

Figure 4.3 — Voltage Selector Jumper

WARNING

Never attempt to change the position of the Voltage Selector Jumper when AC line power is applied to the IQ Data Plus II. Personal injury, including death, could result.

CAUTION

The Voltage Selection Block on the Module accepts the Voltage Selector Jumper **ONLY**. Do not connect any other type of wires to this Terminal Block since improper operation and/or equipment damage will result.

A plastic cover with a screw is used to cover the Voltage Selector Jumper. The Jumper is positioned as determined by the monitored, nominal AC line voltage. There are 4 possible positions, which represent ranges, measured line-to-line. These are:

- 425 to 680 VAC = 460/575V
- 270 to 432 VAC = 380/416V
- 170 to 272 VAC = 208/220/240V
- 96 to 154 VAC = 120V

These ranges are indicated on the Power Module, as shown in Figure 4.3. Consult the wiring plan drawings made up by the user or OEM to determine the intended line voltage. Change the Selector Jumper to the Line Voltage when not using potential transformers. When using potential transformers with a 120 volt (or 110 volt) secondary, the Selector Jumper should be positioned for 96-154 volt range.

After repositioning the Jumper, replace the plastic cover and secure with screw.

4.2 Wiring — The wiring of the IQ Data Plus II must follow a suitable "wiring plan drawing." The term wiring plan, as used here, refers to the drawings made for the specific application. It describes all electrical connections between the IQ Data Plus II and the machine or process equipment. This is made up by the user or OEM.

A typical wiring plan is shown in Figures 4.4A thru 4.4L. Observe the Figures and note the following:

1. Phasing and polarity of the AC current inputs and the AC voltage inputs and their relationship is critical to the correct operation of the wattmeter.
2. The incoming AC line phases A, B and C wire directly to the AC Line Connection Terminals on the chassis, when line voltage is 600 volts or less.
3. NO and NC contacts from the Alarm and Trip Relays can be used to control external devices. These contacts are rated at 10 amperes for 120/240 VAC or 30 VDC.
4. The wires connecting to the IQ Data Plus II must not be larger than AWG No. 14. Larger wires will not connect properly with the various terminal blocks.
5. Wiring between the current transformers and the IQ Data Plus II should be kept as short as possible (200 feet max.). Also, whenever possible, route these lines away from other AC lines and inductive devices. If the lines must cross other AC lines, plan to cross them at right angles.
6. The protective functions of the IQ Data Plus II directly control the Trip or Alarm Relays, as described in Paragraph 2.2 and Table 2.C. DIP switch settings, listed in Paragraph 6.1, determine if and when the Trip and Alarm Relays will be energized.
7. Sync Pulse 24VDC on Terminal 1.
8. WH Pulse Initiator 10A 30VDC, 10A 120/240 VAC NO & NC.

All wiring must conform to applicable Federal, state, and local codes.

WARNING

Insure that the incoming AC power and all "foreign" power sources are turned OFF and locked out before performing any work on the IQ Data Plus II or its associated equipment. Failure to observe this practice can result in serious or even fatal injury and/or equipment damage.

