

270021M21

HT(R) CEN / HT(R) CE Series
Specific Gravity Measurement Kit
Operation Manual

VIBRA

Preface

Thank you very much for having purchased Specific Measurement Kit for Electronic Analytical Balance HT(R) CEN / HT(R) CE series.

This document describes how to install and work with the Specific Measurement Kit.

Instructions

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Important Notice





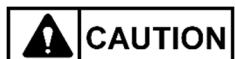

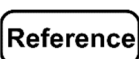



- It should be known that this product contains potential danger. And so please be sure to observe this document when installing, operating or servicing this product.
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- Potential dangers are increasing in the industrial equipment industries due to the advent of new materials and processing methods, and speeding up of machines. It is impossible to foresee all situations related to these dangers. In addition, there are so many “impossible” and “don’ts” and so writing all of them in the operation manual is impossible. Therefore, it is safe to think that what is not written in the operation manual “cannot be performed” unless the operation manual positively writes “it is possible.” When performing installation, operation, maintenance or inspection of this product, not only observe what is written or indicated in this document or on the product surface but also pay adequate consideration to safety measures.
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- For any question or further information concerning this document, please contact the store where you purchased the product with its model (type) name informed.
- Manufacturer: SHINKO DENSHI CO., LTD.
Address: 1-52-1 Itabashi, Itabashi-ku, Tokyo 173-0004 Japan

How to use this document

■ Symbols used in this document

Understand the meaning of the following symbols and observe the instructions of this document.

Symbols	Meaning
	Used for high risk point concerning the operations that may lead to death or severe physical injury to persons if proper precautions are not taken.
	Used for warning concerning the operations that may lead to death or severe physical injury to persons, if proper precautions are not taken.
	Used for caution concerning operations that may lead to a light physical injury to persons or damage of the products/facilities if proper precautions are not taken.
	Used for notation for avoiding from deletion, overwrite of the weighing data or for accurate weighing and appropriate usage of the equipment.
	Used for referenced information which is useful for product operation.
	Used for "Prohibition" items
	Used for "Mandatory" items requiring positive action
	This symbol indicates the operation/specification in related to the verified balance for legal metrology.

This product/ The product/The balance	Refers to the product.
[On/Off] key	The name of an operation key located in front of the main unit is represented in square brackets "[]".
<message>	A message on the display is represented in angle brackets "< >".
<<F1>>	"Free key" or "Shortcut" is represented in double angle brackets "<< >>".
Push the key	Signifies pushing lightly an operation key once.
Push the key long	Signifies keeping pushing an operation key until the designated indication appears.

Contents

Preface	i
Important Notice	ii
How to use this document	iii
Contents	iv
1 Prior to use	1
1-1 Operating precautions.....	1
1-2 For more accurate measurement.....	1
1-2-1 Precautions related to a specimen and medium liquid	1
1-2-5 Precautions related to the specific gravity measuring kit.....	1
1-3 Check for the articles contained in the box	2
2 Assembling and installation	3
3 Procedure for specific gravity measurement	5
3-1 Measuring specific gravity of the solid sample.....	6
3-1-1 Procedure for measuring the solid specimen	6
3-1-2 Switching the display at solid specific gravity mode	9
3-2 Measuring specific gravity of the liquid sample	10
3-2-1 Procedure for measuring specific gravity of the liquid sample.....	10
3-2-2 Switching the display at liquid specific gravity mode	14
4 Specifications	15
5 Print Details	16

1 Prior to use

In addition to the operating precaution of the balance body, following precautions shall be taken care for the specific gravity measurement kit.

1-1 Operating precautions

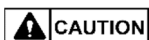


■ **Do not use/measure flammable liquids which generate explosive gases, vapor or fog.**

That may cause explosion or fire. A balance with explosion-proof structure shall be used to handle with such a flammable liquid.

■ **Do not install the balance on unstable or vibrating location, do not move the balance with a water tank set on it, especially when handling with hazardous liquids.**

Specific gravity measurement kit is not fixed to the balance, so that improper installation, carrying or operation may cause spilling of the hazardous liquids and lead to serious accidents.



■ **Take care not to spill water or liquid in the windshield.**

If a large amount of water or liquid is spilled in the windshield, they may enter inside the balance and cause shortsircuit or failure.

1-2 For more accurate measurement

1-2-1 Precautions related to a specimen and medium liquid

Unsuitable specimen	→ Specimen that is pneumatic, foamable or solubility cannot be measured accurately with this product.
Magnetism	→ Specimens affected by strong magnetism repels diamagnetic liquid, and that lead to an error of the measuring result.
Foam/bubbles on the specimen	→ Foam or bubbles produced on the specimen or the glass weight causes an error of the measuring result. If water is used as the medium, add one or two drops of surface-active agent (liquid detergent for kitchen use). It will effectively prevent air bubbles from adhering to any measurement object.
Temperature difference	→ Difference in temperature between the specimen and the medium liquid generates convection flow within the water tank, causing a measurement error.
Accuracy of the water temperature	→ When water is used as the medium, the accuracy of temperature of the water input into the balance affects accuracy of the measurement. Check the water temperature as frequently as appropriate.

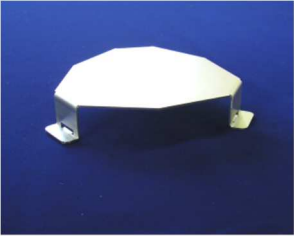
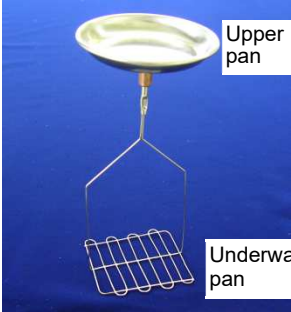



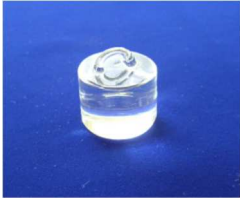


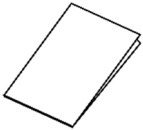
1-2-5 Precautions related to the specific gravity measuring kit

Undesired contact with measurement pan	→ You should be careful not to leave the thermometer in the water tank. It may hit the pan submerged in water to result in inaccurate measurements. When water temperature is to be measured, once remove the water tank from the balance.
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1-3 Check for the articles contained in the box

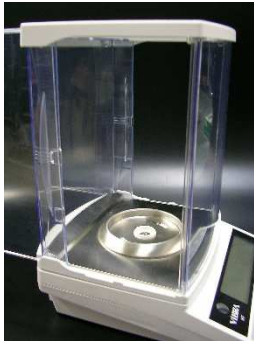
The package box contains the following;

If anything missing or broken should be found, please inform the store where you purchased the product.

<p>① Water tank platform</p>  A white, octagonal platform with four small legs, used for supporting a water tank.	<p>② Measurement Pan</p>  A metal measurement pan assembly. It consists of a shallow upper pan on a stem, which is attached to a wire mesh underwater pan. Labels "Upper pan" and "Underwater pan" are present. <p>Upper pan</p> <p>Underwater pan</p>	<p>③ Pan cradle</p>  A metal pan cradle with a vertical support and a horizontal arm that holds a shallow pan.
<p>④ Height adjuster</p>  A white L-shaped metal height adjuster and a small white plastic cap with a brass pin.	<p>⑤ Water tank</p>  A clear glass water tank.	<p>⑥ Glass weight</p>  A small glass weight with a circular base and a central knob.
<p>⑦ Tweezers</p>  A pair of metal tweezers.	<p>⑧ Thermometer</p>  A yellow thermometer and a silver thermometer.	<p>⑨ Operation manual</p>  A white rectangular operation manual.

