

6.1 LEVEL OF REPAIR

This manual is written assuming you will perform only unit-level troubleshooting. If you trace the cause of a malfunction to the IQ DP-4000, replace the unit with a spare and return the malfunctioning unit to Cutler-Hammer for factory repairs.

6.2 MAINTENANCE AND CARE

The IQ DP-4000 is designed to be a self-contained and maintenance-free unit. The printed circuit boards are calibrated and conformally coated at the factory. They are intended for service by factory trained personnel only.

Operate the IQ DP-4000 in an environment within the temperature range of -25°C to +70°C. The environment should also be free of excess humidity.

If you have spare units, store them in the original packing material and container.

6.3 TROUBLESHOOTING

This section divides troubleshooting into two parts:

- Troubleshooting during initial startup (refer to Table 6.A)
- Troubleshooting during operation (refer to Table 6.B)

 **WARNING**

ALL MAINTENANCE PROCEDURES MUST BE PERFORMED ONLY BY QUALIFIED PERSONNEL WHO ARE FAMILIAR WITH THE IQ DP-4000 AND ITS USES. FAILURE TO OBSERVE THIS WARNING COULD RESULT IN SERIOUS INJURY, DEATH, AND/OR EQUIPMENT DAMAGE.

TROUBLESHOOTING PROCEDURES MAY INVOLVE WORKING ON EQUIPMENT IN AREAS WITH EXPOSED LIVE PARTS WHERE THE HAZARD OF A FATAL ELECTRIC SHOCK IS PRESENT. PERSONNEL MUST EXERCISE EXTREME CAUTION TO AVOID INJURY OR EVEN DEATH.

ALWAYS DISCONNECT AND LOCK OUT THE CURRENT SOURCE AND CONTROL POWER SUPPLY BEFORE TOUCHING THE COMPONENTS ON THE REAR OF THE IQ DP-4000.

6.4 REPLACEMENT

To replace the IQ DP-4000:

1. Turn off control power at the main disconnect or isolation switch of the power supply. If the switch is not located in view of the IQ DP-4000, lock it out to guard against other personnel accidentally turning on the switch.
2. Verify that all “foreign” power sources wired to the IQ DP-4000 are de-energized. These sources may also be present on the relay and the input/output terminal block. Temporarily short the current transformer (CT) inputs at a point prior to the IQ DP-4000’s terminals before attempting to open the terminals on the IQ DP-4000.
3. Before disconnecting any wires from the unit, you must individually identify them to assure that you can reconnect them properly. Make a sketch to aid in terminal and wire identification.
4. If an optional ribbon cable connects with the communication port, carefully disconnect it.
5. If the power module for the unit is in a remote location, carefully unplug the optional extension cable from the IQ DP-4000 chassis, not from the power module. Remove the wires by loosening the wire connection at the screw terminal.

 **WARNING**

SUPPORT THE IQ DP-4000 FROM THE FRONT SIDE WHEN THE SCREWS ARE LOOSENED OR REMOVED IN STEP 6. WITHOUT SUCH SUPPORT, THE UNIT COULD FALL OR THE PANEL COULD BE DAMAGED.

6. Remove the mounting screws holding the unit against the door or panel. The screws are accessible from the rear of the unit. Carefully lay the screws aside for later use.
7. Remove the present unit and mount the replacement unit.
8. To connect the replacement unit, reverse the procedure outlined in steps 4 - 7.
9. Use the sketch you made in step 3 to replace each wire at the correct terminal.
10. Go to Section 4.5 and perform initial startup.

6.5 TECHNICAL ASSISTANCE

For information, technical assistance, or referral to an authorized distributor, contact Cutler-Hammer

Advanced Products Support Center (APSC) at 1-800-809-2772.

