

• DC, AC voltage and frequency monitoring (5 Hz...50 Hz...60 Hz...70 Hz - 400 Hz)

RPL23 : 50 Vac-dc..... 800 Vac 5 Hz to 70 Hz and 1200 Vdc

RPL23-BT : 12 Vac-dc.....250V ac 5 Hz to 70 Hz and 375 Vdc

True RMS measurement (AC+DC)

Monitor : Undervoltage, overvoltage, phase asymmetry, phase loss

Under frequency, over frequency

For single phase, three-phase networks or DC voltage

compatible with variable speed drive (PWM filter embedded)

• Phase sequence control (option)

• RPL23uC: relay for short voltage dips detection

• RPL23peak: relay for peak voltage detection

• RPL23Ho : relay for zero sequence voltage detection

• RPL23F : relay for frequency monitoring up to 400 Hz

• Display Voltage and default indication for fast diagnosis

• Fully configurable with pushbutton under the front face

• Power supply universal 20... 265 Vac-dc or 100... 400 Vac-dc

• SIL2 option in accordance to IEC 61508



Functional security data:

component type B , HFT = 0

$\lambda f = 239 \text{ fit}$, DC = 87.8 % , PFH : 16 to 21 fit , SFF = 92 %



The network control relay RPL23 provides a maximal protection for machines and systems. It detects network and voltage defects in order to avoid any serious and costly breakdown.

Characteristics:

Phase loss or phase failure detection

Under-voltage and over-voltage detection

Under-frequency and over-frequency detection

Phase symmetry control

Time delay and rearm behaviour configurable

Display of network voltage and fault type

Defaults indication by LED

Option : Phases sequence control

Auxiliary power supply : 20...265 Vac/dc or 100...440Vac/dc

Details of operation:

The effective voltages L1N, L2N, L3N are measured and monitored in real time. For networks without neutral, an artificial neutral point is recreated in the relay.

The **RPL23Ho** model computes the rms value of the zero sequence

voltage V_0 with the following equation : $\frac{1}{3} \sqrt{\int (L1N+L2N+L3N)^2}$ (quadratic average of the sum of periodic voltages of each phases). The output relays are activated in normal operation conditions, they are released on assigned fault detection.

An internal default cause the output relays release.

Phase failure detection, even in case of connected loads voltage feedback, by measuring the phase asymmetry. (A motor which continues to turn despite of a phase failure, can regenerate a voltage)

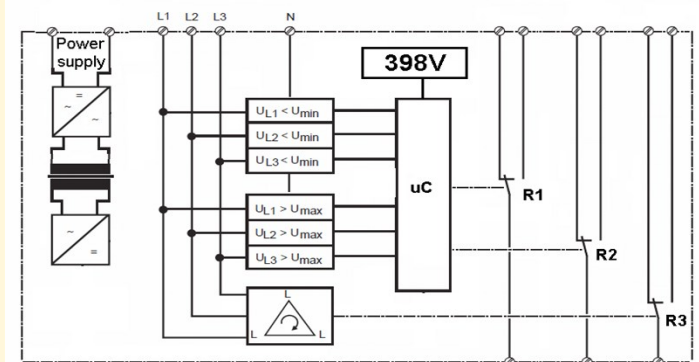
Feature:

- Hinged front face (access to configuration buttons)
- DIN rail mounting
- Pluggable screw terminal blocks (section up to 2.5 mm2)
- Conformal coating, protection rating IP20 (enclosure / terminal blocks)
- Flammability : UL94V-0

Application:

- Monitoring of protection tripping (fuse).
- Failure of control voltage.
- Single phase operation for a three-phase motor (overheating).
- Strongly asymmetrical load detection.
- Network collapse detection.
- Protection against destruction due to overvoltage.
- Speed drive (frequency variation).

Synoptic:



Version and order code:

[Request a quote](#)

- RPL23** : 2 electromechanical output relays, changeover contact auxiliary power supply 20...265Vac/dc or 12...30Vdc
- RPL23-bt**: Low voltage version: 12Vac ... 150Vac (L-N)
- RPL23(bt)/Po**: With phase order detection function
- RPL23uC**: Short voltage dips detection (5ms mini)
- RPL23F**: Specific version for frequency detection (5Hz...440Hz)
- RPL23peak**: Version for peak voltage detection (1ms mini)
- RPL23Ho** : Version for zero sequence voltage detection
- RPL23Ho/Po** : Zero sequence voltage detection with phase order
- RPL23-400** : 400 Hz signals version (without frequency measurement)
- RPL23-A** : Self powered version (single phase only)

