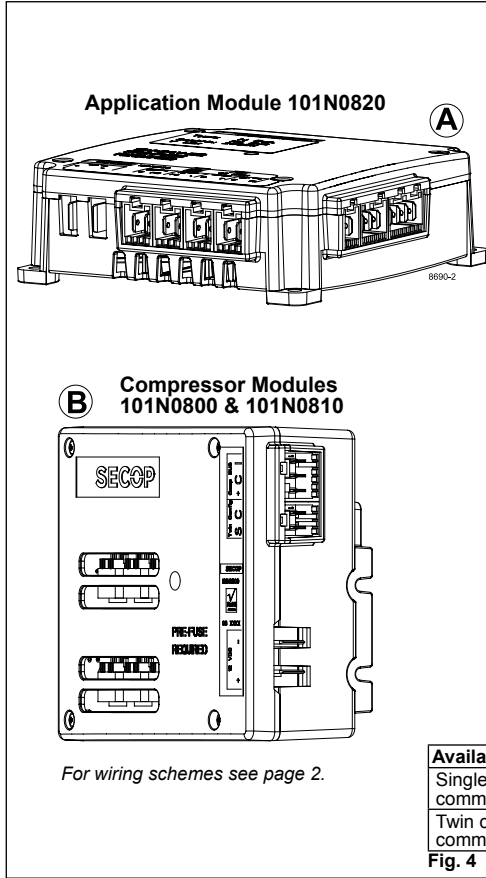


TOOL4COOL®
Flexible control settings

Instructions

SECOP

Compressor Module 101N0800, 12V DC
Compressor Module 101N0810, 24V DC
Application Module 101N0820, 12/24V DC



Battery protection settings 12V DC (± 0.3 V DC, all values)

Voltage (0.1 steps)	Min. value	Default	Max. value
Cut out	VDC 9.6	10.4	17
Cut in diff.	VDC 0.5	1.3	10

Battery protection settings 24V DC (± 0.3 V DC, all values)

Voltage (0.1 steps)	Min. value	Default	Max. value
Cut out	VDC 19	21.3	27
Cut in diff.	VDC 0.5	1.3	10

Fig. 1

Wire Dimensions 12V & 24V DC

Cross section [mm ²]	AWG [Gauge]	Max. length* 12V operation		Max. length* 24V operation	
		[m]	[ft.]	[m]	[ft.]
2 x 4	11	0.75	2.46	1.5	4.92
2 x 6	9	1	3.28	2	6.60
2 x 10	7	2	6.60	4	13.12

Fig. 2 *Length between battery and electronic unit

Recommended fuses and switches

Fuses	12V DC	24V DC
Application module	30A	15A
Compressor module	60A	30A

Main switches	12V DC	24V DC
Single compressor configuration	75A	38A
Twin compressor configuration	150A	75A

Fig. 3

Available cord sets

	Packages	1500 mm	3000 mm
Single compressor communication cable assembly	I - Pack	105N9553	105N9554
Twin compressor communication cable assembly	I - Pack	105N9555	105N9556

Fig. 4

Operational errors

Error code	Error type
7	Communication failure (In case of lost communication between the compressor module(s) and the application module, the compressor(s) and fans will be switched off).
6	Thermostat failure (If the NTC thermistor is short-circuit, has no connection or is outside the operating range (-60°C - 100°C), the compressor module(s) will switch off and show a NTC failure).
5	Thermal cut-out of compressor module (If the refrigeration system has been too heavily loaded, or if the ambient temperature is high/extremely low the compressor module(s) will run too hot/too cold).
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 error / Fan missing (The evaporator fan loads the electronic unit with more than 18A for a 12V system and 9A for a 24V system under start up. The current load exceeds 16.5A for a 12V system or 8.25A for a 24V system under running conditions). (The condenser fan loads the electronic unit with more than 9A for a 12V system and 9.5A for a 24V system under start up. The current load exceeds 8.5A for a 12V system or 4.25A for a 24V system under running conditions).
1	Battery protection cut-out (The voltage is outside the cut-out setting, compressor(s) and fans will stop).

Fig. 5

ENGLISH

The application module 101N0820 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. The compressor module 101N0810 is a 24V single voltage device. This means that the unit can only be used with 24V DC power supply systems. The compressor module 101N0800 is a 12V single voltage device. This means that the unit can only be used with 12V DC power supply systems.

All modules must be protected from direct splash water.
Max. ambient temperature is 55°C.

The modules have 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). The application module can be connected to a PC through the *Secop One Wire/LIN Gateway* communication interface (11) on the **MMI** terminal (I/C/+). Communication gateway modules incl. communication cables can be ordered at Secop. The PC interface allows making different settings and reading out several measurements by using the software tool *TOOL4COOL®* supplied by Secop (must be ordered separately). The application module can also be connected to any modbus-compatible device (12) on the **MMI** terminal (I/C/+). For detailed information please see the specific *Operating Instructions* literature.