2 Assembling and installation

- 1** Remove the weighing pan and pan base of the balance.



- 2** Attach the height adjuster to the pan cradle when needed.



- 3** Attach the pan cradle (turn the screw in the centre)



- 4** Attach the water tank platform.



5

Put the water tank in the position.



6

Set the measurement pan



3 Procedure for specific gravity measurement

Specific gravity is measured with “Specific gravity mode”. In the specific gravity mode, the ratio of the density of a substance to the density of water at its densest (4°C) for liquids is calculated.

Following modes for specific gravity measurement are available:

- Solid specific measurement mode: Measure solid sample with water or other medium liquid.
- Liquid specific measurement mode: Measure liquid sample with reference grass weight.

Legal
Metrology

Specific gravity mode is not legal for trade.

Note

- (1) The total weight of “Pan cradle”, “Measurement pan” and height adjuster is heavier than the weighing pan initially attached to the balance.
Therefore, the difference of the weight is deducted as tare value when the balance is used with this kit, and the maximum capacity to be measured in the balance decreases accordingly.
- (2) The diameter of the wire of the Measurement pan may affects the measurement result especially when volume or specific gravity of the solid sample is small.

Reference

Zero-point adjustment and tare-subtraction also can be executed by command input or external contact input. Please refer to “6 External input/output functions” of “HT/HTR CEN Series operation manual” or “HT/HTR CE Series operation manual”.

3-1 Measuring specific gravity of the solid sample

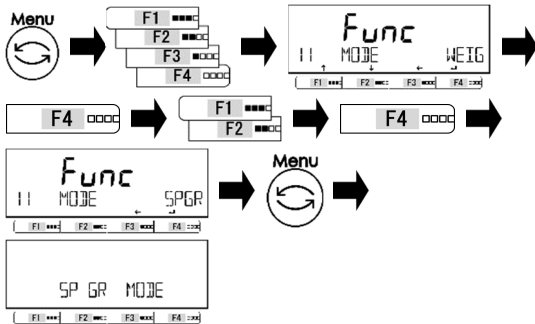
Outline of the procedure

1. Input the water temperature or the specific gravity of the medium liquid.
2. Compensate the buoyancy acting on the underwater part of the measurement pan by tare-subtraction.
3. Measure the specimen weight in the air.
4. Measure the specimen weight in the water/liquid.
5. The specific gravity of the specimen is displayed.

3-1-1 Procedure for measuring the solid specimen

1

Select the specific gravity mode.



Push [Menu] key, then push [F1]-[F4] keys to go to <11 MODE>

Push [F4] key to change the setting value.

Push [F1]/[F2] key to select.

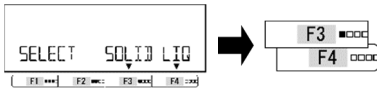
SPGR: specific gravity mode

Push [F4] key to fix.

Push [Menu] key to shift to the specific gravity mode.

2

Select the measurement mode.



Push [F3]/[F4] key to select the measurement mode.

SOLID: Solid specific gravity mode

LIQ: Liquid specific gravity mode

3

Select the medium liquid.



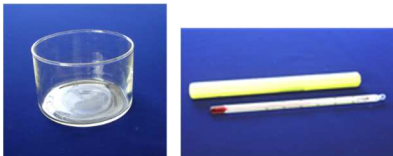
Push [F3]/[F4] key to select the medium liquid.

OTHER: Liquid other than water having a known specific gravity value

H2O: water

4

Run medium liquid to the water tank and take the temperature.



Run medium liquid such as water to the attached water tank.

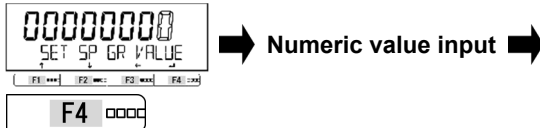
When water is selected as medium liquid, take the temperature and record it.

When other liquid is selected, take the temperature and look up the specific gravity at that temperature.

5

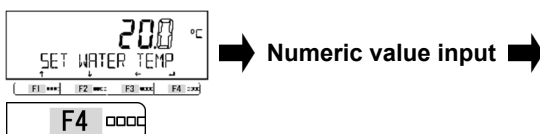
Input the specific gravity of the medium liquid or the temperature of the water.

<OTHER>: Liquid other than water



Enter the specific gravity of the medium liquid and push [F4] key to fix.

<H2O>: Water



Enter the temperature of the water and push [F4] key to fix.

When the specimen sinks

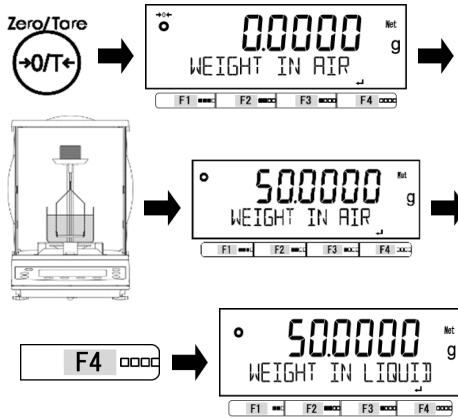
6 Assemble the specific gravity measurement kit.

Refer to "2 Assembling and installation".

7 Measure the specimen weight in the air.

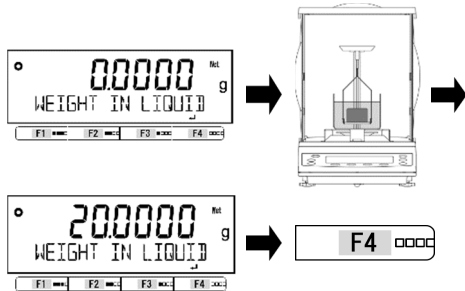
Press [Zero/Tare] key to execute tare subtraction.

Load the specimen on the upper pan to measure the weight of the sample in the air, then push [F4] key to record it.



8 Measure the specimen weight in the water/liquid.

Put the specimen on the underwater pan, then push [F4] key to record it.



9

The specific gravity of the specimen (for the 4°C water) is automatically calculated and displayed.

The result can be output by pressing [Output] key.



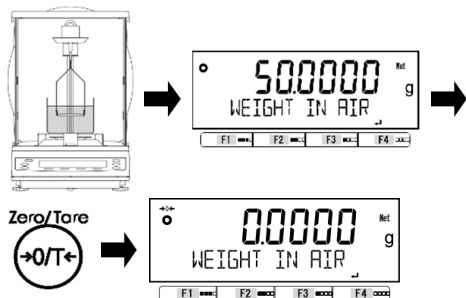
When the specimen floats

6 Assemble the specific gravity measurement kit.

Refer to "2 Assembling and installation". When the specific gravity of the specimen is smaller than that of the medium liquid (the specimen floats), use the height adjuster.

