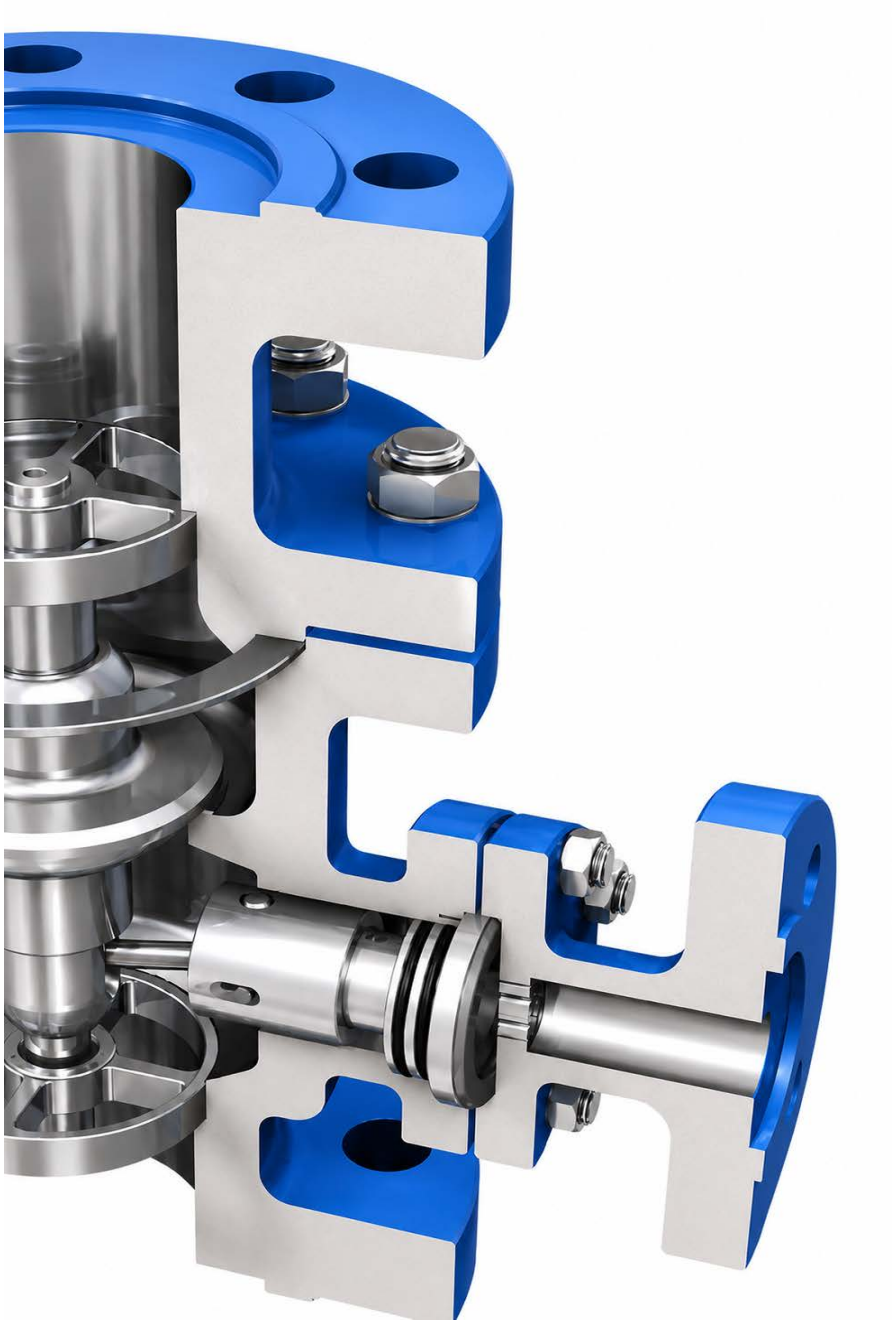
FLOWGUARD™
INTELLIGENT PUMP PROTECTION

Intelligent Pump Protection Technology
for Critical Industrial Applications

Advanced Automatic Recirculation Valves



FlowGuard LP™

FlowGuard MP™

FlowGuard HP™

FlowGuard™ is a premium automatic recirculation valve designed for centrifugal pump protection in refinery, petrochemical, power generation, mining, water treatment, and process industries. The system automatically maintains minimum safe flow conditions to prevent overheating, cavitation, unstable operation, and pump damage.

KV Controls (PTY) Ltd. Reg No: 2016/378940/07

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Control & Isolation Valves

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Solution for pump protection

Modern industrial processes require centrifugal pumps to operate under varying flow conditions. An Automatic Recirculation Valve (ARC Valve) is a multifunctional valve designed primarily to ensure that a predetermined minimum flow is continuously maintained through a centrifugal pump. This is critical because centrifugal pumps are susceptible to overheating, cavitation, and severe internal damage when operating under low-flow or dry-run conditions.

Through many years of research, development, continuous innovation, and practical application, the **FlowGuard** series are developed to prevent overheating, excessive noise, instability, and erosion damage in centrifugal pumps operating under low-load conditions.

Whenever the pump flow rate drops below a predetermined minimum level, the bypass recirculation port automatically opens to ensure the required minimum flow through the pump, thereby protecting the pump from damage and maintaining stable operation.

FlowGuard™ Product Family

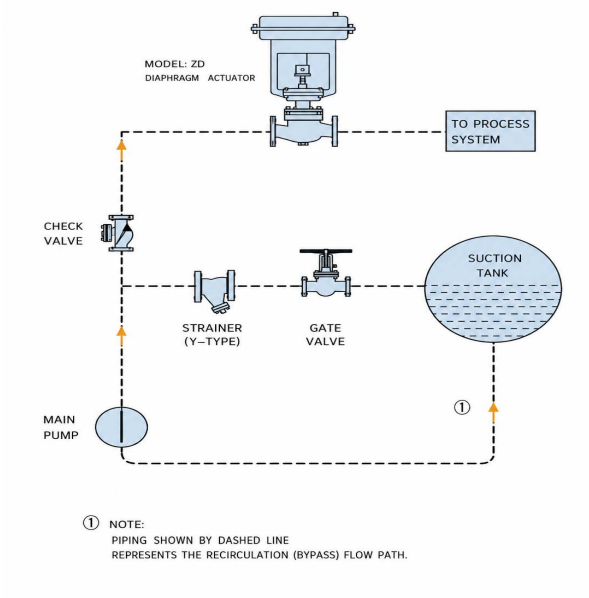
Series	Application	Key Features
FlowGuard LP™	Low pressure systems	Compact design, economical protection
FlowGuard MP™	Medium pressure process pumps	Low-noise multi-cage bypass
FlowGuard HP™	High pressure & boiler feedwater	Multi-stage cavitation control

Three common practises for pump protection

■ Continuous circulating system

The minimum flow requirement of a continuous recirculation system pump is independent of changes in the process flow demand. Once the minimum flow is set, the excess flow is recirculated directly back to the storage tank through an orifice plate.

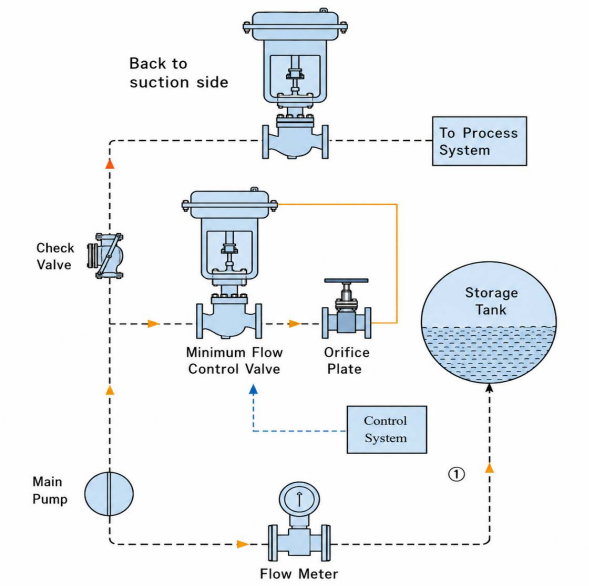
Although continuous minimum flow recirculation provides effective pump protection, the pump is required to deliver additional power to accommodate both the process flow and the recirculation flow. This results in unnecessary energy consumption and reduced system efficiency.



■ Control circulating system

A controlled recirculation system consists of a check valve, flow meter, minimum flow control valve, and a recirculation control system. This type of system provides effective minimum flow protection for centrifugal pumps.

