# Operating Instructions

## OAKTON®

## CTSTestr™ 50 Pocket Testers

CE

### Applications

- Aquaculture
- Aquariums
- Aquariums and fish farms
- Boiler blow-down
- Drinking water
- Hydroponics
- Electroplating rinse tanks
- Printing industry
- Swimming pools
- Verification of reverse osmosis system operation
- Water & wastewater treatment

### Getting Started

The CTSTestr 50 Pocket Tester has been factory calibrated and usually works well out of the box. However, after extended periods of non-use, it is best to remove the sensor cap and soak the sensor in warm tap water for 10 minutes or so. Prior to taking the measurements, periodic callibaration with certified standards is recommended for best accuracy.

### Measurement Parameter Setting

1. Press ON/OFF (⏻) to power on the tester.
2. Press MENU/∨ to enter setup window. Press HOLD/↵ to select Measure. The display shows Cond, TDS and Salinity.
3. Scroll down by pressing MENU/∨ to toggle between Cond, TDS and Salinity. Press HOLD/↵ to select Cond.
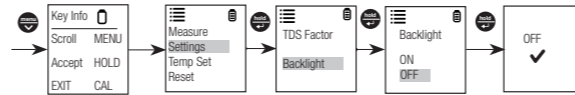4. The display shows the selected measure with a ✔.
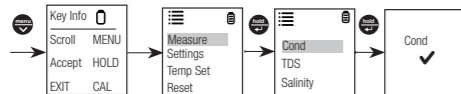
### TDS Factor Setting

1. Press MENU/∨ to enter setup window. Scroll down by pressing MENU/∨ to select Settings.
2. Press HOLD/↵ to select Settings. The display shows TDS factor and Backlight.
3. Press HOLD/↵ to select the default TDS factory setting or MENU/∨ to adjust the setting.
4. Press HOLD/↵ to confirm the selection of the setting. The display shows the set TDS factor with a ✔.
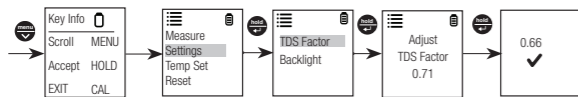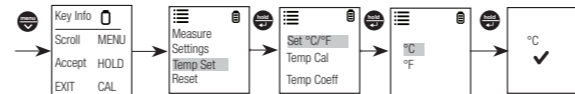
### Backlight Settings

1. Press MENU/∨ to enter setup window. Scroll down by pressing MENU/∨ to select Settings.
2. Press HOLD/↵ to select Settings. The display shows TDS Factor and Backlight.
3. Scroll down by pressing MENU/∨ to toggle between TDS Factor and Backlight. Press HOLD/↵ to select Backlight.
4. The display shows ON and OFF. Scroll down by pressing MENU/∨ to toggle between ON and OFF. Backlight ON increases readability in low-light conditions.
5. Press HOLD/↵ to select the desired backlight option. The display shows the selected backlight option with a ✔.

### Temperature Settings

1. Press MENU/∨ to enter setup window. Scroll down by pressing MENU/∨ to select Temp Set. Press HOLD/↵ to select Temp Set. The display shows Set °C/°F, Temp Cal and Temp Coeff.
2. Press HOLD/↵ to select Set °C/°F. Scroll down by pressing MENU/∨ to toggle between °C and °F.
3. Press HOLD/↵ to select temperature unit. The display shows the selected temperature setting with a ✔.
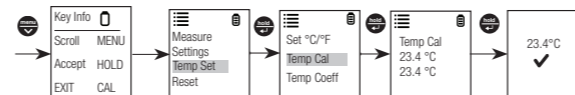
### Temperature Calibration

1. Press MENU/∨ to enter setup window. Scroll down by pressing MENU/∨ to select Temp Set.
2. Press HOLD/↵ to select Temp Set. The display shows Set °C/°F, Temp Cal and Temp Coeff.
3. Scroll down by pressing MENU/∨ to toggle between Set °C/°F, Temp Cal and Temp Coeff. Press HOLD/↵ to select Temp Cal.
4. The lower display shows the current measured temperature reading based on the last set offset and the upper display shows the current measured temperature reading based on factory default calibration.
5. Dip the tester into a solution of known temperature and allow time for the built-in temperature sensor to stabilize.
6. Press MENU/∨ to adjust the temperature value or press the HOLD/↵ to confirm the calibrated value as the new temperature value of the solution.

