RELIANCE ELECTRIC

INSTRUCTION SHEET D2-3169-2
Remote Digital Meter
Model 3DM4000
For use with 230 VAC, 460 VAC AND 575 VAC
GP-2000
General Purpose A-C V★S® Drive Controllers

DANGER
ONLY QUALIFIED ELECTRICAL PERSONNEL FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THIS EQUIPMENT AND THE HAZARDS INVOLVED SHOULD INSTALL, ADJUST, OPERATE, AND/OR SERVICE THIS EQUIPMENT. READ AND UNDERSTAND THIS MANUAL IN ITS ENTIRETY BEFORE PROCEEDING. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

Receive and Accept the Shipment

Reliance Electric's terms of sale, in all instances, are F.O.B. point of origin. The user is responsible for thoroughly inspecting the equipment before accepting shipment from the transportation company.

If all the items called for on the bill of lading or on the express receipt are not included or if any items are obviously damaged, do not accept the shipment until the freight or express agent makes an appropriate notation on your freight bill or express receipt. If any concealed loss or damage is discovered later, notify your freight or express agent within 15 days of receipt and request that he make an inspection of the shipment. Keep the entire shipment intact in its original shipping container.

The user is responsible for making claim against the Carrier for any shortage or damage occurring in transit. Claims for loss or damage in shipment must not be deducted from the Reliance Electric invoice, nor should payment of the invoice be withheld while awaiting adjustment of such claims since the Carrier guarantees safe delivery.

File a Return Request

1. To return equipment, send a written request to Reliance Electric within ten days of receipt.
2. Do not return equipment without a numbered Equipment Return Authorization (ERA) from Reliance Electric.
3. Reliance Electric reserves the right to inspect the equipment on site.

Store the Kit untill Installation

After receipt inspections, repack the kit in its original shipping container until installation. If a period of storage is expected, store in the original shipping container with its internal packing.

To ensure satisfactory operation at startup and to maintain warranty coverage, store the equipment:

- in its original shipping container in a clean, dry, safe place.
- within an ambient temperature range of -10°C to 40°C.
- within a relative humidity range of 5 to 95 % without condensation.
- away from a highly corrosive atmosphere. In harsh environments, cover the shipping/storage container.

Description

The products described in this instruction manual are manufactured by Reliance Electric Industrial Company.

This instruction sheet covers the Remote Digital Meter Kit for the GP-2000 Controller (hereinafter referenced to as "controller"). The Kit provides a remote means of monitoring the controller.

Whenever the Remote Digital Meter is used, the Remote Meter Interface Card (Model 1MI4000) must be installed in the controller. Note that the Remote Meter Interface Card kit (hereinafter referenced to as "RMI card") cannot be used with the Serial Communication Port Kit (Model 1SC4000). The RMI card provides the following isolated analog signals to the Remote Digital Meter:

- Output Frequency (Hz)
- Output Voltage (Volts)
- Output Current (Percent Amps)

These analog signals have a tolerance of (+5%, –3%).

The Remote Digital Meter uses attenuators to calibrate the three input signals, a monitor selector circuit to select one of them, and an A/D converter to indicate the selected signal level to the 3-digit display. Monitor selection is done by pressing the MONITOR SELECTOR switch mounted on the meter.

As the Remote Digital Meter itself has some tolerance (+1%, –1%), the total tolerance is +6%, –4%. If the Hz ADJ pot is adjusted, the total tolerance for the output frequency monitor can be within +1%, –1% at full scale.

The Remote Digital Meter also displays an IET. It is connected to an IET relay contact in the controller. When any IET occurs in the controller, the "IET" LED on the Remote Digital Meter will light and the 3-digit display will be cleared.

The RMI card provides a Run relay contact signal to the Remote Digital Meter. When the controller is in the STOP mode, that is, the controller output is not active, the 3-digit display will be cleared. When the controller is in the RUN mode, the 3-digit display will show some data in accordance with the selected monitor mode.

