Economical Rugged Series

M1400K

T-HENG ECONOMICAL RUGGED SERIES

T-HENG Mechanical & Electrical Co. Ltd.

Tel: (+86) 010-60251782 Fax: (+86) 010-60252017

Web: www.t-heng.com

CONTENT

INTRODUCTION

The Economical Rugged conductivity Meter (Model M1400K) is cost-effective and meets requirements of most users. It is accord with Advanced Rugged Meters like fully waterproof, shockproof, reliable accuracy and a striking exterior.

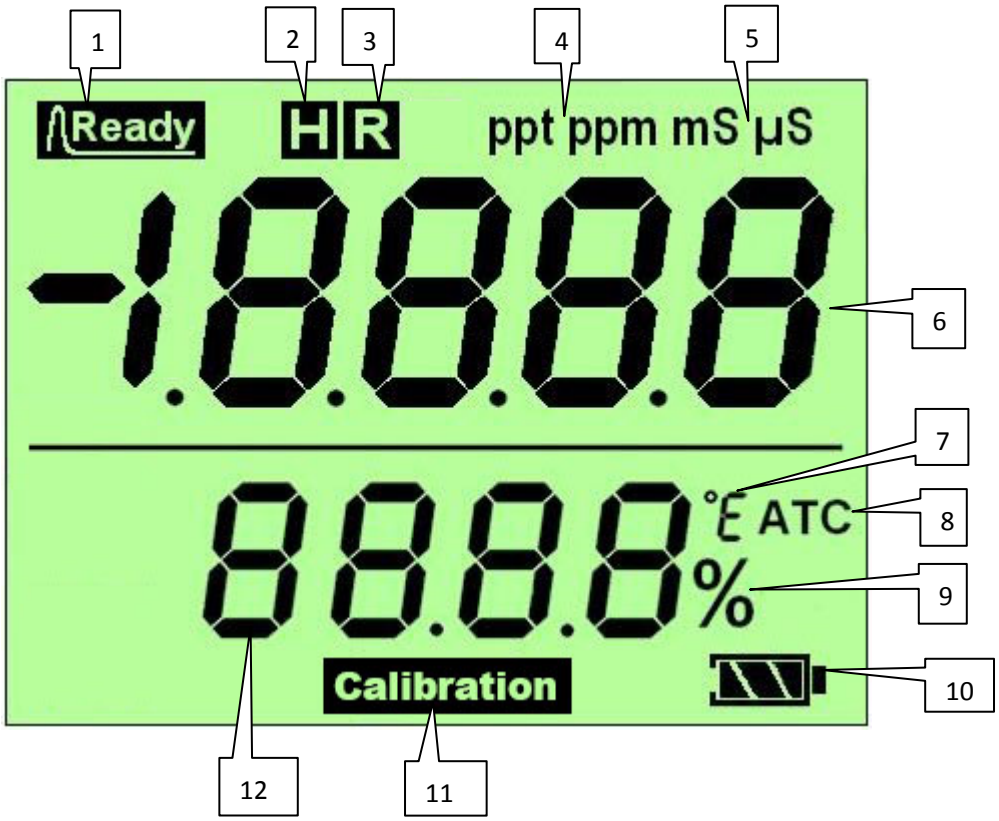
FEATURES

IP67 Waterproof
Shockproof
2*AAA Battery
User friendly
Conductivity Measurement
High Accuracy
2 data points for Calibration
Automatic Temperature Compensation
Rapid Response
Restore Factory Default
HOLD
Auto Power-Off

MATERIALS SUPPLY

Meter
2*AAA Battery
Instruction

LCD DISPLAY



	Name	Description
1	Ready	Displayed when measuring results are stable
2	H	HOLD
3	R	Restore factory defaults
4	ppm ppt	TDS Unit
5	mS uS	Conductivity Unit
6	Main display	
7	Temperature Unit	
8	ATC	Auto Temperature Compensation
9	% Unit	
10	Battery Indicator	
11	Calibration	
12	Second Display	

KEYPAD

	Name	Function	Remark
1	POWER	Power on/off	
2	MODE	Switch mode	
3	HOLD/SET	HOLD/SET	

SETUP MODE

Power On

1. Press **POWER** once to turn the meter on.
2. Press **POWER** again to turn the meter off.

NOTE: All operations are operational when the meters power on.

Temperature Units

Temperature unit ℃， Range [0.0 – 80.0]

Temperature unit ℉， Range [32.0 – 176.0]

Working Mode

MODE，enter into different mode ：

1. Enter into measurement mode as soon as power on.
2. Press **MODE** once，”uS”(“mS”) flash on the Main Display, conductivity mode
3. Press **MODE** twice，”ppt”(“ppm”) flash on the Main Display, TDS mode

4. Press **MODE** three times "℃" flash on the Second Display, Degrees Celsius temperature unit mode.
5. Press **MODE** four times , "℉"flash on the Second Display, Degrees Fahrenheit temperature unit mode.
6. Press **MODE** five times , "Calibrating" flash on the Second Display , Calibration mode.
7. Press **MODE** six times , "R" flash on the Main Display , Restore factory default mode.
8. Press **MODE** seven times , "P.1" flash on the Main Display , TDS Coefficient Setup mode.
9. Press **MODE** eight times , "P.2" flash on the Main Display , Temperature Coefficient Setup mode.

