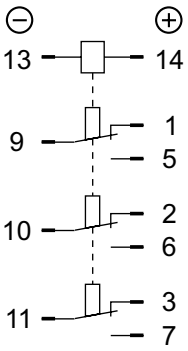
The DY electronic timers are produced with three AC and tree DC operating supply voltages.The front LED indicates the operation of the built-in relay.
Concerning operation mode two versions are produced. The delay times can be set in six time ranges from 1 s to 30 h.
The timers can be ordered without socket or with socket for three different connecting methods.

Ordering information:

DYM/c 100s 110 V DC

Operation mode	Socket	Upper limit of delay and possible delay times		Rated operating supply voltage	
M: delayed operation	**/c**: screw fixed				
E: delayed release	**/ f**: fixed by soldering	**10s** :1...10 s	**100s** :10...100 s	**230 V AC**	**110 V DC**
	/n: can be soldered to printed circuit	**10m**:1...10 min	**100m**:10...100 min	**110 V AC**	**48 V DC**
	: without socket	**10h** :1...10 h	**30h** :10 ... 30 h	**24 V AC**	**24 V DC**

Operation

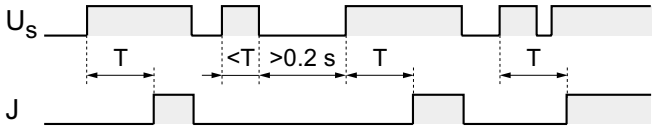


The timers can be started by connecting U_c.
In case of a DC variant be sure to connect the poles according to the label on the device. Reversed poles ao AC power can spoil the timer.
In case of a power failrue lasting less than 200 ms the started delay operation will continue but in case of longer power failures the delay operation will start again.

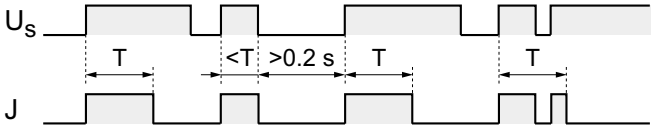
Operation modes

T - The set delay time
U_c - rated operating supply voltage
J - output relay

DYM - delayed operation



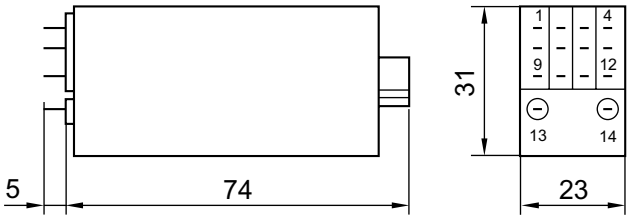
DYE - delayed release



Technical data

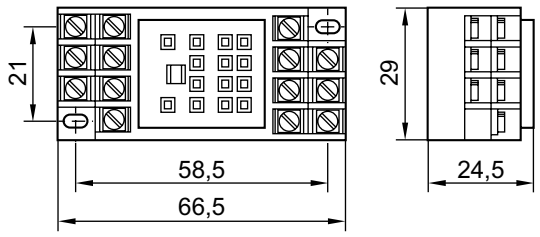
See page 12.

Dimensions



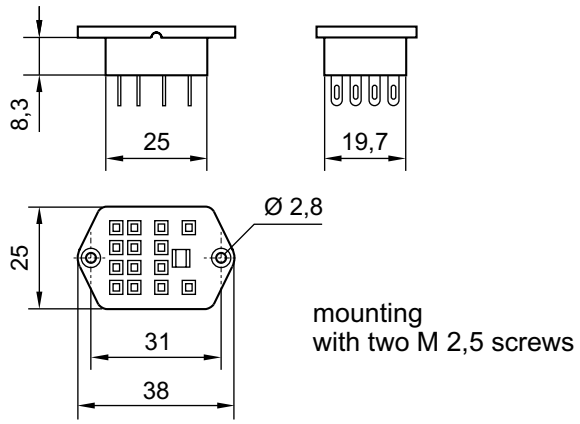
Sockets

Screw-fixed (/c)



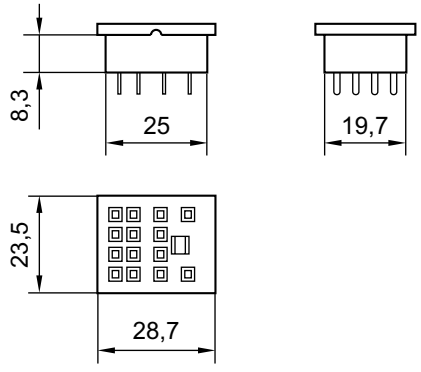
mounting with two M4 screws

Fixed by soldering (/f)



mounting
with two M 2,5 screws

Solder-to printed circuit (/n)



Series GI consists of electronic timers. The power supply does not include a transformer, therefore the timers can be operated either by AC or DC power. The relay operation is indicated by a front-plate LED.
Five variants of GI timers are produced according to operation characteristics, with delay times from 0,3 s to 30 h in 11 time ranges. The operating power can be of four different rated voltages.
Altogether the series consists of 220 different timers but all have unified circuits and structure.

