

- **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)

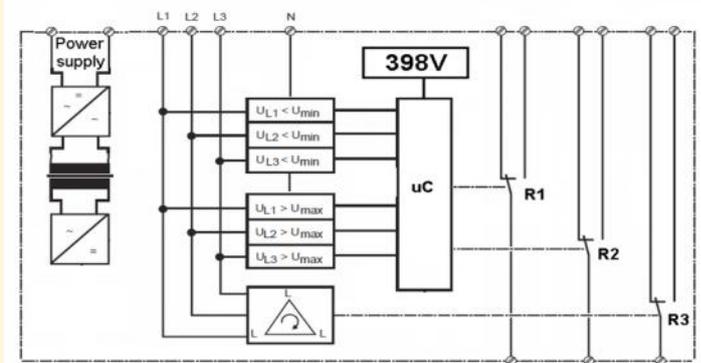
**Feature:**

- 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 **/SIL2** SIL2 version in accordance to IEC 61508

**MEASURE INPUT**

TYPE	RANGE	ACCURACY
<b>RPL23 Standard version</b>		
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
<b>RPL23-bt : Low voltage version</b>		
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**

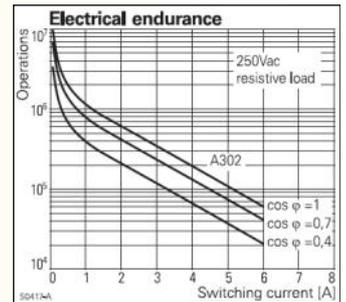
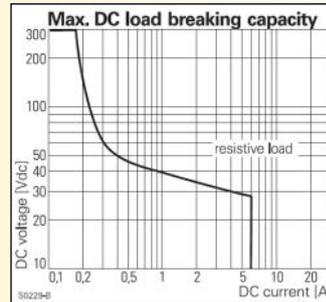
Operating temperature	-20 to 60 °C
Storage temperature	-40 to 85 °C
Humidity	95 % not condensed
Weight	150 g
Protection rating	IP 20
Flammability	UL94V-0
Dielectric strength	2500 Vrms continuous
(Measure input/Power supply/Contacts)	
Shock CEI 60068-2-27 (operational)	5 G / 11 ms
Bump CEI 60068-2-29 (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**

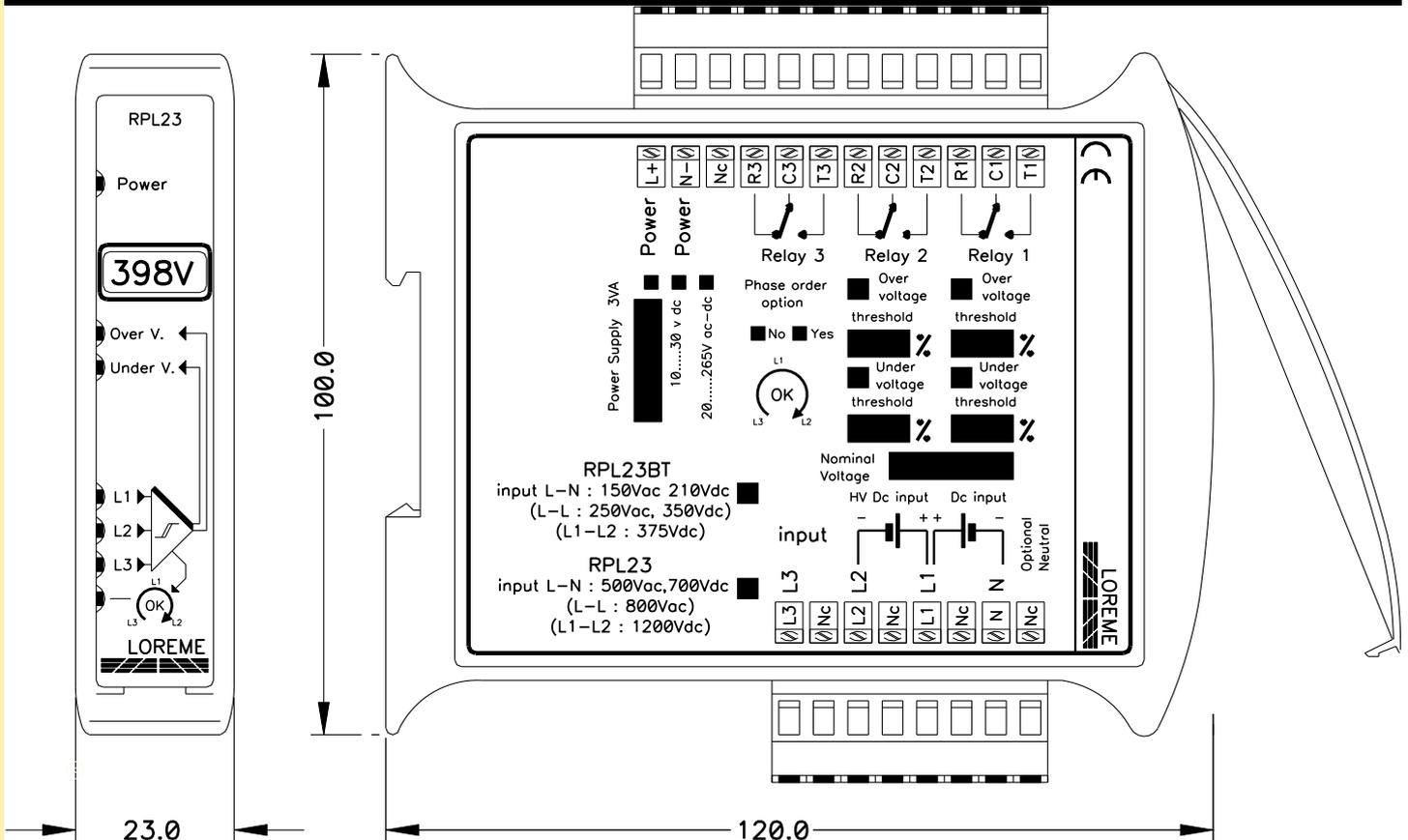
free potential changeover contact	2500Vac
Insulation	6000V
Impulse withstand voltage (1.2 / 50 µs)	440 Vac / 6Aac, 1500 VA
AC Switching power	300 Vdc / 0.15 Adc
DC Switching power	lifetime (nbr of operations)
Load type	1x10 <sup>5</sup>
5 A, 250 Vac, resistive	2x10 <sup>5</sup>
2 A, 250 Vac, cos phi 0.4	2x10 <sup>5</sup>
1 A, 24 Vdc, L / R=48 ms	7x10 <sup>4</sup>
6 A, 250 Vac, resistive	2x10 <sup>5</sup>
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:	

