



CONNECTION BOX FOR AUTOMATIC BACK-UP OF FRONIUS GEN24 AND SYMO HYBRID INVERTERS

USER MANUAL

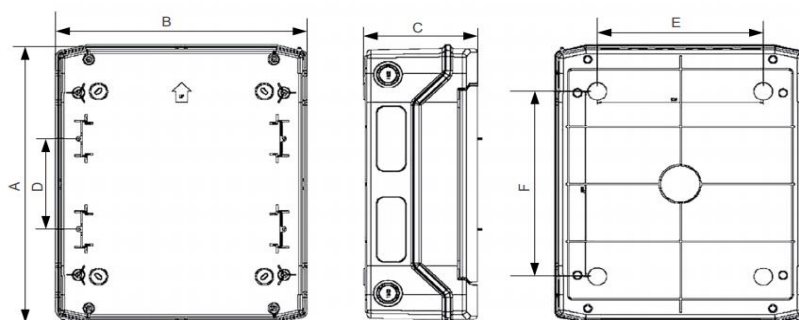


1. Introduction

The operating instructions described below are used to assemble the connection box SH-GEN24-SZR. The switchgear, after connecting the network and the inverter, enables the supply of the three-phase emergency power supply connection during a mains failure as well as during the normal operation of the network. The installation of the switchgear must be carried out in accordance with the content of this manual and the recommendations of the inverter manufacturer. Before sale, each switchgear is tested with the use of an inverter and marked with a serial number, any modifications inside the switchgear as well as its incorrect assembly will result in the loss of warranty.

2. Housing assembly

The connection board is designed for surface mounting. The board case provides IP65 protection to the component inside the electrical switchboard. For installation, open the connection board case, then attach it to the wall by screwing it with screws, using the wall plugs in the wall.



Img.1 Case dimensions.

Tab. 1 Case dimensions

	A	B	C
PHS 48T	653mm	319mm	144mm

Tab. 2 Parameters

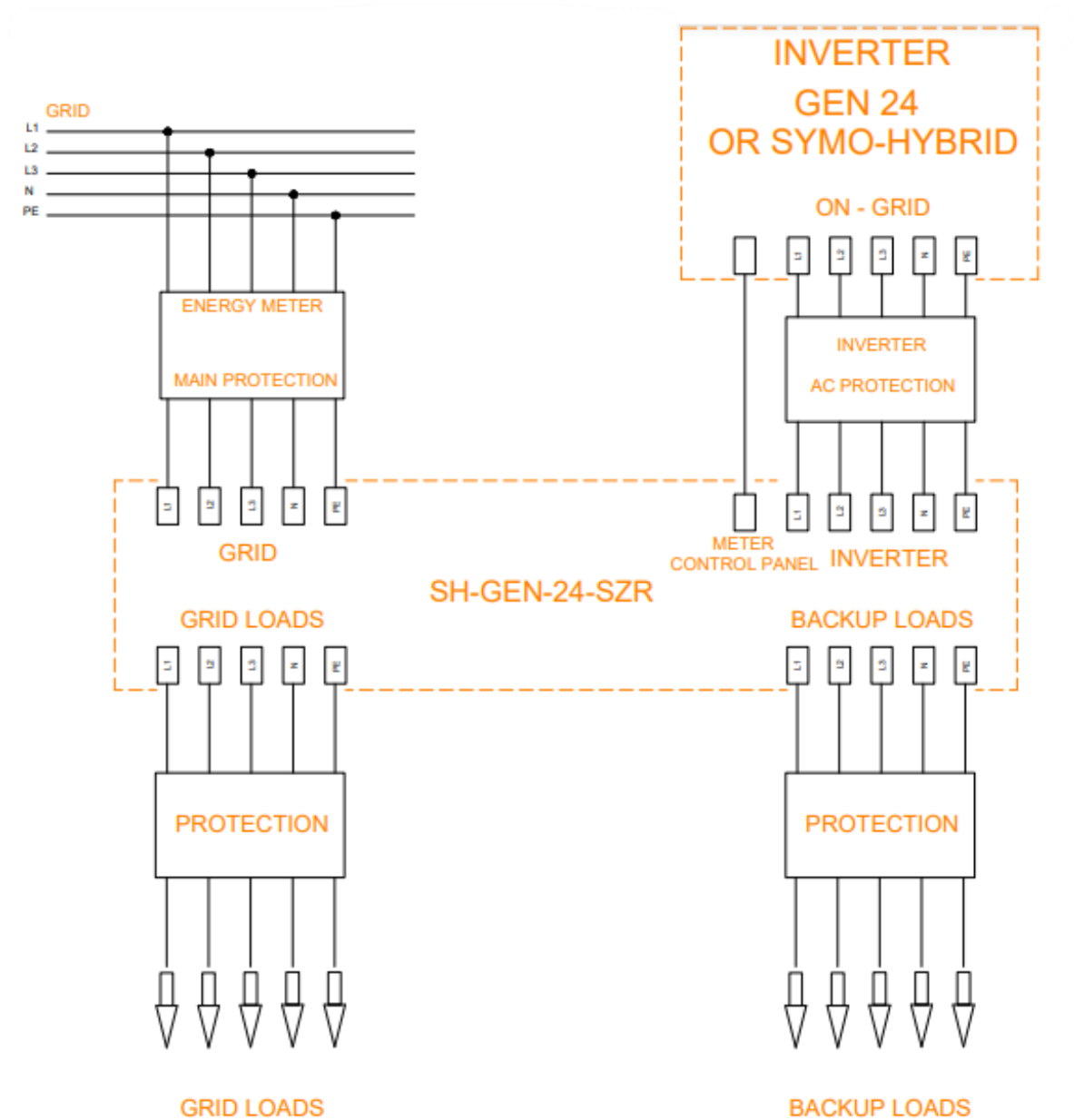
Numbers of rows	4
Case material	Plastic
Expandable	No
Type of cover	Close
Lock	No
Installation type	Surface mounting
Built-in depth	0
Protection class (IP)	65

