PTRP Series Pilots
HD Series

Temperature Control with PTRP Temperature Pilot

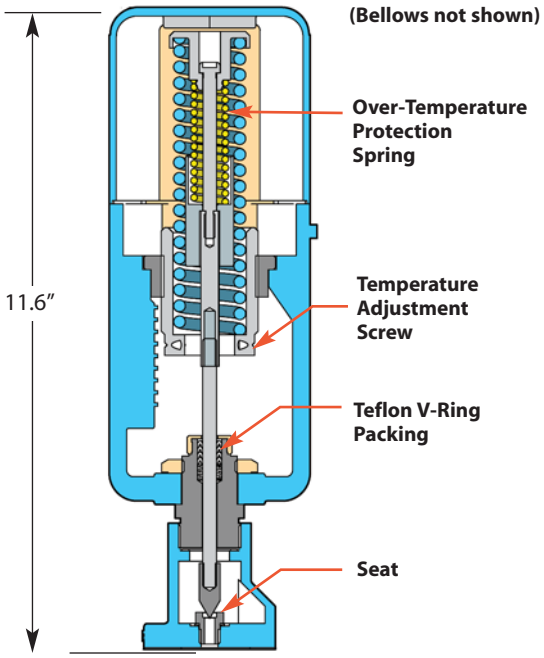
Model	**PTRP**
Pilot Body Material	**Cast Steel**
Max Inlet Pressure	**300 PSIG**
Temperature Control Range	**20-440° F**
Steam Inlet Pressure Range (when Standard Temperature Pilot is used with **HD** Standard main valve)	**15-300 PSIG**
Steam Inlet Pressure Range (when Low-Pressure Temperature Pilot is used with **HD-LP** Low-Pressure main valve)	**5-20 PSIG**

LOW PRESSURE PTRP-LP Pilot (pressures under 15 PSIG)
Use Code **LP**: Low pressure Temperature Pilot is required for steam pressure under 15 PSI. (Range 5 - 20)
PILOT: Example Model Code: PTRP-LP-06-08-S15

LOW PRESSURE HD Main Valve (pressures under 15 PSIG)
Use Code **LP**: A Low Pressure Main Valve must be used in conjuction with a Low Pressure Temperature Pilot for steam pressure under 15 PSIG (Range 5 - 20)
MAIN VALVE: Example Model Code: HD-13-N-LP

Model PTRP-94 contains Temperature Indicating Dial

Model PTRP-91 is Non-Indicating



Typical Applications

The **PTRP-Temperature Pilot** is used with the HD Regulator to control temperature in various processes and systems. The PTRP uses a vapor tension system to actuate the bellows in the temperture pilot giving it a faster reaction time and better temperature sensitivity than the standard PT pilot. They can be used on: oil heaters, ovens, process heaters, vats, dryers, jacketed kettles, and semi-Instantaneous water heaters.

Features

- Stainless steel valve and seat
- Standard bulb & capillary is copper, which has the best heat transfer properties.
- Standard capillary length is 8 ft. with 316 stainless steel armour-protection

Options

- **Capillary Lengths:** Available in 8, 12, 16, 20 & 24-ft.
- **Special Materials:** Sensing bulb, thermowells, and capillary are available in special corrosion resistant materials.
  - 316 stainless steel capillary, bulb & bushing
  - 316 stainless steel armor with standard capillary
- **Thermowell (Separable Socket):** Available in stainless steel or copper
- **Temperature Sensing Dial:** Indicates temperature of process being controlled
- **SDWA Compliance (Safe Drinking Water Act);** Consult factory

Specifications

Dial Thermometer:	4" dial, stainless steel case, swivel and angle adjustment (Model PTRP-94 only)
Housing:	Die cast aluminum, epoxy powder coated grey finish
Bellows:	High pressure brass, corrosion resistant, tin plated finish (not shown)
Over-Temperature Protection:	Upper range limit +100° F

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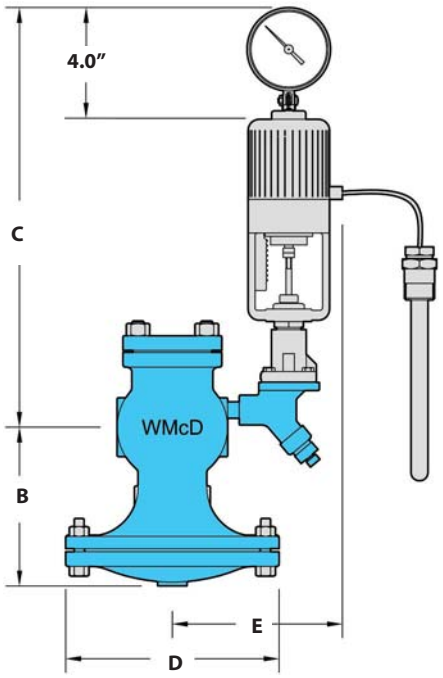


