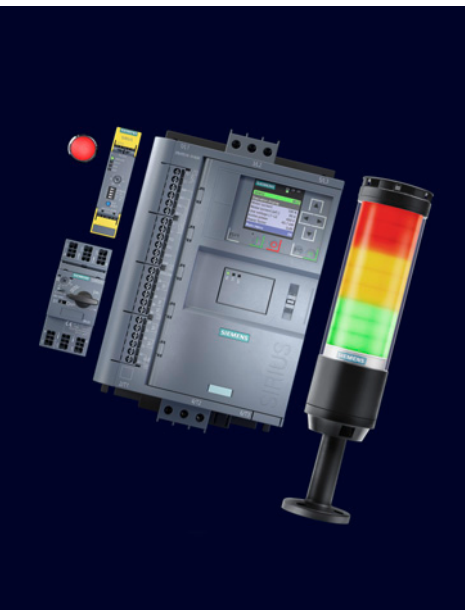


Introduction



1/2	Energy-efficient controls SIRIUS brings down energy costs
1/3	Energy management with SIRIUS Integration into energy management software
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1/8	IE3/IE4 ready SIRIUS controls for reliable switching and protection of highly efficient IE3 and IE4 motors
1/9	Innovative technology for saving energy Electronic starting with hybrid switching technology

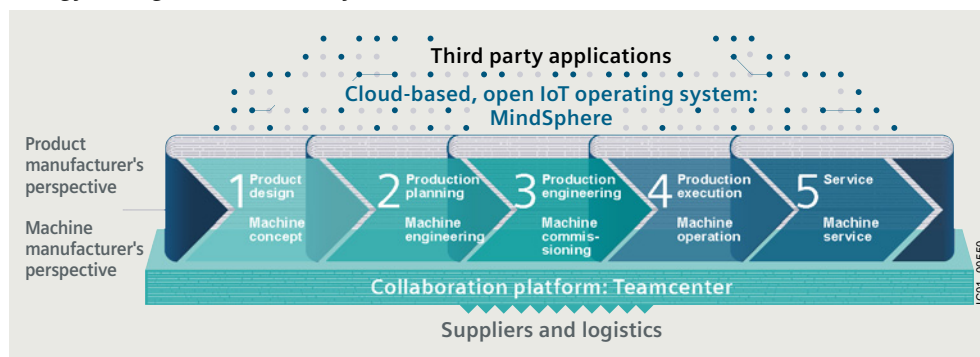
Introduction

Energy-efficient controls

SIRIUS brings down energy costs

Overview

Energy management in industry



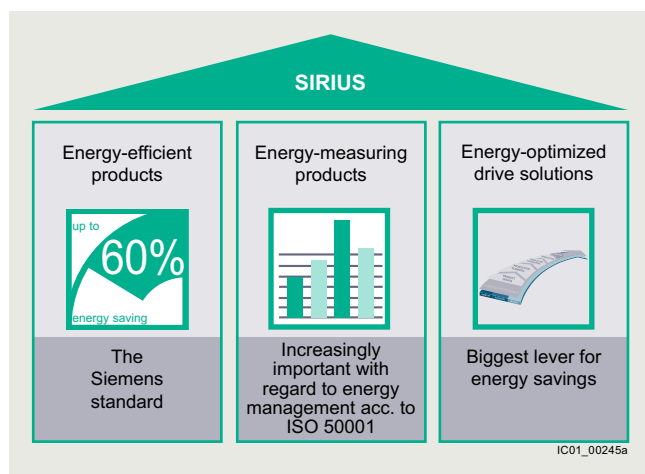
Product development and production process

Energy-efficient production as a success factor

In order to harness energy potential, with our vast portfolio, we always maintain a clear view of the overall product development and production process. Because maximum energy efficiency in production can only be achieved through perfect interaction of all components.

That is why it is important to first create an awareness for existing energy-saving potential, recognize (identify) and assess (evaluate) opportunities for optimization through precise analysis. Finally, appropriate measures must be implemented (realized).

With our full-range portfolio of energy-efficient drive solutions, automation and services, you too will reach maximum energy efficiency, higher productivity and lasting competitiveness in your company.



