

**BB25**

**EN**

**OPERATING MANUAL**  
LAYER THICKNESS  
MEASURING DEVICE



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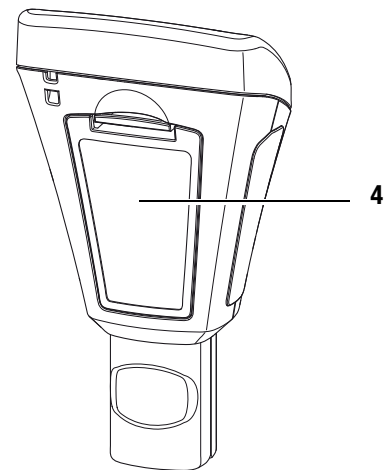
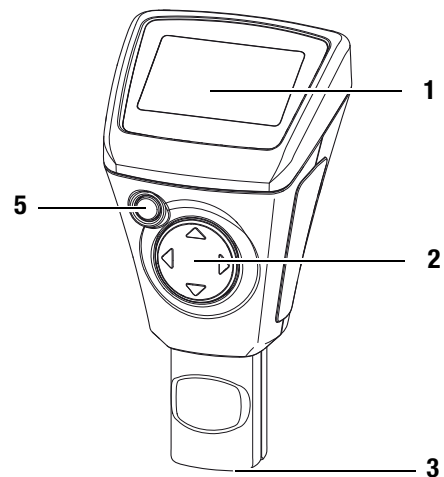
**Information about the device**

**Description of the device**

The layer thickness measuring device BB25 is used to determine the coating thickness on ferromagnetic and non-ferromagnetic metal surfaces.


The measuring device functions according to the magnetic induction principle (for coatings on ferromagnetic surfaces) or the turbulent flow principle (for coatings on non-ferromagnetic surfaces).


**Device depiction**



**Notes regarding the operating manual**

**Symbols**

**Danger!**  
 Warns of a hazard which can lead to injuries.

**Caution!**  
 Warns of a hazard which can lead to damage to property.

The current version of the operating manual can be found at: [www.trotec.de](http://www.trotec.de)

**Legal notice**

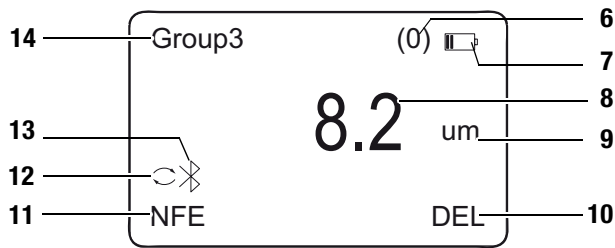
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The only party responsible for determining measured results to be valid, drawing conclusions and deriving actions is the user! TROTEC® accepts no claims of warranty for the correctness of the determined measured values or measured results. Further, TROTEC® accepts no liability whatsoever for possible mistakes or damage which have been caused by utilising the determined measured results. © TROTEC®

No.	Operating element
1	Display
2	Cross control with the keys up, down, right, left
3	Sensor
4	Battery compartment with cover
5	On/Off key

## Display



No.	Display element
6	Indication of the number of measurements
7	Battery indication
8	Measurement value indication
9	Indication of the unit
10	Indication of Delete
11	Measuring mode indication
12	Automatic measuring mode indication
13	Bluetooth indication
14	Group indication

