



EIE INSTRUMENTS PVT. LTD.

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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.

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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	23DQLL85	Issuance Date	: 14/10/2023
Initial Registration Date	: 14/10/2023	Date of Expiry*	: 13/10/2026
1st Surve. Due	: 14/09/2024	2nd Surve. Due	: 14/09/2025


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 EIE INSTRUMENTS PVT. LTD.	Operation & Maintenance Instruction Manual	
	Equipment Name: Grease Roll Stability Test Apparatus	Equipment Serial Number:
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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 – Grease Roll Stability Test Apparatus

The mechanical stability of grease, or its resistance to shear, actually represents its capacity to resist as regards the modification of consistency, when it is subjected to mechanical stress. This stress is usually outlined by shear rate.

The roll stability test is widely used in specifications. Test results are significant insofar as they can show a directional change in consistency that could occur in service. No accurate correlation is established between the test results and shear stability in actual service. By taking this concept **EIE** offers **ROLL STABILITY OF LUBRICATING GREASE TEST APPARATUS** as per **ASTM 1831**.

1.1 Application

Common applications for these include:

- Laboratory test,
- Research studies,
- Industrial testing and more!

1.2 Salient Features

- Unique design & Aesthetic outer appearance.
- Designed for long duration test at required temperature.
- Uniform heating arrangement with good thermal insulator chamber.
- Bench top model integrated with electronic controller.
- Grease Roll Stability specially designed for long runs at elevated temperature.
- Excellent heat uniformity is maintained due to fan assisted air circulation.
- Factory adjusted overheat cut off system is provided for safety purpose.
- Stainless steel cylinder containing the test grease.
- Fitted with stainless steel roller which rotates within the cylinder, base with roller supports allowing smooth rotation.
- Adjustable rotational speed regulator with separate digital RPM indicator display.
- Unit is fitted with 2 rollers, 2 cylinders and tools for closing and opening cylinders.
- Insulated steel cabinet and base are finished with a durable polyurethane enamel finish.

1.3 Included Accessories

- Test Cylinders with threaded end caps and O-ring seals
- Test Rollers made of steel and weighing 5 kg

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2 Technical Specifications

Table 1: Electrical Specifications

Electrical Parts and Parameters	Technical Specifications
Power Supply	230 Volts, 50 Hz, single phase, AC supply
Temperature Controller	Microprocessor based PID – controller
Temperature Range	Ambient to 100°C
Temperature Resolution	0.1 °C
Temperature Accuracy	± 1°C or better result
D.C. Drive	20 – 200 RPM
Temperature Sensor	PT-100, Spring Type 2"
Air Heater	500 Watts, 02 Nos.
Timer	Digital
S.S.R. (Solid State Relay)	25 A

Table 2: Mechanical Specifications

Mechanical Parts and Parameters	Technical Specifications
Type of test mechanism	Grease Test
Roller	Rolling Mechanism
Cylinder	Stainless Steel as per ASTM D1831
Base Platform	Stainless Steel as per ASTM D1831
Blower	650 mm X 650 mm
Cylinder capacity	For Uniform Heating
Weight of Rollers	2 Cylinders
	5 kg ± 50 grams

3 Brief Construction Details

EIE – Roll Stability Test Apparatus is capable of rotating a steel cylinder and 5 ± 0.05 kg roller weight at a rolling speed of 165 ± 15 RPM. One such example of a suitable apparatus is shown in **Figure 1**.