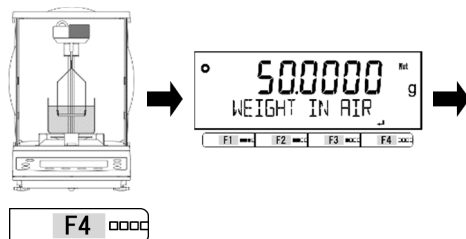
7 Place a weight on the upper pan and execute tare subtraction.

Place a weight on the upper pan. Push [Zero/Tare] key to execute tare subtraction.



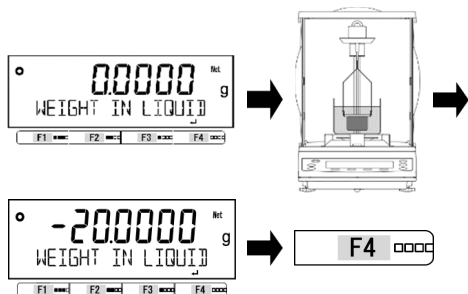
8 Measure the specimen weight in the air.

Load the specimen on the upper pan to measure the weight of the sample in the air, then push [F4] key to record it.



9 Measure the specimen weight in the water/liquid.

Put the specimen UNDER the underwater pan, leaving the weight on the upper pan. Then push [F4] key to record it.



10



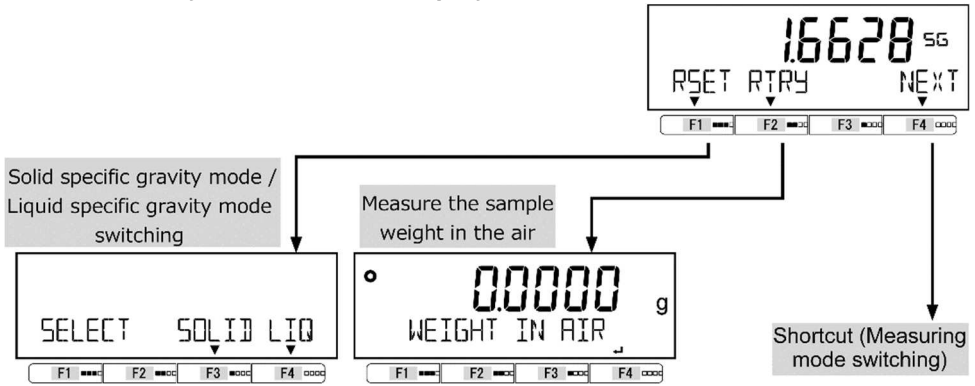
The specific gravity of the specimen (for the 4°C water) is automatically calculated and displayed. The result can be output by pressing [Output] key.

Note

Be sure that the measurement pan does not come off from the pan cradle.

3-1-2 Switching the display at solid specific gravity mode

1 Push [F1]-[F4] keys to switch the display.



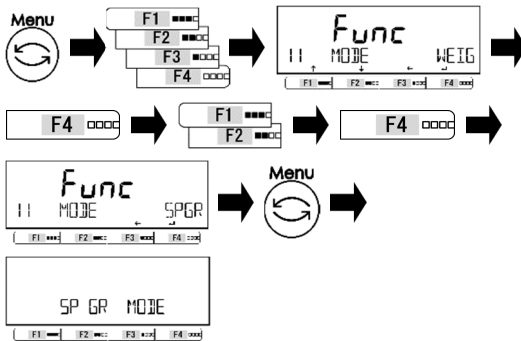
3-2 Measuring specific gravity of the liquid sample

Specific gravity of liquid is measured by using the accessory glass weight as a reference sample. In this measurement procedure, specific gravity of the glass weight is measured before measuring the specific gravity of liquid. The specific gravity value of the glass weight will be saved once it is measured. So, the corresponding operation may be skipped in subsequent measurements. You can also use other reference samples in place of the accessory glass weight. In doing so, you must perform a series of measurement steps to first measure the specific gravity of the reference sample and then to measure liquid specific gravity. Subsequently, you can skip the specific gravity measurement for the sample. Note that using another sample will overwrite the specific gravity value of the glass weight. If you are to use the glass weight again, you must measure the specific gravity of the glass weight before measuring liquid specific gravity.

3-2-1 Procedure for measuring specific gravity of the liquid sample

1

Select the specific gravity mode.



Push [Menu] key, then push [F1]-[F4] keys to go to <11 MODE>

Push [F4] key to change the setting value.

Push [F1]/[F2] key to select.

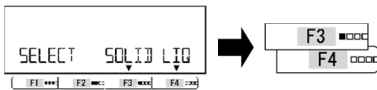
SPGR: specific gravity mode

Push [F4] key to fix.

Push [Menu] key to shift to the specific gravity mode.

2

Select the measurement mode.



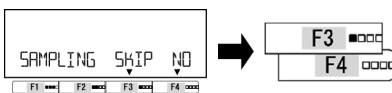
Push [F3]/[F4] key to select the measurement mode.

SOLID: Solid specific gravity mode

LIQ: Liquid specific gravity mode

3

Select execution of sampling of reference weight.



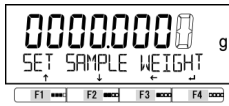
Press the [F3]/[F4] key.

SKIP: Use stored data or input numerical value by key operation.

NO: Execute the sampling of the reference weight

When <SKIP> is selected:

4 Input the weight of the reference sample

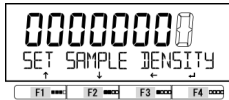


➔ Numeric value input ➔



The weight of the last used reference sample is displayed.
When new reference sample to be used, input the weight of the reference sample.
Press the [F4] key.

5 Input the specific gravity of the reference sample



➔ Numeric value input ➔



The specific gravity of the last used reference sample is displayed.
When new reference sample to be used, input the specific gravity of the sample.
Press the [F4] key.
<CHANGE LIQUID> is displayed for several seconds.

6 Run the liquid specimen to the water tank.

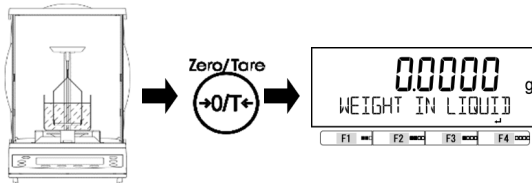


7 Assemble the specific gravity measurement kit.

Refer to "2 Assembling and installation".

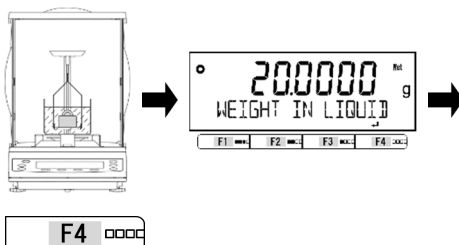
8 Submerge the underwater pan and execute tare subtraction.

The underwater pan into the liquid specimen and push [Zero/Tare] key to execute tare subtraction.



9 Measure the weight of the reference sample in the liquid specimen.

Put the reference sample on the pan submerged in the liquid specimen.
Then push [F4] key to record it.



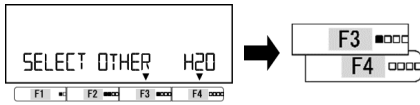
10



The specific gravity of the liquid specimen (for the 4°C water) is automatically calculated and displayed.
The result can be output by pressing [Output] key.

