



# Why machine safety?

In Europe and in many other regions, machine manufacturers and operators are required by law to ensure the safety of people, machinery 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, machinery, and the environment.

## 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 performed 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 switch-off circuit
- Safety-oriented disconnection when hazards arise

Machine manufacturers are obliged to perform a risk assessment to identify all the hazards associated with their machinery, to assess and evaluate the risks, and to design and construct their machinery taking such hazards into account. For most safety functions, the

risk assessment requires safety level SIL 2 or SIL 3\* or PL d or PL e\*\*.

## Save costs by avoiding damage

Possible cost traps:

- Production loss/machine downtimes during repair
- Replacement/repair of damaged machines
- Higher insurance premiums caused by accidents
- Fines/lawsuits after accidents/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) as well as EN ISO 13849-1 (PL e) and therefore fulfill the latest safety standards. So move to the new generation of safety relays now.

\* according to IEC 62061 or IEC 61508

\*\* according to ISO 13849

## Which sensors can be connected?

Mechanical and electronic sensors:



SIRIUS 3SE5 position/safety switches  
SIRIUS 3SE6 non-contact safety switches



SIRIUS ACT EMERGENCY STOP 3SU18 command devices



SIRIUS ACT 3SU1 two-hand operation consoles



SIRIUS 3SE29/39 foot switches



SIRIUS 3SE7 cable-operated switches

Pressure-sensitive mats,  
laser scanners and more

## How can you perform quick, flexible evaluation?

Whereas regular 3SK1 safety applications can be quickly and simply expanded with inputs and outputs using innovative device connectors, demanding safety functions are now also easy to implement on the new 3SK2 devices with simple drag-and-drop parameterization.



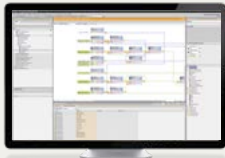
### SIRIUS 3SK1 Hardware benefits at a glance

- Reduced product variety by bundling functions – with cost savings due to reduced stocks
- Slimline design and innovative award-winning enclosure concept – for more space in the control cabinet
- Screw-type and spring-loaded (push-in) connections available at the same price – for less wiring work
- Flexible expansion with modular product concept – for simple adaptation to new circumstances

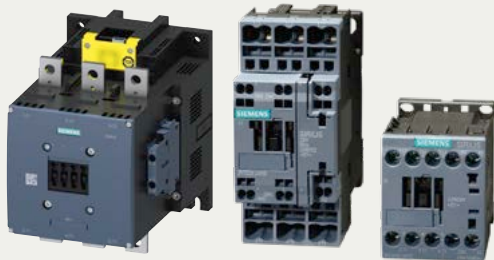


OFF	ON
	<ul style="list-style-type: none"> <li>• Start type</li> <li>• Cross-circuit detection</li> <li>• Sensor type</li> <li>• Testing at start</li> </ul>

Engineering with SIRIUS Safety ES TIA



## Which actuators can be connected?



SIRIUS 3RT contactors



SIRIUS 3RA6 compact starters






### SIRIUS 3SK2 Software benefits at a glance

- Easy setup of complex safety applications with drag-and-drop
- Efficient commissioning using test mode, forcing and extensive diagnostics
- Faster preparation of documentation
- Seamless engineering thanks to integration into the TIA Portal



SIRIUS 3RM1 motor starters

<b>SIRIUS 3SK1 (selection)</b>	<b>Time delay</b>	<b>Rated control supply voltage</b>	<b>Enabling circuits</b>	<b>Signaling circuits</b>	<b>Screw terminals Article No.</b> 	<b>Spring-loaded ter- minals (push-in) </b> Article No.
<b>Standard basic units</b>						
<b>With relay outputs</b>	–	24 V AC/DC	3	1	3SK1111-1AB30	3SK1111-2AB30
	–	110–240 V AC/DC	3	1	3SK1111-1AW20	3SK1111-2AW20
<b>With semiconductor outputs</b>	–	2 F-DQ	2	1	3SK1112-1BB40	3SK1112-2BB40
<b>Advanced basic units</b>						
<b>With relay outputs</b>	–	24 V DC	3	1	3SK1121-1AB40	3SK1121-2AB40
	0.05 to 3 s	24 V DC	2/2 tv	–	3SK1121-1CB41	3SK1121-2CB41
	0.5 to 30 s	24 V DC	2/2 tv	–	3SK1121-1CB42	3SK1121-2CB42
	5–300 s	24 V DC	2/2 tv	–	3SK1121-1CB44	3SK1121-2CB44
<b>With semiconductor outputs</b>	–	24 V DC	1	–	3SK1120-1AB40	3SK1120-2AB40
	–	24 V DC	3	1	3SK1122-1AB40	3SK1122-2AB40
	0.05 to 3 s	24 V DC	2/2 tv	–	3SK1122-1CB41	3SK1122-2CB41
	0.5 to 30 s	24 V DC	2/2 tv	–	3SK1122-1CB42	3SK1122-2CB42
	5–300 s	24 V DC	2/2 tv	–	3SK1122-1CB44	3SK1122-2CB44
<b>Input expansion module 17.5 mm</b>						
<b>Expansion of advanced basic units by adding a 2-channel sensor or two single-channel sensors</b>	–	24 V DC	–	–	3SK1220-1AB40	3SK1220-2AB40
<b>Output expansion module 22.5 mm</b>						
<b>With relay outputs</b>	–	24 V DC	4	1	3SK1211-1BB40	3SK1211-2BB40
<b>3RQ1 coupling relays</b>	–	24 V DC	1	1	3RQ1200-1EB-00	3RQ1200-2EB-00

<b>SIRIUS 3SK2</b>	<b>Screw terminals Article No.</b>	<b>Spring-loaded terminals (push-in) Article No.</b>	<b>STARTER KIT</b>
<b>SIRIUS 3SK2 safety relay, width 45 mm</b>	3SK2122-1AA10	3SK2122-2AA10	 <p>3SK2941-2AA11 Contains 3SK2112-2AA10 basic unit and 3UF7941-0AA00-0 USB PC cable</p>
<b>SIRIUS 3SK2 safety relay, width 22.5 mm</b>	3SK2112-1AA10	3SK2112-2AA10	

<b>Accessories</b>	<b>Article No.</b>	<b>Description</b>
<b>USB PC cable</b>	3UF7941-0AA00-0	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
<b>SIRIUS Safety ES software</b>	3ZS1326-2C*10-0Y*5	for configuring, commissioning, operating and diagnosing of 3SK2 * Different product and license variants
<b>Device connector 17.5 mm</b>	3ZY1212-1BA00	for saving on wiring for advanced basic units, input or output expansion module <b>3SK1</b>
<b>Device connector 22.5 mm</b>	3ZY1212-2BA00	
<b>Device termination connector 22.5 mm</b>	3ZY1212-2DA00	
<b>Device connector 22.5 mm</b>	3ZY1212-2GA00	for saving on wiring for advanced basic units, input or output expansion module <b>3SK2</b>
<b>Device connector 45 mm</b>	3ZY1212-4GA01	

Find out more:  
**siemens.com/safety-relays**

Download link for free version of Safety ES TIA:  
<https://support.industry.siemens.com/cs/ww/en/view/109793090>

Play it safe with SIRIUS 3SK:  
Discover the flexible ways to use them. Find out for yourself how easy it is to set parameters. Easily implement efficient and economical safety chains throughout your installations.

Technical information and support are available at [www.siemens.com/SIOS](http://www.siemens.com/SIOS) or in the Industry Online Support App.



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