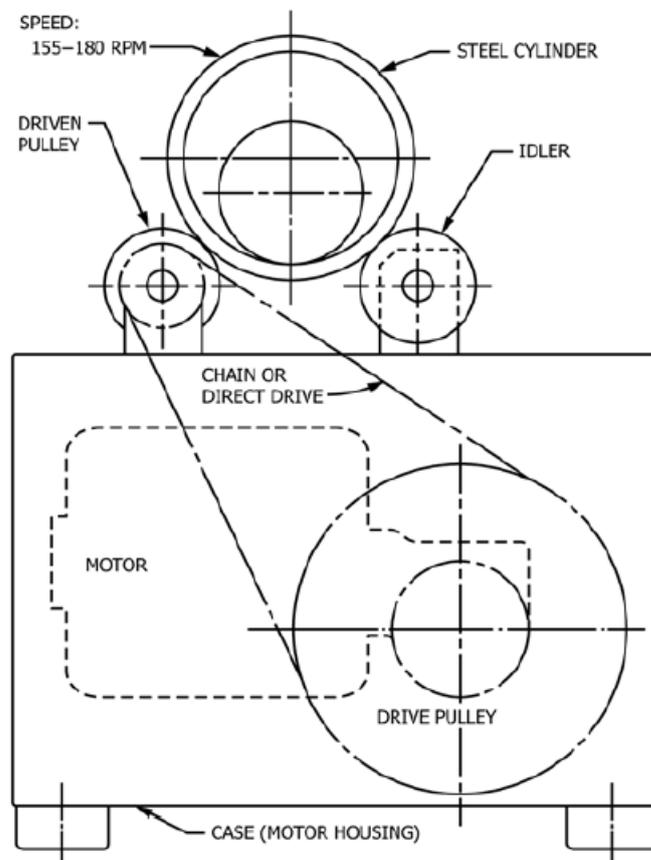


Figure 1: Component diagram

The Test Method ASTM **D 1403** cone penetration (EIE also offers Cone Penetrometers) of an approximately 50 g aliquot of lubricating grease is determined. The grease is then subjected to low shear at 20 to 35°C for 2 hours \pm 5 minutes in a standard roll stability apparatus, before the cone penetration is again measured. The difference between the cone penetration before working and the cone penetration after is used as a measure of the effect of low shear working on grease consistency.

4 Delivery and Installation of the Apparatus

1. Inspect equipment and shipping crate immediately upon receipt. If any damage is apparent, immediately discuss it with the delivery person and contact the transportation company immediately. Make notes of any damages on the bill of landing.
2. Retain all the shipping material for later inspection.

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3. Check packing slip carefully and ensure all materials have been received as indicated in packing slip.
4. Remove packing strip from surroundings of the instrument and all its accessories. Please inspect and note whether any part of the instrument is damaged or any accessory is missing according to packing slip? If it is so, then immediately make note of it and report to the manufacturer.
5. Due to the vibration incurred during shipping and handling, it is possible that mechanical connection could become loose. Inspect all connection to ensure that they are secure.
6. After visual inspection, if everything is found to be okay, transit the instrument to suitable safe place where it is intended to install. **Caution: Handle with care.**
7. Recycle the packing material. Do not throw it away for environment protection.

4.1 How to Make the Instrument Ready for the Use?

- 1) Keep the equipment in well ventilated place.
- 2) Place the equipment on a plane, even and sturdy surface leaving approximately 1 foot – 2 feet space away from the wall.
- 3) Do not use equipment in a corrosive environment. A corrosive environment may lead to poor performance and deterioration of unit.
- 4) Keep instrument away from draft, sunlight, water or near a place of equipment, which emits heat as well as electromagnetic conduction emission.
- 5) Keep standard operating manual handy while operating the apparatus.
- 6) Ensure proper earthing is provided to the instrument prior to the installation.

5 Safety Instructions

- Anyone working with, on or around this equipment should read this operating manual. Failure to read, understand and follow the instructions given in this documentation may result in the damage to the unit, injury to operating personnel, and/or poor equipment performance.
- Any internal adjustment, modification or maintenance to this equipment must be undertaken by qualified service personnel.
- The use of any hazardous materials in this equipment must be monitored by an industrial hygienist, safety officer or some other suitably qualified individual. Before the individual process, the operator must thoroughly understand the installation procedures and take note of the environmental and electrical requirements of the equipment.

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- In this operating manual, important safety related points will be marked with the symbol. If the equipment is used in a manner not specified by this operating manual, the protection provided by this equipment may be impaired.
- All **EIE** equipment are designed to be operated with the highest level of safety. This standard operating & maintenance manual issues note, caution and warning symbols throughout to draw your attention to provide you the important operational and safety information.

5.1 Safety Symbols & Significance



Read and understand all instructions and safety precautions listed in this manual before installing or operating your unit. If you have any questions regarding operation of the unit or instructions in this manual, contact our service department.



Thoroughly understand the safety features and operation of the equipment. This manual will provide operators with safety concerns and general procedures. Be familiar with correct operating principals and use good judgement. Also refer to the appropriate manuals for system component safety instruction manuals.



Obey all national and local electric code requirements.



Warning about an existing or potential hazard, or a note



Necessity to proceed in a specified way or follow safety measures



Proscription of activities or behaviours specified

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6 Introduction of Control Panel



Figure 2: Control panel

The panel shows switches and lamps for mains and other control accessories. Digital temperature indicator cum controller with precise calibration read temperature in degree centigrade corresponding to mill volts, produced by PT – 100, Digital Timer and Digital RPM Indicator is also installed. Separate switches cum indicator for fan and Heater are also incorporated on the panel.