When <NO> is selected:

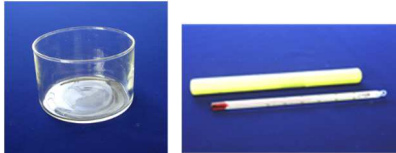
4 Select medium liquid for measuring the reference sample.



Push [F3]/[F4] key to select the medium liquid.

OTHER: Liquid other than water having a known specific gravity value
H2O: water

5 Run medium liquid to the water tank and take the temperature.



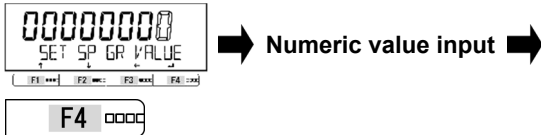
Run medium liquid such as water to the attached water tank.

When water is selected as medium liquid, take the temperature and record it.

When other liquid is selected, take the temperature and look up the specific gravity at that temperature.

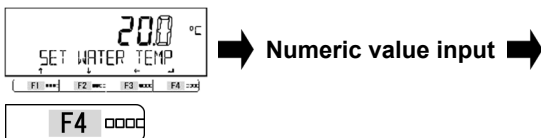
6 Input the specific gravity of the medium liquid or the temperature of the water.

<OTHER>: Liquid other than water



Enter the specific gravity of the medium liquid and push [F4] key to fix.

<H2O>: Water



Enter the temperature of the water and push [F4] key to fix.

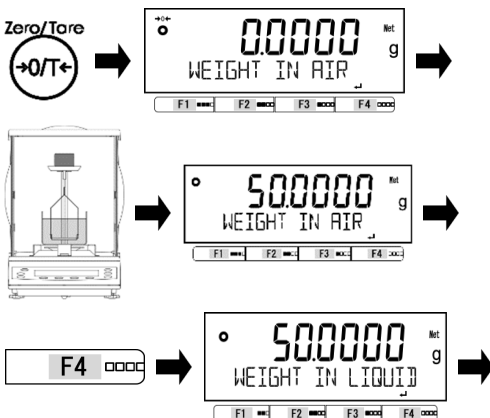
7 Assemble the specific gravity measurement kit.

Refer to "2 Assembling and installation".

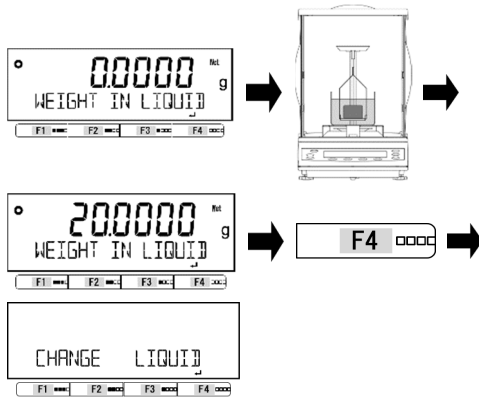
8 Measure weight of the reference sample in the air.

Press [Zero/Tare] key to execute tare subtraction.

Load the reference sample on the upper pan to measure the weight of the sample in the air, then push [F4] key to record it.



9 Measure weight of the reference sample in the water/liquid.



Put the reference sample on the underwater pan, then push [F4] key to record it.
 <CHANGE LIQUID> is displayed for several seconds.

10 Replace the liquid in the tank.

Remove the reference sample, measurement pan and liquid in the tank, then dry them.

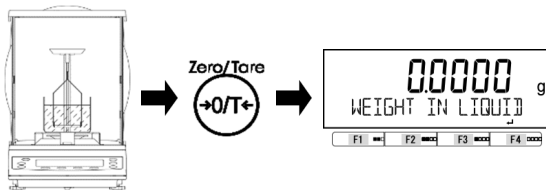
11 Run the liquid specimen to the water tank.

12 Assemble the specific gravity measurement kit.

Refer to "2 Assembling and installation".

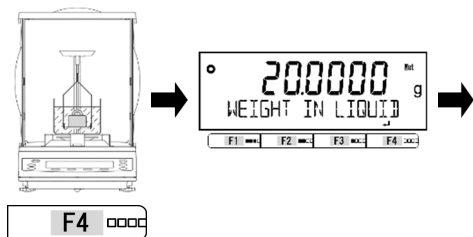
13 Submerge the underwater pan and execute tare subtraction.

The underwater pan into the liquid specimen and push [Zero/Tare] key to execute tare subtraction.



14 Measure the weight of the reference sample in the liquid specimen.

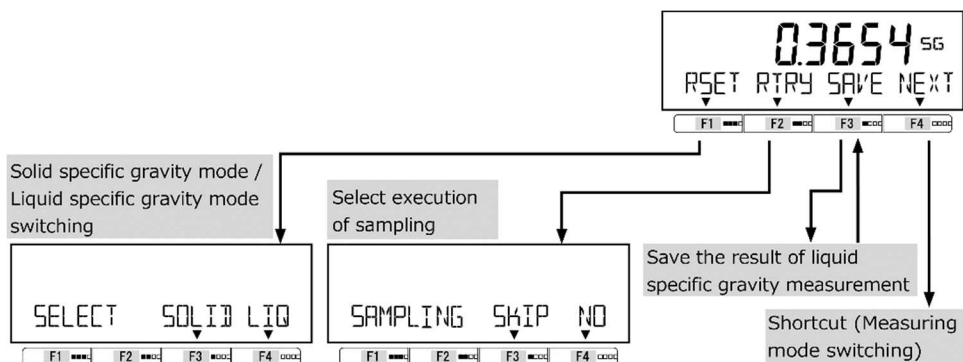
Put the reference sample on the pan submerged in the liquid specimen.
 Then push [F4] key to record it.



The specific gravity of the liquid specimen (for the 4°C water) is automatically calculated and displayed. The result can be output by pressing [Output] key.

3-2-2 Switching the display at liquid specific gravity mode

1 Push [F1]-[F4] keys to switch the display.



4 Specifications

<p>·Solid specific gravity measurement mode</p>
<p>1. Media liquid settings</p> <ul style="list-style-type: none">- Water: Setting Value: Water temperature Displayed Unit: °C Setting Range: 0.0 to 99.9 °C- Other than water: Setting value: Specific gravity of the media liquid Setting Range: Minimum 0.0001 * Result of liquid specific gravity measurement can be used. (Refer to the operation procedure of "3-2 Measuring specific gravity of the liquid sample")
<p>2. Readability of specific gravity result</p> <p>d = 0.0001</p>
<p>·Liquid specific gravity measurement mode</p>
<p>1. Media liquid settings for determining the specific gravity of the reference sample:</p> <ul style="list-style-type: none">- Water: Setting value: Temperature of the water used Same as with solid specific gravity- Other than water: Setting value: Specific gravity of the liquid used Same as with solid specific gravity
<p>2. Reference sample settings:</p> <p>Setting Value: Mass of glass weight or other reference sample [g] Setting Value: Specific gravity of glass weight or other reference sample</p> <ul style="list-style-type: none">- Setting Range: Minimum 0.0001 <p>* Once a series of measurements, i.e., measurement of the specific gravity of glass weight followed by the measurement of liquid specific gravity, is performed, the necessary settings are automatically recorded, and they are reusable in later works. It is also allowed to set the parameters manually. In this case, the steps to measure the specific gravity of the glass weight is skipped. When the specific gravity of the glass weight is measured, the parameters already set are overwritten by the new measurement. If any other sample is used instead of the glass weight, the mass and specific gravity values of the alternative sample are set as the corresponding parameter values.</p>
<p>3. Readability of specific gravity result:</p> <p>d = 0.0001</p>

