SIEMENS

SIRIUS

Industrial Controls

Safety Relays

Catalog
Abridged
IC 10 A

Edition
April
2019

siemens.com/safety-relays

Related catalogs

Industrial Controls IC 10
SIRIUS

PDF (E86060-K1010-A101-A9-7600)

Industrial Communication IK PI
SIMATIC NET

E86060-K6710-A101-B8-7600

SIMATIC ST 70
Products for
Totally Integrated Automation

E86060-K4670-A101-B7-7600

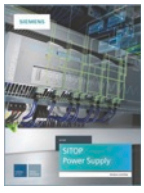
Low-Voltage Power Distribution and Electrical Installation Technology LV 10
SENTRON • SIVACON • ALPHA
Protection, Switching, Measuring and Monitoring Devices, Switchboards and Distribution Systems

PDF (E86060-K8280-A101-A8-7600)
Print (E86060-K8280-A101-A6-7600)

SIMOTICS GP, SD, XP, DP Low-Voltage Motors D 81.1
Type series 1FP1, 1LE1, 1LE5, 1MB1 and 1PC1
Frame sizes 63 to 355
Power range 0.09 to 500 kW
E86060-K5581-A111-B2-7600

SITOP KT 10.1
SITOP
Power supply

E86060-K2410-A101-B3-7600



SITRAIN
Training for Industry

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Miscellaneous

Products for Automation and Drives CA 01
Interactive Catalog
Download

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Industry Mall
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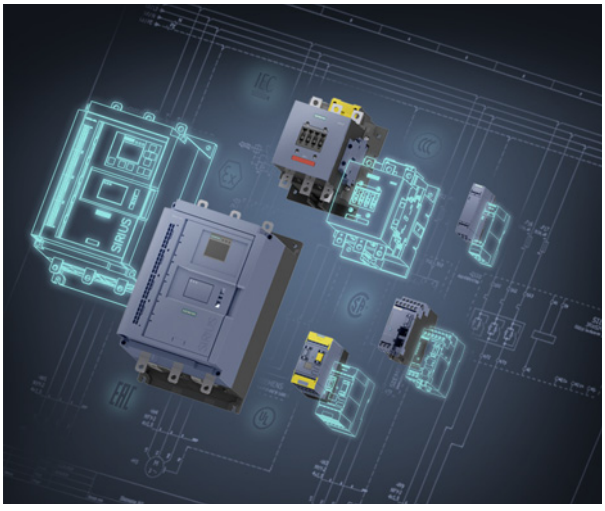
Industrial Controls

SIRIUS



Catalog IC 10 A · 04/2019

The Catalog Abridged IC 10 A · 04/2019 is an extract from the Catalog IC 10 · 2019 with updated contents. This abridged version replaces the corresponding contents of Catalog IC 10 · 2019.

Refer to the Industry Mall for regular updates of this catalog:
www.siemens.com/industrymall

Please contact your local Siemens branch.

The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with EN ISO 9001 (for the Certified Registration Nos., see www.siemens.com/system-certificates/cp). The certificate is recognized by all IQNet countries.

Ordering notes

Things you should know about Catalog IC 10 A

Catalog IC 10 A contains all selection and order-relevant data.

Ordering notes

Ordering special versions

For ordering products that differ from the versions listed in the catalog, the article number specified in the catalog must be supplemented with "–Z"; the required features must be specified by means of the alphanumeric order codes or in plain text.

Small orders

When small orders are placed, the costs associated with order processing are greater than the order value. We recommend therefore that you combine several small orders. Where this is not possible, we unfortunately have to charge a processing supplement of € 20.00 to cover our costs for order processing and invoicing for all orders with a net goods value of less than € 250.00.

Standard delivery time (SD)

SD in days (d)
► Preferred type
X On request

Preferred types are available immediately from stock, i.e. are dispatched within 24 hours.

Normal quantities of the products are usually delivered within the specified time following receipt of your order at our branch.

In exceptional cases, the actual delivery time may differ from that specified.

The delivery times apply up to the ramp at Siemens AG (products ready for dispatch). The transport times depend on the destination and type of shipping. The standard transport time for Germany is one day.

The delivery times specified here represent the situation in April 2019. They are continuously optimized. For more up-to-the-minute information, please visit www.siemens.com/sirius/mall.

Price units (PU)

The price unit defines the number of units, sets or meters to which the specified price applies.

Packaging sizes (PS)

The packaging size defines the number, e.g. of units, sets or meters, contained in an outer packaging.

Only the quantity defined by the packaging size or a multiple thereof can be ordered.

For multi-unit and reusable packaging, see page 16/4.

Price groups (PG)

Each product is assigned to a price group.

Example

3RA2110-0FA15-1AP0

SD: 2 working days
PG: 41D
Order quantity 1 unit or a multiple thereof

3RV1901-0H

SD: Preferred type
PG: 41E
Order quantity 10 units or a multiple thereof

3SU1900-0AB71-0AB0

SD: 5 working days
PG: 41J
Order quantity 10 units or a multiple thereof

SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
2	**3RA2110-0FA15-1AP0**		1	1 unit	41D
►	**3RV1901-0H**		1	10 units	41E
5	**3SU1900-0AB71-0AB0**		100	10 units	41J

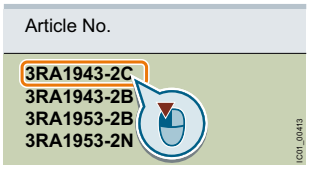
Dimensions

All dimensions in mm.

Note:
Conversion tool,
e.g. from 3TK28 to 3SK, see www.siemens.com/sirius/conversion-tool

clickable

Click on an article number in the catalog PDF to call it up in the Industry Mall and you will have access to all the required information.



Or directly on the Internet, e.g. www.siemens.com/product?3RA1943-2C

Overview

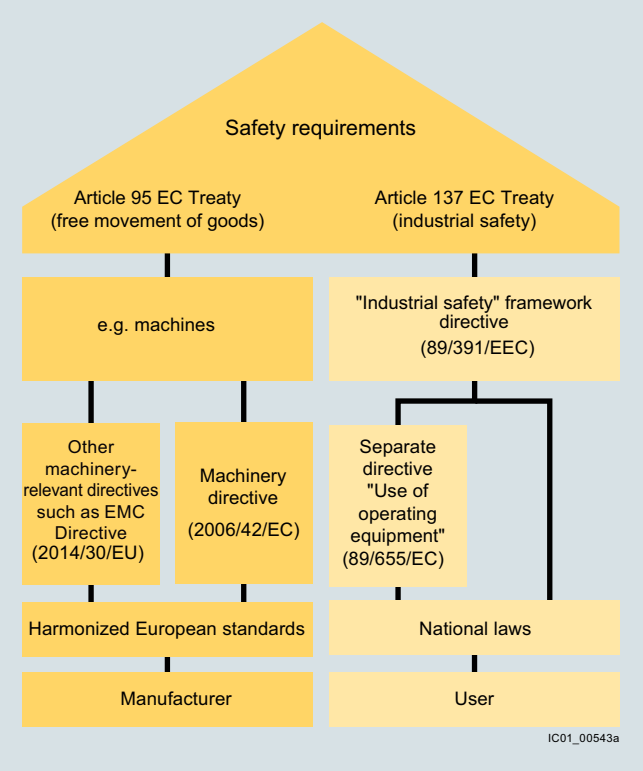
Functional safety of machines and plants – Basic safety requirements in the manufacturing industry

In order to protect people and the environment in many industrial applications in the manufacturing and process industries, machines and plants must meet the fundamental safety requirements of the EU Directives, particularly the Machinery Directive. In addition to design solutions, automation systems and components are also expected to perform safety-related tasks. This means that the life and health of people and the physical integrity of capital goods and the environment depend on the proper operation of these systems and components, on "functional safety".

With the introduction of the uniform European Single Market, national standards and regulations affecting the technical realization of machines were consistently harmonized. This involved defining basic safety requirements which address, on the one hand, machine manufacturers in terms of the free movement of goods (Article 95) and, on the other hand, users in terms of industrial safety (Article 137).

The EU directives:

- Define requirements which must be met by plants and their operating companies in order to protect the health of people and the quality of the environment
- Include standards for health & safety at work (minimum requirements)
- Define product requirements (e.g. for machines) to protect the health and safety of consumers
- Differentiate between the requirements which must be met by the implementation of products in order to ensure the free movement of goods and the requirements which must be met for the use of products



Safety requirements imposed on machines and plants

Objective of the standards

It is the objective of safety technology to minimize as far as possible the hazards from technical facilities for people and the environment while restricting no more than absolutely necessary the scope of industrial production, the use of machines or the production of chemical products.

Production automation is governed in particular by the following standards:

- IEC 61508 or IEC 62061 and
- EN ISO 13849-1

The IEC 62061 standard

The IEC 62061 standard "Safety of machines - Functional safety of electrical, electronic and programmable electronic control systems" defines comprehensive requirements. It includes recommendations for the development, integration and validation of safety-related electrical, electronic and programmable electronic control systems (SRECS) for machines. With the implementation of EN 62061, for the first time, one standard covers the entire safety chain, from the sensor to the actuator. The Safety Integrity Level, or SIL for short, is defined as the application parameter for this standard.

Requirements placed on the capacity of non-electrical – e.g. hydraulic, pneumatic, or electromechanical – safety-related control elements for machines are not specified by the standard.

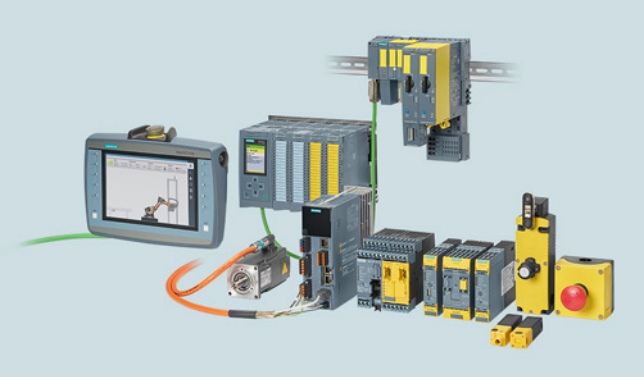
Safety of machines and systems

The EN ISO 13849-1 standard

EN ISO 13849-1 "Safety of machines – Safety-related components of controls, Part 1: General principles" replaced EN 954-1 at the end of 2011. It considers the complete range of safety functions with all the devices which are involved in their performance. EN ISO 13849-1 also makes a quantitative analysis of the safety functions. The standard describes how to determine the performance level (PL) for safety-relevant parts of control systems on the basis of architectures specified for the intended service life.

When combining several safety-related parts to form a complete system, the standard explains how to determine the resulting PL. It can be applied to safety-related parts of control systems (SRP/CS) and all types of machines, regardless of the technology and energy used, e.g. electrical, hydraulic, pneumatic or mechanical.

Safety Integrated – Integrated safety technology from a single source



Safety Integrated

The following applies equally for machine manufacturers and the companies which operate their machines: Maximum possible safety for personnel and machines. The solution: our Safety Integrated concept based on Totally Integrated Automation. Whether for simple safety functions or highly complex tasks – our portfolio offers you maximum safety.

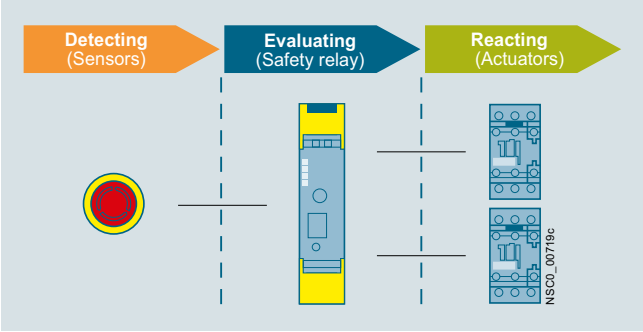
Safety Integrated is a unique, complete and consistent range of safety products covering all safety-related tasks – from detecting, evaluating and reacting, from switches and control systems to operating mechanisms (see graphic on page 11/4).
Our products meet the safety requirements in force in industry, including IEC, ISO, NFPA and UL, and are certified in accordance with the latest safety standards.

All Safety Integrated products or systems can be seamlessly integrated in the standard automation environment. They are therefore particularly flexible and economical, reduce engineering time, increase plant availability and enable practice-related machine operation.

Designing a safety function

A safety chain normally comprises the following functions: detect, evaluate and react. In detail this means:

- Detecting = the detection of a safety requirement with corresponding sensors, such as EMERGENCY STOP or position switches
- Evaluating = the detection of a safety requirement and the reliable initiation of a reaction, e.g. shutting down the enabling circuits.
- Reacting = Shutting down the hazard using contactors or fail-safe motor starters.



Designing a safety function

Our offering

As a partner for all safety requirements, we not only support you with the respective safety-related products and systems, but also consistently provide you with the most current know-how on international standards and regulations. Machine manufacturers and plant managers are offered a comprehensive training portfolio as well as services for the entire lifecycle of safety-related systems and machines.

- A uniform, certified product range
- Courses on CE marking, risk assessment and standards, see www.siemens.com/sitrain-safetyintegrated
- Worldwide service and support, see http://support.industry.siemens.com
- More information, see www.siemens.com/safety-integrated

Safety Evaluation Tool

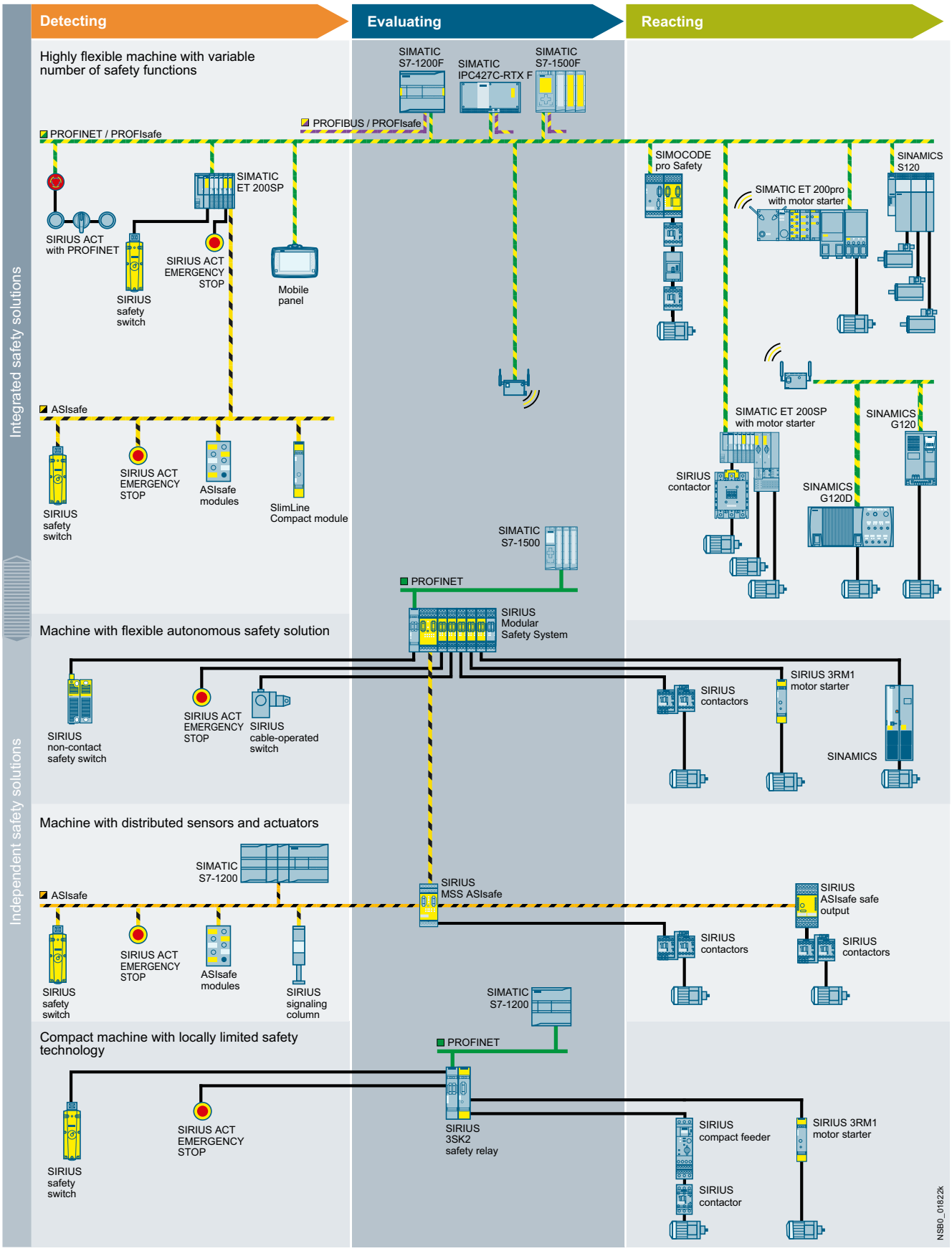
Safety Evaluation Tool

The Safety Evaluation Tool for the IEC 62061 and EN ISO 13849-1 standards guides you quickly and safely through all the calculation steps involved in implementing safety functions on a machine, from definition of the safety system structure through to selection of the components, all the way through to determination of the achieved safety integrity level (SIL/PL). You receive the results as a standards-compliant report that can be integrated in the documentation as proof of safety.

