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SIRIUS 3SK1 Safety Relays

Quickly and easily achieving a safe and productive system

siemens.com/safety-relays

With the SIRIUS 3SK1 safety relays every simple safety application can be optimally implemented, both technically and economically, whether it is EMERGENCY STOP, two-hand operation consoles, light arrays, laser scanners or protection of persons at presses and punching machines. The new safety relays comply with the latest safety standards and can be simply and economically used to achieve a safe and productive system quickly, with many advantages:

Advantages:	Customer benefits:
Compact device range based on bundled functions	Cost saving due to reduced stocks
Multifunctional devices, suitable for electronic and mechanical sensors	More flexibility in the control cabinet
Narrow housing and award-winning innovative enclosure concept	Space saving in the control cabinet
Screw-type and spring-type (push-in) connections available at the same price, simplified connection system	Fast wiring saving time and cost
Flexibly expandable through modular product concept	Simple adaptation of new requirements saves costs
Reduced wiring through device connectors	Avoidance of incorrect wiring saving time and cost
Latest safety standards are met	International use according to IEC 62061 and ISO 13849
Standard device concept	Easy to understand, simple application
Parameterization without software	Operator-friendly, simple handling

Why safety of machinery?

In Europe, machine manufacturers (product safety) and machine owners (system safety) are required by law to ensure the safety of people and the environment.

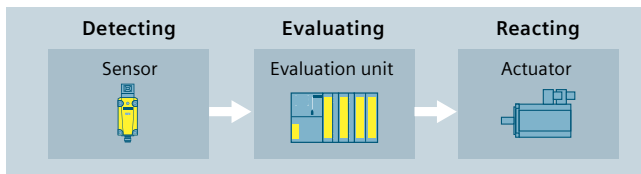
What is safety?

Safety defines a state in which the risk of damage is reduced to a tolerable level, or which can be regarded as risk-free. Functional safety refers to the protection of people, machines and the environment.

The objective of safety systems is to reduce the risk for humans and machines that is posed by a use case to an acceptable level.

Safety function:

A safety function describes the reaction of a machine/plant when a specific event occurs (e.g. opening of a protective door). Execution of the safety function is carried out by a safety-related control system, which usually consists of three subsystems:



The following safety-oriented functions are available:

- Monitoring the safety functions of the sensors
- Monitoring the sensor leads
- Monitoring correct functioning of safety relays
- Monitoring the actuators in the switched-off circuit
- Safety-oriented disconnection when hazards arise

Any machinery manufacturer is obliged to perform a risk assessment to identify all the hazards associated with his machinery. He would need to assess and evaluate the risks involved. Then he would need to design and construct the machinery taking into account such hazards.

For most safety functions the risk assessment requires safety level SIL 2 or SIL 3 or PL d or PL e¹⁾.

1) SIL = Safety Integrity Level

Level 1 = lowest safety level

Level 4 = highest safety level

PL = Performance Level

PL a = low contribution to risk reduction

PL e = high contribution to risk reduction

Why is safety of machinery so important according to the latest safety standards?

Avoidance of costs by avoiding damage

Possible cost traps:

- Production loss/machine downtime during repair
- Replacement/repair of damaged machines
- Higher insurance premiums caused by accidents
- Fines/lawsuits after accident/sickness

Clear added benefit

- Legal certainty
- Increased export opportunities: fulfilling the requirements of the machinery directive is a prerequisite in many markets
- Increased productivity due to high machine availability
- Fewer industrial accidents and associated cost savings



SIRIUS 3SK1 safety relays comply to the most stringent requirements of IEC 61508 or IEC 62061 (SIL 3) and EN ISO 13849-1 (PL e) and therefore the latest safety standards.

So change to the new generation of safety relays now.

Which sensors can be connected?

Mechanical and electronic sensors:
SIRIUS 3SE5 position switches
SIRIUS 3SE6 RFID safety switches



SIRIUS 3SB3 EMERGENCY STOP command devices



SIRIUS 3SB38 two-hand operation consoles



SIRIUS 3SE29 foot switches and



SIRIUS 3SE7 cable-operated switches



Pressure sensitive mats
Light barriers
Laser scanners and more

How can you evaluate quickly software?

