testo 270 · Deep-frying Oil Tester

Instruction manual

Practical tips before commissioning your new testo 270

Dear customer,

Congratulations on your purchase of the new testo 270 deep-frying oil tester.

All of our measuring instruments are checked by us in the factory before the delivery and adjusted to their specific accuracy. To ensure that the accuracy remains at the same high level, we recommend checking the instruments regularly.

With the testo 270 deep-frying oil tester, you have the following options:

1 **testo factory calibration according to ISO** (accuracy +/- 2 % TPM[1]):
   With the order number 0520 0028 you can order an ISO calibration from Testo's calibration subsidiary, Testo Industrial Services in Kirchzarten. In the process, your testo 270 is calibrated at two points (at approx. 3 % and at approx. 24 % TPM) under precise laboratory conditions.

Furthermore, you have the following options for checking your testo 270 yourself at any time:

2 **with testo reference oil** (accuracy +/- 2.5 % TPM[1]):
   With the included testo reference oil (article no. 0554 2650), you can check the measuring instrument precisely and readjust it, if necessary (please observe the description in the instruction manual for this).

3 **with the simple function test in deep-frying oil** (accuracy +/- 3 % TPM[1]):
   For a simple function test without adjustment, we recommend a measurement during the commissioning of your new instrument in unused deep-frying oil at 150 to 180 °C.

   You should ideally perform this measurement repeatedly in succession and note the respective readings. The average of these readings is your specific reference value for subsequent instrument testing. To use the determined reference value as a comparative reading for a check, always perform the measurement for instrument testing in unused deep-frying oil at 150 to 180 °C.

   Please note that when changing the type of oil or the oil supplier, the reference value must be determined anew.

   Your specific reference value:

   _____

[1] typical, referred to testo internal reference, at an ambient temperature of 25 °C

1 Contents

2 Safety and the environment

2.1. About this document

Use

> Please read this documentation through carefully and familiarize yourself with the product before putting it to use. Pay particular attention to the safety instructions and warning advice in order to prevent injuries and damage to the products.

> Keep this document to hand so that you can refer to it when necessary.

> Hand this documentation on to any subsequent users of the product.

Warnings

Always pay attention to information that is marked by the following warnings with warning pictograms. Implement the specified precautionary measures.

Representation	Explanation
⚠ WARNING	Indicates potential serious injuries
NOTICE	indicates circumstances that may lead to damage to the products

Symbols and writing standards

Represen-tation	Explanation
ℹ	Note: Basic or further information.
1. ... 2. ...	Action: more steps, the sequence must be followed.
> ...	Action: a step or an optional step.
- ...	Result of an action.
Menu	Elements of the instrument, the instrument displays or the program interface.

[OK]	Control keys of the instrument or buttons of the program interface.
... | ...	Functions/paths within a menu.
“...”	Example entries

2.2. Ensure safety

> Only operate the product properly, for its intended purpose and within the parameters specified in the technical data. Do not use any force.

> Do not operate the instrument if there are signs of damage at the housing, mains unit or feed lines.

> The objects to be measured or the measurement environment may also pose risks: Note the safety regulations valid in your area when performing the measurements.

> Temperatures given on probes/sensors relate only to the measuring range of the sensors. Do not expose handles and feed lines to any temperatures in excess of 70 °C unless they are expressly permitted for higher temperatures.

> Do not perform contact measurements on non-insulated, live parts.

> Transport and store the instrument exclusively in the aluminium case provided in order to avoid damage to the sensor.

> Do not store the product together with solvents. Do not use any desiccants.

> Carry out only the maintenance and repair work on this instrument that is described in the documentation. Follow the prescribed steps exactly. Use only original spare parts from Testo.

2.3. Protecting the environment

> Dispose of faulty rechargeable batteries/spent batteries in accordance with the valid legal specifications.

> At the end of its useful life, send the product to the separate collection for electric and electronic devices (observe local regulations) or return the product to Testo for disposal.

3 Specifications

3.1. Use

The testo 270 is a handy measuring instrument for the fast inspection of deep-frying oils and is designed in equal measure for left and right handers.

The TPM value (total polar materials) enables a statement on the ageing of deep-frying oils due to the effects of heat.

The following measuring tasks can be performed with the testo 270:

- Display temperature of the deep-frying oil:
  Indicator for correct setting of the deep-fryer, inspection of integrated temperature displays.
- Display TPM value:
  Indicator for the ageing of the deep-frying oil.

