



青岛创梦仪器有限公司

Qingdao Chuangmeng Instrument Co. Ltd.

数显式液体密度计 Digital liquid densimeter

型号 **Model: 1030**



使用说明

USER MUNUAL

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Version 1.0

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请你仔细阅读《使用手册》，正确掌握本产品的安装和使用方法。阅读后请将本《使用手册》妥善保管，以备今后进行检修和维护时使用。

Please read the Instruction Manual carefully, for correctly grasping the installation and using method of this product. Please keep properly this Instruction Manual after reading, for the usage during troubleshooting and maintenance in the future.

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1、概述

数显式液体密度计是用于测定给定体积液体的密度，其精度足以测定 $\pm 0.01\text{g/cm}^3$ 精度的任何一种液体密度值。采用压力传感器通过单片计算机程序换算，液晶显示器直接显示液体密度。避免杠杆式液体密度计因尺杆、支撑刃和游码变形损伤影响测量精度，测定精度高。该数显密度计集测定范围大、操作简单、多种杠杆式密度计优点于一体。是目前较先进的测量仪器。

可广泛适用于各石油、化工、实验室、食品和医药等行业。

2、型号及规格

型 号	名 称	配 置	特 点
1030	数显式液体密度计		

3、仪器的主要技术参数：

名称	技术参数
工作电源	220V 50Hz；（或一号干电池六节）；
测量范围	0.1~5.0 g/cm ³
测量精度	0.01 g/cm ³
杯容量	200ml

4、仪器的结构及工作原理

该仪器结构简单、使用方便。它由不锈钢样品杯和主机组成。采用压力传感器通过单板计算机程序换算，液晶显示器直接显示液体密度。

样品杯：



(图一) 样品杯结构图
1 样品杯盖 2 样品杯体



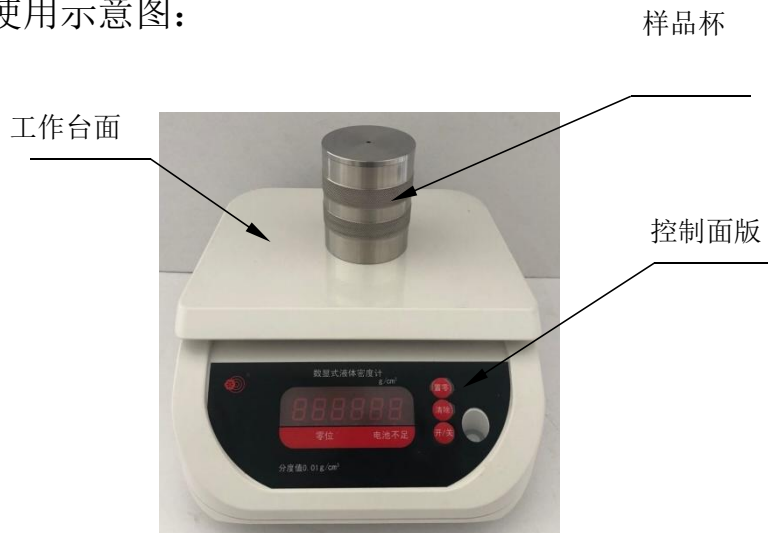
(图二) 控制面版图

说明:

1. 置零: 用于显示错误信息“OF”或“UF”置零。
2. 清除: 用于设置或清除容器本身重量。
3. 开/关: 用于开/关该机。
4. 窗口: 用于观察水平泡。
5. 显示窗: 用于显示测定值。
6. 零位: 当零点调整好且稳定时亮。

7. 电池不足：当电池电压不足时亮，指示电池需更换。当电池电压低至该机不能正常工作时，其余显示熄灭，电池不足指示显示 1 分钟后电源自动彻底关闭（干电池请用户自行购买）。

