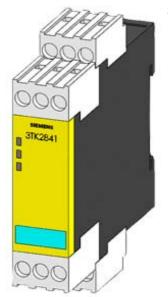
SIEMENS

Data sheet 3TK2821-1CB30



SIRIUS safety relay with relay enabling circuits (EC) 24 V AC/DC, 22.5 mm Screw terminal EC instantaneous: 3 NO EC delayed: 0 NO SC: 1NC Autostart/manual start Basic device Maximum achieved SIL: 1, PL: c as expansion unit up to maximum achieved SIL: 3, PL: e

| General technical data | | | |
|---|-------------------------------------|--|--|
| Product brand name | SIRIUS | | |
| Product designation | safety relays | | |
| Design of the product | for EMERGENCY-STOP and safety doors | | |
| Protection class IP of the enclosure | IP40 | | |
| Protection class IP of the terminal | IP20 | | |
| Protection against electrical shock | finger-safe | | |
| Insulation voltage rated value | 300 V | | |
| Ambient temperature | | | |
| during storage | -40 +80 °C | | |
| during operation | -25 +60 °C | | |
| Air pressure acc. to SN 31205 | 90 106 kPa | | |
| Relative humidity during operation | 10 95 % | | |
| Installation altitude at height above sea level maximum | 2 000 m | | |
| Vibration resistance acc. to IEC 60068-2-6 | 5 500 Hz: 0,075 mm | | |
| Shock resistance | 8g / 10 ms | | |
| Surge voltage resistance rated value | 4 000 V | | |
| EMC emitted interference | EN 60947-5-1 | | |

| Installation environment regarding EMC | This product is suitable for Class A environments only. It can |
|--|---|
| | cause undesired radio-frequency interference in residential |
| | environments. If this is the case, the user must take appropriate |
| | measures. |
| Reference code acc. to DIN 40719 extended according to IEC 204-2 acc. to IEC 750 | KT |
| Reference code acc. to DIN EN 61346-2 | F |
| Number of sensor inputs | <u>'</u> |
| 1-channel or 2-channel | 1 |
| Design of the cascading | none |
| Type of the safety-related wiring of the inputs | single-channel or single-channel and two-channel |
| Product feature cross-circuit-proof | No |
| Safety Integrity Level (SIL) | INO |
| | 3 |
| acc. to IEC 61508 SIL Claim Limit (subsystem) acc. to EN 62061 | 1 |
| SIL Claim Limit (subsystem) acc. to EN 62061 Performance level (PL) | |
| ` ' | |
| • acc. to EN ISO 13849-1 Category acc. to EN ISO 13849-1 | 9 3 |
| Hardware fault tolerance acc. to IEC 61508 | 1 |
| | |
| Safety device type acc. to IEC 61508-2 PFHD with high demand rate acc. to EN 62061 | Type A 0.000000011 1/h |
| Average probability of failure on demand (PFDavg) | 0.0000000011 1/H |
| with low demand rate acc. to IEC 61508 | 0.00000099 1/y |
| T1 value for proof test interval or service life acc. to | 20 y |
| IEC 61508 | · |
| Number of outputs as contact-affected switching | |
| element | |
| • as NC contact | |
| for signaling function instantaneous | 1 |
| contact | |
| • as NO contact | |
| — safety-related instantaneous contact | 3 |
| — safety-related delayed switching | 0 |
| Number of outputs as contact-less semiconductor | |
| switching element | |
| safety-related | |
| — delayed switching | 0 |
| — instantaneous contact | 0 |
| for signaling function | |
| delayed switching | 0 |
| | 0 |
| instantaneous contact | |

