

6. Safety precautions

Installation and maintenance of the device must be carried out by qualified specialists who have studied this operating manual. During operation and maintenance, it is necessary to adhere to the requirements of regulatory documents:

- Rules for the technical operation of users' electrical installations.
- Safety rules for the operation of electrical installations of users.
- Occupational safety during the operation of electrical installations.



The device uses dangerous voltage -

DO NOT CONNECT THE DEVICE DISASSEMBLED!!!

During operation, check the device's mounting on the DIN rail, the condition of electrical connections, and the tightness of the terminal strip screws.

7. Possible faults

Defect	Possible cause	Repair method
No output voltage from the device (voltage indicator flashes)	The current mains voltage is outside the specified limits A long switch-on delay has been set	Check the set upper and lower shutdown limits Check the set startup delay time
No output voltage from the device (indicator does not work)	No voltage at the device input	Check the voltage in the electrical network
No voltage at the device output (the indicator shows the mains voltage)	Internal device failure	Contact the manufacturer or its representative.

8. Storage, transportation and operation conditions

Devices in the manufacturer's packaging must be stored in enclosed spaces with natural ventilation. Climatic factors of storage conditions:

- air temperature: -50°C... +50°C;
- relative average annual humidity: 75% at +15°C.

The device is operational in any location in space.

The device is not intended for operation in conditions of vibration and shocks, as well as in explosive environments.

Do not allow moisture to enter the input contacts of the terminal clamps and internal elements of the device. It is prohibited to use it in aggressive environments containing acids, alkalis, oils, etc. in the atmosphere.

The correct operation of the device is guaranteed at ambient temperatures from -25°C to +50°C and relative humidity from 30 to 80%.

To operate the device at subzero temperatures, it is necessary to install it in a moisture-proof housing to avoid the formation of condensation due to temperature changes.

Service life is 10 years.

9. Warranty

The warranty period for the device is 5 years from the date of sale.

During the warranty period, the manufacturer will repair the device in the event of a malfunction, provided that the consumer has followed the rules of storage, connection, and operation.

Warranty servicing of the device is carried out with the presence of a marking from the selling organization.

The device is not eligible for warranty servicing in the following cases:

1. Expiry of the warranty period.
2. Operating conditions and electrical connection do not comply with the "Operating manual" provided with the device.
3. User-performed self-repair.
4. The presence of signs of mechanical damage (violation of seals, unauthorized appearance, scorching of power terminals from the external side).
5. The presence of signs of exposure to moisture, foreign objects, dust, dirt inside the device (including insects).
6. Lightning strike, fire, flooding, lack of ventilation, and other causes beyond the manufacturer's control.

Warranty and post-warranty servicing is provided by

DIGITOP ELECTRIC sp. z o.o.

Poland, 30-015 Krakow, Świętokrzyska 12/323

Tel +48 794-267-868

www.digitopelectric.pl

The device has passed acceptance tests.

Batch number _____ Release date _____

DigiTOP®

Voltage monitoring relay DigiTOP VA-16Sens

single-phase digital relay with
maximum current control
(overload protection)

Software version r.15



Operating manual

1. Purpose

The DigiTOP VA-16Sens voltage monitoring relay (hereinafter referred to as the device) is designed to protect consumers from high or low mains voltage and overcurrent protection.

2. Technical specifications

Operating voltage, V	50-400
Operating frequency, Hz	45-65
Nominal current* A	12
Maximum current* A	16
Maximum capacity* kW	3.5
Disconnect time at upper limit, sec	0,02
Disconnect time at lower limit, sec, no more than	0,02(<120V) 1 (120-170V)
Disconnection time, sec, at	Iset ≤ I < I+25% 600 Iset+25% ≤ I < 2 Iset 5 I ≥ 2 Iset 0,02
Voltmeter accuracy, %, no more than	1
Measurement accuracy of current, %	2
Power consumption, W, no more than	1
Permissible pollution	II
Electric shock protection class	II
Degree of device protection	IP20
Operating temperature, °C	-25... +50
Overall dimensions, mm	102x57x72

* - under active load

User-configurable parameters:

Parameter	Range	Parameter change step	Factory setting
Upper voltage limit, V	230-270	1	250
Lower voltage limit, V	120-220	1	170
Switch-on delay time, sec	5-600	5	5
Voltage hysteresis, V	1-10	1	3
Current control mode	On/OFF	-	On
Current disconnect limit, A	1-16	1	16
Switch-on delay time (by current), sec	5-600	1	5
Current disconnect limit	1-10, ∞	1	3
Indicator brightness level	1-9	1	7
Automatic button lock	On/OFF	-	OFF
Selecting the operating frequency, Hz	50/Auto	-	50
Shutdown delay time ("Auto" mode), ms	0-900	100	200

3. Supply kit

- Voltage monitoring relay DigiTOP VA-16Sens
- Operation manual
- Packaging

4. Design and principle of operation

The device performs the functions of both a voltage relay and a maximum current relay simultaneously. It is controlled by a microcontroller that analyzes the voltage and current in the load circuit, displaying the current effective values on a digital indicator. Current measurement is carried out using a built-in current transformer. Load switching is performed by an electromagnetic relay. The device can operate with both a standard 50Hz household electrical network and sources of voltage with unstable frequency (such as generators). The device operates correctly within the frequency range of 45-65 Hz. To do this, you need to select the appropriate operating mode in the settings menu.

