GANZ KK

ELECTRONIC DEVICES

TYPES OF ELECTRONIC DEVICES

GLE 5
Electronic Staircase Lighting Timer

GI 24...230 V AC/DC
Multifunctional timer

U1NC
Single-phase Voltage Monitoring Relay

UAS-0
Three-phase Voltage Monitoring Relay in fourwire systems

UASNC
Three-phase Voltage Monitoring Relay

UASNCt
Three-phase Voltage Monitoring Relay with delay

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ELECTRONIC STAIRCASE LIGHTING TIMER GLE 5

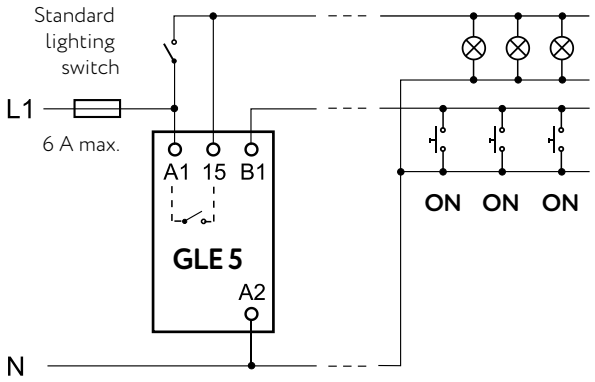
The GLE 5 device is destined supply voltage to the lighting circuits on pushing the „ON" buttons mounted at each floor and to turn the lighting off automatically following the adjusted delay time.

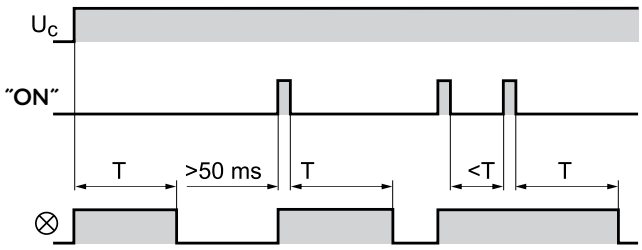
Powering the lighting circuit causes a built-in relay to be activated without the „ON" button having to be pushed. This relay drops out elapsing of the „T" time adjusted on a scale. The whole cycle is repeated whenever the „ON" button is pushed.

Pushing in the button while the „T" time is running causes the preset time delay and restarted. Getting the „ON" button stuck in the pushed position causes no harm whatsoever to the device for reasons of the relay being just permanently energized.

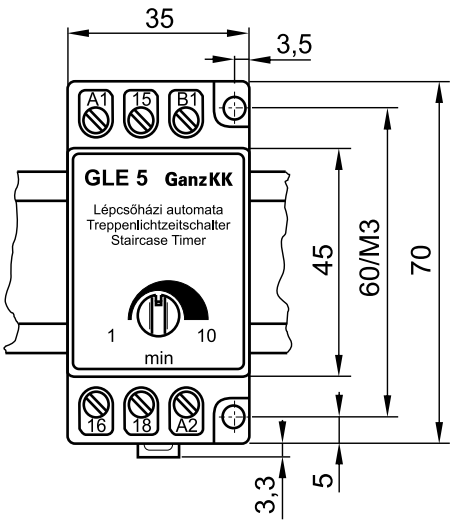
One automatic staircase lighting switch is capable of activating altogether 10 pushbuttons with glow tubes and/or any number of pushbuttons without them. Permanent staircase lighting can be obtained by closing a switch connected across the terminals A1-15.

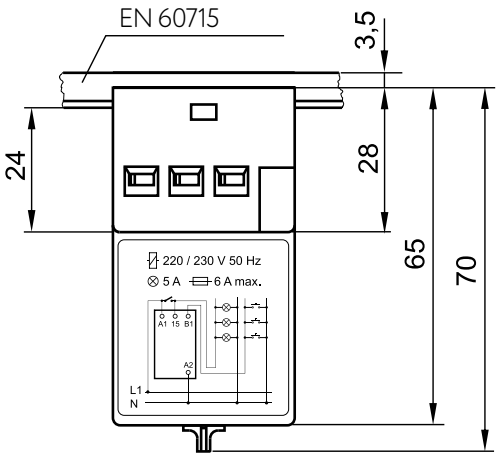
Using consumers with a rating in excess of that specified for the relay requires an auxiliary switch to be interconnected.





Dimensions





ELECTRONIC STAIRCASE LIGHTING TIMER GLE 5

Technical data

Rated control circuit voltage (U_c)		230 V+10 %, -15 %, 50 Hz
Power consumption		5 VA max.
Range of delay time		1 ... 10 min ±20%
Repetition accuracy at rated voltage		±1 %
Ambient temperature range		-5 ... +40 °C
Rated insulation voltage		250 V 50 Hz
Test voltage		1,5 kV 50 Hz
Degree of protection		IP 20
Mounting position		any
Built-in relay	type	1 make
	rated operational voltage	230 V 50 Hz
	rated thermal current	16 A
	switching power (with 40 or 60 W bulbs)	1200 W
	rated operating current (230 V, AC-15)	2 A
	electric endurance	100 000 c
Dimensions		35 x 70 x 70 mm
Mounting		2 pcs M3 screws or on a 35 mm rail
Type of electric connection		screw-clamp
Cross-section of connectable wires		0,75 ... 1,5 mm^2
Mass		about 0,3 kg
Relevant standard		EN 60669

MULTIFUNCTIONAL TIMER GI

The GI type muntifunctional timers are interchangeable with following types: GIM, GIF, GIK, GIL, GIB. The control voltage may be 230 VAC or 24...230 V AC/DC as the type-sign contains values of the control voltage:

- **GI 230 V AC** or
- **GI 24 ... 230 V AC/DC**

The function characteristic (operation mode) is changeable in any time, the timer operates always by characteristic existing at the moment of the start:

M - delay in making (GIM)

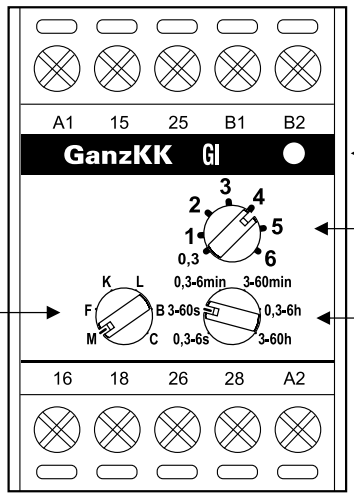
F - delay in breaking (GIF)

K - delay in switch-off (GIK)

L - stepping (GIL)

B - flickering starting by make of relay (GIB)

C - flickering starting by broken relay



Indicating of make position of built-in relay

The delay times and time ranges are changeable during the operation (timing) too, the timer makes or breaks always at the last adjusted value.

