For efficiency and reliability in the control cabinet

The SIRIUS 3RA6 Compact Starter

SIRIUS

Answers for industry.

SIEMENS

Highlights

- Space savings in the control cabinet, thanks to compact compact design
- Minimized engineering, installation, and selection cost as a result of a single complete device
- Fewer variants, thanks to wide ranges of control voltage and current settings
- Maximized system availability, thanks to removable terminals for fast device replacement and integrated functions such as visual indication upon end of service life
- Efficient power distribution with the corresponding SIRIUS 3RA6 infeed system
- Integration in Totally Integrated Automation with optional connection to AS-Interface

Oriented towards current market trends: The new SIRIUS 3RA6 compact starter

The new member of the successful SIRIUS industrial controls portfolio – the SIRIUS 3RA6 compact starter – sets completely new standards. It reduces planning costs and significantly minimizes the overall costs from configuration to commissioning. Compared to conventional feeders, this starter is more compact, offers higher functionality, and is simpler to maintain. In short: The SIRIUS 3RA6 compact starter forms the basis for high availability and future machine concepts.

Lower planning costs, more space in the control cabinet

The new SIRIUS 3RA6 compact starter is functionally positioned between the individual devices of the SIRIUS industrial controls portfolio for the assembly of load feeders and the SIMATIC ET 200S motor starters. Featuring a multitude of technical highlights, the SIRIUS 3RA6 compact starter caters to current market trends. For example, miniaturization and reduced variation: Using a compact design the universal motor feeder, according to IEC/EN 60947-6 2, combines the functions of circuit breaker/MSP, solid-state overload relay and contactor.

The SIRIUS 3RA6 compact starter can be used in applications in which three-phase standard motors up to 32 A (approx. 20HP/480 V) are directly started. Its compact size and fewer variants simplify planning as well as wiring and mounting. This facilitates lower inventory costs and saves space in the control cabinet.

For high availability and future-proof machine concepts

The SIRIUS 3RA6 compact starter demonstrates its ability in maximizing machine utilization while minimizing machine maintenance. With comprehensive onboard functions – such as visual indication upon end of service life or the optional control kit for early fault detection even before commissioning – the SIRIUS 3RA6 compact starter ensures a high reliability of machines and systems. With permanent wiring, it can be easily and rapidly maintained thanks to removable terminals. Maximum efficiency can be attained with the corresponding SIRIUS 3RA6 infeed system. This system not only minimizes wiring costs even further, but can also be easily expanded as required.

Features and benefits of the SIRIUS 3RA6 compact starter

Time- and space-saving installation in the control cabinet

- Enormous space advantages and reduced wiring, thanks to compact design of direct-on-line and reversing starters
- Direct-on-line and reversing starters are the same height, for uniform tier spacing in the control cabinet
- Flexible application options, thanks to spring-loaded or screw-type connection system
- Minimum planning and mounting costs, as well as considerably reduced wiring, thanks to a single complete device with one order number
- Particularly easy mounting and replacement, thanks to removable terminals (with retained wiring)
- Optimum power supply in the control cabinet, thanks to multiple power infeed options

Integrated functionalities for fewer variants and maximum system availability

- Fewer variants, thanks to wide setting ranges for overload (only 5 types up to 32 A) and wide-band control voltage (24V, 42–70V, 110–240V, all AC/DC volts).
- Setting of overload tripping class directly on the compact starter (CLASS 10/20)
- Easy checking of the wiring and testing of the motor's rotation direction prior to commissioning, with the optional control kit
- Maximum system availability, thanks to prevention of main contact welding and disconnection upon end of service life
- Increased productivity, thanks to automatic device reset in case of overload, as well as differentiated overload and short-circuit detection