5 Print Details

[Print samples for CSP-240]

Mode: Solid

Medium: Water

Output: Specific gravity of
the sample / Weight
of the sample /
Temperature of the
water

SAMPLE SP GR
SAMPLE WEIGHT
WATER TEMP

Mode: Solid

Medium: Other than water

Output: Secific gravity of the
sample / Weight of
the sample / Specific
gravity of the media
liquid

SAMPLE SP GR
SAMPLE WEIGHT
MED. LIQ SP GR

Mode: Liquid

Medium: NA

Output: Liquid specific
gravity of the
sample

SAMPLE SP LIQ

HT-N 系列
比重测量工具包操作手册

VIBRA

前言

非常感谢您购买了电子分析天平 HT-N 系列比重测量工具包。
本操作手册向您介绍如何安装和使用比重测量工具包。

声明

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- 本操作手册的描述如有更改，恕不另行通知。
- 本操作手册是精心编制的，但如有任何错误或不完善之处，请及时通知我们。
- 本操作手册如有页面丢失或装订不规则的现象，请联系您购买本产品的商店进行更换。
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警告

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- 由于新材料和加工方法的出现以及电子产品的提升，工业设备行业的潜在危险也会增加。我们不可能预见到所有危险情况。此外，还有很多“不可能”和“不应该”的地方，所以不可能把它们都写在操作手册上。因此，可以肯定的是，除非操作手册中肯定地写有“可能”，否则操作手册中未写的内容都可以理解为“不能执行”。在对本产品进行安装、操作、维护或检查时，除了要遵守本操作手册或产品表面上记载或表明的内容，还要充分考虑安全措施。
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- 制造商：SHINKO DENSHI CO., LTD.
地址：1-52-1 Itabashi, Itabashi-ku, Tokyo 173-0004 Japan

如何使用本操作手册

■ 本操作手册中使用的符号

请理解下列符号的含义并遵守本操作手册的说明。

符号	意义
	用于高风险的操作： - 在未采取妥善预防措施的情况下，可能导致人员死亡或严重的身体伤害。
	用于警告的操作： - 在未采取妥善预防措施的情况下，可能导致人员死亡或严重的身体伤害。
	用于警示的操作： - 在未采取妥善预防措施的情况下，可能导致轻度的人身伤害或产品/设施的损坏。
	用于标注： - 避免称量数据被删除、覆盖或确保准确称量和设备的妥善使用。
	用于提示：对使用本产品有帮助的信息。
	用于“禁止”的项目。
	用于需要积极行动的“强制性”项目。
	此符号表示与法定计量检定天平有关的操作/规范。

该产品/ 产品/天平	指本产品。
[On/Off]键	位于主机前面的操作键的名称，用方括号“[]”表示。
<消息>	显示屏上的信息，用尖括号“<>”表示。
<<F1>>	“自由键”或“快捷键”，用双尖括号“<<>>”表示。
按键	表示轻按一次操作键。
长按键	表示一直按操作键，直到指定的指示出现为止。

目录

前言	i
重要通知	ii
如何使用本操作手册	iii
目录	iv
1 使用前	1
1-1 操作注意事项	1
1-2 为了更准确的测量	1
1-2-1 样品和液态介质的相关注意事项	1
1-2-5 比重测量工具包的相关注意事项	1
1-3 检查包装盒里的物品	2
2 组装与安装	3
3 比重测量步骤	5
3-1 测量固体样品的比重	6
3-1-1 固体样品的测量步骤	6
3-1-2 在固体比重模式下切换显示	9
3-2 测量液体样品的比重	10
3-2-1 液体样品比重的测量步骤	10
3-2-2 在液体比重模式下切换显示	14
4 规格	15
5 打印详细信息	16

1 使用前

除了天平机身的操作注意事项外，使用比重测量工具包还应注意以下注意事项。

1-1 操作注意事项

危险



■ 请勿使用/测量会产生爆炸性气体、蒸气或雾气的易燃液体。

这可能会导致爆炸或火灾。处理此类易燃液体应使用具有防爆结构的天平。

■ 请勿将天平安装在不稳定或有振动的位置，请勿在天平上放有水箱时移动天平，尤其是在处理危险液体时。

比重测量工具包并未固定在天平上，安装、携带或操作不当可能会导致危险液体溢出并导致严重事故。

注意



■ 注意不要将水或液体溅到挡风玻璃上。

如果大量的水或液体溅到挡风玻璃上，它们可能会进入天平内部并导致短路或故障。

1-2 为了更准确的测量

1-2-1 样品和液态介质的相关注意事项

不适用的样品 → 使用本产品无法准确测量气动、发泡或溶解性样品。

磁性 → 受强磁性影响的样品会排斥抗磁性液体，从而导致测量结果的误差。

样品上的泡沫/气泡 → 样品或玻璃砝码上产生的泡沫或气泡会导致测量结果的误差。
当以水为介质时，请加入 1-2 滴表面活性剂（厨房洗涤剂）。这将有效防止气泡粘附在任何测量对象上。

温差 → 样品与液态介质之间的温差在水箱内产生对流，导致测量误差。

水温精确度 → 当以水为介质时，输入天平的水温的精确度会影响测量的精确度。
请根据需要频繁检查水温。

1-2-5 比重测量工具包的相关注意事项

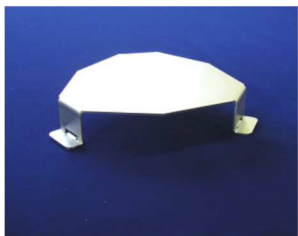
与测量台意外接触 → 您应小心不要将温度计留在水箱中。它可能会撞击浸入水中的测量台，从而导致测量不准确。测量水温时，请暂时将水箱从天平上取下。