3. Technical parameter

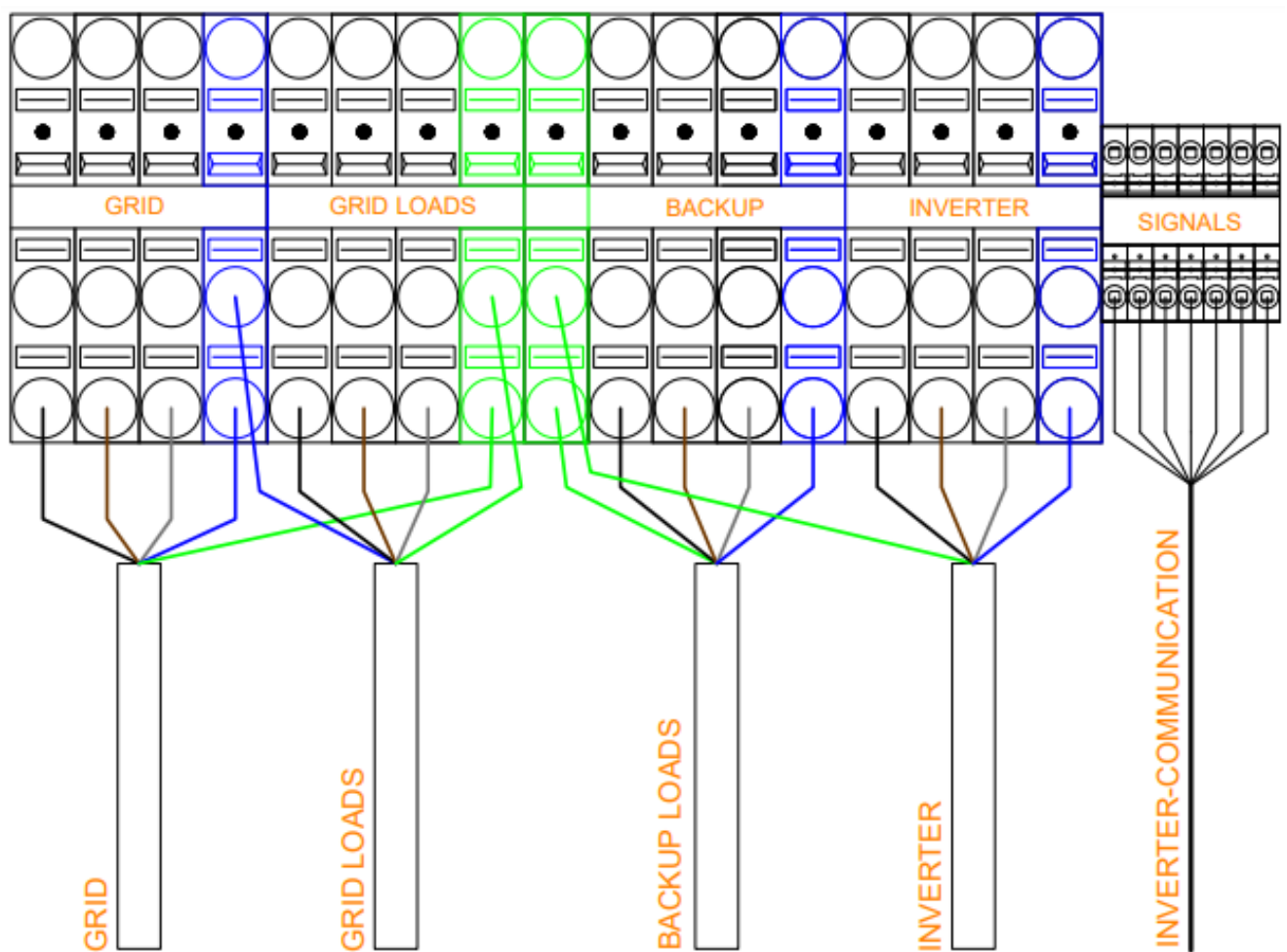
Tab. 3 Technical parameters of the switchboard

