



SH-FOX3-SZR

USER MANUAL

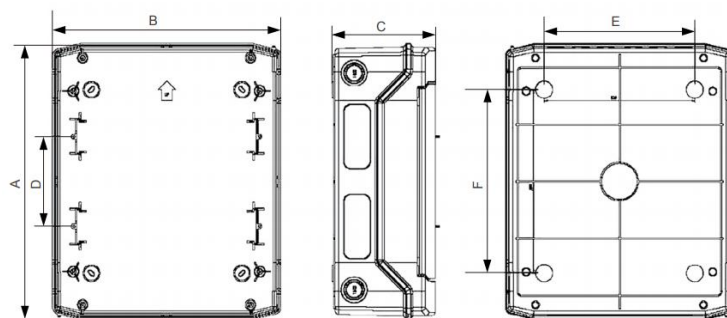


1. Introduction

The operating instructions described below are used to assemble the SH-FOX3-SZR connection box. After connecting the network and the inverter, the switchgear allows for supplying the receivers of the single-phase emergency power supply circuit during a network failure as well as during the normal state of network operation/ 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 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



Rys.1 Case dimensions.

Tab. 1 Case dimensions

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

Tab. 2 Case parameters

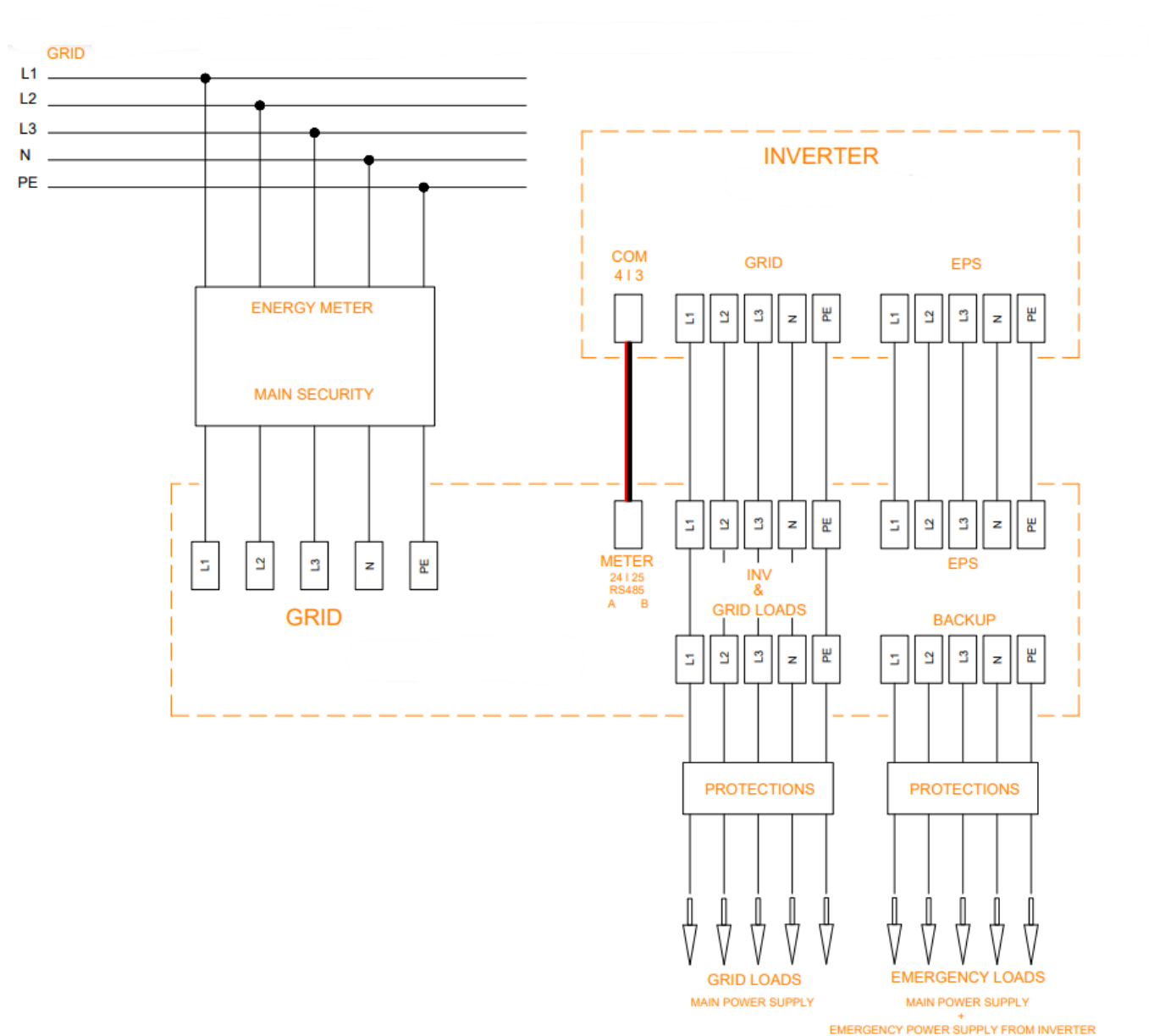
Numbers of rows	4
Case material	Plastic
Expandable	No
Type of lid	Close
Lock	No
Type	Surface mounting.
Built-in depth	0
Protection class (IP)	65