1-3 检查包装盒里的物品

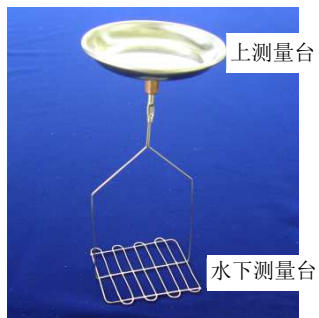
包装盒里包含以下物品：

如果发现任何丢失或损坏，请通知您购买本产品的商店。

① 水箱平台



② 测量台



③ 测量台托架



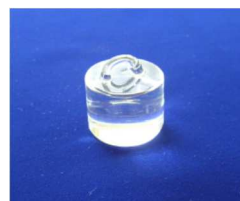
④ 高度调节器



⑤ 水箱



⑥ 玻璃砝码



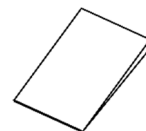
⑦ 镊子



⑧ 温度计

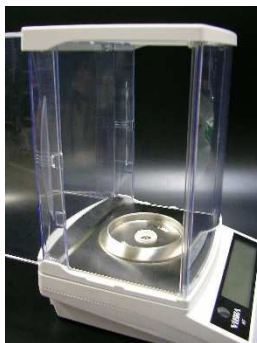


⑨ 操作手册



2 组装与安装

- 1 取下天平的秤盘和秤盘底座。



- 2 根据需要将高度调节器安装到测量台托架上。



- 3 安装测量台托架（转动中心的螺丝）



- 4 安装水箱平台。



5

将水箱放在适当的位置。



6

安装测量台



3 比重测量步骤

测量比重需要用“比重模式”。在比重模式中，会计算物质的密度与水在其液体密度最大（4℃）时的密度之比。

本产品提供以下比重测量模式：

- 固体比重测量模式：用水或其他液态介质测量固体样品。
- 液体比重测量模式：用参考玻璃砝码测量液体样品。

M

比重模式对于贸易是不合法的。

注意

- (1) “测量台托架”、“测量台”和高度调节器的总重量要大于最初安装到天平的秤盘。因此，天平与此工具包一起使用时，重量的差异将作为皮重值扣除，天平中能测量的最大重量也相应减少。
- (2) 测量台的线径可能会影响测量结果，尤其是当固体样品的体积或比重较小时。

参 考

零点调整和减皮重也可以通过指令输入或外部触点输入来执行。请参阅《HT/HTR CEN 系列操作手册》或《HT/HTR CE 系列操作手册》的“6 外部输入/输出功能”。

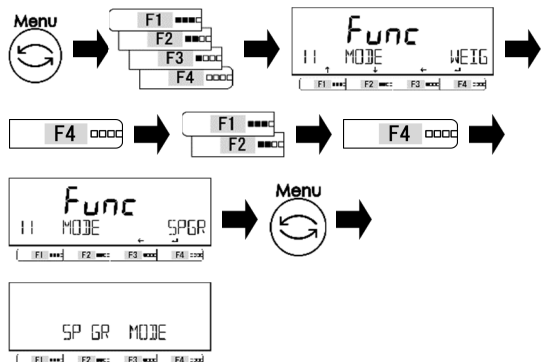
3-1 测量固体样品的比重

步骤概要

1. 输入水温或液态介质的比重。
2. 通过减去皮重来补偿作用在测量台水下部分的浮力。
3. 测量空气中的样品重量。
4. 测量水/液体中的样品重量。
5. 显示样品的比重。

