HORIBA

Instruction Manual

COMPACT Conductivity meter
LAQUAtwin-4EC-11, LAQUAtwin-4EC-22, LAQUAtwin-4EC-33

LAQUAtwin
COMPACT WATER QUALITY METER

CODE:Z0000772454B

Preface

This manual describes things to be known before using the COMPACT WATER QUALITY METER, LAQUAtwin series.
Be sure to read this manual before using the product to ensure proper and safe operation of the instrument. Also safely store the manual so it is readily available for reference whenever necessary.
Product specifications and appearance, as well as the contents of this manual are subject to change without notice.

Warranty and Responsibility

HORIBA Advanced Techno Co., Ltd. warrants that the Product shall be free from defects in material and workmanship and agrees to repair or replace free of charge, at option of HORIBA Advanced Techno Co., Ltd., any malfunctioning or damaged Product attributable to responsibility of HORIBA Advanced Techno Co., Ltd. for a period of two (2) years from the delivery. However, the warranty period of sensor is 6 months.
In addition, the warranty applies only when the sensor repeatedly fails even after cleaning and conditioning. In the following cases, none of the warranties is valid;

- Any malfunction or damage attributable to improper operation
- Any malfunction attributable to attempted repair or modification by any person not authorized by HORIBA Advanced Techno Co., Ltd.
- Any malfunction or damage attributable to violation of the instructions in this manual or operations in an environment and the manner not specified in this manual
- Any malfunction or damage attributable to any cause or causes beyond the reasonable control of HORIBA Advanced Techno Co., Ltd. such as natural disasters
- Any deterioration in appearance attributable to corrosion, rust, and so on
- Replacement of consumables such as the sensor and standard solutions

HORIBA Advanced Techno Co., Ltd. SHALL NOT BE LIABLE FOR ANY DAMAGES RESULTING FROM ANY MALFUNCTIONS OF THE PRODUCT, ANY ERASURE OF DATA, OR ANY OTHER USES OF THE PRODUCT.

February, 2026

Trademarks

Company names and brand names are either registered trademarks or trademarks of the respective companies. (R), (TM) symbols may be omitted in this manual.

Patent marking

This product is protected under one or more of the patents found at the following address:
www.horiba.com/patent

Regulations

EU and UK regulations

- Conformable standards
  This equipment conforms to the following standards:

EMC: EN IEC 61326-1
Class B, Portable test and measurement equipment
RoHS: EN IEC 63000
9. Monitoring and control instruments including industrial monitoring and control instruments

EMC: BS EN IEC 61326-1
Class B, Portable test and measurement equipment
RoHS: BS EN IEC 63000
9. Monitoring and control instruments including industrial monitoring and control instruments

Warning:
This product is not intended for use in industrial environments. In an industrial environment, electromagnetic environmental effects may cause the incorrect performance of the product in which case the user may be required to take adequate measures.

- Information on disposal of electrical and electronic equipment and on disposal of batteries

The symbol for separate collection of batteries shown on the product or accompanying documents indicates the product requires appropriate treatment, collection and recycle for waste electrical and electronic equipment (WEEE) under the Directive 2012/19/EU, and/or waste batteries under the REGULATION (EU) 2023/1542 in the European Union.
This product should not be disposed of as unsorted household waste.

Your correct disposal of WEEE, waste batteries and accumulators will contribute to reducing wasteful consumption of natural resources, and protecting human health and the environment from potential negative effects caused by hazardous substance in products.
Contact your supplier for information on applicable disposal methods.

- Authorised representative in EU and UK

HORIBA Europe GmbH
Hans-Mess-Str.6, D-61440 Oberursel,
Germany
HORIBA UK Limited
Kyoto Close, Moulton Park, Northampton, NN3 6FL, UK

FCC rules

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired 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 Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Responsible party(for FCC matter)
HORIBA Instruments Incorporated
Head Office
9755 Research Drive
Irvine, California 92618 USA
+1 949 250 4811, 949 453 0500, 800 446 7422

Korea certification

- **B 급 기기 (가정용 방송통신기자재)**
  이 기기는 가정용 (B 급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며 , 모든 지역에서 사용할 수 있습니다 .

