


## Troubleshooting the Temperature Indicator

Ensure the temperature indicator operates safely and dependably by adhering to all safety notices when you use or service the temperature indicator.

	<p><b>CAUTION</b></p> <p><b>Equipment Damage</b></p>
<p>When checking diode or connections to diode, do not use a multimeter which could subject the diode to more than five milliamperes forward current, or more than 200 volts reverse bias. Excess current or voltage will permanently damage the diode.</p>	

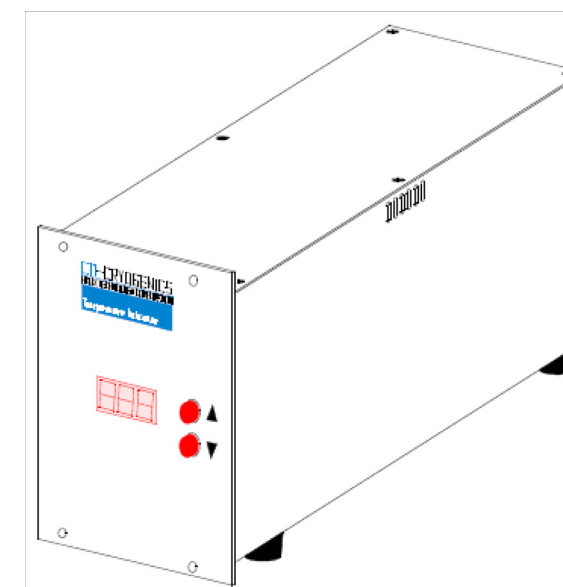
# Temperature Indicator Quick Installation Guide

Part Number 8040687, Revision A, 01/11/2013

ECO Number 63723

### Troubleshooting

Fault	Possible Cause	Corrective Action
Panel meter fails to indicate a reading.	Power switch is off.	Turn switch on.
	Power cord not plugged in.	Plug in power cord
	Fuse blown on rear panel of indicator.	Replace the fuse.
	No power coming from power source.	Check the service fuses, circuit breakers, and wiring associated with power source and repair as needed.
	Defective interconnecting cable.	Check continuity and replace, if needed.
	Connections to the diode sensor are loose or disconnected.	Check the continuity at the cryopump connections pins 3 and 4. Repairs must only be made by a qualified technician.
Solenoid valves or indicator are not operating at proper temperature in accordance with the Relay Connector Pin Assignments Table.	Polarity of diode is incorrect.	Check the polarity.
	Defective relays or electronics.	Check to see if the proper signal is being provided by the electronics. Repair as required by a qualified technician.



Use with Part Number 8043459 (Cryo-Torr system)

- G001 Digital Output
- G002 Digital and Analog Output

## Product Information and Technical Support

Please visit the Brooks Automation website at [www.brooks.com](http://www.brooks.com) or email to [tscallcenter@brooks.com](mailto:tscallcenter@brooks.com).

### Temperature Indicator Specifications

Sensor Excitation	10 Microamperes Constant Current
Display	Three-digit LED
Resolution	0.1k from 9k to 99.9k 1.0k from 100k to 450k
Power Required	100 – 230V, 50/60 Hz
Alarm Setpoints	Two Setpoints [High / Low] Adjustable Over 9k To 450k
Alarm Outputs	Two Spdt Relays (C, No, Nc) 5 Amps@250 VAC
RS-232 Interface	Temperature Output, Read and Set Alarm Points

## Temperature Indicator Description

The Temperature Indicator is a microprocessor based device that displays temperature measurement information received from a temperature sensing diode installed in a Cryo-Torr High-Vacuum Pump. The range of measurement is 9 - 450K, which is visible on the front panel digital display.

The Temperature Indicator has two adjustable alarm setpoints, two alarm relay outputs, and an RS-232 Interface port. When the Cryo-Torr High-Vacuum Pump temperature reaches either setpoint, internal relays are activated for controlling temperature-related functions.

The Temperature Indicator can be used on a desktop or installed in an electronics rack using customer supplied mounting hardware.

Each Temperature Indicator package contains:

- 115VAC power cord
- 230VAC power cord
- Sensor cable (pump-to-temperature-indicator)
- Fuses (2)
- Communication Cable (DB9 TO RJ11)
- Snap-on ferrite beads (2)
- Relay connector
- Temperature indicator
- Copy of this quick installation guide

