

EDP CONCEPTION

TROUBLESHOOTING MANUAL — EDP-A2 AND EDP-A2 520 BOARDS

REVISION 4.1

Safety and Precautions

Troubleshooting procedures must be performed by qualified personnel. Follow the lockout/tagout procedures and safety rules applicable to the machine. Before taking any resistance, measurement or working on components, disconnect and secure the power supply whenever required by the procedure. Some diagnostic procedures require measurements on an energized controller; these must be performed only by a qualified technician using appropriate protective equipment.

Normal Controller Operation

Controller powered, but machine stopped. Note: the controller must remain without power for 2 minutes for a complete shutdown because it contains an internal energy bank.

Each time the EDP-A2 controller is powered up, the cab lamp turns on for approximately 2 seconds, followed by a pause and one flash. This indicates a normal startup.

If you briefly press the magnet control button twice, 1 second apart, the lamp should turn on during that interval. Do not hold the control too long, because the controller will trigger Alarm No. 1: without power, it cannot detect the magnet.

At rest, before the first magnet activation after power-up, the MUL1 LED may flash. This indication is reserved for the manufacturer or technician.

The alarm number is identified by the number of times the lamp flashes. For example, 3 flashes correspond to Alarm 3.

Note: 11 Flashes or more correspond to Alarm 1

Alarm 6 may normally appear when the machine is shut down because it indicates a loss of power to the main board. Note that while Alarm 6 is active, the controller no longer responds to the control button.

Alarms and Diagnostics

Alarm 1 — Magnet Not Detected / Power Supply Problem or Defective Magnet

Alarm 1 indicates that an expected voltage or load (amperage) is not present, or that a power supply problem must be located.

Probable Causes:

- Connection, wiring, or problem in the magnet junction box.
- Circuit breaker not functioning or open.
- No voltage from the generator.
- Problem in the controller.
- Problem in the magnet.

Checks:

- Verify that the circuit breaker is ON.
- Check the operation of the controller voltmeter and measure the available voltage.
- Inspect the generator, wiring, and junction box.

- Check the magnet resistance. The measurement can be taken from the M+ and M– terminals on the main board.
- Compare the measured resistance with the information on the magnet nameplate. If the resistance is not listed, calculate it using $R (\Omega) = V (\text{volts}) \div I (\text{amps})$. Example: 230 volts / 40 amps = 5.75 ohms.

Technical Notes:

- A magnet's resistance is normally below 25 Ω , depending on the model and its nameplate.
- Always use the calculated or specified value for the magnet concerned as the reference.

Alarm 2 — Overload

Alarm 2 is associated with an overload or short circuit in the magnet circuit.

Probable Causes:

- Possible short circuit between the end of the machine stick and the magnet.
- Damaged cable or connection in the magnet circuit.

Checks:

- Visually inspect the wiring between the end of the stick and the magnet.
- Measure the magnet resistance from the M+ and M– terminals in the controller. These large aluminium terminals have a flat-head screw: M+ is located at the lower right of the main board; M– is located on the left, approximately in the centre.
- Compare the reading with the magnet nameplate.
- If the nameplate does not indicate resistance, calculate $R (\Omega) = V \div I$ using the rated voltage and rated amperage shown on the nameplate.

Technical Notes:

- Example: 230 volts / 40 amps = 5.75 ohms.
- The value is normally below 25 Ω , but the magnet nameplate or calculated value remains the reference.

Alarm 3 — Current Transformer (CT) / Anti-Arc Protection

This alarm may be related to the current transformer or the anti-arc protection.

Probable Causes:

- Defective anti-arc protection.
- Defective current transformer (CT) on the main board.

Checks:

- Disconnect power from the controller for approximately 2 minutes.
- Restore power to the controller. Confirm proper controller startup using the lamp and verify that no alarm is present. Then try again by activating the generator without activating the magnet.
- Observe whether metal sticks to the magnet without an activation command being given.

Corrective Actions:

- If metal sticks without a command, stop the machine immediately. As a temporary diagnostic measure, the three small black wires at the bottom of the main board may be disconnected and insulated by a qualified technician. The permanent repair is to replace the anti-arc protection.
- If metal does not stick without a command and Alarm 3 persists, the current transformer is probably defective. Replace the main board because the CT is integrated into it.

Alarm 4 — Relays

Alarm 4 indicates a problem associated with the relays.

