

## 319 Dewpoint Meter

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# User Guide

## Elcometer 319 Model S & T Dewpoint Meter

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For the avoidance of doubt, please refer to the original English language version.

Gauge Dimensions: 174 x 75 x 35mm (6.85 x 2.95 x 1.38")

Gauge Weight: 300g (10.5oz) - including batteries

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## 1 GAUGE OVERVIEW



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- 1 Surface Temperature Probe
- 2 Air Temperature & Humidity Probe
- 3 LED Indicators - Red (left), Green (right)
- 4 LCD Display
- 5 Softkeys
- 6 On/Off Key
- 7 Wrist Strap Connection
- 8 USB Data Output Socket (below cover)
- 9 Battery Compartment
- 10 Integrated Magnets
- 11 K-Type Probe Connector (below cover)

## 2 BOX CONTENTS

- Elcometer 319 Dewpoint Meter
- Protective Pouch with Belt Clip
- 2 x AA Batteries
- Wrist Harness
- ElcoMaster® Software & USB Cable (Model T only)
- Calibration Certificate
- User Guide

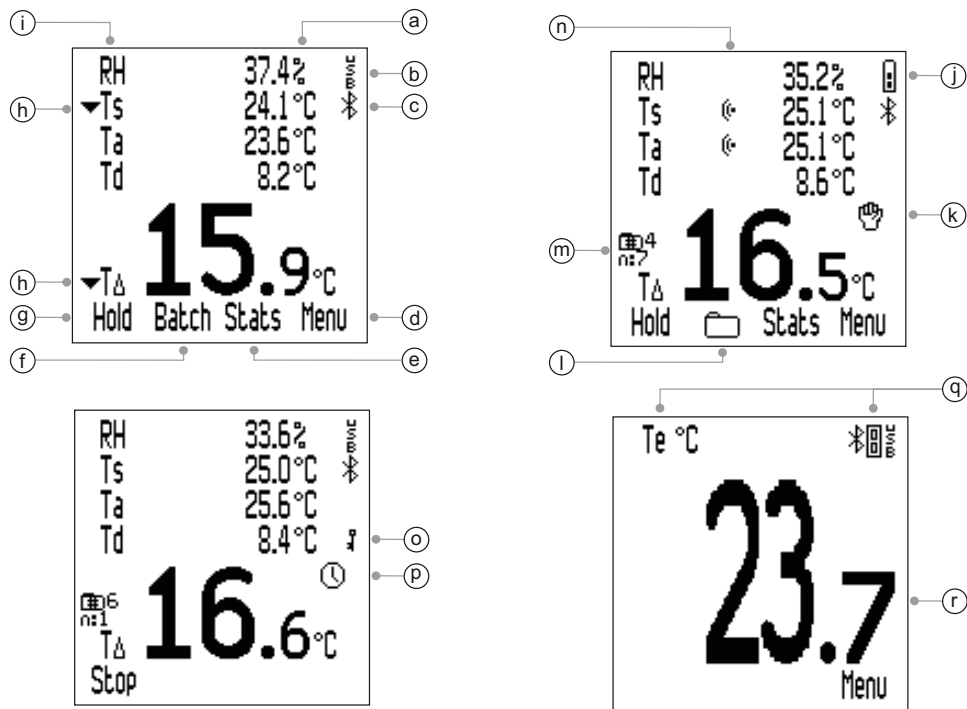
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### 3 USING THE GAUGE

- a Measurement Units - °C, g/kg, °F, gr/lb
- b Power: USB
- c Bluetooth On
- d Menu Softkey
- e Stats Softkey
- f Batch Softkey (Model T)
- g Hold Current Reading; Start / Stop Logging (Model T)
- h Trend Indicators - Value increasing or decreasing
- i Climatic Parameters - Maximum of 5
- j Power: Batteries - including battery life indicator
- k Manual Logging
- l Batch Softkey - when in batching (Model T)
- m Batch Number / Batch Reading Number (Model T)
- n Alarm - reading outside set and enabled limits
- o Softkeys Locked (Model T)
- p Interval Logging - when in batching (Model T)
- q Thermometer Mode On
- r External Probe Temperature



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## 4 GETTING STARTED

### 4.1 FITTING THE BATTERIES

Each gauge is supplied with 2 x AA alkaline batteries.

To insert or replace the batteries:

- 1 Remove the battery cover by rotating the retaining screw anti-clockwise.
- 2 Insert 2 batteries taking care to ensure correct polarity.
- 3 Refit the cover and rotate the retaining screw clockwise to secure.



The battery condition is indicated by a symbol in the top right of the display (▢). The more segments displayed, the better the condition of the batteries.

When no segments are displayed, it is not advisable to use the gauge for interval logging over long periods of time (Model T only; see Section 4.6 - 'Setting Manual or Interval Logging' on page 7).

If the batteries are replaced during interval logging, the gauge may show 'Please Wait' whilst it re-calculates the batch statistics.

When the batteries are nearly depleted, the battery power supply symbol will start flashing and the gauge emits short beeps every 10 seconds to indicate that the batteries should be changed.

