ZUBR

Overvoltage protection for professionals

D6-40 red, D6-50 red, D6-63 red

Technical passport and installation
and operation manual

Voltage relay ZUBR D6 red (hereinafter referred to as the device) designed to protect domestic and industrial electrical equipment (including three-phase electric motors) and can operate in the following modes: a single-phase or a three-phase load.

During operation, the device measures and displays values of RMS voltage on each phase. All settings and trip values are stored in non-volatile memory. The device is powered from the measured phases and a neutral conductor.

SUPPLY PACKAGE

Voltage relay ZUBR D6 red	**1 piece**
Guarantee card, technical passport, manual	**1 piece**
Shipping box	**1 piece**

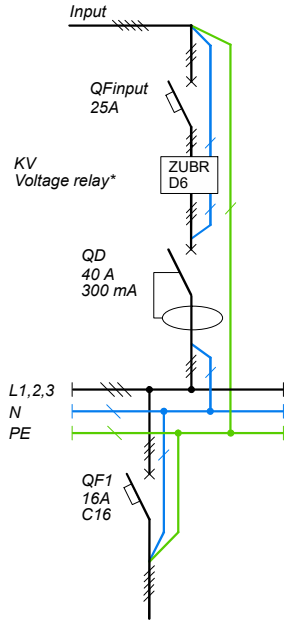
TECHNICAL DATA

Voltage limit		upper 220–280 V lower 120–210 V
Break-time at increasing		not more than 0,04 sec
Break-time at lower:	> 120 V < 120 V	0,1–10 sec not more than 0,04 sec
Power Volt		not less than 100 V not more than 420 V
The number of operating cycles under load of not less cycles		10 000 cycles
The number of operating cycles without load of not less cycles		500 000 cycles
Relay type		polarized
A skew (asymmetry) phases		10–80 V
Device weight		0,43 kg ±10 %
Overall dimensions (w x h x d)		106 x 85 x 66 mm
IP to GOST 14254		IP20

Model	D6-40 red	D6-50 red	D6-63 red
Rated load current	3 x 40 A (max 3 x 50 A in 10 minutes)	3 x 50 A (max 3 x 60 A in 10 minutes)	3 x 63 A (max 3 x 80 A in 10 minutes)
Rated power	3 x 8 800 VA	3 x 11 000 VA	3 x 13 900 VA

CONNECTION SCHEMES

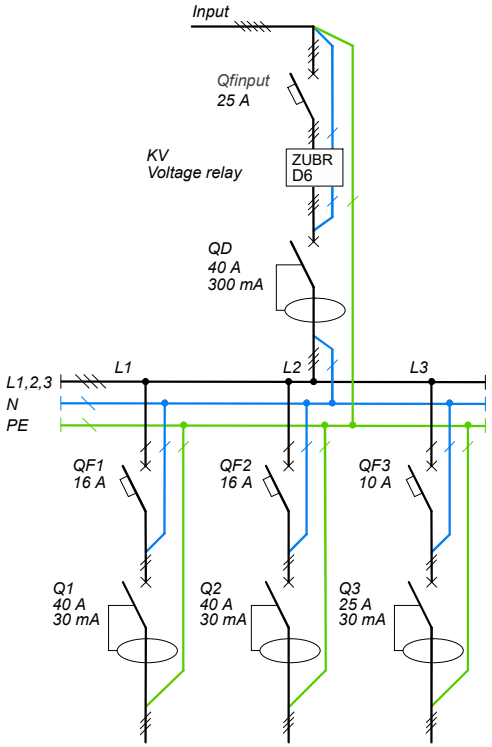
The phases and a neutral conductor for measurement and power supply are determined by an indicator and supplied to the device. The connecting wires of the load phases are connected to the corresponding terminals 5–7 (L1–L3), and the neutral conductor (N) to terminal 8.