The sensor works on a capacitive basis and determines the total amount of polar materials in % as the reading.

The free fatty acids that are determined above all for the evaluation of unloaded oils (rancidity) cannot be detected with the testo 270.

The temperature of the deep-frying oil to be measured must be at least 40 °C. The maximum operating temperature is 190 °C, for brief periods 200 °C.

The following components of the product are designed according to Regulation (EC) 1935/2004 for long-term contact with foodstuffs:

The sensor and the probe tube are designed to come into contact with oil used in deep fat fryers for the typical duration of a spot check measurement. The materials used in these components meet the relevant requirements in the Regulation (EC)1975/2004.

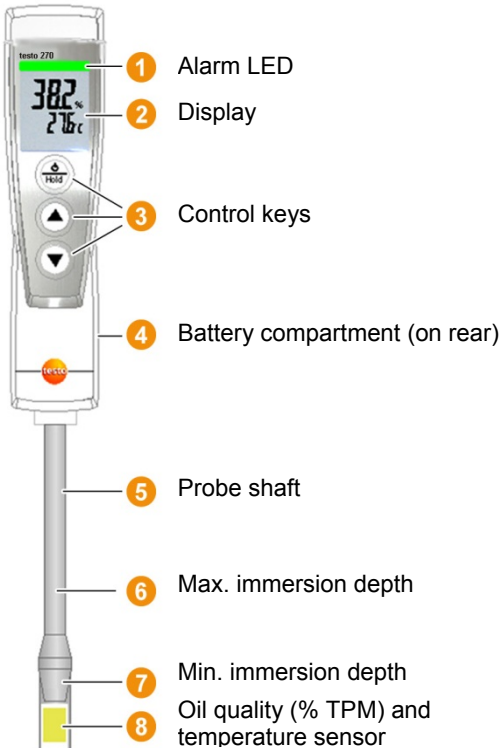
3.2. Technical data

Characteristic	Values
Measuring range	Temperature: 40.0 to 200.0 °C TPM: 0.5 to
Accuracy	Temperature: ± 1.5 °C TPM[2]: ±2 % (40.0 to 190.0 °C)
Resolution	Temperature: 0.5 °C TPM: 0.5 %
Power supply	Batteries: 2x Micro (type AAA)
Battery life at 20 °C	approx. 25 h of continuous operation (corresponds to 500 measurements)
Temperature sensor	PTC
TPM sensor	Capacitive sensor (testo)
Operating temperature	0 to 50 °C
Storage/transport temperature	-20 to 70 °C
Display	LCD, 2-line, display light
Weight incl. TopSafe and wrist strap	164 g
Housing material	PA66 Glass fibre 30%
Dimensions of instrument incl. TopSafe	approx. 354 mm x 50 mm x 30 mm
TPM response time[3]	< 30 s
Protection class	with TopSafe: IP65
Warranty	24 months
EC Directive	2004/108/EC

[2] typical, referred to testo internal reference, at an ambient temperature of 25 °C
[3] Requirement: Reading within the accuracy limits

4 Product description

4.1. Overview



Indications in the display

Displays	Function/property
↑	Temperature measuring range exceeded
↓	Temperature measuring range undershot
☼	Alarm LED activated
🔈	Acoustic alarm activated
🔒	Configuration mode or TPM limit values locked

Displays	Function/property
	Battery capacity low (approx. 3 h remaining life)
	Battery capacity empty (approx. 1.5 h remaining life)
Alarm	Upper TPM limit value exceeded
Hold	Readings held (manual)
Auto Hold	Readings held (automatic)
°C/°F	Temperature in °C or °F

Important display messages

Indications in the display	Explanation
000 lights up when Alarm LED is activated: Alarm LED lights up green	Instrument is ready to measure, sensor is not in the oil
Reading >**190** flashes	The measured temperature is above 190 °C. A double acoustic signal sounds if the acoustic alarm is switched on

Control keys

Keys	Function/property
[⏻/Hold]	• Switching the instrument on/off • Manually holding readings • Configuring the instrument
[▲]	• Setting the upper TPM limit value • Configuring the instrument
[▼]	• Setting the lower TPM limit value • Configuring the instrument

Battery compartment on back of instrument

1. Batteries (Type AAA)
2. Switch for locking/unlocking the TPM limit values see page 16 and the configurations see page 18.

