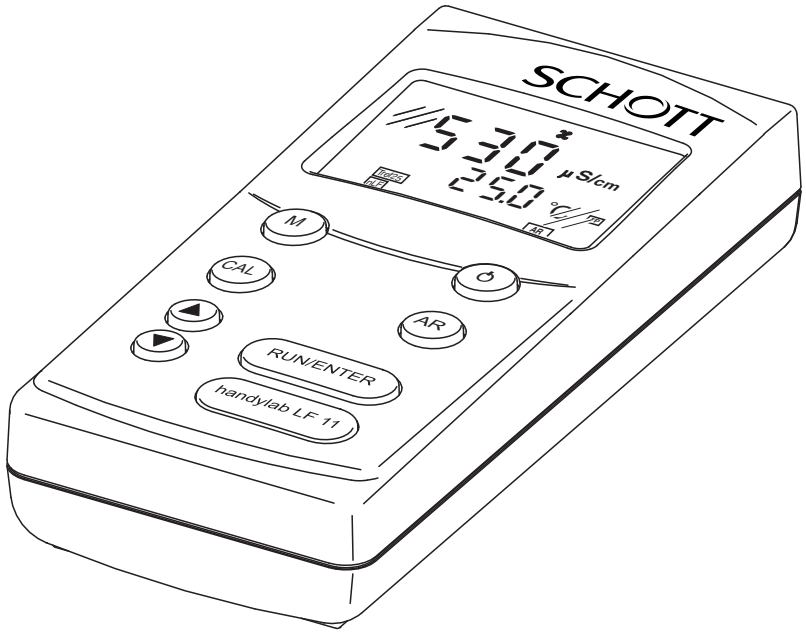
Operating manual

SCHOTT®
Instruments

handylab LF 11



Conductivity Meter

ba75365d04 01/2011

Accuracy when going to press

The use of advanced technology and the high quality standard of our instruments are the result of continuous development. This may result in differences between this operating manual and your instrument. Also, we cannot guarantee that there are absolutely no errors in this manual. Therefore, we are sure you will understand that we cannot accept any legal claims resulting from the data, figures or descriptions.

Warranty

We guarantee the instrument described for 3 years from the date of purchase.
The instrument warranty covers manufacturing faults that are discovered within the warranty period. The warranty does not cover components that are replaced during maintenance work, e.g. batteries.

The warranty claim extends to restoring the instrument to readiness for use but not, however, to any further claim for damages. Improper handling or unauthorized opening of the instrument invalidates any warranty claim.

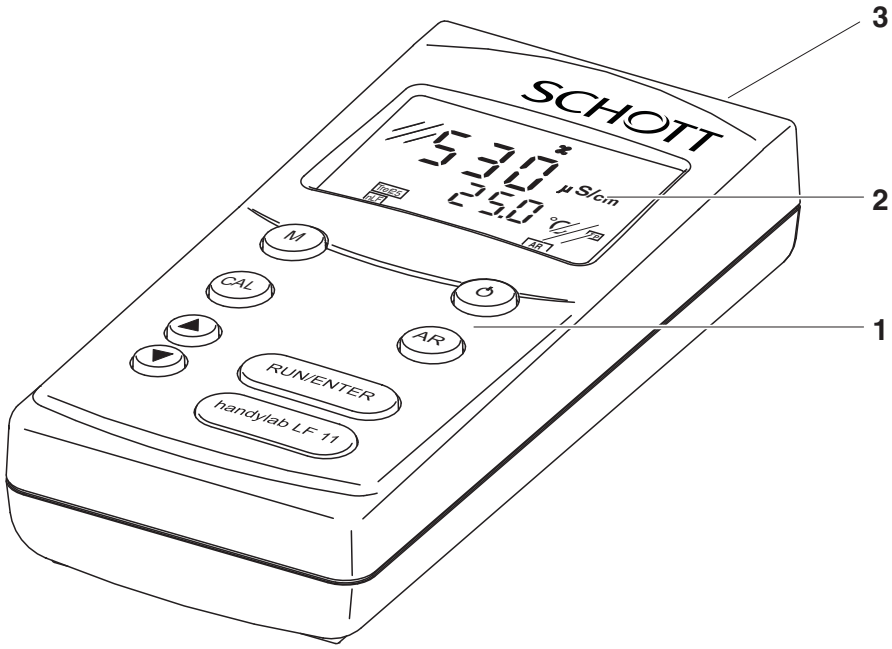
Copyright

handylab LF 11 - List of contents

1 Overview

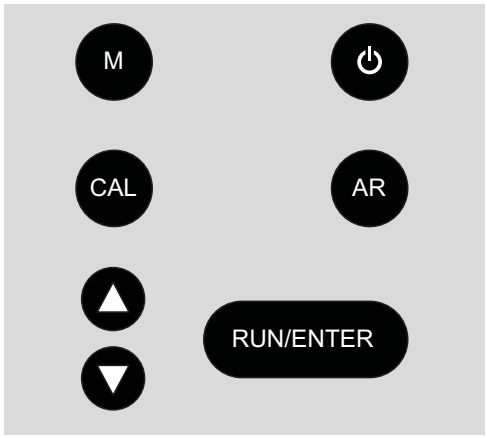
The compact precision handheld meter handylab LF 11 enables you to carry out conductivity measurements rapidly and reliably.
The handylab LF 11 provides the maximum degree of operating comfort, reliability and measuring certainty for all applications.

The proven procedure for adjusting or setting the cell constant and the special *AutoRead* function support you in your work with the handylab LF 11.