Ordering information:

GIM 60s 230

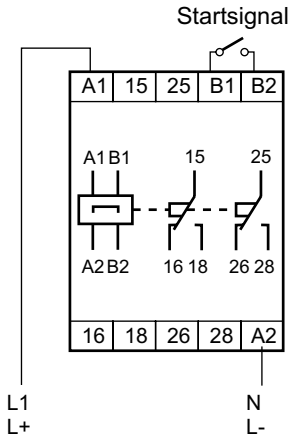
Operation mode	Upper limit of delay and possible delay times			Rated operating supply voltage
M: delayed operation	**3s**: 0,3 ... 3 s	**3m**: 0,3 ... 3 min	**3h**: 0,3 ... 3 h	**230**: 230 V AC, DC
F: delayed release	**6s**: 0,6 ... 6 s	**6m**: 0,6 ... 6 min	**6h**: 0,6 ... 6 h	**110**: 110 V AC, DC
K: delayed switch-off	**30s**: 3 .... 30 s	**30m**: 3 .... 30 min	**30h**: 3 .... 30 h	**42**: 42 V AC, 48 V DC
L: falling edge controll	**60s**: 6 .... 60 s	**60m**: 6 .... 60 min		**24**: 24 V AC, DC
B: flashing				

Operation

The indication of the connecting terminals is according to the method used in Europe (DIN 46199):

- phase conductor of the network or its positiv wire is connected to A1
- neutral conductor of the network or its negative 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, therfore it is practical to connect the neutral wire to A2, so that phase voltage would not apper on B2 as well.
The prevailing rectified rated control supply voltage appears 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.
The flowing current on starting contact is roughly 0,3 mA.
Starting can be made in two ways:



Rated operating voltage

starting by contacts: make short B1 and B2 contacts at least 0,1 s after connecting the operating power.
The minimum power-off time after the timing is 50 ms.

power starting: having made B1 and B2 short, connect the operating power. This method can be used with types GIM, GIF and GIB only.
150 ms is added to the delay time in this case.
The minimum power-off time after the timing is 300 ms.
If the power fails for more than 300 ms, the timers will set to their basic condition, and will work as power-started timers when the power is back.
If the power fails for less than 150 ms, the timing will be continued after the power is back.

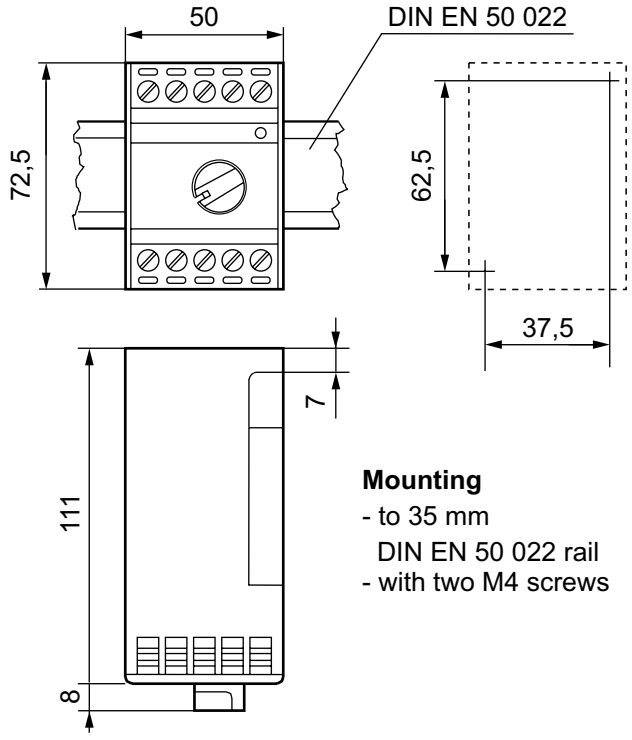
Connecting

Connect with one or two 1,5 ... 2,5 sqmm stiff or soft wire(s) to the screw-fixing wire clamps.

Technical data

See page 12.

Dimensions

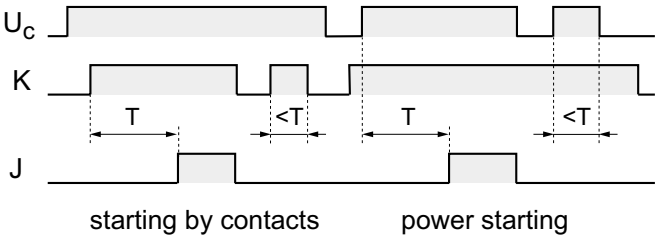


Mounting
- to 35 mm DIN EN 50 022 rail
- with two M4 screws

Characteristics

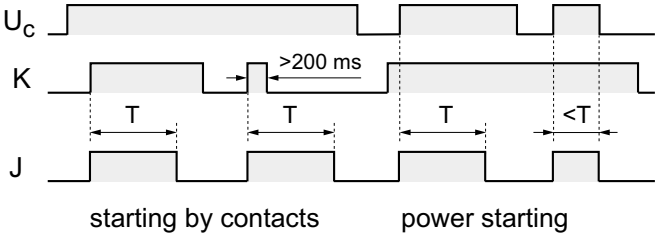
T - the set delay time
U_c - rated operating power supply voltage (A1-A2 contacts)
J - out contacts (relay; 15-16-18, 25-26-28 conacts)
K - starting contact (B1 and B2 made short)

GIM - delayed operation



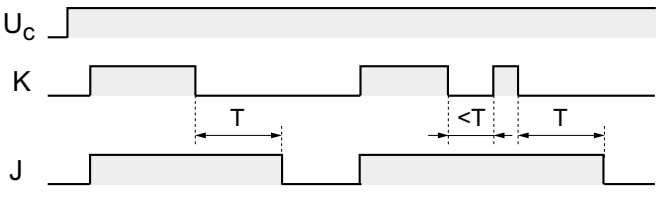
The relay operates T time after the appearance of the startsignal and will release when the startsignal is off. If the startsignal is shorter than the set T time, the relay will not operate.

