



ASVIN ARC VALVE AUTOMATIC RECIRCULATION VALVE For Process Industries



ASVIN Automatic Recirculation Valves (ARC valve) is a kind of pump protection device. It automatic protects centrifugal pump when pump body occur cavitation damage or unstable (especially conveying hot water at low load operation medium). Modern industrial equipment process request centrifugal pump are basically work under condition of variable flow. ASVIN Automatic Recirculation Valve (ARC valve) is a multifunctional valve whose primary purpose is to ensure that a pre-determined minimum flow is assured through a centrifugal pump at all times. This is important as centrifugal pumps suffer from overheating and cavitation and can be permanently damaged if they run dry. Continuous innovation and practice,

ASIAN INDUSTRIAL VALVES AND INSTRUMENTS (ASVIN) manufactures Automatic recirculation control Valve, to 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 the necessary minimum flow of the pump. Sizes range from 1inch to 24inches, including ANSI Class150 through 2500lb. Valve internals are stainless-steel with housing in carbon steel, stainless steel, or special machinable alloys.



Applications Of ASVIN ARC Valve

	<p style="text-align: center;">APPLICATION</p> <ul style="list-style-type: none">• <i>Chemical industry</i>• <i>Petrochemical industry</i>• <i>Steel factory</i>• <i>Fire protection system</i>• <i>Traditional power plant</i>• <i>Paper-making industry</i>• <i>Shipment/shipping</i>• <i>environmental protection industry</i> <p style="text-align: center;">FEATURES</p> <ul style="list-style-type: none">• Precise recirculation control.• Stable design.• Integral check valve.• Low maintenance.• Self-operating.• Ease of installation.• Suitable for all fluids.• Dampening of pulsations.• Multistage pressure let down.• Cavitation prevention.• Eliminate external power sources or signals.• Reliable performance.
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Operational Dependability

ASVIN Automatic Recirculating Valve has only one moving part. No pilot valves or linkages are required for operation. The combination check valve/flow sensing element is guided at the top and bottom for smooth operation. The valve operates without air or electric power and is easily installed with three connections.



Automatic Recirculation Valve Working Principle

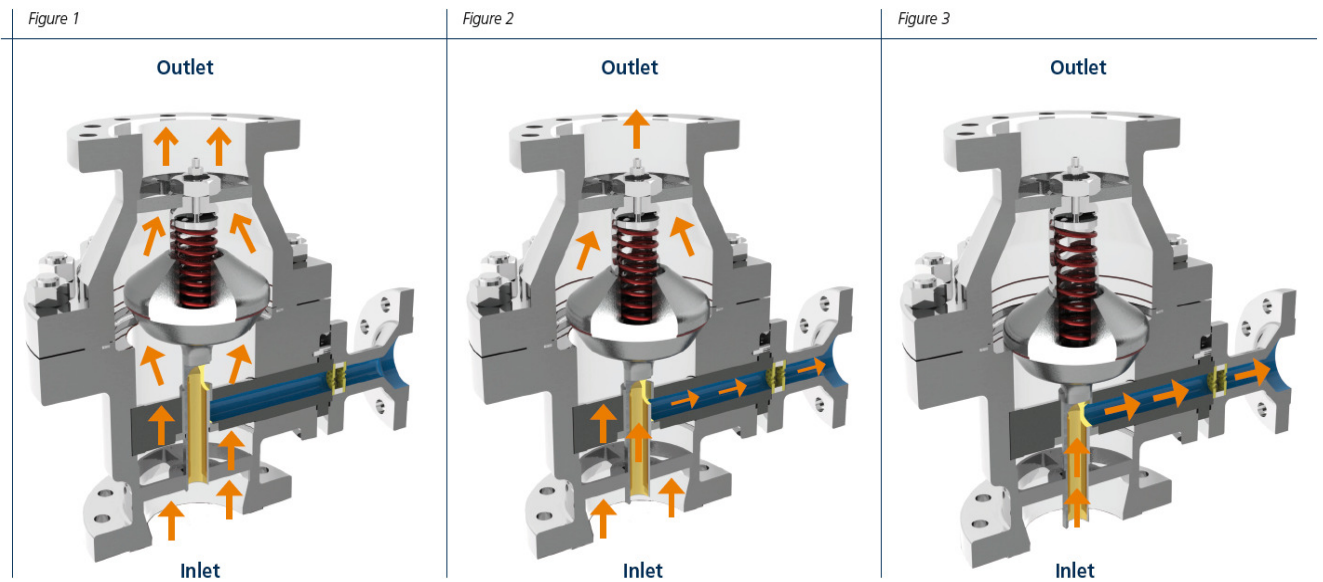
ARV stands for Automatic Recirculation Valve. ARC valve stands for Automatic Recirculation Control valve. The function of this valve is the same as that of an AR Valve. An automatic recirculation valve (ARC) is a multifunctional valve whose primary function is to ensure a pre-determined minimum flow through the centrifugal pump at all times. An ARC valve has one inlet and two outlet ports. The main discharge port connects to the process and bypass port connects back to the deaerator. When the flow is high, the main discharge port of the ARC is kept fully open and bypass port closes. When the flow reduces, the main port starts closing under gravitational pull or spring assistance. Simultaneously, the bypass port starts opening. At transient flow rates, the main port and bypass port are both partially open. When the flow falls below the set minimum flow limit, the main port closes fully and at this condition, the bypass port will be fully open. The bypass port is sized for minimum flow and thus the minimum flow required of Boiler Feed Pump is met. ARC being a combination of NRV and Recirculation Control Valve, does not require any external control system. A special bypass size can be customized. The max flow rate of the bypass is subject to the max Kv value.

