



# Thermatel® Model TA2

## Calibration Verification Procedure



### Purpose

The TA2 measures heat transfer and relates heat transfer to mass flow rate during the calibration. One way to verify the calibration of the TA2 is to verify heat transfer characteristics of the sensor under controlled conditions. The following procedure checks heat transfer at two conditions of no flow and a simulated high flow.

### Equipment

Temperature water bath (approximately 1 liter).  
Temperature bath must be located on a sturdy table without vibrations.

### Procedure

Record the initial (as received) heat transfer characteristics of the sensor then repeat procedure at a future time to verify performance.

1. No Flow Condition:
  - a. Power up the TA2. Wrap the sensor in paper and allow it to stabilize. Select Diagnostics/Signal Values from the TA2 menu and read the Signal in mW.
  - b. This is referred to as the Zero Flow Signal (zfs). Record this value
2. High Flow Condition:
  - a. Select Factory Config/Ctrl Parameters/Set Point from the TA2 menu.

Record the set point value as received. Change the Set Point value to 15°C (password of 2200 is required). The main display may indicate "Initializing." This is expected and will not affect this procedure.

*continued on reverse side*



Vertically hang the probe in a water bath at room temperature (+60° to +80° F or +15° to +26° C) with the sensor submerged. The water bath must be perfectly still without any vibration. To minimize the effect of convective heat flow on the sensor, it is important that the probe be in the vertical position. If not, this test may not produce repeatable results due to natural convection currents.

If a flow body, either submerge the entire flow body in water, or block off one end and fill the flow body with water assuring that the flow arrow is pointed in the same direction for each test.

- b. Select Diagnostics/Delta Temp from the TA2 menu. Wait for the Delta Temp reading on the TA2 display<sup>1</sup> to stabilize. This represents the temperature difference between the heated and reference sensors. Record this value.
- c. **IMPORTANT:** At the completion of obtaining this data, return to the Factory Config/Ctrl Parameters/Set Point menu and change the set point back to the original value recorded during step 2a.<sup>2</sup>

#### DATA COLLECTION

|                                 |    |
|---------------------------------|----|
| TA2 SERIAL NUMBER               |    |
| TAG NUMBER                      |    |
| DATE OF INITIAL TEST            |    |
| INITIAL ZFS mW<br>(Step 1b)     | mW |
| SET POINT VALUE<br>(Step 2a)    | °C |
| INITIAL DELTA TEMP<br>(Step 2b) | °C |
| VERIFICATION DATE               |    |
| ZFS                             | mW |
| DELTA TEMP                      | °C |

#### Verification Procedure

Repeat the procedure recording the Zero Flow Signal and the Delta Temp values.

1. The initial and the new zero flow signals should compare within 5 mW.
2. The initial and the new Delta Temp values should agree within 0.125° C (0.225° F).
3. If the two values agree, then the heat transfer characteristics of the sensor have not changed.
4. If they do not agree then:
  - a. Clean the pins on the sensor and retest.
  - b. Check for a bent pin on the sensor.
  - c. Contact the factory for recalibration of the unit.

<sup>1</sup> The displayed temperature rise will typically drift approximately  $\pm .03^\circ$  C around the average value due to natural convection currents induced by the heated pin. Use average readings.

<sup>2</sup> The operating Set Point can also be found on the calibration certificate supplied with the unit.



5300 Belmont Road • Downers Grove, Illinois 60515-4499 • 630-969-4000 • Fax 630-969-9489 • www.magnetrol.com  
 145 Jardin Drive, Units 1 & 2 • Concord, Ontario Canada L4K 1X7 • 905-738-9600 • Fax 905-738-1306  
 Heikensstraat 6 • B 9240 Zele, Belgium • 052 45.11.11 • Fax 052 45.09.93  
 Regent Business Ctr., Jubilee Rd. • Burgess Hill, Sussex RH15 9TL U.K. • 01444-871313 • Fax 01444-871317



5300 Belmont Road • Downers Grove, Illinois 60515-4499 • 630-969-4028 • Fax 630-969-9489 • www.sticontrols.com

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