Section 5

INSTALLATION

5.0 General — This section describes general mounting, wiring, and wire routing procedures to be followed by the electrical installation crew when installing the IQ-1000 II. The information listed here builds on earlier sections in this manual.

5.1 Mounting — The following subparagraphs describe the mounting of both the IQ-1000 II and the RTD and communication options.

5.1.1 IQ-1000 II — The IQ-1000 II is a self-contained unit which is intended to be mounted through a cutout in a panel or enclosure door. The dimensions for this cutout, along with the location of six required mounting holes, are shown in Figure 5.1. Before actually cutting the metal panel, be sure that the required three-dimensional clearances for the IQ-1000 II chassis allow mounting in the desired location. (Clearances are shown in Figure 5.2 and Figure 5.3).

Cutout tolerances and mounting screw hole placement are critical. In particular, the horizontal dimension between the center of the mounting holes and the cutout's vertical edge must be within 0 and +0.050 in. (0.13 cm).

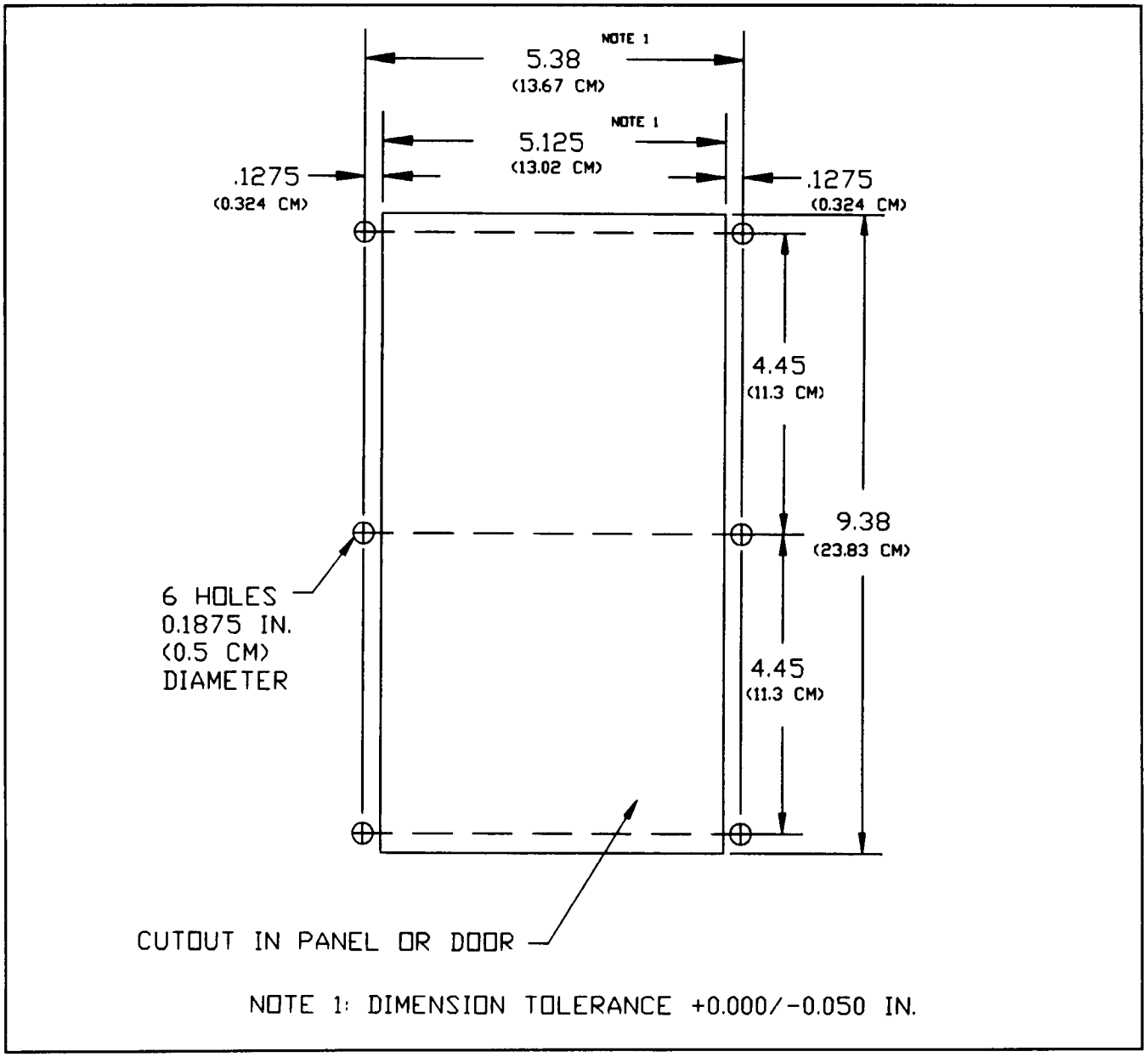

Figure 5.1 — IQ-1000 II Chassis Cutout Dimensions

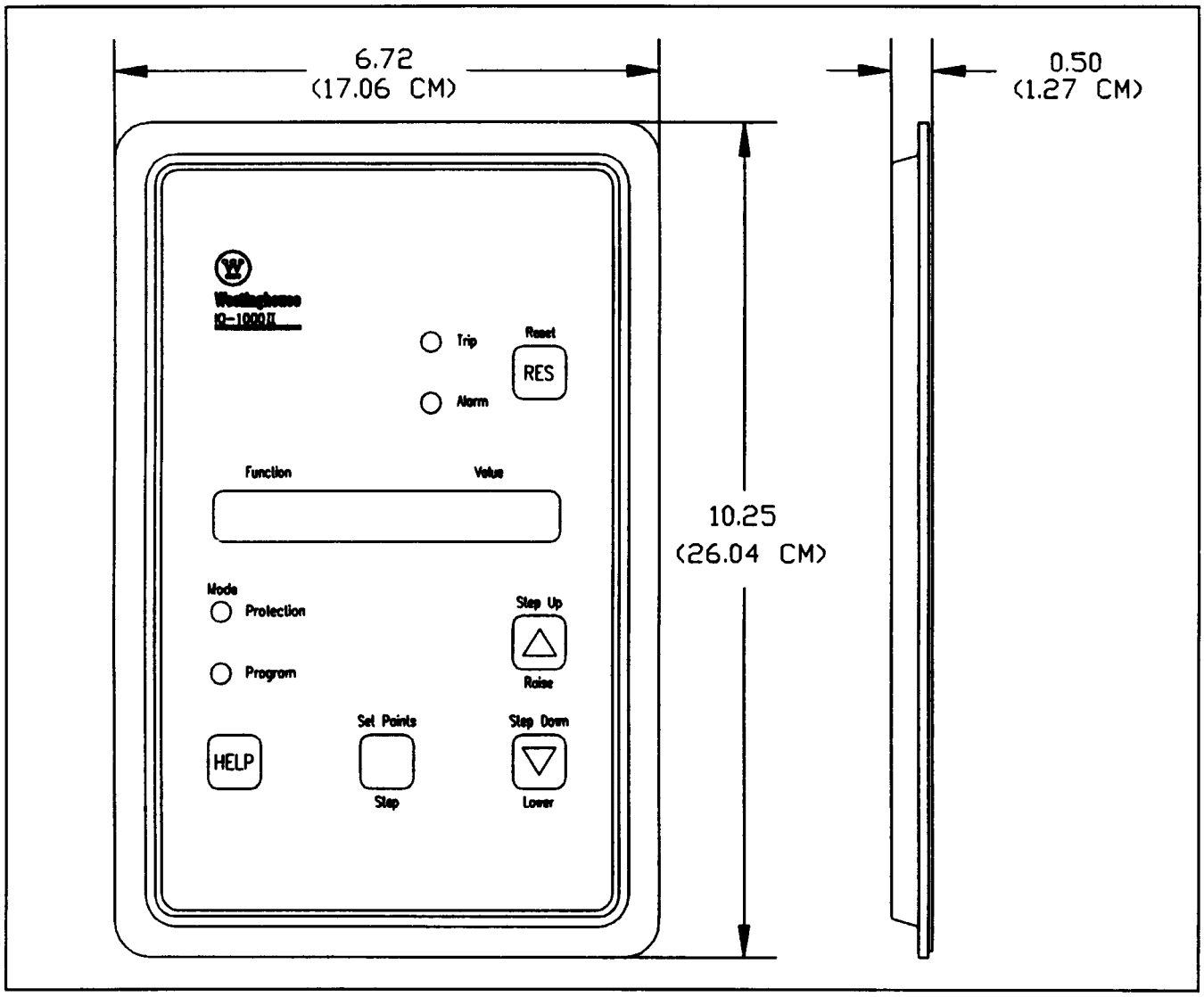

Figure 5.2 — IQ-1000 II Faceplate Dimensions

NOTE

Do not use a tap on the faceplate of the IQ-1000 II since this will remove excessive plastic from the holes, resulting in less threaded material to secure the IQ-1000 II to its mounting panel.

Place the IQ-1000 II through the cutout in the enclosure from the front, with the Operator Panel facing outward. Use 0.375 in. (0.75 cm) long screws (included with the IQ-1000 II) to mount the unit on a single-thickness metal panel.

5.1.2 RTD Option — The RTD option consists of a stand-alone enclosure containing the RTD Module. The Universal RTD Module can be connected to the IQ-1000 II via 3-conductor shielded cable and/or a fiber optic link.

The RTD Module may be mounted either on the back of the IQ-1000 II by using the RTD mounting bracket (supplied with the RTD Module) or mounted remotely from the unit. If the installation requires mounting the RTD Module to the IQ-1000 II, see Figure 5.3 for overall depth clearance requirements.