仪器使用示意图：



(图三) 仪器使用示意图

5、仪器的操作：

仪器的使用

- 1、接通电源 220V(或干电池)。新的干电池可连续使用 500 小时。
- 2、将环境温度调至为 21℃。
- 3、密度计应放置在一个水平的平面上，调整底座四个螺钉使水平气泡处于水平位置。
- 4、打开电源开关，显示窗口显示为“0.000”。
- 5、将样品杯和杯盖置于密度计工作面上，按动“清零”键清零，除去样品杯重量。
- 6、取下样品杯，打开样品杯盖注入需要测定的样品，注满后轻敲样品杯，直至样品内气泡溢出（如测定水泥浆时，需摇动水泥浆 25 次）。
- 7、盖上样品杯盖，并转动样品杯盖，保证使多余的样品液体和空气从杯盖小孔挤出，擦净杯体外的液体，使之洁净、干燥。

- 8、将样品杯置于密度计工作面上，显示窗口显示的数据既为被测定样品的密度值。
- 9、如操作不当出现错误信息“OF”或“UF”时，应将工作台面的重物移出后，按动“置零”键，显示窗口显示为“0.000”。
- 10、每次使用完毕后，关闭电源清洗样品杯，重新放于盒内。仪器应水平放于干燥室内，仪器上面不得放置物品。不得碰撞，以免影响测试。
- 11、如使用内置干电池（1号干电池6节），稳压电源的插头应不在密度计的外接电源插座内。新的干电池可供该机连续使用500小时。
- 12、如使用交流电源时，稳压电源的插头应插入密度计的外接电源插座。



仪器使用时一定要保证接地可靠。



工作台面除样品杯外不能放任何其他物品，保持绝对洁净、平整。



当使用干电池作为电源时用完后请将电池取出。

6、仪器校验程序：

- 1、接通220V(或干电池)电源。
- 2、将室温调至为21℃。
- 3、密度计应放置在一个水平的平面上。调整底座四个螺钉使水平座处于水平位置。
- 4、按动电源开关，显示窗口显示为“0.000”。
- 5、将样品杯和杯盖置于密度计工作面上，按动“清零”键清零，除去样品杯重量。
- 6、取下样品杯，将200ml蒸馏水注满杯内，盖上杯盖，要保证水从杯盖小孔溢出，擦干杯体外的水。
- 7、轻轻将样品杯置于密度计工作面上，显示窗口为“1.000”（表示1g/cm³）。

7、仪器的维护与保养

- 1、仪器使用环境一定要保持干燥、整洁。

2、要求实验员熟悉全部操作过程和操作时可能出现的情况。

3、当移动、维修或清洁仪器时。要轻拿、轻放，以免造成部件变形影响精度和使用。

工作台面除样品杯外不能放任何其他物品，保持绝对洁净、平整。

维修和移动仪器时应切断电源，方能排除故障和移动。

密度计绝对不能倒置。

每次使用后，应及时将仪器擦拭干净，放置干燥环境内。

样品杯盖和样品杯体不得随意更换。

仪器的运输与储存

仪器的运输与储存应符合于 JB/T9329-1999 标准。产品应储存在通风的室内，室内空气中不含有能引起器件腐蚀的杂质。

8、故障的判定与排除

现象	原因	维修方法
接通电源后，显示窗口不亮。	①电源插头接触不良。	①检查电源插头是否连接牢固。重新安装。
如使用干电池，若显示窗口显示“电池不足”提示。	①电池无电。	应即时更换电池。
测量时出现误差。	①仪器不平。	①将密度计底脚调整水平螺钉，校验蒸馏水为 1 g/cm^3 。
测量时显示窗口显示“OF”或“UF”	重量超过最大量程，或开机时工作台上有重物。	①应按动“置零”键置零。
测量时，无法读出准确数据。	样品杯放置位置不对。	应重新放置样品杯，并将其放置在工作台中央位置。

1. Summary

The Model YMS 0.1-5.0 Liquid Densitometer is used to measure the density of various liquids, whose precision is sufficient to reach $\pm 0.01\text{g/cm}^3$. Adopting pressure sensor and calculating using computer program, the instrument can directly display the density of liquids from the liquid crystal monitor, so as to avoid the effect on precision due to the damage or deforming of lever, supporting edge and rider occurred in other kinds of densitometer. It is characterized by the large measuring scope, simple operation and high precision. Hence, the densitometer is considered as an advanced measuring instrument to date and can be extensively applied in the professions such as petroleum, chemical engineering, food and medicine, etc.