The following are the main functioning accessories for various functions on panel:

(Mains Switch Cum Indicator)

In this advanced model, mains switch serves the purpose of switching the entire apparatus. An operator can switch on / switch off the entire unit from the mains switch (MCB) mounted on front panel. It also supplies direct power to digital controller.

Digital Controller

It incorporates the PID temperature controller to monitor and maintain the set-point temperature value inside oven 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.

Digital Timer

Grease Roll Stability incorporates the digital timer to monitor and maintain the set time period for rotation of roller as per the user requirement. After completion of pre-set time interval, rotational mechanism stops automatically and a buzzer blows, which is the indication of the completion of test.

DC - Drive

DC drive is basically a DC motor speed control system that supplies the voltage to the motor to operate at desired speed. The Drive is mounted with a toggle switch to Turn ON/OFF and a regulator to Increase/decrease the rotational speed respectively.

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Figure 3: DC drive

7 Standard Operating Procedure

- Determine the worked penetration in accordance with Test Method ASTM D1403.



Figure 4: EIE offers - Different type of Penetrometers

- Transfer 50 ± 1 g of the unworked grease to the test cylinder. Distribute the grease uniformly on the inside wall of the cylinder with a spatula. Place the weighted roll in the cylinder and tighten the cap.



Figure 5: Grease with cylinder which have to be applied inside

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- Mount the cylinder in position, turn ON the mains switch of the machine from control panel.
- Set the speed, time, require temperature and switch ON the Fan for uniformity.
- Record the time and room temperature which should be limited to 20 to 35°C within the cabinet, the temperature around the cylinder shall be maintained at 20 to 35°C.

Timer Setting:

For time setting in the controller, follow the below steps:

1. Press “SET” key, Display will blink for setting the value.
2. Set require time in Minute (up to 9999) by using “UP” arrow key for Increasing/Decreasing (i.e., 0 – 9) run time.
3. To shift the position of digits, press “DOWN” arrow key.
4. Finally, Press “ENTER” key, to save the changes.

