Instruction Sheet

102-505

Taco Comfort Solutions™ A Taco Family Company

SmartPlug® INSTANT HOT WATER CONTROL

U.S. Patent # 8,594,853 and # 9,207,682.

SUPERSEDES: November 17, 2015 EFFECTIVE: December 14, 2016

Plant ID# 001-4240

APPLICATION:

The Taco SmartPlug Instant Hot Water Control® is designed to upgrade any hot water recirculation system. SmartPlug replaces inefficient timers and aquastats typically used in recirculation systems. It adds intelligence to your system by learning when hot water is used in the home. The pipe-mounted sensor records daily hot water usage patterns during the course of the week. Recorded data is used to automatically run the circulator at the same times the following week. So hot water is awlays available when it is needed. If usage pattern changes, the SmartPlug adjusts automatically.

BENEFITS:

- **Easy to Install:** Upgrades any hot water recirculation pump with a powercord, to “Smart” operation.
- **Water Conservation:** The average residence can save up to 12,000 gallons of water per year by eliminating the wait for hot water to arrive at fixtures and taps.
- **Comfort and Convenience:** Hot water is available in seconds. No timers or programming required.
- **Efficiency:** “Smart” setting maximizes hot water comfort and energy savings.
- **Reliability:** The SmartPlug, when combined with a Taco domestic hot water circulator, provides whisper quiet operation and industry leading electronics for proven performance and dependability.

PUMP CONTROL OPTIONS:

“Smart” Mode: When set to Smart mode, the SmartPlug will run in Pulse mode as described below for the first 7 days of operation. During the first 7 days, the SmartPlug monitors and records the home's hot water usage pattern. For the following 7 days, the SmartPlug will use the preceding week's usage pattern to cycle the pump during the recorded hot water usage times. This process of recording and repeating is continuous, and automatically adjusts the pump "ON" times to match the household's usage pattern.

“Pulse” Mode: When set to Pulse mode, the SmartPlug will cycle the circulator pump "ON" for 5 minutes, then “OFF” for 10 minutes to maintain hot water at all faucets and taps. It will repeat the cycle continuously.

SMARTPLUG INSTALLATION:

1. The SmartPlug is designed for use with standard domestic hot water circulators that have a 120V UL approved line cord. **CONSULT TACO, INC. BEFORE USING SMARTPLUG WITH A CIRCULATOR THAT IS NOT MANUFACTURED BY TACO.**
2. Unplug the circulator from the 120V wall outlet.
3. Using the black sensor strap provided, attach the SmartPlug sensor to the HOT water supply pipe from the hot water heater. **USE EXTREME CAUTION WHEN INSTALLING THE TEMPERATURE SENSOR ON THE HOT WATER SUPPLY PIPE AS PIPE TEMPERATURE MAY BE EXTREMELY HOT.** The sensor must be strapped at least 18" away from the hot water source to ensure proper sensor temperature readings. The "flat" side of the sensor should be strapped directly to the hot water supply pipe using the black sensor strap provided. If the supply pipe is insulated it will be necessary to remove the insulation at the point where the sensor is installed to ensure accurate sensor readings.
4. Install the SmartPlug temperature sensor. Connect the 2 wire leads on the temperature sensor to the green sensor connector terminal block by loosening the 2 set screws. Insert the 2 wire leads from the temperature sensor into the terminal slots on the terminal connector and tighten the 2 set screws. Be careful not to over tighten screws as you may damage the terminal connector. Once the temperature sensor wires are securely fastened, insert the terminal block into the SmartPlug receptacle labeled "SENSOR". NOTE: The SmartPlug sensor is provided with a 10' lead wire. Some installations may require a sensor lead wire in excess of 10'. If the sensor lead length needs to be increased, standard "18 AWG" gage wire and 2 wire nuts can be spliced into the temperature sensor lead wires to extend the overall length.
5. Plug the SmartPlug into a properly grounded 120V wall outlet. LED’s will illuminate and a 10 second diagnostic check will begin.
6. Plug the circulator 120V line cord into the 3 prong receptacle on the face of the SmartPlug. NOTE: The circulator must be a properly grounded 120V pump. The green POWER LED will illuminate.
7. If circulator is equipped with a timer, turn the switch to full ON position. SmartPlug will turn the circulator on after a 10 minute delay.

Setting the SmartPlug Mode:

1. The SmartPlug has a "Mode Select" push button that allows for 2 operation modes. "Smart" or "Pulse" mode can be selected by pressing the mode select button located on the lower right side of the control box. To set the mode, make sure the SmartPlug is plugged into a properly grounded 120V outlet. A yellow LED labeled "MODE" on the face of the SmartPlug identifies the mode selected.

   Smart Mode: Solid Yellow LED

   Pulse Mode: Blinking Yellow LED

   Press and release the mode select button once to change the mode.
2. The SmartPlug is also provided with a red "SENSOR" LED. If the sensor is properly installed the SENSOR LED will not illuminate. If the red LED is flashing, refer to the troubleshooting section below.
3. Installation and mode selection are complete.
4. To ensure the SmartPlug is providing hot water properly, open a hot water tap at the fixture furthest away from the hot water tank. Use CAUTION as the water may be extremely hot.

OTHER UNIQUE FEATURES:

- **Vacation Mode:** After 36 hours of no hot water usage, the SmartPlug will automatically turn the pump OFF, and will restart when hot water usage is detected.
- **Exercise Function:** While in vacation mode, the SmartPlug will cycle the pump for 10 seconds every 7 days to prevent corrosion or scale buildup.

