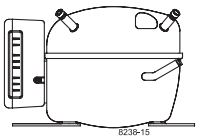
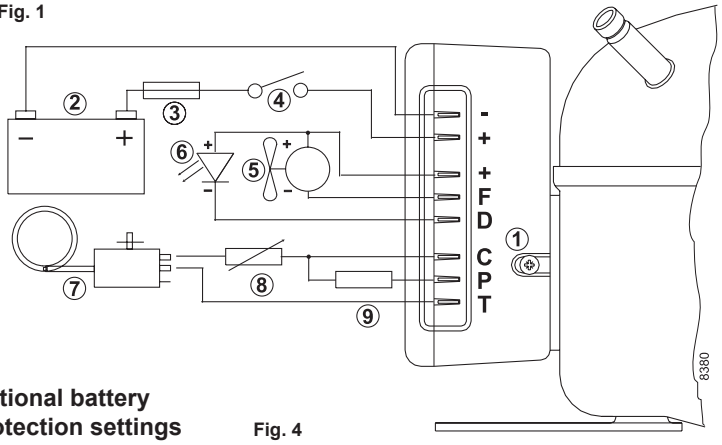


Instructions

Electronic Unit for BD35/50F Compressors, 101N0210/220 and 101N0300/320, 12-24V DC

SECOP

Fig. 1



Optional battery protection settings

Fig. 4

Resistor (9) kΩ	12V cut-out V	12V cut-in V	12V max. Voltage	24V cut-out V	24V cut-in V	24V max. Voltage
0	9.6	10.9	17.0	21.3	22.7	31.5
1.6	9.7	11.0	17.0	21.5	22.9	31.5
2.4	9.9	11.1	17.0	21.8	23.2	31.5
3.6	10.0	11.3	17.0	22.0	23.4	31.5
4.7	10.1	11.4	17.0	22.3	23.7	31.5
6.2	10.2	11.5	17.0	22.5	23.9	31.5
8.2	10.4	11.7	17.0	22.8	24.2	31.5
11	10.5	11.8	17.0	23.0	24.5	31.5
14	10.6	11.9	17.0	23.3	24.7	31.5
18	10.8	12.0	17.0	23.6	25.0	31.5
24	10.9	12.2	17.0	23.8	25.2	31.5
33	11.0	12.3	17.0	24.1	25.5	31.5
47	11.1	12.4	17.0	24.3	25.7	31.5
82	11.3	12.5	17.0	24.6	26.0	31.5
220	9.6	10.9				31.5

Wire dimensions

Size AWG Gauge	Size Cross section mm²	Max length* 12V DC operation ft.	Max length* 12V DC operation m	Max length* 24V DC operation ft.	Max length* 24V DC operation m
12	2.5	8	2.5	16	5
12	4	13	4	26	8
10	6	20	6	39	12
8	10	33	10	66	20

Fig. 2 *Length between battery and electronic unit

Standard battery protection settings

12V cut-out V	12V cut-in V	24V cut-out V	24V cut - in V
10.4	11.7	22.8	24.2

Fig. 3

Compressor speed

Electronic unit	Resistor (8) Ω (calculated)	Motor speed rpm	Contr.circ. current mA
101N0210 101N0220 101N0240	0	2,000	5
	277	2,500	4
	692	3,000	3
	1523	3,500	2
101N0300 101N0320 with AEO	0	AEO	6
	173	2,000	5
	450	2,500	4
	865	3,000	3
	1696	3,500	2

Fig. 5

ENGLISH

The electronic unit is a dual voltage device. This means that the same unit can be used in both 12V and 24V power supply systems. Maximum voltage is 17V for a 12V system and 31.5V for a 24V power supply system. Max. ambient temperature is 55°C. The electronic unit has a built-in thermal protection which is actuated and stops compressor operation if the electronic unit temperature gets too high.

