



Automatic recycling control valve

CAVAL INC.

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About us

As one of the manufacturers of professional flow control, CAVAL Company designs, manufactures, and delivers an expanding range of the highest quality fluid system products and solutions. Through the exclusive network of authorized CAVAL sales and service centers, CAVAL Company delivers knowledge, resources, innovations, and value to customers worldwide.

CAVAL valves are manufactured in 3 specialized plants in the USA, Canada and Mexico through six continents in 18 countries across more than 130 authorized sales and service center network supporting local customers. Until today, we have cooperated with many nuclear power plants and chemical plants in the world, having a great reputation in the valve field.

Commitment Drives Performance.

Our organization holds a long-term view of how to operate a successful, responsible company.

This commitment is evident in four key areas:

Treating everyone with whom we come in contact with integrity and respect – core values that we strive to live by each day.

Ensuring our operational and financial integrity and stability, and maintaining sound corporate governance.

Continually enhancing our technical capabilities and thought leadership – and making them impactful for customers.

Controlling what we can control, which means innovating and adding value no matter what the economic and market conditions.

We believe that a successful, sustainable enterprise starts with being a good corporate citizen. Our corporate values – Customer Focus, Quality, Integrity, Respect for the Individual, Innovation and Continuous Improvement – guide everything we do.

With your support, we are able to be a preferred employer, a high-quality, technology-driven supplier, a critical link in the supply chain, and a responsible corporate citizen – all of which define us as a sustainable organization. We encourage you to engage with us through our sales and service centers to discover how we can partner in Creating Sustainable Performance through Shared Commitment.

Automatic Recirculation Control valve

Modern industrial equipment process request centrifugal pump are basically work under condition of variable flow, which needs set up automatic control devices in the process. However, when centrifugal pump under low load operation will appear overheating, serious noise, unstable and erosion which caused damage of pump. At this moment needs a kind of automatic recycle equipment, when pump under low load operation, through the bypass realize pump minimum flow backflow cycle.



Through many years of research and development, continuous innovation and practice, CAVAL research AR series Automatic Recycle Pump Protection Valve, to prevent prevent overheating, serious noise, unstable and erosion damage of centrifugal pump under low load operation.

As long as the flow rate of the pump valve below a certain value, the bypass backflow mouth will automatically open to ensure necessary minimum flow of pump.

Widespread application on

- Chemical industry
- Petrochemical industry
- Steel factory
- Fire protection system
- Traditional power plant
- Paper-making industry
- Shipment/shipping
- Environmental protection industry

THREE PROTECTION WAYS FOR PUMP

- **Continuous circulating system**

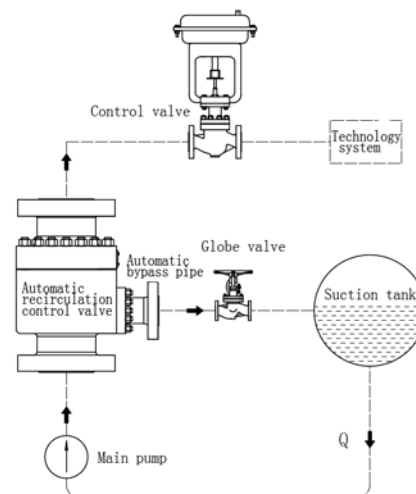
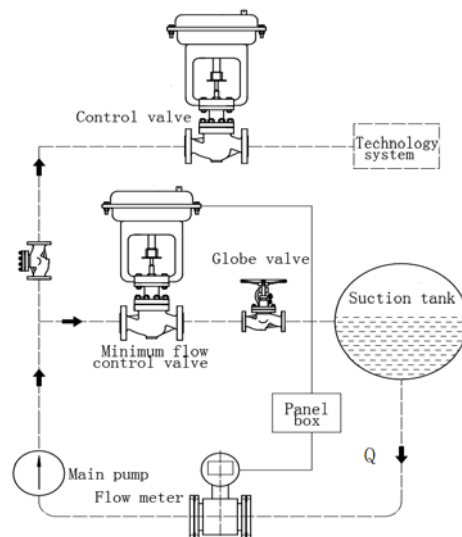
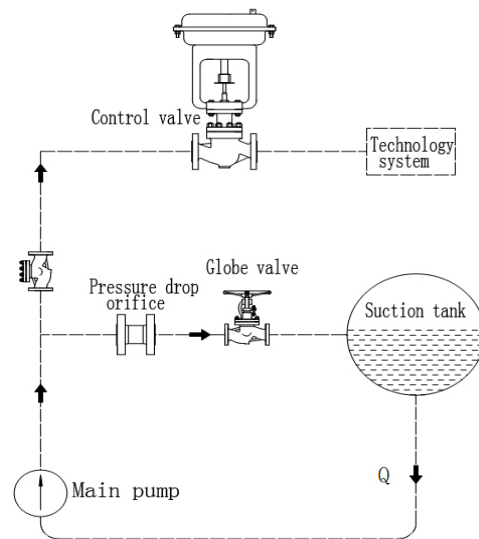
Minimum requirement of continuous circulating system pump is unrelated with the discharge of Process flow changes system. After setting of minimum flow, through orifice plate directly backflow to storage tank. Although continuous minimum flow circulation can protect pump very good, but pump must provide greater power output to ensure system process flow plus recycle flow, which causing additional energy waste.

- **Control circulating system**

Control circulatory system is assembly by the check valve, flow gauge, minimum flow control valve, control circulation system, control circulation system can provide minimum flow protection, when process flow is greater than minimum flow of pump, loop closed, no extra energy loss. But system is complex, control components, purchase, installation, maintenance cost is higher.

- **Automatic Recycle Valve system**

Automatic Recycle valve set check valve, flow perception, bypass control valve, multi-stage step-down in one, do not need power, control system and wiring, essential safety. Take up little space, which reduced the possibility of high-speed fluid to malfunction to minimum. Installation and maintenance cost is low, is the priority pump protection way of modern industrial process.



AR SERIES AUTOMATIC RECYCLE PUMP PROTECTION VALVE

ART Model

- Simple structure, low cost, the long life, suitable for Low pressure Working condition.
- Cast valve body, can choose carbon steel or stainless steel material,ect.
- Bypass flow big, maximum flow is 60% of main flow, KV value can be adjusted.
- Bypass maximum operating pressure differential is 4MPa.
- Pressure level is from PN16 to PN64, diameter is from DN25 to DN400.

ARL Model

- Multi-cage bypass, low noise, suitable for middle and low voltage conditions.
- Forged steel valve body,can choose carbon steel or Stainless steel material, etc.
- Standard bypass non-return valve function, maximum working pressure differential is 6MPa
- With venturi port main flow check valve structure, be applicable for complicated working conditions.
- Pressure grade from PN16 to PN100, diameter from DN25 to DN500.
- Can select manual bypass operation function, used on fault conditions.

ARM Model

- Prevent cavitation multistage decompression bypass, reducing velocity, suitable for high pressure conditions.
- Forged valve body, can choose C.S or S.S material, etc.
- Standard bypass non-return valve function, maximum working pressure differential is 30MPa.
- Pressure grade from PN16 to PN420, diameter from DN25 to DN500.
- Can select manual bypass operation function, used on fault conditions.

Automatic recirculation control valve

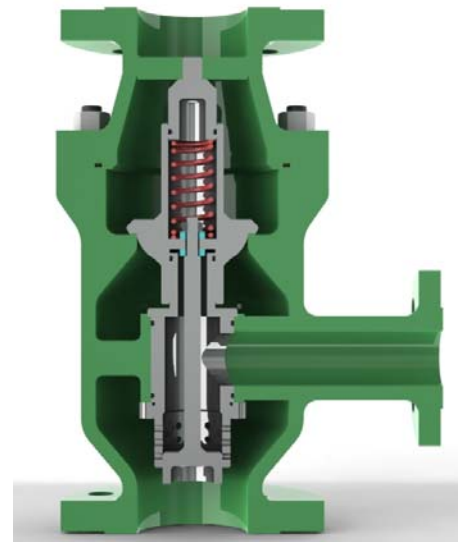
ART Model



Introduction

ART series Automatic Recycle valve is a kind of pump protection device. It automatic protect centrifugal pump when pump body occur cavitation damage or unstable (especially conveying hot water at low load operation medium). Once pump flow is lower than the preseted flow, bypass can completely open to ensure the minimum required flow pump. Even running fully closed, namely running flow is zero, the minimum flow can also pass bypass for Automatic Recycle. Pressure reduced through the multistage bypass pressure reducing valve.

