

**OWNER'S MANUAL**

# **Thermohygrometer**

**Model TH12**



**AIRFLOW™**  
INSTRUMENTS

**TSI Incorporated**

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## LIMITATION OF WARRANTY AND LIABILITY

Seller warrants the goods sold hereunder, under normal use and service as described in the operator's manual, shall be free from defects in workmanship and material for twenty-four (24) months, or the length of time specified in the operator's manual, from the date of shipment to the customer. This warranty period is inclusive of any statutory warranty. This limited warranty is subject to the following exclusions:

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- b. Parts repaired or replaced as a result of repair services are warranted to be free from defects in workmanship and material, under normal use, for 90 days from the date of shipment.
- c. Seller does not provide any warranty on finished goods manufactured by others or on any fuses, batteries or other consumable materials. Only the original manufacturer's warranty applies.
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### Service Policy

Knowing that inoperative or defective instruments are as detrimental to TSI as they are to our customers, our service policy is designed to give prompt attention to any problems. If any malfunction is discovered, please contact your nearest sales office or representative, or call Customer Service department at +44 (0) 149 4 459200 (UK), (800) 874-2811 (USA), or (1) 651-490-2811 (International).

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# TABLE OF CONTENTS

LIMITATION OF WARRANTY AND LIABILITY .....	ii
SECTION 1 General Description.....	2
SECTION 2 Safety.....	2
SECTION 3 Setting Up Model TH12.....	3
Installing the Batteries.....	3
SECTION 4 Operation .....	4
Keypad Functions .....	4
ON/OFF Key .....	4
READ Key.....	5
TEMP/HUMIDITY (▲) Key .....	5
RECALL (▼) Key .....	6
SECTION 5 Maintenance .....	7
Probe Tip .....	7
Cases.....	7
Storage .....	7
SECTION 6 Service and Calibration.....	8
Factory Calibration .....	9
Field Calibration.....	10
SECTION 7 Troubleshooting.....	11
SECTION 8 DIP Switch Settings .....	13

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## **SECTION 1**

### **General Description**

The Thermo hygrometer Model TH12 is a hand-held meter to measure temperature, relative humidity, and dew point. It features a two-line display to show two parameters simultaneously. The probe houses the temperature and relative humidity sensors and can be placed in ductwork or at the face of a grille.

The TH12 ships in a case that provides a limited amount of protection to the meter and the probe. The instrument ships with batteries (which are not installed), a calibration sheet, and this Owner's Manual.

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## **SECTION 2**

### **Safety**

When using the TH12 to check for temperature or humidity values, make certain that you can safely raise and hold the

instrument while making measurements. Be especially careful when working on a ladder.

Observe all necessary precautions so that the unit does not become caught in moving machinery or touch any exposed electrical wiring.

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### **DANGER!**

Use with corrosive or other dangerous or explosive gas mixtures is **not** recommended.

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## **SECTION 3**

### **Setting Up Model TH12**

#### **Installing the Batteries**

Insert four AA batteries as indicated by the diagram located on the inside of the battery compartment. TSI Instrument Ltd. ships the unit with alkaline batteries. The Model TH12 is designed to operate with alkaline batteries. Other batteries are not recommended because of short life and the danger of battery acid leakage. At 15%

battery life remaining, the battery indicator will tell that the batteries need to be changed.

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## SECTION 4

### Operation

#### Keypad Functions

When pressing the keys on the front panel, the Model TH12 will beep to confirm the function. If you press a key and it does not beep, then the instrument does not allow that function during the selected mode.

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#### **WARNING!**

Do **not** expose the sensing probe to excessive heat—it can damage the sensors and probe.

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#### **ON/OFF Key**

Press the ON/OFF key to turn the Model TH12 on and off. When the instrument is first turned on it goes through a preprogrammed power-up sequence that includes an internal self-check (when all displayable items are

shown). The Model TH12 begins by displaying percentage of battery life remaining (accurate for alkaline batteries only). At this point, the Model TH12 will start measuring temperature and % relative humidity.

### **READ Key**

Press and release the READ key to start a sample. The word SAMPLE will flash on the display while a sample is being measured. Press the READ key again to stop taking a sample. The minimum sample time is five seconds, even if the second press occurs after two, three, or four seconds.

The display updates every second and each reading is the average of five samples.

### **TEMP/HUMIDITY (^) Key**

Press the TEMP/HUMIDITY key to toggle from displaying:

- Temperature and % relative humidity (%RH)
- Temperature and dew point

## **RECALL (▼) Key**

If you have pressed the READ key to take a sample measurement, then press the RECALL key to see your values. Press RECALL repeatedly to toggle through the minimum value, maximum value, average value, and time sampled. Press the READ key to return to normal measuring mode.

The instrument does not store readings. The information viewed in the recall mode is for the sample reading just taken. Once a new sample starts or the instrument is turned off, all previous data is lost.

The (▲) and (▼) references on keys are used during the field calibration process.



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## SECTION 5

### Maintenance

#### Probe Tip

Periodically inspect the probe tip to ensure that it is clean. Dust and oil deposits on the sensor may affect the response time of the Model TH12. To remove dust, blow it off with a gentle stream of air.

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#### Caution:

To avoid possible irreparable damage, do **not** use liquid to clean the probe or probe tip.

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#### Cases

If the instrument case or storage case needs cleaning, wipe it off with a soft cloth. Never submerge the Model TH12 in any liquid.

#### Storage

When storing the Model TH12 for more than a month, TSI recommends removing the batteries. This prevents possible damage due to battery leakage.

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## **SECTION 6**

### **Service and Calibration**

Please return your Product Registration Card immediately. This allows us to send service reminders, special offers, and important information about your product.

