



SINCE 1984

Automatic Recirculation Valves

The NLPM Series Centrifugal Pump Protection Valve

NLPM



PROVIDING

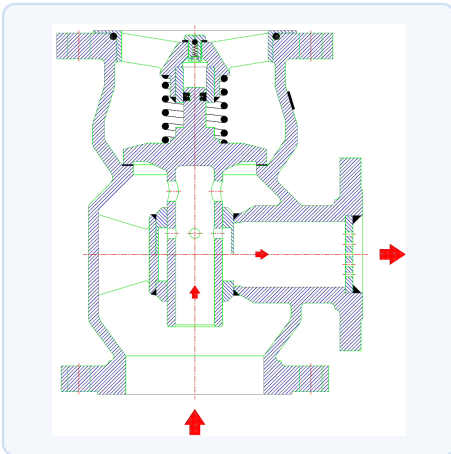
- Check valve for reverse flow protection
- Main flow sensing element
- Bypass modulating minimum-flow control
- Bypass pressure reduction for quiet operation

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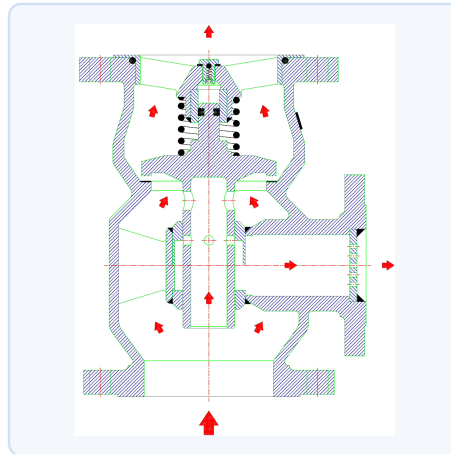
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No main flow demand, minimum flow through bypass

No Main Flow

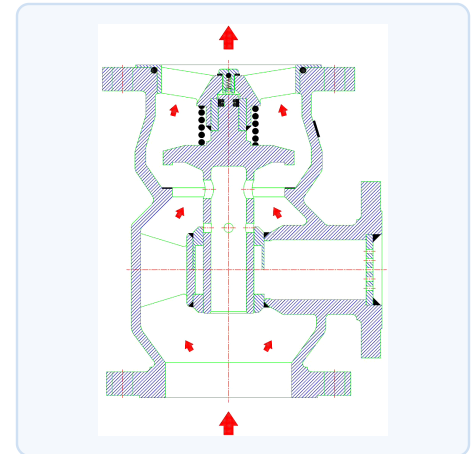
The Disc-Piston Assembly acts as a check valve for the main flow, preventing reverse flow through the centrifugal pump. In this position, the Recirculation Control Valve that is part of the Disc-Piston is fully open, providing the required minimum safe flow.



Modulating flow, main flow is less than minimum flow

Modulating Flow

Main flow is less than required minimum safe flow. Main flow, plus bypass flow, equal or exceed the required minimum safe flow.



Main flow greater than minimum flow, bypass closed

Main Flow Only

When the main flow is greater than the minimum flow required, the recirculation flow is closed.

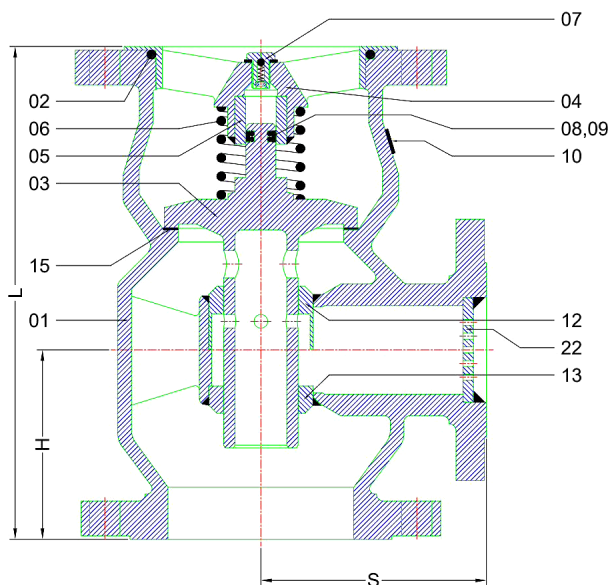
Industries & Applications

INDUSTRIES The valve was developed to serve pump protection requirements of the following: 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 designed.