Symptom	Probable Cause(s)	Solution
All Operator Panel indicators are off.	AC line voltage level is deficient.	Locate cause of deficiency in AC line monitored.
	Separate Source AC control power is deficient (only if using separate source power module).	Locate the cause of the deficiency in the AC control power line. If power is sufficient, replace unit.
	AC line, or optional, external PTs are not properly selected, wired, or installed.	Verify that the AC line and/or PTs are wired as shown on the wiring plan drawings for the application.
Digit 1 flashes in the display window, indicating an external trip.	A trip condition has been externally initiated through the Communications Port.	Determine why the trip was initiated from the external device through the Communications Option.
Digit 2 flashes in the display window indicating an overvoltage	AC line, or optional, external PTs are not properly installed or wired.	Verify that the AC line, and PTs are installed and wired as shown on the wiring plan drawing for the application.
Digit 3 flashes in the display window, indicating an undervoltage.	An Undervoltage condition actually exists.	Isolate the AC line deficiency's cause.
Digit 4 flashes in the display window, indicating a phase unbalance.	A Phase Unbalance condition exists.	Isolate the cause of the AC line deficiency.
Digit 5 flashes in the display window, indicating a voltage phase loss.	A Voltage Phase Loss condition exists.	Isolate the cause of the AC line phase cause.
	Blown or loose fuse(s).	Check the fuse(s) on the affected phase(s). Reseat fuse(s). Replace if necessary.
Digit 6 flashes in the display window, indicating a current phase loss.	A Current Phase Loss condition exists.	Correct the improper wiring.
Digit 7 flashes in display window, indicating a phase reversal.	A Phase Reversal condition exists.	Isolate the cause of the AC line reversal. Check the utility to determine their phase sequence.
Digit 8 flashes in display window, indicating an internal malfunction.	IQ DP-4000 is detecting an internal malfunction.	Replace the unit.
One or more voltage phases read incorrectly.	Blown or loose fuse(s).	Check fuse(s) on the affected phase(s). Reseat the fuse(s). Replace if necessary.
	Incorrect PT ratio.	Check PT ratio.
Current readings are not accurate or read zero.	Incorrect size CTs used.	Replace with proper size CTs.
	Incorrect CT ratio.	Check CT ratio.
Power readings are incorrect.	Phasing for voltage and current is incorrect.	Check phasing. Verify connections with wiring diagrams.

Table 6.A Initial Power-On Troubleshooting

Symptom	Probable Cause(s)	Solution
All Operator Panel LEDs are off.	AC line being monitored is below 96 VAC.	Locate the cause of the deficiency in the monitored AC line.
	Separate Source AC line voltage is deficient.	Locate the cause of the deficiency in the AC control power line.
	AC line fuses are blown, missing, or not contacting correctly.	Verify that the incoming AC line is at the correct voltage level. Check that the fuses are sitting correctly in their clips.
	IQ DP-4000 is malfunctioning.	Replace the unit.
Digit 1 flashes in the display window.	A trip condition has been externally initiated through the Communications Port.	Determine why the trip was initiated from the external device through the Communications Port.
Digit 2 flashes in the display window.	An overvoltage condition is detected.	Isolate the cause in the line.
Digit 3 flashes in the display window.	An undervoltage condition is detected.	Isolate the cause in the line.
Digit 4 flashes in the display window.	A phase unbalance condition is detected.	Isolate the cause in the line.
Digit 5 flashes in the display window.	A voltage phase loss condition is detected.	Isolate the cause in the line.
	Blown or loose fuse(s).	Check fuse(s) on affected phase(s). Reseat the fuse(s). Replace the fuse(s) if necessary.
Digit 6 flashes in the display window.	A current phase loss condition is detected.	Isolate the cause of the AC current phase loss.
Digit 7 flashes in the display window.	The IQ DP-4000 is detecting a phase reversal.	Isolate the cause of the AC line phase reversal.
Digit 8 flashes in the display window.	The IQ DP-4000 is detecting an internal malfunction.	Replace the unit.
One or more voltage phases read incorrectly	Blown or loose fuse(s).	Check fuse(s) on affected phase(s). Reseat the fuse(s). Replace the fuse(s) if necessary.
	Incorrect PT ratio.	Check PT ratio.
Current readings are not accurate or read zero.	Incorrect size CTs used.	Replace with proper size CTs.
	Incorrect CT ratio.	Check CT ratio.
Power readings are incorrect.	Phasing for voltage and current is incorrect.	Check phasing. Verify connections with wiring diagrams.

Table 6.B Operational Troubleshooting

6.6 RETURN PROCEDURE

The troubleshooting section is intended for service personnel to identify whether an observed problem is external or internal to the unit. For assistance with this determination, please contact Advanced Product Support (APSC) at 1-800-809-2772. If a problem is identified as internal, return the unit to the factory for repair or replacement. To return your unit, contact your local Cutler-Hammer authorized distributor.