Before sending your instrument for calibration or repair, you should call Customer Service. The service department will provide you with the cost of service or calibration, Return Material Authorization (RMA) number, and shipping instructions.

Please have the following information available when you call:

- Owner's name, address, and phone number
- Billing address, if different and applicable
- Instrument name and model
- Serial number
- Date of purchase
- Where purchased

TSI recommends that you keep a “calibration log” and keep all records of service on your instrument.

### **Factory Calibration**

To maintain a high degree of accuracy in your measurements, TSI recommends that you return your instrument to the factory for annual calibration. For a nominal fee, we will calibrate the unit and return it to you with a NIST (US National Institute of Standards and Technology) traceable certificate. This “annual checkup” assures you of consistently accurate readings; it is especially important in applications where strict calibration records must be maintained.

Send the instrument to TSI Instruments Ltd. prepaid. Securely package your instrument in a strong container surrounded by at least 5 cm of suitable shock-absorbing material. Include a purchase order that clearly shows the instrument model number and serial number, a contact name, phone, fax number, and RMA number. Mark the outside of your

shipping container with the RMA number. This will expedite processing of your instrument when we receive it.

## **Field Calibration**

Temperature and humidity have a field calibration adjustment available. The temperature adjustment can add or subtract a number of degrees. The range is  $\pm 9.99^{\circ}\text{F}$  ( $\pm 5.55^{\circ}\text{C}$ ). Calibration can be done in either  $^{\circ}\text{F}$  or  $^{\circ}\text{C}$  mode. Humidity adjustment adds or subtracts a constant percentage. The range is  $\pm 12.0\%$  relative humidity. The procedure for field adjustment is as follows:

1. Turn off the instrument, flip DIP switch #7 to "ON." Turn the TH12 on again.
2. Press and hold the READ key to enter calibration mode. The display will begin a countdown from 5 to 0. Release the key when 0 is displayed. The top line of the display will show the adjustment number and the bottom line will show the actual reading value. Use the ( $\blacktriangle$ ) and ( $\blacktriangledown$ ) keys to change the adjustment number and press

READ key to accept. The top line of the display will now show the adjustment factor and the lower line will display the current %RH. Use the (▲) and (▼) key to change the adjustment number and the READ key to accept. When finished, turn the instrument off and flip DIP switch #7 to “off.”

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## SECTION 7

### Troubleshooting

Table 7-1 lists the symptoms, possible causes, and recommended solutions for common problems encountered with the Model TH12. If your symptom is not listed, or if none of the corrective actions solve your problem, please contact TSI Instruments Ltd.

**Table 7-1: Troubleshooting the Model TH12**

<b>Symptom</b>	<b>Possible Causes</b>	<b>Corrective Action</b>
No display	Unit not switched on	Switch on the unit.
	Low or dead batteries	Replace the batteries or plug in the AC adapter.
	Dirty battery contacts	Clean the battery contacts.
Battery symbol is blinking	Batteries are low, 15% or less life remaining	Replace or recharge batteries.
Display reads "LO"	Wrong AC adapter	Replace with the correct AC adapter.
	Low AC line voltage	Correct the AC line voltage or use batteries.
	Dirty battery contacts	Clean the battery contacts.
Display reads "CAL"	The Model TH12 has detected an internal fault	Return to factory for service.

<b>Symptom</b>	<b>Possible Causes</b>	<b>Corrective Action</b>
Display reads "OVER"	A parameter value is too high.	Use an alternate method to make measurement.
Temp. initially reads high or low	Temperature sensor is still adjusting to temperature	Allow sufficient time for the temperature to stabilize.

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## **SECTION 8**

### **DIP Switch Settings**

To access the DIP switches, remove the batteries from the battery compartment. On the inside of the battery compartment, there is a window with eight DIP switches. The table below shows the functions for each switch.

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#### **Caution:**

Make certain that power is turned off before changing DIP switch settings.

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**Table 8-1: DIP Switch Settings**

Switch	OFF	ON
1-3	Must be OFF	-----
4	Must be OFF	-----
5	°F	°C
6	Buzzer OFF	Buzzer ON
7	Normal Mode	Calibrate Mode
8	American Date Format and 12,345.67	European Date Format and 12.345,67

The ON position is away from the batteries and OFF is towards the batteries.

Always leave DIP switch #1-4 in the OFF position.



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## SPECIFICATIONS

(Specifications are subject to change without notice.)

Temperature:	0 to 60°C
Accuracy:	± 0.6°C
Resolution:	0.1°C
Relative Humidity:	5% to 95% RH
Accuracy <sup>1</sup>	±3.0% RH
Resolution:	0.1% RH
Sensor Type:	Thin-film capacitive
Dew Point:	-15 to 49°C
Resolution:	0.1°C
Meter Dimension:	100 mm × 168 mm × 38 mm
Weight (with batteries):	0.53 kg
Display:	2 line, 4-digit LCD
Probe length:	292 mm
Probe tip diameter:	19 mm
Operating Range:	5 to 70°C
Storage Range:	-20 to 70°C
Power Requirements:	Four AA-size batteries (included) or AC adapter (optional)

<sup>1</sup> At 25°C. Add uncertainty of ±0.05%/°C away from calibrated temperature.



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TSI Instruments Ltd.  
Lancaster Road  
Cressex Business Park  
High Wycombe  
Buckinghamshire  
HP12 3QP England

October 2005  
Printed in USA  
Part No. 1980531, Rev. A  
Tel: +44 (0) 149 4 459200  
Fax: +44 (0) 149 4 459700

E-mail: [info@airflowinstruments.co.uk](mailto:info@airflowinstruments.co.uk)  
Web: [www.airflowinstruments.co.uk](http://www.airflowinstruments.co.uk)

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