

# Sample Concentrator (visible)

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**Cat. No. BT1610**

## IMPORTANT SAFETY INFORMATION

- Please read this operation manual carefully before using the instrument.
- This product is an indoor Instrument.
- These units are designed for laboratory use by persons knowledgeable in safe laboratory practices.
- The operator should never open or repair the instrument. Opening or repairing the instrument will void the guarantee and can cause accidents.
- The power plug should safeguard against an electric shock. The 3-pin plug supplied with the instrument should be matched with a suitable grounded socket.
- The temperature of metal block will be very high during the normal operation. The liquid will be boiling. Do not touch any part of the body to the instrument due to risk of scalding.
- Close the test tube lid before putting the tube into the block. Liquids may spill out in the block or onto the device if the tube lid is opened, which will damage the block or the device.
- Make sure the rated electrical outlet load is no lower than the demand. Power line should be replaced with the same type if it is damaged. Make sure there is nothing else on the power line. Hold the jack when pulling out the power line. Do not pull the power line. Do not put the power line in a place where there is a tripping hazard.
- The instrument should be used in an area with low temperature, little dust, no water, no sunshine or hard light and with good air circulation. Do not use where there is corrosive gas or a strong magnetic field. Keep far away from central heating, camp stove and other hot sources. Do not put the instrument in a wet and dusty area. The vent on the instrument is designed for aeration. Do not wall up or cover the vent. The distance between each device should be more than 100cm when there is more than one instrument.
- Power off when not in use. If the instrument will not be used for a long period, unplug, and cover with a piece of cloth to protect it from dust.
- In case of the following, unplug the instrument at once and contact BT Lab Systems.
  - The instrument comes into contact with liquid
  - The instrument gets soaked or burned
  - The instrument emits an abnormal sound or smell
  - The instrument is dropped or the outer shell damaged
  - The instrument functions abnormally.

## MAINTENANCE

The well in the block should be cleaned by a cloth dampened with alcohol to assure good heat translation between the block and the test tube and no residue. If there are smudges on the instrument, clean it with a dry cloth.

Power off when cleaning the instrument. Do not drop the cleaning fluid in the well when cleaning. Do not use corrosive cleaning fluid.

## INTRODUCTION

The nitrogen sample concentrator is mainly used for concentrating or preparing samples in batches such as drug screening, hormone analysis, liquid phase and mass spectrometry in the analysis of sample preparation. It works by blowing nitrogen in the surface of the sample which is being heated to accelerate evaporating and separating the solvent in the samples without oxygen. Instead of the rotary evaporation instrument, nitrogen sample concentrator can efficiently concentrate dozens of samples simultaneously.

## KEY FEATURES

- The instrument works with heating by dry bath in the bottom and blowing nitrogen on the surface which accelerates liquid evaporation and sample concentration.
- The position of the gas needle in the air chamber plate can be adjusted to suit different types of tubes.
- The height of the air chamber plate can be adjusted. The length of a standard gas needle is 150mm.
- Gas needle is controlled independently. Separate blowing of each needle and flow regulating of each needle are available to avoid gas waste.
- The instrument can be put into ventilation cabinet when the concentration sample is toxic solvents.
- Built in overheat protection, automatic fault detection and fault beep alarm devices.
- LED displays immediate temperature and diminishing time. The operation is simple and convenient.