SIRIUS 3SK1 safety relays

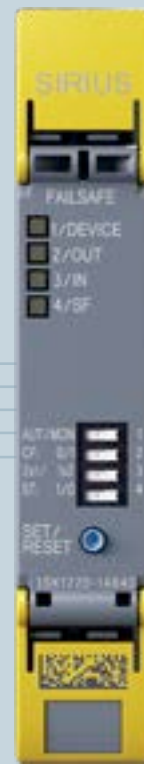
Optional input expansion modules

Standard basic units

- for additional sensor connections
- or a power supply unit
- up to 5 items
- for Advanced basic units only

or

Advanced basic units



3SK1220-1AB40



3SK1121-1CB44

Advanced basic units with simple commissioning without software – parameterization by DIP switches

OFF		ON	
1	<input type="checkbox"/>	1	<input type="checkbox"/>
2	<input type="checkbox"/>	2	<input type="checkbox"/>
3	<input type="checkbox"/>	3	<input type="checkbox"/>
4	<input type="checkbox"/>	4	<input type="checkbox"/>

- Sensor input / start type
- Cross-circuit fault detection
- Sensor connection
- Testing at start

ly and reliably without

Optional output expansion modules

- Number of outputs can be expanded for time-differentiated control of the actuator group



3SK1211-1BB40

Which actuators can be connected?

For example:

SIRIUS 3RT contactors





SIRIUS 3RA6 compact starters



SIMATIC ET 200S or ET 200pro motor starters

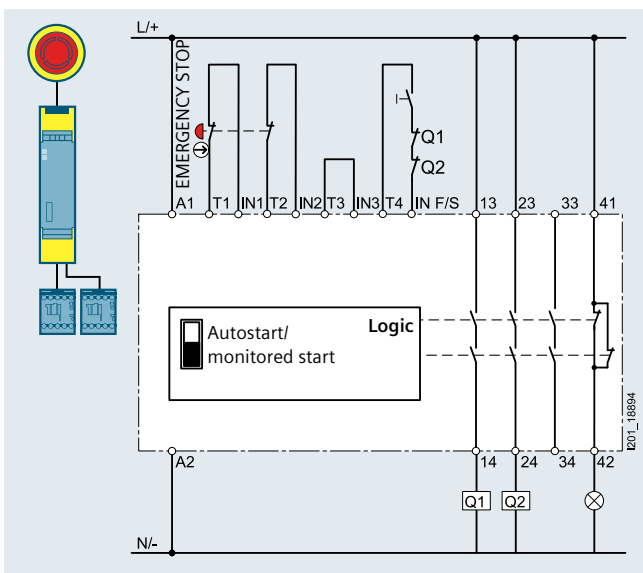


Switching states DIP switches

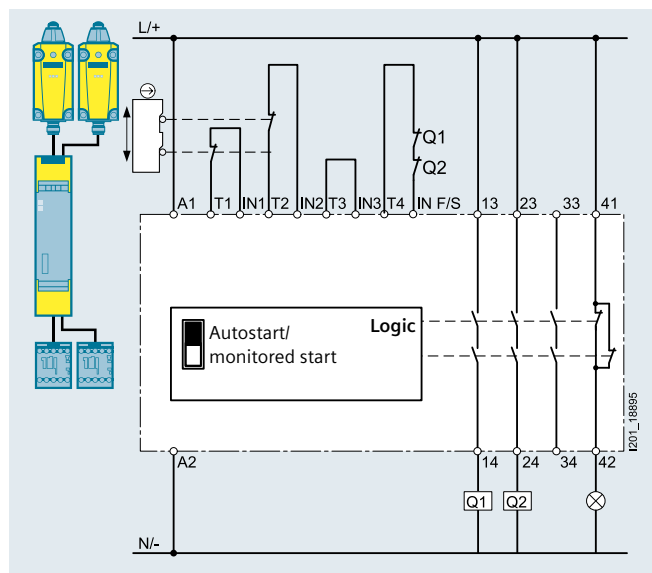
 OFF	 ON
Autostart	Monitored start
Without cross-circuit fault detection	With cross-circuit fault detection
2 X 1 channel sensor connection	1 x 2 channel sensor connection
With testing at start	Without testing at start

