# JUMO TDA-300(0)

## Handheld Thermometer with data logger

## Operating Manual

70254000T90Z001K000

V1.00/EN/00448127

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## 1.1 Preface

Please read this Operating Manual before commissioning the instrument. Keep the manual in a place that is accessible to all users at all times.

Please assist us to improve this operating manual, where necessary.

Your comments will be appreciated.

If any difficulties should arise during commissioning, you are asked not to carry out any manipulations that could endanger your rights under the instrument warranty!

Please contact the nearest subsidiary or the head office in such a case.

When returning modules, assemblies or components, the regulations of EN 61340-5-1 and EN 61340-5-2 “Protection of electronic devices from electrostatic phenomena” must be observed. Use only the appropriate **ESD** packaging for transport.

Please note that we cannot accept any liability for damage caused by ESD.

ESD=electrostatic discharge

## 1.2 Typographical conventions

### Warning signs

**Caution**

This symbol is used when there may be **damage to equipment or data** if the instructions are ignored or not followed accurately!

### Note signs

**Note**

This symbol is used when your **special attention** is drawn to a remark.

**Reference**

This symbol refers to **further information** in other manuals, chapters or sections.

**Footnote**

abc[1]

Footnotes are remarks that **refer to specific points** in the text. Footnotes consist of two parts:

A marker in the text, and the footnote text.

The markers in the text are arranged as continuous superscript numbers.

**Action instruction**

*

This symbol indicates that an **action to be performed** is described.

The individual steps are marked by this asterisk, e.g.

* Press the ▲ key

* Confirm with ENTER

**Disposal**

Do not put this device into the garbage bin after use!

Please ensure a proper and environmentally-friendly disposal.

## 1.3 Instrument features

**Temperature ranges**

- Resistance thermometer (RTD) type Pt100:
  -200 to +850 °C (-328 to +1562 °F) or
  -199.9 to +850.0 °C (-199.9 to +999.9 °F)
- Thermocouple K
  -200 to +1372 °C (-328 to +2501 °F) or
  -199.9 to +999.9 °C (°F)
- Thermocouple J
  -200 to +1200 °C (-328 to +2192 °F) or
  -199.9 to +999.9 °C (°F)
- Thermocouple T
  -50 to +400 °C (-58 to +752 °F) or
  -50.0 to +400.0 °C (-58.0 to +752.0 °F)

**TAG numbers TAG names**

You can enter designations for the measurement points (TAG names) with up to 11 characters. The instrument itself will automatically assign a sequential TAG number to each name.

(TDA-300: max. 5 names; TDA-3000: max. 99 names)

**User names**

With the TDA-3000, you can enter 99 user names with up to 11 characters. The instrument itself will automatically assign a sequential number to each name.

The TDA-300 does not have a user management – there is only one user.

**Limit function**

With this function, you can immediately detect whether the measured temperature is above, below, or within the limits (the upper and lower limits must be set up).

**Data logger**

Measurement point designation (TAG name), measured temperature, date and user name can be entered manually, or automatically detected and saved.

(TDA-300: max. 99 measurements, TDA-3000: max. 9999 measurements)

**MIN and MAX memory**

The minimum and maximum temperatures (Peak and Bottom) can be saved in the instrument.

**Service life**

The handheld thermometer can acquire data continuously for up to 400 hours – using an alkaline LR6 battery (based on IEC and JIS).

**PC evaluation**

With the TDA-3000, data can be checked and evaluated by a PC. Measurement data can be copied to a PC via the USB interface, in CSV format (Comma Separated Values). This data can then be processed by the PC.

# 1 Introduction

## 1.4 Checking the delivery

Before using the handheld thermometer, check the following:

- Order details
- Check that the housing is undamaged
- Check that all the accessories are present (see Accessories)

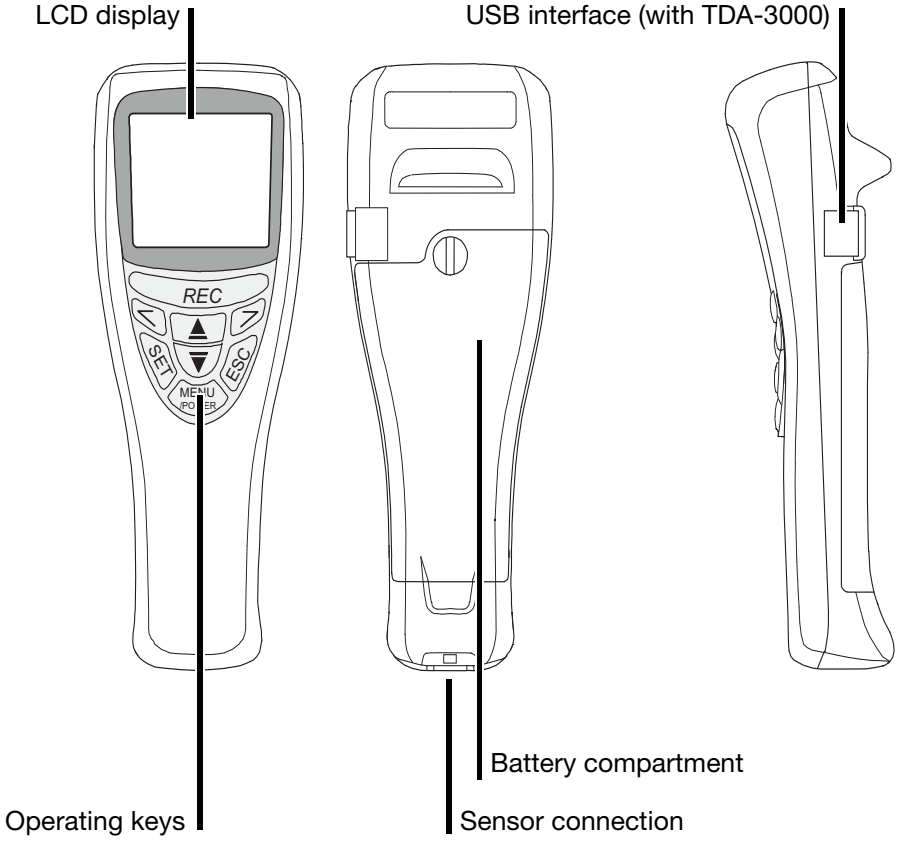
**Order details**

| Order details | Instrument description |
|---|---|
| 702540/... | TDA-300<br>no USB interface, 99 data sets |
| 702541/... | TDA-3000<br>incl. USB interface, 9999 data sets |

**Accessories**

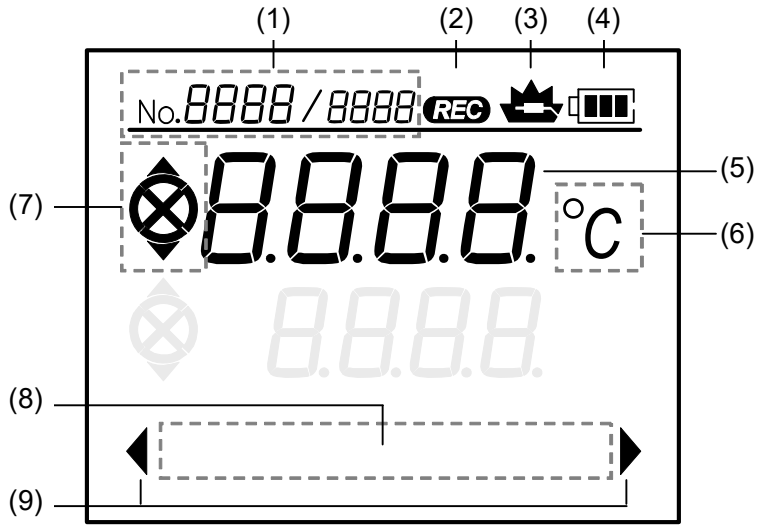
- Operating Manual
- Alkaline battery, type LR6 (IEC and JIS)
- Carrying strap
- USB interface instructions (with TDA-3000)

## 1.5 Instrument description



### 1.5.1 LCD display

The following details are shown in the LCD display.




**(1) Number**

While data is being recorded, or during standby for data recording, the number of the measurement point or the user is shown here.

If stored data are displayed, the memory number for the measurement being displayed appears in front of the "/" symbol and the total quantity of stored data appears after the "/".

**(2) Data logging**

During manual data logging (manual recording) the REC display will only light up when the REC key is pressed. During automatic data logging (automatic recording) the REC display will light up continuously during recording, and will blink during an interruption.

**(3) Input interruption**

This indicates that the input is open (probe break), short-circuited, or not properly connected.

**(4) Battery charge status**

Indicates the charge in the battery.

| | |
|---|---|
| | Battery is full. |
| | Battery is half full. |
| | Battery near end of life; insert new battery. |
| | Battery empty; insert new battery immediately. |

**(5) Temperature**

Indicates the measured temperature and the error number, if an error occurs.

**(6) °C or °F**

Displays the temperature unit that is set at the moment.

**(7) Limit value**

Indicates whether the measured temperature is within the selected range limits.

Caution: The limit values (upper and lower limits) must be set up.

| | |
|---|---|
| | Temperature above the limit temperature. |
| | Temperature within the limits. |
| | Temperature below the limit temperature. |

**(8) Message line**

This shows the name in the function menu, the date[1], the name of the measurement point[3], the user name[2,3] etc.

1. Set the date, so that it can be recorded (see Chapter 2.2 “Setting the date and time”).
2. Will not be displayed if no user name has been defined.
3. Maximum 11 characters.

**(9) Message selection**

Shows that the information in the LCD display changed, by using the (<, >) keys.

### 1.5.2 Operating keys

**MENU/POWER key**

You can use this key to switch the instrument on and off. If you press the key for longer than 2 seconds, when the instrument is switched on, it will switch off.

When the instrument is switched on, you can use this key to call up the function menu and to change between the individual functions.

**SET key**

You can use this key to make settings.

**ESC key**

You can use this key to cancel the alteration of a settings. If the setting procedure is canceled, the instrument will retain the original value.

**UP and DOWN keys**

You can use these keys (▲, ▼) to select the measurement points or the user names that are stored in the instrument, and are shown in the LCD display.

You can select the setting during configuration.

**LEFT and RIGHT keys**

You can use the (<, >) keys to select details on the screen when it is in the normal display mode.

You can move to the next or previous function, while a function menu (Fn0 to Fn9) is displayed.

You can move the cursor in front of and behind every character, when you are altering a setting (editing names).

**REC key**

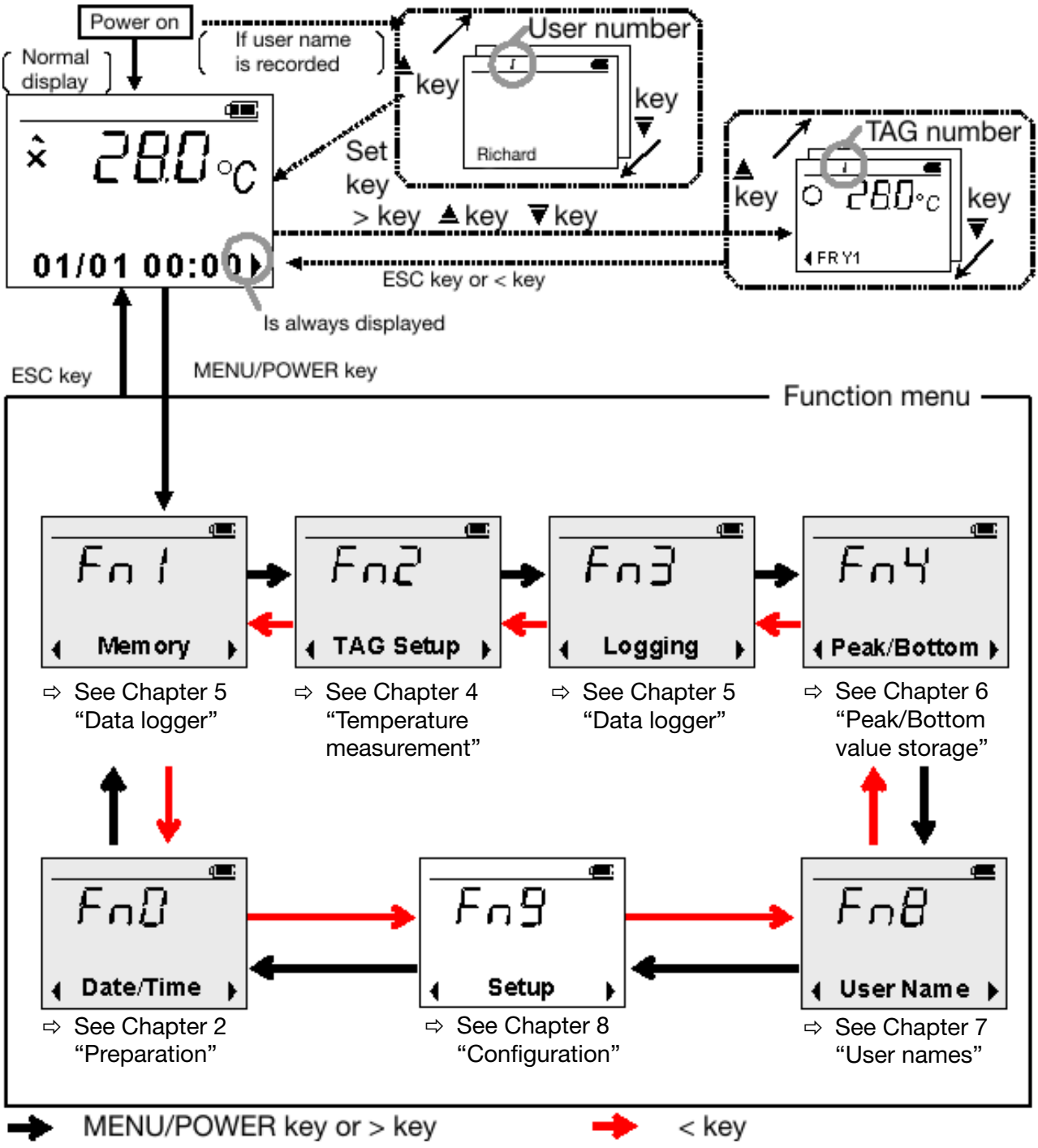
During manual data logging (manual recording) you can use this key to store the temperature and the date.

