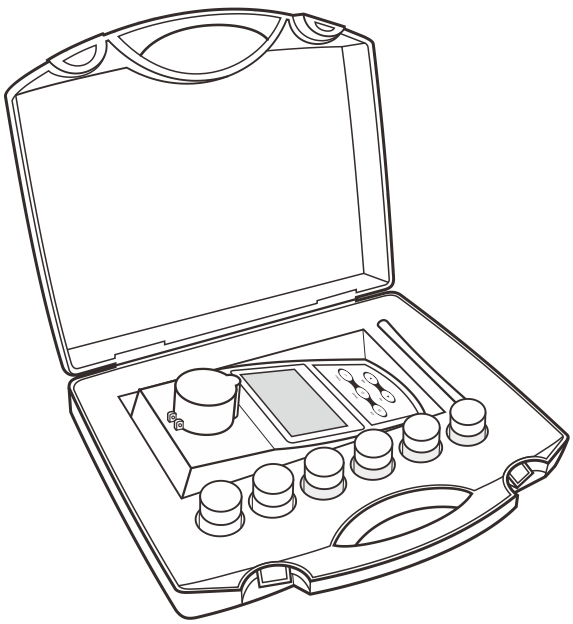
AMTAST

AMT27 PortableTurbidity Meter

USER MANUAL



AMTAST USA INC

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Introduction

Thank you for selecting the AMT27 portable turbidity meter. This user manual provides a step-by-step guide to help you operate the meter, please carefully read the following instructions before use. Any use outside of these instructions may invalidate your warranty and cause permanent damage to the meter.

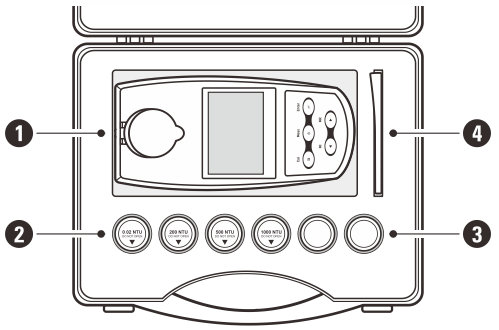
Environmental Conditions

Before unpacking, ensure that current environmental conditions meet the following requirements.

- Relative humidity is less than 80%
- Ambient temperature between 0°C (32°F) and 50°C (122°F)
- No ambient light and electromagnetic interference

Packing List

The following list describes all components of the meter. If any items are missing or damaged, contact the supplier immediately.

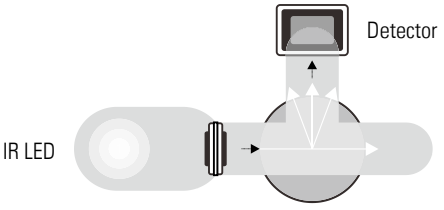


1	AMT27 meter	3	Sample vials
2	Turbidity standards	4	Lint-free cloth

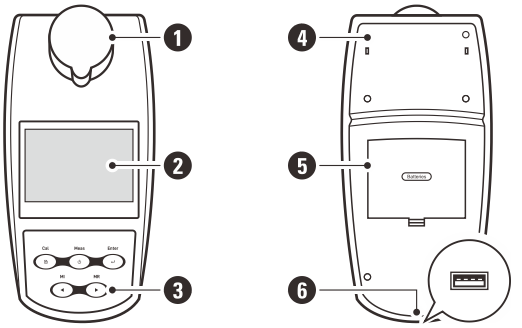
The sample vial in the measurement chamber has been indexed with the 0.02 and 10 NTU standards at the factory.

Operating Principle

The AMT27 turbidity meter operates on the nephelometric principle of turbidity measurement and is designed to meet the criteria specified in ISO 7027.