If mounting the RTD Module remotely from the IQ-1000 II, see Figures 5.4 and 5.5. Figure 5.4 shows the RTD Module chassis dimensions and Figure 5.5 is the mounting screw hole template pattern.

Observe Figure 5.6 which shows the RTD terminal connections, and note the following:

- Wiring for the RTDs is connected to the RTD Module at terminals 1-35.
- The incoming 120 VAC supply line for the RTD Module is wired to J3.
- Wiring between the IQ-1000 II and the RTD Module is connected using 3-conductor shielded cable at terminals 20, 21 and 22 of the IQ-1000 II and at J2 of the RTD board, **and/or** using a fiber optic cable between the fiber optic connectors on the IQ-1000 II and the RTD Module.
- When using 3-conductor shielded cable to connect the IQ-1000 II and RTD Module, the shield should be connected **only** to terminal 23 of the IQ-1000 II.

- A Communications option (PONI card) can be connected to the RTD Module for communications of temperature-only information over an IMPACC network. Mounting and clearance information is contained in a separate Instruction Leaflet, IL 17361.

NOTE

The IQ-1000 II and Universal RTD Module can be linked using both three conductor shielded cable **and** fiber optics. When this configuration is used, the temperature information will be transmitted via the fiber optic link. The 3-conductor shielded cable will transmit this information only if the fiber optic link fails.

If using 3-conductor shielded cable, the user-provided cable (which runs between the RTD chassis and IQ-1000 II) should not exceed 500 ft. (152 m).

If using a fiber optic link, the user-provided link (which runs between the RTD chassis and IQ-1000 II) should not exceed 400 ft. (122 m).

NOTE

The fiber optic cable must be connected between the IQ-1000 II and the Universal RTD Module prior to power-up to ensure normal communications.

If communications between the IQ-1000 II and the RTD Module were operating normally and communications are then lost between the units, press the Reset pushbutton on the IQ-1000 II Operator Panel to restore communications.

