



Liquid Density Meter User Manual





catalogue

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1、 Overview

Thank you for choosing our self-developed handheld liquid densitometer. The instrument can quickly and accurately measure the density and temperature of liquids, with built-in alcohol, sugar, sulfuric acid, and plato concentration calculations, and allows users to create their own concentration calculation formulas.

The instrument uses a 2.4-inch color high-definition display, with an ergonomic grip structure for easy one-handed measurement operation. It has a large built-in memory that can store more than 1000 historical data points, and can import data to a USB flash drive or computer via USB. Connecting to a Bluetooth printer allows for instant wireless printing of measurement results. The instrument is equipped with scanning code and NFC functions, allowing for fast and accurate entry of sample ID information.

The contact area of the liquid sample is made of quartz glass and PTFE (polytetrafluoroethylene) materials, which increases the corrosion resistance of the equipment. The design of quick disassembly of the pump body facilitates equipment cleaning and pump body replacement.



1.1 Product Snapshot





1.2 Packing list

Please inspect the case upon unpacking	
project	quantity
density meter host	1
Power adapter	1
USB-C cable	1
USB-OTG cable	1
polytetrafluoroethylene straw	2
density calibration solution	3
Fasten the PEEK joint 1/4-28 thread	1
Inverted cone pressure ring (YC-2.5-ETFE)	1
Syringe adapter	1
instructions	1
Certificate of conformity	1
Warranty Card	1
Bluetooth printer (optional)	1
Thermal printing paper (optional)	2
NFC smart label (optional)	10

1.3 Technical parameters

Electrical parameters	
project	parameter
External dimensions	150*57*271mm (depth * width * height)
Host quality	350g
Power parameters	5V2A power adapter
Built in battery	3.7V/3000mAH lithium-ion battery
display	2.4-inch full-color LCD screen with resolution of 320x240
printer	The machine is equipped with a wireless thermal printer and uses a 55x30mm print paper roll
Data communication	USB, WIFI, Bluetooth, NFC
QR code scanner	Support barcode and QR code
RFID card	Support NFC card reading and writing function
storage	1000 pieces of historical data
Environmental conditions for use	Ambient temperature: 0℃--50℃ Environmental humidity: 0-80%RH Altitude: for use below 2000 meters
Storage environment	Temperature: 0-40℃ relative humidity:0-50%RH; charge the instrument once every six months.

Instrument material	
project	parameter
Shell	ABS plastic
Measurement pool	quartz glass
Sampling pump body	Quartz glass + PTFE (polytetrafluoroethylene) + 304 stainless steel
Pipette	PTFE (polytetrafluoroethylene)

Technical parameters of the instrument measuring cell	
project	parameter
density	Measuring range: 0.0000~3.0000 g/cm ³ Resolution: 0.0001 g/cm ³ Accuracy: 0.001 g/cm ³ Repeatability: 0.0005 g/cm ³
temperature	Measuring range: 0.0~50.0° C Resolution: 0.1° C Accuracy: ±0.2° C Repeatability: 0.1° C

Test items and parameters		
project	range	accuracy
density	0.0000~3.0000 g/cm ³	±0.001 g/cm ³
temperature	0.0~50.0 ° C	±0.2 °C
Ethanol (%w/w)	0.0~100.0 %	±1.0 %
Ethanol (%v/v)	0.0~100.0 %	±1.0 %
Proof (IP)	0.0~175.0 Proof	±1.75 Proof
Proof (US)	0.0~200.0 Proof	±2.0 Proof
Light Baumeidu	10~100 ° Bé	±0.4 °Bé
Heavy Baume degree	0~72 ° Bé	±0.1 °Bé
Sulfuric acid concentration (%w/w)	0.0~100.0% (10~50° C)	±1.0 %
Sulfuric acid concentration (%v/v)	0.0~100.0% (10~50° C)	±1.0 %
Brix (%w/w)	0.0~85.0% (10~50° C)	±0.3 %
Plato Degree	0.0~85.0 ° P	±0.3 °P
Custom calculation (see the calculation description section for details)	Supports linear and quadratic polynomial functions to calculate density as concentration	

II. Installation and Debugging

2.1 Structure and function of the instrument



Introduction to Instrument Functions		
Number	name	function
1	display screen	Full-color LCD display for displaying the user interface
2	NFC card swiping area	This area is the location of the card swiping antenna for NFC card interaction
3	Keys	Function operation buttons
4	Observation window of measuring cell	Observe whether there is liquid and bubble in the measuring cell
5	Syringe filling hole	Fill and empty the measuring cell interface using a syringe
6	Pipette	Suction and discharge pipes of the measuring cell
7	Observation window of sampling pump	Check the sampling pump and check whether the sample is empty or full
8	Sampling pump cover	Maintenance window of sampling pump
9	USB-C port	Interface for charging, connecting to a computer, and connecting to a USB flash drive
10	QR code scanner	Used for barcode and QR code scanning

2.2 Connect the charger

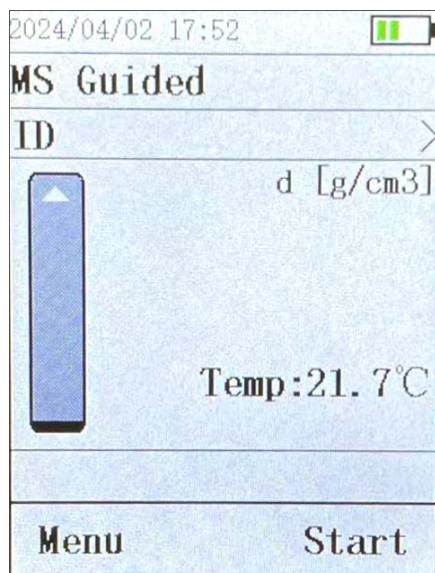
The instrument uses a 5V/2A power adapter. When charging, use a USB-C cable to connect the power adapter to the charging port of the machine. After plugging in the charger, the instrument will automatically turn on and the battery icon will display the charging status.