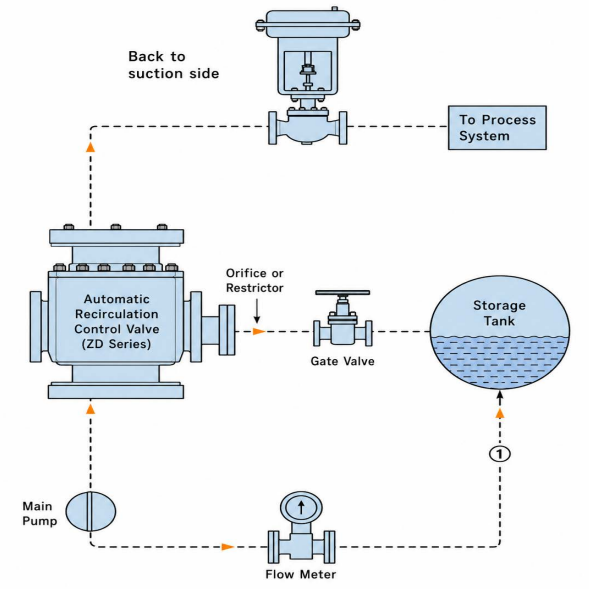
When the process flow exceeds the pump's minimum required flow, the recirculation loop closes automatically, eliminating unnecessary energy loss. However, the system is relatively complex and requires multiple control components, resulting in higher purchase, installation, and maintenance costs



■ Automatic recirculation control valve

The Automatic Recirculation Valve integrates a check valve, flow sensing mechanism, bypass control valve, and multi-stage pressure reduction system into a single compact unit. It operates without the need for external power, control systems, or wiring, ensuring maximum operational safety and reliability.

Its compact design minimizes installation space requirements and significantly reduces the risk of malfunction caused by high-velocity fluid flow. In addition, the valve offers lower installation and maintenance costs, making it the preferred pump protection solution for modern industrial process systems.

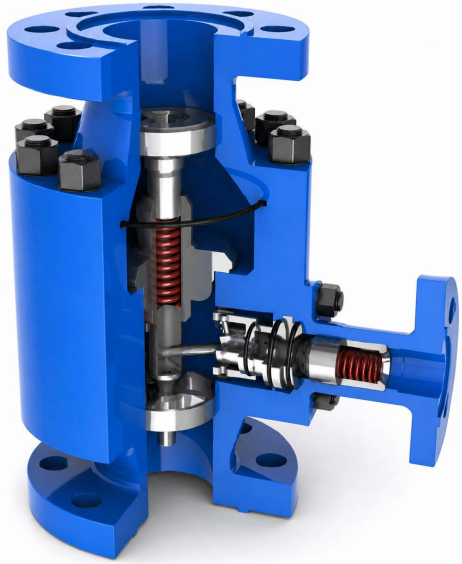


Automatic recirculation control valve

FlowGuard LP™

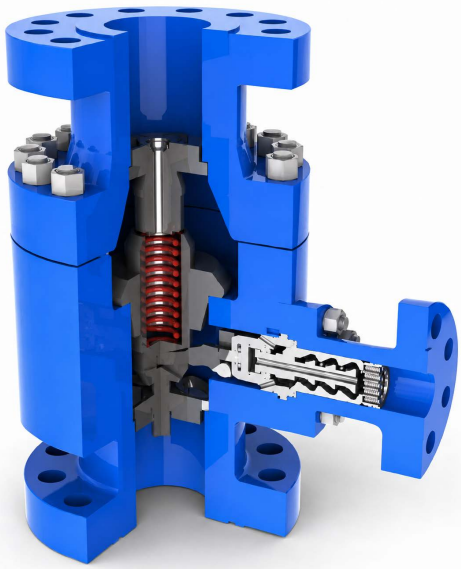
- Simple structure, low cost, long life, suitable for Low pressure Working conditions.
- Cast valve body, material: carbon steel or stainless steel etc.
- Big flow of bypass, maximum flow is 60% of main flow, KV value can be adjusted.
- Bypass maximum operating pressure differential up to 4 MPa.
- Pressure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

FlowGuard MP™



- 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.

FlowGuard HP™



- 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.

FlowGuard LP™

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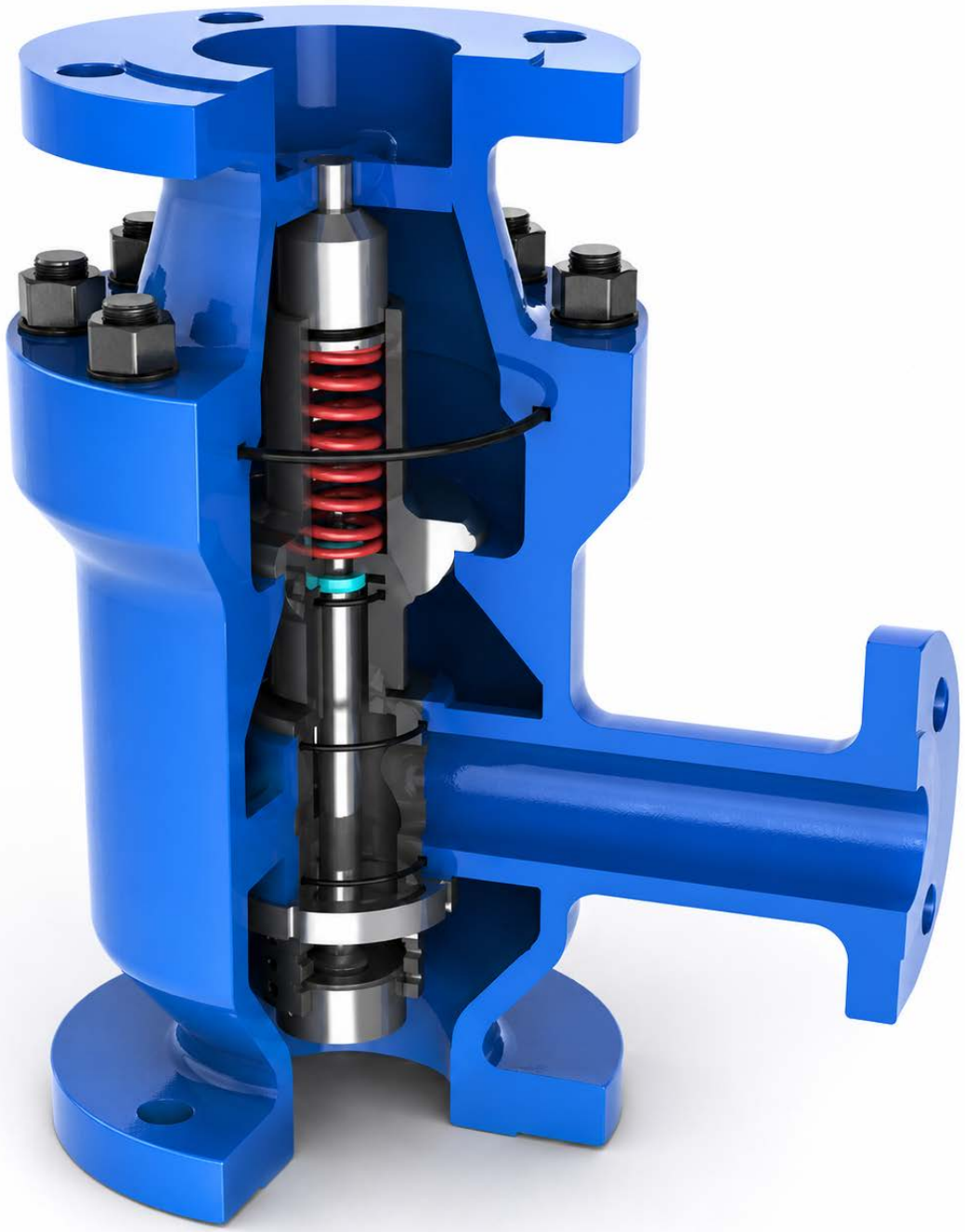

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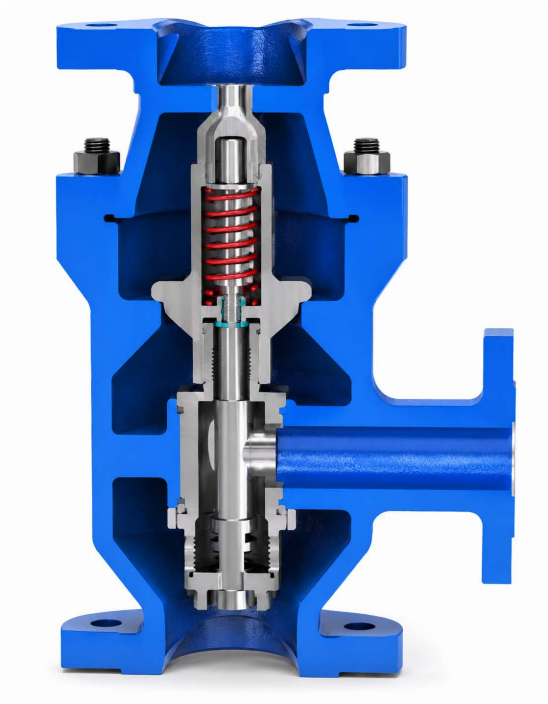


The FlowGuard LP Automatic Recirculation Valve is a pump protection device designed to automatically safeguard centrifugal pumps against cavitation damage and unstable operating conditions, particularly during low-load operation and hot water service applications.