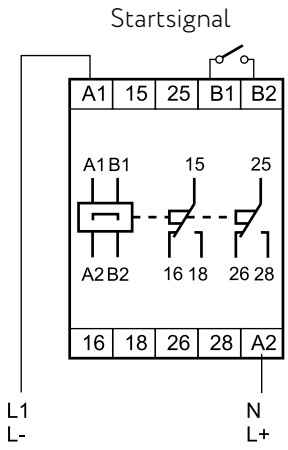
Operation

The indication of the connecting terminals is according to the method used in Europe:

- phase conductor of the network or its negative wire is connected to A1;
- neutral conductor of the network or its positive wire is connected to A2;
- starting is operated on connecting terminals B1, B2;
- the output contacts of the relay are connected to 16, 15, 18, and 26, 25, 28.

A2 and B2 connecting terminals are connected within the device, therefore it is practical to connect the neutral wire to A2, so that phase voltage would not appear on B2 as well.

The prevailing rectified rated control supply voltage appears on the connecting terminal B1, that is why the starting contact has to be capable to switch the U_c voltage safely, and must have at least U_c insulation voltage.



Rated control voltage

The flowing current on starting contact is roughly 0,3 mA.

Starting can be made in two ways:

Starting by contacts: make short B1 and B2 contacts at least 0,1 s after connecting the control voltage. Time needed to restart after the timing is min. 20 ms.

Power starting: having made B1 and B2 short, connect the control voltage. This metod can be used with characteristics GIM, GIF and GIB only. 50 ms is added to the delay time. Time needed to restart after the timing is min. 100 ms.

If the voltage fails more than 100 ms, the timers will set to their basic condition, and will operate as power-started timers when the voltage is back (at the made starting contacts).

If the voltage fails for less than 50 ms, the timing will be continued after the voltage is back.

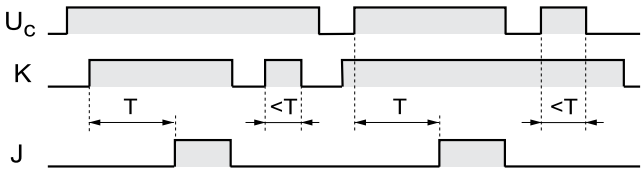
Connecting

Connect with one or two 1,5 ... 2,5 mm^2 solid or flexible wire(s) to the screw clamps.

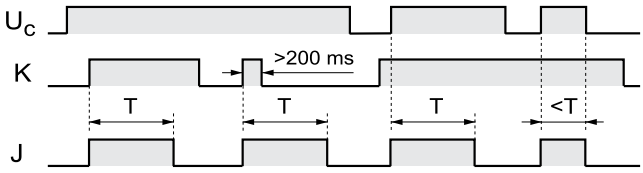
MULTIFUNCTIONAL TIMER GI

Characteristics

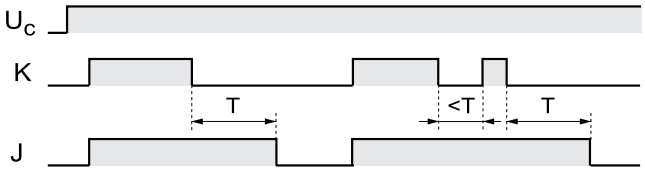
M - delay in making (GIM)



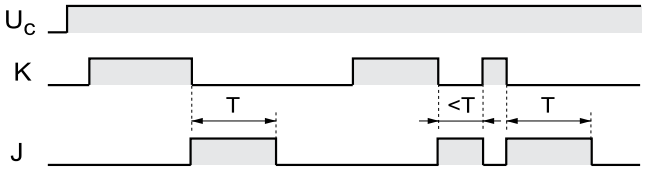
F - delay in breaking (GIF)



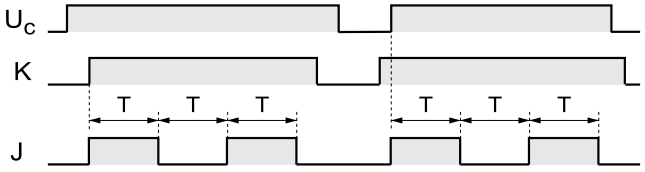
K - delay in switch-off (GIK)



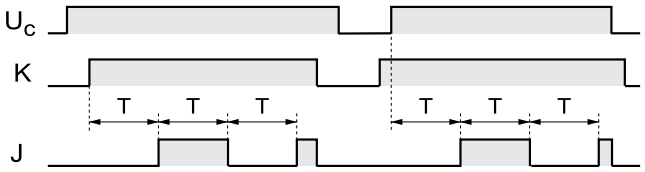
L - stepping (GIL)



B - flickering, starting by make of relay (GIB)



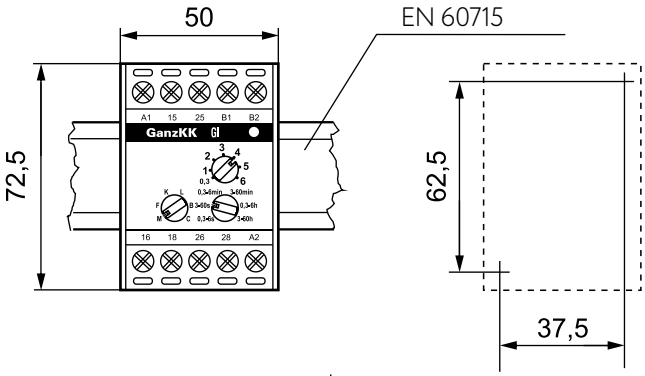
C - flickering, starting by broken relay

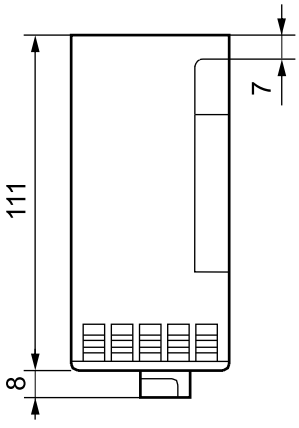


Technical data

Rated control voltage (U_c)	GI 230 V AC	230 V AC
	GI 24...230 V AC/DC	24...230 V AC/DC
Allowed tolerance of U_c		-15...+10 %
Repeting accuracy at U_c		± 25 ms; ±1 %
Temperature error		0,2% / °C
Voltage error		0,1% / %ΔU_c
Scale error		±5 %
Time needed to restart		min. 100 ms
Ambient temperature		-5 °C ... +50 °C
Power consumption		max. 3 W or 4 VA
Rated insulation voltage		250 V, 50 Hz
Degree of protection		IP 20
Mass		about 0,3 kg
Relay contact	system	2 change-over
	thermal current	8 A
	operational current	2 A (230 V, AC-15)
	electrical endurance	$2x10^5$ c
	mechanical endurance	$5x10^6$ c
Relevant standard		EN 61812-1

Dimensions





Mounting

- to 35 mm EN 60715 rail
- with two M4 screws

VOLTAGE MONITORING RELAY U1NC

The U1NC single-phase voltage relay is designed to sensing of increase or decrease of 230 V AC network voltage.

