

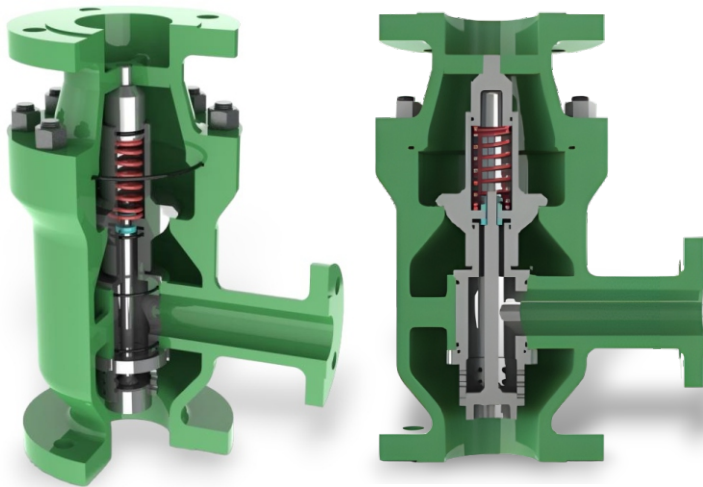
DATIAN ARC PUMP PROTECTION VALVES (AUTOMATIC RECIRCULATION)

ZDT SERIES

The ZDT Series Automatic Recirculation Control (ARC) Valve is a pump protection device that automatically protects centrifugal pumps from cavitation damage or instability, especially when conveying hot water at low load operation. When the pump flow is lower than the preset flow, the bypass can completely open to ensure the minimum required flow of the pump. Even when running fully closed, namely when the main flow is zero, the minimum flow can still be discharged from the bypass.

The ZDT series has a big bypass and is suitable for bypass with big flow. The maximum pressure differential is 4MPa, and the specific choice is determined by the factory.

This valve is an essential safety feature for modern industrial processes as it ensures that a pre-determined minimum flow is maintained through the pump at all times, even when the flow rate drops below a certain value. The valve does not require electrical power and is compact.



Specification

Valve Body Type:	Three-Way Casting Valve
Nominal Diameter:	NPS 1 – 16 Inch (DN25, 32, 40, 50, 65, 80, 100, 200, 250, 300, 350, and 400)
Nominal Pressure:	ANSI B16.34 Class 150, 300, and 400 (PN16, PN25, PN40 and PN64)
End Conn. Type:	ASME B16.5 RF (Raised Face), Flange FF (Flat Face), , RTJ (Ring Type Joint), BW (Butt Weld), SW (Socket Weld), etc.
Applicable Medium:	Water, Oil, Methanol and Other Liquid medium.
Working Temp.:	-196°C (-320.8°F) to +300°C (+572°F)
Materials:	Carbon Steel SA216 WCB, LCB/LCC, Stainless Steel, Sa351, CF8M, PTFE, EPDM, FKM

For other configurations CONTACT US

Features

- Efficient and reliable protection for centrifugal pumps.
- Precise recirculation control.
- Integral check valve.
- Low maintenance.
- Self-operating.
- Ease of installation.
- Suitable for all fluids.
- Dampening of pulsations.
- Multistage pressure letdown.
- Cavitation prevention.
- Elimination of external power sources or signals.
- Reliable performance.