Meter Overview

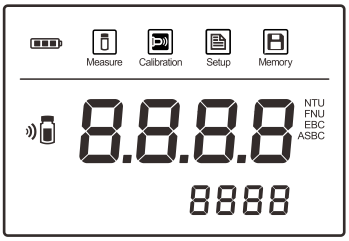


1	Measurement chamber
2	Display
3	Membrane keypad
4	Measurement module
5	Battery compartment
6	USB-A interface to the computer or power adapter

Keypad

Key	Function
Meas	• Switch the meter on or off • Start measurement • Exit the calibration, settings, data logs and return to the measurement mode
Cal	• Start calibration • Press and hold the key to enter the setup menu
MI	• Store current reading to memory • Increase value or scroll up through a list of options
MR	• View the data logs • Decrease value or scroll down through a list of options
Enter	• Confirm the calibration or displayed option

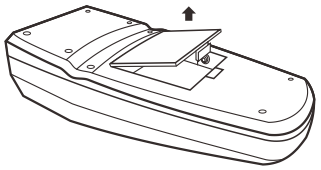
Display



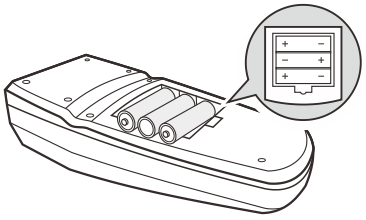
Icon	Description
	Indicates that the meter is in the measurement mode.
	Indicates that the meter is in the calibration mode.
	Indicates that the meter is in the setup mode.
	Indicates that you are viewing the stored readings or a reading is stored into the memory.
	Indicates that the meter is calibrating.
	Shows the battery status. Replace the batteries if icon disappears.

Installing the Batteries

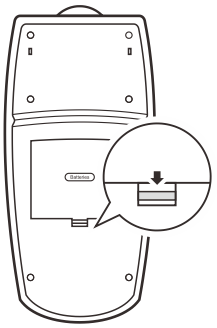
1. Remove the battery compartment cover from the backside of the meter.



2. Insert the three AA batteries into the battery compartment, note polarity.



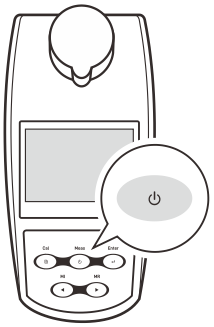
3. Replace the battery compartment cover to its original position, push the limiter until it locks.



The meter allows using the DC 5V power adapter (order code: DCPA-5V) or the USB port on computer as a power supply. Note that take out the batteries before connecting an external power supply.

Switching the Meter On and Off

- Press the ⏻ key to switch on the meter.
- Press and hold the ⏻ key to switch off the meter.



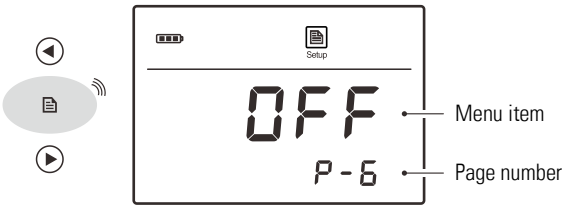
Meter Setup

The AMT27 turbidity meter contains 8 menu items in the setup menu, the following table describes the functions of each option.

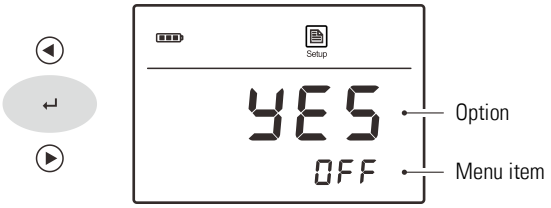
Menu Item	Option and Description	
CAL	**Calibration Points** Set the number of calibration points.	
	2	2 to 5 points (default 2 points)
dATE	**Date and Time** Set the date and time for data logs.	
UNIT	**Measurement Unit** Set the default turbidity unit.	
	NTU	Nephelometric turbidity unit (default)
	FNU	Formazin nephelometric unit
	EBC	European Brewing Convention
	ASBC	American Society of Brewing Chemists
rESO	**Resolution** Set the resolution of the turbidity measurement.	
	0.01	0.01 (default)
	0.1	0.1
HOLd	**Auto-Hold** Set the measurement mode.	
	YES	Single measurement (default)
	NO	Continuous measurement
OFF	**Auto-Power Off** If enabled, the meter will automatically switch off if no key is pressed within 15 minutes.	
	YES	Enable
	NO	Disable (default)
CLr	**Clear Stored Data** Delete all data logs in the memory.	
	YES	Enable
	NO	Disable (default)
rSt	**Factory Reset** Reset the meter to factory default settings. Note, the meter must be recalibrated.	
	YES	Enable
	NO	Disable (default)

Setting a Default Option

1.1 In the measurement mode, press and hold the 🗎 key to enter the setup menu, press the ◄/► key to select a menu item.

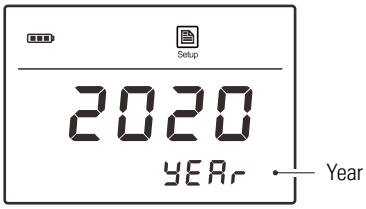


1.2 Press the **Enter** key, the meter shows the current option.
1.3 Press the ◄/► key to select a default option, press the **Enter** key to save.