DIMENSIONS HD-Series – *inches*

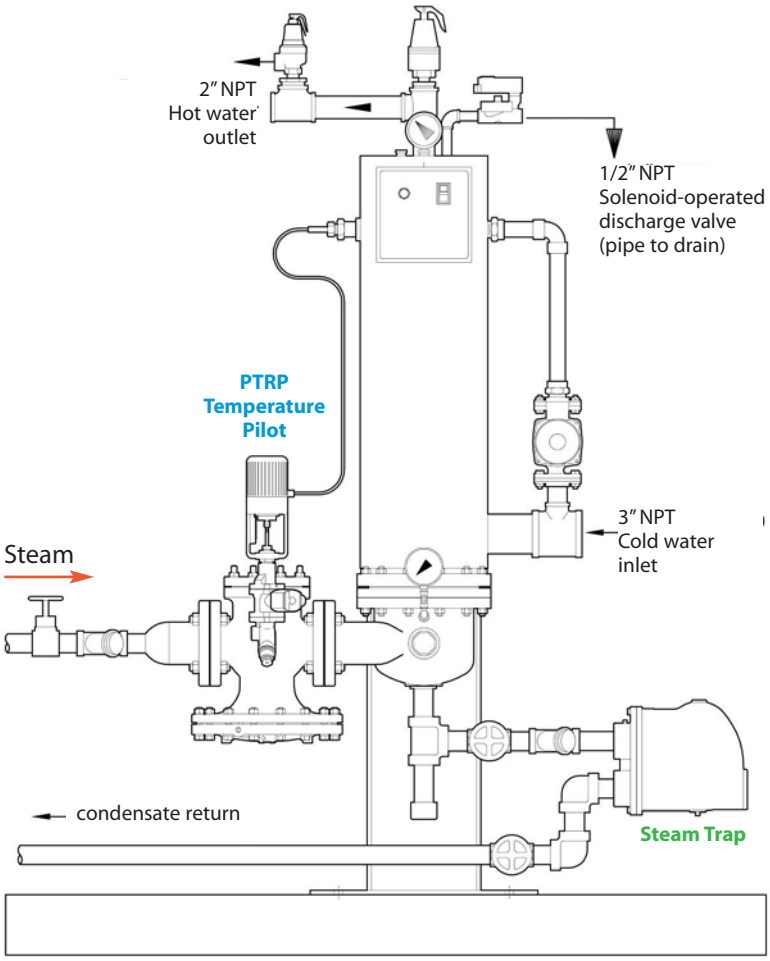
Size	Face-To-Face NPT	Face-To-Face 150#	Face-To-Face 300#	B	C	D	E	Weight (lbs) NPT	Weight (lbs) FLG
1/2"	4 3/8			5 1/2	14	6 1/2	7 3/4	18	
3/4"	4 3/8			5 1/2	14	6 1/2	7 3/4	18	
1"	5 3/8	5 1/2	6	6 1/4	14	7	7 3/4	23	35
1 1/4"	6 1/2			7 3/8	14	8 3/4	8 1/4	43	
1 1/2"	7 1/4	6 7/8	7 3/8	7 3/8	14	8 3/4	8 1/4	43	60
2"	7 1/2	8 1/2	9	8 1/4	14	10 7/8	8 1/2	65	85
2 1/2"		9 3/8	10	9	14	11 3/4	8 1/2		105
3"		10	10 3/4	8 7/8	14	13 1/4	9 1/2		145
4"		11 7/8	12 1/2	10 7/8	14	14 3/4	10 1/2		235
6"		15 1/8	16	14 1/8	14 1/2	19 3/4	11 3/4		470

MATERIALS for PTRP Pilot

Pilot Body	Cast Steel
Valve and Seat	Stainless steel
Support Bracket	Aluminum
Bulb & Capillary	Copper (optional stainless steel)
All Other Parts	Brass

MATERIALS for HD Main Valve

Body	**Ductile Iron**
Cover	**Ductile Iron**
Gasket	Grafoil/Garlock
Cover Screws	Steel
Pilot Adapter	**Ductile Iron/Cast Steel**
Screen	Stainless Steel
Tubing	Copper
Valve Seat	Hardened SST (55 Rc)
Valve Disc	Hardened SST (55 Rc)
Diaphragm	Phosphor Bronze



HD Valve with PTRP-Temperature Pilot Application

A semi-instantaneous steam-to-water heater is a common application where the simple benefits of a self-contained, pilot-operated regulator with temperature sensing pilot may be favored over more complex and expensive control valves. The thermally sensitive bulb of the PTRP pilot contains a fluid that creates a vapor which increases or decreases in pressure as the sensing bulb – sensing the heated water – temperature increases or decreases. This vapor pressure is transmitted hydraulically to the bellows, which actuates the pilot and HD regulator to control the flow of steam into the heater. At start-up, the pilot is manually-adjusted to raise the temperature set point and allow steam to flow through the pilot and valve. As the heated water nears the temperature set point, the vapor pressure in the sensing bulb increases and expands the bellows, closing the pilot and regulator to proportionally limit the steam supply.