Working Principle

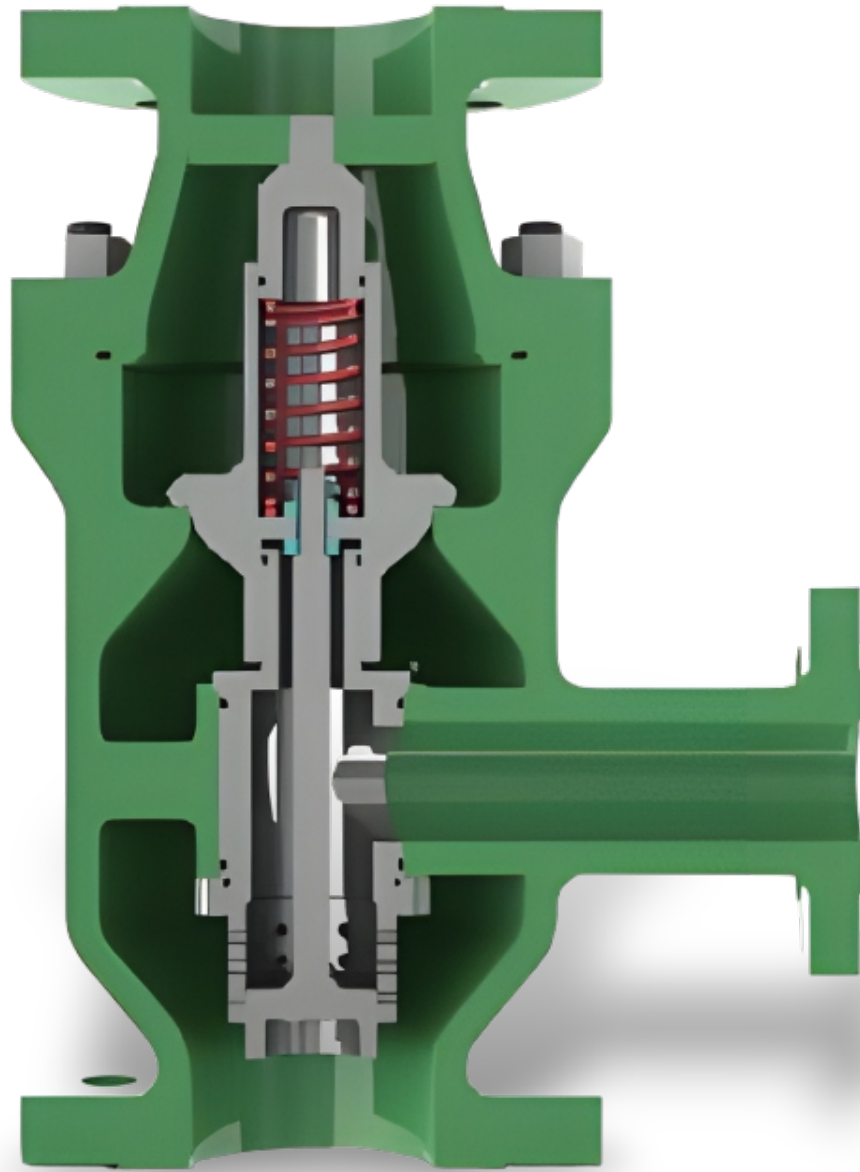
The Automatic Recirculation Control Valve (ARC) is a multifunctional valve that ensures a pre-determined minimum flow is maintained through the pump at all times, even when the flow rate drops below a certain value. The valve has a simple structure, reliable and stable operation with few moving parts. It is easy to install and can be installed vertically or horizontally on the pump outlet.

The valve has four functions in one body:

- **Flow perception:** The main valve disc of the ARC Valve can automatically perceive the main flow of the process system. It determines the position of the main valve disc and bypass disc according to the flow.
- **Recirculation control:** The ARC Valve can inhale the minimum flow required for normal pump operation into a storage device through bypass. This adjusts the H-Q characteristics of the pump to realize recycling.
- **Check valve:** The ARC Valve also has a check valve effect, preventing liquid backflow to the pump body. Bypass non-return function is optional.
- **Customizable bypass size:** The special bypass size can be customized. The maximum flow rate of bypass is subject to the maximum Kv value.

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Datian ZDT Series

Table 1. Material Temperature Capabilities

Sealing \ Body	WCB	LCB/LCC	CF8	CF8M
NBR	-40°C to +120°C	-40°C to +120°C	-40°C to +120°C	-40°C to +120°C
FKM	-20°C to +200°C	-20°C to +200°C	-20°C to +200°C	-20°C to +200°C
PTFE	-10°C to +232°C	-46°C to +232°C	-46°C to +232°C	-46°C to +232°C
SS Winding Gasket	-20°C to +300°C	-20°C to +300°C	-20°C to +300°C	-20°C to +300°C

For applications exceeding 427C (800F), consult your Datian sales office or Local Business Partner for appropriate material selection.

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Table 2. Size Selection

Valve Size	mm	25	32	40	50	65	80	100	125	150	200	250	300
	Inch	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
	Inch	1/2	3/4	3/4	1	1-1/2	1-1/2	2	3	3	4	4	6
Max. Bypass Kv (Cv)	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 size depends on the outlet size of pump.