- option **-HV** Auxiliary power supply 100...440Vac/dc
- option **-RS** Solid state relay output (N.O contact). Switching capacity 60V 0.5A or 400V 0.1A (to define) response time < 5 ms
- option **-RAu** Gold plated contact for relay output (load mini 50mW)
- option **/SIL2** SIL2 version in accordance to IEC 61508

MEASURE INPUT

TYPE	RANGE	ACCURACY
RPL23 Standard version		
phase-to-phase rated voltage:	50 ... 800 Vac, 1200 Vdc +/-0.5% (sine)	
(The accuracy can rise up to 1.5% function of the harmonic ratio)		
maximum measurable voltage:	1100 Vac, 1600 Vdc	
Frequency detection:	5 ... 70 Hz	+/-0.2Hz
RPL23-bt : Low voltage version		
phase-to-phase rated voltage:	12 ... 250 Vac 375 Vdc	+/-0.5%
(The accuracy can rise up to 1.5% function of the harmonic ratio)		
maximum measurable voltage:	275 Vac, 400 Vdc	
Frequency detection:	5 ... 70 Hz	+/-0.2Hz
Adjustable measure range (standard version)		
Undervoltage : - 99 % ; overvoltage: + 99 %		
under frequency : 5Hz ; over frequency: 70 Hz +/- 1 Hz @50 Hz		
scale from 2% to 198% of the rated voltage		
wiring : 3 wires (L1, L2, L3) + neutral (optional)		
Drawn current : < 1 mA		
Input impedance: > 1 Mohms (>250K for low voltage version)		

- RPL23uC:** Dips and short interruptions detection (5ms mini)
- RPL23F:** Frequency fault detection 5Hz...440 Hz +/-0.2Hz
- RPL23peak:** Peak voltage detection (1ms mini)

ENVIRONMENT

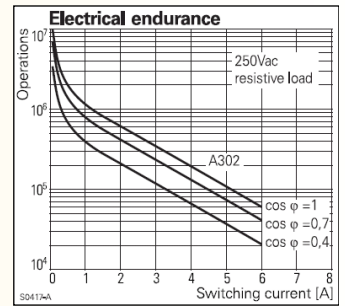
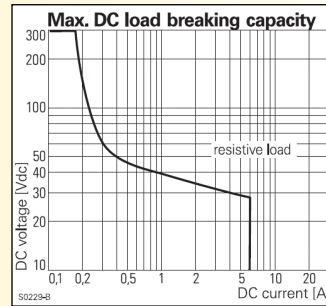
Operating temperature	-20 to 60 °C
Storage temperature	-40 to 85 °C
Humidity	95 % not condensed
Weight	150 g
Protection rating	IP 20
Flammability	UL94V-0
Dielectric strength	2500 Vrms continuous
(Measure input/Power supply/Contacts)	
Shock CEI 60068-2-27 (operational)	5 G / 11 ms
Bump CEI 60068-2-29 (transportation)	30 G / 6 ms
Vibrations CEI 60068-2-6 (operational)	1 G / 10 - 150 Hz
Vibrations CEI 60068-2-6 (transportation)	2 G / 10 - 150 Hz
MTBF (MIL HDBK 217F)	> 4 200 000 Hrs @ 25°C
Life time	> 200 000 Hrs @ 30°C

AUXILIARY POWER SUPPLY

standard:	20 ... 265 Vac-dc, 2 VA
Low voltage:	12 ... 30 Vdc, 3 VA
High voltage:	100 ... 440 Vac-dc, 2.5 VA (RPL23-HV)

OUTPUT RELAY

free potential changeover contact	2500Vac
Insulation	6000V
Impulse withstand voltage (1.2 / 50 µs)	440 Vac / 6Aac, 1500 VA
AC Switching power	300 Vdc / 0.15 Adc
DC Switching power	lifetime (nbr of operations)
Load type	1x10 ⁵
5 A, 250 Vac, resistive	2x10 ⁵
2 A, 250 Vac, cos phi 0.4	2x10 ⁵
1 A, 24 Vdc, L / R=48 ms	7x10 ⁴
6 A, 250 Vac, resistive	2x10 ⁵
3 A, 250 Vac, cos phi 0.4	0.5...600 s (standard version)
Programmable response time:	1%
Hysteresis:	2.5 ms (RPL23uC and RPL23peak version)
Relay latency time:	

