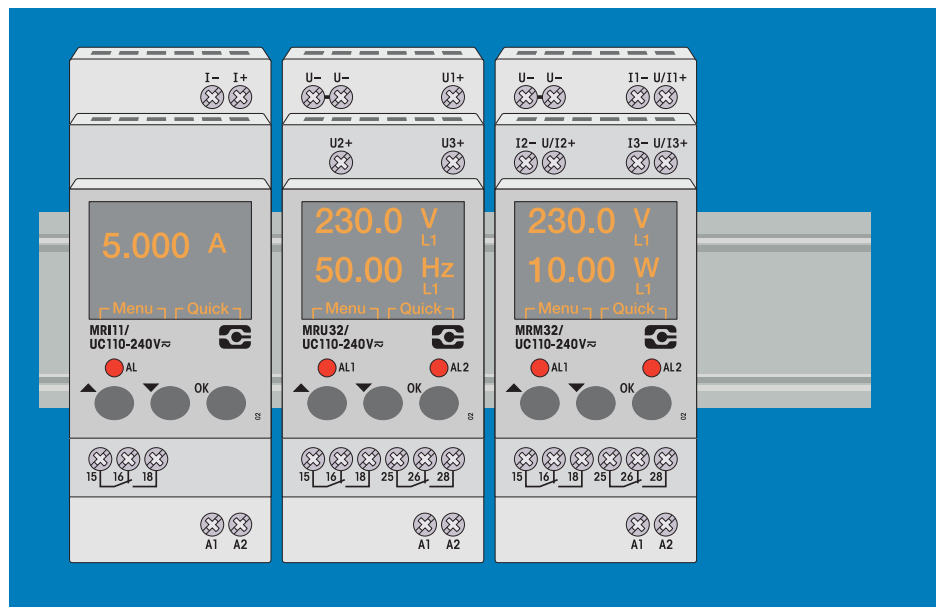
































Monitoring Relays MRx

- Voltage monitoring
- Current monitoring
- Multifunction monitoring
- 1- and 3-phase applications



Application	Types	Measurand	Monitoring range	Output contacts	Design
Voltage monitoring, AC/DC single phase	MRU11	 	0.1 ... AC 480 V / DC 690 V		
Voltage monitoring, AC/DC three phase	MRU32	  	0.1 ... AC 480 V / DC 690 V		
Current monitoring, AC/DC single phase	MRI11	 	0.1 ... 5 A		
Current monitoring, AC/DC three phase	MRI32	  	0.1 ... 5 A		
Multifunction monitoring, AC/DC single phase	MRM11	   	U, I, P, f, cos φ		
Multifunction monitoring, AC/DC three phase	MRM32	   	U, I, P, f, cos φ, Δφ		

MRU11

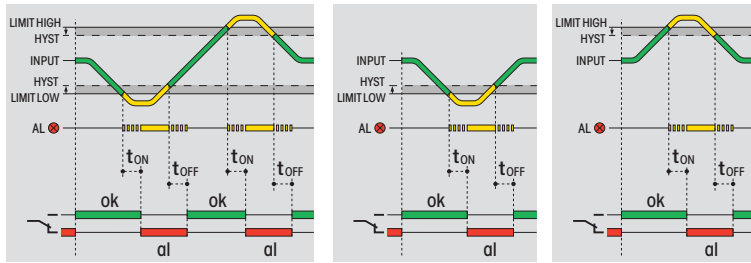
Voltage monitoring relay, AC/DC, single phase.
DIN Rail mounting according to DIN 43 880.



Type: MRU11/...V

Voltage monitoring relay with over- and under voltage thresholds up to 690 V.
 Alarm delay setting. Alarm LED. Display for voltmeter function, alarm signal and interactive parameter setting.
 1 change over alarm contact 6 A 250 V.

