› Monitoring Relays
Phase Control Relays
Phase sequence & failure detection, Asymmetry & Voltage detection

- Control of 3-phase networks: phase sequence and phase failure detection, asymmetry, detection of under and overvoltage with independent settings
- Controls its own supply voltage
- True RMS measurement
- LED status indication

HWUA

Selection guide					
Type	**Function**	**Measuring range**	**Output**	**Power Supply**	**Part-Numbers**
HWUA	Phase sequence / Phase failure detection / Asymmetry	194 → 528 V~	1 x 8 A (changeover)	220 → 480 V~	**84873026**

	HWUA
Timing	
Delay on threshold crossing (Tt)	0.1 → 10 s (0, +10 %)
Repetition accuracy with constant parameters (according to IEC/EN 60255-1)	± 3 %
Power ON delay	≤ 650 ms
Reset time max	1500 ms
Alarm on delay time max Response time on appearance of a fault (Tr)	200 ms
Supply	
Voltage type for actuating	AC
Rated control supply voltage Un at AC	3 x 220 → 3 x 480 V
AC supply voltage frequency 50/60HZ	± 10 %
Voltage supply tolerance	-12 % / 10 %
Operating range	194 → 528 V~
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	20 ms
Maximum Power consumption at Un	14 VA @ 400 V~, 50 Hz
Insulation	
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
Insulation resistance supply and Output circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27)	> 500 MΩ (500 V⎓)

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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**

	HWUA
Insulation resistance Input circuit and Output circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27)	> 500 MΩ (500 V⎓)
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 µs
Input and measuring specifications	
Measurement range	194 → 528 V∿
Display accuracy (according to IEC/EN 60255-1)	± 3 % of the displayed value
Measuring error with drift temperature	0.05 %/°C
Measuring error with drift voltage	< 1 % across the whole range
Repetition accuracy with constant parameters (according to IEC/EN 60255-1)	± 0.5 %
Voltage threshold adjustment	▪ 2 → 20 % of selected Un ▪ (+2 → +10 % across the 3 x 480 V∿ range) ▪ (-12 → -2 % across the 3 x 220 V∿ range)
Frequency of measured signal	50 → 60 Hz ± 10 %
Max. measuring cycle time	140 ms / True RMS measurement
Voltage threshold hysteresis	Under or overvoltage, asymmetry: 2 % of the Un value of the selected network
Selection of phase-phase nominal voltage Un	220-380-400-415-440-480 V∿
Guaranteed phase failure detection threshold	N/A
Asymmetry threshold hysteresis	Asymmetry: 2 % of the Un value of the selected network
Asymmetry threshold adjustment	5 →15 % of selected Un
Maximum regeneration (phase failure)	N/A
Output specifications	
Maximum switching power (resistive)	2000 VA
Maximum rate (at max switching power)	360 operations/hour at full load
Maximum breaking current	▪ 8 AAC 250 V∿ resistive ▪ 8 ADC 30 V⎓ resistive
Minimum breaking current	10 mA / 5 V⎓
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
Voltage breaking capacity (according to IEC/EN 60255-1)	▪ 250 V∿ / 8 AAC resistive ▪ 300 V⎓ / 0.2 A resistive
Electrical life (operations)	3 x 10^4
Mechanical life (operations)	1 x 10^7
1 or 2 changeover relays, AgNi (cadmium-free)	1 C/O
Functions	
Phase Failure detection	True
Phase sequence detection	True
Asymmetry	True
Overvoltage between phases monitoring	False
Undervoltage between phases monitoring	False
Under/overvoltage with independent settings	True
Undervoltage	False
Overvoltage	False
Loss of neutral	False

	HWUA
General characteristics	
Temperature limits use (°C) (according to IEC/EN 60068-2)	-20 → +50
Temperature limits stored (°C) (according to IEC/EN 60068-2)	-40 → +70
MTBF in hours (according to IEC/TR 62380)	1754545.27
MTTF (according to IEC/TR 62380)	200 years
Led status indicator	▪ Un: Green LED (power on) ▪ Extinguished in the event of phase failure ▪ R: Yellow LED (relay status ON) ▪ Flashes during the threshold crossing delay ▪ Def.: Yellow LED ▪ Lights up in the event of asymmetry ▪ Flashes in the event of under or overvoltage ▪ ALL LEDs blink when changing the measurement range.
Creepage distance and clearance (according to IEC/EN 60664-1)	▪ 4 kV / 9.4 mm ▪ Pollution degree 3
IP degree of protection Terminal block (according to IEC/EN 60529)	IP20
IP degree of protection Housing (according to IEC/EN 60529)	IP30
IP degree of protection Front face (according to IEC/EN 60529)	IP50
Vibration resistance (according to IEC/EN 60255-21-1)	▪ 20 m/s² ▪ 10 Hz →150 Hz
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)	▪ Level I (1 V/m: 2.0 GHz →2.7 GHz) ▪ Level II (3 V/m: 1.4 GHz →2.0 GHz) ▪ Level III (10 V/m: 80 MHz →1 GHz)
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 1 kV)
Immunity to radio frequency in common mode (according to IEC/EN 61000-4-6)	Level III (10V rms: 0.15 MHz → 80 MHz)
Immunity to voltage dips and breaks (according to IEC/EN 61000-4-11)	▪ 0 % residual voltage, 1 cycle ▪ 70 % residual voltage, 25/30 cycles
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	▪ 1 x 4² - 2 x 2.5² mm² ▪ 1 x AWG11 - 2 x AWG14
Flexible connecting capacity with ferrule	▪ 1 x 2.5² - 2 x 1.5² mm² ▪ 1 x AWG14 - 2 x AWG16
Tightening torque (according to IEC 60947-1)	0.5…0.6N.m
Housing material (according to IEC/EN 60695-2-11)	▪ Self-extinguishing ▪ Incandescent wire test
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)	64.8
Height (mm)	90
Weight (g)	130
Width (mm) according to DIN 43880	35

