



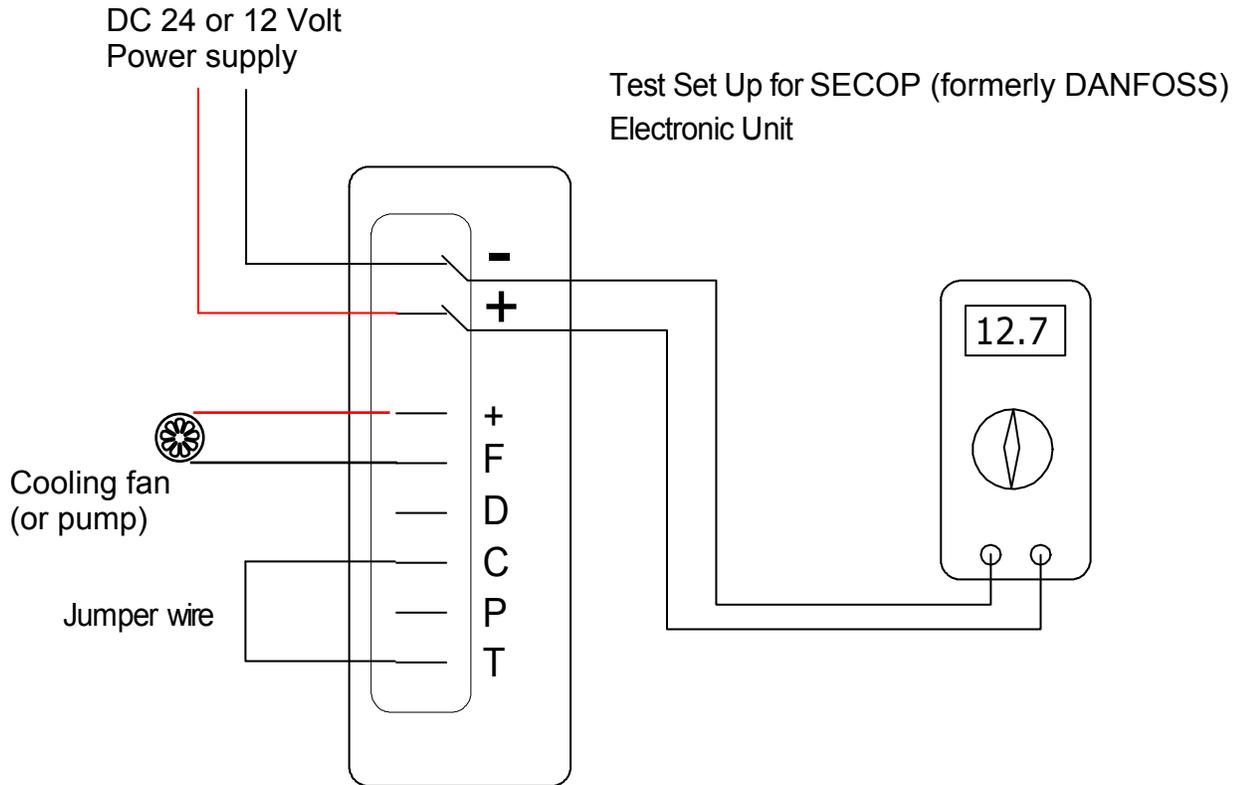
Basic Service Notes - SECOP (formerly DANFOSS) DC compressors

If your refrigerator stops cooling or if a new system fails to run here are a few steps to follow to get the system going again. It is always a good idea to consider if there have been any recent changes to refrigerator - service work done - the compressor moved - new wiring done - even to an unrelated system - or new batteries installed - etc. These may affect the system in unexpected ways - The good news is that these are very reliable and rugged systems and often the solutions are simple - but of course - not always - follow these steps and if all else fails email us with questions - send photos of the equipment - always helpful - and let us know what tests you have been able to do. Here we go