4.2. Basic properties

Power supply

The power is supplied to the instrument via two micro batteries (type AAA). The batteries are included in the delivery.

5 First steps

5.1. Commissioning

Inserting batteries

CAUTION

Incorrectly inserted batteries may damage the instrument!

> Note the polarity when inserting the batteries.

1. Remove TopSafe from the instrument (see picture).
2. Open the battery compartment on the rear of the instrument.
3. Insert batteries.
   - Instrument turns on automatically.
   - A display test is performed: all segments light up.
   - Firmware version is displayed.
   - Instrument changes to Measuring Mode.
   - **000** lights up in the display, alarm LED lights up green, the instrument is ready for operation.
4. Close the battery compartment.
5. Attach TopSafe to the instrument.
6. Switch the instrument off, if necessary.

Fastening wrist strap

- For measurement with the instrument

✓ TopSafe is on the instrument.

1. Carefully pull the opening of the wrist strap over the probe shaft.
2. Fasten the flap of the wrist strap onto the pin of the TopSafe such that the hand can easily be slipped through.

- For storage of the instrument

✓ TopSafe is on the instrument.

1. Fasten the flap at the pin of the TopSafe.
2. Fasten the opening of the wrist strap to a suitable hook.

5.2. Getting to know the product

5.2.1. Switching the instrument on/off

To switch on

> Press **[⏻/Hold]** (< 1 sec).

- A display test is performed: all segments light up.
- Firmware version is displayed.
- Instrument changes to Measuring Mode and is ready for operation.

To switch off

> Press and hold **[⏻/Hold]** for approx. 3 sec.

- Display goes out, instrument switches off.

5.2.2. Alarm LED

The Alarm LED shows in which range the measured TPM value is located:

green	TPM value is below the lower limit value
orange	TPM value is between the lower and upper limit value
red	TPM value is above the upper limit value

The Alarm LED is switched on in the condition upon delivery. The TPM limit values are set as follows:

Lower limit value	20 %
Upper limit value	24 %

To activate/deactivate the Alarm LED: See Configuring the instrument page 16.

To set the TPM limit values: See Setting the TPM limit values page 15.

5.2.3. Battery capacity

With decreasing battery capacity, a symbol lights up in the display ( ). The remaining capacity is then only approx. 3 h (approx. 60 measurements). If the empty battery symbol ( ) lights up in the display, the remaining capacity is only approx. 1.5 h (approx. 30 measurements).

If the battery voltage is too low, the instrument automatically switches off.

> Change batteries, see Changing the batteries page 23.

5.2.4. Hold function

The measured values can be held manually.

Requirement: The sensor is in oil.

1. Briefly press **[⏻/Hold]** (< 1 s).
- **Hold** is shown on the display.
- Readings are held.
2. To change to Measuring Mode: Briefly press **[⏻/Hold]** (< 1 s).
- Hold function is deactivated.
- Current readings are displayed.

5.2.5. Auto Hold function

With the **Auto Hold** function activated, the measured values are automatically held by the instrument after the equalization period.

To activate/deactivate the **Auto Hold** function: See Configuring the instrument page 16.

5.2.6. Auto off function

With the **Auto off** function activated, the instrument automatically switches off after a certain time.

- If the instrument is in Measuring Mode: automatic switch-off after 2 min.
- If the instrument is in hold, configuration or alarm setting mode: automatic switch-off after 10 min.

To activate/deactivate the **Auto off** function: See Configuring the instrument page 16.

5.2.7. Setting the TPM limit values

The TPM limit values can be between 4 and 40 %. The upper limit value (**High Alarm**) must be at least 1 % higher than the lower limit value (**Low Alarm**).

Set the upper TPM limit value

Requirement: Instrument is in Measuring Mode.

1. Hold **[▲]** for approx. 2 s.

- **High Alarm** and the set upper limit value appear in the display.
- If the Alarm LED is activated: Alarm LED lights up red.

2. Using **[▲]** or **[▼]** set the upper limit value (to fast-forward: hold down key).
3. Confirm with **[⏻/Hold]**.

- The new upper limit value is applied.
- Instrument changes to Measuring Mode and is ready for operation.

Set the lower TPM limit value

Requirement: Instrument is in Measuring Mode.

