SIEMENS

Data sheet 3RN2012-1BW30



Thermistor motor protection relay Standard evaluation unit 22.5 mm enclosure screw terminal 2 change-over contacts US = 24 V-240 V AC/DC Manual/Auto/Remote reset with ATEX approval 2 LEDs (READY/TRIPPED) galvanic isolation Test/reset button Wire break monitoring Short circuit monitoring non-volatile

product brand name product category product designation design of the product

product type designation

SIRIUS

SIRIUS 3RN2 thermistor motor protection

Thermistor motor protection relay

Standard evaluation unit with ATEX approval, open-circuit and short-circuit detection in the sensor circuit, non-volatile

3RN2

General technical data

product function display version LED

insulation voltage for overvoltage category III according to IEC 60664 with degree of pollution 3 rated value

degree of pollution

surge voltage resistance rated value

protection class IP

shock resistance according to IEC 60068-2-27 vibration resistance according to IEC 60068-2-6 mechanical service life (switching cycles) typical electrical endurance (switching cycles) at AC-15 at

230 V typical

thermal current of the switching element with

contacts maximum

reference code according to IEC 81346-2

Substance Prohibitance (Date)

thermistor motor protection

Yes

300 V

3

4 kV IP20

11g / 15 ms

10 ... 55 Hz: 0.35 mm

10 000 000

100 000

5 A

Κ

05/28/2009

Product Function

product function

• error memory

dynamic open-circuit detection

external resetauto-RESET

manual RESET

Yes

Yes

Yes Yes

Yes

Control circuit/ Control

type of voltage of the control supply voltage

control supply voltage at AC

• at 50 Hz rated value

• at 60 Hz rated value

control supply voltage at DC

rated value

operating range factor control supply voltage rated value at DC

• initial value

• full-scale value

operating range factor control supply voltage rated value at AC at 50 Hz

AC/DC

24 ... 240 V

24 ... 240 V

24 ... 240 V

0.85

1.1

Initial value at AC at 50 ftz Initial value at 50 ftz Initial val	- initial value	
operating range factor control supply voltage rated value at AC at 60 Mz initial value	• Initial value	0.85
value at AC at 60 Hz • Initial value • Initia	 full-scale value 	1.1
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electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation • between input and output • between the outputs • between the voltage supply and other circuits Yes • between the voltage supply and other circuits Yes Safety related data Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] • at rate of recognizable hazardous failures (\(\lambda\)d) • at rate of non-recognizable hazardous failures (\(\lambda\)d) PFDavg with low demand rate according to IEC 61508 MTBF MTTFd hardware fault tolerance according to IEC 61508 0 6 kV contact discharge / 8 kV air discharge galvanic isolation galvanic	 due to burst according to IEC 61000-4-4 	
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design of the electrical isolation galvanic isolation • between input and output • between the outputs • between the voltage supply and other circuits Safety related data Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] • at rate of recognizable hazardous failures (\(\lambda\)d) • at rate of non-recognizable hazardous failures (\(\lambda\)d) PFHD with high demand rate according to IEC 61508 MTBF MTTFd hardware fault tolerance according to IEC 61508 9 alvanic isolation Yes Yes Yes 1 Yes 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	 due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 	2 kV (line to ground)
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 between the voltage supply and other circuits Safety related data Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] at rate of recognizable hazardous failures (\lambda\dd) at rate of non-recognizable hazardous failures (\lambda\dd) pFHD with high demand rate according to EN 62061 pFDavg with low demand rate according to IEC 61508 nTBF nTTFd 303 y hardware fault tolerance according to IEC 61508 	• due to burst according to IEC 61000-4-4 • due to conductor-earth surge according to IEC 61000-4-5 • due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation
Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] • at rate of recognizable hazardous failures (\lambda\dd) • at rate of non-recognizable hazardous failures (\lambda\dd) PFHD with high demand rate according to EN 62061 PFDavg with low demand rate according to IEC 61508 MTBF MTTFd 303 y hardware fault tolerance according to IEC 61508 0	due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation between input and output	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes
Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] • at rate of recognizable hazardous failures (\lambda\dd) • at rate of non-recognizable hazardous failures (\lambda\dd) PFHD with high demand rate according to EN 62061 PFDavg with low demand rate according to IEC 61508 MTBF MTTFd 303 y hardware fault tolerance according to IEC 61508	due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation between input and output between the outputs	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes
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Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] • at rate of recognizable hazardous failures (λdd) • at rate of non-recognizable hazardous failures (λdu) PFHD with high demand rate according to EN 62061 PFDavg with low demand rate according to IEC 61508 MTBF MTTFd And Ware fault tolerance according to IEC 61508 74 % 18 % 0.000000068 1/h 0.00000031 1/h 0.00000038 1/h 0.00041 97 y MTTFd 303 y hardware fault tolerance according to IEC 61508	• due to burst according to IEC 61000-4-4 • due to conductor-earth surge according to IEC 61000-4-5 • due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation • between input and output • between the outputs • between the voltage supply and other circuits Safety related data Safety Integrity Level (SIL) according to IEC 61508	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes
average diagnostic coverage level (DCavg) failure rate [FIT] • at rate of recognizable hazardous failures (λdd) • at rate of non-recognizable hazardous failures (λdu) PFHD with high demand rate according to EN 62061 PFDavg with low demand rate according to IEC 61508 MTBF MTTFd MTTFd And No 0.00000008 1/h 0.00000031 1/h 0.00000038 1/h 0.0041 97 y MTTFd 303 y hardware fault tolerance according to IEC 61508	• due to burst according to IEC 61000-4-4 • due to conductor-earth surge according to IEC 61000-4-5 • due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation • between input and output • between the outputs • between the voltage supply and other circuits Safety related data Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes Yes
failure rate [FIT] • at rate of recognizable hazardous failures (λdd) • at rate of non-recognizable hazardous failures (λdu) PFHD with high demand rate according to EN 62061 PFDavg with low demand rate according to IEC 61508 MTBF MTTFd MTTFd And	• due to burst according to IEC 61000-4-4 • due to conductor-earth surge according to IEC 61000-4-5 • due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation • between input and output • between the outputs • between the voltage supply and other circuits Safety related data Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes Yes
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PFHD with high demand rate according to EN 62061 PFDavg with low demand rate according to IEC 61508 MTBF 97 y MTTFd 303 y hardware fault tolerance according to IEC 61508 0.00000038 1/h 0.0041 97 y 000000038 1/h	• due to burst according to IEC 61000-4-4 • due to conductor-earth surge according to IEC 61000-4-5 • due to conductor-conductor surge according to IEC 61000-4-5 • electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation • between input and output • between the outputs • between the voltage supply and other circuits Safety related data Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT]	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes 1 c 1 74 % 18 %
PFDavg with low demand rate according to IEC 61508 0.0041 MTBF 97 y MTTFd 303 y hardware fault tolerance according to IEC 61508 0	 due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation between input and output between the outputs between the voltage supply and other circuits Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] at rate of recognizable hazardous failures (λdd) 	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes 1 C 1 74 % 18 % 0.000000068 1/h
MTBF 97 y MTTFd 303 y hardware fault tolerance according to IEC 61508 0	 due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation between input and output between the outputs between the voltage supply and other circuits Safety related data Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] at rate of recognizable hazardous failures (λdd) at rate of non-recognizable hazardous failures (λdd) 	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes Yes 1 c 1 74 % 18 % 0.000000068 1/h 0.00000031 1/h
MTTFd 303 y hardware fault tolerance according to IEC 61508 0	 due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation between input and output between the outputs between the voltage supply and other circuits Safety related data Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] at rate of recognizable hazardous failures (λdd) at rate of non-recognizable hazardous failures (λdd) PFHD with high demand rate according to EN 62061 	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes 1 C 1 74 % 18 % 0.000000068 1/h 0.00000031 1/h 0.00000038 1/h
hardware fault tolerance according to IEC 61508 0	 due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation between input and output between the outputs between the voltage supply and other circuits Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] at rate of recognizable hazardous failures (λdd) at rate of non-recognizable hazardous failures (λdd) PFHD with high demand rate according to IEC 61508 	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes Yes 1 C 1 74 % 18 % 0.000000068 1/h 0.00000031 1/h 0.00000038 1/h 0.00041
	 due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation between input and output between the outputs between the voltage supply and other circuits Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] at rate of recognizable hazardous failures (λdd) at rate of non-recognizable hazardous failures (λdd) PFHD with high demand rate according to EN 62061 PFDavg with low demand rate according to IEC 61508 	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes Yes 1 C 1 74 % 18 % 0.000000068 1/h 0.00000031 1/h 0.00000038 1/h 0.0041 97 y
Connections/ Terminals	 due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation between input and output between the outputs between the voltage supply and other circuits Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] at rate of recognizable hazardous failures (λdd) at rate of non-recognizable hazardous failures (λdd) PFHD with high demand rate according to EN 62061 PFDavg with low demand rate according to IEC 61508 MTBF MTTFd 	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes 1 C 1 74 % 18 % 0.000000068 1/h 0.00000031 1/h 0.00000038 1/h 0.0041 97 y 303 y
	 due to burst according to IEC 61000-4-4 due to conductor-earth surge according to IEC 61000-4-5 due to conductor-conductor surge according to IEC 61000-4-5 electrostatic discharge according to IEC 61000-4-2 Galvanic isolation design of the electrical isolation galvanic isolation between input and output between the outputs between the voltage supply and other circuits Safety Integrity Level (SIL) according to IEC 61508 performance level (PL) according to EN ISO 13849-1 category according to EN ISO 13849-1 Safe failure fraction (SFF) average diagnostic coverage level (DCavg) failure rate [FIT] at rate of recognizable hazardous failures (λdd) at rate of non-recognizable hazardous failures (λdd) PFDavg with low demand rate according to EN 62061 PFDavg with low demand rate according to IEC 61508 MTBF MTTFd hardware fault tolerance according to IEC 61508 	2 kV (line to ground) 1 kV (line to line) 6 kV contact discharge / 8 kV air discharge galvanic isolation Yes Yes Yes 1 C 1 74 % 18 % 0.000000068 1/h 0.00000031 1/h 0.00000038 1/h 0.0041 97 y 303 y