- **국립전파연구원의 인터넷 홈페이지 주소**
  http://www.rra.go.kr/selform/ 관리번호
  https://www.rra.go.kr/ko/license/S_c_search.do

China regurlation

标志的含义

本标志适用于在中华人民共和国境内销售的电器电子产品。标志中央数字代表产品的环保使用年限 （非产品质量保证期）。自制造日起，在遵守产品安全及使用规范的前提下，该年限内产品不会对环境、人体健康及财产安全造成严重危害。请勿随意废弃本产品。

产品中有害物质名称及含量信息表

部件名称	有害物质 物质 1： 铅 (Pb) 物质 2： 汞 (Hg) 物质 3： 镉 (Cd) 物质 4： 六价铬 (Cr (VI)) 物质 5： 多溴联苯 (PBB) 物质 6： 多溴二苯醚 (PBDE) 物质 7： 邻苯二甲酸二正丁酯 (DBP) 物质 8： 邻苯二甲酸二异丁酯 (DIBP) 物质 9： 邻苯二甲酸丁苄酯 (BBP) 物质 10： 邻苯二甲酸二 2- 乙基己酯 (DEHP)									
	物质 1	物质 2	物质 3	物质 4	物质 5	物质 6	物质 7	物质 8	物质 9	物质 10
本体	×	○	○	○	○	○	○	○	○	○
传感器	×	○	×	○	○	○	○	○	○	○

注1：
○：表示该有害物质在该部件所有均质材料中的含量均不超过电器电子产品有害物质限制使用国家标准要求。
×：表示该有害物质至少在该部件的某一均质材料中的含量超出电器电子产品有害物质限制使用国家标准要求。

注2：
以上未列出的部件，表明其有害物质含量均不超出电器电子产品有害物质限制使用国家标准要求。

For Your Safety

Hazard classification and warning symbols

Warning messages are described in the following manner. Read the messages and follow the instructions carefully.

- Hazard classification

DANGER	This indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This is to be limited to the most extreme situations.
WARNING	This indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	This indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

- Warning symbols


Description of what should be done, or what should be followed


Description of what should never be done, or what is prohibited

Safety precautions

WARNING	
This product does not include batteries. However, IT IS DESIGNED TO BE USED WITH A COMMERCIALLY AVAILABLE BUTTON BATTERIES. If swallowed, a lithium button battery can cause severe or fatal injuries within 2 hours. Keep batteries out of reach of children. If you think batteries may have been swallowed or placed inside any part of the body, seek immediate medical attention.	
Do not put batteries in a fire, expose to heat, disassemble or remodel. Doing so could case fluid leakage, overheating or explosion.	
Before disposing of batteries, wrap the terminals with tape to insulate. If a battery is allowed to come in contact with other metal or batteries, it may cause heating, destruction, and fire.	
Wash off any calibration fluid that comes into contact with hands or other exposed skin. If fluid gets in eyes, rinse them immediately and see a doctor.	

CAUTION

Incorrect use of batteries may cause leakage or bursting of the butteries and result in product damage or burn injury.

- Connect the positive and negative terminals of the battery correctly.
- Do not mix different battery types in the same device.
- Replace all of the batteries in the same device at the same time.
- Do not attempt to recharge batteries.
- Do not solder a battery.
- Store in a location away from direct sunlight, high temperature, and high humidity.

Handling precautions

Meter and sensor

- The sensor is a consumable part. If it becomes damaged or its performance deteriorates, replace it with a new one (the sensor cannot be repaired).
- Do not swing the meter and sensor using a strap.
- Do not drop the meter or apply excessive force to it.
- Do not leave the meter in areas of direct sunlight or high temperature/humidity.
- Do not clean the meter with organic solvents.
- Neither the meter nor sensor is waterproof by itself. The sensor must be securely mounted on the meter before use.
- To ensure the waterproof performance, confirm the followings when attaching the sensor.
  - The waterproofing gasket is clean and undamaged.
  - The waterproofing gasket is seated properly in the groove with no twisting or warping.
  - The meter and sensor are not deformed.
- The surface of the electrode needs to be conditioned appropriately.
  Take care not to touch it with anything.

