2.1 INTRODUCTION

The IQ DP-4000 is designed for mounting through a cutout in a panel (usually a cabinet face or door). The hardware description is divided into the following:

- Operator Panel
- Rear Access Area
- User-Supplied External Hardware
- Optional Communications (IMPACC) Module

2.1.1 Operator Panel

The operator panel, the front face of the IQ DP-4000, is accessible from the outside of the panel or door into which it is mounted and allows you to:

- Monitor the actual metered values on the display window
- Determine which metered value is being displayed
- Step through the list of metered items
- Determine that an alarm condition exists
- Determine the cause of the alarm condition
- Reset the unit after an alarm condition
- View and reset minimum and maximum values from the faceplate
- Reset energy

See Section 3 for a detailed description of the operator panel.

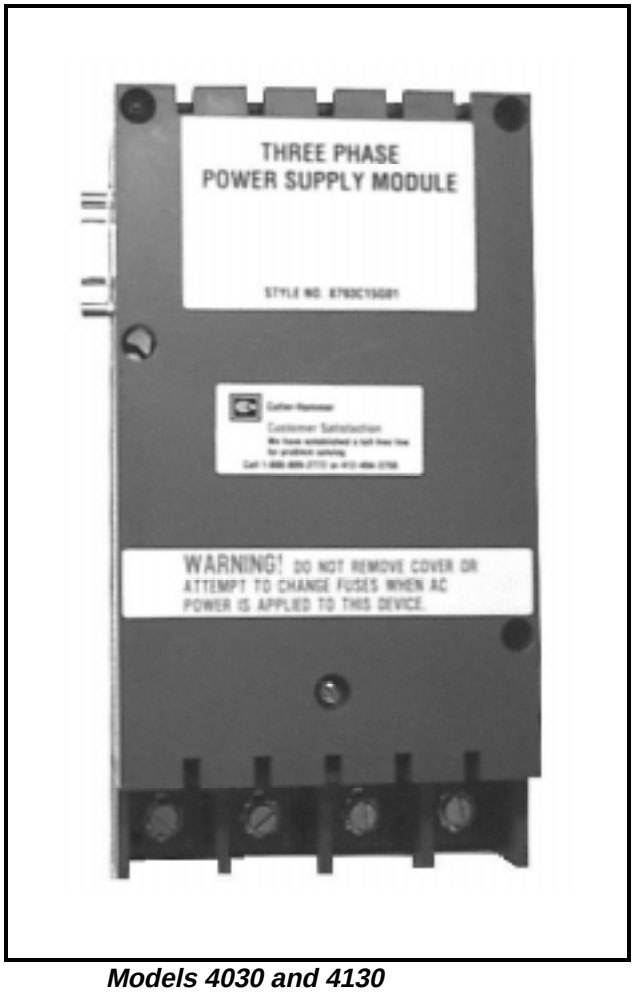
2.1.2 Rear Access Area

You can access the rear of the IQ DP-4000 by opening the door onto which it is mounted. Make all wiring connections to the unit from the rear of the chassis. Figure 2.1 shows the rear of the chassis and includes:

1. The 3-Phase AC line connections to the voltage terminal block at the bottom of the power module.
2. The current transformer terminal block at the top of the chassis connects to the required external current transformers.
3. The Alarm 1/Alarm 2 terminal block connects to controlled, external devices (with the optional I/O module only).
4. Setpoint Switches, located on the rear right side of the chassis, allow you to tailor each IQ DP-4000 model for your specific applications. For a complete description of each Setpoint Switch setting see Section 5.
5. The power module is available as a separate source power module (Models 4010, 4110) and as a 3-Phase power module (Models 4030, 4130).

The Power Module for the IQ DP-4000 is mounted on the rear of the chassis when shipped, but can be detached and moved up to 45 inches (91.44 cm) away using an optional ribbon cable (Style No. 2107A55G03) if local codes prevent AC power devices from being located on the cabinet door.