The gauge can also be powered via USB using the USB cable supplied (Model T) or available to purchase as an accessory (Model S) - see Section 15 - 'Spares & Accessories' on page 21.

*Note: The USB cable can not be used to charge the batteries.*

### 4.2 SELECTING YOUR LANGUAGE

- 1 Press and hold the ON/OFF button until the Elcometer logo is displayed.
- 2 Press Menu/Setup/Languages and select your language using the ↑↓ softkeys.
- 3 Follow the on screen menus.

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#### 4 GETTING STARTED (continued)

- er To access the language menu when in a foreign language:
- 1 Switch the gauge OFF.
  - 2 Press and hold the left softkey and switch the gauge ON.
  - 3 Select your language using the **↑↓** softkeys.

#### 4.3 SCREEN SETTINGS

A number of screen settings can be defined by the user via Menu/Setup/Setup Backlight including:

- **Backlight Brightness;** This can be set to 'Low', 'Medium' or 'High'.
- **Backlight Timeout;** The display will dim if inactive for the period defined by the user. To adjust the backlight timeout use the **↑↓** softkeys to highlight 'Backlight Timeout' and press 'Sel'. Use the **↑↓** softkeys to set the required value - between 0 (off) and 60 seconds - and press 'Ok' to set or 'Esc' to cancel.

The gauge can also be set to switch off automatically after a user defined period of inactivity - between 1 and 10 minutes - via Menu/Setup/Auto Switch Off.

*Note: 'Auto Switch Off' is disabled when the gauge is powered by the USB connection.*

#### 4.4 SETTING UP THE READING DISPLAY

The user can select up to five climatic parameters to be displayed on screen. Measurements are taken for all climatic parameters but only those selected are displayed. Users can select from:

- **RH;** % Relative Humidity
- **Ts;** Surface Temperature
- **Ta;** Air Temperature
- **Td;** Dewpoint Temperature - calculated from Ta and RH
- **TΔ;** Delta Temperature - the difference between surface temperature and dewpoint
- **Tdb;** Dry Bulb Temperature - equal to Ta

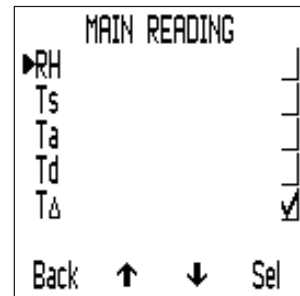
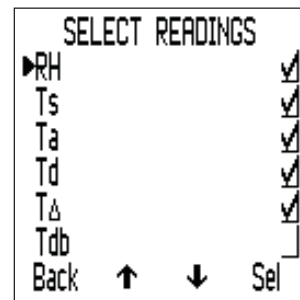
## 4 GETTING STARTED (continued)

- **Twb**; Wet Bulb Temperature - calculated from Ta and RH
- **SH**; Specific Humidity - calculated from Ta and RH

*Note: The formula used for calculation of Twb and SH uses a fixed value of air pressure set at 1.0 atmosphere (1013mbar). The accuracy of Twb and SH will vary at other values of atmospheric pressure. This variation may be greater than  $\pm 1^{\circ}\text{C}$  for Twb and  $\pm 1\%$  / 10 mbar for SH.*

### To setup the display:

- 1 Press Menu/Setup/Display/Select Readings.
- 2 Use the  $\uparrow\downarrow$  softkeys to highlight the required option and press 'Sel'. Pressing 'Sel' again will de-select the option.
  - ▶ The gauge will beep if the user attempts to select a parameter when five are already selected in which case, a parameter must be de-selected before another is chosen.
- 3 To select which parameter is shown in the largest digits at the bottom of the display, press Menu/Setup/Display/Main Reading.
- 4 Use the  $\uparrow\downarrow$  softkeys to highlight the required option from the list displayed and press 'Sel'.
  - ▶ Only those climatic parameters selected via Step 2 above will be available for selection in the 'Main Reading' list.
  - ▶ To increase the size of the main reading, reduce the number of parameters displayed on the reading screen.



*Note: If a reading exceeds any set limits during measurement, it will be shown flashing on the display, even if it has not been selected for display via Steps 1-2 above.*

## 4.5 SELECTING THE MEASUREMENT UNITS

A choice of measurement units is available<sup>a</sup>; °C, °F, g/kg, gr/lb. To select the measurement units, press Menu/Setup/Units.

<sup>a</sup> g/kg and gr/lb relate to 'Specific Humidity' measurements only.

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## 4 GETTING STARTED (continued)

### en 4.6 SETTING MANUAL OR INTERVAL LOGGING

Users can choose to manually log readings - 'Manual Logging' (Model S & T) or program the gauge to take readings at set time intervals and save the readings into the batch memory automatically - 'Interval Logging' (Model T only).

#### To select 'Manual Logging' in immediate mode (Model S & T):

- 1 Press Menu/Setup/Manual Logging.
- 2 To select immediate saving of a reading, use the  $\uparrow\downarrow$  softkeys to highlight 'Save only' and press 'Sel'.
- 3 To select holding of a reading followed by an option to save, use the  $\uparrow\downarrow$  softkeys to highlight 'Hold & Save' and press 'Sel'.
  - ▶ The default setting is 'Hold & Save'.

