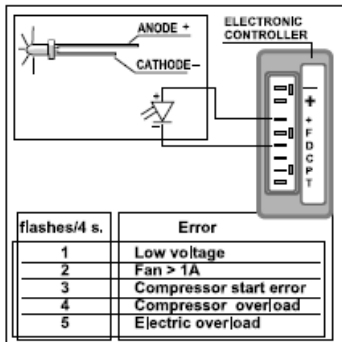


Danfoss BD 35 and 50F Fault Diagnostic.



The Danfoss BD35 and BD50 compressors have their own fault diagnostic allowing easy fault finding. The fault code will only be shown when the compressor fails to start or stops.

Start by Linking out the Thermostat

To ensure the thermostat is not causing problems put a link out between C and T terminals this will force the compressor to run continually during testing.

Connect the LED fault diagnosis circuit

If an LED light is connected between the small positive (+) and 'D' terminal on the control box, as shown in the diagram above, it will flash an error code if the compressor refuses to start.

Hint:

An electrical multi meter can be used instead of an LED. Set the meter to continuity (will also have a beep alarm when continuity is made). Put the probes on the small + and the D terminal and the meter will sound or show a signal.

Interpreting the results

1 Flash Low Voltage

There is insufficient voltage reaching the fridge compressor.

a) Confirm the wire dimension is correct

If this is a new installation check the wire sizing:

Size		Max Distance			
		12V		24V	
mm ²	Awg	M	ft	M	ft
2.5	14	2.5	8.2	5	16.4
4	12	4	13.1	8	26.2
6	10	6	19.6	12	39.4
10	8	10	32.8	20	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 the same as the voltage seen at the battery terminals.
7. Whilst 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 "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 (23.5v) the compressor will start or attempt to re-start again.

WARNING If the multi-meter being used is a digital model that is slow to react, the voltage may drop below 10.5v (23v) and then recover too quickly to register on the meter. This can lead to the situation where the compressor starts then stops from low voltage, the voltage returns to its' original value, and there being no significant drop on the meter.

- 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 "5" above drops below 10.5v (23v) 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 (0.25 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.

HINT

A good place to look first is the negative (ground) connection, especially on a European-built boat. These tend to be multiple, common connections that are added to over time.

2 Flashes Fan Greater 1 amp

a. Air cooled systems

The fan is faulty and drawing more than 1 amp.

Unplug the fan or water pump and restart the compressor.

For air cooled you will need to replace the fan:

<u>Fan Size</u>	<u>Item Number</u>
20x20mm	1E51590C
90x90mm	1E250102C
120mmx120mm	1E51335C

b. Water cooled systems

Unplug the water pump and restart the compressor to confirm the compressor will now run.

If the system now runs it means the pump is drawing more than 1 Amp. The system should be set up with the pump connected via a relay or pump interface to prevent this happening.

- If it is not, add a relay to the system or contact Penguin Refrigeration for further details.
- If there is a relay/pump interface already fitted it may have developed a fault. Again please contact Penguin Refrigeration for further details.

3 Flashes Compressor Start Error

This could still be a voltage error, due to a power surge or similar, or a faulty compressor controller.

First turn off the power to the unit for 1 minute to let the system reset. Turn the power back on and see if the fridge runs.

If the system still fails to start either:

Return the control box to Penguin Refrigeration for testing

Replace electronic controller: 1E50895

http://www.penguinfrigo.co.uk/products/Electronic_Unit_for_Danfoss_BD35_Compressors-185-37.html

4 Flashes Compressor Overload

Send the controller to Penguin Refrigeration for testing, or contact our technical team for further assistance.

5 Flashes Compressor Overload

Send the controller to Penguin Refrigeration for testing, or contact our technical team for further assistance.