When the pump flow drops below the preset minimum flow rate, the bypass opens automatically to ensure the required minimum flow through the pump. Even when the main process flow is fully closed (zero main flow), the minimum required flow can still be discharged through the bypass system, ensuring continuous pump protection.

The FlowGuard LP features a large-capacity bypass design, making it especially suitable for applications requiring high bypass flow rates. The maximum differential pressure is 4 MPa, while the final valve selection is determined according to the specific operating conditions and application requirements.

- Simple structure, operation reliable and stabile, with few movement parts.
- Be easy for installation, can be installed vertically or horizontally on pump 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: -196℃ to +300 ℃.

Specifications

Valve body type: Casted three way design

Nominal diameter: NPS 1'' – 16'' (DN25, 32, 40, 50, 65, 80, 100, 200, 250, 300, 350,

400) Nominal pressure: CL150# - 400# (PN 16, 25, 40, 64)

End 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

FG	T	-Nominal pressure	-Body material	-Main diameter	/Bypass diameter	-Structure type
LP series	T type bypass assembly	PN16=PN16 CLSS150#=CL150	C=WCB LC=LCB P=CF8 PL=CF3 R=CF8M RL=CF3M D=customized	DN25=25 NPS1”=1”	DN25=25 NPS1”=1”	V=vertically mounted H=Horizontally mounted Z=Bypass non-return D=With discharge
For example: T type bypass, pressure is CL150#, body material is WCB, main diameter 2’’, Bypass diameter 1’’, vertically mounted, Model: FGLP-CL150-C-2’’/1’’-V						

Principle of Operation

According to changes in the main process flow, the check cone of the Automatic Recirculation Valve automatically moves to the corresponding position. At the same time, the main valve disc drives the bypass valve stem, transferring the movement of the main valve disc to the bypass system. By controlling the position of the bypass valve disc, the bypass throttling area is adjusted, thereby regulating the bypass flow rate.

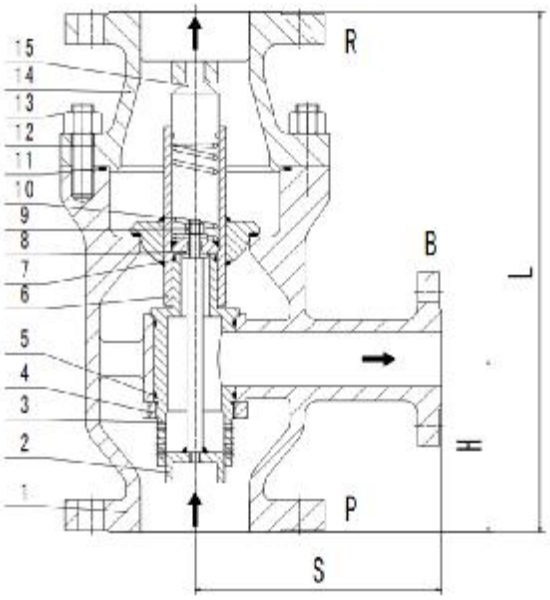
When the main valve disc returns to the valve seat and closes, the entire flow is recirculated through the bypass line. When the main valve disc rises to its fully open position, the bypass closes completely, allowing the full pump flow to be delivered to the process system.

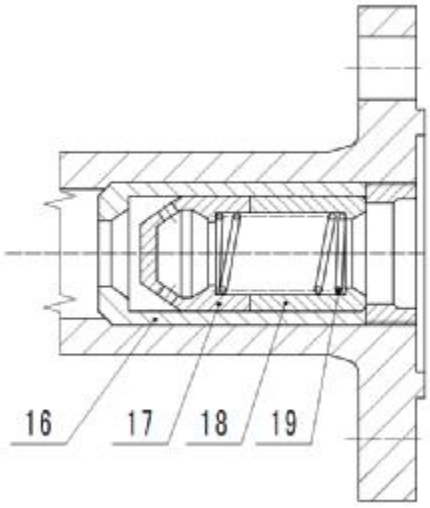
- Flow Sensing: The main valve disc of the Automatic Recirculation Valve automatically senses the main process flow. Based on the flow rate, it continuously adjusts the position of both the main valve disc and the bypass valve disc.
- Recirculation Control: The Automatic Recirculation Valve recirculates the minimum required pump flow back to the storage system through the bypass line, ensuring safe pump operation and optimizing the pump’s H-Q performance characteristics.
- Check Valve Function: The Automatic Recirculation Valve also functions as a non-return valve, preventing reverse flow from returning to the pump. An optional non-return function for the bypass line is also available.
- Custom Bypass Design: Special bypass sizes can be customized according to application requirements. The maximum bypass flow rate is determined by the maximum Kv value.

Size selection

Valve size	mm	25	32	40	50	65	80	100	125	150	200	250	300
	inch	1	11/4	11/2	2	21/2	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	11/2	11/2	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 size depends on the discharge 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	1Cr18Ni				

Dimension and weight

Valve specification DNP DNR	Size mm（in）			Bypass	Weight Kg	
	S	H	L	（DNB）	PN10/16/25 150lbs	PN40/64 300lbs
25（ 1″）	115	102	267	15	12	18
32（ 11/4″）	115	102	267	20	14	20
40（ 11/2″）	115	102	267	20	14	20
50（ 2″）	130	108	305	25	22	26
65（ 21/2″）	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	200	575	80	143	156
150（ 6″）	267	200	575	80	220	240
200（ 8″）	300	220	600	100	255	302
250（ 10″）	356	255	780	100	400	455
300（ 12″）	530	280	830	150	590	650

※ Special dimensions can manufactured upon request

FlowGuard MP™

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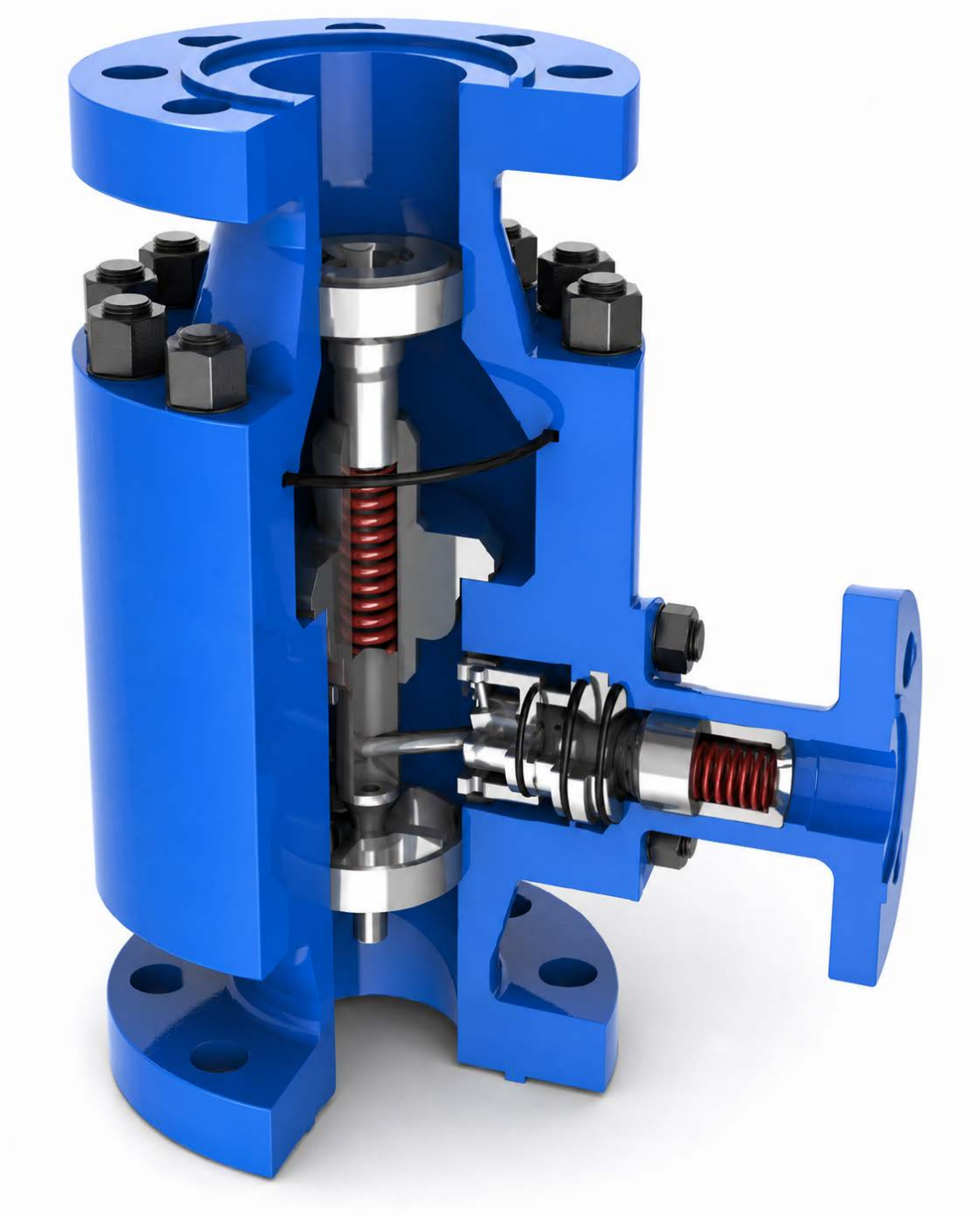

