WARRANTY, SERVICE, OR RECALIBRATION

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Traceable® Products are ISO 9001:2015 Quality-Certified by DNV and ISO/IEC 17025:2017 accredited as a Calibration Laboratory by A2LA.

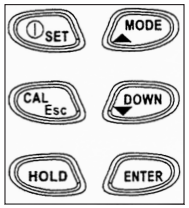
Cat. No. 4360

92-4360-00 Rev. 3 092624

TRACEABLE® EXPANDED-RANGE CONDUCTIVITY METER INSTRUCTIONS

LCD DISPLAY

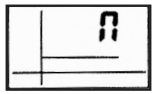
- **Primary** display shows measured conductivity value (CON) in µS or mS per cm.
- **Secondary** display below the primary display shows the temperature of the reading for all models.
- **HLD(Hold)/Ready/ATC** are at the left side.



1. **(POWER) SET button:** Press to power on meter. When meter is on, press and hold to enter setting {SET)mode. Press this button again to turn off.
2. **▲ MODE button:** In normal mode, press switch between Conductivity & TDS. In setting & recall mode, press to switch to different content.
3. **CAL/Esc button:** In normal mode, press to enter calibration mode. While the meter is in calibration, setting or recall mode, press (Esc) to return to previous mode.
4. **▼ DOWN:** Press to change content in setting mode.
5. **HOLD button:** In normal mode, press to hold current reading, then press again to return to current reading.
6. **ENTER button:** Press to confirm the setting, calibration and so on by pressing this button.
7. **SET + ▲:** When meter is off, press and hold simultaneously to disable auto-sleep mode.

AUTO POWER OFF

- To save battery power meter will auto power off after 20 minutes, if no buttons are pressed.
- To disable this function press **POWER** and **UP** buttons simultaneously until **"n"** display on LCD. Press and hold again to turn auto power off back on.



Note: The previous calibration data will be replaced after re-calibrating again. For example, if you previously calibrated conductivity meter at 1413 µS in the 0 to 1999 uS range. when you re-calibrate it at 1500 uS again (also in 0 to 1999µS range), previous 1413µS will be replaced in this range (0-1999µS). However, meter will retain the calibration data for other ranges which are not yet re-calibrated.

If you use a reference solution to calibrate one range and then manually input the cell constant again cell constant of range 1 to 5 will be all changed simultaneously.

NOTE: Temperature coefficient of meter is defaulted at 2.1% per "C (Fig. E) and provides good results for most applications.

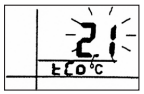


Fig. E

NOTE: The default value of normalization temperature is 25°C. If you need to normalize to another value, please see (Fig. F). Before resetting this value, the calibration standard value of that normalized temp. must be known.

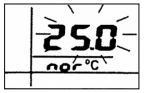
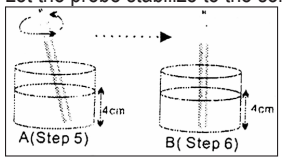


Fig. F

CONDUCTIVITY CALIBRATION

1. Insert probe into demineralized water or distilled water for about 30 minutes to rinse probe.
2. Select conductivity standard for calibration.
3. Pour 4 cm height of the solution into two separate clean containers (A & B).
4. Power on meter. Default LCD will display three times and then get into the normal measurement mode.
5. Rinse probe into one of above containers. Gently stir solution with probe.
6. Dip the rinsed probe into other container. Tap probe on the bottom of container to remove air bubbles. Let the probe stabilize to the solution temperature.



7. Press **CAL** button more than 2 seconds to enter calibration. The probe will automatically detect the conductivity value of solution and blinks the value on the LCD. (Fig. H)

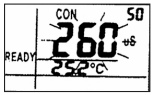


Fig. H

8. Press the **UP/DOWN** buttons to change value on primary display to match the value to the standard which is referred to normalization temp. 25°C You can adjust the conductivity reading up to ±20% from the detected value. However, if your detected value and standard value differs by more than +20%, it means cleaning or replacing probe is needed.

For example: Standard: 10µS: Detected value:19µS Adjustable range: ±3.8us (19*20%) However, under above situation, the values already differed over 20%.

