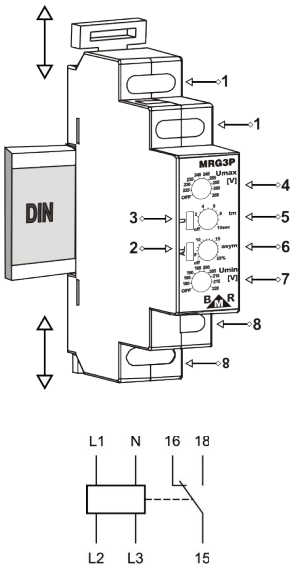
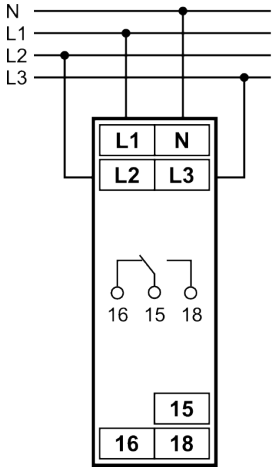
MRG3P

version 1.9

3-phase monitoring relay for asymmetry, phase sequence and voltage level control

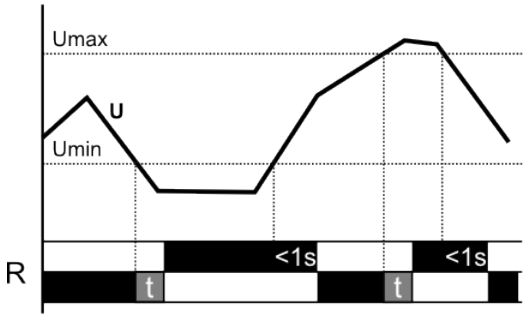
1. Device description

MRG3P is designed to control asymmetry, phase failure and phase sequence of all three phases L1, L2, L3. Relay is also controlling set minimum and maximum voltage level. Relay has one output double-throw contact 8 A.

Terminal description:	Terminal placement:	Connection diagram:
❶ Supply / controlled voltage ❷ Output indication ❸ Supply voltage indication ❹ **Umax** setting ❺ Time delay **T** setting ❻ Phase asymmetry setting. Position “0FF” disconnects asymmetry detection. ❼ **Umin** setting ❽ Outputs		

2. Functions

Monitoring of Umax / Umin voltage levels



If the voltage in any phase is out of the set level, red LED is Off and output relay is opened. If voltage in any of three phases goes over set **Umax** or below the set **Umin**, red LED starts blinking and output relay disconnects. Type of blinking defines the phase with failure. Time delay settings defines delay of failure detection. If failure is shorter than time delay, the output does not react on it.

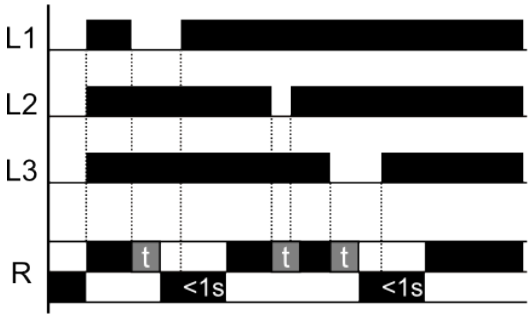
After failure disappears output relay turns back within less than 1 second (red LED turns Off).

There is fix hysteresis of 5% from measured value.

If **Umax** is set on OFF, relay controls only under voltage

If **Umin** is set on OFF, relay controls only over voltage

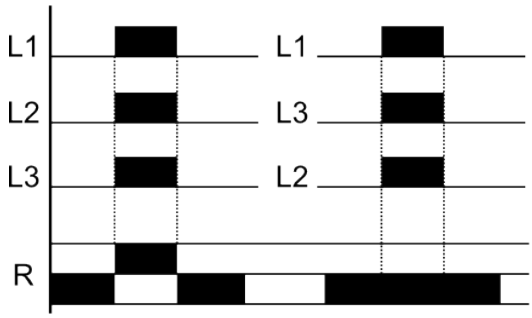
Monitoring of phase failure



If all three phases are available, red LED is Off and output relay is open. If any of phase is missing (voltage level under set **Umin**), then after set time delay output relay disconnects and red LED starts blinking. Type of blinking defines the phase with failure.