**Note:** To exit this program without confirming the calibration, press CAL/ESC.

### Temp Coefficient

1. Press MENU/∨ to enter setup window. Scroll down by pressing MENU/∨ to select Temp Set.
2. Press HOLD/↵ to select Temp Set. The display shows Set °C/°F, Temp Cal and Temp Coeff.
3. Scroll down by pressing MENU/∨ to toggle between Set °C/°F, Temp Cal and Temp Coeff.
4. Press HOLD/↵ to select Temp Coeff or MENU/∨ to adjust the Temp Coeff.
5. Press HOLD/↵ to confirm the Temp Coeff value. The new value is automatically confirmed with a ✔.
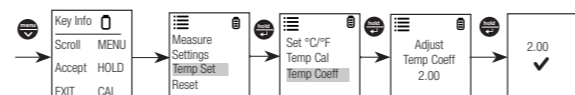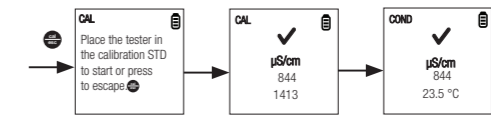
### Calibration for Conductivity, TDS, or Salinity

For best results, periodic calibration with an accurate standard is recommended prior to measurement. Use the calibration standard value that is close to your intended sample value. The tester will retain one calibration value in each mode (conductivity, TDS, salinity) when the instrument is powered off. The conductivity value can be calibrated automatically or manually, while the TDS & salinity values require manual calibration. The tester will begin in the measurement mode that was used when it was powered off. See "Measurement Parameter Setting" to change the desired parameter.

### Automatic Calibration for Conductivity

1. Remove the cap and press ON/OFF (⏻) to power on.
2. Dip the sensor in at least 30 mm of calibration standard.
3. Stir gently and press CAL/ESC key to begin the calibration.
4. The display will show CAL followed by the default value. CAL is indicated on the display during calibration mode.
5. If the reading is within the calibration range of the automatically recognized standards; 80 (84 µS/cm), 1410 (1413 µS/cm), or 12.90 (12.88 mS/cm), the ✔ icon is displayed when the automatic calibration standard value has been detected.
6. Press HOLD/↵ to accept the auto conductivity standard and finish the calibration.
7. Display returns to Measurement window.

### Manual Calibration

When the conductivity reading is outside calibration range of the automatic conductivity standards or when TDS or salinity is used, the tester will require manual adjustment.

1. Repeat steps 1 to 4 from "Automatic Calibration for Conductivity".
2. Press MENU/∨ to manually adjust the value to the desired reading.

**Note:** The adjustment will decrease only, however the adjustment will eventually cycle to the highest available value after decreasing by 40% of the initial value.

3. Press HOLD/↵ to accept and finish the calibration when the desired value is selected.

**Note:** To abort calibration, press CAL/ESC to escape.

4. Once the calibration is finished and user has accepted the changes, measurement window will now show the calibrated reading.

**Note:** The auto conductivity standards are 84 µS/cm, 1413 µS/cm & 12.88 mS/cm.
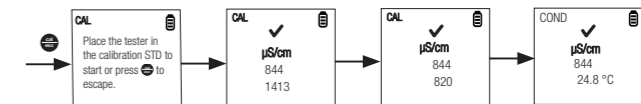
### CTS Measurement

1. Press ON/OFF (⏻) to power the tester on if needed.
2. Dip the electrode about 2 cm to 3 cm into the test solution. Stir and let the reading stabilize. The timer icon will blink during this time. Once the reading is stabilized, the timer stops blinking and ✔ will appear to indicate the stability of the reading.

   **CAUTION:** Testing dry samples is not accurate and can lead to sensor damage or breakage. Soils must be wet and free of particulates that may scratch the glass sensor. Excessive force into dry samples can cause glass breakage.

3. Note the CTS value or press HOLD/↵ to freeze the reading. To release the reading, press HOLD/↵ again.
4. Press ON/OFF (⏻) for 3 seconds to turn off tester. If key is not pressed for 8.5 minutes, the tester will automatically shut off to conserve batteries.
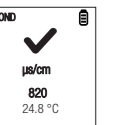
## User Reset

Reset the CTS calibration to the user's default settings by using the user reset function. Temperature user calibration is not affected by the user reset function.

1. Press MENU/∨ to enter setup window. Scroll down by pressing MENU/∨ to select Reset. Press HOLD/↵ to select Reset. The display shows User Reset and Factory Reset.