1	Keypad
2	Sample display
3	Jack field

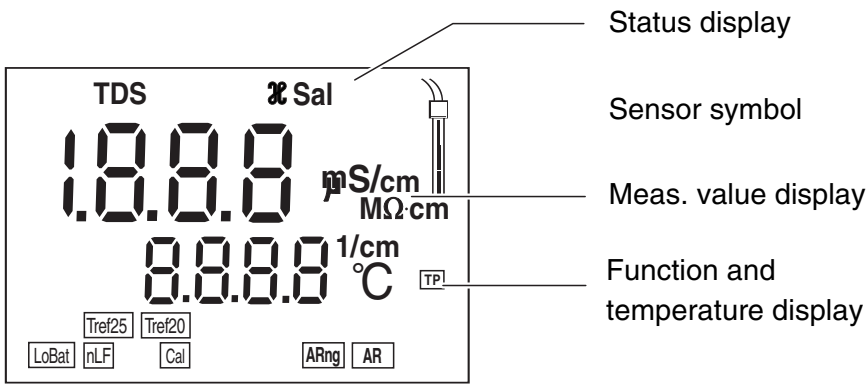
1.1 Keypad



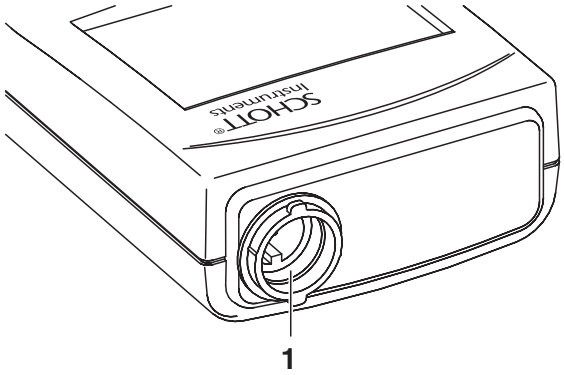
Key functions

M	Select the measuring mode **<M>**: – Conductivity/Resistivity – Salinity – Total dissolved solids (TDS)
⏻	Switch measuring instrument on/off **<ON/OFF>**
CAL	– Determine or set up the cell constant – Select temperature compensation **<CAL>**
AR	Activate/deactivate the AutoRead function **<AR>**
▲	Increase values, scroll **<▲ >**
▼	Decrease values, scroll **<▼>**
RUN/ENTER	Confirm entries, start AutoRead **<RUN/ENTER>**

1.2 Display



1.3 Jack field



1	Conductivity measuring cell

Caution
Only connect conductivity measuring cells to the measuring instrument that cannot return any voltages or currents that are not allowed
(> SELV and > current circuit with current limiting).
Nearly all measuring cells - especially SI Analytics measuring cells - fulfill these conditions.

1.4 Technical Data

Dimensions and weight	Length [mm]	172
	Width [mm]	80
	Height [mm]	37
	Weight [kg]	Approx. 0.3
Mechanical structure	Type of protection	IP 66
Electrical safety	Protective class	III
Test certificates	cETLus, CE	
Ambient conditions	Storage	- 25 °C ... + 65 °C
	Operation	-10 °C ... + 55 °C
	Relative atmospheric humidity	< 90 % of annual average
Measuring ranges	χ [µS/cm]	0.000 ... 1.999 (only for cell constant = 0.010 cm^{-1}) 0.00 ... 19.99 (only at a cell const. = 0.010 cm^{-1} and cell const. = 0.090 ... 0.110 cm^{-1}) 0.0 ... 199.9 0 ... 1999
	χ [mS/cm]	0.00 ... 19.99 0.0 ... 199.9 0 ... 500
	Spec. resistance [MΩ*cm]	0.000 ... 1.999 0.00 ... 19.99 0.0 ... 199.9 0 ... 1999
	SAL	0.0 ... 70.0 according to the IOT table
	TDS [mg/l]	0 ... 1999 Factor can be set to between 0.40 ... 1.00
	T [°C]	– 5.0 ... + 105.0

Accuracy (±1 digit)	χ , Resistivity	No compensation: 0.5 % Nonlinear compensation nLF : Precision ± 0.5 % ± 0.5 % Sample temperature 0 °C ... 35 °C according to EN 27 888; 35 °C ... 50 °C extended nLF function Linear compensation Lin Accuracy ± 0.5 % Sample temperature 10 °C ... 75 °C (The accuracy percentage always refers to the measured value.)
	SAL	Range 0.0 ... 42.0 Accuracy ± 0.1 ± 0.2 Sample temperature 5 °C ... 25 °C 25 °C ... 30 °C
	TDS [mg/l]	1
	T [°C]	NTC 30: Accuracy ± 0.1 PT 1000: Accuracy ± 0.5 ± 0.1 ± 1 Operating temperature 0 °C ... 15 °C 5 °C ... 35 °C 35 °C ... 55 °C
Cell constant, calibration	C [cm^{-1}]	0.450 ... 0.500 0.800 ... 1.200
Cell constant, selection	C [cm^{-1}]	0.010 fixed 0.090 ... 0.110 0.250 ... 2.500
Reference temperature	Tref	Can be set to 20 °C or 25 °C
Temperature input	Manual [°C]	-5 ... +100

Power supply	Batteries	4 x 1.5 V alkali-manganese batteries, Type AA
	Operational life	Approx. 2500 operating hours (depending on conductivity)
Applicable guidelines and norms	EMC	EC guideline 2004/108/EC EN 61326-1 EN 61000-3-2 EN 61000-3-3 FCC Class A
	Instrument safety	EC guideline 2006/95/EC EN 61010-1 ANSI/UL 61010-1 CAN/CSA-C22.2 No. 61010-1
	Climatic class	VDI/VDE 3540
	Type of protection	EN 60529

FCC Class A Equipment Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2 Safety

This operating manual contains basic instructions that you must follow during the commissioning, operation and maintenance of the conductivity measuring instrument. Consequently, all responsible personnel must read this operating manual before working with the measuring system. The operating manual must always be available within the vicinity of the measuring system.

Target group

The measuring instrument was developed for work in the field and in the laboratory.
We assume that, as a result of their professional training and experience, the operators will know the necessary safety precautions to take when handling chemicals.

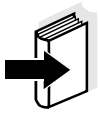
Safety instructions

The individual chapters of this operating manual use safety instructions such as the label shown below to indicate various hazards or dangers:

Caution
indicates instructions that must be followed precisely in order to avoid the possibility of slight injuries or damage to the instrument or the environment.

Further notes

Note
indicates notes that draw your attention to special features.



Note
indicates cross-references to other documents, e.g. operating manuals.

