SIEMENS

## Product data sheet 3TK2824-1AL20

SIRIUS SAFETY RELAY WITH RELAY RELEASE CIRCUITS (RC),
AC 230V, 22.5MM, SCREW TERMINAL,
RC INSTANT.: 2S, RC DELAYED: 0S,
MC: 0NC, AUTOSTART, BASIC DEVICE,
MAX. ACHIEVABLE SIL: 1, PL: C

| 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** | | IP40 |
| **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 the operating phase | °C | -25 … 60 |
| **Air pressure** | | |
| • according to SN 31205 | kPa | 90 … 106 |
| **Relative humidity** | | |
| • during the 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 |
| **Item designation** | | |
| • according to DIN 40719 extendable after IEC 204-2 / according to IEC 750 | | KT |
| • according to DIN EN 61346-2 | | F |
| **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 or single-channel and two-channel |
| **Product feature / transverse contact-secure** | | No |
| **Safety Integrity Level (SIL) / according to IEC 61508** | | SIL2 |

| | | |
|---|---|---|
| **SIL claim limit (for a subsystem) / according to EN 62061** | | 2 |
| **Performance level (PL) / according to ISO 13849-1** | | d |
| **Category / according to EN 954-1** | | 3 |
| **Category / according to ISO 13849-1** | | 3 |
| **Probability of dangerous failure per hour (PFHD) / with high demand rate / according to EN 62061** | 1/h | 0.8699999999999999E-9 |
| **Average probability of failure on demand (PFDavg) / with low demand rate / according to IEC 61508** | 1/h | 0.77E-6 |
| **T1 value / for proof test interval or service life / according to IEC 61508** | a | 20 |
| **Number of outputs / as contact-affected switching element** | | |
| • as NC contact / for reporting function / instantaneous switching | | 0 |
| • as NO contact / fail-safe / instantaneous switching | | 2 |
| • as NO contact / fail-safe / delayed switching | | 0 |
| **Number of outputs / as contact-less semiconductor switching element** | | |
| • fail-safe | | |
| • delayed switching | | 0 |
| • non-delayed | | 0 |
| • for reporting function | | |
| • delayed switching | | 0 |
| • non-delayed | | 0 |
| **Stop category / according to DIN EN 60204-1** | | 0 |

## General technical details:

| | | |
|---|---|---|
| **Design of the input** | | |
| • cascading-entrance/operation-even switching | | No |
| • reducing-entrance | | Yes |
| • start-up entrance | | Yes |
| **Design of the electrical connection / jumper socket** | | Yes |
| **Operating cycles / maximum** | 1/h | 1,000 |
| **Switching capacity current / of the NO contacts of the 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 |
| **Thermal current / of the contact-affected switching element / maximum** | A | 5 |

| | | |
|---|---|---|
| **Electrical operating cycles as operating time / typical** | | 100,000 |
| **Mechanical operating cycles as operating time / typical** | | 10,000,000 |
| **Design of the fuse link / for short-circuit protection of the NO contacts of the relay outputs / necessary** | | gL/gG: 6 A, or quick: 10 A |
| **Resistance to direct current / of the cable / maximum** | Ω | 30 |
| **Cable length / between sensor and electronic evaluation device / with Cu 1.5 mm² and 150 nF/km / maximum** | m | 1,000 |
| **Make time / with automatic start** | | |
| • for AC / maximum | ms | 300 |
| **Backslide delay time / at mains power cut** | | |
| • maximum | ms | 200 |
| **Recovery time / after opening of the safety circuits / typical** | ms | 200 |
| **Recovery time / after mains power cut / typical** | s | 200 |
| **Pulse duration** | | |
| • of the sensor input / minimum | ms | 300 |
| • of the ON pushbutton input / minimum | s | 0.3 |

| **Control circuit:** | | |
|---|---|---|
| **Type of voltage / of the controlled supply voltage** | | AC |
| **Control supply voltage frequency** | | |
| • 1 / rated value | Hz | 50 |
| • 2 / rated value | Hz | 60 |
| **Control supply voltage / 1 / at 50 Hz / for AC / rated value** | V | 230 |
| **Control supply voltage / 1 / at 60 Hz / for AC / rated value** | V | 230 |
| **Operating range factor control supply voltage rated value / of solenoid** | | |
| • at 50 Hz | | |
| • for AC | | 0.85 … 1.1 |
| • at 60 Hz | | |
| • for AC | | 0.85 … 1.1 |

| **Installation/mounting/dimensions:** | | |
|---|---|---|
| **Built in orientation** | | any |
| **Type of mounting** | | screw and snap-on mounting |
| **Width** | mm | 22.5 |
| **Height** | mm | 120 |
| **Depth** | mm | 120 |

| **Connections:** | | |
|---|---|---|
| **Design of the electrical connection** | | screw-type terminals |
| **Type of connectable conductor cross section** | | |

| | |
|---|---|
| • solid | 0.5 ... 4 mm2, 2x (0.5 ... 2.5 mm2) |
| • finely stranded | |
| • with wire end processing | 0.5 ... 2.5 mm2, 2x (0.5 ... 1.5 mm2) |
| **Type of connectable conductor cross section / for AWG conductors** | |
| • solid | 2x (24 ... 16) |
| • stranded | 2x (24 ... 16) |