During automatic data logging (automatic recording) you can use this key as an ON/OFF key for the data logging function.

# 1 Introduction

## 1.6 Function menu

The TDA-300(0) has a function menu for running the functions that are required for temperature measurement and recording (data logger). First select the required function. Additional details about the individual menus can be found on later pages in the operating instructions.



Fn 1 **Memory**

⇨ See Chapter 5 “Data logger”

Fn2 **TAG Setup**

⇨ See Chapter 4 “Temperature measurement”

Fn 3 **Logging**

⇨ See Chapter 5 “Data logger”

Fn4 **Peak/Bottom**

⇨ See Chapter 6 “Peak/Bottom value storage”

Fn8 **User Name**

⇨ See Chapter 7 “User names”

Fn9 **Setup**

⇨ See Chapter 8 “Configuration”

Fn0 **Date/Time**

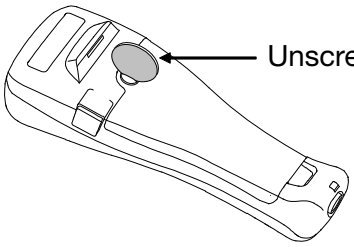
⇨ See Chapter 2 “Preparation”

# 1 Introduction

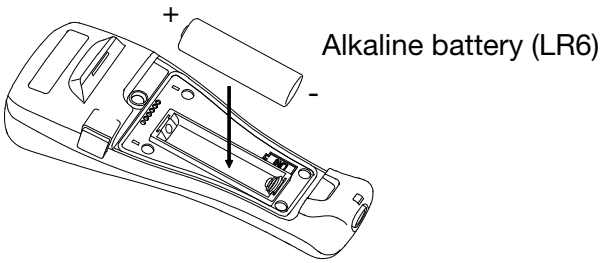
This section describes the preparation that is required for operation of the instrument.

## 2.1 Inserting the battery

* Undo the screw for the battery cover
* Turn the screw with a suitable screwdriver or coin.




* Take off the battery cover.
* Carefully insert a type LR6 (AA) battery.
  Please observe the correct polarity.




* Put the battery cover back in position and tighten up the screw.

After the battery has been fitted, the instrument will make a fresh start (reset).

The function menu “Date/Time (Fn0)”, for setting the year, will be shown in the LCD display.

* Set up the year, date and time.

⇨ Chapter 2.2 “Setting the date and time”

The instrument will automatically switch itself off if no keys are pressed within the auto-switch-off time that has been configured (factory setting: 3 minutes).

⇨ Chapter 8.8 “Automatic switch-off”

# 2 Preparation

## 2.2 Setting the date and time

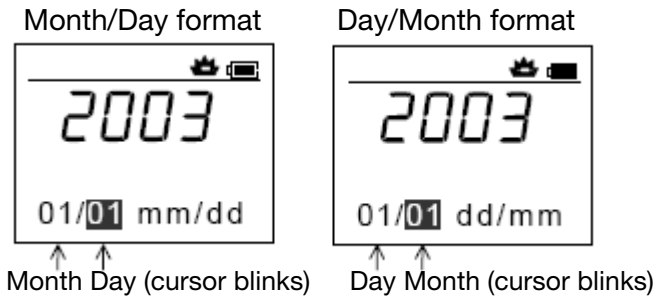
**Year setup**

* Press the LEFT or RIGHT key to move the position where the digit is blinking.
* Press the UP or DOWN key to set the “Year”.
* Press the SET key to save the new value.

Range of values: 0000 (only after RESET)
2003 to 9999
Setting as delivered: 0000

**Month and day setup**

* Press the UP or DOWN key to set the “Day (Month)”.
* Press the LEFT key to move the blinking cursor to “Month (Day)”.
* Press the UP or DOWN key to set the “Month (Day)”.
* Press the SET key to save the new value.




Range of values: Month: 01 to 12
Day: 01 to 31
Setting as delivered: 01/01 (Day/Month format)

**Time setup**

* Press the UP or DOWN key to set the “Minute”.
* Press the LEFT key to move the blinking cursor to “Hour”.
* Press the UP or DOWN key to set the “Hour”.
* Press the SET key to save the new value.

Range of values: Hour: 00 to 23
Minute: 00 to 59
Setting as delivered: 00:00

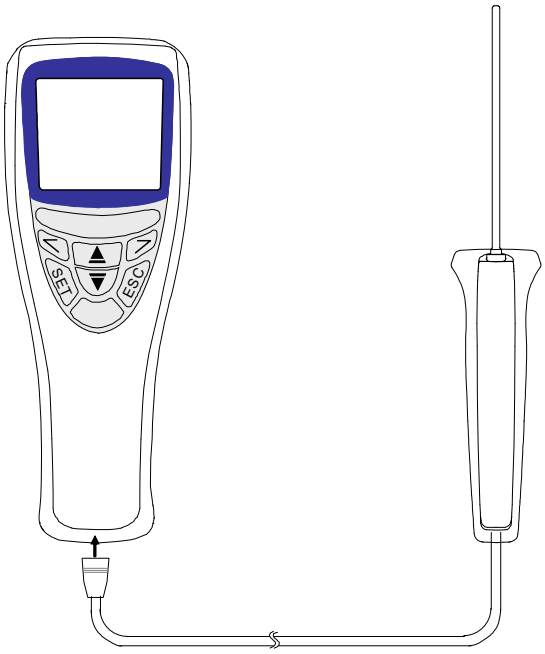
**Version number**

The version number of the device software is shown in the LCD display.

**Setting end**

* Press the ESC key twice: this brings you back to the normal display. Or press the MENU/POWER key for longer than two seconds: this will switch off the instrument.

## 2.3 Connecting the temperature sensor




✱ Attach the temperature sensor to the instrument.

⇨ An overview of the available temperature sensors can be found in the Data Sheet 702540.

# 2 Preparation

## 3.1 Switching on the instrument

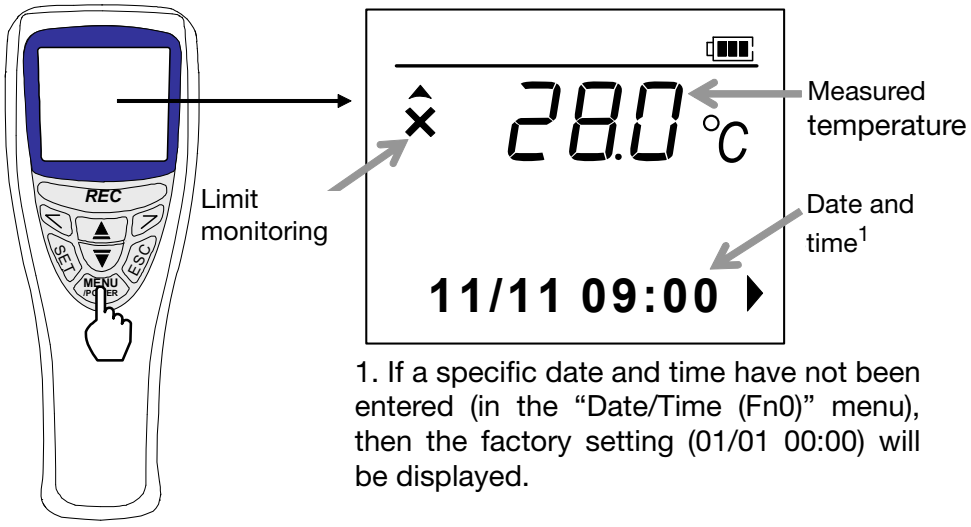
* To switch on the instrument, press the MENU/POWER key.

If user management is active (a user name has been entered), then the next step must be to select a user.

* Select the required user by pressing the UP or DOWN key (▲, ▼) as appropriate, and then press the SET key.

**Normal display**

The instrument is now in the normal display mode.




1. If a specific date and time have not been entered (in the “Date/Time (Fn0)” menu), then the factory setting (01/01 00:00) will be displayed.

When the instrument is switched on for the first time, after the “Preparation for operation” has been concluded, it will be in “Normal display” mode.

⇨ Chapter 4 “Temperature measurement”

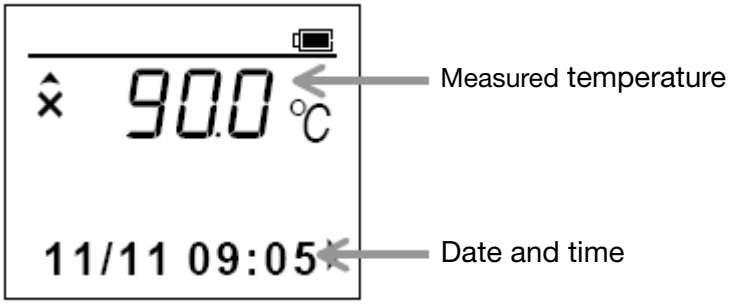
**Auto Off**

The instrument will automatically switch itself off if no keys are pressed within the “Auto Off” time that has been configured (factory setting: 3 minutes).

⇨ Chapter 8.8 “Automatic switch-off”

**Example**

In the example below, a temperature of 90 °C is measured.