1. Hold **[▼]** for approx. 2 s.
- **Low Alarm** and the set lower limit value appear in the display.
- If the Alarm LED is activated: Alarm LED lights up orange.
2. Using **[▲]** or **[▼]** set the lower limit value (to fast-forward: hold down key).
3. Confirm with **[⏻/Hold]**.
- The new lower limit value is applied.
- Instrument changes to Measuring Mode and is ready for operation.

5.2.8. Locking/unlocking the TPM limit values

You can lock/unlock the set TPM limit values. The instrument is delivered with the TPM limit values unlocked (switch 1 at **ON** position).

Requirements: TopSafe is not on the instrument. The instrument is in Measuring Mode or is switched off.

1. Open the battery compartment on the rear of the instrument.
2. Turn over switch 1 using a sharp object.
- TPM limit values are locked (pos. **1**)/unlocked (pos. **ON**).
3. Close the battery compartment.

5.2.9. Configuring the instrument

Setting options in the configuration mode

Configurations	Setting options
Set temperature unit	**°C** or **°F**
Set **Alarm LED** ☼	on: Alarm LED activated off: Alarm LED deactivated
Set acoustic **Alarm** 🔈	on: Acoustic alarm activated off: Acoustic alarm deactivated
Automatically hold readings **(Auto Hold)**	on: Readings are automatically held by the instrument off: Readings are not automatically held
Set display light ☼	on: Display light on off: Display light off

Configurations	Setting options
Automatically switch off instrument **(Auto off)**	on: Instrument switches off automatically after a certain period off: No automatic switching off
Perform calibration **(CAL)**	on: Perform calibration off: Do not perform calibration
Perform reset **(rSt)**	on: Reset adjustment value to factory setting off: Do not reset adjustment value to factory settings

Cancel configuration

You can cancel the configuration mode early. Exception: During the adjustment/calibration process, the configuration mode cannot be cancelled.

> Press and hold **[⏻/Hold]** for approx. 1 s.
- Configuration mode is cancelled.
- Instrument changes to Measuring Mode.
- Previously set values are applied.

Perform configuration

Requirement: Instrument is switched off.

1. Switch on the instrument and during the display test, simultaneously hold down **[⏻/Hold]** and **[▲]** for approx. 3 s.
- **°C** or **F** lights up in the display.
2. Using **[▲]** or **[▼]** set temperature unit (**°C/°F**).
3. Confirm requested temperature unit with **[⏻/Hold]**.
- **Alarm** ☼ and **on** or **off** light up in the display.
4. Using**[▲]** or **[▼]** switch Alarm LED on (**on**) or off (**off**).
5. Confirm with **[⏻/Hold]**.
- **Alarm** 🔈 and **on** or **off** light up in the display.
6. Using **[▲]** or **[▼]** switch the acoustic alarm on or off.
7. Confirm with **[⏻/Hold]**.
- **Auto Hold** and **on** or **off** light up in the display.
8. Using **[▲]** or **[▼]** switch **Auto Hold** on or off.
9. Confirm with **[⏻/Hold]**.
- ☼ and **on** or **off** light up in the display (display light).
10. Using **[▲]** or **[▼]** switch the display light on or off.

11. Confirm with **[⏻/Hold]**.
- **Auto off** and **on** or **off** light up in the display.
12. Using **[▲]** or **[▼]** switch **Auto off** on or off.
13. Confirm with **[⏻/Hold]**.
- **CAL** and **on** or **off** light up in the display.

> If you wish to perform a calibration/adjustment: Continue with chapter Calibrating/adjusting the instrument page 25.
>
> If you do not wish to perform a calibration/adjustment: Continue with step 14.

14. Using **[▲]** or **[▼]** deactivate the calibration/adjustment function (**off**).
15. Confirm with **[⏻/Hold]**.
- **rSt** and **on** or **off** light up.
16. Using **[▲]** or **[▼]** select **on** (= delete adjustment value: factory setting) or **off** (= no reset).
17. Confirm with **[⏻/Hold]**.
- All set values are applied.
- Instrument changes to Measuring Mode.

5.2.10. Locking/unlocking the configurations

You can lock/unlock the set values from the configuration mode. The instrument is delivered with the configuration mode unlocked (switch 2 at **ON** position).

Requirements: TopSafe is not on the instrument. Instrument is switched off.

1. Open the battery compartment on the rear of the instrument.
2. Turn over switch 2 using a sharp object.
- Configuration mode is locked (pos. **2**)/unlocked (pos. **ON**).
3. Close the battery compartment.