3-1-1 固体样品的测量步骤

1 选择比重模式。



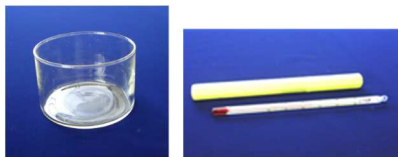
2 选择测量模式。



3 选择液态介质。



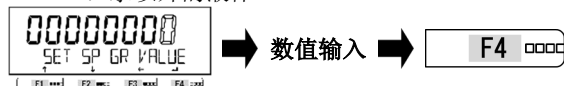
4 将液态介质注入水箱并测量温度。



将水等液态介质注入附属的水箱。
当选择水用作液态介质时，测量温度并记录。
当选择其他液体时，测量温度并查找该温度下的比重。

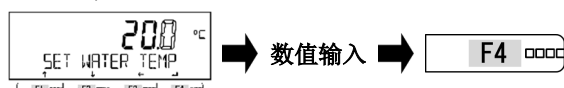
5 输入液态介质的比重或水温。

<OTHER>: 水以外的液体



输入液态介质的比重，按[F4]键确定。

<H2O>: 水



输入水温并按[F4]键确定。

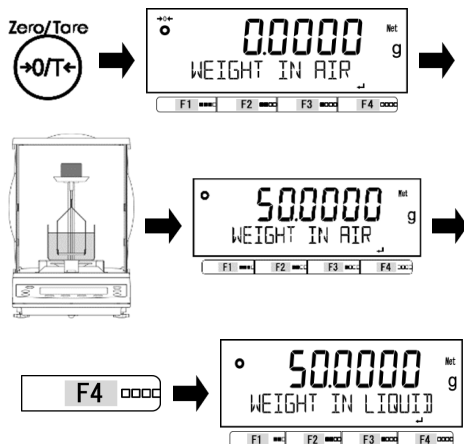
当样品下沉时

6 组装比重测量工具包。

请参阅“2 组装与安装”。

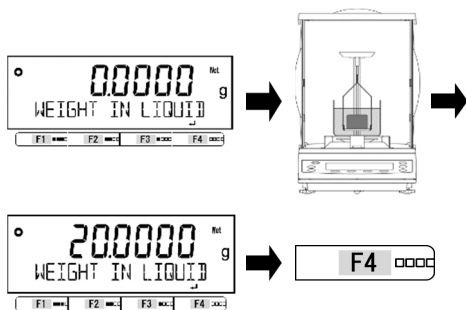
7 测量空气中的样品重量。

按[Zero/Tare]键减去皮重。
将样品装载在上测量台上测量样品在空气中的重量，然后按[F4]键记录。



8 测量水/液体中的样品重量。

将样品放在水下测量台上，然后按[F4]键记录。



9

自动计算并显示样品（相对于 4 °C 的水）的比重。
按[Output]键可以输出结果。



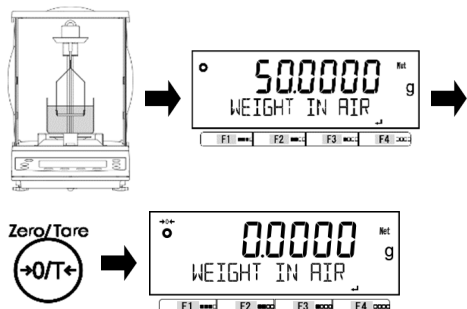
当样品漂浮时

6 组装比重测量工具包。

请参阅“2 组装与安装”。
当样品的比重小于液态介质的比重时（样品漂浮），请使用高度调节器。

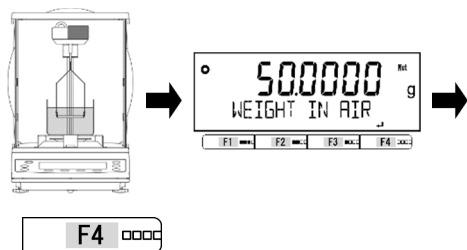
7 在上测量台上放置一个砝码并减去皮重。

在上测量台上放一个砝码。
按[Zero/Tare]键减去皮重。



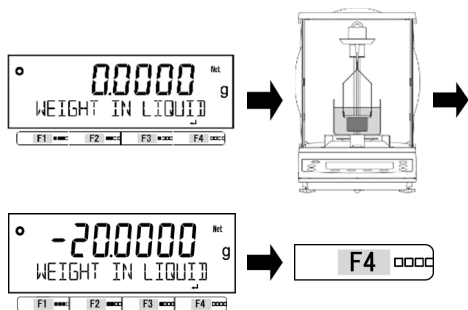
8 测量空气中的样品重量。

将样品装载在上测量台上测量样品在空气中的重量，然后按[F4]键记录。



9 测量水/液体中的样品重量。

将样品放在水下测量台下，将砝码留在上测量台上。然后按[F4]键记录。



10



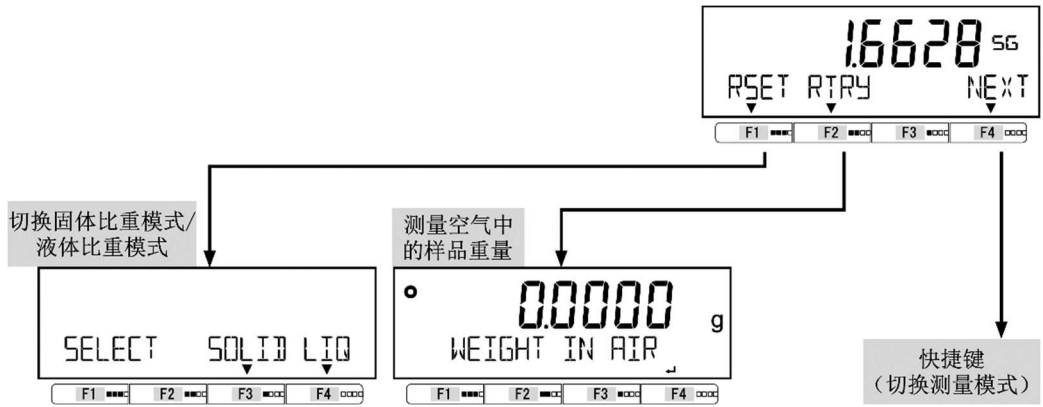
自动计算并显示样品（相对于 4 °C 的水）的比重。
按[Output]键可以输出结果。

注意

确保测量台不会从测量台托架上脱落。

3-1-2 在固体比重模式下切换显示

1 按[F1]-[F4]键切换显示。



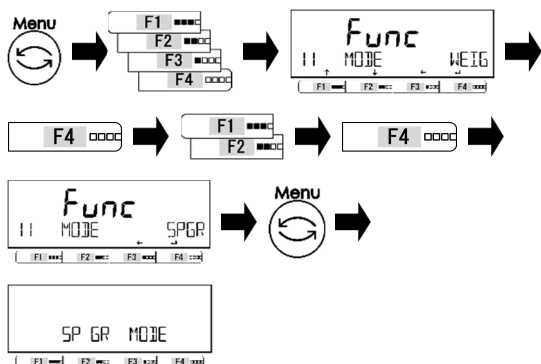
3-2 测量液体样品的比重

液体的比重是通过使用配件中的玻璃砝码作为参考样品来测量的。在此测量步骤中，在测量液体比重之前先测量玻璃砝码的比重。玻璃砝码的比重值被测量后即被保存。因此，在后续的测量中可以跳过相应的操作。您也可以使用其他参考样品代替配件中的玻璃砝码。此时，您必须执行一系列测量步骤，首先测量参考样品的比重，然后测量液体比重。其后，您可以跳过样品的比重测量。请注意，使用另一个样品将覆盖玻璃砝码的比重值。如果要再次使用玻璃砝码，必须再次测量玻璃砝码的比重，然后再测量液体比重。

3-2-1 液体样品比重的测量步骤

1

选择比重模式。



按[Menu]键，然后按[F1]-[F4]键转到
<11 MODE>

按[F4]键改变设定值。

按[F1]/[F2]键进行选择。

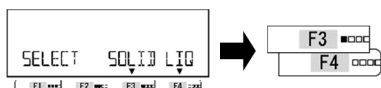
SPGR: 比重模式

按[F4]键确定。

按[Menu]键切换到比重模式。

2

选择测量模式。



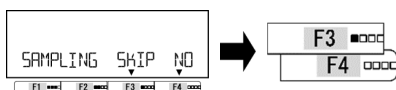
按[F3]/[F4]键选择测量模式。

SOLID: 固体比重模式

LIQ: 液体比重模式

3

选择执行参考重量的采样。



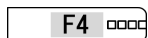
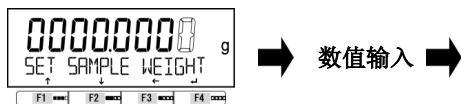
按[F3] (SKIP)/[F4] (NO) 键。

SKIP: 使用存储的数据或通过按键操作输入数值。

NO: 执行参考重量的采样

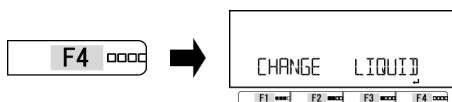
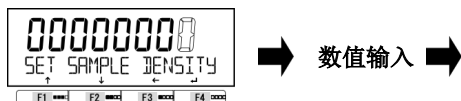
当选择了 <SKIP>时:

4 输入参考样品的重量



显示最后使用的参考样品的重量。
当要使用新的参考样品时，输入参考样品的重量。
按[F4]键。

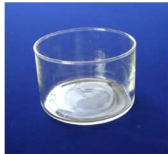
5 输入参考样品的比重



显示最后使用的参考样品的比重。
当要使用新的参考样品时，输入样品的比重。
按[F4]键。

<CHANGE LIQUID>会显示几秒钟。

6 将液体样品放入水箱。

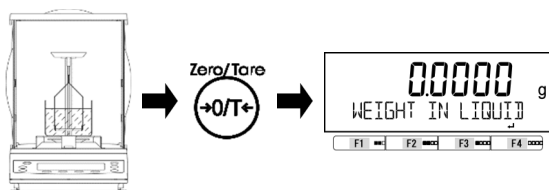


7 组装比重测量工具包。

请参阅“2 组装与安装”。

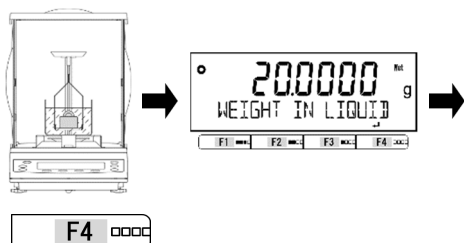
8 淹没水下测量台并减去皮重。

将水下测量台放入液体样品中，按[Zero/Tare]键减去皮重。



9 测量液体样品中参考样品的重量。

将参考样品放在浸没在液体样品中的测量台上。
然后按[F4]键记录。



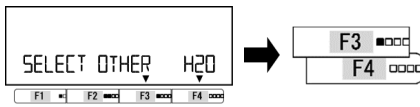
10



自动计算并显示液体样品（相对于 4 °C 的水）的比重。
按[Output]键可以输出结果。

当选择了<N0>时:

