

PH-11

SINGLE PHASE DIGITAL VOLTAGE INDICATOR



OPERATING MANUAL

*The quality management system of development and production complies with the requirements of
ISO 9001:2015*

Review the Operating manual before using the unit.

Dear customer,

Company NOVATEK-ELECTRO LTD. thanks you for purchasing our products.
You will be able to use properly the product after carefully studying the Operating Manual.
Keep the Operating Manual throughout the service life of the product.

ATTENTION! ALL REQUIREMENTS OF THIS OPERATING MANUAL ARE COMPULSORY TO BE MET!



WARNING! – PRODUCT TERMINALS AND INTERNAL COMPONENTS ARE UNDER POTENTIALLY LETHAL VOLTAGE

TO ENSURE THE PRODUCT SAFE OPERATION IT IS STRICTLY FORBIDDEN THE FOLLOWING:

- **TO CARRY OUT MOUNTING WORKS AND MAINTENANCE WITHOUT DISCONNECTING THE PRODUCT FROM THE MAINS;**
- TO OPEN AND REPAIR THE PRODUCT INDEPENDENTLY;
- TO OPERATE THE PRODUCT WITH MECHANICAL DAMAGES OF THE CASE.

IT IS NOT ALLOWED WATER PENETRATION ON TERMINALS AND INTERNAL ELEMENTS OF THE PRODUCT.

If the temperature of the unit after transportation or storage is different from the temperature of the environment in which its operation is assumed, then before connecting to the mains keep the unit in operation conditions for two hours (because on the unit elements condensation may be available).

During operation and maintenance the regulatory document requirements must be met, namely:

- Regulations for Operation of Consumer Electrical Installations;
- Safety Rules for Operation of Consumer Electrical Installations;
- Occupational Safety when in Operation of Electrical Installations



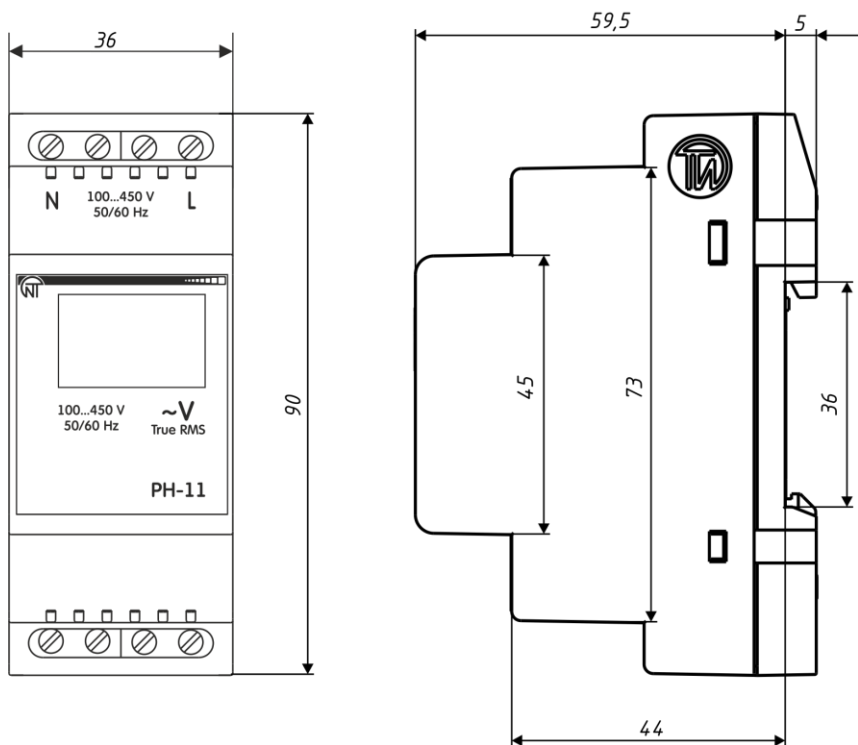
The present Operating Manual is intended for familiarization with the design, safety requirements, operation and maintenance procedure of the single phase digital voltage indicator PH-11 (hereinafter referred to as “the device”, “PH-11”).

The device meets the requirements:

PH-11 complies with the requirements of the following international standards:

EN 60947-1; EN 55011; EN 60947-6-2; EN 61000-4-2.

Harmful substances in quantities exceeding the maximum permissible concentrations are not available.



1. APPLICATION

1.1 PH-11 is designed to measure and display the RMS voltage of the single phase. The measured voltage applied to terminals L, N of the devices at the same time is the supply voltage.

ATTENTION! DO NOT USE PH-11 IN LINE VOLTAGE CIRCUITS (380-415 V). PROLONGED MEASUREMENT OF THE HIGHER VOLTAGE (MORE THAN 350 V) CAN REDUCE THE SERVICE LIFE OF THE DEVICE.

1.2 Overall and setting dimensions diagram

The overall and setting dimensions, is provided in Figure 1.

- N – Network zero;
- L – Phase

Figure 1 – Overall and setting dimensions

1.3 Operating Conditions

PH-11 is designed for operation in the following conditions:

- Ambient temperature: from minus 35 to +55°C;
- Atmospheric pressure: from 84 to 106.7 kPa;
- Relative air humidity (at temperature of +25°C) 30 ... 80%.

ATTENTION! The unit is not intended for use:

- in conditions of significant vibration and shocks;
- in high humidity conditions;
- in corrosion environments with content in the air of acids, alkalis, etc., as well as severe contamination (grease, oil, dust, etc.).