Three columns of energy efficiency with products from the SIRIUS modular system

Energy-efficient products – SIRIUS reduces power loss

SIRIUS controls (3RM motor starter, 3RR2 monitoring relay, 3RB3 overload relay, 3RT2 contactor, 3RW soft starter and 3RV2 motor starter protector/circuit breaker) as well as the ET 200SP motor starters are characterized by extremely low intrinsic power loss. This not only lowers energy costs, but also reduces the amount of waste heat in the control cabinet. This then translates to a higher packing density and a reduction in the required cooling performance.

Energy-measuring products

Energy management can be instrumental in increasing plant productivity to bring about a significant improvement to the competitive ability of a company – in all industries.

Whether you are a plant operator, planner or machine manufacturer: Energy-efficient production is a challenge and an opportunity in equal measure.

Energy data acquisition represents an important component of the overall energy data management process here. Through transparency right down to the loads, it is possible to identify and utilize potential energy savings.

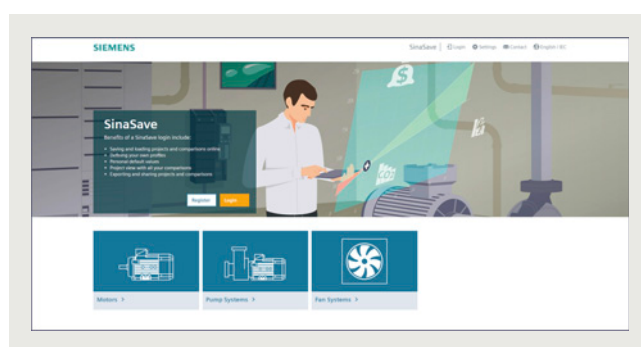
With communication-capable SIRIUS switching devices you can acquire energy data from the drive train without any additional effort.

SIRIUS controls help you make energy flows visible.

Best drive solutions in terms of energy

In order to design processes for optimal energy efficiency, it is not enough to simply measure the energy flow and deploy energy-efficient products. The greatest lever for saving energy can be derived from closely examining the application.

SinaSave energy efficiency tool



Amortization calculator for energy-efficient drive systems

The SinaSave energy efficiency tool determines energy saving potential and amortization times based on your individual conditions of use and therefore offers practical assistance in making decisions about investments in energy-efficient technologies.

In SinaSave, the drive systems to be compared and the relevant drive component parameters are displayed graphically. The various control types and comprehensive product combinations for drive solutions for pump and fan applications can be adapted in your application.

The product portfolio comprises not just SIRIUS controls, but also SIMOTICS motors and SINAMICS converters, thus offering a comprehensive range of comparison possibilities – according to your individual requirements.

SinaSave, the free amortization calculator for energy-efficient drives, see www.siemens.com/sinasave.

Overview

SIMATIC Energy Suite

High energy consumption and automated production processes are typical for many industries.

If you want to keep your energy costs under control in the long term and you are already focusing on the digital future, it's a good idea to equip your plant with integrated energy measuring technology, thus anchoring energy management into the automation of your production processes – which is where most energy is consumed.

SIMATIC Energy Suite as an integrated option for the TIA Portal efficiently links energy management with automation, thus creating energy transparency in the production system.

The considerably simplified configuration of energy measuring components from the product families SIMATIC, SENTRON, SINAMICS, SIRIUS and SIMOCODE significantly reduces the configuration costs. For details on the currently supported devices, see www.siemens.com/energysuite-hardware.

Thanks to the end-to-end connection to SIMATIC Energy Manager PRO (innovative successor to SIMATIC B.Data) or cloud-based Service Energy Analytics, you can seamlessly expand the recorded energy data to create a cross-site energy management system.