- Do not measure samples such as the following, since they may damage the sensor or shorten its life.
  - Organic solvents • Oils • Adhesives • Cement • Alcohols • Surfactants
  - Concentrated acid (0 pH to 2 pH) • Concentrated alkaline (12 pH to 14 pH)
- If the sensor is damaged physically or chemically, stop using the sensor.
- For some samples (such as pure water), the measured value may be unstable. This is natural.

Battery

The battery alarm icon lights up when the battery voltage is low. Replace the batteries when the battery alarm icon (BATT) lights up. The meter power may not be switched ON/OFF when the battery voltage is low.

Identification of manufacturing date

Manufacturing date can be identified from MFG No. described in the ID label on the backside of the instrument.
The number from the middle in the MFG No. indicates manufacturing year and next alphabet indicates manufacturing month. The alphabet is assigned to month according to the table below.

Ex.: ID: XX23M000 means the device manufactured in 2023 December.

JAN	FEB	MAR	APR	MAY	JUN
A	B	C	D	E	F
JUL	AUG	SEP	OCT	NOV	DEC
G	H	J	K	L	M

Table of Contents

1 Product Overview

COMPACT Conductivity meter LAQUAtwin-4EC-11, LAQUAtwin-4EC-22, LAQUAtwin-4EC-33 incorporates HORIBA original flat sensor and enables accurate measurement of Conductivity from a single drop of a sample.

1.1 Components

Parts name		Quantity	Parts name		Quantity
Sensor	S073-4EC	1	Standard solution	1413 µS/cm	1
Meter		1		12.88 mS/cm	1
Storage case		1	Conditioning solution		1
Pipette		1	Instruction manual		1

*Batteries are not included and are not installed. Prepare two (2) CR2032 lithium coin batteries before use.

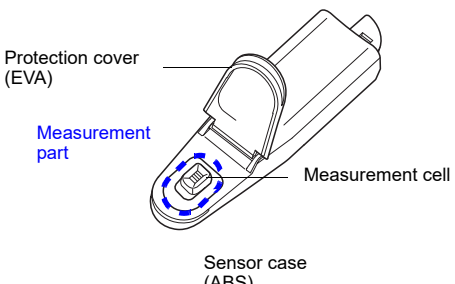
1.2 Consumable parts sold separately

Specifications	Model	Part No.	Specifications	Model	Part No.
Sensor	S073-4EC	3201079162	Standard solution	514-22, 1413 µS/cm	3999960110
Conditioning solution	514-4EC-CON	3201081522		514-23, 12.88 mS/cm	3999960111

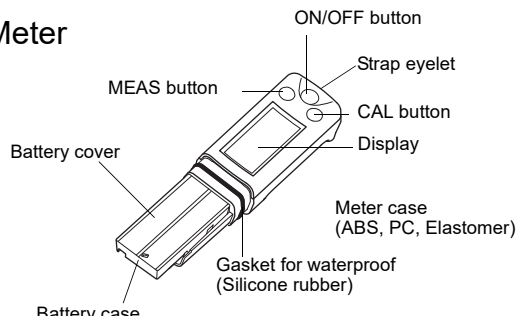
2 Part Names and Functions

∗ It will not respond to the press if the button is pressed for a short time.
Press buttons seconds or more unless otherwise specified.
∗ ( ) are listed for reference at time of disposal.

Sensor



Meter



*Batteries are not included and are not installed.
Batteries: CR2032 × 2 (commercially available)

Battery alarm icon

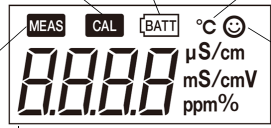
∗ Lights up when the batteries are low and need to be changed.

CAL icon

∗ Notifies that it is the calibration screen.

Temperature alarm icon

∗ Flashes when the temperature is outside the operating temperature range (5°C to 40°C).



MEAS icon

∗ Notifies that it is the measurement screen.

