DATA SHEET
THERMO VALVES

The Pumps with Nine Lives

Brass Models: **7140, 7141, 7142, 7143, 7144, 7145, 7146, 7170, 7171, 7172, 7175, 7176, 7177**

FEATURES

- Protects pump from premature seal failure by eliminating heat build-up in closed loop by-pass systems.
- Choice of three port sizes to allow convenient and easy installation into the by-pass loop.
- Automatically seats during unloader/regulator pressure spikes to prevent liquid bleed. (Pressurized inlet required)
- Temperature protection without interruption in flow.
- Compatible with systems using either unloader or regulator valves.
- Mount multiple thermo valves in-line to handle increased system flow.
- Optional by-pass hose with thermo valve for quick, compact installation.

SELECTION

Select the proper thermo valve by temperature and part size as found under specifications.

INSTALLATION

The thermo valve is designed to be installed in the by-pass line of the pressure regulating device when the by-pass liquid is being recirculated to the inlet of the pump. This thermo valve is effective with either a pressure regulator or an unloader. Exercise caution when installing the thermo valve as to not exceed the maximum inlet pressure of the valve or the pump.

NOTE: If used in a tank fed system the thermal valve will not reseat after opening. The thermo valve must be installed with a pressurized pump inlet.

Some regulating devices may have excessive pressure spikes when in by-pass.

For convenience in installation, by-pass hose and thermo valve assemblies are available for 1/4", 3/8" and 1/2" NPT unloader connections.

SPECIFICATIONS	U.S. Measure	Metric Measure
130° – 7146		
Inlet Port (7146)	1/4" NPT(M)	1/4" NPT(M)
145° – 7140, 7141, 7142		
Inlet Port (7140)	1/4" NPT(M)	1/4" NPT(M)
Inlet Port (7141)	3/8" NPT(M)	3/8" NPT(M)
Inlet Port (7142)	1/2" NPT(M)	1/2" NPT(M)
165° – 7143, 7144, 7145		
Inlet Port (7143)	1/4" NPT(M)	1/4" NPT(M)
Inlet Port (7144)	3/8" NPT(M)	3/8" NPT(M)
Inlet Port (7145)	1/2" NPT(M)	1/2" NPT(M)
180° – 7170, 7171, 7172		
Inlet Port (7170)	1/4" NPT(M)	1/4" NPT(M)
Inlet Port (7171)	3/8" NPT(M)	3/8" NPT(M)
Inlet Port (7172)	1/2" NPT(M)	1/2" NPT(M)
190° – 7175, 7176, 7177		
Max. Inlet Pressure	125 psi	8.6 bar
Inlet Port (7175)	1/4" NPT(M)	1/4" NPT(M)
Inlet Port (7176)	3/8" NPT(M)	3/8" NPT(M)
Inlet Port (7177)	1/2" NPT(M)	1/2" NPT(M)

COMMON SPECIFICATIONS

Max. Inlet Pressure	125 psi	8.6 bar
Bleed Port	1/8" NPT(F)	1/8" NPT(F)
Weight	6.2 oz.	0.17 kg
Dimensions	3.0 x 0.87"	76 x 22 mm

OPERATION

As the system liquid is recirculated during the by-pass cycle, the temperature will increase. Frequent or prolonged by-pass can result in extremely high temperature build-up. These high temperatures cause premature failure of cups and seals. Installing the thermo valve protects the pump against these excessive temperatures. The power pill in the thermo valve detects the temperature rise in the liquid and compresses the spring, opening the bleed port and dumping a portion of the over-heated liquid.

The thermo valve is most effective when operating with ambient temperature liquids and moderate gpm. As the incoming liquid temperature increases, the quicker the by-pass liquid will reach its temperature release point, forcing the thermo valve to bleed-off.

The higher the system gpm, the more heat generating energy is produced, also forcing the thermo valve to bleed-off. For example, a 25 gpm system @ 130 °F will activate the thermo valve much quicker than a 5 gpm system @ 90 °F.

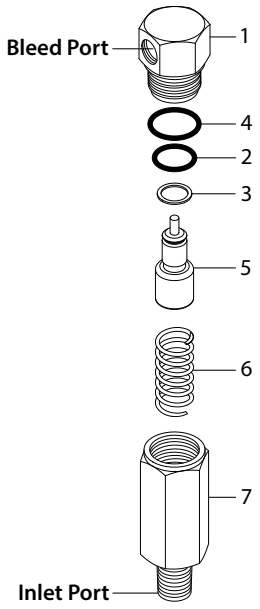
In high flow systems, it may be necessary to install multiple thermo valves to best prevent overheating the system.

Because of the unique design of the thermo valve it will not bleed liquid during a pressure spike from the regulator or unloader as it completely seats and shuts off the flow.

TROUBLESHOOTING

Problems	Probable Cause	Solution
Leaking at low temperature or non by-pass operation through bleed port	• Foreign material trapped	• Check internal and external o-rings on cap for cuts and fit and replace if worn or damaged.
	• Damaged o-ring	• Check for deep cuts or imperfections on top lip of power pill which o-ring seats.
	• Damaged Power Pill	• Check for deep cuts or imperfections on top lip of power pill which seats up to inner cap o-ring and replace if damaged.
		• Check for malfunctioning power pill stem. Failure of stem to expand and retract will prevent opening and closing of valve. Replace if worn.
Leaks between body and cap	• Damaged o-ring	• Check external o-ring on cap and replace if worn or cut.

EXPLODED VIEW



PARTS LIST

ITEM	P/N	MATL	DESCRIPTION	MODEL USED	QTY
1	—	BB	Cap, Bleed	All	1
2	—	NBR	O-Ring, Cap - Internal	All	1
3	—	D	Washer, Back-up	All	1
4	—	NBR	O-Ring, Cap - External	All	1
5	—	CU	Power Pill	All	1
6	—	S	Spring	All	1
7	—	BB	Body	All	1
—	7090.40	—	By-Pass Hose w/7140 Thermo Valve (145°)	2SF	1
—	7093.42	—	By-Pass Hose w/7142 Thermo Valve (145°)	5, 7, 15 PFR	1

MATERIAL CODES (Not Part of Part Number):
BB=Brass CU=Copper D=Acetal NBR=Medium Nitrile (Buna-N) S=304SS

⚠ CAUTIONS AND WARNINGS

All High Pressure Systems require a primary pressure regulating device (i.e. regulator, unloader) and a secondary pressure relief device (i.e. pop-off valve, relief valve). Failure to install such relief devices could result in personal injury or damage to pump or property. Cat Pumps does not assume any liability or responsibility for the operation of a customer's high pressure system.

Read all CAUTIONS and WARNINGS before commencing service or operation of any high pressure system. The CAUTIONS and WARNINGS are included in each service manual and with each Accessory Data sheet. CAUTIONS and WARNINGS can also be viewed online at www.catpumps.com/cautions-warnings or can be requested directly from Cat Pumps.

WARRANTY

View the Limited Warranty on-line at www.catpumps.com/warranty.

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PN 993179 Rev D 19309 1/20