SIEMENS

Flexibly meet any safety requirement

SIRIUS 3SK1 Safety Relays – modular with full depth of functions

siemens.com/safety-relays

Additional information

To learn more about SIRIUS safety relays:
www.siemens.com/safety-relays

To learn more about Safety Integrated:
www.siemens.com/safety-integrated

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

GIT
SECURITY
AWARD
2014
WINNER

Answers for industry.

Flexibility and safety have a new name

System operators currently require their machinery to meet all functional safety requirements and be on the cutting edge of technology. They also expect that their machines are equipped to meet future requirements. The new SIRIUS 3SK1 Safety Relays comply with the latest safety standards and are certified for international use according to IEC 62061 and ISO 13849-1. They are a new component of industrial safety technology at Siemens: Safety Integrated. www.siemens.com/safety-integrated

They can be used easily and economically; For example, you can flexibly expand a basic unit with input and output modules – depending on the application. This keeps you flexible, keeps your stock uncluttered, and keeps your product selection simple without compromising functionality. Moreover, the innovative housing concept of the safety relays received the internationally renowned iF product design award 2013. The Sirius 3SK1 provides the perfect solution for quickly and easily achieving a safe and productive system – while giving yourself a competitive edge.

The decision for SIRIUS 3SK1 Safety Relays means modularity with full depth of function.

SIRIUS 3SK1 Safety Relays

With these safety relays, you can meet a wide variety of safety requirements – from EMERGENCY STOP applications to protective door monitoring and two-hand operation console.
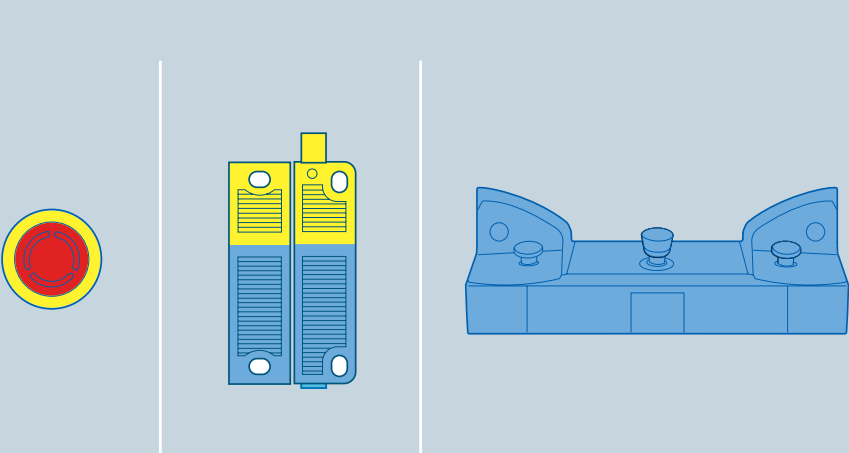
Benefits:

› **Simple** – clear product portfolio and universal functionality
› **Flexible** – thanks to a modular product concept and full integration of SIRIUS 3RM1 Motor Starters
› **Economical** – little variance and low wiring costs

With the SIRIUS 3SK1 Safety Relays, you can handle many locally limited safety applications in automated processes. Not only easy and economical to expand these processes with new devices, you can also enhance and adapt them to future requirements. Up to ten mechanical or electronic sensors and up to twenty secure outputs can be controlled via input and output expansion modules that can be flexibly combined with just a single basic unit.

The design is extremely simple: DIP switches are used to set the parameters on the multifunctional basic units – no programming is necessary. In addition, the new safety relays can be seamlessly integrated into standard automation. This minimizes the costs of engineering and training while maximizing the system's availability. The result: lower installation costs as well as lower costs in terms of system design and operation. The SIRIUS 3SK1 Safety Relays replace the existing SIRIUS 3TK28 product range.
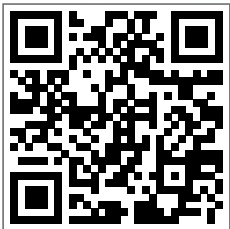
Scan and experience the safe shutdown of a system for yourself!

The basic units – two types for different requirements

SIRIUS 3SK1 Safety Relays offer you a streamlined and clear product range. Whether standard or advanced basic units – safety solutions have never been so easy. With both types you can implement individual solutions as well as solutions integrated into standard automation.

Terminals with optimized working angles:Cable routing and terminal operation occur from the same direction and are clearly visible during wiring. Labeled hinged covers facilitate the assignment of connections.

Standard basic units – for a sensor

Both standard basic units are easy to use and offer variable functionality.