Stability icon

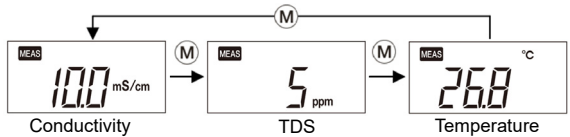
∗ Lights up when the measured value is stable.

Measured value display

Measured unit display

∗ The display flashes when the measured value exceeds the measuring range. (LAUQAtwin-4EC-22, LAQUAtwin-4EC-33)

∗ The display items can be changed by pressing the MEAS button when the measurement mode is AS mode [Page 18].



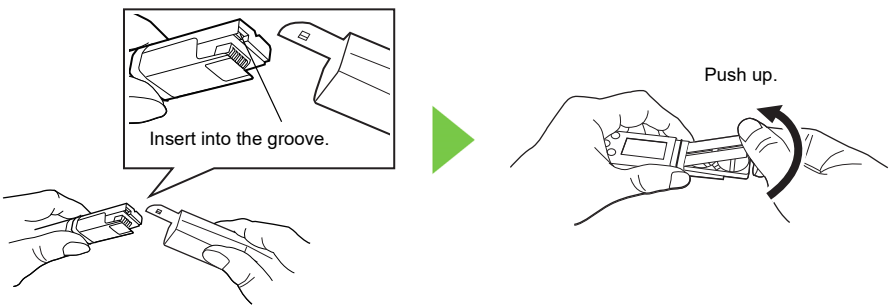
3 Basic Handling

3.1 Inserting batteries / sensor

This product is shipped without batteries installed. Insert two (2) CR2032 batteries before turning the meter on.

Inserting the batteries

1. **Insert the indentation part on the back of the sensor into the groove on the battery case, and push up the battery cover.**

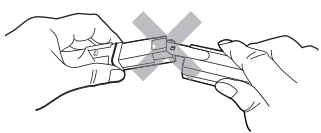


2. When inserting the battery, slide it into the edge of the battery case first.

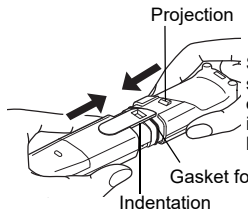
*Batteries are not included and are not installed.
Battery used: CR2032: 2 pieces (commercially available)

Note

Insert the indentation part on the back of the sensor in the correct position. Inserting it in an incorrect position may result in damage to the part.



Inserting the sensor



Slide the sensor onto the meter so that catch the projection part on the back of the meter fits into the indentation part on the back of the sensor as shown.

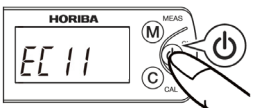
Note

Be careful not to twist the waterproof gasket.

3.2 Power ON / OFF

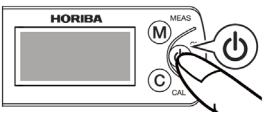
Power ON

Press the ON/OFF button.
The power is turned ON, and the meter type is displayed on the LCD.



Power OFF

Press the ON/OFF button.
The power is turned OFF.



3.3 Sensor conditioning

Note

- Wash promptly after conditioning.
- Wipe the spout of the conditioning solution with a tissue or similar after use and store with the cap tightly closed.
- Before using the sensor, perform sensor conditioning.
- Perform calibration after sensor conditioning.

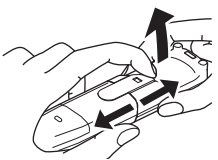
1. **Connect the sensor and meter.**
2. **Power ON the meter.**
3. **Place some drops of conditioning solution on the measurement part of sensor.**
4. **Wait 20 minutes before use.**
5. **Clean the measurement part of sensor with pure water.**

3.4 Removing sensor / batteries

Turn off the meter and remove sensor / batteries.