Highly efficient power wiring and simplified motor connection infeed system

- Reduced wiring in the main circuit
- Connection and routing of infeed cables up to 2/0 AWG
- Plug-in terminal technology allows easy mounting, and replacement of SIRIUS Compact Starters
- Easy replacement of SIRIUS compact starters without removing main circuit or control wiring
- Expansion modules allow for flexible expansion of motor starters
- Integrated PE bar allows direct connection of the motor feeder cables to the SIRIUS 3RA6 infeed system
- Easily integrates into the SIRIUS product family, e. g. with SIRIUS circuit breakers/MSPs and the SIRIUS 3RV19 infeed system

Easy connection to the automation level via AS-Interface

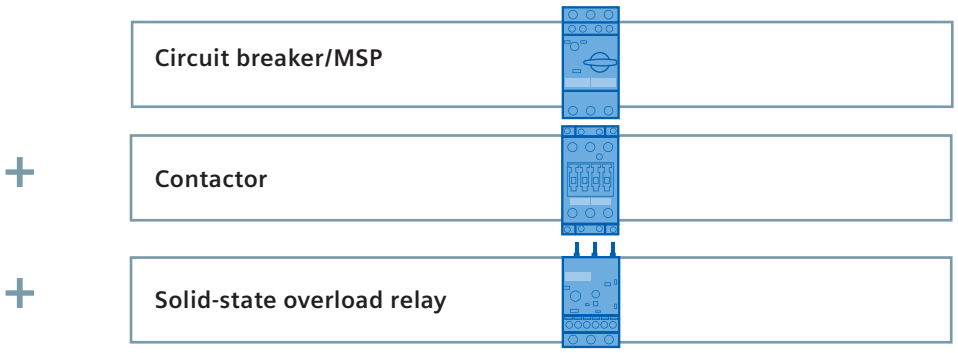
- Significantly reduced wiring in the control circuit
- Improved system availability and process transparency thanks to transfer of diagnostics information to the superior control
- Integration in Totally Integrated Automation

AS-Interface connection:

- Easy wiring of spatially distributed actuators and sensors
- Easy integration in AS-Interface, thanks to mounting of the optional AS-i add-on modules without tools
- Standardized input and output assignment for reduced software programming expenditures and provision of additional local inputs and outputs

Time- and space-saving installation in the control cabinet

Functionalities in detail



With the SIRIUS 3RA6 compact starter, a new generation of load feeders enters the world of industrial controls: A single compact device which combines the functionalities of circuit breaker/MSP, contactor and solid-state overload relay. Also, accessories such as auxiliary switches and a surge suppressor are already integrated.

Three become one

All functions for motor start-up combined in a single device: Doing away with laborious planning, ordering and mounting of each single component for every function, the SIRIUS 3RA6 compact starter offers a fast and easy solution. Three become one – simply three times as fast.

Compact solution with the SIRIUS 3RA6 compact starter

Clean and efficient control cabinet layout

The SIRIUS 3RA6 compact starter helps tidy up the control cabinet, with only one size up to 32 A: 45-mm width with direct-on-line starters and 90-mm width with reversing starters (with mechanical interlocking for electrical safety). The identical height of the direct-on-line and reversing starters facilitates a uniform tier spacing for installation in the control cabinet. These features allow for a tidy and clearly structured control cabinet arrangement, and simplify configuration.

Rapid mounting, easy replacement

The SIRIUS 3RA6 compact starter offers easy mounting and maintenance, thanks to the simplified main and control circuit wiring. Removable terminals in screw-type or spring-loaded technology allow for easy starter replacement while keeping the wiring permanent, which provides a high system availability. A further advantage: The SIRIUS 3RA6 compact starter can be integrated and configured as the last component of the readily wired control cabinet. This ensures maximum flexibility until system start-up and eliminates unnecessary investment.

Optimum power supply in the control cabinet, thanks to multiple infeed options

The SIRIUS 3RA6 compact starter offers numerous wiring options including parallel wiring, a 3-phase comb busbar or wiring via the 8US busbar adapter, upon which the SIRIUS 3RA6 compact starter can be directly mounted on a 60-mm busbar system. The easiest way to connect the SIRIUS 3RA6 compact starter is to employ the corresponding SIRIUS 3RA6 infeed system (more information on page 10).

