Voltage Protection Relay
User Manual



ADDRESS: Ikitelli OSB Mah. Cevre 14. Blok Sok. Telas Blok Dis Kapi No: 1 Kat: 1-2 Basaksehir/Istanbul

Phone: +90 212 438 80 24
Fax: +90 212 438 80 25

info@gruparge.com

V.25.1

CONTENTS

PROPER USE AND SAFETY REQUIREMENTS 3
1. INTRODUCTION 4
1.1. General Features 4
1.2. Technical Features 4
1.3. LED Descriptions 5
1.4. LED Warnings 5
1.5. Use of the Device 6
1.6. Selection Table 6
1.7. Functions 7
1.8. Technical Drawing 7
1.9. Product Assembly and Disassembly 8
1.10. Connection Diagram 8

PROPER USE AND SAFETY REQUIREMENTS



Cut all the power when connecting and disconnecting the device to a panel.



Do not clean the device with a solvent or similar material. Only use a dry cloth.



Please do not intervene to the device when a technical problem is encountered and get in contact with a technical service within the shortest time.



If the warnings are not taken into account, our company or the authorized dealer shall not be held responsible for the negative consequences.



Do not dispose in the trash, the device must be delivered to the collection centers (electronic device recycling centers). It should be recycled or disposed of without harming human health and environment.



The installation, assembly, activation and operation of the device should be done and used by only expert professionals and in accordance with safety regulations and instructions.

1. INTRODUCTION

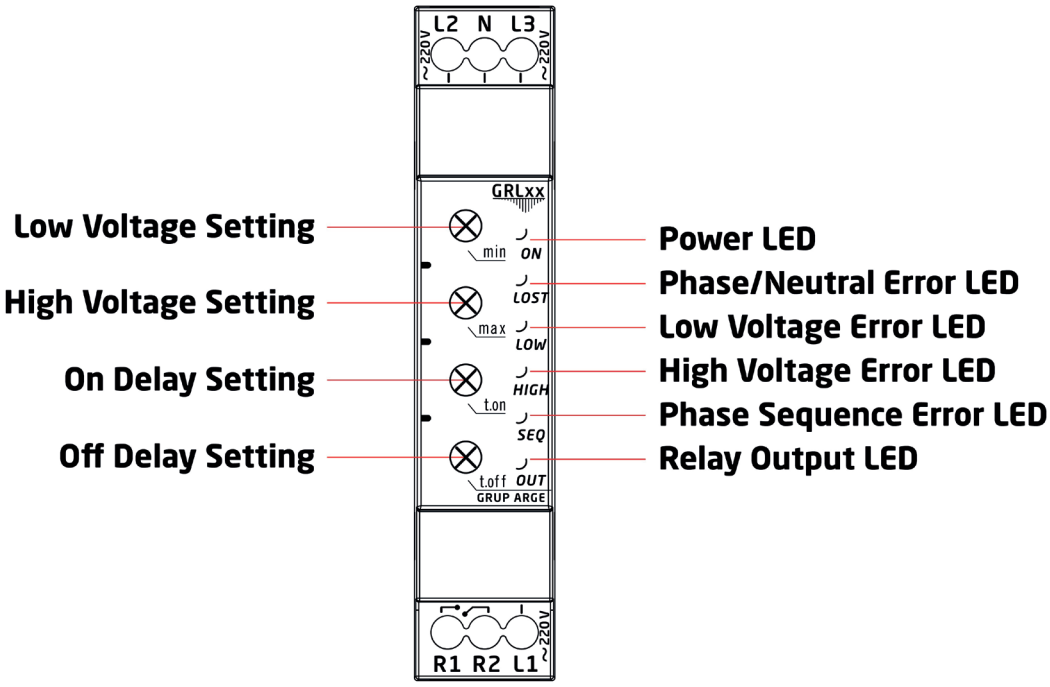
1.1. General Features

Voltage protection relay is a safety device in electrical systems that interrupts the circuit to protect equipment and devices when the voltage goes beyond the specified limits. These relays prevent damage to sensitive components in the system by detecting low or high voltage conditions. It is critical to ensure electrical safety and continuity.

