

## LED Fault Code Explanation

When a fault occurs, the compressor will shut down but the fan or water pump will usually continue to run. Approximately every minute after, the fan or water pump will stop momentarily and the compressor will attempt to restart.

**1 Flash - Low Voltage:** There is insufficient voltage reaching the fridge compressor. System voltage has fallen below 10.5v. Voltage must be above 11.7v for system to restart. This is the most commonly seen fault code.

a) Confirm the wire dimension is correct

If this is a new installation check the wire sizing:

Wire Gauge	12 Volt – Wire length in ft	24 Volt – Wire length in ft
14	8.2	16.4
12	13.1	26.2
10	19.6	39.4
8	32.8	65.6

b) Test the Power supply

To properly test the power supply to a Danfoss powered 12v or 24v system, the following testing procedure must be carried out. This will establish whether the power supply feeding the system is free of bad, loose and/or high-resistance connections. Reading the voltage on the panel or at the batteries is meaningless, as is the fact of a new installation or new batteries. Size and the capacity of the battery bank is irrelevant.

1. Turn off the breaker (or remove the fuse) supplying DC power to the system.
2. Unplug one of the thermostat leads at the controller.
3. Using a multi-meter, read the DC voltage at the battery terminal(s).
4. Connect the multi-meter reading DC voltage to the power terminals (+ and -) on the controller so that it can be left connected and monitored.
5. Turn on the breaker (or install the fuse) to the system.
6. Check that the voltage is within  $\frac{3}{4}$  of a volt of the voltage seen at the battery terminals. Higher voltage drop than that implies undersized wires or a poor connection in the circuit.
7. While watching the multi-meter, reconnect the thermostat lead and monitor the voltage continuously before, during, and after the compressor starts or attempts to start.

Interpreting power supply results

If the power supply is free of loose, bad, and/or high resistance connections, the voltage reading at step 5 above will stay very stable and only drop slightly when the compressor starts. As a general rule, on a 12v system the reading should not drop below 12v. If, when the compressor attempts to start, the voltage reading drops significantly, a bad electrical connection should be suspected. If the voltage drop is sufficient to fall below the 10.5v (23v) cut-off built in to the controller, the compressor will stop. (At this point the voltage may return to its original reading.) The fan or pump will continue to run for

approx. 45 seconds and then the compressor will attempt a re-start. If the voltage is then above 11.5v the compressor will start or attempt to re-start again.

If the compressor starts and runs OK but stops after a short while, the voltage may be gradually dropping towards and below the 10.5v (23v) cut-off point. This should be easily identified on the meter. If the nature of the fault is such that the voltage reading at step 5 above drops below 10.5v even before the compressor attempts to start, a very bad electrical connection must be suspected. This is because even the small load of the fan or pump relay, both less than 0.5 amp, is seemingly sufficient to reduce the voltage considerably.

What to look for

A loose and/or high-resistance connection can be anywhere in the supply between the batteries and the controller. i.e. a bad breaker or fuse, a loose or corroded screw connection, a poorly made or corroded crimp connection, a damaged section of wire, etc.

### **2 Flashes - Fan draw greater than 1 amp**

The fan is faulty and drawing more than 1 amp. Unplug the fan or water pump and restart the compressor. If the compressor starts and the LED doesn't flash, the fan was the problem and needs to be replaced.

### **3 Flashes - Compressor Start Error**

Compressor overloaded and unable to start. Most often associated with a system shutdown followed by an immediate restart attempt while refrigerant pressure differential in system is still high. This could still be a voltage error, due to a power surge or similar, or a faulty compressor control module. First turn off the power to the unit for 10 minutes to let the system reset. Turn the power back on and see if the fridge runs. If it doesn't, the most common problem is a faulty compressor control module. This is very common if the compressor has been exposed to water.

### **4 Flashes – Compressor unable to maintain minimum speed**

If the refrigeration system is too heavily loaded and the compressor is unable to maintain 1,850 rpm. This is a very uncommon error code.

### **5 Flashes – Thermal Cutout of Control Module**

This is an internal overheating protection for the control module itself. If the internal temp of the module reaches 212 degrees it will shut down until it cools below 176 degrees. This can be caused by very high ambient temperatures, or a problem with the condenser fan or water pump failing causing very high head pressure and high temperature.