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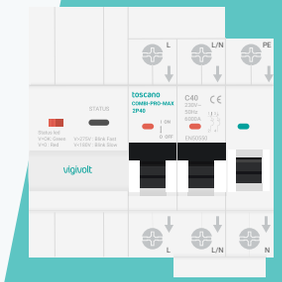
COMBI-PRO-MAX

Control system for backup applications and island mode, with permanent over-undervoltage protection



BEFORE INSTALLING THE DEVICE IT'S NECESSARY TO BE SURE THAT THE INVERTER IS ABLE TO WORK IN "ISLAND MODE".

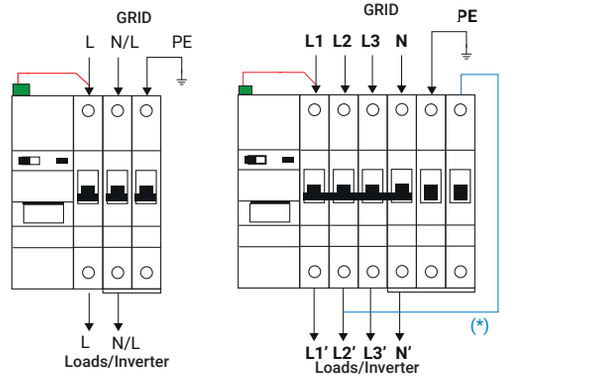
FOR THIS YOU SHOULD CONSULT YOUR INSTALLER OR THE INSTALLATION MANUAL OF YOUR INVERTER.

Before starting, disconnect power and work with the proper tools, THIS DEVICE MUST BE INSTALLED BY A QUALIFIED PROFESSIONAL.

Once installed, the parts connected to the electrical power suply must be covered so that they are not accessible.

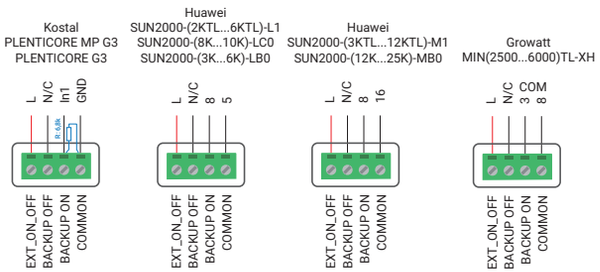
If the equipment is used or modified outside the manufacturer's specifications, safety may be compromised, exempting Toscano from any responsibility for improper use. The interior of the equipment should only be handled by our technical service personnel.

Power wiring



(*) IMPORTANT! This cable jumper must only be made on Huawei "M1" & "MB0" models.

Signal wiring



Description

COMBI-PRO-MAX is a device that combines the functions of circuit breaker protection, a temporary surge protector and island mode activation control in photovoltaic generation inverters. It is valid for single-phase, three-phase and two-phase installations.

The connection of COMBI-PRO-MAX and COMBI-MAX with cascade inverters, parallel inverters, inverter arrays or any application outside the provided diagrams should be consulted and their application is not guaranteed.

How does it work?

In the event of detecting a power cut or an anomaly in the power supply (overvoltage, lack of phase...) it will disconnect the loads connected downstream of the COMBI-PRO-MAX from the supply network, connect the neutral of the solar inverter to earth and send the island mode activation signal to the solar inverter, reactivating the supply to these loads if the conditions allow it (enough solar energy, battery charge). Connecting the neutral to the installation's earth ensures the correct operation of the earth leakage circuit breakers, ensuring the protection of people in this situation.
When the mains power supply returns to normal, for at least 3 minutes, the equipment will proceed to remove the island mode activation signal and reconnect the loads downstream of the COMBI-PRO-MAX to the mains.

It has a status indicator LED which, depending on the colour and flashing rate, shows the status of the equipment. It also incorporates a switch that can be used to activate the island mode manually, which is very useful in the initial start-up of the equipment, maintenance of the installation and special working conditions.
In the event of a trip due to overcurrent, short-circuit or manual disconnection, the unit will not automatically reset or activate island mode and will remain in that state until the user manually raises the handle.