'Manual Logging' is also available when in batching (Model T).

'Interval Logging' is only available when in batching (Model T).

For information on creating a new batch with 'Manual Logging' or 'Interval Logging', see Section 10.1 'Creating a New Batch' on page 15.

## 5 THE SENSORS

The sensors for (a) ~~(b)~~ surface temperature (Ts) are located at the top of the gauge.

*Note: The surface temperature sensor is serialised for calibration traceability purposes.*



### FOR ACCURATE READINGS







- Do not obstruct airflow through the holes in the casing around the humidity and air temperature sensors.
- Keep fingers away from the holes - body heat can affect readings.
- Allow the gauge some time, approximately 20 minutes, to acclimatise once it is brought from a cold environment into a warm place and vice versa.



## 5 THE SENSORS (continued)

### TO AVOID DAMAGE

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-  Do not use excessive force when measuring surface temperature. Light contact between the probe and the surface is sufficient. Using force does not increase the measuring speed or improve the accuracy of the measurement, but it does increase wear and/or damage to the sensor tip.
-  Do not drag the surface temperature probe over the surface to avoid excessive wear.
-  The humidity sensor is fragile and should never be touched. Do not use compressed air to clean the sensors or the gauge.
-  If the surface of the humidity sensor becomes saturated with moisture, allow the moisture to evaporate fully in a dry environment before using the gauge to take measurements.
-  Protect the gauge from paint dust and dirt as much as possible as these can affect the long term accuracy of the humidity sensor. Always keep the gauge in its protective pouch when not in use.
-  Do not wash the sensors in water or with solvents.

## 6 SETTING LIMITS

A lower and/or upper limit can be set by the user for any or all the climatic parameters.

Limits can be set for individual readings (when not in Batching) or limits can be set for each batch (when in Batching).

### To set limits for individual readings (Model S & T):

- 1 Press Menu/Set Limits.
- 2 Use the   softkeys to highlight the required parameter and press 'Sel'.
- 3 Use the   softkeys to highlight 'High Limit on' and press 'Sel' to enable the limit.
- 4 Use the   softkeys to highlight 'High Limit' and press 'Sel'.

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## 6 SETTING LIMITS (continued)

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- 5 Use the **↑↓** softkeys to set the required value and press 'Ok' to set or 'Esc' to cancel.
  - 6 If required, repeat Steps 3-5 to set and enable a low limit value.
  - 7 Repeat Steps 2-6 for each climatic parameter as required.

### To set limits for a batch (Model T):

Limits can be set when a new batch is created. Once a reading is saved into the batch, limits cannot be amended and limits cannot be added.

- 1 Press Batch/New Batch/Limits.
- 2 Use the **↑↓** softkeys to highlight the required parameter and press 'Sel'.
- 3 Use the **↑↓** softkeys to highlight 'High Limit on' and press 'Sel' to enable the limit.
- 4 Use the **↑↓** softkeys to highlight 'High Limit' and press 'Sel'.
- 5 Use the **↑↓** softkeys to set the required value and press 'Ok' to set or 'Esc' to cancel.
- 6 If required, repeat Steps 3-5 to set and enable a low limit value.
- 7 Repeat Steps 2-6 for each climatic parameter as required.
  - ▶ Batch limits can be viewed at any time via Batch/Review Batches.

When the value of a parameter falls outside set and enabled limits;

- the appropriate parameter icon flashes;
  - ▶ If a reading exceeds any set limits during measurement, it will be shown flashing on the display, even if it has not been selected for display via Menu/Setup/Display/Select Readings.
- the alarm symbol is displayed next to the parameter;
- the red LED flashes;
- an audible alarm sounds<sup>b</sup>;
- when in batching (Model T); a reading which exceeds a high limit is marked **⬆** and a reading which exceeds a low limit is marked **⬇**.

*Note: When the value of the parameter returns within limits, the alarm status is cleared automatically.*

<sup>b</sup> The volume of the alarm is determined by the beep volume set via Menu/Setup/Beep Volume

## 7 TAKING A READING

### 7.1 BEFORE YOU START

- 1 Press the On/Off button to switch the gauge on - the gauge will start measuring.
- 2 Set up the reading display - see Section 4.4 on page 5.
- 3 Select the measurement units - see Section 4.5 on page 6.
- 4 Set any required limits - see Section 6 on page 8.

### 7.2 TAKING A READING IN IMMEDIATE MODE

Follow this procedure to take readings manually ('Manual Logging') with the option to save reading data into the rolling memory of the gauge.

- 1 Place the rubber tip of the surface temperature sensor against the surface, preferably at an angle of 90°, and keep it in this position.
  - ▶ The trend indicator next to the parameter indicates if the value is increasing (▲) or decreasing (▼). The absence of a trend indicator indicates that the value is stable.
- 2 Press 'Hold' followed by 'Save' to save the reading data into the gauge memory.
  - ▶ If the 'Manual Logging' setting is "Save only", 'Hold' is not displayed. Simply press 'Save' to save the reading data into the gauge memory.