product component removable terminal for auxiliary Yes and control circuit type of electrical connection screw-type terminals • for auxiliary and control circuit screw-type terminals type of connectable conductor cross-sections 1x (0.5 ... 4.0 mm²), 2x (0.5 ... 2.5 mm²) • finely stranded with core end processing 1x (0.5 ... 4 mm²), 2x (0.5 ... 1.5 mm²) • at AWG cables solid 1x (20 ... 12), 2x (20 ... 14) connectable conductor cross-section 0.5 ... 4 mm² • finely stranded with core end processing 0.5 ... 4 mm² AWG number as coded connectable conductor cross section 20 ... 12 20 ... 12 stranded tightening torque with screw-type terminals 0.6 ... 0.8 N·m Installation/ mounting/ dimensions mounting position any fastening method screw and snap-on mounting onto 35 mm standard mounting rail height 100 mm width 22.5 mm depth 90 mm required spacing • with side-by-side mounting - forwards 0 mm 0 mm - backwards 0 mm - upwards - downwards 0 mm 0 mm - at the side • for grounded parts - forwards 0 mm - backwards 0 mm - upwards 0 mm - at the side 0 mm — downwards 0 mm for live parts - forwards 0 mm - backwards 0 mm - upwards 0 mm - downwards 0 mm - at the side 0 mm **Ambient conditions** installation altitude at height above sea level maximum 2 000 m ambient temperature -25 ... +60 °C during operation -40 ... +85 °C • during storage -40 ... +85 °C · during transport relative humidity during operation 70 % explosion protection category for dust [Ex t] [Ex p] explosion protection category for gas [Ex e] [Ex d] [Ex px] Certificates/ approvals **EMC General Product Approval** Confirmation











For use in hazardous locations

Declaration of Conformity

Test Certificates

Marine / Shipping





Type Test Certificates/Test Report







other

Confirmation

Further information

Information- and Downloadcenter (Catalogs, Brochures,...)

https://www.siemens.com/ic10

Industry Mall (Online ordering system)

https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3RN2012-1BW30

Cax online generator

http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RN2012-1BW30

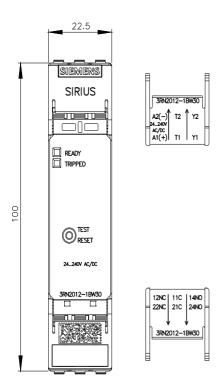
 $Service \& Support \ (Manuals, Certificates, Characteristics, FAQs, ...)$

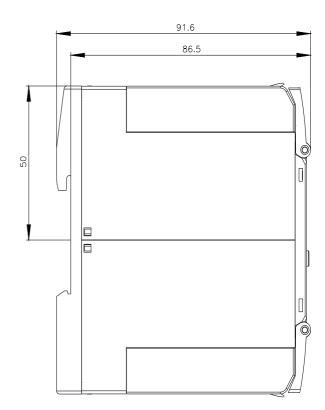
https://support.industry.siemens.com/cs/ww/en/ps/3RN2012-1BW30

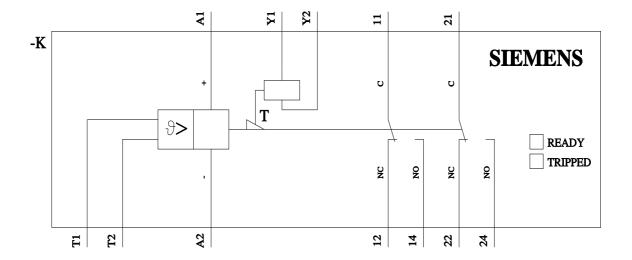
Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...) http://www.automation.siemens.com/bilddb/cax de.aspx?mlfb=3RN2012-1BW30&lang=en

Characteristic: Derating

https://support.industry.siemens.com/cs/ww/en/ps/3RN2012-1BW30/manual







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