Your advantages at a glance:

- Reliability when dealing with the standards: TÜV-certified tool
- Free use of the online tool
- Automatic calculation in accordance with current standards
- Fast results: Standards-compliant report
- Less time needed to evaluate the safety functions
- Fast access to the latest product data
- User-friendly archiving: Projects can be saved and called up again as required
- Fast and easy handling: comprehensive, predefined libraries of examples
- Selection menus for calculating the DC and CCF
- Different switching cycles can be input when used in a two-channel configuration
- Failure rate calculation
- Selection wizard for drive components

For more information, see www.siemens.com/safety-evaluation-tool.

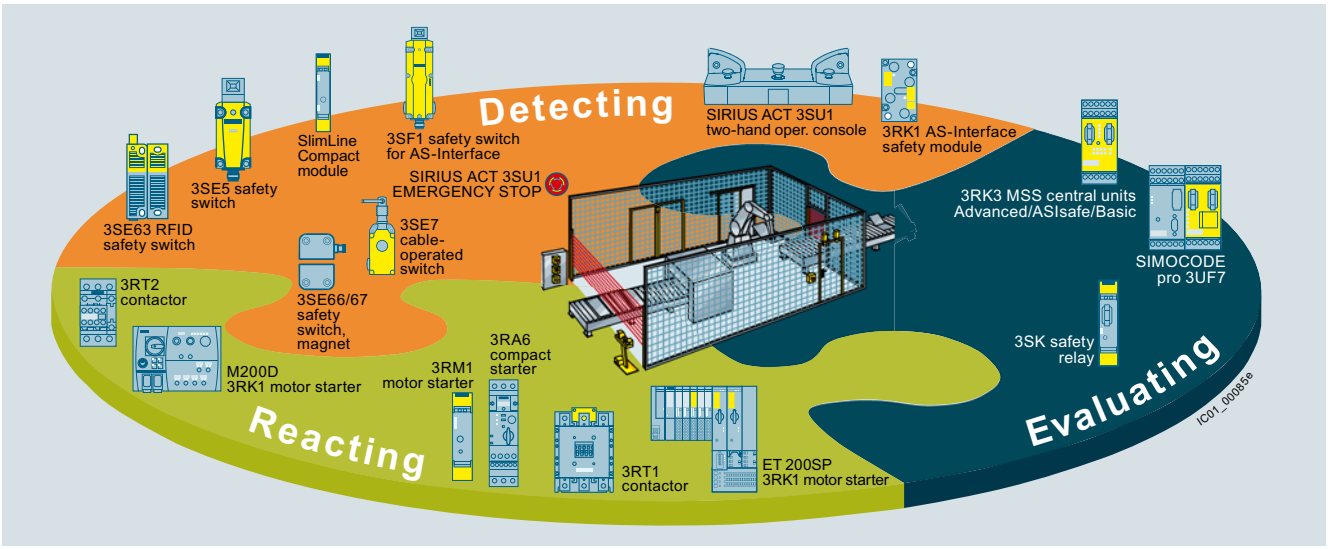


SIRIUS Safety Integrated

Our SIRIUS Safety Integrated controls are a central element of the Siemens Safety Integrated concept. Whether for fail-safe detecting, commanding and signaling, monitoring and evaluating or starting and reliable shutting down – our SIRIUS Safety Integrated controls are experts at performing safety tasks in your plant.

SIRIUS Safety Integrated uses fail-safe communication via standard fieldbus systems, such as ASIsafe via AS-Interface and PROFIsafe via PROFIBUS and PROFINET, to solve even networked safety tasks of greater complexity. This opens the door for flexible safety solutions for compact machines or large-scale plants.

Implementation of many typical safety applications, see Application Manual "SIRIUS Safety Integrated".



SIRIUS Safety Integrated

Monitoring with fail-safe evaluation units from the 3SK and 3RK3 series

Monitoring with fail-safe evaluation units

Notes:

For more information, see FAQ article.
Safety switches, see page 12/1.

Introduction

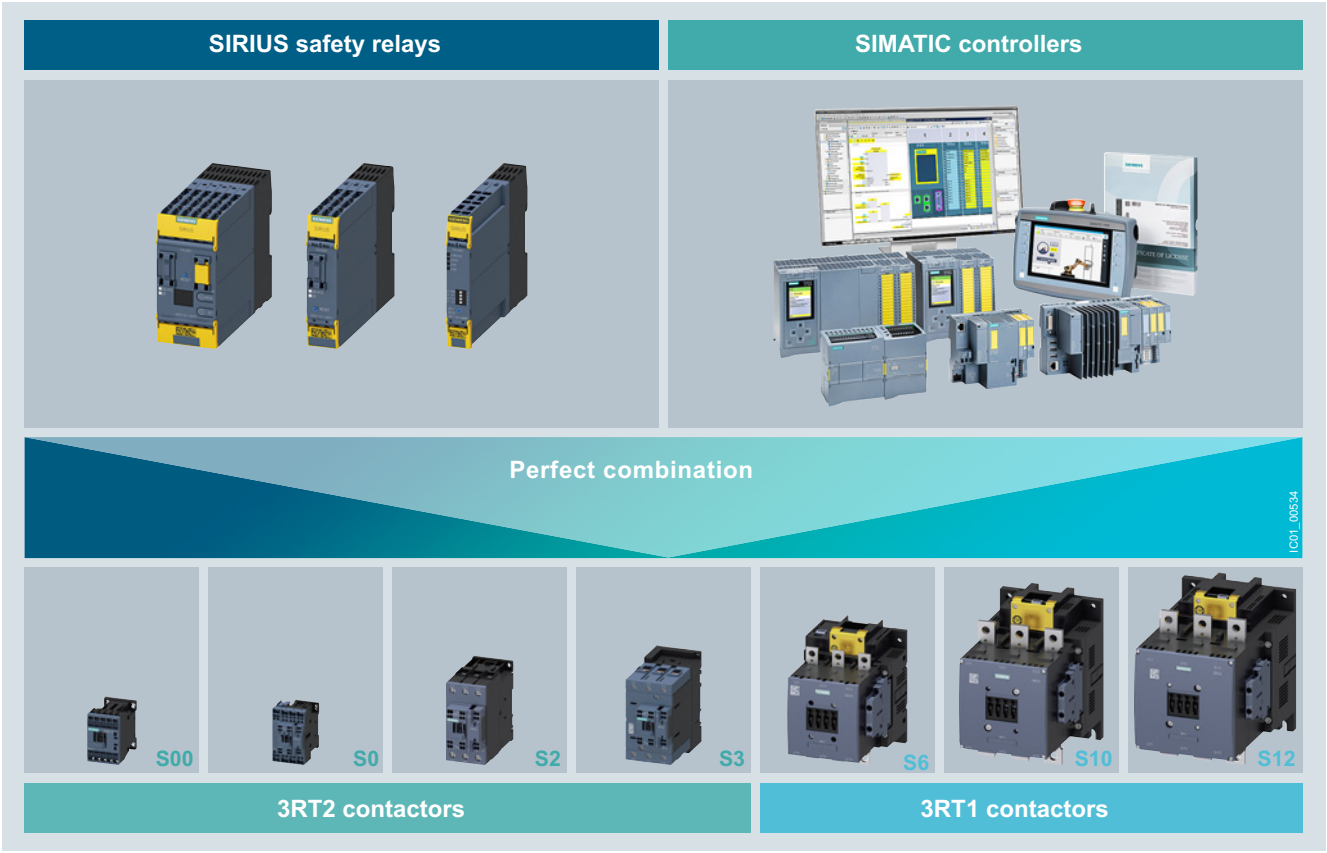
Using SIRIUS 3RT contactors with fail-safe controllers and safety relays

Safety relays and fail-safe controllers work perfectly with SIRIUS contactors optimized for safety application regardless of their size:

- For sizes S00 and S0 we recommend 3RT2 contactors with DC operating mechanism
- 3RT2 coupling contactors with electronic operating mechanisms are available in sizes S2 and S3
- The innovative 3RT1 versions with electronic operating mechanism and fail-safe control input are ideal for higher power ranges, such as sizes S6 to S12

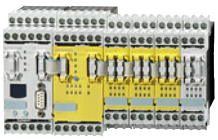
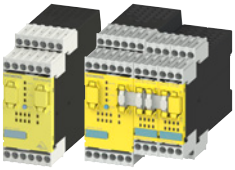
They offer the following advantages:

- Reduced current load on the controller outputs
- Minimization of wear for mechanical relays on controllers or safety relays
- Coupling elements between controllers and contactors are no longer required

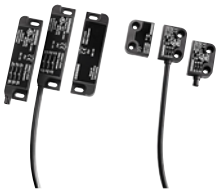


Combination of SIRIUS 3RT contacts with fail-safe controllers and safety relays

		Type	Page
SIRIUS Safety Integrated			
 3SK111	**3SK safety relays** • Key modules of a consistent and cost-effective safety chain • Can be used for all safety applications thanks to compliance with the highest safety requirements (PL e according to EN ISO 13849-1 or SIL 3 according to IEC 61508) • Suitable for use all over the world through compliance with all globally established certifications SIRIUS 3SK1 Standard basic units • Simple, compact devices for all important requirements for monitoring safety sensors and actuators	**3SK111**	11/20
 3SK112	SIRIUS 3SK1 Advanced basic units • Multifunctional series of safety relays with safe relay outputs, semiconductor outputs or time-delayed outputs for: - EMERGENCY STOP monitoring - Protective door monitoring - Monitoring of non-floating sensors such as light arrays, laser scanners, etc. - Monitoring of two-hand operation consoles - Monitoring of equivalent (NC/NC) and antivalent (NO/NC) sensors • Setting by means of DIP switch	**3SK112**	11/21
 3SK2	SIRIUS 3SK2 basic units • Series of safety relays that can be parameterized by software, with semiconductor outputs and independent output functions for: - EMERGENCY STOP monitoring - Protective door monitoring - Protective door monitoring with tumbler - Monitoring of non-floating sensors such as light arrays, laser scanners, etc. - Monitoring of two-hand operation consoles - Monitoring of equivalent (NC/NC) and antivalent (NO/NC) sensors - Muting - Communication via PROFINET (optional)	**3SK2**	11/22
 3SK121	Expansion units • 3RO and 4RO output expansions for SIRIUS 3SK1 Standard basic units, SIRIUS 3SK1 Advanced basic units and SIRIUS 3SK2 basic units • Input expansion for SIRIUS 3SK1 Advanced basic units • Power supply for SIRIUS 3SK1 Advanced basic units • Integration of 3RM1 motor starters possible and simple integration of a main circuit component in a system configuration of the safety relays. There is no need for complex wiring between the safety evaluation unit and the actuator. • Expansion of the Standard device series by means of wiring • Expansion of the SIRIUS 3SK1 Advanced and SIRIUS 3SK2 device series by means of wiring or without wiring outlay by means of 3ZY12 device connectors	**3SK121, 3SK122, 3SK123**	11/24, 11/25
 3TK2810-1BA41	**3TK2810 safety relays** • Further modules of a consistent and cost-effective safety chain • Can be used for all safety applications thanks to compliance with the highest safety requirements (PL e according to EN ISO 13849-1 or SIL 3 according to IEC 61508) • Suitable for use all over the world through compliance with all globally established certifications Safe standstill monitoring with 3TK2810-0 • Monitoring without external sensors • Universal use in applications possible Safe speed monitoring with 3TK2810-1 • Monitoring of speed with encoders and proximity switches possible • Easy diagnostics options via display • Integrated monitoring of a spring-type locking protective door	**3TK2810**	11/29

	Type	Page
SIRIUS Safety Integrated (continued)		
 3RK3	**3RK3 Modular Safety System (MSS)**	**3RK3**	11/32
	• Freely configurable modular safety relays • Safety-related applications up to PL e according to EN ISO 13849-1 or SIL 3 according to IEC 62061 can be implemented • High flexibility and planning reliability thanks to a modular design • More space in the control cabinet and lower costs thanks to highly modular project data • More functionality and time savings thanks to a software-configurable system • Comprehensive on-site diagnostics with the SIRIUS Safety ES software and diagnostics display • Improved plant diagnostics and higher plant availability thanks to exchange of data using PROFIBUS and PROFINET • Automatic creation of plant documentation with regard to MSS and software parameterization • Up to 9 expansion modules can be plugged in for standard I/Os and fail-safe I/Os – optionally electronic or relay-based fail-safe outputs • Graphic parameterization of the logic, online diagnostics, and automatic creation of documentation using SIRIUS Safety ES • Consistent further development of the safety monitors with the Advanced and ASIsafe central units of the SIRIUS 3RK3 Modular Safety System (MSS)		
 3RK3 MSS ASIsafe	Additionally with AS-Interface (ASIsafe): • Modularly expandable and freely configurable safety monitor • With MSS Advanced/ASIsafe up to 50 two-channel, fail-safe outputs (38 central outputs and 12 outputs via AS-i) • Safety-related and standard communication between multiple MSS devices and/or safety monitors • Distributed detection of sensors and disconnection of actuators through AS-Interface • Much more space is available without wiring outlay using AS-Interface • Ready-to-use function blocks (e.g. muting or protective door with tumbler) can also be used on AS-i		
 K45F  SC17.5F	**AS-Interface safety modules** • Complete portfolio of ASIsafe modules • For connection of safety switches with contacts (e.g. position switches) • Degree of protection IP65/IP67 or IP20 • Especially compact dimensions, with widths from 17.5 mm • Up to four safe inputs per module • Up to one safe output per module • Standard outputs are available on the module in addition • Up to Category 4, PL e, SIL 3 Your advantage: Easy integration of safe signals both in the control cabinet or in the field	**3RK1**	2/25
 CM AS-i Master ST and F-CM AS-i Safety ST	**AS-i Master and AS-i Safety module for ET 200SP** The CM AS-i Master ST and F-CM AS-i Safety ST modules are plugged into an ET 200SP configuration and connect an AS-i network, including safety-related inputs and outputs, with the controller. • Single, double and multiple masters possible • Per CM AS-i Master ST up to 496 DI/496 DQ/124 AI/124 AQ possible • Up to 31 safe input signals (two-channel)/16 safe output channels possible per F-CM AS-i Safety ST module • Configuration with TIA Portal or STEP 7 classic • Plant-wide safety programming of the F-CPU via SIMATIC Distributed Safety/Safety Advanced • Integrated diagnostics • No other programming tools required Your advantage: Modular connection of fail-safe AS-i networks with system-wide programming in SIMATIC and SINUMERIK controllers.	**6ES7**	2/32, 2/36
 3RT1...-.S.36	**SIRIUS 3RT contactors, 3-pole, 55 to 250 kW** • Solid-state operating mechanism with fail-safe control input for safety-related applications to SIL 2 with a contactor or SIL 3 with two contactors • 3RT10 for motor loads or 3RT14 for resistive loads • Version with removable lateral auxiliary switches or permanently mounted auxiliary switches and additional approval according to SUVA on request	**3RT10, 3RT14**	3/72, 4/20

