Inverse-time thermal protection and overcurrent protection relay for DC current

RPS23

- ***All types of protection curves***

  Constant time, inverse time

  very inverse time or extremely inverse time curves ...

- ***1 , 2 , 3 or 4 relay outputs***
- ***Measure display (10 000 pts)***

  Configuration on front face

- ***Option: 1 or 2 isolated analog outputs***

  option: measure converter function

- ***Universal power supply***
- ***Option SIL2*** *According to IEC 61508*

RPS23 is a thermal protection relay for direct current, associated with a standard current shunt (provided in option), it is able to measure all intensity. All protection coefficients are freely settable by user, allowing to meet all loads type. In option, RPS23 can be equipped with one or two isolated analog outputs to ensure the measure converter function.

DESCRIPTION :

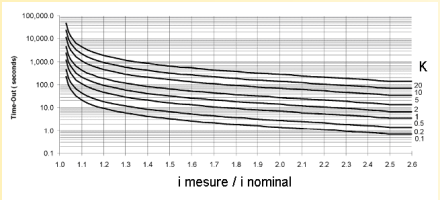
Input :

- Voltage (max : 2000mV) from the measure shunt.

Thermal protection :

- The device continuously calculates with the current measurement, the thermal image of load, allowing to have an alarm and to shutdown power supply in case of overheating.

Curve type, to thermal protection with reverse time



Front face :

- 1 green Led (power supply).
- a 4 digits Led display for electric current in load.
- 2 pushbuttons for device setting and configuration.
- 4 red Leds to controlling the state of relays.

Relays:

- Up to 4 relay (2 changeover contact relay and 2 NO).
- Security, hysteresis and delay individually adjustable on each relay (on tripping and on release).
- R1 and R2 relays provide the thermal protection
- R3 relay signals an exceeding of nominal value current.
- R4 relay is assigned to watchdog normally closed, it indicates a problem on the product or a breaking with the shunt link.

Output : (option)

- 1 or 2 isolated analog outputs. Individually configurable in current or voltage :
  0 ... 4 ... 20 mA or 0...1...5...10 V; ...
- response time and security value adjustable for each output.

Feature:

- 23 mm box width, DIN rail mounting (symmetrical)
- pluggable screw terminal blocks (2.5mm²)
- universal switching power supply
- conformal coating.
- update of firmware via the serial link
- 3 ways galvanic isolation input / outputs / power supply

Operational safety data:
Type B component, HFT = 0
λf = 239 fit , DC = 87.8 %, PFH : 16 fit
SFF = 93.3 % (converter with 2 analog outputs)
SFF = 90.8 % (2 analog outputs + 4 thresholds)

SIL 2 — Safety Integrity Level — IEC 61508 / IEC 61511

Protection algorithm :

- The table below gives algorithms used for thermal protection (tripping time and drop time)
The coefficients : K , a , b , c , R are given for information according to reference standards and remains freely configurable by user.
By default, the product is delivered with normally inverse time curve.

Factory default value output

Triggering time characteristics

Triggering time characteristics	Constants and equations (t in s)			
(k = 0.01...10.00)	a	b	c	R
Constant time			t = K	
According ANSI/IEE C37.112	Triggering			Drop Time
Moderately inverse	0.0515	0.0200	0.1140	4.85
Very inverse	19.6100	2.0000	0.4910	21.60
Extremely inverse	28.2000	2.0000	0.1217	29.10
According to ANSI	Triggering			Drop Time
Normally inverse	8.9341	2.0938	0.17966	9.00
Short time inverse	0.2663	1.2969	0.03393	0.50
Long time inverse	5.6143	1.0000	2.18592	15.75

$$t = k \cdot \left[\frac{a}{\left(\frac{I}{I_{ref}} \right)^{b} - 1} + c \right] \qquad t = k \cdot \frac{R}{\left(\frac{I}{I_{ref}} \right)^{2} - 1}$$

Version and order code:

Request a quote

Basic version :	**RPS23 :**	1 relay (thermal protection)
Option :	**/R2 :**	2 relays (thermal protection)
	/R3 :	3 relays (idem /R2 + current alarm)
	/R4 :	4 relays (idem /R3 + Watchdog)
	/S1 :	1 analog output (image of current)
	/S2 :	2 analog outputs (image of current)
	/SIL2 :	SIL2 version accord. to IEC61508

Note : all options are cumulative.

90 days accuracy (20 °C +/- 2 °C) *DATA SHEET CAN BE DOWNLOADED ON* WWW.LOREME.FR

TECHNICAL SPECIFICATIONS

INPUT
(resolution : 14 bits process; reference: 5 ppm)

Type	Range	Accuracy
Voltage (Low levels)	- 250 to 2000mVdc	+/- 40 uV
Input impedance	1 Mohms	

(on two automatic ranges : 250mV and 2000 mV)

breaking detection current = 5µA

RELAY

R1 and R2 : potential free changeover contact
R3 and R4 : closing contacts (NO)
Switching power : 250VAC , 6A (resistive load)

ANALOG OUTPUT (in option)
(12 bits resolution)

Type	Range	Accuracy
Current S1 and S2	0 ... 4 ... 20 mA	+/- 20 µA
Maximum load :	850 Ohms	
Voltage S1 and S2	0 ... 10 V	+/- 10 mV
Impedance output:	500 Ohms (internal shunt 0.1%)	

