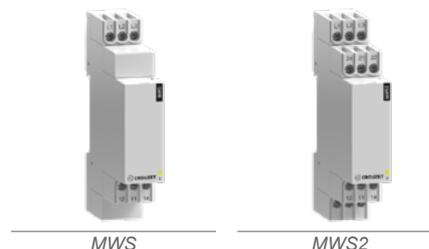


# › Monitoring Relays

## Phase Control Relays

### Phase sequence and Phase failure detection

- › Phase failure and Phase sequence detection on 3-phase networks
- › Wide measurement range from 183 → 528 V $\sim$
- › One or two changeover relays (MWS or MWS2)
- › True RMS measurement
- › LED status indication



Selection guide					
Type	Function	Measuring range	Output	Power Supply	Part-Numbers
MWS	Phase sequence / Phase failure detection	183 → 528 V $\sim$	1 x 8 A (changeover)	208 → 480 V $\sim$	<b>84873029</b>
MWS2	Phase sequence / Phase failure detection	183 → 484 V $\sim$	1 x 6 A (changeover)	208 → 440 V $\sim$	<b>84873021</b>

	MWS	MWS2
<b>Timing</b>		
Delay on threshold crossing (Tt)	N/A	
Repetition accuracy with constant parameters (according to IEC/EN 60255-1)	N/A	
Power ON delay	≤ 650 ms	
Reset time max	N/A	
Alarm on delay time max	130 ms	
Response time on appearance of a fault (Tr)		
<b>Supply</b>		
Voltage type for actuating	AC	
Rated control supply voltage Un at AC	3 x 208 → 3 x 480 V	3 x 208 → 3 x 440 V
AC supply voltage frequency 50/60HZ	± 10 %	
Voltage supply tolerance	-12 % / +10 %	
Operating range	183 → 528 V $\sim$	183 → 484 V $\sim$
Polarity with DC voltage	No	
Galvanic isolation of power supply/Input circuit	No	
Galvanic isolation of power supply/Output circuit	Yes	
Galvanic isolation of Input circuit/Output circuit	Yes	
Immunity from micro power cuts: typical	60 ms	
Maximum Power consumption at Un	10 VA @ 400 V $\sim$ , 50 Hz	14 VA @ 400 V $\sim$ , 50 Hz
<b>Insulation</b>		
Rated Insulation voltage (according to IEC/EN 60664-1)	400 V	
Insulation coordination (according to IEC/EN 60664-1)	Overvoltage category III; pollution degree 3	

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#### Description:

Crouzet's Monitoring Relays are essential for enhancing the safety and efficiency of electrical systems by providing continuous and precise monitoring. These relays help in detecting and alerting users to abnormalities such as overvoltage, undervoltage, phase failure, and phase sequence errors. The relays are designed to be compact and easy to use, making them suitable for an easy integration into various electrical panels without taking up excessive space.

For more information about **Monitoring Relays** please visit [www.crouzet.com](http://www.crouzet.com)