Monitoring functions



gn ok ye fail rd alarm Alarm delay: tOFF, tON

Measuring circuit data

Over/under voltage setting ranges AC/DC	0.1 ... 480 V / ±0.1 ... 690 V
Frequency	DC, AC 16 ... 100 Hz
Resolution	100 mV
Accuracy	1 % ±0.2 V
Input resistance	1 MΩ

Time data

Alarm delay setting time	0.5 ... 999.9 s
Reset time setting range	0.5 ... 999.9 s
Voltage failure buffering time	ca. 30 ms

Alarm contact data

Type / Material	1 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V

Power supply

	UC12-48V	UC110-240V
Nominal voltage AC/DC	12 ... 48 V	110 ... 240 V
Operating voltage range	10 ... 60 V	85 ... 250 V
AC frequency range	16 ... 63 Hz	16 ... 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation data

Test voltage open - contact	1 kVrms 1 minute
Test voltage measuring input - contact	4 kVrms 1 minute
Test voltage measuring input - power supply	4 kVrms 1 minute

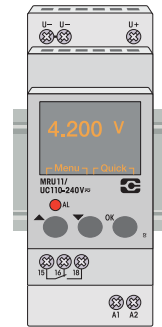
Complementary data

Ambient temperature storage / operation	-40 ... +85 °C / -40 ... +60 °C LCD: -20 ... 60 °C
Mechanical life time of contacts	30 x 10 ⁶ operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Ingress protection rating	IP20
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	107 g

Ordering information

AC/DC 12-48 V, 16...60 Hz
AC/DC 110-240 V, 16...60 Hz

MRU11/UC12-48V
MRU11/UC110-240V



Connection diagram

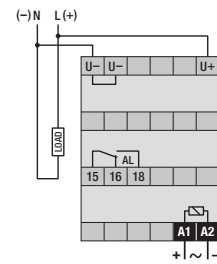


Fig. 1 AC voltage endurance

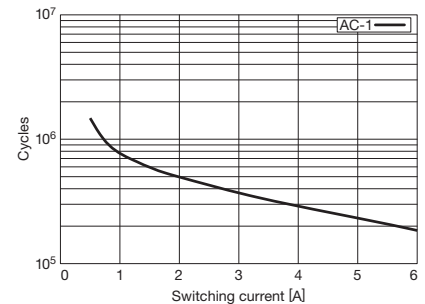
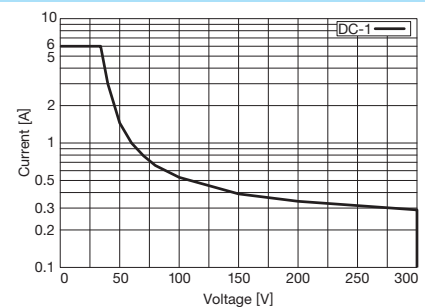
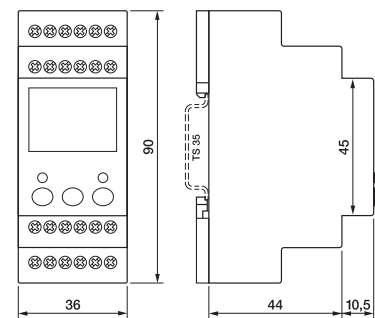


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities



3-phase monitoring

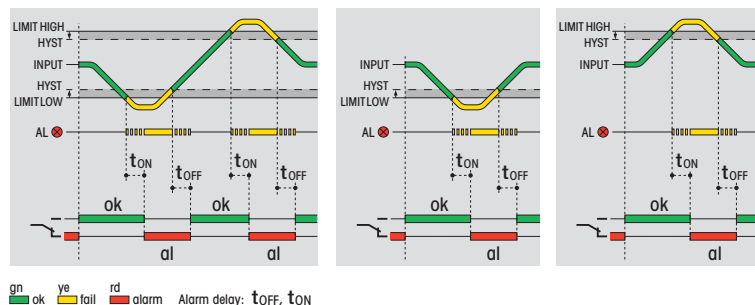
MRU32

Voltage monitoring relay, AC/DC, three phase.
DIN Rail mounting according to DIN 43 880.

Type: MRU32/...V

Voltage monitoring relay with over- and under voltage thresholds up to 690 V.
Alarm delay setting. Alarm LED. Display for voltmeter function, alarm signal and interactive parameter setting.
2 change over alarm contacts 6 A 250 V.