The maximum wire length allowable is 150 feet (50 meters). Use twisted wire to eliminate electrical noise pick-up.

CAUTION: This kit cannot be used on systems that have more than 10 KVA distribution capacities. When the systems capacity is more than 10 KVA, a 230 VAC isolation transformer whose capacity is between 3 VA and 10 KVA must be used with the kit. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

The input power supply voltage is nominal 230 VAC. The allowable voltage range is 180 VAC to 253 VAC.

The input fuses as listed in Table 1 must be installed to provide upstream branch circuit protection.

For more information on the Remote Meter Interface Card, see Instruction Manual D2-3168.

Installation

DANGER
EQUIPMENT IS AT LINE VOLTAGE WHEN A-C POWER IS CONNECTED TO THE CONTROLLER. ALL UNGROUNDED CONDUCTORS OF THE A-C POWER LINE MUST BE DISCONNECTED FROM THE CONTROLLER. AFTER POWER IS REMOVED, USE A VOLTMETER AT TERMINALS 147(+) AND 45(-) TO VERIFY THAT THE D-C BUS FILTER CAPACITORS ARE DISCHARGED BEFORE TOUCHING ANY INTERNAL PARTS OF THE CONTROLLER OR INSTALLING KITS. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

DANGER
THE USER IS RESPONSIBLE FOR CONFORMING WITH THE NATIONAL ELECTRICAL CODE AND ALL OTHER APPLICABLE LOCAL CODES. WIRING PRACTICES, GROUNDING, DISCONNECTS AND OVERCURRENT PROTECTION ARE OF PARTICULAR IMPORTANCE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

1. Disconnect all power to the controller.
2. Loosen the four screws at the corners of the controller enclosure and remove the cover.
3. Install the RMI card according to Instruction Manual D2-3168.
4. Make a cutout for panel mounting in the desired location. (See Figure 1 for the dimensions).
5. Loosen the four screws at the back corners of the Remote Digital Meter kit and pull out the PC board from the kit case.
6. Set the jumper on the PC board to the following position in accordance with the controller input voltage:

   JP1 = 230VAC
   JP2 = 460 VAC
   JP3 = 575 VAC

   Note: This is for calibration only.

   Note: The initial factory setting of jumper is JP1 (230VAC).
7. Replace the PC board in the kit case and secure it with the four screws.
8. Insert the kit case into the cutout.
9. Attach the two screw clamps (accessory) to the top and bottom or the both sides of the kit. Fix the kit to the panel with the two screw clamps.
10. Wire the Remote Digital Meter and the RMI card in accordance with Figure 2. For this signal wire, use twisted wire that is rated at a minimum of #22 AWG within 150 feet (50 meters).
11. Wire the 230 VAC power supply to the Remote Digital Meter through the input fuses listed in Table 1.

Table 1. A-C Input Line Branch Circuit Protection.

Input 1ϕ Volts	Input Current (Amps)	Input Fuse Rating	
		UL Class	Rating (Amps)
180 - 253	0.02	RK5	0.1

Start Up the Kit

Start up the controller according to Instruction Manual D2-3166. Start up the kit after the controller's adjustment is completed.

1. Make sure that the A-C power line is wired to terminals 88 and 89 on the Remote Digital Meter. Check the A-C incoming voltage, before the power supply is turned ON. The allowable voltage variation is from 180 to 253 volts.
2. Turn the power ON to both the controller and the kit. The "Hz" LED will light.
3. Start the controller and increase the speed to maximum Hz. The 3-digit display will show the controller output frequency. Adjust the "Hz ADJ" pot so that the frequency shown on the kit is equal to the frequency shown on the controller keypad. If satisfactory adjustment cannot be reached, refer to Step 6 in Installation.
4. Press the MONITOR Selector switch. The "V" LED will light. The 3-digit display will show the controller output voltage.
5. Press the MONITOR Selector switch. The "PA" LED will light. The 3-digit display will show the controller output current (in units of percent).
6. Run the drive across the speed range under load. Make sure that the monitor is operating correctly by pressing the MONITOR Selector switch.

