



Voltage and frequency control relay PMVF10



moduLo

Lovato
electric
100% electricity

Voltage and frequency monitoring relay



PMVF10

moduLo



| | | | |
|------------|-----------------------------------|-------------|--------|
| Order code | Rated voltage to be controlled Ue | Qty per pkg | Weight |
| | [V] | n° | [kg] |

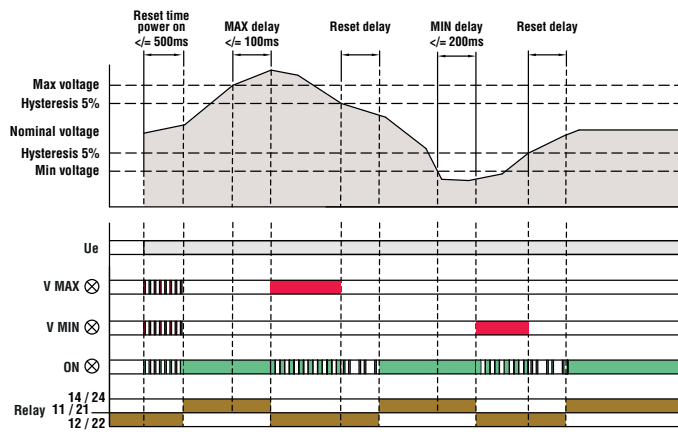
Three-phase low-voltage system, with or without neutral. Compatible for single-phase low-voltage system. Minimum and maximum AC voltage and frequency plus ROCOF.

| | | | |
|---------------|--------------------|---|-------|
| PMVF10 | 230/400VAC 50Hz | 1 | 0.254 |
|---------------|--------------------|---|-------|

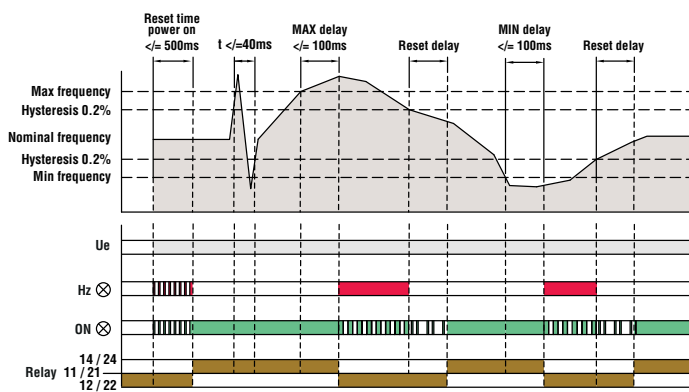
Status indication table

| Anomaly | Green LED "ON" | Red LED "Vmin" | Red LED "Vmax" | Red LED "Hz" | Relay output 1 and 2 |
|----------------------------|--------------------|--------------------|--------------------|--------------------|----------------------|
| None | Constantly lighted | Switched off | Switched off | Switched off | Energised |
| Min/max frequency or ROCOF | Flashing | Switched off | Switched off | Constantly lighted | De-energised |
| Voltage <Vmin | Flashing | Constantly lighted | Switched off | Switched off | De-energised |
| Voltage >Vmax | Flashing | Switched off | Constantly lighted | Switched off | De-energised |

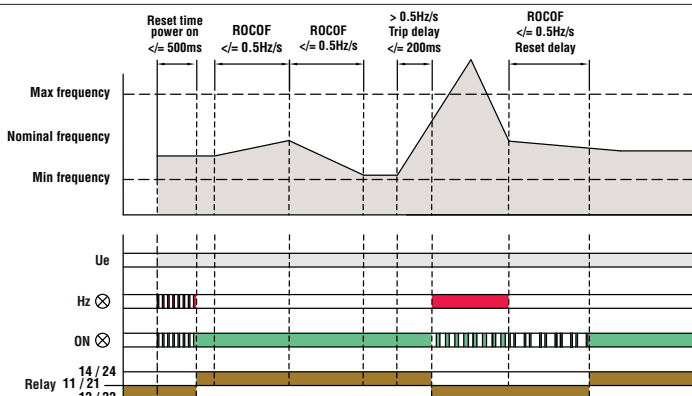
Function diagram of voltage tripping



Function diagram of frequency tripping



Function diagram of ROCOF tripping



General characteristics

The monitoring relay PMVF10 is designed and developed to satisfy requirements of the local power authority (ENEL guide edition 2.1 of 12/2010). The authority imposes that the following automatic controls be done whenever an independent power source (e.g. wind turbine or photovoltaic systems, diesel generating set, etc.) is connected in parallel with the electrical grid (local low-voltage utility):

- Limits of minimum and maximum voltage values
- Limits of minimum and maximum frequency values
- Limit of the Rate Of Change Of Frequency (ROCOF).

When at least one of these limits are not respected, abnormal conditions need to be signalled using a contact.

Typically, the contact is used to isolate the independent power source from the electrical grid.

The following protections are available:

- Maximum voltage
- Minimum voltage
- Maximum frequency
- Minimum frequency
- ROCOF.