3. Technical parameters

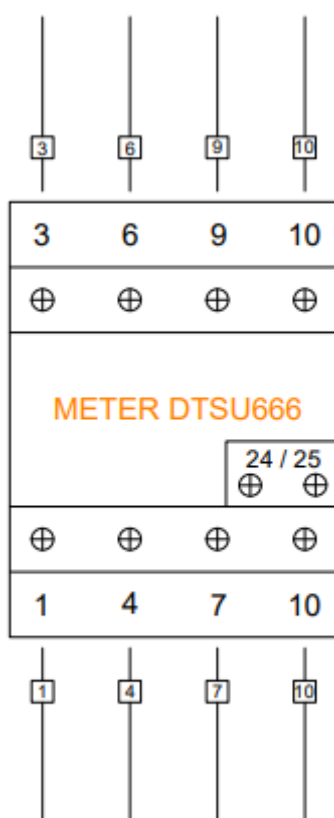
Tab. 3 Technical parameters of the switchboar

SH-FOX3-SZR	
Compatibility	FoxEss AIO 3H 5.0-E - 10.0-E FoxEss H3 5.0-E – 12.0-E FoxEss P3/H3-S 5.0-SH – 15.0-SH
Grid type	TN-S / TN-C-S
Backup energy circuit	Energy storage /PV generator
Energy usage of backup source	Depends on inverter power
Max. input current, A	50
Grid parameter V	230/400
Rated frequency, Hz	50
Type of connection	3F + N
Switching time, s	$0.2 < t$
Switching time (from the emergency circuit), s	≈ 3 (depends on inverter power)
Circuit breaker	K1/K2 63A
Protection class IP	65
Dimensions height/width/depth, mm	653 / 319 / 144
Weight, kg	6,08
Cable gland	5 x M25 1 x M16
Inverter EPS terminal	Terminal block 10 mm ²
Inverter and Grid Loads terminal	Terminal block 10 mm ²
Grid terminal	Terminal block 10 mm ²
Backup loads terminal	Terminal block 10 mm ²
Space for a meter	Yes
Operating temperature, °C	-20÷40

4. Connection



Connection of the energy meter (FoxEss DTSU666) the meter wires are in the place marked on the box as a meter, they must be connected to the energy meter in accordance with their description. Each wire is labeled with its name, upper wires: 3, 6, 9, 10 lower wires 1, 4, 7, 10.