## NORMAL OPERATING CONDITIONS

Ambient temperature: 4°C ~ 45°C

Relative humidity: ≤ 70%

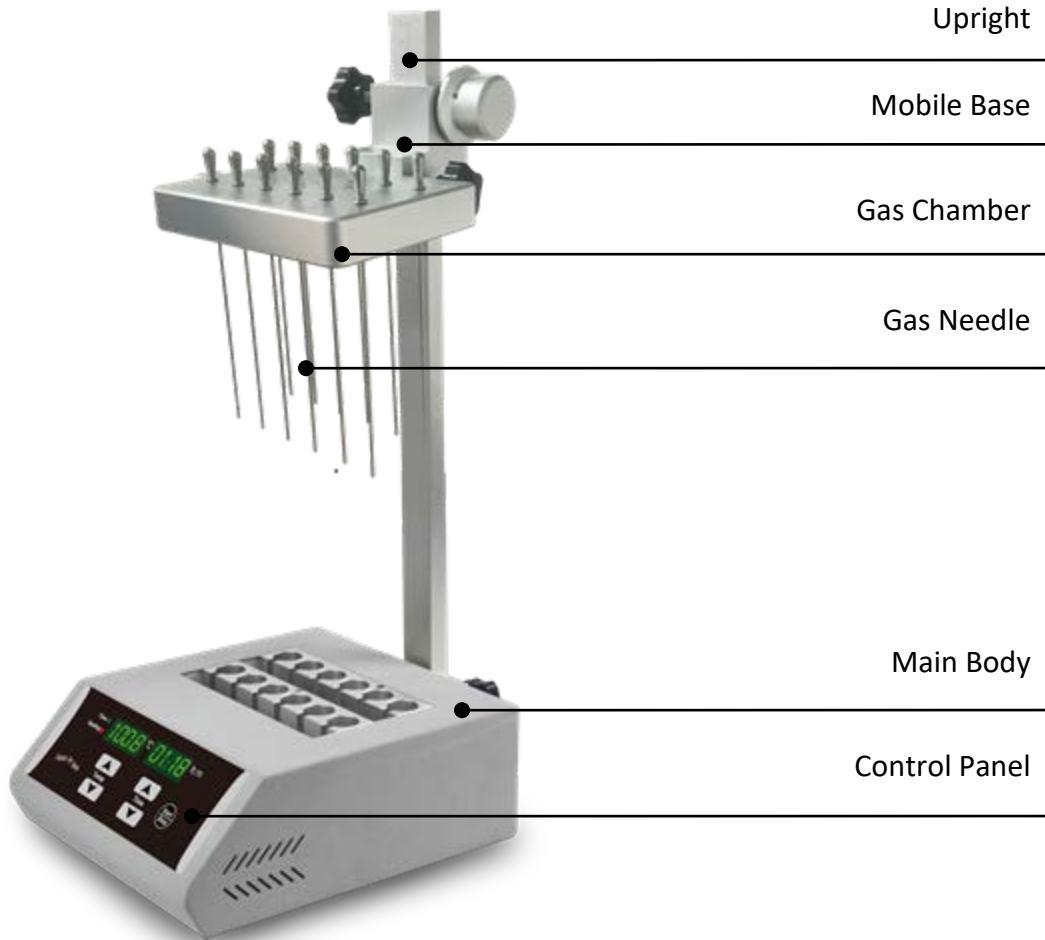
Power supply: AC110V/ AC220V ~ 50-60Hz

## TECHNICAL SPECIFICATIONS

Model	BT1610
Temperature Range	R.T. +5°C ~ 150°C
Temperature Setting Range	5°C ~ 150°C
Temperature Accuracy (40~100°C)	±0.5°C
Temperature Accuracy (100~150°C)	±1°C
Temperature Uniformity (100°C)	±0.5°C
Block Quantity	1 block
Time Range	1min~99h59min
Needle Plate Max. Lift Stroke	285mm
Gas-in Joint Outer Diameter	Φ7mm
Nitrogen Pressure	≤0.1MPa
Nitrogen Flow Rate	0~10L/min
Needle Length	150mm
Power	400W
Dimensions (mm)	260 x 220 x 525
Weight (kg)	5.8kg

## OVERVIEW

This section describes the instrument's mechanical structure, the keyboard, and functions of each key, as well as preparation before turning the power on. Please learn this section well before operating the instrument for the first time.