Monitoring functions



Measuring circuit data

Over/under voltage setting ranges AC/DC	0.1 ... 480 V / ± 0.1 ... 690 V
Frequency	DC, AC 16 ... 100 Hz
Resolution	100 mV
Accuracy	1 % ± 0.2 V
Input resistance	1 M Ω

Time data

Alarm delay setting time	0.5 ... 999.9 s
Reset time setting range	0.5 ... 999.9 s
Voltage failure buffering time	ca. 30 ms

Alarm contact data

Type / Material	2 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V

Power supply

	UC12-48V	UC110-240V
Nominal voltage AC/DC	12 ... 48 V	110 ... 240 V
Operating voltage range	10 ... 60 V	85 ... 250 V
AC frequency range	16 ... 63 Hz	16 ... 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation data

Test voltage open - contact	1 kVrms 1 minute
Test voltage contact - contact	2.5 kVrms 1 minute
Test voltage measuring input - contact	4 kVrms 1 minute
Test voltage measuring input - power supply	4 kVrms 1 minute

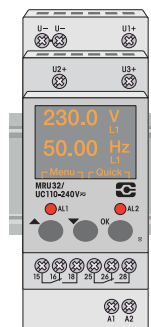
Complementary data

Ambient temperature storage / operation	-40 ... +85 °C / -40 ... +60 °C
	LCD: -20 ... 60 °C
Mechanical life time of contacts	30 x 10 ⁶ operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Ingress protection rating	IP20
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	125 g

Ordering information

AC/DC 12-48 V, 16...60 Hz
AC/DC 110-240 V, 16...60 Hz

MRU32/UC12-48V
MRU32/UC110-240V



Connection diagram

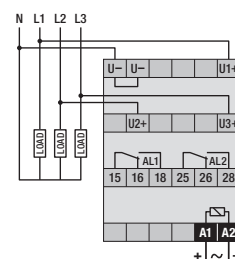


Fig. 1 AC voltage endurance

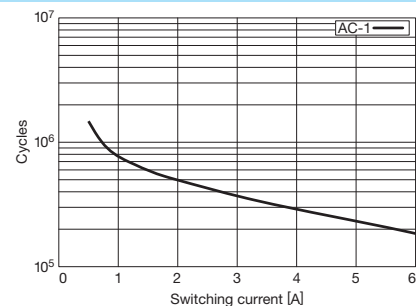
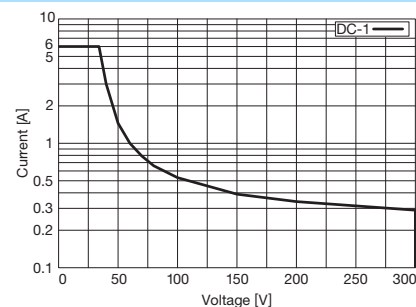
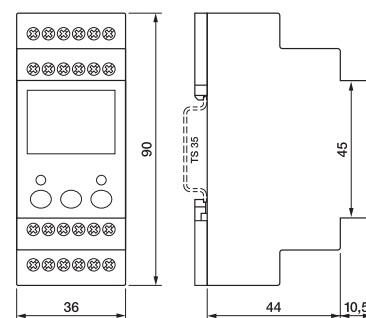


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities



MRI11

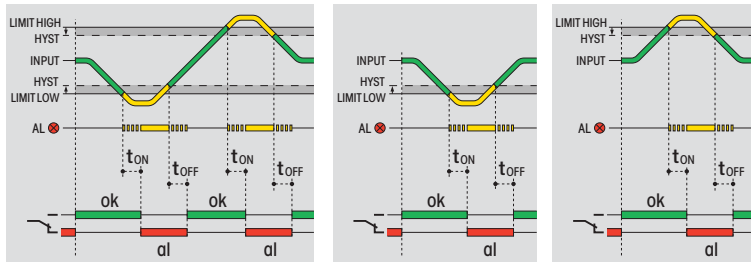
**Current monitoring relay, AC/DC, single phase.
DIN Rail mounting according to DIN 43 880.**



Type: MRI11/...V

Current monitoring relay with over- and under voltage thresholds up to 5 A.
Alarm delay setting. Alarm LED. Display for voltmeter function, alarm signal and interactive parameter setting.
1 change over alarm contact 6 A 250 V.