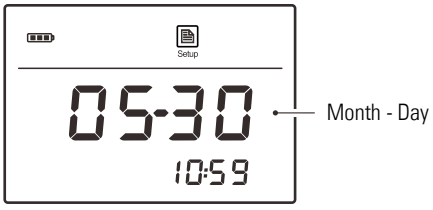


Setting the Date and Time

2.1 In the measurement mode, press and hold the 🗎 key to enter the setup menu.
2.2 Press the ► key until the meter shows dATE/P-2.
2.3 Press the **Enter** key, the meter shows the current year.



2.4 Press the ◄/► key to set the year, press the **Enter** key to switch to the date and time options.
2.5 Press the ◄/► key to set the month, day, hour, minute, press the **Enter** key to save until the meter returns to the measurement mode.



To exit the setup menu without saving changes, press the **Meas** key.

Measurement and Calibration Hints

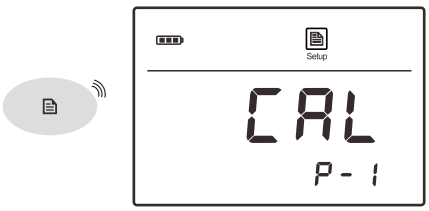
- Do not hold the meter in hand during calibration and measurement.
- Never pour liquid directly into the measurement chamber.
- Keep the outside of vial clean and dry. If necessary, wipe the vial with a lint-free cloth.
- If the vial has scratches or scuffs, replace a new one.
- Ensure that the sample is homogeneous. Do not shake or agitate the solution violently to prevent air bubbles.
- During the calibration and measurement processes, the triangle mark on the vial must be aligned with the arrow on the meter.
- Always close the light shield lid to prevent the measurement error from ambient light.
- Wash the vial thoroughly with distilled water after measurement. Any residues can cause inaccurate readings.

Turbidity Calibration

The AMT27 turbidity meter allows turbidity calibration up to 5 points with minimum of 2 points, the default calibration points include the 0.02, 10, 200, 500, 1000 NTU. For better accuracy, we recommend that selecting a calibration point close to the sample value you are measuring. Note, the meter is calibrated with Formazin Standards at the factory and does not require user calibration before use.

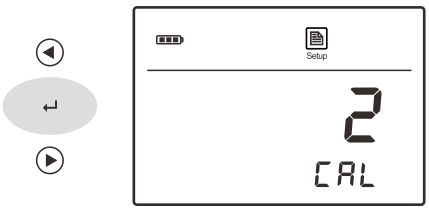
Selecting the Number of Calibration Points

1.1 Press and hold the 🗎 key to enter the setup menu.



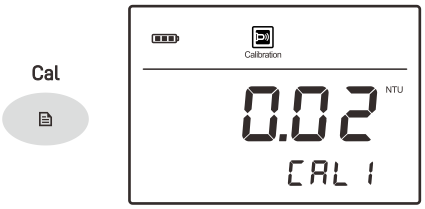
1.2 Press the **Enter** key, the meter shows 2/CAL (2 points calibration).

1.3 Press the ◄/► key to select the number of calibration points. Press the **Enter** key to confirm.



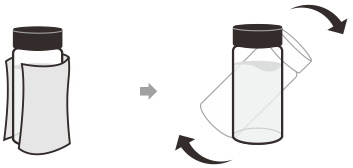
Calibrating the Meter

2.1 Press the **Cal** key, the meter enters the calibration mode, the display shows 0.02 NTU/CAL 1.

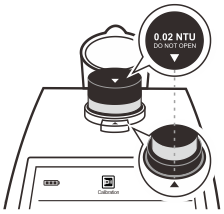


If necessary, press the ► key to select first calibration point, the meter will perform the calibration from the low to high turbidity.