	MWG	MWS2
Insulation resistance supply and Output circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27)	> 500 M $\Omega$ (500 V $_{DC}$ )	
Insulation resistance Input circuit and Output circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27)	> 500 M $\Omega$ (500 V $_{DC}$ )	
Dielectric strength (according to IEC/EN 60664-1 and IEC/EN 60255-27)	2 kV / 1min / 1mA / 50Hz	
Impulse voltage (according to IEC/EN 60664-1 and IEC/EN 60255-27)	4 kV wave 1.2 / 50 $\mu$ s	
<b>Input and measuring specifications</b>		
Measurement range	183 $\rightarrow$ 528 V $\sim$	183 $\rightarrow$ 484 V $\sim$
Frequency of measured signal	50 $\rightarrow$ 60 Hz $\pm$ 10 %	
Guaranteed phase failure detection threshold	< 30 V $\sim$	
Asymmetry threshold hysteresis	N/A	
Asymmetry threshold adjustment	N/A	
Maximum regeneration (phase failure)	< 30 V $\sim$	
<b>Output specifications</b>		
Maximum switching power (resistive)	2000 VA	1500 VA
Maximum rate (at max switching power)	360 operations/hour at full load	
Maximum breaking current	<ul style="list-style-type: none"> <li>▪ 8 AAC 250 V<math>\sim</math> resistive</li> <li>▪ 5 ADC 30 V<math>_{DC}</math> resistive</li> </ul>	<ul style="list-style-type: none"> <li>▪ 6 AAC 250 V<math>\sim</math> resistive</li> <li>▪ 6 ADC 30 V<math>_{DC}</math> resistive</li> </ul>
Minimum breaking current	10 mA / 5 V $_{DC}$	
Operating categories (according to IEC/EN 60947-5-1 and IEC/EN 60947-5-2)	AC 12, AC 13, AC 14, AC 15, DC 12, DC 13, DC 14	
Nominal rating	8 A	6 A
Voltage breaking capacity (according to IEC/EN 60255-1)	<ul style="list-style-type: none"> <li>▪ 250 V<math>\sim</math> / 8 AAC resistive</li> <li>▪ 300 V<math>_{DC}</math> / 0.2 A resistive</li> </ul>	<ul style="list-style-type: none"> <li>▪ 300 V<math>\sim</math> / 5 AAC resistive</li> <li>▪ 250 V<math>_{DC}</math> / 0.2 A resistive</li> </ul>
Electrical life (operations)	5 x 10 <sup>4</sup>	3 x 10 <sup>4</sup>
Mechanical life (operations)	1 x 10 <sup>7</sup>	
1 or 2 changeover relays, AgNi (cadmium-free)	1 C/O	2 C/O
<b>Functions</b>		
Phase Failure detection	True	
Phase sequence detection	True	
Asymmetry	False	
Overvoltage between phases monitoring	False	
Undervoltage between phases monitoring	False	
Under/overvoltage with independent settings	False	
Undervoltage	False	
Overvoltage	False	
Loss of neutral	False	
<b>General characteristics</b>		
Temperature limits use ( $^{\circ}$ C) (according to IEC/EN 60068-2)	-20 $\rightarrow$ +50	
Temperature limits stored ( $^{\circ}$ C) (according to IEC/EN 60068-2)	-40 $\rightarrow$ +70	
MTBF in hours (according to IEC/TR 62380)	1598784.3	1747968.577
MTTF (according to IEC/TR 62380)	180 years	190 years
Led status indicator	<ul style="list-style-type: none"> <li>▪ R: Yellow LED (relay status ON)</li> <li>▪ R: OFF LED (phase sequence or total phase failure fault)</li> </ul>	
Creepage distance and clearance (according to IEC/EN 60664-1)	<ul style="list-style-type: none"> <li>▪ 4 kV / 9.4 mm</li> <li>▪ Pollution degree 3</li> </ul>	
IP degree of protection Terminal block (according to IEC/EN 60529)	IP20	
IP degree of protection Housing (according to IEC/EN 60529)	IP30	

	MWG	MWS2
IP degree of protection Front face (according to IEC/EN 60529)	IP50	
Vibration resistance (according to IEC/EN 60255-21-1)	<ul style="list-style-type: none"> <li>▪ 20 m/s<sup>2</sup></li> <li>▪ 10 Hz → 150 Hz</li> </ul>	
Relative humidity no condensation (according to IEC/EN 60068-2-30)	2 x 24 hr cycle 95 % RH max. without condensation 55 °C	
Electromagnetic compatibility - Immunity to electrostatic discharges (according to IEC/EN 61000-4-2)	Level III (Air 8 kV / Contact 6 kV)	
Immunity to radiated, radio-frequency, electromagnetic field (according to IEC/EN 61000-4-3)	<ul style="list-style-type: none"> <li>▪ Level I (1 V/m: 2.0 GHz →2.7 GHz)</li> <li>▪ Level II (3 V/m: 1.4 GHz →2.0 GHz)</li> <li>▪ Level III (10 V/m: 80 MHz →1 GHz)</li> </ul>	
Immunity to rapid transient bursts (according to IEC/EN 61000-4-4)	Level III (direct 2 kV / Capacitive coupling clamp 1 kV)	
Immunity to shock waves on power supply (according to IEC/EN 61000-4-5)	Level III (2 kV / common mode 2 kV / residual current mode 1kV)	
Immunity to radio frequency in common mode (according to IEC/EN 61000-4-6)	Level III (10V rms: 0.15 → 80 MHz)	
Immunity to voltage dips and breaks (according to IEC/EN 61000-4-11)	<ul style="list-style-type: none"> <li>▪ 0 % residual voltage, 1 cycle</li> <li>▪ 70 % residual voltage, 25/30 cycles</li> </ul>	
Mains-borne and radiated emissions (according to EN55032 (CISPR22), EN55011 (CISPR11))	Class B	
Fixing: Symmetrical DIN rail (according to IEC/EN 60715)	35 mm	
Mounting position	All positions	
Drop to concrete floor (according to IEC/EN IEC 60068-2-31)	High: 1m	
Rigid connecting capacity without ferrule	<ul style="list-style-type: none"> <li>▪ 1 x 4<sup>2</sup> - 2 x 2.5<sup>2</sup> mm<sup>2</sup></li> <li>▪ 1 x AWG11 - 2 x AWG14</li> </ul>	
Flexible connecting capacity with ferrule	<ul style="list-style-type: none"> <li>▪ 1 x 2.5<sup>2</sup> - 2 x 1.5<sup>2</sup> mm<sup>2</sup></li> <li>▪ 1 x AWG14 - 2 x AWG16</li> </ul>	
Tightening torque (according to IEC 60947-1)	0.5...0.6 N.m	
Housing material (according to IEC/EN 60695-2-11)	<ul style="list-style-type: none"> <li>▪ Self-extinguishing</li> <li>▪ Incandescent wire test</li> </ul>	
Shock and bump tests (according to IEC/EN 60255-21-2)	15 g - 11 ms	
Short interruption on power line (according to IEC/EN 61000-4-11)	0% residual voltage, 250/300 cycles	
Delivery: open terminals	True	
Type of electric connection	Screw connection	