To view the statistical analysis of the reading data, press the 'Stats' softkey - see Section 9 'Statistics' on page 14 for further information.

### 7.3 TAKING A READING IN BATCH MODE (MODEL T)


Follow this procedure to take readings manually ('Manual Logging') or automatically at set time intervals ('Interval Logging') and save the reading data into a batch.

#### Using 'Manual Logging':

- 1 Create a new 'Manual Logging' batch - see Section 10.1 on page 15.
- 2 Place the rubber tip of the surface temperature sensor against the surface, preferably at an angle of 90°, and keep it in this position.
  - ▶ The trend indicator next to the parameter indicates if the value is increasing (▲) or decreasing (▼). The absence of a trend indicator indicates that the value is stable.

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## 7 TAKING A READING (continued)

- en 3 Press 'Hold' followed by 'Save' to save the reading data into the batch memory.
- ▶ If the 'Manual Logging' setting is "Save only", 'Hold' is not displayed. Simply press 'Save' to save the reading data into the batch memory.
- 4 To exit batching, press the  softkey followed by 'Exit Batching'.

### Using 'Interval Logging':

Before you start, if you intend to take readings over a long period of time check that the batteries are in good condition; if in doubt, insert new batteries - see Section 4.1 'Fitting the Batteries' on page 4.

Consider the use of an external temperature probe; holding the surface temperature probe integrated into your gauge against a surface over an extended period of time may not be practical - see Section 8 'Using External Temperature Probes' on page 12.

- 1 Create a new 'Interval Logging' batch and set the required logging time interval - see Section 10.1 on page 15.
- 2 Place the rubber tip of the surface temperature sensor against the surface, preferably at an angle of 90°, and keep it in this position.
  - ▶ The trend indicator next to the parameter indicates if the value is increasing (▲) or decreasing (▼). The absence of a trend indicator indicates that the value is stable.
- 3 Press 'Start' to start logging, the reading data is saved automatically at the set interval.
  - ▶ A delayed start time can be set when creating an 'Interval Logging' batch. The gauge will automatically start once the set time has elapsed.
  - ▶ If an 'Auto Switch Off' time is set, the gauge will appear to switch off after the set time delay but whilst you are logging, it will remain on in a reduced power state. In this state, during interval logging, the gauge will continue reading data into batch memory at the set logging interval. When the gauge is next switched on, the batch will reopen.
- 4 Press 'Stop' to stop logging data, followed by 'Yes to confirm or 'No' to escape and continue logging.
- 5 To exit batching, press the  softkey followed by 'Exit Batching'.

## 7 TAKING A READING (continued)

The Elcometer 319 Model T has a 'Softkeys Locked' feature which provides an additional level of security to prevent accidental stopping of interval logging. When 'Softkeys Locked' is enabled, an extra key press is required to stop interval logging.

To enable 'Softkeys Locked'; press Menu/Setup/Softkeys Locked followed by 'Sel'.

To view the statistical analysis of the reading data, press the 'Batch' softkey - see Section 11.2 'Batch Statistics' on page 17 for further information.

## 8 USING EXTERNAL TEMPERATURE PROBES

The Elcometer 319 can be fitted with an external, k-type temperature probe for taking measurements over an extended period of time - 'Interval Logging' (Model T) - or at locations remote from the gauge.

For details of the external probes available from Elcometer, see Section 15 'Spares & Accessories' on page 21.

### 8.1 FITTING AND EXTERNAL TEMPERATURE PROBE

- 1 Open the rubber cover (a) which covers the k-type probe connector at the top of the gauge.
  - ▶ There is no need to switch off the gauge before fitting an external temperature probe.
- 2 Push the external probe connector into the socket; never force the connector into the socket.
  - ▶ One side of the socket is wider than the other therefore, the external probe connector will only fit into the socket one way.



*Note: When an external probe is fitted, the in-built surface temperature probe is deactivated.*

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## 8 USING EXTERNAL TEMPERATURE PROBES (continued)

**e** The Elcometer 319 has a 'Thermometer Mode' feature and when enabled, the gauge only measures and displays the external probe temperature (Te) - all other functions are disabled.

If 'Thermometer Mode' is enabled and an external temperature probe is not fitted, the gauge will display an error reading '---'.

To enable 'Thermometer Mode'; press Menu/Temperature Mode, followed by 'Sel'.

The connection of an external probe is indicated on the display:

- If 'Thermometer Mode' is enabled, the display shows  and Te;
- If 'Thermometer Mode' is not enabled, the display shows  and Ts.

### 8.2 PREPARING THE GAUGE FOR USE WITH AN EXTERNAL PROBE



The Elcometer 319 supports external temperature measurements with a suitable probe from -40° to 200°C (-40°F to 392°F) however, the gauge is only rated between -20° to 80°C (-4°F to 176°F) and should not be exposed to temperatures outside this range.

