

JENCO®

VisionPlus

台式电导率计说明书

MODEL 3175-307A



沪制02270148号



3175-307A

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概述

感谢您选购3175-307A/3175-307。3175-307A/3175-307是一台测量电导率、TDS（3175-307A）及温度的精密仪器，内建的微处理器可用于存储、校正和补偿所有有关电导率、TDS及温度数据。

本仪器拥有IP54等级的防水外壳，机械式按键提供高可信任度，高触觉及声响告知等功能，可使用9V交流电源适配器为电源，也可使用6节7号（AAA）电池为电源。本仪表有低电（BAT）提示功能。校正数据永久储存在主机中，下次开机时不需再次校正。

本仪器使用大型带背光的LCD，可同时显示电导率/TDS（3175-307A），温度及指示目前所在的显示模式，即使在校正或测量程序下，也会提供使用者各种提示。

本仪器可以很方便的选择不同的探头，用户可选择四种类型的探头（0.01, 0.1, 1.0, 10.0），以便于做更精确的测量。整机可显示℃的电导率值与TDS值，此显示可通过按“MODE”键实现（3175-307A）。

其他功能包括自动切换量程，自动温度补偿以及50/60Hz交流噪声排除能力，此仪器适合实验室使用。

产品检视

小心地打开包装，检视仪器及配件是否有因运输而损坏，如有发现，请立即通知 JENCO 的代理。

电源

3175-307A/3175-307可用230V~9V的交流电源适配器也可用6节“AAA”级的碱性电池提供电源。在使用仪器之前，请先检查交流适配器上的标签，以确保电源是正确的。如果发现交流电源适配器有误，请及时通知JENCO的代理。

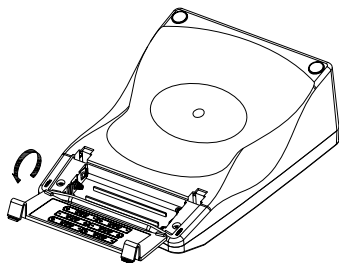
[注意：如果没有正常的交流电，请使用电池供电。]

安装电池

3175-307A/3175-307使用6节7号（“AAA”）电池，以下是安装步骤：

1. 用双手掰开电池盖卡扣，取下电池盖。（图1）
2. 取出旧电池并装上新电池，更换时，请注意电池极性放置要正确。

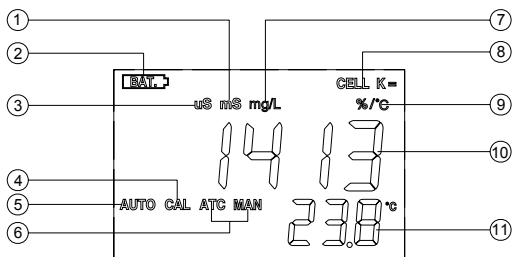
3. 放回电池盖，并确保卡扣卡紧。



图一：电池安装图

显示及按键功能

A. 显示










图二：LCD 显示

<p>1. mS- mS, 电导度单位。</p>	<p>7. mg/L- mg/L, TDS (总固体溶解量) 单位 (3175-307A)。</p>
<p>2. BAT- 低电显示, 表示须更换电池。</p>	<p>8. CELL K= 表示电导探棒的 K 值。</p>
<p>3. uS- uS, 电导度单位。</p>	<p>9. %/ °C- 表示温度系数。</p>

<p>4. CAL- 当“CAL”显示时，表示整机进入校正模式。</p>	<p>10. 主显示- 3175-307 显示电导率值。 3175-307A 显示电导率值和 TDS（总固体溶解量）值。</p>
<p>5. AUTO- 表示整机自动切换测量范围。</p>	<p>11. 次显示- 显示温度值。</p>
<p>6. ATC/MAN- ATC，表示电导率读值具有温度补偿（3175-307A）。 MAN，表示电导率读值不具有温度补偿（3175-307）。</p>	

B. 按键

	<p>On/Off- 按住此键 5 秒打开或关闭主机。开机后，即按此键，可打开或关闭主机背光。</p>
	<p>Cal- 按此键可进入校正模式。</p>
 or 	<p>Mode- 选择仪器的测量模式。 3175-307A 连续按此键，显示的顺序为：带温度补偿的/无温度补偿的电导率、TDS 值（总固体溶解量）。 3175-307 无此键，显示无温度补偿的电导率值。</p> <p>Clear- 清除键。在测量模式下，除非长按此键 5 秒，机器会删除所有校正值，否则此键不起作用，目的是防止用户由于误触而删除校正值。</p>
 	<p>上键和下键 上键和下键仅在校正模式才起作用，增加、减少需变动的设置项目值。在测试状态不起作用。</p>