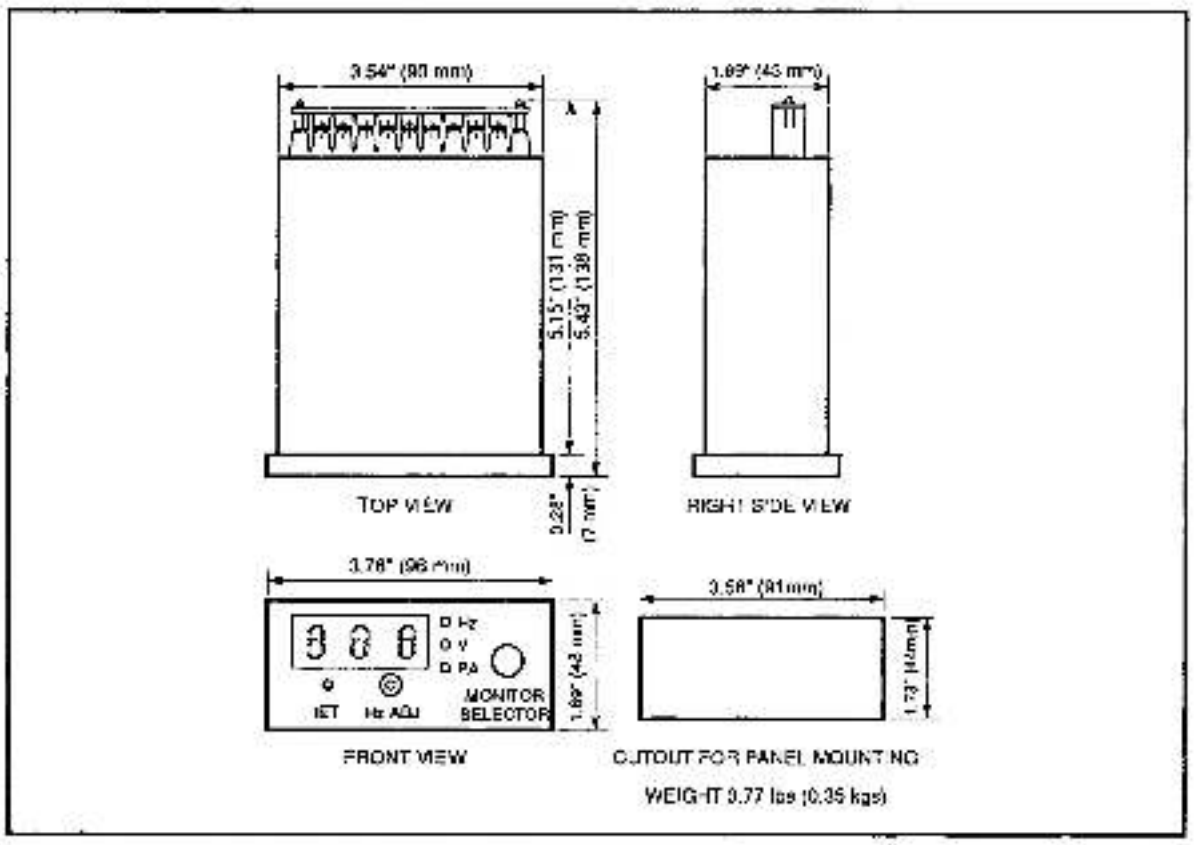

Figure 1. Mounting data for Remote Digital Meter Kit.