GIF - delayed release



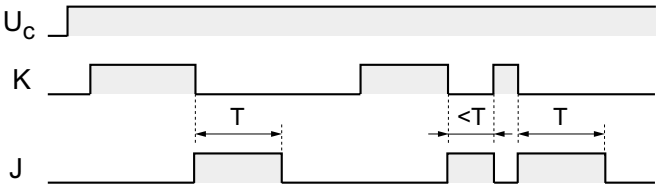
The relay operates at the appearance of the startsignal and release after T time. In case of power starting, if the t startsignal is shorter than the set T delay time, then the broken startsignal cancels the further delay operation.

GIK - delayed switch-off



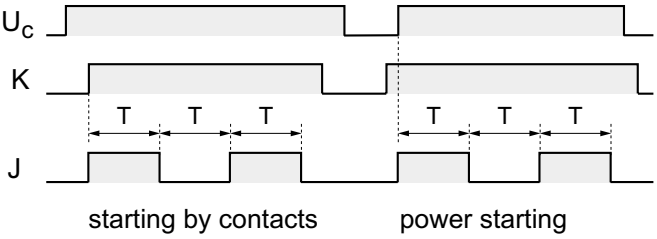
The relay operates at the appearance of the startsignal and release T time after the startsignal is off. Ift he startsignal is back during the T delaying period, then the delay will be cancelled and the relay will release not after T time, but after the next delay cycle only.

GIL - falling edge control



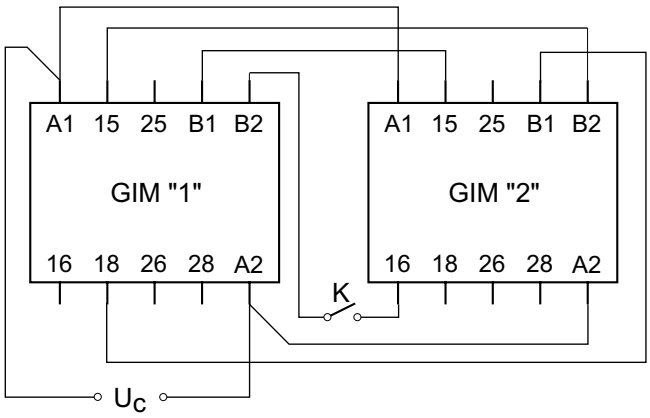
The relay operates at the breaking of the starting short circuit only and releases after T time. If the startsignal is back during this T period, then the delay will be cancelled and the relay will release immediately.

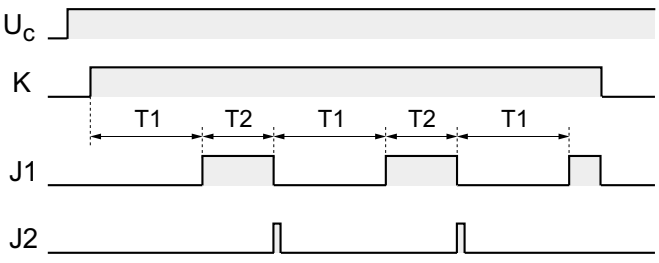
GIB - flashing



While the startsignal is on, the relay T-time operated and released phases are alternating with each other.

Program switch





The different on- and off-times are alternating until the startsignal (K) is off.

The ID electronic timers are produced in two AC and one DC supply voltage versions. DC supply voltage must be connected as shown on rating plate.
An LED indicates on-state of the relay output. Delay time can be set in 8 ranges from 1 s to 30 h. Five operating modes are available.

Ordering information:

IDM 100m 24-48

Operation mode	Upper limit of delay and possible delay period	Rated operating supply voltage
M: delayed operation	**10s**: 1 ... 10 s **10m**: 1 ... 10 min **10h**: 1...10 h	**230**: 230 V AC
E: delayed release	**100s**: 10...100 s **100m**:10...100 min **30h**:10...30 h	**24-48**: 24-42 V AC or 24-48 V DC
K: delayed switch-off		
L: falling edge controll		
B: flashing		