Monitoring functions



gn ok ye fail rd alarm Alarm delay: tOFF, tON

Measuring circuit data

Over/under current setting ranges AC/DC	0.1 ... 5 A
Frequency	DC, AC 16 ... 100 Hz
Resolution	100 mA
Accuracy	5 % ±0.1 A
Input resistance	5 mΩ

Time data

Alarm delay setting time	0.5 ... 999.9 s
Reset time setting range	0.5 ... 999.9 s
Voltage failure buffering time	ca. 30 ms

Alarm contact data

Type / Material	1 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V

Power supply

	UC12-48V	UC110-240V
Nominal voltage AC/DC	12 ... 48 V	110 ... 240 V
Operating voltage range	10 ... 60 V	85 ... 250 V
AC frequency range	16 ... 63 Hz	16 ... 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation data

Test voltage open - contact	1 kVrms 1 minute
Test voltage measuring input - contact	4 kVrms 1 minute
Test voltage measuring input - power supply	4 kVrms 1 minute

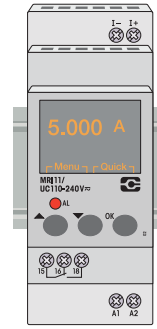
Complementary data

Ambient temperature storage / operation	-40 ... +85 °C / -40 ... +60 °C LCD: -20 ... 60 °C
Mechanical life time of contacts	30 x 10 ⁶ operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Ingress protection rating	IP20
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	107 g

Ordering information

UC 12-48 V (AC/DC), 16...60 Hz
UC 110-240 V (AC/DC), 16...60 Hz

MRI11/UC12-48V
MRI11/UC110-240V



Connection diagram

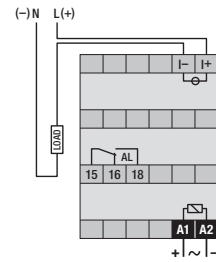


Fig. 1 AC voltage endurance

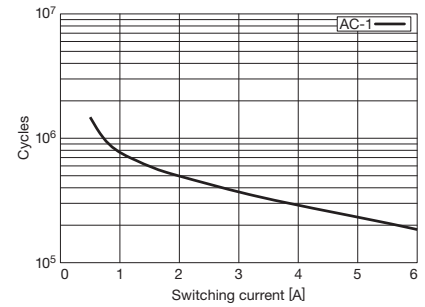
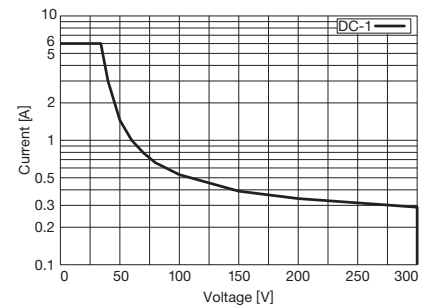
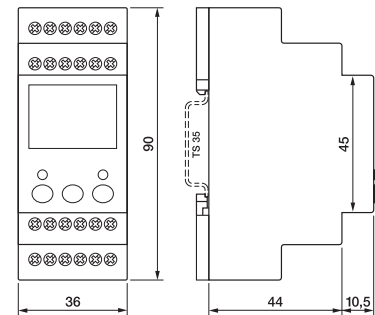


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities



3-phase monitoring

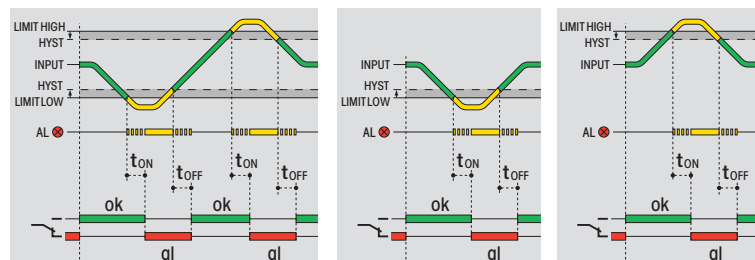
MRI32

**Current monitoring relay, AC/DC, three phase.
DIN Rail mounting according to DIN 43 880.**

Type: MRI32/...V

Current monitoring relay with over- and under voltage thresholds up to 5 A.
Alarm delay setting. Alarm LED. Display for voltmeter function, alarm signal and interactive parameter setting.
2 change over alarm contacts 6 A 250 V.