6 Using the product

6.1. General measuring notes

With the testo 270, several measurement can be performed immediately after each other and without waiting times.

Which oils/deep-frying fats can be measured?

In principle, all oils and fats intended for deep frying can be measured.

This includes, for example, rapeseed, soya bean, sesame, palm, olive, cotton seed or groundnut oil. Fats from animal sources can also be measured. The TPM value in % can vary by several % TPM with fresh deep-frying oils, depending on the type.

The maximum duration of usage for the deep-frying oil cannot be derived from this.

Example: Fresh palm oil has a higher % TPM value than other deep-frying oils, but ages considerably slower.

Use of additives

The testo 270 is designed for the use of pure fats/oils. With the use of additives, deviations may occur.

Comparison of laboratory methods/testo 270

Deep-frying oil is a mixture of substances with different polarities. While ageing, the amount of the highly polar components increases. The chromatography separates the fat into a polar and a non-polar group. The proportion of the polar group compared to the total amount of deep-frying oil inspected is identified as the % TPM value (total polar materials).

The % TPM value of the column chromatography may vary slightly depending on the setting of the border between the polar and the non-polar group.

Depending on the type of fat, slight variations of the polarity in both groups (polar/non-polar) may occur which are not recogonized by the chromatography.

The testo 270, on the other hand, records the entire polarity of the deep-frying oil and thereby the actual polarity of both groups (polar/non-polar). The reading of the testo 270 may therefore be higher or lower than that of the column chromatography in individual cases.

An example of this is coconut oil, for which the testo 270 shows a higher TPM value than the chromatography. This fat is unsuitable for deep frying, however, and is therefore primarily used for pan frying.

Free fatty acids

The testo 270 measures the entire amount of polar materials in the deep-frying fat (% TPM) with which an evaluation of the charge of the oil due to deep frying is highly possible. For the evaluation of the age of the fat during storage, the free fatty acids (FFA) are used. FFA are not suitable for identifying the thermal charges of the oil. FFA cannot be measured with the testo 270.

Polymeric triglycerides (PTG)

The polymeric triglycerides are being used for the evaluation of deep-frying oils with increasing frequency. The results of this method are in most cases comparable with the % TPM value.

PTG ≈ % TPM/2

6.2. Performing measurements

WARNING

Risk of burns due to hot instrument parts (sensor and probe shaft)!

> Do not touch hot instrument parts with your hands.

> In the event of burns, immediately cool corresponding spot with cold water and see a doctor if necessary.

Observe the following notes in order to obtain correct measurement results:

- Switch off induction deep fat fryers during the measurement or remove a deep-frying oil sample as the electromagnetic field can lead to incorrect readings.
- Remove the product being deep fried from the oil and wait 5 min before measuring.
- Clean the sensor before every measurement or when changing from one deep-frying tank into the next, see **Cleaning the sensor**, page 23 .
- Keep the sensor away from metallic parts (e.g. deep-frying basket, walls of tank) as these may affect the measurement result. Minimum distance from metal parts: 1 cm per side.
- "Temperature skeining" in the oil may lead to measuring errors. Move instrument in the deep fryer.
- If measuring errors are suspected due to contained water: Repeat the measurement after 5 min (do not deep fry in this period, keep oil/fat at high temperature). If the new reading is lower, perform another

measurement after 5 min until the reading stabilizes.

- Exchange deep-frying oil as of approx. 24 % TPM. A different limit value applies in certain countries. If the measured values are above the country-specific limit value, the deep-frying oil must be changed.
- We recommend use of the wrist strap in order to secure the instrument against falling.

With activated Auto Hold function

1. Immerse sensor in the deep-frying oil. Note immersion depth!
- If the temperature is within the permissible measuring range (40 to 200 °C): **Auto** flashes in the display.
2. Wait until **Auto Hold** is shown in the display.
- Readings are automatically held by the instrument.
3. Read off readings.
4. To change to Measuring Mode: Briefly press **[⏻/Hold]** (< 1 s).

With deactivated Auto Hold function

1. Immerse sensor in the deep-frying oil. Note immersion depth!
2. If the temperature is within the permissible measuring range (40 to 200 °C): Wait for the equalization period to expire (approx. 20 s).
- The readings are displayed.
- The measurement is ended when the temperature display no longer changes.
3. To hold readings: Briefly press **[⏻/Hold]** (< 1 s).
- **Hold** is shown on the display.
- Readings are held.
4. Read off readings.
5. To change to Measuring Mode: Briefly press **[⏻/Hold]** (< 1 s).