## Product Function:

| | |
|---|---|
| **Product function** | |
| • 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-OFF function | No |
| • step mat monitoring | No |
| **Suitability for interaction / pressing control** | No |
| **Acceptability for application** | |
| • safety cut-out switch | Yes |
| • position switch monitoring | Yes |
| • EMERGENCY-OFF circuit monitoring | Yes |
| • opto-electronical protection device monitoring | No |
| • monitoring of magnetically operated switches | No |
| • monitoring of proximity switches | No |
| • safety-oriented circuits | Yes |

## Certificates/approvals:

| | |
|---|---|
| **Verification of suitability** | BG, SUVA, UL, CSA, EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508 |
| • TÜV (German technical inspectorate) certificate | Yes |
| • UL-registration | Yes |
| • BG BIA certificate | Yes |

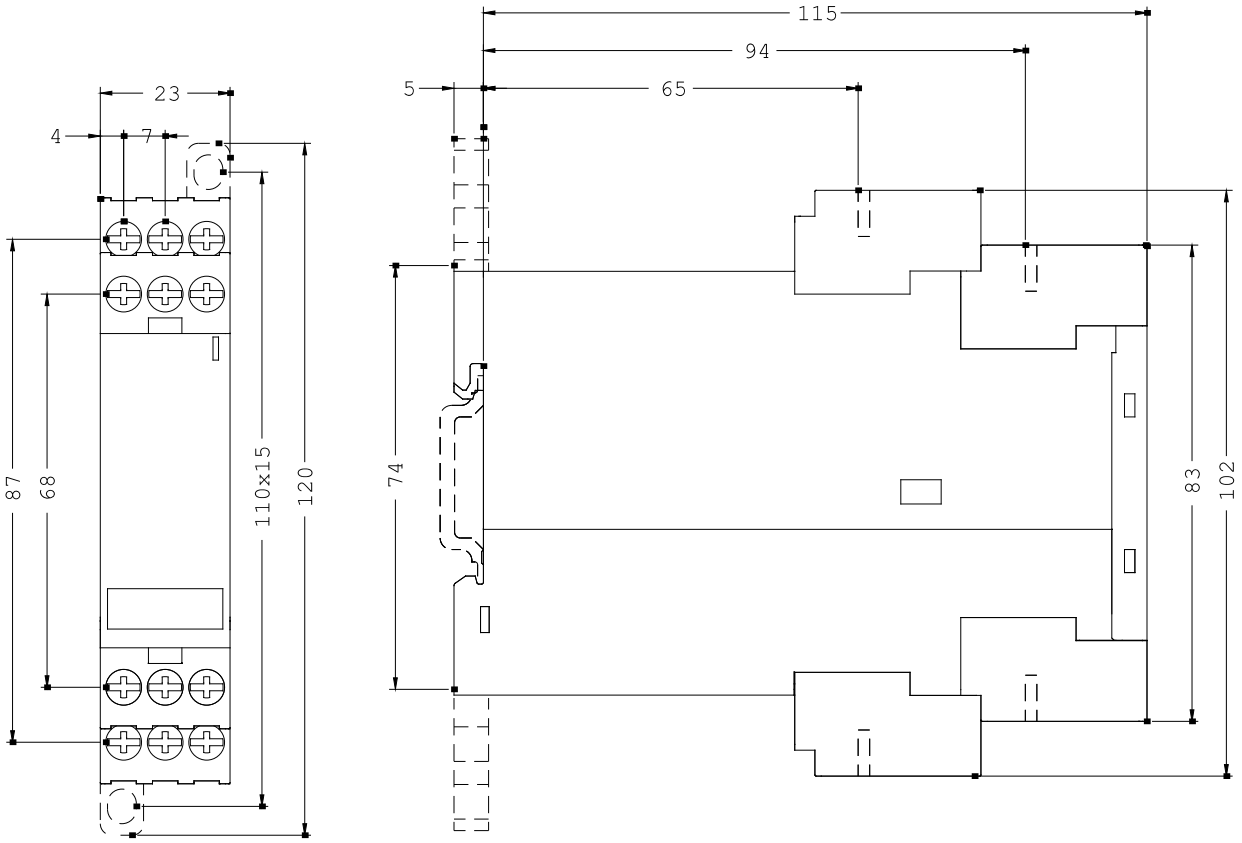
## Further information:

**Information- and Downloadcenter (Catalogs, Brochures,…)**
http://www.siemens.com/industrial-controls/catalogs

**Global Industry Mall (Online ordering system)**
http://www.siemens.com/industrial-controls/mall

**Service&Support (Manuals, Certificates, Characteristics, FAQs,...)**
http://support.automation.siemens.com/WW/view/en/3TK2824-1AL20/all

**Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, ...)**
http://www.automation.siemens.com/bilddb/cax_en.aspx?mlfb=3TK2824-1AL20

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