SIEMENS

Data sheet 3TK2857-2BB44

SIRIUS safety relay with contactor relay enabling circuits (EC) 24 V DC, 90 mm Spring-type terminal EC instantaneous: 0 NO EC delayed: 3NO, 5...300 s SC: 0 Expansion unit Maximum achievable PL: as basic unit Maximum achievable SIL: as basic unit

product brand name product designation design of the product SIRIUS safety relays extension unit

General technical data

protection class IP of the enclosure protection class IP of the terminal touch protection against electrical shock insulation voltage rated value ambient temperature

- during storageduring operation
- air pressure according to SN 31205

relative humidity during operation installation altitude at height above sea level maximum

vibration resistance according to IEC 60068-2-6 shock resistance

surge voltage resistance rated value

EMC emitted interference

installation environment regarding EMC

reference code according to DIN 40719 extended according to IEC 204-2 according to IEC 750 reference code according to EN 61346-2 contact reliability

design of the cascading product feature cross-circuit-proof Safety Integrity Level (SIL)

- according to IEC 61508
- for delayed release circuit according to IEC 61508

SIL Claim Limit (subsystem) according to EN 62061 performance level (PL)

 for delayed release circuit according to EN ISO 13849-1

category according to EN ISO 13849-1
hardware fault tolerance according to IEC 61508
safety device type according to IEC 61508-2
PFHD with high demand rate according to EN 62061
T1 value for proof test interval or service life according to IEC 61508
number of outputs as contact-affected switching

• as NC contact

element

- for signaling function instantaneous contact
- as NO contact
 - safety-related instantaneous contact
 - safety-related delayed switching

number of outputs as contact-less semiconductor switching element

- safety-related
 - delayed switching

IP20 IP20 finger-safe 690 V

-40 ... +80 °C -25 ... +60 °C 90 ... 106 kPa 10 ... 95 % 2 000 m

5 ... 500 Hz: 0,075 mm 8g / 10 ms, 15g / 5 ms

6 000 V

IEC 60947-5-1, IEC 60000-4-3, IEC 60000-4-5, IEC 60000-4-6

This product is suitable for Class A environments only. In household environments, this device can cause unwanted radio interference. The user is required to implement appropriate measures in this case.

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one incorrect switching operation of 100 million switching operations (17 V 5 mA)