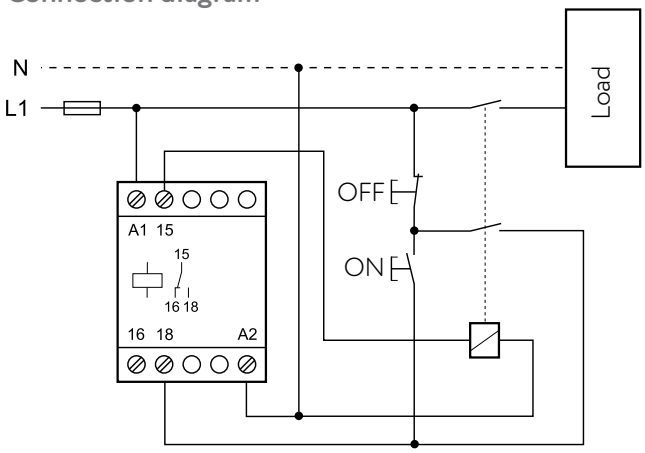
Application, functions

In case of normal (failureless) network the built-in relay is made position indicated by illumination of a green LED on the front plate.

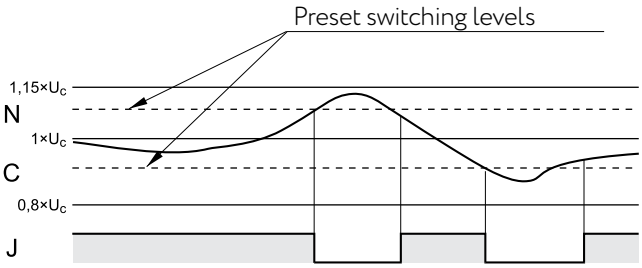
If the controlled network voltage fails under the permitted value set by knob (4) or exceeds the value set by knob, the built-in relay breaks and the LEDs besides the knobs indicate the cause of failure. In order to eliminate malfunction by voltage transients, the operation of the relay is delayed. Delay time is 0,1 ...2 s depending on the extent of voltage deviation.

Approx. 2 % hysteresis is between switch-off value and value of switch-on back.

Connection diagram



Operating diagram



N - voltage increase

C - voltage decrease

J - output contacts

Connecting

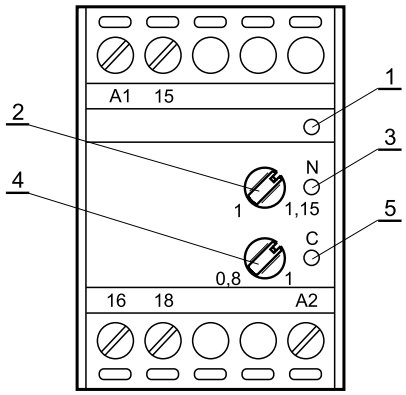
Connect with one or two 1,5 ... 2,5 mm^2 solid or flexible wire(s) to the screw clamps.

VOLTAGE MONITORING RELAY U1NC

Techical data

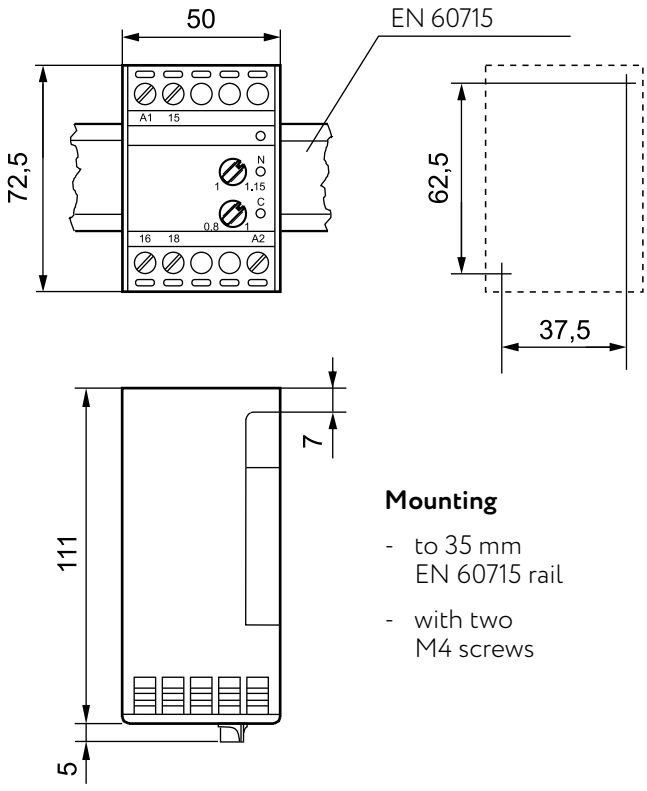
Rated insulation voltage			400 V AC
Rated control voltage (U_c)			230 V AC
Range of operational voltage			80 V AC ... 290 V AC
Voltage increase at break			(1 x U_c) -3 % ... (1,15 x U_c) +3 %
Voltage decrease at break			(1 x U_c) +3 % ... (0,8 x U_c) -3 %
Ambient temperature range			-5 ... +50 °C
Test voltage			2500 V
Degree of protection			IP 20
Relay contact	system		1 change over
	thermal current		8 A
	operational current	400 V, AC-15	0,6 A
		230 V, AC-15	1 A
	electrical endurance		10^4 c
Relevant standard			EN 61010

Frontplate



1 - green LED indicating made position of relay
2 - knob to set the voltage increase at break
3 - red LED indicating failure of voltage increase
4 - knob to set the voltage decrease at break
5 - red LED indicating failure voltage decrease

Dimensions



Mounting

- to 35 mm EN 60715 rail
- with two M4 screws

VOLTAGE MONITORING RELAY U...

The U type three-phase voltage monitors are suitable for complex protection of three-phase loads (mainly motors) against phase-asymmetry and faulty phase-sequence of line voltages as well as symmetrical increase or decrease of line voltage. Their operation does not require neutral conductor. The operating value can be set by turn-knob. The breaking occurs with delay, for this reason the monitor relay does not sensitive to voltage transients.