TRMS (True-rms) measurements of this relay allow to obtain a correct operation even in presence of harmonic voltages.

The device has fixed tripping thresholds for minimum and maximum voltage while those for frequency can be selected between two predefined values using a rotary switch. A reset delay is adjustable by potentiometer.

Operational characteristics

- Self powered by the system to control
- Compatible for:
 - Three-phase systems (400VAC 50Hz), with or without neutral
 - Single-phase systems (230VAC 50Hz)
- TRMS measurements
- 2 relay outputs, each with one changeover contact, rated 8A 250VAC in AC1
- Modular DIN 43880 housing (3 module)
- Degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

PROTECTIONS

Protection for maximum voltage:

- Threshold $\ge 1.13U_e$ (fixed)
- Tripping time $\le 0.1s$ (fixed).

Protection for minimum voltage:

- Threshold $\le 0.825U_e$ (fixed)
- Tripping time $\le 0.2s$ (fixed).

ADJUSTMENTS

"Mode"

Multifunction rotary switch:

- Control of phase or phase-to-phase voltage values
- Frequency threshold ± 0.3 or $\pm 1Hz$
- ROCOF ($>0.5Hz/s$) ON-OFF.

"Reset delay"

Resetting time 0.1-30s.

STATUS INDICATIONS

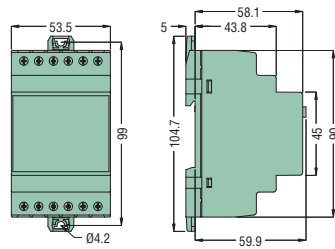
- 1 green LED for system within limits (flashing when out of limits)
- 3 red LEDs for minimum and maximum voltage, minimum and maximum frequency and ROCOF.

Certifications and compliance

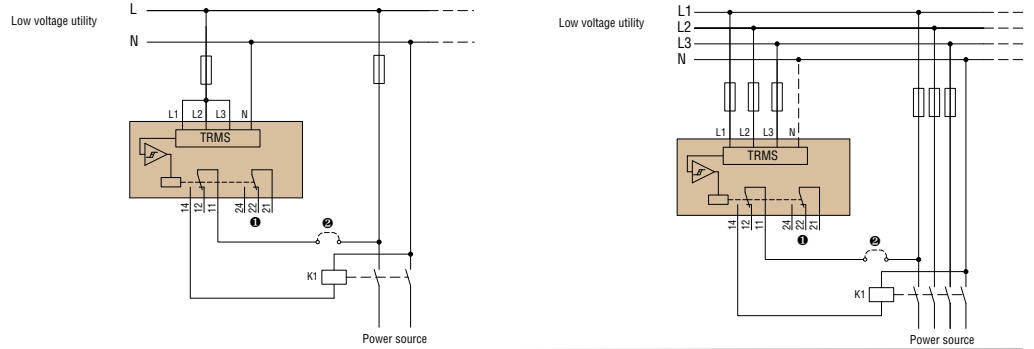
Certifications obtained: local power authority (ENEL Guide, edition 2.1 10/2010).

Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 610006-3.

Dimensions [mm]



Wiring diagrams



- ❶ Contact available for signalling, contactor relay or inverter stop.
- ❷ Remote disconnection device.

Technical characteristics

| TYPE | PMVF10 |
|--|---|
| TRIPPING THRESHOLDS FOR VOLTAGE | |
| Tripping for maximum voltage | 113% of rated voltage U_e |
| Tripping for minimum voltage | 82.5% of rated voltage U_e |
| Voltage threshold hysteresis | 5% |
| Tripping delay for maximum voltage | ≤ 0.1 s |
| Tripping delay for minimum voltage | ≤ 0.2 s |
| TRIPPING THRESHOLDS FOR FREQUENCY | |
| Frequency threshold tripping | ± 0.3 Hz or ± 1 Hz configurable |
| Frequency threshold hysteresis | 0.2% |
| Tripping delay | ≤ 100 ms |
| Transient immunity time | ≥ 40 ms |
| ROCOF threshold | ≥ 0.5 Hz/s |
| ROCOF hysteresis | 25 mHz/s |
| ROCOF tripping delay | ≤ 200 ms |
| ADJUSTABLE DELAYS | |
| Reset delay | 0.1-30 s |
| AUXILIARY SUPPLY | |
| Rated supply voltage (U_s) | 230VAC / 400VAC |
| Operating range | 0.7-1.3 U_e |
| Rated frequency | 50 Hz |
| Power consumption/dissipation max | 27VA / 1.9W |
| Resetting | Automatic |
| Reset time at power up | ≤ 500 ms |
| RELAY OUTPUTS | |
| Number of relays | 2 |
| Contact arrangement | 1 changeover each |
| Rated operational voltage | 250VAC |
| Maximum switching voltage | 400VAC |
| Conventional free air thermal current (I_{th}) | 8A |
| Designation per IEC/EN 60947-5-1 | B300 |
| Electrical life (with rated load) | 10^5 cycles |
| Mechanical life | 30×10^6 cycles |
| CONNECTIONS | |
| Maximum tightening torque | 0.8 Nm (7 lbin) |
| Conductor cross section min...max | 0.2...4.0 mm ² (24...12 AWG) |
| INSULATION (input-output) | |
| Rated insulation voltage | 400V |
| AMBIENT CONDITIONS | |
| Operating temperature | -20...+60°C |
| Storage temperature | -30...+80°C |
| HOUSING | |
| Material | Self-extinguishing polyamide |