3TK2821-1CB30

Design of input

| cascading input/functional switching | No |
|---|----------------------------|
| • feedback input | Yes |
| Start input | Yes |
| Type of electrical connection Plug-in socket | Yes |
| Operating frequency maximum | 1 000 1/h |
| Switching capacity current | |
| of the NO contacts of the relay outputs at DC- 13 | |
| — at 24 V | 5 A |
| — at 115 V | 0.2 A |
| — at 230 V | 0.1 A |
| of the NO contacts of the relay outputs at AC- | |
| 15 | |
| — at 115 V | 5 A |
| — at 230 V | 5 A |
| of the NC contacts of the relay outputs at DC- | |
| 13 | |
| — at 24 V | 5 A |
| — at 115 V | 0.2 A |
| — at 230 V | 0.1 A |
| of the NC contacts of the relay outputs at AC- 15 | |
| — at 115 V | 5 A |
| — at 230 V | 5 A |
| Thermal current of the switching element with | 5 A |
| contacts maximum | |
| Electrical endurance (switching cycles) typical | 100 000 |
| Mechanical service life (switching cycles) typical | 10 000 000 |
| Design of the fuse link for short-circuit protection of the NO contacts of the relay outputs required | gL/gG: 6 A, or quick: 10 A |
| DC resistance of the cable maximum | 30 Ω |
| Wire length between sensor and electronic evaluation device with Cu 1.5 mm² and 150 nF/km maximum | 1 000 m |
| Make time with automatic start | |
| • at DC maximum | 200 ms |
| • at AC maximum | 200 ms |
| Make time with automatic start after power failure | |
| • maximum | 300 ms |
| Backslide delay time after opening of the safety circuits typical | 125 ms |
| Backslide delay time in the event of power failure | |
| • typical | 125 ms |
| | |

