

OR-WE-512	Single-phase meter 100A
OR-WE-514	Single-phase meter 100A with port RS-485
OR-WE-515	Single-phase multitarriff meter 100A with port RS-485
ORNO-LOGISTIC Sp. z o.o. ul. Katowicka 134 43-190 Mikołów tel. 32 43 43 110	Service and assembly manual

## IMPORTANT!

Before use of the device, read this service manual and keep it for future. Repairs and modifications carried out by yourselves result in the guarantee invalidation. The manufacturer is not liable for damages that can get out of improper device installation or operation.

In view of the fact the technical data are subject to continuous modifications, the Manufacturer reserves the right to make changes in the product characteristics and to introduce another constructional solutions that do not deteriorate the product parameters and use values.

The latest version of the manual can be downloaded from [www.orno.pl](http://www.orno.pl). Any rights to translate / construe and the copyright of this manual are reserved.

The meter should be installed by a qualified personnel - persons having knowledge on marking and grounding the electrical appliances and knowing regulations concerning safety. Improper installation can make a risk of electric shock or fire. Do not use the device contrary to its intended use.

The meter shall be stored in a dry room.

Do not immerse the device in water or another fluids.

Do not install nor operate the device with damaged housing.

Do not modify the device nor repair it by yourselves.

Use only insulated tools.

To avoid electric shock or meter damage, switch off the supply voltage before any change of the connection system.

Before connection of the supply voltage, make sure that all conductors are connected properly.

The meter is designed for installation in mechanical environment "M1" where shocks and vibrations are insignificant according to the directive 2014/32/EU. The meter is designed for installation in electromagnetic environment "E2" according to the directive 2014/32/EU.

**NOTE: The 24-months' guarantee includes the product equipped with the factory seal that must not be broken!**



Any household is a user of electric and electronic equipment and therefore a potential producer of waste, hazardous for people and environment due to presence of hazardous substances, mixtures and components in the equipment. On the other hand, the used equipment is a valuable material due to such a raw material as copper, tin, glass, iron, etc. to be recovered. The symbol of the crossed litter bin placed on the equipment, a package or accompanying documents means that the product must not be discarded together with other wastes. The marking means also that the equipment was introduced for trade after 13th August 2005. The user is obliged to transfer the used equipment to an appointed collection point for its proper processing. Information on an available system of used electronic equipment collection can be found at the shop information desk and at the municipality / commune office. Proper disposal of used equipment prevents negative consequences for the natural environment and human health!

09/2017

## 1. INTRODUCTION

OR-WE-512, OR-WE-514, OR-WE-515 are the single-phase, single-module meters with the backlit LCD, to be mounted on the DIN rail. They are used to monitor consumption of electric energy from the single-phase network. They are ideal devices to be used as submeters of alternating current. They are only 18 mm wide but they correspond to the communication standard RS485 and meet the standard DIN EN 50022 that is proper for the current distribution system at household and commercial uses.

## 2. PROPERTIES AND TECHNICAL PARAMETERS

### 2.1 Properties

The meter can read network parameters, analyse energy quality and load condition at certain period.

To be mounted on the standard DIN rail - the width is only 18 mm.

OR-WE-514 The meter can register the electric energy consumed, with possibility of remote readout of the index group register through the wire network of the standard RS485, protocol: Mode Modbus-RTU.

OR-WE-515 The meter can register the electric energy consumed, with possibility of remote readout of the index group register through the wire network of the standard RS485, protocol: Mode Modbus-RTU and 4 independent tariffs (the user can set different times through RS485).

The meters have the lithium battery for the real time clock. Accuracy of the real time clock is 0.5 s daily.

Backlit LCD.

Scroll of the display of current (A), voltage (V), etc.

Accurate measurement of active and wattless power.

2 modes of data display:

- Automatic scroll mode: time interval is 5 s.
- Button mode - using the external button to check data.

**\*Base current** - specifies the current value when percentage measurement error is near zero. If the current flowing through the meter is greater than the base current, then the measurement error has the minus sign. If the current flowing through the meter is lower than the base current, then the percentage measurement error has the plus sign (percentage measurement error versus current).

The meter measures the electric energy properly within the whole measuring range, with an accuracy of the meter class.