	Enter- 在校正状态按此键，把当前的设定值记忆到微处理中。
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操作步骤

A. 标准溶液的配制

适宜的标准溶液配制粉剂需使用商业用或研究用等级的粉剂，以下是三种浓度的标准溶液的配制方法，使用者可以用它们来校正3175-307A/3175-307的电导电极。

1. 1413uS 标准溶液 (25°C)：精确地称量0.746 g研究用等级的KCL, 使它溶解于1000ml的纯水中。
2. 12.90mS标准溶液 (25°C)：精确地称量7.4365 g研究用等级的KCL, 使它溶解于1000ml的纯水中。
3. 111.9mS标准溶液 (25°C)：精确地称量74.264 g研究用等级的KCL, 使它溶解于1000ml的纯水中。

[注意：剩余的未经使用过的标准溶液，您可以用密闭的容器在低于4摄氏度的环境下储存一周。如果您对标准溶液准确性产生疑问，请重新配制新的标准溶液。]

B. 电导率校正

校正步骤包含6个步骤：TDS因数、温度系数、参考温度、电导电极常数种类选择、校正标准溶液方式调整电导电极常数以及直接调整电导电极常数校正。详细步骤如下：

1. 将电导电极的接头与主机的接口连接并按开关键开机。
2. 等温度读值稳定后，请按“Cal”键进入校正模式，“CAL”将显示在LCD上。

TDS因数

TDS（总固体溶解量）是用有温度补偿的电导值乘以TDS因数值得，机器默认值为0.65。你可以用上键和下键调节这个TDS因数，调整范围是0.30~1.00。按“Enter”键储存新的设定值并进入下一个校正参数界面。

温度系数

整机是用温度系数计算具有温度补偿的电导率值的，此温度系数默认值为1.91%。你可以用上键和下键调节这个温度系数值，调整范围是0.00~4.00%。按“Enter”键储存新的设定值并进入下一个校正参数界面。

参考温度

整机是用参考温度来计算具有温度补偿的电导率值的，此参考温度默认值为25℃。你可以用上键和下键调节这个参考温度值，调整范围是15~25℃。按“Enter”键储存新的设定值并进入下一个校正参数界面。

电导电极常数种类选择

整机主显示将显示一个电导电极常数（上次使用校正过的或默认的，此值的调整范围是70%~130%）。次显示将显示电导电极种类，你可以用上键和下键选择电极常数种类，此整机有四种电极常数种类（0.01, 0.1, 1.0 and 10.0）。按“Enter”键储存新的设定值并进入下一个校正参数界面。

校正标准溶液方式调整电导电极常数校正

- (a) 把电导电极放入已知电导率标准溶液中(详见“标准溶液的配制”)，此标准溶液的选择最好基于被测溶液电导值的范围之内。
- (b) 把电极浸入标准溶液中（至少2~3英寸或者5~7cm），并稍作搅动以便消除电极极片上的空气泡。整机将显示标准溶液的电导率值。在校正步骤中，请先确认以下参数已设定完成：温度系数设成1.91%，参考温度设成25.0℃。

[注意：如果你想直接用输入常数值调整，请按“Enter”键进入“直接调整电导电极常数校正”。]

- (c) 稍等片刻，等待温度稳定。当温度稳定后，你可以用上键和下键调节这个标准的电导度值（25℃）。按“Enter”键储存新的设定值并进入下一个校正参数界面。

直接调整电导电极常数校正

- (a) 整机将显示标准溶液的电导率值，“CELL K=”也将显示在LCD上，表示此校正时直接调整电导电极常数。
【注意：如果你已用“校正标准溶液方式调整电导电极常数”，请按“Enter”键退出校正模式回到测量模式。】
- (b) 按住“上键”或“下键”，主显示将显示电导电极常数偏差并同时增加或减少此值(此值可从70%~130%)。放开“上键”或“下键”，主显示将显示标准溶液的电导率值。
- (c) 调动此电导电极常数值，使得电导率值与25℃的标准溶液值一致。按“Enter”键储存新的设定值并退出校正模式回到测量模式。

