



EIE INSTRUMENTS PVT. LTD.


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 EIE INSTRUMENTS PVT LTD	Operation & Maintenance Instruction Manual	
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Organization's ISO 9001:2015 Certificate

QUALITY MANAGEMENT SYSTEM

Certificate of Registration



This is to Certify That The Quality Management System of

EIE INSTRUMENTS PVT. LTD.

A/1301, BVR EK, OPP HOTEL INDER RESIDENCY, NEAR GUJARAT COLLEGE, ELLISBRIDGE, AHMEDABAD-380006
GUJARAT, INDIA.

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :


MANUFACTURER & SUPPLIER OF LABORATORY TESTING INSTRUMENTS.

Certificate No	22DQJT93	
Initial Registration Date	: 27/06/2022	Issuance Date : 27/06/2022
Date of Expiry*	: 26/06/2025	
1st Surve. Due	: 27/05/2023	2nd Surve. Due : 27/05/2024


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The Registration is not a Product Quality Certificate. *Subject to successful completion of surveillance audits. Visit for verification on www.rohs-certification.co.in
Certificate is the property of ROHS and return when demanded



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Forward

Dear valued customer,

We are thankful of you for your keen interest in our company products. We hope you enjoy using them and find them to be helpful and reliable. We greatly appreciate your business and the opportunity you have provided us to assist you. You have joined a selected group of customers who have switched to the technologically superior and quality enhanced laboratory testing products.

Time has changed, so does the technology. Your purchase lists you on the cutting edge of the 21st century technology. To help you get the most out of your EIE Instruments Pvt. Ltd. products, we have created this instruction manual that is an excellent way of expressing and maintaining your trust in EIE's - superior quality testing products. Our continued efforts and commitment are to provide you with the best and efficient services after sales, prompt attention and the highest level of customer satisfaction. If for any reasons, you have questions or comments, we are delighted to hear from you. We welcome your feedback for further improvement in our product(s). We would be happy to help you in any way we can. You can contact us on +91-9909903582 or send us an email at service@eieinstruments.com/kunal@eieinstruments.com. You can expect us to respond to your call or email within 24-48 working hours.

Once again, we would like to thank you for your trust and kind patronage. We look forward to serve you better in the future.

Yours sincerely,

EIE Instruments Private Limited


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1. Introduction to EIE – Constant Temperature Bath

EIE – Constant Temperature Bath is a laboratory equipment made from a container filled with heated Distilled water. It is generally used to keep any sample at a constant temperature over a long period of time according to user's demand. Constant temperature bath is also known as water bath, it is widely used in Research Laboratories, Medical, Educational institution, Bio-Chemical industries and various other industries where testing samples are being performed. This has double walled construction, and its inner chamber is made up of stainless steel and outer chamber is made up of mild steel, and is covered with powder coated paint for attractive look.


All temperature baths are provided with digital interface to allow users to set a desired temperature easily to utilize it for warming of reagents, melting of substrates or maintaining of cell cultures. It is also used to enable certain chemical reaction that requires high temperature.

Constant temperature bath is a preferred heat source for heating flammable chemicals instead of an open flame to prevent ignition. Various different sizes of constant temperature bath are being manufactured and used depending on applications. Almost all temperature bath can be used up to 99.9°C. When temperature is above 100°C, alternative methods are used.

2. Working Principle of EIE – Constant Temperature Bath

EIE – Constant Temperature Bath is a device that maintains water at a constant temperature according to the requirements. It keeps heating of small amount of fluid over a long period of time without changing the concentration of constituents by evaporation. It is also used when several tubes are to be handled at a same temperature of the contents. for e.g. Coagulation tests

This unit is commonly made up of double wall layer fitted with insulation, internal container is of stainless steel or of heat resistant glass with or without an insulation lid. An electric water heater is used to heat the fluid contained in the trough and a stirrer is used to circulate the water in the container in order to maintain a uniform temperature throughout the container. The permanent heater gets turn on and turn off when reaches nearby of preset temperature entered by user and when absolute temperature is gained heater turns off, periodically it gets on and off repeatedly to maintain the exact temperature.