**Maximum current** - the permissible maximum current to load the electric energy meter constantly.

**Minimum current** - the lowest value of the load current that is detected and registered by the meter.

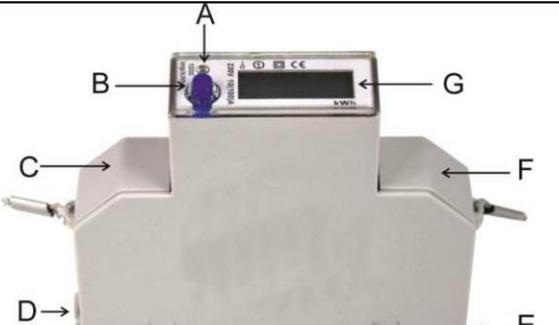
## 2.2 Technical parameters

2.2 Technical parameters	
Conformity:	Directive 2014/32/EU
Standard:	EN50470-1/3
Rated voltage:	230 V
Rated current:	base current (I <sub>b</sub> ): 5 A* maximum current (I <sub>max</sub> ): 100 A* minimum current (I <sub>min</sub> ): 0.25 A*
Pulse constant:	1000 imp/kWh
Frequency:	50 Hz
Accuracy class:	B
LCD:	LCD 5+1 = 99999.9 kW
Working temperature:	-25~55°C
Meter's own consumption:	≤ 8 VA, ≤ 0.4 W
Mean humidity:	≤ 75% (without condensation)
Maximum humidity:	≤ 95%
Starting current:	0.004 I <sub>b</sub>
LED flash:	Pulse type, pulse length = 90 ms
Materials:	Housing: Poly(butyl terephthalate), polycarbonate
Protection level:	IP51 (to be used indoors)
Connector	screw terminals 25 mm <sup>2</sup>
Assembly	rail TH35
Dimensions	1 module (17.7 mm)

## 2.3 Meter series details

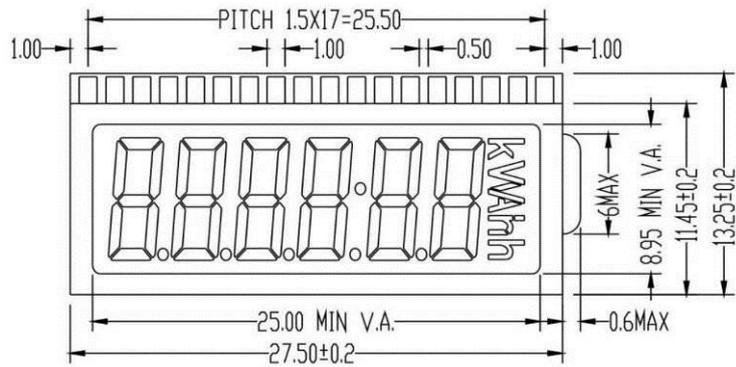
Type	OR-WE-512	OR-WE-514	OR-WE-515
Software version	V1.0	V1.0	V1.1
Meter constant	100/1000/2000 imp/kWh	100/1000/2000 imp/kWh	100/1000/2000 imp/kWh
Communication protocol	n. a.	RS485, Modbus-RTU	RS485, Modbus-RTU
Meter constant setting	Only during production	during production or through RS485	during production or through RS485
Back light	Blue	Blue	Blue
Lithium battery	n. a.	n. a.	YES
Multitariff function	n. a.	n. a.	YES
Measurement mode	Option 1: active and passive (default) Option 2: active, forwards and backwards		

## 3. DESCRIPTION

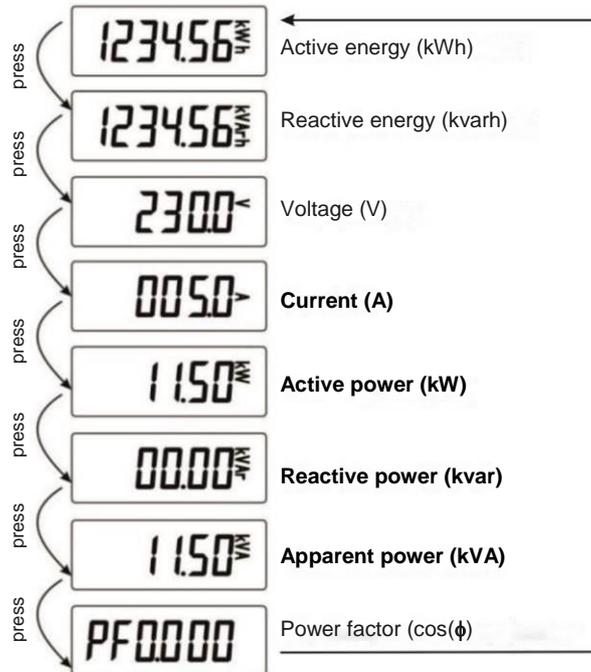
	<p>A Pulse indicator            B Button to check data            C Port RS485            D Output L            E Input L            F Neutral conductor            G LCD</p>
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## 4. LCD

