

SIRIUS 3SK1 Safety Relays

General data

Overview



SIRIUS 3SK1 safety relays

SIRIUS 3SK1 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 of width 22.5 mm every safety application can be implemented 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 3SK1 safety relays are permitted for applications up to SIL 3 (IEC 61508/IEC 62061) or PL e (EN ISO 13849-1).

SIRIUS 3SK1 safety relays stand out on account of their flexibility in both parameterization and system configurations with several evaluation units. Optimized solutions when selecting components are facilitated by a clearly structured component range:

- Standard basic units
- Advanced basic units
- Output expansions
- Input expansions
- Accessories

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

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

However, the 3SK1 Advanced basic units also offer the following:

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

In the case of Advanced basic units, the 3ZY1 device connector allows safety functions involving several sensors and actuators to be constructed very quickly.

The 3SK1 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 exceptions are devices with special functions, such as 3TK2826, 3TK2845 and the 3TK2810 devices.

Note:

Conversion table from 3TK28 to 3SK1 see page 11/12 or conversion tool e.g. from 3TK28 to 3SK1 see www.siemens.com/sirius/conversion-tool.

Overview of functions of the 3SK1 series

Type	Standard basic units		Advanced basic units	
	Relay enabling circuits	Electronic enabling circuits	Relay enabling circuits	Electronic enabling circuits
Sensors				
• Mechanical	✓	✓	✓	✓
• Single-ended	✓ ²⁾	✓	✓	✓
• Antivalent	--	--	✓	✓
• Expandable	--	✓	✓	✓
	by means of cascading			
Parameters				
• Start (auto/monitored)	✓	✓	✓	✓
• Sensor connection 2 x 1-channel/ 1 x 2-channel	✓ by means of wiring	✓	✓	✓
• Cross-circuit detection	✓ by means of wiring	✓	✓	✓
• Start test ON/OFF	--	✓	✓	✓
• Monitoring of two-hand operation consoles	--	--	✓	✓
Enabling circuits				
• Instantaneous	✓	✓	✓	✓
• Time-delayed	--	--	✓	✓
• Expandable with relay enabling circuits	✓ by means of wiring	✓ by means of wiring	✓	✓
• Device connectors	--	--	✓	✓
Rated control supply voltage				
• 24 V DC	✓ ³⁾	✓	✓	✓ ¹⁾
• 115 ... 240 V AC/DC	✓	--	✓ ¹⁾	✓ ¹⁾

✓ Available

-- Not available

¹⁾ Possible using 3SK1230 power supply via device connector.

²⁾ 24 V basic units only.

³⁾ 24 V AC/DC

General data**3SK112 and 3SK1112 safety relays with DIP switches**

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

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

Number of safe outputs

Relays	Type and number of enabling circuits		Signal- ing circuits	Rear panel connection			
	Instanta- neous	Time- delayed					
3SK1 Standard basic units							
3SK1111-A..0	3	--	--	--	1	--	
3SK1112-BB40	--	--	2	--	1	--	
3SK1 Advanced basic units							
3SK1120-AB40	--	--	1	--	--	✓	
3SK1121-AB40	3	--	--	--	1	✓	
3SK1121-CB4..	2	2	--	--	--	✓	
3SK1122-AB40	--	--	3	--	1	✓	
3SK1122-CB4..	--	--	2	2	--	✓	

3SK1 output expansions

• 4RO						
3SK1211	4	--	--	--	1 ²⁾	✓ ¹⁾
• 3RO						
3SK1213	3	--	--	--	1 ²⁾	✓ ¹⁾

✓ Available

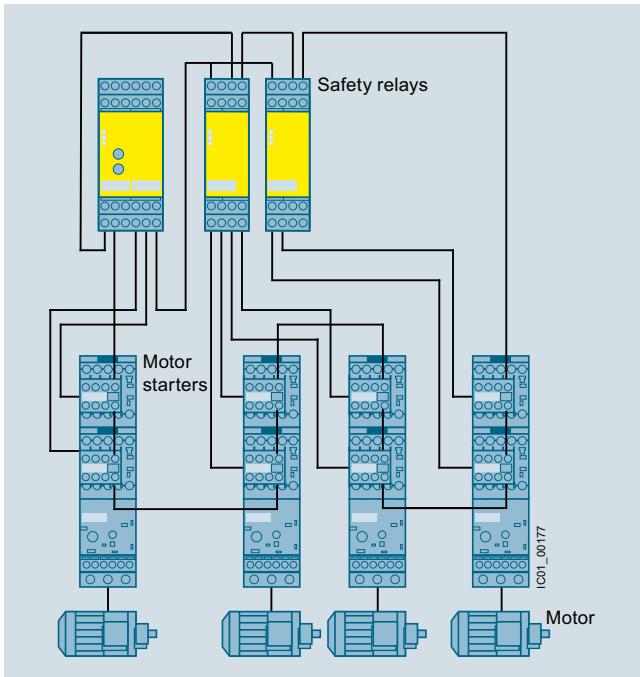
-- Not available

¹⁾ For 24 V DC.