Monitoring functions



gn ok ye fail rd alarm Alarm delay: tOFF, tON

Measuring circuit data

Over/under current setting ranges AC/DC	0.1 ... 5 A
Frequency	DC, AC 16 ... 100 Hz
Resolution	100 mA
Accuracy	5 % ±0.1 A
Input resistance	5 mΩ

Time data

Alarm delay setting time	0.5 ... 999.9 s
Reset time setting range	0.5 ... 999.9 s
Voltage failure buffering time	ca. 30 ms

Alarm contact data

Type / Material	2 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V

Power supply

	UC 12-48V	UC 110-240V
Nominal voltage AC/DC	12 ... 48 V	110 ... 240 V
Operating voltage range	10 ... 60 V	85 ... 250 V
AC frequency range	16 ... 63 Hz	16 ... 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation data

Test voltage open - contact	1 kVrms 1 minute
Test voltage contact - contact	2.5 kVrms 1 minute
Test voltage measuring input - contact	4 kVrms 1 minute
Test voltage measuring input - power supply	4 kVrms 1 minute

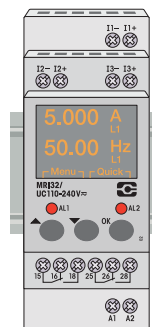
Complementary data

Ambient temperature storage / operation	-40 ... +85 °C / -40 ... +60 °C LCD: -20 ... 60 °C
Mechanical life time of contacts	30 x 10 ⁶ operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Ingress protection rating	IP20
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	125 g

Ordering information

UC 12-48 V (AC/DC), 16...60 Hz
UC 110-240 V (AC/DC), 16...60 Hz

MRI32/UC12-48V
MRI32/UC110-240V



Connection diagram

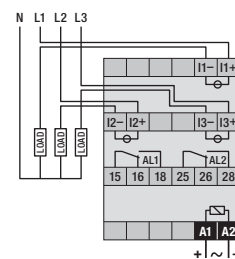


Fig. 1 AC voltage endurance

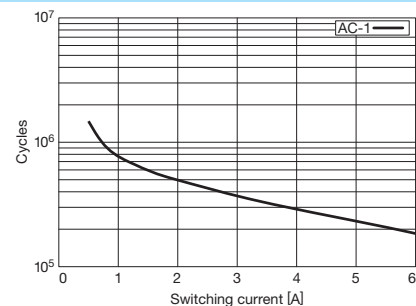
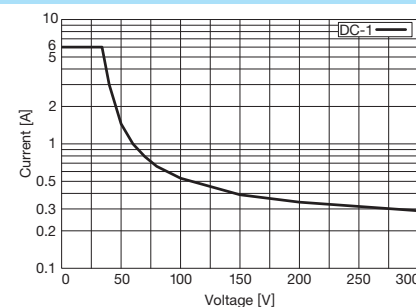
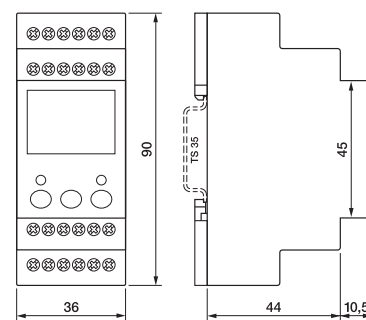


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities



MRM11

**Multifunction monitoring relay, AC/DC, single phase.
DIN Rail mounting according to DIN 43 880.**

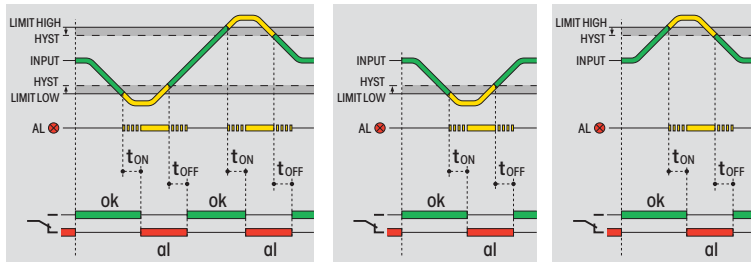


Type: MRM11/...V

Multifunction monitoring relay for simultaneous measurement of current and voltage and monitoring of **U, I, P, S, cosφ** and **f**. Alarm delay setting. Alarm LED. Display for voltmeter function, alarm signal and interactive parameter setting.

1 change over alarm contact 6 A 250 V.