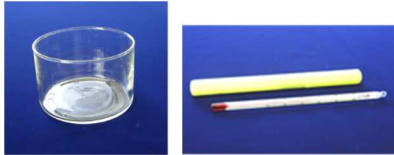
4 选择用于测量参考样品的液态介质。



按[F3]/[F4]键选择液态介质。

OTHER: 已知比重值的水以外的液体
H2O: 水

5 将液态介质注入水箱并测量温度。



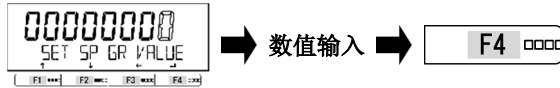
将水等液态介质注入附属的水箱。

当选择水用作液态介质时, 测量温度并记录。

当选择其他液体时, 测量温度并查找该温度下的比重。

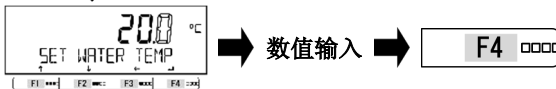
6 输入液态介质的比重或水温。

<OTHER>: 水以外的液体



输入液态介质的比重, 按[F4]键确定。

<H2O>: 水



输入水温并按[F4]键确定。

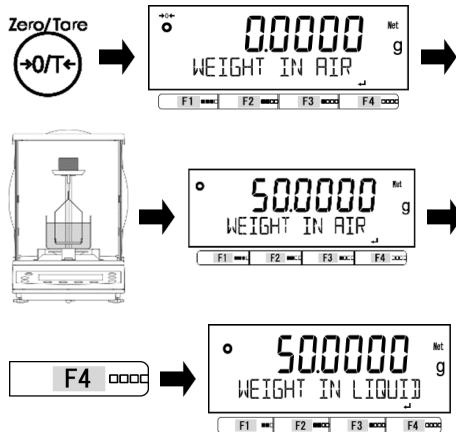
7 组装比重测量工具包。

请参阅“2 组装与安装”。

8 测量空气中的参考样品重量。

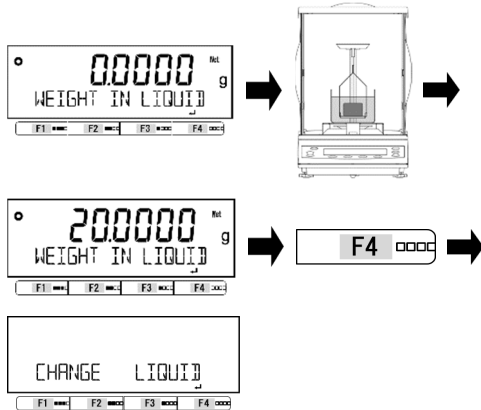
按[Zero/Tare]键减去皮重。

将参考样品装载在上测量台上测量样品在空气中的重量, 然后按[F4]键记录。



9

测量水/液体中的参考样品重量。



将参考样品放在水下测量台上，然后按 [F4] 键记录。
<CHANGE LIQUID>会显示几秒钟。

10

更换水箱中的液体。

移除参考样品、
测量台和水箱中的液体，然后将其擦干。

11

将液体样品放入水箱。

12

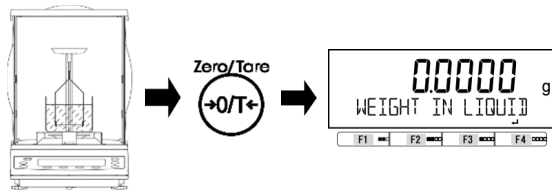
组装比重测量工具包。

请参阅“2 组装与安装”。

13

淹没水下测量台并减去皮重。

将水下测量台放入液体样品中，按 [Zero/Tare] 键减去皮重。

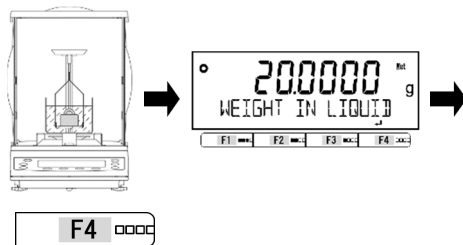


14

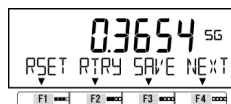
测量液体样品中参考样品的重量。

将参考样品放在浸没在液体样品中的测量台上。

然后按 [F4] 键记录。



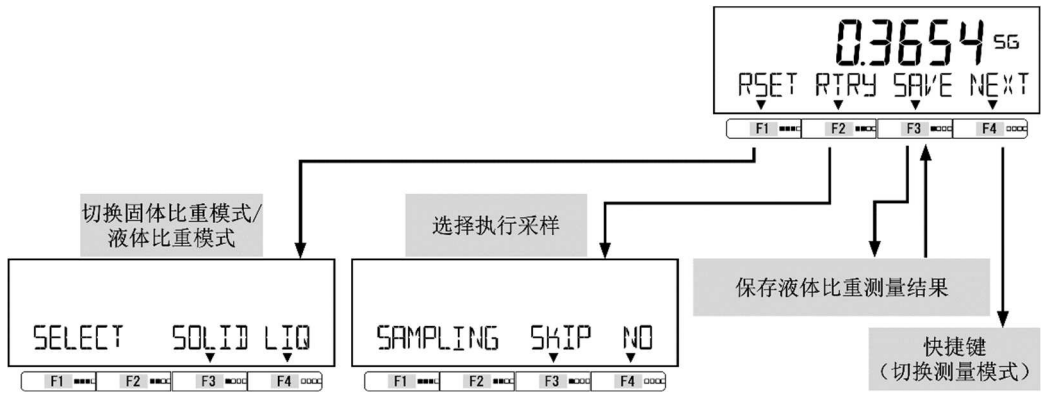
15



自动计算并显示液体样品（相对于 4 °C 的水）的比重。
按 [Output] 键可以输出结果。

3-2-2 在液体比重模式下切换显示

1 按[F1]-[F4]键切换显示。



4 规格

<p>·固体比重测量模式</p> <p>1. 液态介质设置</p> <ul style="list-style-type: none">- 水: 设定值: 水温 显示单位: °C 设置范围: 0.0-99.9 °C- 水以外: 设定值: 液态介质比重 设置范围: 最小值 0.0001 *可以使用液体比重测量的结果。(请参阅“3-2 测量液体样品的比重”的操作步骤)
<p>2. 比重结果的可读性</p> <p>d = 0.0001</p>
<p>·液体比重测量模式</p> <p>1. 用于确定参考样品比重的液态介质设置:</p> <ul style="list-style-type: none">- 水: 设定值: 所用水的温度 与固体比重相同- 水以外: 设定值: 所用液体的比重 与固体比重相同
<p>2. 参考样品设置:</p> <p>设定值: 玻璃砝码或其他参考样品的重量 [g]</p> <p>设定值: 玻璃砝码或其他参考样品的比重</p> <p>- 设置范围: 最小值 0.0001</p> <p>* 一旦进行了一系列测量, 即先测量玻璃砝码的比重, 再测量液体比重, 必要的设置就会被自动记录下来, 并可在其后的步骤中重复使用。也允许手动设置参数。在这种情况下, 将跳过测量玻璃砝码比重的步骤。测量玻璃砝码的比重时, 已设置的参数将被新的测量值覆盖。如果使用任何其他样品代替玻璃砝码, 则将替代样品的重量和比重值设置为相应的参数值。</p>
<p>3. 比重结果的可读性:</p> <p>d = 0.0001</p>

5 打印详细信息

打印示例

模式：固体

介质：水

输出：样品比重/样品重量/
水温

模式：固体

介质：水以外

输出：样品比重/样品重量/液
态介质比重

模式：液体

介质：无

输出：样品液体比重

SAMPLE SP GR

SAMPLE WEIGHT

WATER TEMP

SAMPLE SP GR

SAMPLE WEIGHT

MED. LIQ SP GR

SAMPLE SP LIQ

