

# Solid State Relays System Monitoring Relay (*SOLITRON*) Type RN1S (Sense Relay)



- System (line and load) monitoring relay
- Rated operational current: 30 A and 50 AACrms
- Zero switching for heating and motor applications
- Rated operational voltage: 230, 400 and 480 VACrms
- Transient overvoltage protection built-in
- Alarm output signal
- LED-indication for alarm and supply/relay ON
- DIN-rail mountable

## Product Description

The system monitoring Solid State Relay (Sense Relay) provides an alarm output in the event of a circuit failure. Internal circuits monitor:

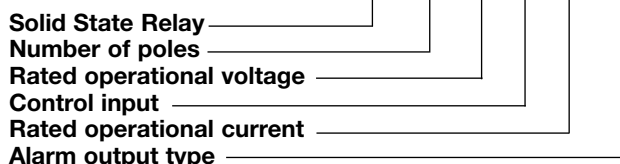
- line voltage
- load current
- correct functioning of the SSR
- SSR input status

The relay is designed for applications where immediate fault detection is required.

A red LED indicates an alarm, a green LED indicates DC control supply OK (half LED light intensity) resp. relay switched ON (full LED light intensity).

## Ordering Key

**RN 1S 23 H 30 NO**



## Type Selection

Rated operational voltage	Control input	Rated operational current	Alarm output type
23: 230 VACrms 40: 400 VACrms 48: 480 VACrms	H: Active high L: Active low	30: 30 AACrms 50: 50 AACrms	NO: NPN, NO NC: NPN, NC PO: PNP, NO PC: PNP, NC

## Selection Guide

Rated operational voltage	Alarm output type	Rated operational current			
		30 AACrms Active high	30 AACrms Active low	50 AACrms Active high	50 AACrms Active low
230 VACrms	NPN, NO	<b>RN 1S23H30NO</b>	<b>RN 1S23L30NO</b>	<b>RN 1S23H50NO</b>	<b>RN 1S23L50NO</b>
	NPN, NC	<b>RN 1S23H30NC</b>	<b>RN 1S23L30NC</b>	<b>RN 1S23H50NC</b>	<b>RN 1S23L50NC</b>
	PNP, NO	<b>RN 1S23H30PO</b>	<b>RN 1S23L30PO</b>	<b>RN 1S23H50PO</b>	<b>RN 1S23L50PO</b>
	PNP, NC	<b>RN 1S23H30PC</b>	<b>RN 1S23L30PC</b>	<b>RN 1S23H50PC</b>	<b>RN 1S23L50PC</b>
400 VACrms	NPN, NO	<b>RN 1S40H30NO</b>	<b>RN 1S40L30NO</b>	<b>RN 1S40H50NO</b>	<b>RN 1S40L50NO</b>
	NPN, NC	<b>RN 1S40H30NC</b>	<b>RN 1S40L30NC</b>	<b>RN 1S40H50NC</b>	<b>RN 1S40L50NC</b>
	PNP, NO	<b>RN 1S40H30PO</b>	<b>RN 1S40L30PO</b>	<b>RN 1S40H50PO</b>	<b>RN 1S40L50PO</b>
	PNP, NC	<b>RN 1S40H30PC</b>	<b>RN 1S40L30PC</b>	<b>RN 1S40H50PC</b>	<b>RN 1S40L50PC</b>
480 VACrms	NPN, NO	<b>RN 1S48H30NO</b>	<b>RN 1S48L30NO</b>	<b>RN 1S48H50NO</b>	<b>RN 1S48L50NO</b>
	NPN, NC	<b>RN 1S48H30NC</b>	<b>RN 1S48L30NC</b>	<b>RN 1S48H50NC</b>	<b>RN 1S48L50NC</b>
	PNP, NO	<b>RN 1S48H30PO</b>	<b>RN 1S48L30PO</b>	<b>RN 1S48H50PO</b>	<b>RN 1S48L50PO</b>
	PNP, NC	<b>RN 1S48H30PC</b>	<b>RN 1S48L30PC</b>	<b>RN 1S48H50PC</b>	<b>RN 1S48L50PC</b>

## General Specifications

	RN1S23.....	RN1S40.....	RN1S48.....
Operational voltage range	120 to 265 VAC	150 to 440 VAC	180 to 530 VAC
Blocking voltage	800 V <sub>p</sub>	1000 V <sub>p</sub>	1200 V <sub>p</sub>
Varistor voltage	275 VAC	420 VAC	510 VAC
Zero voltage turn-on	≤ 15 V	≤ 15 V	≤ 25 V
Operational frequency range	45 to 65 Hz	45 to 65 Hz	45 to 65 Hz
Power factor	≥ 0.5 @ 230 VAC	≥ 0.5 @ 400 VAC	≥ 0.5 @ 480 VAC
Approvals	UL, cUL, CSA	UL, cUL, CSA	UL, cUL, CSA
CE-marking	Yes	Yes	Yes