In the type-mark of voltage monitor the letter U is followed by the letter-combination referring to the kind of protection:

A - phase asymmetry

S - phase sequence

N - line voltage increase

C - line voltage decrease

15 combinations of the four kind of protection are available:

UA	UAS	UASN	UASNC
US	UAN	UASC	
UN	UAC	UANC	
UC	USN	USNC	
	USC		
	UNC		

The delay time is not adjustable at above mentioned versions. The delay time of breaking is adjustable by turn-knob in case of types: UAt, UASt and UASNCt.

Application

Protection against line voltage decrease does not protect against phase-failure. This task can be performed by phase asymmetry protection.

If the U relay performs phase sequence protection, care must be taken when connecting phase wires so that the green LED is on at right phase sequence. In case of altering the phase sequence the output contact immediately opens. If the phase sequence is wrong when the relay turned on, the output contact does not make.

Asymmetry means the maximum difference of the line voltages related to the highest line voltage, expressed in percent.

Operation

In case of normal supply voltage the output contact is made, the green LED illuminates only on the front plate.

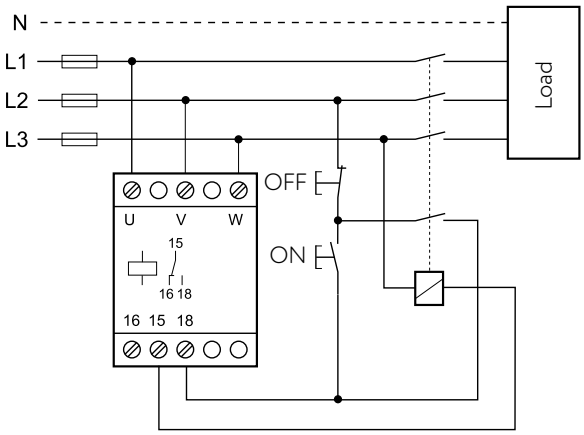
In case of **types** at which the **delay time does not adjustable**, the value of delay is between 0,1 s and 5 s. If the deviation is big (phase-failure) then the breaking occurs more quickly.

One-one red LED corresponds to four protection modes. If case of occurence of one or more failure, the adequate red LED begins to flash, the flash the green LED stops and the built-in relay breaks.

In case of **types** at which the **delay time is adjustable**:

- if one failures occurs then the adequate red LED is flickering inside the delay time,
- if the failure breaks inside the delay time then the failureless situation will be re-established,
- if the failure does not break inside the adjusted delay time, then the flickering of the adequate red LED changes to continuous red light, the built-in relay breaks and the illumination of two-coloured LED changes from green to red light.

Connection diagram



Connecting

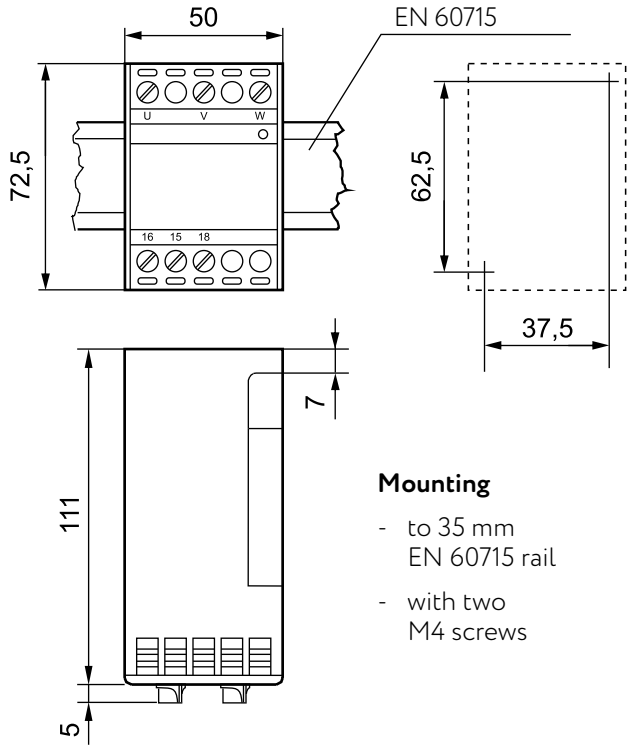
Connect with one or two 1,5...2,5 mm^2 solid or flexible wire(s) to the screw-clamps.

VOLTAGE MONITORING RELAY U...

Technical data

Rated insulation voltage			400 V AC
Rated control voltage (U_c)			3x400 V 50 Hz, 3x380 V 50 Hz, 3x190 V 50 Hz, +15 ... -20 %
Asymmetry at turn-off			5...15 %
Voltage increase at turn-off			(1 x U_c) -5 % ... (1,15 x U_c) +5 %
Voltage decrease at turn-off			(1 x U_c) +5 % ... (0,8 x U_c) -5 %
Delay of turn off (UAt, UASt, UASNCt)			0,2...20 s ±10 %
Temperature range			-5 ... +50 °C
Test voltage			2500 V
Degree of protection			IP 20
Relay contact	system		1 change over
	thermal current		8 A
	operational current	400 V, AC-15	0,6 A
		230 V, AC-15	1 A
	electrical endurance		10^4 operations
Relevant standards			EN 61010