## INSTRUMENT INSTALLATION

### Assembly

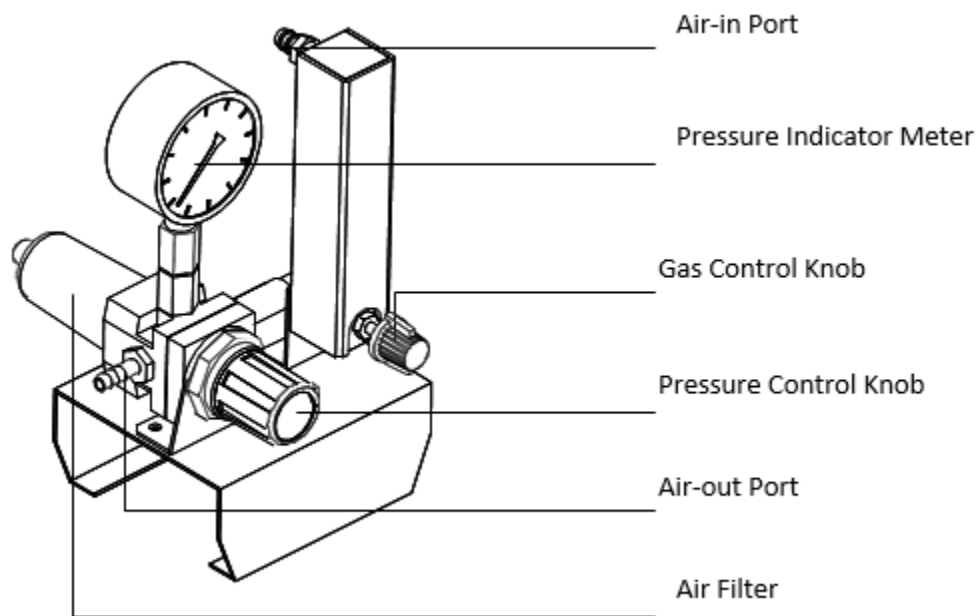


### Installation Steps

1. Put the instrument on a solid and stable bench.
2. Fully insert the upright bar into the hole of the mount behind the instrument. Screw the pillar fixed knob into the mount and tighten to secure the upright bar.
3. Screw the fixed knob into the threaded hole on the left side of the mobile base. While holding the knob of the mobile base, rotate the adjustment knob until the desired position is reached, then tighten the fixed knob to secure the mobile base in place.  
  
Note: When positioning the mobile base, two hands must be used in conjunction with the fixed knob and adjustment knob.
4. Screw the gas chamber fixed knob into the threaded hole on the right side of the mobile base. Insert the gas chamber plate into the corresponding hole in the front of the mobile base. Once the plate has been fully inserted, tighten the knob to secure it in place.

## GAS CONTROL VALVE

The product catalog number for this item is **BT1608**. It is an accessory that is sold separately.



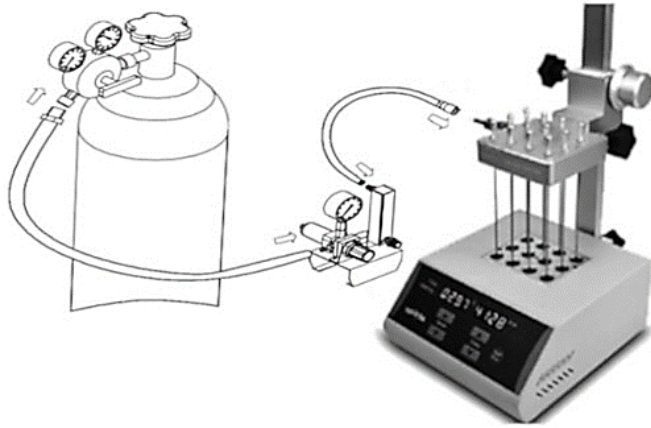
### ***Pressure Control***

- Pull out the Pressure Control Knob to adjust the pressure
  - To increase the pressure, turn it clockwise
  - To decrease the pressure, turn it counterclockwise
- Press in the Pressure Control Knob to lock the current pressure (pressure is fixed and cannot be adjusted)

### ***Gas Flow Adjustment***

- Turn the Gas Control Knob clockwise to increase the flow rate
- Turn the Gas Control Knob counterclockwise to decrease the flow rate until it is shut off