Integrated functionalities for fewer variations and maximum system availability

Fewer variations, more functionality – the SIRIUS 3RA6 compact starter simplifies the planning and assembly of load feeders, while simultaneously increasing the availability of machines and systems. Convincing arguments all along the line.

Less is more

The 3RA6 compact starter, with only five wide current setting ranges (up to 32A) and three wide-range control voltages (24, 42–70, 110–240V, AC/DC), simplifies the many variations of load feeders. Even the overload tripping classes 10 and 20 can be directly selected on one and the same device as required. This consistent variance minimization considerably simplifies planning, stock-keeping and logistics – without limiting the functionality!

System availability par excellence – prior to commissioning ...

Overall system optimization represented an essential aspect in the development of the new SIRIUS 3RA6 compact starter. The goals included improved handling, minimized risk and sustainably increased system availability. The result is impressive: With the control kit, the wiring and direction of rotation of the connected motor can be checked and possible faults detected prior to commissioning.

In addition, the functions for disconnection upon short circuit and overload can be tested before system start-up via the test buttons integrated on the SIRIUS 3RA6 compact starter.

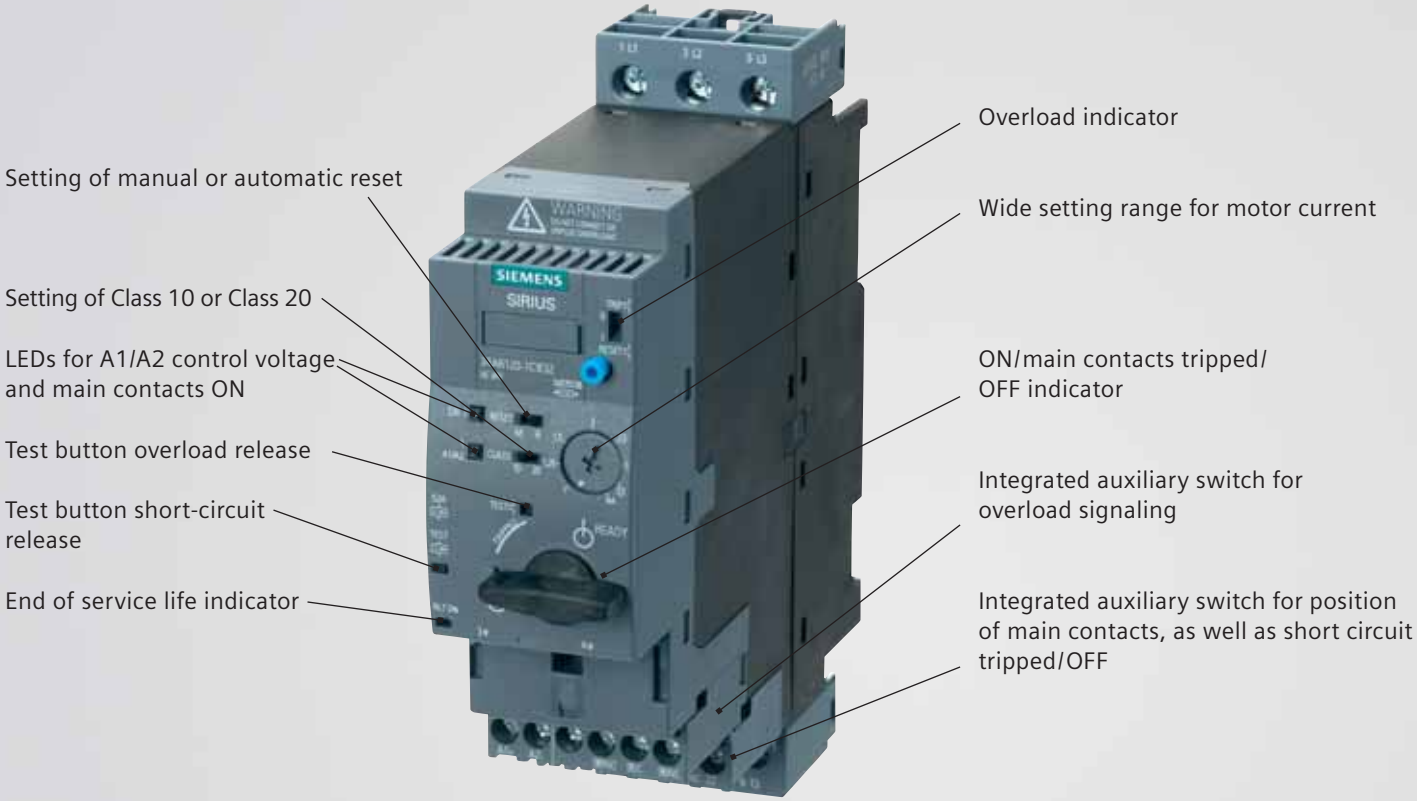
With the optional control kit, faults can be detected prior to commissioning