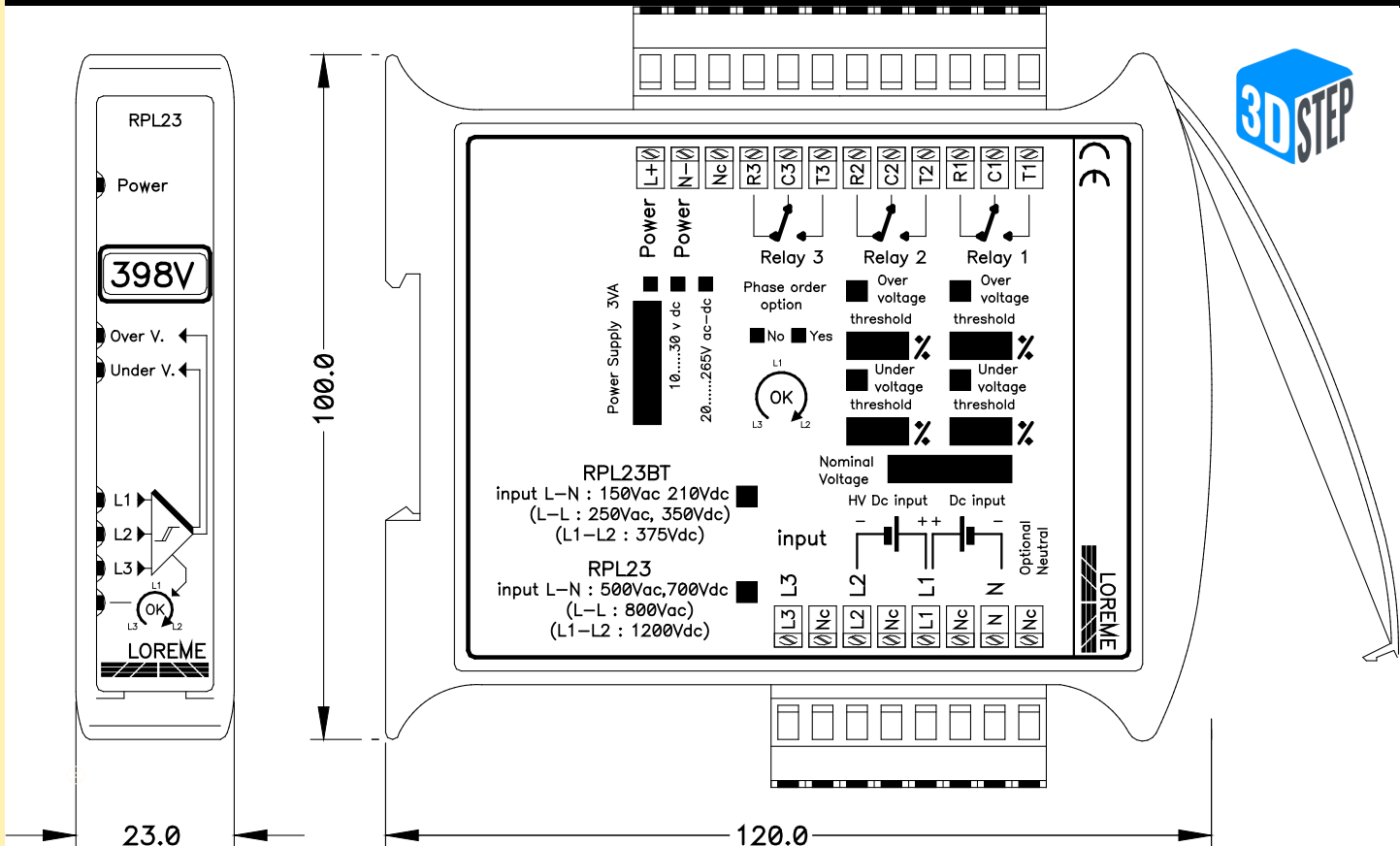


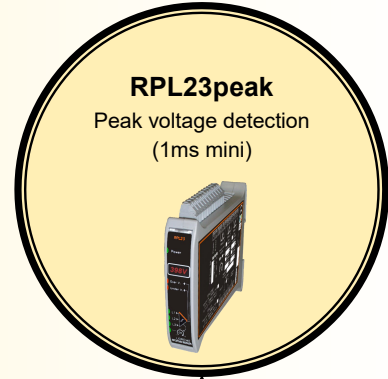
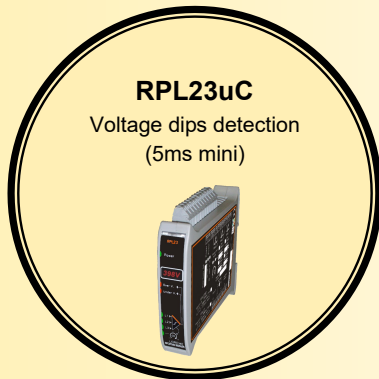
Electromagnetic compatibility 2014/30/UE / Low Voltage Directive 2014/35/UE