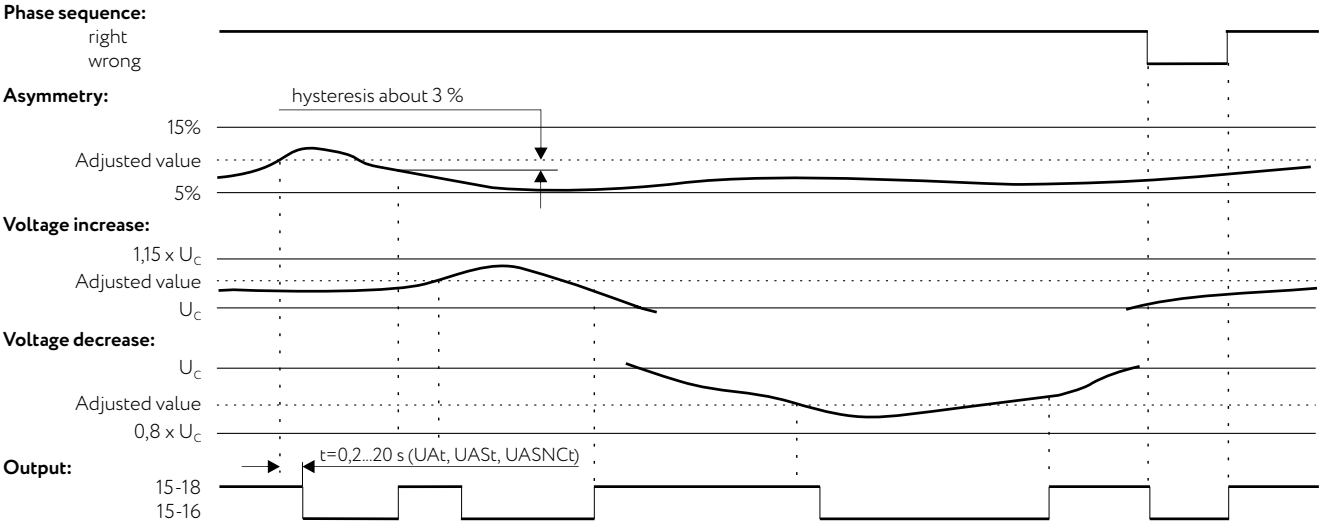
Dimensions



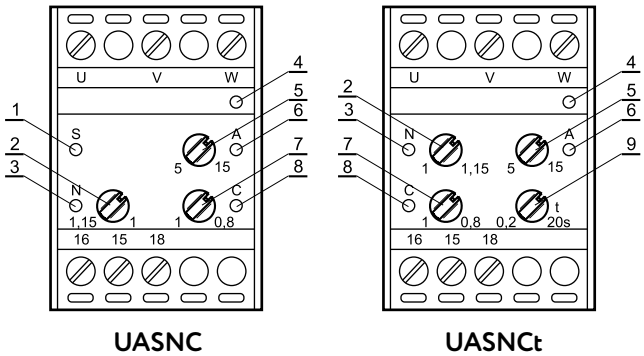
Mounting

- to 35 mm EN 60715 rail
- with two M4 screws

Operating diagrams



Frontplate



1 - red LED indicating phase sequence
2 - knob to set turn-off at voltage increase
3 - red LED indicating failure of voltage increase
4 - green LED, indicating closed output contact (U...) two coulured LED indicating position of output contact
5 - knob to set turn-off at asymmetry
6 - red LED indicating failure of asymmetry
7 - knob to set turn-off at voltage decrease
8 - red LED indicating failure of voltage decrease
9 - knob to set delay of turn-off

VOLTAGE MONITORING RELAY UAS-0

The UAS-0 type three-phase voltage monitor is suitable for protection of three-phase loads (mainly motors) in four-wire systems against phase-asymmetry and faulty phase-sequence of line voltage.

The monitor relay operates reliably too in case of distorted sinusoidal line voltage, occurred by inverters or switching power supply units.

The allowed value of the phase-asymmetry is adjustable between 5...15 % by knob which can be found on the frontplate. The limit-values on the two end-position of the knob are informative only. The required correct value should be adjusted by measurement at starting up of the relay.

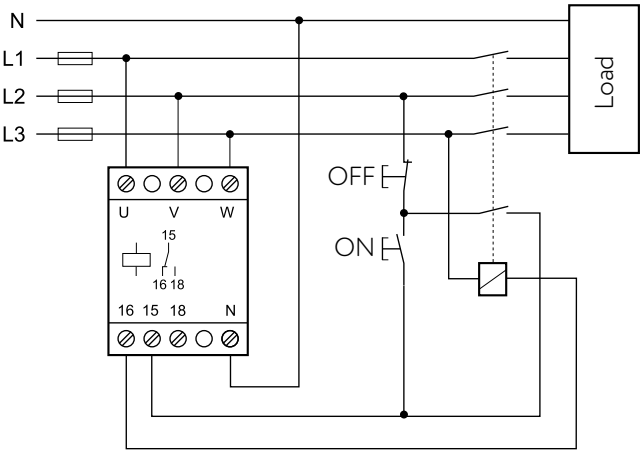
Operation

In case of normal supply voltage the output contact of the built-in relay is made position and the green LED illuminates only on the black stripe of the frontplate, if the line voltage is connected with right phase sequence.

In case of connecting with incorrect phase sequence the output contact does not make, the green LED does not illuminate. The faulty of phase-sequence is indicated by red LED, which can be found under the letter „S".

If the value of phase-asymmetry greater than value adjusted by knob on the frontplate, the red LED (under the letter „A") lights up indicating the asymmetry-faulty, after that the output contact breaks with 2 s delay and the green LED is off. If the faulty breaks, the relay comes back automatically to the basic position. If the faulty stops during the delay time, the output contact does not break.

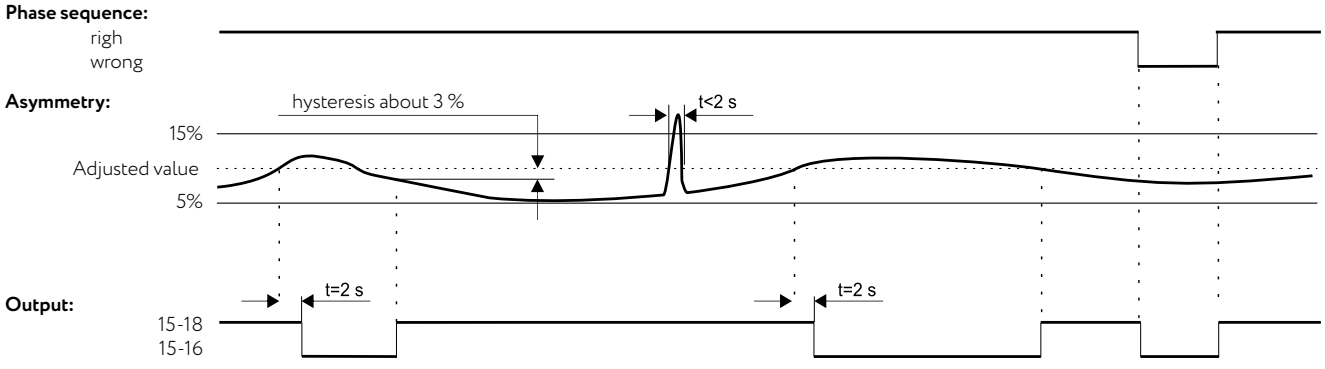
Connection diagram



Connecting

Connect with one or two 1,5 ... 2,5 mm^2 solid or flexible wire(s) to the screw-clamps.

