft is integral flow section with good small flow characteristic.

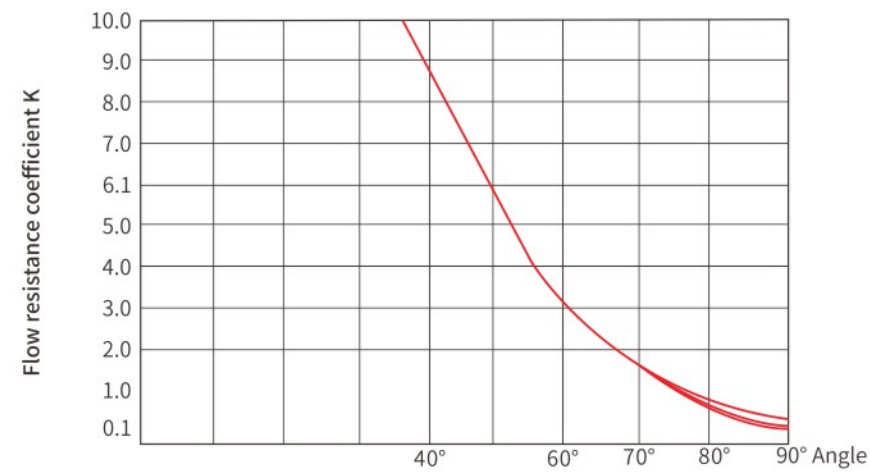


The flow section is designed according to the principle of fluid mechanics, with less eddy in the flow, small eddy-making resistance and energy saving.



The flow section is not designed according to the principle of fluid mechanics, with much eddy in the flow, large eddy-making resistance and energy dissipation.

Relation Curve Of Flow Resistance Coefficient K And Valve Opening Angle
(DN600 DN800 DN1200 values)



Micro - Resistance Slow Closing Check Valve H47X/H

Flow coefficient Kv and flow resistance coefficient K(ζ)

The flow coefficient Kv and flow resistance coefficient K when the valve is fully opened(ζ)

Inside Nominal Diameter	Kv		K(ζ)	
	PN:0.6MPa	PN:1.0MPa	PN:0.6MPa	PN:1.0MPa
250		0.086	0.65	
300		0.13	0.59	
400		0.24	0.51	
500		0.39	0.50	
600		0.58	0.47	
700		0.83	0.43	
800		1.15	0.38	
900		1.50	0.36	
1000		1.90	0.34	
1200	2.92	2.83	0.3	0.32
1400	4.04	3.97	0.29	0.30
1600	5.37		0.28	
1800	7.19		0.25	
2000	9.10		0.24	

注:

Kv- the flow coefficient in the unit of m³/h in certain stroke when water flows through two ends of the valve, with the differential pressure of 100KPa, test water temperature of 5-40°C and medium density of kg/m³.

$$Kv = Q \sqrt{\frac{\rho}{\Delta P}}$$

K- flow resistance coefficient, the non-dimensional coefficient of valve pressure loss. $K = \frac{2\Delta P}{\rho V^2}$

The relational expression of the floe coefficient/ flow resistance coefficient of the valve: $Kv = A \sqrt{\frac{K}{2}}$

A—The sectional area of the valve passageway m²

(See JB/T5296-91 Valves for General Purposes-Test Method of Flow Coefficient and Flow Resistance Coefficient)

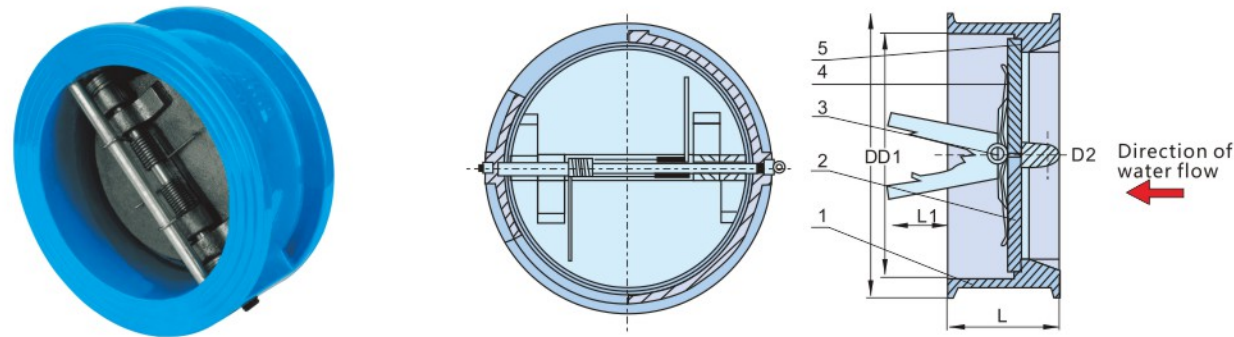
Wafer Check Valve

H76X

Overview

Double disc check valve is mainly composed of valve body, disc, stem and spring, etc. and is designed in thin and light. Due to the shortening of the closing stroke between the disc and the spring action, the closing effect can be accelerated, and the water hammer and water hammer sound can be reduced.