ART series has big bypass, and this valve is suitable for bypass with big flow, maximum pressure differential is 4MPa, specific choice is determined by factory.



Characteristics

- Simple structure, operation reliable and stabile, with few movement parts.
- Be easy for installation, can be installed vertically or horizontally on pump pressure outlet.
- Bypass flow is large, maximum flow is 60% of main flow, KV value can be adjusted.
- Maximum bypass operating pressure differential is 4MPa. Bypass non-return function is optional.
- Applicable medium including: water, oil, methanol and other liquid medium.

Working temperature is from -196℃ to +300 ℃.

Diameter and pressure range

Valve body type: three-way casting valve

Nominal diameter: DN25, 32, 40, 50, 65, 80, 100, 200, 250, 300, 350, 400

Nominal pressure: PN 16, 25, 40, 64, Class 150, 300 L, etc.

Connection type: flange FF, RF, RTJ, BW, SW etc .

Material temperature range

Body material Sealing material	WCB	LCB/LCC	CF8	CF8M
NBR	-20~+100	-30~+100	-30~+100	-30~+100
FKM	-20~+200	-40~+200	-40~+200	-40~+200
PTFE	-20~+230	-40~+230	-80~+230	-80~+230
SS winding gasket	-20~+300	-40~+300	-196~+300	-196~+300

Model Selection

AR	T	Nominal pressure	Body material	Main diameter	/Bypass diameter	Structure type
Auto recirculation pump protection valve	T type bypass assembly	PN16=PN16 CLSS150LB=C L150	C=WCB LC=LCB P=CF8 PL=CF3 R=CF8M RL=CF3M D=Customed	DN25=25 NPS1"=1"	DN25=25 NPS1"=1"	V=vertically mounted H=Horizontally mounted Z=Bypass non-return D=With discharge mouth
Such as: T type Automatic Recycle valve, pressure is PN40, body material is WCB, main diameter DN50, Bypass diameter DN 25, vertically mounted, Model: ART-PN40-C-50/25-V						

Working principle

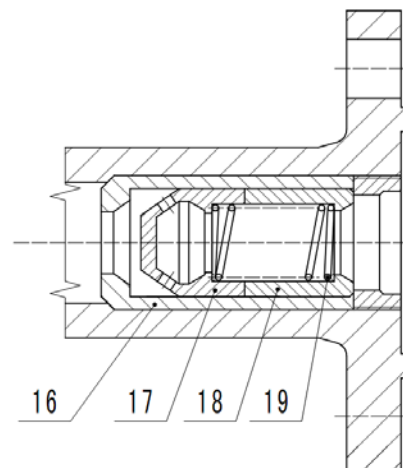
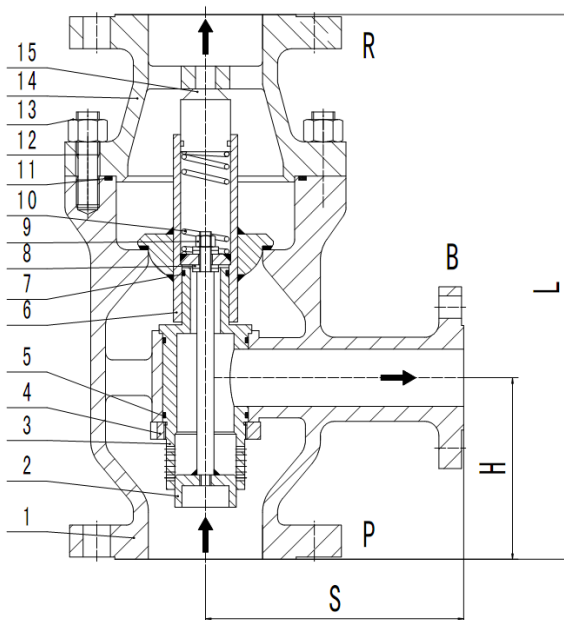
According to the difference of inductive main flow, main valve disc check cone of Automatic Recycle valve will automatically move to a certain position. At the same time the main valve disc drive bypass valve stem, transfer the movement of main valve disc to bypass, through control bypass valve disc position, change bypass throttling area, so as to control bypass flow. When main valve disc back into valve seat closed, all flow backflow through bypass. When main valve disc to rise to top position, bypass is fully closed, all the flow of pump flow to process system. This valve set four functions in one body.

- Flow perception: Automatic Recycle valve main valve disc can automatically perceive main flow of process system, thereby according to the flow to determine position of main valve disc and bypass disc.
- Recirculation control: Automatic Recycle valve can inhaled pump normal operation required minimum flow into storage device through bypass, so as to adjust pump H - Q characteristics, to realize recycling.
- Bypass multistage pressure reducing: bypass control system can reduced the backflow medium from high-pressure pump outlet to appropriate backflow to low-pressure storage device with low noise and small wear.
- Check: Automatic Recycle valve also has check valve effect, preventing the liquid backflow to pump body. Bypass non-return function is optional.
- Special bypass size can be customized. The max flow rate of bypass is subject to the max Kv value.

Size

Valve size	mm	25	32	40	50	65	80	100	125	150	200	250	300
	in	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Max main flow	m ³ /h	12	28	30	50	100	114	200	400	455	750	1250	1650
Bypass size	mm	15	20	20	25	40	40	50	80	80	100	100	150
	in	1/2	3/4	3/4	1	1 1/2	1 1/2	2	3	3	4	4	6
Max bypass Kv	Cv	2.3	4.6	4.6	6.9	18.5	18.5	34.7	69.3	69.3	116	116	170

Note: Valve main outlet size depends on the outlet size of pump.



* bypass Non-return function

Parts and material

NO	Name	Material		NO	Name	Material	
1	Body	WCB	CF8	11	O ring	EPDM	EPDM
2	Recycle disc	2Cr13	304	12	Stud bolt	45	0Cr18Ni9
3	Recycle seat	2Cr13	304	13	Hex nut	35	0Cr18Ni9
4	Screw gland	2Cr13	304	14	Bonnet	WCB	CF8
5	O ring	EPDM	EPDM	15	Guide block	2Cr13	304
6	Main disc	2Cr13+STL	304+STL	16	Bushing	2Cr13	304
7	O ring	EPDM	EPDM	17	Porous set	2Cr13	304
8	Gasket	2Cr13	304	18	End ring	2Cr13	304
9	Hexagon nut	304	304	19	Spring 2	60Si2Mn	1Cr18Ni9Ti
10	Spring	60Si2Mn	1Cr18Ni9Ti				

Dimension and weight

Valve specification DNP DNR	Size mm (in)			Bypass (DNB	Weight Kg	
	S	H	L		PN10/16/25 150lbs	PN40/64 300lbs
25 (1")	115	102	267	15	12	18
32 (1 1/4")	115	102	267	20	14	20
40 (1 1/2")	115	102	267	20	14	20
50 (2")	130	108	305	25	22	26
65 (2 1/2")	165	127	381	40	46	51
80 (3")	181	127	381	40	46	51
100 (4")	209	159	495	50	105	118
125 (5")	267	220	575	80	143	156
150 (6")	267	220	575	80	220	240
200 (8")	300	220	600	100	255	302
250 (10")	356	305	780	100	400	455
300 (12")	530	280	830	150	590	650

※ Since product innovation and technical innovation or some special requirements, various valve connecting size may change, please contact CAVAL technical department to get the latest product information.

