Brass Thermo Valves

Models 7140-7177

FEATURES

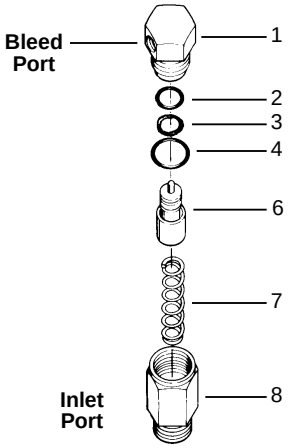
- Protects pump from premature failure of seals and cups by eliminating heat build-up in closed loop by-pass systems.
- Choice of three port sizes to allow convenient and easy installation into the by-pass loop.
- Automatically seats during unloader/regulator pressure spikes to prevent liquid bleed.
- 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.

SPECIFICATIONS

	U.S. Measure	Metric Measure
130°F MODEL 7146		
Max. Inlet Pressure	125 PSI	(8.6 BAR)
Inlet Port (7146)	**1/4" NPTM**	**(1/4" NPTM)**
Bleed Port	1/8" NPTF	(1/8" NPTF)
Weight	6.2 oz.	(.17 kg)
Dimensions	3.0 x .88"	(76 x 22mm)
145°F MODELS 7140, 7141, 7142		
Max. Inlet Pressure	125 PSI	(8.6 BAR)
Inlet Port (7140)	**1/4" NPTM**	**(1/4" NPTM)**
Inlet Port (7141)	**3/8" NPTM**	**(3/8" NPTM)**
Inlet Port (7142)	**1/2" NPTM**	**(1/2" NPTM)**
Bleed Port	1/8" NPTF	(1/8" NPTF)
Weight	6.2 oz.	(.17 kg)
Dimensions	3.0 x .88"	(76 x 22mm)
165°F MODELS 7143, 7144, 7145		
Max. Inlet Pressure	125 PSI	(8.6 BAR)
Inlet Port (7143)	**1/4" NPTM**	**(1/4" NPTM)**
Inlet Port (7144)	**3/8" NPTM**	**(3/8" NPTM)**
Inlet Port (7145)	**1/2" NPTM**	**(1/2" NPTM)**
Bleed Port	1/8" NPTF	(1/8" NPTF)
Weight	6.2 oz.	(.17 kg)
Dimensions	3.0 x .88"	(76 x 22mm)
180°F MODELS 7170, 7171, 7172		
Max. Inlet Pressure	125 PSI	(8.6 BAR)
Inlet Port (7170)	**1/4" NPTM**	**(1/4" NPTM)**
Inlet Port (7171)	**3/8" NPTM**	**(3/8" NPTM)**
Inlet Port (7172)	**1/2" NPTM**	**(1/2" NPTM)**
Bleed Port	1/8" NPTF	(1/8" NPTF)
Weight	6.2 oz.	(.17 kg)
Dimensions	3.0 x .88"	(76 x 22mm)
190°F MODELS 7175, 7176, 7177		
Max. Inlet Pressure	125 PSI	(8.6 BAR)
Inlet Port (7175)	**1/4" NPTM**	**(1/4" NPTM)**
Inlet Port (7176)	**3/8" NPTM**	**(3/8" NPTM)**
Inlet Port (7177)	**1/2" NPTM**	**(1/2" NPTM)**
Bleed Port	1/8" NPTF	(1/8" NPTF)
Weight	6.2 oz.	(.17 kg)
Dimensions	3.0 x .88"	(76 x 22mm)

The Thermo Valve must be installed with a pressurized pump inlet.

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
6	—	CU	Power Pill-130°F	7146	1
	—	CU	Power Pill-145°F	7140, 7141, 7142	1
	—	CU	Power Pill-165°F	7143, 7144, 7145	1
	—	CU	Power Pill-180°F	7170, 7171, 7172	1
	—	CU	Power Pill-190°F	7175, 7176, 7177	
7	—	S	Spring	All	1
8	—	BB	Body 1/2" NPT	7142, 7145, 7172, 7177	1
	—	BB	Body 3/8" NPT	7141, 7144, 7171, 7176	1
	—	BB	Body 1/4" NPT	7140, 7143, 7146, 7170, 7175	1
—	*7090.40*	—	*By-Pass Hose w/7140 Thermo Valve (145°)*	*2SF*	*1*
—	*7091.41*	—	*By-Pass Hose w/7141 Thermo Valve (145°)*	*4SF*	*1*
—	*7092.40*	—	*By-Pass Hose w/7140 Thermo Valve (145°)*	*2SFX*	*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

TROUBLESHOOTING

Problem	Probable Cause	Solution
Leaking at low temperature or non by-pass operation through bleed port	• Foreign material trapped • Damaged o-ring	• Check internal and external o-rings on cap for cuts and fit and replace if worn or damaged. • Check for deep cuts or imperfections on inner lip of cap where 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.

SELECTION: The Thermo Valve is a simple device designed to be **installed in the by-pass line** of the 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.

INSTALLATION: Exercise caution when installing the Thermo Valve as to not exceed the maximum inlet pressure of the valve or the pump.

When installed in a **Piston Pump** application with the **by-pass routed directly to the inlet line,** the maximum inlet pressure to the pump is **40 PSI** and a **pressure reducing valve** must be installed between the Thermo Valve and pump inlet.

When installed in a **Plunger Pump** application with the **by-pass routed directly to the inlet line or inlet port,** the maximum inlet pressure to the pump is **60-70 PSI** and a **pressure reducing valve** must be installed between the Thermo Valve and the pump inlet.

Some regulating devices may have excessive pressure spikes when in by-pass. The maximum inlet pressure to the Thermo Valve is 125 PSI.

Caution should be exercised not to exceed 125 PSI in the by-pass loop as this may cause harm to both the valve and the pump.

For convenience in installation, By-pass Hose and Thermo Valve assemblies are available for 1/4", 3/8" and 1/2" unloader connections.

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.

The Thermo Valve must be installed with a pressurized pump inlet.

WARRANTY

90 Day Warranty

Refer to complete CAT PUMPS Warranty for further information.

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