Instructions for Universal Resistance-Temperature Detector (RTD) Module

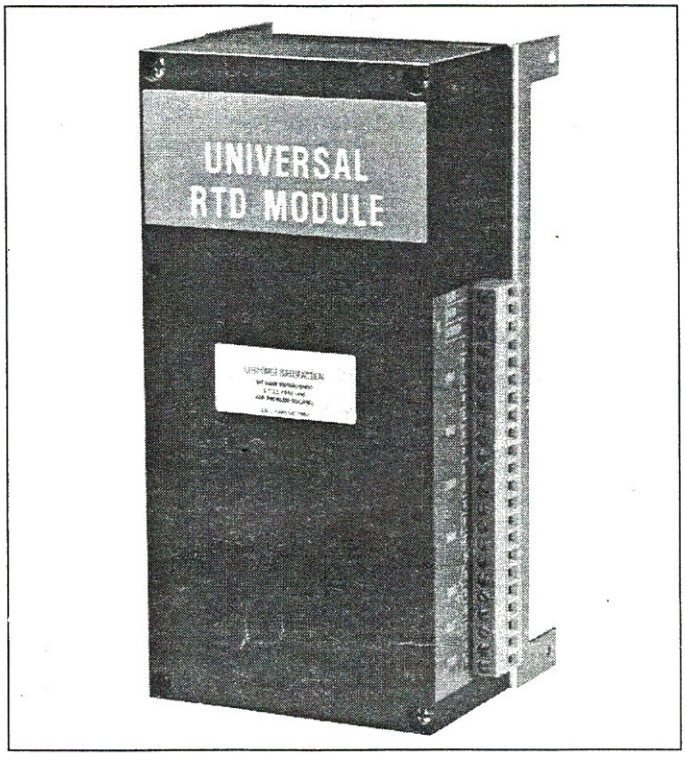


Fig. 1 Universal RTD Module

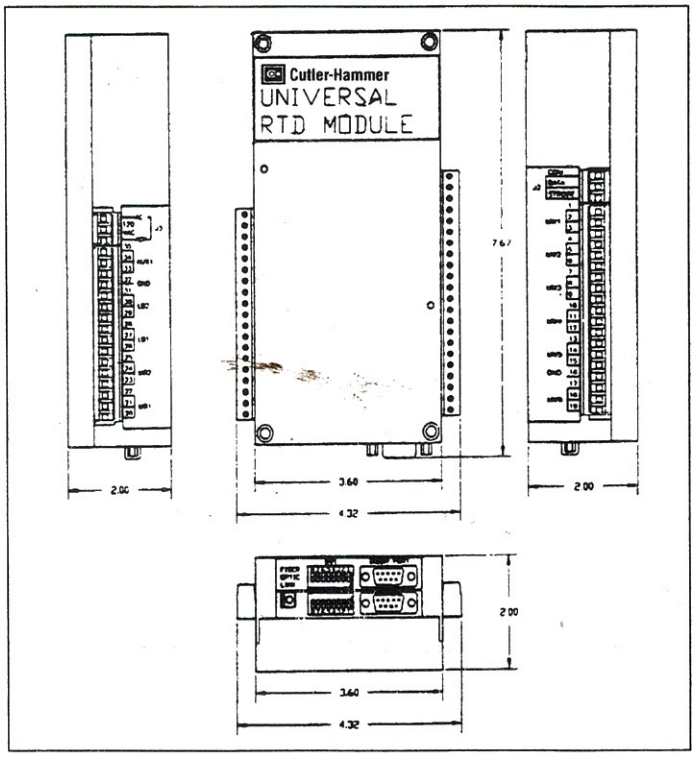


Fig. 2 Dimension Drawing (Dim. in inches)

3THE UNIVERSAL RTD MODULE

The Universal RTD Module is an electronic resistance-temperature detector accessory that is designed to be used in conjunction with the Cutler-Hammer MP-3000, IQ-1000 II, IQ-1000 and IQ-2000 motor protective devices. The Universal RTD Module can be used to monitor as many as 11 RTD inputs (four groups consisting of: six motor windings, two motor bearings, two load bearings and one auxiliary).

The Universal RTD Module can be programmed to accept any of the following types of RTD inputs:

10 Ohm Copper
100 Ohm Platinum
100 Ohm Nickel
120 Ohm Nickel

The type of RTD can be selected for each of the four RTD groups. For example, the winding RTD inputs can be programmed for 10 ohm copper and the motor bearing RTD inputs can be programmed for 120 ohm nickel.