Installation (Fig. 1)

Connect the terminal plug from the electronic unit to the compressor terminal. Mount the electronic unit on the compressor by snapping the cover over the screw head (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 of the installation, a fuse (3) must be mounted in the **+** cable as close to the battery as possible. 15A fuse for 12V and 7.5A fuse for 24V circuits are recommended.

If a main switch (4) is used, it should be rated to a current of min. 20A.

The wire dimensions in **Fig. 2** must be observed.

Avoid extra junctions in the power supply system to prevent voltage drop from affecting the batteryprotection setting.

Battery protection (Fig. 1)

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 appear from **Fig. 3**.

Other settings **(Fig. 4)** are optional if a connection which includes a resistor (9) is established between terminals **C** and **P**.

In solar applications without a battery a 220 kΩ resistor is recommended. In AEO (Adaptive Energy Optimizing) speed mode the BD compressor will always adapt its speed to the actual cooling demand within a random operation voltage of 9.6 to 31.5V.

Thermostat (Fig. 1)

The thermostat (7) is connected between the terminals **C** and **T**. Without any resistor in the control circuit, the compressor with electronic unit 101N0210, 101N0220 or 101N0240 will run with a fixed speed of **2,000 rpm** when the thermostat is switched on. With the thermostat directly connected to terminal C the electronic unit 101N0300 or 101N0320 will adjust its speed to the actual cooling demand.

Other fixed compressor speeds in the range between 2,000 and 3,500 rpm can be obtained when a resistor (8) is installed to adjust the current (mA) of the control circuit. Resistor values for various motor speeds appear from **Fig. 5**.

Fan (optional, Fig. 1)

A fan (5) can be connected between the terminals **+** and **F**. Connect the plus to **+** and the minus to **F**. Since the output voltage between the terminals **+** and **F** is always regulated to 12V,

a 12V fan must be used for both 12V and 24V power supply systems.

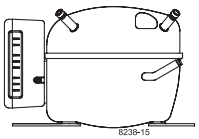
The fan output can supply a continous current of **0.5A$_{avg}$**. A higher current draw is allowed for 2 seconds during start.

LED (optional, Fig. 1)

A 10mA light emitting diode (LED) (6) can be connected between the terminals **+** and **D**.

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 ¼ 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.

Number of flashes	Error type
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 1,850 rpm).
3	**Motor start error** (The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)).
2	**Fan over-current cut-out** (The fan loads the electronic unit with more than 1A$_{peak}$).
1	**Battery protection cut-out** (The voltage is outside the cut-out setting).



Instructions

Electronic Units for BD Compressors

SECOP

VDE/UL Approvals for BD Compressors

Approved Compressor - Electronic Unit Combinations

Compressors		Electronic Units					
		Standard	*EMI*	*High start*	*High speed*	*AEO*	*AEO EMI*
		101N0210	101N0220	101N0230	101N0290	101N0300	101N0320
BD35F mm	101Z0200	**UL**	**UL**			**UL**	
BD35F inch	101Z0204	**UL**	**UL**			**UL**	
BD35K (R600a)	101Z0211						
BD50F mm	101Z1220	**UL**	**UL**	**UL**		**UL**	
BD50F inch	101Z0203	**UL**	**UL**	**UL**		**UL**	
BD80F mm	101Z0280						
BD250GH	101Z0400						
BD250GH Twin	101Z0500						
BD100CN (R290)	101Z0401						

Compressors		Electronic Units					
		Solar	*AC/DC converter*	*Automotive*	*Automotive*	*Telecommunication*	*Extended EMI*
		101N0400	101N0500	101N0600	101N0630	101N0730	101N0900
BD35F mm	101Z0200	**UL**	**VDE/UL**				
BD35F inch	101Z0204	**UL**	**VDE/UL**				
BD35K (R600a)	101Z0211						
BD50F mm	101Z1220		**VDE/UL**				
BD50F inch	101Z0203		**VDE/UL**				
BD250GH (48V)	101Z0402					**UL**	

VDE/UL = Combination possible, VDE or UL approval

= Combination possible, but no approval

= Combination not possible