Installation (Fig. 6, page 2)
Connect the terminal plug from the compressor module (B) to the compressor(s) (10) and connect the compressor module(s) to the application module (A). The application module will automatically detect whether a twin or a single configuration is used. For connecting the application module with the compressor module(s) cables supplied by Secop (D) can be used (Fig. 4).

The input power connectors used on the electronic unit are 9.5 mm spade connectors. Other connectors used are 6.3 mm spade connectors in a Leoco 5011P02HT0A or 5011P03HT0A or 5011P04HT0A housing. Mount the electronic unit on the compressor and fix it with the two screws (1).

Power supply (Fig. 6, page 2)
All modules must always be connected directly to the battery poles (2). Connect the plus to + and the minus to -, otherwise the modules will not work. The modules are protected against reverse battery connection. For protection during installation, fuses (3) should be mounted in the + cable as close as possible to the modules. Each module must have its own fuse. Recommended fuses and switches (4) are shown in Fig. 3. 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. Supply cables (C) should be customized according to recommendations given in Product Bulletin DES.N.100.E. When using the compressor module 101N0800 (12V) the application module must also be applied with 12V DC. When using compressor module 101N0810 (24V) the application module must also be applied with 24V DC.

Battery protection (Fig. 1)
The compressor stops and starts again according to the chosen voltage limits measured on the + and - terminals of the modules. The standard settings for the power supply systems are shown in Fig. 1. Other settings are set through the communication interface.

Thermostat (Fig. 6, page 2)
The thermostat is connected between the terminals C and T. Either a NTC (electrical thermostat) (8) or a mechanical thermostat can be connected (7). Another NTC (9) can also be connected between the terminals C and T1 to obtain another temperature. 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 (11). With factory settings, the compressor will run with 2,500 rpm for the first 30 sec. and then step up to 4,000 rpm when the thermostat is switched on. Other fixed compressor speeds and start speeds in the range between 2,500 and 4,000 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. 6, page 2)
An evaporator fan (200W) (5) can be connected between the terminals C and Fe and a condenser fan (100W) (6) between + and Fc. Connect the plus to + and the minus to Fc.

Connecting Fe with Fc can destroy the unit.

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 compressor modules records an operational error, the error can be read out in the software. Error codes are defined as shown in Fig. 5.