1.2. Technical Features

Operating Voltage:	220 V AC / 3 x 380 V AC + N (GRL01) (Single Phase Compatible) 3 x 380 V AC + N (GRL02, GRL03) 3 x 380 V AC (GRL11, GRL12)
Connection Type:	(1P2W - Single Phase) / (3P4W - Three Phase + Neutral) - (GRL01) (3P4W - Three Phase + Neutral) - (GRL02, GRL03) (3P3W - Three Phase without Neutral) - (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:	0.1 sec. – 20 sec.
Relay Output:	1 × N/O, 5 A @ 250 VAC
Hysteresis:	Un x %2
Adjustment:	Potentiometer
Indicator:	6 LEDs
Ambient Temperature:	-5°C to +50°C
Protection Class:	IP20
Mounting:	DIN Rail

1.3. LED Descriptions



Note: Devices without neutral have no N connection.

1.4. LED Warnings

ON LED	LOST LED	LOW LED	HIGH LED	SEQ LED	OUT LED	
◐	◐	◐	◐	◐	○	**Supply Voltage Too Low Warning** (LEDs flash once per second)
○	◐	◐	◐	◐	○	**Internal Device Error** (LEDs flash once per second)
◐	◐	◐	◐	◐	○	**Supply Voltage Too High Warning** (LEDs flash 4 times per second)
○	◐	◐	◐	◐	○	**Neutral / Phase Reverse Connection Warning** (LEDs flash 4 times per second)

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

Table:1

* ◐ Flasher

1.5. Use of the Device

Voltage Protection Relays;

Voltage Protection Relays are devices used to protect motors and systems against neutral break, phase absence, high voltage, low voltage and phase sequence faults. With the “min” adjustment knob, the minimum voltage value at which any of the phases can fall, and with the “max” adjustment knob, 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, with “t.off” the release delay of the relay in case of a fault is set.

1.6. 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	√				
Relay Output	1 x N/O, 5 A @ 250 VAC	1 x N/O, 5 A @ 250 VAC	1 x N/O, 5 A @ 250 VAC	1 x N/O, 5 A @ 250 VAC	1 x N/O, 5 A @ 250 VAC
Dial	Single Phase	Three-Phase	Three-Phase	Three-Phase	Three-Phase
Supply	3 Phase-Neutral	3 Phase-Neutral	3 Phase-Neutral	3 Phase	3 Phase

A: Adjustable and closable.

Table:2

1.7. 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.

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).

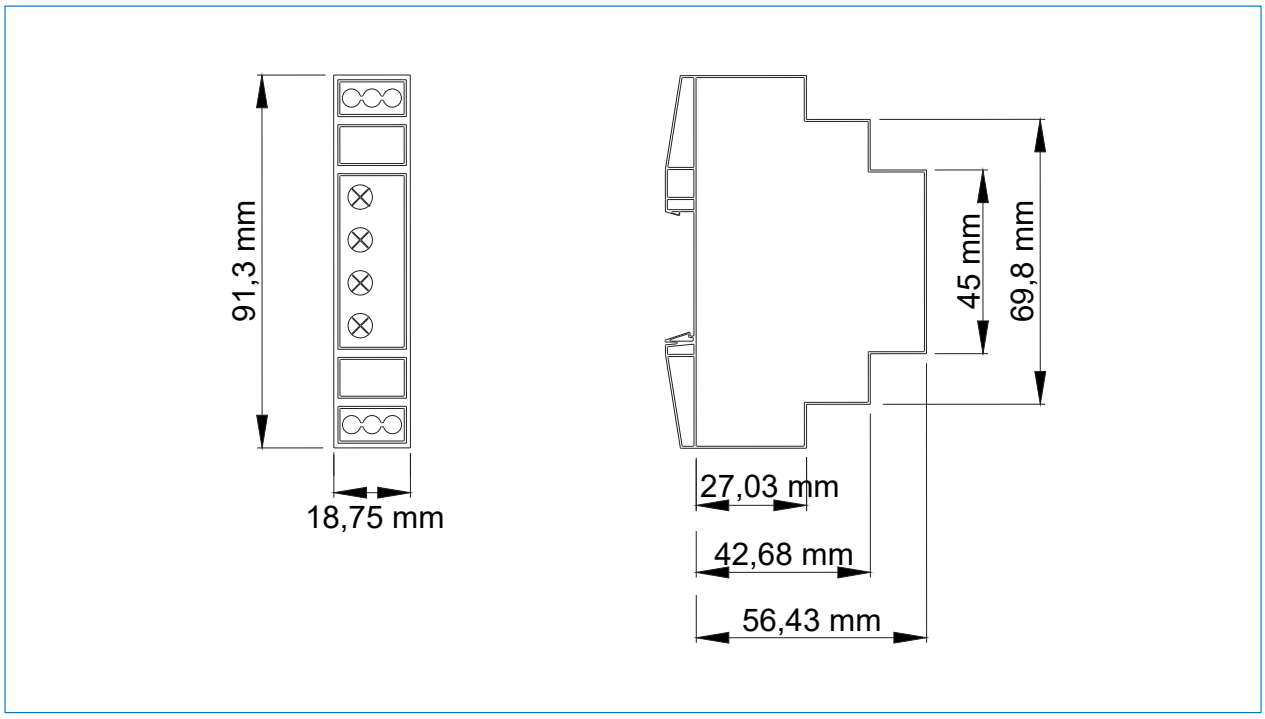
Phase-Neutral Reverse Connection Warning (GRL01):