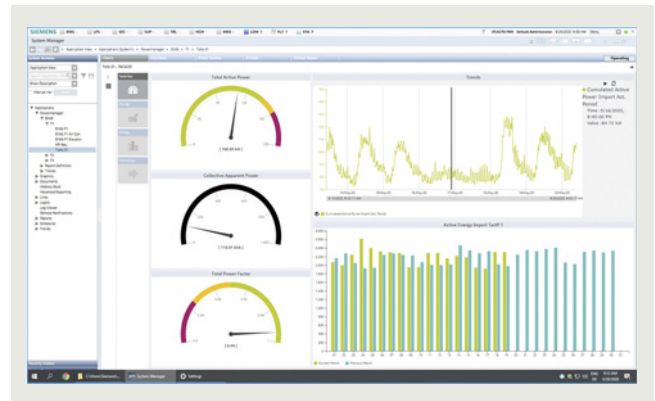
This also enables companies to fulfill all economic and energy management requirements – from purchasing of energy through planning to energy management.

The advantages at a glance:

- Simple and intuitive configuration instead of programming
- Automatic generation of the PLC energy program
- Convenient integration of measuring components from the Siemens portfolio and from the portfolios of other manufacturers
- Integrated in the TIA Portal and automation
- Archiving on WinCC Professional or PLC
- Seamless connection to Energy Manager PRO and Energy Analytics

For more information on SIMATIC Energy Suite, see www.siemens.com/energysuite.

SENTRON powermanager



SENTRON powermanager

The SENTRON powermanager energy monitoring software displays important characteristic quantities for individual devices and the entire system on a clearly organized dashboard and thus analyzes the energy consumption.

The advantages at a glance:

- Analyzing energy flows: Cost-saving measures can be derived directly and faults can be localized rapidly – for greater awareness regarding energy consumption and lower costs.
- Easy to get started: Can be added to existing hardware and available infrastructure.
- Fast savings: Analyzes power curve and detects load peaks.
- High plant availability: Continuous monitoring of power distribution ensures that critical system states are detected at an early stage.

The SIRIUS 3RW55 soft starter is integrated into SENTRON powermanager by simple installation of an XML file, see <https://support.industry.siemens.com/cs/ww/en/view/109798105>

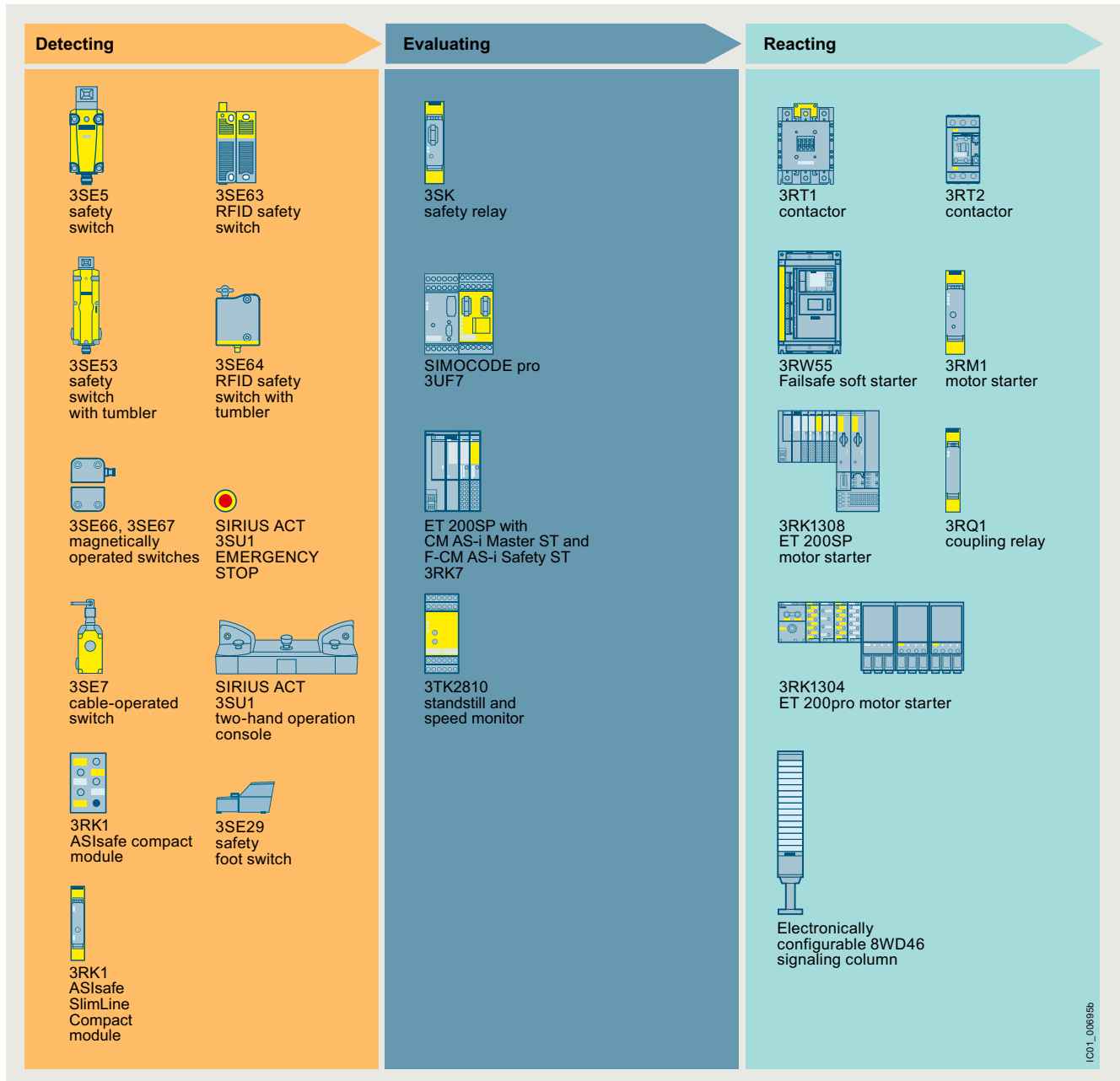
For more information on SENTRON powermanager, see www.siemens.com/powermanager.