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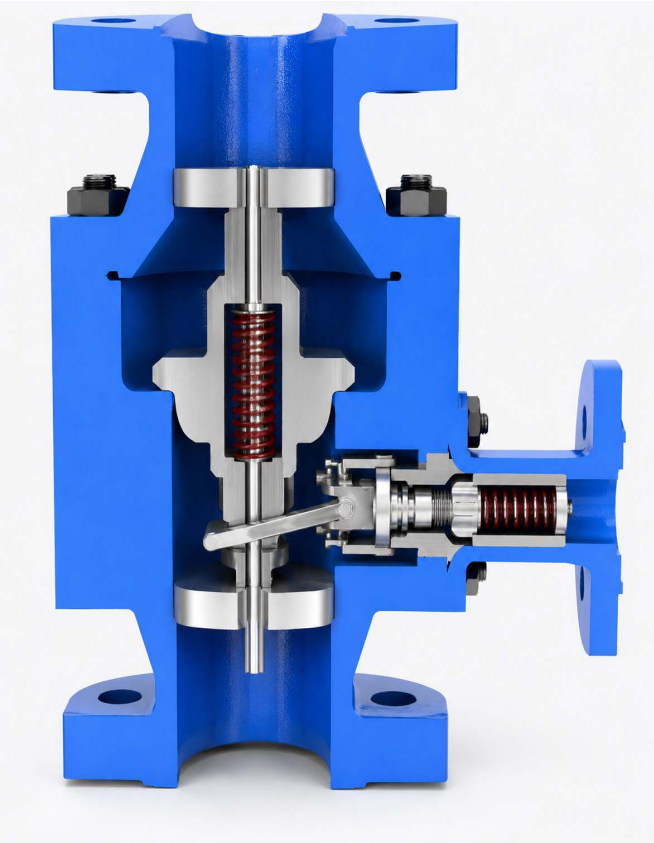


The FlowGuard MP Automatic Recirculation Valve is a pump protection device designed to automatically protect centrifugal pumps against cavitation, instability, and overheating, particularly during low-load operation and hot water service applications.

When the pump flow falls below the preset minimum flow rate, the bypass valve opens automatically to ensure the minimum required flow through the pump. Even when the main process flow is fully closed (zero main flow), the minimum flow can still pass through the bypass system to maintain continuous pump protection.

Pressure reduction is achieved through a multi-stage bypass pressure reducing system, ensuring stable and reliable operation under varying process conditions.

The FlowGuard MP is suitable for applications with medium to low bypass pressure differentials, with a maximum differential pressure of 6 MPa. Final valve selection is determined according to the specific operating requirements and application conditions.

The unique L-type bypass design effectively reduces operational noise caused by high-velocity flow while also minimizing the risk of cavitation damage.

- Multi-stage cage type bypass, low noise, suitable for medium and low pressure working conditions.
- Forged valve body, different materials of construction; 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 various conditions.
- Pressure grade from PN16 to PN100, diameter from DN25 to DN500.
- Can select manual bypass operation function, used in fault.

Specifications

Valve body type: Three-way forged body.

Nominal diameter: NPS 1'' – 20'' (DN25, 32, 40, 50, 65, 80,100, 200, 250, 300, 350, 400, 450, 500)

Nominal pressure: CL150# - 600# (PN 16, 25, 40, 64, 100)

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

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
SS winding gasket	-20～+300	-40～+300	-196～+300	-196～+300

Model seclection

FG	L	Nominal pressure	Body material	Nominal diameter	/Bypass diameter	Structure type
MP series	L type bypass assembly	PN16=PN16 CLSS150#=CL150	C=WCB LC=LCB P=CF8 PL=CF3 R=CF8M RL=CF3M D=customized	DN25=25 NPS1”=1”	DN25=25 NPS1”=1”	V = Vertically mounted H = Horizontally mounted S = manual startup
For example: L type bypass, pressure is Class600#, body material is WCB,Main diameter 2”, bypass diameter 1”, vertically mounted, Model: FGMP-CL600-C-2”/1”-V						

Principle of operation

According to changes in the main process flow, the check cone of the Automatic Recirculation Valve automatically moves to the corresponding position. Simultaneously, the main valve disc drives the bypass valve stem, transferring the movement of the main valve disc to the bypass system. By adjusting the position of the bypass valve disc, the bypass throttling area changes accordingly, thereby controlling the bypass flow rate.

When the main valve disc returns to the valve seat and closes, the entire flow is recirculated through the bypass line. When the main valve disc rises to its fully open position, the bypass closes completely, allowing the full pump flow to pass directly to the process system

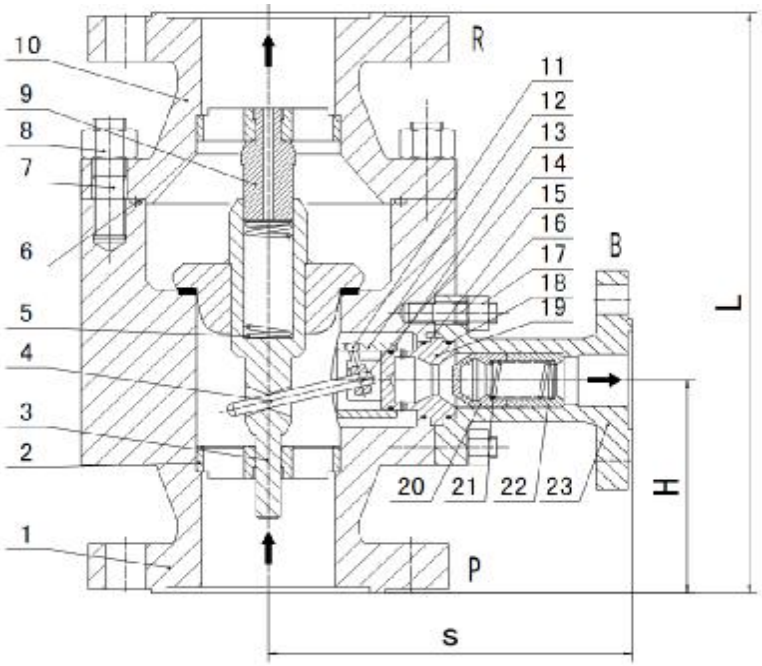
- Flow Sensing: The main valve disc of the Automatic Recirculation Valve automatically senses the main process flow. Based on the flow rate, it continuously adjusts the position of both the main valve disc and the bypass valve disc.
- Recirculation Control: The Automatic Recirculation Valve recirculates the minimum flow required for safe pump operation back to the storage system through the bypass line. This helps optimize the pump’s H-Q performance characteristics and ensures reliable recirculation protection.
- Multi-Stage Bypass Pressure Reduction: The bypass control system reduces the pressure of the recirculated fluid from the high-pressure pump outlet to a suitable lower-pressure level before returning it to the storage system. This design minimizes operational noise, vibration, and wear while improving overall system reliability.
- Check Valve Function: The Automatic Recirculation Valve also functions as a check valve, preventing reverse flow from returning to the pump. A non-return function in the bypass line is provided as a standard feature.
- Custom Bypass Design: Special bypass sizes can be customized to meet specific application requirements. The maximum bypass flow rate is determined by the maximum Kv value.