Podstawowe dane techniczne	
Compatibility	FRONIUS SYMO HYBRID 3.0 / 4.0 / 5.0 -3-S FRONIUS SYMO GEN24 6.0 / 8.0 / 10.0
Grid type	TN-S / TN-C-S
Grid parameter, V	230/400
Rated frequency, Hz	50
Energy storage	Energy storage
Max output current of backup source, A	16.4
Max. output current, A	63
Switching time, s	≈ 60
Type of connection	3F + N
Operating temperature, °C	-25÷40
Protection class IP	65
Weight, kg	8
Dimensions, mm	653 / 319 / 144
Phase signalisation	Yes
Max. input current, A	50A
Wire cross-sections	
Network connector	<10 mm ²
Transmitters cable	<10 mm ²
Inverter input cable	<10 mm ²
Backup circuit transmitter	<10 mm ²
Communication cable	Terminal block PUSH-IN (0,5mm ²) / UTP cat.5 RJ-45
Cable glends	
Network connector	M25
Transmittes connector	M25
Inverter input connector	M25
Emergency connector	M25
Communication connector	M16

4. Connection



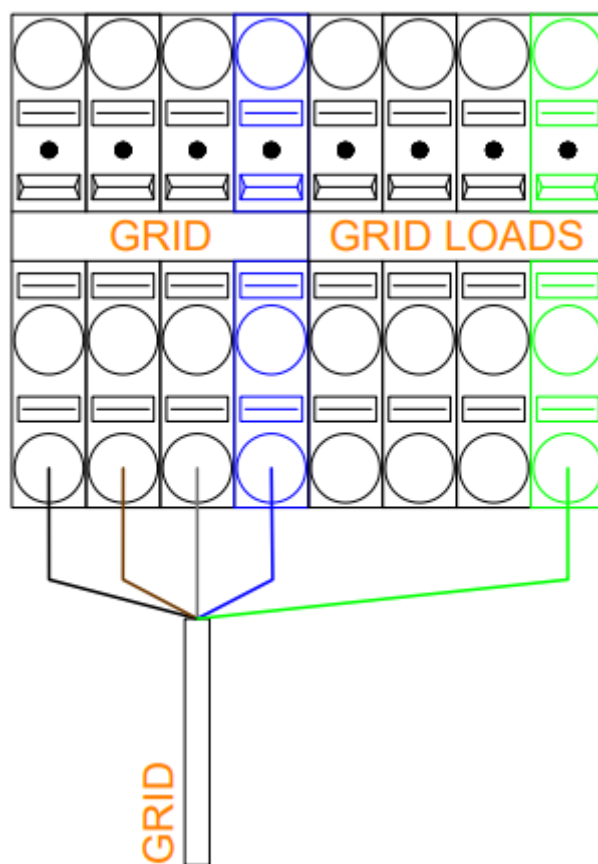
Img.2 Connection diagram.



Img.3 terminal block for power supply and control circuits.

