# SIEMENS

SIRIUS SAFETY RELAY BASIC UNIT 3SK2 SERIES 20 F-DI, 4 F-DQ, 2 DQ, 24 V DC PARAMETERIZABLE VIA SIRIUS SAFETY ES WIDTH 45MM SCREW TERMINALS UP TO SILCL 3 (DIN EN 62061) UP TO PERFORMANCE LEVEL E (ISO 13849-1) 3SK1 OUTPUT EXPANSIONS AND 3RM1 FAIL-SAFE MOTOR STARTER CONNECTABLE VIA DEVICE CONNECTOR



Figure similar

| | |
|---|---|
| product brandname | SIRIUS |
| Product category | Safety relays |
| Product designation | safety relays |

## General technical data

**Product function**

| | |
|---|---|
| • EMERGENCY STOP function | Yes |
| • protective door monitoring | Yes |
| • protective door monitoring with tumbler | Yes |
| • muting, 2 sensor-parallel | Yes |
| • muting, 4 sensor-parallel | Yes |
| • muting, 4 sensor-sequential | Yes |
| • Monitoring parameterizable | Yes |
| • evaluation: electro-sensitive protective equipment | Yes |
| • evaluation: selector switch | Yes |
| • Pressure-sensitive mat monitoring | Yes |
| • evaluation: two-hand operator panel | Yes |

| | |
|---|---|
| • evaluation: enabling switch | Yes |
| • monitored start-up | Yes |
| • two-hand control acc. to EN 574 | Yes |
| Configuration software required | Yes; Safety ES V1.0 and higher |
| Number of function blocks typical | 50 |
| Insulation voltage rated value | 50 V |
| Degree of pollution | 3 |
| Surge voltage resistance rated value | 800 V |
| Consumed current for rated value of supply voltage | |
| • without semiconductor output | 185 mA |
| Protection class IP | IP20 |
| • of the enclosure | IP20 |
| • of the terminal | IP20 |
| Shock resistance | 15g / 11 ms |
| Vibration resistance acc. to IEC 60068-2-6 | 5 ... 500 Hz: 0.75 mm |
| Switching capacity current of semiconductor outputs at DC-13 at 24 V | 4 A |
| Equipment marking | |
| • acc. to DIN EN 61346-2 | K |
| • acc. to DIN EN 81346-2 | F |
| Readback time maximum | 400 ms |
| Light test period | 3 ms |
| Product function suitable for AS-i Power24V | No |
| Product function Diagnostics with CTT2 slave | No |
| Protocol is supported ASIsafe (Safety at work) protocol | No |
| Suitability for use | |
| • Monitoring of floating sensors | Yes |
| • Monitoring of non-floating sensors | Yes |
| • position switch monitoring | Yes |
| • EMERGENCY-OFF circuit monitoring | Yes |
| • valve monitoring | Yes |
| • opto-electronic protection device monitoring | Yes |
| • magnetically operated switch monitoring | Yes |
| • proximity switch monitoring | Yes |
| • safety-related circuits | Yes |
| Suitability for use for monitoring of optoelectronic protective devices acc. to IEC 61496-1 | Yes |
| Operating power rated value | 4.5 W |

| Communication/ Protocol | |
|---|---|
| Protocol is supported PROFINET IO protocol | No |
| Protocol optional is supported PROFIBUS DP protocol | Yes; when using the DP interface module; 64 bit cyclical data |

| | |
|---|---|
| Protocol is supported AS-interface protocol | No |
| **Amount of data of the cyclic user data** | |
| • for inputs with PROFIBUS DP | 64 bit |
| • for outputs with PROFIBUS DP | 64 bit |

## Control circuit/ Control

| | |
|---|---|
| **Type of voltage** | DC |
| **Type of voltage of the control supply voltage** | DC |
| **Control supply voltage rated value** | 24 V |
| **Control supply voltage 1 at DC rated value** | 24 V |

