

## Overview



SIRIUS 3SK safety relays

SIRIUS 3SK safety relays are the key elements of a consistent, cost-effective safety chain. Whether you need EMERGENCY-STOP disconnection, protective door monitoring, light arrays, laser scanners or the protection of presses or punches – with SIRIUS safety relays, all safety applications can be implemented within a minimum width to optimum effect 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. Optimized solutions when selecting components are facilitated by a clearly structured component range:

- 3SK1 Standard basic units
- 3SK1 Advanced basic units
- 3SK2 basic units
- 3SK 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:

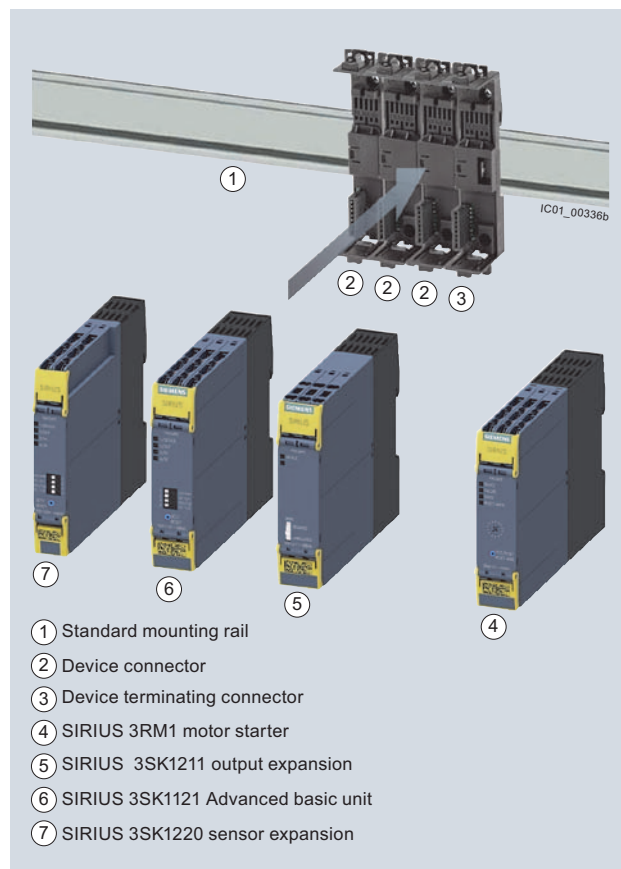
- Universal application possibilities thanks to multifunctionality
- Time-delayed outputs
- Expansion of inputs and outputs

3SK2 basic units

The 3SK2 basic units also offer:

- Up to six fail-safe shutdown functions
- Flexible in use thanks to software parameterization
- Powerful semiconductor outputs
- User-friendly diagnostics using diagnostics display and configuring software

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



System configuration example

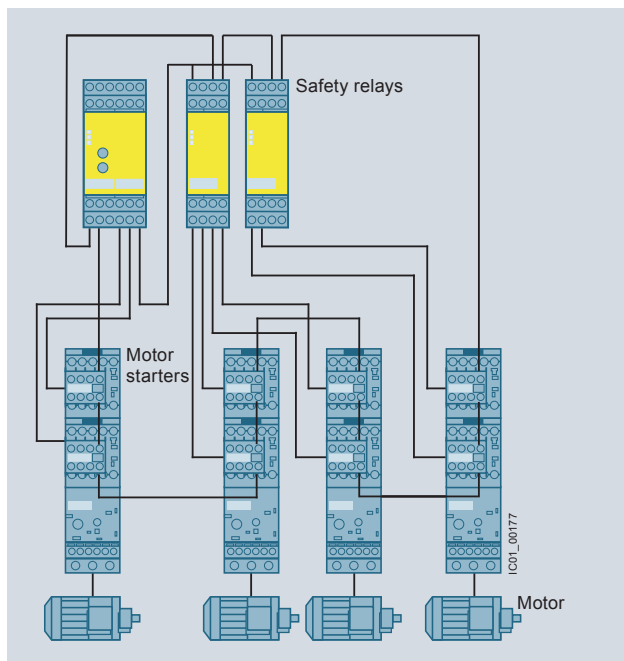
The 3SK1 and 3SK2 Standard and Advanced series are a high-quality replacement for the 3TK28 safety relays. In their narrower design, and equipped with greater functionality, they can replace every 3TK28 device. The only exception to this are the 3TK2810 devices.