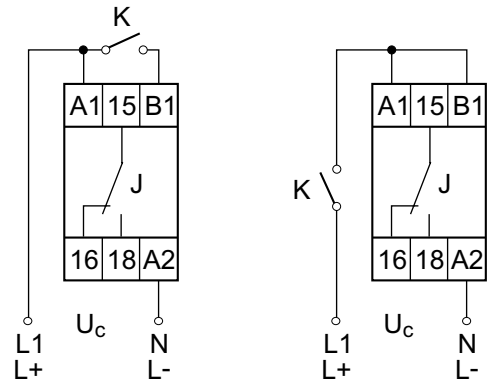
Operation

Indication of connecting terminals follows DIN 46 199 standard:
- connect phase wire or positive pole of supply to A1
- connect neutral wire or negative pole of supply to A2
- starting can be made on B1-B2 contacts
- contacts of output relay are connected to terminals 16, 15 and 18

The starting contact must be capable to switch U_C safely, and must withstand at least U_C insulation voltage. These timers can be started in two ways:

contact starting: by making A1 B1 contacts short at least 0,2 s after connecting the power supply. Minimum 100 ms needed to restart after a timing cycle.

power starting: by connecting the power supply while A1 and B1 are made short. This method can be applied only in case IDM, IDE and IDB versions.
Max. 200 ms is added to the delay time. Minimum 200 ms needed to restart.



Starting by contacts **Power starting**

If the power supply fails, the relays reset to their basic conditon. and will operate as power-started when power is back. (provided the starting contacts are made short).

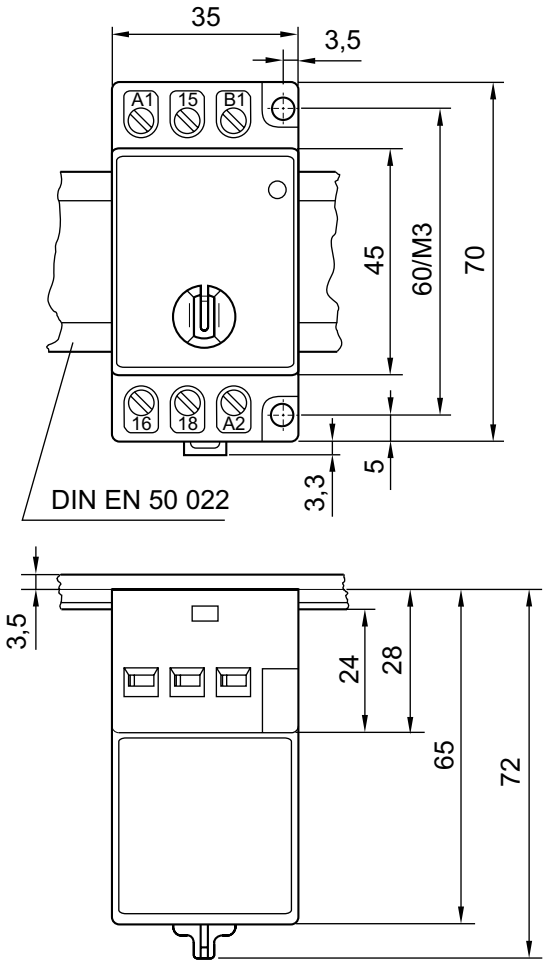
Technical data

See page 12.

Connecting

Connect to screw-fixing wire clamps with one or to rigid or flexible wire(s). Cross-section of connecting wires.
flexible :0,5 ... 1,5 sqmm
rigid :0,75 ... 1,5 sqmm

Dimensions

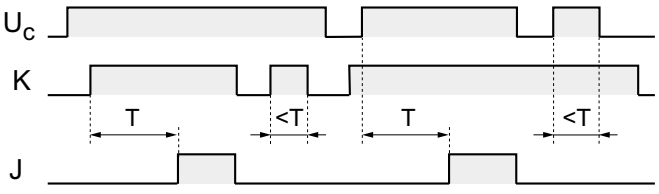


Mounting
- to DIN EN 50 022 35 mm rail
- with two M4 screws

Characteristics

T - set delay time
U_c - rated operating power supply voltage (A1-A2 contacts)
J - out contacts (relay; 15-16-18 contacts)
K - starting contacts (A1 and B1 made short)

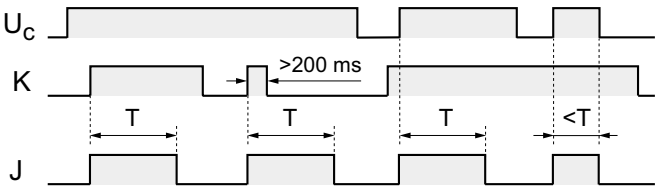
IDM - delayed operation



starting by contacts power starting

The relay operates T time after the appereance at the startsignal and release when the startsignal is off. If the t startsignal is shorter than the set T delay time, the relay will not operate.

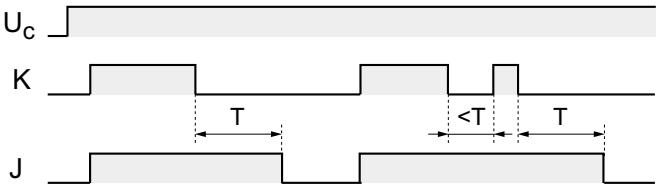
IDE - delayed release



starting by contacts power starting

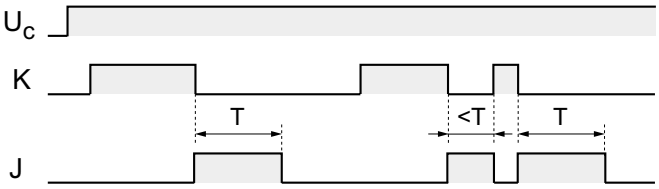
The relay operates at the appearance of the startsignal and release after T time. When power-starting, if the t startsignal is shorter than the set T delay time, then the termination of the startsignal cancels the further delay.