Introduction

Systematic industrial safety technology

SIRIUS Safety Integrated

Overview



SIRIUS Safety Integrated

Manufacturers and operators of machines must fulfill numerous requirements: reducing costs, improving productivity, and ensuring the safety of machines. The industrial safety technology from Siemens offers innovative, economical solutions for the functional safety of machinery.

Machine safety – compliance with directives

Before any machines or plants can be supplied or operated, they must meet the fundamental safety requirements of the EU Directives. Similar requirements apply in many other countries and markets.

To guarantee conformity with these requirements, it is recommended that the correspondingly harmonized standards IEC 62061 or ISO 13849-1 are applied. This gives manufacturers and operators legal certainty regarding compliance with both national regulations and directives, which are confirmed by the manufacturer of a machine.

The aim of safety technology is therefore to allow people, machines and the environment to be protected and statutory safety requirements to be satisfied.

The quick and easy way to safe machinery

In addition to the statutory regulations governing the protection of people there are also economic reasons for avoiding personal injury and the resulting downtimes, and for protecting both machinery and equipment from damage.

Safety Integrated benefits machine manufacturers and plant operators in many ways:

- Lower costs for hardware, assembly and engineering
- Higher availability thanks to faster diagnostics and fewer downtimes

At the same time, using modular safety concepts allows them to modernize their plants more easily and at lower cost.

Smart controls ensure the functional safety of machinery

Our SIRIUS Safety Integrated controls are a central element of the Siemens Safety Integrated concept, based on Totally Integrated Automation.

SIRIUS Safety Integrated, [see www.siemens.com/safety-integrated](http://www.siemens.com/safety-integrated).

Whether for reliable detecting, evaluating and reacting, our SIRIUS Safety Integrated controls ([page 1/6 onwards](#)) provide cost-effective solutions for the safety of your machine or plant. Take the SIRIUS 3SK safety relays for example: They are modularly expandable, and can integrate compact motor starters such as the fail-safe SIRIUS 3RM1 very simply via the device connector (parameterization is performed easily with a screwdriver on the DIP switches or by drag and drop in the engineering software).

The SIMOCODE pro modular motor management system combines all required protection, monitoring, safety and control functions for motor feeders. It can be connected to fail-safe controllers via PROFIBUS or PROFINET and shut down motors in emergency situations.