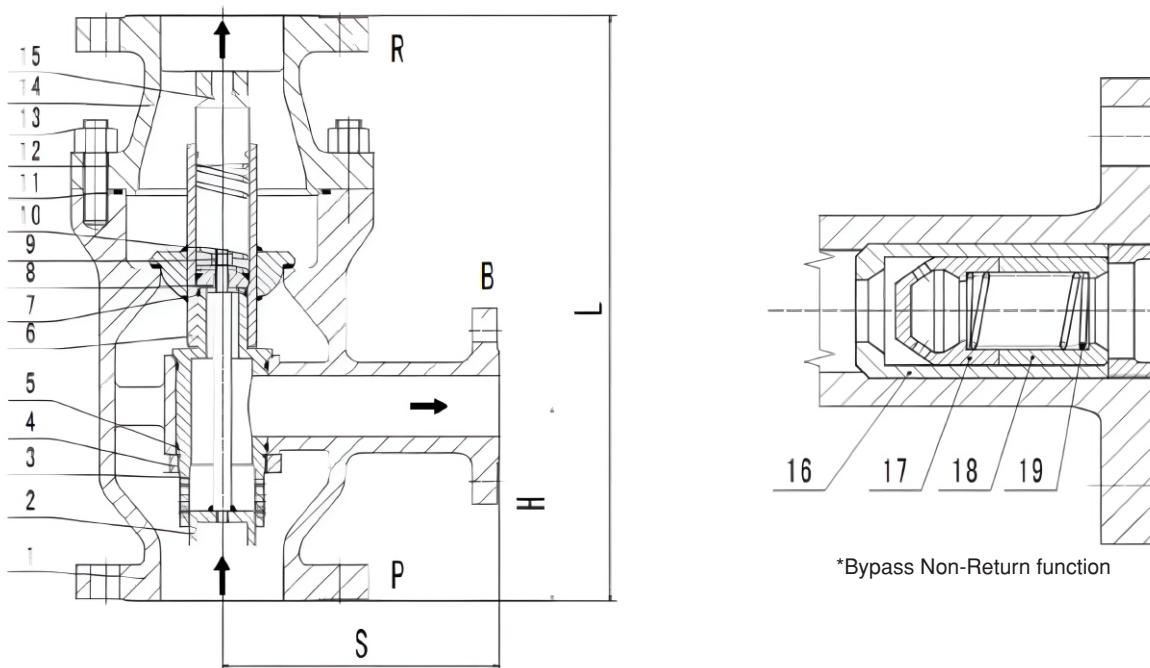


Table 3. Typical ARC ZDT Valve Construction Materials

Key	Part Name	Part Material		Key	Part Name	Part Material	
1	Body	WCB	CF8	11	O-Ring	EPDM	EPDM
2	Recycle Disc	2Cr13	S30400	12	Stud Bolt	45	Cr18Ni9
3	Recycle Seat	2Cr13	S30400	13	Hex Nut	35	Cr18Ni9
4	Screw Gland	2Cr13	S30400	14	Bonnet	WCB	CF8
5	O-Ring	EPDM	EPDM	15	Guide Block	2Cr13	S30400
6	Main Disc	2Cr13/CoCr-A	S30400/CoCr-A	16	Bushing	2Cr13	S30400
7	O-Ring	EPDM	EPDM	17	Porous Set	2Cr13	S30400
8	Gasket	2Cr13	S30400	18	End Ring	2Cr13	S30400
9	Hexagon Nuts	S30400	S30400	19	Spring 2	60Si2Mn	Cr18Ni9Ti
10	Spring	60Si2Mn	1Cr18Ni				

ARC Valve is designed to be installed between two pipe flanges. Valve has not been designed for dead-end service.

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Table 4. Dimensions and Weights

Valve Size		Size mm (Inch)						Bypass		Weight Pounds (Kg)			
DNP	DNR	S		H		L		mm	(Inch)	PN10/16/25 - CL150		PN40/64 - CL300	
25	1	115	(4.5)	102	(4.0)	267	(10.5)	15	(0.6)	12	(6.8)	18	(8.2)
32	1-1/4	115	(4.5)	102	(4.0)	267	(10.5)	20	(0.8)	14	(9.1)	20	(9.1)
40	1-1/2	115	(4.5)	102	(4.0)	267	(10.5)	20	(0.8)	14	(9.1)	20	(9.1)
50	2	130	(5.1)	108	(4.3)	305	(12.0)	25	(1.0)	22	(11.3)	26	(11.8)
65	2-1/2	165	(6.5)	127	(5.0)	381	(15.0)	40	(1.6)	46	(18.1)	51	(23.1)
80	3	181	(7.1)	127	(5.0)	381	(15.0)	40	(1.6)	46	(18.1)	51	(23.1)
100	4	209	(8.2)	159	(6.3)	495	(19.5)	50	(2.0)	105	(22.7)	118	(53.5)
125	5	267	(10.5)	200	(7.9)	575	(22.6)	80	(3.1)	143	(36.3)	156	(70.8)
150	6	267	(10.5)	200	(7.9)	575	(22.6)	80	(3.1)	220	(36.3)	240	(108.9)
200	8	300	(11.8)	220	(8.7)	600	(23.6)	100	(3.9)	255	(45.4)	302	(137.0)
250	10	356	(14.0)	255	(10.0)	780	(30.7)	100	(3.9)	400	(45.4)	455	(206.4)
300	12	530	(20.9)	280	(11.0)	830	(32.7)	150	(5.9)	590	(68.0)	650	(294.8)

*Due to technical innovation or some special requirements, the connection size may be changed if necessary, Please contact Datian Valve technical department to get the latest product information.

Table 5. How to Order

ZD	T	Nom. Press.	Body Material	Main Diameter	By Pass Dia.	Structure Type
ZD Series	T Type Bypass Assy.	PN16 = PN16 CL150 = CL 150 CL300 = CL 300 CL400 = CL 400	C = WCB LC = LCB P = CF8M PL = CF3M R = CF8M RL = CF3M D = Custom	DN25 = 25 NPS1 = 1"	DN25 = 25 NPS1 = 1"	V = Vertically H = Horizontal Bypass Z = Non-Return D = With Discharge
How order (Example): T Type Bypass, Pressure 150#, WCB Body Material, 2 In Main Diameter, 1" Bypass Diameter, Vertically Mounted Model: ZDT-CL150-C-2"-1"-V						

Notes

Datian Valve Pipe Engineering, or any of their affiliated entities assumes responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use, and maintenance of any product remains solely with the purchaser and end user.

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