AUTOMATIC RECIRCULATION VALVE DATA SHEET

Customer Name:		Date:	
Inquiry No.:		Technical Annex No.:	
TAG No.:		Quantity:	
Valve information			
Valve Model:			
Size DN/INCH	Inlet :	Nominal pressure PN/CLASS	Inlet :
	Outlet :		Outlet :
	Bypass :		Bypass :
Material	Body:		
	Trim:		
	Seals:		
	Sealing surface:		
Connection Type	Flange standard/Grade:		
	Welding standard/Grade:		
Orientation of Valve: <input type="checkbox"/> Vertical <input type="checkbox"/> Horizontal			
Process information			
Fluid medium		Density	
Operation Temperature		Design Temperature	
Pump rated flow rate		Pump rated pressure	
Pump normal flow rate		Pump normal pressure	
Pump Minimum flow rate		Pump maximum pressure	
Bypass back pressure			
For more information, please contact us by E-mail: info@cavalinc.com			

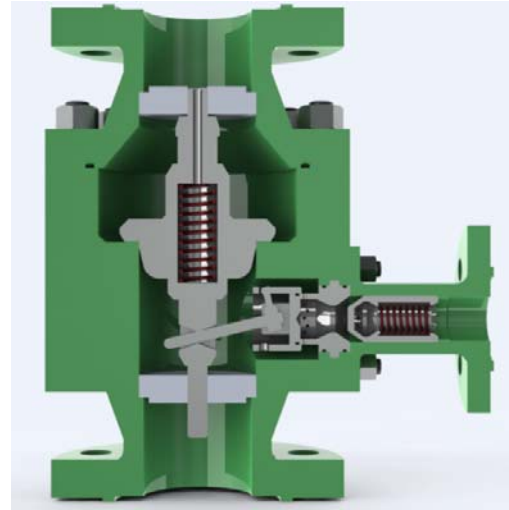
Automatic recirculation control valve

ARL Series



Introduction

ARL series Automatic Recycle valve is a kind of pump protection device. It automatic protect centrifugal pump when pump body occur cavitation damage or unstable (especially conveying hot water at low load operation medium). Once pump flow is lower than the presetted flow, bypass can completely open to ensure the minimum required flow pump. Even running fully closed, namely running flow is zero, the minimum flow can also pass bypass for Automatic Recycle. Pressure reduced through the multistage bypass pressure reducing valve.



ARL series is suitable for bypass with medium or low pressure differential, maximum pressure differential is 6MPa, and specific choice is determined by factory. Unique L bypass can eliminated noise by made high-speed flow medium, and prevent cavitation.

Characteristics

- Multi-cage type bypass, low noise, suitable for medium and low pressure working conditions.
- Forged valve body, can choose carbon steel or stainless steel material, etc.
- Standard bypass non-return function, maximum working pressure differential is 6MPa.
- With venturi port main flow non-return structure, adapt to complicated conditions.
- Pressure grade from PN16 to PN100, diameter from DN2to DN500.
- Can select manual bypass operation function, used in fault.

Size and pressure range

Body type: Three-way forged body.

Nominal diameter: DN25, 32, 40, 50, 65, 80,100, 200, 250, 300, 350, 400, 450, 500.

Nominal pressure: PN 16, 25, 40, 64, 100 CLASS 150, 300, 600 LB.

End connection: Flange, FF, RF, RTJ, BW,SW etc.

Material applicable temperature

Body material Sealing material	A105	LF2	F304	F316
NBR	-20~+100	-30~+100	-30~+100	-30~+100
FKM	-20~+200	-40~+200	-40~+200	-40~+200
PTFE	-20~+230	-40~+230	-80~+230	-80~+230
SS winding gasket	-20~+300	-40~+300	-196~+300	-196~+300

Model Selection

AR	L	Nominal pressure	Body material	Nominal diameter	/Bypass diameter	Structure type
Automatic Recycle Pump Protection Valve	L type bypass assembly	PN16=PN16 CLSS150LB=CL150	C=WCB LC=LCB P=CF8 PL=CF3 R=CF8M RL=CF3M D=Customed material	DN25=25 NPS1"=1"	DN25=25 NPS1"=1"	V = Vertically mounted H = Horizontally mounted S = manual startup
Such as: L type Automatic Recycle valve, pressure is PN40, body material is WCB, Main diameter DN50, bypass diameter DN25, vertically mounted, Model: ARL-PN40-C-50/25-V						

Working principle

According to the difference of inductive main flow, main valve disc check cone of Automatic Recycle valve will automatically move to a certain position. At the same time the main valve disc drive bypass valve stem, transfer the movement of main valve disc to bypass, through control bypass valve disc position, change bypass throttling area, so as to control bypass flow. When main valve disc back into valve seat closed, all flow backflow through bypass. When main valve disc to rise to top position, bypass is fully closed, all the flow of pump flow to process system. This valve set four functions in one body.

- Flow perception: Automatic Recycle valve main valve disc can automatically perceive main flow of process system, thereby according to the flow to determine position of main valve disc and bypass disc.
- Recirculation control: Automatic Recycle valve can inhaled pump normal operation required minimum flow into storage device through bypass, so as to adjust pump H - Q characteristics, to realize recycling.
- Bypass multistage pressure reducing: bypass control system can reduced the backflow medium from high-pressure pump outlet to appropriate backflow to low-pressure storage device with low noise small wear.
- Check: Automatic Recycle valve also has check valve effect, preventing the liquid backflow to pump body. Bypass non return function is standard.
- Special bypass size can be customized. The max flow rate of bypass is subject to the max Kv value.

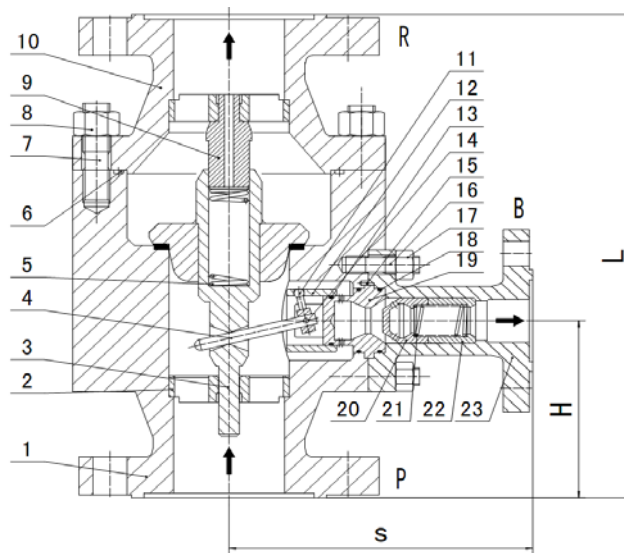
Note

Other bypass size can be made according to requirements, maximum bypass flow depends on maximum Kv value.

Size

Valve size	mm	25	32	40	50	65	80	100	125	150	200	250	300
	in	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Max main flow	m ³ /h	12	28	30	50	100	114	200	400	455	750	1250	1650
Bypass size	mm	15	20	20	25	40	40	50	50	65	80	100	125
	in	1/2	3/4	3/4	1	1 1/2	1 1/2	2	2	2 1/2	3	4	5
Max bypass Kv	Cv	1.6	2.9	2.9	3.7	6.8	6.8	12.3	12.3	21.7	31	51	86

Note: Valve main outlet size depends on the outlet size of pump.



