

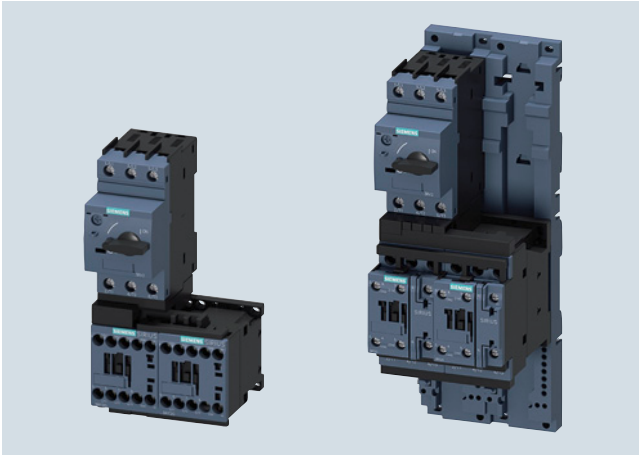
Load Feeders and Motor Starters for Use in the Control Cabinet

SIRIUS 3RA2 Load Feeders

General data

Overview

3RA2 load feeders



3RA22 reversing starters for snapping onto standard mounting rails or for screw fixing with screw terminals

The 3RA2 fuseless load feeders consist of the 3RV2 motor starter protector and the 3RT2 electromechanical contactor. The devices are electrically and mechanically connected using pre-assembled assembly kits (link modules, wiring kits and standard mounting rail or busbar adapters).

Around 500 preassembled 3RA2 combinations can be ordered for direct-on-line and reversing starting of standard three-phase motors up to 65 A (approx. 37 kW/400 V). Preassembled assembly kits are available as accessories for the power range up to 45 kW. The desired fuseless load feeder can thus be assembled quickly and economically by the customer. A time saving is also achieved in connection with switchgear acceptances, as – unlike with conventional wiring systems – there is no need to rectify possible wiring errors.

In the 3RA2 load feeder, the 3RV2 motor starter protector is responsible for overload and short-circuit protection. Back-up protective devices, such as melting fuses or limiters, are superfluous here, as the motor starter protector is short-circuit proof up to 150 kA at 400 V.

The 3RT2 contactor is particularly suitable for extremely complex switching tasks requiring the greatest endurance.

The 3RA2 load feeders are available with setting ranges from 0.14 to 65 A in sizes S00, S0 and S2. Load feeders in size S3 up to 100 A are available for self-assembly.

Size	Width Direct-on-line starters/ reversing starters	Max. rated current $I_{n \max}$	For three-phase motors up to
	mm	A	kW
S00	45/90	16	7.5
S0	45/90	32	15
S2	55/120	65	37
S3	70/150	100	45

The size of the 3RA2 load feeders is based on the size of the contactor:

Size 3RA2	S00	S0	S2	S3
Size of 3RV2 motor starter protector	S00	S00 ¹⁾ , S0	S2	S3
Size of 3RT2 contactor	S00	S0	S2	S3

¹⁾ The combination of an S00 motor starter protector with an S0 contactor is possible only for screw connection versions.

More information

Home page, see www.siemens.com/sirius-starting

Industry Mall, see www.siemens.com/product?3RA2

Online configurator, see www.siemens.com/sirius/configurators

Operating conditions

3RA2 load feeders are climate-proof. They are intended for use in enclosed rooms in which no severe operating conditions (such as dust, caustic vapors, hazardous gases) prevail. Suitable covers must be provided for installation in dusty and damp locations.

Behavior in the event of short circuit

EN 60947-4-1 (VDE 0660 Part 102) and IEC 60947-4-1 make a distinction between two different types of coordination (types "1" and "2"). Any short circuits that occur are cleared safely by both types of coordination. The only differences concern the extent of the damage caused to the device by a short circuit.

T_{OC} 1

Type of coordination "1"

The load feeder may be non-operational after a short circuit has been cleared. Damage to the contactor or to the overload release is permissible.

T_{OC} 2

Type of coordination "2"

There must be no damage to the overload release or to any other components after a short circuit has been cleared. The load feeder can resume operation without needing to be renewed. At most, welding of the contactor contacts is permissible if they can be disconnected easily without any significant deformation.