## Technical data

Sensor	F	N
Measuring principle:	magnetic induction	turbulent flow
Measuring range:	0 to 2000 $\mu\text{m}$ 0 to 78.7 mils	0 to 2000 $\mu\text{m}$ 0 to 78.7 mils
Guaranteed tolerance: (of the measured value)	0 to 1000 $\mu\text{m}$ ( $\pm 2\%$ $\pm 2 \mu\text{m}$ ) 1000 to 2000 $\mu\text{m}$ ( $\pm 3.5\%$ ) 0 to 39.3 mils ( $\pm 2\%$ $\pm 0.08$ mils) 39.3 to 78.7 mils ( $\pm 3.5\%$ )	0 to 1000 $\mu\text{m}$ ( $\pm 2\%$ $\pm 2 \mu\text{m}$ ) 1000 to 2000 $\mu\text{m}$ ( $\pm 3.5\%$ ) 0 to 39.3 mils ( $\pm 2\%$ $\pm 0.08$ mils) 39.3 to 78.7 mils ( $\pm 3.5\%$ )
Accuracy:	0 to 100 $\mu\text{m}$ (0.1 $\mu\text{m}$ ) 100 to 1000 $\mu\text{m}$ (1 $\mu\text{m}$ ) 1000 to 2000 $\mu\text{m}$ (0.01 mm) 0 to 10 mils (0.01 mils) 10 to 78.7 mils (0.1 mils)	0 to 100 $\mu\text{m}$ (0.1 $\mu\text{m}$ ) 100 to 1000 $\mu\text{m}$ (1 $\mu\text{m}$ ) 1000 to 2000 $\mu\text{m}$ (0.01 mm) 0 to 10 mils (0.01 mils) 10 to 78.7 mils (0.1 mils)
Minimum bending radius of the object surface:	1.5 mm	3 mm
Diameter of the smallest measuring surface:	7 mm	5 mm
Min. measurable layer thickness:	0.5 mm	0.3 mm
Operating temperature:	0 °C to 40 °C (32 °F to 104 °F) at 20 to 90 % RH	
Power supply:	2 batteries 1.5 V AAA	
Weight:	110 g	
Dimensions (height x width x depth)	113.5 x 54 x 27 mm	
Display indication for outside of the measuring range:	---	----

## Scope of delivery

- 1 x Layer thickness measuring device BB25
- 2 x 1.5 V batteries AAA
- 1 x Wrist strap
- 1 x Transport case
- 1 x Set with calibration accessories (FE, NFE, various degrees of layer thickness)
- 1 x Getting started guide
- 1 x PC software (available for download)

## Safety

**Carefully read the operating manual before using the device and keep it within reach!**

- Do not use the device in atmospheres containing oil, sulphur, chlorine or salt.
- Protect the device from permanent direct sunlight.
- Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in legible condition.
- Observe the storage and operating conditions (see chapter Technical data).

## Intended use

Only use the device for coating thickness measurements. Here, read and observe the technical data.

To use the device for its intended use, only use accessories and spare parts which have been approved by TROTEC®.

## Improper use

Do not use the device in potentially explosive atmospheres, for measurements in liquids or at live parts. TROTEC® accepts no liability for damages resulting from improper use. In such a case, entitlements to a warranty are forfeited. Any unauthorised modifications, alterations or structural changes to the device are forbidden.

## Personnel qualifications

People who use this device must:

- have read and understood the operating manual, especially the Safety chapter.

## Residual risks



### Danger!

Do not leave the packaging lying around. Children may use it as a dangerous toy.



### Danger!

The device is not a toy and does not belong in the hands of children.



### Danger!

Dangers can occur at the device when it is used by untrained people in an unprofessional or improper way. Observe the personnel qualifications.



### Caution!

To prevent damages to the device, do not expose it to extreme temperatures, extreme humidity or moisture.



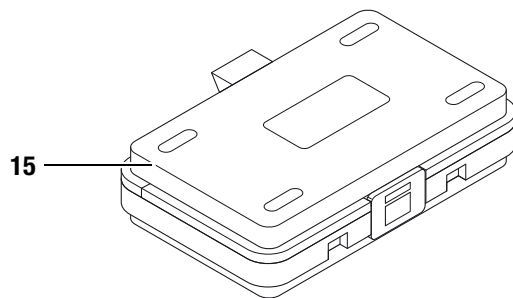
### Caution!

Do not use abrasive cleaners or solvents to clean the device.

## Transport and storage

### Transport

Use the supplied case (15) to transport the device.



### Storage

When the device is not being used, observe the following storage conditions:

- dry,
- protected from dust and direct sunlight,
- in the supplied case,
- with a plastic cover to protect it from invasive dust, if necessary.
- The storage temperature is the same as the range given in the chapter Technical data.
- When storing the device for a long time, remove the batteries.

