

89T Series

Electric Water Heater Controls



Combination Control for Electric Water Heaters

The 89T series controls are designed to meet the high electrical loads and long life requirements of electric water heaters. The 89T combines the temperature control and temperature limit thermostats into a single housing with a small footprint and low profile. Both switches use a temperature sensitive bimetal disc to provide high-speed, snap-action contact separation for a long, dependable life.

Features and Benefits

The 89T series features include:

- An automatic reset control which is adjustable over a 60°F (33°C) range. Lowest calibration of the adjustable range may be specified from 90°F to 150°F (32°C to 65°C).
- A manual reset control which operates at a factory calibrated temperature and may be specified between 160°F (71°C) and 220°F (104°C).
- The 89T mounting tabs snap into the customer's bracket to mount the thermostat to the water tank. The 89T is interchangeable with brackets used on the Therm-O-Disc 59T/66T controls.

Switch Actions

The automatic reset control portion of the 89T is available in two switch actions:

SPST – The switch opens normally closed contacts on temperature rise and automatically recloses the contacts when temperatures fall to the reset point.

SPDT – Switch operation is the same as the SPST with an additional contact, which makes circuit when the switch operates and breaks the circuit when temperatures fall to the reset point.

The manual reset limit control portion of the 89T is only available as an open-on-rise DPST switch. The contacts return to the closed position when the reset button is pressed after the control has cooled below the open temperature. This construction is classified as "M1 Trip Free" by UL and CSA. The manual reset control may automatically reclose at temperatures below 32°F (0°C).



Typical Application

The thermostats and wiring diagram (see figure 1) shows a typical electrical water heater with two heating elements for non-simultaneous operation. The 89T SPDT temperature control switches power from the upper heating element to the lower element when its calibration temperature is reached. The 89T DPST temperature limit provides a full power disconnect through both power conductors in the event of an overheat condition. Pressing the manual reset button will reclose the contacts and restore operation.

The thermostat and wiring diagram (see figure 2) is for 240VAC single element water heaters and commercial water heaters where each heating element is independently controlled. The automatic reset SPST control provides power to the heating element to regulate temperature. The DPST manual reset limit control provides full power disconnect in the event of an overheat condition.