ASVIN ARC valve operation conditions

Figure-1. Main flow only – bypass closed.

Figure-2. Combined flow

Figure-3. Bypass flow only- Main flow Closed





MATERIALS, SIZE AND PRESSURE RANGE

Materials: Carbon steel SA216 WCB, stainless steel SA351, CF8M, PTFE,

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

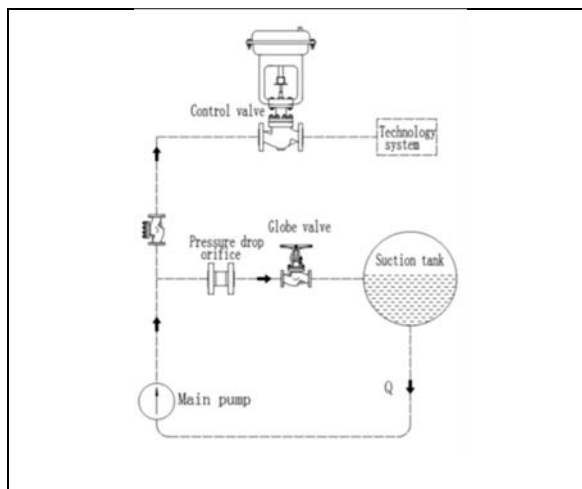
Nominal pressure: PN 16,25,40,64,100,160,250,420 ANSI CLASS 150, 300, 600, 900, 1500, 2500

Temperature range: -100° to 550°F (-73° to 287°C)

