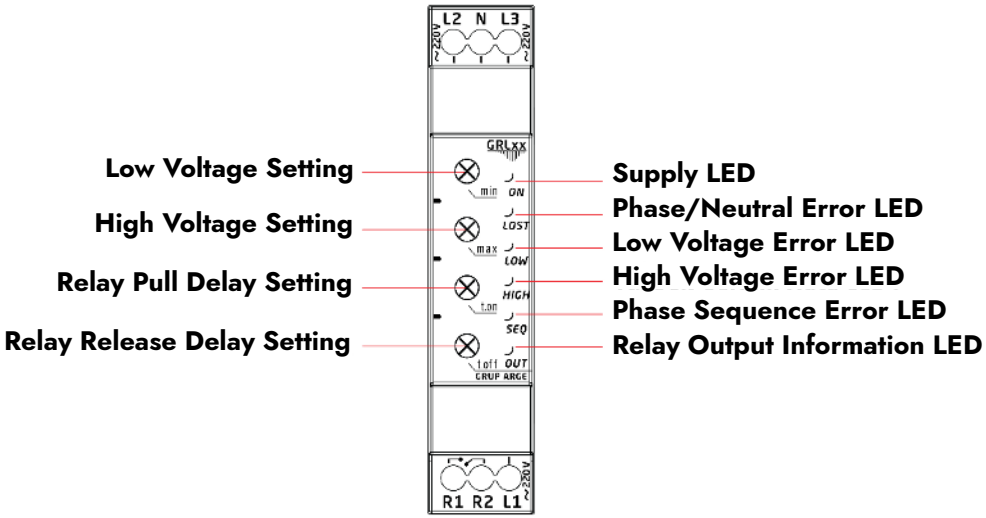
LED Descriptions:



Note: There is no N connection in devices without neutral.

LED Alerts:

1.LED	2.LED	3.LED	4.LED	5.LED	6.LED	
◑	◑	◑	◑	◑	○	**Insufficient Feed Warning** (LEDs flash 1 time per second)
○	◑	◑	◑	◑	○	**In-Device Error Alert** (LEDs flash 1 time per second)
◑	◑	◑	◑	◑	○	**Over Feed Warning** (LEDs flash 4 times per second)
○	◑	◑	◑	◑	○	**Neutral/Phase Reverse Connection Warning** (LEDs flash 4 times per second)

Table:1

Note: Depending on the model, LEDs that are not available on the device will not be taken into account.

* ◑ Flasher

VOLTAGE PROTECTION RELAYS USER MANUAL

Technical features:

Operating Voltage (Un)	3 x 220 V AC and Neutral (GRL01, GRL02, GRL03) 3 x 220 V AC (GRL11, GRL12)
Operating Frequency	50 / 60 Hz.
Low Voltage Setting	150 – 210 V AC (GRL01) 270 – 370 V AC (GRL02, GRL03, GRL11, GRL12)
High Voltage Setting	240 – 300 V AC (GRL01) 410 – 510 V AC (GRL02, GRL03, GRL11, GRL12)
Pull / Release Delay (t)	0.1 sn – 20 sn
Relay Output	1N/O, 5A, 1385 VA
Hysteresis	Un x %2
Setting Shape	Potentiometer
Indicator	6 pieces LED
Ambient Temperature	-5°C ; +50°C
Protection Class	IP20
Connection	DIN rail mounting

Table:2

Use of The Device:

Voltage Protection Relays, These are devices used to protect motors and systems against neutral breakage, phase absence, high voltage, low voltage and phase sequence errors.

The "min" knob is used to set the minimum voltage value at which any of the phases can drop and the "max" knob is used to set the maximum voltage value at which any of the phases can rise. When the knob is set to "off" on the scale, the related function is deactivated. With "t.on" the pull-up delay of the relay is set and with "t.off" the release delay of the relay in case of a error is set.