		Type	Page
SIRIUS Safety Integrated (continued)			
 3RM1	**3RM1 Failsafe motor starters** • Motor starters for safety-related shutdown as 3RM11 direct-on-line starters or 3RM13 reversing starters • Compact devices with 22.5 mm width comprising combinations of relay contacts and power semiconductors (hybrid technology) and an electronic overload relay • For switching three-phase motors up to 3 kW (at 400 V) and resistive loads up to 10 A at AC voltages up to 500 V under normal operating conditions • Safety-related shutdown according to PL e or SIL 3 by shutting down the control supply voltage or control inputs possible without additional devices in the main circuit • Combination with 3SK safety relay through conventional wiring or 3ZY12 device connectors • Simple wiring and collective shutdown with device connectors in assemblies; there is no further need for complex looping of the connecting cables	**3RM1**	8/85
 3RK1308-0CB00-0CP0	**ET 200SP fail-safe motor starters** • Fully integrated in the ET 200SP I/O system (including TIA Selection Tool and TIA Portal) • Fully pre-wired motor starters for switching and protecting any AC loads up to 5.5 kW from 48 V AC to 500 V AC • Less space required in the control cabinet (20 to 80%) as a result of greater functional density (direct-on-line and reversing starters in same width) • Longer service life and reduced heat losses thanks to hybrid technology • Self-assembling 32 A power bus, i.e. the load voltage is only fed in once for a group of motor starters • High degree of flexibility when it comes to safety applications via SIMATIC F-CPU or 3SK safety relays up to SIL 3 and PL e Category 4 • Diagnostics capability for active monitoring of the switching and protection functions • Digital inputs can optionally be used via a 3DI/LC module	**3RK1**	8/95
 ET 200pro Safety	**ET 200pro Safety Motor Starter Solutions** The ET 200pro Safety Motor Starter Solutions comprise: • PROFIsafe modules • Safety repair switch module • Disconnecting module • Standard motor starter • High-Feature motor starter ET 200pro Safety Motor Starter Solutions local Safety Motor Starter Solutions local are preferred from the safety technology point of view for locally restricted safety applications. These motor starters are not dependent on a safe control system. ET 200pro Safety Motor Starter Solutions PROFIsafe Safety Motor Starter Solutions PROFIsafe are often found by contrast in safety applications of the more complex type that are interlinked. In this case a safe control system is used with the PROFINET or PROFIBUS bus systems with the PROFIsafe profile.	**3RK1**	9/11
 SIMOCODE pro V  SIMOCODE pro S	**SIMOCODE pro motor management and control devices** • Flexible, modular motor management system for motors with constant speeds in the low-voltage range • Provides an intelligent interface between the higher-level automation system and the motor feeder • Multi-functional, electronic full motor protection which is independent of the automation system • Integrated control functions for the motor control • Detailed operating, service and diagnostics data • Open communication via PROFIBUS DP, PROFINET/OPC UA, Modbus RTU or EtherNet/IP • Safety relay function for the fail-safe disconnection of motors up to SIL 3 (IEC 61508/IEC 62061) or PL e with Category 4 (EN ISO 13849-1) Fail-safe digital modules • DM-F Local for direct assignment between a fail-safe hardware shutdown signal and a motor feeder • DM-F PROFIsafe for when a fail-safe controller (F-CPU) creates the fail-safe signal for the disconnection	**3UF7**	10/5

		Type	Page
SIRIUS Safety Integrated (continued)			
 3SE51	**Mechanical position switches** • Easy assembly thanks to modular design • Solid, rugged design • Special versions are easily generated and quickly available, also in combination with standard modules • With a 3SE51/3SE52 position switch it is possible to achieve Category 2 according to EN ISO 13849-1 or SIL 1 according to IEC 61508 • Categories 3 and 4 can be achieved by using a second 3SE51/3SE53 position switch	**3SE51, 3SE52**	12/5
 3SE53	**Mechanical safety switches** • With separate actuator, hinge switch, or separate actuator and tumbler • With a position switch it is possible to achieve Category 3 according to EN ISO 13849-1 or SIL 2 according to IEC 61508 • Category 4 according to EN ISO 13849-1 or SIL 3 according to IEC 61508 can be achieved by using a second 3SE51 or 3SE52 position switch • Version in various sizes made of metal or plastic • In the case of safety switches with tumbler, versions in the high IP69K degree of protection • Integrated ASIsafe electronics for all enclosure designs	**3SE51, 3SE52, 3SE53**	12/47
 3SE66, 3SE67	**Non-contact magnetically operated safety switches** • Small, compact, safe • Simple installation even in restricted spaces thanks to connector versions • Two safety contacts and one signaling contact enable simple diagnostics at the maximum safety level	**3SE66, 3SE67**	12/100
 3SE63	**Non-contact RFID safety switches** • Long service life due to non-contact switching • Only one switch required for the maximum safety level PL e or SIL 3 according to EN ISO 13849-1 and IEC 61508 • Tamper protection better than with mechanical safety switches thanks to switches and actuators with individual coding • LED status indication including threshold indication for door displacement • Degree of protection up to IP69K and resistance to cleaning products • Larger switching displacement than mechanical switches; offers better mounting tolerance and sagging tolerance of the protective door	**3SE63**	12/106
 3SU14  3SU1 with PROFINET  3SU1	**Command devices** • Using a special F adapter, EMERGENCY STOP devices according to ISO 13850 can be directly connected through the standard AS-Interface or PROFIsafe with safety-related communication. This F adapter/fail-safe interface module is snapped from the rear onto the EMERGENCY STOP device, enabling the achievement of maximum performance level "e" according to EN ISO 13849-1, or SIL 3 according to IEC 62061. • Thanks to SIRIUS ACT with PROFINET, commanding and signaling devices can be connected directly via PROFINET to the controller and HMI devices – including with safety functions. Engineering and commissioning are simplified by the TIA Portal. • EMERGENCY STOP devices for disconnecting plants in an emergency situation • With positive latching function according to EN ISO 13850 and performance level "e" according to EN ISO 13849-1 or SIL 3 according to IEC 62061 • Various mushroom diameters (also illuminated), with lock, in plastic/metal, as individual or complete units, and in combination with 3SU1 enclosure or two-hand operation console. The 3SU1 enclosures are also optionally available with ASIsafe interface	**3SU1**	13/5

		Type	Page
SIRIUS Safety Integrated (continued)			
 3SE7	**Cable-operated switches** • Control functions and EMERGENCY STOP always within reach • More safety over long distances of up to 2 x 100 m length • Easy release • Fail-safe applications with SIRIUS Safety Integrated • Status display directly on the switch • Signal display for long distances in innovative LED technology with visibility over 50 m • Cable-operated switches with latching according to ISO 13850 (EN 418) and full EMERGENCY STOP function with positive-opening contacts • Quick and safe mounting using uniform mounting accessories • Versions with 1 NO/2 NC with yellow lid	**3SE7**	13/160
 3SE2924-3AA20	**Safety foot switches** • Are used wherever manual operation is not possible • With hood, IP65 metal enclosure • With interlock function according to ISO 13850, manual release by pushbutton switch • With 2 NO + 2 NC, NO contacts close by momentary contact, positive-opening NC contacts with independent latching (safety function)	**3SE2924-3AA20**	13/164

Connection methods

The 3SK safety relays are available with screw or spring-type terminals (push-in).

The 3TK2810 safety relays and the 3RK3 Modular Safety System are available with screw or spring-type terminals.

	Screw terminals
	Spring-type terminals (push-in)
	The terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

3SK safety relays: Spring-type terminals (push-in)

Push-in connections are a form of spring-type terminals allowing fast wiring without tools for rigid conductors or conductors equipped with end sleeves.

As with other spring-type terminals, a screwdriver (with 3.0 x 0.5 mm blade) is required to disconnect the conductor. The same tool can also be used to wire finely-stranded or stranded conductors with no end finishing.

The advantages of the push-in terminals are found, as with all spring-type terminals, in speed of assembly and disassembly and vibration-proof connection. There is no need for the checking and tightening required with screw terminals, see video "SIRIUS spring-type terminals – strong, flexible, safe and fast!"

Overview

SIRIUS 3SK safety relays

More information

Homepage, see www.siemens.com/safety-relays

Industry Mall, see www.siemens.com/product?3SK

Conversion tool, e.g. from 3TK28 to 3SK, see www.siemens.com/sirius/conversion-tool

SIRIUS Sim 3SK2 simulation tool, see https://support.industry.siemens.com/cs/ww/en/view/109763750

SIRIUS 3SK safety relays are the key elements of a consistent, cost-effective safety chain. Whether you need EMERGENCY STOP functionality, protective door monitoring, light arrays, laser scanners or the protection of presses or punches – slimline SIRIUS safety relays enable all safety applications to be implemented in the best possible way in terms of engineering and price.

The following safety-related functions are available:

- Monitoring the safety functions of sensors
- Monitoring the sensor leads
- Monitoring the correct device function of the safety relay
- Monitoring the actuators in the shutdown circuit
- Safety-related disconnection when dangers arise

SIRIUS 3SK safety relays are approved for applications up to SIL 3 (IEC 61508/IEC 62061) or PL e (EN ISO 13849-1).

Device series

SIRIUS 3SK safety relays stand out due to their flexibility for both parameterization and system designs with several evaluation units. This reduces device variance, thus bringing advantages in terms of device selection and spare parts management. Optimized solutions when selecting components and reduced spare part inventory requirements are facilitated by a clearly structured component range:

The following device series are available:

- 3SK1 Standard basic units
- 3SK1 Advanced basic units
- 3SK2 basic units
- 3SK1 output expansions
- 3SK1 input expansions
- Accessories

3SK1 Standard basic units

The 3SK1 Standard basic units are characterized by the following features:

- Compact design
- Simple operation
- Relay and semiconductor outputs
- Economical solution

3SK1 Advanced basic units

The 3SK1 Advanced basic units also offer:

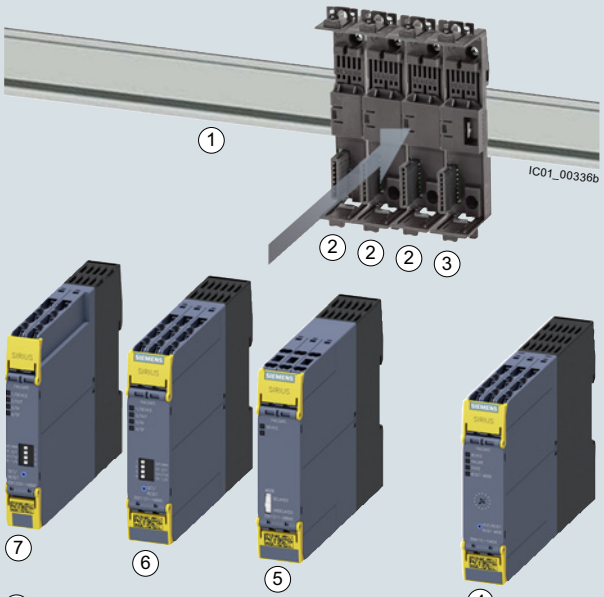
- Universal application possibilities thanks to multifunctionality
- Time-delayed outputs
- Expansion of inputs and outputs

3SK2 basic units

The 3SK2 basic units also offer:

- Up to six fail-safe, independent shutdown functions
- Flexible in use thanks to software parameterization
- Powerful semiconductor outputs
- Convenient diagnostics using diagnostics display and configuration software
- Communication via PROFINET/PROFIBUS by means of communication module

In the case of 3SK1 Advanced basic units or 3SK2 basic units, the 3ZY12 device connectors allow safety functions involving several sensors and actuators to be constructed very quickly.



1 Standard mounting rail
2 Device connector
3 Device termination connector
4 SIRIUS 3RM1 motor starter
5 SIRIUS 3SK1211 output expansion
6 SIRIUS 3SK1121 Advanced basic unit
7 SIRIUS 3SK1220 sensor expansion

System configuration example

The 3SK1 Standard and Advanced and 3SK2 series are a high-quality replacement for the 3TK28 safety relays. In their narrower design, and equipped with greater functionality, they can replace every 3TK28 device. The only exception to this are the 3TK2810 devices.

Overview of functions of the 3SK series

Type	**3SK1 Standard basic units**		**3SK1 Advanced basic units**		**3SK2 basic units**	
					22.5 mm	**45 mm**
	Safe relay outputs	Safe semiconductor outputs	Safe relay outputs	Safe semiconductor outputs	Safe semiconductor outputs	Safe semiconductor outputs
Sensors						
• Mechanical	✓	✓	✓	✓	✓	✓
• Non-floating	✓[1]	✓	✓	✓	✓	✓
• Antivalent	--	--	✓	✓	✓	✓
• Expandable	--	✓ by means of cascading	✓	✓	--	--
Inputs	2 x single-channel, 1 x two-channel	2 x single-channel, 1 x two-channel	2 x single-channel, 1 x two-channel	2 x single-channel, 1 x two-channel	Freely configurable: 10 x single-channel, 5 x two-channel	Freely configurable: 20 x single-channel, 10 x two-channel
Parameters						
• Start (auto/monitored)	✓	✓	✓	✓	A variety of functions can be set for each input/output by means of software parameterization.	
• Sensor connection 2 x single-channel/ 1 x two-channel	✓ by means of wiring	✓	✓	✓		
• Cross-circuit detection	✓ by means of wiring	✓	✓	✓		
• Start test ON/OFF	--	✓	✓	✓		
• Monitoring of two-hand operation consoles according to EN 574	--	--	✓	✓		
• Pressure-sensitive mat	--	--	✓	✓		
Safe outputs						
• Instantaneous	✓	✓	✓	✓	Configurable	Configurable
• Time-delayed	--	--	✓	✓	Configurable	Configurable
• Expandable with safe relay outputs	✓ by means of wiring	✓ by means of wiring	✓	✓	✓	✓
• Independent	--	--	--	--	✓[4]	✓[5]
• Device connectors	--	--	✓	✓	✓	✓
Options						
• External memory module	--	--	--	--	--	✓
• Display on the device	--	--	--	--	--	✓
• External diagnostics module can be connected	--	--	--	--	✓	✓
Control supply voltage						
• 24 V DC	✓[2]	✓	✓	✓	✓	✓
• 110 ... 240 V AC/DC	✓	✓[6]	✓[3]	✓[3]	--	--

✓ Available
-- Not available

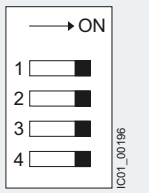
1) 24 V basic units only.
2) 24 V AC/DC.
3) Possible using 3SK1230 power supply via device connector.
4) Up to four independent safe outputs, two of which via device connectors.
5) Up to six independent safe outputs, two of which via device connectors.
6) Possible using 3SK1230 power supply by means of wiring.

General data

Parameter assignment

3SK112 and 3SK1112 with DIP switch

The 3SK112 and 3SK1112 safety relays are configurable safety relays. They are used as evaluation units for typical safety chains (detecting, evaluating, reacting). A number of functions can be set using the DIP switches on the front. 3SK112 and 3SK1112 are therefore universally applicable.

