

MF2-40, MF2-50, MF2-63
MF2-40 red, MF2-50 red, MF2-63 red
Overtoltage protection for professionals

The multifunction relay ZUBR MF2 (hereinafter referred to as the device) is intended to protect single-phase electrical equipment from deviation from the set limits for voltage, current or power with the ability to view the power factor in electric grids (cos φ).

IN THE BOX

Multifunction relay	1 piece
Technical data sheet, installation and operation manual, warranty card	1 piece
The packing box	1 piece

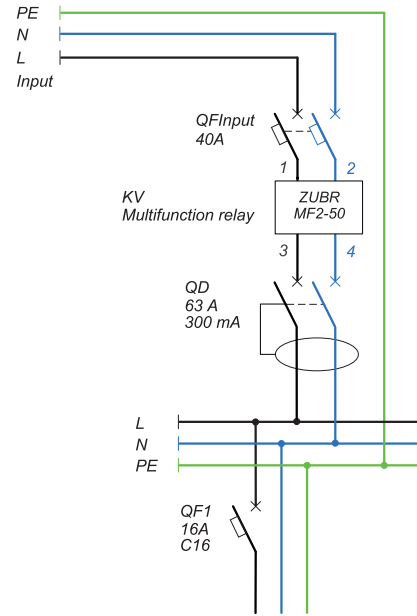
TECHNICAL DATA

Model	MF2-40	MF2-50	MF2-63
Rated load current (max for 10 minutes) for category AC-1	40 A (max 50 A)	50 A (max 60 A)	63 A (max 80 A)
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 ± 0,1–0,3 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	0,1–10 sec	
	< 120 V	not more than 0,03 sec	
Overcurrent or overpower shutdown time	0–240 sec		
Power Volt	not less than 100 V, not more than 420 V		
Power consumption	not more than 0,35 kWt*h / month		
The number of operating cycles under load	not less 10 000 cycles		
The number of operating cycles without load	not less 500 000 cycles		
Relay type	polarized		
Connection	not more than 16 mm ²		
Device weight	0,19 kg ±10 %		
Overall dimensionsc (w × h × d)	36 x 85 x 66 mm		
IP to GOST 14254	IP20		

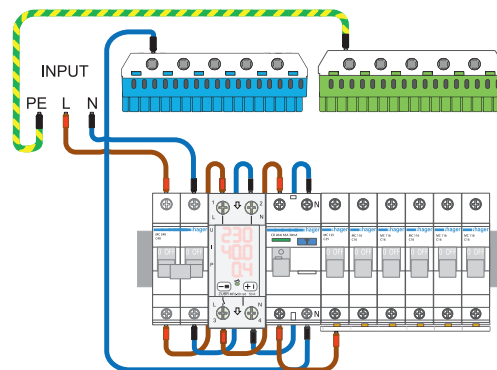
CONNECTION SCHEMES

The supply voltage (100–420 V, 50 Hz), in which the current or power is measured, is supplied to the terminals 1 (phase, L) and 2 (neutral, N). If a circuit without a neutral bypass through MF2 is used, the neutral wire can also be connected to terminal 4.

The connecting wires of the load phases are connected to the corresponding terminals 3, 4 (phase L) is connected to terminal location 3, and zero (N) is connected to terminal location 4).



Scheme 1. Option of wiring diagram with a neutral bypass through MF2-50 red

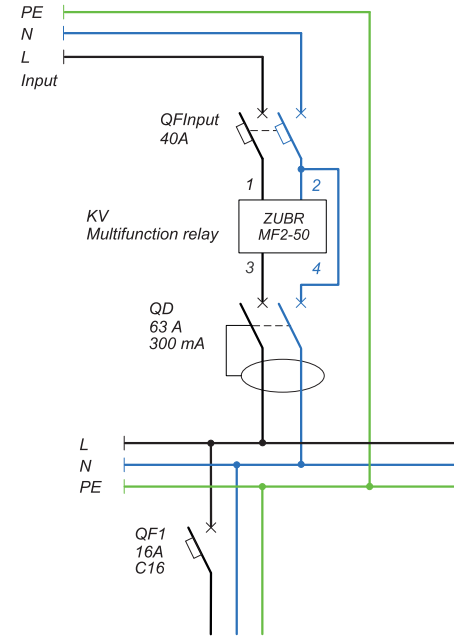


Scheme 2. Option of the connection diagram with a neutral bypass through MF2-50 red

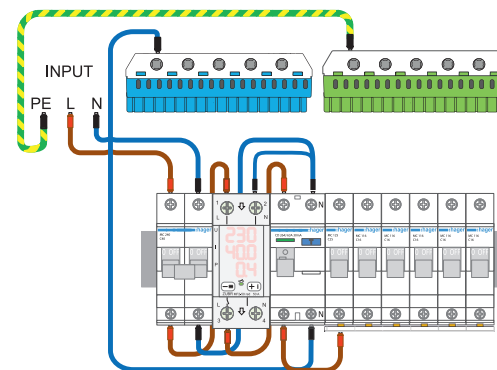
Before the installation and operation of the device, PLEASE READ BY THE END OF THIS DOCUMENT. This will help to avoid possible danger, mistakes and misunderstandings.

