ZUBR **Technical data sheet, installation and operation manual**

MF2-32, MF2-40, MF2-50, MF2-63, MF2-32 red, MF2-40 red, MF2-50 red, MF2-63 red

Overvoltage protection for professionals

Web manual version for browser translation into your native language

The multifunction relay ZUBR MF2 (hereinafter referred to as the device) is designed to protect a single-phase electrical equipment from voltage, current or total power deviations.

IN THE BOX

Multifunction relay	1 piece
Installation and operating manual	1 piece
The packing box	1 piece

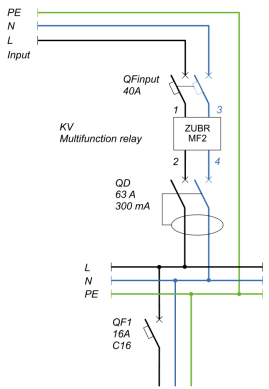
TECHNICAL DATA

Model	MF2-32	MF2-40	MF2-50	MF2-63
Rated load current (for category AC-1)	32 A	40 A	50 A	63 A
no longer than 10 min	40 A	50 A	60 A	80 A
Rated load power (for category AC-1)	7,3 kVA	9,2 kVA	11,5 kVA	14,4 kVA
Main current limit	0,5–32 A	0,5–40 A	0,5–50 A	0,5–63 A
Power limits	0,1–7,3 kVA	0,1–9,2 kVA	0,1–11,5 kVA	0,1–14,4 kVA
The number of operating cycles under load	100 000 cycles	not less 10 000 cycles		
The number of operating cycles without load	1000 000 cycles	not less 500 000 cycles		
Relay type	electro-magnetic	polarized		
Current measurement accuracy	0,5–63 A ±0,1–0,3 A			
Voltage limits	upper 230–280 V, lower 100–210 V			
Switch-off time when overvoltage occurs	not more than 0,03 sec			
Switch-off time when undervoltage occurs	0,1–10 c | ≥ 100 V | not more than 0,03 c | < 100 V |			
Supply voltage	100–420 V			
Power consumption	not more than 0,35 kWt / month			
Connection	wire cross section not more than 16 mm²			
Device weight	0,19 kg ±10%			
Overall dimensions	36 x 85 x 66 mm (w x h x d)			
IP to GOST 14254	IP20			

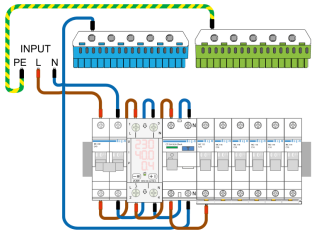
CONNECTION SCHEMES

Supply voltage (100–420 V, 50 Hz) is applied to terminals 1 and 3, with phase (L) connected to terminal 1 and neutral (N) to terminal 3.

The load connection wires are connected to terminals 2 and 4, with phase (L) connected to terminal 2 and neutral (N) to terminal 4.



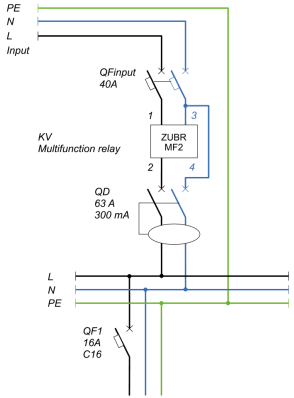
Scheme 1. Electrical diagram with a neutral bypass in ZUBR



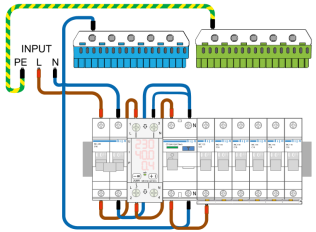
Scheme 2. Wiring diagram with a neutral bypass in ZUBR

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.

Current and power is measured at the phase input of the device.



Scheme 3. Electrical diagram without a neutral bypass in ZUBR



Scheme 4. Wiring diagram without a neutral bypass in ZUBR

INSTALLATION

The device is intended for indoor installation. Minimize the risk of moisture and liquids entering the installation site. The ambient temperature during operation and installation must be within the range of –5 to +45 °C.

The device is mounted in a special cabinet with a standard 35-mm-wide DIN rail and occupies two standard 18-mm modules. The installation height of the device must be between 0.5 and 1.7 m above the floor. The device is mounted and connected after the load has been installed and tested.

The device is installed downstream of a protective circuit breaker (QF), which is installed in the phase wire circuit (Diagram 1). To protect people from electric shock due to leakage current, a residual current device (QD) is installed.

The device's terminals are rated for wire with a cross-sectional area of no more than 16 mm². Strip the wire ends by 10±0.5 mm. It is recommended to use a flexible wire that can be tightened in the terminals using a screwdriver with a blade width of no more than 6 mm and a torque of 2.4 N·m. A screwdriver with a blade width greater than 6 mm may cause mechanical damage to the terminals. This will void the warranty.