NOTE: When calibration is stable, "Ready" will display on LCD. If "Ready" does not display, check calibration solution and make sure the solution is stable. Repeat step 8 if necessary.

NOTE: Meter will automatically detect solution, If the standard value is over the measuring limit or less than 10% of measuring limit, the displayed value will equal to the range limit or 10% of range limit Under this situation, user should go to parameter setting first to manually select a suitable range.

For example 1: Standard: 22 uS: Detected value: 19 uS Adjustable range: ±3.8 us (19*20%) Although the values differ less than 20% but the 22 uS is already over range limit so the maximum value could be input is 19.99 uS only.
To exactly adjust the value to 22 uS. please manual select the range as 0-199.9.

For example 2: Standard: 1.6 uS; Detected value:2. 1 uS Adjustable range: ±0.42 us (2.1*20%) Although the values differ less than 20% but the 1.6 uS is already less than 10% range limit (1.99) so max. value could be input is 1.99 uS.

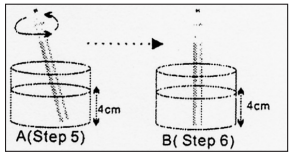
9. After "Ready" is displayed, press "ENTER" to confirm the calibration. The LCD will stop flashing and the meter will switch back to normal measurement mode.
10. Repeat 1-9 for other ranges if needed.

NOTE: When switching meter from measurement to calibration mode, the meter will auto defect solution value based on previously selected cell constant (0.1, 1.0 or 10), so, sometimes display in primary display may seem to jump to auto defected value after entering calibration. Meaning that even in the same solution, displayed values in measurement and calibration mode are different, this is not abnormal.

NOTE: To exit conductivity calibration mode without confirming calibration. DO NOT press ENTER button in step 9. Press Esc instead and this will retain meter's previous calibration data for the current range.

TDS CALIBRATION

1. Insert probe into demineralized or distilled water for about 30 minutes in order to rinse probe.
2. Select TDS standard for calibration. The factory default setting of the TDS conversion factor is 0.50. If your solution has a different TDS factor, you can improve the calibration accuracy by setting the TDS factor before starting the calibration. To converse TDS factors to the correct value. Refer to your company's guidelines for correct value.
3. Pour 4 cm height of the solution into two separate & clean containers. (A & B)
4. Power on meter. Default LCD will display three times and then get into the TDS mode.
5. Rinse the probe into one of the containers. Gently stir the probe.
6. Dip the rinsed probe into other container. Tap probe on the bottom of container to remove air bubbles. Let the probe stabilize to the solution temperature.



7. Press CAL button for more than 2 sec. To begin the calibration. TDS value will flash on LCD. (Fig. I)
8. Press UP/DOWN buttons to change the value on the primary display to match the value to the standard solution. You could refer to your solution normalization temperature. The meter is defaulted at 25°C.

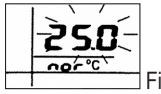


Fig. I

9. Ready display, pressing "ENTER" to confirm the calibration. LCD will stop flashing and meter will switch back to TDS measurement mode.
10. Repeat 1-9 for other ranges if needed

CONDUCTIVITY MEASUREMENT

Range Selection (COND. & TDS)
Meter is default at "auto-ranging" mode. Auto-ranging mode will determine and select range which gives greatest resolution and accuracy. Alternatively, you can manually select one of the five ranges in setup mode.

Example: if you prefer meter to display a reading as 0.50 mS rather than 500 uS, you could select 0 to 19.99 ms· range by the manual ranging function.

The meter will be reset to auto-ranging mode once ii is powered off.

NOTE: Accuracy is a percent of full-scale, so using your meter in the lowest range could bring your measurement the greatest accuracy.

AUTOMATIC TEMPERATURE COMPENSATION
(For COND. & TDS)
To measure with automatic temperature compensation, please follow up below steps:

1. Turn on meter. The text “ATC” should display on left -bottom corner of LCD. If the ATC indicator doesn’t appear, it means manual temperature compensation may be selected already in setting mode.
2. Set temperature coefficient to the right value. All meters are factory default to 2.1 % perC (temperature coefficient) and this will provide good results for most applications.
3. Select normalization temperature. All meters are factory defaulted to 25°C (normalization temp.).
4. Press **Esc** to switch back to normal mode. Rinse the probe with deionized or distilled water before using to remove any impurities adhering to the electrode body.
   If the electrode isn’t used for a long time, please soak probe for more than 30 mins.
5. Dip probe into sample. Make sure there are no air bubbles trapped on slot of the probe. To remove air bubbles, stir probe mildly and make sure electrode tip is submerged.
6. Stir probe gently in sample to create a homogeneous sample. Allow a few seconds for temperature reading to approach solution temperature.
7. Take readings. When the reading is stable, “READY” will be displayed on the left-middle LCD.