The Universal RTD Module can transmit its information to an MP-3000, IQ-1000 II, IQ-1000 or IQ-2000 motor protective device using three conductor shielded cable. The Universal RTD Module can be mounted remotely up to 500 feet (152 m) from the motor protective device when using shielded three conductor cable.

The Universal RTD Module can also transmit its information to an MP-3000, or IQ-1000 II using a fiber optic link. The Universal RTD Module can be mounted remotely up to 400 feet (122 m) from the motor protective device when using the fiber optic link.

INSTALLATION

This industrial type control is designed to be installed, operated, and maintained by adequately trained workmen. These instructions do not cover all details, variations, or combinations of the equipment, its storage, delivery, installation, check-out, safe operation, or maintenance. Care must be exercised to comply with local,

state, and national regulations, as well as safety practices, for this class of equipment.

Programming the Universal RTD Module

The Universal RTD Module must be programmed for the type of RTDs that are being monitored. A DIP switch is located on the module (see Figure 2), to enable programming for the specific application. The switches provide four selection groupings which must be set by the user during installation.

The DIP switch contains eight 2-position switches which are set in combination (see Figure 3). The switches are turned ON or OFF by sliding the switch. As you face the DIP switches, slide:

- To the FRONT of the unit to turn OFF
- To the REAR of the unit to turn ON

Figure 4 shows a side view of a single slide switch and how it is turned ON and OFF.

Observe the ON and OFF designations on the DIP switches shown in Figure 3. Always look for the OFF and ON designations on the hardware or printed circuit board to be sure you are setting the switches correctly.

TABLE I: SPECIFICATIONS

Input Power Requirements
120 VAC (± 15%)

Frequency
50/60 Hz

Power Consumption
6 VA

Operating Temperature
0° to 70°C
(32° to 158°F)

Storage Temperature
-20° to 85°C
(-4° to 185°F)

Humidity
0 to 95% R.H.
noncondensing

Enclosure
Type 1

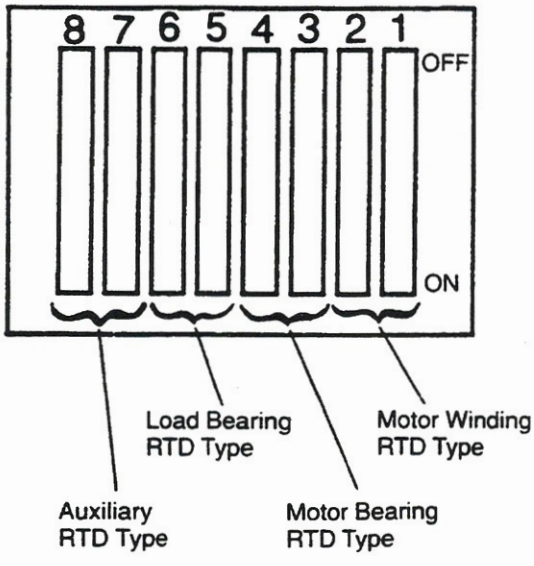


Fig. 3 Dip Switch

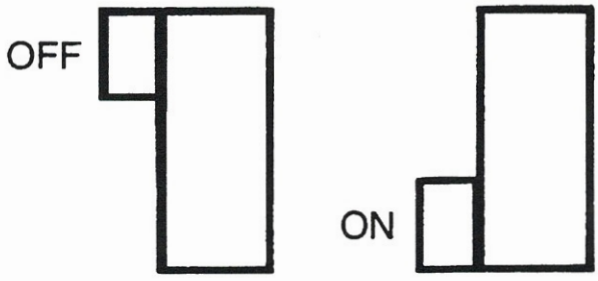


Fig. 4 DIP Switch (side view)

The DIP Switch positions for selecting the appropriate type of RTDs being used are shown in Table II.