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.



Sectional view with item callouts

Dimensions & Weights

Normal Sizes (in) ANSI			Dimensions — in. (mm)			Weight lb. (kg)
Main	Bypass	Class	L	H	S	
2 (50)	1 (25)	150	7.2 (183)	3.6 (92)	3.9 (100)	29 (13)
		300	8.8 (223)	4.3 (110)	4.9 (125)	40 (18)
3 (80)	1.5 (40)	150	8.0 (202)	3.9 (98)	5.1 (130)	42 (19)
		300	10.2 (259)	5.0 (126)	5.9 (150)	51 (23)
4 (100)	2 (50)	150	12.1 (308)	5.0 (127)	6.5 (165)	62 (28)
		300	12.4 (316)	5.7 (145)	6.7 (170)	88 (40)
6 (150)	4 (100)	150	14.3 (362)	6.6 (167)	8.0 (204)	99 (45)
		300	14.4 (366)	7.2 (182)	8.3 (212)	154 (70)
8 (200)	4 (100)	150	17.3 (440)	6.5 (165)	8.7 (220)	176 (80)
		300	18.9 (480)	7.7 (195)	9.8 (250)	264 (120)
10 (250)	6 (150)	150	22.6 (575)	7.9 (200)	10.0 (255)	397 (180)
		300	24.0 (610)	9.1 (230)	11.0 (280)	573 (260)
12 (300)	8 (200)	150	31.3 (795)	10.4 (265)	13.7 (348)	639 (290)
		300	32.0 (813)	11.1 (283)	14.2 (360)	683 (310)
14 (350)	10 (250)	150	35.3 (896)	12.5 (317)	14.8 (376)	705 (320)
		300	36.1 (916)	13.2 (336)	15.3 (388)	782 (355)

Consult HBE for larger sizes

Materials of Construction

Item	Description	Material	Spec.
01	Body	Carbon Steel	ASTM A216 WCB
02	O-Ring	By Application	----
03	Disc	Stainless Steel	AISI 304
04	Upper Guide	Carbon Steel	ASTM A216 WCB
05	Upper Sleeve	Stainless Steel	AISI 17-4 PH
06	Spring	Stainless Steel	AISI 302
07	Dampening Valve	Stainless Steel	----
08	Pressure Ring	By Application	----
09	Slide Ring	Teflon	----
10	Name Plate	Stainless Steel	AISI 304
12	Bypass Ring	Stainless Steel	AISI 17-4 PH
13	Lower Slide Ring	Stainless Steel	AISI 17-4 PH
15	Seat	Stainless Steel Deposit	AWS E316L
22	Orifice	Stainless Steel	AISI 304

Highlighted items recommended as spares.

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.

Sizing & Flow Ratings

Main — Inlet / Outlet

Size (in.)	2	3	4	6	8	10	12	14
Max GPM	120	210	500	800	1600	3000	6300	7600
m ³ /h	27	48	114	182	363	681	1431	1726

Bypass

Size (in.)	1	1.5	2	3	4	6	8	10
Max Cv	3.8	7.5	15	30	80	120	200	300
GPM	35	80	165	375	650	1100	2200	3300
m ³ /h	8	18	38	85	148	250	500	750

Flow values for fluids with specific gravity = 1.0

Valve Model Legend

NLPM-40-015-12788

NLPM	Model Designation
40	Size Code
015	Pressure Class Code
12788	Quote / Order File No.

NLPM — Low pressure modulating automatic recirculation valve.
ASME Class 150 and 300.

Size Code

04=1" 06=1-1/2" 08=2" 12=3" 16=4" 24=6" 32=8" 40=10" 48=12" 56=14"

Pressure Class Code

015 = 150 030 = 300

The centrifugal pump shall be protected by the NLPM 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 single body, spring assisted check valve disc and in-line 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

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