Easy type selection for any application

Starter types		Current setting ranges	
Direct-on-line starter	X	0.1 ... 0.4 A	= 10 device types
		0.32 ... 1.25 A	
Reversing starter		1 ... 4 A	
		3 ... 12 A	
		8 ... 32 A	

Functionalities

Functions and displays of the SIRIUS 3RA6 compact starter (standard version)



... and during operation

The SIRIUS 3RA6 compact starter offers particular advantages during system operation. With high loads or frequent switching of the main contacts, sooner or later, the contact material of conventional devices is subject to wear, which typically results in the welding of the main contacts. The 3RA6 compact starter eliminates this problem: It detects the fault and disconnects the starter – even at the end of its service life.

With this patented technology, the SIRIUS 3RA6 compact starter embarks upon a completely new and innovative path. For even better system availability!

In addition, the SIRIUS 3RA6 compact starter protects three-phase motors against overload and short circuit and prevents long system downtimes. The integrated overload monitoring facilitates targeted fault diagnostics and a fast reset. In case of overload, the fault message can be easily reset – either directly on the SIRIUS 3RA6 compact starter via manual reset, or via automatic reset – without having to open the control cabinet door. Whether the fault was caused by an overload or short circuit is separately indicated, and signaled via separate auxiliary switches. In service cases, the SIRIUS 3RA6 compact starter can be rapidly and easily replaced thanks to its removable terminals. Wiring faults are eliminated!

Highly efficient power wiring and simplified motor connection infeed system

SIRIUS 3RA6 infeed system with SIRIUS compact starters and expansion module

The SIRIUS 3RA6 compact starter ensures an optimum power supply in the control cabinet. For infeed of the main circuit, you can employ conventional methods or opt for an even more efficient way – with the corresponding SIRIUS 3RA6 infeed system.

Systematic infeed

A corresponding infeed system is available for the 3RA6 compact starter. The 3RA6 infeed system comes with the main circuit side completely pre-wired and is available with screw-type or spring-loaded connection technology. In the spring-loaded version, the power infeed is realized from the front for maximum user friendliness. However, particularly when it comes to the routing of large 2/0 AWG conductors or multi-tier assemblies, the screw-type infeed from the top and bottom via two-tier terminals offers additional advantages.

By means of the integrated PE bar, the motor connection cable can be directly connected to the SIRIUS 3RA6 infeed system – doing away with countless rows of connection terminals. This not only reduces configuration and wiring costs, but also saves space and improves your control cabinet's layout.

