

Instructions

Electronic Unit for BDN-EV Compressors 101N2830, 12V DC



Fig. 1

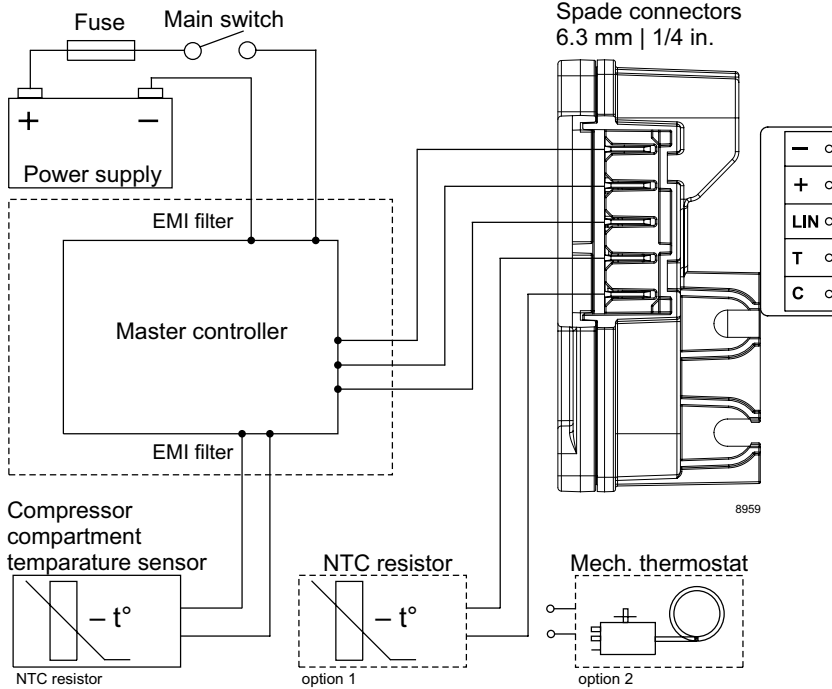


Fig. 2

Battery protection settings

Voltage (0.1 steps)	Default	Min. value	Max. value		
12V ± 0.3V DC, all values	Cut out level	V DC	9.6	9.0	17

Periphery

Secop Gateway	105N9518
Thermistor multi-pack	105N9615

Fig. 4

Operational errors

Error code	Error type
	Can be read out in the software TOOL4COOL®
7	Communication timeout (Communication of customer display stopped for 15 minutes (default)).
6	Thermostat failure (If a NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode).
5	Thermal cut-out of electronic unit (PCB or compressor compartment temperature exceeds minimum or maximum limits).
4	Minimum motor speed error (If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed at approximately 2,150 rpm).
3	Motor start error (The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)).
1	Battery protection cut-out (The voltage is outside the cut-out setting).

Fig. 3

Wire dimensions DC

Cross section	Size		Max. length 12V operation*	
	[mm²]	AWG [Gauge]	[m]	[ft.]
2.5	12		2.5	8
4	12		4	13
6	10		6	20
10	8		10	33

*Length between battery and electronic unit

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The electronic unit is a single voltage device, operation only with 12V supply voltage. The maximum voltage is 17V, the minimum 8.5V. The unit does not contain a reverse-polarity, load dump or overvoltage protection. It can be connected to Tool4Cool on PC and Android using the Secop Gateway (105N9518). The electronic unit is designed to be operated by a master controller which includes EMI filter and protection circuitry. The electronic unit is not designed for stand-alone operation without externally attached EMI filter.

Installation

Attach the electronic unit by pressing it linearly onto compressor Fusite® connector and brackets. Press until both screwheads snap in place. The unit has to be secured with additional screws.

Power supply (Fig. 1)

The electronic unit must always be connected directly to the battery poles. The voltage input of the electronic is not reverse-voltage protected, connecting to wrong polarity will destroy the unit. A 15A automotive fuse must be installed in the supply line, as close as possible to the current source, i.e., the battery. The wire dimensions of Fig. 3 must be observed. Avoid extra junctions and long cables to prevent voltage drop from affecting the battery protection functionality.

Battery protection (Fig. 2)

The compressor is stopped in case the battery voltage level drops below the configured cut-out voltage. The electronic unit restarts when the cut-in threshold is exceeded again. Battery protection voltage levels can be configured by using the software TOOL4COOL® or Modbus.

Thermostat (Fig. 1)

A mechanical Thermostat or a Secop NTC can be connected to the T&C terminal. Cut-In and Cut-Out temperature for NTC operation can be configured via the software TOOL4COOL® or Modbus Interface. The actual temperature measured by the NTC is available via the Modbus interface. The thermostat can be enabled and disabled via modbus interface.

Master controller (Fig. 1)

The unit is designed for compressor control operation within a cabinet, using either a cabinet controller or a master controller. The master controller must incorporate all necessary EMI filters to comply with relevant standards. The electronic unit does not support a deep sleep mode and must be powered down externally to achieve microampere-level (µA) quiescent currents.

Speed selection

The compressor will run at a fixed speed of 3,000 rpm per default. The minimum speed of the compressor is 2,300 rpm, the maximum 3,000 rpm. Any speed within this range can be configured using TOOL4COOL® or the Modbus interface.

Error handling (Fig. 4)

The electronic unit can detect errors during its operation and can start/stop the compressor accordingly. Fig. 4 shows all errors the unit is able to detect.

Compressor compartment temperature

The electronic unit does not measure the compressor compartment temperature and cannot protect the compressor from out-of-envelope operation. The compressor must be protected externally from out-of-envelope operation, with special attention to the condenser temperature. The electronic unit will enable and disable operation according to the max. allowed PCB temperature only. Stopping compressor operation below below -10°C and above 110°C. The communication interface remains active outside this envelope. Please refer to the compressor data sheet for conditions and compressor compartment temperature.