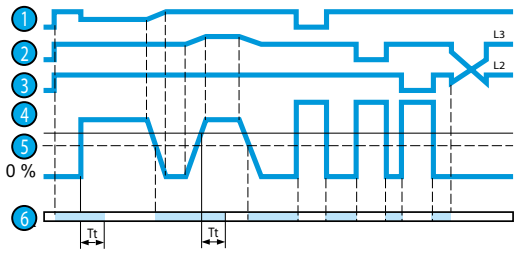
	HWUA
International Directives & Conformity Certification	
RoHS 2015/863/UE	Yes
REACh regulation N°1907/2006/CE	Yes
UK REACh regulation 2023 N°722	Yes
LVD 2014/35/UE	Yes
Directive 2012/19/EU	Yes
European Directive 2005/20/CE	Yes
ISO 14001: 2015	Yes
Certification CE	Yes
Certification UL	Yes
Certification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

Principles

The HWUA 3-phase network control relay monitors:

- The correct sequence of phases L1, L2, L3
- Total phase failure - Undervoltage and overvoltage from 2 → 20 % of Un
- Asymmetry rate from 5 → 15 % of Un
- Faults are signalled via LEDs, distinguishing the origin of the fault.

If a fault persists for longer than the threshold crossing delay configured by the user, both output relays open and LED R is extinguished



1. Overvoltage
2. Hysteresis
3. Undervoltage
4. Phases L1, L2, L3
5. Relay
6. Delay on threshold crossing (Tt)

Operating principles

HWUA: Phase + Asymmetry + Under/Overvoltage controller

Voltage selector switch:

Set the selector switch to the 3-phase network voltage Un.

The position of this selector switch is only taken into account when the unit is powered up.

If the switch position changes while the unit is operating, all the LEDs flash but the product continues to work normally with the voltage selected on energisation prior to the change of position.

The LEDs return to their normal state if the switch is reset to its initial position defined before the last energisation.

The relay monitors its own supply voltage.

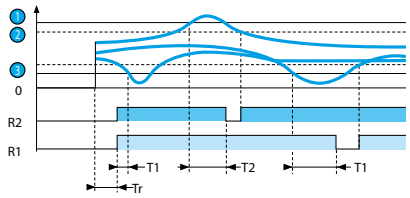
The relay controls:

- Correct sequencing of the three phases,
- Failure of one of the three phases (U measured < 0.7 x Un),
- Asymmetry, adjustable from 5 → 15 % of Un,
- Undervoltage adjustable from - 2 → - 20 % of Un, (-2 → -12 % for the 220 V range) and overvoltage adjustable from +2 → +20 % (+2 → +10 % over the 3 x 480 V range due to the maximum voltage 528 V~).

In the event of a phase sequence or failure fault, the relay opens instantaneously.

In the event of an asymmetry or voltage fault, the relay opens at the end of the time delay set by the user.

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

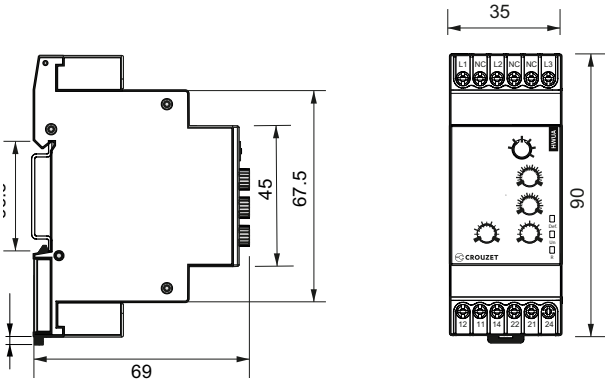


1 Phase L1
2 Phase L2
3 Phase L3

Product Dimensions

Front and Side

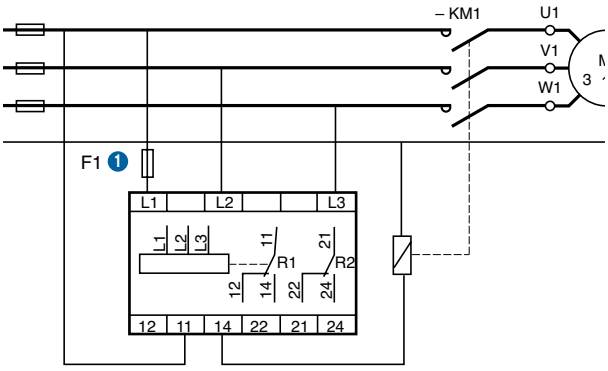
HWUA



Electronic & Wiring Diagrams

Connections

HWUA



1 100 mA fast-blow fuse