cascading and in-service switching

No

3 SIL3

е

3

4

Type B

0.00000011 1/h

20 a

0

0

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| - instantaneous contact - or signaling function - delayed awatching - instantaneous contact - stop category according to EN 80204-1 - instantaneous contact - stop category according to EN 80204-1 - inputs - cascading inputfunctional switching - eceback input - start input - ves - operating frequency maximum - switching capacity current - of the NG contacts of the relay outputs at DC-13 - at 115 V - at 230 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 230 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 230 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 120 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 120 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 120 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 120 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 220 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 220 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 220 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 220 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 220 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 220 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 220 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 220 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 20 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 20 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 20 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 20 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 20 V - of the NG contacts of the relay outputs at AC-15 - at 115 V - at 20 V - of the NG contacts of the relay outputs required - of the N | | |
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| maximum permissible voltage for safe isolation between electronics evaluation device and enabling circuit according to E N 60947-1 design of the fuse link for short-circuit protection of the NO contacts of the relay outputs required DC resistance of the cable maximum wire length between sensor and electronics evaluation device with Cu 1.5 mm² and 150 nF/km maximum Times make time with automatic start after power failure • typical | — at 230 V | 6 A |
| between electronics evaluation device and enabling circuit according to EN 60947-1 design of the fuse link for short-circuit protection of the NO contacts of the relay outputs required DC resistance of the cable maximum sive length between sensor and electronics evaluation device with Cu 1.5 mm² and 150 nF/km maximum. Times make time with automatic start after power failure • typical 6 000 ms • maximum 7 000 ms backslide delay time in the event of power failure • typical 120 ms • maximum 120 ms recovery time after opening of the safety circuits typical 7 s pulse duration • of the cascading input minimum 0.045 s Control circuit/ Control type of voltage of the control supply voltage control supply voltage 1 • at DC rated value operating range factor control supply voltage rated value of magnet coil • at DC Auxiliary circuit contact reliability of auxiliary contacts 1 error per 100 million operating cycles Installation/ mounting/ dimensions mounting position 2 any factor in the side of the casca and side of t | mechanical service life (operating cycles) typical | 30 000 000 |
| circuit according to EN 60947-1 design of the fuse link for short-circuit protection of the NO contacts of the relay outputs required DC resistance of the cable maximum wire length between sensor and electronics evaluation device with Cu 1.5 mm² and 150 nF/km maximum Times make time with automatic start after power failure • typical • maximum backslide delay time in the event of power failure • typical • maximum backslide delay time in the event of power failure • typical • maximum backslide recovery time after opening of the safety circuits typical recovery time after opening of the safety circuits typical recovery time after power failure typical pulse duration • of the cascading input minimum type of voltage of the control supply voltage control circuit/ Control type of voltage of the control supply voltage rated value of magnet coil • at DC Auxiliary circuit contact reliability of auxiliary contacts Auxiliary circuit | | 400 V |
| the NO contacts of the relay outputs required DC resistance of the cable maximum wire length between sensor and electronics evaluation device with Cu 1.5 mm² and 150 nF/km maximum Times make time with automatic start after power failure • typical • maximum backslide delay time in the event of power failure • typical • maximum recovery time after opening of the safety circuits typical recovery time after power failure recovery tim | circuit according to EN 60947-1 | |
| DC resistance of the cable maximum wire length between sensor and electronics evaluation device with Cu 1.5 mm² and 150 nF/km maximum Times make time with automatic start after power failure • typical • maximum backslide delay time in the event of power failure • typical • maximum 120 ms recovery time after opening of the safety circuits typical recovery time after power failure typical pulse duration • of the cascading input minimum 0.045 s Control circuit/ Control type of voltage of the control supply voltage control supply voltage 1 • at DC rated value operating range factor control supply voltage rated value of magnet coil • at DC Auxiliary circuit contact reliability of auxiliary contacts mounting position fastening method width 90 mm | | gL/gG: 10 A |
| wire length between sensor and electronics evaluation device with Cu 1.5 mm² and 150 nF/km maximum Times make time with automatic start after power failure • typical | | 500.0 |
| evaluation device with Cu 1.5 mm² and 150 nF/km maximum Times make time with automatic start after power failure • typical • maximum backslide delay time in the event of power failure • typical • maximum 120 ms recovery time after opening of the safety circuits typical recovery time after power failure typical pulse duration • of the cascading input minimum 0.045 s Control circuit/ Control type of voltage of the control supply voltage control supply voltage 1 • at DC rated value operating range factor control supply voltage rated value of magnet coil • at DC Auxiliary circuit contact reliability of auxiliary contacts Installation/ mounting/ dimensions mounting position fastening method width 90 mm | | |
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| typical maximum typical typical typical typical maximum typical maximum typical maximum tecovery time after opening of the safety circuits typical recovery time after power failure typical pulse duration of the cascading input minimum o.045 s Control circuit/ Control type of voltage of the control supply voltage control supply voltage 1 o at DC rated value operating range factor control supply voltage rated value of magnet coil o at DC Auxiliary circuit contact reliability of auxiliary contacts Installation/ mounting/ dimensions mounting position fastening method width screw and snap-on mounting width | Times | |
| • maximum backslide delay time in the event of power failure • typical • maximum 120 ms recovery time after opening of the safety circuits typical recovery time after power failure typical pulse duration • of the cascading input minimum 0.045 s Control circuit/ Control type of voltage of the control supply voltage control supply voltage 1 • at DC rated value operating range factor control supply voltage rated value of magnet coil • at DC Auxiliary circuit contact reliability of auxiliary contacts value of magnet coil oat DC | make time with automatic start after power failure | |
| backslide delay time in the event of power failure • typical • maximum recovery time after opening of the safety circuits typical recovery time after power failure typical pulse duration • of the cascading input minimum • of the cascading input minimum 0.045 s Control circuit/ Control type of voltage of the control supply voltage control supply voltage 1 • at DC rated value operating range factor control supply voltage rated value of magnet coil • at DC Auxiliary circuit contact reliability of auxiliary contacts Installation/ mounting/ dimensions mounting position fastening method width 120 ms 120 ms 120 ms 120 ms 120 ms 120 ms 120 ms 120 ms 120 ms 120 ms 120 ms 120 ms 120 ms 120 ms 121 ms 120 ms 120 ms 120 ms 120 ms 121 ms 120 ms 120 ms 120 ms 121 ms 120 m | • typical | 6 000 ms |
| typical maximum recovery time after opening of the safety circuits typical recovery time after power failure typical pulse duration of the cascading input minimum of the cascading input minimum out of the control supply voltage type of voltage of the control supply voltage control supply voltage 1 at DC rated value operating range factor control supply voltage rated value of magnet coil at DC Auxiliary circuit contact reliability of auxiliary contacts mounting position fastening method width 120 ms 1 | • maximum | 7 000 ms |
| maximum recovery time after opening of the safety circuits typical recovery time after power failure typical recovery time after power failure typical pulse duration of the cascading input minimum 0.045 s Control circuit/ Control type of voltage of the control supply voltage control supply voltage 1 o at DC rated value operating range factor control supply voltage rated value of magnet coil o at DC Auxiliary circuit contact reliability of auxiliary contacts Installation/ mounting/ dimensions mounting position fastening method width 120 ms 500 ms 500 ms 500 ms 500 ms 7 s DC Control circuit/Control 24 V 0.85 1.1 Auxiliary circuit contact reliability of auxiliary contacts < 1 error per 100 million operating cycles Installation/ mounting/ dimensions mounting position fastening method width 90 mm | • | |
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| typical recovery time after power failure typical pulse duration of the cascading input minimum 0.045 s Control circuit/ Control type of voltage of the control supply voltage control supply voltage 1 of the Cascading input minimum 24 V operating range factor control supply voltage rated value of magnet coil of at DC Auxiliary circuit contact reliability of auxiliary contacts Installation/ mounting/ dimensions mounting position fastening method width 7 s PC O.045 s DC O.05 1.1 Auxiliary circuit contact reliability of auxiliary contacts any fastening method width 90 mm | | ,== , |
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| pulse duration | | 7 s |
| of the cascading input minimum 0.045 s Control circuit/ Control type of voltage of the control supply voltage control supply voltage 1 • at DC rated value operating range factor control supply voltage rated value of magnet coil • at DC 0.85 1.1 Auxiliary circuit contact reliability of auxiliary contacts Installation/ mounting/ dimensions mounting position fastening method width 0.045 s DC 0.85 1.1 Auxiliary circuit < 1 error per 100 million operating cycles any fastening method screw and snap-on mounting width 90 mm | | |
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| at DC rated value operating range factor control supply voltage rated value of magnet coil at DC 0.85 1.1 Auxiliary circuit contact reliability of auxiliary contacts 1 error per 100 million operating cycles Installation/ mounting/ dimensions mounting position any fastening method width 90 mm | | |
| value of magnet coil | | 24 V |
| at DC Auxiliary circuit contact reliability of auxiliary contacts Installation/ mounting/ dimensions mounting position fastening method width 0.85 1.1 Auxiliary circuit < 1 error per 100 million operating cycles any fastering method screw and snap-on mounting 90 mm | | |
| Auxiliary circuit contact reliability of auxiliary contacts Installation/ mounting/ dimensions mounting position fastening method width any 90 mm | value of magnet coil | |
| contact reliability of auxiliary contacts Installation/ mounting/ dimensions mounting position fastening method width | | 0.85 1.1 |
| Installation/ mounting/ dimensions mounting position any fastening method screw and snap-on mounting width 90 mm | | |
| mounting position any fastening method screw and snap-on mounting width 90 mm | contact reliability of auxiliary contacts | < 1 error per 100 million operating cycles |
| fastening method screw and snap-on mounting width 90 mm | Installation/ mounting/ dimensions | |
| width 90 mm | mounting position | any |
| | fastening method | screw and snap-on mounting |
| height 132 mm | | |
| | height | 132 mm |

