

# **Direct Reading Specific Gravity Meter**

**AU-300S AU-600S**

## **Instruction Manual**

Please read the instruction manual carefully before using

# Quality Insurance

Thank you very much for choosing Quarrz Brand Specific Gravity Instrument.

We guarantee this instrument for two years and life-long maintenance.

We will be responsible for fixing or replacing the instrument if quality issue was arisen, the service is excluding if the machine is breakdown caused by following reasons:

- (1) Wrong operation;
- (2) Fixed or refitted personally;
- (3) The machine itself is not the reason caused breakdown;
- (4) Applying the machine under the serious conditions, such as high temperature, moist, corrosive gas, or vibration.
- (5) Move or transportation as soon as installed.
- (6) No including consumables, easy-loss components and sensor.
- (7) Natural disaster

## **After-sales service:**

1. If errors occur, please refer to the troubleshooting tips of the instruction manual.
2. Please contact with our after-sales service department or distribute in time if can't clear fault.

**Quarrz after-sales hot line 400 830 0646**

# Announcement

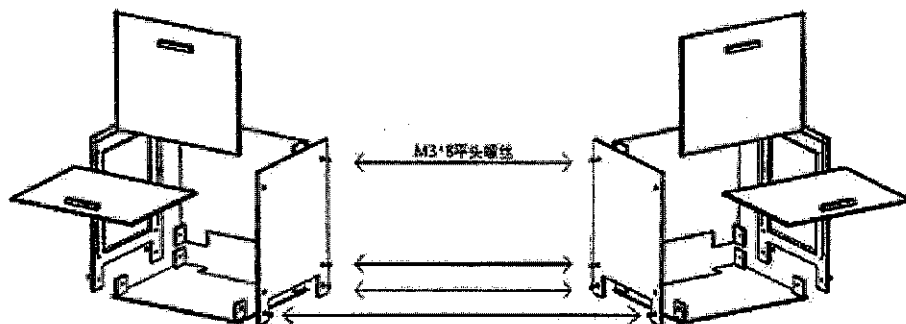
The design of all series of Quarrr Specific Gravity Instruments is aim to meet the demands for products quality management,new materials density researching,testing organization and academic institute laboratory;Quarrr is the primary supplier and manufacturer to the field of densitometer which is applied by Archimedes Principle.Quarrr, authorization facilitator,regional agent,and contributing maintenance centre would provide the all-embracing technical service which is including technical consultant,business transaction,daily maintenance,calibration and so on.

Quarrr reserve all the right for the final explanation;any forms for copy or translation without authorization that absolute is not allowed, otherwise we will retain to take any legal action.

Quarrr reserve the rights of modification for manufacturing technology,feature,technical parameter and design. we will don't give further notice after change.

This handbook is the most completed,accurate and updated version.Quarrr would not take any responsibility if operate this instrument wrongly.

## Assembly Drawing for Installing Windproof Cover



Please refer to the pic to install the wind shield and lock well by using screw.

## Specification Parameter

| Model                    | AU-300S                | AU-600S |
|--------------------------|------------------------|---------|
| Density resolution       | 0.001g/cm <sup>3</sup> |         |
| Maximum weight           | 300g                   | 600g    |
| Minimum weight           | 0.005g                 |         |
| Model                    | Solids                 |         |
| Solution compensation    | Yes                    |         |
| Temperature compensation | Yes                    |         |
| Calibration weight       | 100g                   | 200g    |
| Measuring principle      | Archimedes Principle   |         |

# Contents

|                                              |    |
|----------------------------------------------|----|
| <b>I. Over View</b>                          | 6  |
| 1.1 Principle                                | 6  |
| 1.2 Application                              | 6  |
| <b>II. Instrument Introduction</b>           | 6  |
| 2.1 Main Body Formation                      | 6  |
| 2.2 Key Function                             | 7  |
| 2.3 Control panel                            | 7  |
| <b>III. Installation Method</b>              | 8  |
| <b>IV. Calibration Method</b>                | 9  |
| <b>V. Other Settings</b>                     | 9  |
| 5.1 How to Do Water Temperature Compensation | 9  |
| 5.2 How to do solution compensation          | 11 |
| <b>VI. Operation Method</b>                  | 11 |
| 6.1 Measurement for solids                   | 11 |
| 6.2 Measurement for floating                 | 12 |
| 6.3 Measurement for particle                 | 13 |
| <b>VII. Precaution and Maintenance</b>       | 13 |
| <b>VIII. Troubleshooting Method</b>          | 15 |
| <b>IX. Standard Accessories</b>              | 16 |

