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WARRANTY



OMEGA® User's Guide



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MADE IN TAIWAN

DCB81

Relative Density and Concentration Tester



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WARNING: These products are not designed for use in, and should not be used for, human applications.

RELATIVE DENSITY & CONCENTRATION TESTER

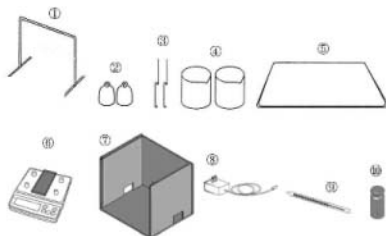
DCB81

Instruction Manual

**Before using this instrument, please read the instructions carefully.
Please keep manual in a ready reference.**

DCB81 is designed by adopting a standard glass weight calculating the unknown liquid density.

1. Standard Accessories:



- ① Liquid specialized frame
- ② Glass weight
- ③ Hook
- ④ 50cc beaker
- ⑤ Support board
- ⑥ Main-body
- ⑦ Windshield (optional)
- ⑧ AC Adapter
- ⑨ Thermometer
- ⑩ Calibration weight

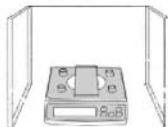
2. The installation of DCB81:

When installing DCB81, it should avoid:

1. The vibration place
2. Static electricity
3. Direct sunshine
4. Electromagnetic wave
5. The places where is too wet or too high temperature

2.1 Installation steps:

1. After placing the DCB81 body in the windshield, adjust the 4 feet of main-body, adjust the level bubble on the after side of the main-body to the center.
2. Put the liquid specialized frame on the weighing scale, and using the four feet getting stuck the frame.
3. Embedding the 4 round feet of the black support plate into the 4 round hole of the main-body.
4. Place the two pieces removable doors of the windshield on the top and the front, then the installation finishes.



3. Warming up

It takes about 10 minutes for an electric circuit to become stable after plugged in and turn on the power.

4. Calibration

When using the direct reading electronic densimeter, the density of the sample is on the basis of the weight calculation. Accurate measurement result is based on measuring the weight accurately.

It is necessary to calibrate with standard weight on the following occasions.

- when the balance is first used
- when the balance has been moved
- when the location of surroundings are changed
- as a periodical adjustment

4.1 How to calibrate

Plug in and preheat for 30 minutes (for cold regions)

Display show

1. When the balance is under the state of weighing mode, press the key **[ZERO]** and hold it. **[0.000]**
2. It means entering calibration procedure when it displays **[CAL]** , **[CAL 120]** it will display mutual flashing between CAL and 120
 - A. Put the 100g calibration weight on the sensor when the screen flickers, the balance will detect the weight automatically and calibrate it simultaneously. **[CAL 100]**
 - B. The calibration finishes when the screen displays - END- . **[100.000]**
 - C. Pick up the weight and back to the under-test mode. **[0.000]**

※**Notice: After calibration, it should calibrate it again if the machine is moved to other places or when the liquid accessories are replaced.**

5. Setting the weight, density of glass weight, the high limit and low limit of density

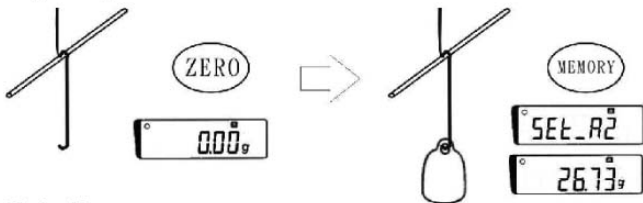
When the screen displays 0.000, press the key **[F]** and hold it to enter parameter setting, click the key **[F]** to enter the next parameter setting, the parameter setting procedure is A2→d→SG Hi→SG Lo→b→E1→E2, press **[PRINT]** to enter the mode to modify the parameter, the methods of data-modifying are as follows:

[PRINT]	1. Increase the value 2. Press [PRINT] and hold it to give up modifying	[MEMORY]	1. Confirm changes
[F]	1. Digital shift 2. Press [F] and hold it to go off the options		

5.1 Setting the weight of glass weight A2: Weighing the glass weight first, and then input the weight of glass weight to A2.

Method1:

Under the 0.000g measuring state of liquid mode, put the hook on the liquid specific frame, press ZERO to re-zero; then catch on the glass weight by using the hook, press **MEMOERY** key after stable, the screen will display SET A2, it indicates that the glass weight has been memorized to A2.



Method2:

Press the key **F** and hold it when the screen shows 0.000; when it shows **A2**, press the key **PRINT** to enter the option; press the key **PRINT** again to change the value, press **F** to shift; At the moment, using **PRINT** and **F** to set the weight of glass weight, after setting, press **MEMOERY** to memorize and back to the next setting mode, press **PRINT** and hold it to give up the option if on need to modify; press the key **F** and hold it back to the measuring state.

5.2 Setting the density of glass weight:

After finishing setting the weight of glass weight, when it shows **d**, press the key **PRINT** to enter the option; press the key **PRINT** again to change the value, press **F** to shift; At the moment, using **PRINT** and **F** to set the density of glass weight, if the density of glass weight is 2.226, input **d 2.226**, after finishing setting, press the key **MEMOERY** to memorize and back to the next setting mode, press **PRINT** and hold it to give up the option if on need to modify; press the key **F** and hold it back to the measuring state.