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3. Component Diagram of EIE – Constant Temperature Bath

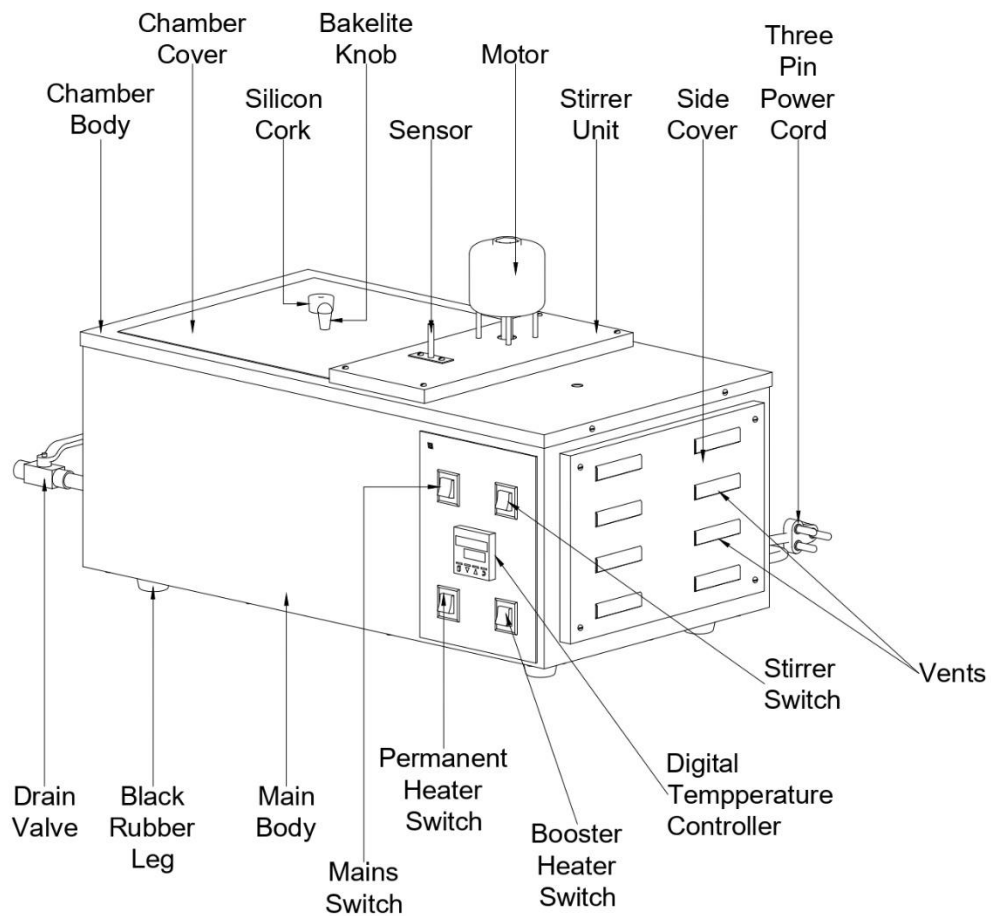



Figure 1 Component Diagram of Constant temperature Bath


4. Brief construction details of Constant Temperature bath

EIE- Constant Temperature bath is manufactured according to latest technology for guaranteed and long lasting performance.

- 1) EIE- Constant temperature bath is supplied with doubled wall layer, separate inner container and external body fitted with thick insulation so that they don't have direct contact with each other.
- 2) Internal water container is made up of high quality stainless steel so as to keep the container corrosion free for long lasting, highly finished in order to eliminate sharp edges.
- 3) External cases are constructed of mild steel and undergone with strong seamless welding, covered with thick layer of finished & attractive powder coating paint. This provides robust and heat resistant surface having long lasting attractive finish.
- 4) The gap between the double walled layer is filled with thick mineral glass wool to prevent direct heat losses and leakages and to ensure maximum thermal efficiency.