| Recovery time after opening of the safety circuits typical typical Recovery time after power failure typical Pulse duration • of the sensor input minimum • of the ON pushbutton input minimum 0.15 s Control circuit/ Control Type of voltage of the control supply voltage Control supply voltage frequency • 1 rated value • 2 rated value 60 Hz Control supply voltage 1 • at DC rated value • at SO Hz rated value • at 60 Hz rated value • at 60 Hz rated value Operating range factor control supply voltage rated value for the foreign of the factor of | • maximum | 200 ms |
|--|---|------------------------------------|
| Pulse duration of the sensor input minimum of the ON pushbutton input minimum of the ON pushbutton input minimum 0.15 s Control circuit/ Control Type of voltage of the control supply voltage Control supply voltage frequency 1 rated value 2 tated value 50 Hz control supply voltage 1 1 at DC rated value 24 V Control supply voltage 1 at AC 1 at 50 Hz rated value 24 V Control supply voltage 1 at AC 1 at 50 Hz rated value 24 V Operating range factor control supply voltage rated value of magnet coil 1 at AC 1 at 50 Hz 1 at 50 Hz 1 at 50 Hz 1 at 50 Hz 2 at 50 Hz 1 at 60 Hz | | 200 ms |
| of the sensor input minimum of the ON pushbutton | Recovery time after power failure typical | 200 ms |
| of the ON pushbutton input minimum O.15 s Control circuit/ Control Type of voltage of the control supply voltage Control supply voltage frequency | Pulse duration | |
| Control circuit/ Control Type of voltage of the control supply voltage Control supply voltage frequency 1 rated value 2 rated value 2 rated value 2 to Control supply voltage 1 1 at DC rated value 2 4 V Control supply voltage 1 at AC 1 at 50 Hz rated value 2 4 V Control supply voltage 1 at AC 1 at 50 Hz rated value 2 4 V Coperating range factor control supply voltage rated value of magnet coil 1 at AC 1 at 50 Hz 1 at DC Oesating range factor control supply voltage rated value of magnet coil 1 at AC 1 at 50 Hz 1 at DC Oesating range factor control supply voltage rated value of magnet coil 2 at AC 2 at 50 Hz 3 at AC 3 at 50 Hz 4 at DC Oesating range factor control supply voltage rated value of magnet coil 2 at AC 3 at 50 Hz 3 at AC 4 at 50 Hz 5 at DC Oesating range factor control supply voltage rated value of magnet coil 2 at AC 4 at 50 Hz 5 at AC 4 at 50 Hz 5 at AC 5 at 50 Hz 5 at 60 Hz 6 at 60 | of the sensor input minimum | 200 ms |
| Type of voltage of the control supply voltage Control supply voltage frequency 1 rated value 2 rated value 60 Hz Control supply voltage 1 1 at DC rated value 24 V Control supply voltage 1 at AC 1 at 50 Hz rated value 24 V Control supply voltage 1 at AC 1 at 50 Hz rated value 24 V Operating range factor control supply voltage rated value of magnet coil 1 at AC 2 at 50 Hz 2 at DC Onesting range factor control supply voltage rated value of magnet coil 24 V Operating range factor control supply voltage rated value of magnet coil 25 substituting range factor control supply voltage rated value of magnet coil 26 substituting range factor control supply voltage rated value of magnet coil 26 substituting range factor control supply voltage rated value of magnet coil 26 substituting range factor control supply voltage rated value of magnet coil 27 substituting range factor control supply voltage rated value of magnet coil 28 substituting range factor control supply voltage rated value of magnet coil 28 substituting range factor control supply voltage rated value of magnet coil 28 substituting range factor control supply voltage rated value of magnet coil 28 substituting range factor control supply voltage rated value of magnet coil 30 substituting range factor control supply voltage rated value of magnet coil 30 substituting range factor control supply voltage rated value of magnet coil 30 substituting range factor control supply voltage rated value of magnet coil 30 substituting range factor control supply voltage rated value of magnet control supply voltage rated value of value o | • of the ON pushbutton input minimum | 0.15 s |
| Control supply voltage frequency • 1 rated value • 2 rated value 60 Hz Control supply voltage 1 • at DC rated value 24 V Control supply voltage 1 at AC • at 50 Hz rated value 24 V • at 60 Hz rated value • at 60 Hz rated value 24 V Operating range factor control supply voltage rated value of magnet coil • at AC — at 50 Hz — at 60 Hz — at 60 Hz — at 60 Hz • at DC Installation/ mounting/ dimensions Mounting position Mounting type Vidth 22.5 mm Height Depth 120 mm Connections/Terminals Type of electrical connection Type of connectable conductor cross-sections • solid • finely stranded — with core end processing Type of connectable conductor cross-sections at AWG conductors • solid • stranded • stranded Product Function | | |
| | | AC/DC |
| | Control supply voltage frequency | |
| Control supply voltage 1 | • 1 rated value | 50 Hz |
| ■ at DC rated value Control supply voltage 1 at AC ■ at 50 Hz rated value ● at 60 Hz rated value ■ at 60 Hz rated value 24 V Operating range factor control supply voltage rated value of magnet coil ● at AC — at 50 Hz — at 60 Hz — at 60 Hz — at 60 Hz — at 60 Hz — at 50 Hz — at 60 Hz — at DC Installation/ mounting/ dimensions Mounting position Mounting type Screw and snap-on mounting Width 120 mm Depth 120 mm Connections/Terminals Type of electrical connection Type of connectable conductor cross-sections ● solid ● finely stranded — with core end processing Type of connectable conductor cross-sections at AWG conductors ● solid ● stranded Product Function Product Function Product Function Product Function Product Function | • 2 rated value | 60 Hz |
| Control supply voltage 1 at AC • at 50 Hz rated value 24 V Operating range factor control supply voltage rated value of magnet coil • at AC — at 50 Hz — at 60 Hz — at 60 Hz — at 60 Hz — at 60 Hz — at DC Installation/ mounting/ dimensions Mounting position any Mounting type screw and snap-on mounting Width 22.5 mm Height 120 mm Connections/Terminals Type of electrical connection screw-type terminals Type of connectable conductor cross-sections • solid • finely stranded — with core end processing Type of connectable conductor cross-sections at AWG conductors • solid • stranded • stranded Product Function | Control supply voltage 1 | |