Parts and materials

NO	Name	NO	Name	NO	Name	NO	Name
1	Body	7	Stud bolt	13	O ring	19	Control head
2	Guide ring	8	Hex nut	14	Pin 1	20	Multi-hole sleeve
3	Main valve disc	9	Guide screw Guide pin	15	Pin 2	21	Spring 2
4	Leverage	10	Bonnet	16	Double-head stud B type	22	Slide Ring
5	Spring 1	11	Turn arm	17	Hex nut	23	Bypass valve body
6	O ring	12	Control slide	18	Oring		

Dimension and weight

DN	PN(bar)	DNB	L(mm)	A(mm)	H(mm)	Weight(Kg)
25	10-16-25-40	25	190	153	73	17
	63-100		250	182	90	32
32	10-16-25-40	25	190	153	73	19
	63-100		250	182	90	32
40	10-16-25-40	25	200	155	75	19
	63-100-160		260	190	90	32
50	10-16-25-40	25	230	163	90	27
	63-100-160		300	185	115	41
65	10-16-25-40	40	290	184	110	42
	63-100-160		340	219	125	60
80	10-16-25-40	40	310	191	115	52
	63-100-160		380	233	140	74
100	10-16-25-40	50	350	221	125	81
	63-100-160		430	258	155	112
125	10-16-25-40	50	400	266	135	122
	63-100-160		500	280	175	182
150	10-16-25-40	65	480	295	165	138
	63-100		550	350	190	273
200	10-16-25-40	80	600	395	200	241
	63-100		650	405	215	467
250	10-16-25-40	100	730	475	240	411
	63-100		775	520	260	714
300	10-16-25-40	125	850	530	280	740
	63-100		900	550	300	930

※Since product innovation and technical innovation or some special requirements, various valve connecting size may change, please contact CAVAL technical department to get the latest product information. We can also produce according to your requirements.

AUTOMATIC RECIRCULATION VALVE DATA SHEET

Customer Name:		Date:	
Inquiry No.:		Technical Annex No.:	
TAG No.:		Quantity:	
Valve information			
Valve Model:			
Size DN/INCH	Inlet :	Nominal pressure PN/CLASS	Inlet :
	Outlet :		Outlet :
	Bypass :		Bypass :
Material	Body:		
	Trim:		
	Seals:		
	Sealing surface:		
Connection Type	Flange standard/Grade:		
	Welding standard/Grade:		
Orientation of Valve: <input type="checkbox"/> Vertical <input type="checkbox"/> Horizontal			
Process information			
Fluid medium		Density	
Operation Temperature		Design Temperature	
Pump rated flow rate		Pump rated pressure	
Pump normal flow rate		Pump normal pressure	
Pump Minimum flow rate		Pump maximum pressure	
Bypass back pressure			
For more information, please contact us by E-mail: info@cavalinc.com			

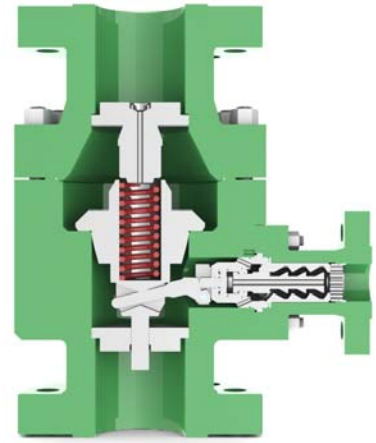
Automatic recirculation control valve

ARM Series



Introduction

ARM series Automatic Recycle valve is a kind of pump protection device. It automatic protect centrifugal pump when pump body occur cavitation damage or unstable (especially conveying hot water at low load operation medium). Once pump flow is lower than the preseted flow, bypass can completely open to ensure the minimum required flow pump. Even running fully closed, namely running flow is zero, the minimum flow can also pass bypass for Automatic Recycle. Pressure reduced through the multistage bypass pressure reducing valve.



ARM series is suitable for bypass with high pressure differential, maximum pressure differential is 30MPa, and specific choice is determined by factory. Multistage decompression type M type bypass can eliminate noise made by high-speed flow medium, prevent damage of cavitation erosion and braising to valve components.

Characteristic

- Prevent cavitation multistage decompression bypass, reducing velocity, suitable for high pressure conditions
- Forged valve body, or you can choose carbon steel or stainless steel material, etc.
- Standard bypass non-return function, maximum working pressure differential is 30MPa.
- Pressure grade from PN16 to PN420, diameter from DN2to DN500.
- Can select manual bypass operation function, used in fault.

Size and pressure range

Body type: Three-way forged valve

Nominal diameter: DN25, 32, 40, 50, 65, 80,100, 200, 250, 300, 350, 400, 450, 500

Nominal pressure: PN 16,25,40,64,100,160,250,420 CLASS 150, 300, 600, 900, 1500, 2500LB

End connection: Flange, FF, RF, RTJ, BW, SW etc.

Material temperature range

Body material	A105	LF2	F304	F316
Sealing material				
NBR	-20~+100	-30~+100	-30~+100	-30~+100
FKM	-20~+200	-40~+200	-40~+200	-40~+200
PTFE	-20~+230	-40~+230	-80~+230	-80~+230
Stainless steel gasket	-20~+300	-40~+300	-196~+300	-196~+300

Working principle

According to the difference of inductive main flow, main valve disc check cone of Automatic Recycle valve will automatically move to a certain position. At the same time the main valve disc drive bypass valve stem, transfer the movement of main valve disc to bypass, through control bypass valve disc position, change bypass throttling area, so as to control bypass flow. When main valve disc back into valve seat closed, all flow backflow through bypass. When main valve disc to rise to top position, bypass is fully closed, all the flow of pump flow to process system. This valve set four functions in one body.

- Flow perception: Automatic Recycle valve main valve disc can automatically perceive main flow of process system, thereby according to the flow to determine position of main valve disc and bypass disc.
- Recirculation control: Automatic Recycle valve can inhaled pump normal operation required minimum flow into storage device through bypass, so as to adjust pump H - Q characteristics, to realize recycling.
- Bypass multistage pressure reducing: bypass control system can reduced the backflow medium from high-pressure pump outlet to appropriate backflow to low-pressure storage device with low noise small wear.
- Check: Automatic Recycle valve also has check valve effect, preventing the liquid backflow to pump body. Bypass non return function is standard.
- Special bypass size can be customized. The max flow rate of bypass is subject to the max Kv value.

Size

Valve size	mm	25	32	40	50	65	80	100	125	150	200	250	300
	in	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Max main flow	m ³ /h	12	28	30	50	100	114	200	400	455	750	1250	1650
Bypass size	mm	15	20	20	25	40	40	50	50	65	80	100	125
	in	1/2	3/4	3/4	1	1 1/2	1 1/2	2	2	2 1/2	3	4	5
Max bypass Kv	Cv	1.0	1.9	1.9	2.7	5.2	5.2	8.5	8.5	11	14	22	35

Note: Valve main outlet size depends on the outlet size of pump.

Model selection

AR	M	Nominal pressure	Body material	Nominal diameter	/Bypass diameter	Structure type
Automatic Recycle pump protection valve	M type bypass assembly	PN16=PN16 Class 150LB =CL150	C=A105 LC=LF2 P=304 PL=304L R=316 RL=316L D=Customized material	DN50=50 NPS2"=2"	DN25=25 NPS1"=1"	V = vertically mounted H = horizontally mounted S = Manual startup
Such as: M Automatic Recycle valve, PN40, body material is WCB, main diameter DN50 bypass diameter DN25 (vertically mounted, Model: ARM-PN40-C-50/25-V						

Note

Other bypass size can be made according to client's requirements, maximum bypass flow depends on maximum Kv value.

