

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

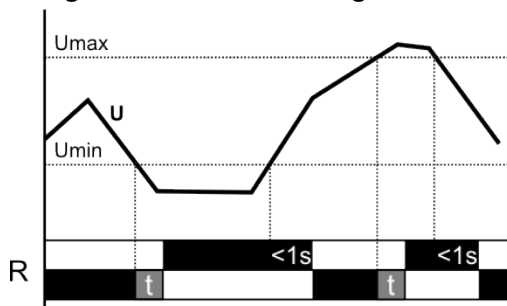
### 1. Device description

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:
<ol style="list-style-type: none"> <li>1 Supply / controlled voltage</li> <li>2 Output indication</li> <li>3 Supply voltage indication</li> <li>4 <math>U_{max}</math> setting</li> <li>5 Time delay T setting</li> <li>6 Phase asymmetry setting. Position "OFF" disconnects asymmetry detection.</li> <li>7 <math>U_{min}</math> setting</li> <li>8 Outputs</li> </ol>		

### 2. Function

#### Monitoring of $U_{max}$ / $U_{min}$ voltage levels



If the voltage in any phase is under the set level, red LED is Off and output relay is opened. If voltage in any of three phases goes over set  $U_{max}$  or below the set  $U_{min}$ , 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.

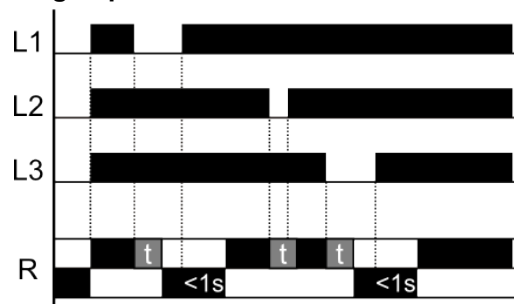
After failure disappears output relay turns back within less than 1 second (red LED turns Off).

There is fix hysteresis of 5% from measured value.

If  $U_{max}$  is set on OFF, relay controls only under voltage

If  $U_{min}$  is set on OFF, relay controls only over voltage

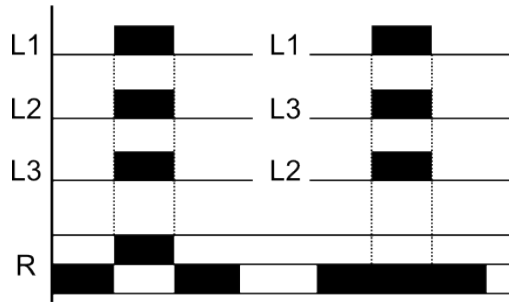
#### Monitoring of phase failure



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  $U_{min}$ ), then after set time delay output relay disconnects and red LED starts blinking. Type of blinking defines the phase with failure.

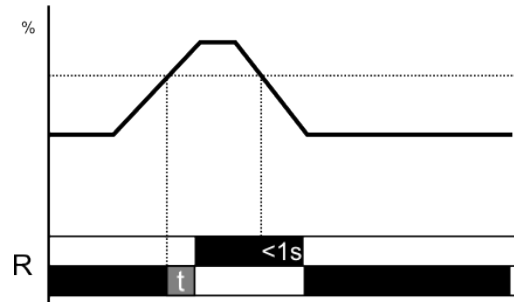
After failure disappears output relay turns back within less than 1 second (red LED turns Off).

### 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. LED signalization

<b>Green LED on</b>	Presence of supply voltage.
<b>Green LED off</b>	Supply voltage is not present.
<b>Red LED on</b>	Irregular phase sequence. Contact No. 15 - 16 closed.
<b>Red LED blinking</b>	Wrong phase asymmetry. Contact No. 15 - 16 closed.
<b>Red LED blinking 1x</b>	Phase 1 failure or exceeded <b>U<sub>min</sub></b> / <b>U<sub>max</sub></b> level. Contact No. 15 - 16 closed.
<b>Red LED blinking 2x</b>	Phase 2 failure or exceeded <b>U<sub>min</sub></b> / <b>U<sub>max</sub></b> level. Contact No. 15 - 16 closed.
<b>Red LED blinking 3x</b>	Phase 3 failure or exceeded <b>U<sub>min</sub></b> / <b>U<sub>max</sub></b> level. Contact No. 15 - 16 closed.
<b>Red LED off</b>	Error condition not detected. Contact No. 15 - 18 closed.

#### 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%)
Power consumption	max. 1,5 VA
Supply voltage indication	green LED
Failure indication	red LED
U <sub>max</sub> range (phase voltage, N)	225 ... 265 V or Off
U <sub>min</sub> 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
<b>Output parameters</b>	
Number and type of contacts	1 x changeover contact
Nominal current	8 A
Switching power	max. AC 2000 VA
Trigger current	30 A
Nominal voltage / max. switching voltage	250 VAC / 440 VAC
Mechanical lifetime	3 x 10 <sup>7</sup>
Electrical lifetime	1 x 10 <sup>5</sup> 250 VAC, 8 A
<b>Others</b>	
Working temperature	-20 ... +55 °C
Storage temperature	-40 ... +70 °C
Working position	any
Mounting	IEC 60715 (DIN 35)
Protection degree	IP 40 on panel / IP 20 terminals
Electrical strength	4 kV
Input wire diameter with/without cavern	max. 2x1,5mm <sup>2</sup> ; 1x2,5mm <sup>2</sup> / max. 2x1,5mm <sup>2</sup> ; 1x2,5mm <sup>2</sup>
Weight	78 g
Dimensions	90 x 18 x 65 mm
Standards	IEC 60255-6, IEC 6101