²⁾ Feedback circuit

Can be expanded by adding the 3RM1 motor starter

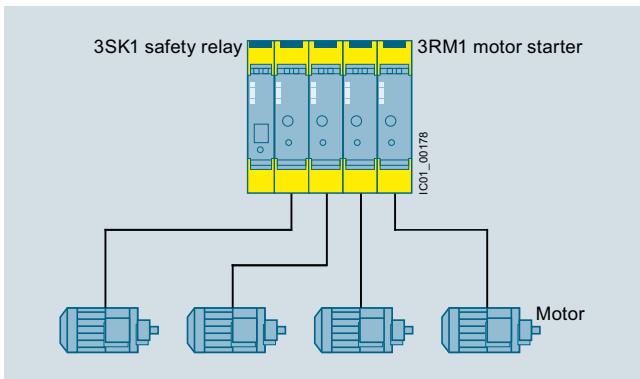
With previous safety relay and motor starter designs, a huge amount of wiring was required to monitor the motor starters in safety applications.



Traditional system design

With the integration of the SIRIUS 3RM1 motor starter into the SIRIUS 3SK1 safety relay system family, this wiring has been minimized for the first time.

Motors up to 3 kW can be easily integrated into the safety relay system using SIRIUS 3ZY1 device connectors, without having to run a cable between the evaluation unit and the motor starter.



System design using 3SK1 and 3RM1

SIRIUS 3SK1 Safety Relays

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Code conversion table

The table below lists the existing 3TK28 article numbers with the corresponding 3SK1 article numbers.