## **I. Over View**

### **1.1 Principle**

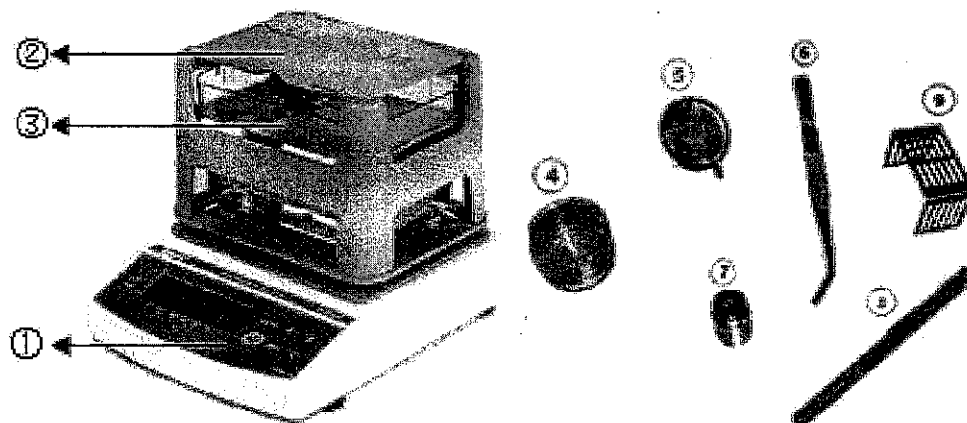
In accordance with standards ASTM D297-93,D792-00,D618,D891 for AU-300S, AU-600S,combined Archimedes principle with mirco-electronical technology,and based on the density of water in actual temperature.the specific gravity of specimen can be calculated by miro computer through the weight and volume that measured twice.

### **1.2 Application**

The instrument was primary applied to rubber,plastic,powder metallurgy,cables,composite materials,mineral,food,cosmetic,shoe materials,glass,chemical materials,precious metal recycle etc.,it can directly read the data of average weight in air,average weight in water,specific gravity value,density value,volume and percentage for solids,particle,thin film,floating and powders

## **II.Instrument Introduction**

### **2.1 Main Body Formation**

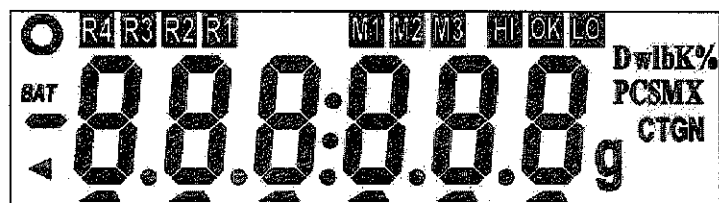


1.host 2.measuring table 3.sink 4.glass cup 5.mesh ball 6.tweezers  
7.weight 8.thermometer 9.floating-resistant shelf 10.windproof and dustproof cover  
11.power supply

## 2.2 Key Function

| Key           | Function                    |
|---------------|-----------------------------|
| <b>NO/OFF</b> | Turn on/Turn off            |
| <b>A</b>      | Function Key                |
| <b>B</b>      | 1.Function key 2.Printing   |
| <b>ENTER</b>  | Memory                      |
| <b>ZERO</b>   | 1.Return Zero 2.Calibration |
| <b>C</b>      | Function key                |

## 2.3 Control Panel



|           |               |           |                 |
|-----------|---------------|-----------|-----------------|
| <b>O</b>  | Stable symbol | <b>SG</b> | Density value   |
| <b>M1</b> | Weight in air | <b>M2</b> | Weight in water |

### III. Installation Method

- **Installation surroundings**

(1) Ideal surroundings: 20°C/68°F and humidity 50%

(2) The installation place should be avoid from direct sunlight, vibration, wind, dust and magnetic interference.

(3) Make sure the voltage is conformed to the requirement.

- **Install windproof cover, place the instrument into the windproof cover.**

- **Horizontal Adjustment**

Adjust the bubble in the gradienter into the centre position of black circle, makes the whole instrument in horizontal status.

- **Installation for Sink**

Pour the distilled water into sink till the water up to the lines. wipe the extra sticking water on sink and put the sink into two strip of fixed groove.

- **Installation of Measuring Shelf**

Put measuring shelf on measuring board. the four feet of testing stand should be fitted into the four fixed groove in measuring board. please be noted that nacelle should be submerged into water and it should be no touch with sink.

Warm up 30 minutes after turn on machine.If display ERR-1 or the zero is not stable,please check if the installation or the surrounds is correct or not.Then press **【ON/OFF】** key to turn on.

## **IV. Calibration Method**

(1) Turn on machine,screen displaying 0.000.press **【ZERO】**return zero if without showing **【0.000】** .

(2)In **【0.000】** status, Long-press **【ZERO】** till shows up **【CAL】** .

(3)Which means it is entering into calibration mode.several seconds later it will automatically show **【100.000】** **【200.000】** along with flickering constantly.place 100g,200g weights onto the centre of measuring bridge.the machine will do calibration automatically.when screen display **【END】** firstly,then display **【100.000】** **【200.000】** .it indicate the calibration is done.