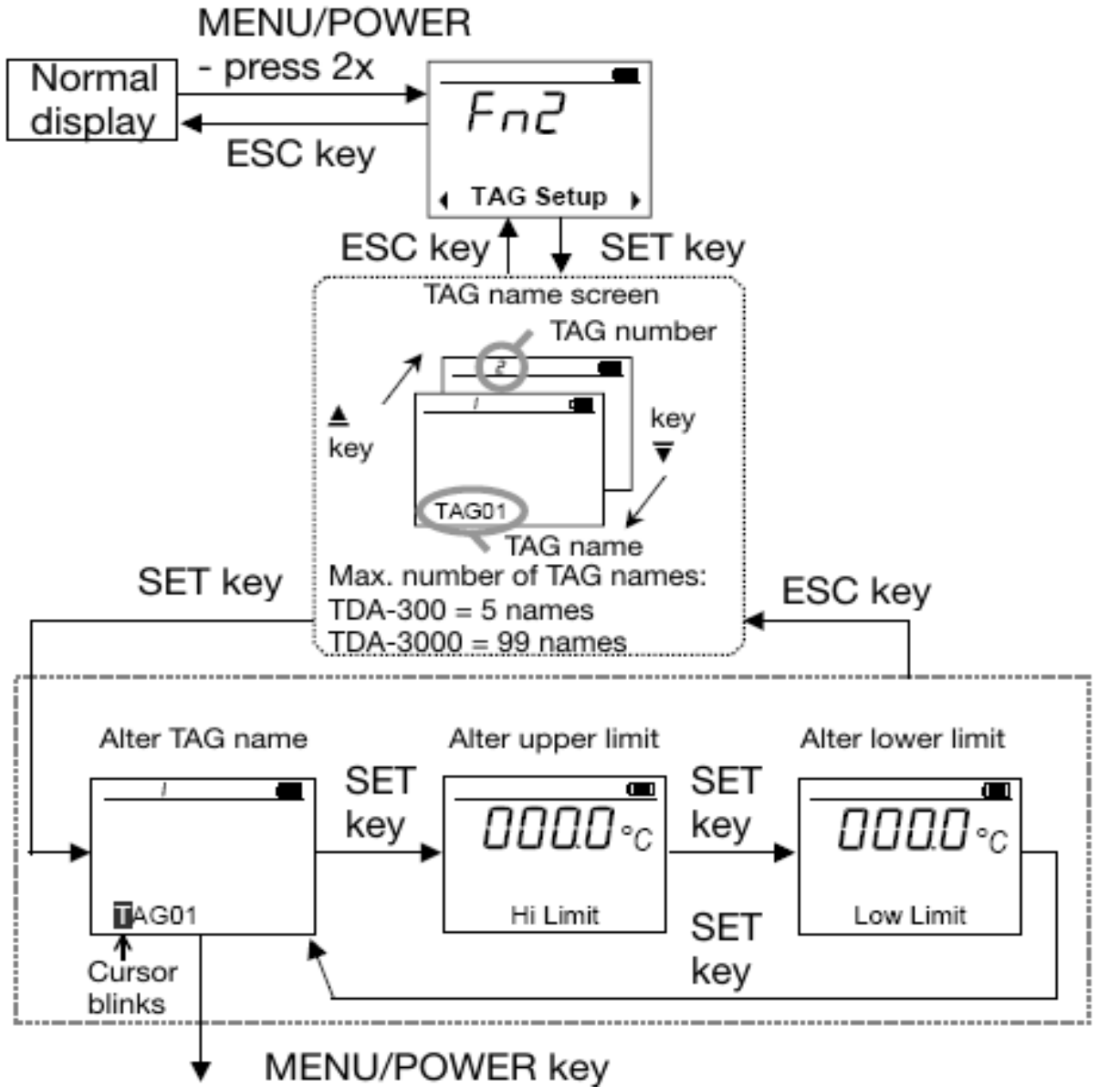
# 3 Operation & normal display

This chapter describes the entering of TAG names (measurement point designations), setting up the limits and the evaluation of the measured temperature.

The entering of the TAG names and the limits is a precondition for “Evaluation of the measured temperatures”.

The settings that are required can be made through the function menu “TAG Setup (Fn2)”.

**TAG Setup (Fn2)**




⇨ Chapter 4.1.1 “Character entry”

# 4 Temperature measurement

## 4.1 Registering TAG names

Each of the 5 to 99 TAG names can be used as a measurement point designation, and be up to 11 characters long. The TAG name is shown in the LCD display.

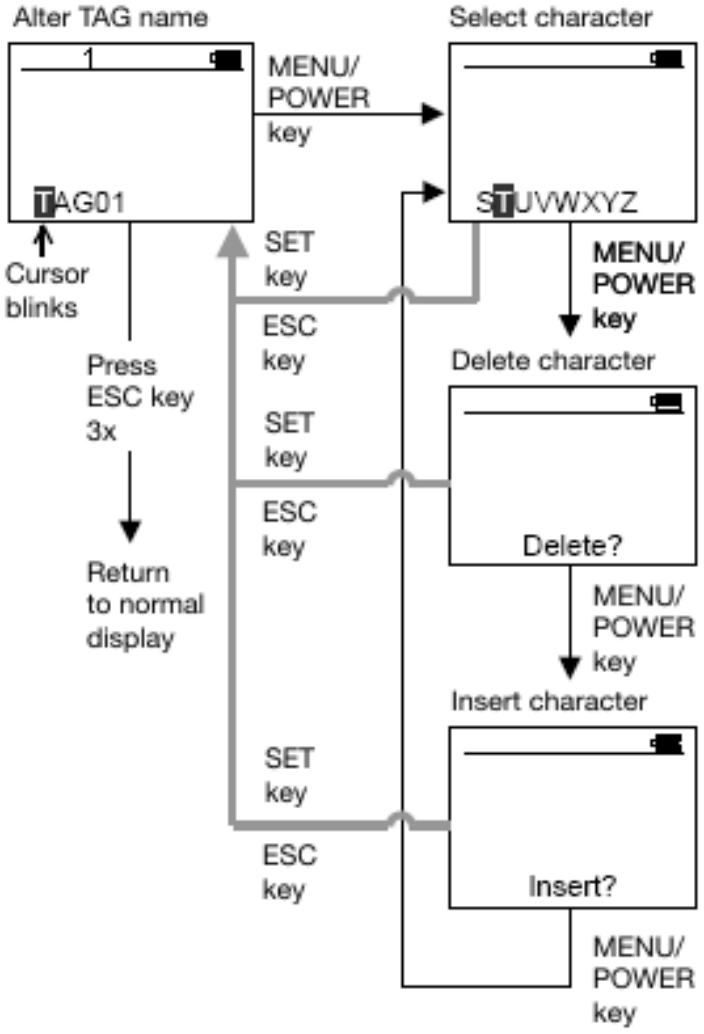
**Available digits** 0123456789

**Available letters** ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

**Other symbols** @!#$%&''+-.;=^_()[]{}
No space character is available.

### 4.1.1 Character entry

**Example** TAG name No. 1 is selected.



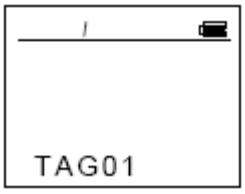
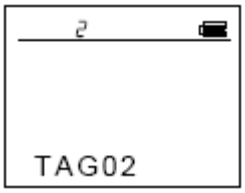
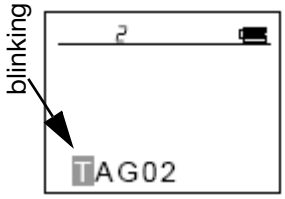
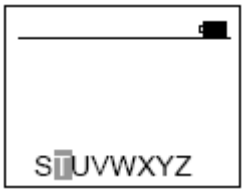
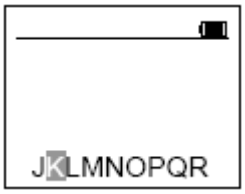
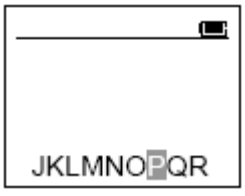

A list of characters is shown (including the one selected at the moment).
The character is selected by using ▲, ▼ and <, >.
SET key: Accept character.
ESC key: Cancel entry.

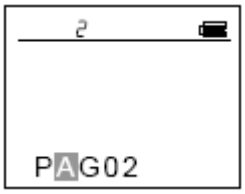
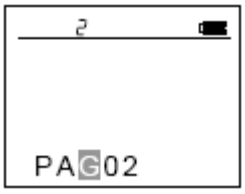
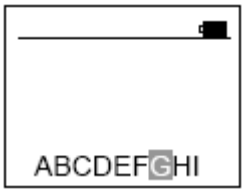
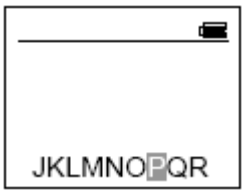
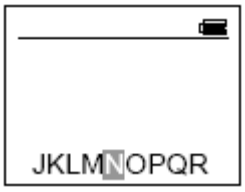
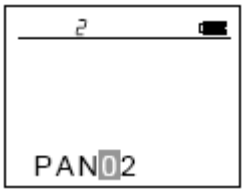
The currently selected character can be deleted.
SET key: Delete character.
ESC key: Retain character.

Another character can be inserted before the currently selected character.
SET key: Insert character.
ESC key: No insertion.

### 4.1.2 Character entry with selection list

**Example** Alter TAG name for No. 2 from “TAG02” to “PAN02”.

| | |
|---|---|
|  | ✱ Press the SET key in the menu “TAG Setup (Fn2)” to show the TAG name on the screen. |
|  | ✱ Press the UP key (▲).<br>The TAG name is shown on screen No. 2 |
|  | ✱ Press the SET key.<br>The cursor is positioned on the first character (“T”) in the TAG name. |
|  | ✱ Press the MENU/POWER key.<br>The character selection list appears. |
|  | ✱ Press the UP key (▲).<br>The character selection list changes. |
|  | ✱ Press the RIGHT key repeatedly (>) to move the cursor to “P”. |

| | |
|---|---|
|  | ✱ Press the SET key to save the new character. The screen returns to the TAG name screen for TAG No. 2, the cursor moves to “A”. |
|  | ✱ Press the RIGHT key (>) to move the cursor to “G”. |
|  | ✱ Press the MENU/POWER key.<br>The character selection list appears. |
|  | ✱ Press the DOWN key (▼).<br>The character selection list changes. |
|  | ✱ Press the LEFT key repeatedly (<) to move the cursor to “N”. |
|  | ✱ Press the SET key to save the new character. The screen returns to the TAG name screen for TAG No. 2, the cursor moves to “0”. |
| | ✱ Press the SET key to save the new name. |

You have finished the setting.

Now you can set the upper and lower limits.

⇨ Chapter 4.2 “Setting limits”

To return to normal display, press the ESC key 3 times.

### 4.1.3 Character entry without selection list

You can also alter the TAG name without the selection list.

**Altering characters**

* Use the LEFT or RIGHT key (< , >) to move the cursor to the position of the character you want to alter.
* Alter the character with the UP or DOWN key (▲, ▼).

**Deleting characters**

* Use the LEFT or RIGHT key (< , >) to move the cursor to the position of the character you want to delete.
* Press the MENU/POWER key twice to confirm deletion.
* Press the SET key to delete the selected character (blinking cursor).

**Inserting characters**

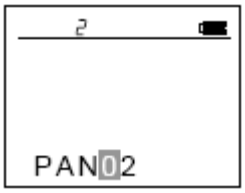
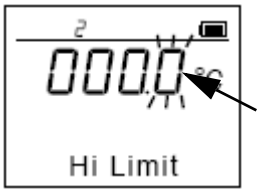
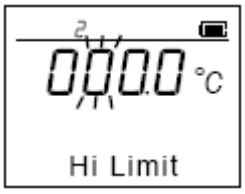
* Use the LEFT or RIGHT key (< , >) to move the cursor to the position where you want to insert a character (in front of the cursor).
* Press the MENU/POWER key three times to confirm insertion.
* Press the SET key to insert a character in front of the cursor.

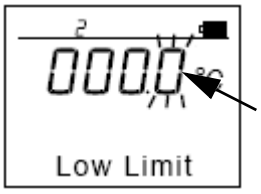
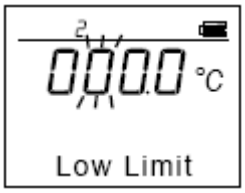
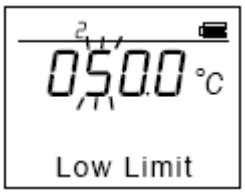
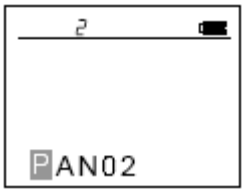
## 4.2 Setting limits

When you set the upper and lower limits, these settings will be active at the next measurement. There are separate limits for each TAG name.

**Example**

You set an upper limit of 90.0°C and a lower limit of 50.0°C for TAG No.2 (TAG name: PAN02). Proceed as follows:

| | |
|---|---|
|  | The cursor blinks on any character in the display.<br>⇨ Chapter 4 “Temperature measurement” |
|  blinking | * Press the SET key in order to set the upper limit. |
|  | * Press the LEFT key (<) twice to alter the tens digit. |

| | |
|---|---|
| | ✱ Press the UP key to set (▲) 9. |
|  | ✱ Press the SET key to save the new value.<br>The display moves to the next screen (lower limit). |
|  | ✱ Press the LEFT key (<) twice to alter the tens digit. |
|  | ✱ Press the UP key to set (▲) 5. |
|  | ✱ Press the SET key to save the new value. The display returns to the TAG name of TAG No.2. |

You have now finished the setting.

To return to normal display, press the ESC key 3 times.

## 4.3 Evaluating measured temperatures

The following example shows how measured temperatures can be evaluated.

**Example**

| | |
|---|---|
| Measured medium: | hot water |
| TAG number: | 2 (TAG name: PAN02) |
| Upper limit: | 90.0°C |
| Lower limit: | 50.0°C |

**Sequence**

* Switch the instrument on and select a user name, if required (▲, ▼ keys and SET). Normal display appears in the LCD display.