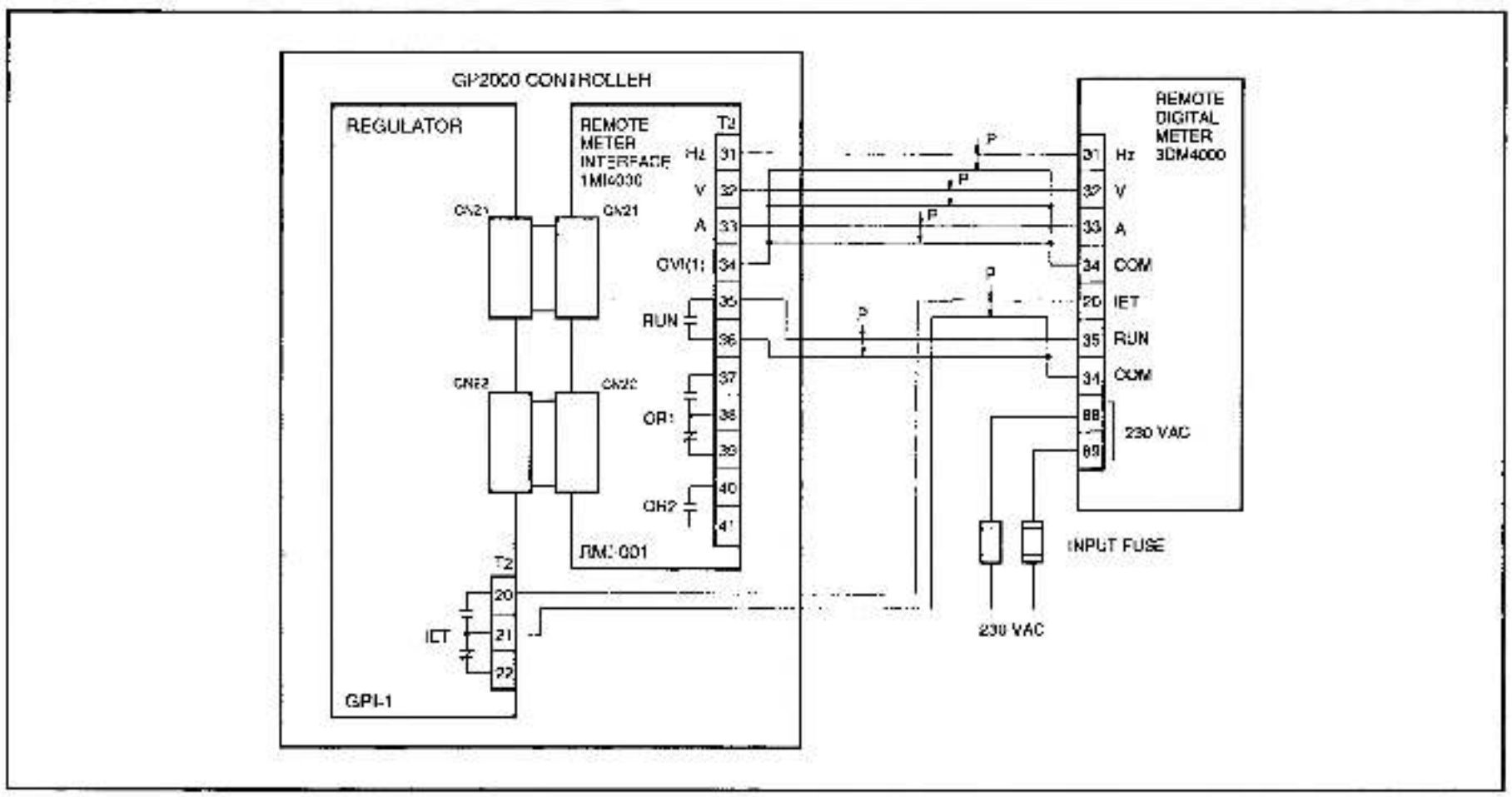

Figure 2. Connection Diagram.

7. Create an IET (Function Loss) by opening the wiring between the controller terminals 11 and 12. If parameter 1 is selected in Function 32 (Function Loss Selection), connect a jumper between the kit terminals 20 and 34 to simulate the IET. The 3-digit display will be cleared and the "IET" LED will light.
8. Replace the wiring or jumper.
9. Turn the power OFF.