## Inputs/ Outputs

| | |
|---|---|
| **Product function** | |
| • Parameterizable inputs | Yes |
| • Parameterizable outputs | Yes |
| • at the digital outputs Short-circuit protection | Yes |
| **Number of inputs** | |
| • safety-related | 20 |
| • non-safety-related | 0 |
| **Input delay time** | 0 ... 150 ms |
| **Type of digital inputs acc. to IEC 60947-1** | Type 1 |
| **Input recording time at digital input maximum** | 60 ms |
| **Input voltage at digital input** | |
| • at DC rated value | 24 V |
| • with signal <0> at DC | -3 ... +5 V |
| • for signal <1> at DC | 15 ... 30 |
| **Input current at digital input** | |
| • for signal <1> typical | 2.6 mA |
| **Number of outputs** | |
| • safety-related 2-channel | 4 |
| • for testing contact-based sensors | 4 |
| **Number of outputs as contact-affected switching element safety-related** | |
| • 1-channel | 0 |
| • 2-channel | 0 |
| **Number of outputs as contact-less semiconductor switching element** | |
| • safety-related 2-channel | 4 |
| • non-safety-related 2-channel | 2 |
| **Design of the contactless switching element safety-related** | P potential |
| **Recovery time of the safe outputs** | 0 ms |
| **Residual current** | |
| • maximum | 0.05 mA |

| | |
|---|---|
| • at digital output with signal <0> maximum | 0.1 mA |
| Total current maximum | 7 A |
| Voltage drop maximum | 0.5 V |
| Wire length of the signal cable | |
| • to the inputs | |
| — shielded maximum | 1 000 m |
| — unshielded maximum | 600 m |
| • to the outputs | |
| — shielded maximum | 1 000 m |
| — unshielded maximum | 600 m |

## Installation/ mounting/ dimensions

| | |
|---|---|
| Mounting position | any |
| Mounting type | Snap-mounted to DIN rail or screw-mounted with additional push-in lug |
| Height | 100 mm |
| Width | 45 mm |
| Depth | 124.5 mm |

## Connections/Terminals

| | |
|---|---|
| Product function | |
| • removable terminal | Yes |
| • removable terminal for control circuit | Yes |
| • removable terminal for auxiliary and control circuit | Yes |
| Type of electrical connection | screw-type terminals |
| • for auxiliary and control current circuit | screw-type terminals |
| Type of connectable conductor cross-sections | |
| • solid | 1x (0.5 ... 2.5 mm²), 2x (1.0 ... 1.5 mm²) |
| • finely stranded with core end processing | 1x (0.5 ... 2.5 mm²), 2x (0.5 ... 1.0 mm²) |
| • at AWG conductors solid | 1x (20 ... 14), 2x (18 ... 16) |
| • at AWG conductors stranded | 1x (20 ... 14), 2x (18 ... 16) |
| Connectable conductor cross-section finely stranded with core end processing | 0.5 ... 2.5 mm² |
| AWG number as coded connectable conductor cross section | |
| • solid | 20 ... 14 |
| • stranded | 20 ... 14 |

## Safety related data

| | |
|---|---|
| Safety Integrity Level (SIL) acc. to IEC 61508 | 3 |
| SIL Claim Limit (subsystem) acc. to EN 62061 | 3 |
| Performance level (PL) acc. to EN ISO 13849-1 | e |
| Category acc. to EN ISO 13849-1 | 4 |
| Stop category acc. to DIN EN 60204-1 | 0 / 1 |

| | |
|---|---|
| Diagnostics test interval by internal test function maximum | 1 000 000 ms |
| PFHD with high demand rate acc. to EN 62061 | 0.000000012 1/h |
| PFDavg with low demand rate acc. to IEC 61508 | 0.000018 |
| MTBF | 90 y |
| Hardware fault tolerance acc. to IEC 61508 | 1 |
| T1 value for proof test interval or service life acc. to IEC 61508 | 20 y |
| Protection against electrical shock | finger-safe |

## Electromagnetic compatibility

| | |
|---|---|
| EMC emitted interference acc. to IEC 60947-1 | class A |
| Conducted interference | |
| • due to burst acc. to IEC 61000-4-4 | 2 kV (power ports) / 1 kV (signal ports) |
| Field-bound parasitic coupling acc. to IEC 61000-4-3 | 10 V/m |
| Electrostatic discharge acc. to IEC 61000-4-2 | 4 kV contact discharge / 8 kV air discharge |

## Ambient conditions

| | |
|---|---|
| Installation altitude at height above sea level maximum | 2 000 m |
| Ambient temperature | |
| • during operation | -25 ... +60 °C |
| • during storage | -40 ... +80 °C |
| • during transport | -40 ... +80 °C |
| Air pressure acc. to SN 31205 | 90 ... 106 kPa |