2.1 Authorized use

The authorized use of the measuring instrument consists exclusively of the measurement of conductivity, salinity, temperature and TDS (total dissolved solids) in the field and laboratory.
The technical specifications as given in section 1.4 TECHNICAL DATA must be observed. Only the operation and running of the measuring instrument according to the instructions given in this operating manual is authorized.
Any other use is considered to be **unauthorized**.

2.2 General safety instructions

This instrument is built and inspected according to the relevant guidelines and norms for electronic measuring instruments (see section 1.4 TECHNICAL DATA).
It left the factory in a safe and secure technical condition.

Function and operating safety

The smooth functioning and operational safety of the measuring instrument can only be guaranteed if the generally applicable safety measures and the specific safety instructions in this operating manual are followed during operation.

The smooth functioning and operational safety of the measuring instrument can only be guaranteed under the environmental conditions that are specified in section 1.4 TECHNICAL DATA.

If the instrument was transported from a cold environment to a warm environment, the formation of condensate can lead to the faulty functioning of the instrument. In this event, wait until the temperature of the instrument reaches room temperature before putting the instrument back into operation.

Safe operation

If safe operation is no longer possible, the instrument must be taken out of service and secured against inadvertent operation!
Safe operation is no longer possible if the measuring instrument:

- has been damaged in transport
- has been stored under adverse conditions for a lengthy period of time
- is visibly damaged
- no longer operates as described in this manual.

If you are in any doubt, please contact the supplier of the instrument.

Obligations of the purchaser

The purchaser of the measuring instrument must ensure that the following laws and guidelines are observed when using dangerous substances:

- EEC directives for protective labor legislation
- National protective labor legislation
- Safety regulations
- Safety datasheets of the chemical manufacturers.

3 Commissioning

3.1 Scope of delivery

- Handheld meter, handylab LF 11
- Operating manual and short operating manual
- 4 batteries, 1.5 V Mignon type AA (in the instrument)

4 Operation

4.1 Switching on the measuring instrument

1	Connect a conductivity measuring cell to the measuring instrument.
2	Press the **<ON/OFF>** key. The display test appears briefly on the display. Subsequently, the selected cell constant and the temperature compensation that was set up appear for approx. one second one after the other. The measuring instrument then automatically switches to the measuring mode that was last selected.

Note
The measuring instrument has an energy saving feature to avoid unnecessary battery depletion. The energy saving feature switches the measuring instrument off if no key has been pressed for an hour. The energy saving feature is not active when the AutoStore function is active.

4.2 Measuring

4.2.1 General information

Preparatory activities

Perform the following preparatory activities when you want to measure:

1	Connect the conductivity measuring cell to the measuring instrument.
2	In conjunction with the measuring cell, check or calibrate the measuring instument. How to calibrate is described in section 4.3.
3	Select the measuring mode with **<M>**.

Temperature sensor

Only carry out measurements with a temperature sensor. The temperature sensor is shown on the display by *TP*.

Note
The conductivity measuring instrument automatically recognizes the type of the temperature sensor used. This enables to connect measuring cells with the NTC30 or Pt1000.

Temperature compensation

The instrument has a nonlinear temperature compensation that can be switched off (see section 4.3.3 SETTING THE TEMPERATURE COMPENSATION TC).

Reference temperature, Tref

The reference temperature (Tref) can be switched between 20 °C and 25 °C. It appears on the display as *Tref20* or *Tref25*. To switch over the reference temperature, see section 4.4 CONFIGURATION.

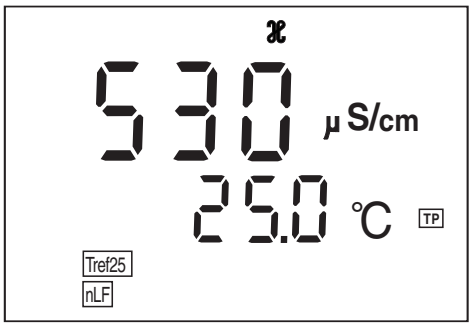
4.2.2 Conductivity / Resistivity

Note
You can display measured values in the units µS/cm (conductivity) or MΩcm (resistivity). This setting is described in section 4.4 CONFIGURATION.

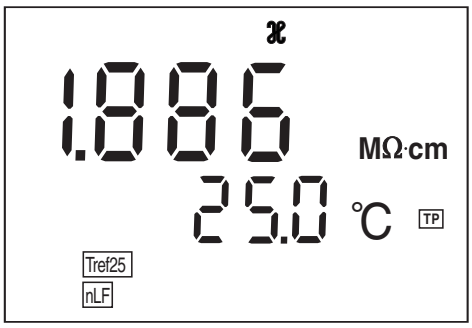
Thus, you can carry out conductivity measurements or measurements of the resistivity:

1	Perform the preparatory activities according to section 4.2.1.
2	Immerse the conductivity measuring cell in the test sample.
3	Press the **<M>** key until **χ** appears on the status display. Depending on the setting, one of the following display indicators appears on the display:

Conductivity µS/cm



Resistivity MΩ·cm

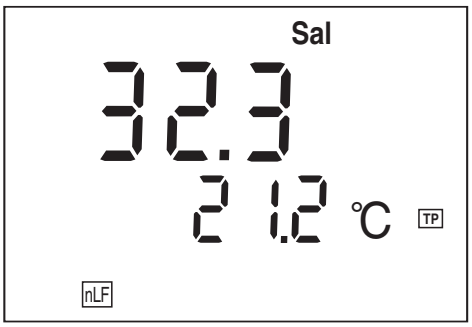


4	Wait for a stable measured value.

4.2.3 Salinity

You can measure the salinity as follows:

1	Perform the preparatory activities according to section 4.2.1.
2	Immerse the conductivity measuring cell in the test sample.
3	Press the **<M>** key until *Sal* appears on the status display. The salinity value appears on the display.

