

Installation and Operating Instructions

INTRODUCTION

The TS300 is a hardwired temperature monitor able to accurately detect variations in temperature. It can monitor the temperature at the unit and at a remote location (using a T280R) simultaneously. Alarm annunciations include a local piezo sounder and two programmable NO/NC outputs which activate when the mapped high or the low limit(s) is exceeded, protecting equipment, property, and perishable items. The NO/NC alarm outputs may be delayed by increments of one minute to allow for expected momentary temperature variations such as during a refrigeration unit's defrost cycle. The audible alert, if programmed, sounds when the temperature limit is violated and can be silenced with the press of a button for a programmed duration. The TS300 can accurately monitor any temperature within the range from 32°F to 140°F (0°C to 60°C). A T280R Remote Temperature Probe may be used to monitor temperature within the range from -40°F to 140°F (-40°C to 60°C) or to monitor temperature in a harsh environment.

INSTALLATION

Mount the unit on a wall at a convenient viewing height. For accurate temperature sensing at the unit, do not mount the TS300 near any heat or cooling source. If the unit does not trip the panel, insure that the contact configuration (NO/NC) as defined in the Setup Procedure agrees with that of the zone to which it is connected.

TO THE INSTALLER

Regular maintenance by the installer and frequent testing by the user are vital to continuous satisfactory operation of any alarm system. The TS300 and the T280R should be tested periodically, at least once a month, depending on conditions. The installer should assume the responsibility of developing and offering a regular maintenance program to the user as well as acquainting the user with the proper operation and limitations of the alarm system and its component parts. Recommendations must be included for a specific program of frequent testing to ensure the system's proper operation at all times.

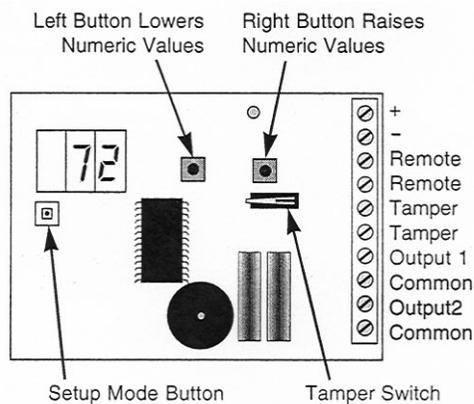


Illustration A

SETUP PROCEDURE

Remove the front cover from the TS300. With power applied to the unit, press the SETUP MODE switch (see Illustration A). Press the Left button to lower a numeric limit by a value of one (press and hold to decrement by tens); Press the right button in raise a numeric limit by a value of one (press and hold to increment by tens). Pressing either button will toggle the either/or choices. When your preferred setting is displayed, press the setup button to accept and move to the next parameter.

Note that, when setting High/Low limits in Centigrade mode, incrementing/decrementing will raise/lower the limit by the equivalent of 1° Fahrenheit (or 10° F, if button is pressed and held).

Table 1. Programmable Parameters

Parameter	Display	Default	Min	Max
Fahrenheit or Centigrade	<i>F-C</i>	<i>F</i>	<i>F</i>	<i>C</i>
Remote Probe Enable	<i>REN</i>	<i>NO</i>	<i>NO</i>	<i>YES</i>
Display Local or Remote temperature	<i>DSP</i>	<i>LCL</i>	<i>LCL</i>	<i>RPR</i>
Set Local Sensor Low Limit	<i>LLO</i>	<i>40</i>	<i>32</i>	<i>140</i>
Set Local Sensor High Limit	<i>LHI</i>	<i>140</i>	<i>32</i>	<i>140</i>
Set Remote Probe Low Limit	<i>RLO</i>	<i>40</i>	<i>-40</i>	<i>140</i>
Set Remote Probe High Limit	<i>RHI</i>	<i>140</i>	<i>-40</i>	<i>140</i>
Select Output Mode (both relays) ¹	<i>OUT</i>	<i>NC</i>	<i>NC</i>	<i>NO</i>
Set Output Map for Output 1 ²	<i>OU1</i>	<i>1 _</i>	<i>1</i>	<i>1 _ _</i>
Set Output Map for Output 2 ²	<i>OU2</i>	<i>2 _</i>	<i>2</i>	<i>2 _ _</i>
Set Alarm Delay for Output 1	<i>DL1</i>	<i>0</i>	<i>0</i>	<i>255</i>
Set Alarm Delay for Output 2	<i>DL2</i>	<i>0</i>	<i>0</i>	<i>255</i>
Enable Alarm Audible Annunciator	<i>AUD</i>	<i>YES</i>	<i>NO</i>	<i>YES</i>
Audible Alarm Silence Timeout	<i>SIL</i>	<i>0</i>	<i>0</i>	<i>255</i>
Hysteresis ³ Degrees of	<i>HYS</i>	<i>0</i>	<i>0</i>	<i>10</i>

NOTES:

¹If programmed for Normally Closed (NC) it is supervised, if Normally Open (NO) it is unsupervised.

²The Output map is a graphical representation of the possible choices.

The left character indicates which relay you are mapping, 1 or 2.

The middle character is the local sensor map and the right character is the remote probe map. See Table 2 for map designations.