- If a magnetic surface is available, attach the gauge to the surface using the magnets built into the back of the gauge. Ensure the gauge is attached securely before use.
- If the external temperature probe is magnetic, attach the probe to the magnetic surface.
- If the external temperature probe is for measuring liquids, place the probe tip in the liquid.

*Note: If the temperature of the external temperature probe exceeds the range of the gauge, there is no error message or warning but the reading value will be saved as '---'.*

## 9 STATISTICS

The Elcometer 319 can display statistics for readings saved in the 10 reading rolling memory (Model S & T) or batch memory (Model T).



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Press the 'Stats' softkey to view the statistics for readings saved in rolling memory.

The following statistical values are displayed. Press the right hand softkey to view the statistics for the next parameter. Press 'Clear' to delete the statistics.

- Number of readings (n:)
- Average reading ( $\bar{x}$ :)
- Lowest reading (Lo:)
- Highest reading (Hi:)
- Standard Deviation ( $\sigma$ :)
- Coefficient of Variation (COV:)

When in the statistics review screen, pressing the 'Rdgs' softkey displays the reading value and date and time of each reading saved in rolling memory. Press the right hand softkey to view the readings for the next parameter.

The appropriate limit icon is displayed next to readings outside any enabled limits,  if the reading is below the low limit and  if above the high limit.

To view the readings and statistics for a batch (Model T) - see Section 11 'Reviewing Batch Data' on page 17.

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## 10 BATCHING - MODEL T

**en** The Elcometer 319 Model S & T have a 10 reading rolling memory. The Model T can also store up to 25,000 sets of readings in up to 999 batches. The following batch functions are available:





- **Batch/New Batch;** Creates a 'Manual Logging' or 'Interval Logging' batch - see Section 10.1 'Creating a New Batch' on page 15.
- **Batch/Open Existing Batch;** Open an existing batch.
- **Batch/Review Batches;** Review the batch information, readings and statistics - see Section 11 'Reviewing Batch Data' on page 17.
- **Batch/Copy Batch;** Copy a batch including the batch header information.
- **Batch/Delete;** Delete a single batch or all batches entirely from the gauge.

### 10.1 CREATING A NEW BATCH

Users can create a 'Manual Logging' batch or an 'Interval Logging' batch:

- **'Manual Logging;** readings are manually saved into the batch by the user.
- **'Interval Logging';** the gauge is programmed to take readings at set time intervals and readings are saved into the batch memory automatically.

#### To create a 'Manual Logging' batch:











- 1 Press Menu/Batch/New Batch.
- 2 If 'Manual Logging Batch' is not displayed on screen, press the  softkey to select 'Manual Logging'.
  - ▶ The  icon will be displayed on the main reading screen indicating that 'Manual Logging' is enabled.
- 3 Press 'Limits' to set any required limits for the batch - see Section 6 'Setting Limits' on page 8.
- 4 Press 'Ok' to create the batch or 'Esc' to cancel.
  - ▶ When a batch is open, the 'Batch' softkey is replaced by . Press  to return to the Batch Menu.

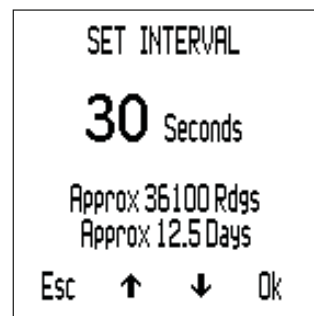
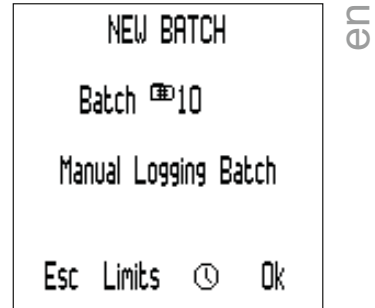


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## 10 BATCHING - MODEL T (continued)

### To create an 'Interval Logging' batch:

- 1 Press Menu/Batch/New Batch.
- 2 If 'Interval Logging Batch' is not displayed on screen, press the  softkey to select 'Interval Logging' followed by 'Ok'.
  - ▶ The  icon will be displayed on the main reading screen indicating that 'Interval Logging' is enabled.
- 3 Use the  sofkeys to set the required time interval, between 1 second and 24 hours, followed by 'Ok' to set.
  - ▶ The approximate number of readings which can be taken and saved in the batch together with the approximate number of days it will take to take those readings at the time interval set is displayed.
- 4 If required, use the  sofkeys to set the required delayed start time, between 1 and 60 minutes or 'Off', followed by 'Ok' to set.
- 5 Press 'Start' to initiate logging.
  - ▶ If a delayed start time has been set, the countdown will begin when 'Start' is pressed. The  icon will be displayed on screen, changing to  when the set delay has elapsed and the gauge starts logging readings.
  - ▶ When a batch is open, the 'Batch' softkey is replaced by . Press  to return to the Batch Menu.