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Selection Table:

Product Name	GRL01	GRL02	GRL03	GRL11	GRL12
Neutral Connection	√	√	√		
Non-Neutral Connection				√	√
Neutral Break Detection		√	√		
3 Phase Use	√	√	√	√	√
Single Phase Use	√				
Phase Sequence Control			√		√
Phase Absence Detection	√	√	√	√	√
High Voltage Control	A	A	A	A	A
Overvoltage Surge Trip Protection	√	√	√	√	√
Low Voltage Control	A	A	A	A	A
Low Voltage Trip Protection	√	√	√	√	√
Adjustable Pull Delay	√	√	√	√	√
Adjustable Switch-on Delay	√	√	√	√	√
Insufficient - Overfeeding Warning	√	√	√	√	√
Neutral - Phase Reverse Connection Warning	√				
Contact Output	1N/O, 5A, 1385 VA	1N/O, 5A, 1385 VA	1N/O, 5A, 1385 VA	1N/O, 5A, 1385 VA	1N/O, 5A, 1385 VA
Dial	Single phase	Three-phase	Three-phase	Three-phase	Three-phase
Feeding	3 Phase-Neutral	3 Phase-Neutral	3 Phase-Neutral	3 Phase	3 Phase

A: Adjustable and closable

Table:3

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Functions

Neutral Break Detection (GRL02, GRL03):

In the event of a neutral disconnection, the relay releases abruptly without waiting for a delay time the LOST error LED lights up. When connection failure occurs, the LOST LED goes out immediately and the relay pulls out when the set pull delay expires.

Phase Absence Detection (GRL01, GRL02, GRL03, GRL11, GRL12):

In the case of a break in any of the phases, the relay releases abruptly without waiting for the delay time, the LOST error LED lights up. When connection failure occurs, the LOST LED goes out immediately and the relay pulls out when the set pull delay expires.

Phase Sequence Control (GRL03, GRL12):

When the phase sequence is detected to be incorrect, the relay releases abruptly without waiting for the delay time, the SEQ error LED lights up. When the phase sequence is corrected, the SEQ LED turns off immediately, and the relay pulls out when the set pull delay time expires.

High Voltage Control(GRL01, GRL02, GRL03, GRL11, GRL12):

The HIGH error LED lights up immediately when any of the phases exceeds the set maximum voltage level, the relay releases at the end of the set release delay. When all phases go below the set level, the HIGH fault LED turns off immediately, the relay pulls out when the set pull-out delay expires. The high voltage control is disabled when the "max" scale is set to the "off" position.

Overvoltage Trip Protection (GRL01, GRL02, GRL03, GRL11, GRL12):

When any of the phases exceeds the voltage level of 1.5xUn, the relay immediately leaves, the HIGH error LED lights up. The HIGH error LED goes off immediately when all the phases go below the set maximum level, the relay pulls out when the set pull delay expires. When the "max" scale is set to the "off" position, the Surge Trip Protection is disabled.

Low Voltage Control(GRL01, GRL02, GRL03, GRL11, GRL12):

When any of the phases goes below the set minimum voltage level, the LOW error LED lights up immediately, the relay leaves at the end of the set release delay. The LOW error LED goes off immediately when all the phases go above the set level, the relay pulls out when the set pull delay expires. the low voltage control is disabled when the ”min“ scale is set to the ”off" position.

Low Voltage Trip Protection (GRL01, GRL02, GRL03, GRL11, GRL12):

When any of the phases falls below 0.5xUn voltage level, the relay releases immediately, the LOW error LED illuminates. When all of the phases are above the set minimum level, the error LED goes off immediately, the relay pulls out when the set pull delay time expires. When the "min" scale is set to the "off" position, the Low Voltage Trip Protection is disabled.

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Adjustable Pull and Release Delay (GRL01, GRL02, GRL03, GRL11, GRL12):

The" t.on" scale is used to set the pull-up delay of the relay and the "t.off" scale is used to set the release delay of the relay in case of an error.

Insufficient / Overfeed Warning (GRL01, GRL02, GRL03, GRL11, GRL12):

When the average of the three phase inputs feeding the device falls below "0.5xUn", the device gives an insufficient supply warning by flashing the LEDs on the device once a second (See Table 1). The relay is released without delay.

When all of the phases feeding the device exceed "1.5xUn", the LEDs on the device are turned on and off 4 times per second and an overfeed warning is given (See Table 1).

Phase-Neutral Reverse Connection Warning (GRL01):

When one of the phases is connected to the neutral input and the neutral is connected to the phase input, the device gives a reverse connection warning by turning on and off the LEDs on it 4 times per second (See Table 1). The relay is released without delay.