Figure 2.1 The Three-Phase Power Module for



Models 4030 and 4130

Note: The Separate source power supply can be powered by 96-264VAC or 100-350VDC.

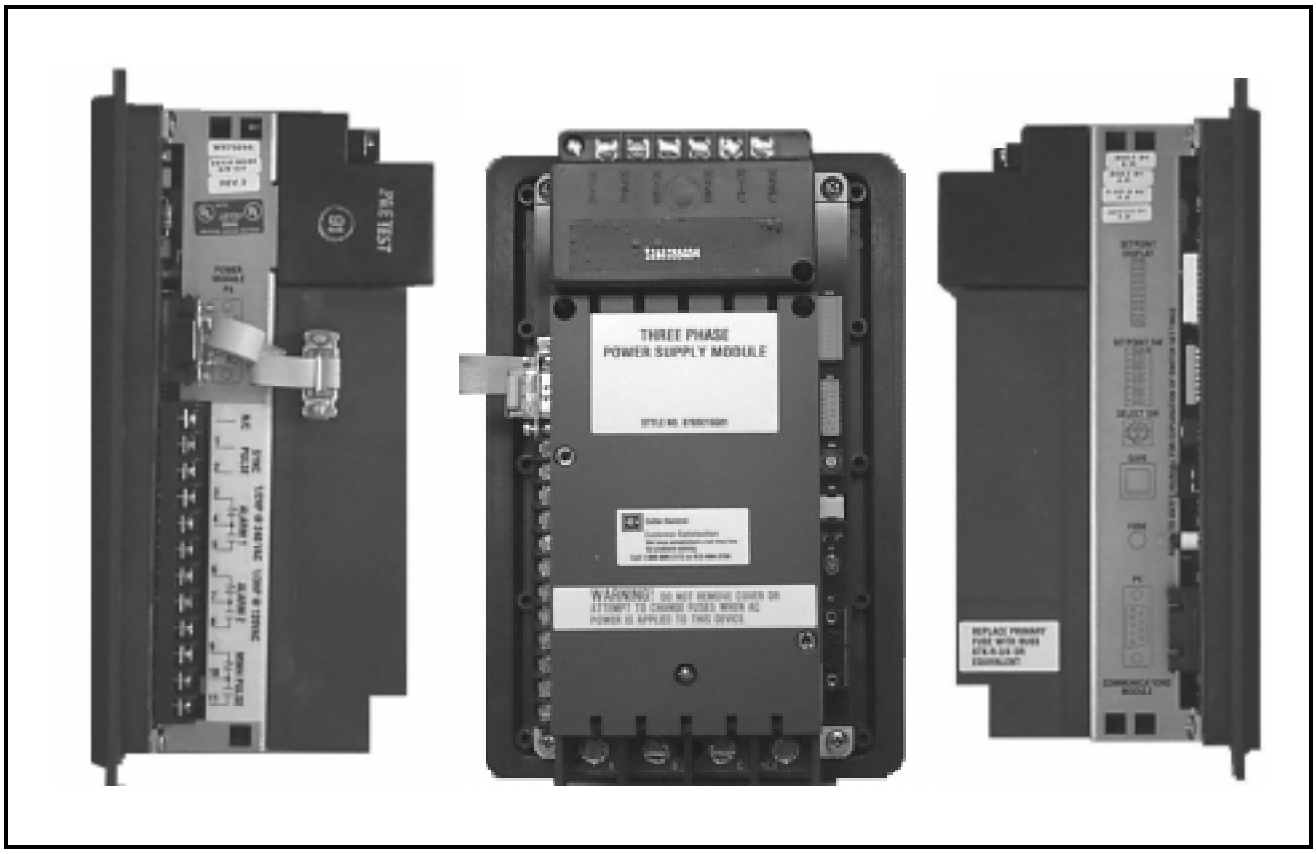


Figure 2.2 Rear Access Area of Chassis

⚠ WARNING

REMOVE ALL VOLTAGE FROM THE IQ DP-4000 BEFORE REMOVING AND/OR REPLACING THE FUSES.