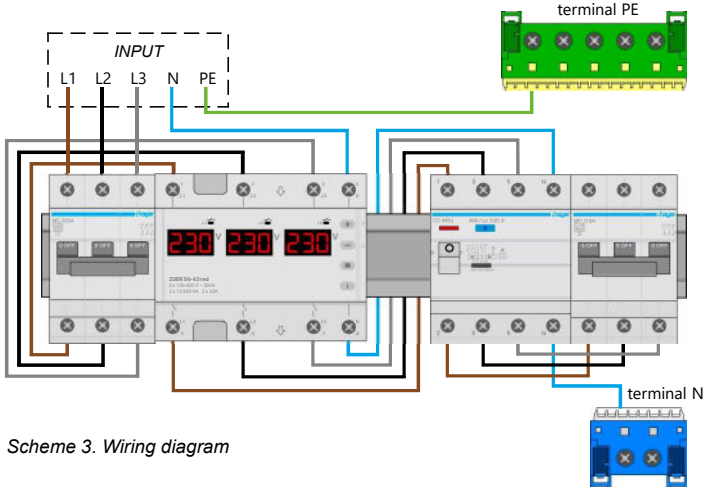
**For correct operation of ZUBR D6, it is enough to connect the neutral conductor to one of the zero terminals (4 or 8).*

Scheme 1. Option for connecting an RCD, a circuit breaker with zero transit through the device to a three-phase load.

IMPORTANT. Before the installation and operation of the device, please read by the end of this document. This will help to avoid possible danger, mistakes and misunderstandings.



Scheme 2. Option for connecting an RCD, a circuit breaker with zero transit through the device to three single-phase loads.



Scheme 3. Wiring diagram

INSTALLATION

The appliance is intended for installation inside residences. The risk of moisture or humidity in the installation site should be minimal. The ambient temperature during installation should be within –5...+45°C.

The device has additional overvoltage protection in the form of a varistor and a fuse. The appliance is installed in a special box, which allows to conduct the easy installation and operation. Cabinet should beequipped with standard mounting rail 35 mm width (DIN rail). The appliance takes in width of 6 standard module on 18 mm. The height of the appliance should be in the range 0,5...1,7 m from the floor.

For protection against short circuit and excess capacity in circuit load necessarily need to set in front of the appliance, the automatic circuit-breaker (QF at the schemes 1,2). The automatic switch off is established in the open-phase fault wire, as shown at the schemes 1,2 (QF). To protect person from electric shock leak is set safety shutdown device (QD at the schemes 1,2).

Terminals of the device designed for wire cross section 2up to 16 mm². It is advisable to use a soft wire, which is tightened in the terminals with a screwdriver with a tip width of no more than 6 mm with a torque of 2.4 Nm. A screwdriver with a blade more than 6 mm wide can cause mechanical damage to the terminals. Doing so will void your warranty claim.

WARRANTY TERMS

The warranty for ZUBR devices is valid for **60 months** from the date of sale, provided that the instructions are followed. The warranty period for products without a warranty certificate is counted from the date of production.

If your device is not working properly, we recommend that you first read the section «Possible problems». If you cannot find an answer, contact Service Center. In most cases, these actions resolve all issues.

If you continue to have issues with the device, please send it to a Service Center or to the store where you purchased the device. If your device is defective due to our fault, we will repair or replace it under warranty within 14 business days.

Please see the full text of the warranty and the data you need to send to your Service Center. The website address can be found in the instructions in the Contacts section.

ZUBR

SERVICE CENTER CONTACT:
+38 (091) 481-91-81
WhatsApp Viber Telegram
support@dse.com.ua

GUARANTEE CARD

serial №:

date of sale:

a seller, a seal:

place of a seal

an owner contact
for a service center:

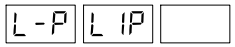
EXPLOITATION

Use the «+» and «–» buttons to change the parameters. After pressing the button for the first time the parameter will flash, after pressing it for the second time the parameter will change. After 5 sec after pressing — return to the previous state or menu level.

Selecting the operating mode

To select a mode, hold down the «≡» button for 6 sec., use the «+» or «–» buttons to select a desired mode. When the mode is changed, the alarm log is automatically cleared.

The single phase load mode
(asynchronous mode)



The device is capable of performing the functionality of three single-phase relays. The setting and control are separate for all power relays, while the device protects the equipment from voltage overshoot.

The three-phase load mode
(synchronous mode)

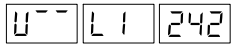
The settings and controls are common to all power relays, while the device protects an equipment from voltage overshooting and monitors phase asymmetry, phase sequence, phase failure (these functions can be disabled).

Setting trip limits

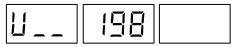
(factory setting242V / 198 V)

To view the upper limit, press the «+», button, to view the lower limit, press the «–» button. Then use the «+» and «–» buttons to change the limit as necessary.

The single phase load mode:
First, use the **«≡»** button to select the desired phase.



The three-phase load mode:



IMPORTANT. When setting the voltage limits use the protected equipment technical documentation.