Easy and flexible expandability

The SIRIUS 3RA6 compact starter is easily installed in the 3RA6 infeed system through plug-in technology without the use of tools. A direct-on-line starter with 45-mm width occupies one slot and a reversing starter with 90-mm width two slots. The system can be flexibly and system-specifically expanded by additional slots, up to a maximum length of 1.2m (3.9'). Expansion modules, either in spring-loaded or screw-type technology as required, incorporate the same plug-in technology.

SIRIUS 3RA6 infeed system in combination with SIRIUS 3RV19 infeed system

Increased Availability

The SIRIUS 3RA6 compact starter can be removed from the corresponding SIRIUS 3RA6 infeed system with only a flick of the wrist. In order to maximize machine runtime, the SIRIUS compact starter 3RA6 has been designed with removable terminals. This design allows the SIRIUS compact starter to be quickly and easily removed from the corresponding SIRIUS 3RA6 infeed system.

Optimum integration within the SIRIUS industrial controls portfolio

With the SIRIUS 3RA6 infeed system, not only the corresponding SIRIUS compact starters, but also further SIRIUS industrial control components can be fed efficiently.

Using suitable adapters, components such as SIRIUS circuit breakers/MSPs in size S00/S0 can be directly plug-connected to the 3RA6 infeed system. Also a power outfeed for external add-on devices can be easily realized via an expansion plug with 3-phase outfeed terminal.

When it comes to power infeed, the SIRIUS components ideally complement each other: All that is needed, for example, to connect the new 3RA6 infeed system with the SIRIUS 3RV19 infeed system and combine the advantages of both systems is a corresponding expansion plug.

The SIRIUS 3RA6 infeed system not only offers benefits for easy assembly in the control cabinet, but also supports a flexible solution in terms of the entire SIRIUS industrial controls portfolio.

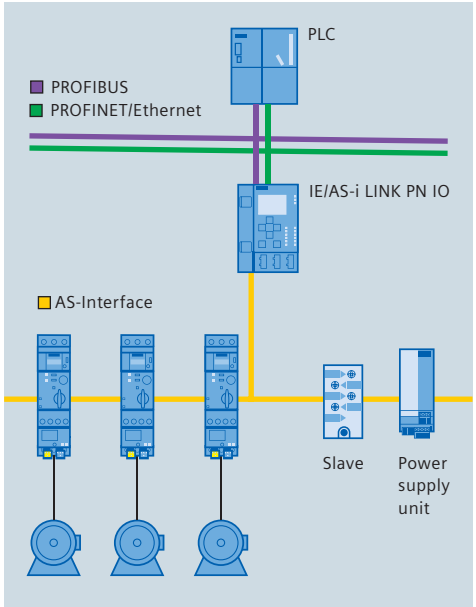
AS-Interface

Easy connection to the automation level

To further reduce wiring costs in the control circuit, we offer corresponding AS-i add-on modules for direct connection of the new SIRIUS 3RA6 compact starter to AS-Interface. The SIRIUS compact starter thus becomes a component of Totally Integrated Automation.

Easy, safe and fast with AS-Interface

Today, a vast number of machines and systems are linked with AS-Interface. AS-Interface (AS-i), is a manufacturer-independent bus system which connects spatially distributed actuators and sensors on the field level with the control level in a particularly clever manner. For this purpose, the cost-favorable and rugged system employs an unshielded, highly flexible 2-wire cable which simultaneously transmits data and power.



SIRIUS 3RA6 compact starter and AS-Interface

The connection of the SIRIUS 3RA6 compact starter to AS-i is particularly easy, thanks to a special AS-i add-on module (in A/B technology), which is simply plugged onto the SIRIUS 3RA6 compact starter without tools or any wiring. The SIRIUS compact starter is optimally integrated in the AS-i system architecture providing a further reduction of wiring costs.