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

All settings are stored in NON-VOLATILE MEMORY.



Scheme 3. Option of wiring diagram without a neutral bypass through MF2-50 red



Scheme 4. Option of the connection diagram without a neutral bypass through MF2-50 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 °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 two standard module on 18 mm. The height of the appliance should be in the range 0,5...1,7 m from the floor.

The device is installed after the protective circuit breaker (QF), which duplicates the protective function (scheme 1, 3). To protect person from electric shock leak is set safety shutdown device (QD).

Terminals of the device designed for wire cross section 2 up 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 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

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

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

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

Use the « \Rightarrow » button to **navigate through the menu** (table 1). To change the parameter, press « $+$ » once, the flashing value of the parameter can be changed with « $+$ » and « $-$ ». 5 seconds after pressing « \rightarrow » return to the settings menu, after other 5 seconds « \rightarrow » to the indication of line parameters.

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.

WHEN SETTING THE VOLTAGE LIMITS USE THE PROTECTED EQUIPMENT TECHNICAL DOCUMENTATION.

Delay in the load starting after a failure

(factory setting 3 sec)

Following the end of an emergency, the device does not immediately load the connected equipment, but after a set turn-on delay time.

After a power surge, the device will display the type of failure, then the current line voltage and start the countdown. If the delay time is set to less than 6 seconds, the device will skip this step.

In case of a long failure, the device will display the type of failure and its meaning, and the countdown will start when voltage stabilizes.

Viewing of temperature of a thermal protection sensor

It is required to control heating inside the case. For example, to assess the degree of heating inside the case or to prevent overheating. To view hold the button « i » for 20 sec.

Log for 100 accidents

The device stores in non-volatile memory the last 100 values of voltage, current, power or thermal protection operation « oht », where « $n0$ » is the last entry, « $n99$ » is the oldest).

To enter the log, hold « i » for 3 seconds, the device will display the number of alarm entries in the log. After release, details of the last alarm (number, type and value) are shown.

To view the log press the « $+$ » or « $-$ » buttons.

To reset the log while viewing it, hold down « $+$ » and « $-$ » simultaneously until « $Err rSt$ » appears. After releasing the buttons, the log will be cleared.

Examples of emergency log entries:

View all measured parameters

Hold « i » for 6 seconds to start viewing. The upper screen will display the parameter, while the middle screen will display its value. Use « $+$ » and « $-$ » to switch between parameters. To quickly exit the view, press « $+$ » and « $-$ » simultaneously. 30 seconds after entering the view mode, the device will return to displaying the measured parameters.

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 firmware version

Hold the button « i » for 9 sec. The version will be displayed as running letters. The manufacturer reserves the right to modify the firmware to enhance the device technical characteristics.

A tripping counter

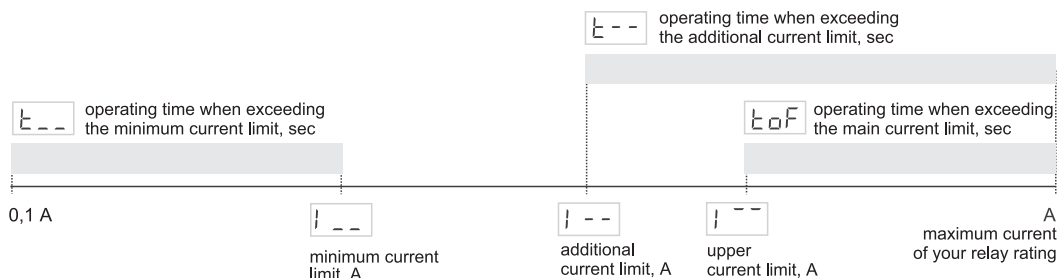
To view hold the button « i » for 15 sec. It is used to estimate the number of switchings of the power relay and its wear.

Reset to factory settings

Hold the button « \Rightarrow » 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.

