



SIRIUS safety relay with contactor relay enabling circuits (EC) 24 V DC, 90 mm Screw terminal EC instantaneous: 2 NO EC delayed: 0 SC: 1NC Autostart/monitored start Basic device Maximum achieved SIL: 2, PL: d

|                                                                         |                                                                                                                                                                                                            |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| product brand name                                                      | SIRIUS                                                                                                                                                                                                     |
| product designation                                                     | safety relays                                                                                                                                                                                              |
| design of the product                                                   | for EMERGENCY-STOP and safety doors                                                                                                                                                                        |
| General technical data                                                  |                                                                                                                                                                                                            |
| protection class IP of the enclosure                                    | IP20                                                                                                                                                                                                       |
| protection class IP of the terminal                                     | IP20                                                                                                                                                                                                       |
| touch protection against electrical shock                               | finger-safe                                                                                                                                                                                                |
| insulation voltage rated value                                          | 690 V                                                                                                                                                                                                      |
| ambient temperature                                                     |                                                                                                                                                                                                            |
| • during storage                                                        | -40 ... +80 °C                                                                                                                                                                                             |
| • during operation                                                      | -25 ... +60 °C                                                                                                                                                                                             |
| air pressure according 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 according to IEC 60068-2-6                         | 5 ... 500 Hz: 0,075 mm                                                                                                                                                                                     |
| shock resistance                                                        | 5g / 11 ms                                                                                                                                                                                                 |
| surge voltage resistance rated value                                    | 6 000 V                                                                                                                                                                                                    |
| EMC emitted interference                                                | IEC 60947-5-1, IEC 60000-4-3, IEC 60000-4-5, IEC 60000-4-6                                                                                                                                                 |
| installation environment regarding EMC                                  | 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. |
| reference code according to DIN 40719 extended                          | KT                                                                                                                                                                                                         |
| according to IEC 204-2 according to IEC 750                             |                                                                                                                                                                                                            |
| reference code according to EN 61346-2                                  | F                                                                                                                                                                                                          |
| contact reliability                                                     | one incorrect switching operation of 100 million switching operations (17 V, 5 mA)                                                                                                                         |
| number of sensor inputs                                                 |                                                                                                                                                                                                            |
| • 1-channel or 2-channel                                                | 1                                                                                                                                                                                                          |
| design of the cascading                                                 | none                                                                                                                                                                                                       |
| type of the safety-related wiring of the inputs                         | single-channel and two-channel                                                                                                                                                                             |
| product feature cross-circuit-proof                                     | Yes                                                                                                                                                                                                        |
| Safety Integrity Level (SIL)                                            |                                                                                                                                                                                                            |
| • according to IEC 61508                                                | 2                                                                                                                                                                                                          |