#### Outline Dimensions

Depth (mm)	69
Height (mm)	90
Weight (g)	80
Width (mm) according to DIN 43880	17.5

#### International Directives & Conformity Certification

RoHS 2015/863/UE	Yes
REACH regulation N°1907/2006/CE	Yes
UK REACH regulation 2023 N°722	Yes
LVD 2014/35/UE	Yes
Directive 2012/19/EU	Yes
European Directive 2005/20/CE	Yes
ISO 14001: 2015	Yes
Certification CE	Yes
Certification UL	Yes
Certification UKCA	Yes
Certification CCC	Yes

**Operating principles**

**MWS-MWS2: Phase controller**

The relay monitors its own supply voltage.

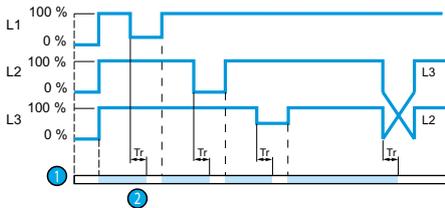
The relay controls:

- Correct sequencing of the three phases,
- Total failure of one of the three phases.

When the phase sequence and voltages are correct ( $> 183 V\sim$ ), the output relay(s) are closed and the yellow LED is lit.

In the event of a phase sequence or total phase failure fault (detected when one of the voltages drops below  $30 V\sim$ ), the relay opens instantly and its LED is extinguished.

When the unit is powered up with a measured fault, the relay stays open.

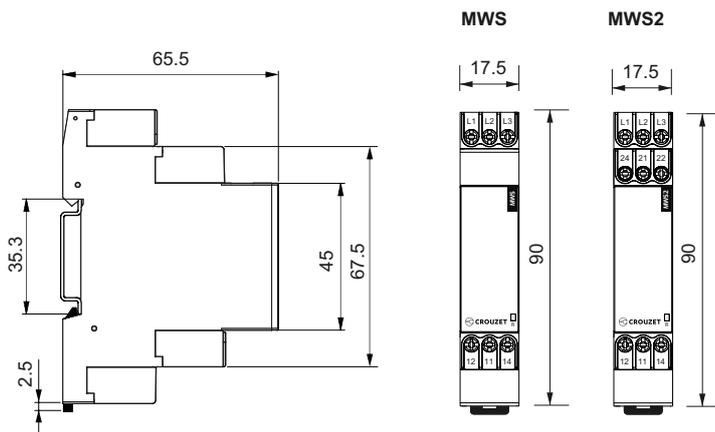


- 1 MWS: Relay R / MWS2: Relay R1/R2
- 2 Response time on appearance of a fault ( $T_r$ )

**Product Dimensions**

**Front and Side**

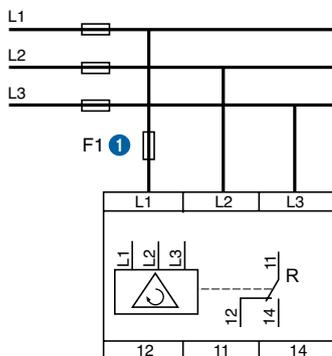
**MWS-MW2S**



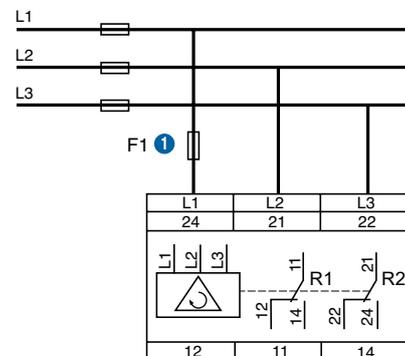
**Electronic & Wiring Diagrams**

**Connections**

**MWS**



**MW2S**



- 1 100 mA fast-blow fuse

**Warning:**

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