Installation

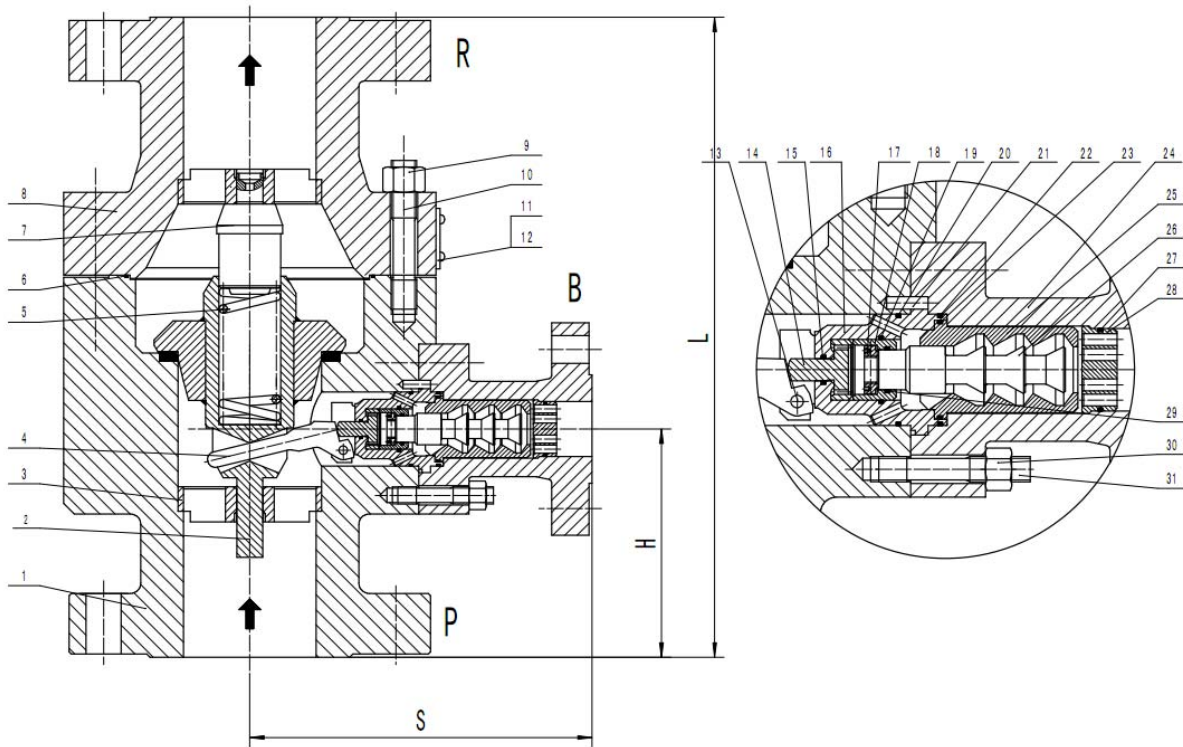
Automatic Recycle valve should be installed nearby the centrifugal pump need Protect as soon as possible, and be better to install the outlet of pump.

Distance between pump outlet and inlet should not exceed 1.5 meters, in order to preventing from liquid pulsing cause low-frequency water attack. Medium flows from top to bottom. Priority should be installed vertically, also can be installed horizontally.

Maintenance

Maintenance and installation according manual provided, inspect the pump weekly in routine, and at the same time inspect valve functions.

Main parts and dimension



NO	Name	Material		NO	Name	Material	
1	Body	A105	F304	16	Disc setting	2Cr13	304
2	Disc	EPDM	EPDM	17	O ring	EPDM	EPDM
3	Guide ring	2Cr13	304	18	O ring	EPDM	EPDM
4	Valve plunger	2Cr13	304	19	Elastic cylindrical pin	2Cr13	304
5	Spring	60Si2Mn	1Cr18Ni9Ti	20	O ring	EPDM	EPDM
6	O ring	EPDM	EPDM	21	O ring	EPDM	EPDM
7	Guide block	2Cr13	304	22	Recycle body	A105	F304
8	Bonnet	A105	F304	23	Recycle cage	2Cr13	304
9	Nut	35	0Cr18Ni9	24	Recycle disc	2Cr13	304
10	Stud	45	0Cr18Ni9	25	O ring	EPDM	EPDM
11	Plunger pin	2Cr13	304	26	Orifice plate	2Cr13	304
12	Disc block	2Cr13	304	27	O ring	EPDM	EPDM
13	O ring	EPDM	EPDM	28	Nut	35	0Cr18Ni9
14	Bonnet	2Cr13	304	29	Bolt	45	0Cr18Ni9
15	Nut	0Cr18Ni9	0Cr18Ni9				

Dimension and weight

DN (IN)	PN(bar)	CLASS	DNB (IN)	L(mm)	S(mm)	H(mm)	Weight(Kg)
25	10-16-25-40	150-300LB	25	190	153	73	17
(1")	63-100	600 LB	(1")	250	182	90	32

32 (1")	10-16-25-40	150-300LB	25 (1")	190	153	73	19
	63-100	600 LB		250	182	90	32
40 (1 1/2")	10-16-25-40	150-300LB	25 (1")	200	155	75	19
	63-100-160	600-900 LB		260	190	90	32
	250	1500LB		300	215	120	43
50 (2")	10-16-25-40	150-300LB	25 (1")	230	163	90	27
	63-100-160	600-900 LB		300	185	115	41
	250	1500LB		350	223	130	59
65 (2 1/2")	10-16-25-40	150-300LB	40 (1 1/2")	290	184	110	42
	63	600 LB		340	219	125	60
	100-160	900 LB		340	227	125	69
	250	1500LB		400	260	145	89
80 (3")	10-16-25-40	150-300LB	40 (1 1/2")	310	191	115	52
	63	600 LB		380	233	140	74
	100-160	900 LB		380	240	140	84
	250	1500LB		450	265	165	122
100 (4")	10-16-25-40	150-300LB	50 (2")	350	221	125	81
	63	600 LB		430	258	155	112
	100-160	900 LB		430	266	155	126
	250	1500LB		520	300	190	106
125 (5")	10-16-25-40	150-300LB	50 (2")	400	266	135	122
	63	600 LB		500	280	175	182
	100-160	900 LB		500	291	175	207
	250	1500LB		600	321	215	200
150 (6")	10-16-25-40	150-300LB	65 (2 1/2")	480	295	165	138
	63	600 LB		550	350	190	273
	100-160	900 LB		585	355	200	289
	250	1500LB		700	405	250	444
200 (8")	10-16-25-40	150-300LB	80 (3")	600	395	200	241
	63	600 LB		650	405	215	467
	100-160	900 LB		680	430	225	501
	250	1500LB		830	485	290	785
250 (10")	10-16-25-40	150-300LB	100 (4")	730	475	240	411
	63	600 LB		775	520	260	714
	100-160	900 LB		800	560	270	857
	250	1500LB		900	560	310	1284
300 (12")	10-16-25-40	150-300LB	125 (5")	850	530	280	740
	63	600 LB		900	550	300	930
	100-160	900 LB		1050	650	360	1485
	250	1500LB		1200	720	420	2100

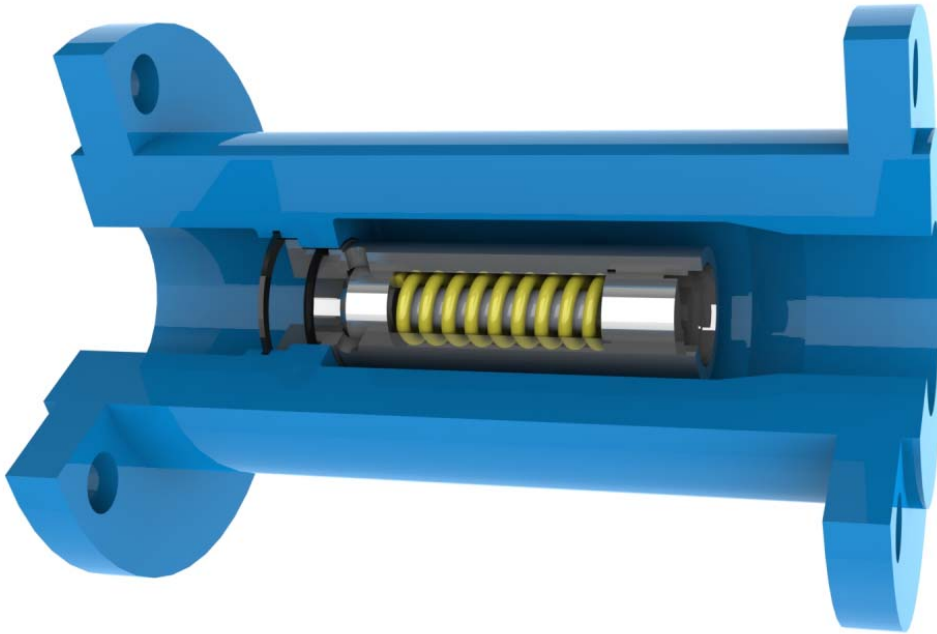
※ Since product and technical innovation or some special requirements, connection size of various valves may change, please contact with CAVAL, We can also produce according to your required size.

