



SIRIUS SAFETY RELAY WITH RELAY RELEASE CIRCUITS (RC),  
AC 24V, 45.0MM, SCREW TERMINAL,  
RC INSTANT.: 2NO,  
RC DELAYED: 2NO 0.5...30S, MC: 1NC,  
AUTOSTART, BASIC DEVICE,  
MAX. ACHIEVABLE SIL: 3/2, PL: E/D

## General technical details:

|                                                              |     |                          |
|--------------------------------------------------------------|-----|--------------------------|
| product brand name                                           |     | SIRIUS                   |
| product designation                                          |     | safety relays            |
| Design of the product                                        |     | for EMERGENCY-STOP units |
| protection class IP / of the housing                         |     | IP20                     |
| Protection class IP / of the terminal                        |     | IP20                     |
| Protection against electrical shock                          |     | finger-safe              |
| Insulation voltage / rated value                             | V   | 300                      |
| Ambient temperature                                          |     |                          |
| • during storage                                             | °C  | -40 ... +80              |
| • during operating                                           | °C  | -25 ... +60              |
| Air pressure                                                 |     |                          |
| • according to SN 31205                                      | kPa | 90 ... 106               |
| Relative humidity                                            |     |                          |
| • during operating phase                                     | %   | 10 ... 95                |
| Installation altitude / at a height over sea level / maximum | m   | 2,000                    |
| Resistance against vibration / according to IEC 60068-2-6    |     | 5 ... 500 Hz: 0,075 mm   |
| Resistance against shock                                     |     | 8g / 10 ms               |
| Impulse voltage resistance / rated value                     | V   | 4,000                    |
| EMC emitted interference                                     |     | EN 60947-5-1             |

|                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Installation environment relating to EMC</b>                                                                                                                                                                                                                                                                                                                             |     | 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. |
| <b>Item designation</b> <ul style="list-style-type: none"> <li>• according to DIN 40719 extendable after IEC 204-2 / according to IEC 750</li> <li>• according to DIN EN 61346-2</li> </ul>                                                                                                                                                                                 |     | KT<br><br>F                                                                                                                                                                                            |
| <b>Number of sensor inputs</b> <ul style="list-style-type: none"> <li>• 1-channel or 2-channel</li> </ul>                                                                                                                                                                                                                                                                   |     | 1                                                                                                                                                                                                      |
| <b>Design of the cascading</b>                                                                                                                                                                                                                                                                                                                                              |     | none                                                                                                                                                                                                   |
| <b>Type of the safety-related wiring / of the inputs</b>                                                                                                                                                                                                                                                                                                                    |     | single-channel and two-channel                                                                                                                                                                         |
| <b>Product feature / transverse contact-secure</b>                                                                                                                                                                                                                                                                                                                          |     | Yes                                                                                                                                                                                                    |
| <b>Safety Integrity Level (SIL)</b> <ul style="list-style-type: none"> <li>• according to IEC 61508</li> <li>• for delayed release circuit / according to IEC 61508</li> </ul>                                                                                                                                                                                              |     | SIL3<br><br>SIL2                                                                                                                                                                                       |
| <b>SIL claim limit (for a subsystem) / according to EN 62061</b>                                                                                                                                                                                                                                                                                                            |     | 3                                                                                                                                                                                                      |
| <b>Performance Level (PL)</b> <ul style="list-style-type: none"> <li>• according to ISO 13849-1</li> <li>• for delayed release circuit / according to ISO 13849-1</li> </ul>                                                                                                                                                                                                |     | e<br><br>d                                                                                                                                                                                             |
| <b>Category / according to EN 954-1</b>                                                                                                                                                                                                                                                                                                                                     |     | 4                                                                                                                                                                                                      |
| <b>Category / according to ISO 13849-1</b>                                                                                                                                                                                                                                                                                                                                  |     | 4                                                                                                                                                                                                      |
| <b>Hardware fault tolerance / according to IEC 61508</b>                                                                                                                                                                                                                                                                                                                    |     | 1                                                                                                                                                                                                      |
| <b>Safety device type / according to IEC 61508-2</b>                                                                                                                                                                                                                                                                                                                        |     | Type A                                                                                                                                                                                                 |
| <b>Probability of dangerous failure per hour (PFHD) / with high demand rate / according to EN 62061</b>                                                                                                                                                                                                                                                                     | 1/h | 0.27E-8                                                                                                                                                                                                |
| <b>Average probability of failure on demand (PFDavg) / with low demand rate / according to IEC 61508</b>                                                                                                                                                                                                                                                                    | 1/y | 0.24E-5                                                                                                                                                                                                |
| <b>T1 value / for proof test interval or service life / according to IEC 61508</b>                                                                                                                                                                                                                                                                                          | a   | 20                                                                                                                                                                                                     |
| <b>Number of outputs / as contact-affected switching element</b> <ul style="list-style-type: none"> <li>• as NC contact / for reporting function / instantaneous switching</li> <li>• as NO contact / safety-related / instantaneous switching</li> <li>• as NO contact / safety-related / delayed switching</li> </ul>                                                     |     | 1<br><br>2<br><br>2                                                                                                                                                                                    |
| <b>Number of outputs / as contact-less semiconductor switching element</b> <ul style="list-style-type: none"> <li>• safety-related <ul style="list-style-type: none"> <li>• delayed switching</li> <li>• non-delayed</li> </ul> </li> <li>• for reporting function <ul style="list-style-type: none"> <li>• delayed switching</li> <li>• non-delayed</li> </ul> </li> </ul> |     | 0<br><br>0<br><br>0<br><br>0                                                                                                                                                                           |

