



SINCE 1984

Automatic Recirculation Valves

for Centrifugal Pump Minimum Flow Protection

DLPM



PROVIDING

- Check valve for reverse flow protection
- Main flow sensing element
- Bypass modulating minimum-flow control
- Bypass pressure reduction for quiet operation

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The DLPM series automatic recirculation valve was developed for centrifugal pump protection, providing the following features and benefits.

OPERATIONS DEPENDABILITY

The 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.

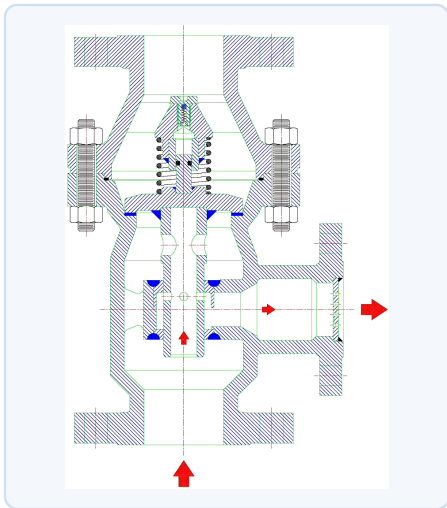
MULTI-FUNCTION VALVE

Provides economical and reliable protection against low flow and reverse flow conditions. The valve combines the functions of (1) main line check valve, (2) flow sensing element, and (3) bypass pressure reduction. The DLPM eliminates at least seven separate components used in a conventional system.

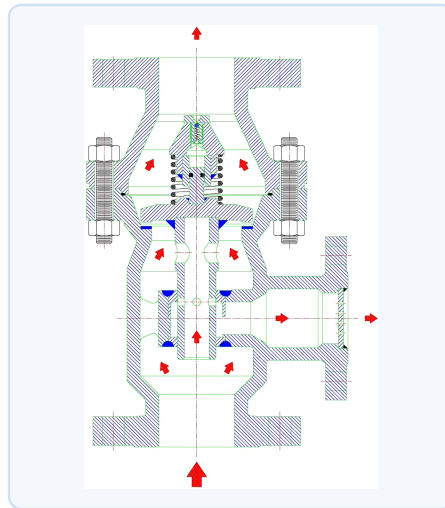
SELF POWERED

The valve operates without air or electric power and is easily installed with three connections.

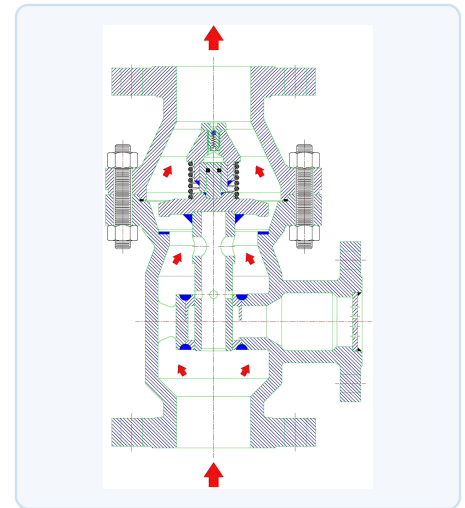
Operational Overview



No main flow demand — minimum flow through bypass.



Modulating flow — main flow less than minimum flow.



Main flow greater than minimum flow — bypass closed.

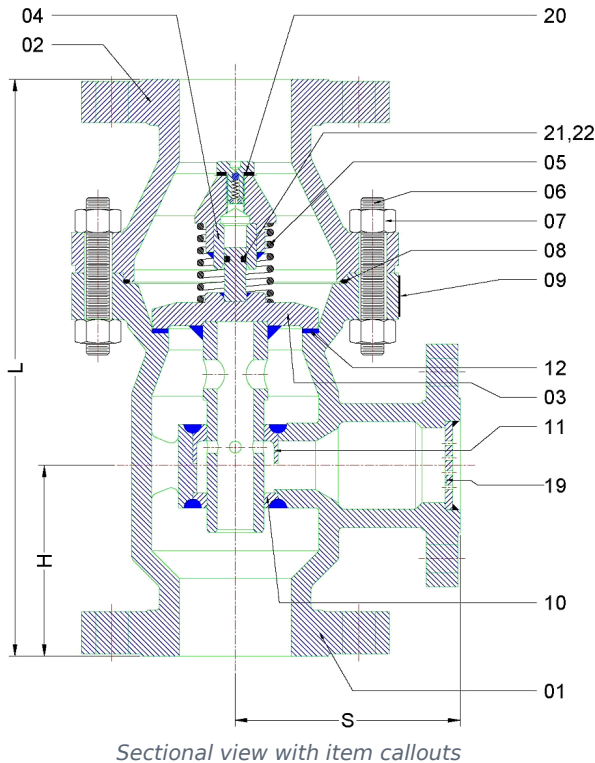
INDUSTRIES The valve was developed to serve pump-protection requirements in Power, Refining, Chemical, Petro-chemical, Pharmaceutical and HVAC.

INSTALLATIONS Typical installations include Transfer, Feeding, Circulating, Boosting and Loading Pumps.

USAGE Typical uses include centrifugal pumps of ANSI / API configuration, vertical turbine, and canned-motor designs.

APPLICATIONS In general, any clean liquid which passes through a strainer or filter before entering the valve. Typical services include but are not limited to boiler feed water, raw water, condensate, gasoline, diesel fuel, light hydrocarbons and feed stocks.