AUTOMATIC RECIRCULATION VALVE DATA SHEET

Customer Name:		Date:	
Inquiry No.:		Technical Annex No.:	
TAG No.:		Quantity:	
Valve information			
Valve Model:			
Size DN/INCH	Inlet :	Nominal pressure PN/CLASS	Inlet :
	Outlet :		Outlet :
	Bypass :		Bypass :
Material	Body:		
	Trim:		
	Seals:		
	Sealing surface:		
Connection Type	Flange standard/Grade:		
	Welding standard/Grade:		
Orientation of Valve: <input type="checkbox"/> Vertical <input type="checkbox"/> Horizontal			
Process information			
Fluid medium		Density	
Operation Temperature		Design Temperature	
Pump rated flow rate		Pump rated pressure	
Pump normal flow rate		Pump normal pressure	
Pump Minimum flow rate		Pump maximum pressure	
Bypass back pressure			
For more information, please contact us by E-mail: info@cavalinc.com			

Back Pressure Valve

BYP Series



Application

Back pressure valve is used to the applicable conditions that the common controlling system can not be used, as a kind of special pressure control valves, it commonly match with Automatic Recycle valve to protect pump system.

Back pressure valve is used to control upstream pressure, enables to achieve factory technological setting pressure value and system required pressure value, preventing vaporization and corrosion phenomena.

Carefully matched technological condition between automatic recycle valve and back pressure valve, ensure pump get the best protection, guarantee long-term stability for safe operation system.

Working principle

This valve is self-support type, do axial movement along valve disc by spring force function, so as to generate differential pressure around back pressure valve. Meanwhile, valve seat hole opening bigger and bigger gradually until pressure differential reaches setting point.



Installation

In order to make the valve to achieve to best performance, BPV should be installed in downstream of the important protected valve, since valve outlet velocity is high, installation location should be close deaerator or water supply tank.

Maintenance

Be easy to operation and maintenance. We can provide installation and maintenance manual.

Valve size

DN25~DN150 (1"-6") Standard size: DN25~DN150 (1"-6")

Pressure range

Nominal pressure range: PN10~PN400 (ANSI 150Lbs~ANSI 2500Lbs) .Other pressure range is according to requirements.

Connection

Flange connection standard is according to DIN or ANSI, other standard (e.g. ISO, BS, JIS, NF) can be customerized.

Material temperature range

Body material Sealing material	A105	LF2	F304	F316
NBR	-20~+100	-30~+100	-30~+100	-30~+100
FKM	-20~+200	-40~+200	-40~+200	-40~+200
PTFE	-20~+230	-40~+230	-80~+230	-80~+230
Stainless steel gasket	-20~+300	-40~+300	-196~+300	-196~+300

Installation

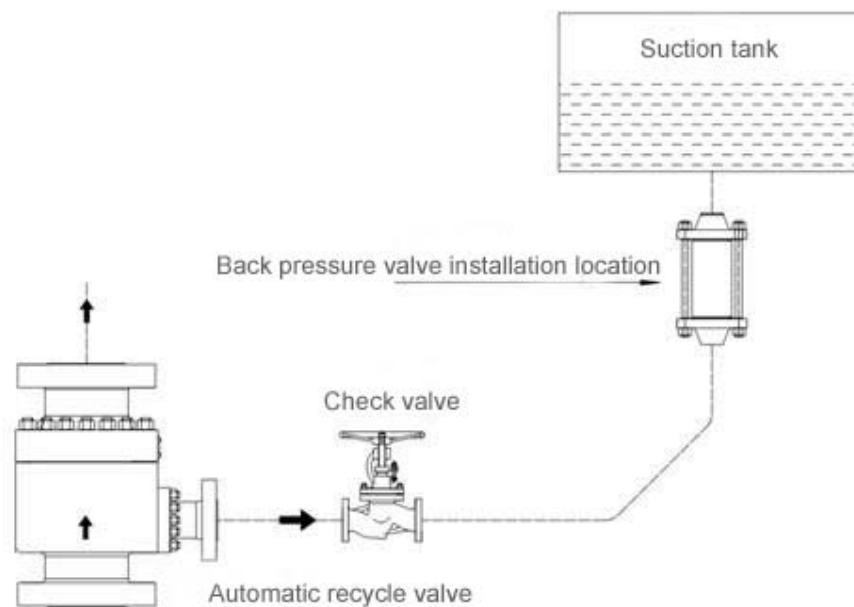
In order to make the valve to achieve best performance, YB7 should be installed in the downstream of the protected valve, since valve outlet velocity flow is high, installation location should near close to deaerator or tank.

Suction tank

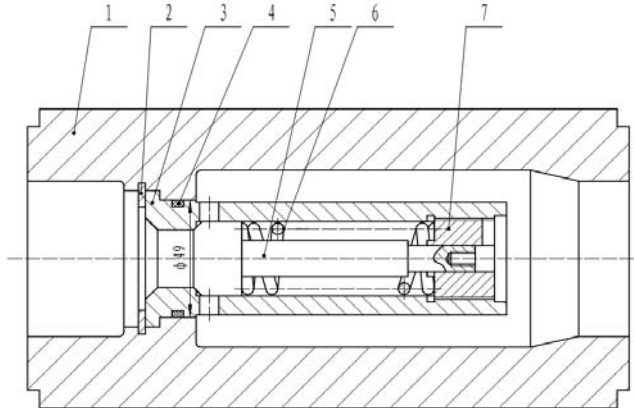
Back pressure valve installation location

Check valve

Automatic recycle valve



Parts and materials



NO	Name	Material (Commonly used)			
		A105	LF2	F304	F316
1	Body	A105	LF2	F304	F316
2	Elastic block circle	2Cr13	2Cr13	304	316
3	Seat	2Cr13+STL	2Cr13+STL	304+STL	316+STL
4	O ring	EPDM	EPDM	EPDM	EPDM
5	Trim	2Cr13+STL	2Cr13+STL	304+STL	316+STL
6	Spring	60Si2Mn	60Si2Mn	1Cr18Ni9Ti	316
7	Pressed nut	2Cr13	2Cr13	304	316