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

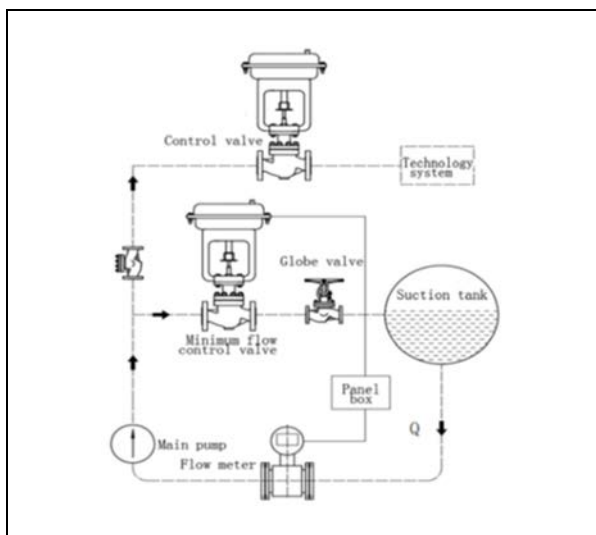
PUMP PROTECTION USING ARC VALVE (ARV)- THREE METHODS

1.CONTINUOUS CIRCULATING SYSTEM- PROTECTION METHODS FOR PUMP



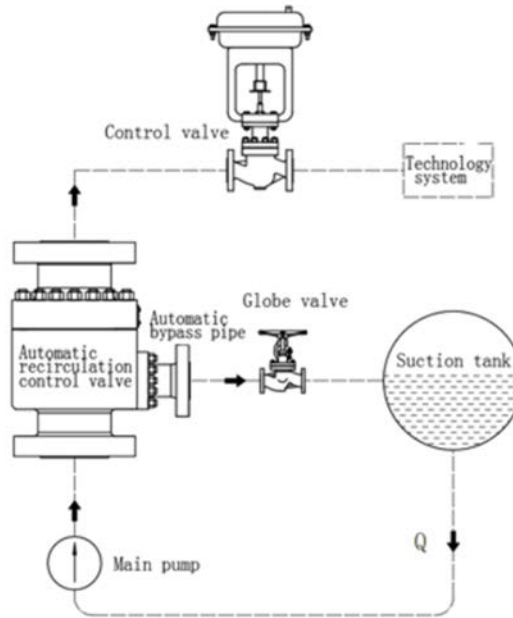
Minimum requirement of continuous circulating system pump is unrelated to the discharge of Process flow changes system. After setting of minimum flow, through orifice plate directly backflow to a storage tank. Although continuous minimum flow circulation can protect the pump very good, the pump must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

2..CONTROL CIRCULATING SYSTEM- PROTECTION METHODS FOR PUMP



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 the minimum flow of the pump, loop closed, no extra energy loss. But the system is complex, control components, purchase, installation, maintenance cost is higher.

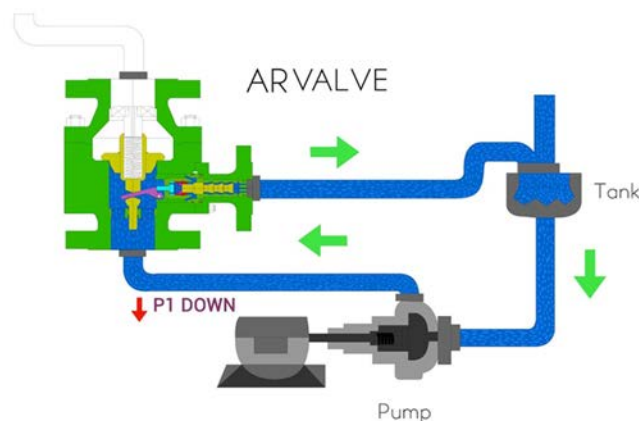
3.AUTOMATIC RECIRCULATION CONTROL VALVE- ARV-PROTECTION METHODS FOR PUMP



ASVIN Automatic recirculation 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. Taking up small space, reducing the possibility of high-speed fluid to malfunction to a minimum, with lower installation and maintenance cost, It is the priority pump protection way of the modern industrial process.

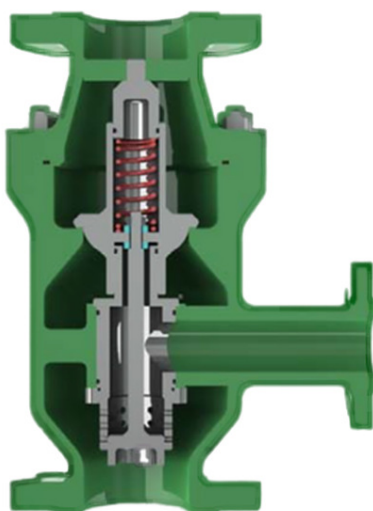
ARC VALVE INSTALLATION

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.



