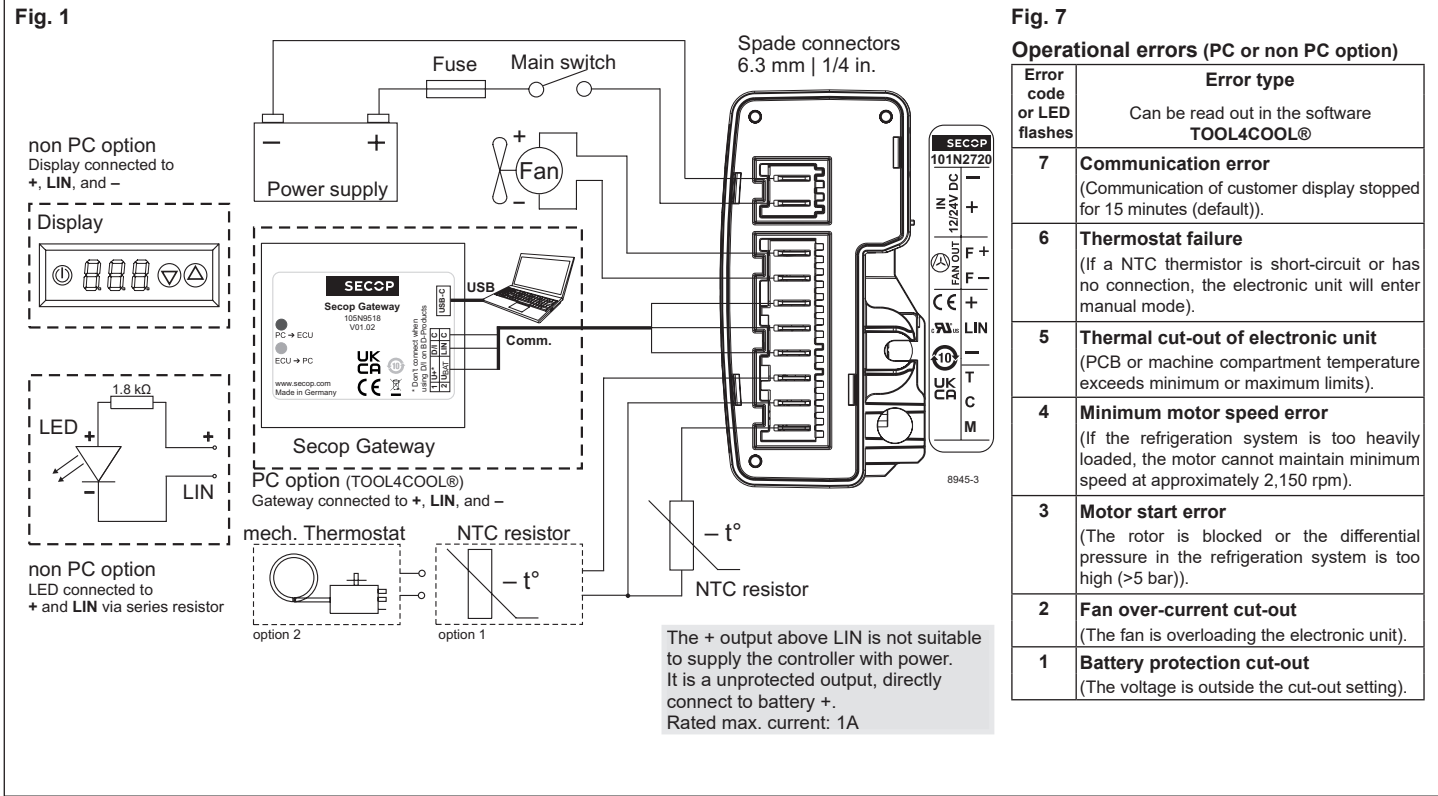


Instructions

Electronic Unit for BDN45F-A Compressors 101N2720, Truck and Car



ENGLISH

The electronic unit is a dual voltage device. This means that the same unit can be used in 12V or 24V power supply systems. Maximum voltage is 17V for a 12V system and 34V for a 24V power supply system.

It can be connected to a PC through the *Secop Gateway* communication interface on the terminal LIN and C (Fig. 1). Communication gateway modules incl. communication cables can be ordered at Secop (Fig. 8).

The PC interface allows you to create different settings and reads out several measurements by using the software *TOOL4COOL®* supplied by Secop.

Installation (Fig. 3)

Attach the electronic unit by pressing it linearly onto compressor *Fusite®* connector and brackets. Press until both screwheads snap in place. Optionally the unit can be secured against excessive vibration with a third screw (Fig. 3).

Power supply (Fig. 1)

The electronic unit must always be connected directly to the battery poles. Connect the plus to + and the minus to -, otherwise the electronic unit will not work. The electronic unit is protected against reverse battery connection. For protection during installation, a fuse must be mounted in the + cable as close to the battery as possible. A 15A fuse for 12V and a 15A fuse for 24V circuits are recommended. If a main switch is used, it should be rated to a current of min. 20A.

The wire dimensions in Fig. 4 must be observed. Avoid extra junctions in the power supply system to prevent voltage drop from affecting the battery protection setting.

Battery protection (Fig. 2)

The compressor stops and restarts again according to the designated voltage limits measured on the + and - terminals of the electronic unit.