Order Datasheet

Main road flow

Minmum _____ M³ /h

Maximum _____ M³ /h

Normal _____ M³ /h

Pressure

Outlet pressure _____ Mpa

Inlet pressure _____ Mpa

Temperature

normal _____ °C

Maximum _____ Mpa

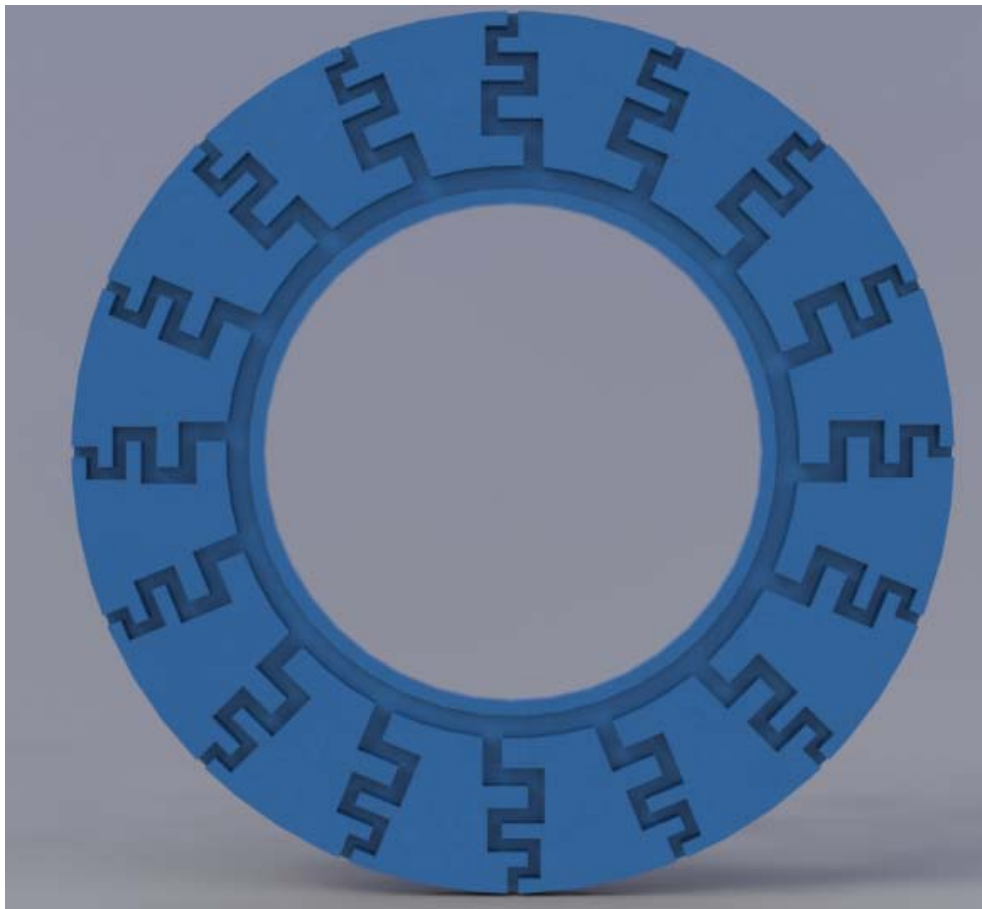
Mediu

Density _____ Kg/M³

Viscosity _____

Minimum flow control valve

ZHD series (Electric/pneumatic)



Introduction

ZHD multistage cage control valve used multilevel cage symmetric sleeve control valve. It complete control medium velocity within valve, and greatly reduced noise made by high pressure gas or steam within valve, stable multistage pressure reducing effective prevent liquid cavitation, so it's the stable control valve used in high-pressure medium performance, customers can also select multi-spring diaphragm mechanism or pneumatic actuators, etc.

Technical parameters and technical performance

Body type: Direct casting ball-type valve

Nominal diameter: DN20, 25, 32, 40, 50, 65, 80, 100, 200

Nominal pressure: PN 1.6, 2.5, 4.0, 6.4, 10.0, 16、25Mpa CLASS 150, 300, 600, 900、1500Lb

Connection flange: FF, RF, RTJ, etc, welding: SW, BW

Flange distance: according to IEC534

Bonnet type: standard type, lengthened (heat dissipation, low temperature, bellows sealing).

Packing: V type PTFE, flexible graphite, etc.

Sealing gasket: Metal with graphite gaskets

Actuator: Pneumatic, multi-spring actuator.

Electric: 3810L series, PSL series.

Valve disc type: multistage cage sleeve type.

Flow characteristics: equal percentage, linear.

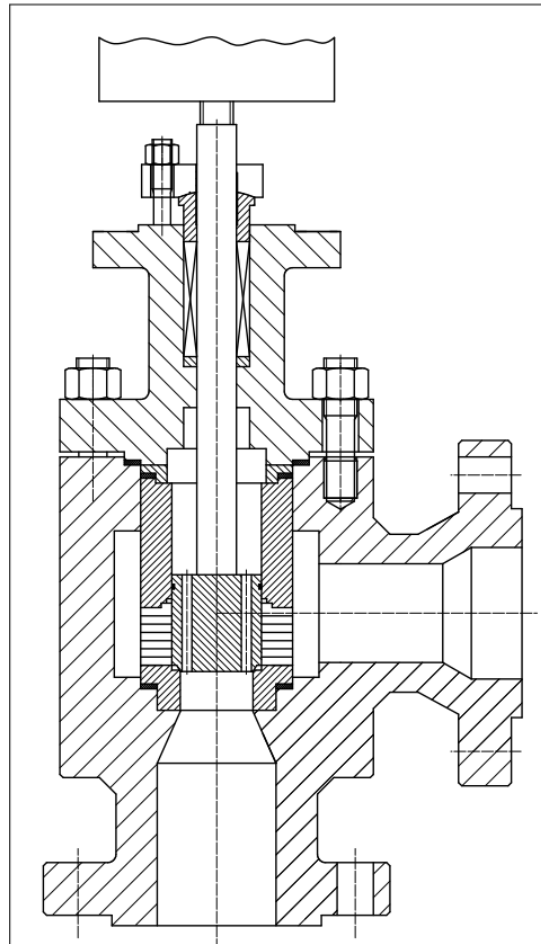
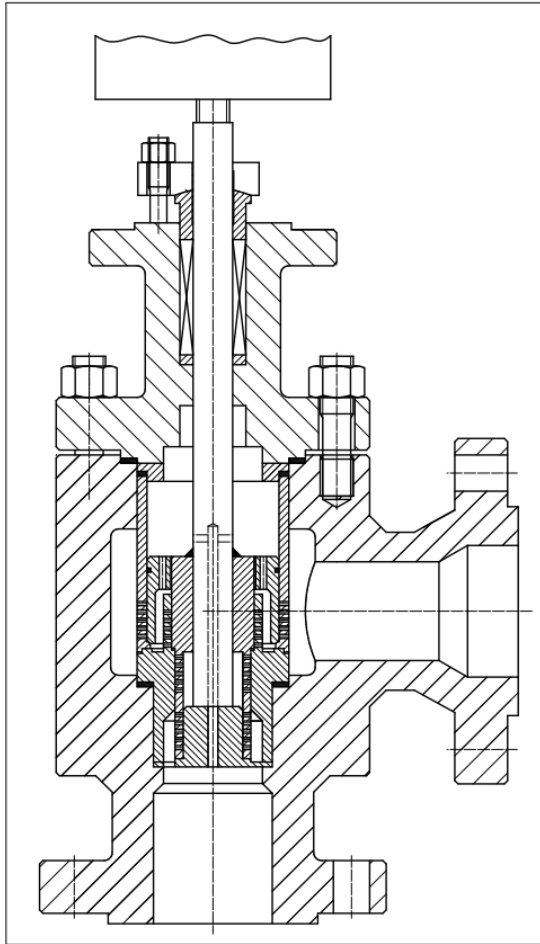
Disc material: standard material composition and applicable temperature, pressure range, please refer to appendix.

Customerized selection

Body	Type	Direct	Bonnet	Model	Standard, lengthened
	Material	WCB, WC9, 304, 316, etc.		Mterial	WCB, WC9, 304, 316, etc.
Disc	Characteristic	Linear, equal percentage, quick opening	Packing	V type PTFE Flexible graphite, bellows sealing	
	Material	304, 304+STL/PTFE, 316, 316+STL/PTFE			
Actuator	Pneumatic: See appendix 6				
	Electric: See appendix 6				
Positioner	Electric valve positioner, intelligent digital positioner				
Accessories	Solenoid valve, valve position feedback device, hand operate mechanism, lock-up valve, air filter pressure relief device etc.				