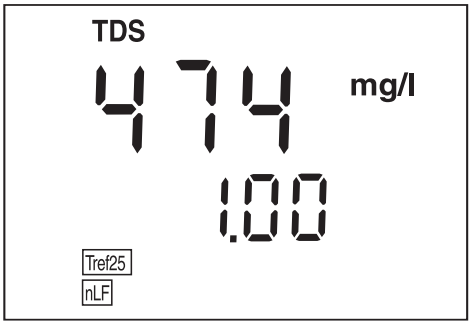


4	Wait for a stable measured value.

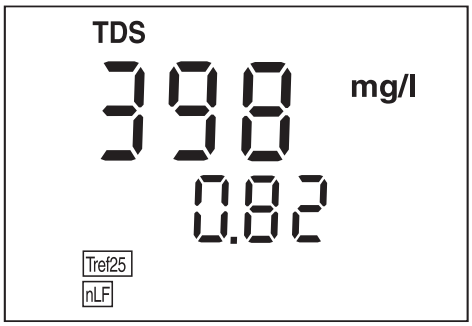
4.2.4 TDS (Total dissolved solids)

You can measure the total dissolved solids as follows:

1	Perform the preparatory activities according to section 4.2.1.
2	Immerse the conductivity measuring cell in the test sample.
3	Press the **<M>** key until *TDS* appears on the status display. The value of the total dissolved solids appears in the upper display line. The TDS factor appears in the lower display line.



4	Using **<▲>** **<▼>**, set the TDS factor (0.40 ... 1.00). (The TDS factor has to be determined by a comparison measurement before.)

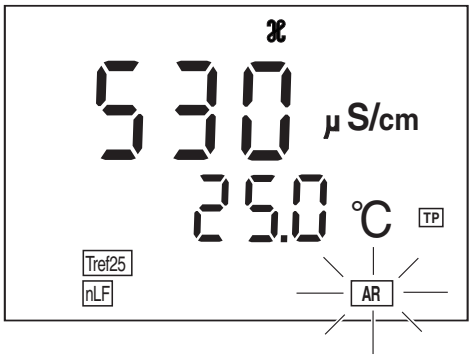


5	Wait for a stable measured value.

AutoRead AR (drift control)

The AutoRead function (drift control) checks the stability of the measurement signal. The stability has a considerable effect on the reproducibility of the measured value.

1	Select the required measuring mode with **<M>**.
2	Activate the AutoRead function with **<AR>**. The current measured value is frozen (hold function).
3	Start AutoRead with **<RUN/ENTER>**. *AR* flashes until a stable measured value is reached.



4	If necessary, start the next AutoRead measurement with **<RUN/ENTER>**.
5	To terminate AutoRead: Press the **<AR>** key.

Note
The current AutoRead measurement can be terminated at any time (accepting the current value) by pressing **<RUN/ENTER>**.

4.3 Determining/setting up the cell constant [C]

Why determine/set up the cell constant?

Aging slightly changes the characteristics of the cell, e. g. by coatings. As a result, an inexact measured value is displayed. The original characteristics of the cell can often be restored by cleaning the cell. Calibration determines the current cell constant and stores it in the instrument.
Thus, you should calibrate at regular intervals (we recommend: every 6 months).

Procedure

The cell constant is determined in the control standard, 0.01 mol/l KCl.

You can determine the actual cell constant of the conductivity measuring cell by calibrating with the control standard in the following ranges:

- 0.450 ... 0.500 cm^{-1}
- 0.800 ... 1.200 cm^{-1}

Besides, you can set the cell constant manually in the following ranges:

- 0.090 ... 0.110 cm^{-1}
- 0.250 ... 2.500 cm^{-1}

The fixed cell constant, 0.010 cm^{-1} can also be selected. It is not necessary to calibrate or adjust it.

Cell constants outside the above mentioned ranges cannot be calibrated.

Calibration evaluation

After the calibration, the measuring instrument automatically evaluates the current status of the calibration. The evaluation appears on the display.

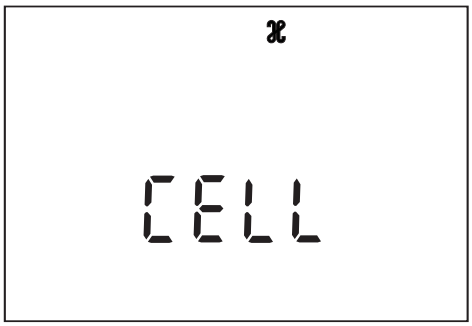
Display	Cell constant [cm^{-1}]
	0.450 ... 0.500 cm^{-1} 0.800 ... 1.200 cm^{-1}
E3 Eliminate the error according to chapter 6 WHAT TO DO IF...	outside the ranges 0.450 ... 0.500 cm^{-1} or 0.800 ... 1.200 cm^{-1}

4.3.1 Determining the cell constant (calibrating in the control standard)

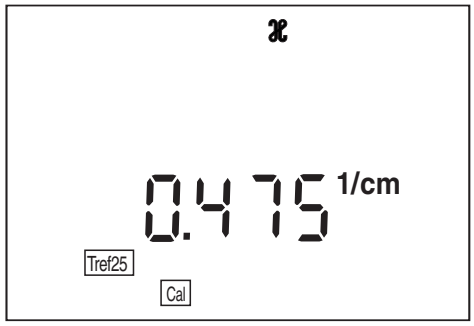
Note
This method of automatically determining the cell constant by calibration with the 0.01 mol/l KCL standard solution can only be used for measuring cells with cell constants in the range 0.450 ... 0.500 cm^{-1} or 0.800 ... 1.200 cm^{-1}.

This is how you can determine the cell constant:

1	Press the **<CAL>** key until *CELL* appears on the display.

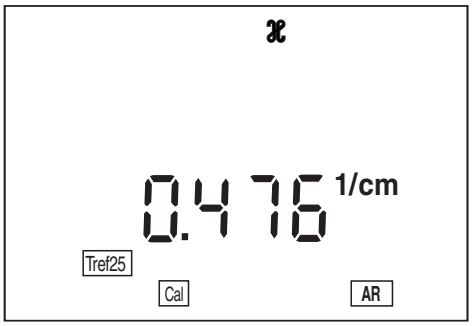


2	Press the **<RUN/ENTER>** key.
3	Press the **<CAL>** key repeatedly, until the calibrated cell constant appears on the display: *CAL* appears on the display.



4	The displayed value is the current, calibrated cell constant. You can: – accept this setting for measuring with **<M>** or – continue with step 5 and start a new calibration.
5	Immerse the measuring cell in the control standard solution, 0.01 mol/KCl.