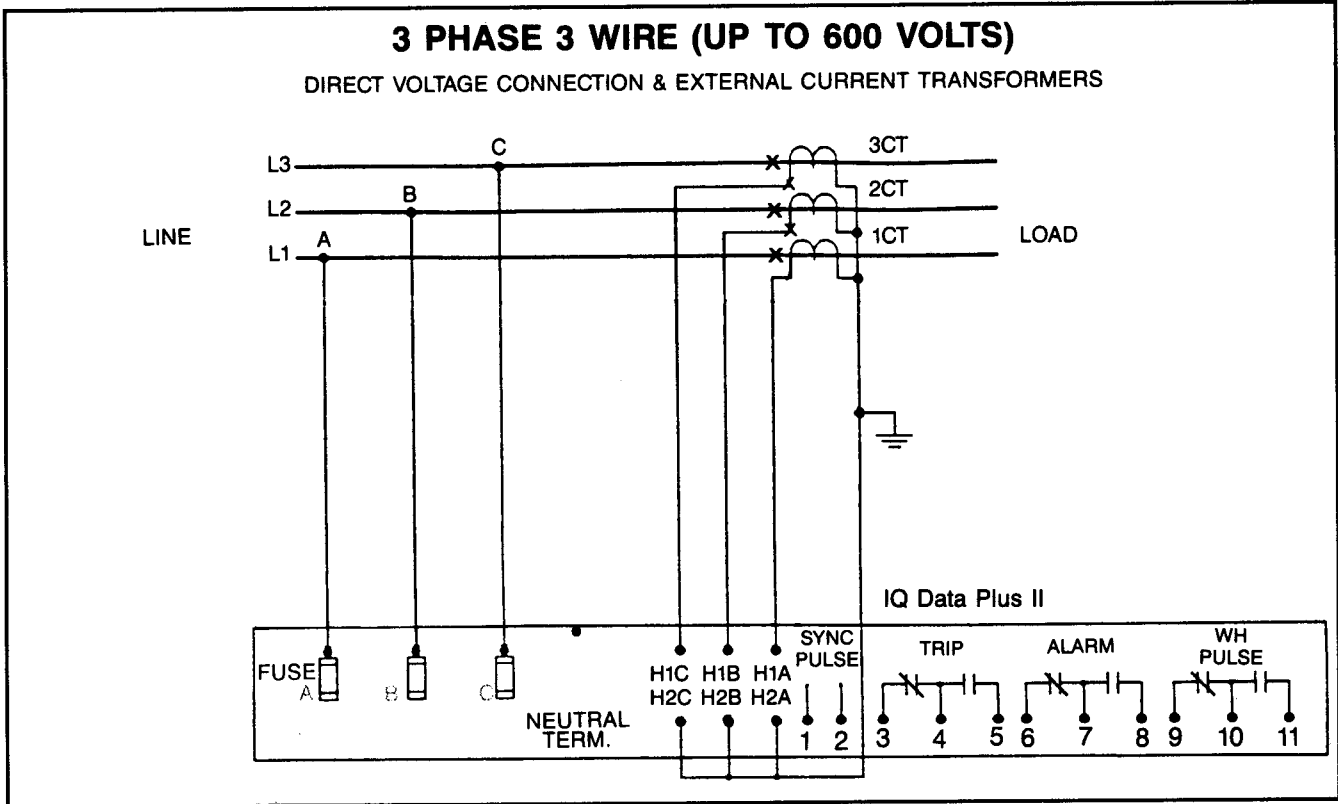


Figure 4.4A — Wiring Diagram

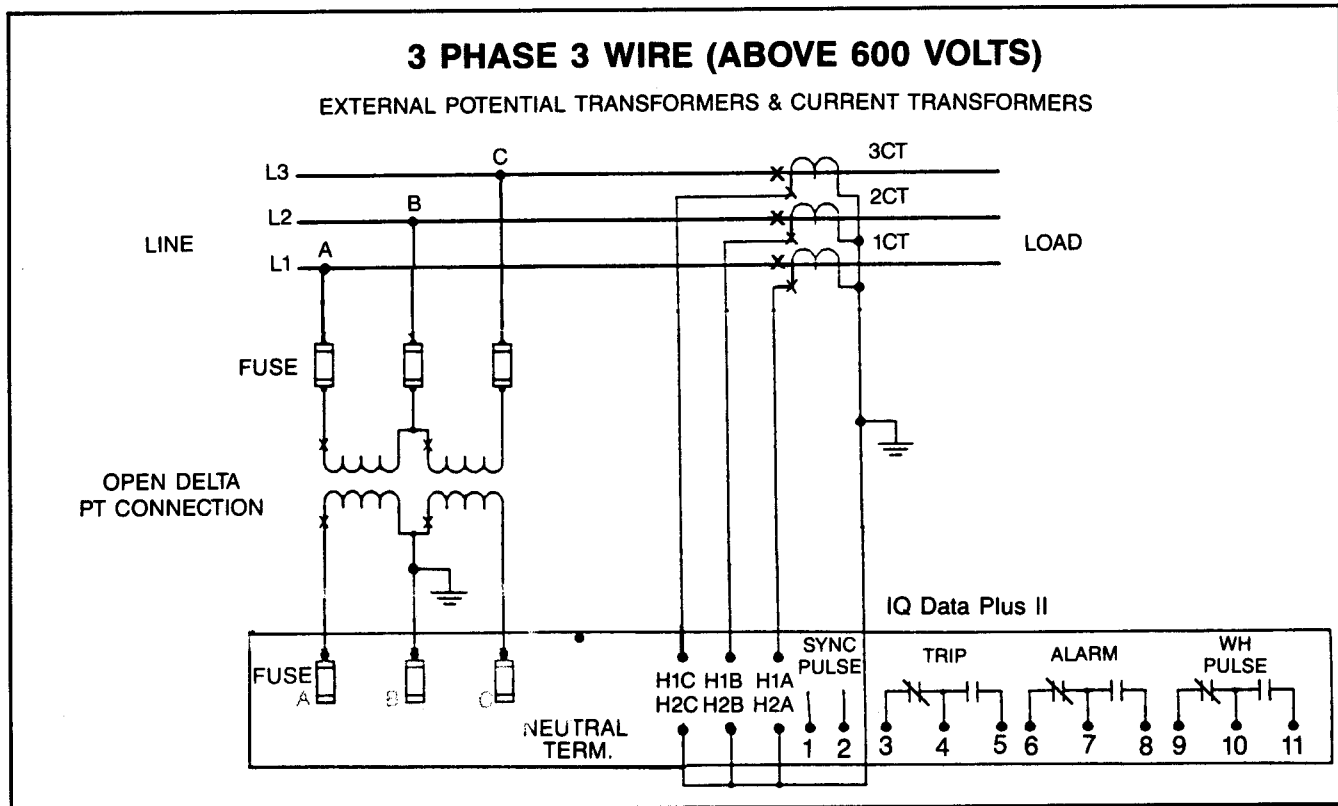


Figure 4.4B — Wiring Diagram

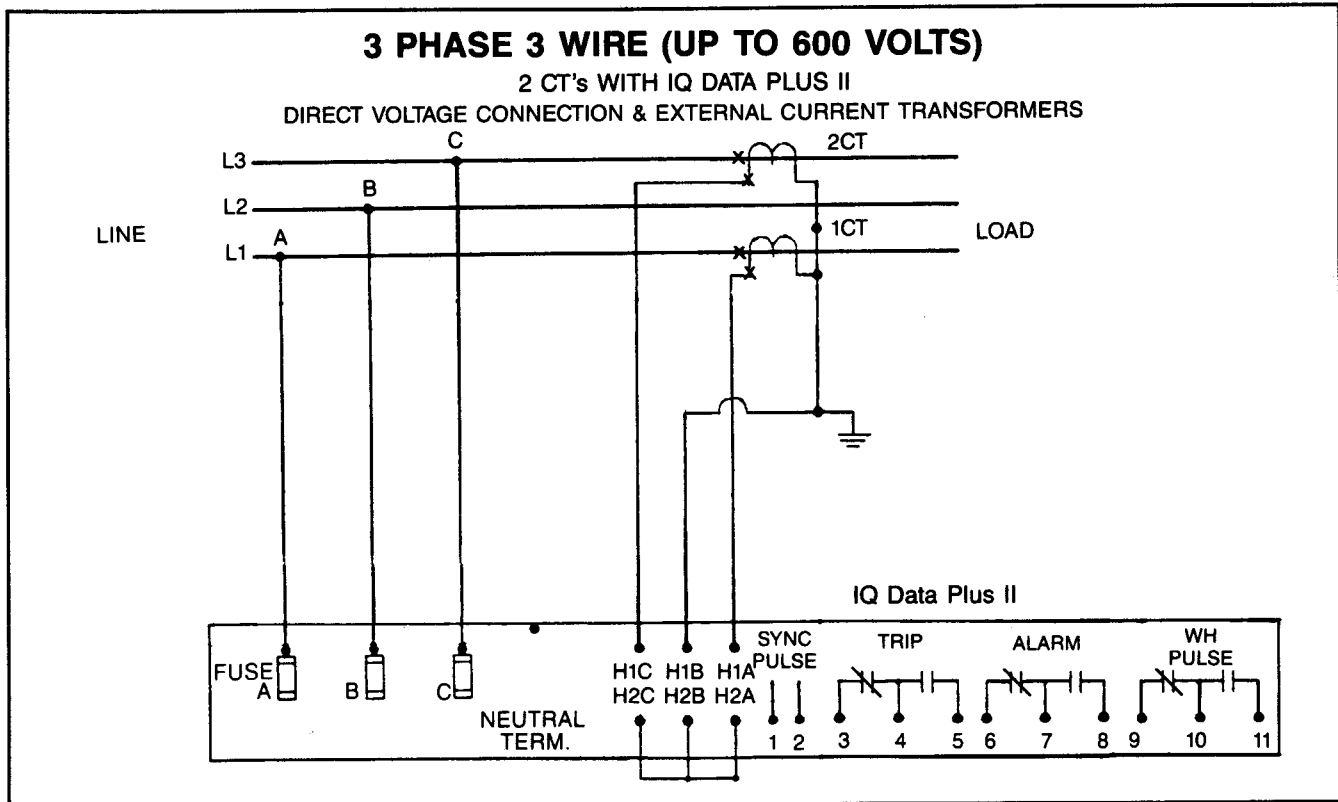