³Hysteresis provides a buffer so that temperature that is shifting back and forth around the alarm limit point will not create multiple alarms. You set the # of degrees that the temperature will have to rise **above** the temperature low limit set point or drop **below** the high limit set point for the alarm to turn off. For example, if you set the HYS at 3 degrees and your low limit is 40 degrees, you will go into an alarm condition when the temperature reaches 39 degrees and restore from alarm would not occur until the temperature rose to 43 degrees. Hysteresis is limited to ½ the difference in degrees between the low temperature limit and high temperature limit **or** the programmed HYS setting (max of 10E) whichever is least.

⁴The setup will **NOT** be lost in the event that power is lost at the panel.

⁵Options that relate to the remote probe will only appear if you have enabled the remote probe in selection 2 of the table parameters.

⁶High/Low limits shown in table are degrees Fahrenheit. Equivalent Centigrade temperatures apply when Centigrade has been selected.

⁷Hysteresis is always programmed in degrees Fahrenheit, even if Centigrade has been selected to set limits.

Table 2. Output Map Designations

/			Output 1 - not used	/	—	—	Output 1 - Local and Remote Low Alarms
/	—		Output 1 - Local Low Alarm	/	—	—	Output 1 - Local Low and Remote High Alarms
/	—		Output 1 - Local High Alarm	/	—	—	Output 1 - Local Low and Remote Low and High Alarms
/	—		Output 1 - Local Low and High Alarms	/	—	—	Output 1 - Local High and Remote Low Alarms
/		—	Output 1 - Remote Low Alarm	/	—	—	Output 1 - Local and Remote High Alarms
/		—	Output 1 - Remote High Alarm	/	—	—	Output 1 - Local High and Remote Low and High Alarms
/		—	Output 1 - Remote Low and High Alarms	/	—	—	Output 1 - All Alarms; Local Low and High and Remote Low and High

Map designations:



Examples: (The same choices can be used for relay 2)

OPERATION

Display - The TS300 displays the selected temperature (local [ambient] or remote) in either Fahrenheit or Centigrade as programmed. To check the temperature at a sensor, press the left button for the local sensor or the right button for the remote probe. The temperature you have requested will flash 5 times and then return to displaying the temperature of the sensor you have chosen to display.

Alarm - If the temperature at an enabled sensor varies outside either of its mapped limits, the audible annunciator will sound, if programmed, **and** the mapped output will switch to its alarm state, but only after the selected delay time has expired. If the delay time is set to 0 the alarm will be immediate. The maximum delay time is 255 minutes (4 hours, 15 minutes). The output will remain in its alarm state until the temperature returns to within the selected limits as buffered by the programmed degrees of hysteresis. As long as the temperature remains outside the selected temperature limits, the display will cycle between the desired display temperature and the name of the limit(s) exceeded.

Silence - The Audible alarm is silenced by pressing either of the buttons. It will remain silenced until the silence timeout time expires and then it will become audible again. In addition, when the output delay time is in the final 60 seconds the audible will switch to a fast beep (250mS pulsed), if it has been enabled.

High and Low Temp limits and Alarm Memory - To display the programmed high and low temperature limits, press and hold both buttons momentarily. The unit will show the programmed limits followed by any alarms in alarm memory. The TS300 stores the last 8 alarm events. An alarm event is one where the relay output was activated. If delays are used, and the temperature restored before the delay time expired, it is not considered an alarm and will not be stored in alarm memory. Alarms are displayed as the limit that was violated. For example LLO for local low limit. The alarms are displayed most recent to oldest. Alarm memory is cleared when you enter set-up mode or when power is cycled to the unit.

TS300 SPECIFICATIONS

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Temperature Range / Accuracy (Local Sensor)	32°F to 140°F (0°C to 60°C) ∇ 3°F (∇ 1.7°C)
Temperature Range / Accuracy (Remote Probe)	-40°F to 140°F (-40°C to 60°C) ∇ 4°F (∇ 2.2°C)
Minimum Span between Hi and Low Limits	4°F (2.2°C)
Alarm Delay	0 - 255 minutes in 1 min increments
Alarm Output Type	(2) Form A reed relays
Alarm Output Resistance	25 ohms maximum
Alarm Output Rating	50 mA max. @ 30 VDC
Audible Alarm	4 kHz, 75 dB @ 10 cm pulsed 750 mS on/off
Audible Alarm Silencing	0 - 255 minutes in 1 min increments
Input Voltage	7 to 16 VDC
Input Current	25 mA (max.)
Case Dimensions	4" x 2.6" x 0.9" (10.2 cm x 6.6 cm x 2.3 cm)

T280R REMOTE TEMPERATURE PROBE (purchased separately)

The T280R is a Remote Temperature Probe for use with the TS300. The Remote Probe is a sealed temperature sensor with 15 feet of two conductor, 24 AWG stranded cable. The cable should be connected to the two terminals labeled REMOTE. (Polarity need not be considered.)

Caution: Excessive force applied to the probe may damage the device.

T280R Remote Probe Specifications	
Chemical Properties	Non-corrosive Water Resistant
Max. Compression Force Applied to Probe	10 lb. force
Max. Tensile Force Applied Between Probe and Cable	5 lb. force
Max. Cable Length	300 feet*

- The T280R may be extended from 15' up to 300' using shielded 24 AWG cable. Insure the shield is grounded for noise immunity.

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