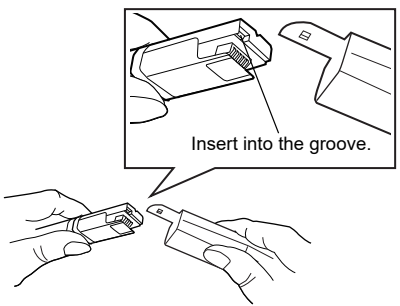
Removing sensor

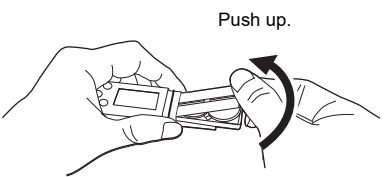
1. **Lift the indentation part on the back of the sensor and the sensor a little away from the meter.**
2. **Pull out the sensor all the way from the meter.**



Removing batteries*

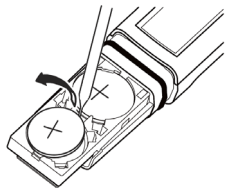
1. **Insert the indentation part on the back of the sensor into the groove on the battery case, and push up the battery cover.**





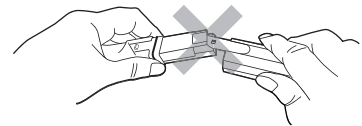
*Batteries are not included and are not installed.

2. **Use a thin non-metallic stick or other tool to pry the batteries out from the battery clip as shown.**



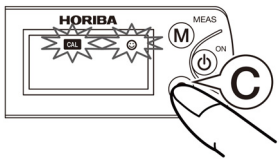
Note

Insert the indentation part on the back of the sensor in the correct position.
Inserting it in an incorrect position may result in damage to the part.



4 Calibration

Please make sure to perform calibration before taking any measurements.
For more accurate results, it is recommended to use a standard solution with electrical conductivity close to that of the sample being measured.



1. **Carefully fill the measurement cell with the standard solution up to the top, making sure no air bubbles are introduced.**

   More accurate calibration is possible by rinsing the sensor with the standard solution before calibration.

2. **Close the protective cover and wait for about one minute until the reading stabilizes.**

3. **Press CAL button to calibrate.**
   Automatically switches to the measurement screen after calibration.

In the case of the calibration error indicator lights up

Not calibrated (Not updated since last calibration data).
Initialize the calibration data [Page 19] and re-calibrate. Condition the sensor and re-calibrate if there is no improvement [Page 8]. If still not calibrated, the sensor has deteriorated and replace the sensor.

4. **Open the protection cover, wash the sensor with pure water.**

Calibration points

The number of calibration points is dependent on the meter model.

* LAQUAtwin-4EC-11:
  Up to three-point calibration at 84 µS/cm, 1413 µS/cm and 12.88 mS/cm
* LAQUAtwin-4EC-22 and LAQUAtwin-4EC-33:
  Up to four-point calibration at 84 µS/cm, 1413 µS/cm, 12.88 mS/cm, and 111.8 mS/cm

Note

When the sensor is replaced, perform "Initialization of calibration data" [page 19] and calibrate the device again.

Although this product is waterproof, avoid immersing it completely.

1. **Carefully drop the sample into the measurement cell up to the rim, and ensure that no air bubbles are present.**

   More accurate measurement is possible by rinsing the sensor with the sample in advance.
2. **Close the protection cover and wait for about one minute until the reading stabilizes.**

Cleaning the sensor promptly after measurement will prevent deterioration of the sensor.

6.1 Maintenance

Open the protection cover, wash the sensor with pure water.

- Neither the meter nor sensor is waterproof by itself. The sensor must be securely mounted on the meter before use.
- Do not measure samples such as the following, since they may damage the sensor or shorten its life.
  - Organic solvents, Oils, Adhesives, Cement, Alcohols, Surfactants, Concentrated acid (pH 0 to 2), Concentrated alkaline (pH 12 to 14)

  If the sensor comes into contact with any of these substances, rinse and clean it with pure water immediately.

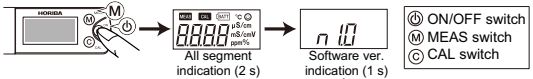
6.2 Storage

- Store the meter and sensor in the case with the meter and sensor connected.
- Store in a non-condensing location with 5°C to 40°C and a relative humidity 85% or less.
- Do not leave the meter in areas of direct sunlight.
- Do not store the meter and sensor immersed in water.
- Befor measurement, perform conditioning and calibration [Page 8].
- Prolonged storage may cause sensor deterioration.