## Operation

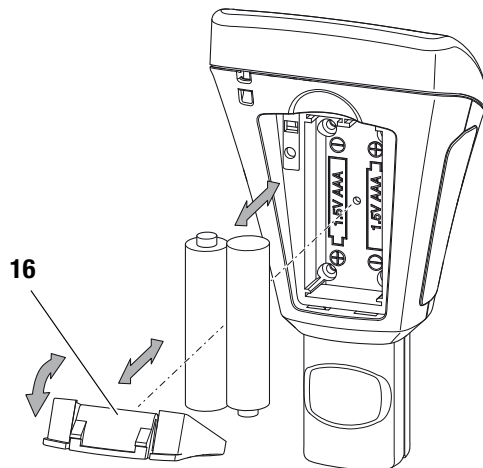
### Inserting the batteries

- Insert the supplied batteries before first use.



#### Caution!

Make certain that the surface of the device is dry and the device is switched off.



1. Push down the clip at the battery cover (16) and remove the cover.
2. If applicable, remove old batteries from the battery compartment.
3. Insert the batteries in the compartment with correct polarity.
4. Put the cover back onto the battery compartment and press the side with the clip down until it clicks into place.

### Switch-on

- Press the On/Off key (5) for approx. 2 seconds.
  - The display is switched on and the device is ready for operation.

#### Note:

Note that moving from a cold area to a warm area can lead to condensation forming on the device's circuit board. This physical and unavoidable effect can falsify the measurement. In this case, the display shows either no measured values or they are incorrect. Wait a few minutes until the device has become adjusted to the changed conditions before carrying out a measurement.

### Calibrating the measuring device

- Carry out a zero point calibration before each measuring operation.

#### Zero point calibration

1. Press the Left key (2).
  - The main menu is called up.
2. Select the menu item *Calibration* by use of the Up and Down keys (2).
3. Confirm your selection by pressing the Left key (2).
  - The submenu *Calibration* with the following menu items is called up:

Designation	Meaning (sensor F = magnetic induction) (sensor N = turbulent flow)
<i>CAL Zero of FE</i>	Performing calibration for sensor F
<i>CAL Zero of NFE</i>	Performing calibration for sensor N
<i>DEL Zero of FE</i>	Deleting calibration for sensor F
<i>DEL Zero of NFE</i>	Deleting calibration for sensor N

4. Select *CAL FE* for sensor F or *CAL NFE* for sensor N.
5. Confirm your selection by pressing the Left key (2).
  - The device switches to measuring mode.
  - *CAL FE* or *CAL NFE* is indicated in the bottom left corner of the display.
6. Position the sensor (3) on an uncoated spot of the material to be measured. The measured medium is to be identical to the coated material to be measured thereafter in terms of material composition, shape and surface condition.
  - The measurement is acknowledged with an acoustic signal.
  - The measured value is indicated on the display.
  - If the calibration was successful, the result should be 0.0.
  - *OK* and *CANCEL* will be indicated at the bottom of the display.
7. Use the Left key (2) to confirm and complete the calibration or cancel this process by use of the Right key (2). You can perform several measurements before confirming or aborting.
  - The main menu will be displayed.
  - If cancelled, the calibration will not be saved!
  - If confirmed, a zero point calibration is carried out.

**Carrying out a measurement**

- Carry out a zero point calibration before each measuring operation.
1. If you want to save your measured values, use the Up and Down keys (2) to select a group (*Group (1) to Group (50)*) or else to perform individual measurements select *Group (0)*.
  2. Select the desired measuring mode. See Setting the measuring mode on page 5.
  3. Position the sensor (3) on the material to be measured and perform group measurements or individual measurements.
    - The measured value will be indicated on the display (8).
    - The measurement is acknowledged with an acoustic signal.