(4)Take down the weights,the machine will return to measuring mode automatically and display **【0.000】** .

## **V. Other Settings**

### **5.1.How to do water temperature compensation**

Specific gravity of water would be changed along with water temperature,there is

necessary to do temperature compensation in base with specific gravity 1.0000 at 4℃ of water. As for water temperature compensation coefficient, this instrument was stored of memory value for 0~49℃. Using thermometer to get actual temperature before testing, then revise the temperature to the one shows up in thermometer. (specific gravity would differ 0.001 if the difference between water temperature is 6℃). Default temperature of this machine is 25℃. Temperature value and other value would be revised by long-press **【A】** Key. Here below is detail procedure.

- (1) Long-press **【A】** till screen display **【C25】**
- (2) Press **【A】** to revise numbers. Press **【ZERO】** to shift
- (3) Press **【ENTER】** to confirm after revise, then get back to measuring mode.

**Water temperature comparison table:**

| Temp.<br>(℃) | Density<br>(g/cm <sup>3</sup> ) | Temp.<br>(℃) | Density<br>(g/cm <sup>3</sup> ) | Temp.<br>(℃) | Density<br>(g/cm <sup>3</sup> ) | Temp.<br>(℃) | Density<br>(g/cm <sup>3</sup> ) |
|--------------|---------------------------------|--------------|---------------------------------|--------------|---------------------------------|--------------|---------------------------------|
| 0            | 0.99984                         |              |                                 |              |                                 |              |                                 |
| 1            | 0.99990                         | 11           | 0.99961                         | 21           | 0.99799                         | 31           | 0.99534                         |
| 2            | 0.99994                         | 12           | 0.99950                         | 22           | 0.99777                         | 32           | 0.99503                         |
| 3            | 0.99996                         | 13           | 0.99938                         | 23           | 0.99754                         | 33           | 0.99471                         |
| 4            | 0.99997                         | 14           | 0.99925                         | 24           | 0.99730                         | 34           | 0.99438                         |
| 5            | 0.99996                         | 15           | 0.99910                         | 25           | 0.99705                         | 35           | 0.99404                         |
| 6            | 0.99994                         | 16           | 0.99894                         | 26           | 0.99679                         | 36           | 0.99369                         |
| 7            | 0.99990                         | 17           | 0.99878                         | 27           | 0.99652                         | 37           | 0.99333                         |
| 8            | 0.99985                         | 18           | 0.99860                         | 28           | 0.99624                         | 38           | 0.99297                         |
| 9            | 0.99978                         | 19           | 0.99841                         | 29           | 0.99595                         | 39           | 0.99260                         |
| 10           | 0.99970                         | 20           | 0.99821                         | 30           | 0.99565                         | 40           | 0.99222                         |

## 5.2.How to do solution compensation

Since measuring special materials need to use other medium as testing solution,it is necessary to revise density of solution to make compensation for measuring result.Here below is detail procedure:

- (1) Long-press **【A】** till screen display **【C25】**
- (2) Then press **【B】** one time to enter into solution density setting
- (3) Press **【A】** to revise numbers.Press **【ZERO】** to shift
- (4) Press **【ENTER】** to confirm after revise,then get back to measuring mode

## VI. Operation Method

To avoid error,please make sure to get more heavier specimen if its' density is more big,please refer to the following table to prepare specimen.

|           |       |       |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|
| Density   | 0.200 | 0.400 | 0.600 | 0.800 | 1.000 | 1.200 | 1.400 | 1.600 |
| Weight(g) | 0.16  | 0.62  | 1.41  | 2.56  | 3.93  | 5.65  | 7.70  | 10.1  |
| Density   | 1.800 | 2.000 | 2.200 | 2.400 | 2.600 | 2.800 | 3.000 | 3.500 |
| Weight(g) | 12.7  | 15.7  | 19.0  | 22.7  | 26.6  | 30.9  | 35.4  | 48.2  |
| Density   | 4.000 | 4.500 | 5.000 | 5.500 | 6.000 | 6.500 | 7.000 |       |
| Weight(g) | 62.9  | 79.6  | 98.3  | 118   | 141.6 | 169.9 | 200   |       |

### 6.1.Measurement for Solids

- (1) Start up machine, screen will display **【QUARRZ】** **【AU-300S】**、**【AU-600S】** ,then **【0.000】** .press **【ZERO】** to return zero if without displaying **【0.000】**

(2) When M1 is flicking ,place specimen onto measuring table. Press 【ENTER】 button when the left top of screen display stable symbol"O".M1 would be changed to M2 and flicking ,which indicate that weight of specimen in air is saved.

(3) Cleaning specimen with ethanol by using tweezers.