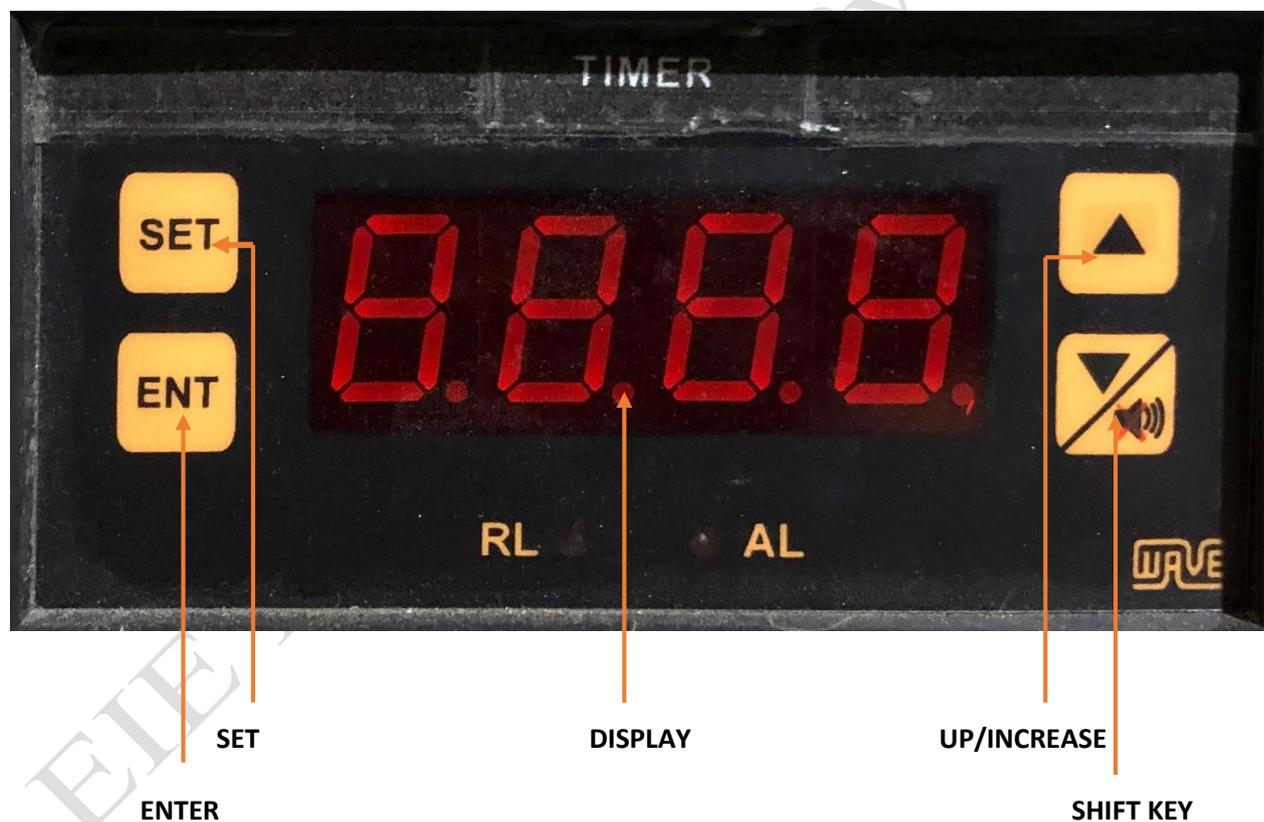
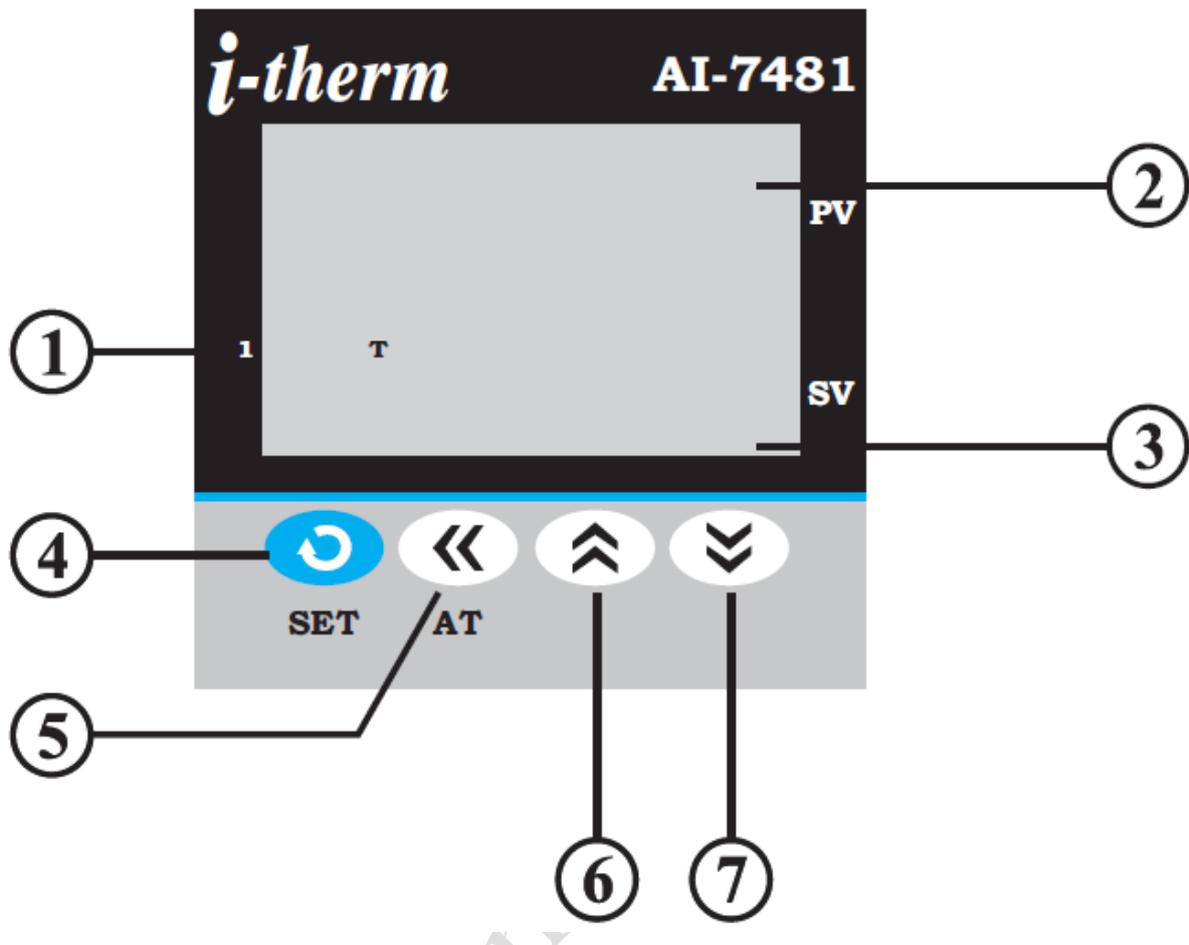


Figure 6: Timer setting

NOTE: DOWN Arrow key have multiple function, i.e., for shifting of digit's place in set mode and also to mute buzzer sound, after completion of set time period.