TABLE II

TABLE II.A - Motor Winding RTD DIP Switch Settings

RTD Type	Switch Settings	
	1	2
100 Ohm Platinum	ON	ON
100 Ohm Nickel	OFF	ON
120 Ohm Nickel	ON	OFF
10 Ohm Copper	OFF	OFF

TABLE II.B - Motor Bearing RTD DIP Switch Settings

RTD Type	Switch Settings	
	3	4
100 Ohm Platinum	ON	ON
100 Ohm Nickel	OFF	ON
120 Ohm Nickel	ON	OFF
10 Ohm Copper	OFF	OFF

TABLE II.C - Load Bearing RTD DIP Switch Settings

RTD Type	Switch Settings	
	5	6
100 Ohm Platinum	ON	ON
100 Ohm Nickel	OFF	ON
120 Ohm Nickel	ON	OFF
10 Ohm Copper	OFF	OFF

TABLE II.D - Auxiliary RTD DIP Switch Settings

RTD Type	Switch Settings	
	7	8
100 Ohm Platinum	ON	ON
100 Ohm Nickel	OFF	ON
120 Ohm Nickel	ON	OFF
10 Ohm Copper	OFF	OFF

RTD Wiring

Each RTD must be wired to the Universal RTD Module as shown in the example Figure 5. The following guidelines must also be followed:

1. Use only one type of RTD (10 ohm copper, 100 ohm nickel, 100 ohm platinum, 120 ohm nickel) for each RTD group (four groups: motor winding, motor bearing, load bearing and auxiliary). For example, you cannot monitor one 10 ohm copper motor bearing RTD and one 120 ohm nickel motor bearing RTD; however, you can monitor 10 ohm copper winding RTDs and 100 ohm nickel motor bearing RTDs.
2. Use #18 three-conductor, stranded, twisted, copper wire to connect between the RTD and the Universal RTD Module.
3. Three conductors must be connected from the RTD to the Universal RTD Module. (Two return wires must be connected together.) In cases where the motor provides only two leads from the RTD, connect two of the three conductors together at one of the leads. Make this connection as close to the RTD as possible (see Figure 6). If only two conductors are connected between the RTD and the Universal RTD Module, then the MP-3000, IQ-1000 II, IQ-1000 or IQ-2000 motor protective devices will not operate correctly.
4. The cable's shield and drain wire must be connected to the appropriate terminal on the Universal RTD Module. At the opposite end, cut the shield and drain wire short and tape them, to prevent short circuits. Do **not** connect these **at the RTD end.**
5. In cases where one or more of the 11 possible RTD inputs on the module are not used, they can be left open or jumpered out without affecting the operation of the MP-3000, IQ-1000 II, IQ-1000 or IQ-2000 motor protective devices.