Note:

Conversions from 3TK28 to 3SK, see [www.siemens.com/sirius/conversion-tool](http://www.siemens.com/sirius/conversion-tool).

### Expansion option by adding the 3RM1 motor starter

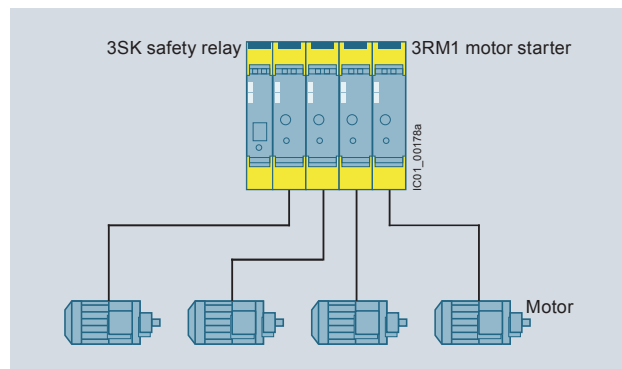
With previous safety relay and motor feeder configurations, a huge amount of wiring was required to monitor the motor feeders in safety applications.



Conventional system configuration

With the integration of the SIRIUS 3RM1 motor starter into the SIRIUS 3SK safety relay system family, this wiring has been minimized for the first time.

Motor starters up to 3 kW can easily be integrated into the safety relay system using SIRIUS 3ZY12 device connectors, without additional wiring between the evaluation unit and the motor starter.



System design using 3SK and 3RM1

### Article No. scheme

#### 3SK1

| Digit of the Article No.             | 1st - 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th | 11th | 12th |
|--------------------------------------|-----------|-----|-----|-----|-----|-----|-----|------|------|------|
|                                      | □□□       | □   | □   | □   | □   | —   | □   | A    | □    | □    |
| Safety relays                        | 3SK       |     |     |     |     |     |     |      |      |      |
| Generation                           |           | □   |     |     |     |     |     |      |      |      |
| Device version                       |           |     | □   |     |     |     |     |      |      |      |
| Device series                        |           |     |     | □   |     |     |     |      |      |      |
| Type of outputs                      |           |     |     |     | □   |     |     |      |      |      |
| Connection type                      |           |     |     |     |     | □   |     |      |      |      |
| Rated control supply voltage         |           |     |     |     |     |     |     | □    |      |      |
| Type of rated control supply voltage |           |     |     |     |     |     |     |      | □    |      |
| Time delay                           |           |     |     |     |     |     |     |      |      | □    |
| Example                              | 3SK       | 1   | 1   | 2   | 1   | —   | 1   | A    | B    | 4 0  |

#### 3SK2

| Digit of the Article No.                           | 1st - 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th | 11th | 12th |
|----------------------------------------------------|-----------|-----|-----|-----|-----|-----|-----|------|------|------|
|                                                    | □□□       | □   | □   | □   | □   | —   | □   | A    | A    | 1 0  |
| Safety relays                                      | 3SK       |     |     |     |     |     |     |      |      |      |
| Generation                                         |           | □   |     |     |     |     |     |      |      |      |
| Device version                                     |           |     | □   |     |     |     |     |      |      |      |
| Device version, alternative volume of project data |           |     |     | □   |     |     |     |      |      |      |
| Type of outputs                                    |           |     |     |     | □   |     |     |      |      |      |
| Connection type                                    |           |     |     |     |     | □   |     |      |      |      |
| Example                                            | 3SK       | 2   | 1   | 1   | 2   | —   | 1   | A    | A    | 1 0  |

#### Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the catalog 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 power 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 fast switching applications
- Insensitive to vibrations and dirt
- Good electrical endurance

**Power outputs (3SK1213 output expansion)**

- Different voltages can be switched through the floating contacts.
- The power relay contacts allow currents of up to 10 A AC-15/6 A DC-13 to be connected.
- 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