They provide a connection for mechanical and electronic sensors and make the wiring particularly easy. On one hand, labeling on the inside of the hinged covers facilitates the connection of the sensor. On the other, the cables are routed in the same direction as the terminals are operated. You can choose between screw-type and spring-loaded connections.

Using the DIP switches, you can set the parameters for the basic units in the blink of an eye for the specific sensor – e.g., EMERGENCY STOP or non-contact safety switch. The standard basic units are available with relay or semiconductor outputs.

Advanced basic units – for even more flexibility

In addition to the product features of the standard units, the advanced basic units additionally offer greater functionality and flexibility.

This means that you can expand the advanced basic units with input expansion modules for additional sensors. Depending on the unit configuration, a time delay for the outputs can be set using a rotary encoder switch.

A further benefit is the unique device connector – it eliminates the wiring between the basic unit and the expansion modules. Simply attach it and you're done. It is fast, convenient, and eliminates the possibility of faulty wiring.

And when there's very little room in the control cabinet? The Mini advanced basic unit product range featuring a width of just 17.5 mm offers a solution.

Application examples

The benefits of this modular product concept are clear to see based on system configurations. Below are three examples for locally limited applications with one sensor, multiple sensors, and applications for safely shutting down motors.
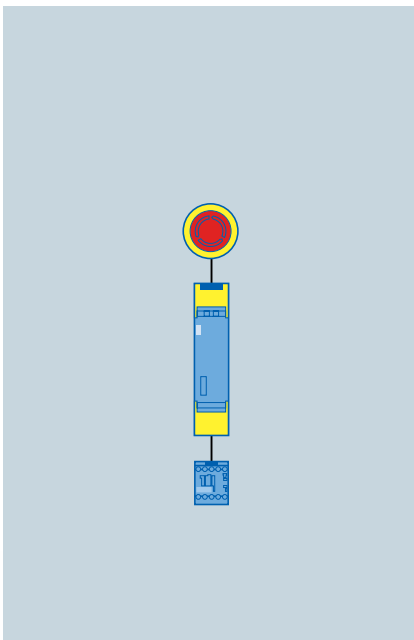
Simple applications

The simplest safety applications require only an individual standard or advanced basic unit to which you can connect two more modules; for example, you could connect one sensor and one actuator.
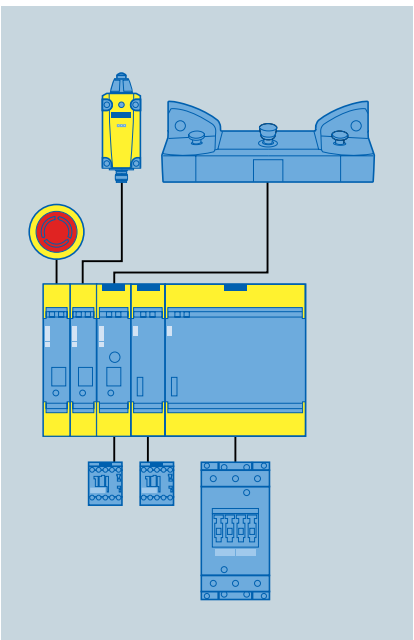
Applications with multiple sensors

If multiple sensors are required for your safety application, a single basic unit is not enough. However, thanks to the modular product design, our safety relays give you the flexibility you need. You can simply use an expandable advanced basic unit and flexibly combine it with a corresponding number of input expansion modules such as additional sensors and output expansion modules for additional actuators.
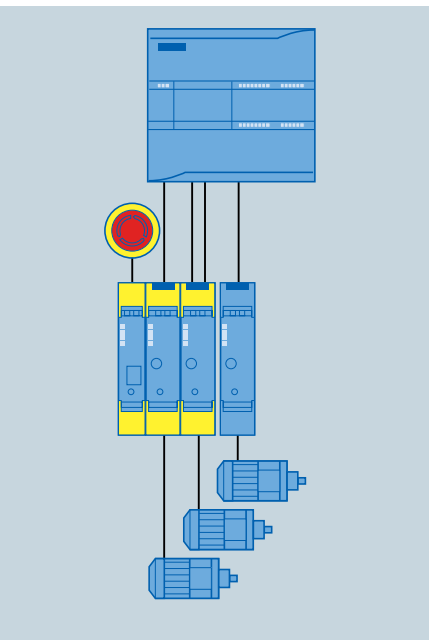
Applications for safe motor control

To safely shut down motors, you can easily combine the new safety relays with the new SIRIUS 3RM1 Motor Starters and integrate them into your safety application. This eliminates the need for additional devices and wiring and thus reduces costs. The motor starters are available as direct or reversing starters.