EXPLOITATION

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



- "U" — voltage network (V)
- "I" — current (A)
- "PF" — full power (kVA)

If the voltage is within the permissible limits, the load is switched on after the set delay time and the green indicator lights up.



When an event occurs, the type of event and its value will flash on the screen.

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

Technical Support Chat
If you haven't found the answer, please contact our technical support engineer **@dselectronics_bot**

Setting voltage shutdown limits



(factory setting is 253 V / 198 V)
To see the upper limit press "+" button, lower limit press "–" button. To change it, use "+" and "–" buttons.

Important! During voltage limits settings use technical documentation for protected equipment.

All settings are stored in non-volatile memory.

Time delay before the load is switched on

The settings are described in the Menu. After the emergency situation is over, the device doesn't immediately supply power to the connected equipment, but after the set switch-on delay time.



After overvoltage or undervoltage events, 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.

Locking the controls

Hold down the "+" and "–" buttons for more than 6 sec until the message "Loc"/"unLoc" appears on the screen.

Log of events for 100 notes

The voltage relay stores the last 100 values, voltage, current, power, or thermal protection tripping in non-volatile memory with a record of the temperature inside the housing, where "n 0" is the last tripping and "n99" is the oldest.

To enter the log, "i" button for 3 seconds.



The device displays the number of event records in the log. When released, the details of the last event (number, type, and value) are displayed.

Use the "+" and "–" keys to view the log.

Examples of notes for different events:
Use "+" and "–" to view the log.



High voltage event



Power limit exceeded event



Current limit exceeded event



Internal temperature limit exceeded event



To reset the log while viewing it, hold down the "+" and "–" simultaneously until "Err rSt" appears. When you release the buttons, the log is cleared.

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 you to read the section "Possible problems" firstly. If you can not 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 terms within 14 business days.

Please look through 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.

ZUBR

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

WARRANTY CARD

serial №: date of sale:

a seller, a seal: place of a seal

an owner contact for a service center:

SETTINGS MENU: SELECT A PARAMETER USING THE "≡"

Use the "+" and "–" to change the settings. Press once to start editing (the value will flash), then press again to adjust it. If no button is pressed for 10 seconds, the device returns to the previous screen or menu level. To view the description of a menu abbreviation, press the "i" button.

Scan the QR-code to watch a short video guide on how to set up the device. Before watching, make sure to turn on subtitles!

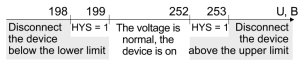
MAIN SETTINGS	HOLD "≡" FOR 3 SECONDS
Upper limit of current or power factory settings – rated current range of change – current or power limits (see Technical Data table)	The device is set to overcurrent protection from the factory. To change the parameter to be monitored to power, go to the "CPt" section (described below).
Time delay before the load is switched on factory setting 3 s, range of change 3–999 s, step 3 s	For protection of refrigeration equipment, if there is a compressor, it is recommended to set a delay of turning on load 120–180 sec.
Delayed shutdown the load due to current or power failure factory setting 5 s, range of change 1–600 s, step 1 s	If the current or power is exceeded (select "Cpt" in the next paragraph), the device will count down the delay time and only then turn off the load. The delay will be calculated for the parameter selected in the "Cpt" item.
Selection of the second parameter: current or power factory setting "I" range of change "PF"	Here you select the parameter for which protection will be performed. There is a current from the factory, you can change it to full power. Accordingly, the second screen of the device will show the parameter selected in this item.
Maximum continious numbers of relay operations for voltage, current, power events factory setting 3, range of change 1–5 or "oFF"	The device will limit the triggering of the same parameter in a row and will lock out to reduce the harmful effects on the equipment and draw the user's attention to the problem. The voltage limitation will work if up to 20 sec have passed between switching on the load beyond the limit and disconnecting it.
ADVANCED SETTINGS	**HOLD "≡" FOR 6 SECONDS**
Voltage correction factory setting 0 V, range of change ±20 V	Use the correction if the voltage readings of the device and your reference device do not match.
Current correction factory setting 0 A, range of change ±20 % of the measured current	Use the correction if the current readings on the device and your reference device do not match. *Example:* With a measured current of 10 A, the maximum correction range is ±2 A. With a measured current of less than 1 A, the parameter cannot be changed.
Pro mode of Switch-off time when undervoltage and overvoltage occurs factory setting "oFF" Useful for low quality AC mains or mains that are overloaded with powerful equipment. Activate it to keep the equipment running when voltage deviations are safe in terms of magnitude and duration Table 1.	Table 1. Load shutdown time when the voltage goes beyond the limits

Pro Mode **is off**	Upper voltage limit	230–280 V	0,03 s
	Lower voltage limit	100–210 V	**0,1...10** s
		< 100 V	0,03 s
Pro Mode **is on**	Upper voltage limit	> 276 V	0,03 s
		230–276 V	0,5 s
	Lower voltage limit	184–210 V	10 s
		161–184 V	**0,1...10** s
		< 161 V	0,03 s

Generator Compatibility Mode (factory setting "oFF")	Necessary in case of a shutdown below the lower voltage threshold when operating from a generator. It can also be used with other alternative power sources.