Operating diagrams

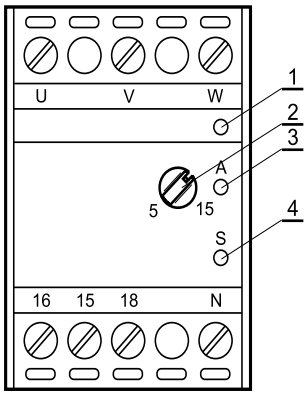


VOLTAGE MONITORING RELAY UAS-0

Technical data

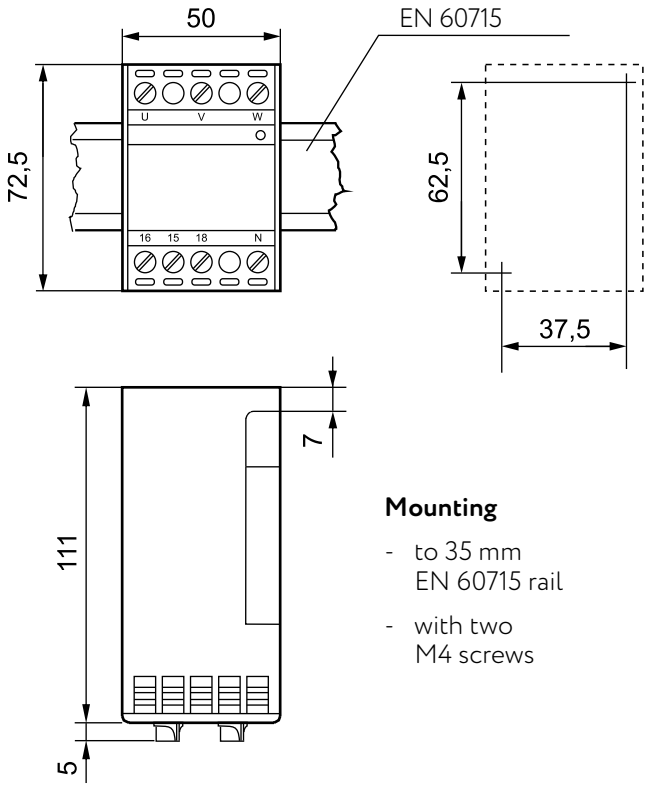
Rated control voltage (U_c)			3 x 230/400 V 50 Hz +15 ... -20 %
Rated insulation voltage			400 V AC
Asymmetry at break			5...15 %
Delay of break			about 2 s
Power consumption			4 VA max.
Temperature range			-5 ... +50 °C
Test voltage			2500 V
Degree of protection			IP 20
Relay contact	system		1 change-over
	thermal current		8 A
	operational current	400 V, AC-15	0,6 A
		230 V, AC-15	1 A
	electrical endurance		10^4 c
Relevant standard			EN 61010

Frontplate



1 - green LED indicating made position of relay
2 - knob to set asymmetry at break
3 - red LED indicating faulty of asymmetry
4 - red LED indicating phase sequence faulty

Dimensions



Mounting

- to 35 mm EN 60715 rail
- with two M4 screws

OVERHEAT PROTECTION RELAY VH

The VH relay is intended to protect industrial electric equipments (first of all motors, but also electric furnaces, welding, X-ray equipments, etc.) against harmful overheating.

Principle of operation

The VH relay is activated by the change of the resistance of the external sensor, a PTC (positive thermo-coefficient) thermistor at nominal temperature. The characteristic of the PTC allows series connection of several PTC's of different nominal temperature without loss of operating precision.

Application

PTC thermistors are mounted to the relevant parts of the equipments to be protected (in case of motors into each phase of the stator windings). The output of the PTC is connected to VH relay. At nominal temperature the output contact of relay breaks and turns off the contactor of the protected equipment, the front-panel LED is off.

As soon as the PTC cooled down 2 ... 5 °C, the output contact makes again and the protected equipment is automatically switched on.

If the VH relay is applied according to connection diagram, the output contact is closed after cooling down but the contactor (and thus the remains in off state. Restart of contactor (and thus the protected equipment) takes place by pushing of push-button ON.

The VH relay must be placed as close to the protected equipment as possible. Cross-section of the connecting wire is min. 0,75 mm^2, max. resistance is 2,5 Ω. Shielded and possibly the shortest wires are suggested, if protection against magnetic or electric interference is necessary. The connecting wires must be placed as far from high-current conductors as possible.

Mounting of PTC thermistors

Maximum allowed initial resistance of applicable PTC thermistors is 800 Ω. Thermal resistance between thermistor and protected equipment must be minimized. Body of PTC thermistors must not be additionally isolated. Outputs of the thermistor and the connecting wires must have equal insulation properties to those of protected equipment.

Motors are normally supplied with thermistors built into the windings of the motor. Assembling thermistors into the motor needs special skill and therefore can only be done by manufacturer of the motor or by specialised service.

Connecting

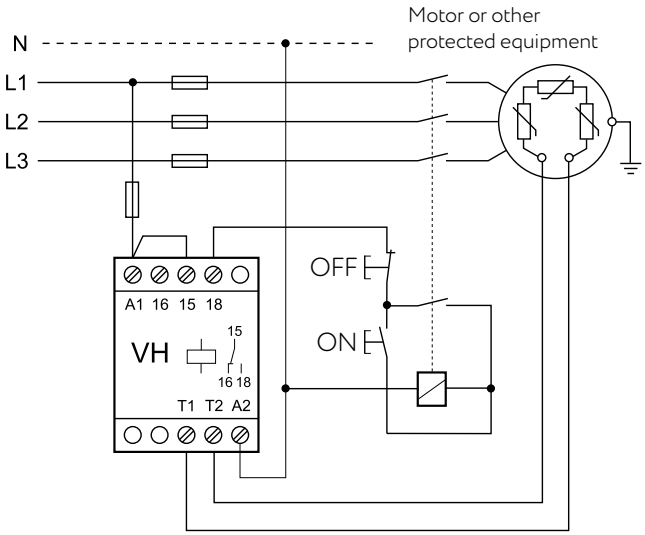
Connect with one or two 0,75...2,5 mm^2 solid or flexible wire(s) to the screw-fixing clamps.