IDK - delayed switch-off



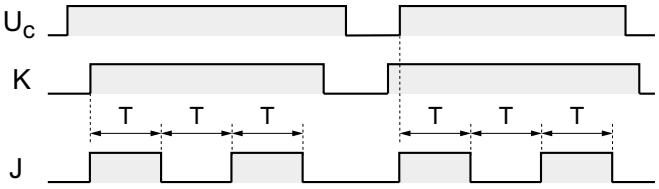
The relay operates when the starting circuit is made short. If the starting circuits is made short during the T delay period, the delay will be cancelled and the relay will not release after T time but after the next timing cycle only.

IDL - falling edge controll



The relay operates at breaking of the short-circuit and releases after T time. If the startsignal is back during this T delay period, the delay will be cancelled and the relay will release immediately.

IDB - flashing



starting by contacts power starting

While the startsignal is on, the on and off states (T time each) follow each other.

The U... relays can protect three-phase equipments (mainly motors) against asymmetry and false sequence of line voltages as much as asymmetrical increase or decrease of line voltages. Their operation dos not require neutral conductor.
Turn-off thresold value of asymmetry, voltage increase and decrease failures can be set by the front-plate knobs. Turn-off is delayed so that the relay is not sensitive to voltage transients. Since the four protection modes are optional, they must be ordered as follows:
First character of ordering code is U. The following characters are combination of the required protection:

A - phase asymmetry
S - phase sequence
N - line voltage increase
C - line voltage decrease

15 combinations of the 4 modes are possible. Ordering codes:

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

The delay can not be adjustable at the above mentioned types. The delay time of the turn-off can be set by the front-plate knob of the types UAt, UASt and UASNCt.

Application

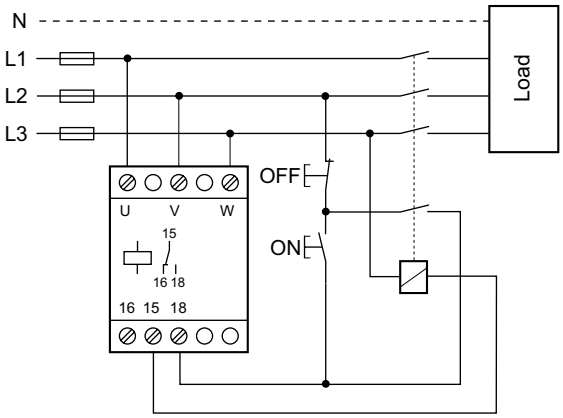
Protection against line voltage decrease does not protect against phase loss. These task can be performed by phase asymmetry protection.
Asymmetry means the maximum difference of the line voltages related to the highest line voltage, expressed in per cent.
In case of normal supply voltage the output contact is closed, the green front-plate LED is on. One red LED corresponds to each protection mode. In case of phase failure the relevant LED turns on, the green LED turns off and the output opens.
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 close.

Operation

In case of normal supply voltage the output contact of the built-in relay is closed, the green front-plate LED is on.
Range of delay of **non adjustable types** is between 0.1 s and 5 s, if the failure is great (e.g. phase-loss) the relay turns off faster.
One red LED corresponds to each (max. four) protection mode. If one or more failure occur, the relevant red LED begins to illuminate, the green LED turns off and the contacts of the built-in relay break.

At **adjustable types**:
- if one or more failure occur the relevant LED begins to flash,
- if the failure breaks within delay time the faultless situation returns,
- the failure does not break within delay time then the flash of the relevant LED changes the continuous, the contacts of the built-in relay break and the illumination of the two-coloured LED changes from green to red light.

Connection diagram



Connection

To screw-clamp with one or two rigid or stranded wires. Cross-section of wires: 1,5 ... 2,5 mm^2

Technical data

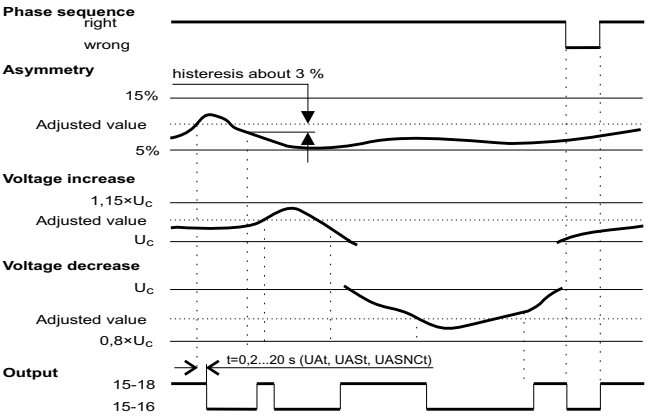
General

Rated insulation voltage	400 VAC
Rated operational voltage (U_C)	3×400 V 50 Hz, 3×380 V 50 Hz, 3×190 V 50 Hz, +15 ... -20%
Asymmetry at turn-off	5 ... 15 %
Voltage increase at turn-off	($1\times U_C$) -3 % ... ($1{,}15\times U_C$) +3 %
Voltage decrease at turn-off	($1\times U_C$) +3 % ... ($0{,}8\times U_C$) -3 %
Delay of turn off (UAt, UASt, UASNCt)	0,2... 20 s ±10%
Temperature range	-5 ... +50 ^oC
Test voltage	2500 V
Degree of protection	IP 20
Relevant standards	EN 61010-1