SIRIUS Safety Integrated uses fail-safe communication via standard fieldbus systems, such as ASIsafe via AS-Interface and PROFIsafe via PROFIBUS and PROFINET, to solve even networked safety tasks of greater complexity. This opens the door to flexible safety solutions for compact machines or large-scale plants – naturally compliant with current standards up to SIL 3/PL e.

The first integrated ASIsafe connection to the distributed I/O system ensures even more consistency. With the SIMATIC AS-i F-Links, AS-i networks can be connected quite simply to safety controls via PROFIsafe via the SIMATIC ET 200SP.

Particular highlights are the 3RT contactors of sizes S2 to S12 with fail-safe control input, the SIRIUS ACT 3SU1 EMERGENCY STOP with PROFINET or PROFIsafe interface, and the fail-safe motor starters for ET 200SP ([page 8/94 onwards](#)) and the 3RW55 fail-safe soft starters ([page 6/39 onwards](#)). With these products, seamless integration into fail-safe control systems is possible.

The Application Manual SIRIUS Safety Integrated (SIAM Safety Integrated Application Manual) provides users with comprehensive application examples for SIRIUS Safety Integrated products, [see https://support.industry.siemens.com/cs/ww/en/view/81366718](https://support.industry.siemens.com/cs/ww/en/view/81366718).

Your partner for machine and plant safety

With Safety Integrated, Siemens has provided the smart answer to constantly increasing requirements for the functional safety of a machine and for its cost-effectiveness and flexibility. Our comprehensive portfolio of safe controls, control technology and drive technology provides scalable solutions for precisely tailored safety concepts for protecting people, machines and the environment. Our products meet the current safety standards in the industry, including IEC, ISO, NFPA and UL.

As a partner for machine and plant safety, Siemens also supports users with examples of functions and up-to-date know-how concerning international standards and directives.

The Safety Selector (www.siemens.com/safety-selector) thus guides the user to the appropriate application example based on selection criteria to be assigned.

The free safety evaluation for evaluating safety functions in accordance with IEC 62061 and ISO 13849-1 is integrated in the TIA Selection Tool, [see www.siemens.com/safety-evaluation](http://www.siemens.com/safety-evaluation).

Thus, the selection of components and their safety-related assessment are implemented in a coherent workflow.

Requirements-based training on CE marking, functional safety, risk assessment, and on our Safety Integrated products rounds off our portfolio, [see www.siemens.com/sitrain](http://www.siemens.com/sitrain).

Introduction

Systematic industrial safety technology

SIRIUS Safety Integrated

Devices with safety functions

Detecting

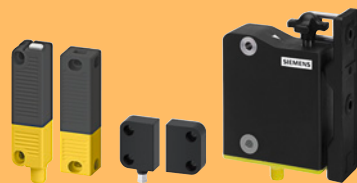
Product Page

3SE position and safety switches 12/2



Flexible thanks to modular design, suitable for offshore applications

3SE6 non-contact safety switches 12/4



Magnetically operated switches (IP67) and RFID safety switches (IP69)

3SU11 EMERGENCY STOP mushroom pushbuttons, 3SU18 two-hand operation console 13/26, 13/50, 13/106



- SIRIUS ACT two-hand operation console with user-friendly capacitive sensor keys
- High level of flexibility due to direct integration of the SIRIUS ACT EMERGENCY STOP via standardized, fail-safe communication protocols (PROFIsafe, ASIsafe)

3SE7 cable-operated switches, 3SE29 safety foot switches 13/156, 13/161

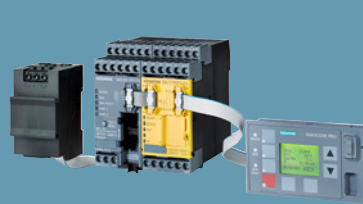


- Foot switches with cover, metal enclosure with degree of protection IP65
- Cable-operated switches with latching and positive-opening NC contacts, in degree of protection IP65 or IP67

Evaluating

Product Page

SIMOCODE pro 3UF7 10/5



Fail-safe expansion modules DM-F Local and DM-F PROFIsafe, safe shutdown of motors up to SIL 3/PL e