| SIL Claim Limit (subsystem) according to EN 62061                       | 2                                                                                                                                                                                                          |
| category according to EN ISO 13849-1                                    | 3                                                                                                                                                                                                          |
| hardware fault tolerance according to IEC 61508                         | 1                                                                                                                                                                                                          |
| safety device type according to IEC 61508-2                             | Type B                                                                                                                                                                                                     |
| PFHD with high demand rate according to EN 62061                        | 0.000000011 1/h                                                                                                                                                                                            |
| T1 value for proof test interval or service life according to IEC 61508 | 20 y                                                                                                                                                                                                       |
| number of outputs as contact-affected switching element                 |                                                                                                                                                                                                            |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• as NC contact <ul style="list-style-type: none"> <li>— for signaling function instantaneous contact</li> </ul> </li> <li>• as NO contact <ul style="list-style-type: none"> <li>— safety-related instantaneous contact</li> <li>— safety-related delayed switching</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                     | 1                                                                        |
| <b>number of outputs as contact-less semiconductor switching element</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                                                                        |
| <ul style="list-style-type: none"> <li>• safety-related <ul style="list-style-type: none"> <li>— delayed switching</li> <li>— instantaneous contact</li> </ul> </li> <li>• for signaling function <ul style="list-style-type: none"> <li>— delayed switching</li> <li>— instantaneous contact</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                   | 0                                                                        |
| <b>stop category according to EN 60204-1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0                                                                        |
| <b>Inputs</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                          |
| <b>design of input</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                          |
| <ul style="list-style-type: none"> <li>• cascading input/functional switching</li> <li>• feedback input</li> <li>• start input</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | No<br>Yes<br>Yes                                                         |
| <b>Outputs</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                          |
| <b>type of electrical connection plug-in socket</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Yes                                                                      |
| <b>operating frequency maximum</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1 000 1/h                                                                |
| <b>switching capacity current</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                          |
| <ul style="list-style-type: none"> <li>• of the NO contacts of the relay outputs at DC-13 <ul style="list-style-type: none"> <li>— at 24 V</li> <li>— at 115 V</li> <li>— at 230 V</li> </ul> </li> <li>• of the NO contacts of the relay outputs at AC-15 <ul style="list-style-type: none"> <li>— at 115 V</li> <li>— at 230 V</li> </ul> </li> <li>• of the NC contacts of the relay outputs at DC-13 <ul style="list-style-type: none"> <li>— at 24 V</li> <li>— at 115 V</li> <li>— at 230 V</li> </ul> </li> <li>• of the NC contacts of the relay outputs at AC-15 <ul style="list-style-type: none"> <li>— at 115 V</li> <li>— at 230 V</li> </ul> </li> </ul> | 10 A<br>1 A<br>0.3 A<br>6 A<br>6 A<br>10 A<br>1 A<br>0.3 A<br>6 A<br>6 A |
| <b>mechanical service life (operating cycles) typical</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 30 000 000                                                               |
| <b>maximum permissible voltage for safe isolation between electronics evaluation device and enabling circuit according to EN 60947-1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 400 V                                                                    |
| <b>design of the fuse link for short-circuit protection of the NO contacts of the relay outputs required</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | gL/gG: 10 A                                                              |
| <b>DC resistance of the cable maximum</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 250 Ω                                                                    |
| <b>wire length between sensor and electronics evaluation device with Cu 1.5 mm² and 150 nF/km maximum</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2 000 m                                                                  |
| <b>Times</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                          |
| <b>make time with automatic start</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                          |
| <ul style="list-style-type: none"> <li>• typical</li> <li>• at DC maximum</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 100 ms<br>200 ms                                                         |
| <b>make time with automatic start after power failure</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                          |
| <ul style="list-style-type: none"> <li>• typical</li> <li>• maximum</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 350 ms<br>500 ms                                                         |
| <b>make time with monitored start</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                          |
| <ul style="list-style-type: none"> <li>• maximum</li> <li>• typical</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 100 ms<br>60 ms                                                          |
| <b>backslide delay time after opening of the safety circuits typical</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 30 ms                                                                    |
| <b>backslide delay time in the event of power failure</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                          |
| <ul style="list-style-type: none"> <li>• typical</li> <li>• maximum</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 100 ms<br>120 ms                                                         |
| <b>recovery time after opening of the safety circuits typical</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20 ms                                                                    |
| <b>recovery time after power failure typical</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.02 s                                                                   |