The device disconnects the load if the voltage goes out of the set range. The load is switched on automatically when the voltage returns to the set range.

When you connect the device to the electrical network, the indicator will display the current voltage in the network and will flash. The flashing indicator indicates that there is no output voltage from the device. If the voltage in the network is within the set range (factory setting 170-250V), after a switch-on delay (factory setting 5 seconds), the load will be switched on, and the indicator will stop flashing. If the voltage is not within the set range (less than 170V or greater than 250V), the load will not be connected to the network until the voltage returns to normal.

The device monitors the current value of the connected load and can act as a power limiter. The load will be disconnected:

- if the set current is exceeded after 600 seconds,
- if the set current is exceeded by more than 25% after 5 seconds,
- if twice the set current is exceeded - after 0.02 seconds.

The socket has protective covers.





The manufacturer has the right to make changes in the design and wiring diagrams of the device that do not deteriorate its metrological and technical characteristics.

5. Installation, preparation for work

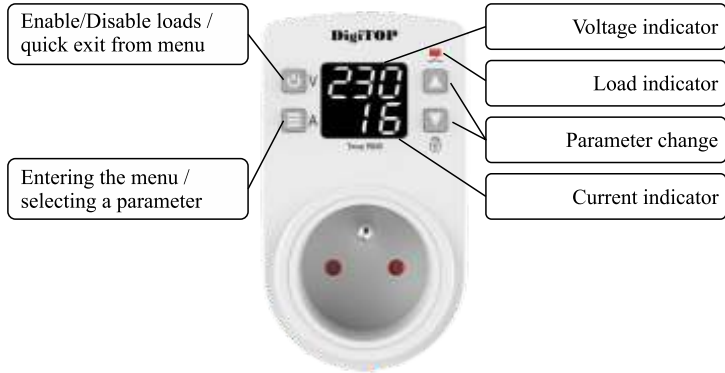
The device connects directly to an electrical socket.

To change the default parameters, select the appropriate parameter in the menu using the buttons located on the front panel of the device.

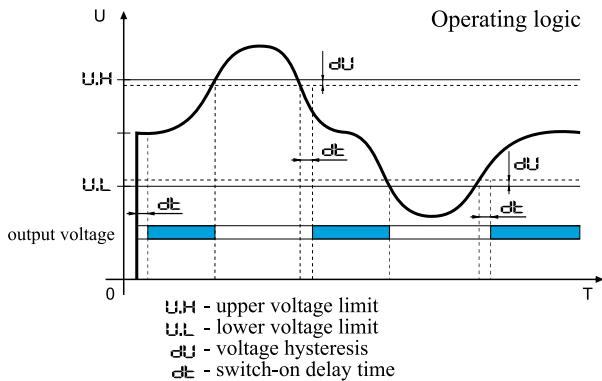
The sequence of parameter setting is shown in the figure below.

The selection of the parameter for setting is carried out by the  button, changing the value - by the   buttons, quick exit from the menu - the  button.


In the setting mode the set value flashes. All set values are stored in the non-volatile memory of the instrument.



To configure surge protection, it is necessary to set the upper and lower voltage limits, voltage hysteresis, and switch-on delay time. Voltage hysteresis is necessary to avoid repeated tripping when the voltage fluctuates around the set limit value.



When the set voltage limit is reached, the load is disconnected. The load will automatically switch on when the voltage returns to the set voltage minus (for the upper limit) or plus (for the lower limit) of the hysteresis value. This means that with an upper limit of 250 and a hysteresis of 3 volts, the load will be disconnected at 250 and switched on at 247 volts.

The device can control the maximum current drawn by the load, which protects the electrical installation from high currents. When the "FUSE" control mode is set to "On", the current cut-off limit must be set between 1 and 16 amps. The time for re-enabling after power shutdown can be set in the range from 5 to 600 seconds. After the power is turned off, the current indicator flashes. You should also set the number of power shutdowns after which the device will be locked (the indicator will display "FUSE"). This can be from 1 to 10 or an infinite number of times ("---"). If you select an infinite number of times, the device will not be locked. After locking the device, the load can be turned on with the  button.