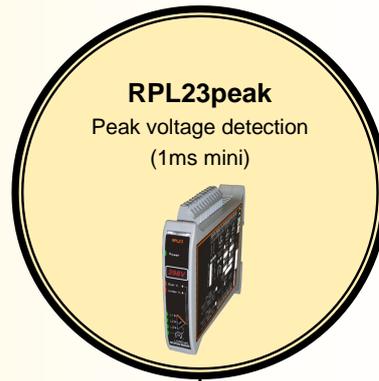
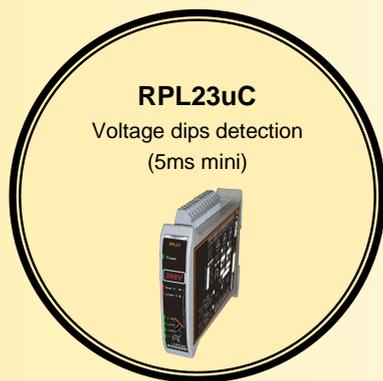


**Electromagnetic compatibility 2014/30/UE / Low Voltage Directive 2014/35/UE**

Immunity standard for industrial environments		Emission standard for industrial environments
EN 61000-6-2		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:**

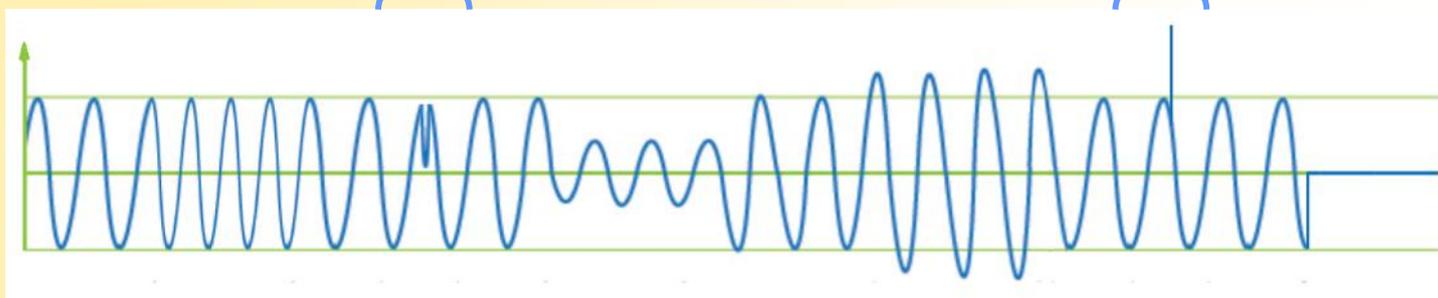




*Choice of protection  
relay in function of  
disturbance type to be  
detected*

Short  
voltage dips

Voltage  
transient

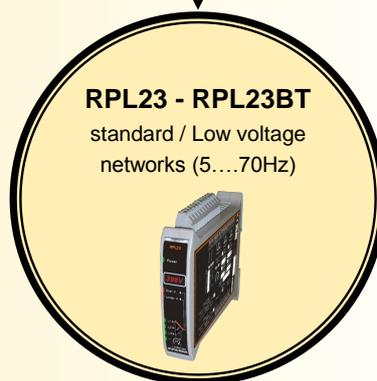


Frequency  
variation

Under  
voltage

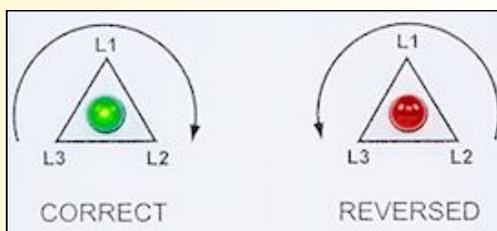
Over  
voltage

Voltage  
cut-off



**RPL23/Po**

with phase order detection function



# Zero sequence voltage protective relay



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).

