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Mod. SOLAR-1

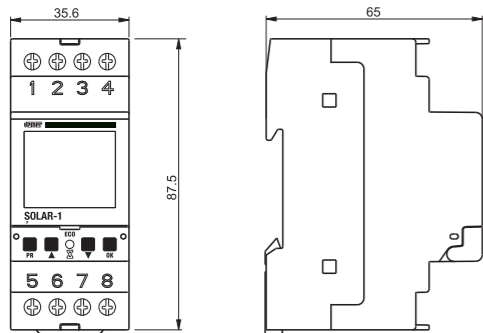
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2 INSTRUMENT DESCRIPTION and DIMENSION



- 1 Terminals for voltage and current inputs
- 2 Backlit display (deactivatable)
- 3 Red led: on indicates inserted load
- 4 Programming keys
- 5 Relay terminals
- 6 Not used
- 7 Deactivation insertion of the load
- 8 Measured power
- 9 Load inserted
- 10 Programming parameters
- 11 Setpoint or hysteresis exceeded (indicates the delay count Ton before insertion of the load or Toff before release)
- 12 Toroid for the measurement of the current produced by the system of generation net of the one absorbed by the load



1 User Manual LOADS CONTROL 1 RELAY FOR ENERGY PRODUCTION

⚠ Read all the instructions carefully

Electronic instrument for controlling the self-produced active power of your photovoltaic system. If the power entered on the network (surplus of power, that is to say **produced power – consumed power**) is higher than a set threshold (setpoint) for a settable period of time (Ton), the SOLAR-1 switches on the load connected to the relay, in order to maximize the selfconsumption of the power produced. Load shedding occurs after a settable release time (Toff).

Code	Model	Description
VE794000	SOLAR-1	Loads control for systems of energy production 1 relay

SAFETY WARNINGS

During the installation and the operation of the instrument it's necessary to observe the following instructions:

- 1) The instrument must be installed by a qualified person by observing scrupulously the connection diagrams.
- 2) The instrument must be installed and activated in compliance with current electric systems standards.
- 3) After installation, inaccessibility to the connection terminals without appropriate tools must be granted.
- 4) Do not use the instrument for other purposes different from the one specified.
- 5) The instrument must be installed in a closed electrical panel adequately protected.
- 6) In the power supply network a bipolar disconnection must be present.
- 7) A protection device against over-currents should be installed in the electrical system, upstream of the device.
- 8) Before accessing the connection terminals, verify that the leads are not live.
- 9) Do not power on or connect the instrument if any part of it is damaged.
- 10) The instrument can be used in environments with overvoltage category III and pollution degree 2, according to the CEI EN 61010-1 standard.

TECHNICAL CHARACTERISTICS

- Power supply: 230 Vac (-15% ÷ +10%) 50/60 Hz
- Maximum own consumption: 6 VA
- Measurement precision: 2% of active power
- Maximum diameter of the conductor through the TA: 10 mm
- Current connection until 65 A through current transformer
- Settable setpoint range: 0,1 ÷ 15 kW
- Settable hysteresis range: 0 ÷ 15 kW
- Time range Ton and Toff: 10 ÷ 999 seconds
- Output: 1 monostable relay with exchange contact 16 A / 250 Vac
- Blocks for cables with maximum section of 6 mm²
- Operating temperature: -10 °C ÷ 45 °C
- Operating humidity: 10% ÷ 90% not condensing
- Storage temperature: -10 °C ÷ 65 °C
- Container: 2 modules DIN
- Protection degree: IP20 / IP40 (on the front panel)
- Insulation: reinforced between accessible parts (front panel) and all other terminals
- Type of actions: 1B

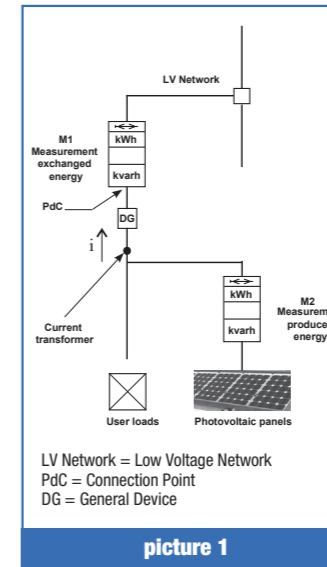
3 INSTALLATION

The positioning of the current transformer is essential for the correct operation of the instrument.