3SK safety relays 11/13



Key modules of a consistent and cost-effective safety chain. Flexible thanks to input and output expansion units

3TK2810 safety relays 11/33



Further modules of a consistent and cost-effective safety chain for fail-safe detection of standstill or speed

Reacting

Product Page

3RQ1 coupling relays 5/21



SIRIUS 3RQ1 force-guided coupling relays, fail-safe up to SIL 3/PL e

3RW55 Failsafe soft starters 6/39



3RW55 Failsafe High Performance soft starters with STO

SIRIUS 3RM1 motor starters 8/83









Compact, narrow and fail-safe hybrid motor starters in IP20
Easy configuration and low outlay for storage thanks to wide setting range of the overload release

ET 200SP fail-safe motor starters 8/94



Compact, fail-safe hybrid motor starters for the ET 200SP system

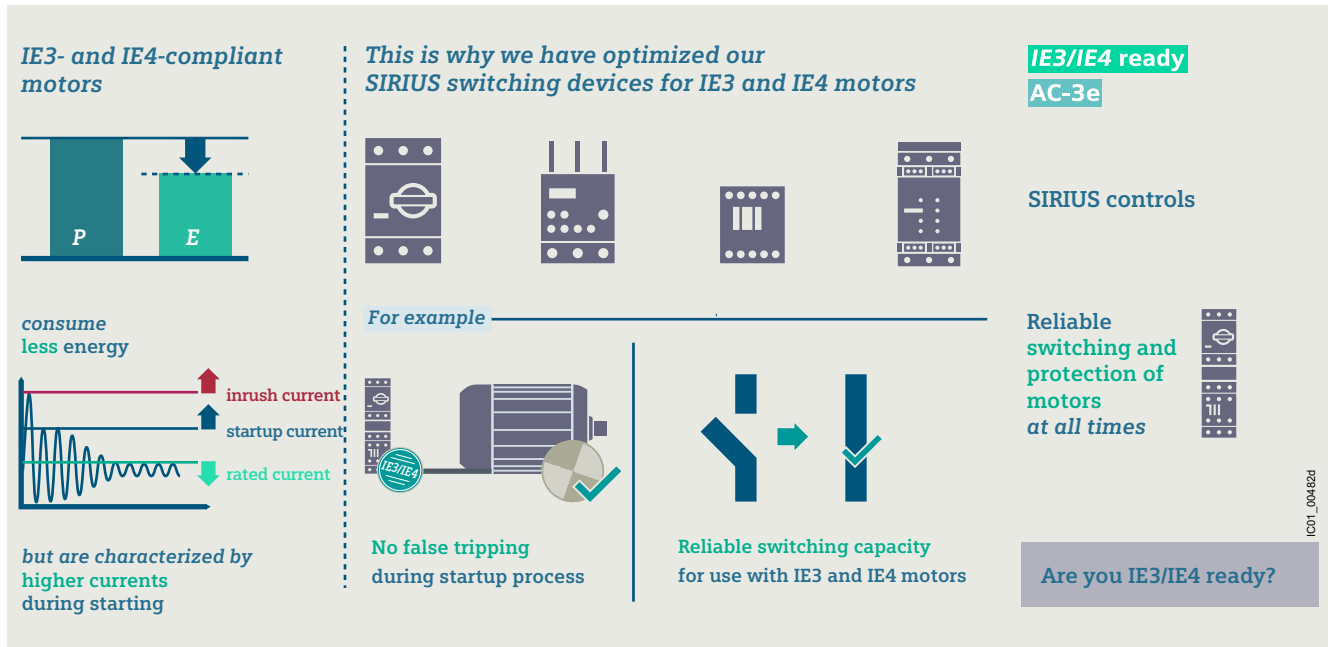
Devices with safety functions for AS-Interface						
Detecting		Evaluating		Reacting		
Product	Page	Product	Page	Product	Page	
Safety modules/EMERGENCY STOP mushroom pushbuttons		CM AS-i Master ST, F-CM AS-i Safety ST for SIMATIC ET 200SP		ET 200pro Safety motor starters Solution PROFIsafe		
<ul style="list-style-type: none">K45F and K20F compact safety modules for use in the field	2/26		2/29, 2/34		9/3	
<ul style="list-style-type: none">SC17.5F SlimLine Compact safety modules for use in the control cabinet	2/26					
	13/100					
Detection of safety-related signals via safe input slaves on the AS-Interface bus (field modules with degree of protection IP67, control cabinet modules with degree of protection IP20, EMERGENCY STOP mushroom pushbuttons in the enclosure with integrated ASIsafe slave with degree of protection IP69)		Evaluation and processing of signals via a fail-safe SIMATIC or SINUMERIK control. Simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful, safety-oriented network transition between PROFINET (or PROFIBUS) and AS-Interface.		3RT contactors from 18.5 kW (F-PLC input)		
3SF1 mechanical safety switches						
12/93				Optimum connection to the fail-safe controller as actuator in the safety chain Considerable simplification of the application in large power ranges thanks to F-PLC input on the following contactors: 3RT203 and 3RT204, 3/62, 3RT105 to 3RT107, 3/65, 3RT145 to 3RT147 4/18		
				Electronically configurable 8WD46 signaling columns		
Flexible thanks to modular design, degree of protection up to IP69, suitable for offshore applications						
				Flexible and versatile thanks to modular design		

