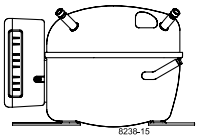
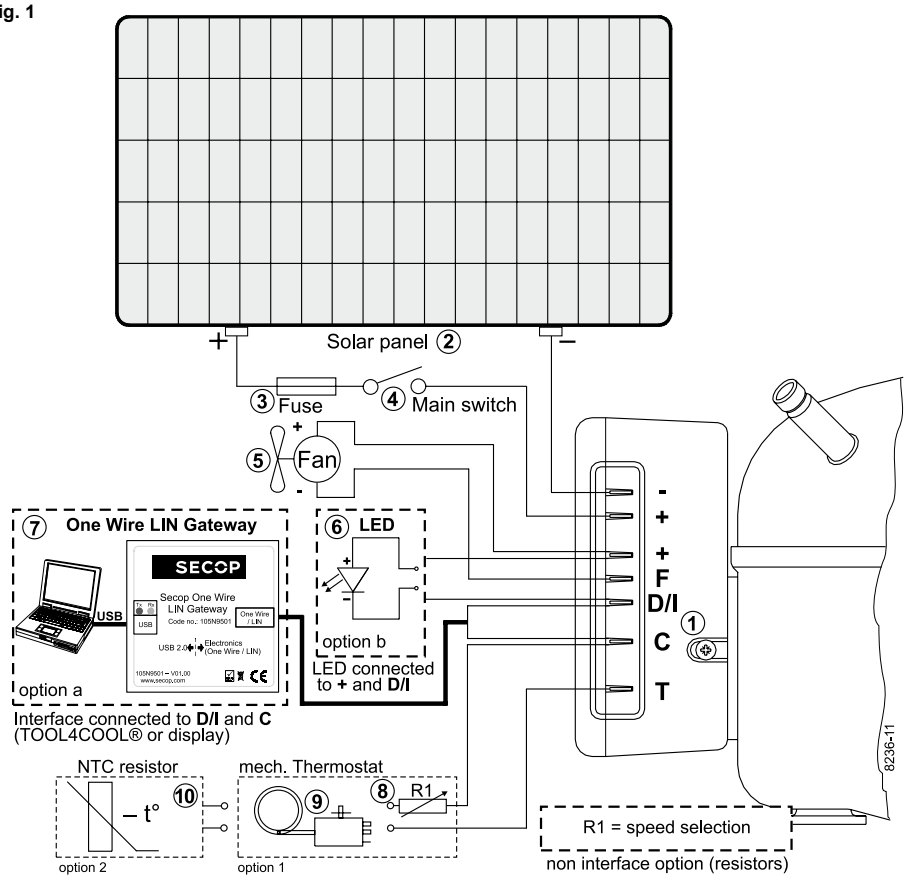


# Instructions

## Electronic Unit (Solar Applications) for BD35F/35K Compressors, 101N0420, 10-45V DC

**Fig. 1**




**Wire Dimensions DC**

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

**Fig. 2** *Length between battery and electronic unit

**Compressor speed**

| Electronit unit Code number | Resistor (R1) [Ω] calculated values | Motor speed [rpm] |
|---|---|---|
| **101N0420 with AEO** | 0 | AEO |
| | 173 | 2,000 |
| | 450 | 2,500 |
| | 865 | 3,000 |
| | 1696 | 3,500 |

**Fig. 3**

## ENGLISH

The electronic unit is intended for direct operation on a solar panel. It can operate within a voltage range from 10 to 45V DC. Max. ambient temperature is 43°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**
The electronic unit should always be connected directly to the solar panel 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 solar panel as possible. A 15A fuse is mandatory. If a main switch (4) is used, the main switch should be rated to a current of min. 20A. The "Wire dimensions" in **Fig. 2** must be observed.

**Thermostat and speed selection**
Either an NTC (electrical thermostat, 10) or a mechanical thermostat (9) can be connected between the terminals **C** and **T**.
If an NTC is used, the set point and speed can be set via a communication interface between terminals **C** and **D/I**.

If a mechanical thermostat is used without any R1 resistor (8), the compressor will run with a variable speed (AEO), adjusting itself 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. Resistor values for various motor speeds appear from **Fig. 3**.

**Fan (optional)**
A fan (5) can be connected between the terminals **+** and **F**. **A 12V fan must be used regardless of the solar panel voltage.**
The fan output can supply a continous current of **0.5A$_{avg}$**. A higher current draw is allowed for 2 seconds during start.

**Protection against too many start attempts**
The electronic is protected against too many start attempts. If more then ten starts occur in an unusual short time, the unit will blink with error code 2 and prevent further starts for 60s. After 60s normal operation will be resumed.

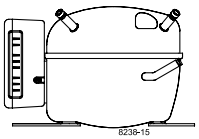
**Communication interface (option a)**
A PC can be connected through the *Secop One Wire/LIN Gateway* (7) to the communication interface between terminal **D/I** and **C**. The software TOOL4COOL® allows you to create different settings and reads out several measurements. Settings can be copied from one unit to another in mass production.

Alternatively a customer specific controller (e.g. display) can be connected to adjust the settings like set point and speed during operation.

**LED (option b)**
A light emitting diode (LED) (6) can be connected between the terminals **+** and **D/I**. It will be driven with a regulated current of 10mA.
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.

**Operational errors**

| Error code or LED flashes | Error type<br>Can be read out in the software **TOOL4COOL®** |
|---|---|
| **6** | **Thermostat failure**<br>(If the NTC thermistor is short-circuit or has no connection). |
| **5** | **Thermal cut-out of electronic unit**<br>(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**<br>(If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed at approximately 1,850 rpm). |
| **3** | **Motor start error**<br>(The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)). |
| **2** | **Too many start attempts or fan over current**<br>(Too many compressor or fan starts in short time or fan current higher than 0.5A$_{avg}$). |
| **1** | **Battery protection cut-out**<br>(The voltage is outside the cut-out setting). |




# Instructions

Electronic Units for BD Compressors

SECOP

# UL/CB/VDE Approvals for BD Compressors

## Approved Compressor - Electronic Unit Combinations

| Compressors | | Electronic Units | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | *Standard* | *AEO* | *High speed* | *Solar* | *AC/DC converter* | *Automotive* | *Telecommunication* |
| | | 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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