C. 电导率的测量

1. 电极接上整机后，开机，把清洗后的电极直接放入被测溶液中（至少浸没2~3英寸或者5~7cm），稍做搅动，赶出电极片上的空气泡。
2. 按“Mode”键切换到自己需要测量的参数（电导率或TDS）。机器在自动切换量程的时候显示“over”或“undr”是正常的。当温度稳定后，就可以读取测量值，此值才为被测溶液的测量值。

【注意：3175-307无“Mode”键，因此无切换功能，整机显示无温度补偿的电导率值。】

错误显示及原因

主显示	次显示	可能发生原因	纠正错误
测量模式显示 "over"	0.0~100.0℃	<ul style="list-style-type: none"> ●被测溶液电导率值 > 200.0mS; 被测溶液 TDS值 > 200g/L。 ●电导电极受污染或已损坏。 ●输入的电极常数值不正确。 	<ul style="list-style-type: none"> ●无法检测样品。 ●清洗电极或更换电极。 ●正确输入电极常数值。
校正模式显示 "over"	/	<ul style="list-style-type: none"> ●标准溶液错误。 ●电导电极受污染或已损坏。 ●输入的电极常数值不正确。 	<ul style="list-style-type: none"> ●更换标准溶液。 ●清洗电极或更换电极。 ●正确输入电极常数值。
测量模式显示 "over"	over	●被测溶液温度 >100℃。	●降低被测溶液温度。
		●电导电极损坏。	●更换电极。
	undr	●被测溶液温度 <0.0℃。	●升高被测溶液温度。
		●电导电极损坏。	●更换电极。

[注意：如果机器仍然不能正常工作，请联系Jenco的服务部门。]

规格

显示	测量范围	分辨率	精确度
电导率 K=0.01	0.000 to 1.999uS/cm	0.001uS/cm	±0.5% 量程
	2.00 to 19.99uS/cm	0.01uS/cm	±0.5% 量程
电导率 K=0.1	0.00 to 19.99uS/cm	0.01uS/cm	±0.5% 量程
	2.0 to 199.9uS/cm	0.1uS/cm	±0.5% 量程
电导率 K=1.0	0.0 to 199.9uS/cm	0.1uS/cm	±0.5% 量程
	200 to 1999uS/cm	1uS/cm	±0.5% 量程
	2.00 to 19.99mS/cm	0.01mS/cm	±0.5% 量程
电导率 K=10.0	0 to 1999uS/cm	1uS/cm	±0.5% 量程
	2.00 to 19.99mS/cm	0.01mS/cm	±0.5% 量程
	20.0 to 199.9mS/cm	0.1mS/cm	±0.5% 量程
温度	0.0 to 100.0 °C	0.1 °C	±0.2°C

参考温度	15.0 to 25.0 °C
温度系数	0.0% to 4.0%
电导电极常数	0.01; 0.10; 1.00; 10.0
TDS因数 (3175-307A)	0.30 to 1.00, 默认为0.65
电源	6节7号 (“AAA”) 电池及稳压源
校正存储	EEPROM
音效回馈	所有按键
终点锁定	有
显示 (pH /mV : 温度)	22mm : 14.5mm 高 LCD
环境温度	0 ~ 50 °C
相对湿度	90%以下
外壳	IP54
尺寸 (长 x 宽 x 高)	150mm x 203mm x 72mm

质量保证

仪器保修一年（以购买日为准）。在保修期内如有质量问题，本公司将无偿代为修复；如有人为因素造成故障或损坏，本公司竭诚代为修复，但需酬收工本费（配件如电极头、标准液等消耗品不在保证范围内）。在将本机退回本公司时，请用包装材料妥为包好，以避免运输途中碰伤。无论何种情况，在退回本机前，请先与本公司联系，并得到本公司认可，方可退回本机。

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GENERAL INTRODUCTION

Thank you for selecting the 3175-307A/3175-307meter. The 3175-307A/3175-307 is a precision tool that measures Conductivity, TDS(3175-307A) and Temperature. A built-in microprocessor stores, calculates and compensates for all parameters related to Conductivity, TDS and Temperature determinations.

This meter has a waterproof IP54 case. The mechanical keys are highly reliable with tactile and audio feedback. This meter is powered by six AAA-size alkaline batteries or with a UL approved AC adapter (OUTPUT: DC9V). The meter also displays a "BAT" message when the batteries are in need of replacement. Re-calibration is not required when power is restored.

The front of the meter has a large LCD that displays Conductivity or TDS and Temperature simultaneously along with user prompts and mode indicators. The unit prompts the user through calibration and measurement procedures.