Figure 4.4C — Wiring Diagram

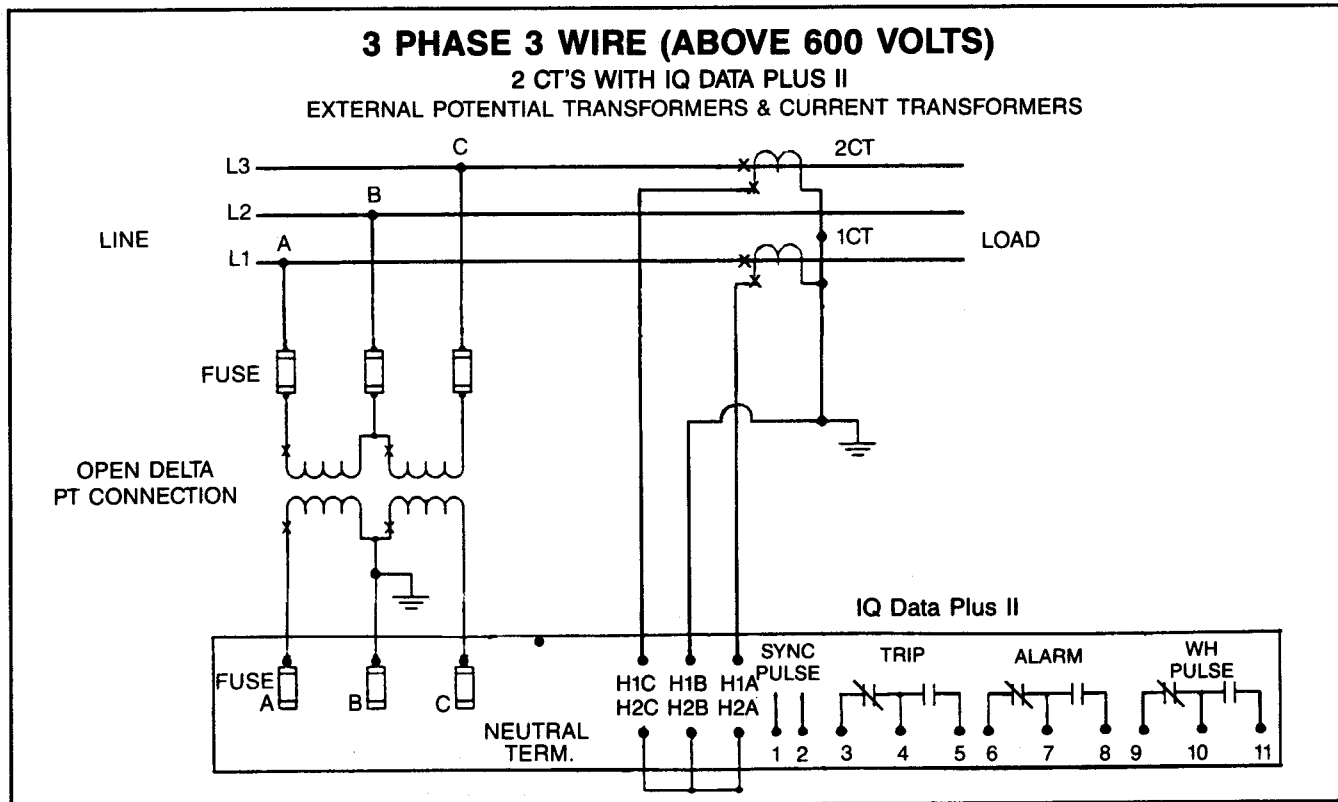


Figure 4.4D — Wiring Diagram

NOTE: This circuit will work, but will not detect a current phase loss if L2 is grounded.