DIP switch No.	OFF	ON	Schematic
1	Sensor input Autostart	Sensor input Monitored start	
2	Without crossover monitoring	With crossover monitoring	
3	2 x single-channel sensor connection	1 x two-channel sensor connection	
4	With start test	Without start test	

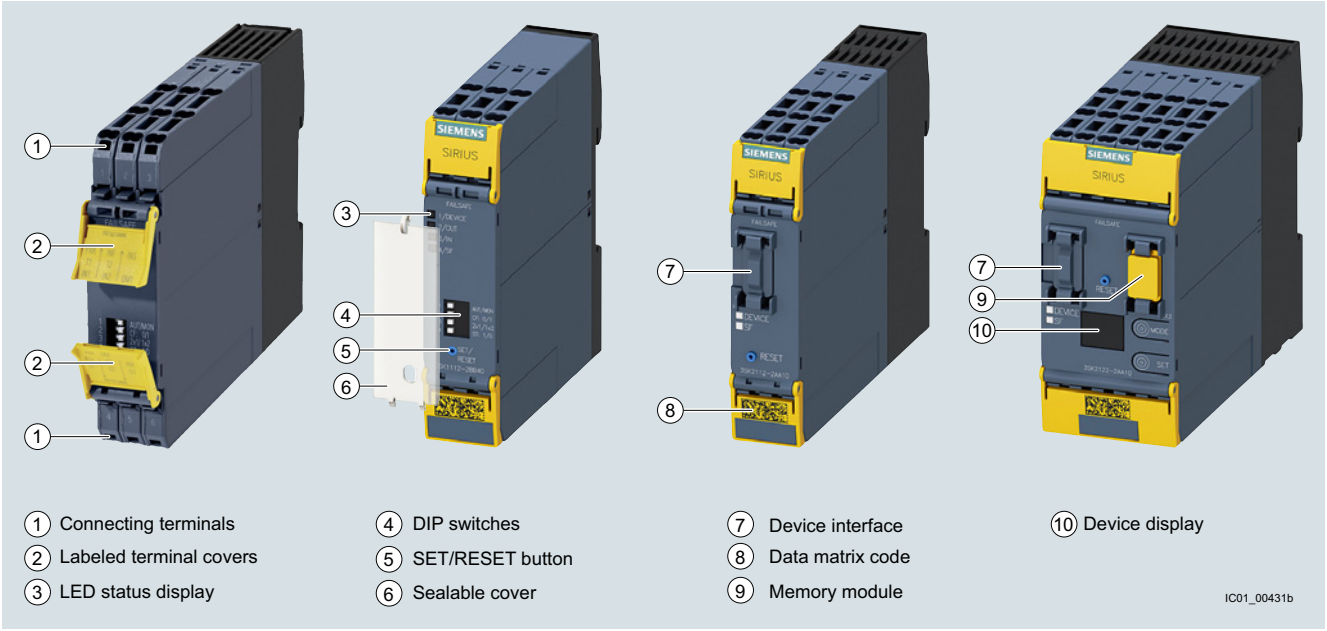
3SK2 with software

The 3SK2 safety relays are configured with the SIRIUS Safety ES software. The behavior of a 3SK2 device as well as the functioning of the individual safe outputs can thus be parameterized simply and conveniently in the logic diagram. In addition, the configuration can be printed out for documentation purposes. The software also supports users in commissioning and troubleshooting by means of online diagnostics and the option of "forcing" signals in the logic diagram. The 3SK2 safety relays thus offer maximum flexibility and universal application options.

Note:

SIRIUS Safety ES, see page 14/22.

Enclosure concept



1 Connecting terminals
2 Labeled terminal covers
3 LED status display
4 DIP switches
5 SET/RESET button
6 Sealable cover
7 Device interface
8 Data matrix code
9 Memory module
10 Device display

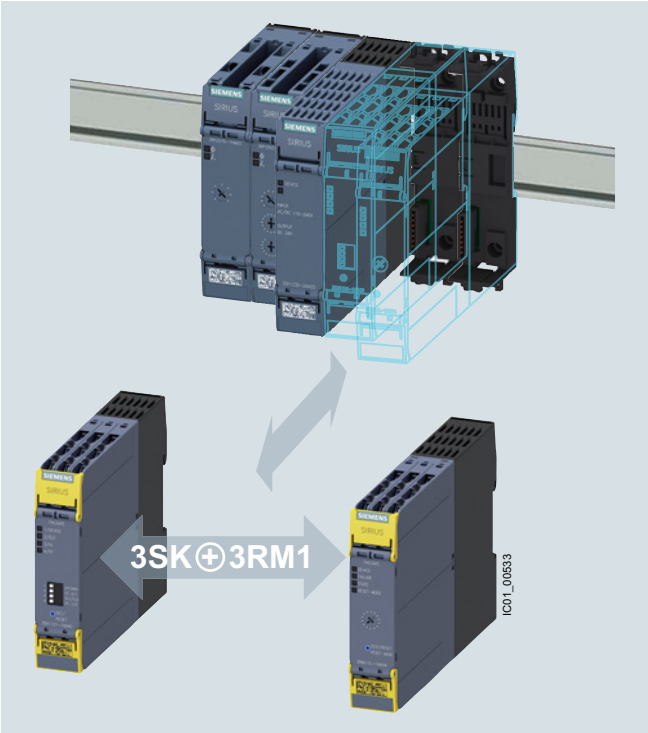
Innovative enclosure concept for SIRIUS 3SK safety relays

Communication

	 3SK2112, 22.5 mm	 3SK2122, 45 mm
PROFINET	✓	✓
PROFIBUS	✓	✓

✓ Available

Seamlessly integrated safety right through to the main circuit



Problem-free integration of functional safety into the main circuit through the simple combination of 3RM1 and 3SK1 devices

Functional safety in the main circuit needs to be both simple and flexible

The unique compatibility of hybrid 3RM1 fail-safe motor starters and 3SK safety relays means that integrated functional safety right through to the main circuit is no longer a problem.

Their compact design allows the motor starters to be installed to the right of the safety relay in a simple manner, just like an output expansion. The wiring of the safety-related signals to the relay can be performed simply, quickly and in an error-free manner using the device connector.

The ergonomically designed enclosure with removable terminals and terminal labeling in the hinged cover allows for the cables to be conveniently diagonally mounted from the front. Either screw or spring-type terminals with push-in technology are available.

Highlights

- Fail-safe disconnection of motors up to 3 kW
- Problem-free combination of fail-safe motor starters and safety relays
- End-to-end system, simple setup using device connectors
- Ergonomic enclosure

Note:

SIRIUS 3RM1 motor starters, see page 8/85.

Article No. scheme

Product versions		**Article number**									
3SK1 safety relays		**3SK1**	□	□	□	–	□	□	□	□	□
Device version	Basic unit		**1**								
	Expansion unit		**2**								
Device variants	3SK11: Standard; 3SK12: Output expansion			**1**							
	3SK11: Advanced; 3SK12: Input expansion			**2**							
Type of outputs	Relay outputs				**1**						
	Semiconductor outputs				**2**						
	Power outputs				**3**						
Connection type	Screw terminals						**1**				
	Spring-type terminals (push-in)						**2**				
Control circuit/actuation	3SK11: 3 enabling circuits							**A**			
	3SK11: 2 enabling circuits							**B**			
	3SK11: 4 enabling circuits							**C**			
Type of control supply voltage	3SK1213: 24 V AC, 50/60 Hz								**B**	**0**	
	3SK1: 24 V AC/DC, 50/60 Hz								**B**	**3**	
	3SK1: 24 V DC								**B**	**4**	
	3SK1213: 115 V AC, 50/60 Hz								**J**	**2**	
	3SK1213: 230 V AC, 50/60 Hz								**L**	**2**	
	3SK1: 110 ... 240 V AC/DC; 50/60 Hz								**W**	**2**	
Time delay	None										**0**
	0.05 ... 3 s										**1**
	0.5 ... 30 s										**2**
	5 ... 300 s										**4**
Example		**3SK1**	**1**	**1**	**1**	**–**	**1**	**A**	**B**	**3**	**0**

General data

Product versions		Article number
3SK2 safety relays		**3SK2 1 □ 2 – □ A A 1 0**
Device variants	10 F-DI, 2 F-DQ, width 22.5 mm	**1**
	20 F-DI, 4 F-DQ, width 45 mm	**2**
Connection type	Screw terminals	**1**
	Spring-type terminals (push-in)	**2**
Example		**3SK2 1 1 2 – 1 A A 1 0**

Product versions		Article number
PROFINET interface modules		**3SK2 5 1 1 – □ F A 1 0**
Connection type	Screw terminals	**1**
	Spring-type terminals	**2**
Example		**3SK2 5 1 1 – 1 F A 1 0**

Note:

The Article No. schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

General

- Approved for all safety applications because of its compliance with the highest safety requirements (SIL 3 and PL e)
- Universally usable thanks to adjustable parameters
- Usable worldwide thanks to globally valid certificates
- Compact SIRIUS design
- Device connectors with standard rail mounting for flexible connectability and expandability
- Removable terminals for greater plant availability
- Yellow terminal covers clearly identify the device as a safety component
- Sensor cable up to 2 000 m long allows it to be used in extensive plants

Relay outputs

- Different voltages can be switched through the floating contacts
- The relay contacts allow currents of up to 5 A at AC-15/DC-13 to be connected

Semiconductor outputs

- Wear-free
- Suitable for operation in frequently switching applications
- Insensitive to vibrations and dirt
- High electrical endurance

Power outputs (3SK1213 output expansion)

- Different voltages can be switched through the floating contacts
- With the power relay contacts currents up to 10 A AC-15/6 A DC-13 can be switched
- High mechanical and electrical endurance
- Protective separation between safe outputs and electronics

Expansion option by adding the 3RM1 motor starter

SIRIUS 3SK safety relays are ideal for combining with the SIRIUS 3RM1 motor starters.

Combinations are made by means of

- SIRIUS 3ZY12 device connectors (in combination with 3SK1 Advanced/3SK2) or
- Conventional wiring (for all 3SK1 and 3SK2 basic units)

This makes collective shutdown very easy in assemblies. The wiring, and ultimately the shutting down of the control supply voltage for the expansion components in EMERGENCY STOP situations, is performed via the device connector. There is no further need for complex looping of the connecting cables between the safety relay and the motor starters.

The 3RM1 motor starter combines the benefits of semiconductor technology and relay technology. This combination is also known as hybrid technology.

The hybrid technology in the motor starter is characterized by the following features:

- The inrush current in the case of motorized loads is conducted briefly via the semiconductors. Advantages include protection of the relay contacts and a long service life due to low wear.
- The uninterrupted current is conducted via relay contacts. Advantages include lower heat losses compared with the semiconductor.
- Shutdown is implemented again via the semiconductor. The contacts are only slightly exposed to arcs, and this results in a longer service life.
- Integrated overload protection

Note:

SIRIUS 3RM1 motor starters, see page 8/85.

3ZY12 device connectors

Using 3ZY12 device connectors to combine devices reduces the time required to configure and wire the components. At the same time errors are avoided during wiring, and this considerably reduces the testing required for the fully-assembled application.

Configuration and stock keeping

Variable setting options by means of DIP switches or software, a wide voltage range (3SK1111) and a special power supply unit (3SK1 only) reduce the cost of keeping stocks and the considerations involved in configuration where the evaluation units to be selected are concerned.

Communication

The 3SK2 safety relays can be easily integrated in the overall application via PROFINET or PROFIBUS using optionally available interface modules.

This provides the following advantages:

- Exchange of signals and information with the plant controller
- Read-out and visualization of diagnostics information of the safety relay via the controller supports troubleshooting and reduces plant downtimes
- Access with the Safety ES engineering software via the fieldbus for parameterization, commissioning and diagnostics

Simulation

The SIRIUS Sim simulation tool for 3SK2 can be used to quickly and easily test configurations that have been created without real devices. The configurations thus created can then be loaded directly into the real devices. Time and costs for engineering are thus reduced.

Note:

SIRIUS Sim 3SK2, see page 11/22 or
https://support.industry.siemens.com/cs/ww/en/view/109763750.

Application

3SK1 safety relays

SIRIUS 3SK1 safety relays are used mainly in autonomous safety applications which are not connected to a safety-related bus system. Their function here is to evaluate the sensors and the safety-related shutdown of hazards. Also they check and monitor the sensors, actuators and safety-related functions of the safety relay.

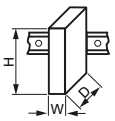
3SK2 safety relays

SIRIUS 3SK2 safety relays are used primarily in autonomous, more complex safety applications for which the functional scope of the 3SK1 devices is no longer sufficient, such as in the implementation of independent shutdown functions or integration into higher-level control systems for diagnostics via fieldbus. Their function here is to evaluate the sensors and the safety-related shutdown of hazards. Also they check and monitor the sensors, actuators and safety-related functions of the safety relay.

Technical specifications

More information	
Manual 3SK1, see https://support.industry.siemens.com/cs/ww/en/view/67585885	Manual 3SK2, see https://support.industry.siemens.com/cs/ww/en/view/109444336
Technical specifications 3SK1230, see https://support.industry.siemens.com/cs/ww/en/ps/16389/td	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16382/faq

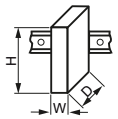
SIRIUS 3SK1 safety relays

Article number		3SK1111-.AB30, 3SK1211-.BB00, 3SK1211-.BB40	3SK1111-.AW20, 3SK1121, 3SK1211-.BW20	3SK1112	3SK1120	3SK1122	3SK1213	3SK1220
General data:								
Width x height x depth 	mm	22.5 x 100 x 121.6		22.5 x 100 x 91.6	17.5 x 100 x 121.6	22.5 x 100 x 121.6	90 x 100 x 121.6	17.5 x 100 x 121.6
Ambient temperature								
• During operation	°C	-25 … +60						
• During storage	°C	-40 … +80						
Installation altitude at height above sea level, maximum	m	2 000						
Air pressure acc. to SN 31205	kPa	90 … 106						
Shock resistance		10 *g* /11 ms					5 *g* /10 ms	10 *g* /11 ms
Vibration resistance acc. to IEC 60068-2-6		5 ... 500 Hz: 0.75 mm						
IP degree of protection of the enclosure		IP20						
Touch protection against electric shock		Finger-safe						
Insulation voltage, rated value	V	300		50			300	50
Impulse withstand voltage, rated value	V	4 000		800			4 000	800
Safety integrity level (SIL) according to IEC 61508		3						
Performance level (PL) according to EN ISO 13849-1		e						
T1 value for proof test interval or service duration according to IEC 61508	y	20						
EMC emitted interference		IEC 60947-5-1, class B	IEC 60947-5-1, class A				IEC 60947-5-1, class B	IEC 60947-5-1, class A
Certificate of suitability								
• UL certification		Yes						
• TÜV approval		Yes						

Article number		3SK1111, 3SK1121-.AB40, 3SK1211	3SK1112, 3SK1122	3SK1120	3SK1121-.CB4.	3SK1213
Switching capacity current of the NO contacts of the relay outputs						
• At AC-15 at 230 V	A	5	--		3	10
• At DC-13 at 24 V	A	5	--		3	6
Switching capacity current of the semiconductor outputs at DC-13 at 24 V	A	--	2	0.5	--	

Article number		3SK1111-.AB30, 3SK1211	3SK1111-.AW20	3SK1112, 3SK1220	3SK1120, 3SK1122-.AB40	3SK1121-.AB40	3SK1121-.CB4.	3SK1122-.CB4.	3SK1213
PFHD at high demand rate according to EN 62061	1/h	1.7×10^{-9}	1.5×10^{-9}	1.0×10^{-9}	1.3×10^{-9}	2.5×10^{-9}	3.7×10^{-9}	1.5×10^{-9}	1.0×10^{-9}
PFDavg at low demand rate according to IEC 61508		1.0×10^{-6}		7.0×10^{-6}					1.0×10^{-6}

SIRIUS 3SK2 safety relays

Article number		3SK2112-.AA10	3SK2122-.AA10	3SK2511-.FA10
General data:				
Width x height x depth 	mm	22.5 x 100 x 124.5	45 x 100 x 124.5	22.5 x 100 x 124.5
Ambient temperature				
• During operation	°C	-25 ... +60		
• During storage	°C	-40 ... +80		-40 ... +85
Installation altitude at height above sea level, maximum	m	2 000		
Air pressure acc. to SN 31205	kPa	90 ... 106		
Shock resistance		15 *g* /11 ms		
Vibration resistance acc. to IEC 60068-2-6		5 ... 500 Hz: 0.75 mm		
IP degree of protection of the enclosure		IP20		
Touch protection against electric shock		Finger-safe		
Insulation voltage, rated value	V	50		
Impulse withstand voltage, rated value	V	800		
EMC emitted interference according to IEC 60947-1		class A		
Certificate of suitability				
• UL certification		Yes		
• TÜV approval		Yes		

Article number		3SK2112-.AA10	3SK2122-.AA10
Safety integrity level (SIL) according to IEC 61508		3	
Performance level (PL) according to EN ISO 13849-1		e	
T1 value for proof test interval or service duration according to IEC 61508	y	20	
Switching capacity current of the semiconductor outputs at DC-13 at 24 V	A	4	
PFHD at high demand rate according to EN 62061	1/h	1.0×10^{-8}	1.2×10^{-8}
PFDavg at low demand rate according to IEC 61508		1.5×10^{-5}	1.8×10^{-5}

Article number		3SK2511-.FA10
Transmission type for Industrial Ethernet		PROFINET with 100 Mbps full duplex (100BASE-TX)
Number of interfaces acc. to PROFINET		1
Type of interface Ethernet interface		Yes
Type of interface 1 RJ45 (Ethernet)		Yes
PROFINET Conformance Class		B
Network load class according to PROFINET		1
Volume of cyclic user data for PROFINET IO		
• For outputs	bit	64
• For inputs	bit	64

SIRIUS 3SK1 Standard basic units

Overview

3SK111 Standard basic units

The 3SK111 Standard basic units are characterized by simple, variable functionality. These devices are recommended for safety functions requiring only a few sensors and a small number of outputs on the safety relay.