2.2 Take out the corresponding turbidity standard from carrying case (e.g., 0.02 NTU), wipe the vial with a lint-free cloth to remove fingerprints. Hold the vial cap and gently inverting vial several times. Ensure that the turbidity standard is homogeneous and no air bubbles.

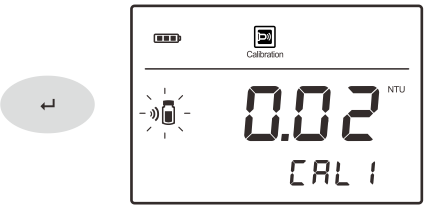


2.3 Insert the vial into the measurement chamber. Align the triangle mark on the vial cap with the arrow on the meter. Close the light shield lid.



Align arrows

2.4 Press the **Enter** key, the meter begins the calibration, the 🔋 icon continuously flashing.



2.5 When the reading stabilizes, the meter will automatically show the next calibration point. If necessary, press the ► key to select a desired calibration point.

2.6 Repeat steps 2.2 through 2.4 above until the meter shows End. Calibration is completed.

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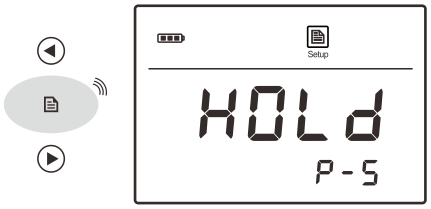
To exit the calibration without saving calibrated value, press the **Meas** key.

Measurement

Selecting the Measurement Mode

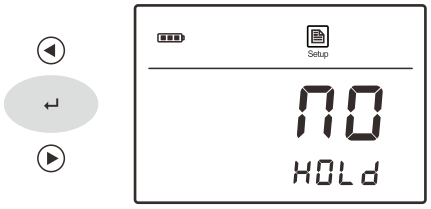
The AMT27 turbidity meter contains two measurement modes. If the single measurement mode is enabled, the meter will automatically sense a stable reading and lock the measurement. If the continuous measurement mode is enabled, the meter will continuously measure and update readings.

1. In the measurement mode, press and hold the 🗎 key to enter the setup menu.
2. Press the ► key until the meter shows HOLD/P-5.



3. Press the **Enter** key, the display shows YES/HOLD indicating that the single measurement mode is enabled.

4. Press the ► key, the display shows NO/HOLD indicating that the continuous measurement mode is enabled.



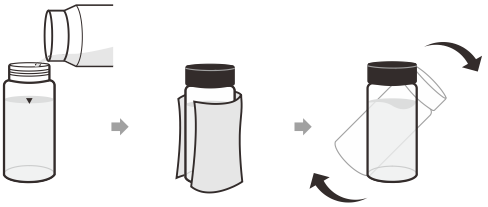
5. Select one of the above options, press the **Enter** key to confirm.

Single Measurement - Low Turbidity Samples

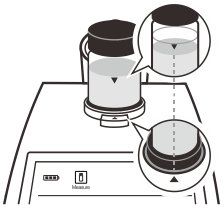
For the low turbidity samples (< 200 NTU), we recommend that use the same vial to perform the calibration and measurement.

1.1 Rinse the vial with approximately 10 ml of sample. Cap the vial and gently inverting it several times. Discard the used sample and repeat the rinsing procedure two more times.

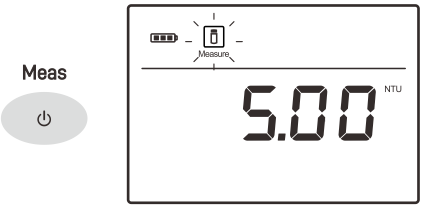
1.2 Fill the vial with the sample. Cap the vial and wipe with the lint-free cloth to remove waterdrop and fingerprints. Ensure that the outside of vial is dry and clean, the sample is homogeneous, no air bubbles.



1.3 Insert the vial into the measurement chamber. Align the triangle mark on the vial with the arrow on the meter. Close the light shield lid.



1.4 Press the **Meas** key, the meter begins measurement. When the reading stabilizes, the Measure icon will stop flashing.



1.5 If necessary, press the **Meas** key to take a new measurement.

Single Measurement - High Turbidity Samples

For the high turbidity samples (> 1100 NTU), the solution must be diluted before measurement. The dilution water can be obtained by filtering distilled water through a < 0.45 µm filter membrane.