TDS MEASUREMENT

1. Power on meter.
2. Set TDS conversion factor to a correct value. The factory default value of the TDS conversion factor is 0.50.
3. Select Range, automatic temperature compensation or manual temperature compensation per your application.
4. Start taking readings. Press “MODE” to switch meter to TDS mode and then get reading from LCD. (Fig. L)

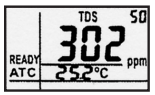


Fig. L

PARAMETER SETTING

1. When meter is in normal mode, press SET button more than two seconds to enter to setup mode.
2. Press ▲ or ▼ to switch setting parameter one by one.
3. Press **ESC** button to return to previous status.
4. Press **ENTER** to enter each parameter setting as follows:
   P1.0: manual range setting (rAn)
   Normally, meter will automatically select a range when readings appear.
   There are 5 ranges to select. Press UP or DOWN buttons to select ranging function, rAn. (Fig. P).
   When you see P1.0, press ENTER to select setting. The text of the central LCD will flash.

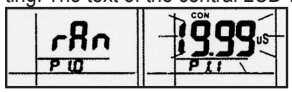


Fig. P

Pressing UP or DOWN button to select from P1.1 to P1.5 and then press ENTER to save.
NOTE: Press ENTER to select P1.1 or other ranges, LCD will flash limit value (Fig. P). Press **ENTER** to confirm, meter will return to normal measure mode.

The LCD will display **E03** if measured conductivity/ TDS values are beyond limit value. Select measure range again when it is above range. Meter will be reset to Auto-ranging function once it is turned off. Set manual ranging function each time when the meter is powered on again.

TYPE		RANGE		
		Cell Constant =0.1	*Cell Constant =1.0*	*Cell Constant =10*
P1.1	1st Range	0-1.99uS/ppm	0-19.99uS/ppm	0-199.9uS/ppm
P1.2	2nd Range	0-19.99uS/ppm	0-199,9uS/ppm	0-1999uS/ppm
P1.3	3rd Range	0-199.9uS/ppm	0-1999uS/ppm	0-19.99uS/ppt
P1.4	4th Range	0-1999uS/ppm	0-19.99uS/ppt	0-199.9uS/ppt
P1.5	5th Range	0-19.99uS/ppt	0-199.9uS/ppt	0-1999uS/ppt

P2.0 Meter configuration: (CoF) P2.1: TDS factor:
Concentration of dissolved salts in solution increases conductivity. This effect varies from salt to salt and is roughly linear in a given range for a given salt. TDS conversion factor is a value used by meter to convert from conductivity to TDS.
After selecting P2.0, press **ENTER** to select P2.1.
Press again to enter P2.1. TDS factor flashes on LCD (Fig. Q). Press UP/DOWN to change value from 0.40 to 1.00. Default value is 0.50.Press ENTER to confirm TDS factor and select P2.2 automatically.

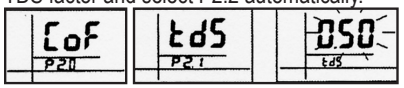


Fig. Q

P2.2: READY indicator: (rdy)
P2.2 lets you select READY indicator “on” to remind you measurement is stable. You might also select READY indicator “off” for faster response. Press UP/ DOWN to switch ready function to “on” or “off”. (Fig. R) Press ENTER to confirm the last state and select P2.3 automatically.

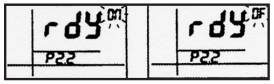


Fig. R

P2.3: Auto endpoint function: (AEP)
P2.3 lets you switch on or off “Auto endpoint function”. Select auto endpoint to “on” could HOLD your measurement when it is stable for more than 5 seconds. Display value will freeze and HLD indicator will appear on LCD. Press HLD button again to release display.