1. Is the compressor running ? This is the place to start and it should be a simple check but often because of where the compressor is mounted and also because these compressors are so quiet you may need to get close to the compressor and to limit the amount of background noise and vibration from engines - air conditioning - etc. in order to hear or feel if the compressor is running. Place a hand on the top of the compressor and check for a steady vibration - the compressor will also be warm to the touch. Check to make sure the cooling fan or pump is also on. If it is uncertain if the compressor is running try turning the power supply breaker off - waiting a couple minutes for the system pressure to settle and on again. With a hand on top of the compressor it will shake for a moment as it starts and will settle into a steady rhythm as it runs. It will draw DC current (approximately 3 to 5 amps) At this point you should be able to determine if the compressor is running. If the system is running continuously but not cooling the next step may be to check the charging instructions. If the system is not running go to the next step.
2. **Power Supply** -Check for voltage on the DC power terminals - Check the connections and be aware that the compressor is very sensitive to loose or poor connections and voltage drops. Make sure the power polarity is correct - a voltmeter is a very useful tool or you can trace the wires and note the color code. Power supply problems are the most common reason the compressor will not run - double check this carefully. If the compressor still will not run go to the next step.
3. **Thermostat** The power is ON and connected correctly but compressor still does not run (or start and quickly stop) - Check to make sure the thermostat is turned on and to a temperature setting low enough to get the compressor running (On a mechanical thermostat turn the knob clock wise). IF NO response you can bypass the thermostat by placing a jumper wire between terminals T and C (T = thermostat C= Common) - with Terminals T and C connected the compressor will start and run continuously when the power supply is ON. If the compressor is now running then you may need to replace the thermostat. Or if NO go to the next step.
4. **Electronic Module test or replacement** - The modules are normally very reliable but like any electronic device they can be damaged by voltage pulses or spikes. Double check the power supply - and all connections - perhaps run a temporary test power supply wire - if the compressor still fails to run it may be time to replace the module. If possible, it is good to test the module on a known working system - or to sent the module to us for a test.

If you have gone thru these basic steps with out success you may try the Advanced Trouble Shooting on the next pages. You may email for technical assistance - make sure to include the model and age of the equipment - also include photos (always very helpful!)

SECOP (formerly DANFOSS) Compressor –Advanced Troubleshooting



This drawing shows how to connect directly to the SECOP (formerly DANFOSS) electronic unit for testing.

The compressor should run continuously at low speed when terminals T and C are connected.

This will confirm that the electronic module is OK and that the power supply is adequate for low speed operation.

If the compressor does not run or runs intermittently, starting and stopping after a few seconds this may be caused by a poor power supply, a faulty electronic unit or a faulty cooling fan (or pump).

Disconnect the cooling fan and test again - if the cooling fan (or pump) draws more than 1 amp 12VDC the electronic unit protection circuit will stop the compressor. If the compressor runs with the fan disconnected it may need to be replaced.

To test the power supply use a Digital Voltmeter. Measure the voltage at the electronic unit with the compressor off and note the voltage. Measure the voltage again with the compressor starting or running - the voltage should drop no more than .5 volts - If there is more than .5 V drop check all terminals and connections carefully for good contact, tightness and signs of corrosion.

It can be helpful to connect a separate test power supply wire. Run separate wires (both positive and negative) directly to the batteries and re-test the power supply.

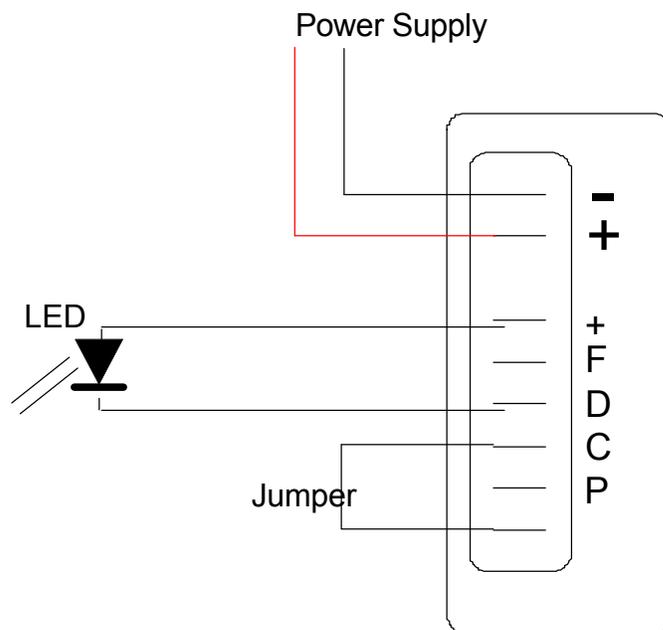
In general a minimum 10 gauge wire should be used for runs up to 20 ft and 8 gauge for longer runs.

SECOP (formerly DANFOSS) Compressor –Advanced Troubleshooting

SECOP (formerly DANFOSS) compressors have a built in Error code system that can be helpful in diagnosing problems.

To display the error code an LED (light emitting diode) must be connected between the + and D terminals on the module. The exact error is determined by counting the number of times the LED blinks in a group

If an error is triggered the compressor will stop & will attempt a re-start in approximately 60 seconds.



1 Flash - Battery Protection cut out activated

Power supply voltage too low

2 Flashes - Fan over-current cut-out

Fan current exceeds 1A maximum at terminals F & +

3 Flashes - Motor start error

The rotor is blocked or pressure is too high. More than 73 psi (5 bar)

4 Flashes - Minimum motor speed error

System over loaded. Motor cannot maintain minimum speed (1850 rpm)

5 Flashes = Thermal cut-out of electronic unit

The system is overloaded or the ambient temperature is too high. Temp overload set at 131° F (55° C)