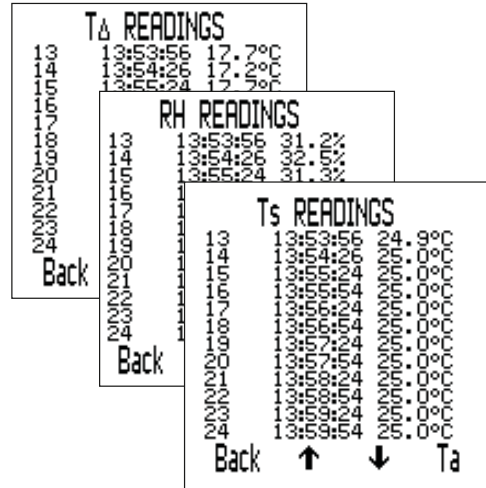
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## 11 REVIEWING BATCH DATA - MODEL T

### en 11.1 BATCH READINGS

To view the batch readings:

- 1 Press Batch/Review Batches
  - ▶ If already in a Batch, press  followed by 'Review Batches'.
- 2 Use the  $\uparrow\downarrow$  sofkeys to select the required batch, followed by 'Sel' to select.
- 3 Press 'Rdgs' the view the batch readings.
- 4 Press 'Back' to return to the batch menu.




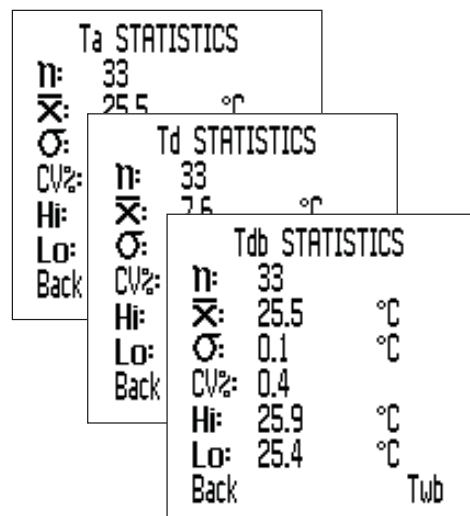
The date and time of each reading together with the reading value is displayed. Press the  $\uparrow\downarrow$  sofkeys to scroll through the readings and the right hand softkey to view the readings for the next parameter.

The appropriate limit icon is displayed next to readings outside any enabled limits,  $\text{L}$  if the reading is below the low limit and  $\text{H}$  if above the high limit.

### 11.2 BATCH STATISTICS

To view the batch statistics:

- 1 Press Batch/Review Batches
  - ▶ If already in a Batch, press  followed by 'Review Batches'.
- 2 Use the  $\uparrow\downarrow$  sofkeys to select the required batch, followed by 'Sel' to select.
- 3 Press 'Stats' the view the batch statistics.
- 4 Press 'Back' to return to the batch menu.
  - ▶ If in an 'Interval Logging' batch, logging is halted whilst statistics are displayed. Logging recommences when 'Back' is pressed.



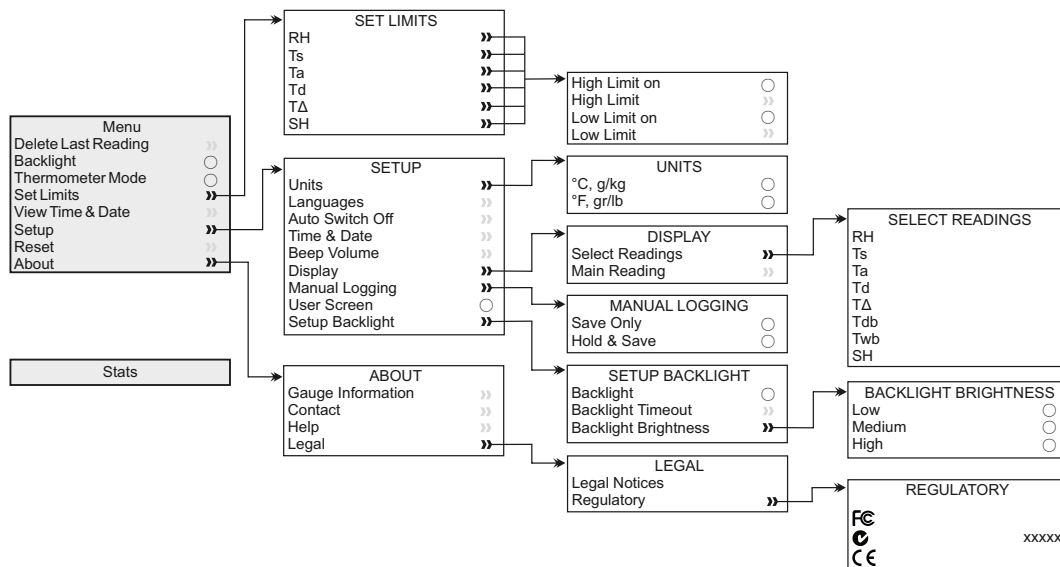
## 11 REVIEWING BATCH DATA - MODEL T (continued)

The following statistical values are displayed. Press the right hand softkey to view the statistics for the next parameter.