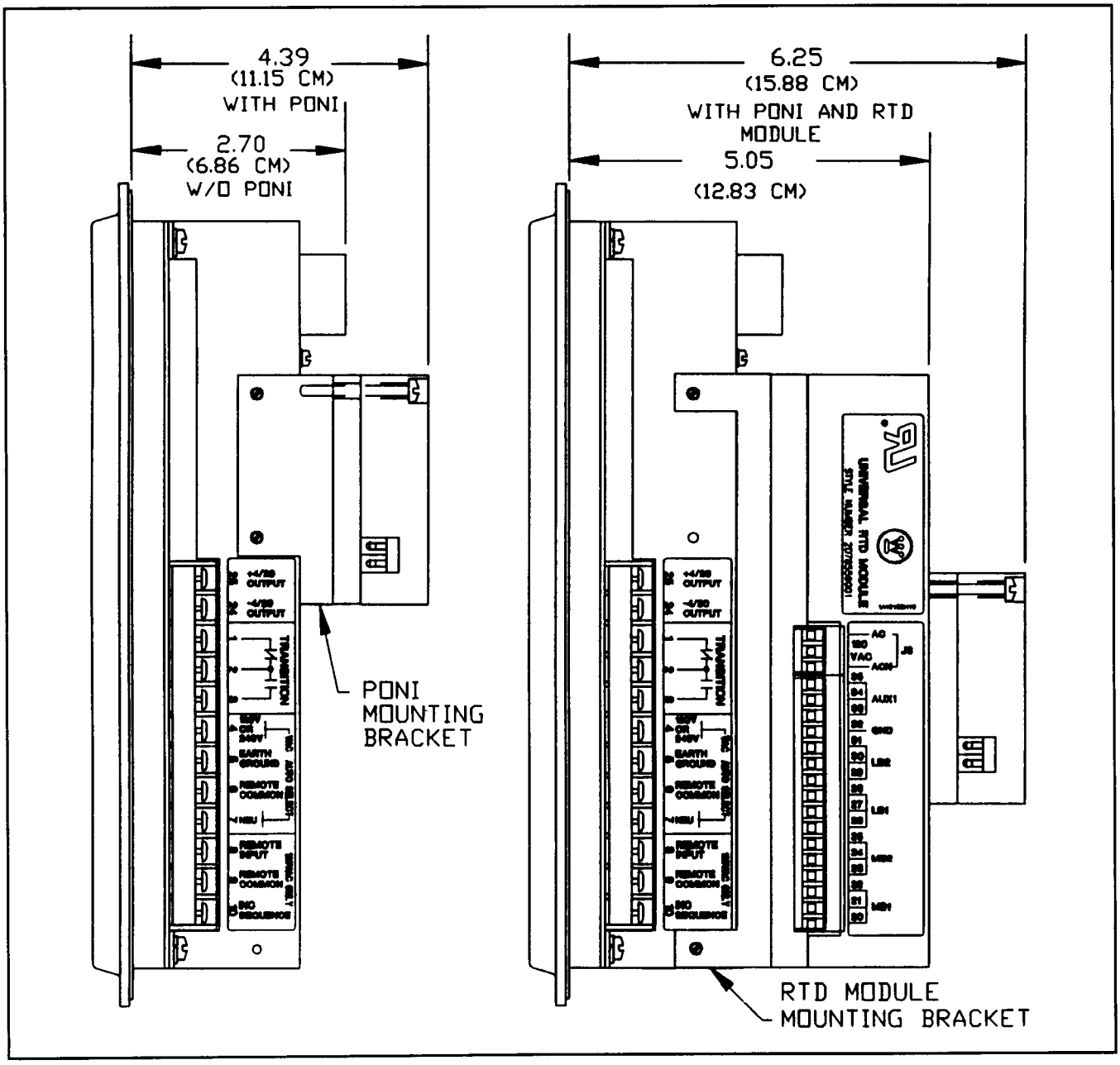

Figure 5.3 — IQ-1000 II Chassis Depth Clearances

There are no restrictions on the actual orientation of the RTD Module as long as the terminal blocks are accessible for wiring.

For additional information on the Universal RTD Module, consult IL 17367.

NOTE

All drawings and information in this manual concerning RTDs refer to the Universal RTD Module (Style Number 2D78559G01, Catalog Number URTD). If using an original RTD Module (Style Numbers 2D78508G01/G02/G03/G04), consult IL 17193 for features, dimensions, and mounting and installation instructions.