The brightness of the indicator can be selected from nine values - "br1-br9".

The device can operate with voltage sources with unstable frequency, such as generators. For this purpose, there is a function for selecting the frequency control mode: "50.H" or "Auto". The "50.H" mode is intended for operation in a household electrical network, the "Auto" mode is an automatic adjustment of voltage measurement when operating from sources with an unstable frequency. However, stable operation is not guaranteed with significant deviations (below 45 Hz or above 65 Hz) frequency.

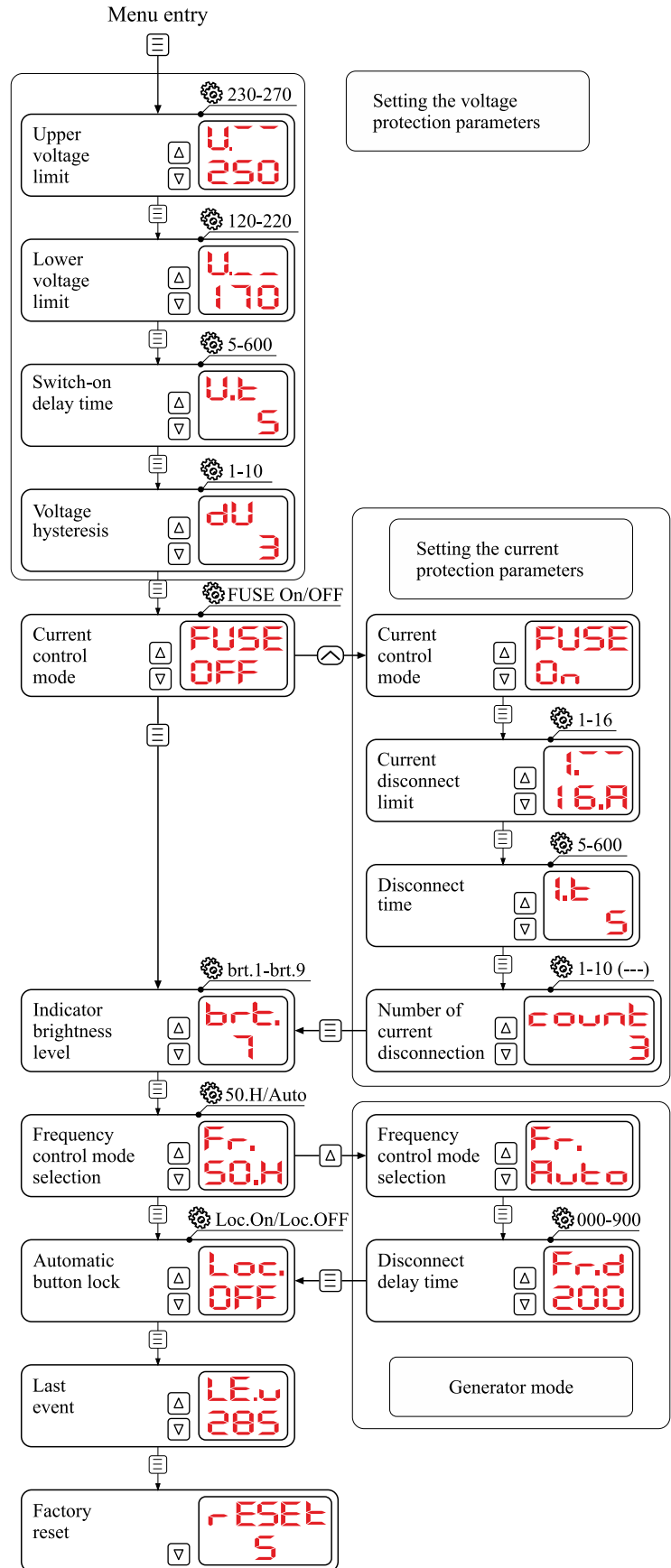
In "Auto" mode, you can set the disconnect delay time "Fr.d": "000"- "900". This may be necessary when operating with generators, where large differences in engine speed occur when switching large loads. When set to "000" there is no delay (off time 20 ms).

The device has automatic button locking, which locks the buttons 30 seconds after the last push of the button:

- "Loc. On" - blocking is enabled,
- "Loc. OFF" - blocking is disabled.


Removing the lock is a long press on the  button.


Parameter setting sequence



The device has a last event memory function, which is displayed in the menu. The indicator displays the voltage or current value that activated the protection:

- "LE.u" - protection against excessive voltage;
- "LE.c" - overcurrent protection.

The factory settings can be restored using the "RESET" function. Press and hold the button  in this menu item until the device restarts (a countdown will appear on the display).

Turning the load off/on - long press the  button. After turning off the device, the display shows "OFF".