Connection of the main power supply takes place at the input marked as "GRID" (IMG.4), as in with a connection diagram (IMG.2). Such connection enables the measurement of the energy consumed through the built-in energy meter inside the connection switchboard. When connecting the junction box, it is important to keep the phase sequence, all gray connection blocks on the busbar are prepared in the phase sequence L1 L2 L3. Use the M25 gland to lead the cables inside the switchgear.

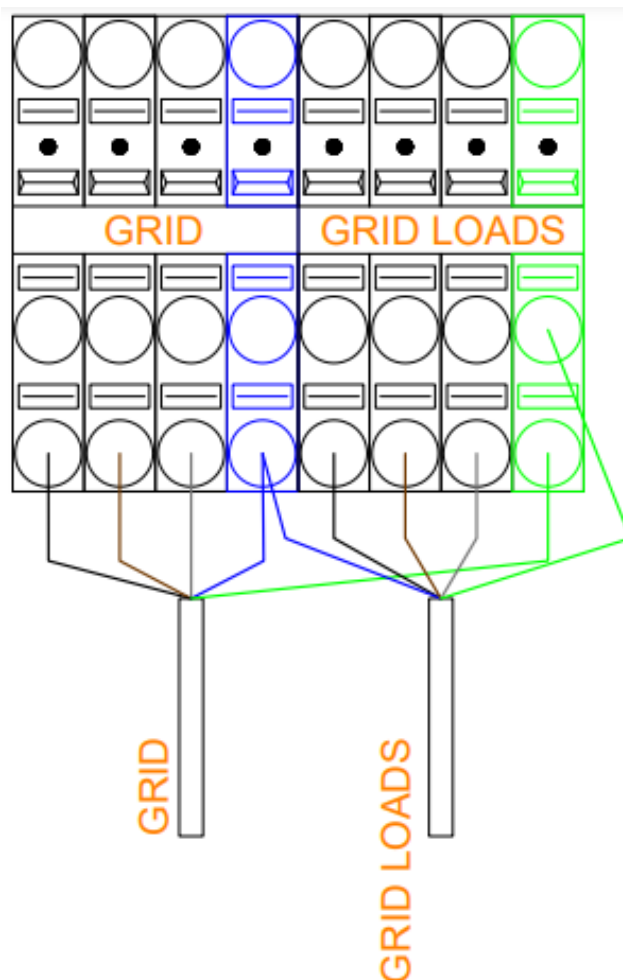
- gray connectors - phase wires in the order L1, L2, L3,
- blue connector- neutral wire,
- greenish/yellow connector- neutral-protecting wire.



Img.4. The used terminal block of the grid with the connected power supply of the switchgear.

Connection of household consumers, for connection of consumers that do not require emergency power supply, the "GRID LOADS" connector is used (Img.5). Connected grid loads will be supplied only during the network operation, in the event of a power failure, this circuit remains disconnected. Connection of loads as shown is required due to the energy measurement on the energy meter.

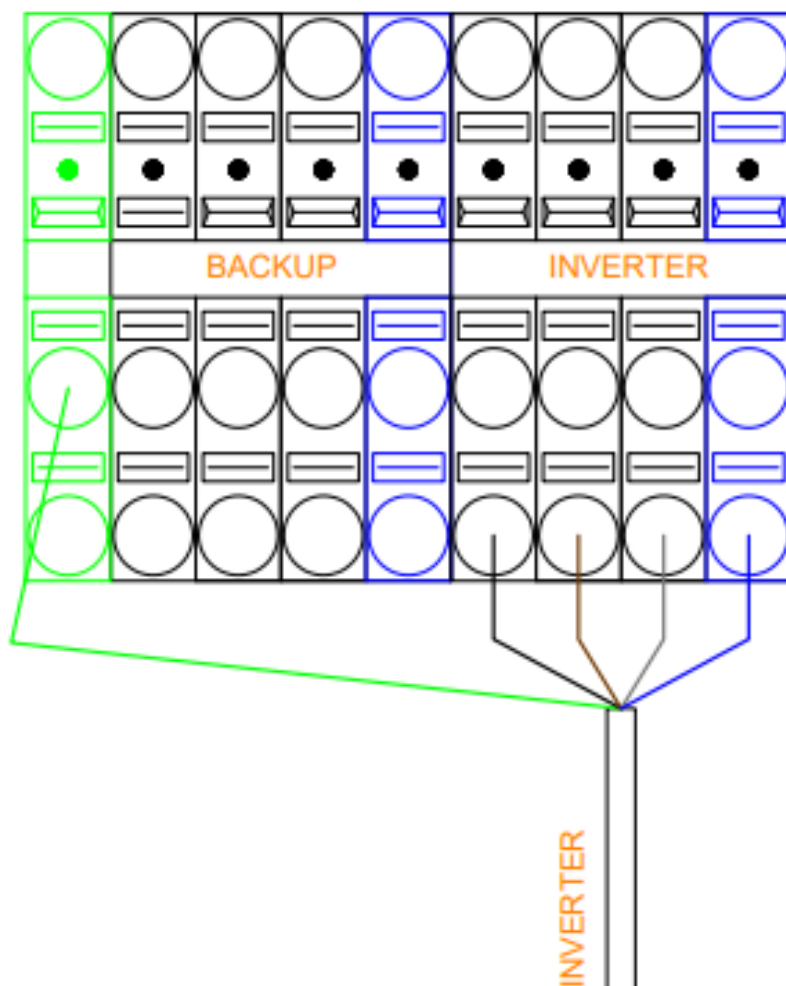
- gray connectors - phase wires in the order L1, L2, L3,
- blue connector- neutral wire,
- greenish/yellow connector- neutral-protecting wire.