(4) Gently place specimen into nacelle.press 【ENTER】 button after the left top screen display stable symbol"O",then M2 would be disappeared and screen would display density value.

(5)Keep record of needed data.Press 【ENTER】 and return to measuring mode to test next specimen.

## **6.2.Measurement for Floating(the specimen of which specific gravity is less than one)**

(1) Place floating-resistant shelf to nacelle in water.Press 【ZERO】button to deduct weight of the shelf(please be noted that shelf should be submerged into water)

(2) When M1 is flicking.Place specimen onto measuring table.Press 【ENTER】 button when the left top of screen display stable symbol"O".M1 would be changed to M2 and flicking ,which indicate that weight of specimen in air is saved.

(3) Cleaning specimen with ethanol by using tweezers.

(4) Place specimen into nacelle and press it with the floating-resistant shelf,screen would display negative number because specific gravity of specimen is less than one.press

【ENTER】 button after the left top screen display stable symbol"O",then M2 would be disappeared and screen would display density value.

(5) Keep record of needed data.Press 【ENTER】 and return to measuring mode to test next specimen.

### **6.3.Measurement for Particle**

(1) Place ball into nacelle and glass onto measuring board.Press 【ZERO】 button to deduct weight of the ball and the glass.

(2) When M1 is flicking.Place specimen onto glass.Press 【ENTER】 button when the left top of screen display stable symbol"O".M1 would be changed to M2 and flicking,which it indicate that weight of specimen in air is saved.

(3) Take down glass cup,open up lip of measuring table,take out ball from nacelle by using tweezers,open up the ball,pour specimen from glass cup into the ball,lock the ball.(please be noted specimen should keep the same quantity)

(4) Cleaning ball with ethanol by using tweezers.shake ball gently to make sure there is no bubble among particles.

(5) Placing ball into nacelle.Put glass cup back to measuring table.

(6) press 【ENTER】 button after the left top screen display stable symbol"O",then M2 would be disappeared and screen would display density value.

(7) Keep record of needed data.Press 【ENTER】 and return to measuring mode to test next specimen.

## **VII. Precaution and Maintenance**

## **7.1 Attention before using**

Please do weights calibration before using or after removing.

Tips:

Please prepare alcohol before testing to get accurate measuring data.(The best purity of ethanol is 95%)

Since it is the precision instrument, please be careful to operate this machine.

Take out wind shield and install it well. Place the densitometer into shield. (this action can protect measuring from wind)

## **7.2. Attention when using**

(1) Keep the static specimen away from measuring table, it will take effect on testing result otherwise.

(2) All the action should be gentle. Specimen should be placed into centre of measuring table,

(3) Specimen putted into nacelle should be submerged into water, also there is no bubble on the surface of specimen.

(4) Don't hit the Key by using sharp hard staff.

(5) Press ZERO Key every time before using can avoid the error measuring.

## **7.3. Special notice**

(1) Keep this machine away from hit and drop

(2) Please don't disassemble by yourself

(3) Please don't wipe this machine with organic solvent

(4) Please avoid inside of machine from dust and water

(5) Please do not use overload

(6) Please pull out power and take down measuring table and sink if don't use for a long time

## **VIII. Troubleshooting Method**

### **(1)When the weights is not stable**

Please check out:whether the windproof and dustproof cover is closed well;whether the measuring shelf is touched with container plate;whether there is dirty or water drop is underneath of plate.if it is,please clean up the dirty or water drop,re-install container plate and measuring shelf.

### **(2) When the measuring is not correct**

Please do calibration again.and put the weight on the centre of measuring bridge.for AU-300S,the error should be within  $100g \pm 0.005g$ ;for AU-600S,the error should be within  $200g \pm 0.005g$ .

Please check if it is surroundings take effect on measuring.

Please check if there is bubble on specimen when it is put into water.

*Remark:*

*If this instrument still can't get back to normal according to above procedure.please call Quarrz's after-sale hot line:400 830 0646*

## IX. Standard Accessories

| No. | Item                         | Unit | Qty | Remark |
|-----|------------------------------|------|-----|--------|
| 01  | Host                         | set  | 1   |        |
| 02  | Sink                         | pcs  | 1   |        |
| 03  | Measuring table              | pcs  | 1   |        |
| 04  | 220V power                   | pcs  | 1   |        |
| 05  | Weight                       | pcs  | 1   |        |
| 06  | Windproof<br>dustproof cover | pcs  | 1   |        |
| 07  | Thermometer                  | pcs  | 1   |        |
| 08  | Tweezers                     | pcs  | 1   |        |
| 09  | Glass cup                    | pcs  | 1   |        |
| 10  | Ball                         | pcs  | 1   |        |
| 11  | Floating-resistant<br>shelf  | pcs  | 1   |        |
| 12  | Instruction manual           | pcs  | 1   |        |