6	Press the **<RUN/ENTER>** key. – If no temperature sensor is connected, enter the current temperature of the solution with **<▲> <▼>** and confirm with **<RUN/ENTER>**. – If a temperature sensor is connected, the AR measurement to determine the cell constant starts. The *AR* display indicator flashes until a stable signal is reached. The cell constant determined is displayed. The measuring instrument automatically stores the cell constant.



Note
If the error message E3 appears, refer to chapter 6 WHAT TO DO IF...

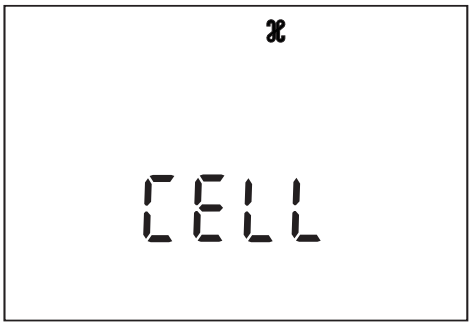
4.3.2 Setting the cell constant manually

Note
The cell constant to be set must either be taken from the operating manual of the measuring cell or is printed on the measuring cell.

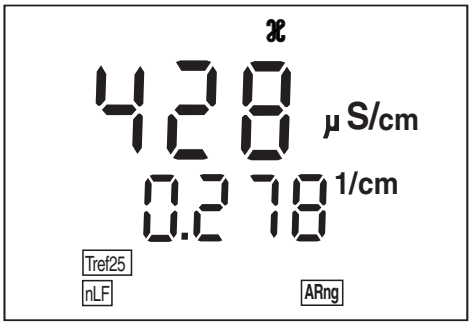
You can set the cell constant manually as follows:

Range
0.250 ... 2.500 cm^{-1}

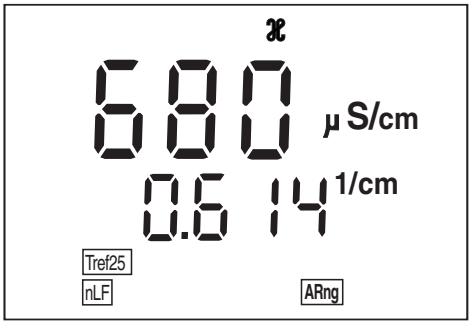
1	Press the **<CAL>** key repeatedly until *CELL* appears on the display.



2	Press the **<RUN/ENTER>** key.
3	Press the **<CAL>** repeatedly until the adjustable cell constant, e.g. 0.278 cm^{-1} appears.



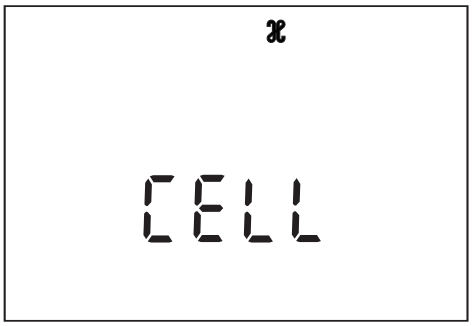
4	Set the cell constant to be used with **<▲> <▼>** , e.g. 0.614 cm^{-1}.



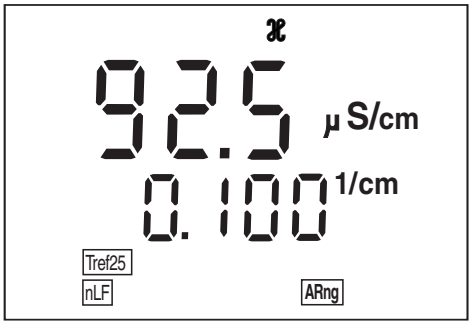
5	To return to the measuring mode: Press the **<M>** key. From now on, the cell constant 0.614 cm^{-1} will be used.

Range
0.090 ... 0.110 cm^{-1}

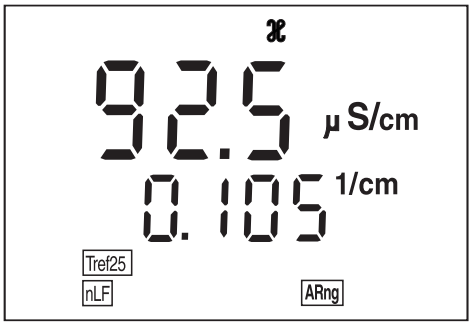
1	Press the **<CAL>** key repeatedly until *CELL* appears on the display.



2	Press the **<RUN/ENTER>** key.
3	Press the **<CAL>** key repeatedly until a cell constant in the range 0.090 ... 0.110 cm^{-1} appears on the display.



4	Set the cell constant to be used with **<▲> <▼>** , e.g. 0.105 cm^{-1}.

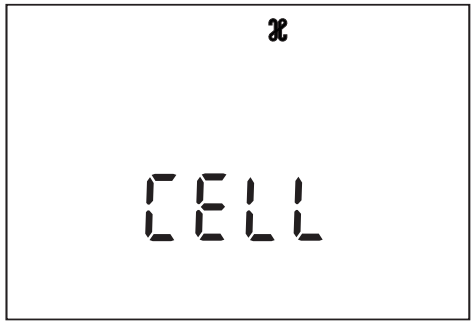


5	To return to the measuring mode: Press the **<M>** key. Now this setting is accepted for measuring.

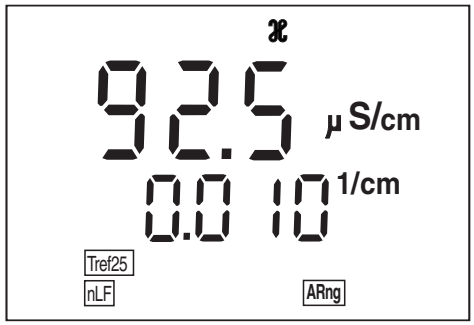
Setting the fixed cell constant 0.010 cm^{-1}

You can set the fixed value 0.010 cm^{-1} for the cell constant as follows:

1	Press the **<CAL>** key repeatedly until *CELL* appears on the display.



2	Press the **<RUN/ENTER>** key.
3	Press the **<CAL>** key repeatedly until the cell constant 0.010 cm^{-1} appears on the display.