2. Model and specification

Model	Name	Collocation	Feature
1030	Digital liquid densimeter		

3. Main technical parameters

Name	Technical parameters
Power supply	220V 50Hz; (or Six No.1 dry batteries);
Measuring range	0.1~5.0 g/cm ³
Measuring accuracy	0.01 g/cm ³
Measuring range	200ml

4. Structure and working principles

The instrument has a simple structure and is easy to use. It is composed of a stainless steel sample cup and the main instrument. Adopt pressure sensor and the one-board computer program for calculations. The liquid crystal monitor can directly show the density of liquids.

(1) Sample cup



Fig. 1 The structure of sample cup
1----- The cap of sample cup
2-----The body of sample cup

(2) Controlling panel:



Fig. 2 Structure of controlling panel

Explanation:

1 Null-set: Nullify the densitometer.

2 Remove: Used to set or remove the weight of sample cup.

3 Switch: Used to turn on/turn off the instrument.

4 Window: Observe the bubble level.

5 Display window: Display the measuring values

6 Null position: Be bright when adjusting the dial reading to null position

7 Insufficient battery: lights up when the battery voltage is insufficient, indicating that the battery needs to be replaced.

When the battery voltage is so low that the machine can not work normally, the other displays will go out, and the power supply will be turned off completely after 1 minute of battery shortage indication (please purchase the dry battery by yourself).

(3) Diagram of the instrument

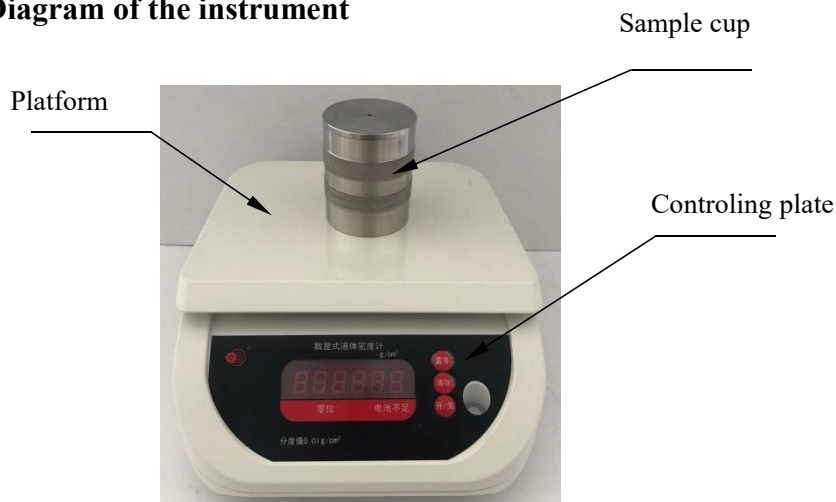


Fig.3 Diagram of liquid densitometer

5. Operation

1. Turn on the power supply of 220 V (or dry battery). The new dry battery can last 500 hours.
2. Adjust the ambient temperature to 21 °C.
3. The densimeter should be placed on a horizontal plane, and the four screws on the base should be adjusted to make the horizontal bubble in the horizontal position.
4. Turn on the power switch and the display window will display "0.000".
5. Place the sample cup and cup cover on the densimeter working surface and press the " Null-set " to clear the sample cup weight.
6. Take down the sample cup, open the cover of the sample cup and inject the sample to be measured. After filling, tap the sample cup gently until the bubbles in the sample overflow (for example, when measuring the cement slurry, shake the cement slurry 25 times).
7. Cover the sample cup cover and rotate the sample cup cover to ensure that the excess sample liquid and air are squeezed out from the small hole of the cup cover, and wipe the liquid outside the cup to make it clean and dry.
8. Put the sample cup on the working surface of densitometer, and the data displayed in the display window is the density value of the sample to be measured.
9. If the error message "OF" or "UF" appears due to improper operation, remove the weight from the worktable, press the " Null-set " , and the display window will display "0.000".
10. After each use, turn off the power, clean the sample cup and put it back in the box. The instrument should be placed horizontally in the drying room, and no articles should be placed on it. Collision is not allowed to affect the test.
11. If the built-in dry batteries (6 dry batteries No.1) are used, the plug of regulated power supply shall not be in the external power socket of densitometer. The new dry battery can be used continuously for 500 hours.
12. If AC power supply is used, the plug of regulated power supply should be inserted into the external power socket of densimeter.