The setup mode allows the operator to customize the meter to specific needs. To enter the setup mode, press and hold the MEAS and ON/OFF buttons for over 3 seconds when the meter is switched OFF.

7.1 Setup Mode

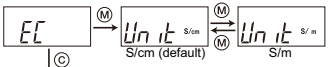
- Setup mode entry



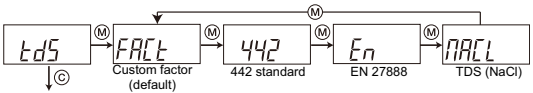
The setting is saved and the next item is selected when the CAL button is pressed on the item being set.

If the ON/OFF button is pressed before the CAL button is pressed, it is changed.
(It is changed until the item is changed in the previous item.)

- Unit setting: The display units can be changed.

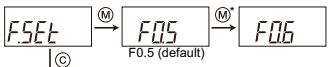


- TDS method setting (Only LAQUAtwin-4EC-33):
  The TDS method can be selected from the following options only on LAQUAtwin-4EC-33.
  This step is bypassed on LAQUAtwin-4EC-11 and LAQUAtwin-4EC-22.



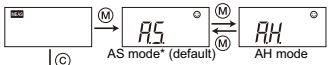
FACt: KCl with factor adjustable from 0.4 to 1.0 (default 0.5)
442: Myron L 442 non-linear standard curve
En: European environmental standard non-linear curve
NACL: Non linear salinity curve

- Factor setting (Only LAQUAtwin-4EC-33 with the TDS method set to FACt) :
  This step is bypassed on LAQUAtwin-4EC-11 and LAQUAtwin-4EC-22, and when the TDS method is set to 442, En, or NACL on LAQUAtwin-4EC-33.



*The setting range is from F0.4 to F1.0.
In this setting, pressing the MEAS switch increases the displayed value. After the displayed value reaches F1.0, it returns to F0.4.

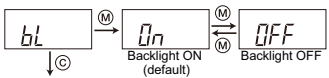
- Measurement mode change: The measurement mode can be switched.



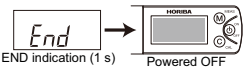
AS (Auto Stable)
The measurement value is fixed when it is stable. The fixed measurement value is released and the instantaneous value is displayed.

AH (auto hold)
The measurement value is always displayed as instantaneous value. Pressing the MEAS button starts stability determination. The measurement value is fixed when it is stable. To unfreeze, press the MEAS button.

- Backlight setting: The backlight can be switched to ON or OFF.



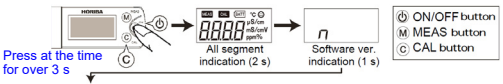
- Setup completion



7.2 Initialization of calibration data

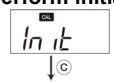
Calibration data is erased. The meter is reset to the factory default calibration setting value.

1. Initialization of calibration data mode entry



To enter the Initialization of calibration data mode, press and hold the CAL and ON/OFF buttons for over 3 seconds when the meter is switched OFF.

2. Perform initialization of calibration data

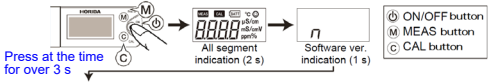


3. Initialization of calibration data completion

7.3 Initialization of the settings

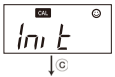
All setup choices are erased. The meter is reset to the factory default values.

1. Initialization of the settings mode entry

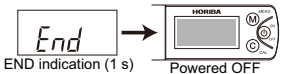


To enter the initialization of the settings mode, press and hold the MEAS, CAL and ON/OFF buttons for over 3 seconds when the meter is switched OFF.

2. Perform initialization of the settings



3. Initialization of the settings completion



8 What to do if...

Check the cause of the issue and try the recommended action. If the issue is still unresolved, replace the sensor or meter with a new one.