2.1 Repeat steps 1.1 through 1.4 above and record the reading.

2.2 Calculate the true turbidity of the original sample using the following formula.

$$T = [T_d (V_s + V_d)] / V_s$$

Where: T = Ture turbidity of the original sample
V_s = Volume of the original sample (ml)
T_d = Measured value
V_d = Volume of the dilution water (ml)

Continuous Measurement

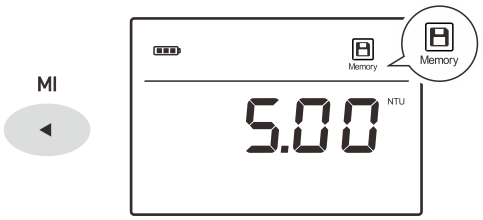
3.1 Ensure that the meter is in the continuous measurement mode.
3.2 Repeat steps 1.1 through 1.3 above.
3.3 Press the **Meas** key, the Measure icon begins flashing, the meter continuously measures the sample.

i To stop the measurement, press the **Meas** key again.

Data Management

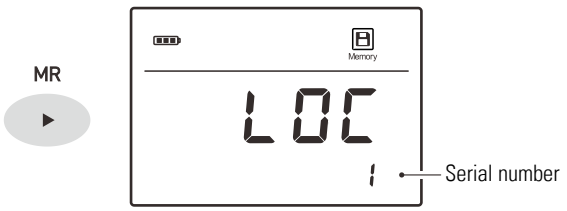
Storing a Measurement Result

The AMT27 turbiditymeter is capable of storing and recalling up to 100 data sets. In the measurement process, press the **MI** key to store the reading into the memory, the Memory icon appears on the display.

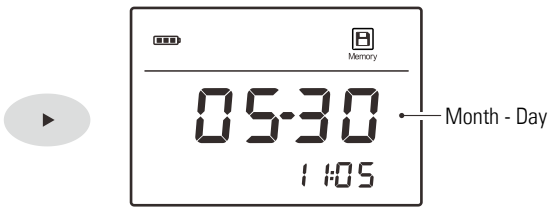


Viewing the Data Logs

1.1 Press the **MR** key, the meter shows the serial number of stored data.



1.2 Press the ► key to view the date and time of measurement.



1.3 Press the ► key to view the stored data.

1.4 Press the ► key to view the next data set.
1.5 Press the **Meas** key to return to the measurement mode.

Clearing the Data Logs

If the memory is full, the meter will automatically show FULL when the **MI** key is pressed. To delete data logs, please follow the steps below.

2.1 In the measurement mode, press and hold the 🖹 key to enter the setup menu.
2.2 Press the ◄ key until the meter shows CLr/P-7.
2.3 Press the **Enter** key, the meter shows NO/CLr.
2.4 Press the ◄ key to select the YES/CLr, press the **Enter** key to confirm.

Communication

The meter can transfer the data to a computer or import the data to Excel by a DAS software. You are able to download this software from www.amtast.com Before installation, make sure that the Windows 10 operating system has been installed on your computer.

Receiving the Data

1. Connect the USB cable to meter and computer.
2. Click the **DAS_TB_Series** icon, the system automatically scans an available communication port and shows a message box "Found a port on your computer".
3. Click the **OK** button, the application starts.
4. Click the **Connect** button, the screen shows "Port is connected".
5. Click the **OK** button, then click the **Receive** button, the stored data automatically transfer to computer.

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If your computer can not find a communication port, click the "CP210x VCPInstaller_x64.exe or CP210xVCPInstaller_x86.exe" to update the drive program.

Creating an Excel File

When the transfer is completed, click the **Save as Excel** button, the readings in data sheet will automatically convert to Excel file.

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Note, once the software is closed, all received data will be lost and can not be recovered.

Appendix

Indexing a Sample Vial

The United States Environmental Protection Agency recommends that the vial used for turbidity calibration or sample measurement be indexed. Its purpose is to obtain a position which provides the lowest turbidity reading. The indexing methods are as follows.