Temperature Control

Sensing Bulb Selection & Installation:

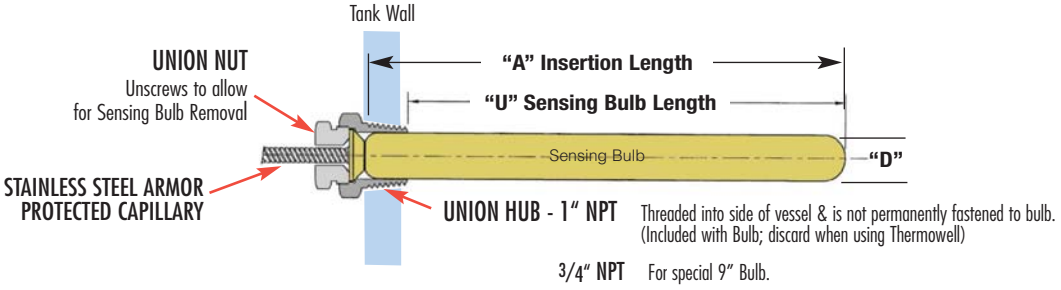
The sensing bulb and capillary is available in either Copper (standard) or Stainless Steel (for corrosive applications). Copper has the best heat transfer properties and should always be chosen unless used in corrosive service. Sensing bulb length is dependent upon the capillary length required; longer capillary lengths require a longer bulb to hold the additional actuating fluid. When installing the sensing bulb, the Union Hub is first threaded into a tank or piping system. The bulb slides thru the Union Hub and held in place by threading in the Union Nut. The angled seating surface of the bulb forms a metal-to-metal seal to the Union Hub, preventing the leakage of process fluid.

Sensing Bulb & Capillary

ORDER CODE	Sensing Bulb Material	Capillary Tubing Material		Capillary Length in Feet 8, 12, 16	20	24	"D" Bulb Dia.
S15	**Copper** (Brass Union Hub)	Copper with Stainless Steel Spiral Armor	A	13"	16"	20"	1"
			U	12.25"	15.25"	19.25"	
S16	**Stainless Steel** (Stainless Steel Union Hub)	Stainless Steel with Stainless Steel Spiral Armor	A	13"	16"	20"	1"
			U	12.25"	15.25"	19.25"	
SB15* (special 9")	**Copper** (Brass Union Hub) (9" bulb)	Copper with Stainless Steel Spiral Armor	A	9"	9"	9"	3/4"
			U	8.25"	8.25"	8.25"	
SB16* (special 9")	**Stainless Steel** (Stainless Steel Union Hub) (9" bulb)	Stainless Steel with Stainless Steel Spiral Armor	A	9"	9"	9"	3/4"
			U	8.25"	8.25"	8.25"	

***Note for 9" Bulb:**

Care should be taken when using 9" bulbs, and they should only be used in applications where space considerations exist. They should not be used when the temperature of the actuator housing is higher than the sensing bulb temperature, as this condition may create erratic temperature control. The temperature of the actuator housing is affected by the surrounding ambient temperature as well as the steam temperature flowing through the valve and may reach 140°F.



Thermowell Option (ordered separately)

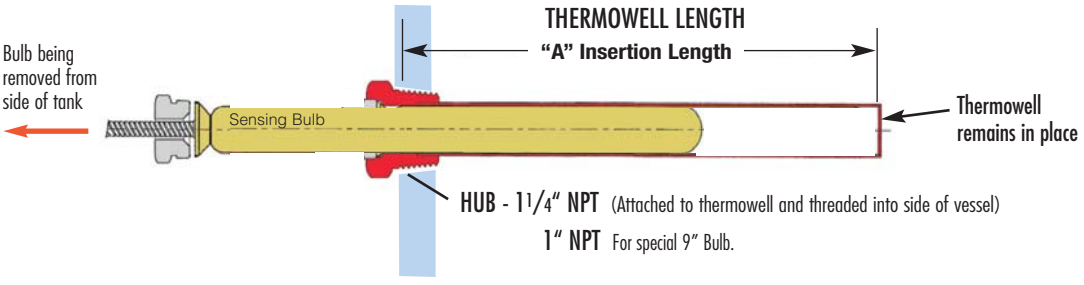
Thermowells isolate and protect the sensing bulb from the process fluid; available in either brass (better heat transfer properties) or Stainless Steel for corrosion resistance. They allow for sensing bulb removal and replacement without having to drain liquid from the system. For corrosive applications, a Stainless Steel thermowell (with a copper sensing bulb) can be used. For best temperature control use a copper sensing bulb with a brass thermowell. Thermowells are also recommended for applications with excessive system pressures or extremely turbulent flow to protect the sensing bulb from damage.