2011



Fuse holders
1000 VDC



DC fuses 10x38



Modular digital multimeters



Flush mount digital multimeters
and power analyzers



Energy meters

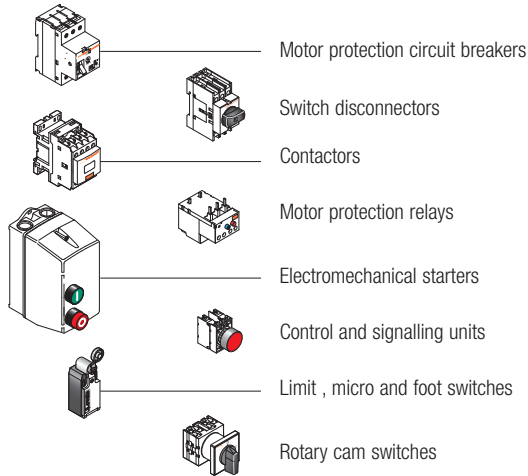


Switching battery chargers

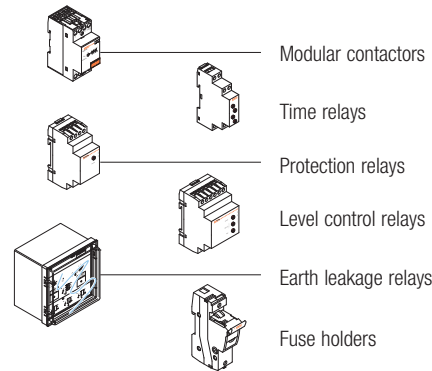


100% electricity

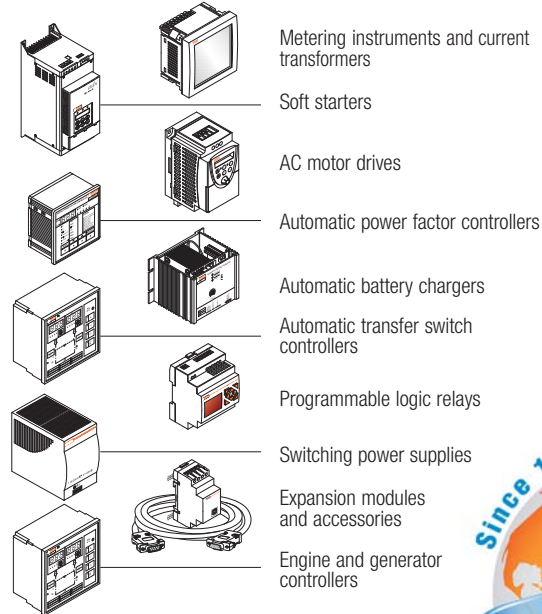
Planet Switch



Planet Din



Planet Logic



www.LovatoElectric.com

LOVATO ELECTRIC S.P.A.
CONTROL SOLUTIONS FOR INDUSTRY
VIA DON E. MAZZA, 12 - 24020 GORLE (BERGAMO) ITALY
Tel. +39 035 4282111 Fax +39 035 4282200
E-mail: info@LovatoElectric.com

Sales department: Tel. +39 035 4282354 - Fax +39 035 4282400

LOVATO Electric offices in the world

United Kingdom
LOVATO (UK) LTD
Tel. +44 8458 110023
www.Lovato.co.uk

Czech Republic
LOVATO S.R.O.
Tel. +420 382 265482
www.LovatoElectric.cz

Germany
DELTEC LOVATO GmbH
Tel. +49 7237 1733
www.DeltecLovato.de

USA
LOVATO ELECTRIC INC
Tel. +1 757 545 4700
www.LovatoUsa.com

Spain
LOVATO ELECTRIC S.L.U.
Tel. +34 93 7812016
www.LovatoElectric.es

Canada
LOVATO ELECTRIC CORPORATION
Tel. +1 450 681 9200
www.Lovato.ca

Poland
LOVATO ELECTRIC SP. Z O.O.
Tel. +48 71 7979010
www.LovatoElectric.pl

Mexico
LOVATO ELECTRIC DE MEXICO, S.A. DE C.V.
Tel. +52 555 3415662
www.LovatoElectric.com.mx



The products described in this publication are subject to be revised or improved at any moment. Catalogue descriptions and details, such as technical and operational data, drawings, diagrams and instructions, etc., do not have any contractual value. In addition, products should be installed and used by qualified personnel and in compliance with the regulations in force for electrical systems in order to avoid damages and safety hazards.