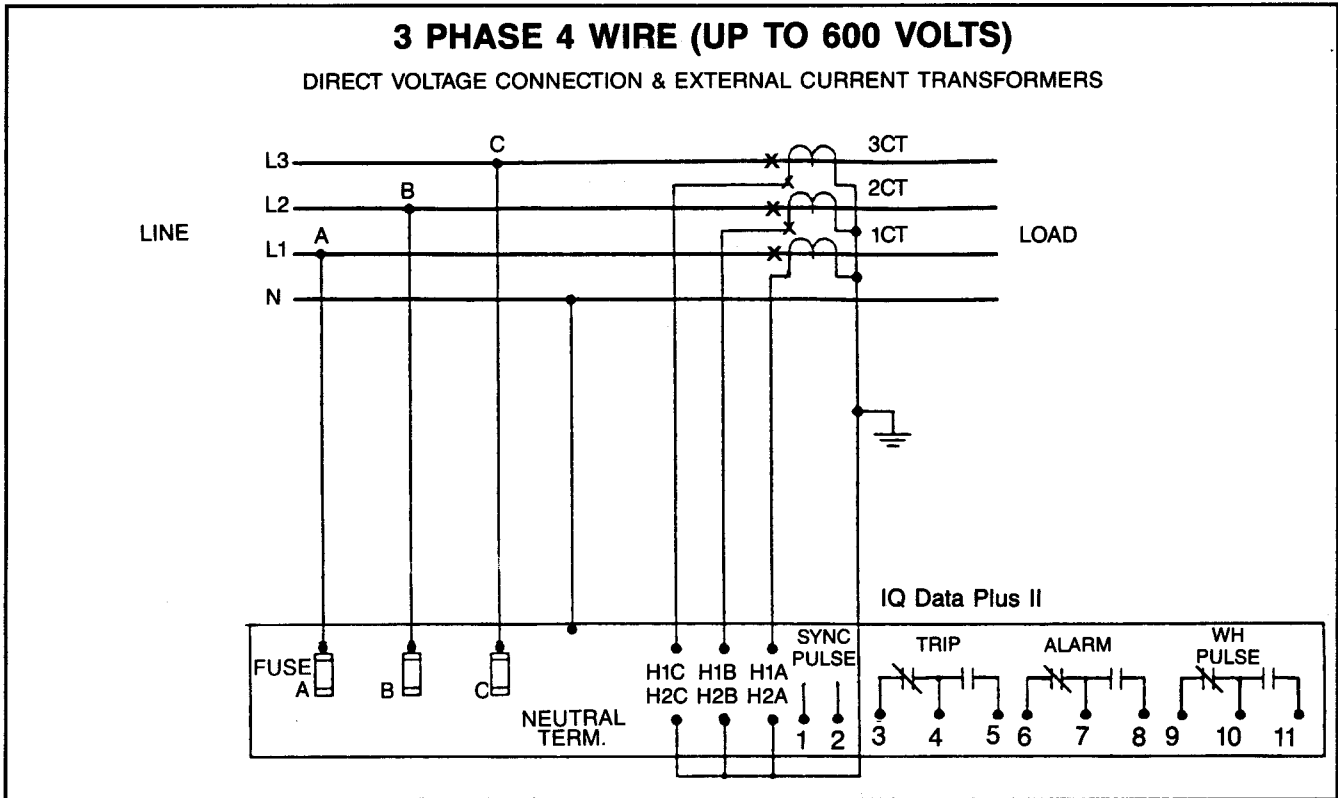


Figure 4.4E — Wiring Diagram

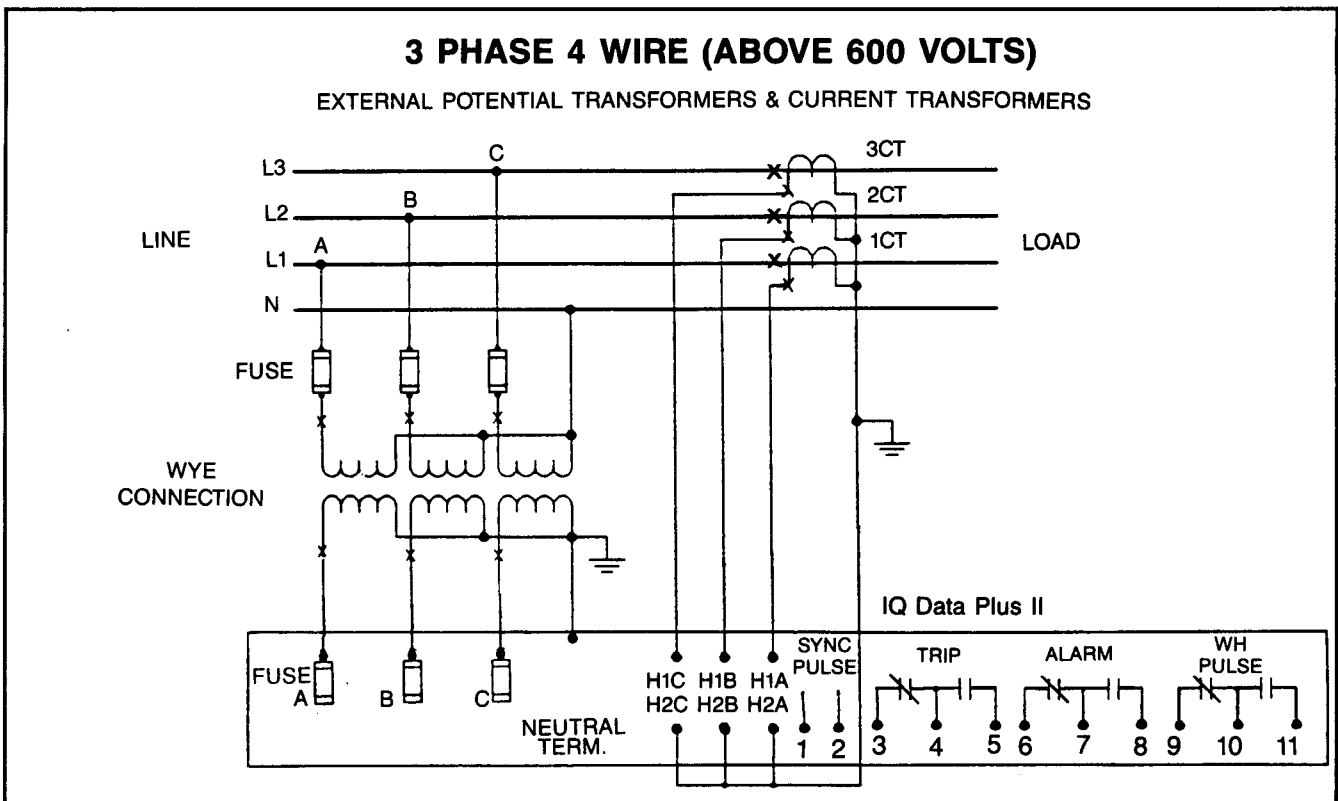


Figure 4.4F — Wiring Diagram

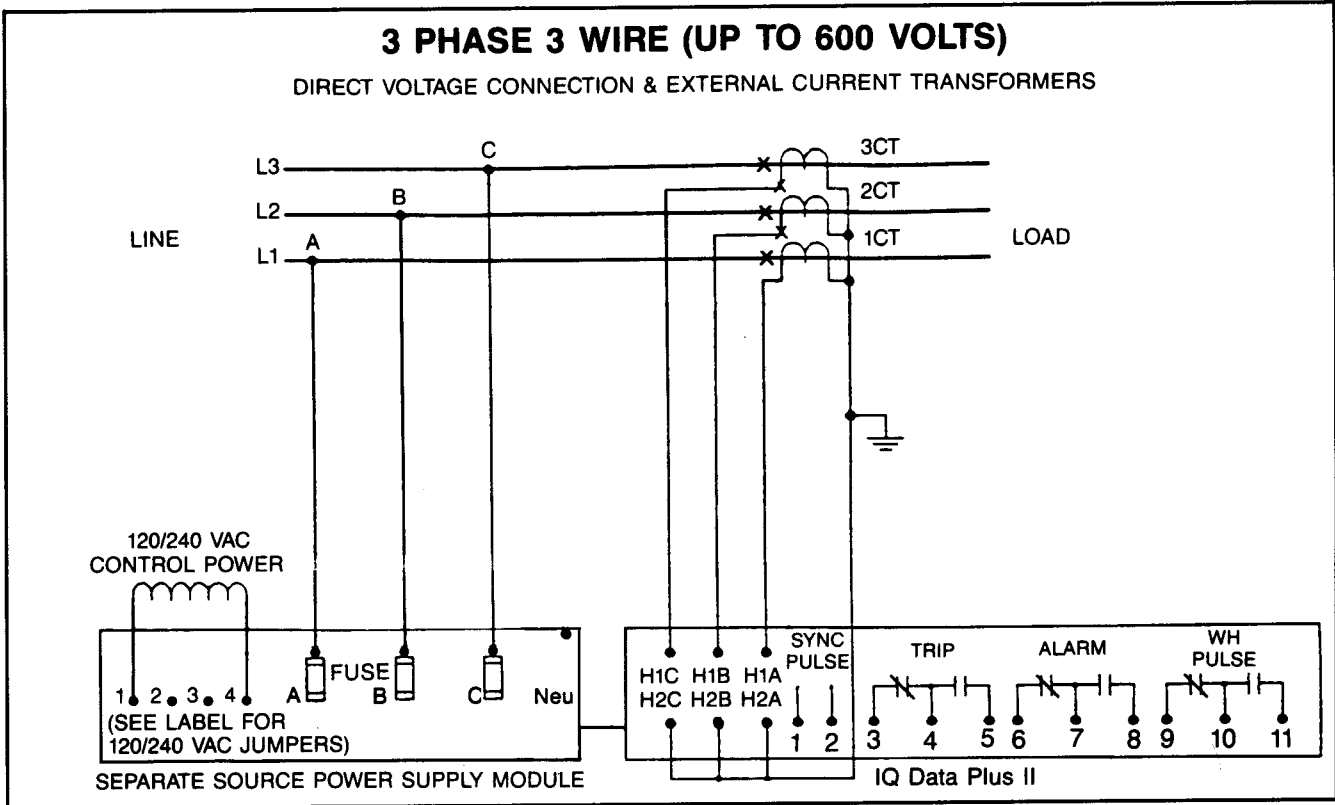


Figure 4.4G — Wiring Diagram

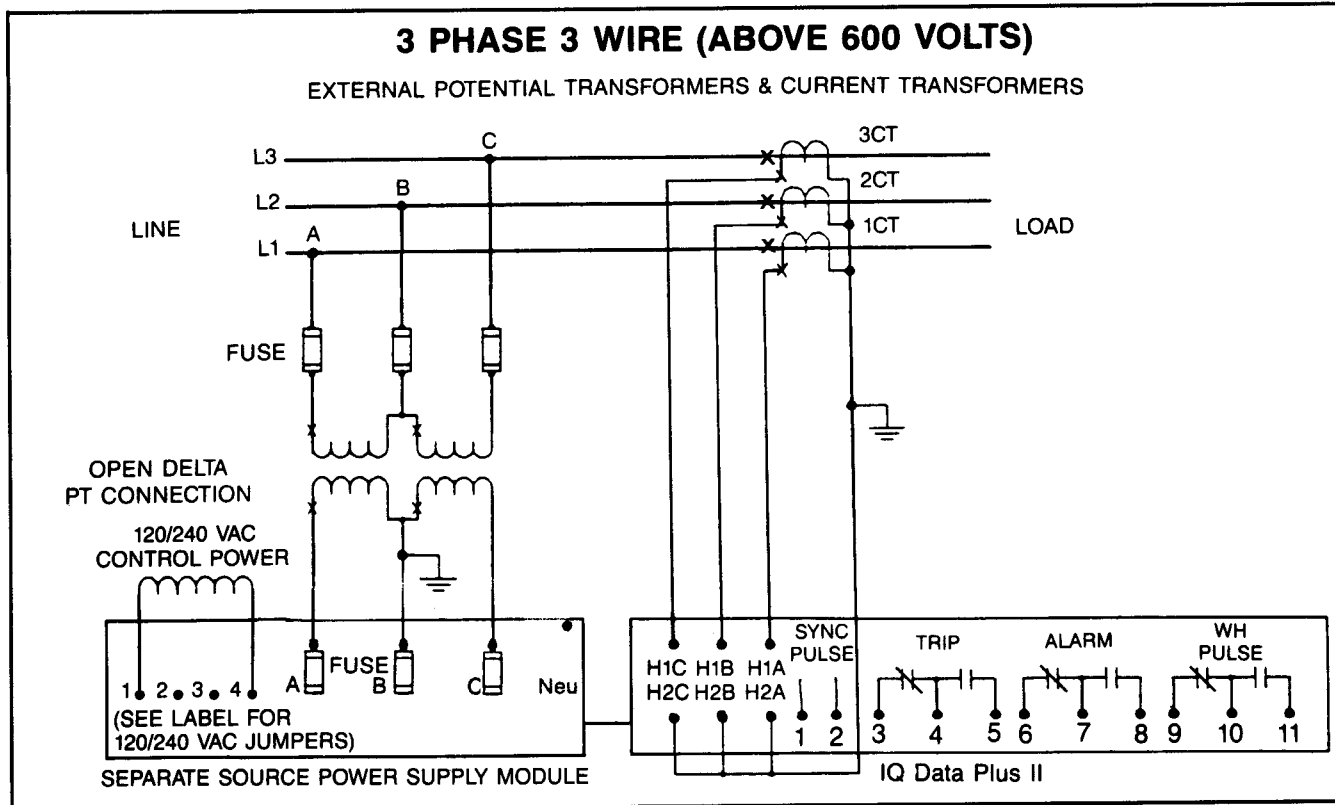


Figure 4.4H — Wiring Diagram

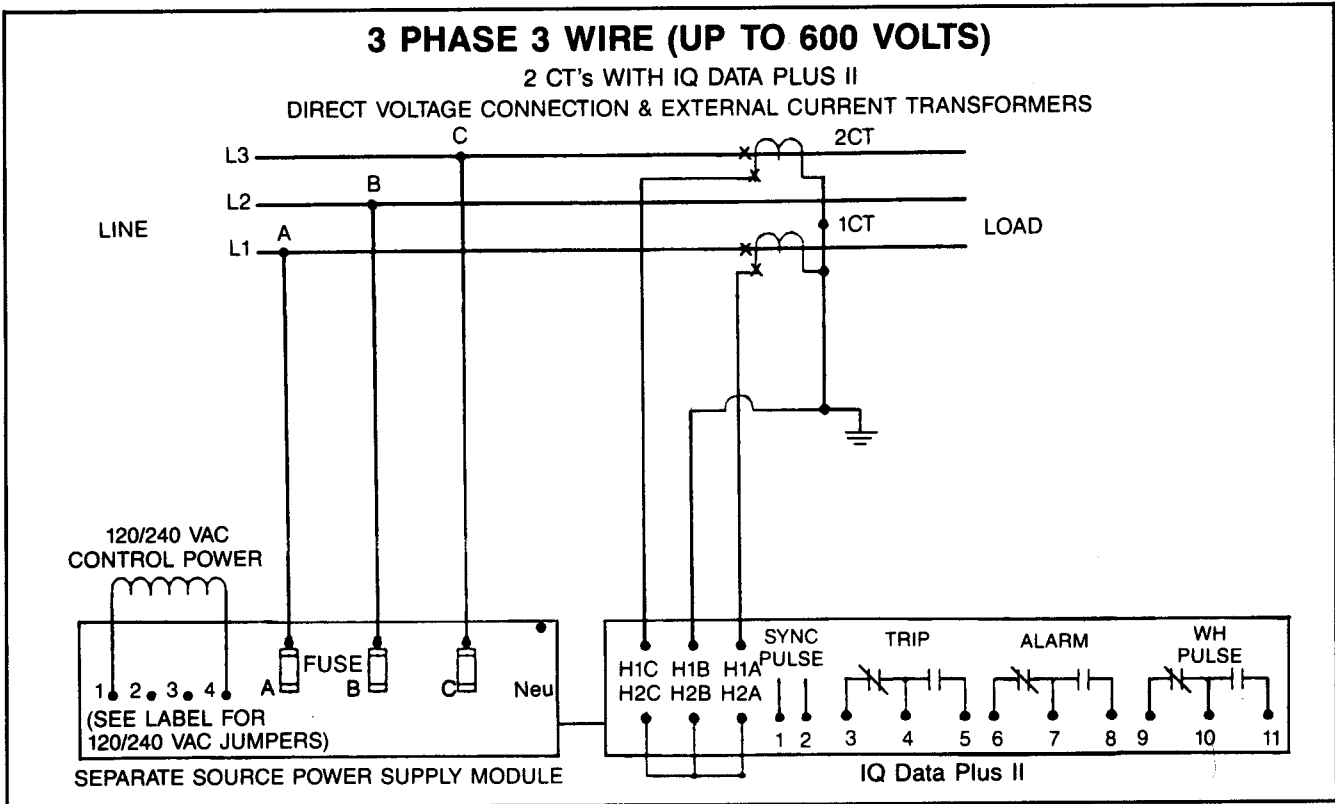


Figure 4.4I — Wiring Diagram

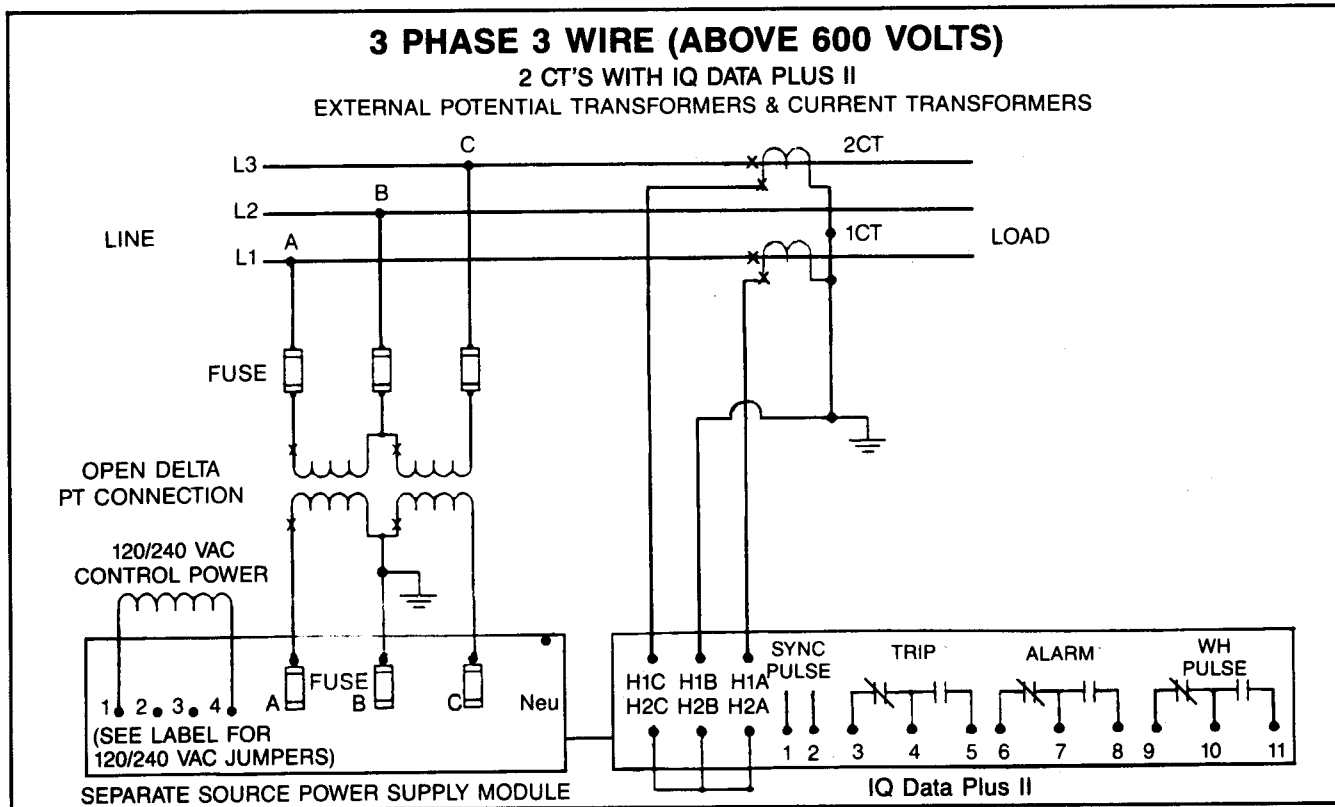


Figure 4.4J — Wiring Diagram

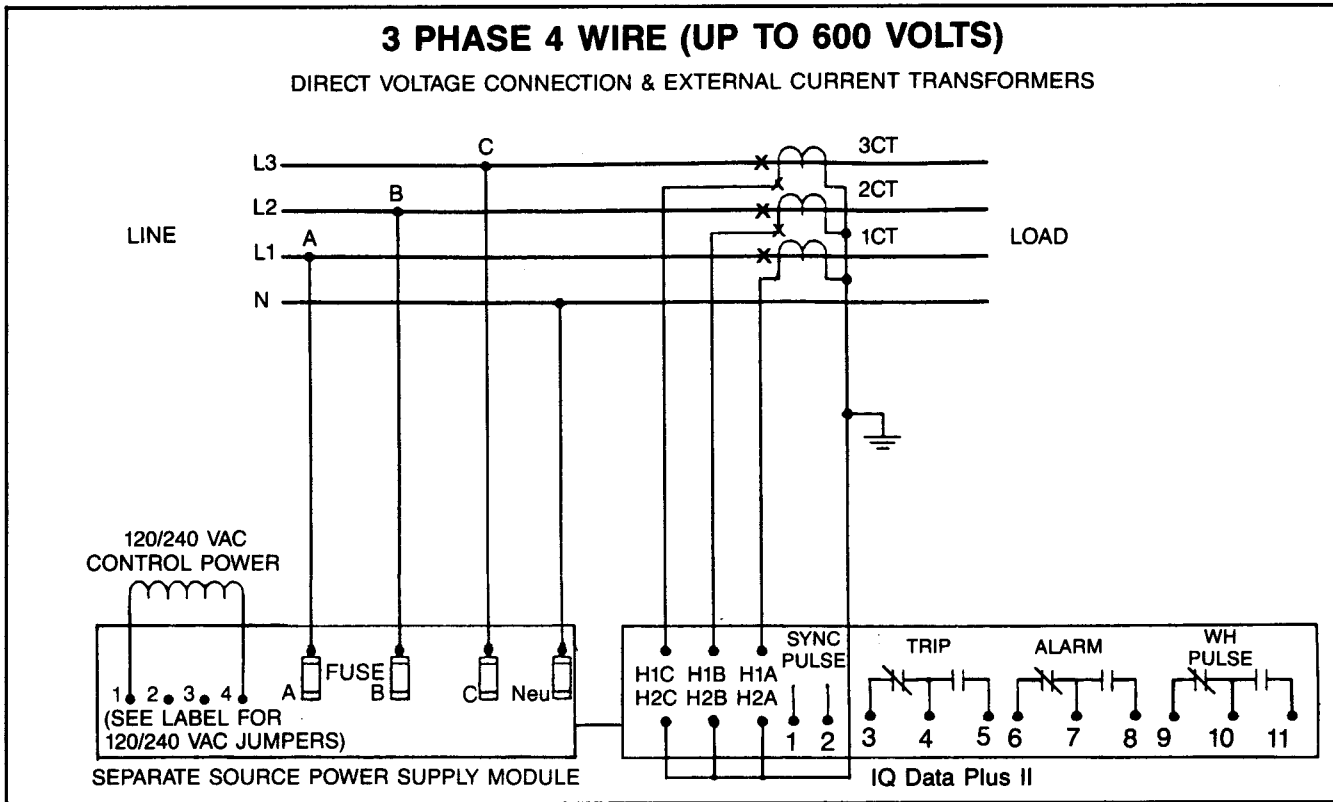


Figure 4.4K — Wiring Diagram

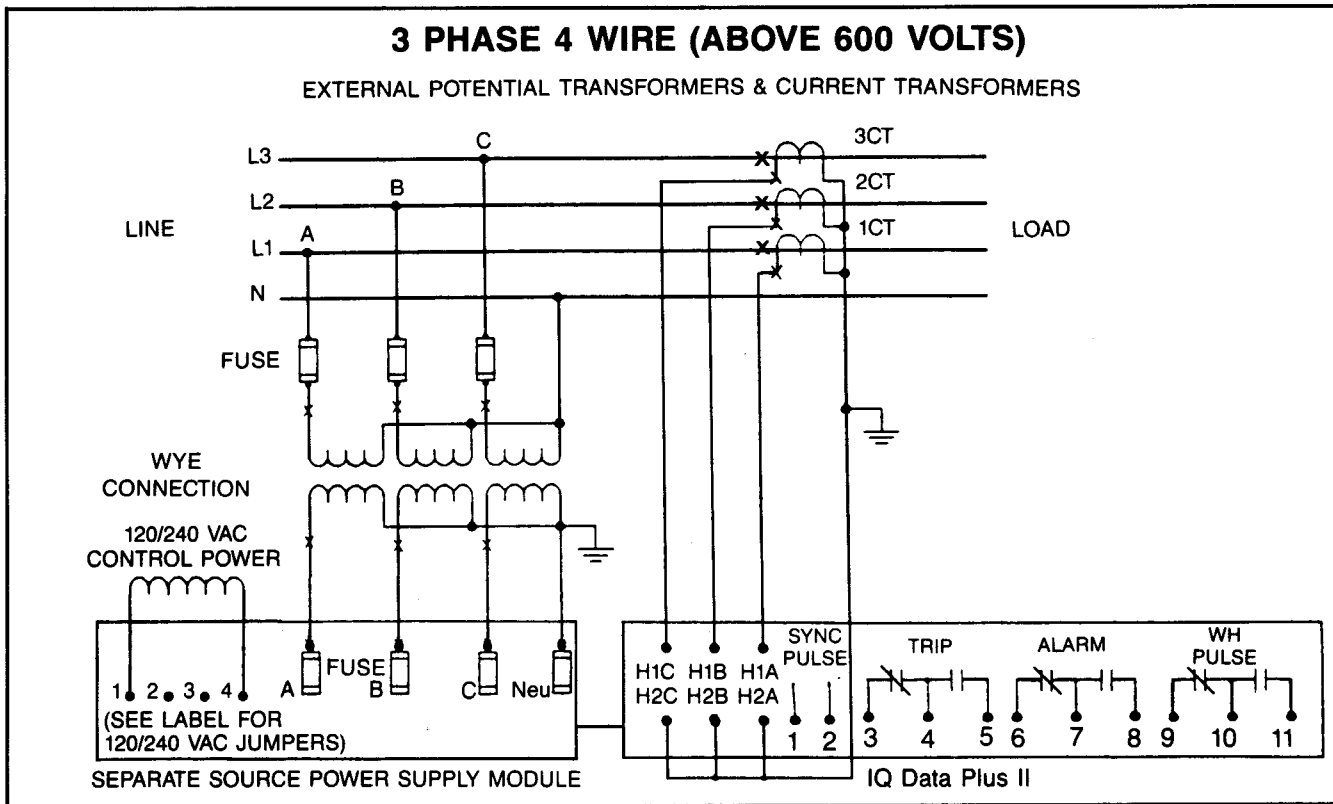


Figure 4.4L — Wiring Diagram

4.3 DIP Switch Settings — The DIP switches located and accessed from the rear-right portion of the chassis must be properly set according to application requirements. Obtain the Installation Record Sheet produced specifically for the