

# UNDERVOLTAGE- RELAIS

- **Application in DC circuits**
- **No auxiliary voltage required**
- **Continuously adjustable hysteresis and delay time**



## Operation

The measuring relay RUGH-M is designed for DC networks to switch in the case of undervoltage with an user-adjustable time delay (0.1-3 s, 1-10 s or 2-30 s). No auxiliary supply voltage is required.

Normal operating conditions are indicated by the green LED on the front panel and contacts 4-6 and 10-12 are closed. In case of undervoltage the red LED lights up and the delay time circuit gets started. If the undervoltage condition still persists at the end of the delay time the output relay trips and contacts 2-4 and 8-10 are closed. In case of total DC voltage fail the relay switches immediately.

Returning to normal conditions a hysteresis of 2-20% (adjustable) is taken into account to change the output relay and LED state.

The RUGH-M relay is enclosed in a plastic case (flame retardant, self extinguishing), which fits into a special 14 pin plug-in socket. The socket (type U or K) provides 14 screw terminals 2 x 4 mm<sup>2</sup>. A 35 mm DIN rail adapter is available for socket K.

## Specifications

(other values on request)

Rated Voltage  $U_N$  ..... : 12, 24, 48, 60, 110, 220 V DC

Delay Time Setting Range  $t_v$  : 0.1-3 s, 1-10 s, 2-30 s or  
without delay ( $\leq 50$  ms)

please specify **rated voltage** and **delay time** on order

Setting Range ..... : 60% to 100% of rated voltage  
continuously adjustable  
except 12 V DC: 70% to 100%

Disengaging Ratio Range ..... : 2% to 20% of voltage setting value  
(Hysteresis) continuously adjustable

Power consumption ..... :  $\leq 2.5$  W

Overload (continuous) ..... : 140% of rated voltage

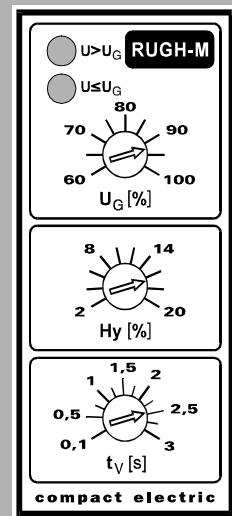
Operating temperature ..... : -20 - +50 °C

Storage temperature ..... : -40 - +85 °C

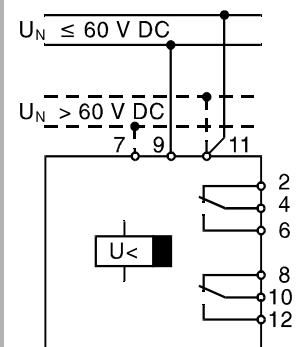
Temperature coefficient ..... : 0.01% / °C

Recovery time after total  
power fail ..... :  $\leq 0.3$  s

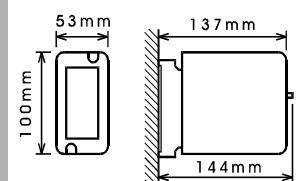
# RUGH-M



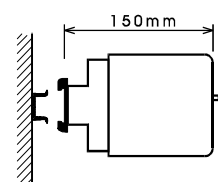
front view



wiring diagram



Socket Type U



Socket Type K

dimensions

# UNDERVOLTAGE- RELAY

# RUGH-M

## Output Relay (2 changeover contacts)

Rated / Max. switching voltage : 250 V / 440 V AC  
Rated / Max. switching current : 8 A (UL: 10 A) / 14 A AC  
Rated switching power ..... : 2000 VA (cos  $\varphi$  = 1)  
Make-break capacity ..... : 250 V / 8 A AC (cos  $\varphi$  = 1)  
220 V / 0.6 A AC (cos  $\varphi$  = 0.8) ( $1.3 \cdot 10^6$  operating cycles)  
300 V / 0.2 A DC  
40 V / 8 A DC  
Mechanical endurance ..... :  $20 \cdot 10^6$  operating cycles  
Contact material ..... : Ag Cd O

Safety Standard: EN60255-6 10.95

## Insulation

test voltage ..... : IEC 255-5: 2,5 kV<sub>RMS</sub> 50 Hz 1min  
impulse test ..... : IEC 255-5: 5 kV 1.2/50  $\mu$ s

Mechanical resistance ..... : IEC 255-21-1 class 1  
IEC 255-21-2 class 1  
IEC 255-21-3

Operating position ..... : any position

## Electromagnetic compatibility

Immunity:

EN 50082-2 (Industry) 2.95

IEC 255-22-1 1 MHz disturbance test class III (2.5 kV)

IEC 255-22-2 (IEC 801-2) electrostatic discharge immunity test class III (8 kV)

IEC 801-3 high frequency disturbance test / 10 V/m

IEC 225-22-4 (IEC 801-4) burst class III, 2 kV 5/50 ns 5 kHz 15 ms

Emission:

EN 50081-1 (radiated RF) 3.92

## Maximum EMC interference (rated voltage applied)

Set point ..... :  $\leq 3 \%$

Delay time ..... :  $\leq 10 \%$

Protection degree ..... : IP40

Case material ..... : Polycarbonat

Flame retardance ..... : UL 94 V-0, self-extinguishing

Weight ..... : 0.3 kg

## Installation instructions

- 1) To ensure specified EMC features keep a minimum distance of 1.5 cm to other equipments or metallic parts.
- 2) Lock the case on the socket by the two clamping devices (metal spring clips with two notches). To lock the case push down the spring clips with a screwdriver positioned in the notches near the outside of the case. To unlock the case push down the spring clips using the notches near the inside of the case.

Specifications are subject to change without.



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