1.1 Fill the vial with the distilled water (< 0.5 NTU). Cap the vial.
1.2 Wipe the vial with the lint-free cloth. Ensure that the outside of vial is clean and dry.
1.3 Place the vial in the measurement chamber. Align the triangle mark on the vial with the arrow on the meter.
1.4 Press the **Meas** key, the meter begins the measurement.
1.5 Slowly rotate the vial approximately 45°. Close the light shield lid and record the reading.
1.6 Repeat the step 1.5 until the lowest turbidity reading is shown. Mark this position on the vial.

Matching the Sample Vials

For better accuracy and repeatability, using an indexed sample vial is best choice for turbidity measurement. If you need to use a few vials, match these vials are necessary.

2.1 Repeat steps 1.1 through 1.6 above for each vial and record the readings.
2.2 Find the closest position of these vials measuring value and mark it.

Preparation of Formazin Standards

Turbidity-Free Water:
The turbidity-free water is used for preparation of turbidity standards and is prepared by filtering distilled water through a 0.45 µm or smaller pore-sized membrane.

Turbidity Standards:

4000 NTU: Dissolve 1 gram hydrazine sulfate $(NH_2)_2 \bullet H_2SO_4$ in the turbidity-free water and dilute to 100 ml in a volumetric flask.
Dissolve 10 grams hexamethylenetetramine $(CH_2)_6N_4$ in the turbidity-free water and dilute to 100 ml in a volumetric flask.
Mix 5 ml of hydrazine sulfate and 5 ml of hexamethylenetetramine solutions in a 100 ml volumetric flask and let stand 24 hours at 25/±3°C.

1000 NTU: Mix 25 ml of 4000 NTU standard in a 100 ml volumetric flask and dilute to the mark.

500 NTU: Mix 12.5 ml of 4000 NTU standard in a 100 ml volumetric flask and dilute to the mark.

200 NTU: Mix 10 ml of 4000 NTU standard in a 100 ml volumetric flask and dilute to the mark. Mix 50 ml of above standard in a 100 ml volumetric flask and dilute to the mark.

10 NTU: Mix 10 ml of 4000 NTU standard in a 100 ml volumetric flask and dilute to the mark. Mix 2.5 ml of above standard in a 100 ml volumetric flask and dilute to the mark.
- Or -
Mix 2 ml of 500 NTU standard in a 100 ml volumetric flask and dilute to the mark.

Optional Accessories

Order Code	Description
TB-GV	Glass sample vial, 60 (H) × 25 (Ø) mm (2.36 × 0.98 in.)
TB-CAL	Turbidity standards 0.02, 200, 500, 1000 NTU, 20 ml
USB-A	USB connector A to A, 1 m (3.3 ft.) cable
DCPA-5V	DC 5V power adapter, european standard plug

Specifications

Model	AMT27
Measurement Method	ISO 7027 nephelometric method (90°)
Range	0 to 1100 NTU/FNU 0 to 275 EBC 0 to 9999 ASBC
Resolution	0.01, 0.1, 1
Accuracy	±2% of reading (0 to 500 NTU) ±3% of reading (501 to 1100 NTU)
Calibration Points	2 to 5 points
Calibration Standards	0.02, 10.00, 200, 500, 1000 NTU
Light Source	Infrared-emitting diode (850 nm wavelength)
Detector	Silicon photodiode
Stray Light	< 0.02 NTU
Memory	100 data sets
Communication	USB interface
Operating Temperature	0 to 50°C (32 to 122°F)
Storage Temperature	0 to 60°C (32 to 140°F)
Relative Humidity	< 80% (non-condensing)
Display	LCD, 60 × 40 mm (2.36 × 1.57 in.)
Power Requirements	3 × 1.5V AA alkaline batteries or 5V DC power adapter
Dimensions	180 (L) × 85 (W) × 70 (H) mm (7.08 × 3.34 × 2.75 in.)
Weight	300 g (10.6 oz.)

Disposal

This product is required to comply with the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC and may not be disposed of in domestic waste. Please dispose of product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

Warranty

The warranty period for meter is one year from the date of shipment.
Above warranty does not cover the turbidity standards and glass vials.
Out of warranty products will be repaired on a charged basis.
The warranty on your meter shall not apply to defects resulting from:

- Improper or inadequate maintenance by customer
- Unauthorized modification or misuse
- Operation outside of the environment specifications of the products

For more information, please contact the supplier.

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