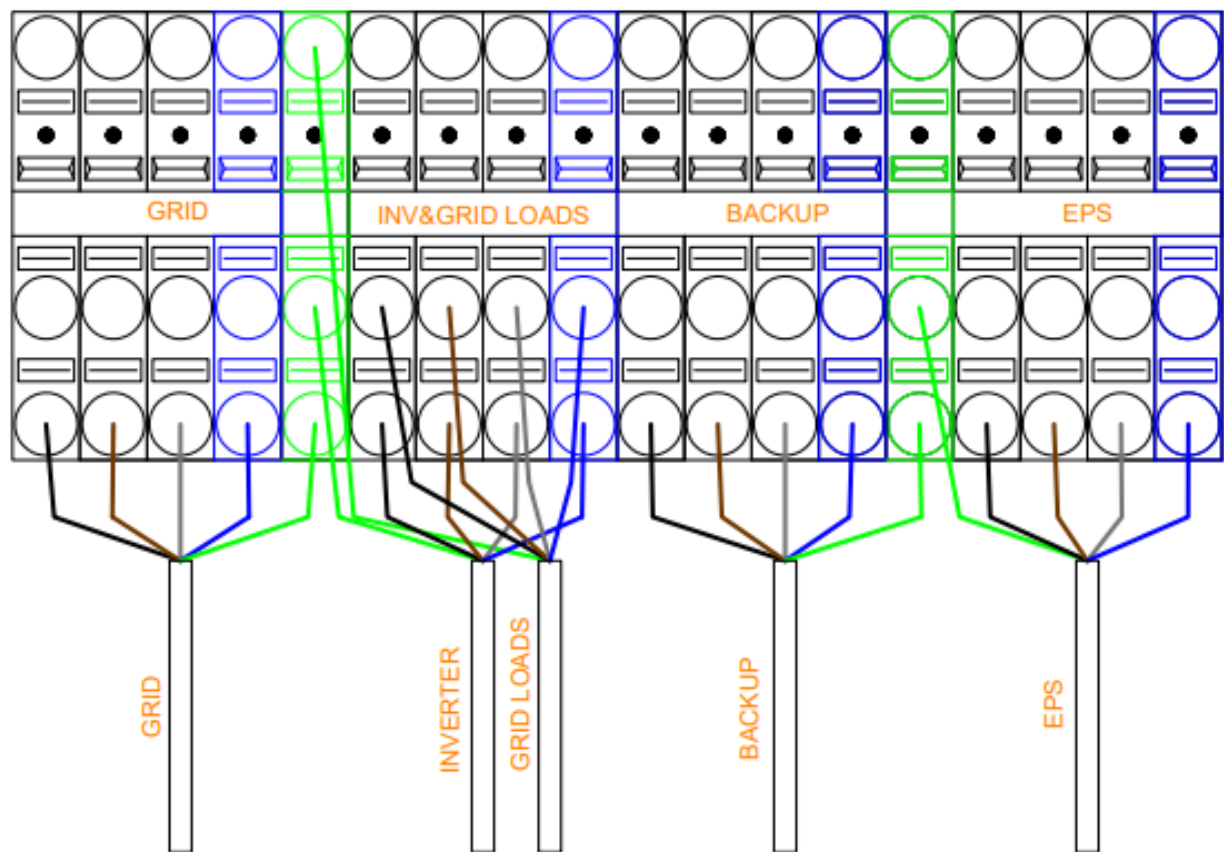
Img. 2 Meter connection circuit.

*** If the meter is not installed in the place intended for its installation, the wires used to connect the meter should be removed and the sleeves should be reattached. If the wires are not removed, a metallic short circuit may occur inside the junction box.**

A communication cable must be run between the built-in meter and the inverter, the connection can be made, for example, with a communication twisted-pair. Use M16 cable gland to pass the cables inside the housing.

Tab. 4 Connection system Inverter - Matter

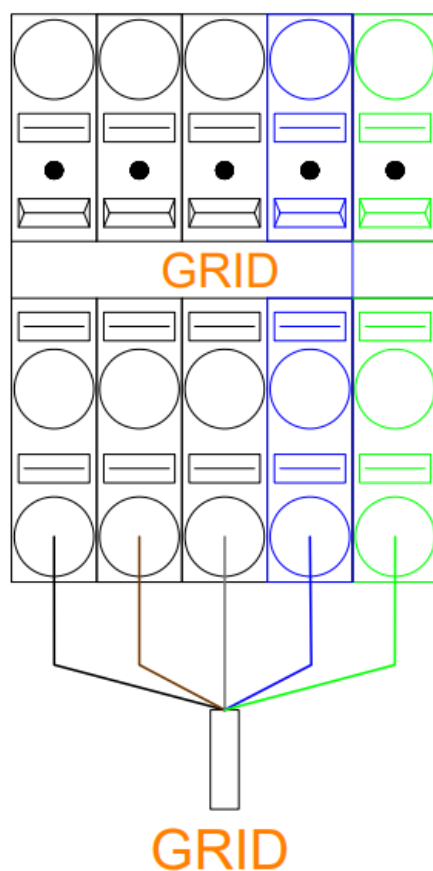
Inverter (COM)	Matter
4	24
3	25



Img 3. Terminal blocks of the SH-AIO3H-SZR switchgear

The connection of the main power supply takes place at the input marked as "GRID" (fig. 3). From this point, all circuits will be powered, the maximum value of phase current that can be connected to the Network connector is 50A. When connecting the connection switchboard, it is important to maintain the phase sequence, all gray connection cubes on the busbar are prepared in phase sequence L1 L2 L3. Use the M25 gland to lead the cables inside the switchgear.