Monitoring functions



gn ok ye fail rd alarm Alarm delay: tOFF, tON

Measuring circuit data

Voltage setting ranges AC/DC	0.1 ... 480 V / ±0.1 ... 690 V
Current setting ranges AC/DC	0.1 ... 5 A
Frequency	DC, AC 16 ... 100 Hz
Resolution U / I	100 mV / 100 mA
Accuracy	1 % ±0.2 V / 5 % ±0.1 A
Input resistance U / I	1 MΩ / 5 mΩ

Time data

Alarm delay setting time	0.5 ... 999.9 s
Reset time setting range	0.5 ... 999.9 s
Voltage failure buffering time	ca. 30 ms

Alarm contact data

Type / Material	1 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V

Power supply

	UC12-48V	UC110-240V
Nominal voltage AC/DC	12 ... 48 V	110 ... 240 V
Operating voltage range	10 ... 60 V	85 ... 250 V
AC frequency range	16 ... 63 Hz	16 ... 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation data

Test voltage open - contact	1 kVrms 1 minute
Test voltage measuring input - contact	4 kVrms 1 minute
Test voltage measuring input - power supply	4 kVrms 1 minute

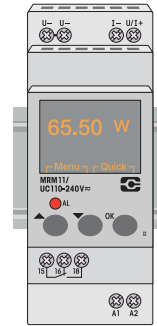
Complementary data

Ambient temperature storage / operation	-40 ... +85 °C / -40 ... +60 °C LCD: -20 ... 60 °C
Mechanical life time of contacts	30 x 10 ⁶ operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Ingress protection rating	IP20
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	107 g

Ordering information

UC 12-48 V (AC/DC), 16...60 Hz
UC 110-240 V (AC/DC), 16...60 Hz

MRM11/UC12-48V
MRM11/UC110-240V



Connection diagram

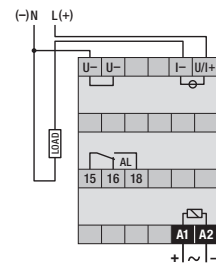


Fig. 1 AC voltage endurance

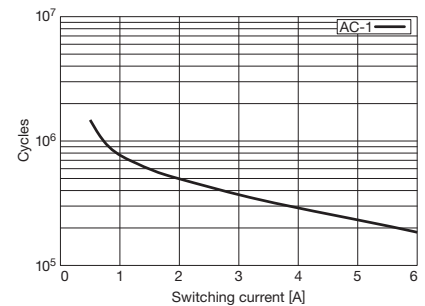
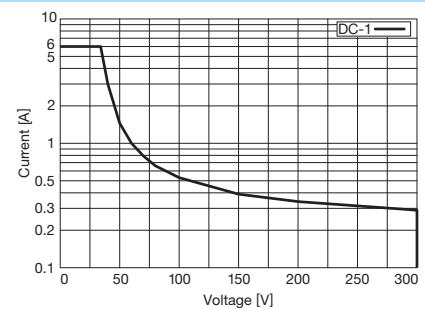
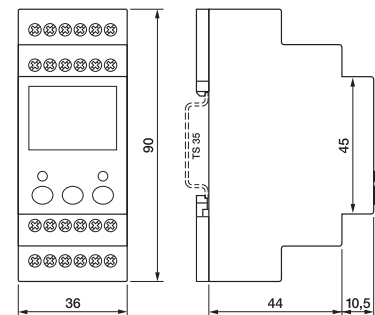


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities



MRM32

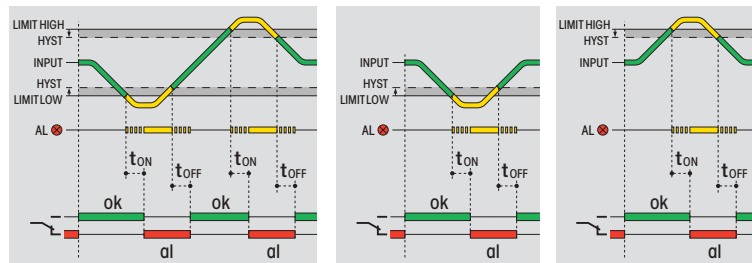
**Multifunction monitoring relay, AC/DC, three phase.
DIN Rail mounting according to DIN 43 880.**

Type: MRM32/...V

Multifunction monitoring relay for simultaneous measurement of current and voltage and monitoring of **U, I, P, S, cosφ, Δφ** and **f**. Alarm delay setting. Alarm LED. Display for voltmeter function, alarm signal and interactive parameter setting.