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- Number of readings in the batch (n:)
- Average reading for the batch ( $\bar{x}$ :)
- Lowest reading in the batch (Lo:)
- Highest reading in the batch (Hi:)
- Standard Deviation ( $\sigma$ :)
- Coefficient of Variation (COV:)

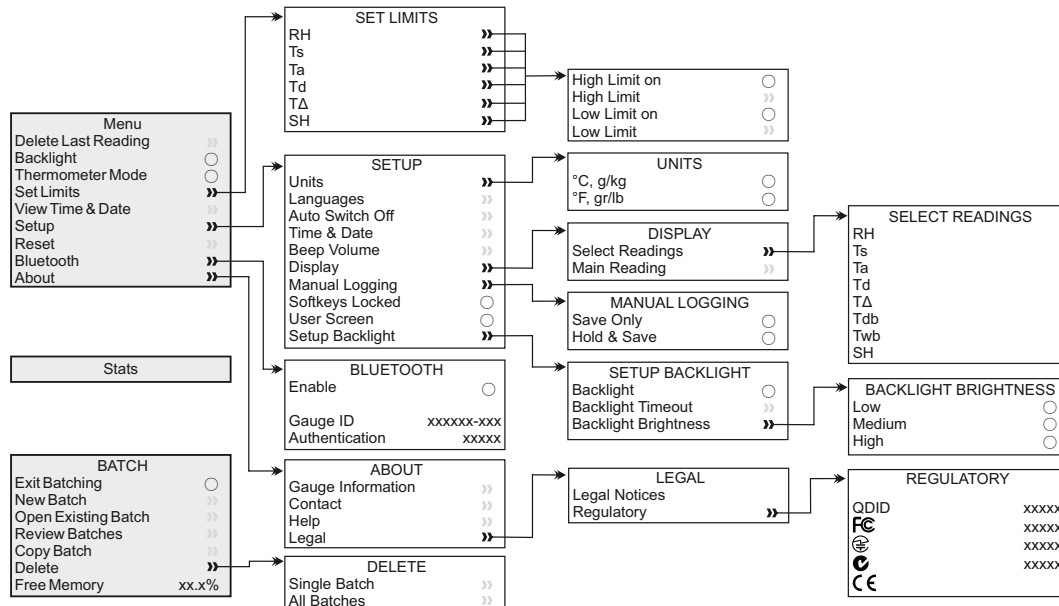
## 12 MENU STRUCTURE - MODEL S



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### 13 MENU STRUCTURE - MODEL T

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### 14 DOWNLOADING DATA - MODEL T

#### 14.1 DOWNLOADING DATA USING ELCOMASTER®

Using ElcoMaster® - supplied with each gauge and available as a free download at [elcometer.com](http://elcometer.com) - gauges can transmit readings to a PC for archiving and report generation. Data can be transferred via USB or Bluetooth®. For more information on ElcoMaster® visit [www.elcometer.com](http://www.elcometer.com)

#### 14.2 DOWNLOADING DATA USING ELCOMASTER® MOBILE APPS

Ideal when out in the field or on-site, using the ElcoMaster® Android™ or iOS Mobile App users can:

- Store live readings directly on to a mobile device and save them into batches together with GPS coordinates.
- Add photographs of the test surface.
- Inspection data can be transferred from mobile to PC for further analysis and reporting.

For more information on ElcoMaster® Mobile Apps visit [www.elcometer.com](http://www.elcometer.com)

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**14 DOWNLOADING DATA - MODEL T (continued)**



Compatible with smart phones and tablets running Android 2.1 or above. To install, download via [www.elcometer.com](http://www.elcometer.com) or using the Google Play™ Store app, and follow the on screen instructions.

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Made for iPhone 6 Plus, iPhone 6, iPhone 5s, iPhone 5c, iPhone 5, iPhone 4s, iPhone 4, iPad Air 2, iPad mini 3, iPad Air, iPad mini 2, iPad (3rd and 4th generation), iPad mini, iPad 2, and iPod touch (4th and 5th generation). To install, download via [www.elcometer.com](http://www.elcometer.com) or the App Store, and follow the on screen instructions.



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## 15 SPARES & ACCESSORIES

**en** The following spares and accessories are available from your local Elcometer supplier or direct from Elcometer.

### 15.1 MAGNETIC SURFACE TEMPERATURE PROBES

Range	Cable Length	Part Number
-40°C to 80°C (-40°F to 176°F)	100mm (3.94")	T31920162
-50°C to 150°C (-58°F to 302°F) <sup>°</sup>	1m (3' 3")	T31911728
-25°C to 250°C (-13°F to 482°F) <sup>°</sup>	1.5m (4' 9")	T99921281
-25°C to 250°C (-13°F to 482°F) <sup>°</sup>	3m (9' 8")	T99921282
-25°C to 250°C (-13°F to 482°F) <sup>°</sup>	6m (19' 7")	T99921283

### 15.2 OTHER ACCESSORIES

Description	Part Number
External Temperature Probe for Liquids; -200°C to 1100°C (-328°F to 2012°F) <sup>°</sup>	T9996390-
Protective Pouch with Belt Clip	T99923480
USB Cable	T99921325
Wrist Harness	T99916063

## 16 WARRANTY STATEMENT

The Elcometer 319 is supplied with a 12 month warranty which excludes contamination and wear. The warranty can be extended to two years within 60 days of purchase via [www.elcometer.com](http://www.elcometer.com).