The model 3175-307A/3175-307 micro-processor allows the user to easily recalibrate the parameters for the probe. A few keystrokes will adjust all the parameters for conductivity and will also give the user the option to select four types (0.01, 0.1, 1.0, 10.0) of probe cell constant for a better selection of available probes and applications. And the user can input K value of the cell by keypad directly.

The system simultaneously displays temperature in °C along with either Conductivity or TDS. The user can switch back and forth from all these displays by just pushing a single "MODE" key (3175-307A/3175-307).

Other features include automatic conductivity ranging, automatic temperature compensation, long battery life, and 50/60 Hz AC noise rejection. This meter is user-friendly for laboratory application.

INITIAL INSPECTION

Carefully unpack the unit and accessories. Inspect for damages made in shipment. If any damage is found, notify your **Jenco** representative immediately. All packing materials should be saved until satisfactory operation is confirmed.

POWER INPUT

The model 3175-307A/3175-307 can be powered by an 115V or 230VAC adaptor as well as 6 "AAA" alkaline batteries. Check the label on the AC

adaptor supplied with the instrument to make sure that the AC line voltage is correct. If the wrong AC adaptor is supplied, notify your **Jenco** representative immediately.

INSTALLING THE BATTERIES

To insert the batteries into the meter, follow the procedure outlined below.

1. Use two hands to flip the two buckles and battery cover to expose the battery compartment. (Figure 1.)
2. Note the polarity and insert the six AAA batteries into the battery compartment correctly.
3. Replace the battery cover.

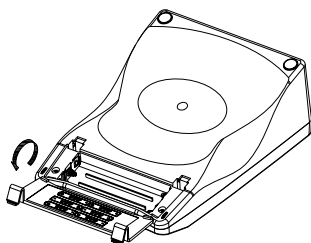


Figure 1: Battery compartment

DISPLAY & KEYS FUNCTIONS

A. Display

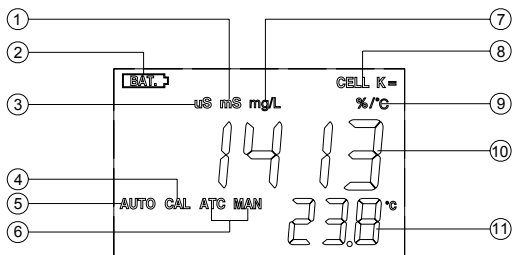









Figure2: Active LCD screen

<p>1. mS- Millisiemens , indicates Conductivity measurement.</p>	<p>7. mg/L- Milligrams/Liter indicates TDS measurement (3175-307A) .</p>
<p>2. BAT- Low battery indicator.</p>	<p>8. CELL K= Indicates conductivity cell constant value.</p>
<p>3. uS- Microsiemens, indicates Conductivity measurement.</p>	<p>9. %/ °C- Indicates Temperature Coefficient</p>
<p>4. CAL- This will be displayed when the unit enters into the calibration mode.</p>	<p>10. MAIN DISPLAY- For Conductivity and TDS values (3175-307A). For Conductivity values (3175-307).</p>
<p>5. AUTO- Auto ranging indicator</p>	<p>11. SECONDARY DISPLAY- For temperature in °C display.</p>
<p>6. ATC/MAN- ATC, indicates Compensated Conductivity (3175-307A). MAN, indicates Uncompensated Conductivity (3175-307).</p>	

B. Keys

	<p>On/Off- Press and hold this key for 5 seconds to power on and shut off the meter. Once the unit is power up, press the same key to turn on or off the backlight.</p>
	<p>Cal- During normal operation, this key will change the mode from "Measure" mode to "Calibration" mode.</p>
 or 	<p>Mode- 3175-307A selects display mode. In normal operation, press this key to sequentially display Compensated Conductivity / Uncompensated Conductivity and TDS. 3175-307 has not this key. It displays Uncompensated Conductivity.</p> <p>Clear- When this key is pressed, it clears all calibration values stored in the internal memory. Under normal use the key will not be activated unless pressed and held for 5 seconds to prevent accidental erasing stored memory.</p>
 	<p>Up/Down- Increases or decreases the display value as desired.</p>
	<p>Enter- In Calibration mode, press this key to save the current parameter to memory.</p>

OPERATIONAL PROCEDURES

A. Preparing Standard Solutions

Suitable conductivity standards are available commercially or the user can prepare them using research grade reagents.