Img.5 Terminal block for connection of loads supplied directly from the grid with a connected cable for grid loads that do not require emergency power supply

Connectors connected to the inverter: the inverter connector should be plugged into dedicated places marked in the connection switchboard with the name "INVERTER" (Img.6). If additional inverter overvoltage protections are used, a switchgear with AC protections should be used between the ATS switching station and the inverter.

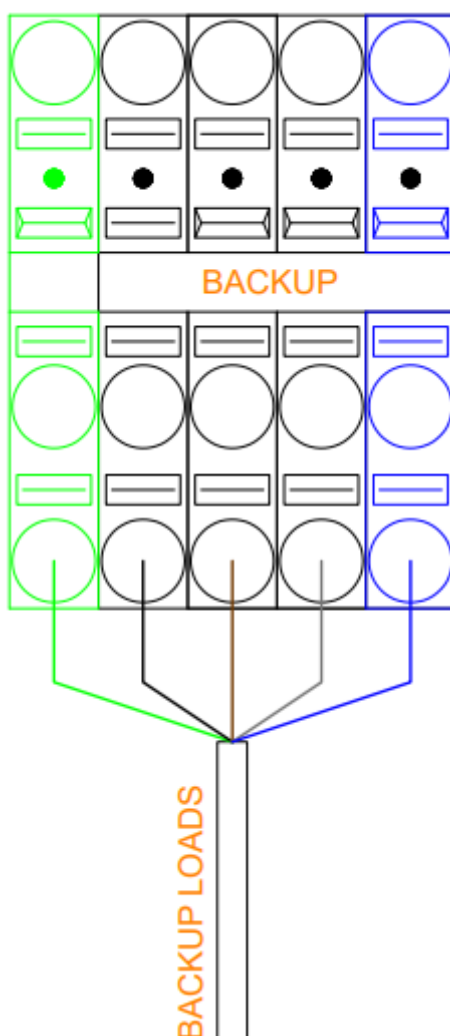
- gray connectors - phase wires in the order L1, L2, L3,
- blue connector- neutral wire,
- greenish/yellow connector- neutral-protecting wire



Img.6 Terminal block for connection of the inverter with the connected cable from the inverter.

The emergency power supply circuits are connected directly to the place designated for them, labeled "BACKUP" (Img. 7). It is important that the power of the connected circuits is adequate to the output power of the chosen inverter. If emergency power starts on receivers with higher power than the inverter emergency power output power, it will be overloaded, which will cause its shutdown. This connector is active both during network operation as well as in the event of a power outage.

- gray connectors - phase wires in the order L1, L2, L3,
- blue connector- neutral wire,
- greenish/yellow connector- neutral-protecting wire



Img.7 Terminal block for connection of backup loads with the connected wire of the circuits which will be supplied at the moment of grid supply and in the event of its failure.