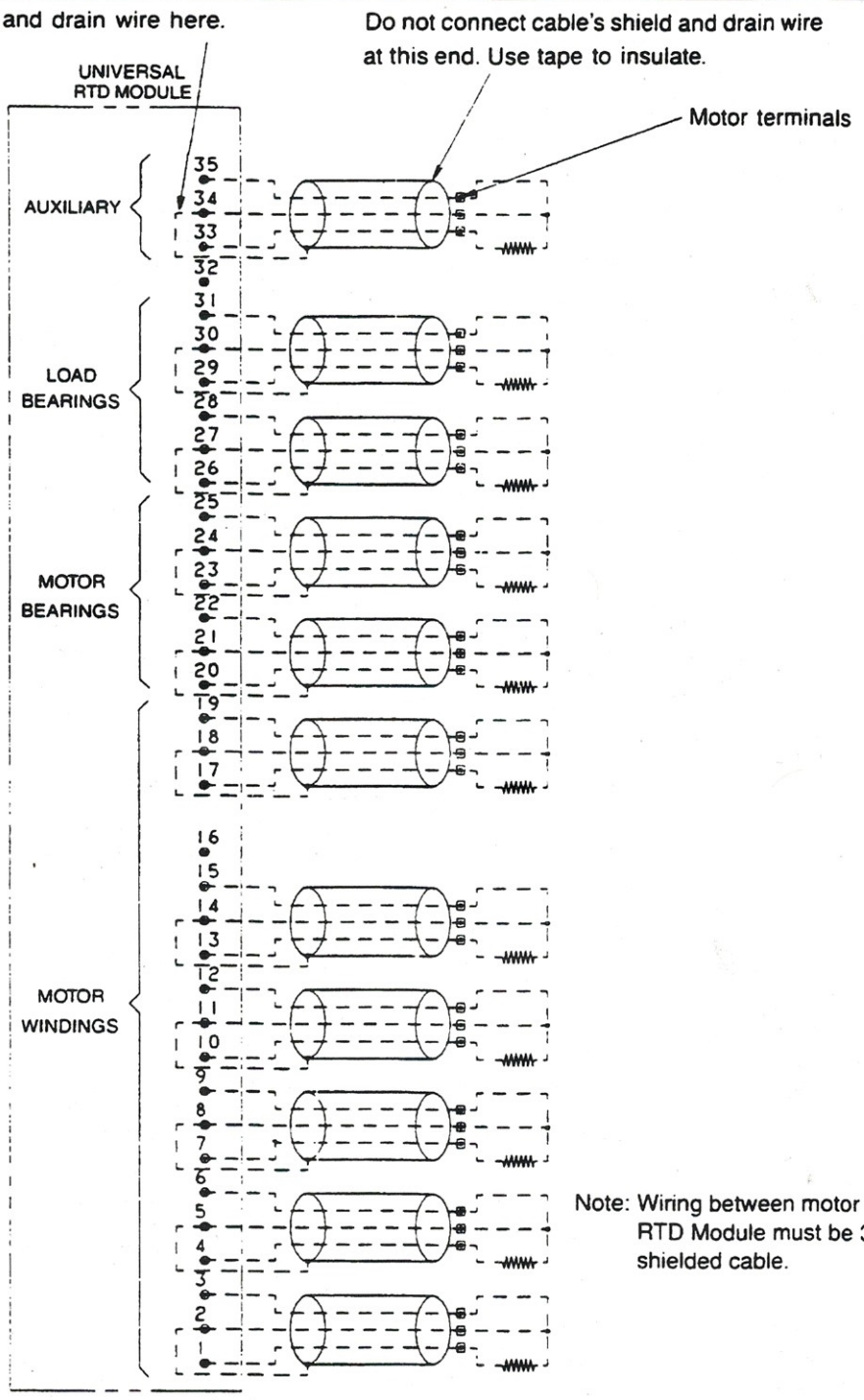
Wire Routing

Wire routing is divided into two types: high voltage (440 VAC and higher) and low voltage (120 VAC and DC signals). Low voltage would be the control and the RTD wiring. Maintain at least 1.5 to 2 feet (45 to 60 cm) between high voltage and low voltage conductors. Never route high voltage and low voltage lines in the same raceway.

NOTE: If the fiber optic link is used, the optic cable can be run in the same cable tray as high voltage conductors.

Connecting to Motor Protective Device

The Universal RTD Module is compatible with thefollowing motor protective devices: MP-3000, IQ-1000 II, IQ-1000, 10-2000. Connection requirements for each are described below:

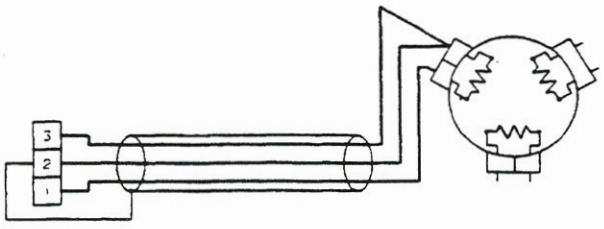


1. Each shielded cable's conductors must be connected on Universal RTD Module as shown.
2. Use of 3-lead RTDs is recommended.
3. RTDs must not be grounded at the motor, and no common connections between RTDs should be made at the Universal RTD Module or the motor.
4. Terminal 16 or 32 should be connected to a suitable earth ground **(only one of these terminals should be grounded, not both).**

Fig. 5 RTD Wiring (3-Lead Type)

1. When connecting an **MP-3000**, or **IQ-1000 II** to the Universal RTD Module using **three-wire shielded cable**, wire per connection guidelines in Table III. The three-wire shielded cable should be #16 AWG or #18 AWG. Connect the cable shield only at the Motor Protective Relay end, at terminal 23.
2. When connecting an **MP-3000**, or **IQ-1000 II** to the Universal RTD Module using the **fiber optic link**, a separate fiber optic cable is required. The fiber optic cable may be no longer than 400 feet (125 meters) in length. This cable is available from Hewlett Packard using style number HFBR-ELS-xxx where xxx is the length of the cable in meters. This is plastic fiber cable and comes with connectors already attached to each end.

   Equivalent cable and connectors may be used. See Figure 7 for a sample wiring diagram.
3. When connecting an **IQ-1000** to the Universal RTD Module using **three-wire shielded cable**, wire per connection guidelines in Table III. The three-wire shielded cable should be #16 AWG or #18 AWG. Connect the cable shield to a noncurrent-carrying



CAUTION

The two leads that are connected together must be wired to the correct terminals on the RTD Module. (In this case, they are No. 2 and 3. See Figure 5 for other terminal identifications.)