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- 5) A high speed stirrer with a motor of 1/70 HP is fitted to the unit for continuous stirring and to maintain a uniform temperature throughout the chamber.
- 6) The heating mechanism consists of electric water heater of 1000 watt pertaining to fast heating and operates by 220 V AC single phase only.
- 7) This equipment is mainly designed for immersion equipment and external circulation to maintain constant temperature throughout the fluid.
- 8) On the top of the unit chamber cover is provided which is removable for filling of distilled water, also for placing test samples. It is manufactured of stainless steel.
- 9) Remove the chamber cover for cross checking of water temperature with thermometer or any other measuring instruments with the digital temperature being displayed.
- 10) When the fluid temperature is almost nearby to preset temperature, permanent heater gets turn off and on accordingly to gain preset temperature. If after a period of time fluid temperature is decreasing it gets turn on of its own to maintain the temperature this functions with the help of “sensor” placed beside the stirrer motor.
- 11) Precise temperature control is obtained by microprocessor based on PID temperature controller (latest advance model) for ease of operation.
- 12) One fuse of one ampere is fitted at back side of unit to avoid short circuit or over voltage issues.
- 13) The specially designed footrest keeps the unit in correct equilibrium.
- 14) The unit is fixed with caution and safety stickers as per international safety norms for human safety.

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5. Circuit Diagram of Constant Temperature Water Bath