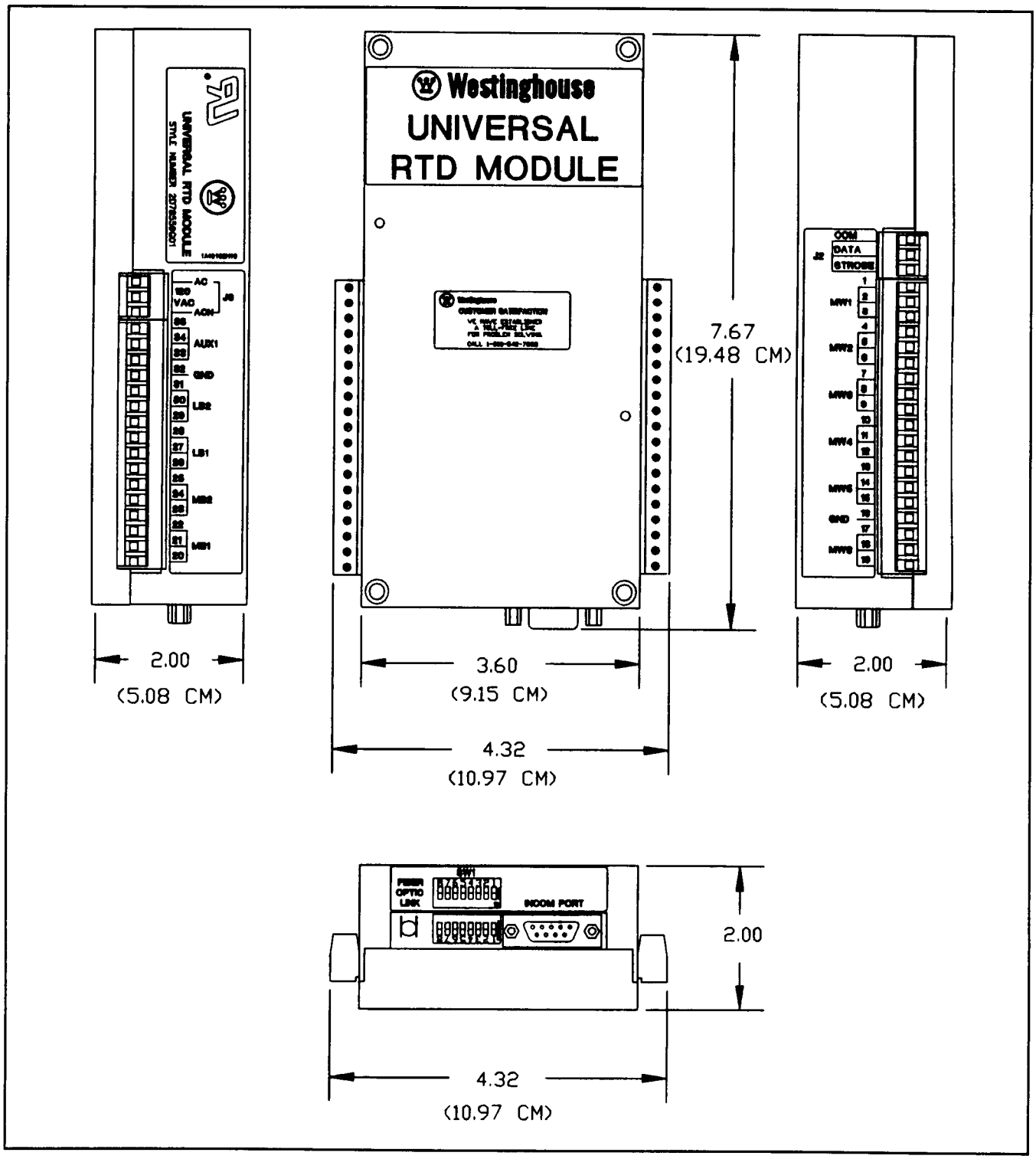

Figure 5.4 — Universal RTD Module Chassis Dimensions

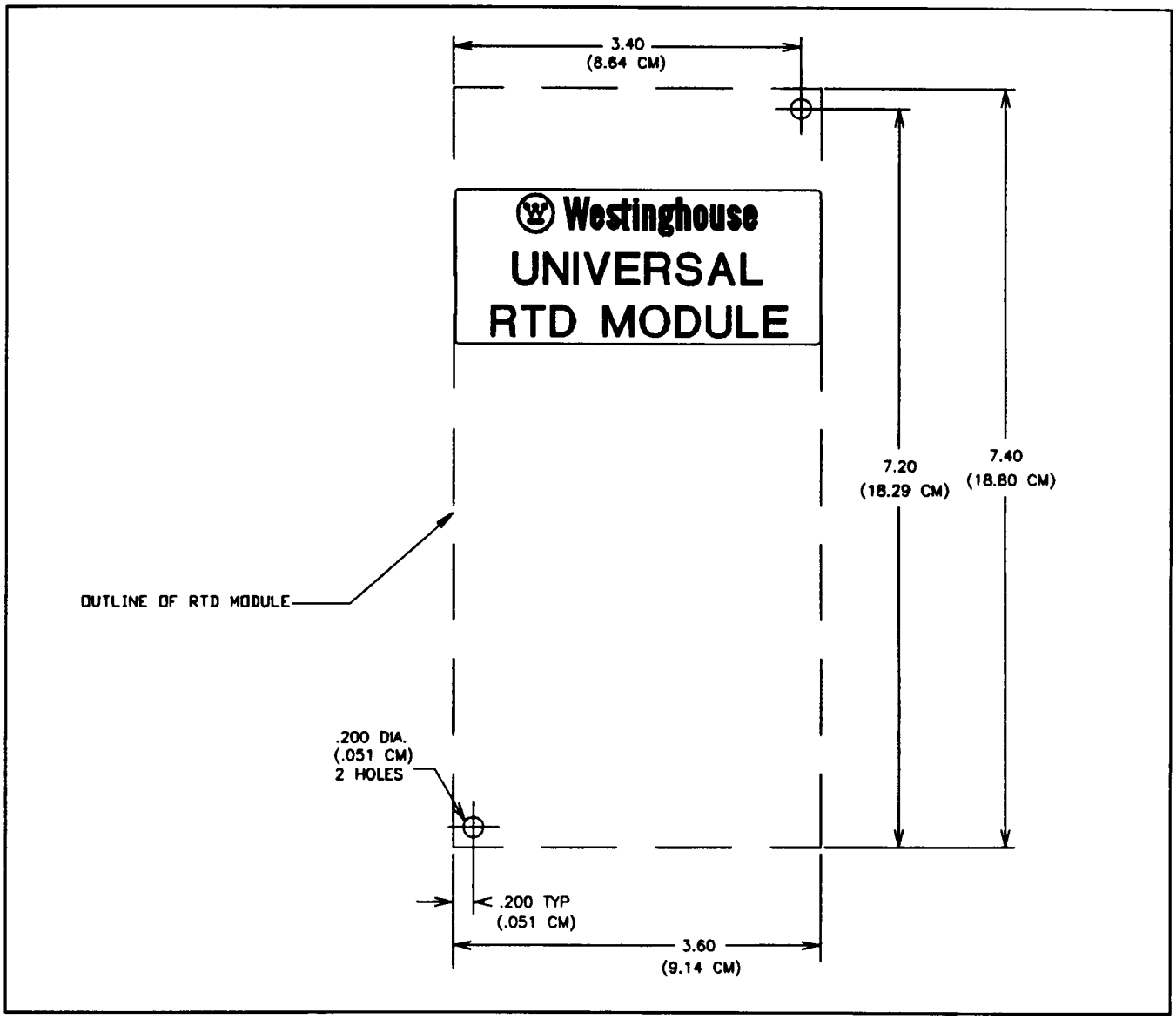

Figure 5.5 — Universal RTD Module Mounting Template Pattern

5.1.3 Communications Option — A Communications Module (PONI card) can be connected to the IQ-1000 II for transmission of all information from the device over an IMPACC network. A PONI mounted on an IQ-1000 II can be seen in Figure 5.3. Mounting and clearance information for the PONI card is contained in a separate Instruction Leaflet, IL 17361.

5.2 Wiring – General — The wiring of the IQ-1000 II must follow a suitable "Wiring Plan Drawing". When the starter and the IQ-1000 II are supplied together from Westinghouse, the wiring is factory-installed, and a suitable Wiring Plan Drawing is supplied. Otherwise, the term refers to the drawings made for the specific application. They describe all electrical connections between the IQ-1000 II and the machine or process equipment. These are made up by the user or OEM and must include at least the following items:

- Wiring between IQ-1000 II and any interposing relays used
- Main contactor wiring
- Current transformers, ground fault transformer, and control power transformer wiring
- The RTD Option, if included in the application

A typical wiring plan is shown in Figure 5.7. Note that two jumpers are factory-installed between terminals 4 and 10 and 6 and 9. These jumpers are valid for either 120 VAC or 240 VAC operation. Remove these two jumpers ONLY if the Incomplete Sequence function is used in the application. If the Incomplete Sequence function is not used in the application, the two jumpers must be in place for proper functioning of the IQ-1000 II.

NOTE

The IQ-1000 II can accept 120 VAC or 240 VAC control power. All relays can accept 120 VAC or 240 VAC; however, Remote Trip/Reset and Incomplete Sequence terminals are 120 VAC rated only.

NO and NC contacts from the Alarm, Auxiliary Trip, Transition, and Trip Relays can be used to control external devices. These contacts are rated at 10 amperes (resistive) for 240 VAC or 10 amperes for 30 VDC. A +4/20 mA and –4/20 mA DC analog output is available from the IQ-1000 II for use with external devices such as an ammeter or a programmable controller. See Figure 5.8 for IQ-1000 II rear panel terminals.

Typical wiring for the RTD Option is shown in Figure 5.9. The exact RTD wiring for each application should be included in the Wiring Plan Drawings.