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

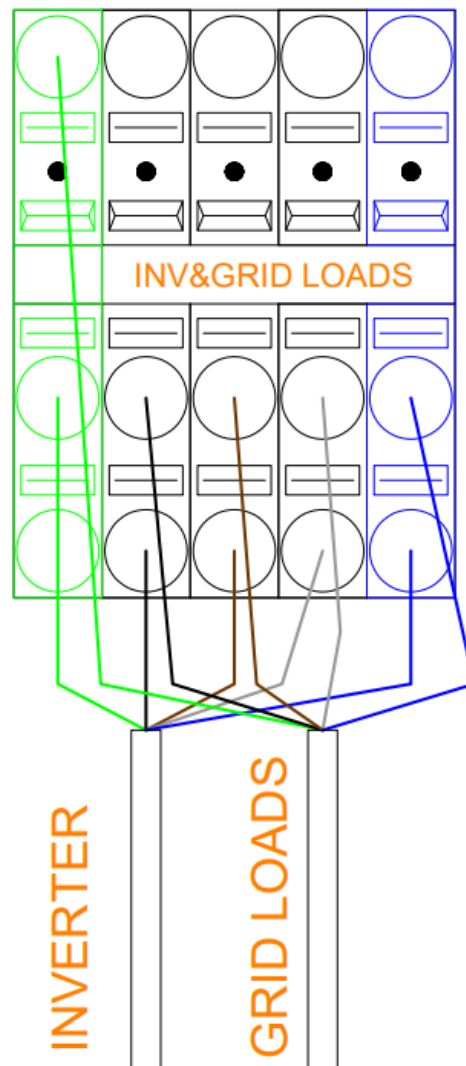


Img.4 The network terminal block used with the connected switchgear power supply

The **network circuits** powered directly from the power system are connected to the common "INV& GRID LOADS" cubes. IMG. 5 Such connection enables the measurement of the energy of the entire building with the use of an installed energy meter inside the connection switchboard. Connected commissioning of the customer's installation should be additionally secured in accordance with the installation design. These loads will be turned off in the event of power failure from the mains or any of the phases. 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.

The **connection of the inverter's grid connector** takes place at the input marked as GRID. Use the M25 gland to route the cables to the inside of the switchgear.

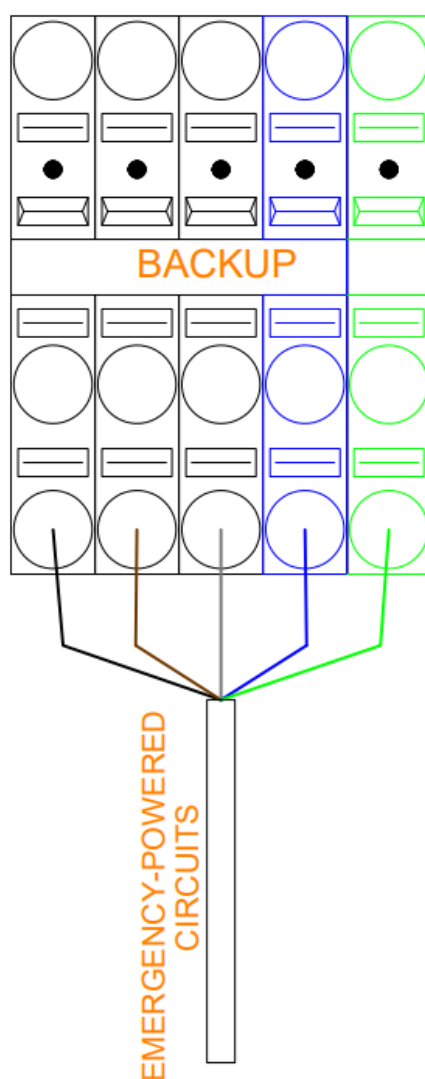
- gray connectors - phase wires in the order L1, L2, L3,
- blue connector- neutral wire,
- greenish/yellow connector- neutral-protecting wire



Img. 5 Common terminal block for grid loads and inverter GRID connection used.