Fig. 6 Two-Lead RTD Wiring

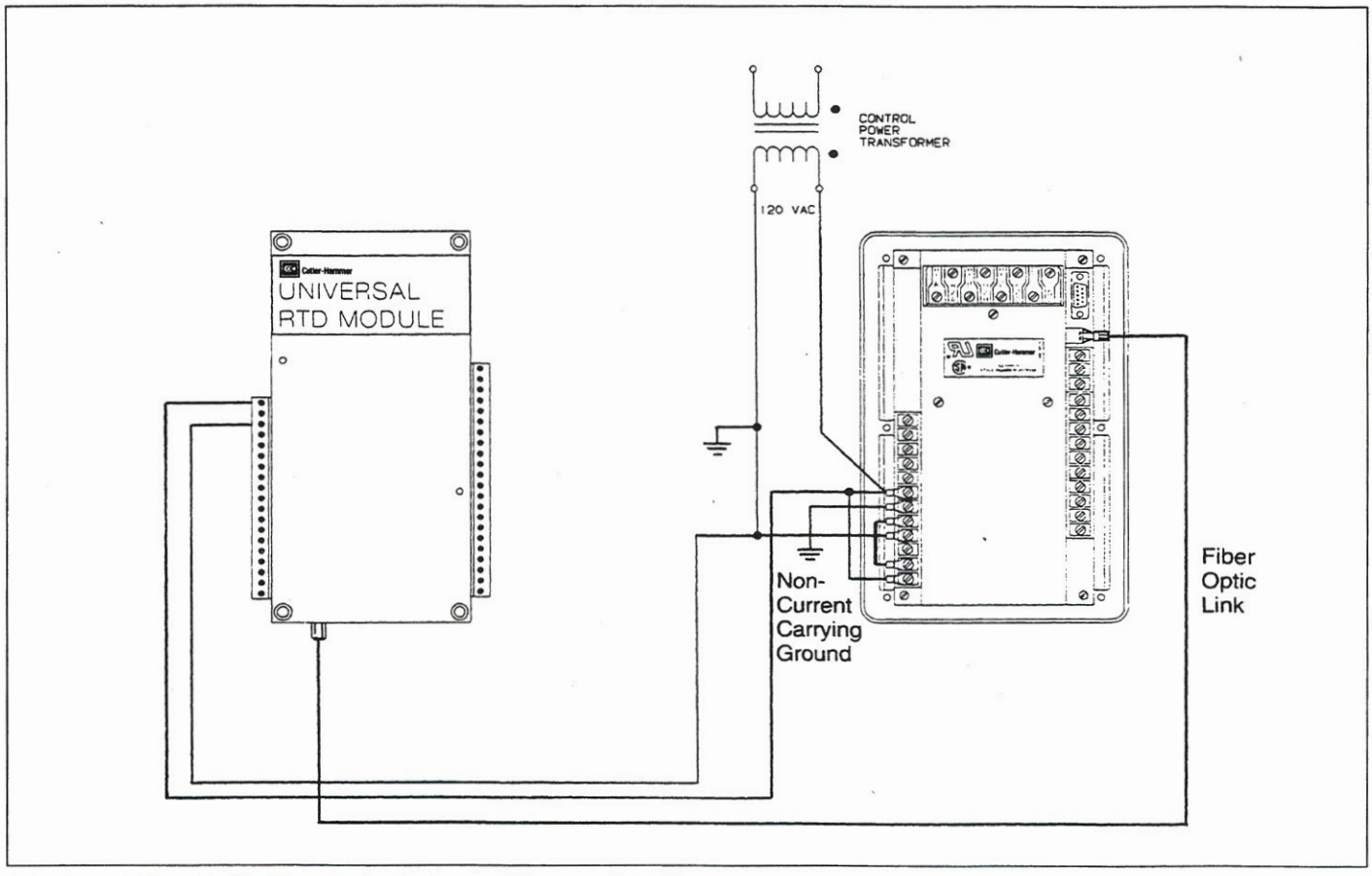


Fig. 7 Fiber Optic Connection between IQ-1000 II and Universal RTD Module

ground. For remote mounting of the Universal RTD Module, this should be at the RTD Module location.

4. When connecting an **IQ-2000** to the Universal RTD Module using **three-wire shielded cable**, use adaptor kit 7066C10G01 (for IQ-2000 Model A) or 7066C10G02 (for IQ-2000 Model B) and wire per connection guidelines in Table III. The three-wire shielded cable should be #16 AWG or #18 AWG. Connect the cable shield to a non-current carrying ground. For remote mounting of the Universal RTD Module, this should be at the RTD Module location.