Loss of power supply:
When the mains power supply is lost, the unit triggers the MCB, disconnecting the loads connected downstream of it, connecting the neutral of the generator to earth at the same time and after this, it will activate the solar inverter's island mode activation signal. The activation time of the equipment is 2 seconds, but the time needed for the solar inverter to activate the output depends on the model and the operating conditions. In this operating mode, the MCB handle can be raised manually, so that in the event that the power loss has been caused by overconsumption and consequent cut-off by the meter, the installation can be reset without the need to manipulate the meter. Contact your supply company to find out how to reset the meter. When the handle is raised, the island mode is automatically deactivated and will be reactivated if it is lowered again.

Overvoltage:
When the voltage exceeds the voltage established in the standard, the equipment trips the MCB. The time it takes to start tripping will depend on the level of overvoltage detected (according to the specifications of the UNE-EN50550 Standard). Once the MCB has tripped, the island mode of the solar inverter will be activated in the

Toscano Línea Electrónica, S.L.
P.I. La Isla c/Río Viejo, 50 - 41700 - Dos Hermanas - SEVILLA - SPAIN - (+34) 954 999 900 - www.toscano.es - info@toscano.es

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same way as indicated in the 'Loss of power supply' section, except that the handle cannot be raised manually. When the voltage drops below 255V and is maintained for at least 3 minutes, the unit will reset the MCB by reconnecting the voltage to the mains.

Undervoltage:
If the supply voltage drops below 180V for more than 10 seconds, the equipment triggers the MCB, leaving the installation without supply. Once the MCB has tripped, the island mode of the solar inverter will be activated in the same way as indicated in the 'Loss of power supply' section, except that the handle cannot be raised manually. When the voltage stabilises above 210V for at least 3 minutes, the unit will automatically reset the MCB.

Remote (EXT_ON_OFF):
The device incorporates a remote control input. If it is opened, the device acts and triggers the MCB, preventing it from being raised manually. After having closed it, it will reset. This input must be connected for correct operation of the equipment.

Mode switch:
COMBI-PRO-MAX has a switch that allows the installation to be placed in forced island mode. In this way the installation can be checked, maintenance or any other work or check can be carried out. To activate the manual island mode, move the mode switch to position B, the MCB handle will drop and the island mode will be activated. In this mode the handle cannot be raised manually. To deactivate the manual island mode, move the mode switch to position A and the unit will enter the normal operating mode.

Status indicator:
The device is also equipped with an LED light that indicates the status of the input voltage and the island mode:

- Green: voltage within normal, island mode deactivated.
- Green flashing: Timing for automatic switch-on.
- Red flashing fast: Overvoltage, goes low on MCB and island mode is activated.
- Slow flashing red: Undervoltage, goes low on MCB and island mode is activated.
- Red: MCB is down due to overcurrent, short circuit or manually or remote control signal is missing. Island mode disabled.
- Off: Loss of power supply. Island mode activated.

Inverter wiring diagrams

Scan the following QR to access the different connection diagrams with the different compatible inverters.

Specifications

GENERAL	Nominal operating voltage	240 VAC (L/N)/(L/L)
	Frequency	50-60 Hz
	Power consumption	0,3 W
	Max. terminal cross-section	25 mm^2 (power) / 2,5 mm^2 (control)
	Tightening torque	2,5 Nm
	Temperature	-10º + 70º C / 80% H.R.
	IP	IP20
	Polution grade	2
	Assembly	DIN 35
	Number of DIN modules	5 / 8 (depending on the reference)
ISLAND MODE	Response time	2 s
	Connection time	180 s
	Verified inverters:	Scan this QR code to view the full compatibility list of the product.
	Contact	12VAC/VDC 0,1A
PERM.	Trigger voltage	UNE-EN50550/63052 IEC-63052:2019
	Response time for overvoltage	
	Reconnection voltage	<255V ±2%
UNDERVOLTAGE	Trigger voltage	<180V ±2%
	Trigger time	10 s
	Rearming voltage	>210V ±2%
	Rearming time	180 s
MCB	Nominal current	16, 20, 25, 32, 40, 50, 63A (depending on the reference)
	Curve	C
	Cutting power	6 kA

Consult the standards that our products are compliant with and download your declaration of conformity at:
toscano.es/standards

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