| ■ at 50 Hz rated value ■ at 60 Hz rated value ②4 V Operating range factor control supply voltage rated value of magnet coil ■ at AC — at 50 Hz — at 60 Hz — at 60 Hz ■ at DC Installation/ mounting/ dimensions Mounting position Mounting type Width 22.5 mm Height Depth 120 mm Connections/Terminals Type of connectable conductor cross-sections ■ solid ● mith core end processing Type of connectable conductor cross-sections at AWG conductors ● solid ②x (20 14) ● stranded Product Function Product Function ACC 24 V 26 V 27 V 28 V 28 V 29 V 20 V 2 | • at DC rated value | 24 V |
| ■ at 60 Hz rated value Operating range factor control supply voltage rated value of magnet coil ■ at AC — at 50 Hz — at 60 Hz — at 60 Hz ■ at DC Installation/ mounting/ dimensions Mounting position Mounting type Width 22.5 mm Height 120 mm Depth Connections/Terminals Type of electrical connection Type of connectable conductor cross-sections ■ solid — with core end processing Type of connectable conductor cross-sections at AWG conductors ■ solid ■ stranded ¬ stranded | Control supply voltage 1 at AC | |
| Operating range factor control supply voltage rated value of magnet coil • at AC — at 50 Hz — at 60 Hz • at DC Installation/ mounting/ dimensions Mounting position Mounting type width 22.5 mm Height 120 mm Depth 120 mm Connections/Terminals Type of electrical connection Type of connectable conductor cross-sections • solid • finely stranded — with core end processing Type of connectable conductor cross-sections at AWG conductors • solid • stranded • stranded Product Function | • at 50 Hz rated value | 24 V |
| value of magnet coil • at AC | • at 60 Hz rated value | 24 V |
| at 50 Hz at 60 Hz at 60 Hz at 60 Hz at DC at DC | | |
| - at 60 Hz | • at AC | |
| ● at DC Installation/ mounting/ dimensions Mounting position Mounting type Width 22.5 mm Height 120 mm Depth 120 mm Connections/Terminals Type of electrical connection Type of connectable conductor cross-sections ● solid ● finely stranded — with core end processing Type of connectable conductor cross-sections at AWG conductors ● solid 2x (20 14) ● stranded Product Function | — at 50 Hz | 0.85 1.1 |
| Installation/ mounting/ dimensions Mounting position Mounting type Screw and snap-on mounting Width 22.5 mm Height 120 mm Depth 120 mm Connections/Terminals Type of electrical connection Type of connectable conductor cross-sections Solid So | — at 60 Hz | 0.85 1.1 |
| Mounting position any Mounting type screw and snap-on mounting Width 22.5 mm Height 120 mm Depth 120 mm Connections/Terminals Type of electrical connection screw-type terminals Type of connectable conductor cross-sections 1x (0.5 4.0 mm²), 2x (0.5 2.5 mm²) • finely stranded | • at DC | 0.85 1.2 |
| Mounting type screw and snap-on mounting Width 22.5 mm Height 120 mm Depth 120 mm Connections/Terminals Type of electrical connection screw-type terminals Type of connectable conductor cross-sections • solid 1x (0.5 4.0 mm²), 2x (0.5 2.5 mm²) • finely stranded with core end processing 1x (0.5 2.5 mm²), 2x (0.5 1.5 mm²) Type of connectable conductor cross-sections at AWG conductors • solid 2x (20 14) • stranded 2x (20 14) | | |
| Width 22.5 mm Height 120 mm Depth 120 mm Connections/Terminals Type of electrical connection screw-type terminals Type of connectable conductor cross-sections • solid 1x (0.5 4.0 mm²), 2x (0.5 2.5 mm²) • finely stranded 1x (0.5 2.5 mm²), 2x (0.5 1.5 mm²) Type of connectable conductor cross-sections at AWG conductors • solid 2x (20 14) • stranded 2x (20 14) Product Function | | |
| Height 120 mm Depth 120 mm Connections/Terminals Type of electrical connection screw-type terminals Type of connectable conductor cross-sections • solid 1x (0.5 4.0 mm²), 2x (0.5 2.5 mm²) • finely stranded 1x (0.5 2.5 mm²), 2x (0.5 1.5 mm²) Type of connectable conductor cross-sections at AWG conductors • solid 2x (20 14) • stranded 2x (20 14) Product Function | | |
| Depth 120 mm Connections/Terminals Type of electrical connection screw-type terminals Type of connectable conductor cross-sections • solid 1x (0.5 4.0 mm²), 2x (0.5 2.5 mm²) • finely stranded 1x (0.5 2.5 mm²), 2x (0.5 1.5 mm²) Type of connectable conductor cross-sections at AWG conductors • solid 2x (20 14) • stranded 2x (20 14) | | |
| Type of electrical connection Type of connectable conductor cross-sections • solid • finely stranded — with core end processing Type of connectable conductor cross-sections at AWG conductors • solid • stranded 2x (20 14) Product Function | | 120 mm |
| Type of electrical connection Type of connectable conductor cross-sections • solid • finely stranded — with core end processing Type of connectable conductor cross-sections at AWG conductors • solid • stranded 2x (20 14) Product Function | Depth | 120 mm |
| Type of connectable conductor cross-sections • solid • finely stranded — with core end processing Type of connectable conductor cross-sections at AWG conductors • solid • stranded Product Function | Connections/Terminals | |
| ◆ solid ★ finely stranded — with core end processing Type of connectable conductor cross-sections at AWG conductors ★ solid ★ stranded Product Function 1x (0.5 4.0 mm²), 2x (0.5 2.5 mm²) 1x (0.5 2.5 mm²), 2x (0.5 1.5 mm²) 2x (20 14) | Type of electrical connection | screw-type terminals |
| finely stranded — with core end processing 1x (0.5 2.5 mm²), 2x (0.5 1.5 mm²) Type of connectable conductor cross-sections at AWG conductors • solid • stranded | Type of connectable conductor cross-sections | |
| — with core end processing 1x (0.5 2.5 mm²), 2x (0.5 1.5 mm²) Type of connectable conductor cross-sections at AWG conductors • solid • stranded 2x (20 14) Product Function | • solid | 1x (0.5 4.0 mm²), 2x (0.5 2.5 mm²) |
| Type of connectable conductor cross-sections at AWG conductors • solid • stranded 2x (20 14) 2x (20 14) Product Function | • finely stranded | |
| AWG conductors ● solid 2x (20 14) ● stranded 2x (20 14) Product Function | with core end processing | 1x (0.5 2.5 mm²), 2x (0.5 1.5 mm²) |
| • stranded 2x (20 14) Product Function | | |
| Product Function | • solid | 2x (20 14) |
| | • stranded | 2x (20 14) |
| Product function | | |
| | Product function | |