Normal display

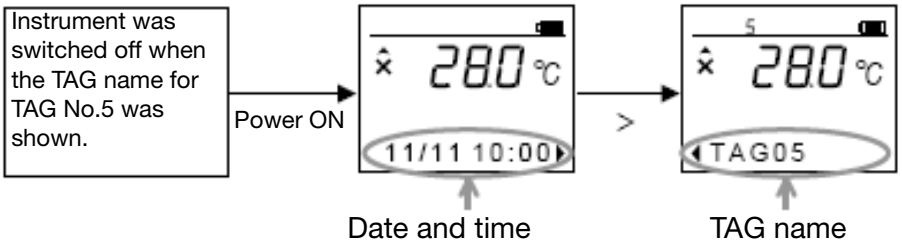
Example: TAG name for TAG No.1

Example: TAG name for TAG No.2

* Press the RIGHT key (>). The TAG name is shown.
* First check whether the screen displayed is for the TAG name of TAG No.2. If not, press the UP or DOWN key (▲, ▼) to select the TAG name for TAG No.2.

The TAG name that is shown when the RIGHT key (>) is pressed is the TAG name which was selected before the instrument was switched off.

If, for example, the TAG name of TAG No.5 was selected last, the TAG name of TAG No.5 is shown when you change the display over from the date to the TAG name.



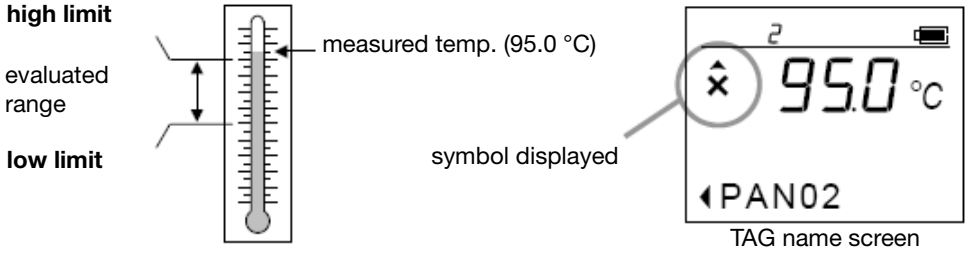

Date and time

TAG name

# 4 Temperature measurement

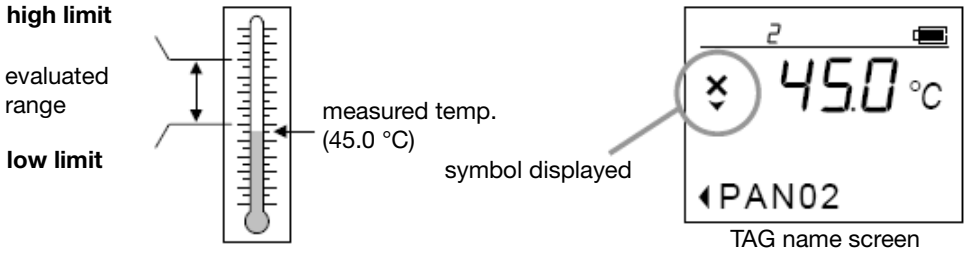
**Measurement** The water temperature is measured.

- The measured temperature rises above the upper limit (90.0 °C).



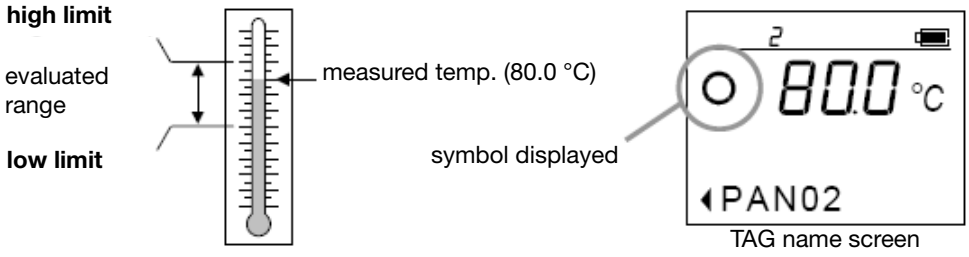
TAG name screen

- The measured temperature drops below the lower limit (50.0 °C).



TAG name screen

- The measured temperature lies within the limits (50.0 to 90.0 °C).

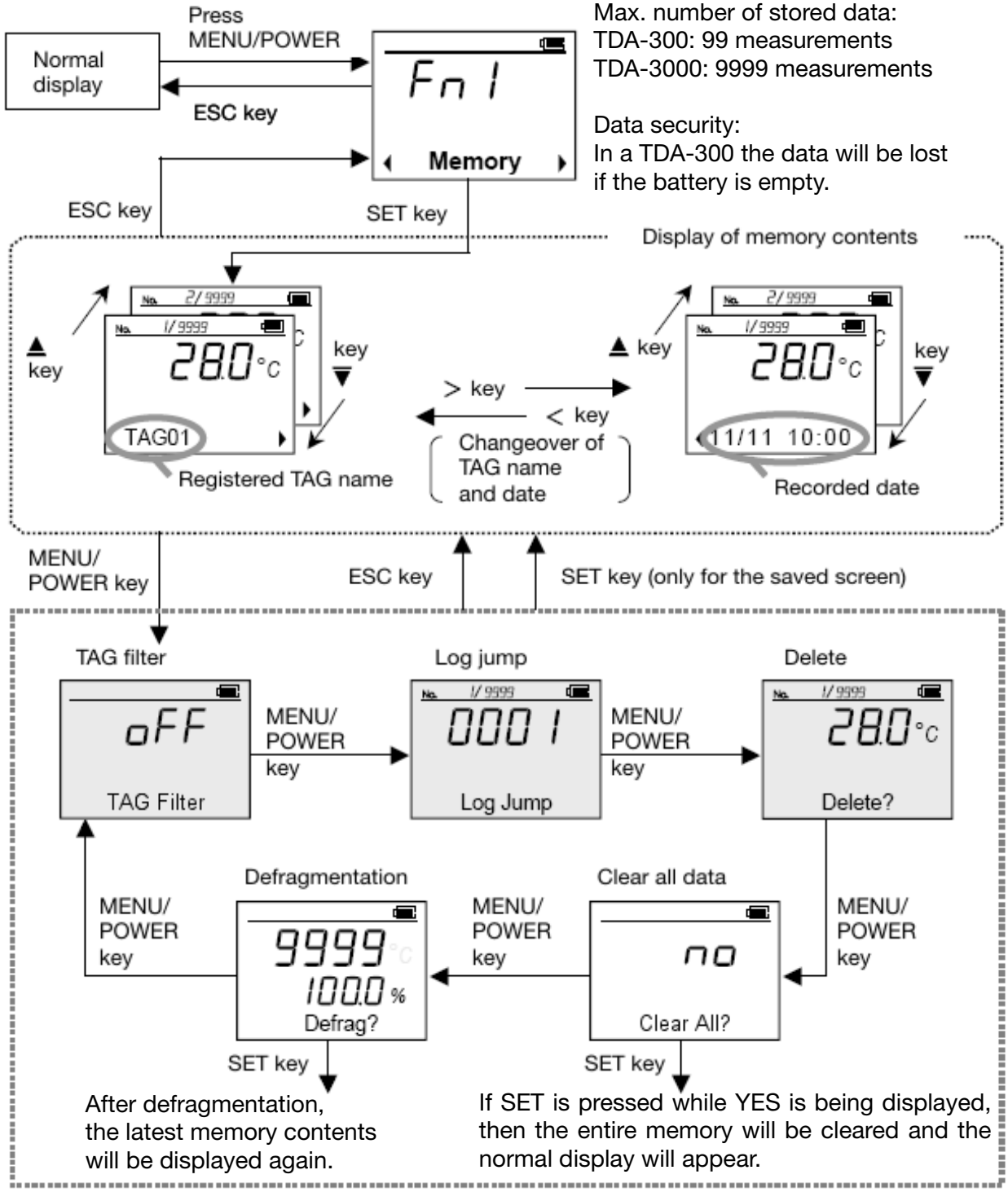


TAG name screen

⇨ Chapter 5 “Data logger”

This chapter describes the recording of the measured data in the memory through the data logger function. You can record data in the memory either manually or automatically. With both methods (manual or automatic), the measured data can be retrieved through the function menu “Memory (Fn1)”. Data are recorded in the memory in the order of their arrival.

Memory menu “Memory (Fn1)”:



# 5 Data logger

## 5.1 Manual logging

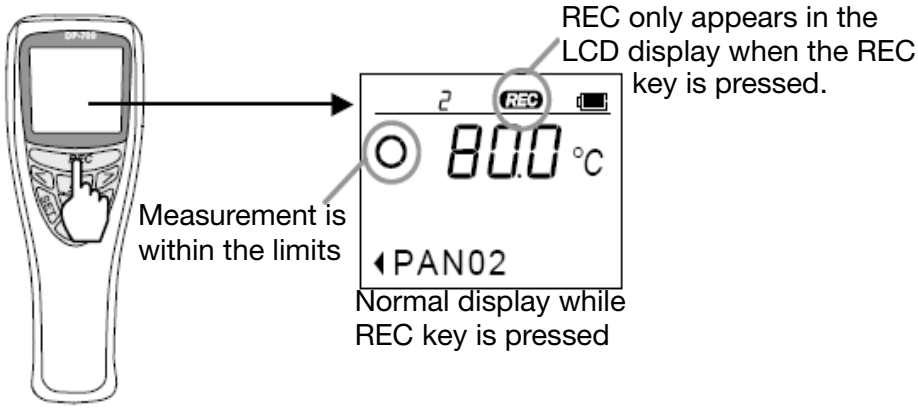
With manual logging (interval = off), you can record the measurement in the memory by using the REC key. REC will appear in the LCD display only when the REC key is pressed.

The following can be logged:
- the measured temperature,
- the date (without “year”),
- the TAG name and
- the user name.

**Logging**

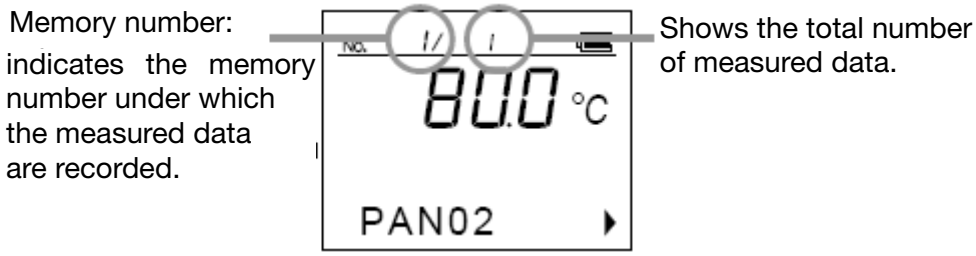
Hold down the REC key during measurement. The measurement shown on the screen is recorded in the memory.

::




**Checking the logged data**

* Press the MENU/POWER key during normal display in order to view the memory screen (Fn1) in the display.
* Press the SET key to check the measured data on the memory screen.




If you want to carry out an ongoing check of two or more data:

* Press the DOWN (▼) or UP key (▲)

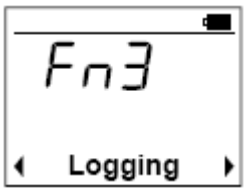
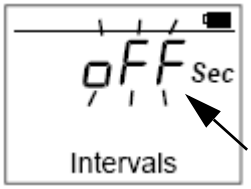
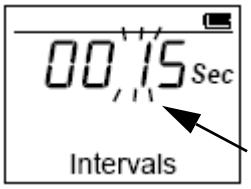
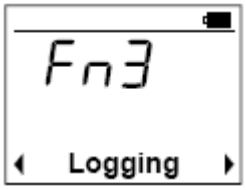
It is possible to change the display (between TAG name and memory date) in the message line. To do this, press the LEFT or RIGHT key (< , >).

## 5.2 Automatic logging

The measured data are recorded in the memory at the preset interval. For automatic data logging, you must first set the interval.

The following can be logged:
- the measured temperature,
- the date (without “year”),
- the TAG name and
- the user name.

### 5.2.1 Activating the interval

| | |
|---|---|
|  | ✱ In normal display, press the MENU/POWER key three times to access the function menu “Logging (Fn3)”. |
|  | ✱ Press the SET key.<br>You will now see the interval setting screen.<br>**Interval:**<br>setting range: OFF (manual logging) or<br>1 to 3600 seconds (automatic logging)<br>factory-set: OFF |
|  | ✱ Set the interval with the UP key (▲) and the shift keys (< , >).<br>Example: interval 15 seconds |
|  | ✱ Press the SET key to save the new value.<br>The display returns to the data logging screen (Fn3). When you have set the interval (to a value other than “OFF”), the REC symbol (REC) blinks to indicate “ready to measure”; automatic measurement, however, is not yet active. |

To return to normal display after setting, press the ESC key.