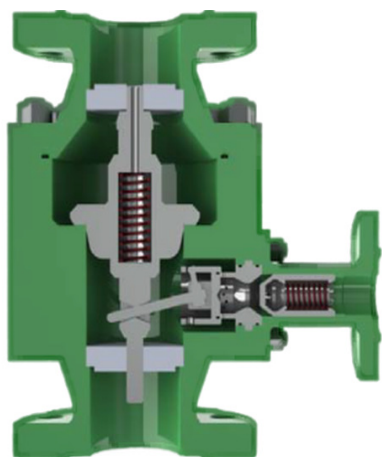


ASVIN ARC-T, MODEL ARV



- Simple structure, low cost, long life, suitable for Low-pressure Working conditions.
- Cast valve body, material: carbon steel or stainless steel, etc.
- The big flow of bypass, maximum flow is 60% of the main flow, KV value can be adjusted.
- Bypass maximum operating pressure differential up to 4 MPa.
- Pressure CL150# - 400#, size1'' - 16''

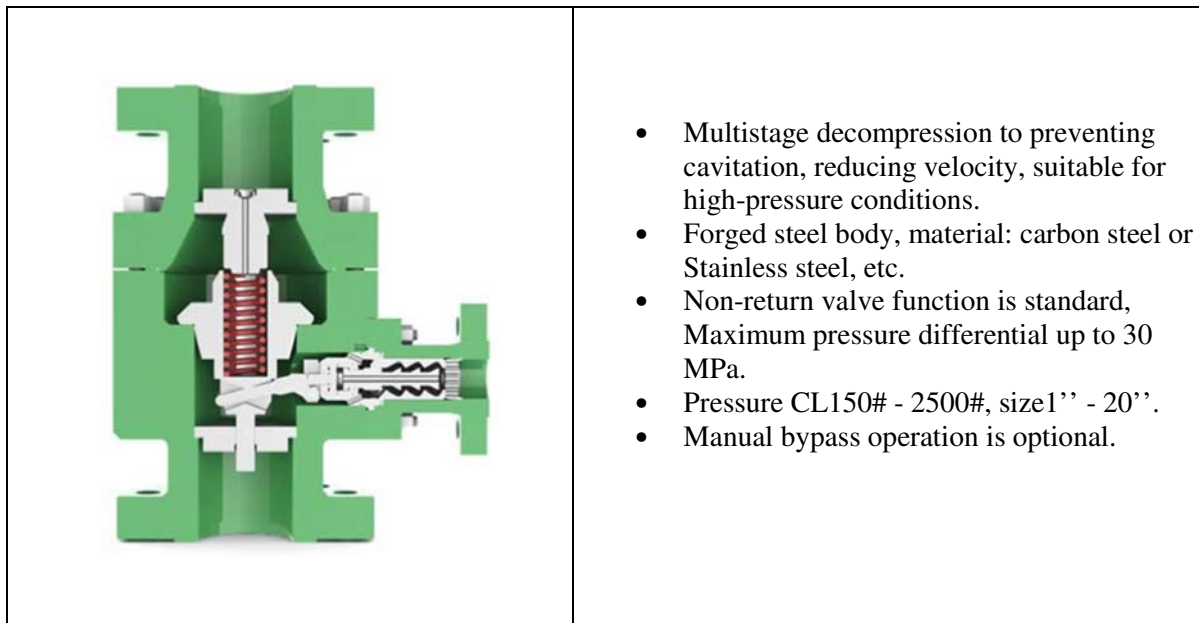
ASVIN ARC-L, MODEL ARV



- Multi-orifice cage bypass, low noise, suitable for middle and low-pressure conditions.
- Forged steel body, material: carbon steel or Stainless steel, etc.
- Non-return valve function is standard, Maximum pressure differential up to 6 MPa.
- With venturi port main flow check valve structure, be applicable for complicated working conditions.
- Pressure CL150# - 600#, size1'' - 20''.
- Manual bypass operation is optional.



ASVIN ARC-M, MODEL ARV



- Multistage decompression to preventing cavitation, reducing velocity, suitable for high-pressure conditions.
- Forged steel body, material: carbon steel or Stainless steel, etc.
- Non-return valve function is standard, Maximum pressure differential up to 30 MPa.
- Pressure CL150# - 2500#, size1'' - 20''.
- Manual bypass operation is optional.