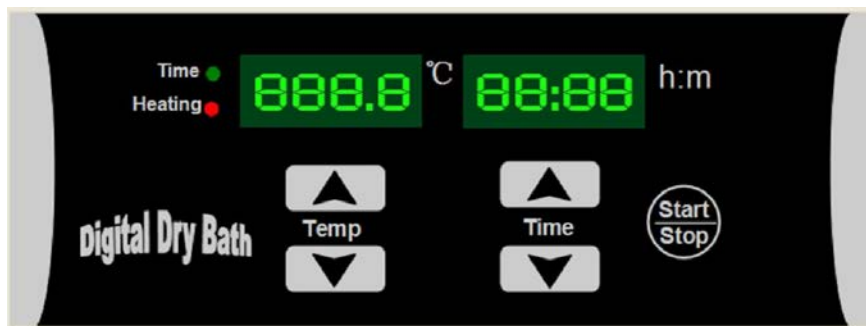
### Gas Control Valve Installation



Refer to the above figure.

1. Connect the Air-out Port of the Gas Control Valve and Air Connection of the sample concentration with a tube (length is around 1.5m).
2. Connect the air-out port of the nitrogen gas cylinder and Air-in Port of the Gas Control Valve with a tube (length is around 3m).
3. Slowly turn on the nitrogen gas cylinder and make the air pressure between 0.1MPa and 0.2Mpa.
4. Use the Pressure Control Knob of the Gas Control Valve to slowly adjust the pressure to around 0.02MPa (value indicated by the Pressure Indicator Meter).  
The actual pressure is better controlled between 0.02MPa and 0.05MPa depending on the required needle quantity.

### OPERATION PANEL



#### Key Function

“DOWN” arrow      Decreases the value

“UP” arrow      Increases the value

Start/Stop      Run/stop button: start operation by pressing the button after setting the temperature and the time value. Hold this button down for 2 seconds to stop operation.



## OPERATIONAL GUIDE

### ***Temperature and Time Setting***

1. When powered on, the LED will display “8” as the instrument enters the initial state.
2. After approximately 2 seconds, the values will change. The temperature will display the current block temperature and the time will show time setting from the last operation.
3. Press the “UP” or “DOWN” key on the temperature, then the temperature value will update to the setting value of the last operation. The last digit will begin to flicker. Use the “UP” or “DOWN” button to set desired temperature value. Holding down the key will increase the value changing speed. When the value reaches the target, release the key and the instrument will automatically save the value.
4. Repeat step 3 using the “UP” or “DOWN” key on the time to set the desired time setting value.  
NOTE: The time setting “00:00” means no operation timing is set. The instrument runs continuously at the temperature setting.

### ***Start/Stop***

5. After setting the temperature and time, press the “Start/Stop” key to start the instrument operation. The temperature will display the current temperature as it continues to rise. The decimal point (.) will continue to flicker until the target temperature is reached.
6. After the temperature stops rising, the decimal point (.) will stop flickering, then the colon (:) in the time will start to flicker. This is when the countdown will begin. Press the “Start/Stop” key for 2 seconds during the operation to pause, then press “Start/Stop” again to continue.
7. When the time is up, the operation stops with a buzzer alarm. The LCD will display the current block temperature and the time display “OVER”. This indicates the operation is complete. The instrument will go into standby mode.
  - a. Press the “Start/Stop” key to restart the operation with the current saved settings.
  - b. Press the “UP” or “DOWN” key to adjust the values for the temperature and time, then press the “Start/Stop” key to begin a new operation.

## TEMPERATURE CALIBRATION

The temperature of the unit has been adjusted before it is sold. If there is a deviation between the actual temperature and the displayed temperature, do the following to calibrate the instrument.