application. A blank Record Sheet is shown in the Tables 6.A, 6.C, 6.H, 6.K, 6.N, 6.Q. Note: Section 6 describes how to determine the DIP switch positions. Each of the DIP switches — SW1 thru SW6 — contains eight 2-position switches which are set in combination. (See Figure 4.5.) The switches are turned ON or OFF by sliding the switch. As you face the DIP switches, slide:

- To the LEFT to turn the switch OFF
- To the RIGHT to turn the switch ON

Figure 4.6 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 4.5. Always look for the OFF and ON designations on the hardware or printed circuit board to be sure you are setting the switches correctly.

After all the DIP switches are set according to the settings listed on the Installation Record Sheet, the system is ready to have AC power applied. Follow the procedure listed in Paragraph 4.4 when first applying power to the IQ Data Plus II.

4.4 Initial Startup — The information here is intended to be used when first applying AC power to the IQ Data Plus II. Each item is shown with a box to the left. In this way it can be used as a checklist to reduce the chance of omitting or skipping an item.

WARNING

The following startup procedures must be performed only by qualified personnel who are familiar with the IQ Data Plus II and its associated electrical and/or mechanical equipment. Failure to observe this caution can result in serious or even fatal personal injury and/or equipment damage.

4.4.1 Before Power Application — Before applying AC power to the IQ Data Plus II, perform the following:

- Verify that the incoming AC power to the system is disconnected. Also, if foreign power sources — such as may be wired to the Alarm and Trip Relay contacts — are wired into the panel, verify that these sources are turned OFF and, if possible, locked out.
- Verify all DIP switches are set according to the Installation Record Sheet.
- If installing an IQ Data Plus II with a 3-Phase Power Module, verify that the position of the Voltage Selector Jumper on the Voltage Terminal Block is correct for the nominal voltage.
- Verify that all wiring is correct, as shown on the wiring plan drawings.
- When possible, disable the IQ Data Plus II until the rest of the machine or process has been started up and checked out.

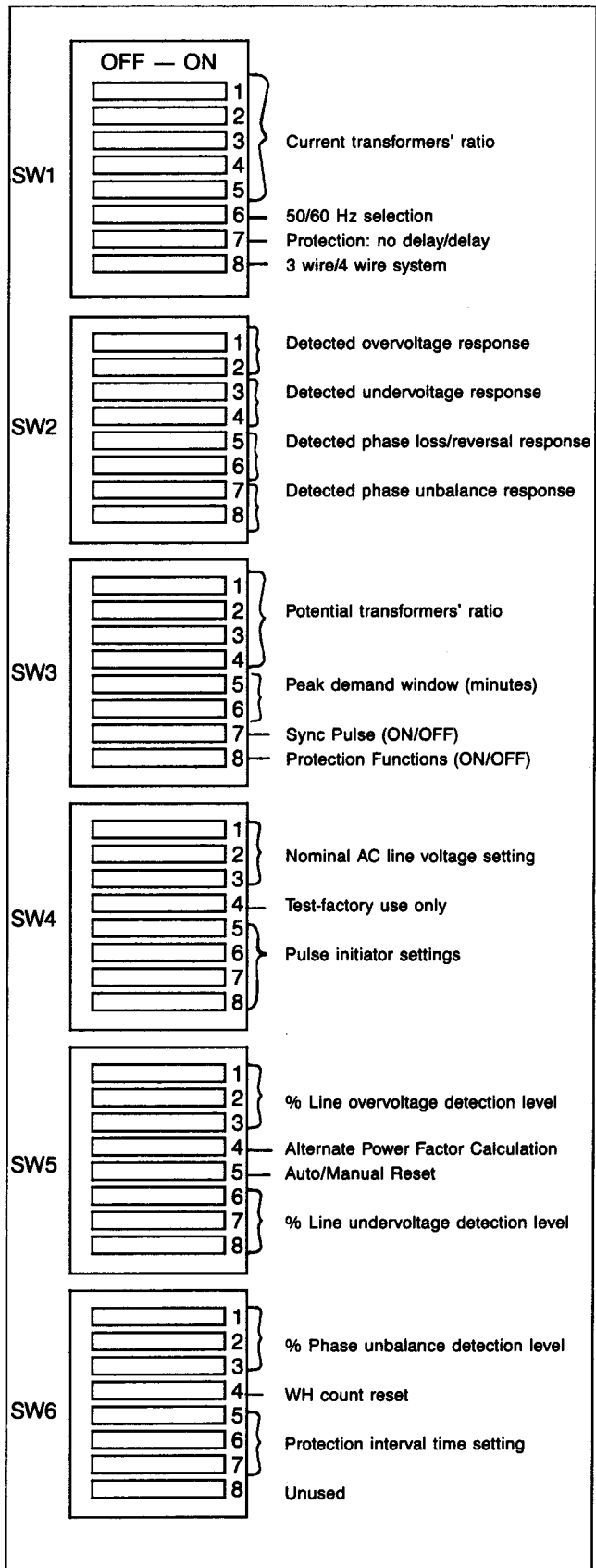


Figure 4.5 — DIP Switches — See Section 6 for programming information

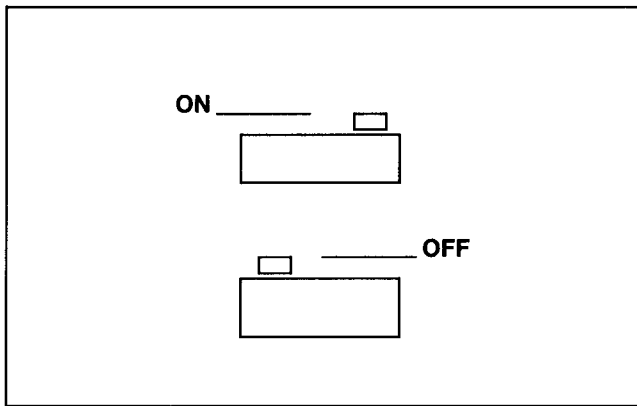


Figure 4.6 — DIP Switch (side view)