Notes

* If you do not know the temperature coefficient of your solution you can determine the correct value using the formula in Appendix "Calculating Temperature Coefficients".

Appendix

Calculating Temperature Coefficients

To determine the temperature coefficient of your **sample solution** use this formula:

$$\mathbf{TC} = 100 \times \frac{\mathbf{CT2} - \mathbf{CT1}}{\mathbf{CT1}(\mathbf{T2} - 25) - \mathbf{CT2}(\mathbf{T1} - 25)}$$

TC = Temperature coefficient
CT1 =Conductivity at Temp. 1
CT2 = Conductivity at Temp. 2
T1 = Temp. 1
T2 = Temp. 2
25 = 25°C

A controlled temperature water bath is ideal for this procedure.

1. Immerse the probe into a sample of your solution and adjust the temperature coefficient to 0% (that is, no compensation) by performing the following:

2. Wait for 5 minutes. Note **T1** and **CT1** (conductivity at **T1**).

3. Condition the sample solution and probe to a temperature (**T2**) that is about 5°C to 10°C different from **T1**, and note the conductivity reading **CT2**.

NOTE: Record your results for future reference. Ideally **T1** and **T2** should bracket your measurement temperature, and should not differ by more than 5°C.

4. Calculate the temperature coefficient of your solution according to the formula shown above.

5. Enter the temperature coefficient you calculated into the meter.

The calculated temperature coefficient will now be applied to all the meter readings.

To determine the conductivity to TDS conversion factor for your solution:

Appendix

1. Factor—the conductivity to ppm TDS conversion factor. Multiply conductivity by this factor to get ppm TDS for the type of TDS reading needed.
2. 442—a formulation that most closely represents the conductivity to ppm relationship, on average, for naturally occurring fresh water.
3. TDS Your Material—These columns are for you to write in your application-specific conductivity-to-ppm values and conversion factors for future reference.

Factor = actual TDS ÷ Actual Conductivity @ 25°C lists some commonly used conversion factors.

Conductivity at 25°C	TDS KCl		TDS NaCl		TDS 442		TDS Your Material	
	ppm Value	Factor	ppm Value	Factor	ppm Value	Factor	ppm Value	Factor
1413 µS	744.7	0.5270	702.1	0.4969	1000	0.7078		
12880 µS	7447	0.5782	7230	0.5613	11,367	0.8825		

HOLD/SET

HOLD/SET，when in the Measurement Mode, it acts as HOLD function.

When in the Setting Mode, it acts as Confirmation or Selection function.

Set Temperature Units

1. Press **MODE** three times , “℃” flash on the Second Display , press **HOLD/SET** to confirm temperature unit.
   When the meter connect to probe, current temperature value will show on the Second Display; on the other hand, show “Ur” on the Second Display and “Or” on the Main Display without probe。

2. Press **MODE** four times, “℉” flash on the Second Display, press **HOLD/SET** to confirm temperature unit.
   When the meter connect to probe, current temperature value will show on the Second Display; on the other hand, show “Ur” on the Second Display and “Or” on the Main Display without probe。

Calibration

In the Conductivity Measurement Mode

1. Immerse the probe in standard solution until **READY** shows.(Get high accuracy ,please immerse the probe for 3min or longer .)

2. Press **MODE** five times, **Calibrating** flash on the Second Display, press **HOLD/SET** to enter Calibration Mode. (Calibrating stop flashing)

3. The meter will automatically recognize the standard solution and automatic calibration. During this process, calibration value will be shown on the Second Display.

4. After Calibration, meter automatically returns to Measurement Mode.

At most 2 points calibration: 1413uS and 12.88mS, when the solution cannot be recognized, show "Err" for 2s. Then automatically returns to Measurement Mode.

Note : For high accuracy, we recommend that users should regularly calibrate. In the following situation, users must recalibrate meters.

- Replace probe
- After measuring aggressive chemicals
- **Note:** TDS don't need be calibrated after Calibration of conductivity, because there is a certain Coefficient between TDS and conductivity value. Calibration should be on fixed value solution, the Coefficient between TDS and conductivity value is adjustable. Normally, don't calibrate TDS.

Restore Factory Default

Press **MODE** six times， **R** flash on the Main Display，press **HOLD/SET** to restore factory default and meter will return to Measurement Mode after LCD full-shown for 1S.

AUTO POWER-OFF

The meter will automatically power off without any operation for 8 min.

SPECIFICATION

Conductivity Meter			
Mode	Conductivity	TDS	Temperature
Range	0 to 19.99uS 20.00 to 199.9uS 200.0 to 1999uS 2.00 to 19.99mS 20.0 to 100.0mS	0.0 to 9.99ppm 10.0 to 99.9ppm 100 to 999ppm 1.0 to 9.99ppt 10.0 to 100.0ppt	0.0-80.0℃ (32-176℉)
Resolution	0.1	0.01	0.1℉ (0.1℃)
Accuracy	±2% FS	±2% FS	±0.9℉(±0.5℃)
Responding Time	20S	20S	30S
Calibration	At most 2 points		
Temperature Compensation	Auto (ATC) from 32-212℉ or 0-100℃		
Operating Temperature	32-122℉ (0~50℃)		
Battery	2*AAA		
Probe	Plastic electrode		