

**CV2-40, CV2-50, CV2-63**  
**CV2-40 red, CV2-50 red, CV2-63 red**  
**Overtoltage protection for professionals**

The voltage relay with current control ZUBR CV2 (hereinafter referred to as the device) is designed to protect single-phase electrical equipment from deviated voltage, current or full power. It allows to estimate the power factor in electric grids ( $\cos \varphi$ ).

**IN THE BOX**

Voltage relay with current control	1 piece
Technical data sheet, installation and operation manual, warranty card	1 piece
The packing box	1 piece

**TECHNICAL DATA**

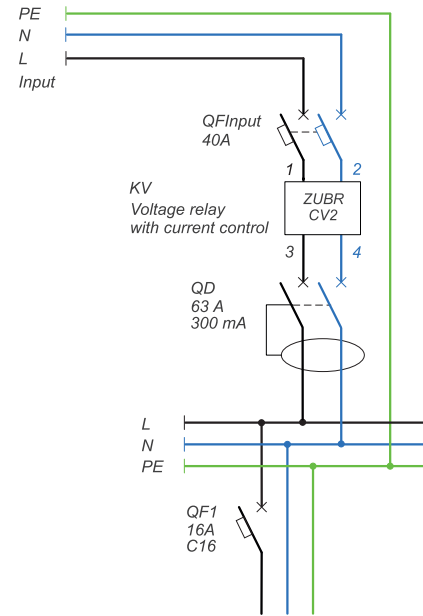
Model	CV2-40	CV2-50	CV2-63
Rated load current (for category AC-1)	40 A (max 50 A 10 min)	50 A (max 60 A 10 min)	63 A (max 80 A 10 min)
Rated power (for category AC-1)	8 800 VA	11 000 VA	13 900 VA
Basic current limit	0,1–40 A	0,1–50 A	0,1–63 A
Power limitation	0,1–8,8 kVA	0,1–11 kVA	0,1–13,9 kVA
Current measurement accuracy	0,5–63 A $\pm$ 0,2 A		
Voltage limit	upper 220–280 V lower 120–210 V		
Break-time at increasing	not more than 0,03 sec		
Break-time at lower	> 120 V < 120 V	0,1–10 sec not more than 0,03 sec	
Power Volt	not less than 100 V not more than 420 V		
Power consumption	not more than 0,35 kWt / month		
The number of operating cycles under load	not less 100 000 cycles		
The number of operating cycles without load	not less 500 000 cycles		
Relay type	polarized		
Connection	not more than 16 mm <sup>2</sup>		
Device weight	0,19 kg $\pm$ 10 %		
Overall dimensions (w x h x d)	36 x 85 x 66 mm		
IP to GOST 14254	IP20		

**CONNECTION SCHEMES**

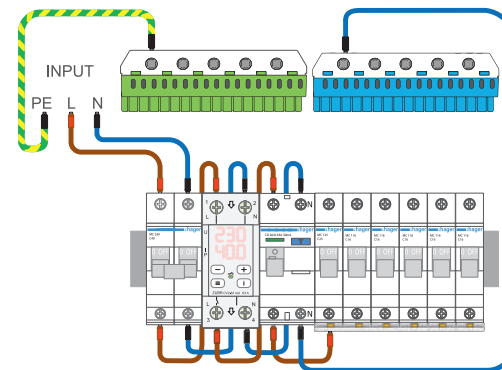
Supply voltage (100 – 420 V, 50 Hz) served on terminals 1 and 2, phase (L) is connected to terminal location 1, and the neutral conductor (N) to terminal 2.

The connecting voltage wires connected to terminal 3 and 4 (phase (L) is connected to terminal location 3, and the neutral (N) to terminal 4).

If a circuit without zero transit through the device is used, then zero is connected to terminal 2 or 4.