DANGER

Ensure that the incoming AC power and all "foreign" power sources are turned OFF and locked out before performing any work on the motor starter or IQ-1000 II. Failure to observe this practice can result in serious or fatal injury and/or equipment damage.

5.3 Wiring Guidelines — The following guidelines must be observed by the electrical crew when installing the IQ-1000 II.

5.3.1 Wire Routing and Wire Types — When routing wires between the starter and the associated machine or process equipment, follow these guidelines:

Guideline 1 — Do not route the control or RTD wiring through the high-voltage compartment of the motor starter. If it is necessary to do so, consult Westinghouse Electrical Components Division for specific instructions.

Guideline 2 — Separate the lower voltage (120 VAC) from the higher voltage (440 VAC, or higher) conductors as much as possible. In general, maintain a minimum distance of 1.5 ft. (45 cm) between the two types.

Guideline 3 — Any low-voltage control wiring routed out of the motor starter cabinet should be at least #14 AWG stranded copper wire.

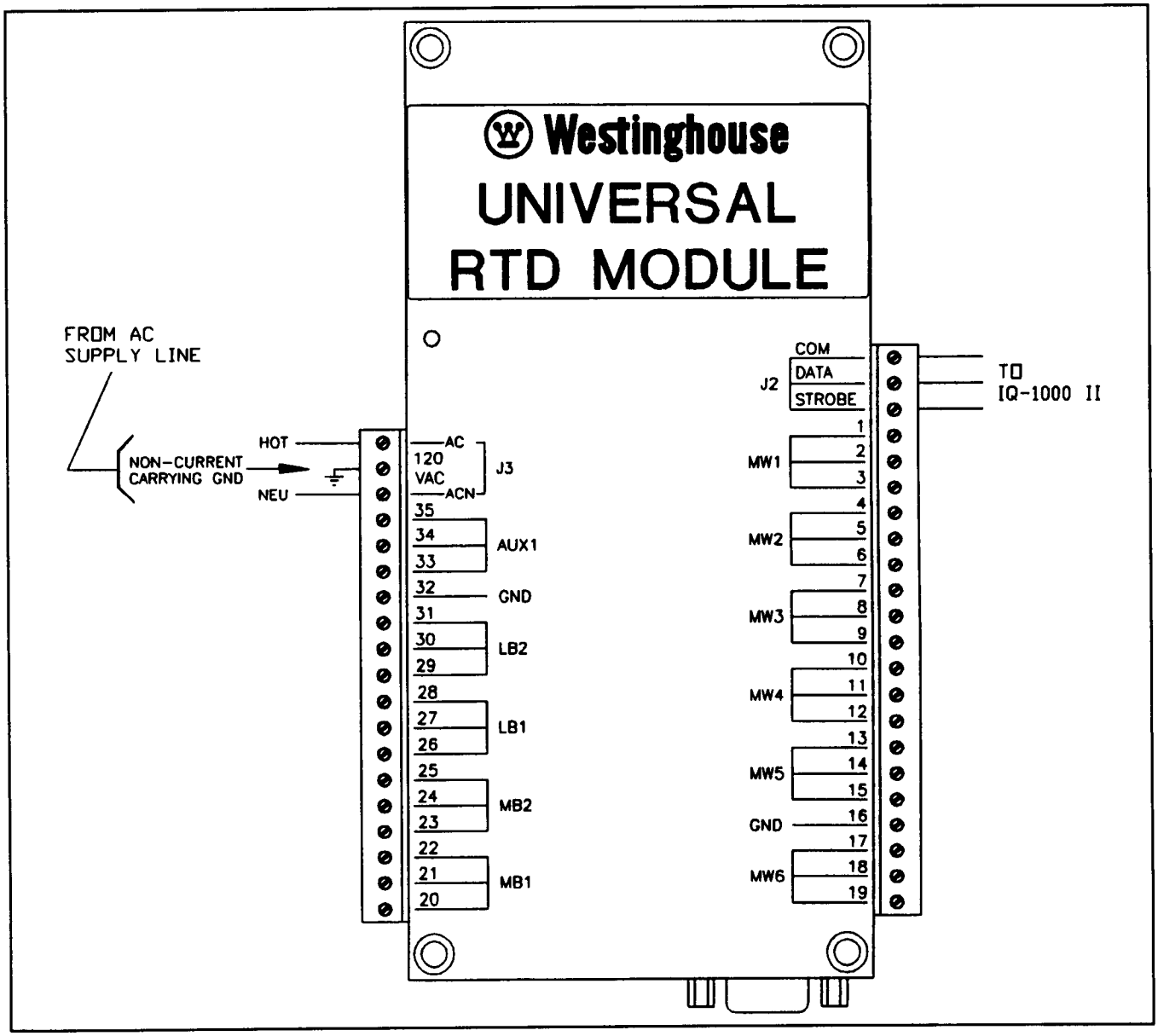