2 change over alarm contacts 6 A 250 V.

Monitoring functions



gn ok ye fail rd alarm Alarm delay: tOFF, tON

Measuring circuit data

Voltage setting ranges AC/DC	0.1 ... 480 V / ±0.1 ... 690 V
Current setting ranges AC/DC	0.1 ... 5 A
Frequency	DC, AC 16 ... 100 Hz
Resolution U / I	100 mV / 100 mA
Accuracy	1 % ±0.2 V / 5 % ±0.1 A
Input resistance U / I	1 MΩ / 5 mΩ

Time data

Alarm delay setting time	0.5 ... 999.9 s
Reset time setting range	0.5 ... 999.9 s
Voltage failure buffering time	ca. 30 ms

Alarm contact data

Type / Material	2 CO / AgNi 0.15
Rated operational current	6 A
Max. inrush current	15 A
Max. switching voltage	250 V
Max. AC load AC-1 (Fig.1)	1250 VA
Max. DC load DC-1, 24 V / 220 V (Fig.2)	120 W / 25 W
Recommended min. contact load	10 mA / 10 V

Power supply

	UC 12-48V	UC 110-240V
Nominal voltage AC/DC	12 ... 48 V	110 ... 240 V
Operating voltage range	10 ... 60 V	85 ... 250 V
AC frequency range	16 ... 63 Hz	16 ... 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation data

Test voltage open - contact	1 kVrms 1 minute
Test voltage contact - contact	2.5 kVrms 1 minute
Test voltage measuring input - contact	4 kVrms 1 minute
Test voltage measuring input - power supply	4 kVrms 1 minute

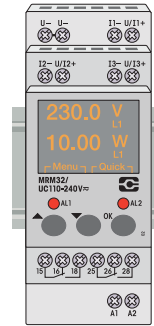
Complementary data

Ambient temperature storage / operation	-40 ... +85 °C / -40 ... +60 °C
	LCD: -20 ... 60 °C
Mechanical life time of contacts	30 x 10 ⁶ operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Ingress protection rating	IP20
Max. screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	125 g

Ordering information

UC 12-48 V (AC/DC), 16...60 Hz
UC 110-240 V (AC/DC), 16...60 Hz

MRM32/UC12-48V
MRM32/UC110-240V



Connection diagram

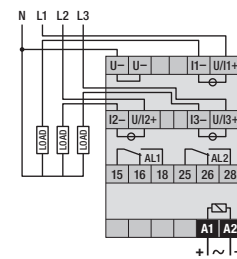


Fig. 1 AC voltage endurance

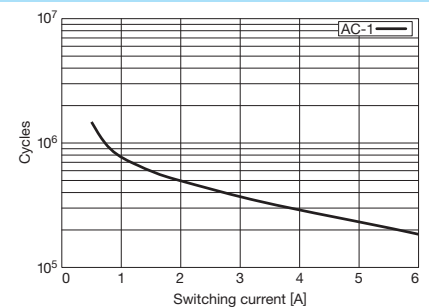
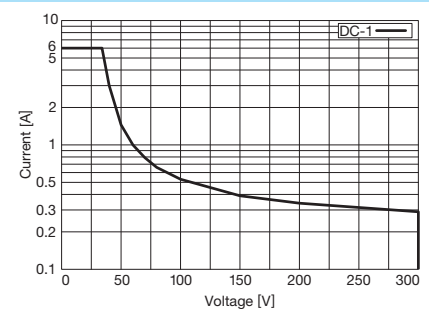
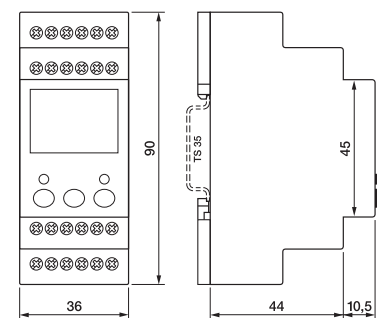


Fig. 2 DC load limit curve



Dimensions [mm]



Technical approvals, conformities





Kühn Controls AG

Notes:

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