Norms fulfilled EN 60947-1  
EN 61000-6-2

Low-voltage switchgear and control gear. Part 1- General Rules.  
Generic Immunity Standard. Industrial Environment

## Control Specifications

Supply voltage range	20 to 32 V	PNP alarm output Alarm output voltage open Alarm output voltage @ 100 mA Alarm output current	≤ 0 VDC V <sub>cc</sub> - 2 VDC ≤ 100 mA
Supply current	≤ 40 mA		
Response time pick-up @ 50 Hz	≤ 10 ms		
Response time drop-out @ 50 Hz	≤ 10 ms		
Active high control input		NPN alarm output Alarm output voltage open Alarm output voltage @ 100 mA Alarm output current	≤ 32 VDC 2 VDC ≤ 100 mA
Pick-up voltage	Typ. 7 VDC		
Drop-out voltage	Typ. 6.8 VDC		
Input current (V <sub>c</sub> = 32 V)	≤ 4 mA		
Active low control input			
Pick-up voltage	Typ. V <sub>cc</sub> - 10 VDC		
Drop-out voltage	Typ. V <sub>cc</sub> - 10 VDC		
Input current (V <sub>cc</sub> = 32 V)	≤ 4 mA		

## Output Specifications

		RN1S...30..	RN1S...50..
Rated operational load current			
AC 51	@T <sub>a</sub> = 30°C	30 Arms	50 Arms
	@T <sub>a</sub> = 40°C	30 Arms	50 Arms
	@T <sub>a</sub> = 50°C	23 Arms	38 Arms
	@T <sub>a</sub> = 60°C	20 Arms	30 Arms
AC 53a	@T <sub>a</sub> = 40°C	6 Arms	12 Arms
Zero crossing detection		Yes	Yes
Min. operational current		200 mA	250 mA
Non-rep. surge current t = 10 ms (T <sub>j</sub> init. = 25°C)		≤ 325 A <sub>p</sub>	≤ 600 A <sub>p</sub>
Off-state leakage current @ rated voltage and frequency (T <sub>j</sub> = 125°C, max.)		< 6 mA	< 6 mA
I <sup>2</sup> t for fusing t = 10 ms		525 A <sup>2</sup> s	1800 A <sup>2</sup> s
Critical dV/dt off-state		500 V/μs	500 V/μs

## Sense Specifications

	RN1S23.....	RN1S40.....	RN1S48.....
Current			
Sensed load current	≥ 50 mA	≥ 50 mA	≥ 50 mA
Non-sensed leakage current	≤ 20 mA	≤ 20 mA	≤ 20 mA
Voltage			
Sensed line voltage	≥ 120 Vrms	≥ 150 Vrms	≥ 180 Vrms
Non-sensed line voltage	≤ 50 Vrms	≤ 80 Vrms	≤ 100 Vrms
Timing			
Response time from fault to alarm output	≤ 100 ms	≤ 100 ms	≤ 100 ms
Short-circuit of semiconductor	Will be sensed	Will be sensed	Will be sensed



### Thermal Specifications

Operating temperature	- 20° to +70°C (-4° to +158°F)
Storage temperature	- 40° to +100°C (-40° to +212°F)

### Housing Specifications

Mounting	DIN-rail 35 mm
Weight with RHN1	470 g
Weight with RHN2	780 g
Housing material	Noryl SEI, GFN1, Black
LED window material	PC Lexan 141R
Base plate	Aluminium, nickel plated
Potting compound	Polyurethane, Casco Nobel
Terminals	Screw with captive wire clamp
Control terminals nominal	4 mm <sup>2</sup> or 2 x 2.5 mm <sup>2</sup> AWG 12 or 2 x AWG 14
Min. cable dimension	0.5 mm <sup>2</sup> , AWG 20
Mounting torque max.	0.6 Nm
Power terminals nominal	10 mm <sup>2</sup> or 2 x 6 mm <sup>2</sup> AWG 6 or 2 x AWG 10
Min. cable dimension	1 mm <sup>2</sup> , AWG 16
Mounting torque max.	2.0 Nm
Heatsink compound used	Electrolube HTS

### Insulation

Rated impulse withstand voltage	4000 V <sub>imp</sub>
Input to output	
Rated impulse withstand voltage	4000 V <sub>imp</sub>
Output to case	