Size selection

Valve size	mm	25	32	40	50	65	80	100	125	150	200	250	300
	in	1	11/4	11/2	2	21/2	3	4	5	6	8	10	12
Max main flow	m3/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	11/2	11/2	2	2	21/2	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 size depends on the discharge size of pump.

Main parts and dimension



Parts and material

NO	Name	Material(common used)		NO	Name	Material(common used)	
1	Main Body	A105	F304	13	O ring	FKM	FKM
2	Guide ring	2Cr13	F304	14	Pin 1	2Cr13	F304
3	Main disc	2Cr13+STL	F304+STL	15	Pin 2	2Cr13	F304
4	Lever	2Cr13	F304	16	Stud bolt	B7	0Cr18Ni9Ti
5	Spring1	60Si2Mn	1Cr18Ni9Ti	17	Hex nut	2H	0Cr18Ni9Ti
6	O ring	FKM	FKM	18	O ring	FKM	FKM
7	Stud bolt	B7	0Cr18Ni9Ti	19	Control head	2Cr13	F304
8	Hex nut	2H	0Cr18Ni9Ti	20	porous sleeve	2Cr13	F304
9	Guide pin	2Cr13	F304	21	Spring2	60Si2Mn	1Cr18Ni9Ti
10	Bonnet	2Cr13	F304	22	End ring	2Cr13	F304
11	Turn arm	2Cr13	F304	23	Bypass body	A105	F304
12	Control block	2Cr13	F304				

Dimension and weight

DN	PN(bar)	CLASS	DNB	L(mm)	S(mm)	H(mm)	Weight(Kg)
25 (1'')	10-16-25-40	150-300 lbs	25 (1'')	190	153	73	17
	63-100	600 lbs		250	182	90	32
32 (1 1/4'')	10-16-25-40	150-300 lbs	25 (1'')	190	153	73	19
	63-100	600 lbs		250	182	90	32
40 (1 1/2'')	10-16-25-40	150-300 lbs	25 (1'')	200	155	75	19
	63-100-160	600 lbs		260	190	90	32
50 (2'')	10-16-25-40	150-300 lbs	25 (1'')	230	163	90	27
	63-100-160	600 lbs		300	185	115	41
65 (2 1/2'')	10-16-25-40	150-300 lbs	40 (1 1/2'')	290	184	110	42
	63-100-160	600 lbs		340	219	125	60
80 (3'')	10-16-25-40	150-300 lbs	40 (1 1/2'')	310	191	115	52
	63-100-160	600 lbs		380	233	140	74
100 (4'')	10-16-25-40	150-300 lbs	50 (2'')	350	221	125	81
	63-100-160	600 lbs		430	258	155	112
125 (5'')	10-16-25-40	150-300 lbs	50 (2'')	400	266	135	122
	63-100-160	600 lbs		500	280	175	182
150 (6'')	10-16-25-40	150-300 lbs	65 (2 1/2'')	480	295	165	138
	63-100	600 lbs		550	350	190	273
200 (8'')	10-16-25-40	150-300 lbs	80 (3'')	600	395	200	241
	63-100	600 lbs		650	405	215	467
250 (10'')	10-16-25-40	150-300 lbs	100 (4'')	730	475	240	411
	63-100	600 lbs		775	520	260	714
300 (12'')	10-16-25-40	150-300 lbs	125 (5'')	850	530	280	1281
	63-100	600 lbs		900	550	300	1480

※ Special dimensions can manufactured upon request

FlowGuard HP™

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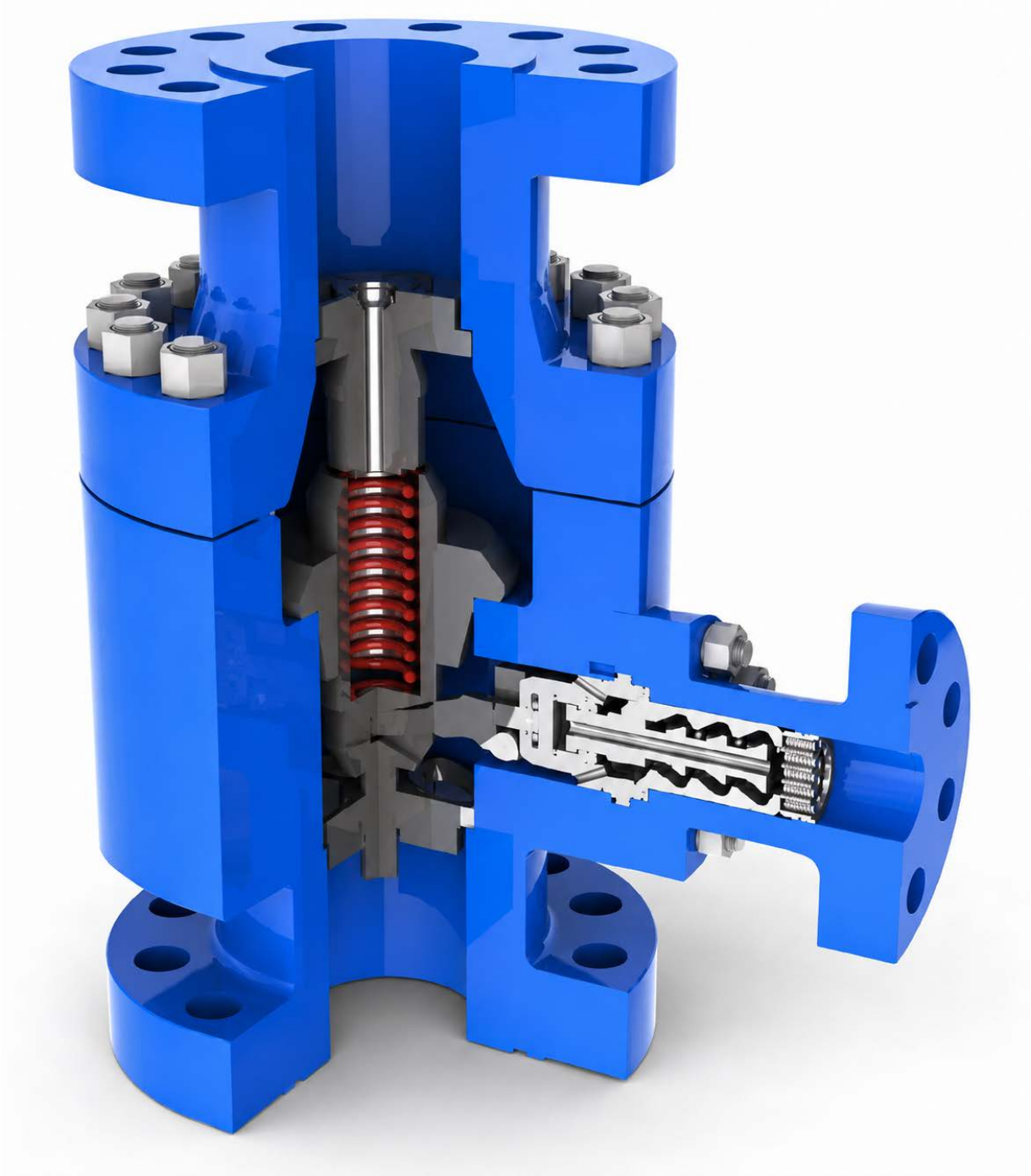

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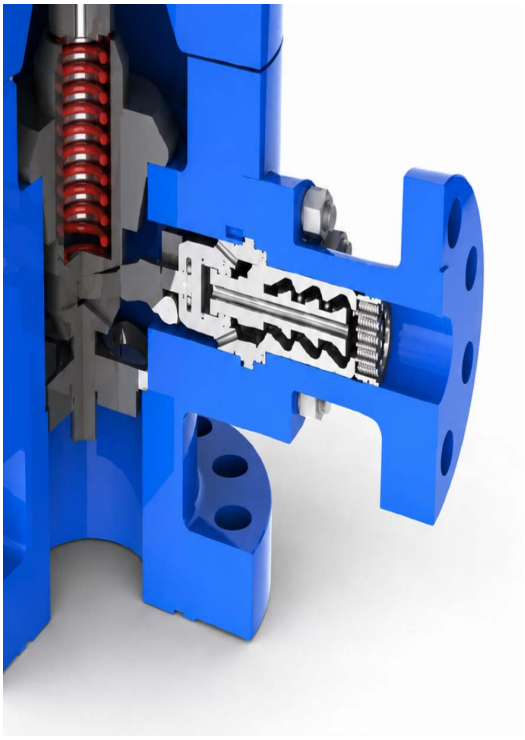


The FlowGuard HP Automatic Recirculation Valve is a pump protection device designed to automatically protect centrifugal pumps against cavitation, instability, and overheating, particularly during low-load operation and hot water service applications.