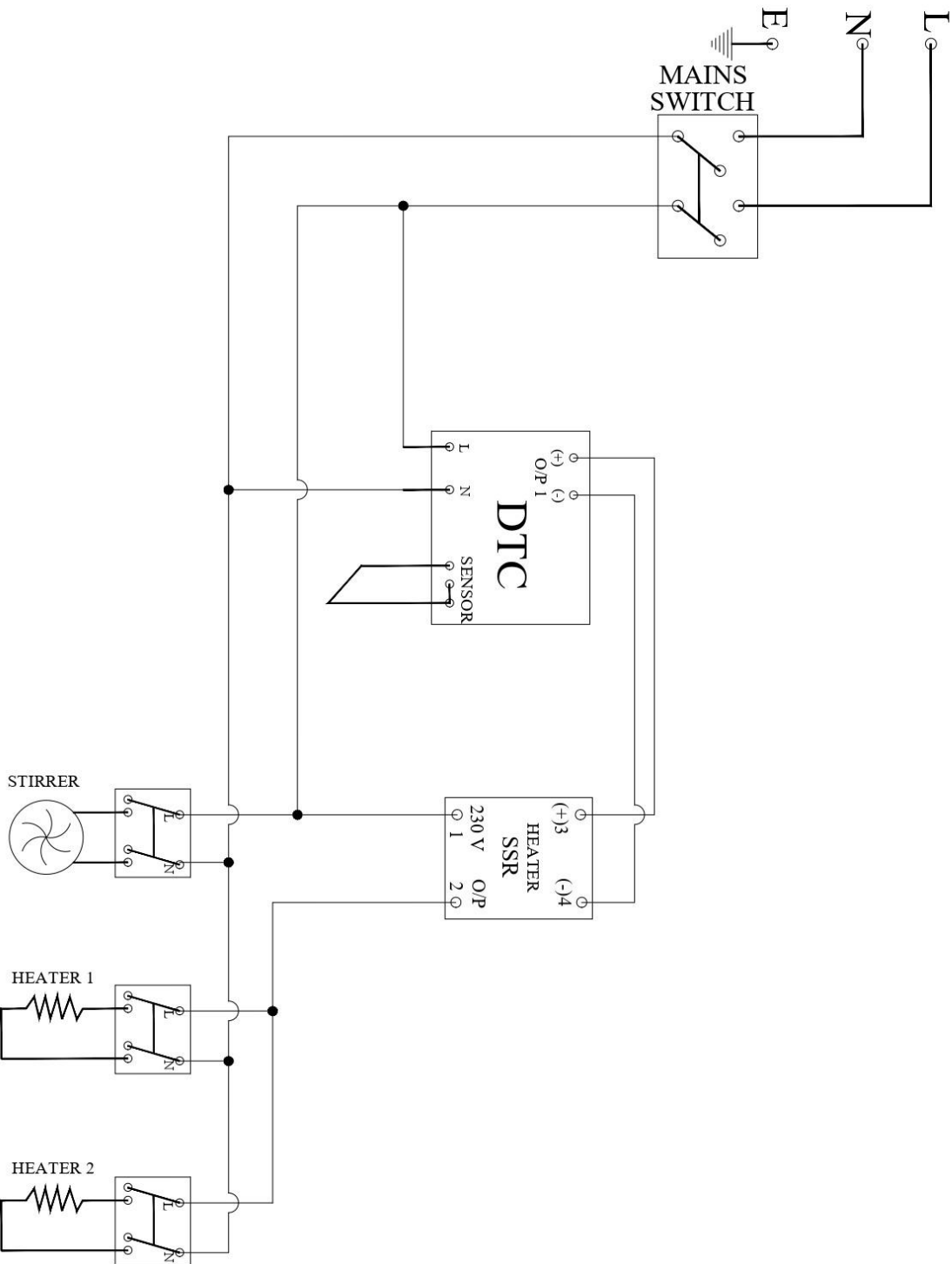


Figure 2 Circuit Diagram of Constant Temperature Bath

6. Introduction about Control panel & accessories


Control panel of Constant temperature bath is generally placed at right hand side in front side of the unit. It consists of various functioning components as shown in figure 3.



Figure 3 Control Panel & Digital controller

➤ Main switch cum indicator

This is advanced model main switch which serves both the purpose of switching and indicating. An operator can switch on/ switch off of entire unit from mains switch mounted on front panel. Also, the switch incorporates a lamp inside, which indicates that the main supply is on and the unit is completely in the operating mode.

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➤ **Stirrer switch cum indicator**

This is also based on same technology it serves the motor fitted for the circular motion to maintain uniform temperature of water inside the container, it can be manually turned On/off according to demand of users. It is turned off if the required temperature is obtained, after few minutes if the temperature is getting low user can turn it on. And the indicator indicates that the stirrer motor is functioning.

➤ **Digital temperature controller**

EIE- Constant temperature bath incorporates the PID temperature controller to monitor and maintain the set-point temperature value inside chamber. A proportional–integral–derivative controller (PID controller) is a generic control loop feedback mechanism (controller) which calculates an "error" value as the difference between a measured temperature value and a desired set-point value. The controller attempts to minimize this error by adjusting the process control inputs. User can set the precise temperature increase or decrease according to his requirements using the adjusting keys present below it.

➤ **Permanent heater**

This switch operates the water heater which is placed in the water container to heat the water and to maintain the temperature accordingly. Lamp present inside the switch indicates that the heater is in operation mode.

➤ **Booster heater**

This is an additional heater provided in bigger size constant temperature bath on demand of customer for fast heating of water.

CAUTION: The heater must be completely immersed in water and also use distilled water for long lasting of heater.


➤ **Fuse**

A glass-fuse of 1 amp is installed in series connection with digital temperature controller as to protect the temperature controller in case of voltage fluctuation and short-circuit scenario.

7. Technical specifications of Constant temperature bath

Table 1: Electrical specifications

Name of elements	Properties
Power source	220 volt, 50 Hz, single phase AC (Bigger size models are also available for more detail visit to our site)
Power consumption	According to the size selected
Temperature range	From ambient 5°C to 100°C

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Temperature accuracy	± 0.5°C
Temperature resolution	0.1°C
Temperature control	Through digital microprocessor based PID temperature controller
Temperature display	Digital
Heating element	Water Rod heater
Heater watt	1000 Watt
Temperature sensor	RTD
Safety devices	SSR (solid state relay), fuse of 1 ampere

Table 2: Mechanical Specifications

Name of element	Properties
Container	Stainless steel-304 quality/Stainless steel-316 quality (on customer demand)
Exterior cover	Mild steel powder coated/complete stainless steel
Weight	According to selected size
Knob	Bakelite, silicon cork
Stirrer motor	1300 rpm, 1/20 HP power, 230 volt
Valve	Metallic
Leg	Black rubber legs for friction and maintain balance
Insulation	Mineral glass wool
No. of legs	4

8. Installation Procedure

- 1) Remove the packing strip of the unit and transit it to suitable safe place where it has been intended to install.
- 2) Install the unit on plain, even and sturdy surface. Place it near regular water supply for easier case and also for easy draining purpose. **CAUTION:** Always place it in even and uniform surface so that water could not fall over the container.
- 3) Never place the equipment upside down.
- 4) Do not place the equipment in a draft, sunlight or near the equipment which emits heats as well as electromagnetic conduction emission.
- 5) Check carefully whether all accessories are included or not as mentioned in the slip.