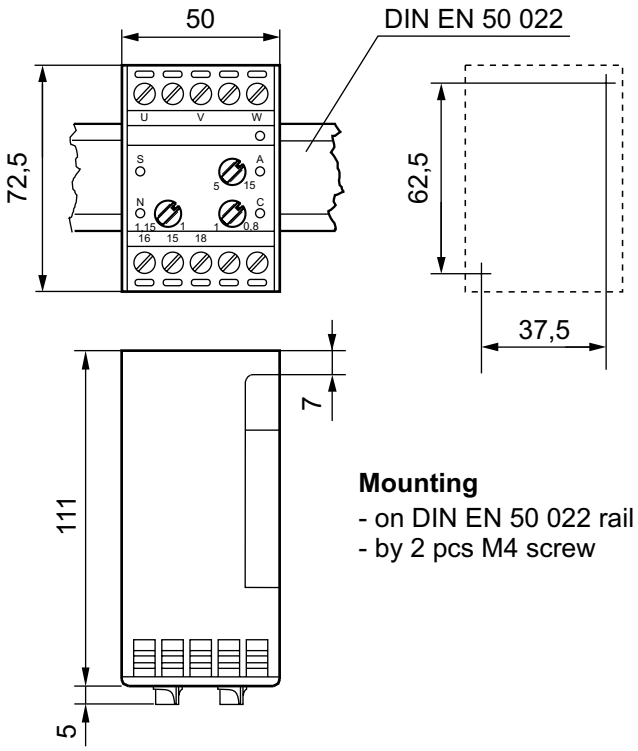
Contact

Arrangement	1 Form C (changeover)
Thermal current	8 A
Rated operational current	
400 V AC 15	0,6 A
230 V AC 15	1 A
Electrical endurance	10^4 operations

Operating diagrams

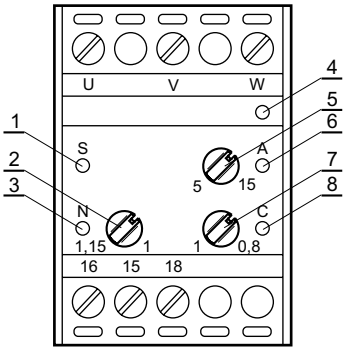


Dimensions



Mounting
- on DIN EN 50 022 rail
- by 2 pcs M4 screw

Frontplate (UASNC)



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
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

U1NC single-phase voltage relay

The U1NC single-phase voltage relay is designed to monitor loss, increase or decrease of 230 VAC mains voltage.

Application, functions

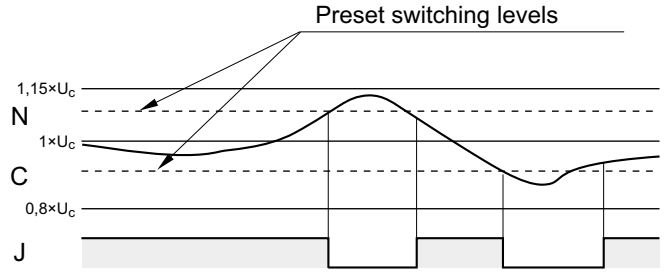
In case of normal mains voltage conditions the output contact is closed, indicated by on-state green LED(1).
If the mains voltage falls under the value set by knob (2) or exceeds the value set by knob (4) the output contact opens and the LED's besides the knobs turn on indicating type of failure. In 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.
Values of voltage incease and decrease at the frontplate knobs are for information. The required values can be set exactly by measurement at installation.
The switching mode power supply of the relay requires appr. 0,2 A for appr. 1 ms at each half cycle. This must be taken into consideration. For example if a transformer is used for galvanic separation, its power must be min. 630 VA in order to avoid distortion of monitored voltage.

Connection

To screw-clamp with one or two rigid or stranded wires.
Cross-section of wires: 1,5 ... 2,5 mm^2

Operating diagram

N - voltage increase
C - voltage decrease
J - output contacts



Technical data

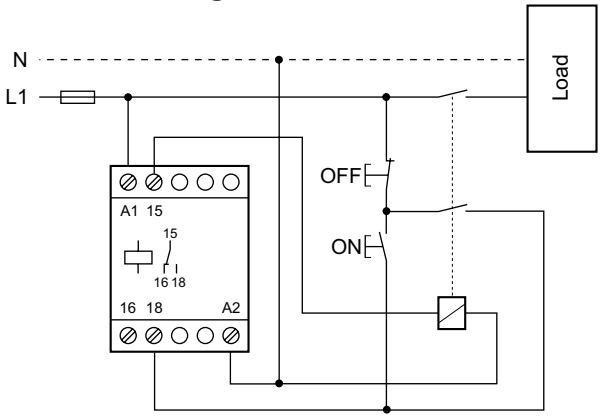
General

Rated insulation voltage	250 V AC
Rated operational voltage (U_C)	230 V AC
Range of operational voltage	80 V AC ... 290 V AC
Switch-off range of voltage increase	$(1\times U_C)$-3 % ... $(1{,}15\times U_C)$+3 %
Switch-off range of voltage decrease	$(1\times U_C)$+3 % ... $(0{,}8\times U_C)$-3 %
Environmental temperature range	-5 ... +50 °C
Test voltage	2500 V
Degree of protection	IP 20
Relevant standard	EN 61010-1