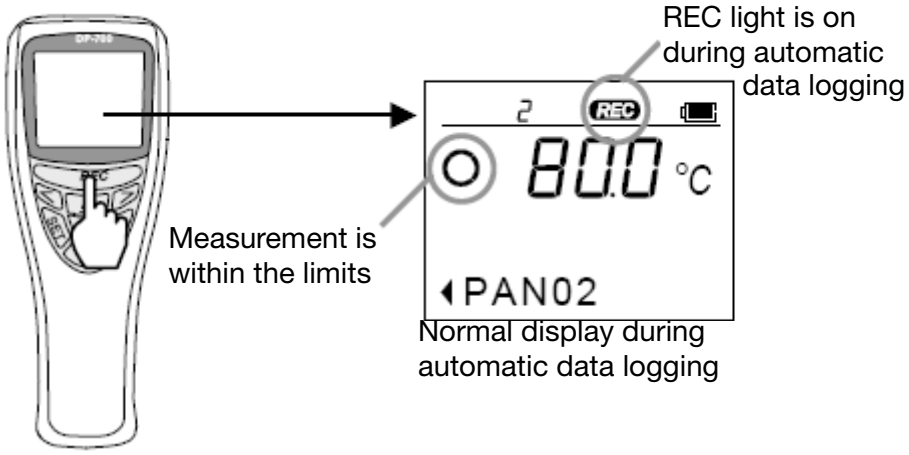
How can I cancel the interval setting?

Press the ESC key during setting, not the SET key. The display returns to the data logging screen (Fn3).

### 5.2.2 Starting data logging

* Press the REC key. Data logging starts at the preset interval. The REC symbol light is on permanently.

**Example** Automatic data logging was started with TAG name No.2.




Automatic data logging can be started and stopped in normal display and on the data logging screen (Fn3) by pressing the REC key.

If the instrument is switched off during data logging by pressing the MENU/POWER key or by automatic switch-off, data logging continues with the preset interval. In the ON state, press the REC key to cancel data logging.

### 5.2.3 Canceling data logging

* Press the REC key. The REC symbol starts blinking and automatic data logging is canceled.

### 5.2.4 Checking data

⇨ See “Checking the logged data” on Page 32.

It is possible to check the measured data on the memory screen (Fn1) during automatic data logging. The total number increases with each new measurement.

Total number of recorded measurements

## 5.3 Searching recorded data

The measured data are recorded in the memory in the order of the individual measurements. You can use two methods to retrieve the TAG names and recorded data.

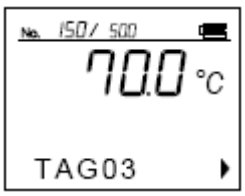
**TAG filter** You can search data for a specific TAG name.

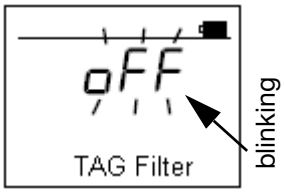
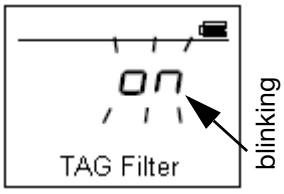
⇨ Chapter 5.3.1 “Searching data with a specific TAG name (TAG filter)”

**LOG jump** You can retrieve the data directly from the memory, via the memory number.

⇨ Chapter 5.3.2 “Searching data with a specific LOG No. (LOG jump)”

### 5.3.1 Searching data with a specific TAG name (TAG filter)

| | |
|---|---|
| | * In normal display, press the MENU/POWER key and then the SET key.<br>The memory screen (Fn1) is displayed. |
|  | * Press the UP or DOWN key (▲, ▼) until the required TAG name is shown on the screen. |

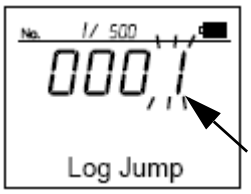
| | |
|---|---|
|  | ✱ Press the MENU/POWER key to display the TAG filter screen. |
|  | ✱ Press the UP key (▲) to change the setting to “ON”. |
| | ✱ Press the SET key to activate the TAG filter.<br>The TAG name is again displayed on the screen. |
| | ✱ If you press the UP or DOWN key (▲, ▼) you will now only see the data that have been stored under the TAG name.<br>✱ Press the ESC key twice to return to normal display. |

☞ How can I cancel the TAG filter time setting?

Change the TAG filter position by pressing the DOWN key (▼) to “OFF” and then press the SET key.

### 5.3.2 Searching data with a specific LOG No. (LOG jump)

The more data you have, the more difficulties you will have in finding the required data. Using the LOG jump function you can search the required data number and display it readily on the screen.

| | |
|---|---|
| | ✱ In normal display, press the MENU/POWER key and then the SET key.<br>The memory screen (Fn1) is displayed. |
|  | ✱ Press the MENU/POWER key twice to display the LOG jump screen.<br>The number of the current memory location is shown blinking. |
| | ✱ Press the DOWN (▼), UP (▲), LEFT (<) or RIGHT key (>) until the required number of the memory location you have been searching is displayed. |
| | ✱ Press the SET key.<br>The screen with the required memory number is shown. Press the ESC key twice to return to normal display. |

How can I cancel the LOG Jump function?

During selection of the memory number, press the ESC key. The display returns to the memory screen (Fn1).

# 5 Data logger

## 5.4 Deleting recorded data

There are two ways of deleting the measured data in the memory.

**Delete?** "Delete" means that only individual data will be deleted from the memory.

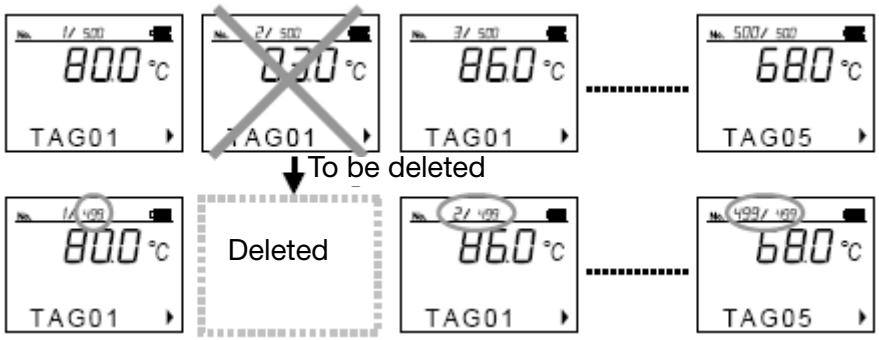
⇨ Chapter 5.4.1 "Deleting individual data only (delete?)"

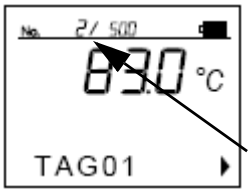
**Clear all?** "Clear all" means that all data will be deleted from the memory.

⇨ Chapter 5.4.2 "Deleting all data (Clear all?)"

### 5.4.1 Deleting individual data only (delete?)

You can delete a selected measurement. The total number display will be decreased by 1 after deletion.




| | |
|---|---|
| | ✱ In normal display, press the MENU/POWER key and then the SET key.<br>The memory screen (Fn1) is displayed. |
|  Memory location | ✱ Press the UP (▲) or DOWN key (▼) until the measurement to be deleted is shown.<br>Alternatively, you can also use the "TAG filter" and "LOG jump" functions. |
| | ✱ Press the MENU/POWER key three times until you reach the "Delete?" function. |

| | |
|---|---|
| | ✱ Press the SET key to delete the measurement.<br>The total number is decreased by 1. |

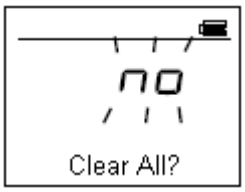
☞ How can I cancel the “Delete” function?

Press ESC when you are asked “Delete?”. The memory screen (Fn1) is displayed again.

If, afterwards, you press the ESC key twice, the instrument returns to normal display.

### 5.4.2 Deleting all data (Clear all?)

You can use this function to deleted all data.

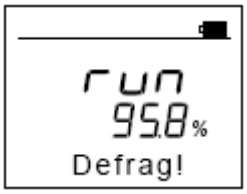
| | |
|---|---|
| | ✱ In normal display, press the MENU/POWER key and then the SET key.<br>The memory screen (Fn1) is displayed. |
|  | ✱ Press the MENU/POWER key four times until you get to the “Clear all?“ deleting function. |
| | ✱ Press the UP key (▲) in order for the setting to change from NO to YES and press the SET key.<br>The memory is automatically deleted. While deleting is in progress, it **cannot** be canceled. |

| | |
|---|---|
| | During deletion of the memory, a progress indication appears. If automatic data logging was active when the “Delete” function was started, it is ended. The instrument is “ready to measure” (REC blinks in the display).<br>Do not press any key as long as deleting is in progress.<br>When the deleting procedure is finished, the instrument returns to normal display. |

## 5.5 Optimizing recorded data (defragmenting)

If data have been recorded and deleted repeatedly, it is possible that some memory areas are not used, resulting in a reduction of memory capacity. In this case, it is recommended to optimize the memory and thus make these memory areas usable again.

| | |
|---|---|
| | ✱ In normal display, press the MENU/POWER key and then the SET key.<br>The memory screen (Fn1) is displayed. |
| | ✱ Press the MENU/POWER key five times until you reach the “Defrag” function. |

| | |
|---|---|
|  | * Press the SET key and the memory is automatically optimized. If you press the MENU/POWER key, the function is not executed.<br><br>While defragmenting is in progress, it **cannot** be canceled.<br><br>During defragmentation of the memory, progress is indicated. The optimization time depends on the memory condition. If automatic data logging was active, it remains active during optimization; it is not ended.<br>Do not press any key as long as defragmenting is in progress.<br>When the optimization procedure is finished, the instrument returns to the memory display (Fn1). |

From the memory screen (Fn1), you can reach normal display by pressing the ESC key twice.

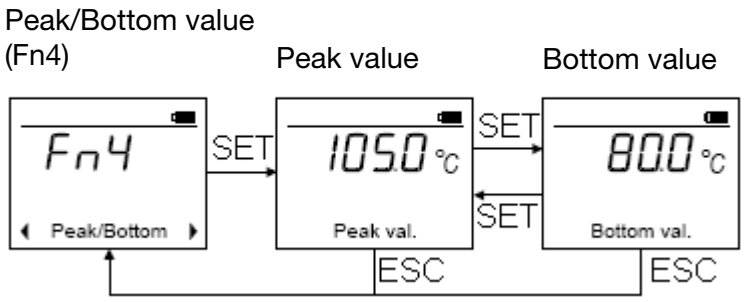
# 5 Data logger

The minimum temperature (Bottom) and maximum temperature (Peak) can be stored by the TDA-300(0). Each of these two values is updated when the measured temperature is higher or lower than the stored value.

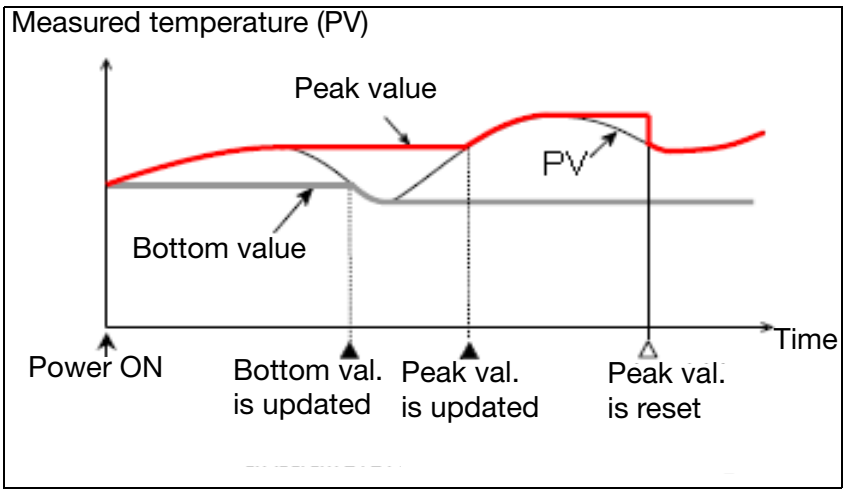
Performing any of these functions will re-initialize peak/bottom storage and set the current temperature as the peak/bottom value:

- when the battery has been replaced;
- when the sensor type, unit of display or decimal point position has been altered;
- when the peak/bottom value has been set from the keys (Fn4).