Also available is a special version that provides for a safe shutdown. Only 22.5 mm wide, these devices offer the additional benefit of integrated overload protection which enables them to protect people, machinery, and the environment as well as your motors.

Input expansion module and power supply

Thanks to the modular product concept of the safety relays, you can tailor the basic units to suit your needs on the input side. Adding additional sensor connections is as easy as adding an optional power supply with minimal wiring.

The new housing concept of the safety relays incorporates clearly labeled hinged covers, which facilitates sensor connection. In addition, you can add a seal to prevent parameters from accidentally being adjusted and to avoid time delays.

Input expansion module – when more is needed

Could you use a little bit more? If you need more than just one sensor for your safety application, you don't need an additional basic unit – instead you can simply install a cost-effective input expansion module. This module has two sensor inputs which enable you to connect both mechanical and electronic sensors.

The input expansion module can only be used with advanced basic units. Up to five of these modules can be easily connected to an advanced basic unit via a device connector.
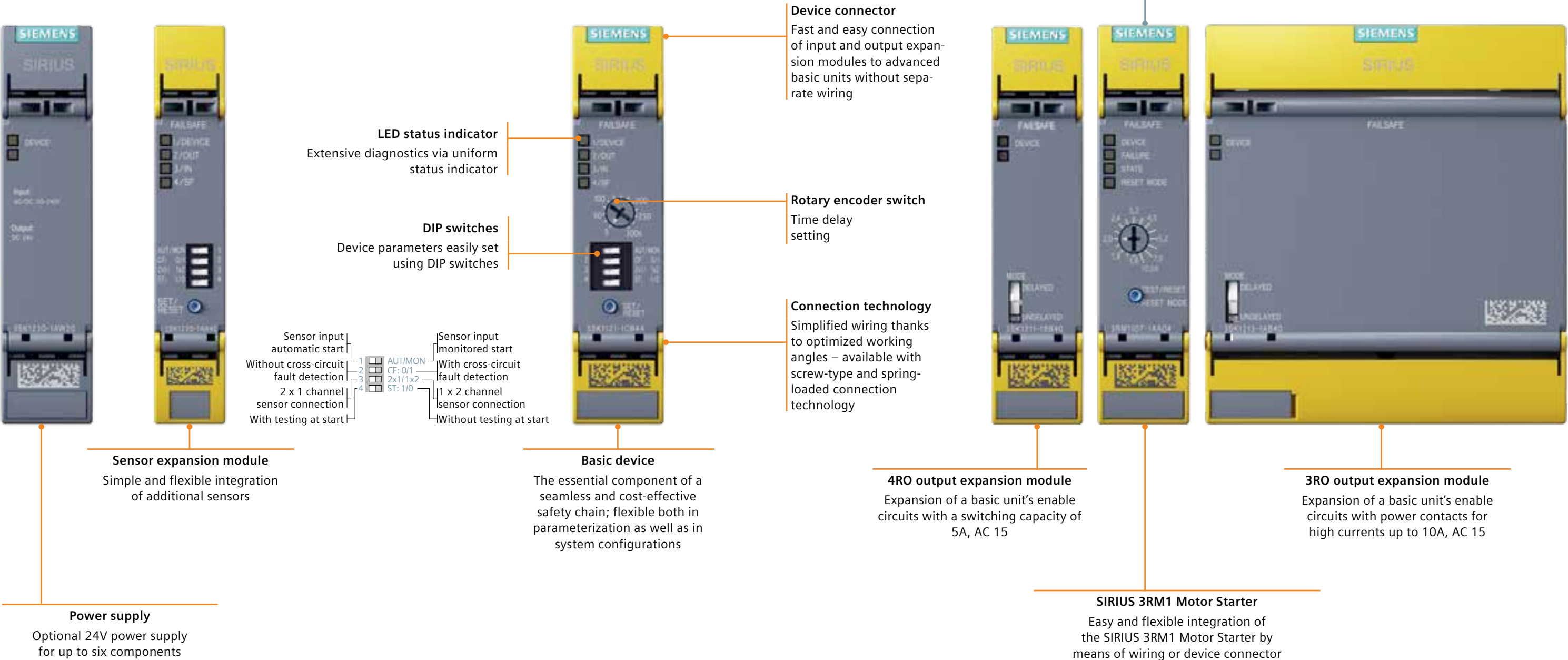
Optional power supply – for worldwide use

The 24V power supply can supply power to up to six components – whether they are basic units, input expansion modules, or output expansion modules. It handles all common international control voltages from 110 to 240V AC/DC, enabling the safety relays to be used worldwide. This eliminates the need for country-specific versions, which greatly simplifies ordering and stockkeeping process.