**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.

**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. 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.

## 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.

## Number of safe outputs

| Type and number of safe outputs |  | Semiconductors     |                  | Signal-<br>ing<br>circuits | Device<br>connec-<br>tors |
|---------------------------------|--|--------------------|------------------|----------------------------|---------------------------|
|                                 |  |                    |                  |                            |                           |
| Relays                          |  | Instanta-<br>neous | Time-<br>delayed |                            |                           |
| Instanta-<br>neous              |  |                    |                  |                            |                           |
| Time-<br>delayed                |  |                    |                  |                            |                           |

| 3SK1 Advanced basic units |    |    |    |    |    |   |
|---------------------------|----|----|----|----|----|---|
| 3SK1120-.AB40             | -- | -- | 1  | -- | -- | ✓ |
| 3SK1121-.AB40             | 3  | -- | -- | -- | 1  | ✓ |
| 3SK1121-.CB4.             | 2  | 2  | -- | -- | -- | ✓ |
| 3SK1122-.AB40             | -- | -- | 3  | -- | 1  | ✓ |
| 3SK1122-.CB4.             | -- | -- | 2  | 2  | -- | ✓ |

✓ Available

-- Not available

## Selection and ordering data

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



3SK1121-1AB40



3SK1120-1AB40



3SK1122-1AB40



3SK1122-1CB41

| Rated control<br>supply<br>voltage $U_s$<br>at DC    | Adjustable<br>OFF-delay time | Number of outputs               |                      |                                                 |                      | DT | Screw terminals |                 |  | DT | Spring-type<br>terminals<br>(push-in) |                 |  |
|------------------------------------------------------|------------------------------|---------------------------------|----------------------|-------------------------------------------------|----------------------|----|-----------------|-----------------|---------------------------------------------------------------------------------------|----|---------------------------------------|-----------------|---------------------------------------------------------------------------------------|
|                                                      |                              | as contacting contact<br>block  |                      | as contactless semicon-<br>ductor contact block |                      |    | Article No.     | Price<br>per PU |                                                                                       |    | Article No.                           | Price<br>per PU |                                                                                       |
|                                                      |                              | Instanta-<br>neous<br>switching | Delayed<br>switching | Instanta-<br>neous<br>switching                 | Delayed<br>switching |    |                 |                 |                                                                                       |    |                                       |                 |                                                                                       |
| V                                                    | s                            |                                 |                      |                                                 |                      |    |                 |                 |                                                                                       |    |                                       |                 |                                                                                       |
| Advanced basic units with safe relay outputs         |                              |                                 |                      |                                                 |                      |    |                 |                 |                                                                                       |    |                                       |                 |                                                                                       |
| 24                                                   | --                           | 3                               | --                   | --                                              | --                   | ▶  | 3SK1121-1AB40   | ▶               |                                                                                       |    | 3SK1121-2AB40                         |                 |                                                                                       |
| 24                                                   | 0.05 ... 3                   | 2                               | 2                    | --                                              | --                   | A  | 3SK1121-1CB41   |                 | B                                                                                     |    | 3SK1121-2CB41                         |                 |                                                                                       |
| 24                                                   | 0.5 ... 30                   | 2                               | 2                    | --                                              | --                   | ▶  | 3SK1121-1CB42   |                 | A                                                                                     |    | 3SK1121-2CB42                         |                 |                                                                                       |
| 24                                                   | 5 ... 300                    | 2                               | 2                    | --                                              | --                   | B  | 3SK1121-1CB44   |                 | B                                                                                     |    | 3SK1121-2CB44                         |                 |                                                                                       |
| Advanced basic units with safe semiconductor outputs |                              |                                 |                      |                                                 |                      |    |                 |                 |                                                                                       |    |                                       |                 |                                                                                       |
| 24                                                   | --                           | --                              | --                   | 1                                               | --                   | A  | 3SK1120-1AB40   |                 | A                                                                                     |    | 3SK1120-2AB40                         |                 |                                                                                       |
| 24                                                   | --                           | --                              | --                   | 3                                               | --                   | A  | 3SK1122-1AB40   |                 | A                                                                                     |    | 3SK1122-2AB40                         |                 |                                                                                       |
| 24                                                   | 0.05 ... 3                   | --                              | --                   | 2                                               | 2                    | B  | 3SK1122-1CB41   |                 | B                                                                                     |    | 3SK1122-2CB41                         |                 |                                                                                       |
| 24                                                   | 0.5 ... 30                   | --                              | --                   | 2                                               | 2                    | A  | 3SK1122-1CB42   |                 | A                                                                                     |    | 3SK1122-2CB42                         |                 |                                                                                       |
| 24                                                   | 5 ... 300                    | --                              | --                   | 2                                               | 2                    | B  | 3SK1122-1CB44   |                 | B                                                                                     |    | 3SK1122-2CB44                         |                 |                                                                                       |