SIRIUS 3SK1		Adjustable off-delay time	Rated control supply voltage	Enable circuits	Signal-ing circuits	Article No. Screw-type connection	Article No. Spring-type connection (push-in)
Standard basic units							
	with relay outputs	--	24 V AC/DC	3	1	3SK1111-1AB30	3SK1111-2AB30
		--	110 - 240 V AC/DC	3	1	3SK1111-1AW20	3SK1111-2AW20
	with semiconductor outputs	--	24 V DC	2	1	3SK1112-1BB40	3SK1112-2BB40
Advanced basic units							
	with relay outputs	--	24 V DC	3	1	3SK1121-1AB40	3SK1121-2AB40
		0.05 to 3 s	24 V DC	2/2tv	--	3SK1121-1CB41	3SK1121-2CB41
		0.5 to 30 s	24 V DC	2/2tv	--	3SK1121-1CB42	3SK1121-2CB42
	with semiconductor outputs	--	24 V DC	3	1	3SK1122-1AB40	3SK1122-2AB40
		0.5 to 30 s	24 V DC	2/2tv	--	3SK1122-1CB42	3SK1122-2CB42
Input expansion module 17.5 mm							
	Sensor expansion module for safety-oriented expansion of the Advanced basic units by adding an additional 2-channel sensor or two 1-channel sensors	--	24 V DC	--	--	3SK1220-1AB40	3SK1220-2AB40
Output expansion module 4RO 22.5 mm							
	with relay outputs	--	24 V DC	4	1	3SK1211-1BB40	3SK1211-2BB40
Device connectors for saving wiring for Advanced basic units, input or output expansion modules							
	Device connector, 17.5 mm					3ZY1212-1BA00	
	Device connector, 22.5 mm					3ZY1212-2BA00	
	Device termination connector, 22.5 mm					3ZY1212-2DA00	

Application examples



EMERGENCY STOP application, 3SK1111-.AB30, SIL 3, PI e, monitored start



Protective door monitoring, 3SK1111-.AB30, SIL 3, PI e, autostart

Get more information

More about SIRIUS safety relays:
www.siemens.com/safety-relays

More about Safety Integrated:
www.siemens.com/safety-integrated

Planning Efficiency for SIRIUS:
www.siemens.com/planning-efficiency



Siemens AG
Industry Sector
Industry Automation
Control Components and
Systems Engineering
Partner of the Electrical Wholesale Trade
Postfach 23 55
90713 FÜRTH
GERMANY

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Conversion list for fast-moving types

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22 different fast-moving types of the 3TK28 series can be replaced by 7 different 3SK1 basic units as standard version or 6 different 3SK1 basic units as advanced version. Benefit from the advantages yourself:

Simple	<ul style="list-style-type: none">■ Clear, concise product portfolio■ Universal functionality
Flexible	<ul style="list-style-type: none">■ Modular product concept
Economical	<ul style="list-style-type: none">■ Few variances■ Reduction in types■ Minimum wiring time and effort



Previous Article No. 3TK28		New Article No. of the successor type 3SK1, only 22.5 mm wide	
		Standard version	Advanced version
3TK282...			
3TK2820-1CB30	⇔	3SK1111-1AB30	3SK1121-1AB40
3TK2821-1CB30	⇔	3SK1111-1AB30	3SK1121-1AB40
3TK2821-2CB30	⇔	3SK1111-2AB30	3SK1121-2AB40
3TK2822-1CB30	⇔	3SK1111-1AB30	3SK1121-1AB40
3TK2823-1CB30	⇔	3SK1111-1AB30	3SK1121-1AB40
3TK2824-1AL20	⇔	3SK1111-1AW20	3SK1121-1AB40 + 3SK1230-1AW20
3TK2824-1BB40	⇔	3SK1111-1AB30	3SK1121-1AB40
3TK2824-1CB30	⇔	3SK1111-1AB30	3SK1121-1AB40
3TK2825-1AJ20	⇔	3SK1111-1AW20	3SK1121-1AB40 + 3SK1230-1AW20
3TK2825-1AL20	⇔	3SK1111-1AW20	3SK1121-1AB40 + 3SK1230-1AW20
3TK2825-1BB40	⇔	3SK1111-1AB30	3SK1121-1AB40
3TK2825-2BB40	⇔	3SK1111-2AB30	3SK1121-2AB40
3TK2827-1BB40	⇔	--	3SK1121-1CB42
3TK2827-1BB41	⇔	--	3SK1121-1CB41
3TK2828-1BB40	⇔	--	3SK1121-1CB42
3TK2828-1BB41	⇔	--	3SK1121-1CB41
3TK283...			
3TK2830-1AL20	⇔	3SK1211-1BW20	3SK1211-1BB40
3TK2830-1CB30	⇔	3SK1211-1BB40	3SK1211-1BW20
3TK2830-2CB30	⇔	3SK1211-2BB40	3SK1211-2BB40
3TK2834-1BB40	⇔	--	3SK1121-1AB40
3TK284...			
3TK2840-1BB40	⇔	3SK1112-1BB40	3SK1122-1AB40
3TK2841-1BB40	⇔	3SK1112-1BB40	3SK1122-1AB40

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