The power supply can be used with standard and advanced basic units. The power supply can be wired or, in the case of advanced basic units, connected via the device connector.

Flexible, simple, and economical

With SIRIUS 3SK1, you receive safety relays that simplify operation, save money and time, and are distinguished by their high degree of modularity and flexibility.

Sensor expansion module
Simple and flexible integration of additional sensors

Power supply
Optional 24V power supply for up to six components

LED status indicator
Extensive diagnostics via uniform status indicator

DIP switches
Device parameters easily set using DIP switches

Sensor input
automatic start
Without cross-circuit
fault detection
2 x 1 channel
sensor connection
With testing at start

AUT/MON
CF: 0/1
2x1/1x2
ST: 1/0

Sensor input
monitored start
With cross-circuit
fault detection
1 x 2 channel
sensor connection
Without testing at start

Basic device
The essential component of a seamless and cost-effective safety chain; flexible both in parameterization as well as in system configurations

Device connector
Fast and easy connection of input and output expansion modules to advanced basic units without separate wiring

Rotary encoder switch
Time delay
setting

Connection technology
Simplified wiring thanks to optimized working angles – available with screw-type and spring-loaded connection technology

Here you can find out more about the SIRIUS 3RM1 multifunctional Motor Starters.

4RO output expansion module
Expansion of a basic unit's enable circuits with a switching capacity of 5A, AC 15

SIRIUS 3RM1 Motor Starter
Easy and flexible integration of the SIRIUS 3RM1 Motor Starter by means of wiring or device connector

3RO output expansion module
Expansion of a basic unit's enable circuits with power contacts for high currents up to 10A, AC 15

The output expansion modules

The modular product concept enables you to individually tailor the number of outputs to control the actuators to match your specific safety application. The output expansion modules are the same for all basic units. They can be connected to standard basic units via wiring. For connection to advanced basic units, the modules can be either wired or connected via convenient device connectors.

Output expansion modules

When additional output are needed output expansion modules come into play:

› Contact expansion with four relay outputs for low currents up to 5 A
› Contact expansion with three power relay outputs for high currents up to 10 A

With these expansion modules you can easily add additional outputs to the basic units. Using a slide switch on the expansion module, you can set the parameters for the respective outputs as instantaneous or time-delayed for the advanced basic units. This means you need just a single basic unit in order to switch multiple groups of actuators at different times. To keep the product line transparent and ensure that the product selection remains simple, the output expansion modules are identical for standard as well as advanced basic units.

Standard basic units are connected by means of wired links or in the case of advanced basic units alternatively via the user-friendly unit connector.

This simplifies planning and assembly for you and reduces the costs associated with purchasing, storage, and maintenance.

SIRIUS 3RM1 Motor Starters

Unique, space-saving, and fail-safe: The safety relays provide for the seamless connection of the new, innovative line of SIRIUS 3RM1 Motor Starters for three-phase motors up to 3kW. For the first time, units from the control and main circuit have been merged into a single system.

The SIRIUS 3RM1 Motor Starters are multifunctional with a width of just 22.5 mm. They replace up to four devices – three contactors and one overload relay – because the motor starters take over the functions of reverse or direct starting, overload protection, and safe shutdown. The new motor starters use durable and energy-efficient hybrid switching technology, an ideal combination of semiconductor and relay technology.

The combination of safety relays and motor starters is unique and reduces wiring costs as well as fault potentials. With advanced basic units, device connectors provide for easy and safe connections. Not only are the safety relays and the motor starters perfectly coordinated when it comes to technology, they also share a uniform design.
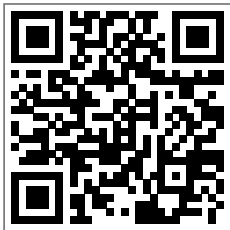
Before