Note:

Use of device connectors not possible.

Selection and ordering data

3SK1111-1AB30

3SK1111-1AW20

3SK1112-1BB40

Control supply voltage		Number of outputs						SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
At AC at 50 Hz	At DC	as contacting contact block			as contactless semiconductor contact block								
		as NO contact, instantaneous switching	as NO contact, delayed switching	for signaling function, instantaneous switching	instantaneous switching	delayed switching	for signaling function, instantaneous switching						
V	V							d					
Standard basic units													
24	24	3	0	1	0	0	0	▶	**3SK1111-□AB30**		1	1 unit	41L
110 … 240	110 … 240	3	0	1	0	0	0	▶	**3SK1111-□AW20**		1	1 unit	41L
--	24	0	0	0	2	0	1	2	**3SK1112-□BB40**		1	1 unit	41L

Type of electrical connection

- Screw terminals
- Spring-type terminals (push-in)

1
2

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Overview

3SK112 Advanced basic units

The 3SK112 Advanced basic units form an innovative system landscape that allows even complex safety functions with large numbers of sensors and outputs to be built up using the device connectors. It is possible to increase both the number of inputs for sensors and the number of safe outputs of the basic unit without the need for wiring outlay between the devices.

Note:

Use of device connectors possible.

Selection and ordering data

3SK1121-1AB40

3SK1120-1AB40

3SK1122-1AB40

3SK1122-1CB41

Control supply voltage at DC	Number of outputs as contacting contact block: as NO contact, instantaneous switching	as NO contact, delayed switching	as NC contact for signaling function, instantaneous switching	as contactless semiconductor contact block: instantaneous switching	delayed switching	for signaling function, instantaneous switching	Adjustable OFF-delay time	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
V							s	d					
Advanced basic units													
24	3	0	1	0	0	0	--	2	**3SK1121-□AB40**		1	1 unit	41L
	2	2	0	0	0	0	0.05 ... 3	2	**3SK1121-□CB41**		1	1 unit	41L
							0.5 … 30	2	**3SK1121-□CB42**		1	1 unit	41L
							5 … 300	5	**3SK1121-□CB44**		1	1 unit	41L
24	0	0	0	1	0	0	--	2	**3SK1120-□AB40**		1	1 unit	41L
				3	0	1	--	2	**3SK1122-□AB40**		1	1 unit	41L
				2	2	0	0.05 ... 3	5	**3SK1122-□CB41**		1	1 unit	41L
							0.5 … 30	2	**3SK1122-□CB42**		1	1 unit	41L
							5 … 300	5	**3SK1122-□CB44**		1	1 unit	41L

Type of electrical connection

- Screw terminals **1**
- Spring-type terminals (push-in) **2**

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

SIRIUS 3SK2 basic units

Overview

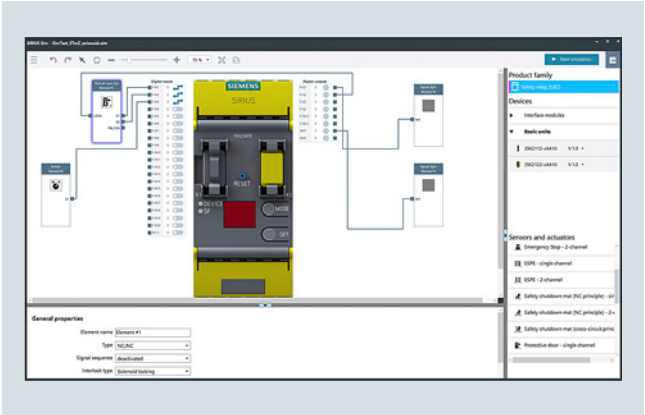
3SK2 basic units

The 3SK2 basic units have a large number of inputs and outputs within a narrow width. In addition, demanding safety applications can be implemented simply with several independent safety functions. Flexible application options are enabled by powerful semiconductor outputs, as well as by expandability with additional 3SK output expansions and 3RM1 Failsafe motor starters. Flexible time functions and diagnostics options are available.

The 3SK2 basic units can be easily integrated in control systems by means of optional communication modules for the purpose of diagnostics or access via software, for example. Furthermore, system states and fault diagnostics can be displayed easily and more rapidly on site using the diagnostics module for installation in the control cabinet front.

The 22.5-mm-wide version of the 3SK2 basic units has 10 x single-channel (5 x two-channel) inputs, while the 45-mm-wide 3SK2 version comes with 20 x single-channel (10 x two-channel) inputs.

SIRIUS Sim 3SK2

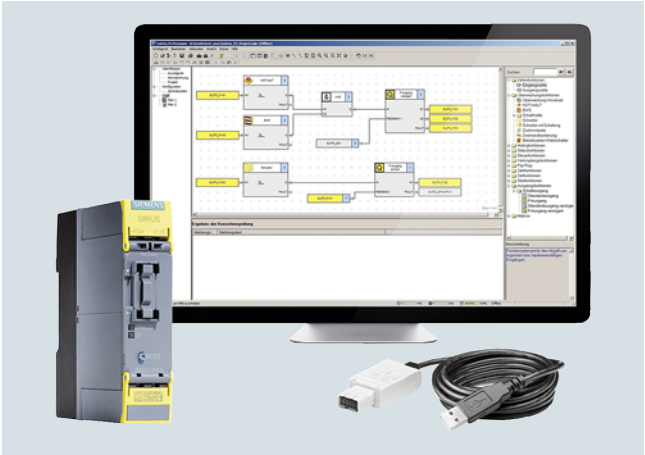


SIRIUS Sim 3SK2

The SIRIUS 3SK2 simulation tool can be used to quickly and easily test functions and configurations in an office environment. These configurations can then be loaded directly into real devices. Time and costs for engineering are reduced.

SIRIUS Sim 3SK2 is available free of charge as a download, see https://support.industry.siemens.com/cs/ww/en/view/109763750.

Starter Kit



Starter Kit

The Starter Kit is a favorably-priced complete package for the simple creation of complex safety applications and comprises:

- 3SK2112-2AA10 basic unit, 22.5 mm wide, with spring-type terminals (push-in)
- SIRIUS Safety ES Standard software for configuring, commissioning, operating and diagnosing
- USB PC cable for easy transmission of the configuration to the device by means of USB

Selection and ordering data

3SK2112

3SK2122

Control supply voltage At DC	Number of outputs as contactless semiconductor contact block, safety-related, two-channel	Number of outputs as contactless semiconductor contact block, non-safety-related, two-channel	Number of outputs to the device connector, safety-related	Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
V				mm	d					
3SK2 basic units										
24	2	1	2	22.5	2	**3SK2112-□AA10**		1	1 unit	41L
	4	2	2	45	2	**3SK2122-□AA10**		1	1 unit	41L

Type of electrical connection

- Screw terminals — **1**
- Spring-type terminals (push-in) — **2**

3SK2511-1FA10

Product type designation	Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	mm	d					
Interface modules *NEW*							
For connecting 3SK2 and 3RK3 safety relays via PROFINET	22.5	2	**3SK2511-□FA10**		1	1 unit	42B

Type of electrical connection

- Screw terminals — **1**
- Spring-type terminals (push-in) — **2**

Note:

The 3UF7930-0AA00-0 connection cable is not included in the scope of supply and must be ordered separately, see page 11/27.

Control supply voltage At DC	Number of outputs as contactless semiconductor contact block, safety-related, two-channel	Number of outputs as contactless semiconductor contact block, non-safety-related, two-channel	Number of outputs to the device connector, safety-related	Width	SD	**Spring-type terminals (push-in)** Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
V				mm	d					
Starter Kit										
Contains 3SK2112-2AA10 basic unit, SIRIUS Safety ES Standard and 3UF7941-0AA00-0 USB PC cable										
24	2	1	2	22.5	2	**3SK2941-2AA10**		1	1 unit	4N1

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Output expansions

Overview

3SK121 output expansion

The 3SK121 output expansions can be used to expand all 3SK basic units.

3SK1211 output expansion

The 3SK1211 output expansion is used to expand the safe outputs of a basic unit by adding another four safe outputs. These outputs have a switching capacity of AC-15 5 A at a switching voltage of 230 V. The devices can be connected to any 3SK basic unit by means of wiring. In addition, the devices with a 24 V DC control supply voltage can also be connected to 3SK1 Advanced basic units and 3SK2 basic units by means of the 3ZY12 device connectors.

3SK1213 output expansion

The 3SK1213 output expansion is used to expand the safe outputs of a basic unit by adding three safe outputs with high switching capacity. These outputs have a switching capacity of AC-15 10 A at a switching voltage of 230 V. The devices can be connected to any 3SK basic unit by means of wiring. As with the 3SK1211, the devices with a 24 V DC control supply voltage can also be connected to 3SK1 Advanced and 3SK2 basic units by means of the 3ZY12 device connectors.

Note:

It is only possible to expand the Standard basic units by means of wiring. Advanced basic units and 3SK2 basic units can be expanded using the 3ZY12 device connector.

Benefits

- Perfect adaptation of the number of outputs
- Simple expansion of instantaneous and time-delayed safe outputs of the Advanced basic units using device connectors
- When using the device connector the outputs on the terminals of the basic device can still be used
- Another two freely configurable shutdown functions on 3SK2 basic units when using device connectors
- Expansion with power contacts for high AC-15/DC-13 currents in the control circuit
- No wiring of the feedback circuit to the basic units is required when using device connectors
- Shorter installation times
- Less configuring and testing required

Selection and ordering data

3SK1211-1BB40

3SK1213-1AB40

Control supply voltage		Number of outputs as contacting contact block			3ZY12 device connectors	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
At AC at 50 Hz	At DC	as NO contact, instantaneous switching	as NO contact, delayed switching	as NC contact instantaneous switching for feedback circuit							
V	V					d					
Output expansions											
24	--	4	0	1	No	5	**3SK1211-□BB00**		1	1 unit	41L
--	24	4	0	1	Yes	▶	**3SK1211-□BB40**		1	1 unit	41L
110 ... 240	110 ... 240	4	0	1	No	2	**3SK1211-□BW20**		1	1 unit	41L
--	24	3	0	1	Yes	5	**3SK1213-□AB40**		1	1 unit	41L
115	--	3	0	1	No	5	**3SK1213-□AJ20**		1	1 unit	41L
230	--	3	0	1	No	5	**3SK1213-□AL20**		1	1 unit	41L

Type of electrical connection

- Screw terminals **1**
- Spring-type terminals (push-in) **2**

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

3SK1220 sensor expansion

With the input expansions

- 3SK1220 sensor expansion
- 3SK1230 power supply

the 3SK1 Advanced basic units can be made more flexible.

3SK1220 sensor expansion

The 3SK1220 input expansion allows additional sensors to be integrated easily and flexibly. The device monitors two single-channel sensors or one two-channel sensor, whatever their output technology (floating/single-ended).

Note:

The 3SK1220 sensor expansion can only be connected to the 3SK1 Advanced basic units by means of the 3ZY12 device connector, see page 11/26.

3SK1230 power supply

The 3SK1230 power supply makes the 3SK1 devices universally usable, whatever control supply voltage is to be used.

Note:

Alongside the 3ZY12 device connector, the 3SK1230 power supply can also be wired to act as a power supply for 3SK1 devices.

Benefits

- A wide voltage range of 110 ... 240 V AC/DC allows the devices to be used worldwide
- Low stock keeping due to little variance
- Flexible expansion of the number of sensors without the need for additional wiring between the devices
- Perfect adaptation of the number of inputs to suit the application
- Universal use thanks to the wide range of adjustable parameters for sensor expansion (parameters as for 3SK1 Advanced basic units)

Selection and ordering data

3SK1220-1AB40

3SK1230-1AW20

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Sensor expansions						
For safety-related expansion of the 3SK1 Advanced basic units by adding a further two-channel sensor or two single-channel sensors	2	**3SK1220-☐AB40**		1	1 unit	41L
Power supplies						
For supplying 3SK1 Advanced basic units via 3ZY12 device connectors at voltages of 110 ... 240 V AC/DC	2	**3SK1230-☐AW20**		1	1 unit	41L
Type of electrical connection						
• Screw terminals		**1**				
• Spring-type terminals (push-in)		**2**				

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Overview

Numerous accessories are available for 3SK, such as device connectors, terminals, cables, adapters, covers, memory and diagnostics modules or software.

Device connectors for 3SK112., 3SK12.. and 3SK2

The device connector can be used to connect devices of the 3SK/3RM1 system together, with the last device in a system configuration being placed on a device termination connector. Use of device connectors not possible with 3SK1 standard.

Device connectors are available in various versions specifically for the 3SK safety relays:

For type	Device connectors				Device termination connectors	
	3ZY1212-1BA00 (for 3SK1, width 17.5 mm)	**3ZY1212-2BA00** (for 3SK1, width 22.5 mm)	**3ZY1212-2GA00** (for 3SK2, width 22.5 mm)	**3ZY1212-4GA01** (for 3SK2, width 45 mm)	**3ZY1212-2DA00** (for 3SK1, width 22.5 mm)	**3ZY1212-0FA01** (for 3SK1, set for enclosures ≥ 45 mm)
3SK1 Advanced basic units						
3SK1120	✓	--	--	--	--	--
3SK1121	--	✓	--	--	✓	--
3SK1122	--	✓	--	--	✓	--
3SK2 basic units						
3SK2112	--	--	✓	--	--	--
3SK2122	--	--	--	✓	--	--
Output expansions						
3SK1211	--	✓	--	--	✓	--
3SK1213	--	--	--	--	--	✓
Input expansions						
3SK1220	✓	--	--	--	--	--
3SK1230	--	✓	--	--	--	--

✓ Available
-- Not available

Removable terminals for 3SK

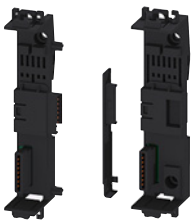
The following removable terminals are available for the 3SK safety relays for pre-wiring of the terminals in the control cabinet, or for replacing terminals:

For type	Removable terminals			
	Screw terminals		Spring-type terminals (push-in)	
	2-pole 3ZY1121-1BA00	**3-pole 3ZY1131-1BA00**	**2-pole 3ZY1121-2BA00**	**3-pole 3ZY1131-2BA00**
3SK1 basic units				
3SK1111	--	✓	--	✓
3SK1112	✓	--	✓	--
3SK1120	--	✓	--	✓
3SK1121	--	✓	--	✓
3SK1122	✓ bottom	✓ top	✓ bottom	✓ top
3SK2 basic units				
3SK2112	--	✓	--	✓
3SK2122	--	✓[1)]	--	✓[1)]
Output expansions				
3SK1211	✓	--	✓	--
3SK1213	--	--	--	--
Input expansions				
3SK1220	--	✓ top	--	✓ top
3SK1230	✓ bottom	--	✓ bottom	--

✓ Available
-- Not available
[1)] Two sets of terminals are required for 3SK2122.