6.3. Function test

For a simple function test without adjustment (accuracy +/- 3 % TPM[4]), we recommend a measurement during the commissioning of your new instrument in unused deep-frying oil at 150 to 180 °C.

We recommend performing the function test every time after refilling the deep fryer with fresh oil.

1. Perform measurement in unused deep-frying oil at 150 to 180 °C (see **Performing measurements**, page 20) .
2. Note reading.
3. Repeat steps 1 and 2 several times.

- The average of the readings is your specific reference value for subsequent instrument testing.

When changing the type of oil or the oil supplier, the reference value must be determined anew.

With implausible readings, we recommend the calibration or adjustment in the testo reference oil, see **Calibrating/adjusting the instrument**, page 25.

Your specific reference value:

_____

[4] typical, referred to testo internal reference, at an ambient temperature of 25 °C

7 Maintaining the product

7.1. Changing the batteries

CAUTION

Incorrectly inserted batteries may damage the instrument!

> Note the polarity when inserting the batteries.

Requirement: Instrument is switched off.

1. Open the battery compartment on the rear of the instrument.
2. Remove empty batteries from the holder and insert new batteries (type AAA).

- Instrument automatically switches on.

3. Close the battery compartment.

- Switch the instrument off, if necessary.

7.2. Cleaning the sensor

WARNING

Risk of burns due to hot instrument parts (sensor and probe shaft)!

> Do not touch hot instrument parts with your hands.
> Allow instrument to cool sufficiently before cleaning.
> In the event of burns, immediately cool corresponding spot with cold water and see a doctor if necessary.

CAUTION

Possible damage to the sensor!

> Do not remove cold oil residues from the sensor.
> Do not use any sharp-edged objects.
> Do not use aggressive cleaning agents and solvents.

> Use weak household cleaning agents, standard household rinsing agents, water or soap suds.
> Gently clean sensor with a soft paper towel, or rinse under running water.
> Carefully dry sensor with a soft paper towel.

With cold oil residues on the sensor

1. Immerse sensor in hot oil.
2. Allow sensor and probe shaft to cool until there is no longer a risk of burns.
3. Clean sensor before the oil residues cool down.

7.3. Cleaning the housing/TopSafe/wrist strap

Requirement: Instrument is switched off and TopSafe/wrist strap is not on the instrument.

CAUTION

Possible damage to housing/TopSafe/wrist strap!

> Do not use any sharp-edged objects.

> Do not use aggressive cleaning agents and solvents.

TopSafe and wrist strap can be cleaned in a dishwasher.

> Use weak household cleaning agents, standard household rinsing agents, water or soap suds.

> Clean housing/TopSafe/wrist strap with moist cloth.

> Dry housing/TopSafe/wrist strap.

7.4. Calibrating/adjusting the instrument

You can check the accuracy of the instrument by performing a comparative measurement with the testo reference oil (calibrate). If the reading differs too much from the reference value, future readings from the instrument can be adjusted to the reference value (adjustment).

- The testo 270 should be checked with the testo reference oil on a regular basis and adjusted, as needed (accuracy +/- 2.5 % TPM[5]). We recommend a monthly check as part of the quality assurance.
- We recommend always using the testo reference oil (order no. 0554 2650, 1 piece when calibrating/adjusting the sensor.
- The sensor is exposed to sizeable jumps in temperature and pollutants while in Measuring Mode. We therefore recommend having an annual test performed by Testo Customer Service. Further information can be found under www.testo.com.
- For measurements as part of a quality-assurance concept (e.g. ISO 9001), we recommend the annual renewal of a calibration certificate (accuracy +/- 2 % TPM[5]). Further information can be found under www.testo.com

Prepare calibration/adjustment

1. Clean sensor before the calibration/adjustment, see **Cleaning the sensor**, page 23.

When heating the reference oil, make sure that no water gets into the reference oil or onto the sensor. The reference oil must be heated to approx. 50 °C for calibration and adjustment.

2. Heat water in a container (e.g. a cup) to approx. 50 °C. Place closed reference oil bottle in the water bath for approx. 10 min (maximum water level to lower edge of sealing cap). Then briefly shake the closed reference oil bottle, for better heat distribution in the bottle.