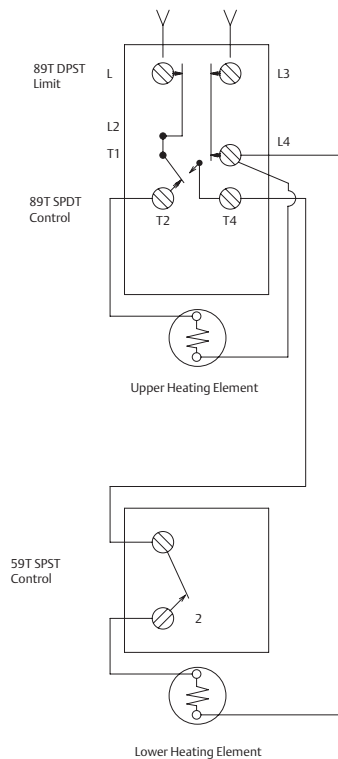


Figure 1

**Double heating element
non-simultaneous operation circuit.**

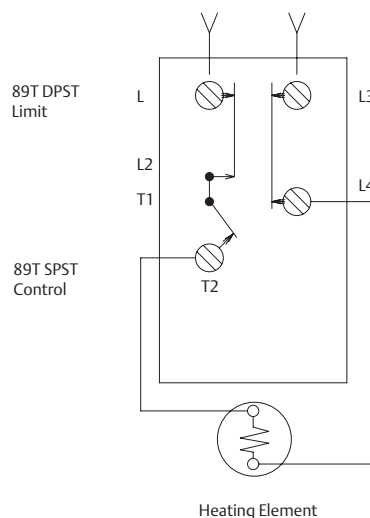
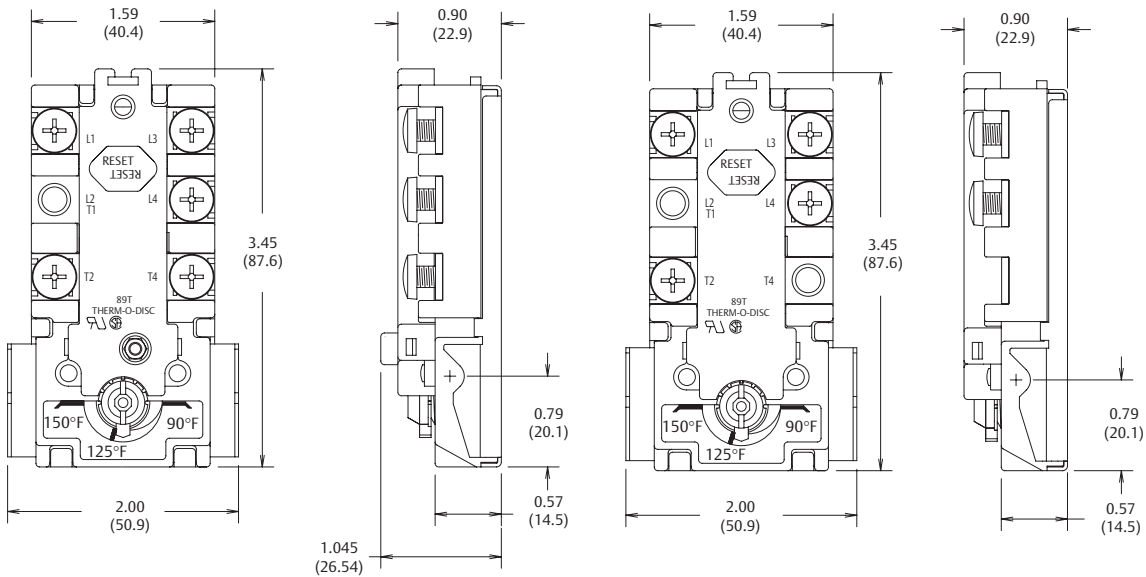


Figure 2

Single heating element circuit.

89T33 SPDT Control, DPST Limit

89T13 SPST Control, DPST Limit



Dimensions are shown in inches and (millimeters).

General Electrical Ratings

The 89T series of controls has been rated by major agencies throughout the world. The agency ratings can be used as a guide when evaluating specific applications. However, the mechanical, electrical, thermal and environmental conditions to which a control may be exposed in an application may differ significantly from agency test conditions. Therefore, the user must not rely solely on agency ratings, but must perform adequate testing of the product to confirm that the control selected will operate as intended in the user's application.

Thermostat Type	Max Temp.	Comments	Cycles	Inductive Amperes		Pilot duty VA	Resistive Amperes	Watts	Volts AC	Agency Recognition
				FLA	LRA					
89T SPST Control	200°F 93°C	Cycling Thermostat	100,000	—	—	—	30.0 25.0	—	250 277	UL File E19279
89T SPDT Control	200°F 98°C	Cycling Thermostat	30,000	—	—	—	30.0 25.0	—	250 277	
89T DPST Limit	220°F 104°C	Limit Thermostat	6,000	—	—	—	40.0 25.0	—	277 480	CSA LR62082

NOTE: For complete and current rating information, please contact our Sales Engineering Department. At thermostat end-of-life, the contacts may remain permanently closed or open.

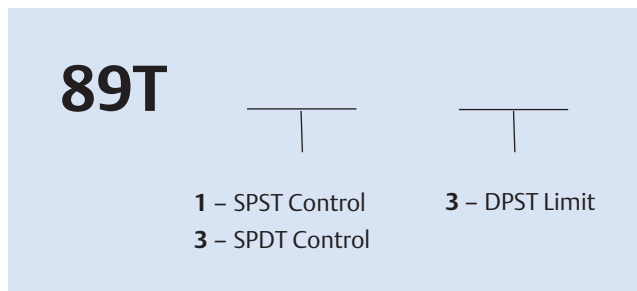


Calibration Temperatures – Residential Storage-Tank Water Heaters

Series	Switch Action	Standard Adjustable Temperature Range	Standard Calibration
89T Control	SPST	90°-150°F (32°-65°C)	120±5°F (49±3°C)
	SPDT	90°-150°F (32°-65°C)	120±5°F (49±3°C)
SPST differential 5-15°F (3-8°C)			
SPDT differential 17-27°F (9-15°C)			

Series	Switch Action	Calibration
89T Limit	DPST Manual Reset	170±5°F (77±3°C)

Part Numbering System



Important Notice

Users must determine the suitability of the control for their application, including the level of reliability required, and are solely responsible for the function of the end-use product.

These controls contain exposed electrical components and are not intended to withstand exposure to water or other environmental contaminants which can compromise insulating components. Such exposure may result in insulation breakdown and accompanying localized electrical heating.

A control may remain permanently closed or open as a result of exposure to excessive mechanical, electrical, thermal or environmental conditions or at normal end-of-life. If failure of the control to operate could result in personal injury or property damage, the user should incorporate supplemental system control features to achieve the desired level of reliability and safety. For example, backup controls have been incorporated in a number of applications for this reason.