Select auto endpoint to “off” could deactivate this feature. Press UP/DOWN to switch auto endpoint function on or off (Fig. S). Press ENTER to confirm the last state and select P2.4 automatically.

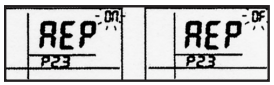


Fig. S

P2.4: ATC or non-ATC: (Atc)
P2.4 allows you to select Automatic or Manual Temperature Compensation. The default is ATC.
Press **UP/DOWN** to switch automatic temperature compensation on or off (Fig. T). Press ENTER to confirm last state and return to P2.0.
NOTE: To be summarized, meter default is “Ready Indicator on”, “auto endpoint function off” 8 “ATC on”.

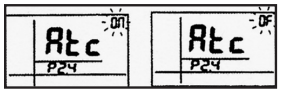


Fig. T

P3.0: Unit: (Unt)
P3.1 selecting °C or °F:(t)
Select P3.0 and press **ENTER** to enter P3.1.
Press **UP** or **DOWN** button to switch °C or °F. Press **ENTER** again to confirm the last unit and then enter P3.2 automatically. (Fig. U)

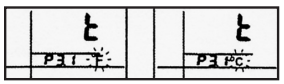


Fig. U

P3.2 selecting ppm or mg/L: (tdS)
After entering P3.2 from P3.1, TDS unit (mg/l or ppm) will flash on LCD. Default unit is ppm.
Press **UP** or **DOWN** button to switch ppm or mg/l.
Press **ENTER** again to confirm last unit and return to P3.0.(Fig. V)

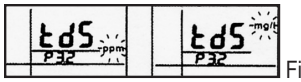


Fig. V

P4.0: temperature parameters: (t)
P4.1: Temperature coefficient: (tCo) The temp. coefficient (expressed as percent per °C) is the changed ratio of conductivity per degree of temp. By using a suitable temperature coefficient for solution could let you accurately compensate temperature for most solution. The adjustable range is 0.0 per °C to 10.0% per °C. The default is 2.1% per °C. 0.0% has no effect on temperature so displayed value is same as actual temperature.

Select P4.0 and press ENTER to select P4.1. Press ENTER again and Temperature Coefficient will flash on the LCD. Press UP/DOWN to change the value from 0.0 to 10.0, the unit is %/°C (Fig. W). Press ENTER to confirm the last value and select P4.2 automatically.

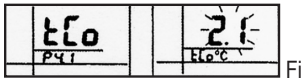


Fig. W

P4.2: Normalization temperature.: (nor)
Meter will normalize its cond. measurement to a standard temp, preset. User can adjust normalization temp. from 15 to 30°C (59 to 86°F). Meter is defaulted at 25°C (77°F). After pressing ENTER, the normalization temperature will flash on LCD. Press UP/DOWN to change the value from 15.0 to 30.0°C (59.0~86.06°F). (Fig. X)
Press **ENTER** to confirm last value and select P4.3 automatically.

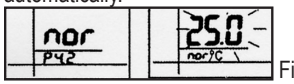


Fig. X

P4.3: Manual temp. Compensation: (Int)
When you disable ATC and select manual temperature compensation, manually enter temp. value of solution into meter. You can select any temperature between 0 and 50°C (32 to 212°F). The default is 25°C (77°F). Press ENTER to enter P4.3 from P4.2, default manual input temperature will flash on LCD. Press UP and DOWN buttons to change flashing value from 0-9.) (Fig. Y). Adjustable range is from 0.0-50.0°C (32.0-122.0°F). The default is 25.0°C (77.0°F). Press ENTER to confirm the last input and return to P4.0.

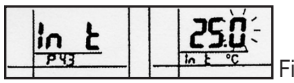


Fig. Y

P5.0: CELL setting: (CEL)

P5.1: Cell Constant:(SEL)

The cell constant, **K**, could be 1.0, 10. or 0.1.
To use Cell Constant = 1.0 for midrange measurements.
To use Cell Constant = 10 for high range measurements (above 20 mS or 10 ppt)
To use Cell Constant = 0.1 for low range measurements (below 20 or 10 ppm)

Using correct cell constant is important to obtain the optimal reading in various ranges of measurement. Refer to below table for suggested K values.