## Certificates/approvals

| General Product Approval | | | Functional Safety/Safety of Machinery | Declaration of Conformity | other |
|---|---|---|---|---|---|
| CSA | UL | EAC | Type Examination Certificate | CE EG-Konf. | Confirmation |

## Further information

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

**Industry Mall (Online ordering system)**
https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3SK2122-1AA10

**Cax online generator**
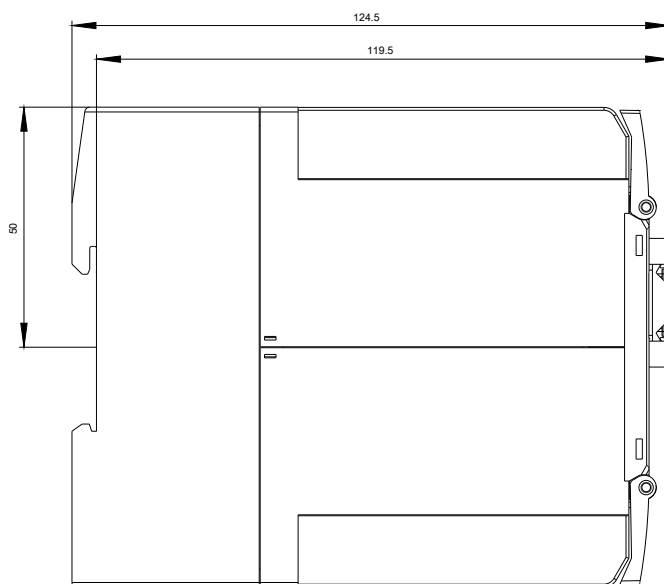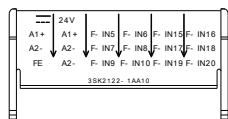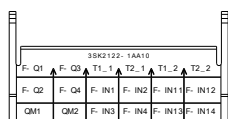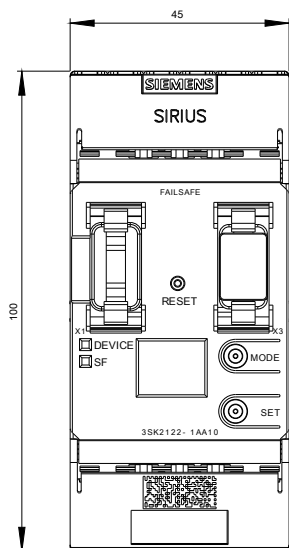http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3SK2122-1AA10

**Service&Support (Manuals, Certificates, Characteristics, FAQs,...)**
https://support.industry.siemens.com/cs/ww/en/ps/3SK2122-1AA10

**Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)**
http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3SK2122-1AA10&lang=en

## SIEMENS

SIRIUS

FAILSAFE

RESET

X1

DEVICE

SF

X3

MODE

SET

3SK2122- 1AA10

45

100

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3SK2122- 1AA10

| F- Q1 | F- Q3 | T1_1 | T2_1 | T1_2 | T2_2 |
| F- Q2 | F- Q4 | F- IN1 | F- IN2 | F- IN11 | F- IN12 |
| QM1 | QM2 | F- IN3 | F- IN4 | F- IN13 | F- IN14 |

| 24V | | | | | |
| A1+ | A1+ | F- IN5 | F- IN6 | F- IN15 | F- IN16 |
| A2- | A2- | F- IN7 | F- IN8 | F- IN17 | F- IN18 |
| FE | A2- | F- IN9 | F- IN10 | F- IN19 | F- IN20 |

3SK2122- 1AA10

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124.5

119.5

50

-K

X1

X3

Logic

A1+
A1+
24V+

T1_1
T1_2
F-IN1
F-IN3
F-IN5
F-IN7
F-IN9
F-IN11
F-IN13
F-IN15
F-IN17
F-IN19
T2_1
T2_2
F-IN2
F-IN4
F-IN6
F-IN8
F-IN10
F-IN12
F-IN14
F-IN16
F-IN18
F-IN20

FE
A2-
A2-
A2-
F-Q1
F-Q2
F-Q3
F-Q4
QM1
QM2
SYS

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