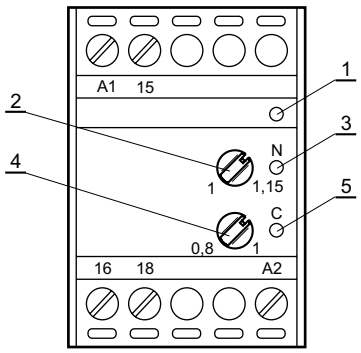
Contact

Arrangement	1 Form C (changeover)
Thermal current	8 A
Rated operational current	
230 V AC-15	0,6 A
400 V AC-15	1 A
Electrical endurance	10^4 c

Connection diagram

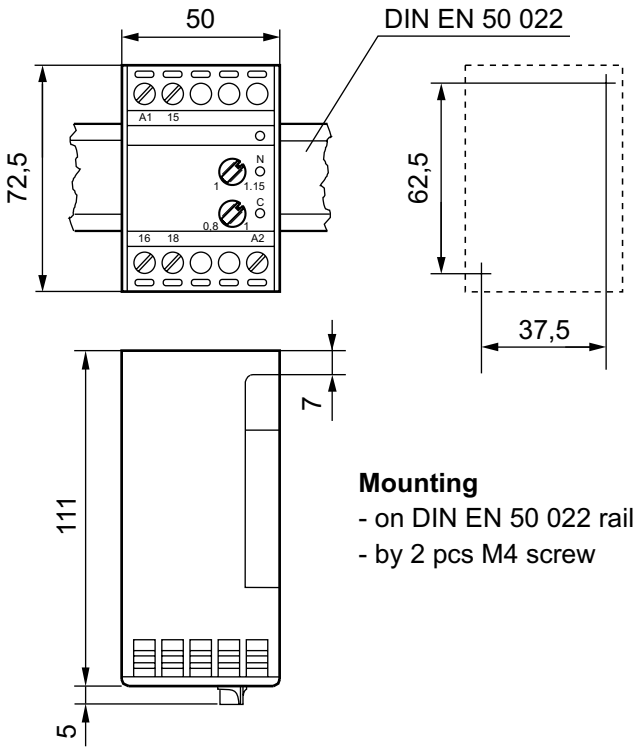


Frontplate



1 - green LED indicating closed output contact
2 - knob to set turn-off value of voltage increase
3 - red LED indicating voltage increase failure
4 - knob to set turn-off value of voltage decrease
5 - red LED indicating voltage decrease failure

Dimensions



Mounting
- on DIN EN 50 022 rail
- by 2 pcs M4 screw

The VH relay is intended to protect industrial electric equipments (first af 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.
Features of PTC protection (compared with bimetallic protection):

- one VH relay can protect both winding and bearings of a motor;
- it is impossible to disable the operation of the relay or to destroy the efficiency and precisity of protection by improper handling;
- protection can be performed in case of failures that do not cause harmful increase of current consumption of the motor (e.g. the motor is operated at high ambient temperature or ventillation is blocked;
- while utilizing maximum power of the motor protection is guaranteed against heavy starting, repeated breaking, phase failure, too high or too low supply voltage, high or changing switching rate.

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 opens and turns off the contactor of the protected equipment, the front-panel LED is off.
As soon as the PTC cooled down 2 ... 5 ^{o}C, the output contact is closed 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 remains in off state. Restart of contactor (and thus the protected equipment) takes place by depressing 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 ohm. 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 ohm. Thermal resistance between thermistor and protected equipment must be minimized.
Body of PTC thermistors must not be additionally isolated. Terminations 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.

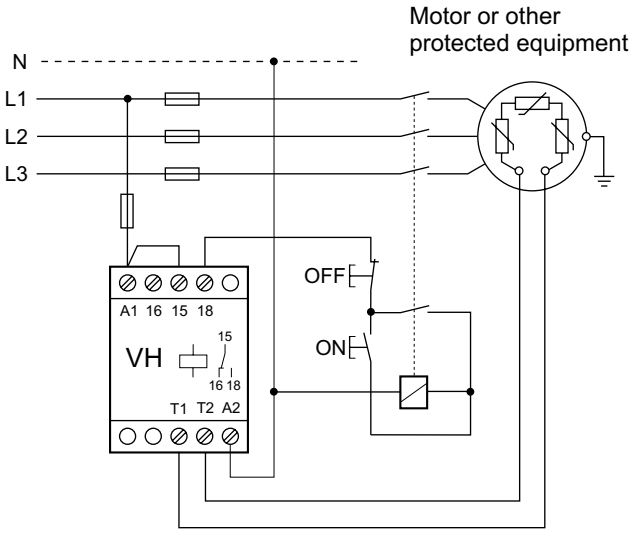
Connection

To screw-clamp with one or two rigid or stranded wires.
Cross-section of wires: 1,5 ... 2,5 mm^2