When the pump flow drops below the preset minimum flow rate, the bypass valve opens automatically to ensure the minimum required flow through the pump. Even when the main process flow is fully closed (zero main flow), the required minimum flow continues to pass through the bypass system, ensuring continuous automatic recirculation and reliable pump protection.

Pressure reduction is achieved through a multi-stage bypass pressure reducing system, providing stable and controlled operation under high differential pressure conditions.

The FlowGuard HP is specifically designed for applications with high bypass pressure differentials, with a maximum differential pressure capability of up to 30 MPa. Final valve selection is determined according to the specific operating conditions and process requirements.

The multi-stage decompression M-type bypass design effectively reduces noise generated by high-velocity fluid flow while preventing cavitation erosion, flashing, and damage to internal valve components.

- Multi-Stage Pressure Reduction: The multi-stage decompression bypass design effectively reduces fluid velocity, making it suitable for high-pressure operating conditions while minimizing cavitation and excessive wear.
- Forged Valve Body: The valve body is manufactured from forged materials for superior strength and reliability. Optional materials include carbon steel, stainless steel, and other special alloys to suit various operating conditions.
- Standard Bypass Non-Return Function: A bypass non-return function is provided as a standard feature. The maximum allowable working differential pressure is up to 30 MPa.
- Wide Pressure and Size Range: Pressure ratings are available from PN16 to PN420, with valve sizes ranging from DN25 to DN500.
- Manual Bypass Operation: An optional manual bypass operation function can be selected for emergency or fault-condition operation.

Size and pressure range

Valve body type: Three-way forged valve

Nominal diameter: NPS 1'' – 20''(DN25, 32, 40, 50, 65, 80,100, 200, 250, 300, 350, 400, 450, 500)

Nominal pressure: CL150# - 2500# (16,25,40,64,100,160,250,420)

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

Material temperature range

Body material Sealing materuial	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

Principle of operation

According to changes in the main process flow, the check cone of the Automatic Recirculation Valve automatically moves to the corresponding position. Simultaneously, the main valve disc drives the bypass valve stem, transferring the movement of the main valve disc to the bypass system. By adjusting the position of the bypass valve disc, the bypass throttling area changes accordingly, thereby controlling the bypass flow rate.

When the main valve disc returns to the valve seat and closes, the entire flow is recirculated through the bypass line. When the main valve disc rises to its fully open position, the bypass closes completely, allowing the full pump flow to pass directly to the process system

- Flow Sensing: The main valve disc of the Automatic Recirculation Valve automatically senses the main process flow. Based on the flow rate, it continuously adjusts the position of both the main valve disc and the bypass valve disc.
- Recirculation Control: The Automatic Recirculation Valve recirculates the minimum flow required for safe pump operation back to the storage system through the bypass line. This helps optimize the pump's H-Q performance characteristics and ensures reliable recirculation protection.
- Multi-Stage Bypass Pressure Reduction: The bypass control system reduces the pressure of the recirculated fluid from the high-pressure pump outlet to a suitable lower-pressure level before returning it to the storage system. This design minimizes operational noise, vibration, and wear while improving overall system reliability.
- Check Valve Function: The Automatic Recirculation Valve also functions as a check valve, preventing reverse flow from returning to the pump. A non-return function in the bypass line is provided as a standard feature.
- Custom Bypass Design: Special bypass sizes can be customized to meet specific application requirements. The maximum bypass flow rate is determined by the maximum Kv value.

Size selection

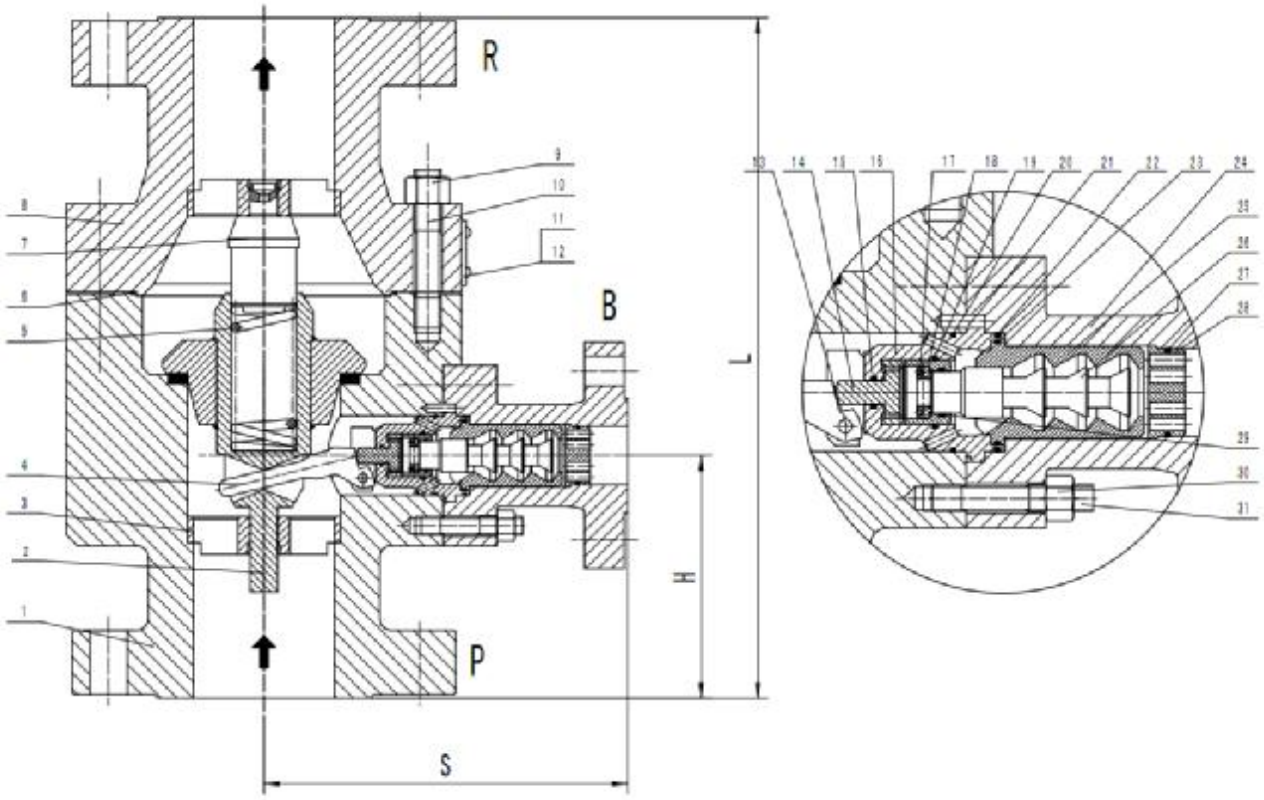
Valve size	mm	25	32	40	50	65	80	100	125	150	200	250	300
	in	1	11/4	11/2	2	21/2	3	4	5	6	8	10	12
Max main flow	m^3/h	12	28	30	50	100	114	200	400	455	750	1250	1650
Bypass size	mm	15	20	20	25	40	40	50	50	65	80	100	125
	in	1/2	3/4	3/4	1	11/2	11/2	2	2	21/2	3	4	5
Max bypass Kv	Cv	1.0	1.9	1.9	2.7	5.2	5.2	8.5	8.5	11	14	22	35

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

Model selection

FG	M	-Nominal pressure	-Body material	-Nominal diameter	/Bypass diameter	-Structure type
HP series	M type bypass assembly	PN16=PN16 Class 150# =CL150	C=A105 LC=LF2 P=304 PL=304L R=316 RL=316L D=customized	DN50=50 NPS2"=2"	DN25=25 NPS1"=1"	V = Vertically mounted H = Horizontally mounted S = manual startup
For example: M type bypass, Class 1500#,body material is WCB,main diameter 2', bypass diameter 1'',vertically mounted, Model: FGM-CL1500-C-2''/1''-V						