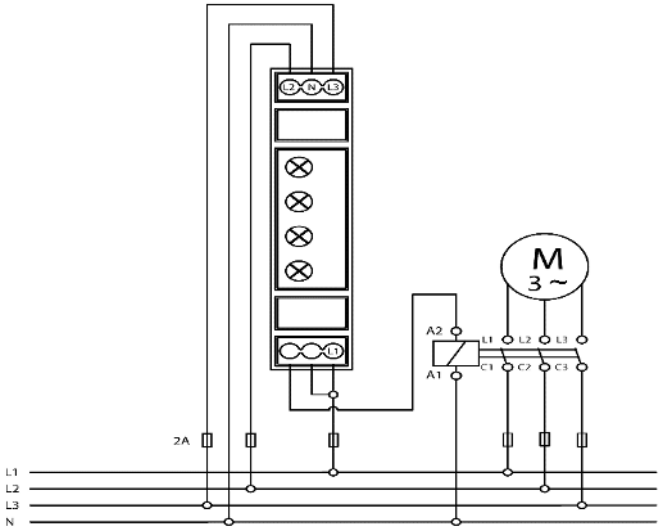
In-Device Error Alert:

When the device detects an error in its hardware, it gives an in-device error warning by turning the LEDs on and off once per second (See Table 1). The relay is released without delay.

Connection Diagram:

Note: Devices without neutral have no N connection.

Use in 3-Phase Systems



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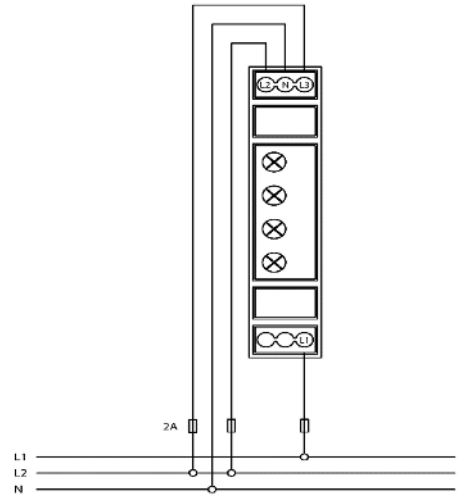
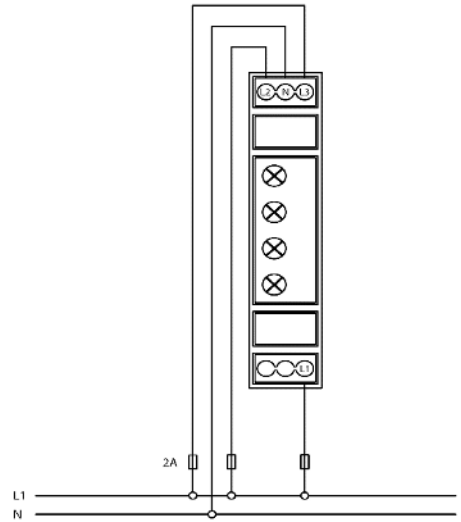
Use in 2-Phase Systems (for GRL01)



Use in Single-Phase Systems (for GRL01)



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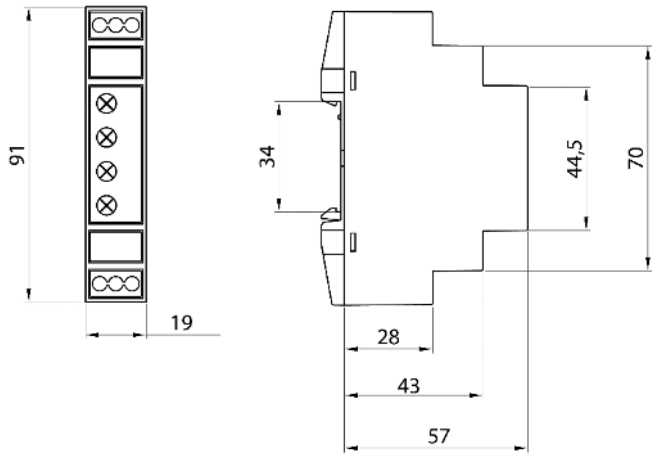
Product Size(mm):



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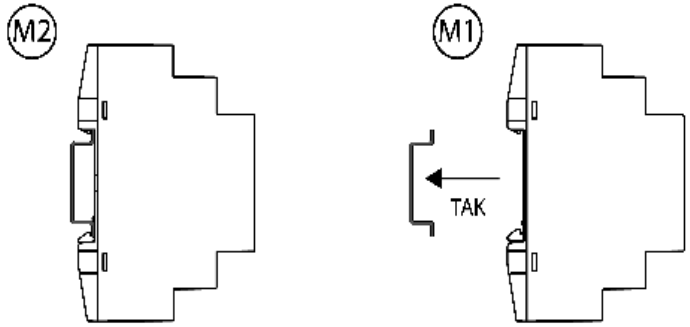
Product Installation:

Installation of Voltage Protection Relay



Disassembly of Voltage Protection Relay