**Adjusting the storage settings for the measured values**

- The measured values are stored in groups.
- The measured values can be saved in the groups from 1 to 50.
- If you have selected *Group (0)*, measured values will only be displayed, but not saved.
- In each group up to 50 measured values can be stored.
- The groups can be selected in the start screen or else via the submenu *Working Mode*.
- The measured values can be deleted across groups or individually.

**Selecting a group**

- Select the desired group in the start screen by use of the Up and Down keys (2).

OR

1. Press the Left key (2) to call up the main menu.
2. Select the menu item *Working Mode* by use of the Up and Down keys (2).
3. Confirm your selection by pressing the Left key (2).
  - A listing of the groups will be displayed.
4. Select the desired group by use of the Up and Down keys (2).
5. Confirm your selection by pressing the Left key (2).
  - The main menu will be displayed.

**Deleting measured values**

1. Press the Left key (2) to call up the main menu.
2. Select the menu item *Measure View* by use of the Up and Down keys (2).
3. Confirm your selection by pressing the Left key (2).
  - The submenu *Measure View* will be displayed.
4. If you want to delete all measured values, select the menu item *Delete All*.
5. If you want to delete the measured values of a certain group, select the group by use of the Up and Down keys (2).
6. Confirm your selection by pressing the Left key (2).
  - In case of *Delete All* there will be a prompt, whether you are sure. Confirm the delete operation by pressing the Left key (*OK*) or cancel it by pressing the Right key (*Back*).
  - When a group is selected, an overview of the group values will be displayed.
7. Again press the Left key (2) to delete the measured values of the selected group (*Delete Group*) or abort this process by pressing the Right key (*Back*).
  - The main menu will be displayed.

**Setting the measuring mode**

1. Press the Left key (2) to call up the main menu.
2. Select the menu item *Measure Mode* by use of the Up and Down keys (2).
3. Confirm your selection by pressing the Left key (2).
  - The submenu *Measure Mode* will be displayed.
  - The measuring mode currently activated in the device is marked with a star (e.g. *NFE\**).

Designation	Meaning (sensor F = magnetic induction) (sensor N = turbulent flow)
<i>AUTO</i>	The sensor automatically selects the measuring mode.
<i>FE</i>	Sensor F is active.
<i>NFE</i>	Sensor N is active.

4. Select the measuring mode by use of the Up and Down keys (2).
5. Confirm your selection by pressing the Left key (2).
  - The main menu will be displayed.
  - The measuring mode is set.
6. Press the Right key (2) to leave the main menu.

### Setting the unit $\mu\text{m}$ or mils

1. Press the Left key (2) to call up the main menu.
2. Select the menu item *Set* by use of the Up and Down keys (2).
3. Confirm your selection by pressing the Left key (2).  
– The submenu *Set* will be displayed.
4. Select the menu item *Units* by use of the Up and Down keys (2).  
– The submenu *Units* will be displayed:

Designation	Meaning
$\mu\text{m}$	unit is $\mu\text{m}$
<i>mils</i>	unit is mils

5. Select the desired unit by use of the Up and Down keys (2).
6. Confirm your selection by pressing the Left key (2).  
– The desired unit is set.  
– The submenu *Set* will be displayed.

### Setting the background illumination

1. Press the Left key (2) to call up the main menu.
2. Select the menu item *Set* by use of the Up and Down keys (2).
3. Confirm your selection by pressing the Left key (2).  
– The submenu *Set* will be displayed.
4. Select the menu item *Backlight* by use of the Up and Down keys (2).
5. Confirm your selection by pressing the Left key (2).  
– A scale with the current setting will be displayed.
6. Select the desired setting by use of the Up and Down keys (2).
7. Confirm your selection by pressing the Left key (2).  
– The desired setting is selected.  
– The submenu *Set* will be displayed.

### Setting automatic switch-off

When the automatic switch-off function is activated, the device switches off after approx. 10 minutes without measurement.