|                                                                                                                  |     |                            |
|------------------------------------------------------------------------------------------------------------------|-----|----------------------------|
| Stop category / according to DIN EN 60204-1                                                                      |     | 0 + 1                      |
| <b>General technical details:</b>                                                                                |     |                            |
| <b>Design of the input</b>                                                                                       |     |                            |
| • cascading-input/functional switching                                                                           |     | No                         |
| • feedback input                                                                                                 |     | Yes                        |
| • start input                                                                                                    |     | Yes                        |
| <b>Design of the electrical connection / jumper socket</b>                                                       |     | Yes                        |
| <b>Operating cycles / maximum</b>                                                                                | 1/h | 1,000                      |
| <b>Switching capacity current</b>                                                                                |     |                            |
| • of NO contacts of relay outputs                                                                                |     |                            |
| • at DC-13                                                                                                       |     |                            |
| • at 24 V                                                                                                        | A   | 5                          |
| • at 115 V                                                                                                       | A   | 0.2                        |
| • at 230 V                                                                                                       | A   | 0.1                        |
| • at AC-15                                                                                                       |     |                            |
| • at 115 V                                                                                                       | A   | 5                          |
| • at 230 V                                                                                                       | A   | 5                          |
| • of NC contacts of relay outputs                                                                                |     |                            |
| • at DC-13                                                                                                       |     |                            |
| • at 24 V                                                                                                        | A   | 5                          |
| • at 115 V                                                                                                       | A   | 0.2                        |
| • at 230 V                                                                                                       | A   | 0.1                        |
| • at AC-15                                                                                                       |     |                            |
| • at 115 V                                                                                                       | A   | 5                          |
| • at 230 V                                                                                                       | A   | 5                          |
| <b>Thermal current / of the contact-affected switching element / maximum</b>                                     | A   | 5                          |
| <b>Electrical operating cycles as operating time / typical</b>                                                   |     | 100,000                    |
| <b>Mechanical operating cycles as operating time / typical</b>                                                   |     | 10,000,000                 |
| <b>Design of the fuse link / for short-circuit protection of the NO contacts of the relay outputs / required</b> |     | gL/gG: 6 A, or quick: 10 A |
| <b>Resistance to direct current / of the cable / maximum</b>                                                     | Ω   | 30                         |
| <b>Cable length / between sensor and electronic evaluation device / with Cu 1.5 mm² and 150 nF/km / maximum</b>  | m   | 1,000                      |
| <b>Make time / with automatic start</b>                                                                          |     |                            |
| • for AC / maximum                                                                                               | ms  | 80                         |
| <b>Backslide delay time / at mains power cut</b>                                                                 |     |                            |
| • maximum                                                                                                        | ms  | 100                        |
| <b>Adjustable backslide delay time</b>                                                                           |     |                            |
| • after opening of the safety circuits                                                                           | s   | 0.5 ... 30                 |