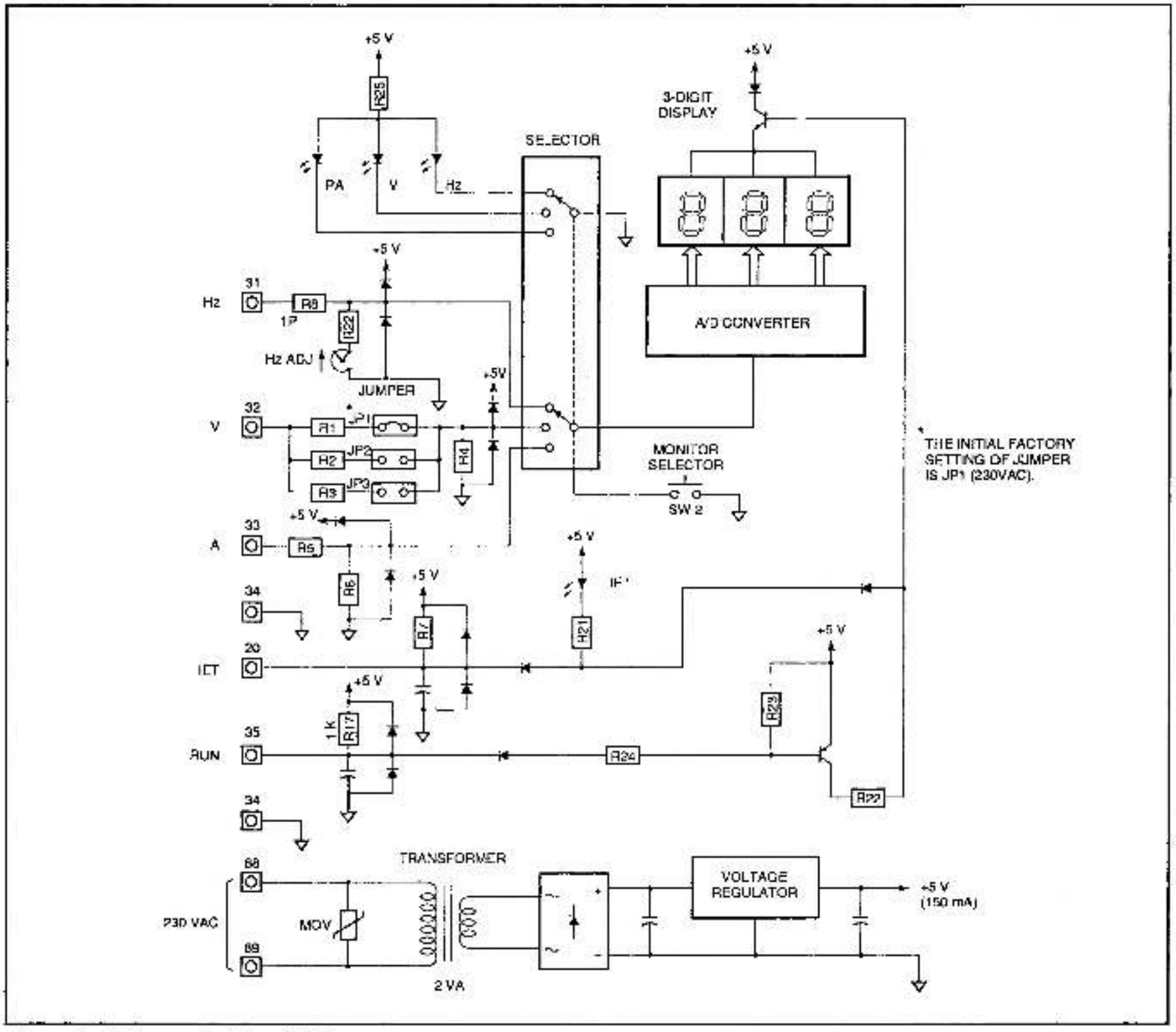

Figure 3. Schematic Circuit Diagram.