4	To return to the measuring mode: Press the **<M>** key. From now on, the cell constant 0.010 cm^{-1} will be used.

4.3.3 Setting the temperature compensation TC

The calculation of the temperature compensation is based on the preset reference temperature, Tref 20 or Tref 25 (see section 4.4 CONFIGURATION).

You can select one of the following temperature compensation methods:

- **Nonlinear temperature compensation (*nLF*)**
  according to EN 27 888
- **Linear temperature compensation (*Lin*)**
  with selectable coefficients of 0.001 ... 3.000 %/K
- **No temperature compensation (- - - -)**

Note
Select the following temperature compensations given in the table according to the respective test sample:

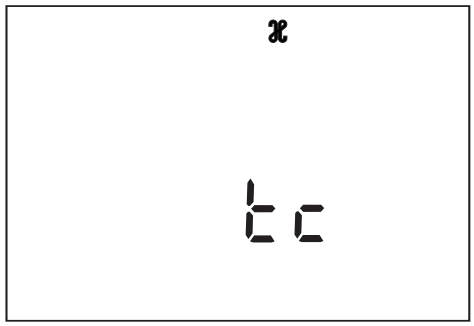
Application tips

Test sample	Temperature compensation (TC)	Display indicator
Natural water (ground water, surface water and drinking water)	nLF according to DIN 38404 EN 27 888	nLF
Ultrapure water	nLF according to DIN 38404 EN 27 888	nLF
Other aqueous solutions	Set linear temperature coefficient 0.001 ... 3.000 %/K	Lin
Salinity (seawater)	Automatically nLF according to IOT	Sal, nLF

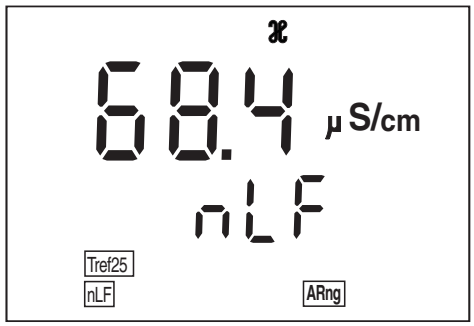
Selecting the nonlinear temperature compensation

You can select the nonlinear temperature compensation as follows:

1	Press the **<CAL>** key repeatedly until *tc* appears on the display.



2	Press the **<RUN/ENTER>** key.
3	Press the **<CAL>** key repeatedly until *nLF* appears on the display.

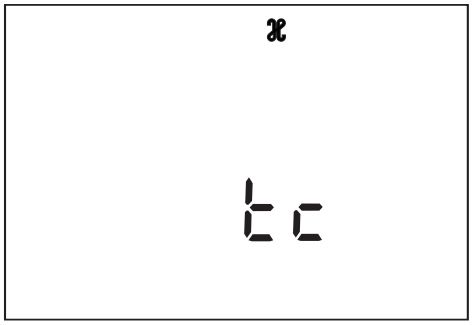


4	To return to the measuring mode: Press the **<M>** key. From now on, nLF will be used for the temperature compensation.

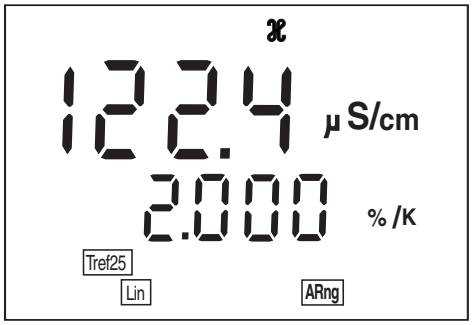
Selecting the linear temperature compensation

You can select the linear temperature compensation as follows:

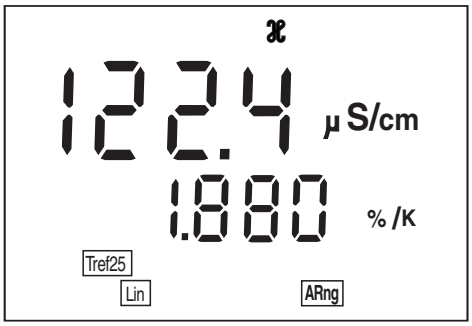
1	Press the **<CAL>** key repeatedly until *tc* appears on the display.



2	Press the **<RUN/ENTER>** key.
3	Press the **<CAL>** key repeatedly until the adjustable linear temperature coefficient appears on the display.



4	Set the temperature coefficient with **<▲> <▼>** , e.g. 1.880 %/K.

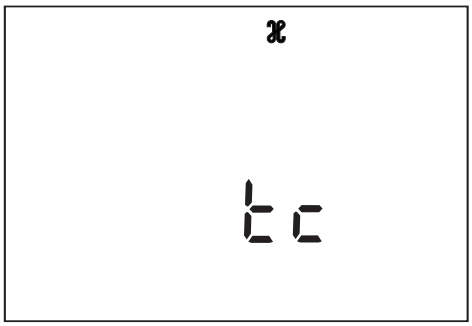


5	To return to the measuring mode: Press the **<M>** key. From now on, the adjusted linear temperature coefficient will be used for the temperature compensation.

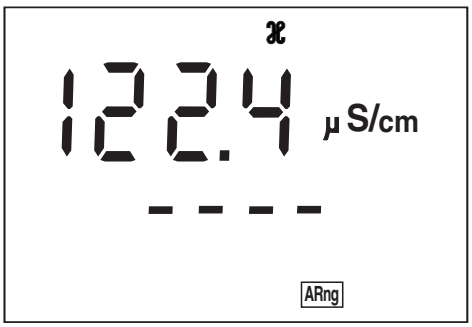
Switching the temperature compensation off

You can switch off the temperature compensation as follows:

1	Press the **<CAL>** key repeatedly until *tc* appears on the display.



2	Press the **<RUN/ENTER>** key.
3	Press the **<CAL>** key repeatedly until the following display appears.



4	The temperature compensation is switched off.
5	To return to the measuring mode: Press the **<M>** key. From now on, the instrument will measure without temperature compensation.