Range	K=0.1	K=1.0	K=10
COND:TDS (Factor+0.5)			
0.00-19.99uS / 0-9.99ppm	*	*	
0.0-199.9uS / 0-99.9ppm	*	*	
0-1999uS / 0-999 ppm		*	
0.0-19.99mS / 0-9.99 ppt		*	*
0.0-199.9mS / 0.0-999 ppt		*	*

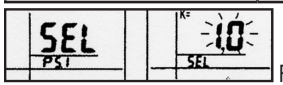


Fig. Z

Select P5.0 and press **ENTER** to enter P5.1. Press **ENTER** again and cell constant value will flash on LCD. Press UP/DOWN to switch value from 0.1, 1.0, 10.0 one by one. The default value is 1.0. (Fig. Z) Press **ENTER** to confirm last input and select P5.2 automatically.

NOTE: When using a cell constant K=0.1, measured range will be only 1/10 of range which is measured by K=1. So, lowest range will be 0-1.99us (0-0.99 ppm). Only 5 ranges are available, the highest range will only be 0-19.99mS (0~9.99ppt).

When using a cell constant K=10, the measured range will be 10 times the range which is measured by K=1. Highest range will be: 0 to 1999 mS (0.0 to 999 ppt). Only 5 ranges are available. the lowest range will be 0 to 199.9uS (10.0 to 99.9 ppm)

P5.2: Input the cell constant:(InPt)

If constant K=0.1/1/10 could not completely meet your need, you can input the cell constant after selecting the K=0.1, 1 or 10.
For example: if K=0.992 After saving P5.1. the P5.2 will be selected. Press **ENTER** again to enter P5.2. Cell constant (0.1 or 1 or 10) will flash on LCD.

Press **UP** to select the flashing value from 0-9. (Fig. AA) Press **DOWN** to change flashing digit. The selectable range is ±20% of cell constant which is selected in P5.1. Press **ENTER** to confirm last value and return to P5.0.
NOTE: After inputting cell constant, all calibration information in P8.0 will be clear. Manual input Cell Constant will change all the constant in range 1-5 at the same time.

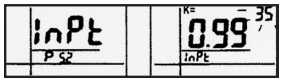


Fig. AA

P7.0:Reset to factory default setting(rSt)

P7.1: Meter reset (rSt)

P7.1 lets you reset all parameters to factory default settings. This function will clear all calibration data and any other setup functions which you have done. However, it will not clear clock settings & memory. In P7,0. press ENTER to enter P7.1. Press UP/DOWN to select “n”-NO or “y”-YES. (Fig. AC) Press ENTER to confirm and then return to P7.0.
NOTE: To completely recalibrate meter or if using a replacement probe, it is best to clear all calibration data in memory.

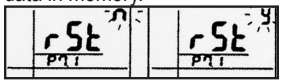


Fig. AC

P.8.0:View calibration data (CAL)

This function lets you recall previous calibration data and could help you know when is needed to re-calibrate meter. This function is made for “Review” purpose only.

In P8.0, press **ENTER** to enter P8.1. User can press UP/DOWN button to change to P8.X.Ex: **UP** button to enter P8.2 or DOWN button to return P8.0. P8.1 is calibration data for range 1 P8.2 is for range 2, P8.5 is for range 5. (Fig. AD) If there is no previous calibration data at a particular range. the primary display will show “---”

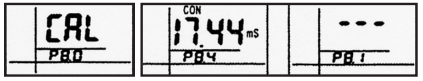


Fig AD

P9.0:Electrode data:(ELE)

This mode has five options for you to check the probe cell constant value for diagnostic purposes.
If no solution calibration proceed, cell constant value will be equal to the value in P5.2 for 5 ranges. If solution calibration is proceeded in specific range after P5.2 setting, the cell constant in specific range is adjusted according to your calibration.

In P9.0, press ENTER to enter P9.1. Press UP/DOWN button to change to P9.X (P9.1-P9.5).Ex: **UP** button to enter P9.2 or **DOWN** button to enter P9.0 (Fig. AE). P9.1 is the cell constant value for range 1. P9.2 is for range 2....P9.5 is for range 5.

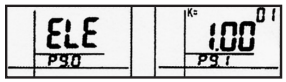


Fig. AE