### NOTICE:

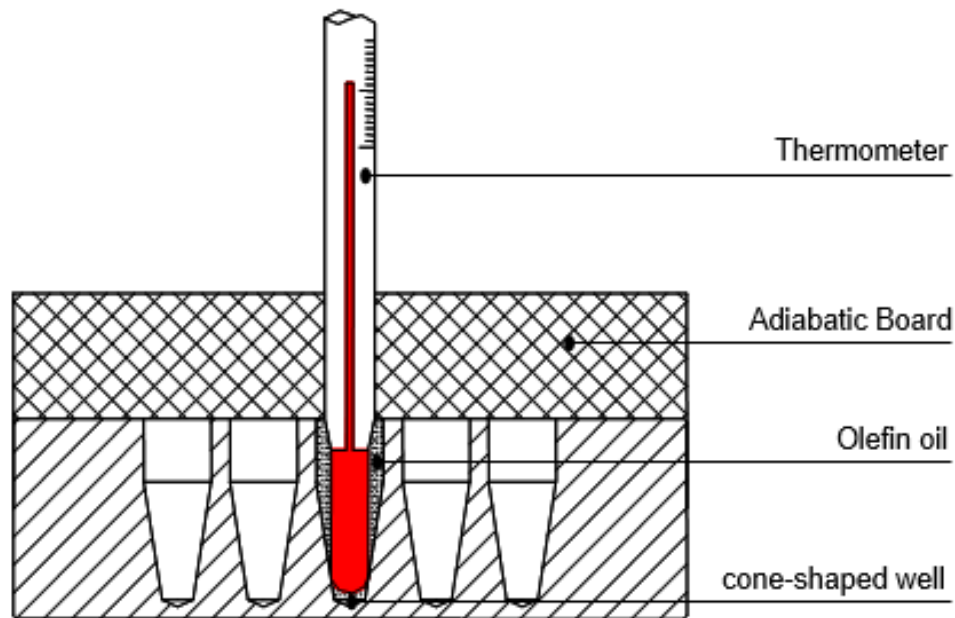
The instrument uses two temperature adjustments to ensure its accuracy. It is linearly adjusted on 40°C and 100°C. The temperature accuracy will be within  $\pm 0.5^\circ\text{C}$  after the temperature calibration.

Both the environmental and block temperature should be lower than 35°C when calibrated.

### Adjustment Methods

1. Power on the instrument and it will enter standby mode. Make sure the current temperature in the display is below 35°C. If the temperature is higher than 35°C, then please wait until it is below 35°C.
2. Inject olefin oil into one of the block wells. Place a thermometer into this well (the precision of the thermometer should be 0.1°C and the temperature ball should be immersed in the olefin oil in the block well).

Adiabatic material is needed on the block to separate it from the oil.



**NOTICE:** To ensure the calibration precision, read the actual temperature and allow 20 minutes for the temperature to reach calibration point

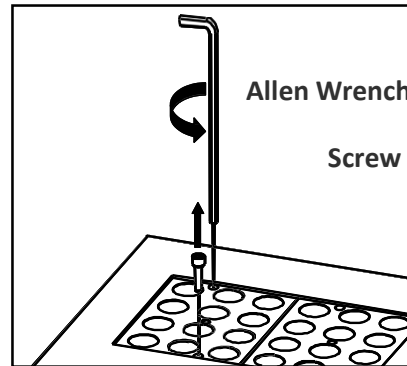
3. Press the “UP” and “DOWN” keys simultaneously to enter the temperature calibration interface. The LED will display “ADJT” in the time setting and the temperature will display the current temperature. The program will auto control the temperature to 40°C.
4. When the temperature reaches 40°C, the decimal digit will begin to flicker. Wait for at least 20 minutes at constant temperature, then use the “UP” or “DOWN” keys of the temperature to amend the value to match the actual temperature of the thermometer.

5. Press the “Start/Stop” button to confirm. The program will save the value, then the temperature will rise to 100°C automatically.
6. When the temperature reaches 100°C, the decimal digit will begin to flicker. Wait for at least 20 minutes at constant temperature, then use the “UP” or “DOWN” keys of the temperature to amend the value to match the actual temperature of the thermometer. Press the “Start/Stop” button to confirm.
7. After the temperature has been adjusted, press the “UP” and “DOWN” keys simultaneously to exit the temperature calibration. The unit will return to standby mode and the temperature will display the practical temperature of the block.

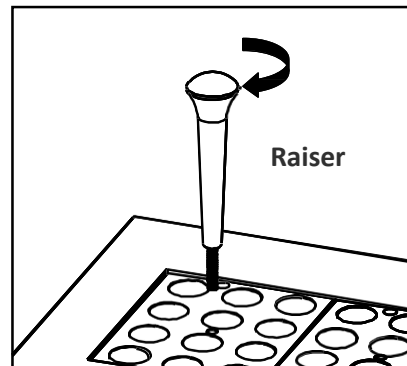
NOTICE: Pressing the “UP” and “DOWN” keys simultaneously during the calibration to exit the adjustment process will cause the calibration to become invalid.