1. Press the Left key (2) to call up the main menu.
2. Select the menu item *Set* by use of the Up and Down keys (2).
3. Confirm your selection by pressing the Left key (2).  
– The submenu *Set* will be displayed.
4. Select the menu item *Auto Power Off* by use of the Up and Down keys (2).
5. Confirm your selection by pressing the Left key (2).  
– The submenu *Auto Power Off* will be displayed:

Designation	Meaning
<i>Enable</i>	automatic switch-off enabled
<i>Disable</i>	automatic switch-off disabled

6. Select the desired setting by use of the Up and Down keys (2).
7. Confirm your selection by pressing the Left key (2).  
– The desired setting is selected.  
– The submenu *Set* will be displayed.

### Bluetooth settings

1. Press the Left key (2) to call up the main menu.
2. Select the menu item *Set* by use of the Up and Down keys (2).
3. Confirm your selection by pressing the Left key (2).  
– The submenu *Set* will be displayed.
4. Select the menu item *Bluetooth* by use of the Up and Down keys (2).
5. Confirm your selection by pressing the Left key (2).  
– The submenu *Bluetooth* will be displayed:

Designation	Meaning
<i>Enable</i>	Bluetooth enabled
<i>Disable</i>	Bluetooth disabled

6. Select the desired setting by use of the Up and Down keys (2).
7. Confirm your selection by pressing the Left key (2).  
– The desired setting is selected.  
– The Bluetooth symbol (13) is indicated in the display.  
– The submenu *Set* will be displayed.  
– The device can now be connected to another Bluetooth device (e.g. PC).  
– The device will be displayed as *BB 25*.

## Setting the contrast

1. Press the Left key (2) to call up the main menu.
2. Select the menu item *Set* by use of the Up and Down keys (2).
3. Confirm your selection by pressing the Left key (2).
  - The submenu *Set* will be displayed.
4. Select the menu item *Contrast* by use of the Up and Down keys (2).
5. Confirm your selection by pressing the Left key (2).
  - The submenu *Contrast* will be displayed.
6. Select the desired setting by use of the Up and Down keys (2).
7. Confirm your selection by pressing the Left key (2).
  - The desired contrast is set.
  - The submenu *Set* will be displayed.

## Accessing device information

1. Press the Left key (2) to call up the main menu.
2. Select the menu item *Set* by use of the Up and Down keys (2).
3. Confirm your selection by pressing the Left key (2).
  - The submenu *Set* will be displayed.
4. Select the menu item *Info* by use of the Up and Down keys (2).
5. Confirm your selection by pressing the Left key (2).
  - The submenu *Info* will be displayed.
  - This submenu contains information on the device name, firmware version and serial number.
6. Press the Left key (2) to return to the submenu *Set*.

## Switch-off

When the automatic switch-off function is activated, the device switches off after approx. 10 minutes without measurement. See Setting automatic switch-off on page 6.

- Press the On/Off key (5).
  - The device is switched off.

## Menu structure

The menu structure provides an overview of the setting options and where to find these.

Main menu	Submenu 1	Submenu 2
Working Mode	Group (0) to Group (50)	-
Measure Mode	Auto	-
	FE	-
	NFE	-
Set	Unit	µm mil
	Backlight	Scale
	Auto Power Off	Enable Disable
	Bluetooth	Enable Disable
	Contrast	1 to 62
	Info	Product name Firmware Serial number
	Measure View	Delete All Group (12) to Group (50)
Calibration	CAL Zero of FE	-
	CAL Zero of NFE	-
	DEL Zero of FE	-
	DEL Zero of NFE	-

## PC software

Using the software *Coating Thickness Tester* stored measurement data can be called up via a Bluetooth interface and saved.

The software is available for download at [www.trotec.de](http://www.trotec.de).

### Note:

The supplied free software is designed for useful basic functionalities. Trotec assumes no liability with regard to this free software and also provides no support on that score. Trotec accepts no liability concerning the use of this free software and is under no obligation to make adjustments or to further develop updates or upgrades.