TABLE III: MODULE CONNECTIONS

To Motor Protective Device			
RTD Module	**MP-3000 IQ-1000 II**	**IQ-1000**	**IQ-2000**
J2 Terminal Block	Terminal	Terminal	Terminal
#1 (Strobe)	#20	#20	#1
#2 (Data)	#21	#21	#3
#3 (Common)	#22	#22	#2
Shield	#23	do not connect at IQ-1000	do not connect at IQ-2000

To Power Supply	
Terminal Block Power (J3)	**120 VAC Power Supply**
VAC	"Hot" wire
ACN	Neutral wire

NOTE: It is only possible to view the Auxiliary RTD temperature on an MP-3000, or IQ-1000 II motor protective device.

NOTE: The MP-3000, or IQ-1000 II and Universal RTD Module can be linked using both three-conductor shielded cable and the fiber optic link. When both connection schemes are used, the temperature information will be transmitted via the fiber optic link. The three-conductor shielded cable will only be used for transmitting the information if the fiber optic link fails.

Control Power

Connect the power supply terminals (labeled J3) on the Universal RTD Module to a suitable 120 VAC source. See Table III for connection guidelines.

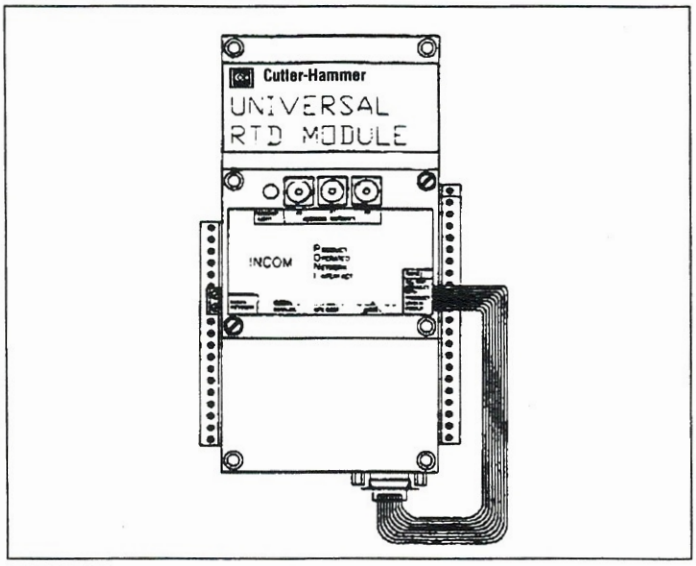


Fig. 8 Module with PONI Card Mounted

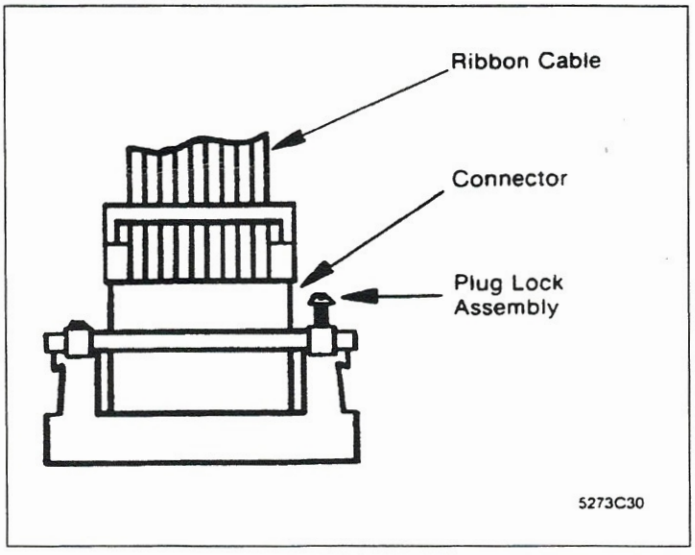


Fig. 9 Plug Lock Assembly

Grounding

Connect terminal 16 or 32 of the Universal RTD Module to a good earth ground with a green #14 AWG or#16 AWG grounding conductor.

COMMUNICATIONS

The Universal RTD Module is capable of communicating its temperature information directly back to a computer or other controller using the Cutler-Hammer PowerNet system. A communications (PONI) card is necessary in order to retrieve information from the Universal RTD Module.