Main parts and dimension



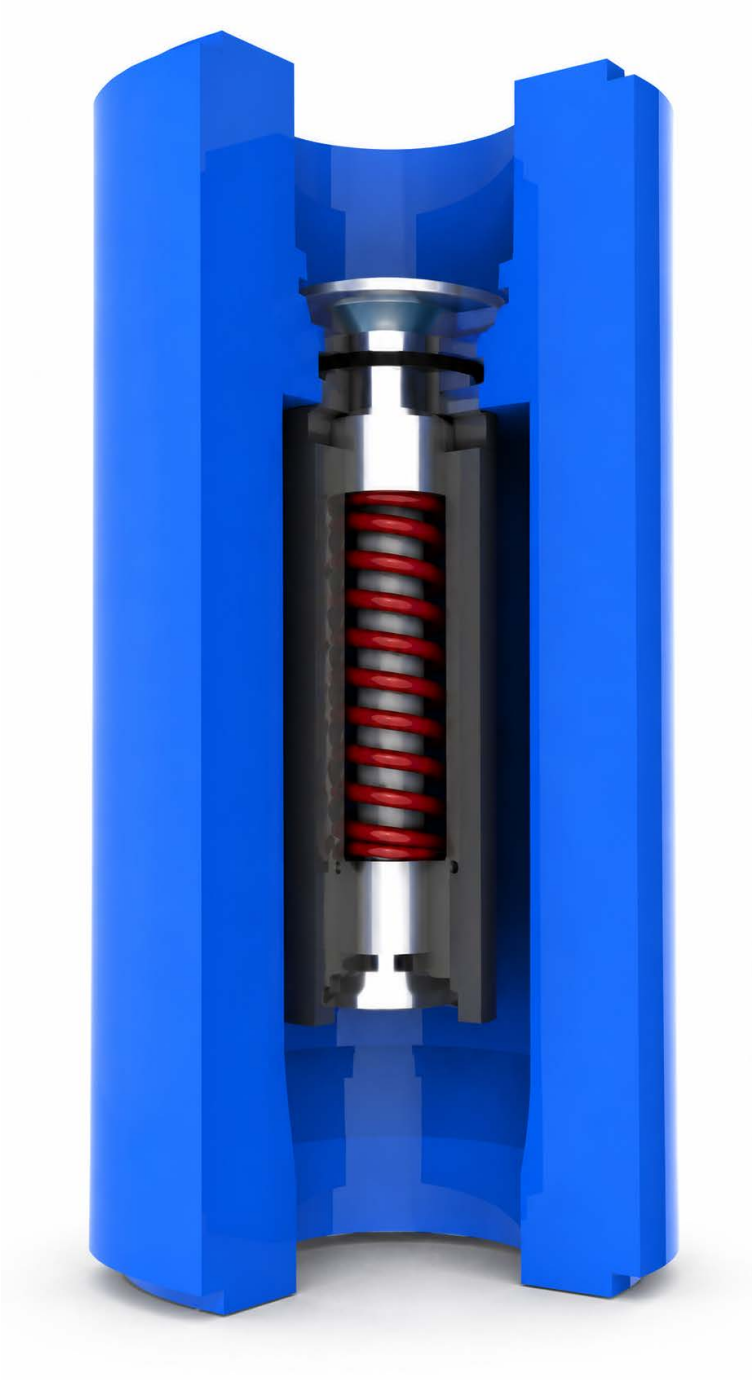
NO	Name	Material(common used)		NO	Name	Material(common used)	
1	Body	A105	F304	16	Disc setting	2Cr13	304
2	Disc	2Cr13	304	17	O ring	FKM	FKM
3	Guide ring	2Cr13	304	18	O ring	FKM	FKM
4	Valve plunger	2Cr13	304	19	Straight pin	2Cr13	304
5	Spring	60Si2Mn	1Cr18Ni9Ti	20	O ring	FKM	FKM
6	O ring	FKM	FKM	21	O ring	FKM	FKM
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	FKM	FKM
11	Plunger pin	2Cr13	304	26	Orifice plate	2Cr13	304
12	Disc block	2Cr13	304	27	O ring	FKM	FKM
13	O ring	FKM	FKM	28	Nut	2H	2H
14	Bonnet	2Cr13	304	29	Bolt	B7	B7
15	Core Nut	0Cr18Ni9	0Cr18Ni9				

Dimension and weight

DN（IN）	PN(bar)	CLASS	DNB（Inch）	L(mm)	S(mm)	H(mm)	(Kg)
25 (1″)	10-16-25-40	150-300 lbs	25 (1″)	190	153	73	17
	63-100	600 lbs		250	182	90	32
32 (1″)	10-16-25-40	150-300 lbs	25 (1″)	190	153	73	19
	63-100	600 lbs		250	182	90	32
40 (11/2″)	10-16-25-40	150-300 lbs	25 (1″)	200	155	75	19
	63-100-160	600-900 lbs		260	190	90	32
	250	1500 lbs		300	215	120	43
50 (2″)	10-16-25-40	150-300 lbs	25 (1″)	230	163	90	27
	63-100-160	600-900 lbs		300	185	115	41
	250	1500 lbs		350	223	130	59
65 (21/2″)	10-16-25-40	150-300 lbs	40 (11/2″)	290	184	110	42
	63	600 lbs		340	219	125	60
	100-160	900 lbs		340	227	125	69
	250	1500 lbs		400	260	145	89
80 (3″)	10-16-25-40	150-300 lbs	40 (11/2″)	310	191	115	52
	63	600 lbs		380	233	140	74
	100-160	900 lbs		380	240	140	84
	250	1500 lbs		450	265	165	122
100 (4″)	10-16-25-40	150-300 lbs	50 (2″)	350	221	125	81
	63	600 lbs		430	258	155	112
	100-160	900 lbs		430	266	155	126
	250	1500 lbs		520	300	190	206
125 (5″)	10-16-25-40	150-300 lbs	50 (2″)	400	266	135	122
	63	600 lbs		500	280	175	182
	100-160	900 lbs		500	291	175	207
	250	1500 lbs		600	321	215	300
150 (6″)	10-16-25-40	150-300 lbs	65 (21/2″)	480	295	165	138
	63	600 lbs		550	350	190	273
	100-160	900 lbs		585	355	200	289
	250	1500 lbs		700	405	250	444
200 (8″)	10-16-25-40	150-300 lbs	80 (3″)	600	395	200	241
	63	600 lbs		650	405	215	467
	100-160	900 lbs		680	430	225	501
	250	1500 lbs		830	485	290	785
250 (10″)	10-16-25-40	150-300 lbs	100 (4″)	730	475	240	411
	63	600 lbs		775	520	260	714
	100-160	900 lbs		800	560	270	857
	250	1500 lbs		900	560	310	1284
300 (12″)	10-16-25-40	150-300 lbs	125 (5″)	850	530	280	740
	63	600 lbs		900	550	300	930
	100-160	900 lbs		1050	650	360	1485
	250	1500 lbs		1200	720	420	2100

※ Special dimensions can manufactured upon request

FlowGuard FS™



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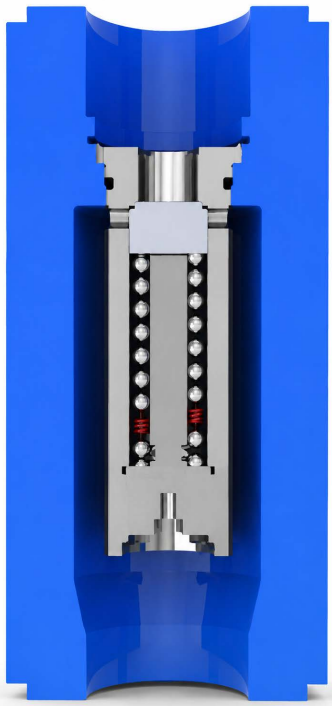
KV CONTROLS
Control & Isolation Valves

FLOWGUARD™
INTELLIGENT PUMP PROTECTION

FlowGuard FS.



The FlowGuard FS is a back pressure valve that is designed for applications where conventional control systems are not suitable. As a specialized pressure control valve, it is commonly used in combination with an Automatic Recirculation Valve to protect pump systems.

The FlowGuard FS controls the upstream pressure, allowing the system to maintain the required operating pressure and preset process pressure values. This helps prevent vaporization, cavitation, and unstable operating conditions within the pump system.

By carefully matching the operating conditions of the Automatic Recirculation Valve and the Back Pressure Valve, optimal pump protection can be achieved, ensuring long-term stability, reliability, and safe system operation.

The valve operates as a self-actuated design. Under the force of the spring, the valve disc moves axially, generating a differential pressure across the back pressure valve. At the same time, the opening area of the valve seat gradually increases until the differential pressure reaches the preset operating value.

Installation

To achieve optimal valve performance, the Back Pressure Valve (BPV) should be installed downstream of the primary protected valve. As the outlet flow velocity can be high, the installation location should be positioned as close as possible to the deaerator or water supply tank.

Maintenance

The valve is designed for easy operation and maintenance. Detailed installation and maintenance manuals can be provided upon request.