Continued Advanced settings

Switch-off time when undervoltage occurs factory setting 1 s, range of change 0,1–10 s	For more fine-tuning of protection response time to the voltage drops. The time set in this way will be valid only when voltage drops from 161 to 184 V when Pro Mode is turned on from 100 to 210 V when Pro Mode is turned off.
Selecting the type of Time delay factory setting "tAr"	• "tAr" time after voltage recovery — the delay is counted from the moment of voltage recovery. • "tAo" time after switching off — the delay 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 of change 0–5 V	It is necessary to reduce the number of overcurrent trips when the mains voltage is close to the limit and unstable.



Screen brightness in standby mode factory setting 100%, range of change 0–100%	If the brightness setting is 0, the screen will turn off completely for 30 seconds after the last button press. During an emergency, the screen will be 100% lit.
SETTING CURRENT LIMITS	**HOLD "≡" 9 SECONDS**
Please note: These settings are available if current control "I _ " is selected in the menu item "CPt".	
Additional limit of switching-off of current factory setting oFF, a range of change 0,5 or "I_ _" to rated current or oFF	An additional current limit that can be used for more flexible configuration. For example, its value can be set higher than "I¯¯", but the delay "t2 ¯" can be set lower than "toF".
Delayed shutdown when the additional current limit is exceeded factory setting 5 s, range of change 1 to 600 s	The setting is available only when the additional current limit is enabled. The delay is the time the device waits before turning off the overcurrent when the additional current limit is exceeded.
Minimum limit overcurrent trip factory setting oFF, range of change 0,5 to "I¯¯" or "I2¯¯"	Example, this is the maximum current of an electric motor without load to limit its idling. See Figure 1 for more details.
Delayed shutdown when exceeding the minimum current limit factory setting 6 s, range of change 1–600 s	This is the time that the device will wait before switching off the load when the current drops below the minimum limit. Available when the minimum current limit is enabled.

Viewing of firmware version
Hold down "i" for 9 seconds. The version is displayed as a moving line. The manufacturer reserves the right to modify the firmware to improve the performance of the device.

Counter of operation cycles
To view, hold down "i" for 15 seconds. Required to estimate the number of power relay switchings and its demolition. It is not reset.

Temperature of the thermal protection sensor
To view the temperature, hold down "i" for 21 seconds. This function is useful, for example, for assessing the degree of heating inside the housing and preventing overheating in advance.

Factory reset
Hold the button "≡" for 30 seconds until the "dEF" message appears on the screen. When you release the button, the settings are reset and the device reboots.

POSSIBLE PROBLEMS, CAUSES AND WAYS TO OVERCOME THEM

At turning on neither the indicator nor the screen don't light up

Possible cause: there is no power supply voltage.
It is necessary to: ensure supply voltage presence.

Screen normal voltage level, 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 center.

The load switches off frequently

Possible causes: The upper (lower) limit value is too low (too high). Exceeding the set current limits or the selected power.

Required: 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 has exceeded 80 °C and the internal overheating protection has been activated. "oht" and the temperature of the thermal protection sensor flash 1 time/s on the screen.

Cause: internal overheating of the device.

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.

Internal overheating protection features: when the temperature inside the enclosure drops below 60 °C, the device will resume operation. If the protection is triggered more than 5 times per day, the relay will lock and the "oht" inscription will be displayed continuously. Eliminate the overheating problem and wait until the temperature inside the relay drops below 60 °C — the relay will indicate this by displaying a dot at the end of "oht." Then press any button on the relay to unlock it.

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.

The load is off, on the screen: "rEP Err"

Cause: the maximum number of consecutive trips for exceeding current, power or voltage limits has been exceeded.
It is necessary to: unlock the relay by pressing any button, then press "i" to find out the cause of the trip in the Log. Take measures to eliminate the problem, if possible. Please note that the relay has an automatic unlocking function 1 hour after the "rEP" trip, this measure will ensure partial operation of your equipment until the network problem is resolved.

SAFETY INSTRUCTIONS

Carefully read and become aware of 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, 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 ºC 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 ensures the safety of the product.

The device can be 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 something is not clear, call the Service center, the telephone number is listed below.

ZUBR MF2
version: d2.3.3G.36.1
RoHS Directive 2011/65/EU
Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU

Manufacturer and vendor: DS ELECTRONICS LTD
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