The types of coordination are indicated in the corresponding tables by the symbols shown on orange backgrounds.

Tripping times

All 3RA2 load feeders described here are designed for normal starting, in other words for overload tripping times of less than 10 s (CLASS 10). At rated-load operating temperature the tripping times are shorter, depending on the particular equipment and the setting range. The exact values can be derived from the tripping characteristics of the motor starter protectors.

Connection methods

For all 3RA2 feeders up to 32 A, spring-type connection is available as well as screw terminals. To connect two devices with spring-type terminals, there are plug-in connection modules for sizes S00 and S0 which enable very quick mounting of the feeders and a vibration-resistant assembly.

To connect a motor starter protector with screw terminals to a contactor with spring-type terminals there are special hybrid connection modules for the sizes S00 and S0.



Screw terminals



Spring-type terminals

The terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

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Use of load feeders in conjunction with IE3/IE4 motors

Note:

For the use of SIRIUS 3RA2 load feeders in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see ["Application Manual for Controls with IE3/IE4 Motors"](https://support.industry.siemens.com/cs/ww/en/view/94770820), <https://support.industry.siemens.com/cs/ww/en/view/94770820>.

For more information, see [Preface, page 7](#).

3RA2 complete units

The 3RA2 fuseless load feeders can be ordered as preassembled complete units for direct-on-line starting (3RA21) or for reversing duty (3RA22) with screw or spring-type connection. From size S2, complete units for direct-on-line starting (3RA21) are only available with screw-type connections.

There are control supply voltages available of 50 Hz 230 V AC and 24 V DC.

A distinction is also drawn between whether the feeder is mounted onto a 35 mm standard mounting rail, on a flat surface using screws, or on a 60 mm busbar system.

3RA21 load feeders in the size S0 must be configured on standard mounting rail adapters if high vibration and shock loads (railways, power generation,...) are involved.

A vibration and shock kit is available for mounting on busbar adapters.

Accessories

As the 3RA2 fuseless load feeders are constructed from 3RV2 motor starter protectors and 3RT2 contactors, the same accessories – such as auxiliary switches, undervoltage releases or door-coupling rotary operating mechanisms – can be used for the 3RA2 fuseless load feeders as for these motor starter protectors and contactors.

In particular, certain accessories have been optimized for the fuseless load feeders. These include the top-connected, transverse auxiliary switch on the motor starter protector, which is available in a range of different versions. Special auxiliary switch blocks that can be snapped on from below are available for the contactor. These two accessories enable the fuseless load feeders to be wired simply without having to route cables through the device.

Incoming power supply

In total, four different energy supply options are available (see ["3RV29 infeed system for load feeders" on page 8/56](#)).

Customer assembly of fuseless load feeders

Whereas preassembled 3RA2s can be ordered up to 65 A, combinations in size S3 up to 100 A (approx. 45 kW/400 V) can be self-assembled.

The standard devices can be combined optimally – in terms of both technical specifications and dimensions, thanks to the modular system of the SIRIUS series.

The fuseless load feeders can thus be assembled easily by the customer. It is simply necessary to assemble the standard 3RV2 motor starter protector, the 3RT2 contactor and the appropriate assembly kit.

For single devices and assembly kits, see the ["Selection and ordering data" for 3RA21 direct-on-line starters and 3RA22 reversing starters, page 8/21 or 8/33 onwards](#).

For assembly kits for direct-on-line starting or reversing duty for mounting onto standard mounting rails or busbars, see [page 8/50](#).

For size S3 direct-on-line starters and sizes S0, S2 and S3 reversing starters, it is imperative that a standard mounting rail adapter is used to ensure the necessary mechanical strength. If a busbar adapter is used (not possible for size S3) then a standard mounting rail adapter is not necessary.

SENTRON 3VA circuit breakers and SIRIUS 3RT contactors are available for rated currents >100 A.

Special equipment for customer assembly can be ordered if other rated control supply voltages are required. Assembly kits can be used to facilitate assembly.