Issue	Cause	Recommended action
No display on screen. (Power is not turned on.) Display disappears midway.	Batteries are not installed.	Install two (2) CR2032 batteries. [Page 5]
	Dead batteries.	Replace 2 batteries both with new ones at the same time. [Page 9, Page 5]
	Batteries not in contact with metal fittings of battery case.	Remove batteries [Page 9] and gently press the metal fittings form above, then re-install batteries [Page 5].
°C is blinking on the display.	The temperature of measurement environment is outside 5°C to 40°C.	The measured temperature is not within the specified operating temperature (5°C to 40°C). If the ambient temperature is within the specified range and °C blinks, replace the sensor.
	Sensor is not connected.	Connect the sensor to the meter [Page 5] and confirm that the blinking display disappears.
Or or Ur is displayed.	Measurement range is exceeded.	If Or or Ur is displayed even after measuring the standard solution, the sensor may be deteriorated. Replace the sensor with a new one.
	Sensor is not connected.	Re-connect the sensor to the meter [Page 5]. If Or or Ur is displayed even after measuring the standard solution, the sensor may be deteriorated. Replace the sensor with a new one.

Issue	Cause	Recommended action
Er1, Er2 or Er3 is displayed.	The internal IC in the meter may be defective.	Initialize the meter [Page 20]. If initialization does not improve the issue, replace the meter with a new one (The meter cannot be repaired).
Temperature readings are off.	Since the temperature sensor is installed inside the sensor, temperature error occurs when measuring a small amount of sample, depending on the temperature of the measurement environment.	Normally temperature sensor adjustment is not necessary, but temperature value can be adjusted. After changing to the temperature measurement screen [Page 4], press the CAL button, the temperature display will blink, and press the MEAS button to set the temperature to be adjusted. Each press of the MEAS button increases the displayed temperature, which can be set within ±2°C of the displayed temperature. After setting, press the CAL button to complete the adjustment. If Er4 is displayed, the temperature sensor is faulty and should be replaced with a new sensor.
Measurement value remains the same on display.	Measurement value remains fixed in AH measurement mode.	Press MEAS button and release the hold.
Response or repeatability of measurement is poor	Surface condition of electrodes is not stable.	Perform sensor conditioning [Page 8].

9 Specifications

Model		LAQUAtwin-4EC-	11	22	33
Target		Electrical conductivity			
Measurement principle		4-electrode method			
Minimum sample volume		0.12 mL			
Range and resolution (valid digits)					
	Conductivity	0 to 199 µS/cm: 1 µS/cm 200 to 1999 µS/cm: 1 µS/cm 2.00 to 19.99 mS/cm: 0.01 mS/cm	√	√	√
		20.0 to 199.9 mS/cm: 0.1 mS/cm		√	√
	TDS	0.0 to 99.9 ppm: 0.1 ppm 100 to 999 ppm: 1 ppm 1000 to 9990 ppm: 10 ppm			√
Calibration		Up to 3 points	√		
		Up to 4 points		√	√
Accuracy*1		±2% full scale (for each range)	√		
		±2% full scale (0 to 19.99 mS/cm) ±5% full scale (20.0 to 199.9 mS/cm)		√	√
Temperature display		0°C to 50.0°C		√	√

Display	Custom (monochrome) digital LCD with backlight
Operating temperature/ humidity	5°C to 40°C 85% or less relative humidity (no condensation)
Power	CR2032 batteries (×2)*2
Battery life	Approx. 400 h continuous operation (backlight off mode)*3
Outer dimensions/ mass	164 × 29 × 20 mm (excluding projections), Approx. 45 g (only meter, excluding batteries)
Main function	Temperature compensation (2%/°C fixed), waterproof*4, auto stable/auto hold, automatic power OFF

*1 Accuracy refers to the reproducibility of the measurement when the standard solution used in the final calibration point is measured, after calibration has been performed using each standard solution, under conditions where both the ambient temperature and the standard solution are at 25°C. The error of the standard solution and rounding error (±1 digit) are not included.
*2 Batteries are not included and are not installed.
*3 When the backlight is used, battery life will shorten.
*4 IP67: no failure when immersed in water at a depth or 1 meter for 30 minutes.
Please note that the meter can not be used underwater

10 Reference information

Disposal

When disposing of the product, battery and standard solutions follow the related lows and regulations of your country for disposal of the product.

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For any questions regarding this product, please contact your local agency, or inquire from the following website.
http://global.horiba.com/contact_e/index.htm