



## VOLTAGE RELAY PH-116



# OPERATING MANUAL



*Quality control system on the development and production complies with requirements  
ISO 9001:2015*

Review the Operating manual before using the unit.  
Store the unit in the operating environment for 2 hours before switching to the mains.  
Do not use abrasives or organic compounds for cleaning (spirit, gasoline, solvents, etc.).



**NEVER ATTEMPT TO REMOVE AND REPAIR THE UNIT.**

Some of the unit components may be live.

**NEVER ATTEMPT TO OPEN AND REPAIR THE PROTECTED EQUIPMENT, IF SWITCHED TO THE UNIT SOCKET.**



The electrical contact between the plug and the socket remains even in case of deactivated unit  
**NEVER ATTEMPT TO OPERATE THE UNIT WITH THE MECHANICAL DAMAGE OF THE HOUSING.**

**NEVER ATTEMPT TO OPERATE THE UNIT UNDER CONDITIONS OF HIGH HUMIDITY.**

Do not let water into the unit.



**WARNING! THE UNIT SHOULD BE OPERATED IN THE ELECTRIC MAINS PROTECTED WITH AUTOMATIC CIRCUIT BREAKER WITH THE BREAKING CURRENT OF 16 A OR MORE.**

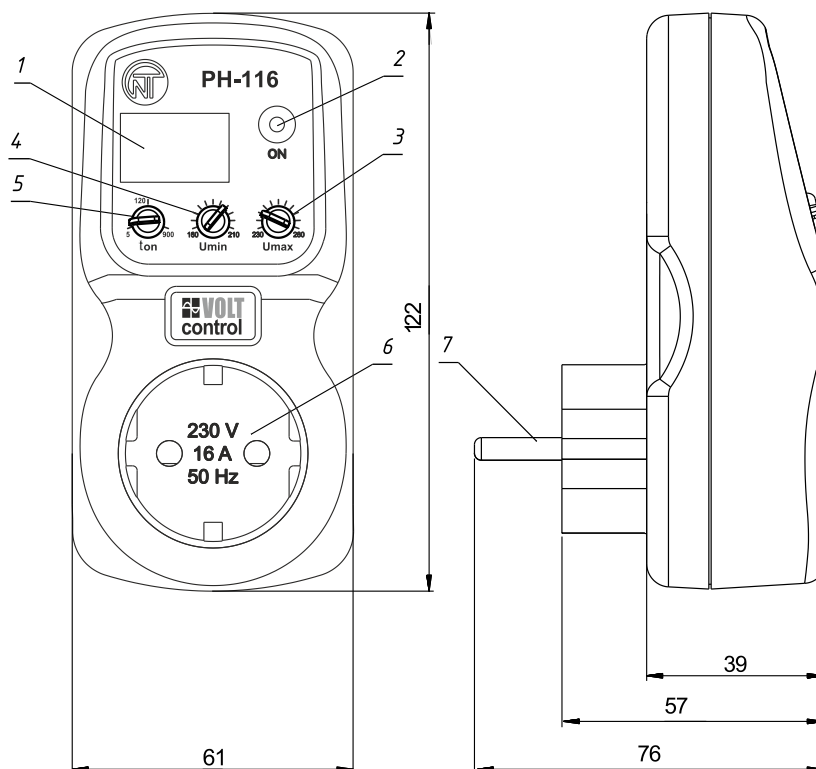
This unit is not designed for power-cut in event of a short circuit.

This unit is safe for use in case of compliance with operating rules.

## 1 APPLICATION

Voltage Relay PH-116 is designed for turning off the residential and industrial single-phase load with power of up to 3.6 kW (up to 16 A) at unallowable circuit voltage fluctuation with automatic reset (hereinafter referred to as AR) after circuit parameter recovery.

PH-116 indicates actual input voltage value, fault condition and output relay condition.



- 1 - tricharged seven-segment indicator;
- 2 - load switch indicator;
- 3 - maximum voltage adjustment;
- 4 - minimum voltage adjustment;

- 5 - AR time adjustment;
- 6 - output contacts;
- 7 - input contacts.