Customers can also assemble tested combinations of motor starter protectors with solid-state controls (soft starters, solid-state contactors) and load feeders with additional monitoring and control devices (3RR monitoring relays, SIMOCODE 3UF).

For the electrical and mechanical connection of protection equipment and controls there are preassembled assembly kits (link modules, wiring kits and standard mounting rail or busbar adapters).

The following types of configuration are possible:

- Direct-on-line/reversing starting
- Star-delta (wye-delta) starting
- Solid-state/soft starting

For more information and assignment tables for combinations of the 3RA2 generation for self-assembly, see

- [Configuration manual](https://support.industry.siemens.com/cs/ww/en/view/39714188), <https://support.industry.siemens.com/cs/ww/en/view/39714188>
- [Manual "SIRIUS – SIRIUS 3RA21 / 3RA22 Load Feeders"](https://support.industry.siemens.com/cs/ww/en/view/60284351), <https://support.industry.siemens.com/cs/ww/en/view/60284351>

Customer assembly of fused load feeders

The flexible, modular system of SIRIUS also enables the configuration of fused load feeders up to 100 A (approx. 45 kW/400 V). Up to 32 A is also available for 45 mm installation widths.

Compact 3NW7...-1 cylindrical fuse holders for IEC fuses size 10 x 38 mm, or 3NW7...-1HG holders for Class CC UL fuses, can be used for this purpose.

For more information about fuse systems, see [Catalog LV 10](#).



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General data

Communications integration using IO-Link

Load feeders can also be assembled with IO-Link for connection to the higher-level control system. For each feeder, this requires a contactor with a voltage tap onto which a 3RA27 11 function module is plugged (various versions for direct-on-line, reversing and wye-delta starters). The design of the SIRIUS load feeders permits a group of up to four SIRIUS controls to be conveniently connected through the standardized open system IO-Link to a control system, thus reducing wiring considerably compared to the conventional parallel wiring method. The electrical connection is made using only three standard cables.

The function modules perform not only the communication (contactor operation and feedback, ready signal) but also the electrical interlocking (for reversing and wye-delta starters) and the timing relay function (wye-delta reversing time).

Communication information and control supply voltages are passed on through ribbon cables so that the complete control current wiring on the feeder is no longer needed.

The monitoring and maintenance of a plant is made considerably easier by transmitting diverse diagnostics data from the function modules (e.g. missing main and auxiliary voltage, local disconnection...) through IO-Link to the higher-level control system. Also, feeders equipped for IO-Link can be conveniently controlled from the control cabinet door using the optional operator panel.

More information:

- For IO-Link, [see page 2/101 onwards](#)
- For 3RA27 function modules, [see pages 3/79, 3/86 and 3/106](#)

Communications integration via AS-Interface

Connection of the load feeders to the higher-level control system is possible not only through IO-Link but also through AS-Interface. The AS-Interface connection is recommended wherever load feeders are used in distributed applications. In this case, too, a contactor with a voltage tap is required with a corresponding 3RA27 12 function module (various versions for direct-on-line, reversing and wye-delta starters). The devices are implemented in A/B technology, making it easy to connect up to 62 feeders to an AS-i master (regardless of whether they are direct-on-line, reversing or wye-delta starters). This results in a significant reduction of wiring compared to the conventional parallel wiring method. The electrical connection is made using standard cables.

The function modules perform not only the communication (contactor operation and feedback, ready signal) but also the electrical interlocking (for reversing and wye-delta starters) and the timing relay function (wye-delta reversing time).

Communication information and control supply voltages are passed on through ribbon cables so that the complete control current wiring on the starter is no longer needed.

More information:

- For AS-Interface, [see page 2/18 onwards](#)
- For 3RA27 function modules, [see pages 3/79, 3/86 and 3/106](#)

Contactors with voltage tap-off

For configuring load feeders with communication interfaces (AS-i/IO-Link), contactors with voltage taps are required. These contactors are not included as standard in the preassembled 3RA2 load feeders. A load feeder with communication interface must be assembled therefore from single devices.

Complete integration in the automation landscape

As the result of the communication connection through IO-Link or AS-i, the SIRIUS load feeders are fully integrated in the automation landscape and can draw on all the advantages of TIA (e.g. integration in the TIA Maintenance Station).