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Temperature Setting



Sr.	NAME	FUNCTION
1	OP1 LED	Glows when OP1 is ON & flashes when delay time (dly1) is in operation(if selected mode is ON-OFF)
2	UPPER DISPLAY	It will display (1) Measured value of selected input or Error messages in run mode. (2) Parameters Value in program mode.
3	LOWER DISPLAY	It will display (1) SP (Main set point) / SP2 (Auxiliary/Alarm) set value / Set Soak time value/ balance or elapsed soak time in run mode. (2) Parameter code in program mode.
4	SET KEY	(1) For SP programming. (2) To access Control mode. (3) To access Configuration mode along with UP key. (4) To scroll the parameter & to store its value.
5	SHIFT KEY	(1) To increase/alter parameter value in program mode with Up / Dn Key. (2) Press for 3Sec in Programming this will help to go back to previous parameter.
6	UP KEY	(1) To increase/alter parameter value in program mode. (2) To Enter in configuration mode (with SET key) . (3) To acknowledge Alarm. (4) To enter in tune mode (with DOWN Key).
7	DOWN KEY	(1) To decrease / alter parameter value in program mode. (2) To enter in tune mode (with UP Key).

Figure 7: Temperature controller

To set the temperature for heating of the sample, press UP (Arrow key) to increase the temperature value as per desired set point is increased than release the key at that point, set value will be auto saved and repeat the same process to decrease the value.

NOTE: The controller is factory set and it does not require any settings except required temperature.

Speed Setting



ON/OFF SWITCH
SPEED REGULATOR

Figure 8: Speed setting

1. Switch ON the toggle switch present on drive.
2. Regulate the require speed and RPM counter will show the respective speed on RPM indicator at the time of operation.
3. After setting of all parameter, press and hold "ENTER" key of timer to start the test.
4. After execution of rolling for $2\text{ h} \pm 5\text{ minutes}$, buzzer blows indicating the completion of pre-set time period. To stop the buzzer sound, press "DOWN ARROW" key as indicated in time setting section.



Figure 9: Roller for grease test

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- Remove the grease from the cylinder promptly and proceed with the requirements of worked penetration in Test Method ASTM D1403. Record the worked penetration. After completion of test, clean the roll stability test apparatus by wiping with clean cloth or tissue.
- Convert the fractional scale penetration values determined by Test Method ASTM D1403 (before and after rolling) into the equivalent full scale cone penetration values using the appropriate equations described in Test Method ASTM D1403.

8 Calculation

Calculate the change in consistency of the sample as follows:

$$\text{Penetration change} = P2 - P1$$

where,

$P2$ = final full-scale penetration reading, and

$P1$ = initial full-scale penetration reading.

9 Precautions to be Followed

- 1) 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 so as to maintain its finishing.
- 2) Ensure proper earthing is provided to the instrument prior to the installation. Use of voltage stabiliser is recommended in case of power fluctuations.
- 3) Disassembly of this equipment is strictly limited to the qualified personnel and licensed engineers only. In case of any difficulty, do not try to repair without consulting the manufacturer, especially when the instrument is under the warranty period.
- 4) Always wear hand gloves during the cleaning operation.
- 5) The equipment should be cleaned regularly to avoid blockage.
- 6) Clean the equipment with a clean soft cloth. Do not use isopropyl alcohol or any other cleaning agent. Clean the instrument before and after the use to maintain its finishing. Also, wipe the residue after the sample is tested (if any).
- 7) Switch the mains on only after all the above precautions are taken before testing.
- 8) WARNING! The instrument has moving parts which may constitute a pinching risk for hand/fingers and entanglement risks for hair/clothing.
- 9) Reasonable care must be taken at all times - do not touch the moving parts during operation and ensure hair and clothing is kept clear. The instrument contains no user serviceable parts. Do not open the instrument enclosure – risk of electric shock or fire.

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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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Please write to us at info@eieinstruments.com, Thank you!

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