Table 1. MODELS SHUTDOWN EXIT time voltage beyond

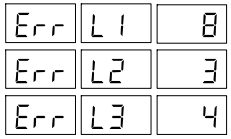
The usual default (default) **Pro oFF**	Upper limit	220–280 V	0,04 sec
	Lower limit	120–210 V	0,1...10 sec
		< 120 V	0,04 sec
Professional **Pro on**	Upper limit	> 264 V	0,04 sec
		220–264 V	0,5 sec
	Lower limit	176–210 V	10 sec
		154–176 V	0,1...10 sec
		< 154 V	0,04 sec

Log in the single phase load mode

The phase in which the alarm occurred will flash. The log is able to store in the non-volatile memory the last 99 emergency alarms (n 1... n99, while «n 1» — last actuation, and «n99» — the oldest).

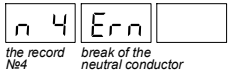
To enter the log, press the **«i»** button. The screen will display the total number of alarms log entries. To navigate through the general log, use the **«i»**, **«+»** or **«–»** buttons.

To view the alarms of a specific phase, after entering the log, press **«≡»**. Select the required phase by pressing the next **«≡»**. Use the **«i»**, **«+»** or **«–»** buttons to view the alarms of the selected phase.

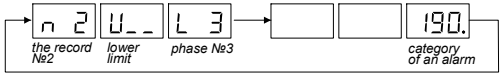


Examples of alarms log entries:

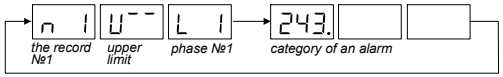
An alarm due to break of the neutral conductor.
The function Neutral Conductor Failure Control is responsible for the neutral conductor failure control.



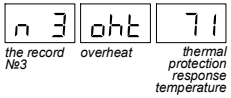
Low limit alarm



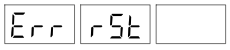
Upper limit alarm



Overheating alarm



To reset the log while viewing it, hold down **«≡»** for 3 seconds, before a message appears **«Err rSt»**.



The log will also be cleared when the device switches between the single-phase and the three-phase loads.

After releasing the button, the log will be cleared.

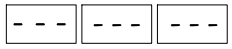
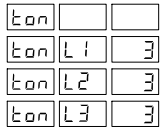
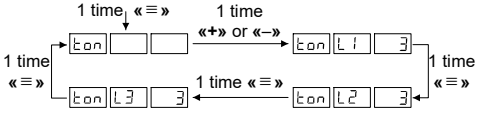
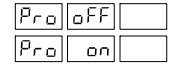
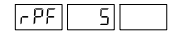
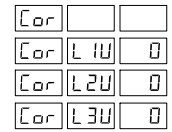
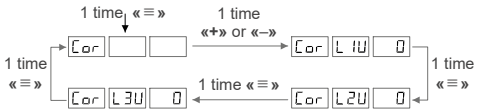
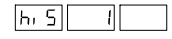
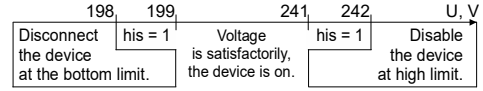
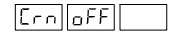