Model Selection

Z	R: 3810L series	H: Linear actuat or	D: multistage cage sleeve type	16: PN1.6Mpa	C: Carbon steel	DN 20 Size:20m m
	P: PSL series			P: Chromium-Nickel- titanium Steel		
	J: Pneumatic diaphragm			I: Chromium-molybden um steel	B: Air to close	IN 1" Size: 1"
	H: Linear cylinder			V:Chrominm-molybd enum-vanadium steel	K : Air to open	



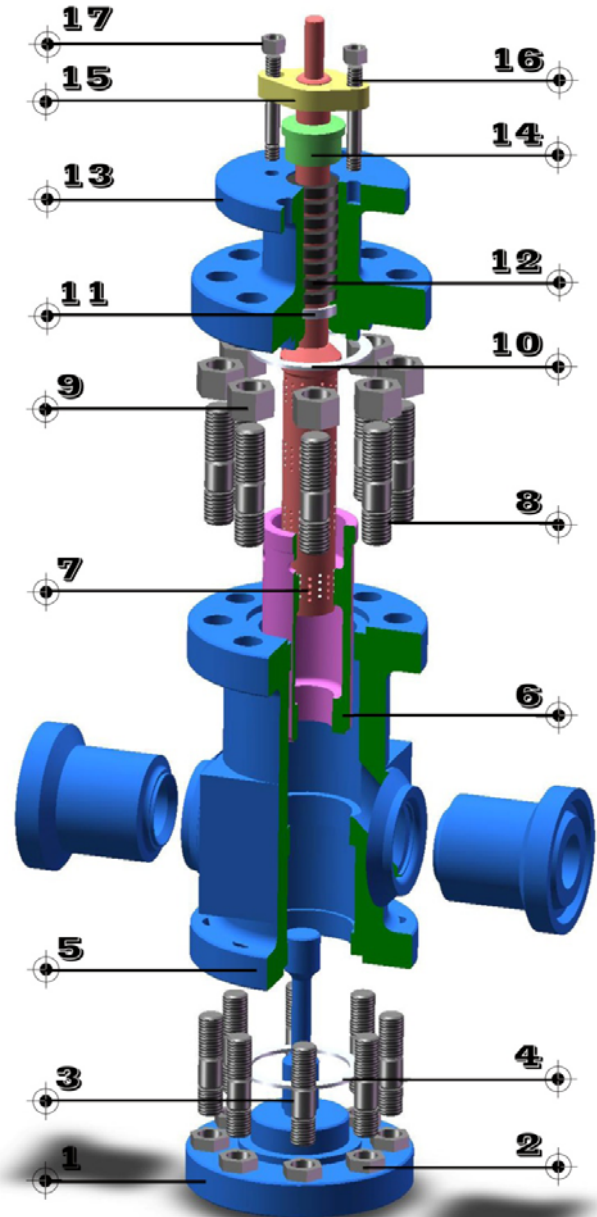
Material and internal structure

Body is cast steel

1	Seat	25	LF2	F22
2	Nut	25	35	25Cr2Mo1VA
3	Stud	35	40MnB	25Cr2Mo1VA
4	Gasket	316+graphite/PTFE		
5	Body	25	LF2	F22
6	Seat	304	304	304
7	Stem	304	304	304
8	Stud	35	40MnB	25Cr2Mo1VA
9	Nut	25	35	25Cr2Mo1VA
10	Gasket	316+graphite/PTFE		
11	Packing gasket	304	304	304
12	Stuffing	PTFE/Flexible graphite		
13	Bonnet	25	LF2	F22
14	Pressing sleeve	304	304	304
15	Gland	25	LF2	F22
16	Nut	35	40MnB	25Cr2Mo1VA
17	Stud	25	35	25Cr2Mo1VA

Appendix3: Body material is Stainless steel

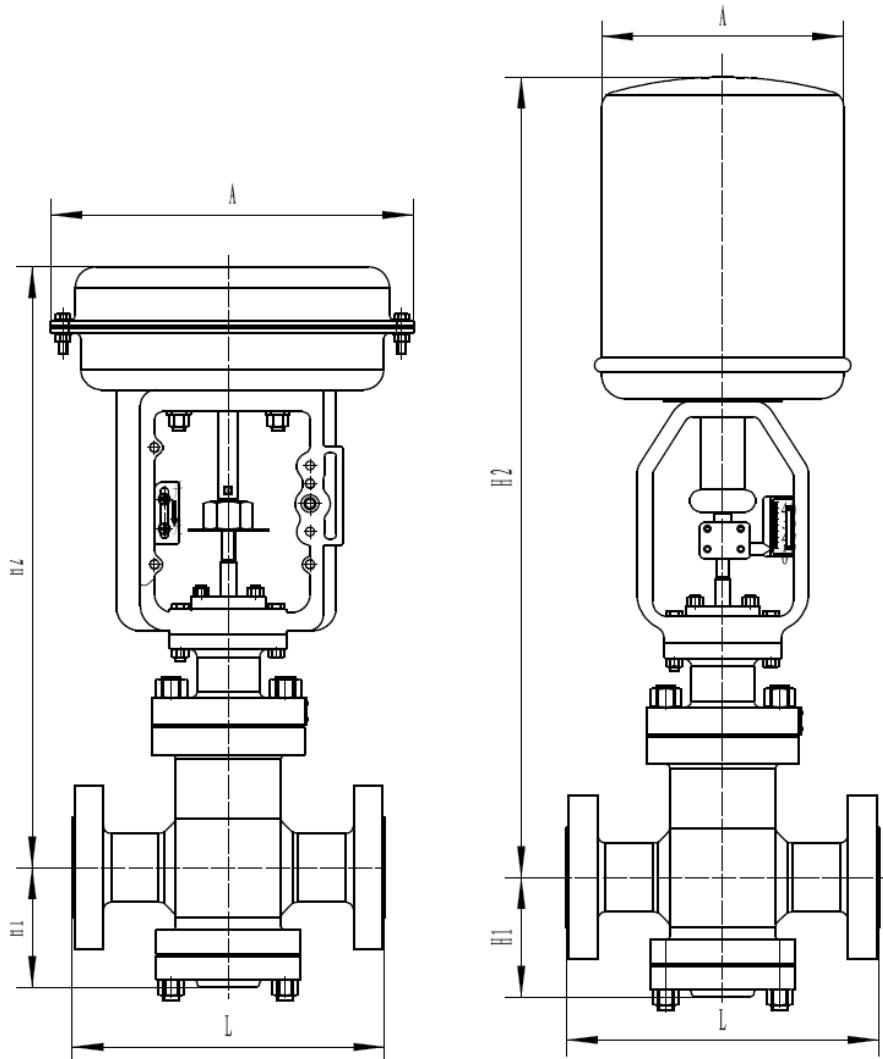
1	Sest	CF8	CF8M	CF3M
2	Nut	304	316	316L
3	Stud	304	316	316L
4	Gasket	316+graphite/PTFE		
5	Body	CF8	CF8M	CF3M
6	Seat	304	316	316L
7	Setm	304	316	316L
8	Stud	304	316	316L
9	Nut	304	316	316L
10	Gasket	316+Graphite/PTFE		
11	Stuffing gasket	304	316	316L
12	Stuffing	PTFE/Flexible graphite		
13	Bonnet	CF8	CF8M	CF3M
14	Pressing sleeve	304	316	316L
15	Gland	CF8	CF8M	CF3M
16	Stud	304	316	316L
17	Nut	304	316	316L



※NOTE

1. The above is standard configuration structure, valve seat is metal to metal, and we can still provide strengthened trim with stellite alloy coating. For specific applicable temperature, we have more reasonable bolts, nuts for choose.
2. PTFE v-shaped ring stem packing is standard configuration and can also choose flexible graphite.
3. Standard body material is carbon steel and stainless steel, and we can still provide various high corrosive-resistance alloy materials.

Control valve structural size



Valve size		L		Pneumatic			Electric		
inch	mm	PN100-320	PN 420	H1 mm	H2 mm	A mm	H1 mm	H2 mm	A mm
1"	25	279	318	140	690	360	140	1005	270
1 1/2"	40	330	359	153	770	360	153	1025	270
2"	50	375	400	153	770	360	153	1025	270
3"	80	460	498	170	900	470	170	1095	310
4"	100	530	575	190	932	470	190	1120	310
6"	150	768	819	223	950	560	223	1170	350
8"	200	832	1029	265	990	560	265	1220	350

※ Since product and technical innovation or some special requirements, connection size of various valves may change, please contact with CAVAL Technical Department to get the latest product information. We can also produce according to your required size.

Contact us

CAVAL INC.

Tel: 713-235-2757

Fax: 713-235-2758

Email: info@cavalinc.com

Web: www.cavalinc.com

Add: 12210 Beauregard Drive, Houston, TX77024 ,USA