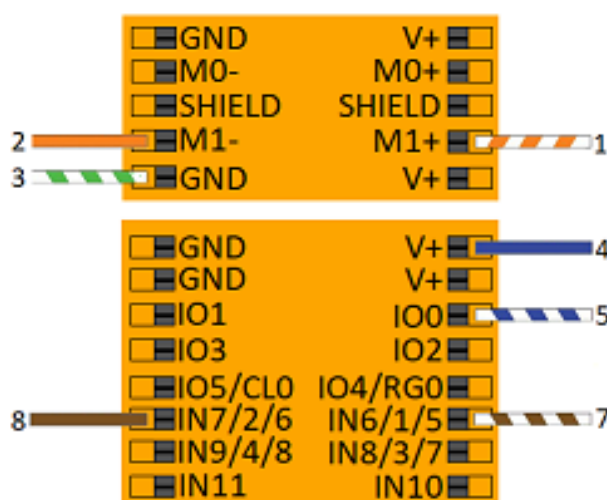
Connection of communication cables, properly terminated RJ45 connector in type 2 (Img. 8) should be plugged into the communication cube of the switchgear. Connect the communication cable to the inverter in accordance with the diagram below (Img. 9). For communication connectors without marking on the RJ45 connector housing, the connection of wires to the inverter will be in the following configuration: "TYPE 1", for the RJ-45 adapter housing with "TYP2" it will be TYPE2, as shown in the images (Img.10).



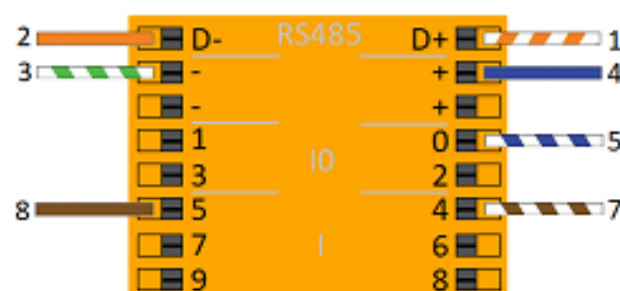
Img.8 How to make RJ45 cat.5 plugs

TYP 1

GEN24

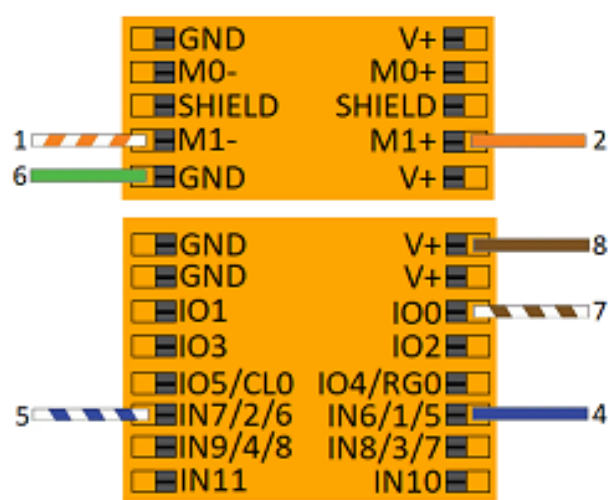


Symo Hybrid

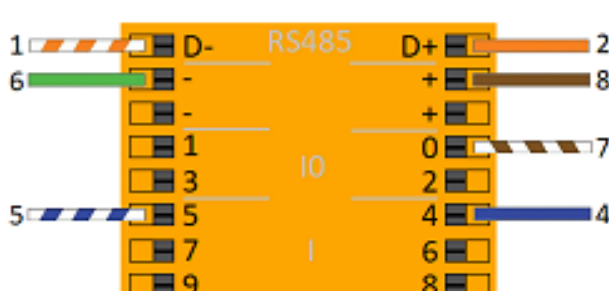


TYP 2

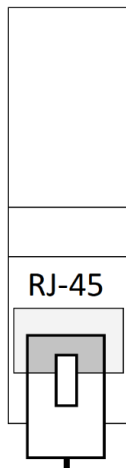
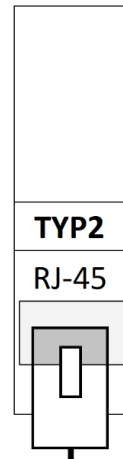
GEN24