The valve is mainly used in water supply systems, high-rise buildings and industrial areas. Because the distance between its surfaces is shorter than the general check valve, it is most convenient to places with limited installation space.



Technical parameters

Pressure grade	PN10, PN16
Maximum working pressure	1MPa, 1.6MPa
Test pressure of valve seat	1.1MPa, 1.76MPa
Test pressure of valve body	1.5MPa, 2.4MPa

Materials of main parts

No.	Part name	Material
1	Valve body	Gray cast iron (PN10)
		Nodular cast iron (PN16)
2	Valve clack	Aluminum bronze
3	Valve rod	Stainless steel
4	Spring	Stainless steel
5	Valve seat	Rubber

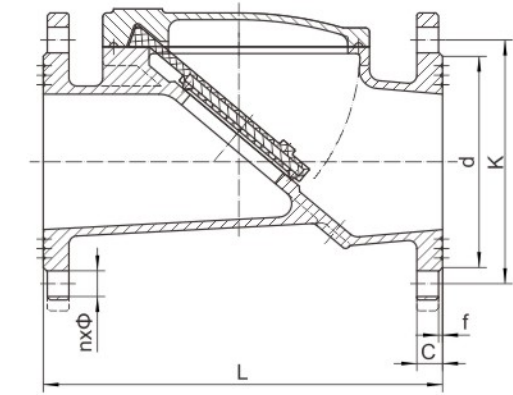
Size table

公称通径DN	产品代号	L	L1	D1	D2	D	
						PN10	PN16
50	DDCV-0050	54	6	65	48	105	105
65	DDCV-0065	60	10	78	57	124	124
80	DDCV-0080	67	10	91	70	137	137
100	DDCV-0100	67	20	117	91	162.5	162.5
125	DDCV-0125	83	25	144	113	192.5	192.5
150	DDCV-0150	95	32	171	135	218	218
200	DDCV-0200	127	40	222	176	273	273
250	DDCV-0250	140	59	276	222	328	329
300	DDCV-0300	181	64	327	270	379	378
350	DDCV-0350	184	80	377	320	435	437
400	DDCV-0400	190	106	426	365	482	488
450	DDCV-0450	222	116	478	407	538	556
500	DDCV-0500	229	138	527	454	590	617
600	DDCV-0600	267	169	626	563	685	730
700	DDCV-0700	292	205	722	660	804	804
800	DDCV-0800	318	240	822	760	911	911

Attention: If other valves must be installed at the rear end of this valve, the impact of L1 stroke must be considered to avoid collision with the inner parts of the pipe.

Swing non-return valve

H44X



Performance specification table

Nominal pressure		PN10	PN16	MPa
Test pressure	Shell strength	1.5	2.4	
	Liquid high-pressure sealing	1.1	1.76	
Medium temperature		-10~80°C		
Applicable medium		Clean water, etc.		

Materials of main parts

Valve body	Nodular cast iron, gray pig iron
Bonnet	Nodular cast iron, gray pig iron
Valve clack	High-quality carbon structural steel + nylon + rubber
Seal ring	Nitrile rubber, EPDM
Fastener	High-quality carbon structural steel, stainless steel

Main dimensions

DN	L	D		K		d		C		f	nxΦ	
		PN10	PN16	PN10	PN16	PN10	PN16	PN10	PN16		PN10	PN16
40	203	150	150	110	110	84	84	19	19	3	4×19	4×19
50	203	165	165	125	125	99	99	19	19	3	4×19	4×19
65	216	185	185	145	145	118	118	19	19	3	4×19	4×19
80	241	200	200	160	160	132	132	19	19	3	8×19	8×19
100	292	220	220	180	180	156	156	19	19	3	8×19	8×19
125	330	250	250	210	210	184	184	19	19	3	8×19	8×19
150	356	285	285	240	240	211	211	19	19	3	8×23	8×23
200	495	340	340	295	295	266	266	20	20	3	8×23	12×23
250	622	395	405	350	355	319	319	22	22	3	12×23	12×28
300	698	445	460	400	410	370	370	24.5	24.5	4	12×23	12×28
350	686	505	520	460	470	429	429	24.5	26.5	4	16×23	16×28
400	762	565	580	515	525	480	480	24.5	28	4	16×28	16×31
450	864	615	640	565	585	530	548	25.5	30	4	20×28	20×31
500	914	670	715	620	650	582	609	26.5	31.5	4	20×28	20×34
600	1064	780	840	725	770	682	720	30	36	5	20×31	20×37