

Model 788HP

TWO-STAGE HYDRAULIC VALVES

DESCRIPTION

The Model 788HP is a two-stage hydraulically actuated control valve designed for applications where the flowing stream is the only available source of power. It is commonly used with a positive displacement flowmeter, a mechanical preset counter, and a model 1788HP pilot to provide shock-free two-stage closure. Through the use of optional accessory pilots, mounted in series with the 1788HP pilot, functions such as back pressure, pressure reducing, or rate of flow control can be obtained.

The main valve includes a strainer in the hydraulic pilot fluid supply line and a needle valve to control closing speed. Low flow rate is controlled by the adjustable position of the hydraulic pilot. High flow rate is not limited unless a flow limiting control function is specified.

Operation is simple and troublefree affording all the advantages of mechanical systems, without the need for a separate flow limiting valve. When specified, the model 788HP valve can be supplied as a unit, with the valve coupled to the outlet flange of a BiRotor meter, including all interconnecting tubing and fittings between the smooth operating, economical package with less pressure drop than conventional mechanical systems.

APPLICATIONS

Typical batching applications would include low viscosity products such as gasoline, No. 2 fuel oil, kerosene, jet fuel, diesel, solvents, etc., or other products compatible with O-Ring seal material and the metallurgy of the system.



⚠ WARNING

Do not operate this instrument in excess of the specifications listed. Failure to heed this warning could result in serious injury and/or damage to the equipment.

DESIGN FEATURES

- Modular construction - all internal parts including seat ring can be removed with the cylinder assembly without disturbing line connections.
- No diaphragms or stuffing boxes
- 45° body design assures high capacity
- Positive shut-off
- Uniform speed of response
- Linear control characteristics
- Inherently checks reverse flow
- O-Ring plus metal-metal seat

FLANGE CONNECTIONS / RATINGS (DIN)

Valve Size	DIN PN16	DIN PN25	DIN PN40	DIN PN64 (300 lbs.)
	MAX. WORKING PRESSURE @ 120°C	MAX. WORKING PRESSURE @ 120°C	MAX. WORKING PRESSURE @ 120°C	MAX. WORKING PRESSURE @ 38°C
DN50 - DN300	16 bar	25 bar	40 bar	51 bar

Temperature Range: -20°F to 150°F (-29°C to 66°C) Optional 250°F (121°C)

FLANGE CONNECTIONS / RATINGS (ANSI)

Valve Size	MAXIMUM WORKING PRESSURE @ 100° F	
	150 lbs. ANSI	300 lbs. ANSI
2" - 6"	285 psi	740 psi

PRINCIPLE OF OPERATION

The valves are pilot operated on a balanced piston principle, spring biased to a closed position. Pressure differential overcomes the force of the spring, causing the main valve to open and establish flow. The pilot control(s) vary the pressure on the spring side of the piston for position.

The hydraulic pilot is mechanically attached to, and actuated by, the preset counter of the flowmeter and is hydraulically connected to the shut-off valve.

When the preset counter "start" button is depressed, the pilot opens to its full-open position and the main valve opens to high flow. As the preset counter engages its first stage trip, the pilot is partially closed, causing the main valve to throttle to a low flow position. Upon final trip of the preset counter, the mechanically actuated pilot is forced to a fully-closed position. This causes the hydraulic pressure across the main valve piston to be balanced, thus closing the valve.

PRESSURE DROP

Refer to Publication DSVALVEC_v.

MATERIALS OF CONSTRUCTION

Main Valve Body

Steel - ASTM-A218-GR-WCB

Main Valve Cylinder

2-4" Stainless Steel

6" Steel, Nickel Coated

Main Valve Piston

2-6" Stainless Steel

Seat Ring

2-6" Stainless Steel

O-Rings

Standard - Buna-N

Optional - Other O-Rings are available Neoprene[®],
EPR, all Viton[®], all Buna-N, Kalrez/Teflon ("AP"
Valves)

Other Internal Parts

Stainless Steel

Pilot Valve Strainer/Needle Valve Body

Stainless Steel

Pilot Valve Strainer/Needle Valve Trim

Stainless Steel

Tubing and Fittings

Standard - Steel

Optional - Stainless Steel

PILOT SPRING RANGES (Flow Limiting)

160 - 300 lb. Valves	
(psi)	(kPa)
10 - 40	0 - 276
30 - 80	207 - 552
70 - 180	483 - 1241

*Spring selection based on downstream control pressure or differential pressure.

VALVE CAPACITY DATA

Valve Size	2"	3"	4"	6"
*Cv - gpm	86	186	309	688

For capacities and pressure drops, please consult Publication DSVALVEC_v, "Capacity Charts for Valve Sizing."

*C_v based on wide open valve utilizing water at 60°F (15.6°C).

