

***SINGLE PHASE VOLTAGE  
MONITORING RELAY***

**PH-102**



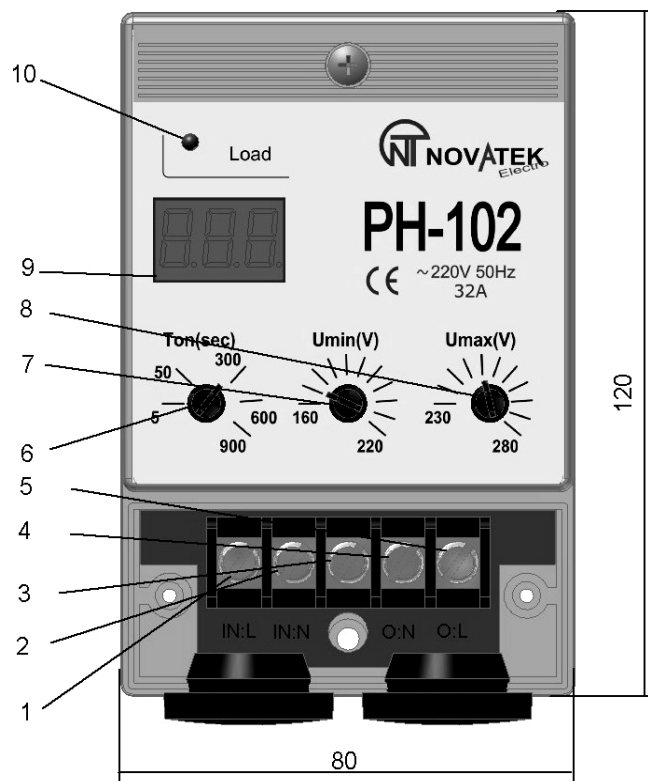
**USERS MANUAL**

## 1. APPLICATION

Voltage monitoring relay **PH-102** (hereinafter **PH-102**) is designed for the protection of industrial and consumer use single phase equipment with rated voltage of 240V and frequency 50 Hz. Main purpose of the device is to protect the equipment and electrically driven machinery and electronics from unallowable voltage drops and fluctuations in the mains power circuits and automatic turning **ON** the equipment after the voltage recover and return to normal values with the user defined time delay. Total maximal power that could be connected to **PH-102** is **6,5 kW** (32A AC-1).

**PH-102** contains built-in high frequency filter which additionally protects equipment also from impulse interruptions.

On the front panel there is a digital display indicating the acting value of input voltage during operation and when spinning the setting knobs it shows the precise parameter values adjusted by user. Additional **LED** indicator "**Load**" shows the **ON/OFF** state of the output relay (**ON/OFF** state for the connected equipment).



- 1 – Input connection terminal to connect **phase wire (IN:L)**;
- 2 – Input connection terminal to connect **neutral wire (IN:N)**;
- 3 – Common terminal for the **ground connection (input/output)**;
- 4 – Output connection terminal to connect **neutral wire (O:N)**;
- 5 – Output connection terminal to connect **phase wire (O:L)**;
- 6 – Adjustment knob for the auto-reclosing time delay setting (**Ton**);
- 7 – Minimal voltage tripping threshold (**Umin**);
- 8 – Maximal voltage tripping threshold (**Umax**);
- 9 – Three digits seven segment LED indicator;
- 10 – LED indicator for the **ON/OFF** state of the connected power load