Introduction

IE3/IE4 ready

SIRIUS controls for reliable switching and protection of highly efficient IE3 and IE4 motors

Overview



IE3/IE4 ready with SIRIUS controls

We are IE3/IE4 ready and have AC-3e values

On July 1, 2021, the new EU Regulation (EU) 2019/1781 on electric motors and speed controls came into force. This regulation requires:

- Compliance with the legally required minimum efficiency levels IE3 for outputs from 0.75 to 1000 kW

In the next stage as of July 1, 2023:

- Compliance with the legally required minimum efficiency levels IE4 for outputs between 75 and 200 kW.

From an electrical viewpoint, IE3 and IE4 motors behave differently than less energy-efficient models – they are characterized by higher startup currents and modified dynamic behavior. This entails certain challenges for our controls.

The SIRIUS switching and protection devices are ideally suited for use with Premium High Efficiency motors (IE3) or Super Premium Efficiency motors (IE4). This is further underlined by the new utilization category AC-3e for contactors, circuit breakers, motor starters and other devices.

They avoid false tripping due to higher inrush currents of IE3 and IE4 motors, offer optimized setting ranges for rated currents, and ensure reliable switching and protection in any situation – the best prerequisites for the use of modern IE3 and IE4 motors.

Highlights

- Comprehensive range of IE3 and IE4 motors for every application
- Siemens offers expertise through extensive analysis of IE3 and IE4 motors
- Optimized SIRIUS controls for use with IE3 and IE4 motors
- Easy selection thanks to consistently identical rated values of utilization categories AC-3 and AC-3e

Introduction of utilization category AC-3e



Video: What is the purpose of the utilization category AC-3e?

More information

Application Manual for controls with IE3 and IE4 motors, see <https://support.industry.siemens.com/cs/ww/en/view/94770820>.

All IE3/IE4 ready products are marked in the catalog with the symbol **IE3/IE4 ready**.

All products with the utilization category AC-3e are marked in the catalog with the symbol **AC-3e**.

Overview

SIRIUS 3RV29 infeed system with 3RA2 load feeder and 3RM1 motor starter



Simple

Minimum wiring in the main and control circuits thanks to assembly option



Long service life

Hybrid switching technology uses benefits of relay and semiconductor technology

Compact



Only 22.5 mm wide, regardless of whether direct-on-line or reversing starter function