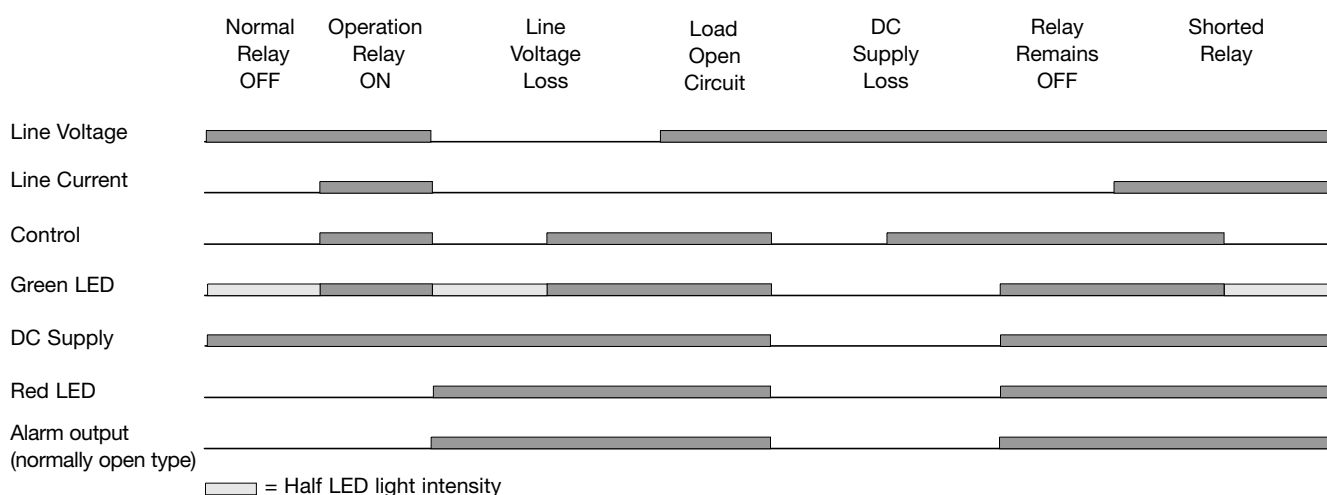
### Environment Specifications

Humidity max.	95%, no condensation
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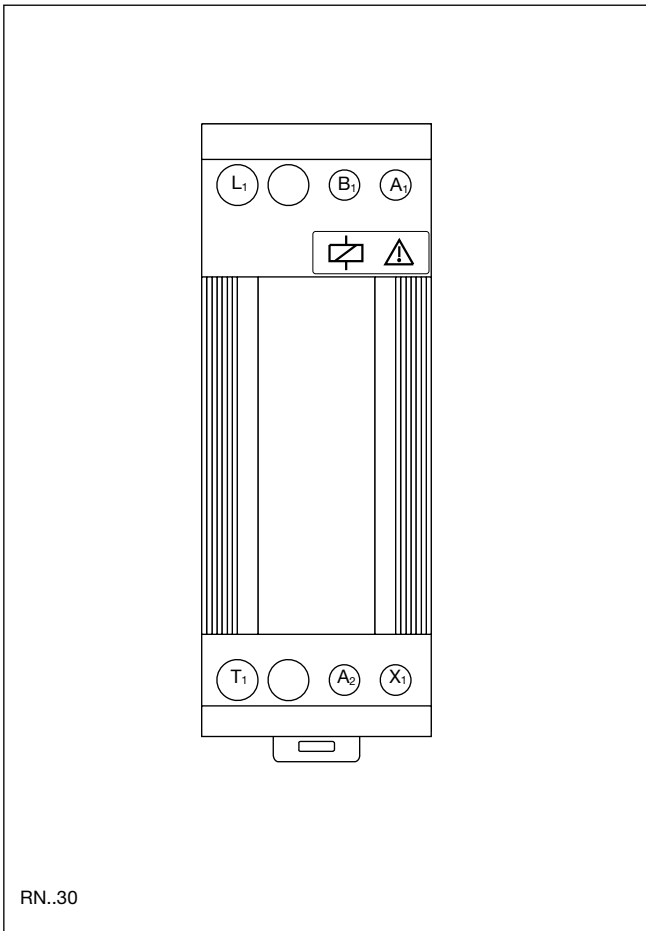
### Dimensions

Dimensions	(H x W x D)
RN..30	120 x 45 x 110 mm
RN..50	120 x 90 x 110 mm

### Operation Diagram



## Terminal Layout



RN..30

## Functional Diagrams