Table 2. **THE MENU IN THE SINGLE PHASE LOAD MODE**

Menu section	Press «≡»	Screen	Notes
Load delay (factory setting 3 sec, a range of change 3–600 sec, step 3 sec) To go to change Press 1 time **«+»** or **«–»**. For phase selection — **«≡»**. The third click on **«≡»** — an exit to the main menu.	1 time		During the countdown of the delay, the time until the voltage is switched on in seconds (**t18.**) Will flash on the corresponding display. Menu navigation: 
Delay type of load starting (factory setting «tAr»)	2 times		**«tAr»** time after voltage recovery — delay (ton) is counted from the moment of voltage recovery. **«tAo»** time after switching off — delay (ton) is counted from the moment the relay is turned off. This type of delay takes into account response time of the emergency in the total on-delay time.
Models of time offwhen the output voltage limits (factory setting «oFF»)	3 times		Professional model is not off load at safe in magnitude and duration of voltage deviations. More details of the model of the shutdown time when voltage goes beyond the limits are described in the Table. 1.
Maximum number of protection operations in sequence (factory setting 5 operations, a range of change 1–5)	4 times		Limits the number of repeated trips of the device by the limit, if no more than 20 seconds have elapsed between shutdown at the limit and turn on the load. To disable this function, select «oFF».
ADVANCED SETTINGS.	To enter hold for 3 seconds **«≡»**		
Enable/disable the screen in the standby mode (factory setting «on»)			Turns off the screen after 20 seconds after the last interaction with the device and in the absence of an emergency situation. In the event of an emergency situation on any of the phases, the corresponding screen will flash. To exit the sleep mode, press one of the buttons once.
Correction of screen reading (factory setting 0 V, a range of change ±20 V) To go to change Press 1 time **«+»** or **«–»**. For phase selection — **«≡»**. The third click on **«≡»** — an exit to the main menu.	1 time		You can use correction if voltage indications on the screen of the device and your reference device differ. 
Break-time on voltage dip (factory setting 0,1 sec, a range of change 0,1–10 sec)	2 times		It is necessary to fine-tune the response time of the protection to power failures. More details in the Table 1: the Pro mode is enabled: 164-176 V, the Pro mode off: 120–210 V.
Hysteresis (factory setting 1 V, a range of change 0–5 V) It is necessary to reduce the number of the device operations by the limit, when the voltage in the network is close to the limit and is not stable.	3 times		
Neutral conductor failure control (factory setting **«oFF»**, a range of change 10–35 %) Permissible phase angle deviation in percent	4 times		In a three-phase circuit, the phase angle is 120°, but in case of a neutral conductor failure, the phase angles are unbalanced. Set the permissible percentage of phase angle unbalance if you want to enable neutral conductor failure control.

Log in the three-phase mode load

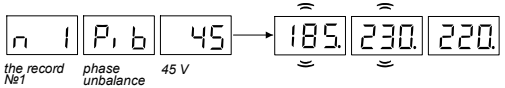
The phase at which the alarm occurred will flash. The log is able to store in the non-volatile memory the last 99 emergency alarms (n 1... n99, while «n 1» — last actuation, and «n99» — the oldest).

To enter the log, press the **«i»** button. The first 1.5 sec the screen will display the total number of alarms in the log, then the last trouble. Use **«i»**, **«+»** or **«–»** to navigate through the log.

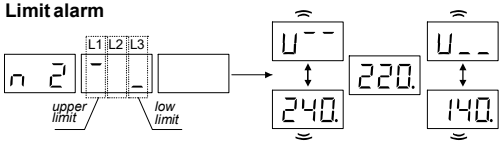
Displaying alarms in the log
First, you see the number of the log entry with the type of emergency. Then the value of the alarm with dots in the rightmost digits.

Examples of alarms log entries:

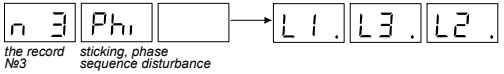
Phase unbalance alarm



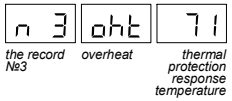
Limit alarm



Phase sequence failure alarm



Overheating alarm



An alarm due to break of the neutral conductor. The function Neutral Conductor Failure Control is responsible for the neutral conductor failure control.

To reset the log while viewing it, hold down **«≡»** for 3 seconds, before a message appears **«Err rSt»**. The log will also be cleared when the device switches between the single-phase and the three-phase loads.

After releasing the button, the log will be cleared.
At turning on neither indicator nor screendo not shine

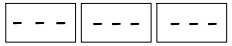
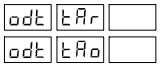
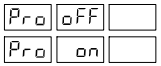
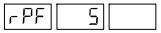
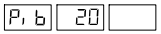
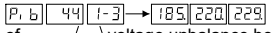
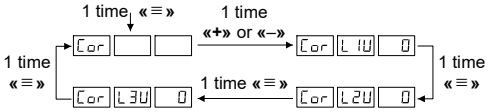
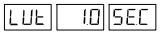
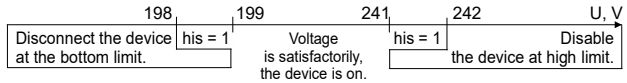
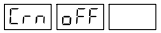


