

3.0 Monitoring & Measuring Devices

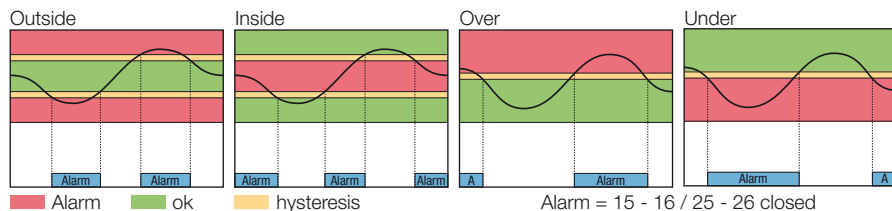


Notes

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3.1 Multifunction Monitoring

Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
MRM Series					
Multifunction monitoring AC / DC single phase	MRM11		U, I, P, f, cosφ	1 CO	35 mm
Multifunction monitoring AC / DC three phase	MRM32		U, I, P, f, cosφ	2 CO	35 mm

Monitoring function**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	AC 15 ... 150 Hz
Input resistance U / I	1 M Ω / 5 M Ω
Measured variables	U, I, f, P, S, cos ϕ

Time data

Voltage failure buffering	ca. 30 ms
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Alarm contacts

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
Alarm delay setting time	0.1 ... 999.9 s (factory adjustment = 0.0 s)
Reset time setting range	0.1 ... 999.9 s (factory adjustment = 0.0 s)

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	16 ... 63 Hz	16 ... 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation

Measuring input – Measuring input	1.5 kV 1 minute
Measuring input – Supply	2.0 kV 1 minute
Measuring input – Contact	2.0 kV 1 minute
Supply – Contact	2.0 kV 1 minute
Contact set – Contact set	1.5 kV 1 minute

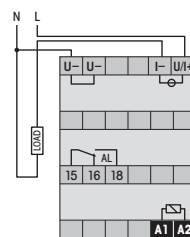
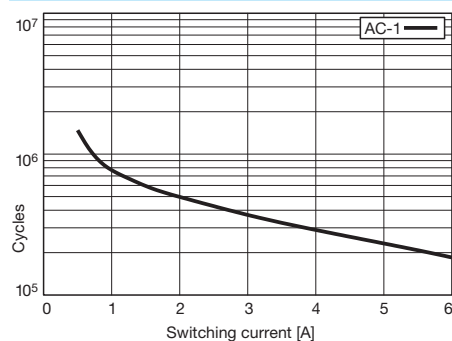
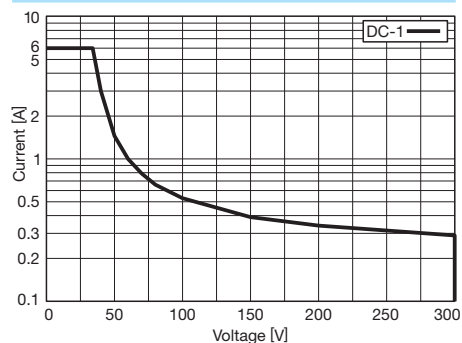
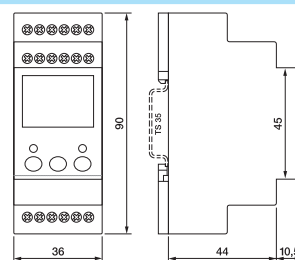
Specifications

Ambient temperature storage /operation	-40 ... +85 °C / -40 ... +60 °C (no ice) LCD: -20 ... +60 °C (no ice)
Mechanical life of contacts	30 x 1 000 000 operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Protection degree	IP20, (electronics: IP40)
Nominal screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	107 g

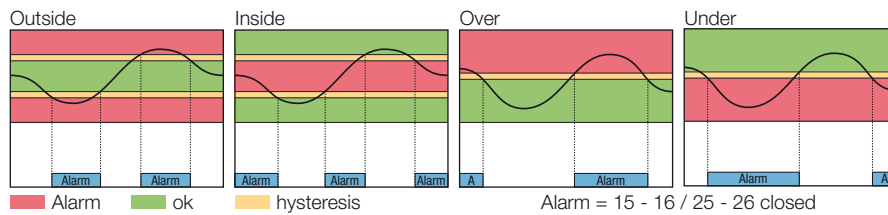
Product References

AC/DC 12-48 V, 15...60 Hz
AC/DC 110-240 V, 15...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**

IEC/EN 60730 IEC/EN 60947

Monitoring function**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	AC 15 ... 150 Hz
Input resistance U / I	1 M Ω / 5 M Ω
Measured variables	U, I, f, P, S, $\cos\phi$ und $\Delta\phi$ (phase sequence)

Time data

Voltage failure buffering	ca. 30 ms
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Contacts

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
Alarm delay setting time	0.1 ... 999.9 s (factory adjustment = 0.0 s)
Reset time setting range	0.1 ... 999.9 s (factory adjustment = 0.0 s)