Here are some standard solutions the user can prepare to calibrate the probe of the model 3175-307A/3175-307.

1. Standard solution of 1413uS at 25°C: Accurately weight out 0.746 grams of research grade dried Potassium Chloride (KCL). Dissolve in 1000ml of distilled water.
2. Standard solution of 12.90mS at 25°C: Accurately weight out 7.4365 grams of research grade dried Potassium Chloride (KCL). Dissolve in 1000ml of distilled water.
3. Standard solution of 111.9mS at 25°C: Accurately weight out 74.264 grams of research grade dried Potassium Chloride (KCL). Dissolve in 1000ml of distilled water.

[Note: You can store the remaining solution in a plastic container for one week but the air space between the cap and the solution must be kept to an absolute minimum. Storing the excess solution below 4°C can increase the storage life. If you have any doubt of the accuracy of the stored solution, a fresh batch should be prepared.]

B. Calibration

Calibration setup contains six sections: TDS Constant, Temperature Coefficient, Temperature Reference, Probe Basic Cell Constant, Cell Constant Calibration and K Value Input. To access these sections:

1. Connect the conductivity probe to the unit and turn the unit on.
2. Allow temperature reading to stabilize, press “**Cal**” key to enter the calibration mode. **CAL** appears on the LCD.

[Note: Press “**Enter**” key to accept any values changes in each section and automatically advance to the next section. If there are no changes, the unit accepts the current value and proceeds to the next section.]

TDS Constant

TDS is determined by multiplying conductivity (mS) by a TDS factor. The default factor value is 0.65. To change the TDS factor, use the “**up**” and “**down**” keys to adjust the value between 0.30 and 1.00. Press “**Enter**” key to save the new value and go to the next calibration parameter.

Temperature Coefficient

The unit uses the temperature coefficient to calculate temperature compensated conductivity. The default value is 1.91%. To change the Temperature Coefficient, use the “**up**” and “**down**” keys to adjust the value between 0 and 4.00%. Press “**Enter**” key to save the new value and go to the next calibration parameter.

Temperature Reference

The unit uses the temperature reference value to calculate temperature compensated conductivity. The default value is 25°C. To change the Temperature Reference, use the “**up**” and “**down**” keys to adjust the value between 15 and 25°C. Press “**Enter**” key to save the new value and go to the next calibration parameter.

Probe Basic Cell Constant

The main display shows the deviation of the conductivity probe (calibrated previously or default, the deviation range is 70%~130%, 100% without error). The secondary display shows the current selected cell constant. Using the “**up**” and “**down**” keys to adjust the probe basic cell constant to that you use from the 4 available cell constants (0.01, 0.1, 1.0 and 10.0). Press “**Enter**” key to save the new value and go to the next calibration parameter.

Cell Constant Calibration

- (a) Immerse the probe in a standard of known conductivity solution (See section **Preparing Standard Solutions**), preferably a standard in the middle range of the solutions to be measured. Immerse the probe (at least 2” to 3” or 5~7cm from the tip) without touching the sides of the calibration container. Shake the probe lightly to remove any air bubbles trapped in the conductivity cell. The unit will display the conductivity value of the standard solution. During cell constant calibration, the following parameters

are over-ridden: temperature reference (fixed to 25.0°C) and temperature coefficient (fixed to 1.91%).

[Note: If you want input K value directly, please press the “Enter” key to go to the K Value Input.]

- (b) Wait for the values of temperature and conductivity to stabilize for a few seconds. Using the “up” and “down” keys to adjust the reading of the display until it matches the value of the known standard conductivity solution at 25 °C.
- (c) Press “Enter” key to calculate and save the new value of **Cell Constant** or press the “Enter” key to the next calibration parameter.

K Value Input

- (a) The unit will display the conductivity value of the standard solution with the **CELL K=** staying on.
[Note: If the Cell Constant has been calibrated, please press the “Enter” key to exit calibration and return to normal operation.]
- (b) Press and hold the “up” or “down” key, the main display will show the deviation of the conductivity probe. You can now input the K value (from 70%~130% of the probe basic cell constant). After releasing the up or down key, the unit will display the conductivity value with the **CELL K=** staying on.
- (c) adjust the K value until the conductivity value displayed on the LCD matches the value of the known standard conductivity solution at 25°C.
- (d) Press “Enter” key to save the new **K value** of the cell to exit calibration and return to normal operation mode.