Valve Size

Standard Size Range: DN25 ~ DN150 (1” ~ 6”)
Pressure Range
Nominal Pressure Range: PN10 ~ PN400 (ANSI Class 150 ~ ANSI Class 2500)
Other pressure ratings are available upon request.
Connections

Flange connection standards are available according to DIN or ANSI specifications. Other standards, including ISO, BS, JIS, and NF, can also be customized according to customer requirements.

Material temperature range

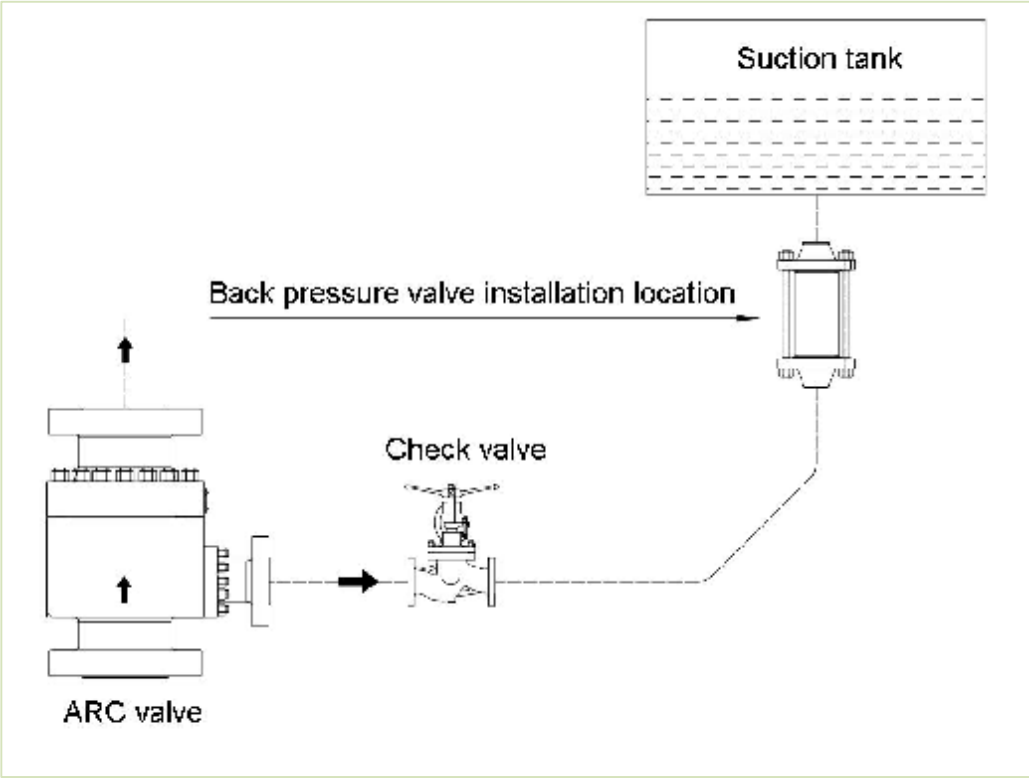
Body material / Sealing material	A105	LF2	F304	F316
NBR	-20～+100	-30～+100	-30～+100	-30～+100
FKM	-20～+200	-40～+200	-40～+200	-40～+200
PTFE	-20～+230	-40～+230	-80～+230	-80～+230
Stainless steel gasket	-20～+300	-40～+300	-196～+300	-196～+300

Model selection

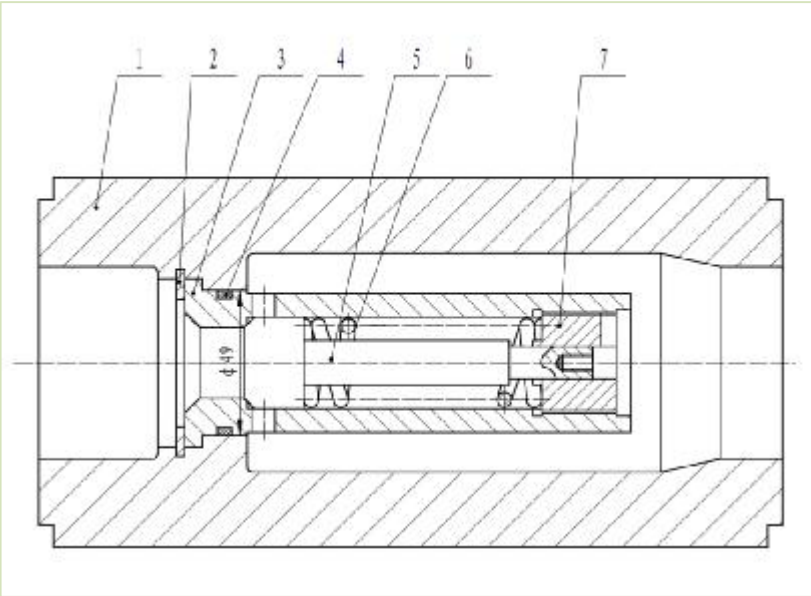
FG	7	-Nominal pressure	-Body material	-Nominal diameter	-Structure type
FS BOV	7 series	PN16=PN16 Class 150# =CL150	C=A105 LC=LF2 P=304 PL=304L R=316 RL=316L	DN50=50 NPS2”=2”	D = Wafer type F = Flange connection S = overflow function
For example: 7 series BPV,Class 1500#,body material is A105, diameter 2’, flange type connection, Model: FS7-CL1500-C-2’’-F					

Installation

In order to make the valve to achieve best performance, FS7 should be installed in the downstream of the protected valve, since valve outlet velocity flow is high, installation location should be near to the deaerator or tank.



Parts and material



NO	Name	Material（ Common used）			
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_____M^3 /h

Maximum _____M^3 /h

Normal _____M^3 /h

Pressure:

Outlet pressure_____Mpa

Inlet pressure _____Mpa

Temperature:

Normal _____℃

Maximum_____℃

Medium:

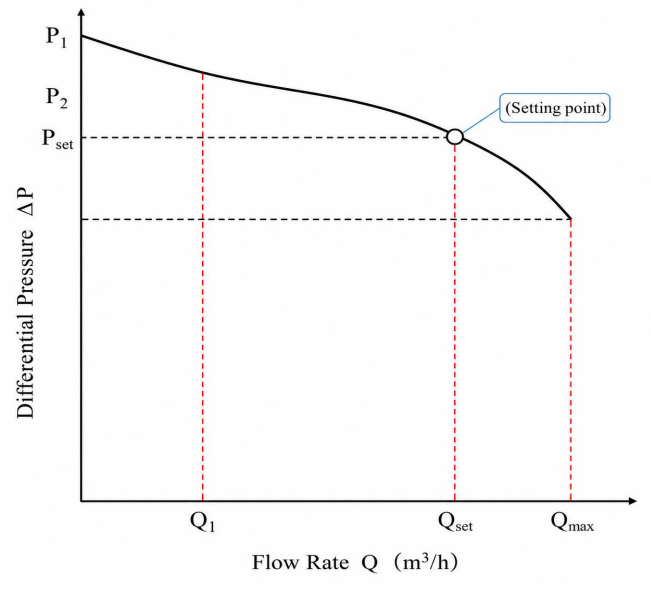
Density _____Kg/M^3

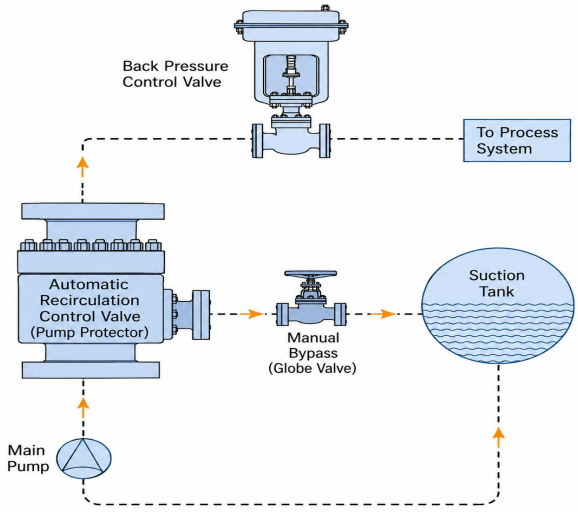
Viscosity_____

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: □ Vertical □ Horizontal			

Process information			
Fluid medium		Density	
Operation Temperature		Design Temperature	
Pump flow rate (rated)		Pump pressure (rated)	
Pump flow rate (normal)		Pump pressure (normal)	
Pump flow rate (minimum)		Pump pressure (maximum)	
Bypass back pressure		Main pressure difference	





DNV OHSAS 18001 CE TSE ISO 14001 TS TS-EN ISO ISO ISO

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