Table 1. Settings

BASIC SETTINGS	Hold « \Rightarrow » for 3 seconds	Notes
Upper current or power limit (factory setting 10 A or 3.0 kVA, see the range in the Technical data on page 1)	press 1 time « \Rightarrow »	The parameter that will be controlled can be changed, it is selected in the « Cpt » menu (described below).
Delay in the load starting after a failure (factory setting 3 sec, a range of change 3–999 sec, step 3 sec)	press 1 time « \Rightarrow »	For protection of refrigeration equipment , where there is a compressor, it is recommended to set a delay of turning on load 120–180 sec.
Time delay of the load disconnection (factory setting 5 sec, a range of change 0–240 sec, step 1 sec)	press 2 times « \Rightarrow »	If the current or power limit is exceeded, the device will count the delay and only then turn off the load. The function reduces the number of relay operations and is necessary for finer adjustment of the protection response time to overcurrent or overpower.
Select the parameter to control: current or power (factory setting « I », can be switched to « PF »)	press 3 times « \Rightarrow »	Select the parameter by which the control will be carried out together with the control of voltage drops in the system: « I » — current, « PF » — full power.
The maximum number of consecutive triggers for exceeding current, power or voltage (factory setting 3 times, a range of change 1–5 or « oFF »)	press 4 times « \Rightarrow »	If the maximum number of operations in a row is exceeded for one of the parameters, the device will completely turn off the load in order to reduce the harmful effects on equipment. To restore the relay operation, press one of the buttons. For voltage limits, the limit is triggered if up to 20 sec has passed between on limit and off load.
ADVANCED SETTINGS	Hold « \Rightarrow » for 6 seconds	
Correction of voltage (factory setting 0 V, a range of change ± 20 V)	press 1 time « \Rightarrow »	You can use correction if voltage indications on the screen of the device and your reference device differ. Please note that your reference device should measure voltage using the True RMS method, just like ZUBR MF2.
Correction of current (factory setting 0 A, range ± 20 % of measured current)	press 1 time « \Rightarrow »	Amend if the current readings on the device and your reference instrument diverge. With a measured current of 10 A, the maximum correction range is ± 2 A. When the measured current is less than 1 A, the correction is not available.
Professional model of the tripping time when the voltage goes beyond the limits (factory setting « oFF »)	press 2 times « \Rightarrow »	Does not disable the protected equipment at safe voltage deviations in value and duration. See table 2 for the response speed in accordance with the voltage deviation degree.
Break-time on voltage dip (factory setting 1 sec, a range of change 0, 1–10 sec)	press 3 times « \Rightarrow »	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
Delay type of load starting (factory setting « tAr »)	press 4 times « \Rightarrow »	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.
Hysteresis (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 « \Rightarrow »	<p>For example: voltage limits 198 and 242 V, hysteresis 1 V. The device will turn off the load when the voltage goes beyond the limits, but work will resume only when the voltage is closer to normal by hysteresis (199 and 241 V).</p>
Standby brightness (factory setting 100%, a range of change 0–100%, step 10%)	press 6 times « \Rightarrow »	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%.



Scheme 5. Relationship of current limits with the tripping time for such limits

continuation of Table 1. Setting the additional current limits

Menu section	Hold «≡» for 9 seconds	Notes
Additional current trip limit (factory setting OFF, range 0,1...«I _{min} » or between «I _{min} » and «I _{max} »)	available if «Cpt» is set to «I _{min} »	For example, to protect the electric motor, it is necessary to limit its operation at maximum power. The additional limit «I _{max} » is set no higher than the main «I _{min} » and not lower than the minimum «I _{min} », if it is enabled. See details in diagram 5.
Shutdown delay when additional current limit is exceeded (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. See details in diagram 5.
Minimum current trip limit (factory setting OFF, range 0,1...«I _{max} » or between 0,1 and «I _{min} »)	press 2 times «≡» (1 time, if «I _{max} » is off)	For example, this is the maximum current of the electric motor without load, to limit its operation at idle. See details in diagram 5.
Shutdown delay when the minimum current limit is exceeded (factory setting 6 sec, range 0–240 sec)	press 3 times «≡» (2 times, if «I _{max} » 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. See details in diagram 5.

	Upper limit	220–280 V	0,04 sec
The usual default 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	

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.

POSSIBLE PROBLEMS, CAUSES AND WAYS TO OVERCOME THEM

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: check which line parameter is triggered, and set the limits of this parameter so that the protected equipment is tolerant of such values.

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.

At turning on neither indicator nor screen do not shine

Possible cause: There is no power supply voltage.

It is necessary to: Ensure supply voltage presence.

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 or incorrectly selected cross-section of wires for connecting.

It is necessary to: check the tightness of the power wires in the terminals of the device and make sure that the cross section of the wires for connection 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 two screens will keep flashing), until the temperature inside the housing drops below 50 °C (the display will not flash) and one of the buttons is pressed.

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.

Er t Every 5 sec the screen displays «Er t»

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.

If you don't find the answer to your question

Please contact our technical support engineer via telegram bot @dselectronics_bot



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.

vF3296 2309



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

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