The surface temperature probe is supplied with a 12 month warranty against manufacturing defects only.

<sup>°</sup> The usable measuring range of the gauge is -40°C to 200°C (-40°F to 392°F).

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**17 TECHNICAL SPECIFICATION**

	<b>Temperature Range</b>	<b>Accuracy</b>	<b>Resolution</b>
<b>Gauge<sup>d</sup></b>	-20°C to 80°C (-4°F to 176°F)	±0.5°C (±1°F)	±0.1°C (±0.1°F)
<b>Air Temperature (Ta)</b>	-20°C to 80°C (-4°F to 176°F)	±0.5°C <sup>e</sup> (±1°F)	±0.1°C (±0.1°F)
<b>Surface Temperature (Ts)</b>	-20°C to 80°C (-4°F to 176°F)	±0.5°C (±1°F)	±0.1°C (±0.1°F)
<b>External K-Type Probe (Te)</b>	-40°C to 200°C (-40°F to 392°F)	±0.5°C <sup>f</sup> (±1°F)	±0.1°C (±0.1°F)
<b>Relative Humidity (RH)</b>	0 to 100% RH	±3% RH <sup>g</sup>	0.1%
<b>Specific Humidity (SH)</b>	0 g/kg to 325 g/kg (0 gr/lb to 2275 gr/lb)	±8% SH	0.1 g/kg (0.1 gr/lb)
<b>Gauge Memory</b>	Model S & T: 10 sets of readings (rolling memory) Model T: 25,000 sets of readings in up to 999 batches		
<b>Gauge &amp; LCD Operating Range</b>	-20°C to 80°C (-4°F to 176°F)		
<b>Power Supply</b>	2 x AA Batteries <sup>h</sup> or via USB Cable		
<b>Battery Life</b>	Manual Logging: Greater than 40 hours (backlight off) Interval Logging: up to 400 hours (1 reading every 10 minutes)		
<b>Gauge Dimensions</b>	174 x 75 x 35mm (6.85 x 2.95 x 1.38")		
<b>Gauge Weight</b>	300g (10.5oz) - including batteries		
Can be used in accordance with: BS 7079-B4, IMO MSC.215(82) <sup>i</sup> , IMO MSC.244(83) <sup>i</sup> , ISO 8502-4, US Navy NSI 009-32, US Navy PPI 63101-000			

<sup>d</sup> Do not expose the gauge to temperatures outside the gauge and LCD operating range.

<sup>e</sup> Accuracy ±0.75°C below 10°C (±1.35°F below 50°F).

<sup>f</sup> Accuracy ±2°C (±4°F) with K type probes supplied by Elcometer. Probes supplied by other manufacturers may vary.

<sup>g</sup> At 1m/s

<sup>h</sup> The batteries supplied with the gauge have a maximum working temperature of 45°C (113°F). Prolonged use of the gauge in excess of this temperature may require the use of alternative batteries.

<sup>i</sup> For the IMO PSPC (International Marine Organisation, Performance Standard for Protective Coatings), the relative humidity, surface temperature and dewpoint should be recorded. The Elcometer 319 can be used for this.

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## 18 LEGAL NOTICES & REGULATORY INFORMATION

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The Elcometer 319 Model T meets the Radio and Telecommunications Terminal Equipment Directive.

The Elcometer 319 Model S meets the Electromagnetic Compatibility Directive.

This product is Class B, Group 1 ISM equipment according to CISPR 11.

Class B product: Suitable for use in domestic establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

Group 1 ISM product: A product in which there is intentionally generated and/or used conductively coupled radiofrequency energy which is necessary for the internal functioning of the equipment itself.

The USB is for data transfer only and is not to be connected to the mains via a USB mains adapter.

The ACMA compliance mark can be accessed via: Menu/About/Legal/Regulatory

Elcometer 319 Model T: The Giteki mark, its ordinance number, the FCC ID and Bluetooth SIG QDID can be accessed via: Menu/About/Legal/Regulatory

Elcometer 319 Model T: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Changes or modifications not expressly approved by Elcometer Limited for compliance could void the user's authority to operate the equipment.

Elcometer 319 Model S: NOTE: 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.

Elcometer 319 Model T: Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Elcometer 319 Model S: This Class B digital apparatus complies with Canadian ICES-003.

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Elcometer 319 Model T: Made for iPhone 6 Plus, iPhone 6, iPhone 5s, iPhone 5c, iPhone 5, iPhone 4s, iPhone 4, iPad Air 2, iPad mini 3, iPad Air, iPad mini 2, iPad (3rd and 4th generation), iPad mini, iPad 2, and iPod touch (4th and 5th generation).

"Made for iPod," "Made for iPhone," and "Made for iPad" mean that an electronic accessory has been designed to connect specifically to iPod, iPhone, or iPad, respectively, and has been certified by the developer to meet Apple performance standards. Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards. Please note that the use of this accessory with iPod, iPhone, or iPad may affect wireless performance.

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