Article number 3TK28 basic units	Article number 3SK1 Standard basic units	Article number 3SK1 Advanced basic units	Article number 3TK28 basic units	Article number 3SK1 Standard basic units	Article number 3SK1 Advanced basic units
3TK2820					
3TK2820-1AJ20	3SK1111-1AW20	3SK1121-1AB40 + 3SK1230-1AW20	3TK2828-1AB20	--	--
3TK2820-1AL20	3SK1111-1AW20	3SK1121-1AB40 + 3SK1230-1AW20	3TK2828-1AB21	--	--
3TK2820-1CB30	3SK1111-1AB30	3SK1121-1AB40	3TK2828-1AJ20	--	3SK1121-1CB42 + 3SK1230-1AW20
3TK2820-2AJ20	3SK1111-2AW20	3SK1121-2AB40 + 3SK1230-2AW20	3TK2828-1AJ21	--	3SK1121-1CB41 + 3SK1230-1AW20
3TK2820-2AL20	3SK1111-2AW20	3SK1121-2AB40 + 3SK1230-2AW20	3TK2828-1AL20	--	3SK1121-1CB42 + 3SK1230-1AW20
3TK2820-2CB30	3SK1111-2AB30	3SK1121-2AB40	3TK2828-1AL21	--	3SK1121-1CB41 + 3SK1230-1AW20
3TK2821					
3TK2821-1CB30	3SK1111-1AB30	3SK1121-1AB40	3TK2828-1BB40	--	3SK1121-1CB42
3TK2821-2CB30	3SK1111-2AB30	3SK1121-2AB40	3TK2828-1BB41	--	3SK1121-1CB41
3TK2822					
3TK2822-1CB30	3SK1111-1AB30	3SK1121-1AB40	3TK2828-2AB20	--	3SK1121-2CB42 + 3SK1230-2AW20
3TK2822-2CB30	3SK1111-2AB30	3SK1121-2AB40	3TK2828-2AB21	--	3SK1121-2CB41 + 3SK1230-2AW20
3TK2823					
3TK2823-1CB30	3SK1111-1AB30	3SK1121-1AB40	3TK2828-2AJ20	--	3SK1121-2CB42 + 3SK1230-2AW20
3TK2823-2CB30	3SK1111-2AB30	3SK1121-2AB40	3TK2828-2AJ21	--	3SK1121-2CB41 + 3SK1230-2AW20
3TK2824					
3TK2824-1AJ20	3SK1111-1AW20	3SK1121-1AB40 + 3SK1230-1AW20	3TK2828-2AL20	--	3SK1121-2CB42 + 3SK1230-2AW20
3TK2824-1AL20	3SK1111-1AW20	3SK1121-1AB40 + 3SK1230-1AW20	3TK2828-2AL21	--	3SK1121-2CB41 + 3SK1230-2AW20
3TK2824-1BB40	3SK1111-1AB30	3SK1121-1AB40	3TK2828-2BB40	--	3SK1121-2CB42
3TK2824-1CB30	3SK1111-1AB30	3SK1121-1AB40	3TK2830		
3TK2824-2AJ20	3SK1111-2AW20	3SK1121-2AB40 + 3SK1230-2AW20	3TK2830-1AJ20	3SK1211-1BW20	3SK1211-1BB40
3TK2824-2AL20	3SK1111-2AW20	3SK1121-2AB40 + 3SK1230-2AW20	3TK2830-1AL20	3SK1211-1BW20	3SK1211-1BB40
3TK2824-2BB40	3SK1111-2AB30	3SK1121-2AB40	3TK2830-1CB30	3SK1211-1BB40	3SK1211-1BB40
3TK2824-2CB30	3SK1111-2AB30	3SK1121-2AB40	3TK2830-2AJ20	3SK1211-2BW20	3SK1211-2BB40
3TK2825					
3TK2825-1AB20	3SK1111-1AW20	3SK1121-1AB40 + 3SK1230-1AW20	3TK2830-2AL20	3SK1211-2BW20	3SK1211-2BB40
3TK2825-1AJ20	3SK1111-1AW20	3SK1121-1AB40 + 3SK1230-1AW20	3TK2830-2CB30	3SK1211-2BB40	3SK1211-2BB40
3TK2825-1AL20	3SK1111-1AW20	3SK1121-1AB40 + 3SK1230-1AW20	3TK2834		
3TK2825-1BB40	3SK1111-1AB30	3SK1121-1AB40	3TK2834-1AB20	--	--
3TK2825-2AB20	3SK1111-2AW20	3SK1121-2AB40 + 3SK1230-2AW20	3TK2834-1AJ20	--	3SK1121-1AB40 + 3SK1230-1AW20
3TK2825-2AJ20	3SK1111-2AW20	3SK1121-2AB40 + 3SK1230-2AW20	3TK2834-1AL20	--	3SK1121-1AB40 + 3SK1230-1AW20
3TK2825-2AL20	3SK1111-2AW20	3SK1121-2AB40 + 3SK1230-2AW20	3TK2834-1BB40	--	3SK1121-1AB40 + 3SK1230-1AW20
3TK2825-2BB40	3SK1111-2AB30	3SK1121-2AB40	3TK2834-2AB20	--	3SK1121-1AB40 + 3SK1230-2AW20
3TK2825-2CB30	3SK1111-2AB30	3SK1121-2AB40	3TK2834-2AJ20	--	3SK1121-2AB40 + 3SK1230-2AW20
3TK2827					
3TK2827-1AB20	--	--	3TK2834-2AL20	--	3SK1121-2AB40 + 3SK1230-2AW20
3TK2827-1AB21	--	--	3TK2834-2BB40	--	3SK1121-2AB40 + 3SK1230-2AW20
3TK2827-1AJ20	--	3SK1121-1CB42 + 3SK1230-1AW20	3TK2840		
3TK2827-1AJ21	--	3SK1121-1CB41 + 3SK1230-1AW20	3TK2840-1BB40	3SK1112-1BB40	3SK1122-1AB40
3TK2827-1AL20	--	3SK1121-1CB42 + 3SK1230-1AW20	3TK2840-2BB40	3SK1112-2BB40	3SK1122-2AB40
3TK2827-1AL21	--	3SK1121-1CB41 + 3SK1230-1AW20	3TK2841		
3TK2827-1BB40	--	3SK1121-1CB42	3TK2841-1BB40	3SK1112-1BB40	3SK1122-1AB40
3TK2827-1BA41	--	3SK1121-1CB41	3TK2841-2BB40	3SK1112-2BB40	3SK1122-2AB40
3TK2827-2AB20	--	--	3TK2842		
3TK2827-2AB21	--	--	3TK2842-1BB41	--	3SK1122-1CB41
3TK2827-2AJ20	--	3SK1121-2CB42 + 3SK1230-2AW20	3TK2842-1BB42	--	3SK1122-1CB42
3TK2827-2AJ21	--	3SK1121-2CB41 + 3SK1230-2AW20	3TK2842-1BB44	--	3SK1122-1CB44
3TK2827-2AL20	--	3SK1121-2CB42 + 3SK1230-2AW20	3TK2842-2BB41	--	3SK1122-2CB41
3TK2827-2AL21	--	3SK1121-2CB41 + 3SK1230-2AW20	3TK2842-2BB42	--	3SK1122-2CB42
3TK2827-2BB40	--	3SK1121-2CB42	3TK2842-2BB44	--	3SK1122-2CB44
3TK2827-2BB41	--	3SK1121-2CB41	3TK2850		
3TK2850					
3TK2850-1AJ20	3SK1111-1AW20 + 3SK1213-1AJ20	3SK1120-1AB40 + 3SK1213-1AJ20	3TK2850-1AB20	3SK1111-1AW20 + 3SK1213-1AL20	3SK1120-1AB40 + 3SK1213-1AB40
3TK2850-1AL20	3SK1111-1AW20 + 3SK1213-1AL20	3SK1120-1AB40 + 3SK1213-1AB40	3TK2850-1BB40	3SK1111-1AB30 + 3SK1213-1AB40	3SK1120-1AB40 + 3SK1213-1AB40
3TK2850-2AJ20	3SK1111-2AW20 + 3SK1213-2AJ20	3SK1120-2AB40 + 3SK1213-2AB40	3TK2850-2AB20	3SK1111-2AW20 + 3SK1213-2AL20	3SK1120-2AB40 + 3SK1213-2AB40
3TK2850-2AL20	3SK1111-2AW20 + 3SK1213-2AL20	3SK1120-2AB40 + 3SK1213-2AB40	3TK2850-2BB40	3SK1111-2AB30 + 3SK1213-2AB40	3SK1120-2AB40 + 3SK1213-2AB40