5.3 The function of high limit and low limit: (Setting of SG Hi, SG Lo)

DCB81 has the function of high limit and low limit, the range of high limit and low limit can be set freely. If the density of the sample is higher than the high limit, the screen will display Hi; if lower than the low limit, it will show Lo; If the density is between the high limit and low limit, the screen will show OK.

Notice: When the setting of high limit and low limit is 00.0000, the function is closed.

5.3.1 The density setting of high limit: SG Hi

The steps are as follows:

Enter setting mode, press **F** for several times until the screen displays the density setting of high limit **SG Hi**, press **PRINT** to enter the option; then press **PRINT** again to modify the value, and press **F** to shift; At the moment press **PRINT** and **F** to set the value needed, press the key **MEMORY** to back to the next setting mode after finishing setting. Press **PRINT** and hold it to give up the option if on need to modify; press the key **F** and hold it back to the test state.

5.3.2 The density setting of low limit: SG Lo

The steps are as follows:

Enter setting mode, press **F** for several times until the screen displays the density setting of low limit **SG Lo**, press **PRINT** to enter the option, then press **PRINT** again to modify the value, and press **F** to shift; At the moment using **PRINT** and **F** setting the value needed, press the key **MEMORY** to memorize and back to the next setting mode after finishing the setting. Press **PRINT** and hold it to give up the option if on need to modify; press the key **F** and hold it back to the test state.

5.4 Setting the compensation value of air-buoyancy (b)

After setting density of weight, when the machine show **b**, press **PRINT** to enter it; press **PRINT** to modify the value and press **F** to shift; At the moment using **PRINT** and **F** setting the air buoyancy compensation value; for example, if the air buoyancy compensation value is 0.00122, please input **b** 0.00122, press the key **MEMORY** to memorize and back to the next setting mode after finishing setting. Press **PRINT** and hold it to give up the option if on need to modify; press the key **F** and hold it back to the test state.

The reference of air buoyancy compensation value:

T °C	-25	-20	-15	-10	-5	0	5
ρ g/cm ³	0.00142	0.00139	0.00136	0.00134	0.00131	0.00129	0.00126
T °C	10	15	20	25	30	35	
ρ g/cm ³	0.00124	0.00122	0.00120	0.00118	0.00116	0.00114	

5.5 Setting E1, E2 for testing concentration

According to the transformation formula of density and concentration ($y = a + bx$), y is concentration, x is density, and it can be calculated by using back-stepping linear. For example as follows:

Conc.(%)	Den.(g/cm ³) at 20°C	Conc.(%)	Den.(g/cm ³) at 20°C
10.0	0.9820	10.6	0.9842
10.1	0.9824	10.7	0.9845
10.2	0.9827	10.8	0.9849
10.3	0.9831	10.9	0.9852
10.4	0.9835	11.0	0.9855
10.5	0.9838		

According to the data as above and according to the transformation formula $y = a + bx$, and by using the back-stepping linear of commercial software, we can get the formula $y = 283.21x - 268.12$. Thus, the parameter of E1 (-268.12) and E2 (283.21) can be set.

5.5.1 E1 Setting:

Entering setting procedure, press **[F]** for several times until the screen shows E1, press the key **[PRINT]** to enter the option, press the key **[PRINT]** again to change the value, press **[F]** to shift; At the moment, using **[PRINT]** and **[F]** to set E1, after finishing setting, press the key **[MEMORY]** to memorize and back to the next setting mode, press **[PRINT]** and hold it to give up the option if on need to modify; press the key **[F]** and hold it back to the test state.

5.5.2 E2 Setting:

Entering setting procedure, press **[F]** for several times until the screen shows E2, press the key **[PRINT]** to enter the option, press the key **[PRINT]** again to change the value, press **[F]** to shift; At the moment, using **[PRINT]** and **F** to set E2, after finishing setting, press the key **[MEMORY]** to memorize and back to the next setting mode, press **[PRINT]** and hold it to give up the option if on need to modify; press the key **[F]** and hold it back to the test state.

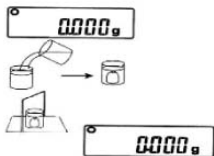
Note: If E1 or E2 is negative value, please note to input a minus sign (-) before the value.

Notes:

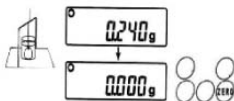
The machine should be kept clean, it needs to be cleaned if the liquid spills out. Please be careful when measuring the explosive or high volatile liquid, because the liquid will be harmful to human body and the machine.

6. The operating steps of liquid mode:

1. Pour the 50ml liquid sample into the beaker
2. Put the standard glass weight whose weight has been memorized into the liquid
3. Put the beaker on the center of the support plate



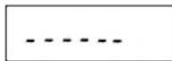
4. Hang the hook on the center of the liquid specific frame
5. Press **RE-ZERO** to deduct the weight of the hook



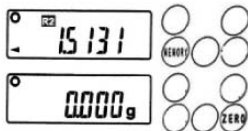
6. Use the hook catching on the standard glass weight, it will display the weight of glass weight in measuring liquid
Make sure the measuring liquid is higher than glass weight, and the glass weight can not touch the beaker.



7. After stable, press **MEMORY**, it will calculate the liquid density value.



8. The screen will display the liquid density value
9. If E1, E2 has been set, concentration will be showed by pressing F.
10. If another sample needs to be measured, press **MEMORY** to back to the under test state 0.000g.
11. If need to measuring again, please note one point as follows
After cleaning the hook and the glass weight, use another measuring liquid.



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If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

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1. Purchase Order number to cover the COST of the repair,
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