- 6) Check all electrical specification label located on back side of the equipment. Make sure the power specification must confirm your local standard.
- 7) Plug the main power cord into a properly grounded outlet.
- 8) Inspect carefully that internal circuits components are not short-circuited due to the transit and unloading before operating the equipment.
- 9) Reuse or recycle the packing materials.

9. Operating Instructions

- 1) Clean the container properly with clean, dry and smooth cloth before starting your operation.
- 2) Remove the chamber cover and Fill the container with distilled water.
- 3) Heater must be immersed in the water completely otherwise it may burn. Water level must be always "1" inch above the water heater. This leads your unit for long lasting.
- 4) Place the working samples inside the container and put the chamber cover back on it.
- 5) Plug in the main supply cord to the power source carefully.
- 6) Switch on the main switch cum indicator and visualize that the inside lamp of main switch is glowing.
- 7) As the main switch glow, the digital microprocessor based PID controller will indicate the temperature of water in container, now set the required temperature in digital temperature controller using the adjuster keys, now switch on the permanent heater.
- 8) Turn on stirrer switch which will circulate the water for uniformity.
- 9) As the internal water temperature reaches near the required temperature the permanent heater starts getting on and off repeatedly of its own with the help of sensor, so that it may not cross the preset temperature range.

10. Directions of Cleaning

- 1) Disconnect the main cord from the power supply prior to clean.
- 2) Drain out the water from the container properly, wipe internal chamber with soft dry cloth and for external cover use moist cloth.
- 3) While cleaning take care that the heater must not be disturbed.
- 4) Wear hand gloves while cleaning of equipment.
- 5) Never use benzene or paint thinner or any other chemicals for cleaning.
- 6) Lift the unit from right side toward the drainage pipe for complete drain out of water, after that close the valve.


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11. Things to Remember While Operating the Unit

- 1) Switch on main supply, main indicator must glow now, which indicates that the instrument is in operational mode. If it does not glow, then there is something wrong with the power supply or mains cord. Please ensure about both the condition before moving further.
- 2) Never switch on the unit with empty container. Fill the trough with water (recommended distilled water) to a desired level but you must take care that the heater is completely immersed in water and then switch it on.
- 3) Now set the temperature according to your requirement using the keys provided in digital temperature controller and allow the water to that temperature.
- 4) Switch on the stirrer circulation motor for uniform temperature of water throughout the container.
- 5) Check the temperature of water with the help of thermometer in order to verify that the unit is operating properly.
- 6) Keep the lid closed when not in use to prevent evaporation of water.
- 7) Periodically check and counter-check the water temperature with internal as well as with an external thermometer.
- 8) The thermometer should not be placed in such a way that it must be away from heating element and the walls, to prevent from false reading of thermometer.
- 9) The "PV" digits at the top display in microprocessor PID controller indicate the ambient temperature value, while the "SV" digits at the bottom indicates the set-point temperature value.
- 10) Leave the instrument working only in balanced and secured conditions.
- 11) Please remember to touch and operate microprocessor buttons with gentle touch. Do not operate PID micro-controller rigidly, it will lead to long lasting of the unit.


12. Precautions to be followed

- Use with caution and according to safety labels.
- It is not recommended to use constant temperature bath with moisture sensitive or pyrophoric reactions. Do not heat bath fluid above its flash point.
- Water level should be regularly monitored, and filled with distilled water only. This is required to prevent salts from depositing on the heater.
- The chamber cover is closed to prevent evaporation and to help reaching high temperatures.
- Disinfectants can be added to prevent growth of organisms.
- Raise the temperature to 90°C or higher once a week for half an hour for the purpose of decontamination.