The standard settings for 12V and 24V power supply systems are shown in Fig. 2. (**PC option**).

Thermostat (Fig. 1)

The thermostat is connected between the terminals C and T. Either a NTC (electrical thermostat) or a mechanical thermostat can be connected. Three different thermostat modes can be chosen in the software - *Auto* (both NTC and mechanical), *NTC* or *Mechanical*. Standard setting is *Auto*. In case of using a NTC the set point in the range between -40°C and 40°C is set with the software and the temperature can also be seen by using the interface. When using the *Auto* setting in the software it is not possible to obtain NTC failures, so it is recommended to set the thermostat mode to *NTC* when using a NTC.

Customer display (Fig. 1)

A Customer designed display can be supplied by the electronic unit and used to control e.g. the speed settings, battery protection settings or temperature settings. The used display can communicate with the electronic unit via the LIN terminal and Modbus protocol. Display is connected to +, LIN, and -. For more detailed recommendations on how to use and initialise a customer display please contact Secop. Do not use the battery + terminal above LIN to supply the controller with power.

Speed selection

The compressor will run with a fixed speed of 3,000 rpm when the thermostat is switched on. Other fixed compressor speeds and start speeds in the range between 2,300 and 4,500 rpm can be obtained when changing the speed settings in the software (**PC option**).

Fan (Fig. 1)

A fan can be connected to the FAN OUT terminals. Connect the plus to F+ (FAN OUT) and the minus to F-. Since the output voltage between the terminals F+ (FAN OUT) and F- is always regulated to 12V, a 12V fan must be used for both 12V and 24V power supply systems.

The fan output can supply a continuous power of 6W_{avg}.

Fan settings can be adjusted via *TOOL4COOL®*. It is also possible to set a start delay on the fan in the range from 0 – 240 sec..

Factory default setting for a fan is 0 seconds. Per default, the fan speed follows the compressor speed in a definable envelope. A fixed speed or fixed on and off of the output is configurable. It is also possible to configure the fan speed to follow the motor speed.

Error handling (Fig. 7)

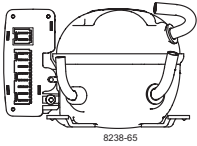
If the electronic unit records an operational error, the error can be read out in the software (**PC option**). Error codes are defined as shown in Fig. 7.

An external LED can be connected to show the error blinking. To use the external error LED, connect the anode via a 1.8 kΩ Resistor to battery+ and the cathode to LIN.

In case the electronic unit records an operational error, the diode will flash a number of times. The number of flashes depends on what kind of operational error was recorded. Each flash will last 1/5 second. After the actual number of flashes there will be a delay with no flashes, so that the sequence for each error recording is repeated every 4 seconds (**non PC option**).

Machine compartment temperature (Fig. 5)

The electronic unit disables the compressor operation in case its PCB exceeds the maximum limits. The electronic unit limits the compressor operation depending on the compressors compartment temperature. An additional Thermistor (Type: 105N9615) must be connected to Pin M and C. The compartment temperature sensor must be placed on the condenser hot-spot or center (Fig 5). The compressor will be switched off depending on the configured limits.
Min. PCB temperature: -10°C (14°F)
Max. PCB temperature: 110°C (230°F)
Please refer to the compressor datasheet regarding operating conditions and machine compartment temperature.



Instructions

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SECCP

Fig. 2

Battery protection settings

Voltage (0.1 steps)		Default	Min. value	Max. value
12V ± 0.3V DC, all values	Cut out level V DC	10.4	8.5	17
24V ± 0.3V DC, all values	Cut out level V DC	21.3	19	32
Battery cut-in difference		V DC	1.3	0.5

Fig. 4

Wire dimensions DC

Cross section	Size		Max. length* 12V operation		Max. length* 24V operation	
	[mm ²]	[Gauge]	[m]	[ft.]	[m]	[ft.]
2.5	12		2.5	8	5	16
4	12		4	13	8	26
6	10		6	20	12	39
10	8		10	33	20	66

*Length between battery and electronic unit

Fig. 8

Periphery

Secop Gateway	105N9518*
Thermistor multi-pack	105N9615

*The previous gateway (105N9501) is not fully compatible with electronics using LIN bus above 24V. Please use the most recent gateway version.

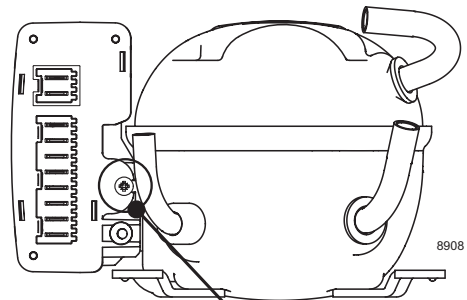
Fig. 5

Fig. 6

Recommended connector types

Power Supply	2-circuit	Molex: 945504102
Fan	2-circuit	Molex: 945504202
Display/Communication	3-circuit	Molex: 932504023
Thermostat Machine Compartment	3-circuit	Molex: 932504003
Crimp, 0.5 - 0.75 mm ²		Molex: 945180100
Crimp 0.75 - 2.5 mm ²		Molex: 945180201
Crimp for 2 wires 1.5 - 3.0 mm ² total		Molex: 945180400

Fig. 3



**! Optional third screw:
max. torque: 0,9 Nm**