OVERHEAT PROTECTION RELAY VH

Technical data

Rated insulation voltage			400 V AC
Rated control voltage (U_c)			24; 42; 110; 230; 400 V AC +10 ...-15 %
Connectable thermistors	initial resistance		max. 1300 Ω
	operational resistance		2,8 ±0,3 kΩ
	re-switching resistance		1,5 .±0,15 kΩ
Ambient temperature range	in operation		-5 ... +40 °C
	in storage		-25 ... +55 °C
Testing voltage			2500 V
Degree of protection			IP 20
Relay contact	system		1 change over
	thermal current		8 A
	operational current	24 V, AC-15	1,6 A
		230 V, AC-15	1 A
		400 V, AC-15	0,6 A
	electrical endurance		10^4 c
Relevant standard			EN 61010, EN 60255-6

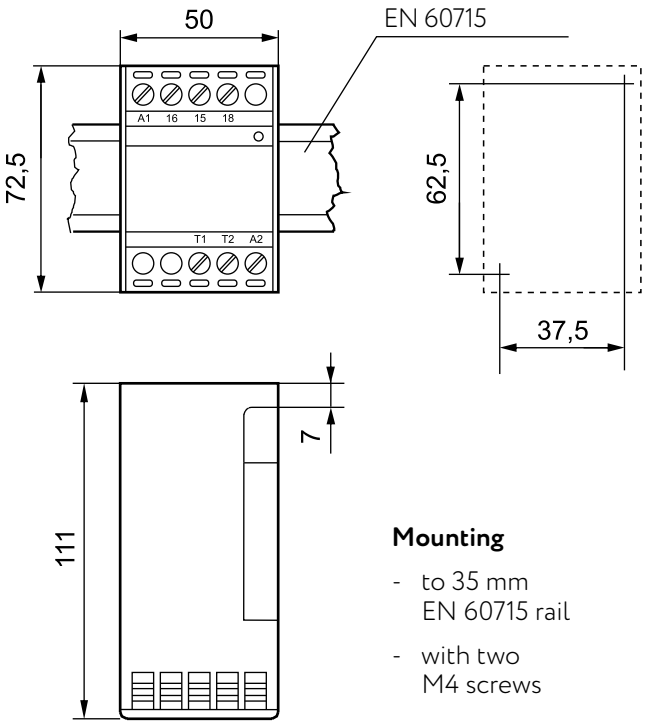
Connection diagram



Attention!

T1 and T2 terminals of VH relay are under voltage!

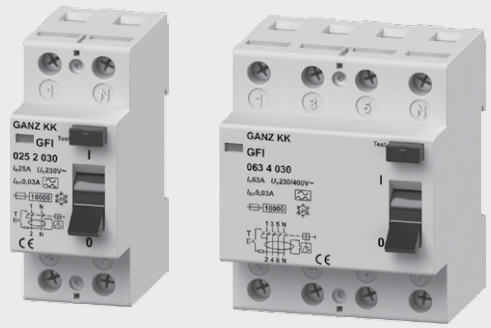
Dimensions



Mounting

- to 35 mm EN 60715 rail
- with two M4 screws

RESIDUAL CURRENT CIRCUIT BREAKERS GFI



The residual current circuit breaker (RCCB) is the most effective device for protection of the human life against electric shock. It breaks the electric circuit within a short time (some tenths of second), if the fault (residual) current exceeds the rated fault current of the device. Fault current may be occur in case of short-circuit, infiltration, or in case of touching by human's body.

Residual current circuit breakers (RCCB):

- **make protective earthing less expensive** as earth resistance, related to a given touch voltage, can be much higher;
- are most effective **to in prevent accidents of electric shock** since the current, flowing through the person accidentally touching the phase line, is disconnected in short time;
- play an important role in **preventing fires** resulting from deteriorated insulation as the earth-shorted equipment is disconnected at the value of residual current.

The two- and four-pole RCCBs operate on electromagnetic principle, they have not any electronic system.

The "AC" type RCCBs sense the alternating residual current only, the type-sign shows AC letters. The "A" type RCCBs sense the alternating and the pulsating direct residual current too (the type-sign does not contain any marking) and their functioning is not disturbed by controlling devices containing semiconductors.

Neither the two-, nor the four-pole design contains built-in short-circuit and overload protection, so these protective devices have to be fitted additionally.

The short-circuit and overload-protective devices that are to be fitted on line with the residual current circuit breaker in case of different rated currents and presumed value of short circuit currents are:

63 A: gG80 I 40 A: gG63 I 25 A: gG63 I 16 A: gG63

The allowed earth resistance maximums for the different rated residual current release in case of 25 V and 50 V touch voltage are:

$I_{\Delta n}$ [mA]	R_m [Ω] at 25 V	R_m [Ω] at 50 V
10	2500	5000
30	835	1670
100	250	500
300	83	167
500	50	100

Ordering information

GFI 025. 4. 100 AC

Rated current	Number of poles	Rated residual current	Kind of current
016*: 16A **025:** 25 A **040:** 40 A **063:** 63 A	**2:** two poles **4:** four poles	**010**:** 10 mA **030:** 30 mA **100:** 100 mA **300:** 300 mA **500:** 500 mA	**AC:** alternating **without sign:** alternating and pulsating direct current (type A)

* At two-pole 2×

** At two-pole 2× I_e= 16 A and 25 A executions only

To choose the appropriate residual current circuit breaker, it must be considered that for the effective shockprotection the device having the higher sensitivity is the better, but the application is restricted by the fact that the capacitive and leakage currents in larger networks can exceed the residual (fault)-current release limit and this could lead to an unnecessary release.

To solve the problems:

- The fitting of a RCCB with sensitivity 300 mA or 500 mA at the feeding point of a larger network,
- The fitting of a RCCB with sensitivity 30 mA of the important premises (e.g. flats, bathrooms, kitchens, etc.) from point of view of electric shock.

The installation of the RCCBs should be done by an expert only. When installing, specific attention must be paid, because the following connection should be made:

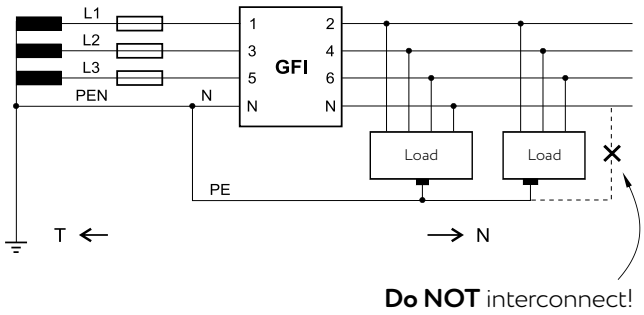
- in and out neutral conductors (N) with each other, or
- on the load side, the earth wire and the neutral conductor with each other.

The devices not need maintenance, only the functionning must be checked once a month by pushing

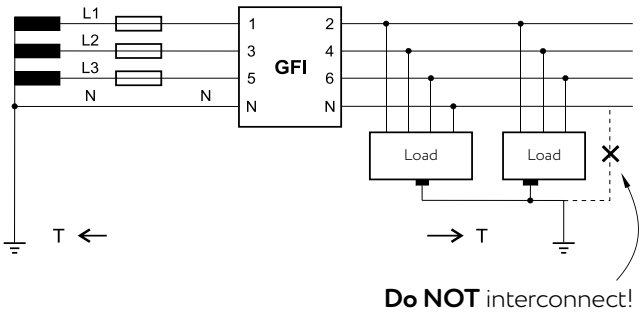
the **TEST** button.