General data

Article number 3TK28 basic units	Article number 3SK1 Standard basic units	Article number 3SK1 Advanced basic units
3TK2851		
3TK2851-1AJ20	3SK1111-1AW20 + 3SK1213-1AJ20	3SK1120-1AB40 + 3SK1213-1AB40
3TK2851-1AL20	3SK1111-1AW20 + 3SK1213-1AL20	3SK1120-1AB40 + 3SK1213-1AB40
3TK2851-1BB40	3SK1111-1AB30 + 3SK1213-1AB40	3SK1120-1AB40 + 3SK1213-1AB40
3TK2851-2AJ20	3SK1111-2AW20 + 3SK1213-2AJ20	3SK1120-2AB40 + 3SK1213-2AB40
3TK2851-2AL20	3SK1111-2AW20 + 3SK1213-2AL20	3SK1120-2AB40 + 3SK1213-2AB40
3TK2851-2BB40	3SK1111-2AB30 + 3SK1213-2AB40	3SK1120-2AB40 + 3SK1213-2AB40
3TK2852		
3TK2852-1AL20	3SK1111-1AW20 + 3SK1213-1AL20	3SK1120-1AB40 + 3SK1213-1AB40
3TK2852-1BB40	3SK1111-1AB30 + 3SK1213-1AB40	3SK1120-1AB40 + 3SK1213-1AB40
3TK2852-2AL20	3SK1111-2AW20 + 3SK1213-2AL20	3SK1120-2AB40 + 3SK1213-2AB40
3TK2852-2BB40	3SK1111-2AB30 + 3SK1213-2AB40	3SK1120-2AB40 + 3SK1213-2AB40

Article number 3TK28 basic units	Article number 3SK1 Standard basic units	Article number 3SK1 Advanced basic units
3TK2853		
3TK2853-1BB40	3SK1111-1AB30 + 3SK1213-1AB40	3SK1120-1AB40 + 3SK1213-1AB40
3TK2853-2BB40	3SK1111-2AB30 + 3SK1213-2AB40	3SK1120-2AB40 + 3SK1213-2AB40
3TK2856		
3TK2856-1BB40	3SK1213-1AB40	3SK1213-1AB40
3TK2856-2BB40	3SK1213-2AB40	3SK1213-2AB40
3TK2857		
3TK2857-1BB41	--	3SK1213-1AB40 (delay as for basic unit)
3TK2857-1BB42	--	3SK1213-1AB40 (delay as for basic unit)
3TK2857-1BB44	--	3SK1213-1AB40 (delay as for basic unit)
3TK2857-2BB41	--	3SK1213-2AB40 (delay as for basic unit)
3TK2857-2BB42	--	3SK1213-2AB40 (delay as for basic unit)
3TK2857-2BB44	--	3SK1213-2AB40 (delay as for basic unit)

Note:

Conversion tool e.g. 3TK28 to 3SK1 see
www.siemens.com/sirius/conversion-tool.

Article No. scheme

Digit of the article No.	1st - 3rd	4th	5th	6th	7th	-	8th	9th	10th	11th	12th
Safety relays	<input type="checkbox"/> □	-	<input type="checkbox"/> □	<input checked="" type="checkbox"/> A	<input type="checkbox"/> □	<input type="checkbox"/> □	<input type="checkbox"/> □				
Generation		<input type="checkbox"/> □									
Device version			<input type="checkbox"/> □								
Device series				<input type="checkbox"/> □							
Type of outputs					<input type="checkbox"/> □						
Connection type						<input type="checkbox"/> □					
Rated control supply voltage							<input type="checkbox"/> □				
Type of rated control supply voltage								<input type="checkbox"/> □			
Time delay									<input type="checkbox"/> □		
Example	3SK	1	1	2	1	-	1	A	B	4	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.