Selection and ordering data

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Device connectors for the electrical connection of SIRIUS devices in the industrial standard mounting rail enclosure						
Device connectors for 3SK1						
• Width 17.5 mm	2	**3ZY1212-1BA00**		1	1 unit	41L
• Width 22.5 mm	2	**3ZY1212-2BA00**		1	1 unit	41L
Device connectors for 3SK2						
• Width 22.5 mm	2	**3ZY1212-2GA00**		1	1 unit	41L
• Width 45 mm	2	**3ZY1212-4GA01**		1	1 unit	41L
Device termination connectors For 3SK1, width 22.5 mm Note: Observe positions of the slide switch, see Manual "3SK1".	2	**3ZY1212-2DA00**		1	1 unit	41L
Device daisy chain connectors For 3RM1 and 3SK, 24 V DC, 22.5 mm, for implementation of distances between devices according to the installation guidelines	2	**3ZY1212-2AB00**		1	1 unit	41L
Device connectors For height adjustment for devices without electrical connection via device connector, with a width of 22.5 mm or greater	2	**3ZY1210-2AA00**		1	1 unit	41L
Device termination connector set For 3SK1213, width > 45 mm, comprising 3ZY1212-2FA00 and 3ZY1210-2AA00	2	**3ZY1212-0FA01**		1	1 unit	41L



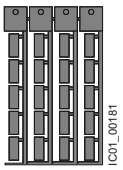
3ZY1212 -1BA00 3ZY1212 -2DA00

* You can order this quantity or a multiple thereof.
Illustrations are approximate

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
		d					
Terminals for SIRIUS devices in the industrial standard mounting rail enclosure							
 3ZY1121-2BA00	**Removable terminals**		**Screw terminals**				
	• Screw terminals up to 2 x 1.5 mm² or 1 x 2.5 mm²						
	- 2-pole	2	**3ZY1121-1BA00**		1	6 units	41L
	- 3-pole[1)]	2	**3ZY1131-1BA00**		1	6 units	41L
	- 4-pole NEW	2	**3ZY1141-1BA00**		1	6 units	41L
			Spring-type terminals (push-in)				
	• Push-in terminals up to 2 x 1.5 mm²						
	- 2-pole	2	**3ZY1121-2BA00**		1	6 units	41L
	- 3-pole[1)]	2	**3ZY1131-2BA00**		1	6 units	41L
	- 4-pole NEW	2	**3ZY1141-2BA00**		1	6 units	41L
PC cables for 3SK2 (essential accessory)							
 3UF7941-0AA00-0	**USB PC cables** For connecting to the USB interface of a PC/PG, for communication with 3SK2 through the system interface, recommended for use in connection with 3SK2	▶	**3UF7941-0AA00-0**		1	1 unit	42J
Connection cables for 3SK2 (essential accessory for diagnostics/interface modules)							
 3UF7932-0AA00-0	For connecting diagnostics/interface modules to 3SK2 basic unit						
	Central units with interface module / Diagnostics modules with central unit or interface module / Length						
	✓ / -- / • 0.025 m (flat)	▶	**3UF7930-0AA00-0**		1	1 unit	42J
	-- / ✓ / • 0.1 m (flat)	▶	**3UF7931-0AA00-0**		1	1 unit	42J
	-- / ✓ / • 0.15 m (flat)	▶	**3UF7934-0AA00-0**		1	1 unit	42J
	-- / ✓ / • 0.3 m (flat)	▶	**3UF7935-0AA00-0**		1	1 unit	42J
	-- / ✓ / • 0.5 m (flat)	▶	**3UF7932-0AA00-0**		1	1 unit	42J
	-- / ✓ / • 0.5 m (round)	▶	**3UF7932-0BA00-0**		1	1 unit	42J
	-- / ✓ / • 1.0 m (round)	▶	**3UF7937-0BA00-0**		1	1 unit	42J
	-- / ✓ / • 2.5 m (round)	▶	**3UF7933-0BA00-0**		1	1 unit	42J
Operating and monitoring modules for 3SK2							
 3SK2611-3AA00	**Diagnostics modules** For direct display of errors, e.g. of cross-circuits Note: The 3RK3611-3AA00 MSS diagnostics module cannot be operated on the 3SK2 devices.	2	**3SK2611-3AA00**		1	1 unit	41L
Door adapters for 3SK2							
 3UF7920-0AA00-0	For external connection of the system interface, e.g. outside a control cabinet	▶	**3UF7920-0AA00-0**		1	1 unit	42J
Interface covers for 3SK2							
 3RA6936-0B	For system interface • Titanium gray	10	**3RA6936-0B**		1	5 units	42F
Memory modules for 3SK2							
 3RK3931-0AA00	For backing up the complete parameterization of the 3SK2 safety system without a PC/PG through the system interface	2	**3RK3931-0AA00**		1	1 unit	42C
Software for 3SK2							
 3ZS1316-.C.10-0Y.5	**SIRIUS Safety ES** Software for configuring, commissioning, operating and diagnosing of 3SK2 and 3RK3, see page 14/22 or www.siemens.com/product?3ZS1.						
	SIRIUS SIM 3SK2 NEW Available free of charge as a download for simulating configurations, see https://support.industry.siemens.com/cs/ww/en/view/109763750						

[1)] For 3SK2122 two terminal sets are required.

Accessories

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Accessories for enclosures							
 3ZY1321-2AA00	**Sealing covers** • 17.5 mm (for 3SK1120 and 3SK1220)	2	**3ZY1321-1AA00**		1	5 units	41L
	• 22.5 mm (for all 3SK1 devices except 3SK1120 and 3SK1220)	2	**3ZY1321-2AA00**		1	5 units	41L
 3ZY1311-0AA00	**Push-in lugs** For wall mounting	2	**3ZY1311-0AA00**		1	10 units	41L
 3ZY1440-1AA00	**Coding pins** For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure; they enable the mechanical coding of terminals, see Manual "3SK1"	2	**3ZY1440-1AA00**		1	12 units	41L
   3ZY1450-1AB00  3ZY1450-1BB00	**Hinged cover** Replacement cover, without terminal labeling						
	• Titanium gray						
	- 22.5 mm wide (for 3SK1230, 3SK2511)	2	**3ZY1450-1AB00**		1	5 units	41L
	• Yellow						
	- 17.5 mm wide (for 3SK1220, 3SK1120)	2	**3ZY1450-1BA00**		1	5 units	41L
	- 22.5 mm wide (for 3SK11 except 3SK1120, 3SK1211, 3SK2112)	2	**3ZY1450-1BB00**		1	5 units	41L
	- 45 mm wide (for 3SK2122)	2	**3ZY1450-1BC00**		1	5 units	41L
Blank labels							
 3RT2900-1SB20	**Unit labeling plates** For SIRIUS devices 20 mm x 7 mm, titanium gray[1)]	20	**3RT2900-1SB20**		100	340 units	41B
Tools for opening spring-type terminals							
 3RA2908-1A	**Screwdrivers** For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated	2	**Spring-type terminals (push-in)** **3RA2908-1A**		1	1 unit	41B

[1)] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH,
see page 16/16.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

SIRIUS 3TK2810 safety relays

More information

Homepage, see www.siemens.com/safety-relays
Industry Mall, see www.siemens.com/product?3TK28

3TK2810-0 standstill monitors

The standstill monitor increases safety in hazardous areas. Without a sensor, it detects motor stoppage from the residual magnetization of the rotating motor. When an adjustable threshold value is undershot, it uses its outputs to allow access to hazardous areas, for example by unlocking a protective door.

3TK2810-1 speed monitors

The speed monitor combines two safety functions in one unit by continuously monitoring machines and plants for standstill and speed.

Through simple parameterization and permanent diagnostics on the display, faults can be quickly remedied at any time – often before they cause plant downtimes.

In addition to standstill and speed monitoring, the unit also features an integrated monitoring function of a protective door with spring-type interlocking. Therefore, an additional evaluation unit is not needed.

Article No. scheme

Product versions		Article number										
Safety relays with special functions		**3TK2810**	**–**	**□**	**□**	**A**	**□**	**□**				
Device version	Standstill monitor			**0**								
	Speed monitor for NPN/PNP proximity switches and encoders			**1**								
Type of control supply voltage	24 V DC				**B**							
	230 V AC, 50/60 Hz				**G**							
	400 V AC, 50/60 Hz				**J**							
	120 ... 240 V AC/DC; 50/60 Hz				**K**							
Time delay	0.2 ... 6 s (standstill)						**0**					
	0 … 999 s (release delay)						**4**					
Connection type	Screw terminals							**1**				
	Spring-type terminals (push-in)							**2**				
Version	Speed monitor for NAMUR proximity switches and encoders								**–**	**0**	**A**	**A** **0**
Example		**3TK2810**	**–**	**0**	**B**	**A**	**0**	**1**				

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

3TK2810-0 standstill monitors

- No additional sensors required
- Signaling of faults with diagnostics display
- Standstill time can be set
- Unit can be used with frequency converters

3TK2810-1 speed monitors

- Menu-prompted, easy parameterization
- Direct diagnostics on the display means shorter downtimes thanks to early fault detection
- Integrated protective door monitoring means greater safety because access to the plant is allowed only in the safe state
- Suitable for all standard sensors, i.e. high flexibility

With special functions

Technical specifications

More information

Operating instructions 3TK2810-0, see
https://support.industry.siemens.com/cs/ww/en/view/25437254
Manual 3TK2810-1, see
https://support.industry.siemens.com/cs/ww/en/view/43707376
Technical specifications, see
https://support.industry.siemens.com/cs/ww/en/ps/16391/td
FAQs, see
https://support.industry.siemens.com/cs/ww/en/ps/16391/faq

Type	3TK2810-0 standstill monitors	3TK2810-1 speed monitors
Sensors		
• Inputs	3	4
• Electronic	--	3
• With contacts	--	1
• Without sensors (measuring inputs)	3	--
• Magnetically operated switch (Reed contacts)	--	--
Safety mats	--	--
Start		
• Auto	✓	✓
• Monitored	--	✓
Cascading input 24 V DC	--	--
Key-operated switch	--	--
Enabling circuit, floating		
• Stop category 0	3 NO + 1 NC	2
• Stop category 1	--	--
Enabling circuit, electronic		
• Stop category 0	--	--
• Stop category 1	--	--

Type	3TK2810-0 standstill monitors	3TK2810-1 speed monitors
Signaling outputs		
• Floating	1 CO	--
• Electronic	2	2
Standards	IEC 60204-1, EN ISO 12100, EN ISO 13849-1, IEC 61508	IEC 60947-5-1, EN ISO 13849-1, IEC 60204-1, IEC 61508
Test certificates	TÜV, UL, CSA	TÜV, UL, CSA
SIL level max. acc. to IEC 61508	3	3
Performance level PL acc. to EN ISO 13849-1	e	e
Probability of a dangerous failure per hour (PFH_d)	1.5×10^{-8} 1/h	3.38×10^{-9} 1/h
Rated control supply voltage		
• 24 V DC	✓	✓
• 230 V AC	✓	--
• 400 V AC	✓	--
• 120 ... 240 V AC/DC	--	✓

✓ Available
-- Not available

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 unit
PG = 41L


3TK2810-0BA01

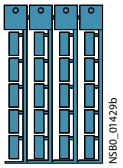

3TK2810-0GA02


3TK2810-1BA41

Rated control supply voltage U_s	Times	SD	Screw terminals		SD	Spring-type terminals	
			Article No.	Price per PU		Article No.	Price per PU
V	s	d			d		
Standstill monitors							
3TK2810-0							
• 24 DC	0.2 ... 6 (standstill)	5	**3TK2810-0BA01**		15	**3TK2810-0BA02**	
• 230 AC	0.2 ... 6 (standstill)	15	**3TK2810-0GA01**		15	**3TK2810-0GA02**	
• 400 AC	0.2 ... 6 (standstill)	15	**3TK2810-0JA01**		15	**3TK2810-0JA02**	
Speed monitors							
3TK2810-1 for NPN/PNP proximity switches and encoders							
• 24 DC	0 ... 999 (release delay)	2	**3TK2810-1BA41**		2	**3TK2810-1BA42**	
• 120 ... 240 AC/DC	0 ... 999 (release delay)	5	**3TK2810-1KA41**		5	**3TK2810-1KA42**	
3TK2810-1 for NAMUR proximity switches and encoders							
• 24 DC	0 ... 999 (release delay)	5	**3TK2810-1BA41-0AA0**		5	**3TK2810-1BA42-0AA0**	
• 120 ... 240 AC/DC	0 ... 999 (release delay)	5	**3TK2810-1KA41-0AA0**		5	**3TK2810-1KA42-0AA0**	

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Selection and ordering data

	Use	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Blank labels								
 3RT1900-1SB20	For 3TK28	**Unit labeling plates** For SIRIUS devices 20 mm x 7 mm, pastel turquoise[1]	20	**3RT1900-1SB20**		100	340 units	41B
	For 3TK28	**Adhesive labels** For SIRIUS devices						
		• 19 mm x 6 mm, pastel turquoise	15	**3RT1900-1SB60**		100	3 060 units	41B
		• 19 mm x 6 mm, zinc yellow	15	**3RT1900-1SD60**		100	3 060 units	41B
Push-in lugs and covers								
 3RP1903	For 3TK28	**Push-in lugs** For screw fixing, 2 units required per device	5	**3RP1903**		1	10 units	41H
Adapters and connection cables for speed monitors								
	For 3TK2810-1	**Adapters** For connecting encoders of type Siemens/Heidenhain						
 3TK2810-1A		• 15-pole	2	**3TK2810-1A**		1	1 unit	41L
 3TK2810-1B		• 25-pole	2	**3TK2810-1B**		1	1 unit	41L
 3TK2810-0A	For 3TK2810-1	**Connection cables** For connecting the speed monitor to the 3TK2810-1A or 3TK2810-1B adapter	15	**3TK2810-0A**		1	1 unit	41L
Tools for opening spring-type terminals								
				Spring-type terminals				
 3RA2908-1A	For auxiliary circuit connections	**Screwdrivers** For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit	41B

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH, see page 16/16.

Overview

SIRIUS 3RK3 Modular Safety System

More information

Homepage, see www.siemens.com/sirius-mss
Industry Mall, see www.siemens.com/product?3RK3

The 3RK3 Modular Safety System (MSS) is a freely configurable modular safety relay. Depending on the external circuit version, safety-related applications up to Performance Level e according to EN ISO 13849-1 or SIL 3 according to IEC 62061 can be realized.

The modular safety relay enables the interconnection of several safety applications.

The comprehensive error and status diagnostics provides the possibility of finding errors in the system and localizing signals from sensors. Plant downtimes can be reduced as the result.

The MSS comprises the following system components:

- Central units
- Expansion modules
- Interface modules
- Diagnostics modules
- Parameterization software
- Accessories

Central units

MSS Basic

The 3RK3 Basic central unit is used wherever several safety functions need to be evaluated and the wiring parameterization of safety relays would involve significant cost and effort. It reads in inputs, controls outputs and communicates through an interface module with higher-level control systems. An application's entire safety program is processed in the central unit. The 3RK3 Basic central unit is the lowest expansion level and fully functional on its own, without the optional expansion modules.

MSS Advanced

The 3RK3 Advanced central unit is the logical expansion of the Basic central unit with the functionality of an AS-i safety monitor. In addition to having a larger volume of project data and scope of functionality it can be integrated in AS-Interface and therefore make use of the many different possibilities offered by this bus system. The function can be optionally activated in the central unit.

The service-proven insulation piercing method of AS-Interface enables not only the distributed expansion of the project data volume using safe AS-i outputs, safe AS-i sensors and other MSS Advanced or safety monitors (F cross traffic) but also a highly flexible adaptation of the application, e.g. very fast connection of AS-i outputs, EMERGENCY STOP command devices, position switches with and without tumbler, or light curtains.

Safety-related disconnection using MSS or by distributed means using safe AS-i outputs and the formation of switch-off groups can be realized very easily. The same applies for any subsequent modifications. They are now possible by simply readdressing, meaning that rewiring is no longer necessary.

The AS-i bus is connected directly to the central unit.

MSS ASIsafe

The MSS ASIsafe basic and MSS ASIsafe extended central units are a logical development of the AS-i safety monitors based on the 3RK3 Modular Safety System.

Like MSS Advanced, MSS ASIsafe detects – in a comparable way to the safety monitors – safe sensor technology on the AS-i bus and switches actuators off in a safety-related manner via a configurable safety logic. It stands out by virtue of its greater project data volume, wider range of functions and the possibility of increasing the integrated I/O project data volume by means of expansion modules from the MSS system family. In this case the range of functions, such as the number and type of the logic elements that can be interconnected, is equivalent to that of MSS Advanced.

Expansion modules

With the optional expansion modules, both safety-related and standard, the system is flexibly adapted to the required safety applications.

Interface modules

Interface modules are used for transferring diagnostics data and device status data to a higher-level controller, e.g. for purposes of visualization using HMI. Both PROFIBUS and PROFINET modules are available to this end. When using the Basic central unit, 32-bit cyclic data can be exchanged with the control system. If an Advanced/ASIsafe central unit is used, the number is doubled to 64-bit cyclic data. In acyclic mode, both central units can call up diagnostic data.