## 6.1 Displaying the peak/bottom value



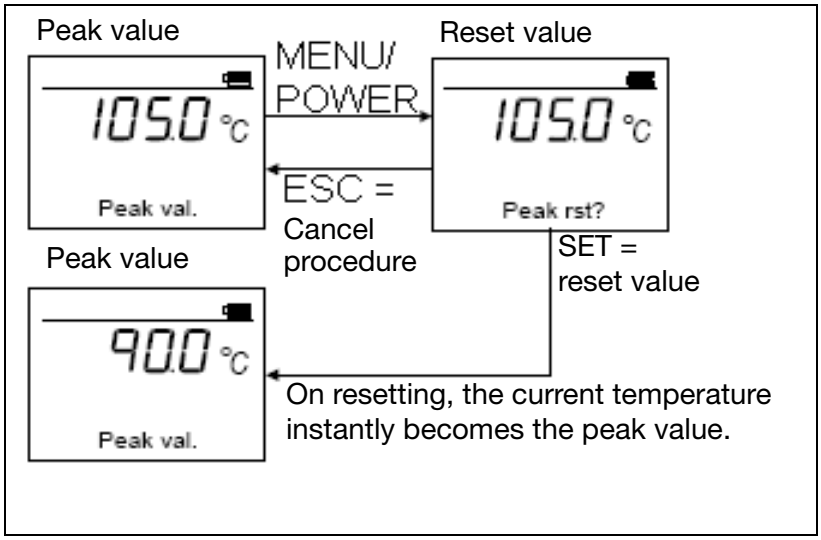

* In normal display, press the MENU/POWER key four times; the display shows the “Peak/Bottom menu (Fn4)”.
* If you press the SET key, the peak value is displayed.
* If you press the SET key, the bottom value is displayed.
* If you press the SET key, the peak value is displayed again.



# 6 Peak/Bottom value storage

## 6.2 Resetting the peak value

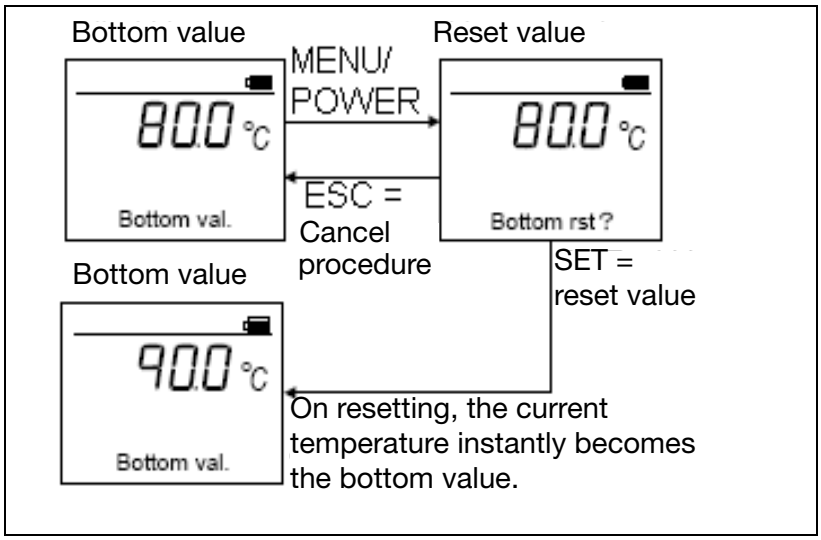
* Press the MENU/POWER key in the peak value display;
  The “Peak reset?” message is shown on the screen.
* If you press the SET key, the peak value is reset.
* If you press the ESC key, the current peak value is retained.




After SET or ESC, the display returns to showing the peak value.

## 6.3 Resetting the bottom value

* Press the MENU/POWER key in the bottom value display;
  The “Bottom reset?” message is shown on the screen.
* If you press the SET key, the bottom value is reset.
* If you press the ESC key, the current bottom value is retained.




After SET or ESC, the display returns to showing the bottom value.

# 7 User names

This chapter describes how to handle user names.

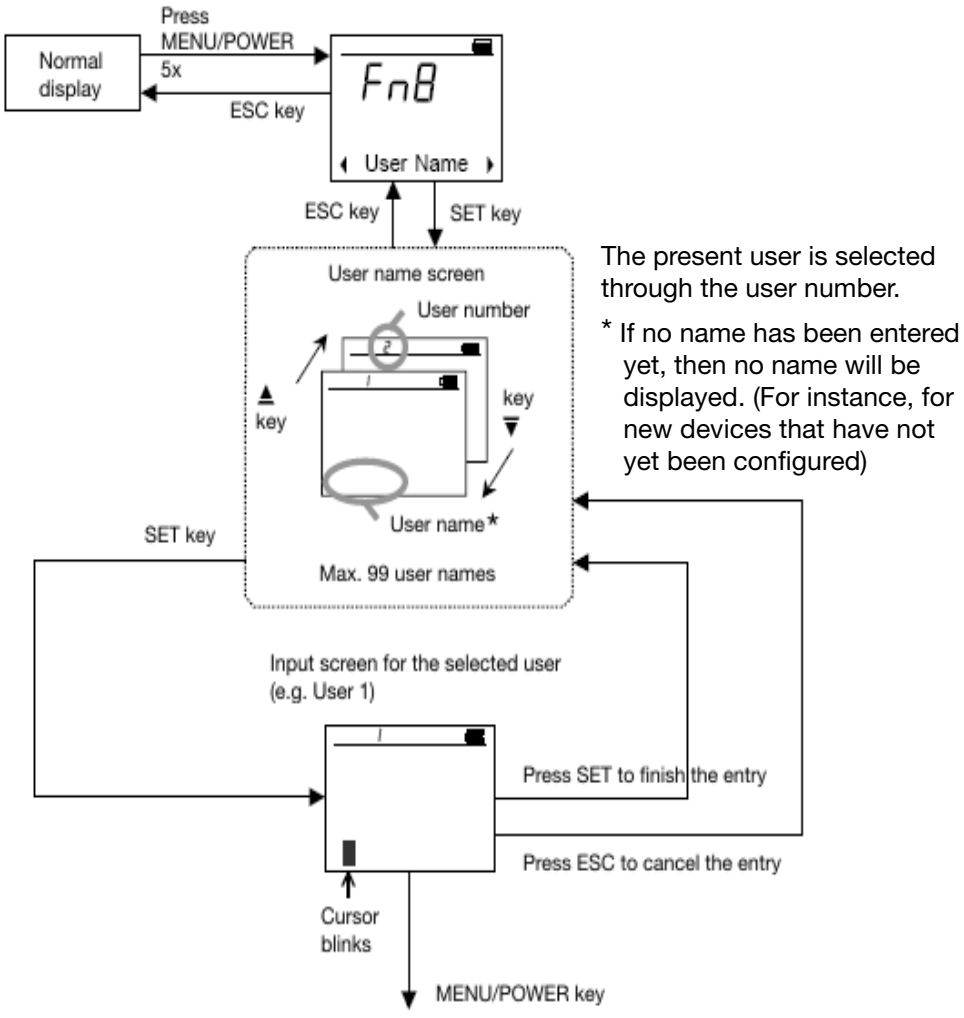
Different user names can only be implemented with the handheld TDA-3000.

This enables different users (persons) to acquire data at the same or at different measurement points using the same instrument.

The measurement, user and measurement point designation (TAG name) as well as the date and time are stored together.

You can allocate a user name (up to 11 characters) for each user number. You can set the user by selecting the user number. The user that has been set in this way, remains active in the memory until the instrument is switched off.

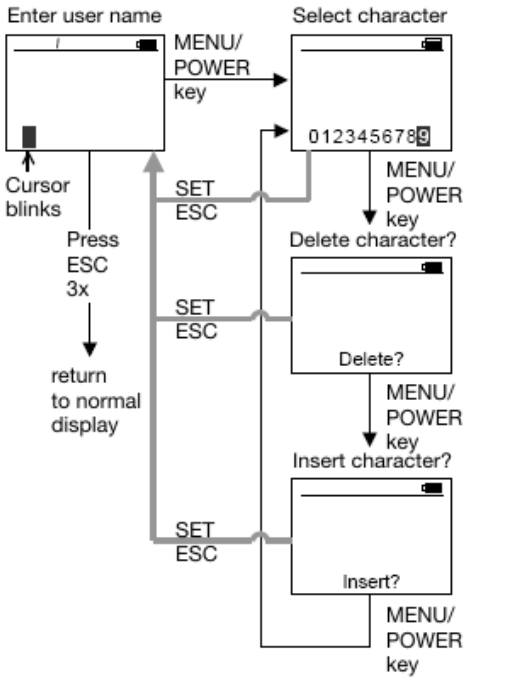
**Menu**
**User (Fn8)**




The present user is selected through the user number.

* If no name has been entered yet, then no name will be displayed. (For instance, for new devices that have not yet been configured)

# 7 User names




A list of characters is shown, including the one selected at the moment.
The cursor (blinking) indicates the present position.
Use the UP/DOWN keys to select a list.
Use the LEFT/RIGHT keys to select a character.

SET key: Accept entry
ESC key: Cancel entry

Query whether the currently selected character should be deleted.

SET key: Delete character.
ESC key: Retain character.

Query whether a character should be inserted.

SET key: Insert character.
ESC key: No insertion.

Available characters *

| | |
|---|---|
| | 0123456789 |
| | ABCDEFGHI |
| | JKLMNOPQR |
| | STUVWXYZ |
| | abcdefghi |
| | jklmnopqr |
| | stuvwxyz |

| | |
|---|---|
| | @!#$%&'` |
| | +-.;=^_ |
| | ()[]{} |

* Space characters are not permitted

* Select a list, using the UP/DOWN keys

**Entry**

The way in which names are entered is identical with that of entering TAG names.

⇨ Chapter 4.1.2 “Character entry with selection list”

⇨ Chapter 4.1.3 “Character entry without selection list”

To return to normal display, press the ESC key repeatedly.

This chapter deals with the possibilities provided by the configuration menu “Setup (Fn9)”. From normal display, start the configuration menu as follows:

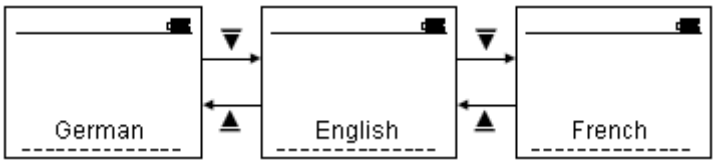
* Press the MENU/POWER key until “Fn9” and “Setup” are displayed and then press the SET key.

You are now in the configuration menu and are able to set the parameters.

- UP or DOWN key (▲, ▼): alter selection.
- SET key: confirm selection and call the next parameter.
- ESC key: cancel selection and quit menu.

## 8.1 Language

Select the language in which you want to operate the instrument.

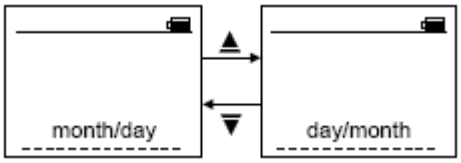



Select between: German, English and French
factory-set: German

* Press the UP (▲) or DOWN (▼) key to change between the languages.
* Press the SET key to activate the selected language.
* Press the ESC key twice to return to normal display.

## 8.2 Date format

Select the format in which to display the date.



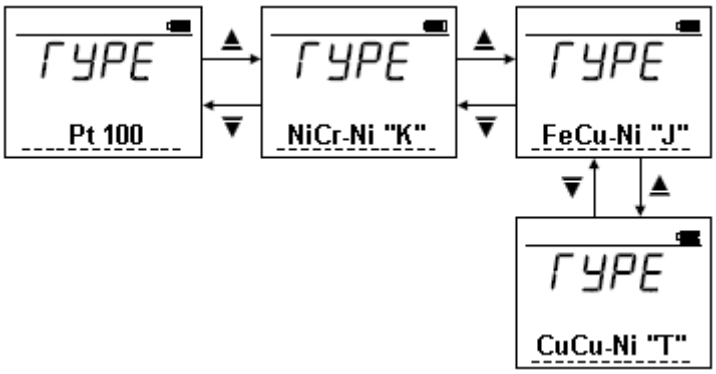

Select between: month/day and day/month
factory-set: day/month

* Press the UP (▲) or DOWN (▼) key to change between the individual formats.
* Press the SET key to activate the selected format.
* Press the ESC key twice to return to normal display.

# 8 Configuration

## 8.3 Sensor type

**Type** Select the sensor type connected.

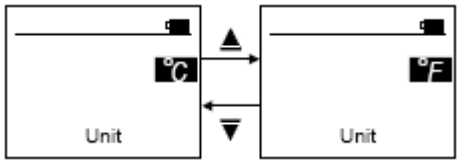



Select between: Pt100 (RTD),
TC-K (thermocouple K),
TC-J (thermocouple J) and
TC-T (thermocouple T)
factory-set: Pt100

* Press the UP (▲) or DOWN (▼) key to change between the individual sensor types.
* Press the SET key to activated the selected sensor type.
* Press the ESC key twice to return to normal display.