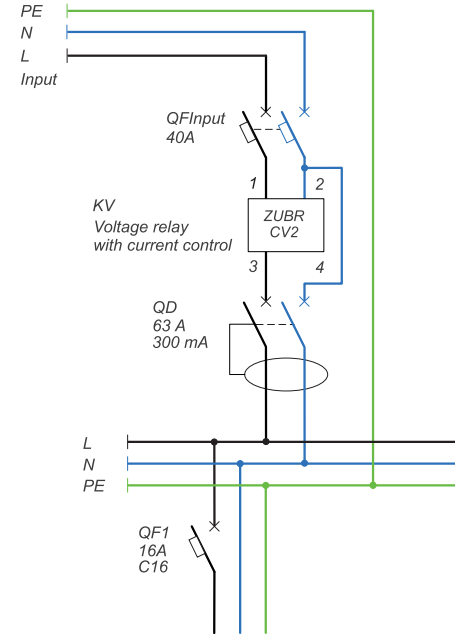
Scheme 1. Option of wiring diagram with a neutral bypass through CV2 red



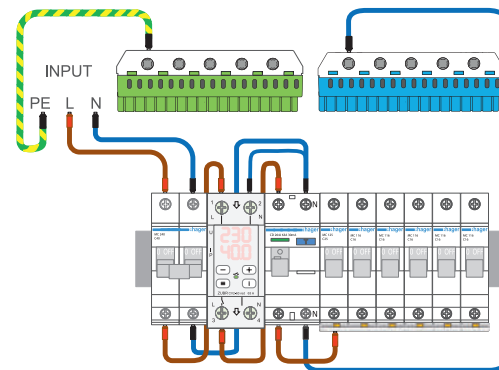
Scheme 2. Option of the connection diagram with a neutral bypass through CV2 red

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.

CURRENT AND POWER IS MEASURED at the phase input of the device.



Scheme 3. Option of wiring diagram without a neutral bypass through CV2 red



Scheme 4. Option of the connection diagram without a neutral bypass through CV2 red

**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 the installation should be within  $-5...+45^{\circ}\text{C}$ .

The appliance is installed in a special box, which allows to conduct the easy installation and operation. Cabinet should be equipped with standard mounting rail 35 mm width (DIN rail). The appliance takes in width of 2 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), see schemes 1, 3. To protect person from electric shock leak is set safety shutdown device.

Terminals of the device designed for wire cross section up to 16 mm<sup>2</sup>. Clean the end wires of 10 $\pm$ 0,5 mm. 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 N·m. 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 on the website <https://www.ds-electronics.company>. If you have a warranty case, please, contact the General distributor in your area.





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

**WARRANTY CARD**

serial Nr:	date of sale:
a seller, a seal:	place of a seal
an owner contact for a service center:	

## EXPLOITATION



When switched on, the device first displays the parameter symbols, then the parameters themselves.

 →  mains voltage (V),  
selected option for protection.  
By default current (A).

The protection settings can be changed (see «Controlled parameter selection» — «Cpt» in Table 1):

«I» — current (A);  
«PF» — full power (kVA).

If the voltage is within acceptable limits, after the set delay time, the load is turned on and the green indicator starts to glow.

 →  In case of an emergency, the alert type and its meaning will flash on the screen.

If the voltage deviates from the set limits, the load is switched off. When the current or power limits are exceeded, the lower screen will flash and after a delay the load will be disconnected.



Use the «≡» button to navigate through the menu. 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.

The menu is exited 5 sec. after pressing the buttons or by briefly pressing «≡». When exiting, the device first displays the symbols of the displayed parameters, then the parameters themselves.

To view the abbreviation of the menu item, use the «i» button.

### Setting voltage tipping point


(factory setting 242 V / 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.

All settings are stored in NON-VOLATILE MEMORY.

When setting the voltage limits USE THE PROTECTED EQUIPMENT TECHNICAL DOCUMENTATION.

### Reset to factory settings



 Hold the button «≡» for 30 seconds till the «dEF» sign appears on the screen. After releasing the buttons the device will restart and reset the settings to the factory settings.


## Viewing of firmware version


Hold the button «i» for 6 sec. The version will be displayed as running letters. The manufacturer reserves the right to modify the firmware to enhance the device technical characteristics.

### Delay in the load starting

(control is described in Table 1)

 →  If a voltage surge occurs and the delay time is greater than 9 sec, the device will display the maximum value, then the current voltage with a flashing dot on the right.

 The countdown in seconds («t99.», «t98.»...) will start until the load is turned on.


 If you set a delay longer than 100 sec, the screen will display the current voltage with a flashing dot to the right. If the remaining time is less than 99 sec, it will display the countdown in seconds.

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.

### Log for 100 accidents

The device stores in non-volatile memory the last 100 values of voltage, current, power or thermal protection operation with temperature inside the case, according to which the load was disconnected (n 0... n99, where «n 0» is the last entry, «n49» is the oldest).