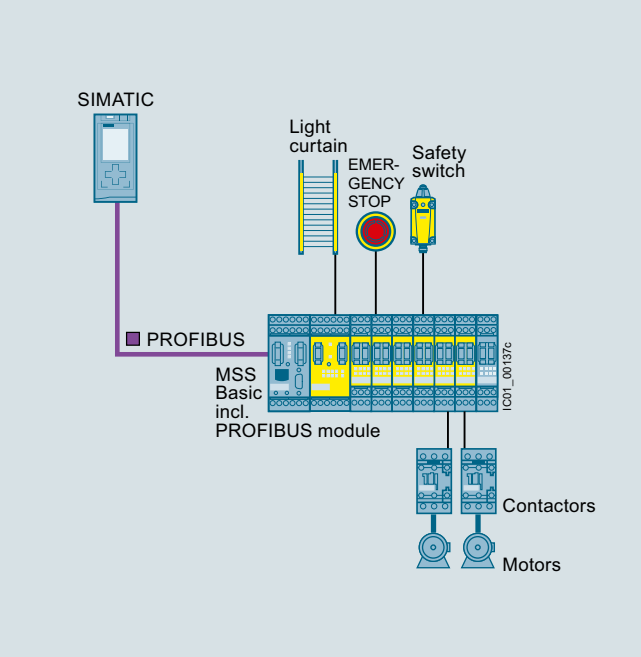
Diagnostics modules

Actuated sensors or faults, e.g. cross-circuit, are indicated directly on the diagnostics display. The fault is diagnosed directly in plain text by the detailed alarm message. The device is fully functional upon delivery. No programming is required.

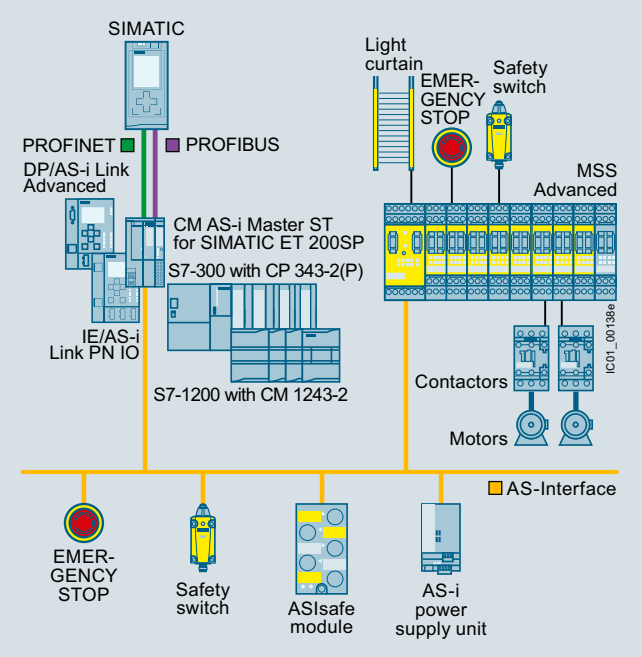
Parameterization software

Using the SIRIUS Safety ES graphical parameterization tool, it is very easy to create the safety functions as well as their logical links on the PC. You can define disconnection ranges, ON-delays, OFF-delays and other dependencies for example.

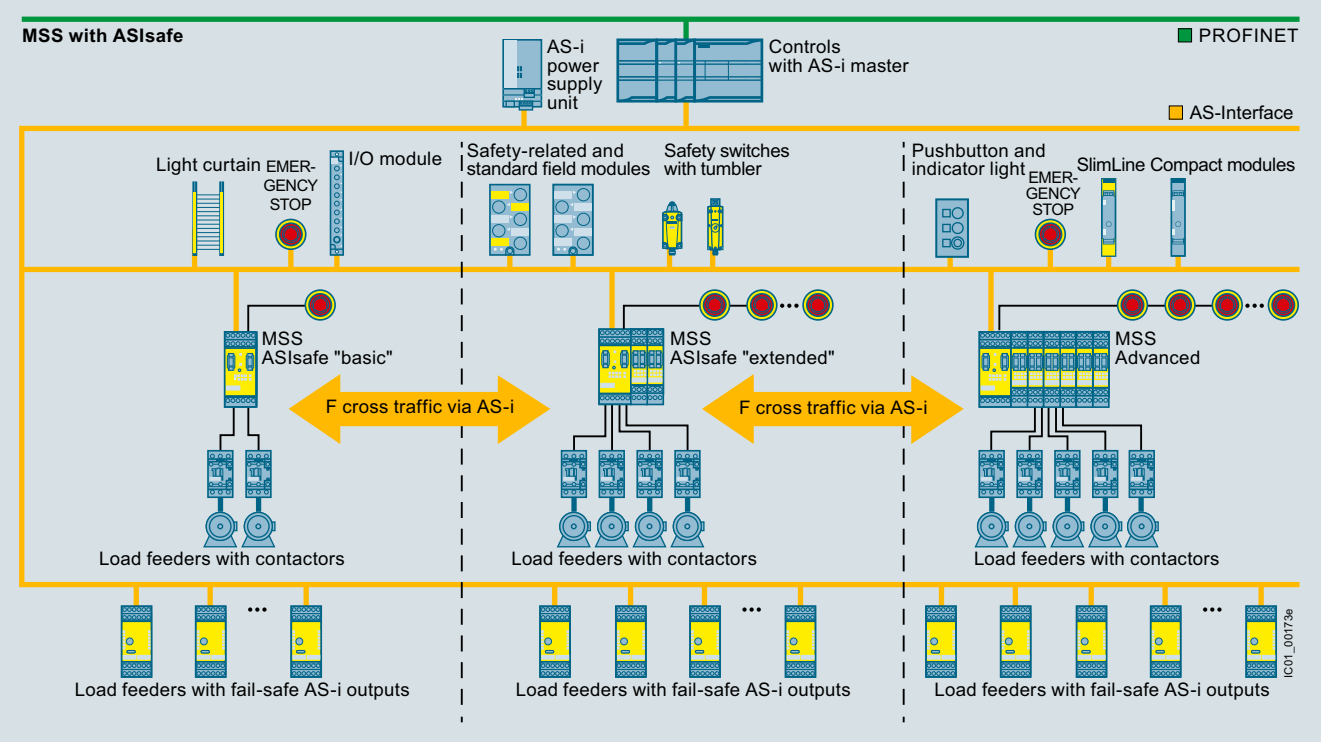
SIRIUS Safety ES also offers comprehensive functions for diagnostics and commissioning. Documentation of the MSS hardware configuration and the parameterized logic is created automatically.



System design of MSS with Basic central unit



System design of MSS with Advanced central unit



System design of MSS as a combination of various central units with AS-Interface

Communication

	3RK3 Basic	Advanced	3RK3 ASIsafe "Basic" version	"Extended" version
	3RK3111-.AA10	3RK3131-.AC10	3RK3121-.AC00	3RK3122-.AC00
PROFINET	--	✓	✓	✓
PROFIBUS	✓	✓	✓	✓

✓ Available -- Not available

General data

Article No. scheme

Product versions		Article number
Basic units		**3RK3 1 □ □ – □ A □ □ 0**
Device variants	3RK3 Basic	**1 1**
	3RK3 ASIsafe "basic" variant	**2 1**
	3RK3 ASIsafe "extended" variant	**2 2**
	3RK3 Advanced	**3 1**
Connection type	Screw terminals	**1**
	Spring-type terminals	**2**
Communication 1	None	**A**
	AS-Interface without master	**C**
Communication 2	3RK3122: Max. 2 expansion modules can be connected	**0**
	3RK3131: Max. 9 expansion modules can be connected	**1**
Example		**3RK3 1 1 1 – 1 A A 1 0**

Product versions		Article number
Expansion modules with safe inputs/outputs		**3RK3 2 □ □ – □ A A 1 0**
Device variants	4/8 F-DI	**1 1**
	2/4 F-DI 1/2 F-RO	**2 1**
	2/4 F-DI 2 F-DO	**3 1**
	4 F-DO	**4 2**
	4/8 F-RO	**5 1**
Connection type	Screw terminals	**1**
	Spring-type terminals	**2**
Example		**3RK3 2 1 1 – 1 A A 1 0**

Product versions		Article number
Expansion modules with standard inputs/outputs		**3RK3 3 □ □ – □ A A 1 0**
Device variants	8 DO	**1 1**
	8 DI	**2 1**
Connection type	Screw terminals	**1**
	Spring-type terminals	**2**
Example		**3RK3 3 1 1 – 1 A A 1 0**

Product versions		Article number
DP interface modules		**3RK3 5 1 1 – □ B A 1 0**
Connection type	Screw terminals	**1**
	Spring-type terminals	**2**
Example		**3RK3 5 1 1 – 1 B A 1 0**

Product versions		Article number
PROFINET interface modules		**3SK2 5 1 1 – □ F A 1 0**
Connection type	Screw terminals	**1**
	Spring-type terminals	**2**
Example		**3SK2 5 1 1 – 1 F A 1 0**

Note:

The Article No. schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

- More functionality and flexibility through freely configurable safety logic
- Suitable for all safety applications thanks to compliance with the highest safety standards in production automation
- For use all over the world through compliance with all product-relevant, globally established certifications
- Modular hardware configuration
- Parameterization by means of software instead of wiring
- Removable terminals for greater plant availability
- Distributed detection of sensors and disconnection of actuators through AS-Interface
- All logic functions can also be used for AS-Interface, e.g. muting, protective door with tumbler
- Up to 12 independent safe switch-off groups on the AS-i bus
- Volume of project data can be greatly increased by means of AS-Interface
- Up to 50 two-channel enabling circuits per system

Communication via PROFIBUS/PROFINET

The 3RK3 Modular Safety System can be connected to PROFINET or PROFIBUS through communication modules and exchange data with higher-level control systems.

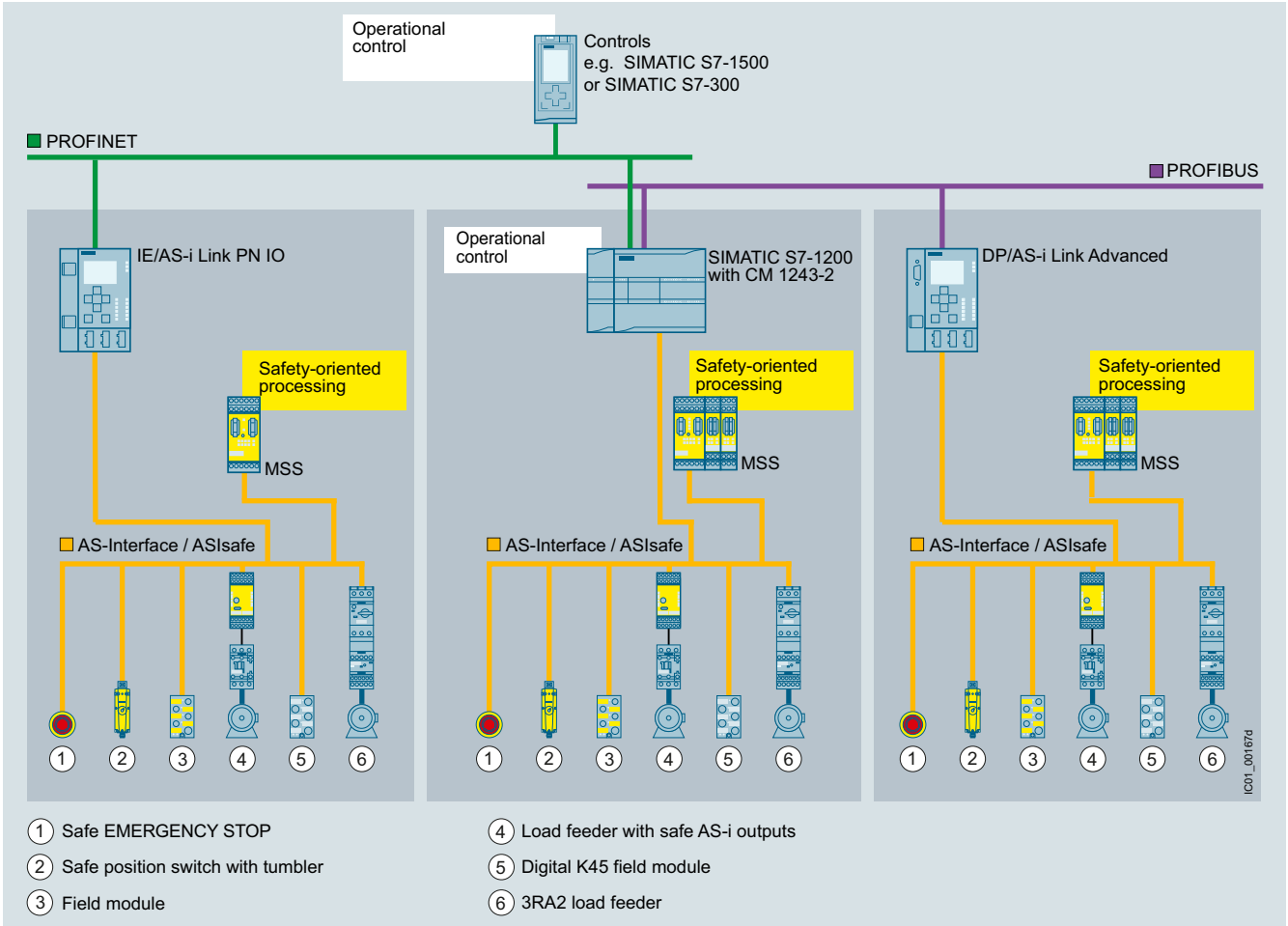
The MSS supports among other things:

- Cyclic and acyclic data (data records)
- Exchange of 32-bit cyclic data with MSS Basic or 64-bit cyclic data with MSS Advanced/MSS ASIsafe
- Diagnostics using data record invocations
- Access with Safety ES via fieldbus

AS-Interface communication

Using the Advanced and ASIsafe "basic" and "extended" central units, the 3RK3 Modular Safety System can be integrated in AS-Interface.

- MSS can read and evaluate the I/O data of up to 31 AS-i modules
- Up to 12 safe output signals per MSS can be placed on the AS-i bus for switching safe AS-i output modules or for fail-safe cross traffic between multiple MSS stations
- Safe cross traffic between multiple MSS stations or between one MSS and AS-i safety monitors
- Standard signals, e.g. for acknowledgment, can also be output on the AS-i bus



Integration of the MSS into AS-Interface

Notes:

MSS with communication function, see page 11/40 onwards.
Accessories, see page 11/42 onwards.
SIRIUS Safety ES, see page 14/22.

For more information on AS-Interface with ASIsafe, see also page 2/18.