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	16 ... 63 Hz	16 ... 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation

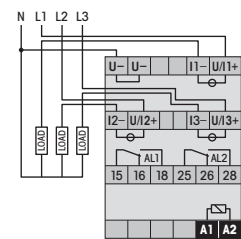
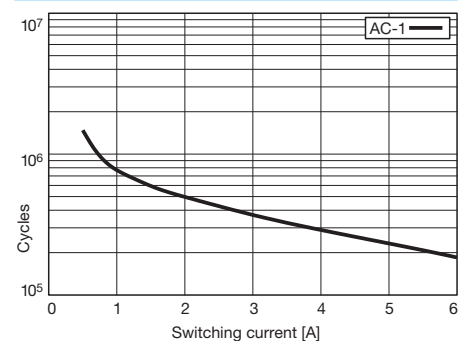
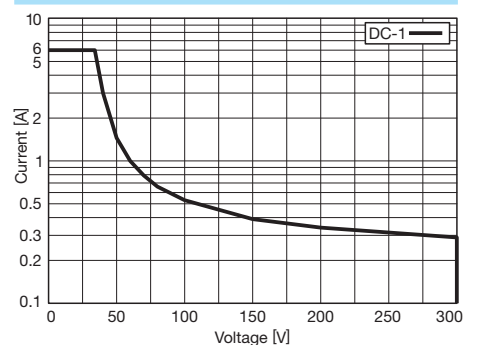
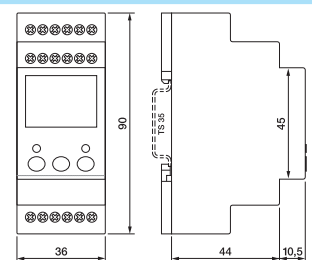
Measuring input – Measuring input	1.5 kV 1 minute
Measuring input – Supply	2.0 kV 1 minute
Measuring input – Contact	2.0 kV 1 minute
Supply – Contact	2.0 kV 1 minute
Contact set – Contact set	1.5 kV 1 minute

Specifications

Ambient temperature storage /operation	-40 ... +85 °C / -40 ... +60 °C 8no ice)
	LCD: -20 ... +60 °C (no ice)
Mechanical life of contacts	30 x 1'000'000 operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Protection degree	IP20, (electronics: IP40)
Nominal screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	125 g

Product References

AC/DC 12-48 V, 15...60 Hz	MRM32/UC12-48V
AC/DC 110-240 V, 15...60 Hz	MRM32/UC110-240V

**Connection diagram****Fig.1 AC voltage endurance****Fig. 2 DC load limit curve****Dimensions [mm]****Technical approvals, conformities**

IEC/EN 60730 IEC/EN 60947

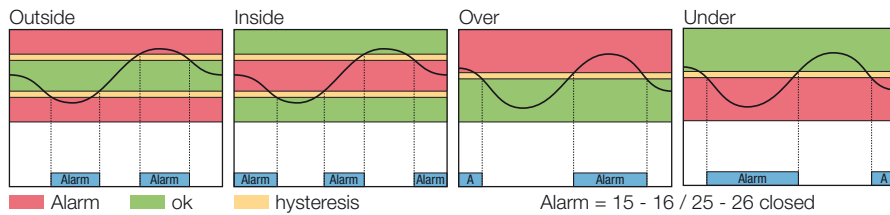
Notes

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3.2 Voltage Monitoring

Application	Types	Monitoring	Monitoring ratings	Output contacts	Design
MRU Series					
Voltage monitoring I AC / DC single phase	MRU11	 	0.1 ... 480 V AC / 690 V DC	1 CO	35 mm
Voltage monitoring I AC / DC three phase	MRU32	 	0.1 ... 480 V AC / 690 V DC	2 CO	35 mm

Monitoring function



Measuring circuit data

Voltage setting ranges AC / DC	0.1 ... 480 V / ± 0.1 ... 690 V
Frequency	AC 15 ... 150 Hz
Input resistance U / I	1 M Ω
Measured variables	U, f

Time data

Voltage failure buffering	ca. 30 ms
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Alarm contacts

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
Alarm delay setting time	0.1 ... 999.9 s (factory adjustment = 0.0 s)
Reset time setting range	0.1 ... 999.9 s (factory adjustment = 0.0 s)

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	16 ... 63 Hz	16 ... 63 Hz
Power consumption	1.6 W / 3.2 VA	1.5 W / 2.6 VA

Insulation

Measuring input – Measuring input	1.5 kV 1 minute
Measuring input – Supply	2.0 kV 1 minute
Measuring input – Contact	2.0 kV 1 minute
Supply – Contact	2.0 kV 1 minute
Contact set – Contact set	1.5 kV 1 minute