## Installation requirements

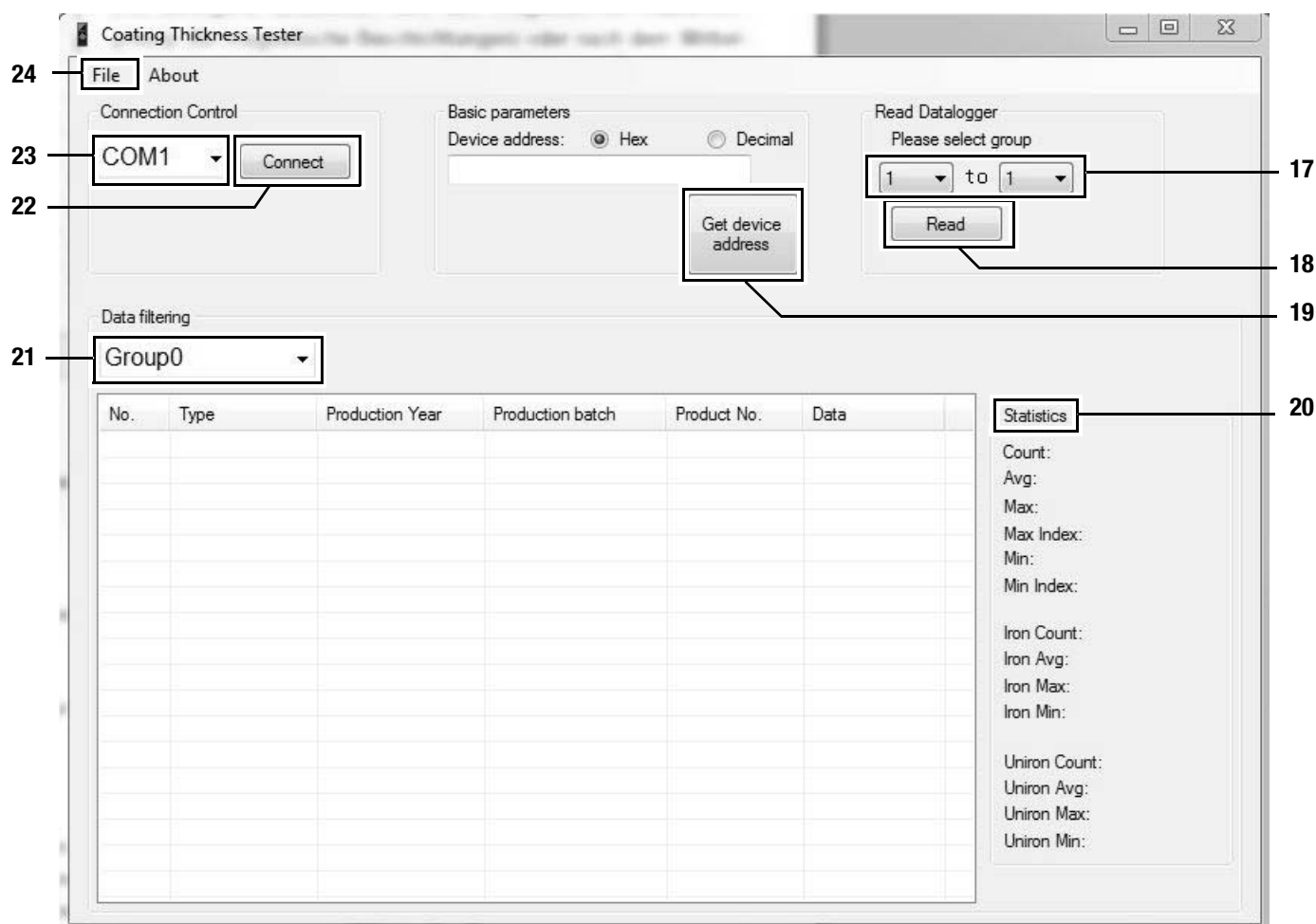
Ensure that the following minimum installation requirements for the PC software are met:

- Supported operating systems:
  - Windows 7
- Hardware requirements:
  - Bluetooth interface

## Installing the PC software

1. Insert the data medium with the software in the drive.
2. Double-click the installation file *Setup.exe*.
3. Follow the instructions of the installation wizard.