Probable Causes:

- Defective relay or relay control circuit.

Checks:

- Disconnect power from the controller for approximately 2 minutes.
- Restore power to the controller and confirm proper startup using the lamp.

- If the alarm returns, perform the relay test procedure described later in this manual.

Quick Relay Test

For the functional test, prepare the controller according to the test procedure by pressing the **DOWN** button until the **MUL10** and **MUL1** LEDs begin flashing unusually. The **Lamp LED** and the **cab light** will flash continuously. At this point, the controller is in **configuration mode**; use only the **TEST** button to avoid changing the controller settings.

Briefly press the **TEST** button, then press it again within a maximum of **1 second**. After **1½ seconds**, the controller will trigger **Alarm No. 1**, and you will need to wait **35 seconds** for the controller to clear this alarm.

Check the **AC, LOAD, and DROP LEDs**. Each time an LED turns on, the corresponding relays are activated; listen for the clicking sounds. Repeat the procedure as many times as necessary.

At this point, if the machine and generator were running, the magnet should operate exactly as it would when controlled from the cab.

Corrective Actions:

- If the problem persists after these checks, contact an EDP technician.

Alarm 5 — IGBT Test Failed

Alarm 5 indicates that the IGBT test was unsuccessful.

Probable Causes:

- Short-circuited IGBT.
- IGBT failed open circuit.
- Fault in the board or its connections.

Checks:

- Power up the controller without starting the machine.
- If the alarm returns, perform the detailed IGBT test in Section 5.

Corrective Actions:

- Replace the IGBT module if the test results confirm a fault. After, and only after, replacing an IGBT module, reset the IGBT memory by pressing the TEST button until the lamp LED flashes.

Alarm 6 — Power Drop

Alarm 6 may normally appear when the machine is shut down. If it appears during operation, it indicates a drop in power to the main board.

Probable Causes:

- Poor connection on a power supply wire.
- Defective fuse holder or poor contact.
- Defective fuse or intermittent connection.

Checks:

- Check the fuses.
- Check the fuse holders and their contacts.
- Check and tighten, as needed, the main board power-wire connections.

IMPORTANT: When Alarm 6 is active, the controller no longer responds to the magnet control button.

Alarm 10 — Overheating

Alarm 10 indicates controller overheating.

Probable Causes:

- Normal magnet duty cycle exceeded.

- External heat source heating the controller enclosure.

Checks:

- Verify that the duty cycle is being respected.
- Check for an external heat source near the enclosure and correct the situation if necessary.
- The controller is not in a vertical position, and its cooling plate is not sufficiently ventilated or cooled.

Technical Note: The normal duty cycle is 75%, or approximately 15 seconds of magnet power followed by 5 to 6 seconds of rest.

Reading the Last Stored Alarm

Turn off power to the controller for 2 minutes.

Press and hold the magnet control button.

Restore power to the controller while holding the button until the cab lamp flashes rapidly.

The cab lamp flashes to indicate the number of the last stored alarm. Note: Alarm 9 is a null alarm.

To clear the memory, press the control button once; otherwise, disconnect the power.

Detailed Procedure — IGBT Board Test

WARNING: This procedure involves measurements on an energized controller and must be performed only by a qualified technician.

Power the controller.

Set the multimeter to diode mode with the audible continuity indicator.

Touch the two-meter probes together to confirm that the multimeter beeps.

Disconnect the green terminal block from the IGBT board.

Place the black multimeter probe on the first screw of the second row on the left.

Place the red probe on the second screw of the second row on the left.

Observe the IGBT LED. Each time the IGBT flashes, the multimeter should beep.

If the beep is continuous, the IGBT is probably defective due to a short circuit. This confirms the controller indication.

If there is no beep, the IGBT has probably failed open circuit. This confirms the controller indication.

If necessary, press the TEST button once. The test duration becomes longer, giving the multimeter more time to react and display the reading.

Checking the External Enclosure Resistance

On the IGBT board, disconnect the green terminal block with 4 screws.

Check the resistance between the two upper screws or the two white wires. Expected value: 17 to 22 ohms.

Troubleshooting Without an Alarm

Cab Lamp Does Not Turn On

Check whether the lamp LED is working on the main board.

Check the lamp power supply. On the five-screw green terminal block at the bottom of the main board, check terminals 2 (COM) and 3 (LAMP), as well as the wiring and connections between the controller and the cab.