## 8.4 Temperature unit

**Unit** Select the unit for the temperature display.



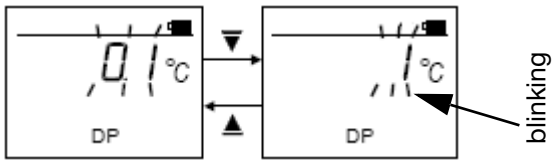

Select between: °C and °F
factory-set: °C

* Press the UP (▲) or DOWN (▼) key to change between the temperature units.
* Press the SET key to activate the selected temperature unit.
* Press the ESC key twice to return to normal display.

## 8.5 Decimal point (decimal place)

**DP**

Select the position of the decimal point.



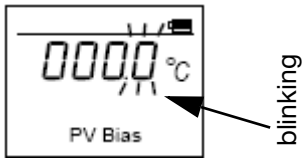

Select between: 0.1 = one decimal place and
1 = no decimal place
factory-set: 0.1

* Press the UP (▲) or DOWN (▼) key to change between the formats.
* Press the SET key to activate the selected format.
* Press the ESC key twice to return to normal display.

## 8.6 Temperature correction

**PV Bias**

Using this parameter, the temperature can be corrected by a constant value, e.g. with known measurement errors.

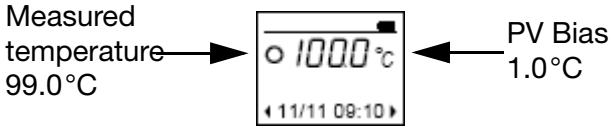



Select between: -99.9 to +99.9 °C (°F)
factory-set: 0.0

* Select the digit to be altered by pressing the LEFT (<) or RIGHT (>) key (digit is shown blinking).
* Press the UP (▲) or DOWN (▼) key to alter the value.
* Press the SET key to activate the selected correction.
* Press the ESC key twice to return to normal display.

**Example**

"PV Bias" is set to 1.0°C. The temperature is 99.0°C. The sum of both values is displayed and stored (100.0°C).

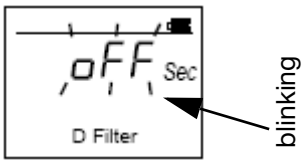


# 8 Configuration

## 8.7 Digital filter

**D filter**

The TDA-300(0) has an integrated first-order digital filter. This filter is used to eliminate display flickering. You can set the filter time constant through this parameter.




Select between: OFF and 1 to 100 seconds (OFF = filter not active)
factory-set: OFF

* If the parameter is set to “OFF”, press the UP key (▲) once to set the filter time constant.
* Select the digit you want to alter by pressing the LEFT (<) or RIGHT (>) key (digit is shown blinking).
* Press the UP (▲) or DOWN (▼) key to alter the value.
* Press the SET key to activate the selected filter time constant.
* Press the ESC key twice to return to normal display.

☞ A larger filter time constant means a higher damping of interference signals and a slower reaction of the temperature display to temperature changes.

## 8.8 Automatic switch-off

**Auto Off**

You can prolong the life of the battery through this parameter. If no key is pressed for the duration of the preset time, the instrument switches off automatically. If automatic data logging is active, then the temperature is measured and stored even if the instrument is switched off.

Select between: OFF and 1 to 60 minutes (OFF = no switch-off)
factory-set: 3

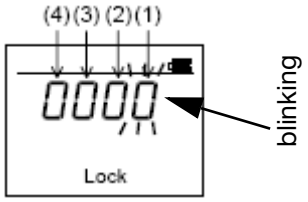
* Select the digit you want to alter by pressing the LEFT (<) or RIGHT (>) key (digit is shown blinking).
* Press the UP (▲) or DOWN (▼) key to alter the value.
* Press the SET key to activate the selected correction.
* Press the ESC key twice to return to normal display.

☞ If switch-off is not active (OFF), then press the UP key (▲) once to activate it. Afterwards, you can alter the time as described.

## 8.9 Locking

**Lock**

Different menus and individual parameters can be protected against accidental alteration through this parameter; the display for the current settings remains visible.




Select between:
- (1) 0 = Date and time can be altered.
  1 = Date and time cannot be altered.
- (2) 0 = Menus Fn3, Fn8 and Fn9 are not locked.
  1 = Menus Fn3, Fn8 and Fn9 are locked against alterations.
- (3) 0 = Menu Fn2 is not locked.
  1 = Menu Fn2 is locked against alterations.
- (4) 0 = Measurements (one or all) can be deleted.
  1 = Measurements cannot be deleted.

factory-set: 0000 (locking inactive)

* Select the digit you want to alter by pressing the LEFT (<) or RIGHT (>) key (digit is shown blinking).
* Press the UP (▲) or DOWN (▼) key to alter the value.
* Press the SET key to activate the selected correction.
* Press the ESC key twice to return to normal display.

# 8 Configuration

With the handheld TDA-3000, it is possible to evaluate the measured data using a personal computer (PC). The data are transferred via the USB interface.

**System requirements**

PC compatible computer with operating system Windows® 2000, XP, Vista, 7, 8.1 or 10 (32-bit and 64-bit).

☞ Windows and EXCEL are registered trademarks of the Microsoft Corporation.

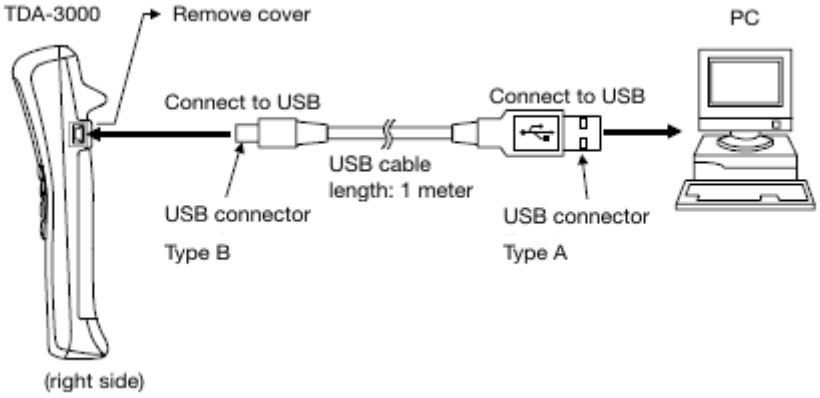
## 9.1 Connection between the TDA-3000 and the PC

Since the TDA-3000 is operated with the standard drivers of the operating system, it can only be connected to a PC and not to other computer systems.

* Connect the instrument to the PC using the USB interface cable that comes with the delivery.

It does not matter whether the TDA is switched on or off. The necessary power (for the data transfer) is supplied by the PC via the USB interface.

☞ If the TDA is connected to the PC for the first time, the necessary instrument drivers are automatically installed by the PC operating system. If you are using Windows XP, Windows Vista or Windows 7, 8.1 or 10, then start the computer before making the connection to the instrument. This ensures that you are logged on and have the necessary authorization.




* Open “My computer” of Windows and then “Removable disk”.

The following illustration serves as an example. It shows which files have been created.

| Name | Size | Type | Modified |
|---|---|---|---|
| LOG_M0507066.CSV | 4 KB | CSV File | 30/08/2005 13:49 |
| SETUP_M0507066.CSV | 3 KB | CSV File | 30/08/2005 09:51 |
| TAG_M0507066.CSV | 4 KB | CSV File | 25/08/2005 08:29 |

# 9 Evaluating data with a PC

## 9.2 Stored data

Three files are created in the TDA and are ready for readout.

- LOG_M0507066.CSV: recorded temperature data
- TAG_M0507066.CSV: TAG names and limits
- SETUP_M0507066.CSV: user name and configuration data

The files - in CSV format (Comma Separated Values) - are only created when the TDA is connected to a PC.

The characters in the file name in front of the "_" character are fixed, i.e. they are the same for different instruments. The names after the "_" differ. This makes it possible to distinguish between data from different instruments.

**LOG_*.CSV**

The file contains the recorded temperatures. It is stored in the TDA in the "Read only" mode. The file can be opened and evaluated, for instance through spreadsheet programs, and copied to the hard disk of the PC.

If the file is deleted in the TDA, the data in the TDA memory will also be lost. Then it will no longer be possible to check the data with the TDA.

The file contains the following data: memory number, date, time, temperature, TAG number and user number.

A1 fx Memory No.

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Memory No. | Date | Time | Temperature | | Tag No. | User No. | | |
| 2 | 1 | 03. Jun | 11:06 | 25.9 | | 2 | 1 | | |
| 3 | 2 | 03. Jun | 11:06 | 26.6 | | 2 | 1 | | |
| 4 | 3 | 03. Jun | 11:06 | 27.3 | | 2 | 1 | | |
| 5 | 4 | 03. Jun | 11:06 | 27.9 | | 2 | 1 | | |
| 6 | 5 | 03. Jun | 11:06 | 28.5 | | 2 | 1 | | |
| 7 | 6 | 03. Jun | 11:06 | 29.0 | | 2 | 1 | | |
| 8 | 7 | 03. Jun | 11:06 | 29.4 | | 2 | 1 | | |
| 9 | 8 | 03. Jun | 11:06 | 29.9 | | 2 | 1 | | |
| 10 | 9 | 03. Jun | 11:06 | 30.3 | | 2 | 1 | | |
| 11 | 10 | 03. Jun | 11:06 | 30.7 | | 2 | 1 | | |
| 12 | 11 | 03. Jun | 11:06 | 31.1 | | 2 | 1 | | |
| 13 | 12 | 03. Jun | 11:07 | 31.4 | | 2 | 1 | | |
| 14 | 13 | 03. Jun | 11:07 | 31.7 | | 2 | 1 | | |
| 15 | 14 | 03. Jun | 11:07 | 31.9 | | 2 | 1 | | |
| 16 | 15 | 03. Jun | 11:07 | 32.2 | | 2 | 1 | | |
| 17 | 16 | 03. Jun | 11:07 | 32.4 | | 2 | 1 | | |
| 18 | 17 | 03. Jun | 11:07 | 32.7 | | 2 | 1 | | |
| 19 | 18 | 03. Jun | 11:07 | 33.0 | | 2 | 1 | | |
| 20 | 19 | 03. Jun | 11:07 | 33.2 | | 2 | 1 | | |

**TAG_*.CSV**

The file contains the TAG names and the limits. As standard, it is available in the write/read mode and can be edited directly on the TDA.

Writing directly to the file on the TDA can be prevented through the parameter (3) “Lock menu Fn2”. If parameter (3) is set, the file receives the “Read only” attribute.

⇨ See “Lock” on Page 51.

The file contains the following data:

| Name | Value range | factory-set |
|---|---|---|
| TAG number | 1 to 99 | - |
| TAG name | 11 characters<br>⇨ Chapter 4.1 | TAG01 to TAG99 |
| Upper limit<br>(Hi Limit) | identical with the upper range end | 0.0 °C or 32 °F |
| Lower limit<br>(Low Limit) | identical with the lower range end | 0.0 °C or 32 °F |

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| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Tag No. | Tag Name | Temp. Hi Limit | Temp. Low Limit | | | | |
| 2 | 1 | TAG01 | 30.0 | 15.0 | | | | |
| 3 | 2 | TAG02 | 25.0 | 10.0 | | | | |
| 4 | 3 | TAG03 | 0.0 | 0.0 | | | | |
| 5 | 4 | TAG04 | 0.0 | 0.0 | | | | |
| 6 | 5 | TAG05 | 0.0 | 0.0 | | | | |
| 7 | 6 | TAG06 | 0.0 | 0.0 | | | | |
| 8 | 7 | TAG07 | 0.0 | 0.0 | | | | |
| 9 | 8 | TAG08 | 0.0 | 0.0 | | | | |
| 10 | 9 | TAG09 | 0.0 | 0.0 | | | | |
| 11 | 10 | TAG10 | 0.0 | 0.0 | | | | |
| 12 | 11 | TAG11 | 0.0 | 0.0 | | | | |
| 13 | 12 | TAG12 | 0.0 | 0.0 | | | | |
| 14 | 13 | TAG13 | 0.0 | 0.0 | | | | |
| 15 | 14 | TAG14 | 0.0 | 0.0 | | | | |
| 16 | 15 | TAG15 | 0.0 | 0.0 | | | | |
| 17 | 16 | TAG16 | 0.0 | 0.0 | | | | |
| 18 | 17 | TAG17 | 0.0 | 0.0 | | | | |
| 19 | 18 | TAG18 | 0.0 | 0.0 | | | | |
| 20 | 19 | TAG19 | 0.0 | 0.0 | | | | |

**SETUP_*.CSV** The file contains the user names and configuration data. As standard, it is available in the write/read mode and can be edited directly on the TDA.

