

TOOL4COOL®
Flexible control settings

Instructions

Electronic Unit for BD250GH.2 Compressor, 101N0732, 48V DC



Fig. 1

Wire Dimensions

Size		Max. length* 48V operation	
Cross section [mm ²]	AWG [Gauge]	[m]	[ft.]
2 x 4	11	1.5	4.92
2 x 6	9	2	6.60
2 x 10	7	4	13.12

*Length between battery and electronic unit

Battery protection settings

Voltage (0.1 steps)	Min. value	Default	Max. value
Cut out	VDC	32	36
Cut in diff.	VDC	0.5	4.0

Operational errors

Error code	Error type
	Can be read out in the software TOOL4COOL®
6	Thermostat failure (If the NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode).
5	Thermal cut-out of electronic unit (If the refrigeration system has been too heavily loaded, or if the ambient temperature is high, the electronic unit will run too hot).
4	Minimum motor speed error (If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed at approximately 1,850 rpm).
3	Motor start error (The rotor is blocked or the differential pressure in the refrigeration system is too high).
2	Fan over-current cut-out (The fan loads the electronic unit with more than 1.8A _{peak}).
1	Battery protection cut-out (The voltage is outside the cut-out setting).

Fig. 2

Fig. 3

Fig. 4

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The electronic unit is a single voltage device. This means that the unit can only be used with 48V DC power supply systems. Maximum voltage is 60V DC, max. ambient temperature is 55°C. The electronic unit has a built-in thermal protection which is actuated and stops the compressor operation if the electronic unit temperature becomes too high (100°C / 212°F on the PCB). It can be connected to a PC through the *Secop One Wire/LIN Gateway* communication interface (9) on the terminals **I**, **+** and **C**.

Communication gateway modules incl. communication cables can be ordered at Secop. The PC interface allows you to create different settings and reads out several measurements by using the software tool TOOL4COOL® supplied by Secop.

Installation (Fig. 1)
Connect the terminal plug from the electronic unit to the compressor terminal (10). Mount the electronic unit on the compressor and fix it with a screw (1).

Power supply (Fig. 1)
The electronic unit must always be connected directly to the battery poles (2). 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 (3) must be mounted in the **+** cable as close to the battery as possible. The fuse must be rated 15A in 48V circuits. If a main switch (4) is used, it should be rated to a current of min. 25A. The wire dimensions in Fig. 2 must be observed.

Avoid extra junctions in the power supply system to prevent voltage drop from affecting the battery-protection setting. Special supply cables can be ordered as accessories (Molex type 42816-0212).

Battery protection (Fig. 3)
The compressor stops and starts again according to the chosen voltage limits measured on the **+** and **-** terminals of the electronic unit. The standard settings for the power supply systems are shown in Fig. 3. Other settings are set through the communication interface.

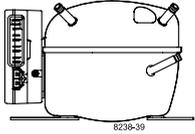
Thermostat (Fig. 1)
The thermostat is connected between the terminals **C** and **T**. Either a NTC (electrical thermostat) (8) or a mechanical thermostat can be connected (7). Three different thermostat modes can be chosen in the software – “Auto” (both NTC and mechanical), “NTC” or “Mechanical”. Standard setting is “Auto”. In case of using a NTC the set point in the range between -25° 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.

Speed selection
Speed can be set through the *Secop One Wire/LIN Gateway* communication interface (9). The speed setting in TOOL4COOL® will be 4,400 rpm with factory settings. Even if the setting is 4,400 rpm the compressor will run with a fixed speed of 3,500 rpm at 48 V DC power supply when the thermostat is switched on.

To obtain the max. speed of 4,400 rpm the supply voltage needs to be 56 V DC. With a speed setting of 4,400 rpm in TOOL4COOL® and an increased supply voltage the speed will step up until the max. Speed of 4,400 rpm is reached at 56 V DC. Other fixed compressor speeds in the range between 2,500 and 4,400 rpm can be obtained when changing the speed settings in the software. A start delay in the range from 2-240 sec. (factory setting 4 sec.) after thermostat cut-in can also be chosen.

Fan (Fig. 1)
An evaporator fan (60W) (6) can be connected between the terminals **+** and **Fe** and a condenser fan (60W) (5) between **+** and **Fc**. Connect the plus to **+** and the minus to **Fe** or **Fc**. If both fans are used, the settings in the software must be adapted. The factory setting is *no fans* and 48V. The unit must be restarted when these settings have been changed. If fans are used without adapting the software settings, the fans will run but no error signal will be sent in case of fan failure. It is also possible to set a start delay on the fans in the range from 0-240 sec. Factory settings for the evaporator fan is 6 sec. and for the condenser fan 0 sec. Fan speed can be adjusted through the interface from 40-100%.

Error handling
If the electronic unit records an operational error, the error can be read out in the software. Error codes are defined as shown in Fig. 4.



Instructions

Electronic Units for BD Compressors



UL/CB/VDE Approvals for BD Compressors

Approved Compressor - Electronic Unit Combinations

Compressors		Electronic Units						
		<i>Standard</i>	<i>AEO</i>	<i>High speed</i>	<i>Solar</i>	<i>AC/DC converter</i>	<i>Automotive</i>	<i>Telecommunication</i>
		101N0212	101N0340	101N0390	101N0420	101N0510	101N0650	101N0732
BD35F mm	101Z0200		UL / CB / VDE		CB / VDE	UL / VDE	UL / CB / VDE	
BD35F inch	101Z0204		UL / CB / VDE		CB / VDE	UL / VDE	UL / CB / VDE	
BD35F-B	101Z0205		UL / CB / VDE		CB / VDE	UL / VDE	UL / CB / VDE	
BD35F-HD.2	101Z0216						UL / CB / VDE	
BD35K (R600a)	101Z0211		UL / CB / VDE		CB / VDE	CB / VDE	UL / CB / VDE	
BD50F mm	101Z1220		UL / CB / VDE			UL / VDE	UL / CB / VDE	
BD50F inch	101Z0203		UL / CB / VDE			UL / VDE	UL / CB / VDE	
BD50K (R600a)	101Z0213							
BD80F	101Z0280							
BD80CN (R290)	101Z0403		UL / CB / VDE			UL	UL / CB / VDE	
BD100CN (R290)	101Z0401							
BD250GH.2 (12/24V)	101Z0406							
BD250GH.2 (48V)	101Z0405							UL

- UL / CB / VDE = Combination possible, UL, CB or VDE approval
- = Combination possible, but no approval
- = Combination not possible

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