Table 3. **THE MENU IN THE THREE-PHASE LOAD MODE**

Menu section	Press «≡»	Screen	Notes
Load delay (factory setting 3 sec, a range of change 3–600 sec, step 3 sec)	1 time		During the countdown of the delay, the time until the voltage is switched on in seconds will flash on the corresponding display.
Delay type of load starting (factory setting «tAr»)	2 times		**«tAr»** time after voltage recovery — delay (ton) is counted from the moment of voltage recovery. **«tAo»** time after switching off — delay is counted from the moment the relay is turned off. This type of delay takes into account response time of the emergency in the total on-delay time.
Models of time offwhen the output voltage limits (factory setting «oFF»)	3 times		Professional model is not off load at safe in magnitude and duration of voltage deviations. More details of the model of the shutdown time when voltage goes beyond the limits are described in the Table. 1.
Maximum number of protection operations in sequence (factory setting 5 operations, a range of change 1–5)	4 times		Limits the number of repeated trips of the device by the limit, if no more than 20 seconds have elapsed between shutdown at the limit and turn on the load. To disable this function, select «oFF».
ADVANCED SETTINGS. To enter hold for 3 seconds **«≡»**			
Phase unbalance voltage (factory setting 20 V, a range of change 10–80 V or «oFF») This is permissible voltage difference between the two phases.			If the load is switched off due to a violation of the phase unbalance voltage limit, will alternate on the screen:  value of — voltage unbalance between which there was this unbalance To disable, increase the unbalance value until the «oFF» message appears.
The phase unbalance disconnection time (factory setting 1 V, a range of change 0–30 V)	1 time		Available only when «Phase unbalance voltage» is on. Setting the protection reaction time to phase unbalance.
Enable/disable the screen in the standby mode (factory setting «on»)	2 times (1 time, if «Phase unbalance voltage» is off)		Turns off the screen after 20 seconds after the last interaction with the device and in the absence of an emergency situation. In the event of an emergency situation on any of the phases, the corresponding screen will flash. To exit the sleep mode, press one of the buttons once.
Correction of screen reading (factory setting 0 V, a range of change ±20 V) To go to change Press 1 time **«+»** or **«–».** For phase selection — **«≡».** The third click on **«≡»** — an exit to the main menu.	3 times (2 times, if «Phase unbalance voltage» is off)		You can use correction if voltage indications on the screen of the device and your reference device differ. 
Break-time on voltage dip (factory setting 0,1 sec, a range of change 0,1–10 sec)	4 times (3 times, if «Phase unbalance voltage» is off)		It is necessary to fine-tune the response time of the protection to power failures. More details in the Table 1: the Pro mode is enabled: 164-176 V, the Pro mode off: 120–210 V.
Hysteresis (factory setting 1 V, a range of change 0–5 V) It is necessary to reduce the number of the device operations by the limit, when the voltage in the network is close to the limit and is not stable.	5 times (4 times, if «Phase unbalance voltage» is off)		
Neutral conductor failure control (factory setting **«oFF»**, a range of change 10–35 %) Permissible phase angle deviation in percent	6 times (5 times, if «Phase unbalance voltage» is off)		In a three-phase circuit, the phase angle is 120°, but in case of a neutral conductor failure, the phase angles are unbalanced. Set the permissible percentage of phase angle unbalance if you want to enable neutral conductor failure control.
ADVANCED SETTINGS. To enter hold for 9 seconds **«≡»**			
Phase sequence (factory setting **«on»**)			If the phase sequence is violated, the current phase sequence and the voltage across them will alternate on the screen. The phase sequence is always determined relative to phase L1.
No-phase control (factory setting **«on»**) No-phase control is only possible when the Phase Unbalance Voltagemenu is off	1 time		No-phase control is only possible when the Phase Unbalance Voltagemenu is off. When the function is disabled, the device will not disconnect the load if there is no voltage on the phase(s).

Delay time of load turning on

This is an adjustable time until the load is switched on after an emergency. The delay control is described in Tables 2 and 3.

When the mode is on **«tAr»**: if the set delay time is greater than 6 sec, then during a short-time voltage jump before the countdown for 2 sec, an emergency situation will be displayed and remaining time before the load is switched on.

For protection of refrigeration equipment, where there is a compressor, it is recommended to set a delay of turning on load 120–180 sec. It will allow to increase the service life of the compressor.

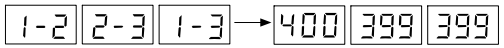
Locking the controls

To lock (unlock), hold down the **«+»** and **«–»** buttons for more than 6 seconds until the message **«Loc»** (**«unLoc»**) appears on the screen.

Viewing of calculated linear stresses

Hold the button **«i»** for 3 sec. At the corresponding screens, the phase numbers will appear, between which linear voltages are calculated.

When releasing the screens for 30 sec calculated linear voltages will be displayed with an accuracy of 2-3 V.

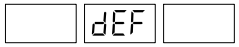


Viewing of firmware version

Hold the button **«i»** for 6 sec. The manufacturer reserves the right to modify the firmware to enhance the device technical characteristics.