RESIDUAL CURRENT CIRCUIT BREAKERS GFI

Wiring diagram



Do NOT interconnect!

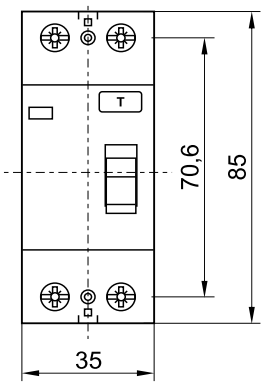


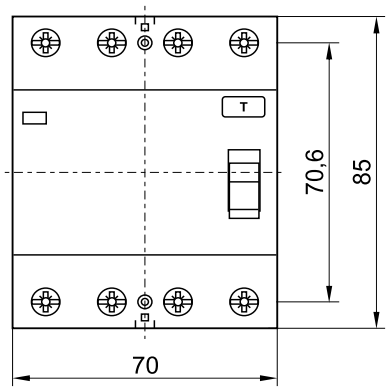
Do NOT interconnect!

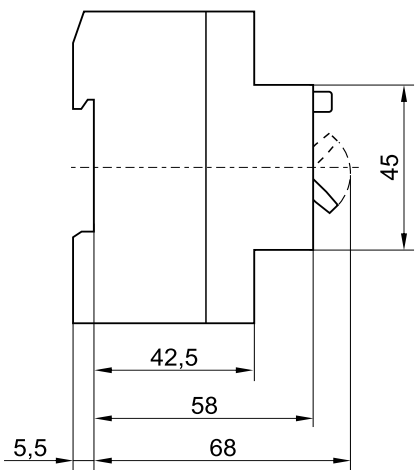
Technical data

Number of poles			2				4		
Rated current	I_n	A	16	25	40	63	25	40	63
Rated residual operating (fault) current	$I_{\Delta n}$	A	0,01	0,01					
			0,03	0,03	0,03	0,03	0,03	0,03	0,03
			0,1	0,1	0,1	0,1	0,1	0,1	0,1
			0,3	0,3	0,3	0,3	0,3	0,3	0,3
				0,5	0,5	0,5	0,5	0,5	0,5
Rated voltage	U_n	V	230				230/400		
Rated frequency		Hz	50/60						
Rated short-circuit capacity I_m	$I_m = I_{\Delta m}$	A	500				630		
Rated residual capacity $I_{\Delta m}$									
Allowed value of fuse	I_n	gG (A)	63	63	63	80	63	63	80
Rated conditional short-circuit current	I_{cn}		10 000 A						
Degree of protection			IP 20, after building in enclosure IP 40						
Mounting position			any						
Ambient temperature			-25°C ... +40°C						
Mass			230 g				390 g		
Wiring capacity			1... 25 mm^2						
Release time			at 1 x $I_{\Delta n}$: <0,2 s; at 5 x $I_{\Delta n}$: <0,04 s						
Electrical endurance			>10 000 c						
Relevant standard			EN 61008						

Dimensions







LIGHT DEPENDED RELAY GFK 3

Dimming switches type GFK 3 are designed to automatically turn on the various lights in the evening and turn them off at sunrise.

In daylight, the relay inside the device is deenergized. As soon as the light intensity falls to below the preset value, it is energized and a circuit is made. The cycle taking place when the light intensity increases is reversed. The circuit is made with a certain delay in order to prevent any unnecessary disconnections due to short-term increases in the light intensity (such as f. in. caused by lightning.)

The device comes preset to the desired activating threshold (to be specified when ordering), which is somewhere between 5 and 40 lux. Unless otherwise ordered, it leaves the factory preset to between 10 and 25 lux, a widely accepted rule-of-thumb value.

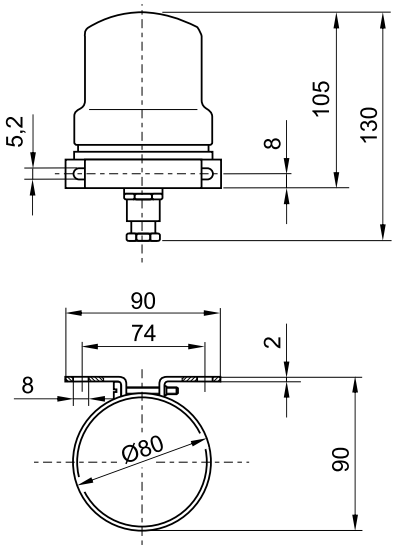
When installing, should be mounted to a vertical surface, with the covering upwards, using 2 pcs. M5 screws.

When mounting, it should be made sure that enough light falls onto the device, and that other light sources possibly disturb with the night-time operation are avoided.

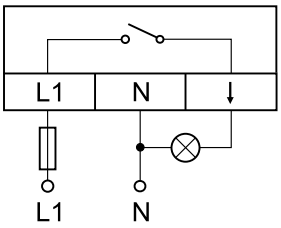
When connecting it should be removed the covering and connected the three-wire cable to the terminal block by reason of wiring diagram given on the data plate. Recommended wire: A05VV-F 3x1 mm^2, blue, brown, black.

It is a good practice to clean the covering of the dimming switch at regular intervals in function of the climatic conditions in order to prevent reduced transparency.

Dimensions



Wiring diagram



Technical data

Rated insulation voltage		250 V
Rated control circuit voltage		230V 50 Hz +10%,-15 %
Power consumption		5 VA max.
Activating threshold		10 ... 25 lx
Deactivating threshold		1.3 ... 1.8 times the actual actuating threshold
Operate delay on abrupt changes in light intensity		2 s min.
Switching frequency		120 c/h max.
Degree of protection		IP 54
Shock protection method		by double insulation
Operating temperature range		-20 ... +50 °C
Wiring capacity		0,5 ... 1,5 mm^2
Operating position		with the covering pointing upwards
Mass		0,4 kg
Contact details		
Contact		1 make (closed in darkness)
Rated operational voltage		230 V, 50 Hz
Rated thermal current		16 A
Allowable loading current and electric endurance	in the utilization category AC-15	1,6 A and 10^5 cycles
	with 60 W bulbs max.	900 W and $2x10^4$ cycles
Recommended MCB		6 A B or C
Relevant standard		EN 60669

GFI 025 2 030
Residual Current Circuit Breakers

GFI - 063 4 030
Residual Current Circuit Breakers

VH
Overheat Protection relay

GFK 3
Light depended relay