**Figure 1 - Controls description and dimensions diagram  
(upper terminal cover lid is not shown)**

## 2. TECHNICAL CHARACTERISTICS

Rated voltage, V	240
Rated voltage frequency, Hz	47 – 65
Adjustable settings ranges: - Minimal voltage tripping threshold ( $U_{min}$ ), V - Maximal voltage tripping threshold ( $U_{max}$ ), V - Auto-reclosing time delay, sec	160 – 220 230 – 280 5 – 900
Fixed tripping time delay when input voltage exceeds the minimal tripping threshold ( $U_{min}$ ), sec	12
Fixed tripping time delay when input voltage exceeds the maximal tripping threshold ( $U_{max}$ ), sec	1
Fixed tripping time delay in case of voltage decrease more than 60V than the adjusted minimal voltage tripping threshold ( $U_{min}$ ), sec	0,2
Fixed tripping time delay in case of voltage increase more than 30V than the adjusted maximal voltage tripping threshold ( $U_{max}$ ), sec	0,2
Maximal commutation current (active power load), A (not less than) AC-1 type	32
Accuracy for tripping basing the voltage level measurement, V	< 3
Minimal operation voltage level at which PH-102 will keep working, V	100
Maximal operation voltage level at which PH-102 will keep working, V	400
Voltage hysteresis, V	4
Operational temperature range, °C	from -25 to + 45
Storage temperature, °C	from -45 to + 70
Total power consumption, mA	< 15
Commutation lifetime of the output contacts: - under 32A power load, times (not less than) - under 5A power load, times (not less than)	100 000 1 000 000
Outer dimensions, mm	120 x 80 x 43
Net weight, kg	0,170
Wall mounting in vertical position in order to read the digits of the front panel indicator	

## 3. START UP PREPARATIONS

3.1. Set maximum ( $U_{max}$ ) and minimum ( $U_{min}$ ) voltage by adjusting the corresponding knobs on the front panel, and then set auto-reclosing time as per the recommended instructions for the connected equipment (conditioners, fridges and others compressor devices admit repetitive start with time interval not less than after 3-4 minutes, the others are in accordance with their service instructions).

3.2. Turn the power supply **ON**, and if it necessary correct the values of maximum and minimum voltage, as well as the auto-reclosing time. During adjusting, parameter values will be indicated on digital display and the flashing decimal points will flash along with the numeric values.

## 4. GENERAL DESCRIPTION AND OPERATION

PH-102 relay has 3 main functional states:

- A. Normal operation mode;
  - B. Voltage fault alarm mode;
  - C. Back off auto reclosing time mode.
- A. If controlled voltage is within the allowed range and auto reclosing time after the voltage interruption has expired, then **PH-102** will keep on working in the normal operation mode. In this mode equipment is connected to the power supply and turned **ON**, green “**Load**” **LED** is **ON**, and current input voltage is indicated on the digital display.
- B. If the voltage comes out of the user pre-adjusted range for the longer time then those stated in the technical parameters (see table above) then **PH-102** will switch to voltage fault alarm

mode. In this mode, power load will be immediately turned **OFF**, green “**Load**” **LED** will turn off, controlled input voltage will be flashing on the digital display

- C.** When voltage parameters return back to normal values on the digital display of **PH-102** the remaining time for auto-reclosing is being displayed in seconds along with the dot in the low decimal order position of the display. After the expiration of the auto-reclosing time **PH-102** returns back to the normal operation mode.

To avoid **PH-102** fault tripping due to insignificant and short time voltage fluctuations the fixed time delay of 12 seconds for minimal voltage interruptions is provided. In case the **PH-102** detect serious voltage drops more than 60V then there is accelerated voltage tripping and the equipment is disconnected within the time of 0,2 sec.

**ATTENTION!!!** *At first start-up or after the **PH-102** was completely de-energized additional time delay of 0,3-0,4 sec is required for the device self testing. During this time digital display indicates “**StA**” and then starts showing the remaining time to turn **ON** the power load. Thus turn **ON** time will be 0,3 sec + **Ton** time.*

**ATTENTION!!! ALL CONNECTIONS MUST BE PERFORMED ONLY ON DEENERGIZED PH-102 AND ACCORDING ALL SAFETY REGULATIONS**

#### **5. WARRANTY AND CLAIMS CONDITIONS**

**Novatek-Electro Ltd.** Assures, trouble-free operation of the PH-102 device within 36 months from the date of purchase, on condition that following terms are provided:

- the proper connection;
- the safety of the inspection quality control department seal;
- the relay is not overloaded which is indicated by good working condition (Display) but no output.
- The integrity of the case, no traces of opening, cracks, spalls etc.

**Novatek-Electro Ltd.** does not consider reclamations, if device was damaged by user intentions or the improper usage or if the user didn't follow correctly the guidelines stated in this manual.