Application

The 3RK3 Modular Safety System can be used for all safety-related requirements in the manufacturing industry and offers the following safety functions:

	Symbol	MSS Basic	MSS Advanced, MSS ASIsafe
Monitoring functions			
Universal monitoring Evaluation of any binary signals from single-channel and two-channel sensors		--	✓
EMERGENCY STOP Evaluation of EMERGENCY STOP devices with positive-opening contacts		✓	✓
Safety shutdown mat Evaluation of switching mats with NC contacts and/or crossover detection		✓	✓
Protective door monitoring Evaluation of protective door signals and/or protective flap signals		✓	✓
Protective door tumbler mechanism Evaluation of protective doors with tumbler and of the actuation/release of this tumbler		--	✓
Approval switches Evaluation of OK buttons with NO contact		✓	✓
Two-hand operator controls Evaluation of two-hand operator controls		✓	✓
ESPE monitoring Evaluation of non-contact protective devices, e.g. light curtains and laser scanners		✓	✓
Muting Temporary bridging of non-contact protective devices, 2/4 sensors in parallel, 4 sensors in sequence		--	✓
Mode selector switches Evaluation of operating mode selector switches with NO contacts		✓	✓
Monitoring AS-i (AS-i 2F-DI) Logic element for monitoring of AS-i input slaves		--	✓

	Symbol	MSS Basic	MSS Advanced, MSS ASIsafe
Logic operation functions			
AND		✓	✓
OR		✓	✓
XOR		✓	✓
NAND		✓	✓
NOR		✓	✓
Negation		✓	✓
Flip-flop		✓	✓
Counting functions			
Counter 0 -> 1		✓	✓
Counter 1 -> 0		✓	✓
Counter 0 -> 1/1 -> 0		✓	✓
Timer functions			
With ON-delay		✓	✓
Passing make contact		✓	✓
With OFF-delay		✓	✓
Clock-pulsing		✓	✓
Start functions			
Monitored start		✓	✓
Manual start		✓	✓
Output functions			
Standard output		✓	✓
F output		✓	✓
AS-i output function		--	✓
Status functions			
Element status		--	✓

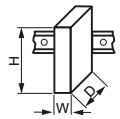
✓ Available

-- Not available

Technical specifications

More information	
Manual, see https://support.industry.siemens.com/cs/ww/en/view/26493228	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16392/faq
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16392/td	

Central units and expansion modules

Type		Central units				Expansion modules						
		Basic	Advanced	ASIsafe basic	ASIsafe extended	4/8F-DI	2/4 F-DI 1/2 F-RO	2/4 F-DI 2F-DO	4/8 F-RO	4 F-DO	8 DI	8 DO
Dimensions (W x H x D) 												
• Screw terminals	mm	45 x 111 x 124				22.5 x 111 x 124			45 x 111 x 124	22.5 x 111 x 124		
• Spring-type terminals	mm	45 x 113 x 124				22.5 x 113 x 124			45 x 113 x 124	22.5 x 113 x 124		
Device data												
Shock resistance (sine pulse)	*g*/ms	15/11										
Touch protection acc. to IEC 60529		IP20										
Permissible mounting position		Vertical mounting surface (+10°/-10°), deviating mounting positions are permitted for reduced ambient temperature										
Minimum distances		For heat dissipation through convection from the devices 25 mm to the ventilation openings (top and bottom)										
Permissible ambient temperature												
• During operation	°C	-20 ... +60										
• During storage and transport	°C	-40 ... +85										
Number of sensor inputs (single-channel)												
• Fail-safe		8	8	2	4	8	4	4	--	--	--	--
• Not fail-safe		--	--	6	4	--	--	--	--	--	8	--
Number of test outputs		2							--			
Number of outputs												
• Relay outputs												
- Single-channel		--	--	--	--	--	2	--	8	--	--	--
- Two-channel		1	1	1	1	--	--	--	--	--	--	--
• Electronic outputs												
- Single-channel		--	--	--	--	--	--	--	--	--	--	8
- Two-channel		1	1	1	1	--	--	2	--	4	--	--
Weight	g	300				160			400	135	125	160
Installation altitude above sea level	m	2 000										
Environmental data												
EMC interference immunity		IEC 60947-5-1										
Vibrations												
• Frequency	Hz	5 ... 500										
• Amplitude	mm	0.75										
Climatic withstand capability		IEC 60068-2-78										

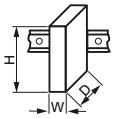
General data

Type		Central units				Expansion modules						
		Basic	Advanced	ASIsafe basic	ASIsafe extended	4/8 F-DI	2/4 F-DI 1/2 F-RO	2/4 F-DI 2 F-DO	4/8 F-RO	4 F-DO	8 DI	8 DO
Electrical specifications												
Rated control supply voltage U_s acc. to IEC 61131-2	V	24 DC ± 15%[1]										
Operating range		0.85 ... 1.15 x U_s										
Rated insulation voltage U_i	V	300				50	300	50	300	50		
Rated impulse voltage U_{imp}	kV	4				0.5	4	0.5	4	0.5		
Total current input	mA	185				60	85		140	8	78	60
Rated power at U_s	W	4.5				1.5	2		3	4.8	1.9	1.5
Utilization category acc. to IEC 60947-5-1												
Relay outputs												
• AC-15 at 230 V	A	2				--	2	--	2	--	--	--
• DC-13 at 24 V	A	1				--	1	--	1	--	--	--
Semiconductor outputs												
• DC-13 at 24 V	A	1.5				--	--	1.2	--	2	--	0.5
Mechanical endurance During rated operation	Operating cycles (relay)	10 x 10^6				--	10 x 10^6	--	10 x 10^6	--		
Switching frequency z At rated operational current	1/h	1 000				--	1 000		360	1 000	--	1 000
Conventional thermal current I_{th}	A	2/1.5				--	1	1.2	3	2	--	0.5
Protection for output contacts												
Fuse links												
LV HRC type 3NA, DIAZED type 5SB, NEOZED type 5SE												
• Operational class gG	A	4				--	4	--	4	--		
• Operational class quick	A	6				--	6	--	6	--		
Safety specifications												
Probability of a dangerous failure												
• per hour (PFH_d)	1/h	5.14 x 10^{-9}	3.8 x 10^{-9} with AS-i, 2.8 x 10^{-9} without AS-i			1.89 x 10^{-9}	3.79 x 10^{-9}	2.7 x 10^{-9}	7.15 x 10^{-9}	3.18 x 10^{-9}	--	
• On demand (PFD)		1.28 x 10^{-5}	1.7 x 10^{-4}			4.29 x 10^{-6}	5.85 x 10^{-6}	8.34 x 10^{-6}	4.36 x 10^{-5}	2.2 x 10^{-5}	--	
Parameters for cables												
Line resistance	Ω	100							--		100	--
Cable length from terminal to terminal With Cu 1.5 mm^2 and 150 nF/km	m	1 000							--		1 000	--
Conductor capacity	nF	330							--		330	--

[1] Device current supply through a power supply unit according to IEC 60536 protection class III (SELV or PELV).

11

Interface and diagnostics modules

Type		Interface modules		Diagnostics modules
		PROFINET	DP interface	
Dimensions (W x H x D) 				
• Screw terminals	mm	22.5 x 100 x 121.6	45 x 111 x 124	96 x 60 x 44
• Spring-type terminals	mm	22.5 x 100 x 121.6	45 x 113 x 124	--
Device data				
Shock resistance (sine pulse)	*g*/ms	15/11		
Touch protection acc. to IEC 60529		IP20		
Permissible mounting position		Vertical mounting surface (+10°/-10°), deviating mounting positions are permitted for reduced ambient temperature		
Minimum distances		For heat dissipation through convection from the devices 25 mm to the ventilation openings (top and bottom)		
Permissible ambient temperature				
• During operation	°C	-20 ... +60		
• During storage and transport	°C	-40 ... +85		
Weight	g	270		90
Installation altitude above sea level	m	2 000		
Environmental data				
EMC interference immunity		IEC 60947-5-1		
Vibrations				
• Frequency	Hz	5 ... 500		
• Amplitude	mm	0.75		
Climatic withstand capability		IEC 60068-2-78		
Electrical specifications				
Rated control supply voltage U_s acc. to IEC 61131-2	V	24 DC ± 15%		24 DC ± 15% via connecting cable to the central unit
Operating range		0.85 ... 1.15 x U_s		
Rated insulation voltage U_i	V	50		
Rated impulse voltage U_{imp}	kV	0.5		
Total current input	mA	--		24
Rated power at U_s	W	--		0.6

Selection and ordering data

3RK3111-1AA10
3RK3121-1AC00
3RK3122-1AC00
3RK3131-1AC10

Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
3RK31 central units						
3RK3 Basic						
Central units with safety-related inputs and outputs • 8 fail-safe inputs • 1 two-channel relay output • 1 two-channel electronic output Max. 7 expansion modules can be connected Note: Memory module 3RK3931-0AA00 is included in the scope of supply.	2	**3RK3111-☐AA10**		1	1 unit	42B
3RK3 Advanced						
Central units for connecting to AS-Interface with safety-related inputs and outputs and extended functional scope • 8 fail-safe inputs • 1 two-channel relay output • 1 two-channel electronic output Max. 9 expansion modules can be connected Note: Memory module 3RK3931-0AA00 is included in the scope of supply.	2	**3RK3131-☐AC10**		1	1 unit	42B
3RK3 ASIsafe						
Central units for connecting to AS-Interface with safety-related inputs and outputs and extended functional scope • 1 two-channel relay output • 1 two-channel electronic output						
"Basic" version • 2 fail-safe inputs • 6 non-fail-safe inputs No expansion modules can be connected	2	**3RK3121-☐AC00**		1	1 unit	42B
"Extended" version • 4 fail-safe inputs • 4 non-fail-safe inputs Max. 2 expansion modules can be connected Note: Memory module 3RK3931-0AA00 is included in the scope of supply.	2	**3RK3122-☐AC00**		1	1 unit	42B
Type of electrical connection						
• Screw terminals		**1**				
• Spring-type terminals (push-in)		**2**				

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* You can order this quantity or a multiple thereof.
Illustrations are approximate

Selection and ordering data

3RK3211-1AA10
3RK3221-1AA10
3RK3231-1AA10
3RK3242-1AA10

3RK3251-1AA10

3RK3311-1AA10
3RK3321-1AA10

3RK3511-1BA10

Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
3RK32, 3RK33 expansion modules						
4/8 F-DI Safety-related input module • 8 inputs	2	**3RK3211-□AA10**		1	1 unit	42B
2/4 F-DI 1/2 F-RO Safety-related input/output module • 4 inputs • 2 single-channel relay outputs	2	**3RK3221-□AA10**		1	1 unit	42B
2/4 F-DI 2F-DO Safety-related input/output module • 4 inputs • 2 two-channel electronic outputs	2	**3RK3231-□AA10**		1	1 unit	42B
4/8 F-RO Safety-related output module • 8 single-channel relay outputs	2	**3RK3251-□AA10**		1	1 unit	42B
4 F-DO Safety-related output module • 4 two-channel electronic outputs	2	**3RK3242-□AA10**		1	1 unit	42B
8 DI Standard input module • 8 inputs	2	**3RK3321-□AA10**		1	1 unit	42B
8 DO Standard output module • 8 electronic outputs	2	**3RK3311-□AA10**		1	1 unit	42B
3SK2/3RK35 interface modules						
PROFINET interface NEW PROFINET interface, 12 Mbps, RS 485, 32-bit cyclic data exchange with Basic central unit or 64-bit with Advanced and ASIsafe central unit, acyclic exchange of diagnostics data	2	**3SK2511-□FA10**		1	1 unit	42B
DP interface PROFIBUS DP interface, 12 Mbps, RS 485, 32-bit cyclic data exchange with Basic central unit or 64-bit with Advanced and ASIsafe central unit, acyclic exchange of diagnostics data	2	**3RK3511-□BA10**		1	1 unit	42B
Type of electrical connection • Screw terminals • Spring-type terminals (push-in)		**1** **2**				

Notes:

For the required connection cable, see page 11/42.

Selection and ordering data

Version				SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
				d					
Connection cables (essential accessory)									
 3UF7932-0AA00-0	For connection of								
	Central units with expansion modules or interface module	Diagnostics modules with central unit or interface module	Length						
	✓	--	• 0.025 m (flat)	►	**3UF7930-0AA00-0**		1	1 unit	42J
	--	✓	• 0.1 m (flat)	►	**3UF7931-0AA00-0**		1	1 unit	42J
	--	✓	• 0.15 m (flat)	►	**3UF7934-0AA00-0**		1	1 unit	42J
	--	✓	• 0.3 m (flat)	►	**3UF7935-0AA00-0**		1	1 unit	42J
	--	✓	• 0.5 m (flat)	►	**3UF7932-0AA00-0**		1	1 unit	42J
	--	✓	• 0.5 m (round)	►	**3UF7932-0BA00-0**		1	1 unit	42J
	--	✓	• 1.0 m (round)	►	**3UF7937-0BA00-0**		1	1 unit	42J
	--	✓	• 2.5 m (round)	►	**3UF7933-0BA00-0**		1	1 unit	42J
Operating and monitoring modules for 3RK3									
 3SK2611-3AA00	**Diagnostics modules** For direct display of errors, e.g. of cross-circuits			2	**3SK2611-3AA00**		1	1 unit	41L
PC cables (essential accessory)									
 3UF7941-0AA00-0	**USB PC cables** For connecting to the USB interface of a PC/PG, for communication with 3RK3 through the system interface, recommended for use in connection with 3RK3			►	**3UF7941-0AA00-0**		1	1 unit	42J
Door adapter									
 3UF7920-0AA00-0	For external connection of the system interface, e.g. outside a control cabinet			►	**3UF7920-0AA00-0**		1	1 unit	42J
Interface covers									
 3UF7950-0AA00-0	For system interface			►	**3UF7950-0AA00-0**		1	5 units	42J
Memory modules									
 3RK3931-0AA00	For backing up the complete parameterization of the 3RK3 Modular Safety System without a PC/PG through the system interface			2	**3RK3931-0AA00**		1	1 unit	42C
Push-in lugs									
 3RP1903	For screw fixing, e.g. on mounting plate, 2 units required per device Can be used for 3RK3			5	**3RP1903**		1	10 units	41H
Software for 3RK3									
 3ZS1316-.C.10-0Y.5	**SIRIUS Safety ES** Software for configuring, commissioning, operating and diagnosing of 3SK2 and 3RK3, see page 14/22 or www.siemens.com/product?3ZS1.								

✓ Available

-- Not available

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Notes

Conditions of sale and delivery

1. General Provisions

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following Terms and Conditions of Sale and Delivery (hereinafter referred to as "T&C"). Please note that the scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following T&C apply exclusively for orders placed with Siemens Aktiengesellschaft, Germany.

1.1 For customers with a seat or registered office in Germany

For customers with a seat or registered office in Germany, the following applies subordinate to the T&C:

- for installation work the "General Conditions for Erection Works – Germany"[1] ("Allgemeine Montagebedingungen – Deutschland" (only available in German at the moment)) and/or
- for Plant Analytics Services the "Standard Terms and Conditions for Plant Analytics Services – for Customers in Germany"[1] ("Allgemeine Geschäftsbedingungen für das Plant Analytics Services – für Kunden in Deutschland" (only available in German at the moment)) and/or
- for stand-alone software products and software products forming a part of a product or project, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office in Germany"[1] and/or
- for other supplies and/or services the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"[1].
  In case such supplies and/or services should contain Open Source Software, the conditions of which shall prevail over the " General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry "[1], a notice will be contained in the scope of delivery in which the applicable conditions for Open Source Software are specified. This shall apply mutatis mutandis for notices referring to other third party software components.

1.2 For customers with a seat or registered office outside Germany

For customers with a seat or registered office outside Germany, the following applies subordinate to the T&C:

- for Plant Analytics Services the "Standard Terms and Conditions for Plant Analytics Services"[1] and/or
- for services the "International Terms & Conditions for Services"[1] supplemented by "Software Licensing Conditions"[1] and/or
- for other supplies of hard- and software the "International Terms & Conditions for Products"[1] supplemented by "Software Licensing Conditions" [1]

1.3 For customers with master or framework agreement

To the extent our supplies and/or services offered are covered by an existing master or framework agreement, the terms and conditions of that agreement shall apply instead of T&C.

2. Prices

The prices are in € (Euro) ex point of delivery, exclusive of packaging.

The sales tax (value added tax) is not included in the prices. It shall be charged separately at the respective rate according to the applicable statutory legal regulations.

Prices are subject to change without prior notice. We will charge the prices valid at the time of delivery.

To compensate for variations in the price of raw materials (e.g. silver, copper, aluminum, lead, gold, dysprosium and neodym), surcharges are calculated on a daily basis using the so-called metal factor for products containing these raw materials. A surcharge for the respective raw material is calculated as a supplement to the price of a product if the basic official price of the raw material in question is exceeded.

The metal factor of a product indicates the basic official price (for those raw materials concerned) as of which the surcharges on the price of the product are applied, and with what method of calculation.

An exact explanation of the metal factor can be downloaded at:

www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

To calculate the surcharge (except in the cases of dysprosium and neodym), the official price from the day prior to that on which the order was received or the release order was effected is used.

To calculate the surcharge applicable to dysprosium and neodym ("rare earths"), the corresponding three-month basic average price in the quarter prior to that in which the order was received or the release order was effected is used with a one-month buffer (details on the calculation can be found in the explanation of the metal factor).

3. Additional Terms and Conditions

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches apply only to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the individual pages of this catalog – especially with regard to data, dimensions and weights given – these are subject to change without prior notice.

[1] The text of the Terms and Conditions of Siemens AG can be downloaded at www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

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We shall not be obligated to fulfill any agreement if such fulfillment is prevented by any impediments arising out of national or international foreign trade or customs requirements or any embargoes and/or other sanctions.

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Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

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