C. Conductivity Measurements

- 1. Turn the unit on. Place the probe in the solution to be measured. Immerse the probe (at least 2” to 3” or 5~7cm from the tip). Shake the probe lightly to remove any trapped air bubbles in the conductivity cell.
- 2. Press “Mode” key to enter the desired measurement mode (Conductivity or TDS). The message “over” or “undr” may appear briefly on the display indicate auto-ranging; this is

normal. Allow temperature to stabilize before taking measurements.

ERROR DISPLAYS AND TROUBLESHOOTING

Main Display	Secondary Display	Possible cause(s)	Corrective Action(s)
"over" during measurements	0.0~100.0°C	<ul style="list-style-type: none"> ● Sample Conductivity value > 200.0mS; Sample TDS > 200g/L. ● Conductivity cell contaminated or defective. ● Incorrect K constant value input. 	<ul style="list-style-type: none"> ● Sample cannot be tested ● Decontaminate / clean cell or replace cell. ● Input correct K value.
"over" during calibration	/	<ul style="list-style-type: none"> ● Incorrect standard solution. ● Conductivity cell contaminated or defective. ● Incorrect K constant value input. 	<ul style="list-style-type: none"> ● Replace standard solution. ● Decontaminate / clean cell or replace cell. ● Input correct K value.
"over " during measurements	over	<ul style="list-style-type: none"> ● Sample temperature >100°C. 	<ul style="list-style-type: none"> ● Reduce sample temperature.
		<ul style="list-style-type: none"> ● Defective conductivity cell. 	<ul style="list-style-type: none"> ● Replace cell.
	undr	<ul style="list-style-type: none"> ● Sample temperature <0.0°C 	<ul style="list-style-type: none"> ● Increase sample temperature.
		<ul style="list-style-type: none"> ● Defective conductivity cell. 	<ul style="list-style-type: none"> ● Replace cell.

[Note: If the meter still does not perform normally after the above measures are taken, call Jenco representative.]

SPECIFICATIONS

Display	Range	Resolution	Accuracy
Conductivity K=0.01	0.000 to 1.999uS/cm 2.00 to 19.99uS/cm	0.001uS/cm 0.01uS/cm	±0.5% FS ±0.5% FS
Conductivity K=0.1	0.00 to 19.99uS/cm 2.0 to 199.9uS/cm	0.01uS/cm 0.1uS/cm	±0.5% FS ±0.5% FS
Conductivity K=1.0	0.0 to 199.9uS/cm 200 to 1999uS/cm 2.00 to 19.99mS/cm	0.1uS/cm 1uS/cm 0.01mS/cm	±0.5% FS ±0.5% FS ±0.5% FS
Conductivity K=10.0	0 to 1999uS/cm 2.00 to 19.99mS/cm 20.0 to 199.9mS/cm	1uS/cm 0.01mS/cm 0.1mS/cm	±0.5% FS ±0.5% FS ±0.5% FS
Temperature	0.0 to 100.0 °C	0.1 °C	±0.2°C

Reference Temperature	15.0 to 25.0 °C
Temperature Coefficient	0.0% to 4.0%
Cell Constant	0.01; 0.10; 1.00; 10.0
TDS Constant Range (3175-307A)	0.30 to 1.00, default at 0.65
Power	Six "AAA" Batteries
Calibration Back-up	EEPROM
Audio Feedback	All Touch Keys
Display (Conductivity/TDS: Temp)	22mm : 14.5mm high LCD
Ambient Temperature Range	0 to 50 °C
Relative Humidity	up to 90%
Case	IP54
Dimensions (W x D x H)	150mm x 203mm x 72mm
Weight	504 grams(Batteries included)

WARRANTY

Jenco warrants this product to be free from significant deviations in material and workmanship for a period of 1 year from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse, within the year period, please return-freight-prepaid and the correction of the defect will be made free of charge. If you purchased the item from our **Jenco** distributors and it is under warranty, please contact them to notify us of the situation. **Jenco** Service Department alone will determine if the product problem is due to deviations or customer misuse.

Out-of-warranty products will be repaired on a charge basis.

RETURN OF ITEMS

Authorization must be obtained from one of our representatives before returning items for any reason. When applying for authorization, have the model and serial number handy, including data regarding the reason for return. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. **Jenco** will not be responsible for damage resulting from careless or insufficient packing. A fee will be charged on all authorized returns.

NOTE: Jenco reserves the right to make improvements in design, construction and appearance of our products without notice.

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