Reset to factory settings

To reset the factory settings, hold the three buttons **«+», «–»** and **«≡»** at the same time for more than 12 sec. until «dEF» message appears on the screen. After release, reset to factory settings and reboot will take place, the alarm log is cleared.



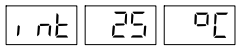
A tripping counter

(not discharged)

To view hold the button **«i»** for 12 sec.

Viewing of temperature of a thermal protection sensor

Hold the button **«i»** for 18 sec.



POSSIBLE PROBLEMS, CAUSES AND WAYS TO OVERCOME THEM

At turning on neither indicator nor screendo not shine

Possible cause: There is no power supply voltage.

It is necessary to: Ensure supply voltage presence.

After turning on on the screennormal voltage level, but load is not turning on

Possible cause:

- the current voltage in the network is close to the established limits and not stable.

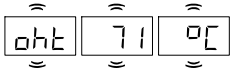
It is necessary to:

- check the values of the limits; increase their values so that the protected equipment is tolerated to them.

In other cases, please, address to a service centre.

The load is disabled, «oht» flashes on the screen

The temperature inside the housing exceeded 70 °C and triggered protection against internal overheating.



Possible cause: inner overheating of the device to which can lead: bad contact in the terminals of the device, high ambient temperature, overwhelming power output or incorrectly selected cross-section of wires for connecting.

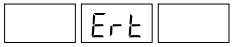
It is necessary to: check tension of power wires in the device terminals, make sure that the switching load does not exceed the permissible and that the cross section of the wires is selected correctly.

Feature of protection against internal overheating: the device will be unlocked in case if the temperature inside will decrease to 60 °C.

If the protection trips more than 5 times within 24 hours, the voltage relay is blocked until the temperature inside the case drops to 52 °C and one of the buttons is pressed.

A problem with the overheating sensor

Every 5 sec the screen displays:



Possible cause: open or short circuit of the internal overheating sensor. Control over inner overheating will not be done.

It is necessary to: Send the device to the Service Center. Otherwise, control over inner overheating will not be done.

Frequent load trip

Possible cause:

- underestimated (overestimated) value of the upper (lower) limit;
- low hysteresis value set.

It is necessary to:

- increase the value of the limits so that the protected equipment is tolerant of their values;
- increase the hysteresis value.

POWER RELAY STATUS CONTROL

During operation, the device constantly monitors the state of the power relay (on or off) and signals this by glowing a green LED on the corresponding phase.

If the state of the power relay differs from what it should be, **«ErL»** (Error relay) will flash once/2 sec on the corresponding screen. In this case, the device will try to change once/1 sec the state of the power relay in the single-phase load mode or disconnect all power relays in the three-phase load mode. To clear the error, you must restart the device by turning off and turning on the power. If the error persists, contact the Service Center.

If it is not possible to determine the state of the relay on the corresponding phase, the indicator will flash with periodic attempts to turn off the power relay, except for the three-phase load mode, in which the phase absence control parameter is disabled.

ADDITIONAL INFORMATION

Do not fire and do not throw away the device with the household waste.

After the end of its service life, the product must be disposed of in accordance with applicable law.

Transportation of goods carried in the package, ensuring the safety of the product.

The deive is transported by any kind of transport (rail, sea, motor, air transportation).

Date of manufacture is on the back side of device. Application time is unlimited.

The device does not contain harmful substances.

If you have any questions or you something will not clear, call the Service centre the telephone number listed below.

SAFETY INSTRUCTIONS

Carefully read and become aware of yourself these instructions.

Connection of the device must be done by a qualified electrician.

Before the installation (dismantling) and connection (disconnection) of the device, turn off voltage supply and also act according to the «Rules of an arrangement of electric installations».

Turning on and off or and configure the device should be with dry hands.

Do not connect the device to the network disassembled.

Avoid hitting of water or moisture to the device.

Do not expose the device to extreme temperatures (higher than 40 ºCor below -5°C) and high humidity.

Never clean the device with the use of chemicals such as benzene, solvents.

Do not store the device and do not use it in areas with the dust.

Do not attempt to disassemble and repair the device.

Do not exceed the landmarks value adaptor and power.

To protect against overvoltage caused by lightning discharges, use a lightning protector.

Protect the children from games with the working device, it is dangerous.

vd6.0.02.3_220608

Low Voltage Directive 2014/35/EU
EMC Directive 2014/30/EU

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