Dimensions, Materials & Flow



Dimensions & Weights

Normal Sizes (in.) Pressure			Dimensions (in.)			Weight
Main	Bypass	Class	L	H	S	lb.
1	0.75	150	9.6	3.4	4.3	22
		300	9.6	3.4	4.3	33
		600	10.2	3.7	4.5	48
1.5	0.75	150	9.6	3.4	4.3	26
		300	9.6	3.4	4.3	37
		600	10.2	3.7	4.5	48
2	1	150	10.9	4.0	4.9	40
		300	10.9	4.0	4.9	48
		600	11.6	4.3	5.1	57
3	2	150	14.1	4.6	5.6	66
		300	15.5	5.1	6.0	92
		600	16.3	5.3	6.6	119
4	3	150	15.8	5.4	6.8	108
		300	18.2	6.2	7.3	158
		600	19.6	6.6	8.1	220
6	4	150	21.0	6.9	8.4	220
		300	22.8	7.5	9.3	315
		600	25.0	8.1	10.2	453
8	6	150	29.5	9.6	10.8	438
		300	31.3	10.2	11.6	598
		600	33.7	10.8	12.6	779
10	8	150	35.4	11.8	13.4	946
		300	37.4	12.6	14.2	1342
		600	43.3	14.4	16.3	1925

Dimensions & Weights — consult HBE for larger sizes

Flow Ratings

Normal Sizes (in.)		Flows — GPM		Bypass Cv	
Main	Bypass	Main Max	Bypass Max	Max	Min
1	0.75	60	35	2.0	0.5
1.5	0.75	75	35	3.8	0.5
2	1	210	75	7.5	1.0
3	2	450	165	15.0	2.0
4	3	800	320	32.0	3.0
6	4	1800	650	85.0	5.0
8	6	3100	1250	155.0	7.0
10	8	4900	2400	325.0	25.0

Flow ratings shown for fluids with specific gravity = 1.0

Valve Model Legend

DLPM-12-030-4124

DLPM Model Designation
12 Size Code
030 Pressure Class Code
4124 Quote / Order File No.

DLPM — Low pressure modulating ARC valve. ASME Class 150 and 300.
DMPM — Medium pressure modulating ARC valve. ASME Class 600.

Size Code

04 = 1" 06 = 1-1/2" 08 = 2" 12 = 3" 16 = 4" 24 = 6" 32 = 8" 40 = 10"

Pressure Class Code

015 = 150 030 = 300 060 = 600

Materials of Construction

Item	Description	Material	Spec.
01	Body	Carbon Steel	ASTM A216 WCB
02	Bonnet	Carbon Steel	ASTM A216 WCB
03	Disc	Stainless Steel	AISI 304
04	Slide Ring	Stainless Steel	AISI 17-4 PH
05	Spring	Stainless Steel	AISI 302
06	Stud Bolt	Alloy Steel	ASTM A193 B7
07	Hex Nut	Alloy Steel	ASTM A194 2H
08	O-Ring	By Application	----
09	Name Plate	Stainless Steel	AISI 304
10	Bypass Ring	Stainless Steel	AISI 17-4 PH
11	Lower Slide Ring	Stainless Steel	AISI 17-4 PH
12	Seat	Stainless Steel Deposit	AWS E316L
19	Orifice	Stainless Steel	AISI 304
20	Dampening Valve	Stainless Steel	----
21	Pressure Ring	By Application	----
22	Slide Ring	PTFE	----

BACK PRESSURE ACCESSORIES

Depending upon the bypass pressure differential, an orifice can be installed inside the bypass. A remote orifice or back-pressure regulator (BPR) installed in the bypass piping may also be required. HBE will quote and supply the necessary orifice or BPR with installation instructions to assure quiet operation without two-phase flow during bypass.

The centrifugal pump shall be protected by the DLPM series automatic recirculation valve which is completely self-contained and fully automatic via flow activation.

The valve protects the pump from reverse flow and prevents overheating during low process demands. Operation of the valve bypass will be modulating so the sum of the main and bypass flow will never be less than the minimum flow requirement of the pump.

Valve design will incorporate a radial split body, spring-assisted check-valve disc and inline bypass. Materials of construction will consist of a cast carbon steel body ASTM A216 grade WCB with stainless steel internals. If service conditions dictate, other materials are available such as stainless steel, low temperature steel and nickel alloys.

The valve will be designed to operate without flashing or cavitation occurring during bypass operation. Any necessary accessories such as orifices or back-pressure regulators will be provided by HBE to prevent flashing or cavitation on the bypass piping.

Required Application Data

Main Flow

- Minimum _____ GPM (m³/Hr)
- Maximum _____ GPM (m³/Hr)
- Normal _____ GPM (m³/Hr)
- Minimum Pump Flow _____ GPM (m³/Hr)

Pump Discharge Pressure @:

- Normal Flow _____ PSIG (kPa)
- Bypass Flow _____ PSIG (kPa)
- Shut Off _____ PSIG (kPa)
- Bypass Backpressure _____ PSIG (kPa)

Temperature

- Normal _____ °F (°C)
- Maximum _____ °F (°C)

Liquid (*if other than water)

- *Specific Gravity _____
- *Vapor Pressure _____ psia
- *Viscosity _____ centipoise

Why DLPM

- One moving part — no pilot valves or linkages.
- Combines check valve, flow sensing and bypass pressure reduction in one body.
- Eliminates at least seven separate components of a conventional system.
- Operates without air or electric power; three simple connections.
- Cast carbon steel body (ASTM A216 WCB) with stainless internals; alloy options available.
- Sized on required main flow, bypass Cv and minimum flow.

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