4.4 Configuration

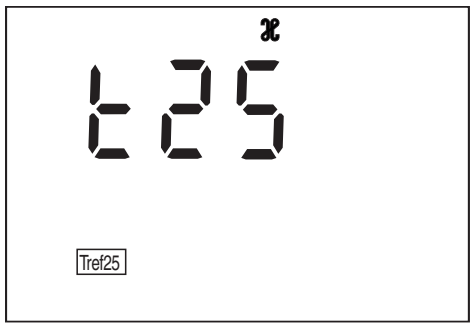
You can adapt the measuring instrument to your individual requirements. To do this, the following parameters can be changed (the status on delivery is marked in bold):

Reference temperature	– **25 °C (TREF25)** – 20 °C (TREF20)
Display of the measured value as conductivity or resistivity	**S/cm** or MΩ

Note
You can leave the configuration menu at any time with **<M>** . The parameters that have already been changed are stored.

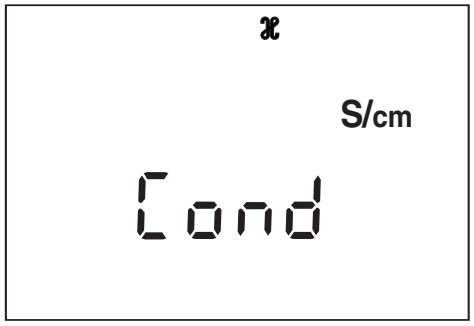
1	Switch off the measuring instrument.
2	Press the **<M>** key and hold it down.
3	Press the **<ON/OFF>** key. The display test appears briefly on the display. *t25* appears on the display.

Reference temperature



4	Using **<▲> <▼>**, switch between *t25* and *t20*.
5	Confirm with **<RUN/ENTER>**. *Cond* appears on the display.

Display of the measured value as conductivity / resistivity



6	Using **<▲> <▼>**, switch between *S/cm* and *MΩcm*.
7	Confirm with **<RUN/ENTER>**. The measuring instrument automatically switches to the measuring mode.

4.5 Reset

Measurement parameters

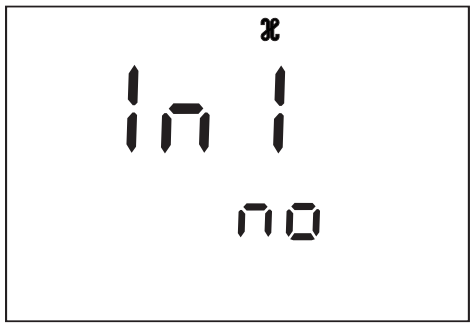
The following measured parameters *(χ Inl)* are reset to the default condition:

Measuring mode	χ
Cell constant	0.475 cm^{-1} (calibrated) 0.475 cm^{-1} (set up)
Temperature compensation	nLF
Reference temperature	Tref25
Temperature coefficient of the linear temperature compensation	2.000 %/K
TDS factor	1.00

Note
The calibration data gets lost when the measuring parameters are reset. Recalibrate after performing a reset.

Resetting the measuring parameters

1	Press the **<RUN/ENTER>** key and hold it down.
2	Press the **<CAL>** key.



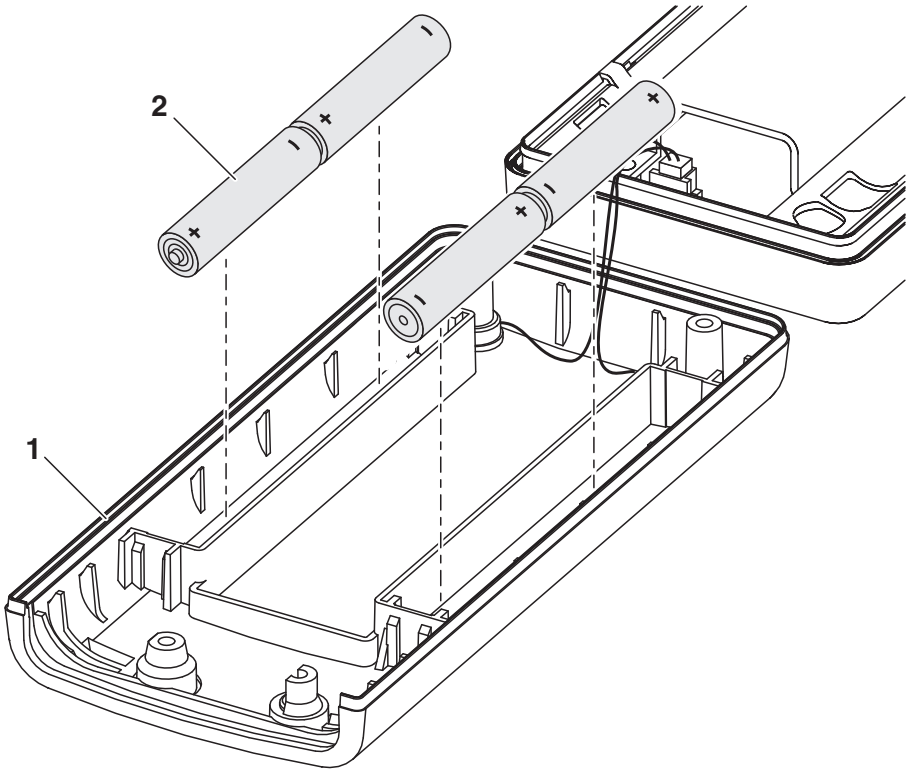
3	Using **<▲> <▼>**, switch between *no* and *YES*. *YES*: Resetting the measuring parameters *no*: Retaining settings.
4	Confirm with **<RUN/ENTER>**. The measuring instrument automatically switches to the measuring mode.

5 Maintenance, cleaning, disposal

5.1 Maintenance

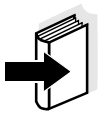
The measuring instrument is almost maintenance-free.
The only maintenance task is replacing the batteries.
LoBat indicates that the batteries should be changed. The batteries are then largely depleted.

Replacing the batteries



1	Open the housing after the instrument has been switched off: – Undo the four screws on the underside of the instrument – Pull down the lower cover (1).
2	If necessary, take the four depleted batteries (2) out of the battery compartment.
3	Place four new batteries (type Mignon AA) in the battery compartment.
4	Close the lower cover (1).