|                                                                                                   |                                                        |                                              |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------|
| <b>pulse duration</b>                                                                             |                                                        |                                              |
| <ul style="list-style-type: none"><li>• of the sensor input minimum</li></ul>                     | 20 ms                                                  |                                              |
| <ul style="list-style-type: none"><li>• of the ON pushbutton input minimum</li></ul>              | 0.02 s                                                 |                                              |
| <ul style="list-style-type: none"><li>• of the cascading input minimum</li></ul>                  | 0.02 s                                                 |                                              |
| <b>Control circuit/ Control</b>                                                                   |                                                        |                                              |
| <b>type of voltage of the control supply voltage</b>                                              | DC                                                     |                                              |
| <b>control supply voltage 1</b>                                                                   | 24 V                                                   |                                              |
| <ul style="list-style-type: none"><li>• at DC rated value</li></ul>                               |                                                        |                                              |
| <b>operating range factor control supply voltage rated value of magnet coil</b>                   |                                                        |                                              |
| <ul style="list-style-type: none"><li>• at DC</li></ul>                                           | 0.85 ... 1.1                                           |                                              |
| <b>Auxiliary circuit</b>                                                                          |                                                        |                                              |
| <b>contact reliability of auxiliary contacts</b>                                                  | < 1 error per 100 million operating cycles             |                                              |
| <b>Installation/ mounting/ dimensions</b>                                                         |                                                        |                                              |
| <b>mounting position</b>                                                                          | any                                                    |                                              |
| <b>fastening method</b>                                                                           | screw and snap-on mounting                             |                                              |
| <b>width</b>                                                                                      | 90 mm                                                  |                                              |
| <b>height</b>                                                                                     | 132 mm                                                 |                                              |
| <b>depth</b>                                                                                      | 108 mm                                                 |                                              |
| <b>Connections/ Terminals</b>                                                                     |                                                        |                                              |
| <b>type of electrical connection</b>                                                              | screw-type terminals                                   |                                              |
| <b>type of connectable conductor cross-sections</b>                                               |                                                        |                                              |
| <ul style="list-style-type: none"><li>• solid</li></ul>                                           | 1x (0.2 ... 2.5 mm²), 2x (0.2 ... 1.0 mm²)             |                                              |
| <ul style="list-style-type: none"><li>• finely stranded</li></ul>                                 |                                                        |                                              |
| <ul style="list-style-type: none"><li>— with core end processing</li></ul>                        | 1x (0.25 ... 2.5 mm²), 2x (0.25 ... 1.0 mm²)           |                                              |
| <b>type of connectable conductor cross-sections at AWG cables</b>                                 |                                                        |                                              |
| <ul style="list-style-type: none"><li>• solid</li></ul>                                           | 2x (24 ... 18)                                         |                                              |
| <ul style="list-style-type: none"><li>• stranded</li></ul>                                        | 2x (24 ... 18)                                         |                                              |
| <b>Product Function</b>                                                                           |                                                        |                                              |
| <b>product function</b>                                                                           |                                                        |                                              |
| <ul style="list-style-type: none"><li>• light barrier monitoring</li></ul>                        | No                                                     |                                              |
| <ul style="list-style-type: none"><li>• standstill monitoring</li></ul>                           | No                                                     |                                              |
| <ul style="list-style-type: none"><li>• protective door monitoring</li></ul>                      | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• automatic start</li></ul>                                 | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• magnetically operated switch monitoring NC-NO</li></ul>   | No                                                     |                                              |
| <ul style="list-style-type: none"><li>• rotation speed monitoring</li></ul>                       | No                                                     |                                              |
| <ul style="list-style-type: none"><li>• laser scanner monitoring</li></ul>                        | No                                                     |                                              |
| <ul style="list-style-type: none"><li>• monitored start-up</li></ul>                              | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• light array monitoring</li></ul>                          | No                                                     |                                              |
| <ul style="list-style-type: none"><li>• magnetically operated switch monitoring NC-NC</li></ul>   | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• EMERGENCY OFF function</li></ul>                          | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• pressure-sensitive mat monitoring</li></ul>               | No                                                     |                                              |
| <b>suitability for interaction press control</b>                                                  | No                                                     |                                              |
| <b>suitability for use</b>                                                                        |                                                        |                                              |
| <ul style="list-style-type: none"><li>• monitoring of floating sensors</li></ul>                  | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• monitoring of non-floating sensors</li></ul>              | No                                                     |                                              |
| <ul style="list-style-type: none"><li>• safety switch</li></ul>                                   | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• position switch monitoring</li></ul>                      | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• EMERGENCY-OFF circuit monitoring</li></ul>                | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• valve monitoring</li></ul>                                | No                                                     |                                              |
| <ul style="list-style-type: none"><li>• tactile sensor monitoring</li></ul>                       | No                                                     |                                              |
| <ul style="list-style-type: none"><li>• magnetically operated switch monitoring</li></ul>         | No                                                     |                                              |
| <ul style="list-style-type: none"><li>• safety-related circuits</li></ul>                         | Yes                                                    |                                              |
| <b>Certificates/ approvals</b>                                                                    |                                                        |                                              |
| <b>certificate of suitability</b>                                                                 | UL, CSA, EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508 |                                              |
| <ul style="list-style-type: none"><li>• TÜV (German technical inspectorate) certificate</li></ul> | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• UL approval</li></ul>                                     | Yes                                                    |                                              |
| <ul style="list-style-type: none"><li>• BG BIA approval</li></ul>                                 | Yes                                                    |                                              |
| <b>General Product Approval</b>                                                                   | <b>EMC</b>                                             | <b>Functional Safety/Safety of Machinery</b> |