The **emergency power supply circuits** are connected directly to their designated place and signed with the same name. Img. 6. These circuits are live both when the network is working properly and at the time of a network failure. It is important that the power of the connected circuits is adequate to the output power of the chosen inverter. In the event that the power consumed by the emergency circuits exceeds its maximum power, the inverter will be overloaded and cut off the emergency power supply. For the AIO unit, the power on the emergency circuits is directly related to the power of the inverter and the amount of energy stored in the battery. Emergency circuits require additional protection in accordance with the assumptions of the building's electrical installation. Use the M25 gland to lead the cables inside the switchgear.

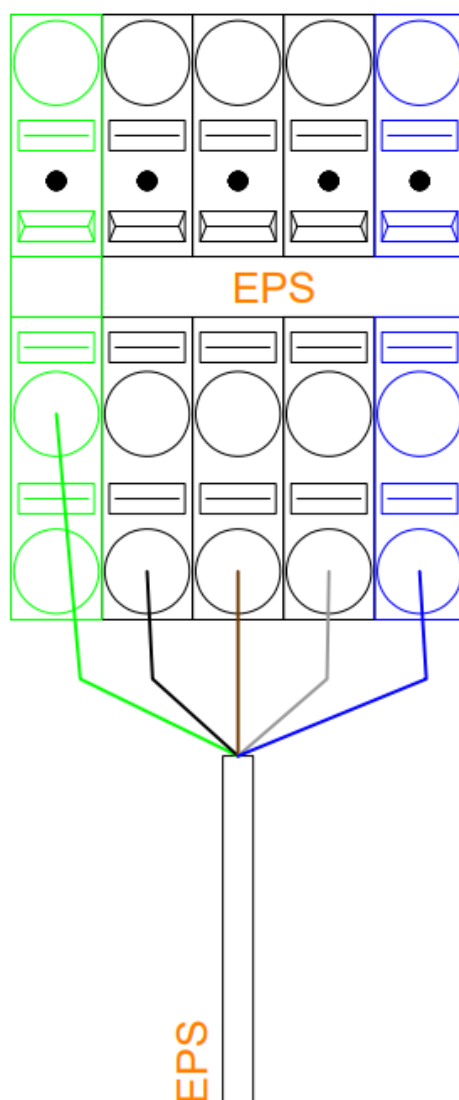
- gray connectors - phase wires in the order L1, L2, L3,
- blue connector- neutral wire,
- reenish/yellow connector- neutral-protecting wire.



Img. 6 Common terminal block for basic loads and inverter GRID connection used.

EPS connectors of the inverter: attach the connector to the connector labeled with the same name in the switchboard. 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. 7 Connecting EPS loads from the inverter in the ATS switchgear.

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.

After installation is complete, start the EPS function on the AIO inverter. In order for the entire system to work properly.

5. Informacje ogólne

- The default switching time is set to 0.5s. Changing the time settings of the time relays is associated with the possibility of failure of the system and loss of warranty.
- In order to disconnect the voltage on the side of emergency circuits, switch off the EPS control installation switches.
- In the event of exceeding the power of the circuits connected to the emergency power supply side, the inverter is overloaded and the EPS connector is temporarily disconnected.
- If the meter is not installed in the place designated for its installation, the cables used to connect the meter should be removed and new cables connected. If the wires are not connected, a metallic short circuit may occur inside the connection box.
- To use the inverter backup power, the EPS function must be enabled in the inverter settings.
- The loss of voltage in any of the phases causes the switchover of the emergency circuits supply from the mains supply to the inverter emergency supply.
- The loss of voltage in any of the phases causes the disconnection of the basic mains loads as well as the inverter's GRID connector.
- **The energy meter is included with each FoxEss AIO unit.**
- In the emergency power mode, the inverter maintains the grid compatibility and operates in the TN-S network system.
- The system enables the unbalanced load in the emergency power supply circuits.
- When designing the installation, make sure that all connected components are usable only within the permissible operating range of the connection switchboard.
- When there is a potential difference between the PE and N conductors in the customer's installation, when the power is connected, the residual current circuit breaker connected upstream of the inverter may trip, this phenomenon occurs because the inverter short-circuits the PE and N conductors during an emergency operation. This phenomenon is a standard solution and it is conditioned by the necessity to operate the inverter in the TN network system during emergency power supply.
- The N and PE conductor of the EPS connector is connected in order to preserve the TN network system during the emergency power supply operation in the customer's installation.