Note: to ensure minimum response time, Heat Transfer Paste should be applied to the sensing bulb before installation into the thermowell.

THERMOWELLS - Model Numbers & Lengths

Brass Model No.	Stainless Steel Model No.	Nominal Length	"A" INSERTION LENGTH (in.) BULB	THERMOWELL	Capillary Length in Feet
536-S2	**536-S6**	13"	12.25	13.00	8, 12 or 16
536-SE2	**536-SE6**	16"	15.25	16.00	20
536-WE2	**536-WE6**	20"	19.25	20.00	24
535-M2*	**535-M6***	9"	8.25	9.00	8, 12 or 16

Notes: 1) Other connections and lengths may be available, consult factory.
2) External pressure rating on Brass is 500 PSI max.
3) External pressure rating on 316 SS is 1000 PSI max.



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Model Code Chart with Temperature Ranges (8 ft. Capillary Lengths)

Range Code	Nominal Range (˚F)	Recommended Working Span (˚F)	Model Code NON-Indicating	Model Code Indicating	Weight lbs
01	20 - 70	40 to 65 °F	PTRP-91-01-08	PTRP-94-01-08	8
02*	40 - 90	65 to 85 °F	PTRP-91-02-08	PTRP-94-03-08	8
03	30 - 115	85 to 110 °F	PTRP-91-03-08	PTRP-94-03-08	8
04	50 - 140	110 to 135 °F	PTRP-91-04-08	PTRP-94-04-08	8
05	75 - 165	135 to 160 °F	PTRP-91-05-08	PTRP-94-05-08	8
06	105 - 195	160 to 190 °F	PTRP-91-06-08	PTRP-94-06-08	8
07	125- 215	190 to 210 °F	PTRP-91-07-08	PTRP-94-07-08	8
09	155- 250	210 to 245 °F	PTRP-91-09-08	PTRP-94-09-08	8
10	200 - 280	245 to 275 °F	PTRP-91-10-08	PTRP-94-10-08	8
11	225 - 315	275 to 310 °F	PTRP-91-11-08	PTRP-94-11-08	8
12	255 - 370	305 to 365 °F	PTRP-91-12-08	PTRP-94-12-08	8
13	295 - 420	365 to 415 °F	PTRP-91-13-08	PTRP-94-13-08	8
14	310 - 440	415 to 435 °F	PTRP-91-14-08	PTRP-94-14-08	8

* The recommended working span typically falls within the upper third of the nominal temperature range.

CROSS REFERENCE: **PTRP** = Spence T-14

Model Code Configuration Chart

Models		Temperature Range		Capillary Length		Bulb	
PTRP-91	Non-Indicating	**01 – 14**	Refer to	**08**	8 Feet (std)	**S15**	(copper bulb) (standard)
PTRP-94	Indicating Dial		Temperature	**12**	12 Feet		
PTRP-LP-91	Non-Indicating		Range Chart	**16**	16 Feet	**S16**	(SS bulb)
PTRP-LP-94	Indicating Dial			**20**	20 Feet	**SB15**	(9" copper bulb)
				24	24 Feet	**SB16**	(9" SS bulb)

Note: Thermowells are ordered separately.
LP = Low Pressure Models.

HD Main Valve
with
PTRP Temperature Pilot

Model Code for Main Valve:
HD-17-F150
(2" HD Series Valve with 150# Flanged)

Model Code for Pilot: **PTRP-94-06-08-S15**
(Temperature Pilot with Indicating Dial (105-195˚F) with 8 Ft. Capillary, Copper Bulb)

How to write proper model number:

Explanation of Model Number:	PTRP-91	06	08	S15
	Model	Temp. Range	Cap. Length	Bulb Type
Model Number:	**PTRP-91-06-08-S15**			

Model PTRP-94 contains Temperature Indicating Dial
Model PTRP-91 is Non-Indicating

Example Model Codes:

1) **PTRP-91-06-08-S15** (105°F - 195°F Temp Range, 8 ft. Capillary, 12" Copper Bulb)
2) **PTRP-94-06-08-S15** (105°F - 195°F Temp Range, with Dial Thermometer, 8 ft. Capillary, 12" Copper Bulb)