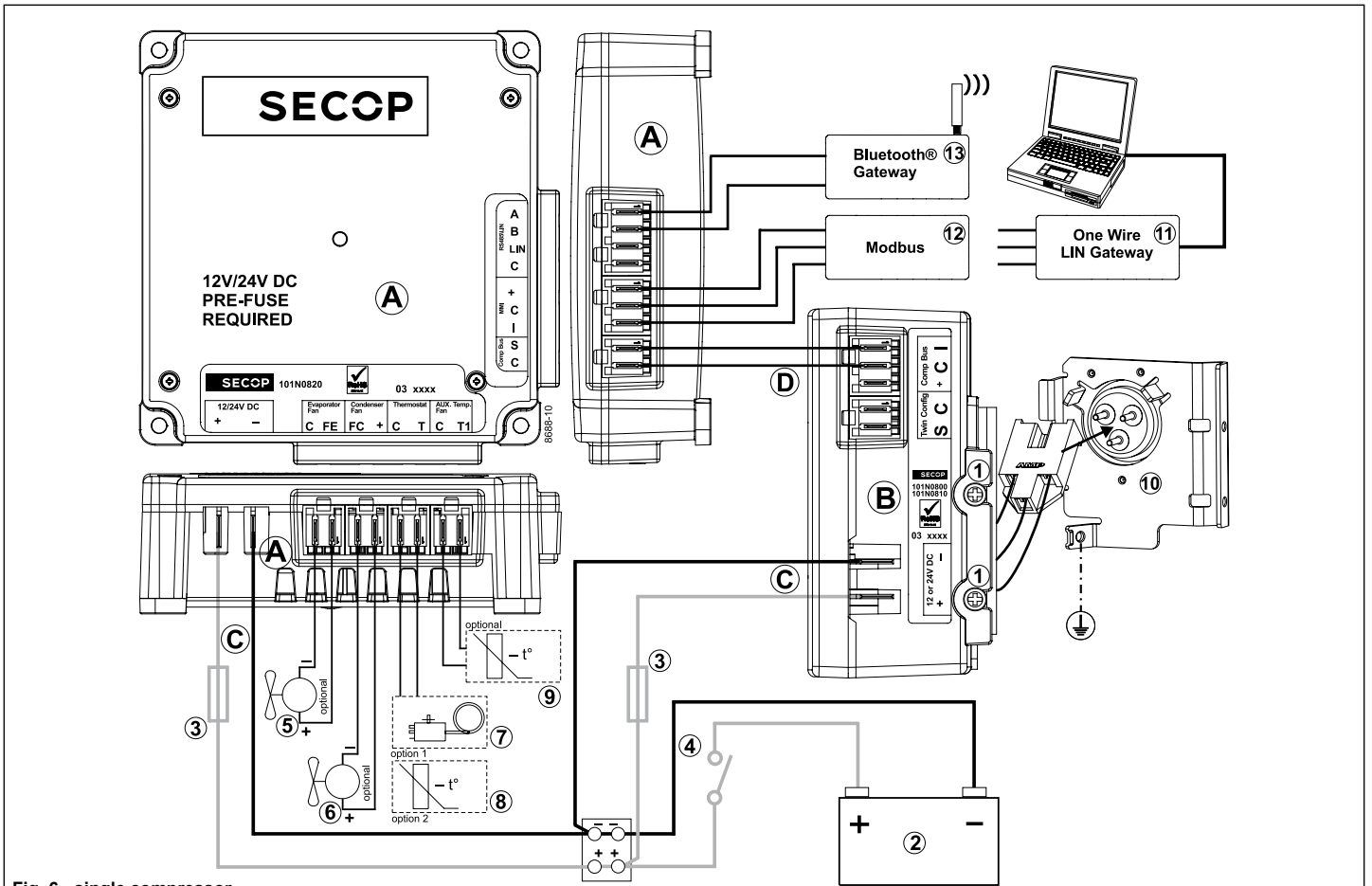


Fig. 6 - single compressor

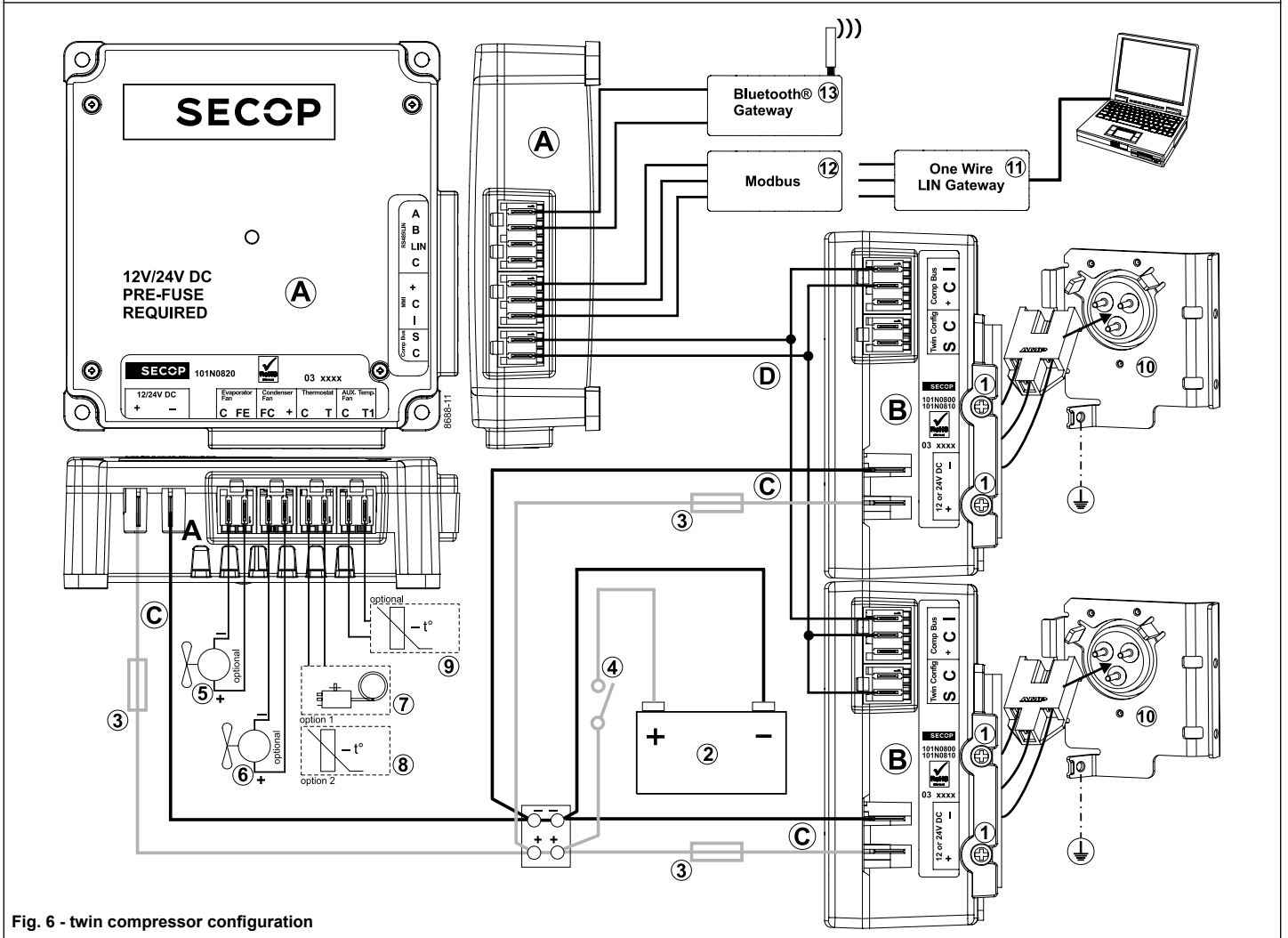


Fig. 6 - twin compressor configuration

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