| depth | 108 mm | | | |
|---|----------------------------|------------------------|---|--|
| Connections/ Terminals | | | | |
| type of electrical connection | spring-loaded terminals | | | |
| type of connectable conductor cross-sections | | | | |
| • solid | 1x (0.2 2.5 mm²) | | | |
| finely stranded | | | | |
| — without core end processing | 1x (0.25 1.5 mm²) | | | |
| type of connectable conductor cross-sections at AWG | | | | |
| cables | | | | |
| • solid | 1x (24 18) | | | |
| • stranded | 1x (24 18) | | | |
| Product Function | | | | |
| product function | | | | |
| light barrier monitoring | No | | | |
| standstill monitoring | No | | | |
| protective door monitoring | No | | | |
| automatic start | No | | | |
| magnetically operated switch monitoring NC-NO | No | | | |
| rotation speed monitoring | No | | | |
| laser scanner monitoring | No | | | |
| monitored start-up | No | | | |
| light array monitoring | No | | | |
| magnetically operated switch monitoring NC-NC | Yes | | | |
| EMERGENCY OFF function | Yes | | | |
| pressure-sensitive mat monitoring | No | | | |
| suitability for interaction press control | No | | | |
| suitability for use | | | | |
| safety switch | Yes | | | |
| position switch monitoring | Yes | | | |
| EMERGENCY-OFF circuit monitoring | Yes | | | |
| valve monitoring | No | | | |
| tactile sensor monitoring | No | | | |
| magnetically operated switch monitoring | No | | | |
| safety-related circuits | Yes | | | |
| Certificates/ approvals | | | | |
| certificate of suitability | UL, CSA, EN 60204-1, EN IS | SO 12100, EN 954-1, IE | EC 61508 | |
| TÜV (German technical inspectorate) certificate | Yes | | | |
| UL approval | Yes | | | |
| BG BIA approval | Yes | | | |
| General Product Approval | | EMC | Functional Safety/Safety of Machinery | |











Type Examination Certificate

Test Certificates other

Special Test Certific-

ate

Confirmation

Further information

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

https://www.siemens.com/ic10

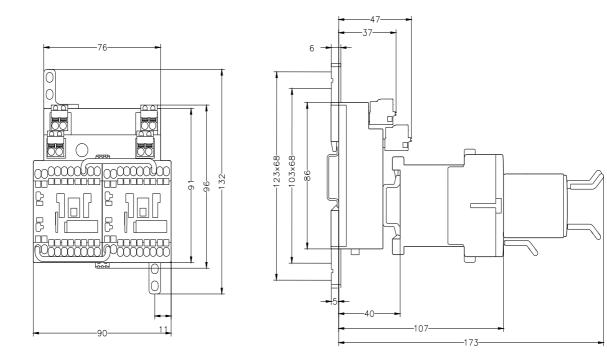
Industry Mall (Online ordering system)

https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3TK2857-2BB44

Cax online generator

http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3TK2857-2BB44

Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...) http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3TK2857-2BB44&lang=en



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