[5] typical, referred to testo internal reference, at an ambient temperature of 25 °C

Perform calibration/adjustment

1. Switch on the instrument and during the display test, simultaneously hold down **[⏻/Hold]** and **[▲]** for approx. 3 s.

- **°C** or **F** lights up in the display.

2. Using **[⏻/Hold]** press through the configuration mode until **CAL** and **on** or **off** light up in the display.
3. Use **[▲]** or **[▼]** to switch on the calibration/adjustment function.
4. Confirm with **[⏻/Hold]**.

- **OIL** and **CAL** light up in the display.

> The accuracy of the calibration/adjustment is negatively influenced when the reference oil bottle is held in your hand.

5. Immerse sensor in reference oil. Note immersion depth!

- If the Alarm LED is activated: Alarm LED lights up orange.

6. Begin calibration/adjustment process with **[⏻/Hold]**. For faster recording of readings: Move sensor in the oil.

> The calibration/adjustment function is ended when the sensor is not immersed into or removed from the oil.

- Control keys are locked.
- If the Alarm LED is activated: Alarm LED lights up red.
- The measured TPM value and temperature are displayed.
- With a stable reading and activated Alarm LED: Control keys are released, Alarm LED lights up green.

7. Compare the value shown in the display with the nominal value, which is specified on the label of the reference oil bottle.

> If the deviation > 1 %, an adjustment should be performed. Continue with step **8**.

> If the deviation </= 1 %, no adjustment is required. Continue with step **9**.

> Adjustment with reference oil impairs the accuracy by 0.5 % TPM compared to the factory adjustment.

8. Using **[▲]** or **[▼]** set the TPM value to the value that is specified on the label of the reference oil bottle.
9. Confirm with **[⏻/Hold]**.

- **rSt** and **on** or **off** light up.

10. Using **[▲]** or **[▼]** select **on** (= delete adjustment value and reset to factory setting) or **off** (= no reset of the adjustment value).
11. Confirm with **[⏻/Hold]**.

- All set values are applied.
- Instrument changes to Measuring Mode.

8 Tips and assistance

8.1. Questions and answers

Indications in the display	Possible causes/solution
↓ lights up and **40** flashes	Permissible measuring range undershot > Increase oil temperature.
↑ lights up and **200** flashes	Permissible measuring range exceeded > Decrease oil temperature.
Battery symbol lights up	Charge status of the batteries is low (approx. 3 h remaining life) > Change batteries, if necessary, see Changing the batteries page 23.
Battery symbol flashes	Batteries empty (approx. 1.5 h remaining life) > Change batteries, see **Changing the batteries** page 23.
000 lights up	Sensor not in oil > Immerse sensor in oil.
Alarm lights up and flashes	TPM limit values locked > Unlock TPM limit values, see Locking/unlocking the TPM limit values page 16.
Conf lights up and flashes	Configuration mode locked > Unlock configuration mode, see Locking/unlocking the configurations page 18.
Err 1 lights up	TPM sensor defective > Contact Testo-Customer Service or your dealer.
Err 2 lights up	Temperature sensor defective > Contact Testo-Customer Service or your dealer.

Indications in the display	Possible causes/solution
Err 3 lights up	TPM sensor and temperature sensor defective > Contact Testo-Customer Service or your dealer.
Err 4 lights up	Other defect > Contact Testo-Customer Service or your dealer.
SEr lights up	When entering the adjustment value, a deviation from the TPM value of greater than 10 % TPM occurs. > We recommend a technical inspection of the instrument by Testo-Customer Service.

If we could not answer your question, please contact your dealer or Testo-Customer Service. For contact details see the rear side of this document or the web page www.testo.com/service-contact

8.2. Accessories and spare parts

Description	Article no.
testo 270 incl. TopSafe and wrist strap, in aluminium case, testo reference oil	0563 2700
Aluminium case for testo 270 (spare part)	0516 2650
TopSafe, indestructible protection case (spare part)	0192 0963
Wrist strap for TopSafe (spare part)	0192 1279
ISO calibration certificate for testo 270, calibration points 3 % and 24 % TPM	0520 0028
Testo reference oil (1 pc.)	0554 2650

For further accessories and spare parts, please refer to the product catalogues and brochures or look up our website: www.testo.com

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