SIZE, DIMENSIONS AND WEIGHT OF THE ASVIN ARC VALVE

Size NB	25	32	40	50	65	80	100	125	150	200	250	300
Bypass- NB	15	20	20	25	40	40	50	50	65	80	100	125
Max Flow M ³ /Hr	12	28	30	50	100	114	200	400	455	750	1250	1650
Max Bypass Cv	1.6	2.9	2.9	3.7	6.8	6.8	12.3	12.3	21.7	31	51	86
Overall Height, mm	190	190	200	230	290	310	350	400	480	600	730	850
	250	250	260	300	340	380	430	500	550	650	775	900
Centre to Bypass Face	153	153	155	163	184	191	221	266	295	395	475	530
	182	182	190	185	219	233	258	280	350	405	520	550
Inlet Face to Bypass Centre	73	73	75	90	110	115	125	135	165	200	240	280
	90	90	90	115	125	140	155	175	190	215	260	300
Weight in Kgs	17	19	19	27	42	52	81	122	138	241	411	740
	32	32	32	41	60	74	112	182	273	467	714	930

*FOR RATINGS- PN 10, PN 16 & PN 25, ANSI 150#

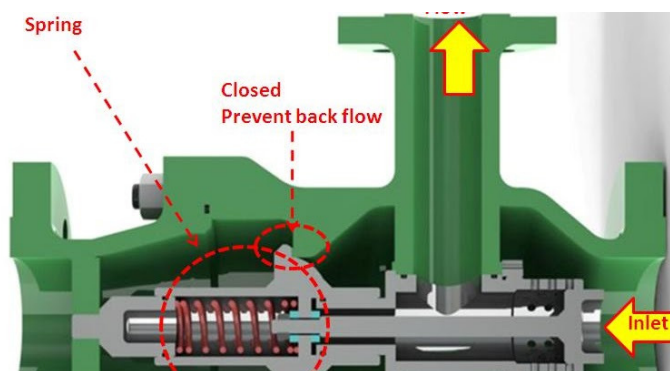
** FOR RATINGS- PN 40, PN 64& ANSI 300#

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



Testing of the ASVIN ARC Valve

- 1) Testing and markings of valves to EN 1349, EN 19 (technical terms of delivery for valves)
- 2) Mechanical technical testing to EN 10213 part 2 (for casting of material GP 240 GH). & PED 97/23/EG
- 3) Pressure testing with water including rust-protection-inhibitor.
- 4) Special testing after consultation.



ASVIN SERVICE, SUPPORT & REPAIRS

Engineering Assistance for Valve Selection, Specific Valve Design According to Pump/Process Data Fluid/Medium, Pressure Rating/Connections.

Spare Parts, Modification, Repair, and Reconditioning of Valves

Disassembly/Part Replacement/Reassembly.

Experienced service engineers are available on call for worldwide start-up assistance, training, and repair. All repairs are supervised by specialists with direct access to factory engineering personnel.

TECHNICAL CALCULATIONS

$kv = Q \cdot \sqrt{\rho / (\Delta p \times 1000)}$ - kv in [m³/h]; Q in [m³/h]; Δp in [bar], ρ in [kg/m³]

$cv = kv \cdot 1,156$ - cv in [US gallons/min]

$\Delta p = H \cdot 9,81 \cdot \rho / 100000$ - Δp in [bar]; H in [m], ρ in [kg/m³]

Kv= Flow in m³/h that flows through the full open valve at a pressure drop of 1 bar.

Cv= Flow in US gallons/min that flows through the full open valve at a Pressure drop of 1 Psi.

Switch point= Process flow at which the bypass closes.

Bypass backpressure = Pressure in the bypass line immediately behind the automatic pump recirculation valve at full bypass flow (normally tank pressure + static height+ line losses)



ASIAN INDUSTRIAL VALVES AND INSTRUMENTS

Registered Office & Correspondence Address :

A18/1, Industrial Area,
Mogappair East,
Chennai – 600 037, India.

www.asianvalves.net
www.asvinvalves.com

Phone : 044 – 2656 5370, 29998970

Fax : +91 – 44-2656 5930

E mail : asvinvalves@asvinvalves.com
asianvalves@asvinvalves.com
asvinvalves@gmail.com
asianrajan@gmail.com