|                                                        |    |       |
|--------------------------------------------------------|----|-------|
| <b>Recovery time / after mains power cut / typical</b> | s  | 1     |
| <b>Pulse duration</b>                                  |    |       |
| • of the sensor input / minimum                        | ms | 25    |
| • of the ON pushbutton input / minimum                 | s  | 0.025 |

|                                                                                       |    |              |
|---------------------------------------------------------------------------------------|----|--------------|
| <b>Control circuit:</b>                                                               |    |              |
| <b>Type of voltage / of the controlled supply voltage</b>                             |    | AC           |
| <b>Control supply voltage frequency</b>                                               |    |              |
| • 1 / rated value                                                                     | Hz | 50           |
| • 2 / rated value                                                                     | Hz | 60           |
| <b>Control supply voltage / 1 / at 50 Hz / for AC / rated value</b>                   | V  | 24           |
| <b>Control supply voltage / 1 / at 60 Hz / for AC / rated value</b>                   | V  | 24           |
| <b>operating range factor control supply voltage rated value / of the magnet coil</b> |    |              |
| • at 50 Hz                                                                            |    |              |
| • for AC                                                                              |    | 0.85 ... 1.1 |
| • at 60 Hz                                                                            |    |              |
| • for AC                                                                              |    | 0.85 ... 1.1 |
| • for DC                                                                              |    | 0.85 ... 1.1 |

|                                          |    |                            |
|------------------------------------------|----|----------------------------|
| <b>Installation/mounting/dimensions:</b> |    |                            |
| <b>mounting position</b>                 |    | any                        |
| <b>Type of mounting</b>                  |    | screw and snap-on mounting |
| <b>Width</b>                             | mm | 44.8                       |
| <b>Height</b>                            | mm | 138.5                      |
| <b>Depth</b>                             | mm | 120                        |

|                                                                             |  |                                            |
|-----------------------------------------------------------------------------|--|--------------------------------------------|
| <b>Connections:</b>                                                         |  |                                            |
| <b>Design of the electrical connection</b>                                  |  | screw-type terminals                       |
| <b>Type of the connectable conductor cross-section</b>                      |  |                                            |
| • solid                                                                     |  | 1x (0.5 ... 4 mm²), 2x (0.5 ... 2.5 mm²)   |
| • finely stranded                                                           |  |                                            |
| • with wire end processing                                                  |  | 1x (0.5 ... 2.5 mm²), 2x (0.5 ... 1.5 mm²) |
| <b>Type of the connectable conductor cross-section / for AWG conductors</b> |  |                                            |
| • solid                                                                     |  | 2x (20 ... 14)                             |
| • stranded                                                                  |  | 2x (20 ... 14)                             |

|                            |  |    |
|----------------------------|--|----|
| <b>Product Function:</b>   |  |    |
| <b>Product function</b>    |  |    |
| • light barrier monitoring |  | No |

|                                                                              |     |
|------------------------------------------------------------------------------|-----|
| • standstill monitoring                                                      | No  |
| • protective door monitoring                                                 | Yes |
| • automatic start                                                            | Yes |
| • magnetic switch monitoring Normally closed contact-Normally open contact   | No  |
| • rotation speed monitoring                                                  | No  |
| • laser scanner monitoring                                                   | No  |
| • monitored start-up                                                         | No  |
| • light grid monitoring                                                      | No  |
| • magnetic switch monitoring Normally closed contact-Normally closed contact | No  |
| • emergency stop function                                                    | No  |
| • step mat monitoring                                                        | Yes |
| <b>Suitability for interaction / pressing control</b>                        | No  |
| <b>Acceptability for application</b>                                         |     |
| • monitoring of floating sensors                                             | Yes |
| • monitoring of non-floating sensors                                         | No  |
| • safety cut-out switch                                                      | Yes |
| • position switch monitoring                                                 | Yes |
| • EMERGENCY-OFF circuit monitoring                                           | No  |
| • valve monitoring                                                           | No  |
| • tactile sensor monitoring                                                  | No  |
| • magnetically operated switches monitoring                                  | No  |
| • safety-related circuits                                                    | Yes |

#### Certificates/approvals:

##### Verification of suitability

- TÜV (German technical inspectorate) certificate
- UL-registration
- BG BIA certificate

BG, SUVA, UL, CSA, EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508

Yes  
Yes  
Yes

##### General Product Approval

##### EMC



CCC



CSA



GOST



UL



C-TICK

##### Functional Safety / Safety of Machinery

##### Declaration of Conformity

##### Test Certificates

##### other



ATEX



VDE



EG-Konf.