To enter the log, press «i» once.



 To view the number of entries in the log, hold «i» for no more than 3 seconds.


To view and scroll through the log, press the «i» button. Hold «i» to quickly view the log. To view in both directions, press «+» or «-». First, the device displays the alarm value, then its number.

### Examples of emergency log entries:

 →  High voltage alarm













 →  Power limit exceeded alarm

 →  Current limit exceeded alarm

 →  Internal temperature limit exceeded alarm

To reset the log, hold «i» for 3 seconds until «Err» appears. Without releasing the button, press and hold «≡» until «rSt» appears. After releasing the buttons, the log will be cleared.

Table 1. FUNCTION MENU

Menu section	Button «≡»	Screen	Notes										
<b>Control parameter setting</b> (factory setting I <sup>---</sup> , see the range in the note)	press 1 time		Select the controlled parameter in the menu item «Cpt» and configure it: «I <sup>---</sup> »: factory setting 10 A, range see Technical data; «PF <sup>---</sup> »: factory setting 3.0 kVA, range see Technical data.										
<b>Delay in the load starting after a failure</b> (factory setting 3 sec, a range of change 3–999 sec, step 3 sec)	press 2 times		For protection of refrigeration equipment, where there is a compressor, it is recommended to set a delay of turning on load 120–180 sec.										
<b>Time delay of the load disconnection</b> (factory setting 5 sec, a range of change 0–240 sec, step 1 sec)	press 3 times		The time that the device will wait before disconnecting the load, if the controlled parameter is exceeded, as selected in the «Cpt» menu item.										
<b>Controlled parameter selection</b> (factory setting «I <sup>---</sup> », a range of change «I <sup>---</sup> », «PF <sup>---</sup> »)	press 4 times		Select the parameter by which the control will be carried out together with the control of voltage drops in the system: «I <sup>---</sup> » — current, «PF <sup>---</sup> » — full power.										
<b>The maximum number of consecutive triggers for exceeding current, power or voltage</b> (factory setting 3 times, a range of change 1–5)	press 5 times		The device will limit the operation in a row for the same parameter and will be blocked in order to reduce the detrimental effect on the protected equipment and draw the user's attention to the issue. For voltage limits, the limit is triggered if up to 20 sec has passed between on limit and off load. «OFF» — the function is disabled.										
ADVANCED SETTINGS		Hold for 3 seconds											
<b>Correction of voltage</b> (factory setting 0 V, a range of change ±20 V)			You can use correction if voltage indications on the screen of the device and your reference device differ.										
<b>Correction of current</b> (factory setting 0 A, range ±20 %) When the measured current is less than 1A, the parameter change is not available, and the lower screen will display dashes.	press 1 time		Amend if the current readings on the device and your reference instrument diverge. Example: with a measured current of 10 A, the maximum correction range is ±2 A										
<b>Professional model of the tripping time when the voltage goes beyond the limits</b> (factory setting «oFF»)	press 2 times		Does not disable the protected equipment at safe voltage deviations in value and duration. See the table 2 for more details.										
<b>Break-time on voltage dip</b> (factory setting 1 sec, a range of change 0,1–10 sec)	press 3 times		It is necessary to fine-tune the response time of the protection to power failures. More details in the Table 2: the Pro mode is enabled: 154–176 V, the Pro mode off: 120–210 V										
<b>Delay type of load starting</b> (factory setting «tAr»)	press 4 times		Choose one of the delay options: «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 and takes into account response time of the emergency in the total on-delay time.										
<b>Hysteresis</b> (factory setting 1 V, range 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.	press 5 times		<table border="1"> <tr> <td>198</td> <td>199</td> <td>241</td> <td>242</td> <td>U, V</td> </tr> <tr> <td>Disconnect the device at the bottom limit</td> <td>his = 1</td> <td>Voltage is satisfactorily, the device is on</td> <td>his = 1</td> <td>Disable the device at high limit</td> </tr> </table>	198	199	241	242	U, V	Disconnect the device at the bottom limit	his = 1	Voltage is satisfactorily, the device is on	his = 1	Disable the device at high limit
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Disconnect the device at the bottom limit	his = 1	Voltage is satisfactorily, the device is on	his = 1	Disable the device at high limit									
<b>Standby brightness</b> (factory setting 100%, a range of change 0–100%, step 10%)	press 6 times		You can lower the screen brightness in standby mode if it bothers you. At 0% brightness, the screen will turn off 30 seconds after the last button press. In case of an emergency, the screen will light up at 100%.										