Response time (programmable) from 100 ms to 60 s

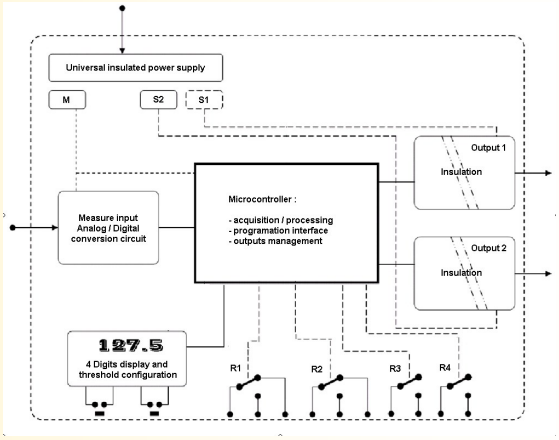
POWER SUPPLY

Universal : (2 versions: standard and low voltage, not polarized)
standard : 20....to.....265Vac/dc
low voltage : 9 vdc....to.....30Vdc.
Consumption: < 3 VA

ENVIRONMENT

Operating temperature	-10 to +60 °C
Storage temperature	-20 to +85 °C
Temperature drift	< 20 PPM / °C
Relative humidity	85 % (not condensed)
Weight	~ 160 g
Protection rating	IP20
Dielectric strength	1500 Veff continuous 2500 Veff 1 minute.
MTBF (MIL HDBK 217F)	> 4 000 000 Hrs @ 25°C
Life time	> 200 000 Hrs @ 30°C

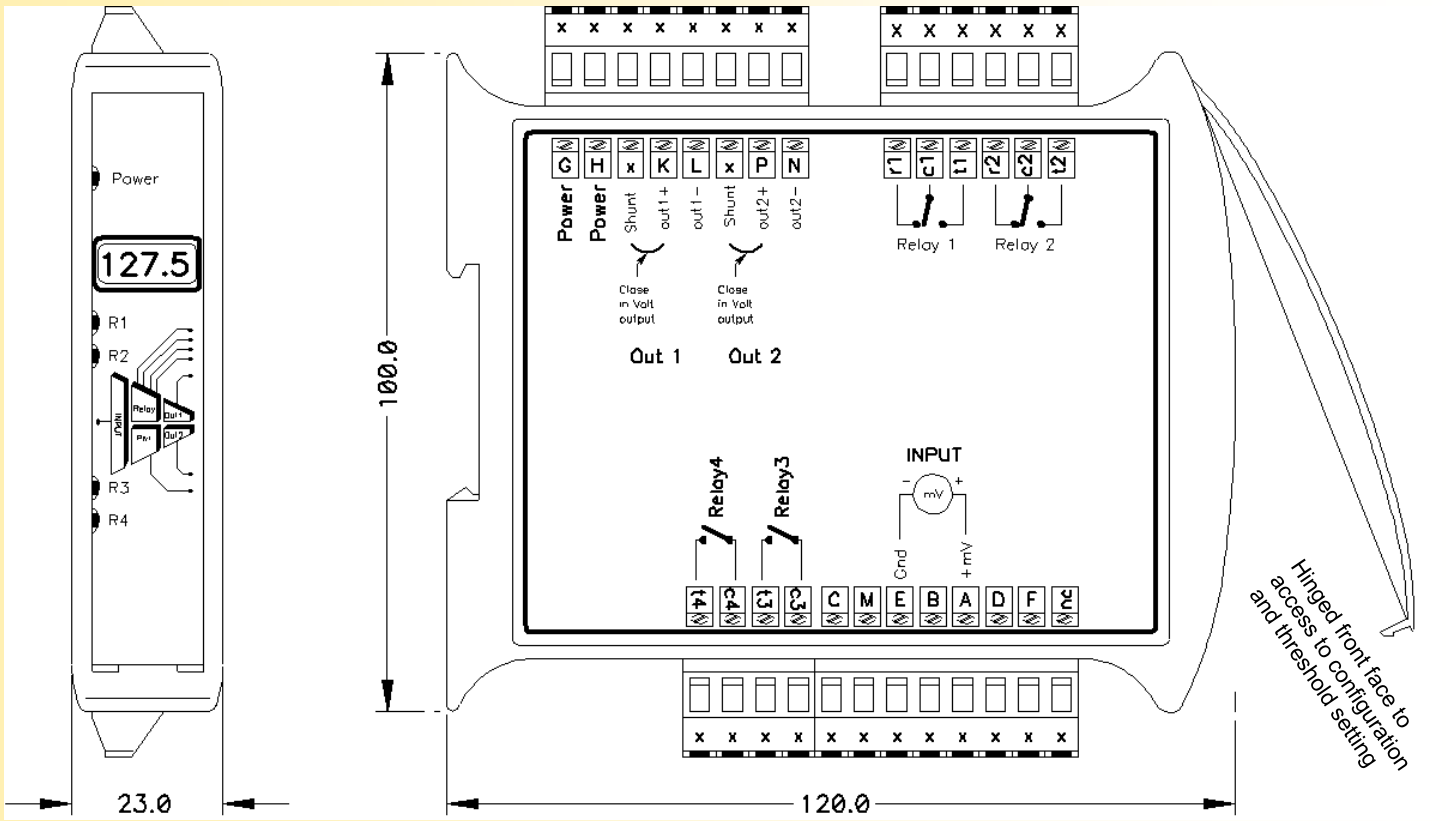
Synoptic :



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:



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