2. Press HOLD/↵ to select User Reset.

3. The display automatically shows No and Yes. Scroll down by pressing MENU/∨ to toggle between No and Yes.

4. Press HOLD/↵ to confirm either No or Yes. Display shows User Reset option with a ✔.
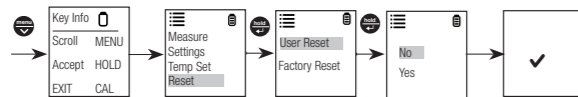


## Factory Reset

Reset the CTSTestr to the factory default settings by using the factory reset function.

1. Press MENU/∨ to enter setup window. Scroll down by pressing the MENU/∨ to select Reset. Press HOLD/↵ to select Reset. The display shows User Reset and Factory Reset.

2. Scroll down by pressing MENU/∨ to toggle between the resets. Press HOLD/↵ to select Factory Reset.

3. The display automatically shows No and Yes. Scroll down by pressing MENU/∨ to toggle between No and Yes.

4. Press HOLD/↵ to confirm either No or Yes. The display shows the Factory Reset option with a ✔.
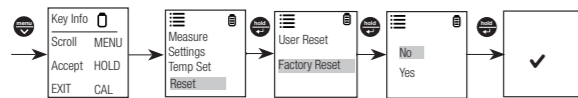


## HOLD Function

This feature helps to freeze the display for a delayed observation.

1. Press HOLD/↵ button to freeze measurement.

2. Press HOLD/↵ again to release measurement.



## Sensor Maintenance

1. Always keep the sensors electrodes clean. Rinse the electrodes with deionized water and wipe them dry with clean cloth before storing with its protective cap. For cup type electrodes, remove the white plastic cup and insert to thoroughly clean viscous solutions. Never scratch electrodes with a hard substance.

2. For better performance, soak the electrode in alcohol for 10 to 15 minutes and rinse with de-ionized water before starting any measurement process. This is to remove dirt and oil stains on the electrode which may affect the accuracy of the measurements.

## Sensor Replacement

Replace the sensor module at the fraction of the cost of a new tester. When the tester fails to calibrate or gives fluctuating readings in calibration standards, you need to change the electrode.

1. With dry hands, grip the ring with sensor facing you. Twist the ring counter-clockwise. Save the ring for later use.

2. Pull the old sensor module away from the tester.

3. Align the four tabs on the new module so that they match the four slots on the tester.

4. Gently push the module onto the slots to sit it in position. Push the smaller O-ring fully onto the new sensor module. Push the other O-ring over the module and thread it into place by firmly twisting clockwise.
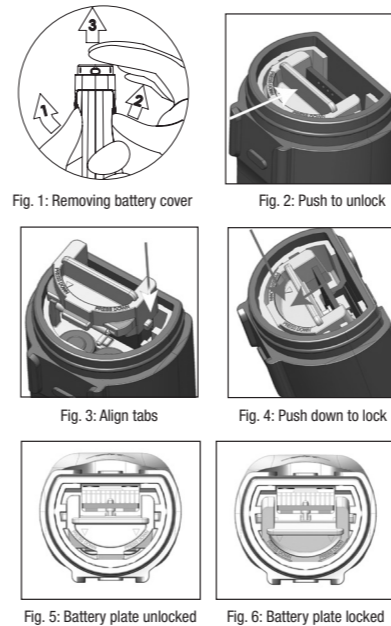
**Note:** It is necessary that you recalibrate your tester prior to measurement after a sensor replacement.
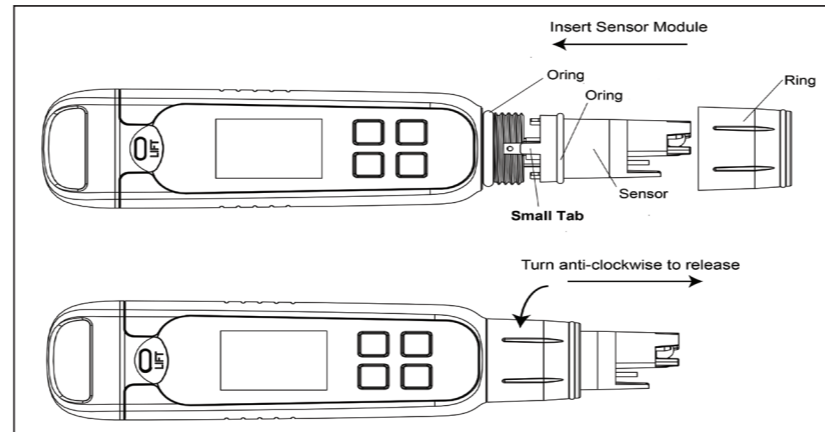


## Replacing the Batteries

The CTSTestr 50 Pocket Tester uses four AAA 1.5 V batteries.