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13. Maintenance and services

- 1) Always disconnect from main power supply prior to maintenance & servicing.
- 2) To avoid electric shocks, this equipment must always use a properly grounded electrical outlet or correct voltage handling.
- 3) Disassembly of this equipment is strictly limited to the qualified personnel and licensed engineers.
- 4) Maintain a safe distance of at least 5" to 6" from the wall while installing the unit.
- 5) Please do not overload the working chamber with excessive test samples.
- 6) Always cover the lid to prevent evaporation of water, which lead to decrease in water level in container.
- 7) Stirrer motor must be switched on for uniform internal water temperature throughout.
- 8) Bakelite knob is fitted on chamber cover for ease of lifting and to prevent you from hot burn.
- 9) Unit is fitted with four rubber legs for high friction and to maintain the entire unit in equilibrium.
- 10) Clean the sensor periodically for accurate temperature reading.
- 11) Never place the test samples near the sensor element as it will affect or damage its accuracy.
- 12) Test samples must be completely dipped in water for accurate result.
- 13) Test samples should be placed away from the circulation motor otherwise it will destroy your sample elements.
- 14) Always clean the circulating rod of stirrer motor, do not let threads or any other materials which may stick on it and lead to decreasing its rotational speed.
- 15) Keep the instrument tidy, clean and dry with mint cream. Before initiating the fresh day, use preferably clean soft cloth. Brush up the unit body to maintain its paint and finishing.
- 16) Never leave the instrument connected to main supply after completion of your applications.
- 17) In case of any difficulty, please don't try to repairs it of your own without consulting us, especially when the instrument is under guarantee period.

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14. Troubleshooting

Causes	Reason	Solution
Water heater is not working (Water is not getting heated in the container)	<ul style="list-style-type: none"> a) Terminals end of water heater may have lost the circuit connection. b) An operator may have not switched on permanent heater switch. c) Permanent heater switch may not be working. d) Sensor may not be functioning properly. 	<ul style="list-style-type: none"> a) Open right side chamber of the unit, find out the end terminals and fix it properly b) Turn on the permanent heater switch. c) Replace the switch completely. d) Check the Sensor it may be out of date replace it.
Stirrer circulation motor is not functioning	<ul style="list-style-type: none"> a) Stirrer switch may be turned off. b) Motor terminals end may have lost the circuit connection. c) Stirrer switch may not be working d) Motor may be jammed or burned. 	<ul style="list-style-type: none"> a) Check the switch and turn it on. b) Check motor connection and its terminal end inside the chamber and fix it. c) Replace the switch. d) It has to be serviced or you may have to replace the motor.
Water in container is not getting drained out	<ul style="list-style-type: none"> a) Drainage tap is not working b) Drain pipe may be jammed. 	<ul style="list-style-type: none"> a) Replace the tap b) Clean the drain pipe properly.
Unit is completely dead, not a single part is working	<ul style="list-style-type: none"> A) 1 ampere fuse may be shorted B) Required operating power may not be supplied C) Main cord wire may be damaged D) Main switch cum indicator or control panel is not working. 	<ul style="list-style-type: none"> A) Replace the fuse B) Supply at least 220v of power to the unit C) Replace the main cord wire completely D) Replace the main switch cum indicator.


Warranty Certificate

Your EIE product is guaranteed to be free from defects in materials and workmanship for one (1) year under normal use from the date of purchase. This warranty does not apply to any product damaged by accident, misuse, mishandling, abuse, negligence, transit, improper line voltage, drop, fire, flood or if the products were altered or repaired by anyone other than the qualified service personnel. The liability of EIE Instruments is limited to repair or replacement and under no circumstances shall EIE be liable for any collateral consequential damages or loss. This guarantee specifically excludes the expendables and consumables. All warranty claims must be directed to your corresponding purchase organization that is responsible for the sale of this equipment. The users are responsible for shipping expense. The warranty cards which are not signed and stamped by the actual user will be treated as void. The warranty card should accompany the defective products sent for repair, without which no claims would be entertained. Please detach the below warranty card from following cut-line.

.....

Attributes	Details
Name of the company	
Address	
Telephone number	
Mobile number	
Email address	
Date of purchase	
Product model	
Serial Number	
Bill or cash memo number	

This card should be detached, filled in properly and posted within 15 days from the date of purchase otherwise the warranty becomes invalid.

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