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.

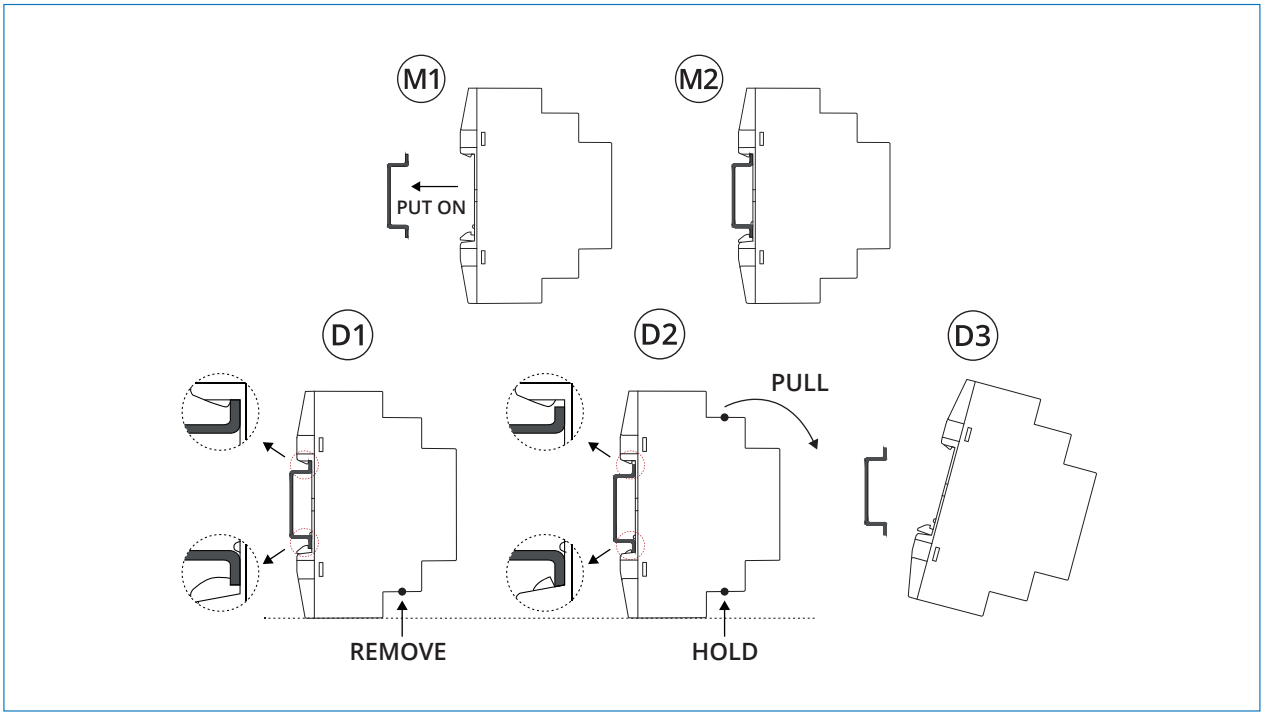
Internal Device Error Warning:

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.

1.8. Technical Drawing



1.9. Product Assembly and Disassembly



1.10. Connection Diagram