Technical data

General	
Rated insulation voltage	250 V AC
Rated operational voltage (U_c)	24; 42; 110; 230 V AC +10 ... -15 %
Operating temperature range	-5 ... +40 ^{o}C
Storage temperature range	-25 ... +55 ^{o}C
Testing voltage	2500 V
Degree of protection	IP 20
Relevant standard	EN 61010-1
Thermistor	
Initial resistance	max. 800 ohm
Operational resistance	2,5±0,5 kohm
Re-switching resistance	1...1,3 kohm
Contact	
Arrangement	1 Form C (changeover)
Rated thermal current	8 A
Rated operational current 230 V, AC-15	1 A
Electrical endurance	10^4 operations

Connection diagram



Attention!
T1 and T2 terminals of VH relay are under voltage!

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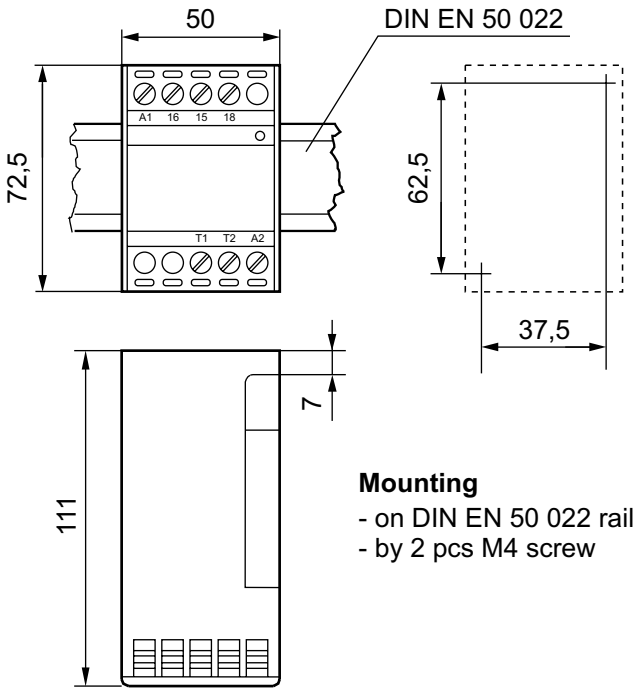

Mounting
- on DIN EN 50 022 rail
- by 2 pcs M4 screw

Technical data

	GI	ID	DY
Rated operating voltage (U_C)	230 V AC/DC 110 V AC/DC 42 V AC / 48 V DC 24 V AC/DC	230 V AC 24 ... 42 V AC 24 ... 48 V DC	230 V AC 110 V AC 24 V AC 110 V DC 48 V DC 24 V DC
Allowed tolerance of U_C	-15 ... +10 %	AC: -15 ... +10 % DC: -10 ... +10 %	AC: -15 ... +10 % DC: -10 ... +10 %
Delay ranges	0,3 ... 3 s 0,6 ... 6 s 3 ... 30 s 6 ... 60 s 0,3 ... 3 m 0,6 ... 6 m 3 ... 30 m 6 ... 60 m 0,3 ... 3 h 0,6 ... 6 h 3 ... 30 h	1 ... 10 s 10 ... 100 s 1 ... 10 m 10 ... 100 m 1 ... 10 h 3 ... 30 h	1 ... 10 s 10 ... 100 s 1 ... 10 m 10 ... 100 m 1 ... 10 h 3 ... 30 h
Repeating error	±2 %	±1 %	±1 %
Temperature error	0,2 % / °C	0,2 % / °C	0,2 % / °C
Voltage error	0,1 % / % U_C	0,1 % / % U_C	-
Scale error	±5 %	-	-
Time needed to restart	min. 300 ms	min. 200 ms	min. 200 ms
Ambient temperature	-5 °C ... +50°C	-5 °C ... +40°C	-5 °C ... +40°C
Power consumption	max. 3 W or 4 VA	max. 3 W or VA	max. 3 W or VA
Rated insulation voltage	250 V, 50 Hz	250 V, 50 Hz	250 V, 50 Hz
Shock resistance	10g (50 Hz)	-	-
Degree of protection	IP 20	IP 20	IP 00
Weight (approx.)	0,3 kg	0,12 kg	0,06 kg
Contact: arrangement	2 Form C	1 Form C	3 Form C
Rated insulation voltage	250 V, 50 Hz	250 V, 50 Hz	250 V, 50 Hz
Thermal current	5 A	5 A	3 A
Switch-on current	20 A	20 A	-
Electrical durability	2×10^5 c 230 V AC, 4 A; cos =1 230 V AC, 2 A; cos =0,4	3×10^5 c 230 V AC, 4 A; cos =1 230 V AC, 2 A; cos =0,4	2×10^5 c 230 V AC, 0,8 A; cos =0,4
Mechanical durability	5×10^6 c	3×10^6 c	3×10^6 c
Relevant standard	EN 61010-1	EN 61010-1	EN 61010-1