6. A fuse, internal to the power module, is located in series with each of the 3 incoming AC lines. The fuses are 3/4 amp, 600 volt, 200kA interrupting rating. These fuses are internal to the power module. You can access them by removing the three screws holding the cover in place (see Figures 2.2 and 2.3).

7. A fuse, external to the power module, is located on the rear right of the chassis. This fuse is a 1/4 amp fuse to protect the 24V on Terminal Block 1 for the Discrete input.

Required: The voltage terminal block has four terminals for wiring (one is neutral). The neutral must be connected to Neutral or Ground depending on your configuration.

8. The communication port, located on the lower right chassis, is designed to connect with the optional communication module (a PONI module). See Section 2.1.4 for a detailed description.

9. The discrete input can be configured to be either a reset input or a sync pulse input. The input is activated by a contact closure across terminal block contacts 1 and 2. See Section 5.15.1 for configuring this input.

10. Watt-hour Pulse. The Watt-hour pulse initiator is a set of contacts that completes a circuit and sends a pulse signal to an external pulse recorder. You can program the amount of energy between pulses using Setpoint Switches (see Section 5.15.3). The pulse initiator is a KYZ output, meaning the relay will change state for each pulse.

2.1.3 User-Supplied External Hardware

The IQ DP-4000 requires you to wire at least 2, and up to 3 current transformers into the CT terminal block from an external location (see Figures 4.4 - 4.15). These are user-supplied and must have a 5 amp secondary. Potential transformers are required only for voltages above 600 V and are wired directly to the AC line connection terminals.

2.1.4 Optional Communications Module

The IQ DP-4000 is an IMPACC-(Integrated Monitoring Protection and Control Communications) compatible device. IMPACC can remotely monitor, control and program the IQ DP-4000 when it is equipped with the optional communications module. An IPONI is typically mounted on the back of the power module and connects to the IQ DP-4000 via the communications port on the lower right side of the rear of the chassis.

IMPACC is a noise immune communications system that permits communications from the IQ DP-4000 to a master computer via a high frequency carrier signal over a shielded twisted pair of conductors. The conductors can extend up to 10,000 feet without using repeaters. The INCOM (Industrial Communications) chip allows communications between IMPACC compatible devices, and accounts for the system's high degree of reliability.

Functions available remotely through the communications option are:

- Monitoring and trending of displayed values and device status
- Device programming
- Min/Max values
- *Cause of alarm* information

2.1.4.1 IMPACC Series III Software

Series III Software provides the ability to monitor and record power distribution system data as it occurs. Series III is a Microsoft™ Windows-compatible application featuring user-friendly, menu-driven screens with easy set-up and operation. Additional features include:

- System/device alarm logging and reporting
- Gateway interface for connectivity to other information networks
- Data trending

2.1.4.2 IMPACC Enhanced Graphics

Enhanced Graphics software provides the capability to generate custom animated color graphics. For example, animated one-line drawings of electrical power distribution systems, flow diagrams of processes, equipment elevation view, and other graphical representations can be developed.

2.1.4.3 IMPACC Connectivity

An IMPACC network or computer running Series III software can interface with other networks. Examples of IMPACC connectivity interfaces include:

- PLCs (Programmable Logic Controllers)
- DCSs (Distributed Control Systems)
- BMSs (Building Management Systems)
- PC-based graphical operator interface programs

2.2 SPECIFICATIONS

This section covers the following specifications:

- General Specifications (Table 2.A)
- Protection Function Specifications (Table 2.B)
- Metering specifications (Table 2.C)

2.2.1 General Specifications

The IQ DP-4000 meets the following specifications:

Function	Specifications
Power Requirement	PT Burden (3-Phase power module) 10VA PT Burden (separate source

	power module) 0.02 VA CT Burden 0.003 VA
Frequency	50/60 Hz
Line Characteristics	Nominal Line ±20%
Operating Temperature	-20° to 70°C (-4° to 158°F)
Storage Temperature	-30° to 85°C (-22° to 185°F)
Humidity	5 to 95% RH non-condensing
Fuses	1/4 ampere 3/4 ampere, 600 volts, Buss Type KTK-R-3/4 (3 required).
Alarm/WH Contact Ratings	10 amps @ 120/240 VAC (Resistive) 10 amps @ 30 VDC (Resistive)

Table 2.A General Specifications

2.2.2 Protective Function Specifications

You can individually select each of the protection functions to initiate an alarm on any, all, or no functions. A short description of each of the protection functions follows:

- Voltage phase loss. A Voltage phase loss is detected when the amplitude of any single phase is less than 50% of the nominal amplitude.
- Current phase loss. A Current phase loss is detected when the current amplitude of the smallest phase is 6.25% of the current amplitude of the largest phase.
- Phase Unbalance. A phase voltage unbalance is detected when the difference between the largest and smallest line-to-line voltages exceeds the percentage of nominal line voltage by a factor of 5, 10, 15, 20, 25, 30, 35, or 40%. (The Setpoint Switch position determines the % factor.)Phase Reversal. A phase reversal is detected if a phase sequence different from that which was programmed (ABC or CBA) is detected.
- Overvoltage. An overvoltage is detected when the amplitude of the AC line voltage exceeds 105, 110, 115, 120, 125, 130, 135, or 140% of the nominal line voltage. (The Setpoint Switches determine the % factor.)
- Undervoltage. An undervoltage is detected when the amplitude of the AC line voltage falls below 95, 90, 85, 80, 75, 70, 65, or 60% of the nominal line voltage. (The Setpoint Switches determine the % factor.)

All protected functions update every 1.4 seconds with a 60 Hz line, or every 1.5 seconds with a 50 Hz line.

Protection Function	Description
Voltage Phase Loss	Any phase less than 50% of nominal
Current Phase Loss	Smallest phase less than 6.25% of largest phase
Phase Unbalance	Line voltage ± nominal in ranges from 5 to 40%
Phase Reversal	Absolute monitoring
Overvoltage	Range 105 to 140%
Undervoltage	Range 95 to 60%
Alarm Delay	Range 1 to 20 seconds
Reset Delay	Range 1 to 120 seconds

Table 2.B Protection Function Specifications

2.2.3 Metering Specifications

Table 2.C shows the metering specifications for the IQ DP-4000.

Item	Displayed through IMPACC	Local Display
AC Amperes Phases A, B, C	+/- 0.3%	+/- 0.3% +/- 1 digit
AC Voltage Phase A-B, B-C, C-A Phase A-N, B-N, C-N	 +/- 0.3% +/- 0.3%	 +/- 0.3% +/- 1 digit +/- 0.3% +/- 1 digit
Watts	+/- 0.6%	+/- 0.6% +/- 1 digit
Vars	+/- 0.6%	+/- 0.6% +/- 1 digit
VA	+/- 0.6%	+/- 0.6% +/- 1 digit
Watt-hours	+/- 0.6%	+/- 0.6% +/- 1 digit
Var-hours	+/- 0.6%	+/- 0.6% +/- 1 digit
VA-hours	+/- 0.6%	+/- 0.6% +/- 1 digit
Power Factor	+/- 1 %	+/- 1 %
Frequency	+/- 0.1Hz	+/- 0.1 Hz
% THD	Through 31st Harmonic	

Table 2.C Metering Specifications

Accuracy is maintained from 3% to 250% of the full scale of the device.

Nominal Full Scale Current: 5 Amps ac

Nominal Full Scale Voltage: 120-600 Vac

Certification

UL:	Listed UL-508, File E62791, NKCR Auxiliary Devices
NEMA:	3R, 12 (when gasketed)
FCC:	Part 15, Class A