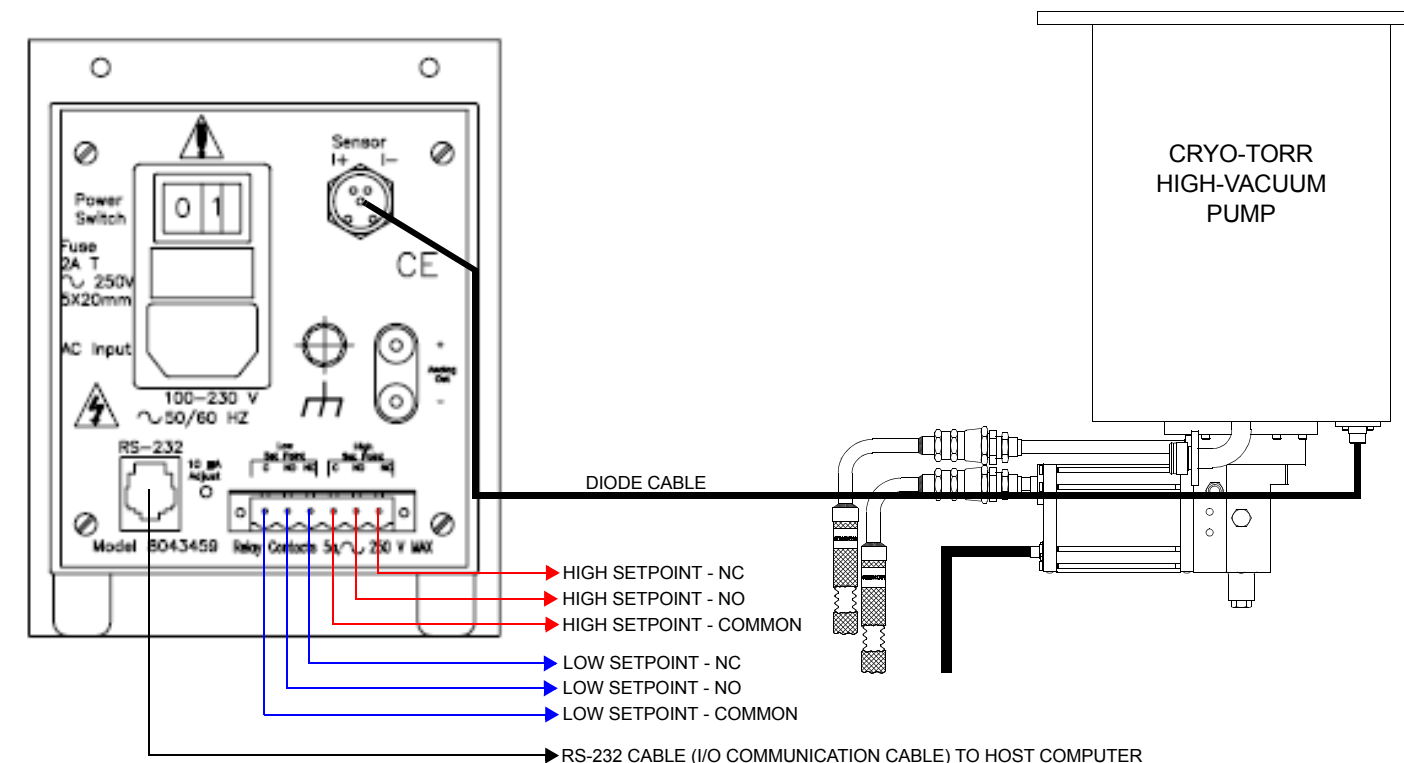


Figure 1: Temperature Indicator Connections

## Temperature Indicator Installation

1. If electronics rack installation is desired, perform the following steps:
  - a. Remove the four pads from the bottom of the Temperature Indicator using a Phillips screwdriver.
  - b. Install the Temperature Indicator into the electronics rack using customer supplied mounting hardware.
2. Refer to *Figure 1* and make the following connections:
  - a. Connect the diode cable between the SENSOR connector on the Temperature Indicator and the DIODE connector on the Cryo-Torr High-Vacuum Pump.
  - b. Connect the ground stud on the Temperature Indicator to a suitable connection.
  - c. Connect the relay(s) to the Temperature Indicator RELAY connector according to *Table 1*.

Table 1: Relay Connector Pin Assignments

Pin Number	Low Setpoint	Pin Number	High Setpoint
1	Common	4	Common
2	Normally Open (NO)	5	Normally Open (NO)
3	Normally Closed (NC)	6	Normally Closed (NC)

- d. If required, connect an RS-232 Cable between the RS-232 connector on the Temperature Indicator and the Host computer, using the cable supplied. Set the baud rate of the Host computer to 9600, no parity, 8 data bits and 1 stop bit. See temperature indicator manual for proper installation of ferrites.
  - e. Connect an AC power cord to the power receptacle on the rear panel of the Temperature Indicator. Determine the input power and connect with appropriate power cable included in kit.
3. Proceed with *Establishing Temperature Setpoints*.

## Establishing Temperature Setpoints

Temperature setpoints control the operation of the relays within the Temperature Indicator. When the sensing diode inside the Cryo-Torr High-Vacuum Pump senses the temperature has fallen below the **LOW** setpoint temperature, power to the **LOW SETPOINT RELAY** will be activated. If the temperature is at or above the **HIGH** setpoint, the **HIGH SETPOINT RELAY** will be activated.

1. Turn power ON by setting the power switch to the (1) ON position. Normal temperature will be displayed.
2. Press and release the UP arrow button to display the HIGH setpoint or press the DOWN arrow button to display the LOW setpoint.
3. Press and hold both UP and DOWN arrow buttons. The digital display will flash.

**NOTE:** Pressing and holding the UP or DOWN arrow button causes the digital display value to change rapidly.

4. Press the UP or DOWN arrow buttons to increase/decrease the temperature setpoint.
5. Release the UP or DOWN arrow button once the setpoint temperature has been reached. Three seconds after the new setpoint has been set, the setpoint is stored and displayed for two additional seconds. Normal Cryo-Torr High-Vacuum Pump temperature is then displayed.
6. A display of **00.0** indicates an open sensor, contact Brooks Automation.

## Startup the Temperature Indicator

See the 8040700, *Temperature Indicator Operating Manual*, for details.