OPTIONAL EQUIPMENT

1. Valve Position Indicator
2. Stainless Steel Position Indicator - (Visual Only)
3. Position Indicator Switches
4. Stainless Steel Main Valve Piston
5. Independent Opening Speed Control
6. Stainless Steel Tubing
7. Thermal Relief
8. Additional Pilot Control Functions
9. Excess Flow Shutoff (Pressure Sensitive)
10. Pilot Line Isolation Block Valves
11. Fusible Link Pilot Valve (closes at 160°F)
12. Manual Override (Opens Valve)
13. Epoxy coating main valve body unmachined surfaces

RECOMMENDED SPARE PARTS

O-Rings

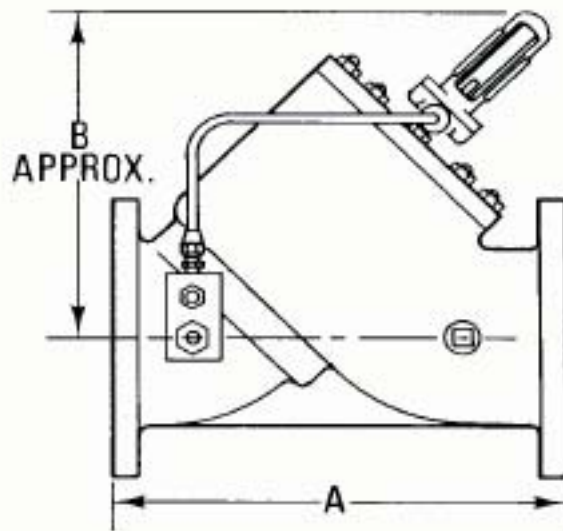
"AP" (AGGRESSIVE PRODUCTS) OPTION

The "AP" option valve cylinder incorporates a combination of seals and O-ring materials to provide optimum performance in aggressive product applications. This option includes reinforced cylinder heads, stat-o-seals, washers and gaskets. Specify "AP" Option at time of order when used on alcohols, MTBE, TAME and reformulated fuels.

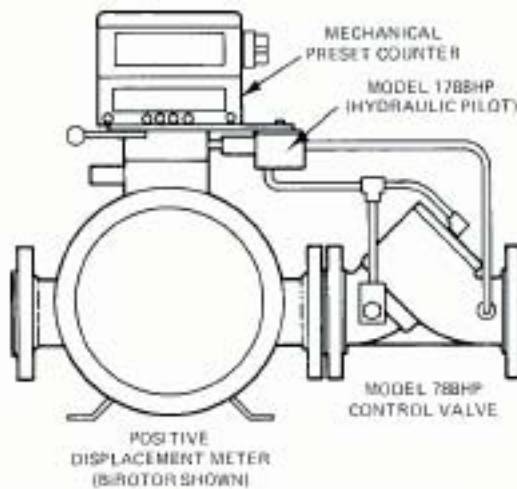
SHIPPING WEIGHT AND VOLUME (Approximate)

Valve Size	150 - 300 lbs. (ANSI Flanges)			
	lbs.	kgs.	Cubic Feet	Cubic Meters
2"	60	27.22	1.66	0.047
3"	105	47.63	2.36	0.067
4"	140	63.5	2.51	0.071
6"	250	113.4	4.84	0.137

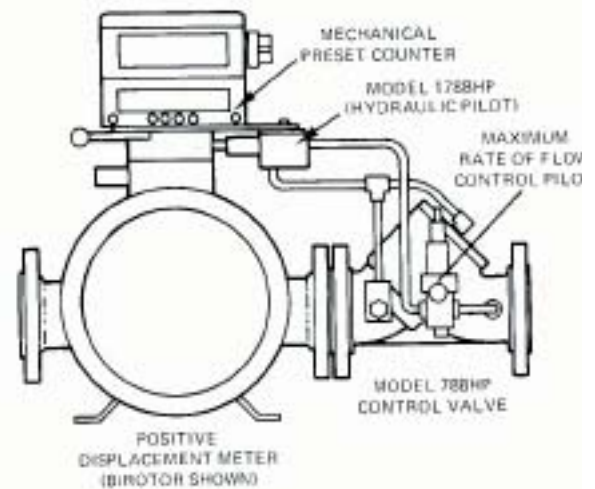
DIMENSIONS (For certified dimension prints - consult factory)



Valve Size	DIMENSION A (ANSI Flanges)				DIMENSION B (ANSI Flanges)	
	150 lbs.		300 lbs.		150 - 300 lbs.	
	Inches	mm	Inches	mm	Inches	mm
2"	10 1/4	260	10 1/2	267	10 7/8	276
3"	11	279	13 1/8	333	10 7/8	276
4"	13	330	14 1/2	368	10 7/8	276
6"	17	432	17 7/8	454	13 3/8	340



TYPICAL INSTALLATION FOR ON-OFF CONTROL-MODEL
1788 HYDRAULIC PILOT (HP)



TYPICAL INSTALLATION FOR RATE OF FLOW CONTROL-
MODEL 1788 HYDRAULIC PILOT (HP) WITH OPTIONAL RATE
OF FLOW CONTROL MOUNTED IN SERIES

PURCHASE SPECIFICATIONS

These valves give two-stage shut-off plus flow limiting control contained on a single valve requiring no outside power. They shall be hydraulically operated and pilot controlled using the flowing stream as the operating medium. The main valves shall be pressure balanced, single seated, piston operated with 45° body construction. All internal parts, including cylinder, spring, piston and seat ring shall be removed as a cartridge assembly without disturbing line connections. The pilot valves shall be pressure balanced, piston operated and single seated. A manual flow control valve shall be included in the pilot supply line to provide an adjustable closing rate. These valves shall, in all respects, be similar or equal to a Model 788HP two-stage shut-off, hydraulic control valve with adjustable flow limiting control.

ORDERING INFORMATION

When ordering, the following information must be supplied:

1. Size
2. Flange connections
3. Product, product viscosity, product specific gravit
4. Minimum and maximum operating temperature
5. Minimum and maximum flow rate
6. Minimum, normal and maximum operating pressure
7. Control functions to be performed
8. O-Ring material
9. Control pilot materials
10. Tubing material
11. Main valve piston material
12. Pilot spring range
13. Pilot spring setting (psi or kPa)

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