Figure 5.6 — Universal RTD Module Terminals

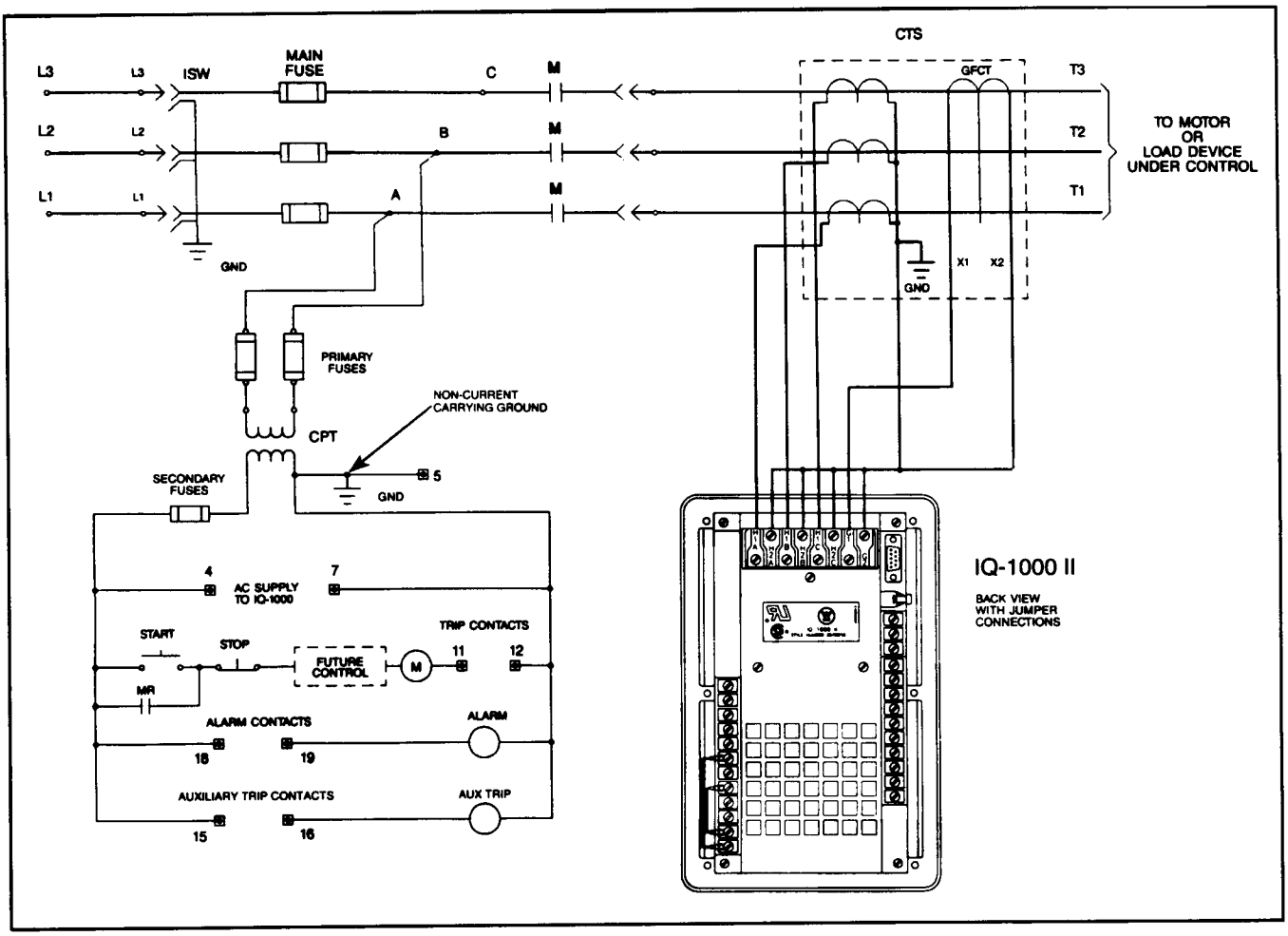

Figure 5.7 — Wiring Plan Drawing (partial plan)

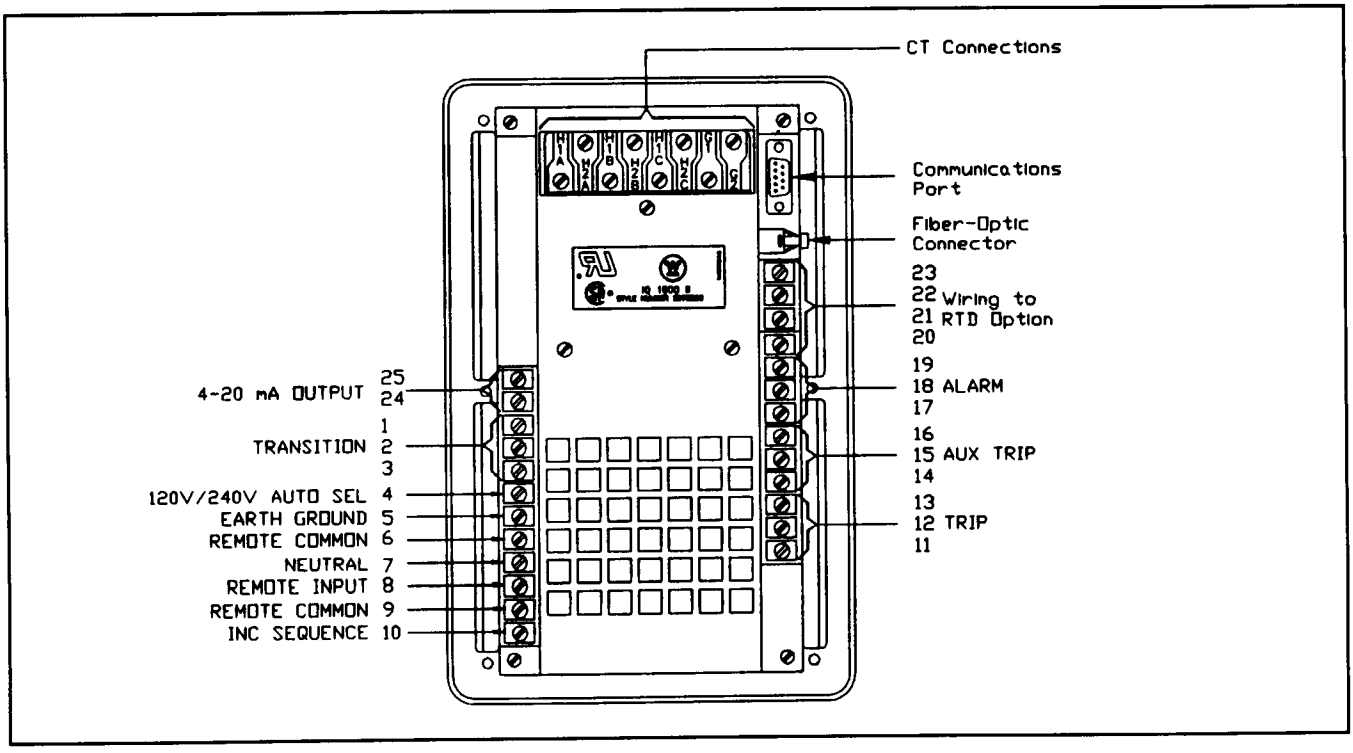

Figure 5.8 — IQ-1000 II Rear Panel Terminals

Guideline 4 — The wiring between the IQ-1000 II and the RTD Module should be at least #14 AWG stranded copper, 3-conductor shielded cable.

Guideline 5 — The wiring between the RTD Module and the RTDs in the motor must be #18 AWG, 3-conductor shielded cable.

5.3.2 Wiring Connections — Make wiring connections according to the application-specific Wiring Plan Drawing for each installation. Certain wiring connections are noted here for emphasis.

- Unused RTD inputs on the RTD Module should be wired together. For example, if MW5 and MW6 are unused, MW5 terminals 13, 14 and 15 should be wired to each other and MW6 terminals 17, 18 and 19 should be wired together.
- The interconnecting cable between the RTD Module and the RTD must have the cable's shield connected to the RTD Module ONLY. Cut the shield short at the RTD end and use shrink tubing or electrical tape to insulate it.