SPECIFICATIONS:

Input:	120VAC, 50/60HZ, single phase, 6A.
Output:	120VAC, 50/60HZ, single phase, 1/2 hp (limited to 6 FLA, 36LRA).
Sensor:	NTC Thermistor, 10K ohm @ 77°F, B= 3392.
Fuse:	125V, 6A, Medium Acting 5x20 mm glass, Littelfuse® p/n 0233006 mxp.
Operating Ambient Temp:	50-104°F, 10-40°C.

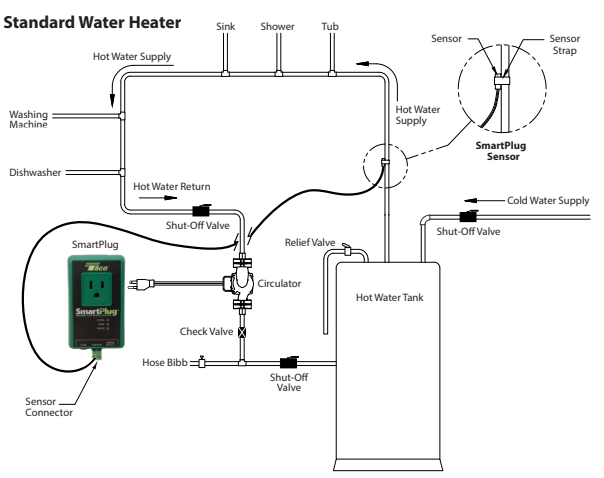
WARNING: For indoor use only.

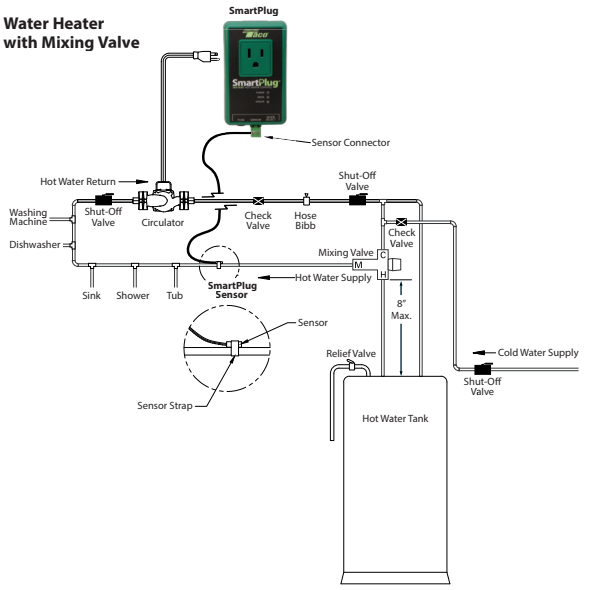
WARNING: All local plumbing and electrical codes should be followed when installing this product.

WARNING: Risk of electrical shock. This product is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of shock, be certain that it is connected only to a properly grounded grounding-type receptacle.

TROUBLESHOOTING:

Symptom	Possible Cause	Service Tip
No Hot Water	Pump installed incorrectly	Check to see if the flow arrow on the pump casing is pointing in the right direction.
	Pump not running	-Check the circuit breaker. -Check power supply outlet. -Ensure pump is firmly plugged into SmartPlug and SmartPlug is properly plugged into electrical outlet.
	SmartPlug SENSOR error	-Red SENSOR LED blinking once every 5 seconds = sensor shorted. Use sensor replacement kit 194-3574. -Red SENSOR LED blinking twice every 5 seconds = bad sensor connection.
	SmartPlug is in Vacation mode	-Check to ensure the SmartPlug SENSOR lead is installed correctly on the hot water supply pipe. The sensor lead must be in direct contact with hot water supply pipe. -Sensor may be installed too close to the hot water tank and it may need to be moved at least 18" from the hot water tank.
	Blown fuse in SmartPlug	-Red SENSOR LED blinking 3 times every 5 seconds - Unplug SmartPlug and replace 6A, 125V fuse. Use fuse replacement kit 003-014RP.





Piping diagrams for reference only.

FCC STATEMENT: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna. • Increase the separation between the equipment and receiver. • Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. • Consult the dealer or an experienced radio/TV technician for help.

LIMITED WARRANTY STATEMENT

Taco, Inc. will repair or replace without charge (at the company's option) any product or part which is proven defective under normal use within three (3) years from the date of manufacture.

In order to obtain service under this warranty, it is the responsibility of the purchaser to promptly notify the local Taco stocking distributor or Taco in writing and promptly deliver the subject product or part, delivery prepaid, to the stocking distributor. For assistance on warranty returns, the purchaser may either contact the local Taco stocking distributor or Taco. If the subject product or part contains no defect as covered in this warranty, the purchaser will be billed for parts and labor charges in effect at time of factory examination and repair.

Any Taco product or part not installed or operated in conformity with Taco instructions or which has been subject to misuse, misapplication, the addition of petroleum-based fluids or certain chemical additives to the systems, or other abuse, will not be covered by this warranty.

If in doubt as to whether a particular substance is suitable for use with a Taco product or part, or for any application restrictions, consult the applicable Taco instruction sheets or contact Taco at [401-942-8000].

Taco reserves the right to provide replacement products and parts which are substantially similar in design and functionally equivalent to the defective product or part. Taco reserves the right to make changes in details of design, construction, or arrangement of materials of its products without notification.

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TACO WILL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF ITS PRODUCTS OR ANY INCIDENTAL COSTS OF REMOVING OR REPLACING DEFECTIVE PRODUCTS.

This warranty gives the purchaser specific rights, and the purchaser may have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts or on the exclusion of incidental or consequential damages, so these limitations or exclusions may not apply to you.

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