Make sure the ground protection is reliable during using.



Anything can not be placed on the surface of working platform except the sample cup. Keep the working platform absolutely clean.



When using dry battery as power supply, please remove the battery after use.

6. Calibration

- (1) Put through the 220 V of power supply or dry battery.
- (2) Adjust environmental temperature to be 21 °C.
- (3)The densimeter should be placed on a horizontal plane. Adjust the four screws of the base to make the horizontal seat in the horizontal position.
- (4) Turn on the switch of power supply;the display window must show “000”.
- (5) Place the sample cup and cup cover on the densitometer working surface and press the " Null-set " button to clear the sample cup weight.
- (6) Take off the sample cup. Open the cup lid and pour 200ml of distilled water into the cup. Cover the cup. Clean any sample from the outside of the balance cup and lid.

(7) Gently place the sample cup on the working surface of densitometer, and the display window is "1.000" (representing 1g / cm³).

7. Maintenance

1. The use environment of the instrument must be kept dry and tidy.
2. The experimenter is required to be familiar with the whole operation process and the possible situations during operation.
3. When moving, repairing or cleaning the instrument. It should be handled with care, so as not to cause deformation of parts and affect the accuracy and use.

No other items can be placed on the worktable except the sample cup, which is absolutely clean and flat. When repairing and moving the instrument, the power supply should be cut off to eliminate the fault and move.

The densitometer must not be inverted.

After each use, the instrument should be wiped clean in time and placed in a dry environment.

The cover and body of the sample cup shall not be replaced at will.

Transportation and storage of instruments

The transportation and storage of the instrument shall comply with JB / t9329-1999 standard. The product should be stored in a ventilated room, the indoor air does not contain impurities that can cause corrosion of the device.

8. Troubleshooting

Phenomenon	Reason	Maintenance method
After the power is turned on, the display window does not light up.	Poor contact of power plug.	Check that the power plug is firmly connected. Re install.
If dry battery is used, if the display window displays "battery insufficient" prompt.	The battery is dead.	The battery should be replaced immediately.
There is an error in the measurement.	The instrument is uneven.	Adjust the foot of densitometer to the horizontal screw, and check that the distilled water is 1 g/cm ³ .
When measuring, the display window displays "OF" or "UF"	The weight exceeds the maximum range, or there are heavy objects on the workbench when starting up.	Press the " Null-set " key to set zero.
When measuring, the accurate data cannot be read out.	The sample cup is not placed in the right position.	The sample cup should be repositioned and placed in the center of the bench.

青岛创梦仪器有限公司 装箱单
Qingdao Chuangmeng Instrument Co., Ltd. Packing list

生产企业：青岛创梦仪器有限公司

Manufacturing enterprise: Qingdao Chuangmeng Instrument Co.,Ltd.

生产地址：青岛市城阳区流亭街道兴海路3号

Production address:No. 3 Xinghai Road, Liuting Street, Chengyang District, Qingdao

主机型号:1030

Model of the main motor:

出厂编号：

Manufacturing No:

序号	编号	名称及规格	数量
1	1030	主机 Main engine	1
2	10301	泥浆杯 Slurry cup	1
3		稳压电源 Regulated power supply	
4		使用手册 User Manual	1
5		合格证 Cerificate	1
6		装箱单 Packing list	1