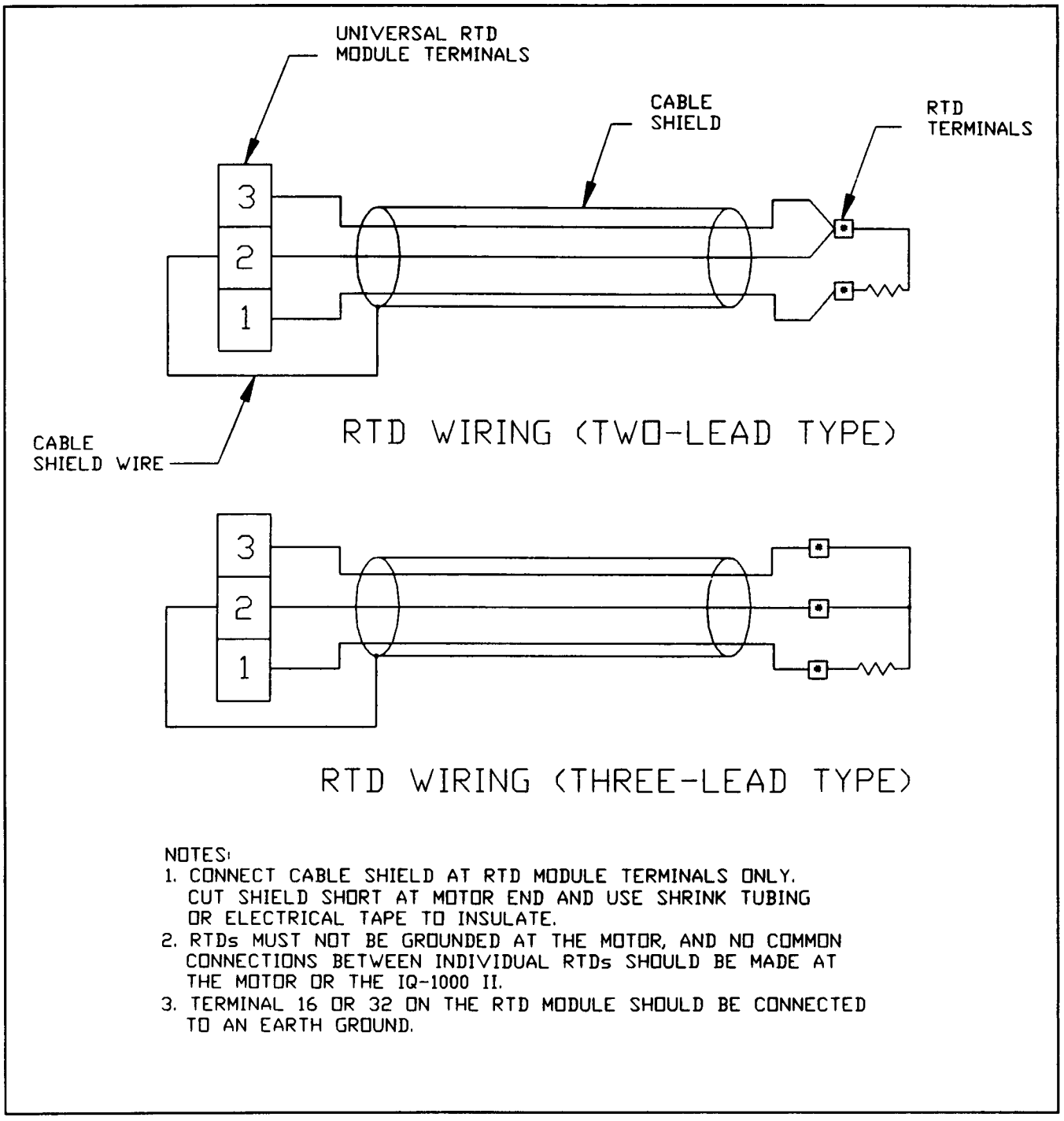

Figure 5.9 — RTD Wiring

- When making connections between the RTD Module and an RTD that has only two leads, connect two of the interconnecting cable's leads to one of the RTD's leads (see Figure 5.9). Make this connection as close to the motor as possible. Tie the third interconnecting lead to the remaining RTD lead.
- When making connections between the RTD Module and a three lead RTD, connect the shield and drain wire to the RTD Module terminal as shown in Figure 5.9.
- The Universal RTD Module accepts 120 VAC control power ONLY (see Figure 5.10). If the installation uses 240 VAC control power for the IQ-1000 II, a separate source 120 VAC must supply the Universal RTD Module.
- The IQ-1000 II accepts either 120 or 240 VAC inputs for control power or remote inputs (see Figure 5.11). All input relays are rated for 120 or 240 VAC with the exception of the Incomplete Sequence and Remote Trip/Reset terminals, which are rated for 120 VAC ONLY.

5.3.3 Grounding — The IQ-1000 II and associated system components must be grounded as follows to ensure proper operation:

- Connect the ground side of the control power transformer to terminal 7 of the IQ-1000 II.
- Connect one side of the CTs to the system ground. System noise may disrupt the IQ-1000 II if the CTs are tied to a current carrying ground.
- Connect a #14AWG wire between terminal 5 and the main ground bus of the system. **Do NOT connect terminals 5 and 7 together.** The ground connecting terminal 5 to the system ground bus must be a non-current carrying ground.