### 4.1 Screen dimensions

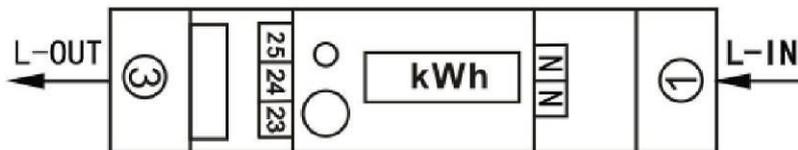


### 4.2 Display parameters / parameter switch

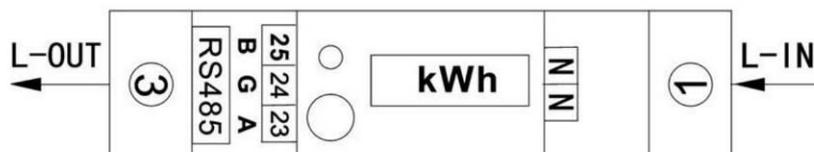


## 5. CIRCUIT DIAGRAM

OR-WE-512:



OR-WE-514 i OR-WE-515:

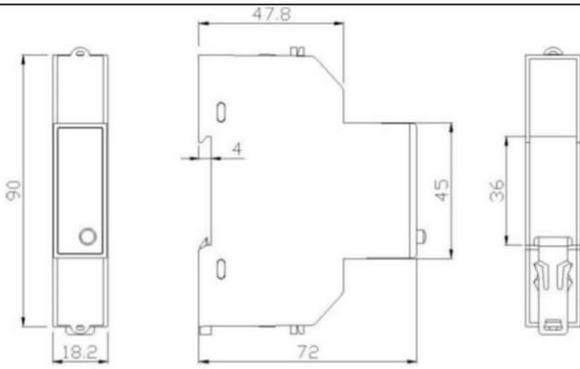


Note: Terminals 23, 24, 25 correspond to A, G, B.

If the communication converter RS485 has no G port, no connection is needed. For the neutral conductor, you can connect one N port and connected the both.

## 6. DIMENSIONS

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Height 95.3 mm  
Width 18.2 mm  
Depth 72 mm  
Net weight: 0.1 kg

### 7. ASSEMBLY

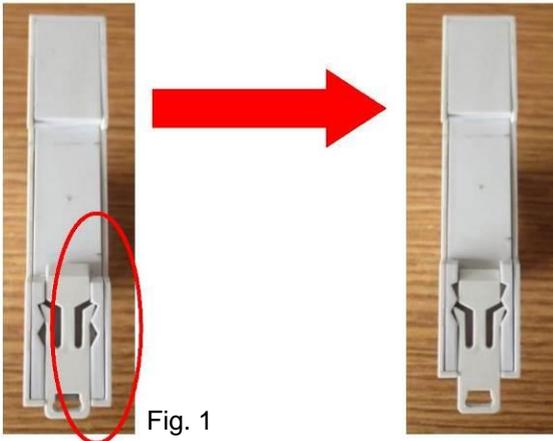


Fig. 1

Fig. 2

1. Disconnect the power supply.
2. Choose the standard rail DIN 35 mm and fasten the meter.
3. Push in the DIN rail clamp, see details in fig. 1 and fig. 2.
4. Install the meter on the DIN rail.
5. Connect according to the circuit diagram.
6. Once connected, seal the cover with seal wires.

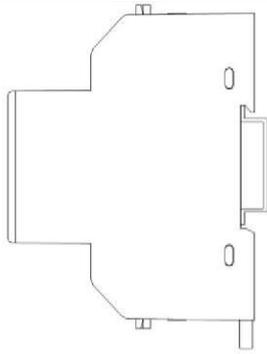


Fig. 3

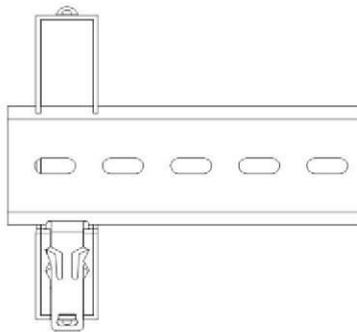


Fig. 4

## 8. Communication

8.1 The meters OR-WE-514 and OR-WE-515 work with RS485; protocol - mode Modbus-RTU;

Standard parameters: the meter ID:1, baud rate: 9600 bits per second, data bit: 8, Parity: even, rzysty, stop bit: 1.

Connection between the protocol MODBUS-RTU and the application is implemented through the standard converter USB RS485. Connection between the converter and the meter should be carried out by means of twin-core communication cable adapted to the standard RS485.

### Installation

To allow suitable configuration and reading the values from the meter, you need to install the software before; download the software free of charge from the manufacturer's website.

### Values available from the software level

1. Modbus ID	7. Active Power
2. Modbus Baudrate	8. Reactive Power
3. LCD Display state	9. Apperent Power
4. Grid Frequency	10. Power Factor
5. Voltage	11. Active Energy
6. Current	12. Reactive Energy