Note: The voltage of the power adapter used for the instrument must not exceed 6V, otherwise it will cause permanent damage to the device. Users are advised not to use fast-charging power adapters.

III. Quick use

3.1. Startup and use

Long press the middle power button to turn on the machine. The default display after turning on is the test interface, as shown in Figure 3.1.1.



- Status bar: time, status, battery information.
- Measurement method: describe different measurement scenarios
- Measurement ID: Sample ID
- Measurement result: The current measurement result, including temperature, unit, result, and pump position
- Measurement status bar
- Keys

Figure 3.1.1 Measurement interface

3.2. Measurement method

Click the menu, "Measurement Method" option, there are two default measurement methods: manual and guided. Guided is the guided method. When the cursor is on this item, press the start button directly, and the instrument automatically enters the measurement interface and uses this method. When you press the right button like button ">", you can enter the method details (Figure 3.2.2) for editing.

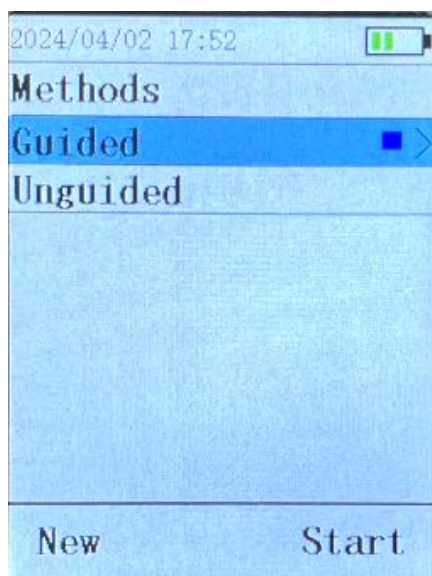


Figure 3.2.1 Measurement Method

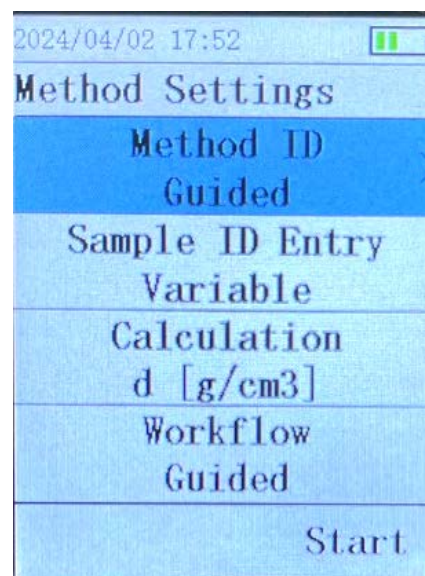
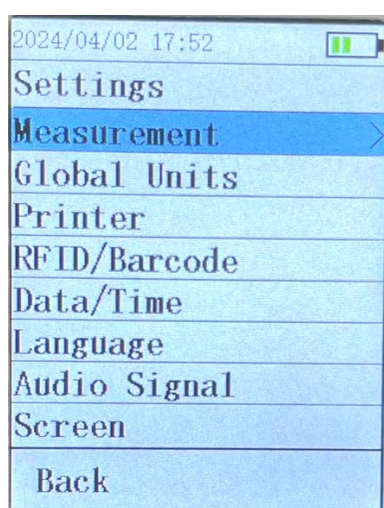


Figure 3.2.2 Method Details

Users can create multiple different measurement methods to cope with different measurement scenarios.

3.3 System settings



After entering the system settings, as shown in Figure 3.3.1, the "Measurement" item is the sampling method of the instrument, and you can choose to use the built-in pump or external syringe. The "International Units" item is the density and temperature units

displayed by the machine, and the "Printer" is used to set up a wireless printer for connection.

During normal use, users can set the screen to an appropriate brightness. It is not recommended to set the screen brightness to the highest level for non-outdoor applications, as high brightness will significantly reduce the battery life of the instrument.

If the sample to be tested does not have a barcode or RFID tag, the "RFID/Barcode" card swiping and scanning functions can be disabled.

Figure 3.3.1 System Settings Current software version, "Language" supports both Chinese and English.

IV. Instrument maintenance

4.1. Cleaning of instrument pipelines

After using the instrument, it is necessary to clean it immediately. You can choose different types of cleaning agents for measuring samples. Finally, you need to use clean water to clean the machine to prevent residues from depositing on the internal pipelines.

4.2 Cleaning of the instrument shell

The instrument housing is made of ABS material, and it is recommended to use only soft towels and water for cleaning. When using other cleaning agents, please read the instructions carefully.

4.3 Instrument inspection

For instruments that have not been used for a long time or in application scenarios with high metrological requirements, a device inspection is required before use. Enter the "Device Inspection" item in the system menu, right-click to start, and use pure water to inspect the machine. When using other substances as standards, users need to set the parameters of the standard substances themselves.

4.4 Instrument calibration

Due to the mechanical oscillation component of the instrument detection principle, there may be some deviation in the measured value during long-term storage or use, which is affected by material deformation. At this time, users are allowed to calibrate the instrument themselves.

Instrument calibration is divided into two points: standard substance (suggested to use purified water) and empty tube (dry air) calibration. When using dry air for calibration, it is necessary to use a pump to dry the internal glass pipeline. Users can only perform standard substance calibration during use.