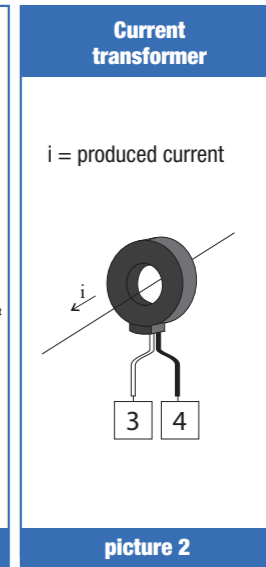
- The correct position of the current transformer within the electrical system is shown in the picture 1
- The direction of the produced current (i) is shown in the picture 2 (incoming current in the current transformer form the side indicated on the label)
- The current transformer must be connected to the terminals 3 and 4 of SOLAR-1 (respect the polarity):
- terminal 3: white thread
- terminal 4: black thread

Two loads or groups of loads must be identified as follows:

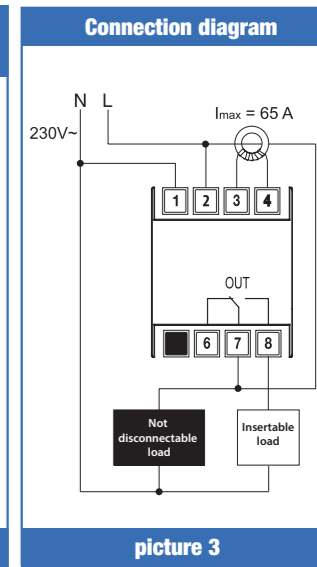
- **not disconnectable load**, that is the load which is always connected to the power line and which will not be released by the SOLAR-1 if the energy production is lower than necessary (its consumption must in any case be counted by the device to determine the total consumption).
- **insertable load**, which will be connected if the power surplus is higher than the setpoint.



picture 1



picture 2



picture 3

4 OPERATION

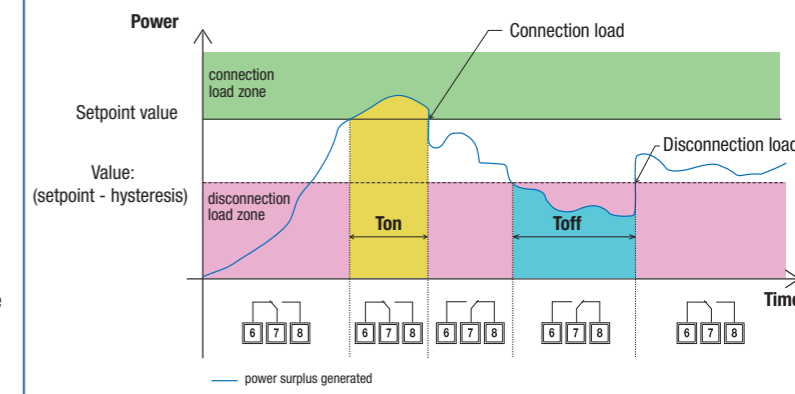
DEFINITION OF OPERATION PARAMETERS

- **SEt P - Setpoint** [kW] represents the activation threshold that is to say the minimum value of surplus of power necessary for connect the load.
- **hYStE - Hysteresis** (or differential) [kW] represents the value to subtract from the setpoint to determine the disconnection zone (that is to say the zone where the load is disconnected). This value can be set higher than the setpoint value. This setting of SOLAR-1 allows the use of all self-produced power and the use of the remaining power from the low voltage grid.
- **tOn - Ton** [seconds] represents the period of time in which the power must be above the setpoint before the load is actually switched on. During this phase the red LED flashes and the icon appears on the display.
- **tOFF - Toff** [seconds] represents the period of time in which the power must be lower than the set threshold before the load is released. During this phase the red LED flashes and the icon appears on the display.
- **rELAY - Relay** allows to set the operating logic of the relay between NO (rEL nO) and NC (rEL nC).
- **LIGHt - Backlight** allows you to set the operation of the display backlight between:
- On always on
- Off always off
- tIME timed (30 seconds at the push of a button)

Example 1: if setpoint = 3 kW and differential = 0.5 kW any connected load is released if the measured absorbed power value is less than 2.5 kW

Example 2: if setpoint = 3 kW and differential = 4 kW any connected load is released if the measured absorbed power value is less than "-1 kW" (i.e. 1kW taken from the low voltage network). In this way the load will exploit all the self-produced power and the power of 1 kW from the low voltage grid.