Today
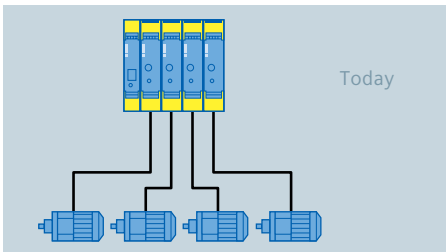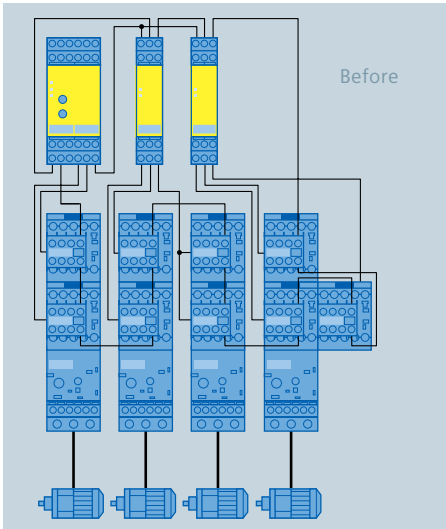
Benefits:

› **Integrated unit** – SIRIUS 3RM1 Motor Starters are seamlessly integrated into the new safety relays
› **Greater flexibility** – fewer basic units and main circuit components
› **More simplicity** – less wiring thanks to device connectors and infeed system for the SiRIUS 3RM1 Motor Starters
› **Highly compact** – narrow widths and multifunctionality

Maximum flexibility for any application

With SIRIUS 3SK1 Safety Relays, you can easily implement locally limited safety solutions at the cell level and reliably shut down machinery when a hazard is detected for the protection of operators, the environment, and machinery.

Example of a filling system with protective door and EMERGENCY STOP

This automated filling system meets high requirements relating to hygiene and personal protection and is housed in a safety cell. If the cell is entered during operation or if the EMERGENCY STOP is activated, the safety relays safely shut down the system.

The monitored start and safe stop of the machinery is handled via an advanced basic unit, in which the motor is switched via the integrated SIRIUS 3RM1 motor starter. In addition, the valves are controlled via the output expansion module for lower currents up to 5A and via the output expansion module for larger currents up to 10A.

The non-contact safety switch is connected to the basic unit, and the EMERGENCY STOP connections are made via input expansion modules. All safety relays can be quickly and easily plugged into the SIRIUS 3ZY12 device connector – without complex wiring.

Thanks to the modular product concept, the filling system can be quickly and easily expanded at any time and tailored to changing requirements.

Scan and experience the system expansion in moving images!

With the SIRIUS 3SK1 Safety Relays and the SIRIUS 3RM1 Motor Starters, it is just as easy to safely shut down a system as it is to expand it.

Order number overview

The simplicity of the modular product concept is matched by the clear range of products and order numbers. Based on the order numbers, you can also determine the connection type and the off delay time.

	Relay enable circuit		Semiconductor enable circuit			Current	Number of outputs	Device connector*
SIRIUS 3SK1 standard basic units	3SK1 111 – ☐ AB 30					24 V AC/DC	3EC + 1SC	
	3SK1 111 – ☐ AW 20					110 – 240 V AC/DC	3EC + 1SC	
			3SK1 112 – ☐ BB 40			24 V DC	2EC + 1SC	
SIRIUS 3SK1 advanced basic units			3SK1 120 – ☐ AB 40			24 V DC	1	3ZY1212-1BA00
	3SK1 121 – ☐ AB 40		3SK1 122 – ☐ AB 40			24 V DC	3EC + 1SC	3ZY1212-2BA00
	3SK1 121 – ☐ CB 4 ☐		3SK1 122 – ☐ CB 4 ☐			24 V DC	EC: 2 / 2td	or
SIRIUS 3SK1 output expansion modules	3SK1 211 – ☐ BB 00					24 V AC	4	3ZY1212-2DA00 (device terminator)
	3SK1 211 – ☐ BB 40					24 V DC	4	
	3SK1 211 – ☐ BW 20					110 – 240 V AC/DC	4	
	3SK1 213 – ☐ AB 40					24 V DC	3	3ZY1212-0FA01
	3SK1 213 – ☐ AJ 20					115 V AC	3	
	3SK1 213 – ☐ AL 20					230 V AC	3	
SIRIUS 3SK1 sensor expansion module	3SK1 220 – ☐ AB 40							3ZY1212-1BA00
Power supply	3SK1 230 – ☐ AW 20							3ZY1212-2BA00

1	Screw-type connection
2	Spring-loaded connection

EC = enable circuit(s)
SC = signaling circuit(s)
td = delayed

1	0.05 – 3 sec
2	0.5 – 30 sec
4	5.0 – 300 sec

* Device connector: The device connector is necessary for connecting various expansion modules to an Advanced basic unit. Use of the device connector in output expansion modules is optional. The last device in the system must have a device terminator.

You will find practice-oriented information about SIRIUS 3RM1 Motor Starters in the Manual under http://support.automation.siemens.com/WW/view/en/66295730