Specifications

Ambient temperature storage /operation	-40 ... +85 °C / -40 ... +60 °C (no ice) LCD: -20 ... +60 °C (no ice)
Mechanical life of contacts	30 x 1 000 000 operations
Conductor cross section	Stranded wire 2.5 mm ² , 2 x 1.5 mm ²
Protection degree	IP20, (electronics: IP40)
Nominal screw torque	0.4 Nm
Housing material	Lexan EXL 9330
Weight	107 g

Product References

AC/DC 12-48 V, 15...60 Hz
 AC/DC 110-240 V, 15...60 Hz

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



Connection diagram

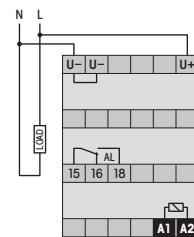


Fig.1 AC voltage endurance

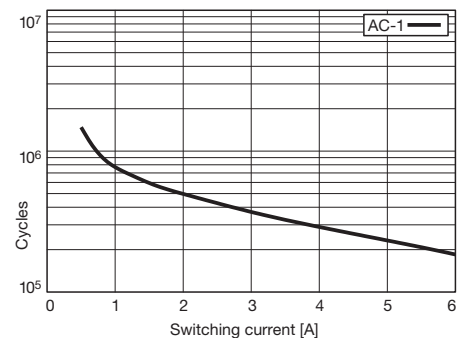
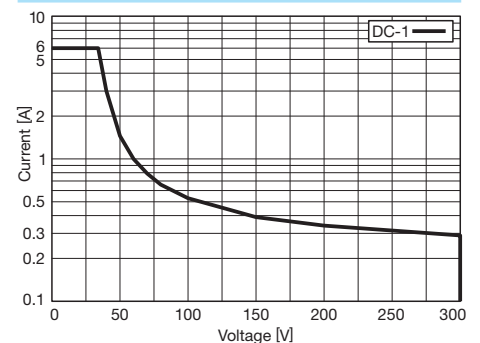
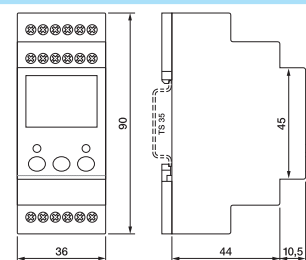


Fig. 2 DC load limit curve



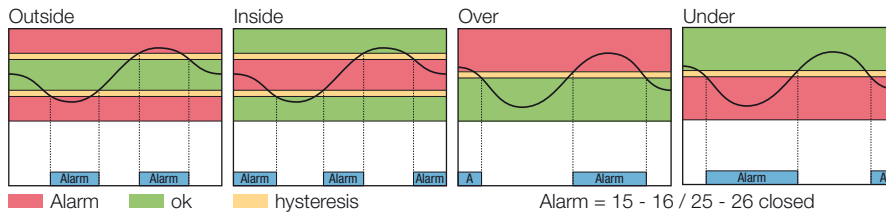
Dimensions [mm]



Technical approvals, conformities



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Monitoring function**Measuring circuit data**

Voltage setting ranges AC / DC	0.1 ... 480 V / ± 0.1 ... 690 V
Frequency	AC 15 ... 150 Hz
Input resistance U / I	1 M Ω
Measured variables	U, f, $\Delta\phi$ (phase sequence)

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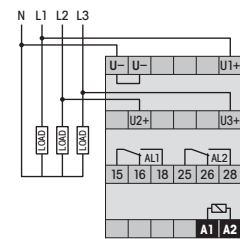
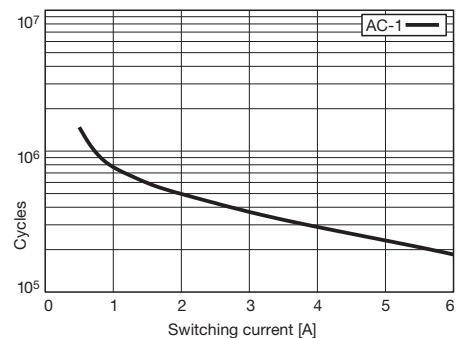
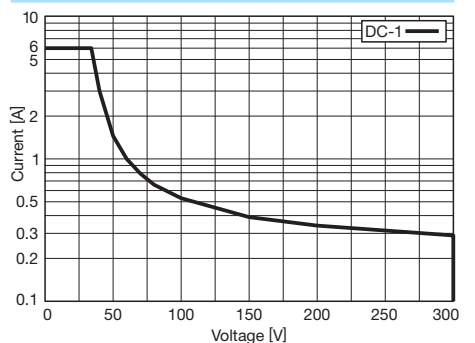
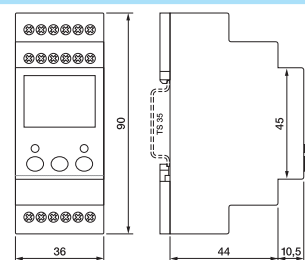
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