**Figure 1** – Faceplate and overall dimensions

## 2 TECHNICAL SPECIFICATIONS

Rated voltage, V	230/240
Rated voltage frequency, Hz	47 – 65
Harmonical configuration (nonsinusoidality) of power supply voltage	EN 50160
Protection degree apparatus	IP 30
Protection class against electric shock	I
Permissible contamination level	II
Overvoltage category	II
Adjustment ranges:	
- minimal voltage tripping range (Umin), V	160 – 210
- maximal voltage tripping range (Umax), V	230 – 280
- autoreclosing time delay (Ton), sec	5 – 900
Fixed tripping time delay in case maximal voltage fault (Umax) detected, sec	1
Fixed tripping time delay in case minimal voltage fault (Umin) detected, sec	7
Fixed tripping time delay in case of voltage decrease more than 60V than the adjusted minimal voltage tripping threshold (Umin) or at voltage reduction to less than 145 V, sec	0.12
Fixed tripping time delay in case of voltage increase more than 30V than the adjusted maximal voltage tripping threshold (Umax) or at voltage of over 285 V, sec	0.12
Fixed tripping time at pulsed voltage build-up to over 420 V at pulse duration of over 1.5 msec, sec, not more	0.02
Maximal commutation current (active power load), A (no less than)	16
U tripping threshold determination accuracy, V	up to 3
Minimal operation voltage level at which PH-116 will keep working (present value), V	120
Maximal operation voltage level at which PH-116 will keep working (present value), V	400
Rated voltage of insulation, V	450
Voltage hysteresis, V (no less than)	4

Operational temperature range, °C	from -20 to + 45
Power consumption (under load), W, not more than	2
Commutation life of the output contacts: - under 16 A power load, times (no less than) - under 5 A power load, times (no less than)	50 000 1 000 000
Outer dimensions, (2 S-modules),mm	Figure 1
Weight, kg, no less than	0.160
Mounting to standard 35mm DIN rail	

**PH-116** complies with requirements:

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

No harmful substances in excess of the maximum permissible concentration is available.

### 3 PREPARATION FOR OPERATION

3.1 By using the potentiometer knobs, located on the faceplate, set the maximum (**U<sub>max</sub>**) and minimum (**U<sub>min</sub>**) voltage values, at which the relay must trip, as well as the AR time (**T<sub>on</sub>**), depending on what device will be protected by the relay (air-conditioners, refrigerators and other compressor devices allow repeated turning on not less than after 3-4 minutes, while other devices – according to their service instructions).

**ATTENTION!** Not to break or turn the knobs, please, don't make excessive efforts when performing adjusting operations.

3.2 Connect PH-116 to the electric circuit. LED display indicates «**5tA**» message and then PH-116 start showing the AR time.

If necessary, set improved values of minimum and maximum voltage, as well as the AR time. While rotating the potentiometer knob, the indicator displays the corresponding parameter value together with point blinking.

3.3 Connect the protected devices to the output contacts of PH-116.

### 4 RELAY OPERATION

The relay may be in one of the following conditions:

- normal operation;
- voltage faults;
- AR time delay.

4.1 The relay is in the normal operation condition, if the controlled voltage is within the preset limits and the AR time has run out. In this condition, the load relay is connected to the circuit, the **ON** LED glows, and the indicator displays the controlled voltage value.

4.2 If the controlled voltage value exceeds the limits, preset by the user, for a period that is more than one specified in the technical brief, the relay will turn to the voltage fault condition.

In this condition, the load relay is disconnected from the circuit, the **ON** LED does not glow, and the indicator displays the controlled voltage value in the blink mode.

4.3 After voltage parameter recovery, if the AR time has not run out, the relay will turn to the AR time indication condition.

In this condition, the indicator displays the time in seconds, which is left for the relay to turn to the normal condition, and there is a glowing point in the low-order of the indicator. After the automatic reset time has finished, the relay will turn to the normal operation condition.

4.4 In order to prevent the relay from tripping at slight and/or short undervoltage, there is the fixed timed delay at minimum voltage tripping.

### 5 STORAGE AND TRANSPORTATION CONDITIONS

PH-116 should be stored in a factory package in enclosed rooms with ambient temperature from - 45° to +60° C and exposed to not more than 80% of relative humidity. It should be no fumes in the air that may exert a deleterious effect on package and the PH-116 components. The Buyer must provide the protection of the relay against possible mechanical damages in transit.

### 6 WARRANTY AND CLAIMS CONDITIONS

**6.1.** The lifetime of the relay is 10 years. Upon expiration of the service life, contact the manufacturer.

**6.2.** Shelf life is 3 years.

**6.3.** Warranty period of the relay operation is 5 years from the date of sale.

During the warranty period of operation (in the case of failure of the relay) the manufacturer is responsible for free repair of the relay.

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

6.4. Warranty service is performed at the place of purchase or by the manufacturer of the relay.

6.5. Post-warranty service of the relay is performed by the manufacturer at current rates.

6.6. Before sending for repair, the relay should be packed in the original or other packing excluding mechanical damage.

**7 ACCEPTANCE CERTIFICATE**

PH-116 was produced and accepted in accordance with the requirements of effective technical documentation and was recognized as suitable for operation.

Seal

Head of QCD

Date of manufacture

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**8 DATA ON CLAIMS**

**Earnest request:** indicate the reason for return in the notice of faults field at the return of the relay or in case of submitting for warranty service or post-warranty service.

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With all questions, please, contact the manufacturer.

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Sale date \_\_\_\_\_

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