2. TECHNICAL CHARACTERISTICS

The technical characteristics are resulted in the tables 1 and 2.

Table 1- General information

Item	Value
Purpose of device	Control and distribution equipment
Typical operation	Continued
Mounting	to standard 35 mm DIN-rail
Protection degree: - face panel - terminal block	IP40 IP20
Index protection of electrical shock	II
Climatic version	NF 3.1
Permissible degree of pollution	II
Overvoltage category	II
Nominal voltage of insulation, V	450
Rated impulse withstand voltage, kV	2.5
Connecting plugs cross section of conductors, mm ²	0.3-3.3
Maximum torque of terminal screws, Nm	0.4

Table 2 - Main Technical Specifications

Rated voltage, V	230
Rated voltage frequency, Hz	48 – 62
Harmonical configuration (nonsinusoidality) of power supply voltage	EN 50160
Adjustment voltage ranges, V	100 – 450
Precision measurements of voltage in range 150 – 250 V, V	2
Precision measurements of voltage in range 100 – 450 V, V	4
Minimal operation voltage level at which PH-11 will keep working, V	90
Maximal operation voltage level at which PH-11 will keep working, V	450
Power consumption, W ,not more than	3.5
Overall dimensions (2 S-modules) H*B*L, mm	90*36*59,5
Operating position - arbitrary	
Housing material - self-extinguishing plastic	

3. INTENDED USE

3.1. Preparation for operation

3.1.1. Preparation for connection:

- Unpack and Check the product for damage after transportation; in case of such damages detection, contact the supplier or manufacturer;
- Carefully study the Operation Manual (**pay special attention to the connection diagram to power the product**);
- If you have any questions regarding the installation of the product, please contact the manufacturer by telephone number indicated at the end of this Operating Manual.

3.2 Product connection

To ensure the reliability of electrical connections you should use flexible (stranded) wires with insulation for voltage of no less than 500 V, the ends of which it is necessary to be striped of insulation for 5±0.5 mm and tightened with bootlaces. Recommended cable cross section for connection is not less 1 mm². Wires fastening should exclude mechanical damage, twisting and abrasion of the wire insulation.

IT IS NOT ALLOWED TO LEAVE EXPOSED PORTIONS OF WIRE PROTRUDING BEYOND THE TERMINAL BLOCK.

For reliable contact it is necessary to perform tightening of screws of removable terminal block with the force specified in Table 1.

When reducing the tightening torque, the junction point is heated, terminal block may be melted and wire can burn. If you increase the tightening torque, it is possible to have thread failure of terminal block screws or the compression of the connected wires.

To improve operational properties of the product it is recommended to install the fuse or its analogue for 1 A current in power supply circuit for PH-11.

3.2.1 Connect the device (terminals L, N) to the mains.

3.2.2 Apply the supply voltage.

When applying the voltage to the indicator for short moment (0.2 s) it displays the inscription "5L A", and then the RMS value of the measured voltage appears.

If the RMS value of the measured voltage is less than 100 V, then the indicator displays the code "L a". If the RMS value of the measured voltage is more than 450 V, then the indicator displays the code "H i".

4 MAINTENANCE

4.1 Safety precautions



THE TERMINALS AND THE PRODUCT INTERNAL ELEMENTS CONTAINS POTENTIALLY LETHAL VOLTAGE.

DURING MAINTENANCE IT IS NECESSARY TO DISABLE THE PRODUCT AND CONNECTED DEVICES FROM THE MAINS.

4.2 Maintenance of the unit should be performed by persons admitted to the operation and have the appropriate permission.

4.3 The recommended frequency of maintenance is every six months.

4.4 Maintenance Procedure:

- 1) check the wires connection reliability, if necessary – clamp with force as specified in Table 3.1;
- 2) check visually the housing integrity;
- 3) if necessary, wipe with cloth the front panel and the unit housing.

It is not allowed to clean the unit with abrasive materials or organic compounds (alcohol, gasoline, solvents, etc.).

5 SERVICE LIFE AND WARRANTY

5.1 Service life – is 10 years. Contact manufacturer upon the expiry of the service life.

5.2 Guaranteed storage life – is 3 years.

5.3 Warranty period of the unit operation is 5 years from the date of sale.

During the warranty period the Manufacturer is responsible for free repair of the unit, if the Consumer has complied with the requirements of this Operating Manual.

ATTENTION! IF THE UNIT HAS BEEN OPERATED WITH VIOLATION OF THE REQUIREMENTS OF THIS OPERATION MANUAL, THE USER WILL LOSE THE RIGHT TO WARRANTY MAINTENANCE.

5.4 Warranty service is performed at the place of purchase or by the Manufacturer of the product.

5.5 Post-warranty service is performed by the Manufacturer at current rates.

5.6 Before sending for repair, the unit should be packed in the original or other packaging excluding mechanical damage.

Please, when returning the unit or sending it for warranty or post warranty repair, in reclamation data line in passport, explain in details the reason of returning.

6 TRANSPORTATION AND STORAGE

PH-11 in the shipping box should be stored indoors at a temperature of -45 to +60 °C and relative humidity of no more than 80% with no vapors available in the air, capable of producing harmful effect on the shipping box and unit materials.

7 ACCEPTANCE CERTIFICATE

PH-11 is manufactured and accepted in accordance with the applicable technical documentation and considered as fit for use.

Stamp

Head of quality division

Date of manufacture

Date of sale _____

8 DATA ON CLAIMS

Please contact the manufacturer should you have any questions.

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