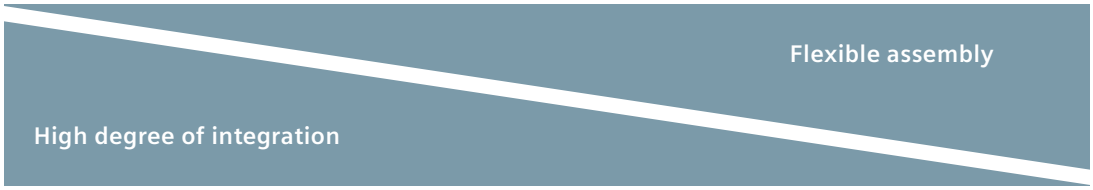
As a second version, the AS-i add-on module is also available with two local inputs for safe disconnection. This way, safety relays can be directly connected to the SIRIUS compact starter. A respectively wired limit switch can then directly effect a standard-compliant disconnection in accordance with IEC/EN 954-1 (according to Category 2) without making a detour via the control.

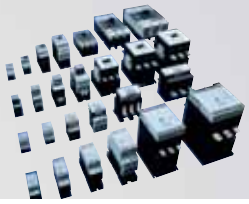
Connection to Totally Integrated Automation

Via AS-Interface, the SIRIUS 3RA6 compact starter can also be embedded in Totally Integrated Automation, our unique product and system portfolio for integrated automation in all sectors. The various signaling functions of the device such as diagnostics, status and overload signals can be directly transmitted to the controller and are available throughout the system. The individual signals' bit assignment corresponds to the usual standard for SIRIUS motor starters.

Motor starting solutions with SIRIUS

Whether conventional solutions with SIRIUS 3RA1 load feeders, high-feature applications with SIMATIC ET 200S motor starters or the new SIRIUS 3RA6 compact starters – the following overview provides information as to which of our motor starting solutions with SIRIUS is suitable for the respective application.



	SIMATIC ET 200S motor starter	SIRIUS 3RA6 compact starter	SIRIUS modular system
			
Current/power range	16 A/10HP	32 A/20HP	630 A/700HP
Starter and assembly type	Direct-on-line and reversing starters, soft starters and frequency converters as modules of an I/O system	Direct-on-line and reversing starters as a compact unit	Flexible assembly of all starter types with individual devices
Main and control circuit wiring	Completely pre-wired system both on the main and control circuit side with power bus, PE connection option and retained wiring for fast replacement	Completely pre-wired system on the main circuit side with power bus, PE connection option and retained wiring for fast replacement	Individual devices which can be combined via connection modules and conventional wiring in the main and control circuit
Integration in the automation environment	Modular I/O system with optional motor starters which is connected to the control via PROFIBUS or PROFINET without additional wiring; remote parameterization and comprehensive diagnostics included in the system	Conventional compact switching device which is connected to the control via I/Os, an AS-Interface add-on module or on the basis of an IO-Link design	Conventional switching devices which are connected to the control via I/Os
Conclusion	**The solution offering maximum integration in the control level**	**The compact solution with minimum wiring costs and integration options**	**The solution featuring the largest power range and very flexible assembly options**

Technical data

Device standard			IEC/EN 60947-6-2
Number of poles			3
Permissible operating temperature	In acc. with IEC/EN 60721-3-3		-20 to +60 °C
Relative humidity			10 to 90 %
Rated frequency			50/60 Hz
Rated impulse voltage			6 kV
Degree of protection	In acc. with IEC 60947-1		IP20
Touch protection	In acc. with DIN VDE 0660 Part 514, DIN EN 50274		finger-safe
Max. dimensions direct-on-line starter	Screw-type connection system (W x H x D)		45 x 170 x 165 mm
	Spring-loaded connection system (W x H x D)		45 x 191 x 165 mm
Max. dimensions reversing starter	Screw-type connection system (W x H x D)		90 x 170 x 165 mm
	Spring-loaded connection system (W x H x D)		90 x 191 x 165 mm
Trip Class (selectable)	10		5...10s
	20		10...20s
Short Circuit Current (Group Installation)	Solid State Overload Setting Range	480V	600V
	0.1 - 0.4A	30 kA	10 kA
	0.32 - 1.25A	30 kA	10 kA
	1 - 4A	30 kA	10 kA
	3 - 12A	30 kA	10 kA
	8 - 32A	15 kA	5 kA
Horse Power Ratings (Three-Phase)	Solid State Overload Setting Range	460/480V	575/600V
	0.1 - 0.4A	—	—
	0.32 - 1.25A	1/2	1/2
	1 - 4A	2	3
	3 - 12A	7 1/2	10
	8 - 32A	20	30
Electrical service life (switching cycles)			2 million
Surge suppressor	Coil		Integrated
Number of integrated control circuit contacts	Internal Aux switches		1NO/1NC
	Short Circuit signalling contact		1NO
	Overload signalling contact		1CO
Inrush / Holding current	Types up to 12 A		250/100 mA
	Types 8 A to 32 A		350/150 mA