OPERATION LOGIC



Information to users pursuant to art. 14 of the directive 2012/19 / EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)



If the crossed-out bin symbol appears on the equipment or packaging, this means the product must not be included with other general waste at the end of its working life.

The user must take the worn product to a sorted waste center, or return it to the retailer when purchasing a new one.

Products for disposal can be consigned free of charge (without any new purchase obligation) to retailers with a sales area of at least 400 m², if they measure less than 25 cm.

An efficient sorted waste collection for the environmentally friendly disposal of the used device or its subsequent recycling, helps avoid the potential negative effects on the environment and people's health, and encourages the re-use and/or recycling of the construction materials.

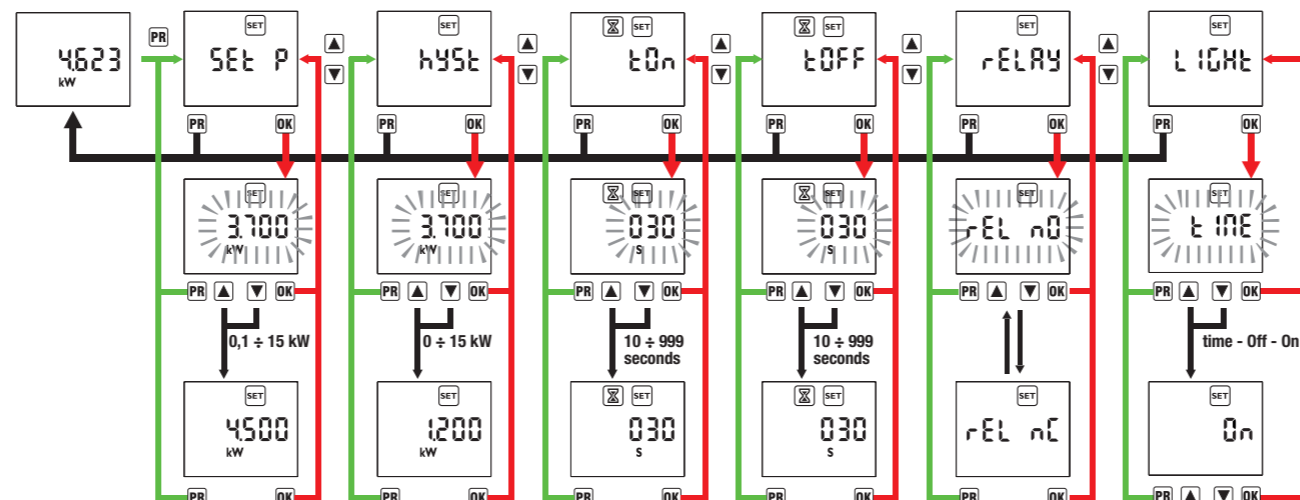
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REFERENCE STANDARDS

Compliance with Community Directives:
2014/35/UE (LVD) e 2014/30/UE (EMCD)
is declared with reference to the following standards:
• EN 61010-1 • EN 61000-6-2 • EN 61000-6-3

5 PROGRAMMING

To access the operating parameters selection menu, press the **PR** key. Use the **▲** and **▼** keys to move within the menu and press **OK** to access the parameter modification. Use the **▲** and **▼** keys to set the desired value and press the **OK** key to confirm (the value will stop flashing for 2 seconds) and return to the selection menu or **PR** to return to the selection menu without saving.

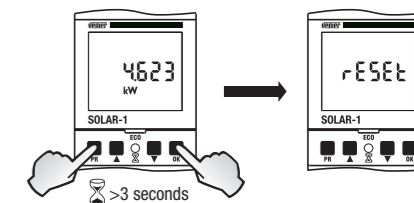


Reset parameters

To restore the default parameters while the main screen is displayed and the LED is off, press the keys **PR** and **OK** simultaneously for 3 seconds at least, rESEt appears on the display.

The default values are:

- Setpoint: 1,0 kW
- Hysteresis: 0 kW
- Ton: 30 seconds
- Toff: 30 seconds
- Relay: NO (rEL nO)
- Backlight: timed (tIME)
- Decline load insertion: disabled



Decline load insertion

To exclude relay switching, press and hold the **OK** button for at least 3 seconds, the icon appears on the display.

The SOLAR-1 will continue to measure the power, signaling by means of a flashing LED the exceeding of the set thresholds without inserting the load connected to the relay. To restore the normal operation of the SOLAR-1 keep the **OK** key pressed for at least 3 seconds.