### EXCHANGING BLOCKS

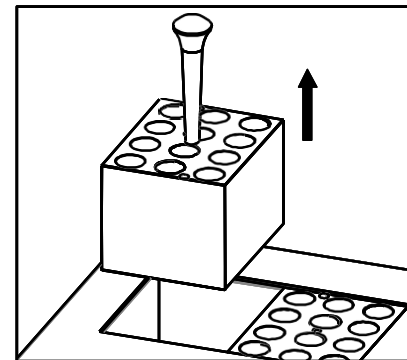
1. Use the allen wrench to unscrew the two screws attaching the block to the heating board.



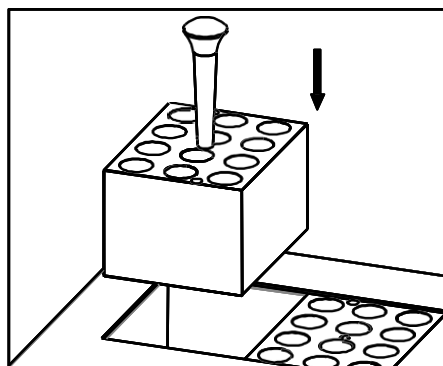
2. Secure the raiser in the center well of the block.



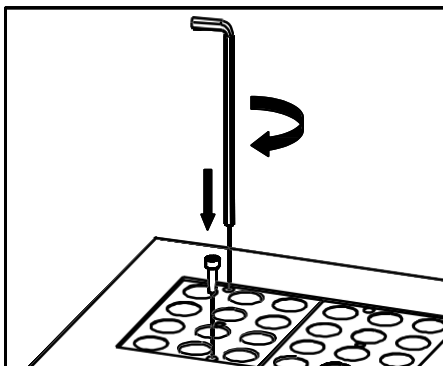
3. Lift the block up and out of the unit using the raiser tool



- Remove the raiser from the current block, then secure it into the new block. Carefully place the block into the instrument.



- Use the allen wrench to fasten two screws into the block attaching it to the heating board, then remove the raiser.



## TROUBLESHOOTING

Issue	Possible Causes	Solution
No signal display when power-is turned on.	No power	Check the power connection.
	Broken Fuse	Exchange fuse (250V 4A $\Phi$ 5x20)
	Broken Switch	Exchange the switch
	Other	Contact BT Lab Systems
The actual and displayed temperatures are different.	Broken sensor or loose contact to the block	Contact BT Lab Systems
“ERR” in the display with an alarm sound.	Broken sensor or room temperature is below zero	Contact BT Lab Systems
Block not heating	Broken sensor	Contact BT Lab Systems
	Solid state relay damage	
	Broken heater	
Key does not work	Key is broken	Contact BT Lab Systems

## **WARRANTY**

Our company guarantees that this unit is warranted against defective material and workmanship for a period of one year from the date of shipment. We will repair or replace the defective equipment returned during the warranty period free if the equipment has been used under normal laboratory conditions and in accordance with the instruction in this manual. The following defects are specifically excluded:

1. Damage caused by accident, misuse, or abuse
2. Damage caused by disaster
3. Repair or modification by anyone else without our authorization
4. Corrosion due to the use of improper solvent or sample
5. Defects caused by improper operation
6. Use of fittings or other spare parts supplied by different manufacturers

This warranty does not apply to platinum wire and all the accessories.

A return authorization must be obtained from us before returning any product for repair on a freight prepaid basis.

For any inquiry or request for repair service, please contact BT Lab Systems via the email below.

E-Mail: [info@BTLabSystems.com](mailto:info@BTLabSystems.com)

## **TECHNICAL SUPPORT**

BT Lab Systems offers technical support for all its products. If you have any questions about the product's use or operation, please contact BT Lab Systems at the following info.

E-Mail: [info@BTLabSystems.com](mailto:info@BTLabSystems.com)