Restore AC power and verify that the Operator Panel functions, after an initial 2-second delay, are as follows:

- The I_A AMPS RMS LED illuminates
- The Display Window shows the actual line phase A amperes

4.4.2 Initial Power Application — Perform the following steps when first applying AC power to the IQ Data Plus II:

Apply 120/240 VAC control power between terminals 1 and 4 of Separate Source Power Supply Module. The display should be illuminated. If the unit is not powered, remove control power and check connections to Separate Source Power Supply Module.

Turn on AC power to line being monitored and verify that the line-to-line voltages (A-to-B, A-to-C, and B-to-C) fall within the correct range, as noted on the wiring plan diagram. This is the last step in the initial power application of an IQ Data Plus II with a Separate Source Power Supply Module.

Remove the 3 line fuses contained in the Power Module of the IQ Data Plus II.

Turn on AC power and verify that the line-to-line voltages (A-to-B, A-to-C, and B-to-C) fall within the correct range, as noted on the wiring plan drawing. Note: The voltage range must match the Voltage Selector Jumper's position. See Paragraph 4.1.4 which lists the ranges.

If the voltages do not match — as determined by comparing the actual reading with the Voltage Selector Jumper's position, refer to the system wiring drawings to locate the error.

Remove AC power and re-install the 3 line fuses.

NOTE

If a trip or alarm occurs, refer to Section 7, Maintenance, for details.

Shaded area designates information that replaces or supplements applications using the 120/240 VAC Separate Source Power Supply Module.

Section 5

THEORY OF OPERATION

5.0 General — This Section provides a general description of how the IQ Data Plus II functions internally. Its purpose is to give the user only an overview theory of operation.

5.1 Basic Block — The IQ Data Plus II is controlled by a self-contained microprocessor which is directed by an "executive program" resident in ROM (read-only memory). (See Figure 5.1.) The microprocessor directs the following 4 operations:

- Monitoring the AC line voltage and currents and storing their levels in a "data table" which is a solid state memory device. (The actual signals from the AC line are "conditioned" by various circuits grouped together here and referred to simply as the line interface).
- Checking the information obtained from the AC line being monitored for the various trip and alarm conditions, as listed in Paragraph 2.2.

- Updating the Operator Panel on a regular basis. When a component of the Panel — such as the Step Display Up pushbutton — is pressed, the executive program reacts by displaying the new information requested in the Display Window.
- Conditioning the signals from the control area to make them compatible with the Operator Panel devices and the internal Trip and Alarm Relays. This is carried out in the interface area.

The executive program assigns the highest priority to energizing the Trip and Alarm Relays. Lower priorities are given to other operations, such as updating the Display Window of the Operator Panel.

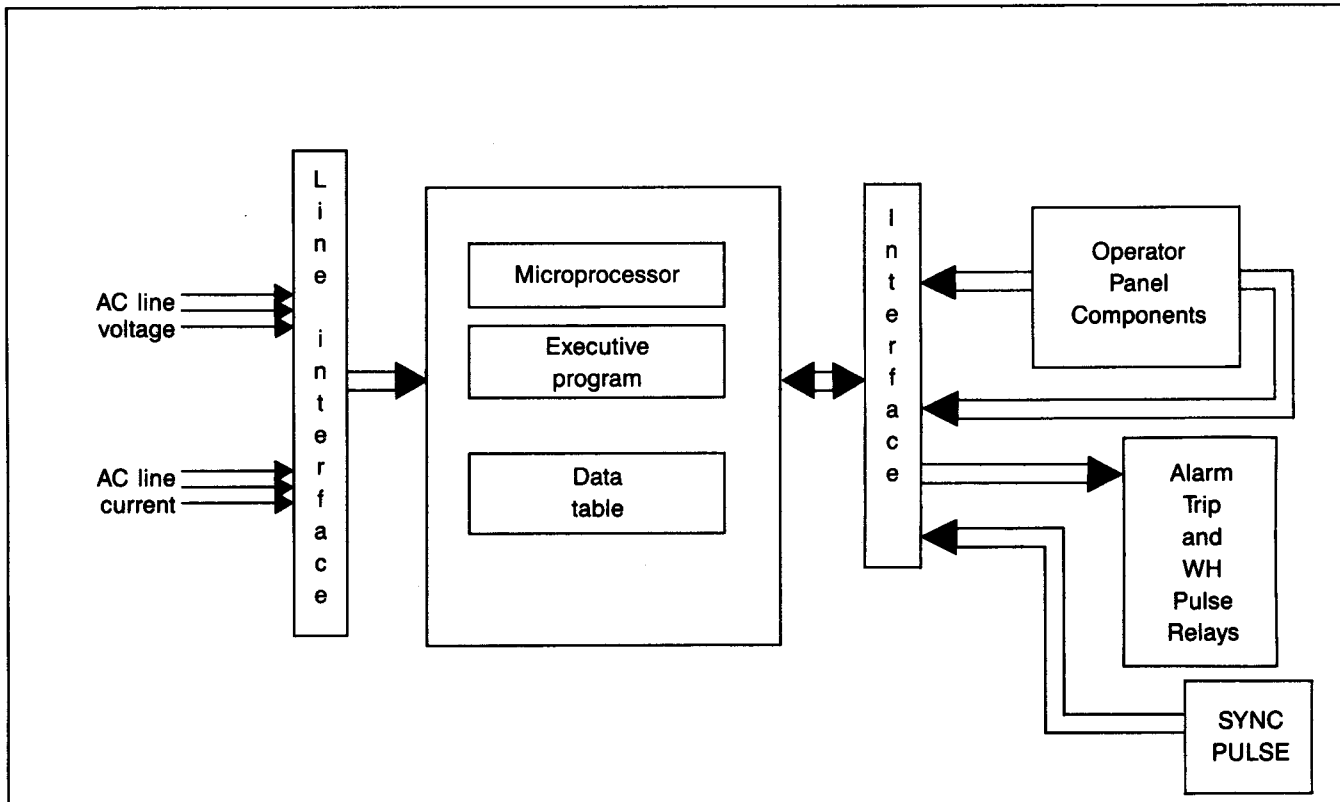


Figure 5.1 — IQ Data Plus II Basic Block