Menu section	Button «≡»	Screen	Notes
SETTING CURRENT LIMITS	Hold for 6 seconds		Available only if «I <sup>-</sup> » is selected in the «CPT» menu item
<b>Additional current trip limit</b> (factory setting OFF, range 0,1...«I <sup>-</sup> » or between «I <sub>1</sub> » and «I <sup>-</sup> »)			For example, to protect the electric motor, it is necessary to limit its operation at maximum power. The additional limit «I <sup>-</sup> » is set no higher than the main «I <sup>-</sup> » and not lower than the minimum «I <sub>1</sub> », if it is enabled.
<b>Shutdown delay when additional current limit is exceeded</b> (factory setting 10 sec, range from «toF»+1 to 240 sec)	press 1 time		This is the time the device will wait before disconnecting the load when the additional current limit is exceeded. Available when additional current limit is enabled.
<b>Minimum current trip limit</b> (factory setting OFF, range 0,1...«I <sup>-</sup> » or between 0,1 and «I <sup>-</sup> »)	press 2 times (1 time, if «I <sup>-</sup> » is off)		For example, this is the maximum current of the electric motor without load, to limit its operation at idle.
<b>Shutdown delay when the minimum current limit is exceeded</b> (factory setting 6 sec, range 0-240 sec)	press 3 times (2 times, if «I <sup>-</sup> » is off)		This is the time that the device will wait before disconnecting the load when the minimum current limit is exceeded. Available when the minimum current limit is enabled.

RELATIONSHIP OF CURRENT LIMITS WITH THE TRIPPING TIME FOR SUCH LIMITS

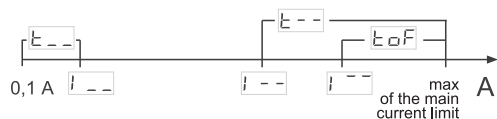


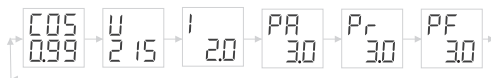
Table 2. MODELS SHUTDOWN exit time voltage beyond

The usual default (by default)	Upper limit	220-280 V	0,04 sec
Pr o OFF	Lower limit	120-210 V	0,1...10 sec
		< 120 V	0,04 sec
Professional Pr o 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	

View all measured parameters

Parameters available for viewing: COS — power factor in the mains (cos φ), U — mains voltage, I — current, PF — full power, Pr — reactive power, PA — active power.

Hold «i» for 4 sec. When the button is released, viewing is available for 30 seconds. The upper screen displays the symbol of the measured parameter, the lower one displays its value. Use the «+» and «-» buttons to navigate through. Press «≡» to quickly exit viewing.



Viewing of temperature of a thermal protection sensor

Hold the button «i» for 16 sec.

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.

A tripping counter

Not discharged. To view hold the button «i» for 12 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 screen normal 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.

Frequent load trip

*Possible cause:* underestimated (overestimated) value of the upper (lower) limit. Exceeding the set current limits or selected power.

*It is necessary to:* increase the value of the limits so that the protected equipment is tolerant of their values.

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

The temperature inside the housing exceeded 80 °C and triggered protection against internal overheating. «oht» and the temperature of the thermal protection sensor flash 1 time/sec on the screen.

*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 resume operation if the temperature inside the housing drops below 60 °C. If the protection is triggered more than 5 times within 24 hours, the device will lock (then «oht» is displayed permanently and the bottom screen flashes) until the temperature inside the housing drops below 60 °C (the display will not flash) and one of the buttons is pressed.

Every 5 sec the screen displays «Ert»

*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.

The load is disabled, the screen displays: «rEP Err»

*Possible cause:* the maximum number of consecutive trips for exceeding current, power or voltage limits has been exceeded.

*It is necessary to:* check the cause of the operation according to the alarm log. Make sure that the protection operation settings are correct (see Table 1 «rEP»). If necessary, change the protection settings, if this does not conflict with the capabilities of the connected load. Unlock the relay by pressing any button.

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 °C or 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.

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 device 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.

vG96\_2309



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

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