Symo Hybrid

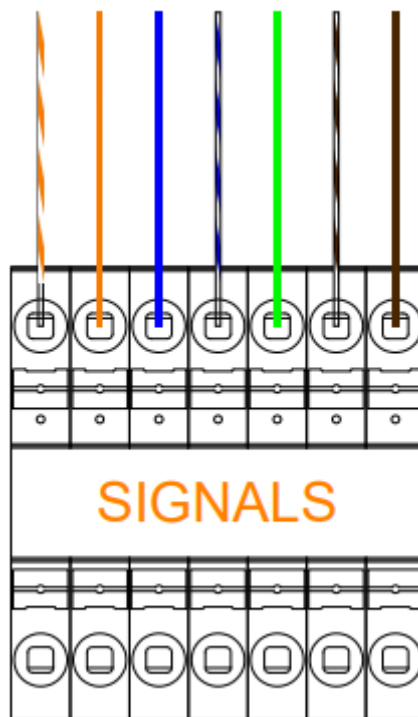


Img.9 Connection of the switchgear RJ45 connector to the inverter connectors. The standard of connection depends on the description on the RJ45 adapter, point: "Connection of communication cables"

TYP 1**TYP 2**

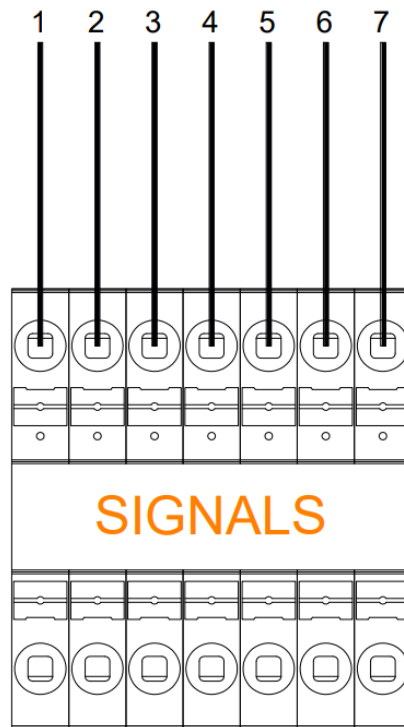
Img.10 Labeling of the adapter.

In the version of the switchgear with a signal connector based on a PUSH-IN terminal block and a UTP cable (Img.11), route the signal wires in the same colour order as the RJ45 connector in Type 2, omitting the white/green wire. The plugs in the inverter connector remain unchanged (Img.9).

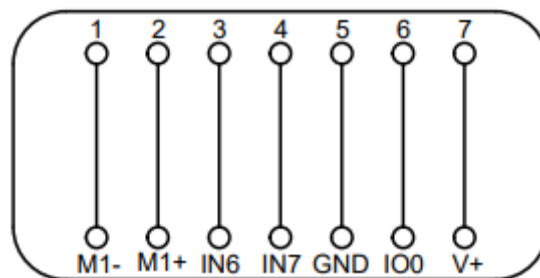


Img.11 Communication terminal block.

In the version of the switchgear with a PUSH-IN type connector block and 0.5mm² wires (Img.12), the signal wires must be routed in the order of the wires according to the wiring diagram in the switchgear, which corresponds to the port markings on the inverter connector (Img.13). The plugs in the inverter connector remain unchanged (Img.9).



Img.12 Communication terminal block.



Img.13 Communication terminal block description.

After complete assembly, before putting the switchgear into operation, the assembler is obliged to carry out electrical measurement tests and check the phase sequence, he is also obliged to verify the tightening torque of all electrical devices before starting up.

4. General informations

- The connection box has AC side protection of the inverter. RCD 300mA 40A S+A and B25 overcurrent protection.
- The switching time depends on the inverter control and is <90sec
- Disabling the protections causes the inverter power supply to be disconnected, the remaining circuits remain powered.
- In order to use the inverter's emergency power supply, the BACK-UP function must be activated in the inverter settings. Default settings :
 - Backup Power Mode: Full Backup,
 - Activate backup interlock: Pin 0 (Default),
 - Backup interlock feedback: Pin 7 (Default),
 - Open grid relais feedback: Pin6 (Default).
- The loss of voltage in any of the phases causes the switching of the emergency circuits supply from the mains supply to the emergency supply from the inverter.
- The energy meter is installed in the connection switchboard.
- In the emergency power mode, the system maintains network compatibility and works in the network system TN-S / TN-C-S.
- The system enables the asymmetrical load in the emergency power supply circuits.
- The system requires an energy storage connected to the inverter to operate.
- When designing the installation, it should be ensured that all connected components are usable only within the permissible operating range of the connection switchboard.