[Special Test Certificate](#)

[Confirmation](#)

[Environmental Confirmations](#)

#### Further information:

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

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

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Industry Mall (Online ordering system)

<http://www.siemens.com/industrial-controls/mall>

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Cax online generator:

<http://www.siemens.com/cax>

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

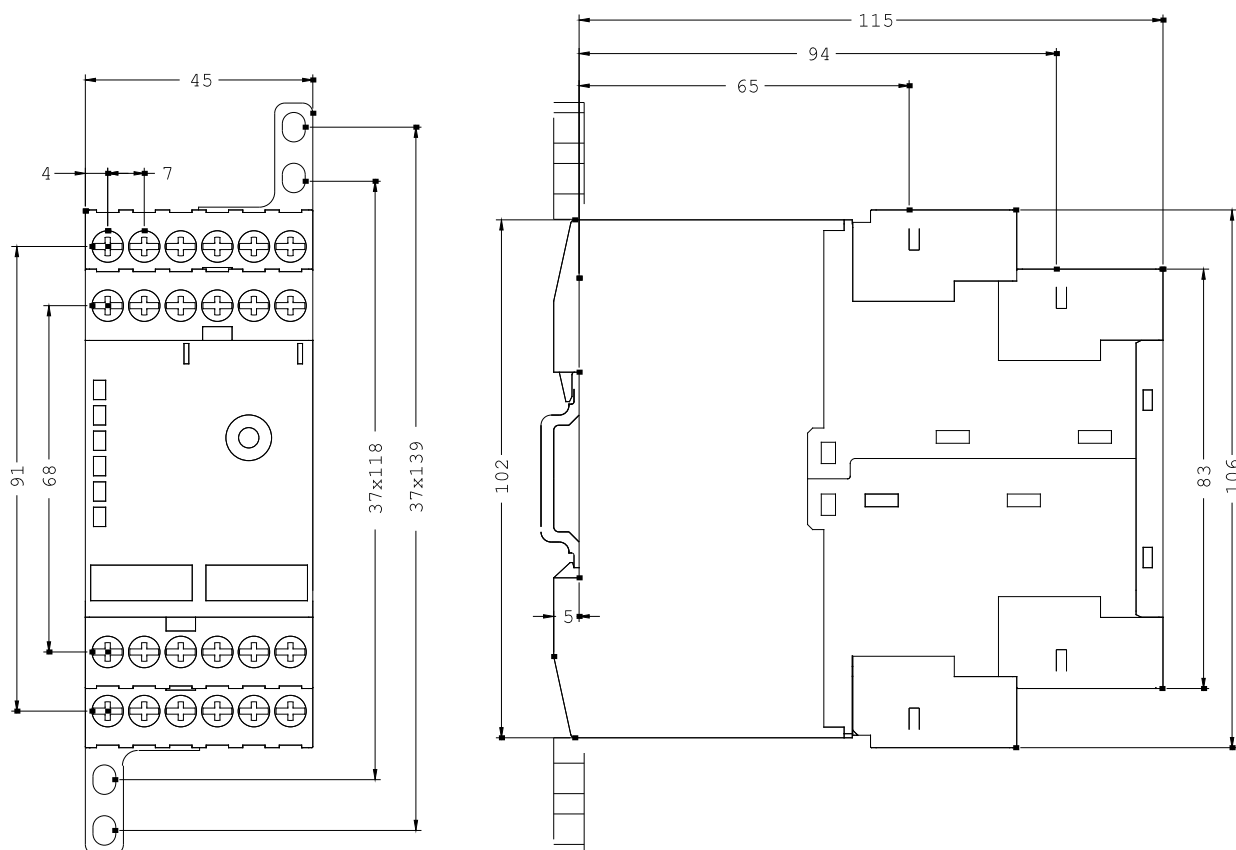
<http://support.automation.siemens.com/WW/view/en/3TK2828-1AB20/all>

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

[http://www.automation.siemens.com/bilddb/cax\\_en.aspx?mlfb=3TK2828-1AB20](http://www.automation.siemens.com/bilddb/cax_en.aspx?mlfb=3TK2828-1AB20)

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last change:

Feb 18, 2013