Economical

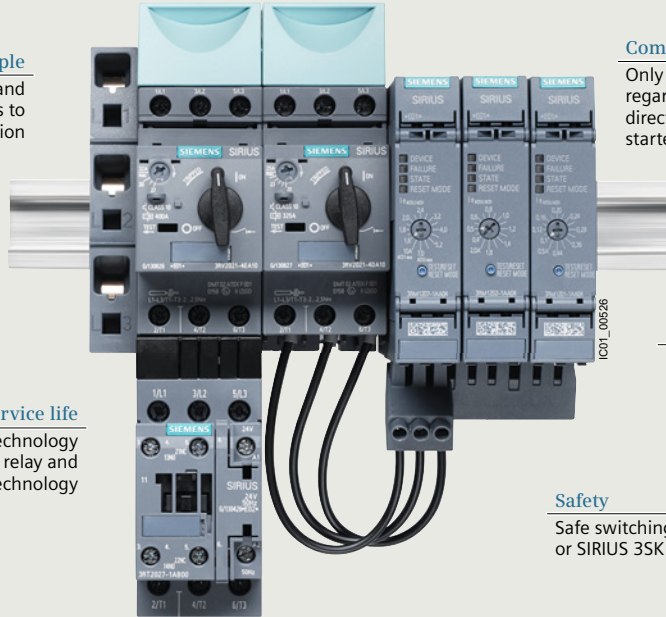


Thanks to low device variance due to wide setting range

Safety



Safe switching possible with F-CPU or SIRIUS 3SK safety relays



The hybrid switching technology uses low-wear semiconductor technology for switching the motor on and off, and in the operating phase it relies on energy-saving relay technology.

This ensures durability, especially with high switching frequency, and thus significantly reduces maintenance costs and extends the life of the motor starters.

In addition, due to the hybrid switching technology, motor starters have lower electromagnetic interference emissions, enabling you to increase your plant availability.

Further energy savings are provided by the integrated electronic overload protection.

This causes a lower intrinsic power loss than comparable motor feeders with thermal overload protection.

In this way, you benefit from reduced heat generation and therefore lower cooling power. And that saves energy.

SIRIUS soft starters 3RW30, 3RW40, 3RW50, 3RW52, 3RW55 and 3RW55 Failsafe



Long service life

Reduced mechanical and electrical load

Safe



SIL 1/STO without additional safety relay or contactor



Energy saving

Reduced temperature rise in the control cabinet thanks to bypass contacts

Simple



Fast and easy commissioning



Introduction

Innovative technology for saving energy

Electronic starting with hybrid switching technology



+ Easy to wire

Thanks to push-in technology

+ Option handling

Increased flexibility and efficient savings through single configuration of complex automation projects

+ Reduced space requirements

50% slimmer than other distributed I/O systems

+ Hybrid switching technology

Durable and energy saving, since relay contacts are not subject to loading when switched

+ Power bus

Supply with power only once, then automatic setup with side-by-side mounting of multiple modules

+ Quick stop and end position disconnection

Load switch off even at high speed – independent of central controller

+ Quick installation

Hook in, slide into place and engage

Once it is installed and wired, you simply connect the ET 200SP motor starter to the controller in the TIA Portal ready for parameterization.

Highlights

Use of hybrid switching technology for:

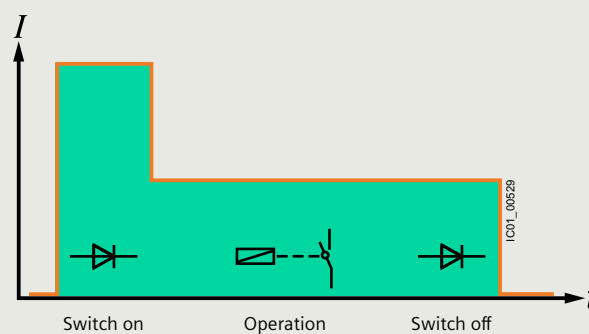
- SIRIUS 3RM1 motor starters
- ET 200SP motor starters
- SIRIUS soft starters

Failsafe functionality for SIRIUS 3RW55 soft starters, SIRIUS 3RM1 motor starters and ET 200SP:

- Maximum safety:
Safety function up to SIL 3/PL e

Additional benefits for SIRIUS 3RM1 motor starters:

- Using device connectors safety-related group shutdown with reduced wiring is possible
- Direct connection to the 3SK safety relay, without additional wiring



👍 Service life

👍 Plant availability

👍 Energy saving