### Starting the PC software

1. Enable the Bluetooth function at the device. See Bluetooth settings on page 6.
2. Using Windows connect the device to the PC (*Add device* via the corresponding Bluetooth menu).
3. Start the PC software.
4. Click on the *Connect* button (22).
  - The software connects to the device.
  - If the connection attempt fails, try again with the various COM interfaces displayed under (23) until you succeed and the corresponding identification data is displayed in the *Device Address* box. If *Hex* is activated, a sequence of letters will be displayed. If *Decimal* is activated, a sequence of numbers will be displayed.
  - You can now download data from the device or with each measurement directly load values to the software in real time and later save the entire dataset on your PC, see *Saving measured values (export)*. With the so-called live measurement the number of measured values per group is not limited to 50.

### Retrieving measured values (download)

By use of the software you can download the measured values from the device. You can choose which groups to download. If you perform a measurement within the PC's reception range, the stored measured values will directly be transferred to the software.

1. You connected the device to the software as described in *Starting the PC software*.
2. Select the groups you want to download by choosing the group numbers (from ... to ... ) from the two drop-down menus under (17). As with the device the value range here too is 1 to 50.
3. Click on the *Read* button (18).
  - Data is being loaded.
  - A progress bar appears beside the drop-down box *Data filtering* (21). The loading process is completed, when the bar is filled.
  - If the loading process cannot be completed successfully, an error message will be displayed instead. In that event check the Bluetooth connection between device and PC. If in doubt, disconnect and then re-establish the connection. Proceed as described in *Starting the PC software* and then try to load the desired data again.

4. Select a group from the drop-down box *Data filtering* (21) to display the measured values.
  - The measured values are displayed in the table below the drop-down box *Data filtering* (21).
  - When clicking on a measured value in the table, further information will be indicated under *Statistics* (20).

**Saving measured values (export)**

You can export a selected group as Excel file and save it on your PC. There the table looks as it does in the software.

1. Select the File menu tab (24).
2. Select the submenu *Save as*.
3. Select the storage location and insert the desired file name.
4. Then click on *Save*.
  - The measured values from the selected group are stored in the Excel table.

**Errors and faults**

The accurate functionality of the device was tested during production a number of times. However, if functionality faults do occur, then check the device according to the following list.

**The device does not switch on:**

- Check the charging status of the batteries. Change the batteries, if required. See *Inserting the batteries* on page 4.
- Check that the batteries are properly positioned. Check the polarity is correct.
- Never carry out an electrical check yourself; instead, contact your TROTEC® customer service.

**Table of faults**

Error code	Cause of error
Err1	Measuring mode FE: Layer thickness outside the measuring range
Err2	Measuring mode NFE: Layer thickness outside the measuring range
Err3	Measuring mode AUTO: Layer thickness outside the measuring range
Err4	Measuring mode FE: No FE data could be detected.
Err5	Measuring mode NFE: No NFE data could be detected.

**Maintenance and repair**

**Battery change**

A battery change is required, when the Battery indication (7) lights up or the device can no longer be switched on. See *Inserting the batteries* on page 4.

**Cleaning**

Clean the device with a soft, damp and lint-free cloth. Ensure that no moisture enters the housing. Do not use any sprays, solvents, alcohol-based cleaning agents or abrasive cleaners. Only use clean water to moisten the cloth.

**Repair**

Do not modify the device. Never open the device housing or install any spare parts. For repairs or device testing, contact the manufacturer.

## Disposal



In the European Union, electronic equipment must not be treated as domestic waste, but must be disposed of professionally in accordance with Directive 2002/96/EC of the European Parliament and Council of 27th January 2003 concerning old electrical and electronic equipment. At the end of its life, please dispose of this instrument in a manner appropriate to the relevant legal requirements.

## Declaration of conformity

in accordance with the EC Low Voltage Directive 2006/95/EC and the EC Directive 2004/108/EC about electromagnetic compatibility.

Herewith, we declare that the layer thickness measuring device BB25 was developed, constructed and produced in compliance with the named EC directives.

The C€ marking is found on the rear of the device.

Manufacturer:  
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