1. To remove the battery cover, see Figure 1. Clear the front catch and then the back catch, before sliding the cover off.

2. To remove the battery plate, push the center tab towards the front of the tester as shown in Figure 2. Once unlocked, remove the plate to access the batteries.

3. Invert the tester upside down to remove the batteries. Each side uses two AAA batteries. Orient each battery with positive terminal facing downward.

4. To lock the battery plate, align the small tabs (Figure 3) into the guide ribs on the housing and then press down. See Figure 4.



Fig. 1: Removing battery cover    Fig. 2: Push to unlock

Fig. 3: Align tabs    Fig. 4: Push down to lock

Fig. 5: Battery plate unlocked    Fig. 6: Battery plate locked

## Warranty

This instrument is supplied with a warranty against manufacturing defects for a period of one year from the date of purchase.

## Return of Items

Authorization must be obtained from your distributor before returning items for any reason. When applying for authorization, please include information regarding the reason the item(s) are to be returned.

We reserve the right to make improvements in design, construction and appearance of products without notice. Prices are subject to change without notice.

## Self-Diagnostic Messages

| | |
|---|---|
| 🔋 | Batteries are weak and need replacement soon. |
| stable error | Appears when calibration is attempted but the reading is not yet stable. Wait for the reading to stabilize or manually confirm the calibration by pressing enter. |
| over range | The reading is above the measuring range of tester. |

| Specifications | CTSTestr 50 |
|---|---|
| **Conductivity** | |
| Conductivity range | 0.0 to 200.0 µS, 200 to 2000 µS, 2.00 to 20.00 mS |
| Resolution | 0.1 µS, 1 µS, 0.01 mS |
| Relative accuracy | ±1% full scale |
| Normalization temperature | 25.0℃ (77℉) |
| Temperature co-efficient | 0.0% to 10.0% |
| Calibration points | Up to 3 points |
| **TDS** | |
| TDS range | 0.0 to 100.0 ppm, 100 to 1000 ppm, 0.10 to 10.00 ppt (TDS Factor 0.5) |
| Resolution | 0.1 ppm, 1 ppm, 0.01 ppt |
| Relative accuracy | ±1% full scale |
| Calibration points | Up to 3 points |
| TDS factor | 0.40 to 1.00 (selectable) |
| **Salinity** | |
| Salinity range | 0.00 to 10.00 ppt |
| Resolution | 0.10 ppt |
| Relative accuracy | ±1% full scale |
| Calibration points | 1 |
| **Temperature** | |
| Temperature range | 0 to 60°C (32.0 to 140.0°F) |
| Temperature resolution | 0.1°C / 0.1°F |
| Temperature accuracy | From 0 to 50°C (±0.5°C / ±0.9°F + 1 LSD); from 50 to 60°C (±1.0°C / ±1.8°F + 1 LSD) |
| Temperature compensation | Yes (Automatic Temperature Compensation) |
| **General** | |
| Display | Graphics, dot matrix 80 x 100 pixel |
| Auto off | 8.5 minutes (from last key press) |
| Reset | User / Factory |
| Power requirement | Four AAA 1.5 V batteries |
| Battey life | >150 hours |
| Water proofing | IP67 |
| **Environmental operating conditions** | |
| Ambient operating temperature | 5 to 45°C / 41 to 113°F |
| Relative humidity | 5% to 85% noncondensing |
| Storage temperature | −20 to 60°C / −4 to 140°F |
| Storage humidity | 5% to 85% noncondensing |

## Accessories

| Ordering Code | Product Description |
|---|---|
| 35634-55 | CTSTestr 50P pin-style pocket tester with case, lanyard, and batteries |
| 35634-65 | CTSTestr 50C cup-style pocket tester with case, lanyard, and batteries |
| 35634-57 | Replacement sensor module for CTSTestr 50P pin-style tester |
| 35634-07 | Replacement sensor module for CTSTestr 50C cup-style tester |
| 35634-09 | Replacement sensor cap |
| 09376-00 | Replacement alkaline batteries; AAA, 1.5 V. Pack of 12 |
| 17101-45 | NIST-traceable calibration with data for pocket testers |

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## INSTRUMENTS          www.4oakton.com