Note: All devices are suitable for tap conductor protection in group applications, over current protection for control transformers, and self protected combination starters per UL508 Type E at 600 Y/347 VAC maximum.

Selection and ordering data

Three-phase standard motor 3-pole with 480 V AC [1] Horse Power (HP)	Setting range solid-state overload relay in A	Order number
SIRIUS 3RA61 compact starter (direct-on-line starter)		
—	0.1 ... 0.4	3RA61 20-□A□3□
1/2	0.32 ... 1.25	3RA61 20-□B□3□
2	1 ... 4	3RA61 20-□C□3□
7 1/2	3 ... 12	3RA61 20-□D□3□
20	8 ... 32	3RA61 20-□E□3□
SIRIUS 3RA62 compact starter (reversing starter)		
—	0.1 ... 0.4	3RA62 50-□A□3□
1/2	0.32 ... 1.25	3RA62 50-□B□3□
2	1 ... 4	3RA62 50-□C□3□
7 1/2	3 ... 12	3RA62 50-□D□3□
20	8 ... 32	3RA62 50-□E□3□

Order number supplement for connection type
- without terminals for use with 3RA6 infeed system and AS-i add-on module ..... 0 ... 0
- with screw-type terminals 1
- with spring-loaded terminals 2

Order number supplement for rated control supply voltage
- 24 V AC/DC ..... B
- 42 ... 70 V AC/DC ..... E
- 110 ... 240 V AC/DC ..... P

Order number supplement for alternative equipment
- for DIN rail or screw fastening basic version, including 1 pair of main and control circuit terminals each 2
- for use with the infeed system for 3RA6 without main circuit terminals, with control circuit terminals 3
- for DIN rail or screw fastening for use with the AS-i add-on module without control circuit terminals, with main circuit terminals 4

1) The specific start-up and rated data of the motor to be protected are critical for selection

Accessories for direct-on-line and reversing starters	Selection	Technical features	Order number
Auxiliary switch block for 3RA6 compact starter 	Screw-type terminals	2NO	3RA69 11-1A
		2NC	3RA69 12-1A
		1NO + 1NC	3RA69 13-1A
	Spring-loaded terminals	2NO	3RA69 11-2A
		2NC	3RA69 12-2A
		1NO + 1NC	3RA69 13-2A
Terminal block according to UL 508 	Infeed terminals according to UL 508 for "self-protected combination motor controller (type E)" for parallel wiring of compact starters	For extended clearance and creepage distances	3RV19 28-1H
Adapter for screw fastening 		For screw fastening of the compact starter (set incl. plug-in lugs)	3RA69 40-0A
Control kit 		For mechanical operation of the compact starter's main contacts	3RA69 50-0A
Connection to AS-Interface 	AS-i add-on module	For communication of the compact starter with the control via AS-i	3RA69 70-3A
	AS-i add-on module with two local inputs	For safe disconnection via local safety relays, e.g. cable-operated switches	3RA69 70-3B
	AS-i add-on module with two free external inputs	Occupation of the digital standard inputs "Motor ON" and "Group warning"	3RA69 70-3C
	AS-i add-on module with one free external input and output each	Replacement of the digital standard input "Group warning"	3RA69 70-3D
	AS-i add-on module with two free external outputs	Only for direct-on-line starters; replacement of the digital standard output "Motor left"	3RA69 70-3E