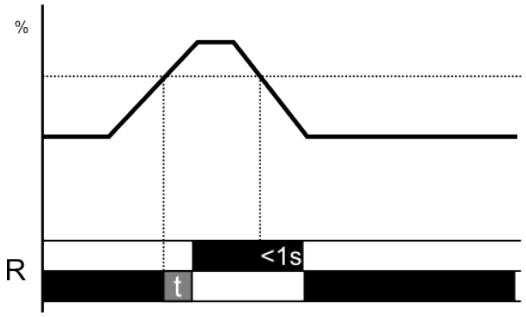
After failure disappears output relay turns back within less than 1 second (red LED turns Off).

Monitoring of phase sequence



If all three phases are in correct phase sequence, red LED is Off and output relay is closed. If phase sequence will change, red LED turns On and output relay disconnects.

Monitoring of asymmetry



If asymmetry of controlled phases is under the set level, red LED is Off and output relay is opened. If the set maximum level of asymmetry is exceeded, red LED turns On and output relay disconnects.

When asymmetry goes under the set level and after the set time **T** elapses, output relay closes again (red LED turns Off).

If asymmetry setting is set on OFF, asymmetry is not controlled.

3. Signalization

U – ON (green)	Presence of supply voltage.
U – OFF (green)	Supply voltage is not present.
AL – On (red)	Phase sequence failure. Contact No. 15 - 16 closed.
AL – flash (red)	Phase asymmetry failure. Contact No. 15 - 16 closed.
AL – flash 1x (red)	L1 failure or exceeded **Umin** / **Umax** level. Contact No. 15 - 16 closed.
AL – flash 2x (red)	L2 failure or exceeded **Umin** / **Umax** level. Contact No. 15 - 16 closed.
AL – flash 3x (red)	L3 failure or exceeded **Umin** / **Umax** level. Contact No. 15 - 16 closed.
AL – Off (red)	No failure. Contact No. 15 - 18 closed.

BMR *trading*
Horní lán 1200/17
779 00 Olomouc
Czech Republic

phone: +420 778 066 566
export@bmr-trading.com
www.bmr-trading.com

4. Technical features

Parameter	Value
Supply / controlled terminals	L1, L2, L3, N
Supply terminals	L, N
Supply / controlled voltage	3 x 400 / 230 V_{AC} (+10%,-15%)
System frequency	50 Hz (60 Hz on request)
Power consumption	max. 1.5 VA
Supply voltage indication	green LED
Failure indication	red LED
Umax range (phase voltage, N)	225 ... 265 V or Off
Umin range (phase voltage, N)	180 ... 220 V or Off
Hysteresis	fix 5%
Asymmetry (adjustable)	5 ... 20% or Off
Time delay T (adjustable)	1 ... 10 sec or Off (other times available on the request)
Output parameters	
Number and type of contacts	1x changeover contact
Rated operating voltage / current	250 V_{AC} / 8 A, 24 V_{DC} / 8 A
Maximum switched voltage	400 V_{AC} (5 A) / 150 V_{DC} (0.3 A)
Maximum switched power	2000 VA / 192 W
Trigger current	15 A
Mechanical lifetime	3 x 10^7 cycles
Electrical lifetime	1 x 10^5 cycles (250 V_{AC}, 8 A)
Others	
Working temperature	-20 ... +55 °C
Storage temperature	-40 ... +70 °C
Working position	arbitrary
Mounting	IEC 60715 (DIN 35)
Protection degree	IP 20
Electrical strength	4 kV
Conductor rigid and flexible	0.2 … 2.5 mm^2
Weight	78 g
Dimensions	90 x 18 x 65 mm
Standards	IEC 60255, IEC 61010, IEC 61000

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