[Type Examination Certificate](#)

Test Certificates

other

[Special Test Certificate](#)

[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=3TK2851-1BB40>

Cax online generator

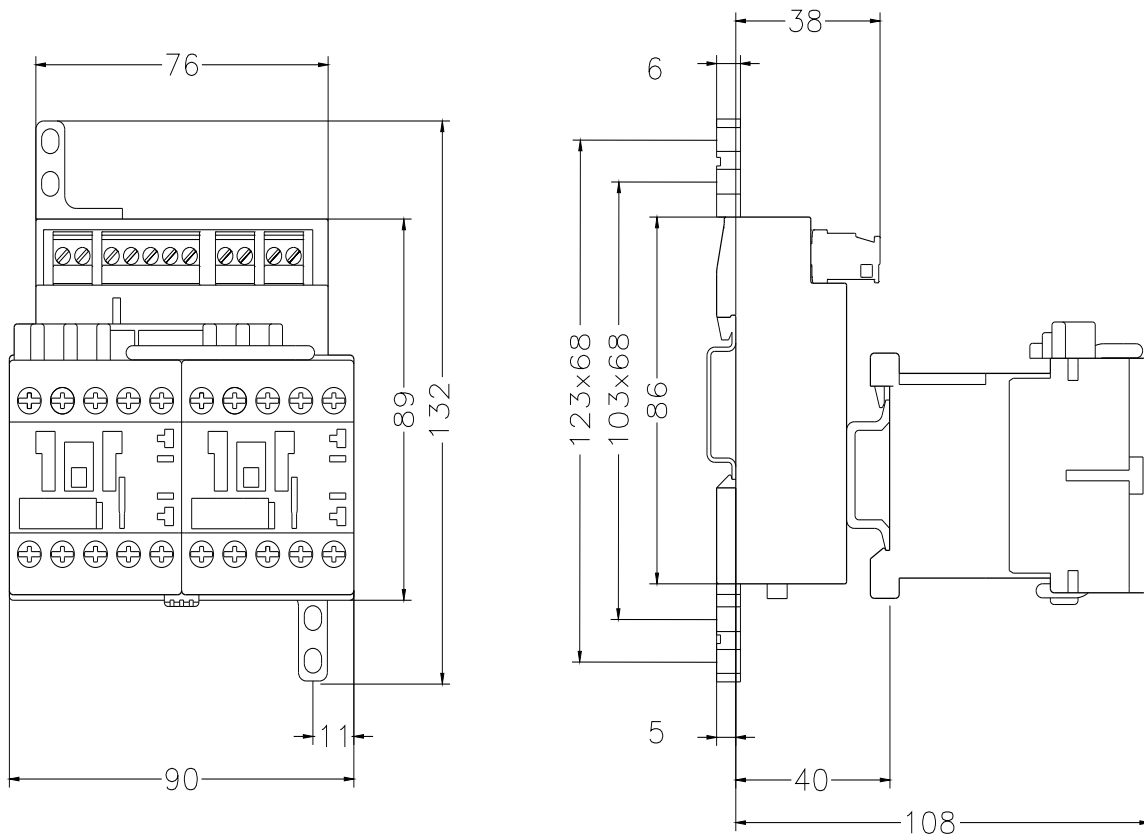
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3TK2851-1BB40>

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

<https://support.industry.siemens.com/cs/ww/en/ps/3TK2851-1BB40>

Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)

[http://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3TK2851-1BB40&lang=en](http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3TK2851-1BB40&lang=en)



last modified:

7/6/2022