SIRIUS infeed system for 3RA6			
3-phase infeeds	**Selection**	**Technical features**	**Order number**
Screw-type infeed 	Infeed left, motor output side in screw-type technology, including built-in PE bar	4–2 AWG left with permanently attached triple expansion module up to 63A	3RA68 12-8AB
		0–2/0 AWG left with permanently attached triple expansion module up to 100A acc. UL508 Type E	3RA68 13-8AB
	Infeed left, motor output side in spring-loaded technology, including built-in PE bar	4–2 AWG left with permanently attached triple expansion module up to 63A	3RA68 12-8AC
		0–2/0 AWG left with permanently attached triple expansion module up to 100A acc. UL508 Type E	3RA68 13-8AC
Spring-loaded infeed 	Infeed left, right or center with spring-loaded technology	4–2 AWG left or right up to 63 A	3RA68 30-5AC
Expansion modules	**Selection**	**Technical features**	**Order number**
Screw-type expansion module 	Expansion module, motor output side in screw-type technology, including built-in PE bar	Double expansion module with 2 slots for 2 direct-on-line starters or1 reversing starter	3RA68 22-0AB
		Triple expansion module with 3 slots for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter	3RA68 23-0AB
	Expansion module, motor output side in spring-loaded technology, including built-in PE bar	Double expansion module with 2 slots for 2 direct-on-line starters or1 reversing starter	3RA68 22-0AC
		Triple expansion module with 3 slots for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter	3RA68 23-0AC

Accessories for SIRIUS infeed system for 3RA6	Selection	Technical features	Order number
PE infeed 	Screw-type terminal	4–2 AWG	3RA68 60-6AB
	Spring-loaded terminal	4–2 AWG	3RA68 60-5AC
PE tap-off 	Screw-type terminal	10–8 AWG	3RA68 70-4AB
	Spring-loaded terminal	10–8 AWG	3RA68 70-3AC
Expansion plug 	PE expansion plug	Interconnects the PE bars of expansion modules	3RA68 90-0EA
	Expansion plug for SIRIUS 3RV19 infeed system	Connects infeed system for 3RA6 with 3RV19 infeed system	3RA68 90-1AA
Adapter 	Adapter in 45-mm width	For integration of SIRIUS 3RV1 circuit breaker/MSP size S00/S0 in screw-type technology	3RA68 90-0BA

Further information is available at www.sea.siemens.com/compactstarter or contact your local Siemens representative.

Engineering tool: The online configurator simple and complete

siemens.com/lowvoltage/configurator/3RA6

To further simplify the application of the SIRIUS 3RA6 compact starter, we offer an intelligent and user-friendly tool which helps you with the selection of the suitable components for your application no matter whether you require the compact starter as a stand-alone solution, with corresponding infeed system, connection to AS-Interface or in IO-Link design. The configuration can be easily and rapidly realized. All data required for the compact starter's correct assembly are compiled during the configuration process.

With the help of the online configurator, not only can the suitable compact starter be selected, but the complete product documentation is also prepared. All relevant technical and graphical data as well as the BOM can be easily downloaded to your PC.

The following data is available for download:

Technical documentation
- Operating instructions
- System manual
- Product data sheets
- Characteristic curves

Graphical data
- Images
- Dimension drawings (dxf)
- ISO illustrations (dxf)
- 3-D models (stp)

Ordering data
- Complete BOM (Excel)


Product configuration

Product data sheet


Characteristic curves


CAD data in 2-D/3-D format


Ordering data

Notes:

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