Writing directly to the file on the TDA can be prevented through the parameter (2) “Lock menu Fn3, Fn8 and Fn9”. If parameter (2) is set, the file receives the “Read only” attribute.

⇨ See “Lock” on Page 51.

The file contains the following data:

| Name | Display | Value range | factory-set |
|---|---|---|---|
| User name | User= | 11 characters<br>⇨ Chapter 4.1 | not specified |
| Display language | Language= | 0: German<br>1: English<br>2: French | 0 |
| Date format | Date_format= | 0: month/day<br>1: day/month | 1 |
| Sensor type | Input= | 0: RTD (Pt100)<br>1: Thermocouple K<br>2: Thermocouple J<br>3: Thermocouple T | 0 |
| Temperature unit | Unit= | 0: °C<br>1: °F | 0 |
| Decimal place | TempDP= | 0: No decimal place<br>1: One decimal place | 1 |
| Temperature correction | TBias= | -99.9 to +99.9°C (°F) | 0.0 |
| Digital filter | TFilter= | 0 to 100 seconds<br>(0: inactive) | 0 |
| Switch-off | AutoOFF= | 0 to 60 minutes<br>(0: inactive) | 3 |
| Interval | Interval= | 0 to 3600 seconds<br>(0: manual data logging) | 0 |

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| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | User= | 1 | Service-1 | | | | | |
| 2 | User= | 2 | TDA-3000 | | | | | |
| 3 | User= | 3 | 123 | | | | | |
| 4 | User= | 4 | ABC | | | | | |
| 5 | User= | 5 | RKC!5678901 | | | | | |
| 6 | User= | 6 | | | | | | |
| 7 | User= | 7 | | | | | | |
| 8 | User= | 8 | | | | | | |
| 9 | User= | 9 | | | | | | |
| 10 | User= | 10 | | | | | | |
| 11 | User= | 11 | | | | | | |
| 12 | User= | 12 | | | | | | |
| 13 | User= | 13 | | | | | | |
| 14 | User= | 14 | | | | | | |
| 15 | User= | 15 | | | | | | |
| 16 | User= | 16 | | | | | | |
| 17 | User= | 17 | | | | | | |
| 18 | User= | 18 | | | | | | |
| 19 | User= | 19 | | | | | | |
| 20 | User= | 20 | | | | | | |

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| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 97 | User= | 97 | | | | | | |
| 98 | User= | 98 | | | | | | |
| 99 | User= | 99 | | | | | | |
| 100 | | | | | | | | |
| 101 | Language= | 1 | | | | | | |
| 102 | Date_format= | 1 | | | | | | |
| 103 | Input= | 0 | | | | | | |
| 104 | Unit= | 0 | | | | | | |
| 105 | TempDP= | 1 | | | | | | |
| 106 | TBias= | 0.0 | | | | | | |
| 107 | TFilter= | 0 | | | | | | |
| 108 | AutoOFF= | 3 | | | | | | |
| 109 | Interval= | 1 | | | | | | |
| 110 | | | | | | | | |
| 111 | | | | | | | | |
| 112 | | | | | | | | |
| 113 | | | | | | | | |
| 114 | | | | | | | | |
| 115 | | | | | | | | |
| 116 | | | | | | | | |

# 9 Evaluating data with a PC

## 9.3 Disconnecting

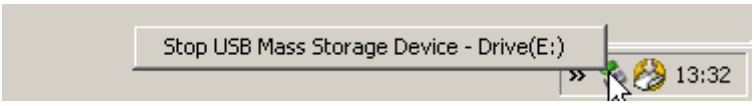
Disconnect the TDA from the PC after the PC has been shut down and switched off or observe the following instructions:

- Do not disconnect when the files are open or being stored at the moment. This may result in a malfunction.
- Disconnecting a USB link is described in the documentation for the PC operating system.

**Example** Windows XP

* Please make sure that all files are closed.
* Left-click the “Hardware removal” icon (disconnecting a USB link) in the task bar of Windows.

* Select the instrument you want to remove by clicking on it with the left mouse button.




* As soon as the message “Removal OK” appears, the instrument can be removed from the USB interface.

## 9.4 Opening CSV data on the PC

**Processing in EXCEL**

* Start EXCEL (e.g. EXCEL 97).
* From the *File* menu, select the function *Open*.
* Switch the file type over to *Text files*.
* Open the corresponding CSV file.

EXCEL will automatically start the Text Wizard for converting the data to the EXCEL format.

* In the EXCEL Text Wizard, step 1 of 3 is confirmed with “Continue”.
* With step 2 of 3, the “Tab” separator has to be inactivated and “Comma” activated.
* Close the Text Wizard with “Close”.

The CSV file data are now available for displaying them graphically, or for calculation purposes.

In the more recent versions of EXCEL, the Text Wizard does no longer start automatically.

* Open a blank table.
* Use the “Import external data” function in the “Data” menu.

**Decimal sign**

According to the operating system language (German, English, ...), a “.” (point) or “,” (comma) is used as decimal signs.

If required, use the EXCEL “Search and Replace” function for conversion. If a wrong format is used, EXCEL will interpret the data as text and not as numbers. This means that the data cannot readily be displayed graphically.

# 9 Evaluating data with a PC

## 10.1 Replacing the battery

When the battery charge indicator shows that the battery is nearly empty (), you should replace it.

**Type of battery** LR6 - alkaline battery (to IEC and JIS)

**Number of batteries** one battery

**Battery life** With a battery, the TDA-300(0) can measure temperatures continuously for about 400 hours (ambient temperature 23 °C). The effective battery life depends on the operating and ambient conditions.

When the battery is replaced, the instrument is started in the RESET condition. For this reason, there are some parameters which will be initialized (factory setting). In addition, please note that all recorded data will be deleted on the TDA-300.

**Displayed data**

| Parameter | TDA-300 | TDA-3000 |
|---|---|---|
| Peak value | is reset to the first measurement that is recorded after the reset | |
| Bottom value | is reset to the first measurement that is recorded after the reset | |
| Temperature data | are deleted | are retained |

**Configuration data**

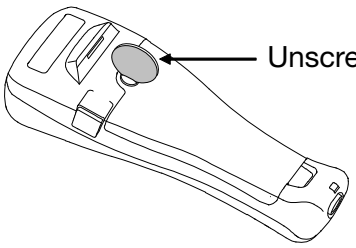
| Parameter | TDA-300 | TDA-3000 |
|---|---|---|
| TAG filter | is reset (switched off) | |
| TAG name | is retained | |
| Limits (high/low) | are retained | |
| Interval | is retained | |
| Selected user No. | --- | is set to 1 |
| User names | --- | are retained |
| Language | is retained | |
| Date format | is retained | |
| Sensor type | is retained | |
| Temperature unit | is retained | |
| Decimal place | is retained | |
| Temperature correction | is retained | |

# 10 Appendix

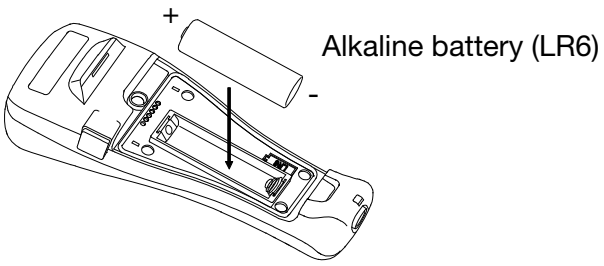
| Parameter | TDA-300 | TDA-3000 |
|---|---|---|
| Digital filter | is retained | |
| Switch-off | is retained | |
| Locks | Date/time can be set,<br>the state of the other locks is retained | |
| Year | 0 | |
| Date | 01.01 | |
| Time | 00:00 | |

**Replacing the battery**

* Press the MENU/POWER key for more than two seconds to switch the TDA-300(0) off.
* Undo the screw for the battery cover.
* Turn the screw with a suitable screwdriver or coin.




* Take off the battery cover.
* Remove the old battery and carefully insert a new one (LR6). Please observe the correct polarity.




* Put the battery cover back in position and tighten up the screw.

After the battery has been replaced, the instrument will start in the RESET state.

The “Date/Time (Fn0)” menu for setting the date will be shown in the LCD display. If no year is set, then no calendar function (recording of date and time) can be used. Always set the year if you want to use the calendar function.

* Press the ESC key twice to show the normal display.

## 10.2 Cleaning

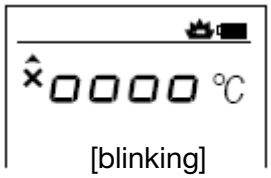
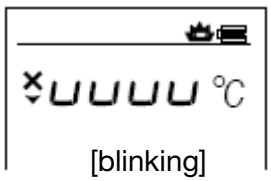
* Switch the instrument off before cleaning.
* Moisten a soft cloth with a diluted neutral detergent, wring the cloth, then wipe the instrument.
  Do not use a volatile solvent, such as a paint thinner, for cleaning. Deformation or discoloration could occur.
  The TDA-300 can be washed in running water, since it is protected to IP67 against water and dust.
  The TDA-3000 must not be washed in running water, since it is protected to IP54.

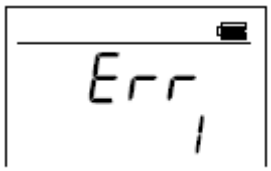
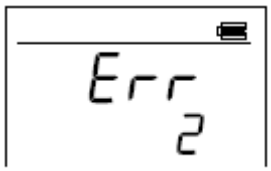
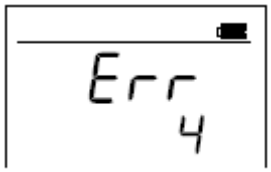
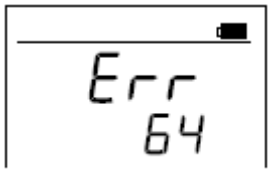
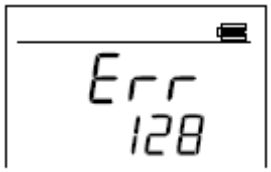
# 10 Appendix

## 10.3 Fault finding

Always switch the instrument off when replacing the sensor.

### 10.3.1 Error messages

| Display | Description | Solution |
|---|---|---|
| | Battery is nearly discharged. | Fit a new battery.<br>⇨ Chapter 10.1 |
| | Battery is discharged. | Fit a new battery at once.<br>⇨ Chapter 10.1 |
| | Sensor break | Check sensor and connection. |
|  <br>[blinking] | Overrange<br><br>The measured temperature is 5% above the upper range limit or higher than the maximum display range (9999). | Check the input, input range, sensor and sensor connection. |
|  <br>[blinking] | Underrange<br><br>The measured temperature is 5% below the lower range limit or lower than the minimum display range (-1999). | Check the input, input range, sensor and sensor connection. |

| Display | Description | Solution |
|---|---|---|
|  | Internal error | Remove the battery, wait a few seconds, then re-insert it.<br>If the fault does not disappear, contact the supplier. |
|  | EEPROM error<br>- Response signal from EEPROM is faulty.<br>- Data could not be written. | |
|  | A/D converter error<br>- Response signal from A/D converter is faulty.<br>- A/D conversion is outside the valid range. | |
|  | Stack overflow | |
|  | Watchdog reports errors<br>- A part of the internal monitoring stops the system. | |

If two or more self-diagnosed errors occur (Err 1, Err 2, Err 4, Err 64 and Err 128), the error numbers are added up.

### 10.3.2 Problems and solutions

| Problem | Possible cause | Solution |
|---|---|---|
| Instrument cannot be switched on (no display) | No battery fitted or battery is discharged or voltage too low. | ⇨ Chapter 2.1 “Inserting the battery”<br>⇨ Chapter 10.1 “Replacing the battery” |
| Measured temperature is faulty | Battery voltage too low. | ⇨ Chapter 10.1 “Replacing the battery” |
| | Interference from another device. | - Remove the device that causes the interference.<br>- Use the parameter “digital filter”.<br>⇨ See “D filter” on Page 50. |
| | Wrong sensor is used. | - Use the correct sensor. |
| | Sensor connector not inserted far enough. | - Check the sensor connection to instrument. |
| Measured temperature is not identical with the actual temperature | Temperature correction (PV bias) is used. | - Switch off temperature correction.<br>⇨ See “PV Bias” on Page 49. |
| Display does not respond, instrument does not react to a key stroke. | CPU overrun | - Remove the battery, wait a few seconds, then re-insert it.<br><br>If the error does not disappear, contact the supplier. |

## 10.4 Technical data

⇨ See Data Sheet 702540

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