| Light barrier monitoring | No |
|--|-----|
| Standstill monitoring | No |
| protective door monitoring | Yes |
| Automatic start | Yes |
| 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 | No |
| EMERGENCY OFF function | Yes |
| Pressure-sensitive mat monitoring | No |
| Suitability for interaction press control | No |
| Suitability for use | |
| Monitoring of floating sensors | Yes |
| Monitoring of non-floating sensors | No |
| • 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 | BG, SUVA, UL, CSA, EN 60204-1, EN ISO 12100, EN 954-1, IEC |
| | 61508 |
| • TÜV (German technical inspectorate) certificate | Yes |
| UL approval | Yes |
| BG BIA certificate | Yes |

General Product Approval

EMC

Functional Safety/Safety of Machinery











Type Examination Certificate

| Declaration of 0 | Conformity | Test Certific- ates | other | |
|------------------|---------------|--------------------------|-----------------------------|--------------|
| (€ | Miscellaneous | Special Test Certificate | Environmental Confirmations | Confirmation |

Further information

EG-Konf.

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

http://www.siemens.com/industrial-controls/catalogs

Industry Mall (Online ordering system)

 $\underline{\text{https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3TK2821-1CB30}$

Cax online generator

http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3TK2821-1CB30

Service&Support (Manuals, Certificates, Characteristics, FAQs,...) https://support.industry.siemens.com/cs/ww/en/ps/3TK2821-1CB30

Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...) http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3TK2821-1CB30&lang=en