Immunity standard for industrial environments EN 61000-6-2		Emission standard for industrial environments EN 61000-6-4
EN 61000-4-2 ESD	EN 61000-4-8 AC MF	EN 55011 group 1 class A
EN 61000-4-3 RF	EN 61000-4-9 pulse MF	
EN 61000-4-4 EFT	EN 61000-4-11 AC dips	
EN 61000-4-5 CWG	EN 61000-4-12 ring wave	
EN 61000-4-6 RF	EN 61000-4-29 DC dips	



WIRING AND OUTLINE DIMENSIONS:

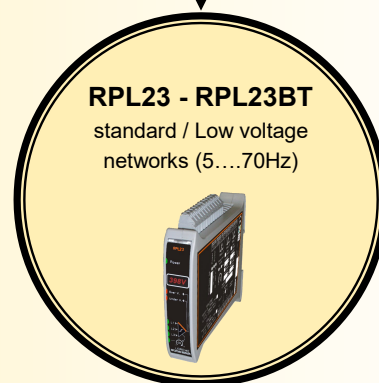
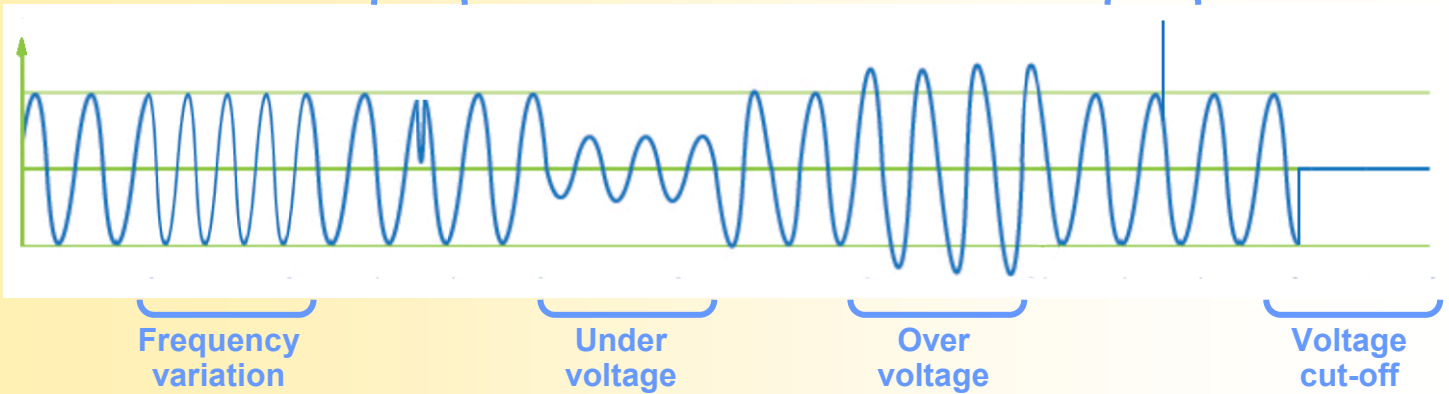




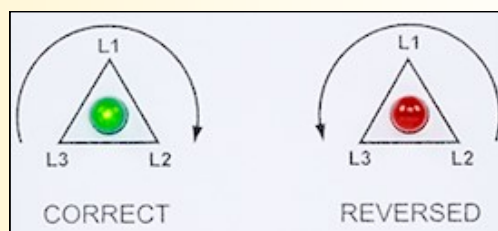
*Choice of protection
relay in function of
disturbance type to be
detected*

Short
voltage dips

Voltage
transient



RPL23/Po
with phase order detection function



The RPL23Ho is designed to monitoring the zero sequence voltage on three-phase networks with isolated or with high impedance neutral. This multi-functions relay monitor the phase and earth defaults.

The RPL23Ho compute the RMS value of zero sequence voltage V_0 from the following formula :

$$\frac{1}{3} \sqrt{\int (L_1N + L_2N + L_3N)^2} \quad (\text{quadratic average of the sum of periodic voltages of each phases}).$$

The output relays are activated in normal conditions operation.

The output relays are released on an assigned fault detection (zero sequence overvoltage).