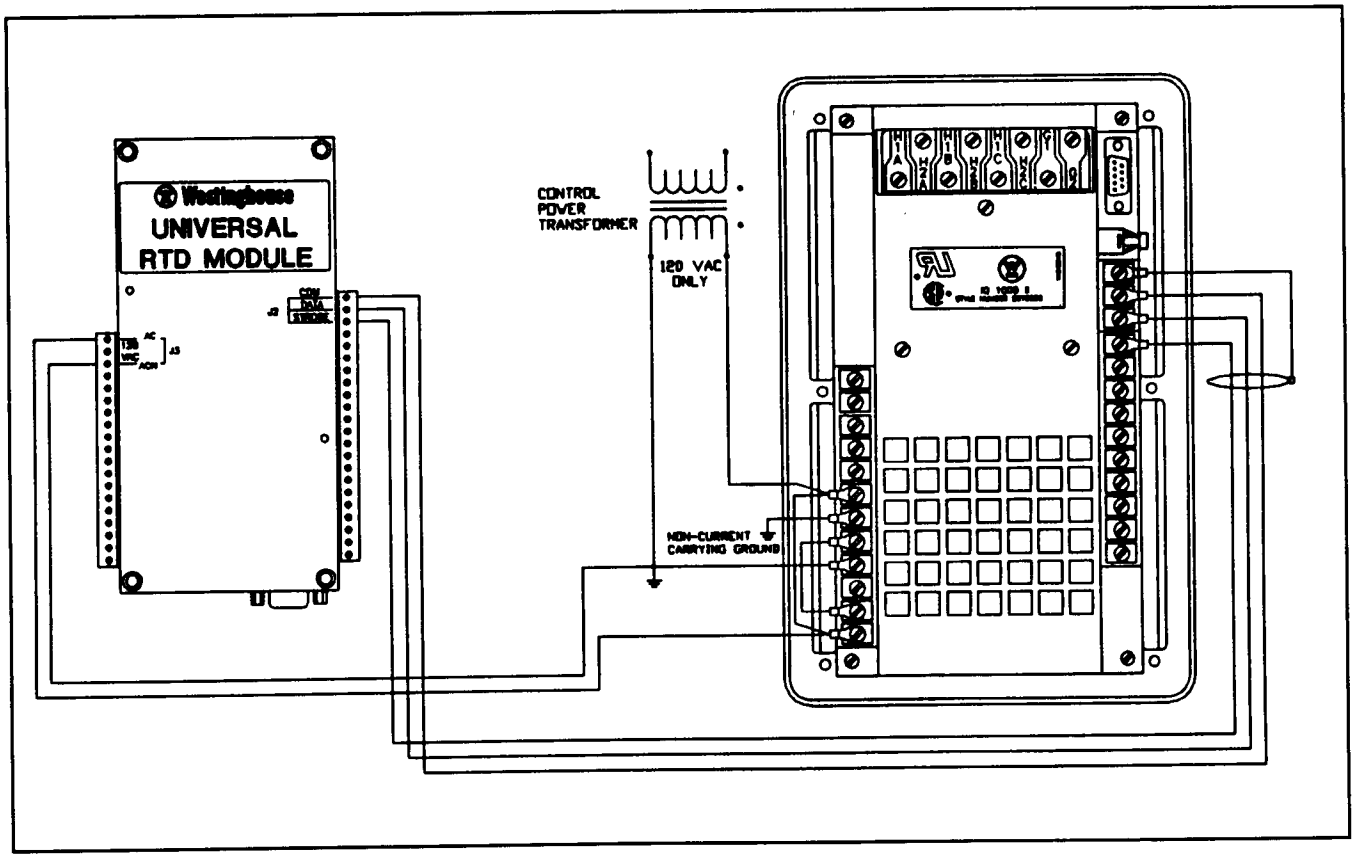

Figure 5.10 — IQ-1000 II to Universal RTD Module Control Wiring

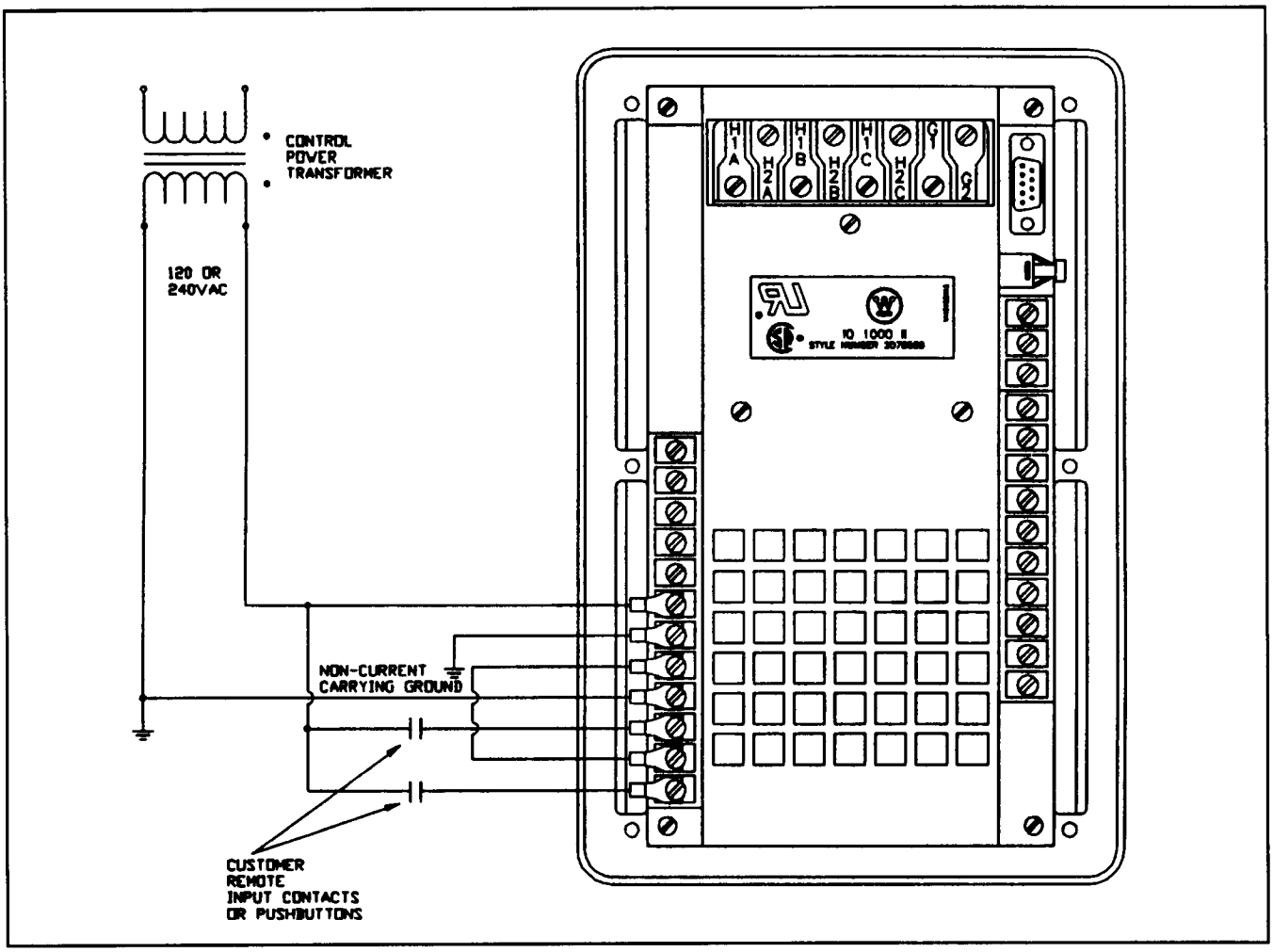

Figure 5.11 — IQ-1000 II Remote Input Wiring for 120 or 240 VAC Control Power