Caution
Make sure that the poles of the batteries are the right way round.
The ± signs on the batteries must correspond to the ± signs in the battery compartment.
Only use leakproof alkaline manganese batteries.



Note
For the maintenance of the measuring cells, follow the corresponding operating manual.

5.2 Cleaning

Occasionally wipe the outside of the measuring instrument with a damp, lint-free cloth. Disinfect the housing with isopropanol as required.

Caution
The housing is made of a synthetic material (ABS). Thus, avoid contact with acetone and similar detergents that contain solvents. Remove any splashes immediately.

5.3 Disposal

Packing

This measuring instrument is sent out in a protective transport packing. We recommend: Keep the packing material. The original packing protects the instrument against damage during transport.

Batteries

This note refers to the battery regulation that applies in the Federal Republic of Germany. We would ask end-consumers in other countries to follow their local statutory provisions.

Note
This instrument contains batteries. Batteries that have been removed must only be disposed of at the recycling facility set up for this purpose or via the retail outlet.
It is illegal to dispose of them in household refuse.

Measuring instrument

Dispose of the measuring instrument as electronic waste at an appropriate collection point. It is illegal to dispose of the instrument in household refuse.

6 What to do if...

LoBat display

Cause	Remedy
– Batteries almost empty	– Replace batteries (see section 5.1 MAINTENANCE)

Instrument does not react to key-stroke

Cause	Remedy
– Operating condition undefined or EMC load unallowed	– Processor reset: Press the **<CAL>** and **<ON/OFF>** keys at the same time and release them again. The software version is displayed.

Error message OFL

Cause	Remedy
The measured value lies outside the measuring range	
– Measuring cell not connected	– Connect measuring cell
– Cable broken	– Replace measuring cell

Error message E3

Cause	Remedy
– Measuring cell contaminated	– Clean cell and replace it if necessary
– Unsuitable calibration solution	– Check calibration solutions

Display to

Cause	Remedy
– Time-out of the interface	– Check the instrument that is connected

7 Lists

This chapter provides additional information and orientation aids.

Abbreviations The list of abbreviations explains the indicators and the abbreviations that appear on the display and in the manual.

Specialist terms The glossary briefly explains the meaning of the specialist terms. However, terms that should already be familiar to the target group are not described here.

Index The index will help you to find the topics that you are looking for.

Abbreviations

$\mathcal{X}$	Conductivity value (international γ)
AR	AutoRead (drift control)
ARng	Automatic range switching Measuring instrument measures with highest resolution
C	Cell constant [cm^{-1}] (internat. k)
°C	Temperature unit, degrees Celsius
Cal	Calibration
InI	Initialization Resets individual basic functions to the status they had on delivery
Lin	Linear temperature compensation
LoBat	Batteries almost empty(Low Battery)
nLF	Nonlinear temperature compensation
OFL	Display range exceeded (Overflow)
SELV	Safety Extra Low Voltage
TC	Temperature coefficient (internat. α)
TDS	Total Dissolved Solids
TP	Temperature measurement active (Temperature Probe)
T_{Ref} 20/T20	Reference temperature of 20 °C
T_{Ref} 25/T25	Reference temperature of 25 °C

Glossary

Adjusting To manipulate a measuring system so that the relevant value (e. g. the displayed value) differs as little as possible from the correct value or a value that is regarded as correct, or that the difference remains within the tolerance.

AutoRange Name of the automatic selection of the measuring range.

AutoRead Name for a function to check the stability of the measured value.

Calibration Comparing the value from a measuring system (e. g. the displayed value) to the correct value or a value that is regarded as correct. Often, this expression is also used when the measuring system is adjusted at the same time (see adjusting).

Cell constant, k Characteristic quantity of a conductivity measuring cell, depending on the geometry.

Conductivity Short form of the expression, specific electrical conductivity. It is a measured value of the ability of a substance to conduct an electric current. In water analysis, the electrical conductivity is a dimension for the ionized substances in a solution.

Conductometry Name of the conductivity measuring technique.

Measured parameter The measured parameter is the physical dimension determined by measuring, e. g. pH, conductivity or D. O. concentration.

Measured value The measured value is the special value of a measured parameter to be determined. It is given as a combination of the numerical value and unit (e. g. 3 m; 0.5 s; 5.2 A; 373.15 K).

Measuring system The measuring system comprises all the devices used for measuring, e. g. measuring instrument and probe. In addition, there is the cable and possibly an amplifier, terminal strip and armature.

Molality Molality is the quantity (in Mol) of a dissolved substance in 1000 g solvent.

Reference temperature Fixed temperature value to compare temperature-dependent measured values. For conductivity measurements, the measured value is converted to a conductivity value at a reference temperature of 20 °C or 25 °C.

Reset Restoring the original condition of all settings of a measuring system.

Resistance Short name for the specific electrolytic resistance. It corresponds to the reciprocal value of the electrical conductivity.

Resolution Smallest difference between two measured values that can be displayed by a measuring instrument.

Slope The slope of a linear calibration function.

Standard solution	The standard solution is a solution where the measured value is known by definition. It is used to calibrate a measuring system.
TDS	Total dissolved solids
TDS factor	In conductometric measurements, the measuring instrument calculates the total dissolved solids (TDS) from the electric conductivity of the test sample. For the calculation, a simple multiplication factor between 0.4 and 1.0 suffices. The exact factor depends on the quality of the water to be examined and has to be determined for each water type.
Temperature coefficient	Value of the slope of a linear temperature function.
Temperature compensation	Name of a function that considers the temperature influence on the measurement and converts it accordingly. Depending on the measured parameter to be determined, the temperature compensation functions in different ways. For conductometric measurements, the measured value is converted to a defined reference temperature. For potentiometric measurements, the slope value is adjusted to the temperature of the test sample but the measured value is not converted.
Temperature function	Name of a mathematical function expressing the temperature behavior of a test sample, a probe or part of a probe.
Test sample	Designation of the sample ready to be measured. Normally, a test sample is made by processing the original sample. The test sample and original sample are identical if the test sample was not processed.

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