Mounting

3RA2 fuseless load feeders can be supplied:

- For assembly on TH 35 standard mounting rails according to EN 60715 (depth 15 mm)
- For assembly on busbar adapters (busbar center-to-center clearance 60 mm, busbar thickness 5 to 10 mm with beveled edges)

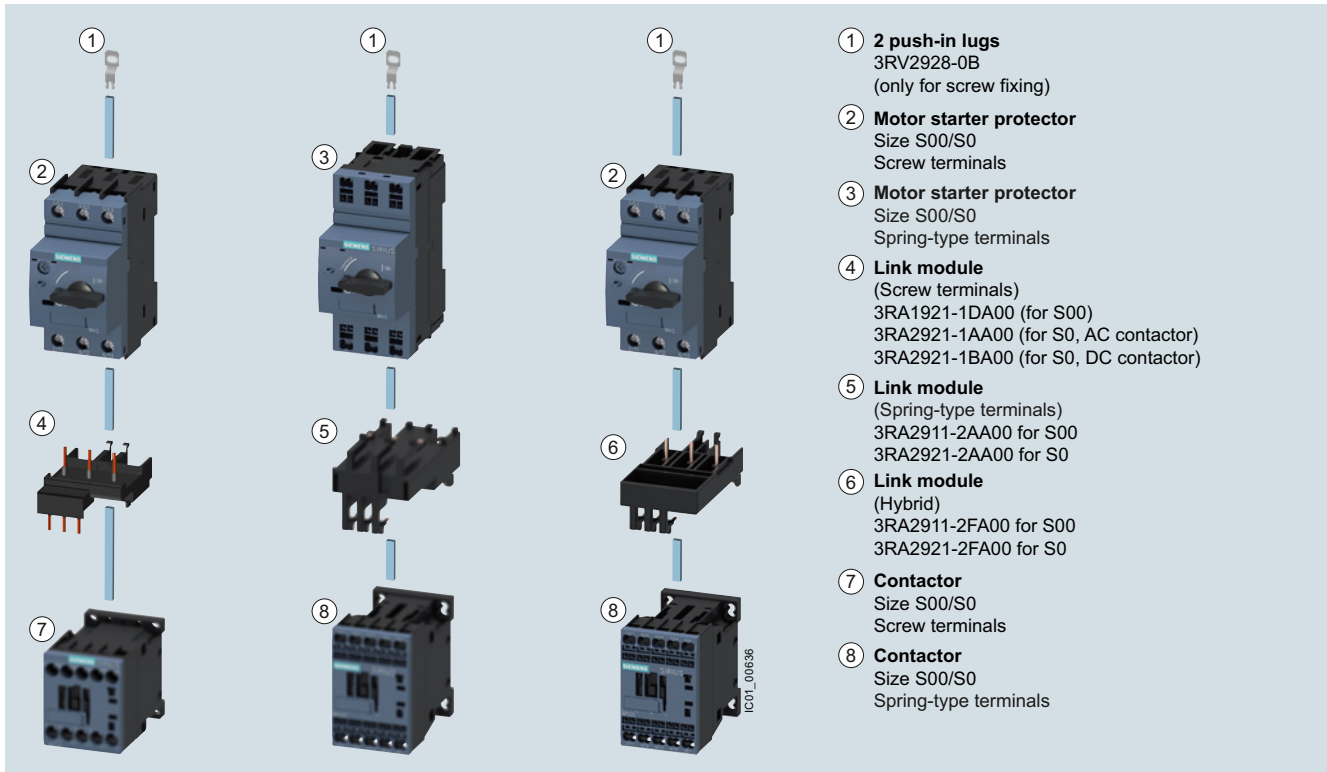
The fuseless load feeders are also suitable for screw fixing using two 3RV2928-0B push-in lugs.

3RA2 fuseless load feeders can also be installed using infeed system 3RV29 (S0 and S00 only, [see page 7/55](#)).

Load Feeders and Motor Starters for Use in the Control Cabinet SIRIUS 3RA2 Load Feeders

General data

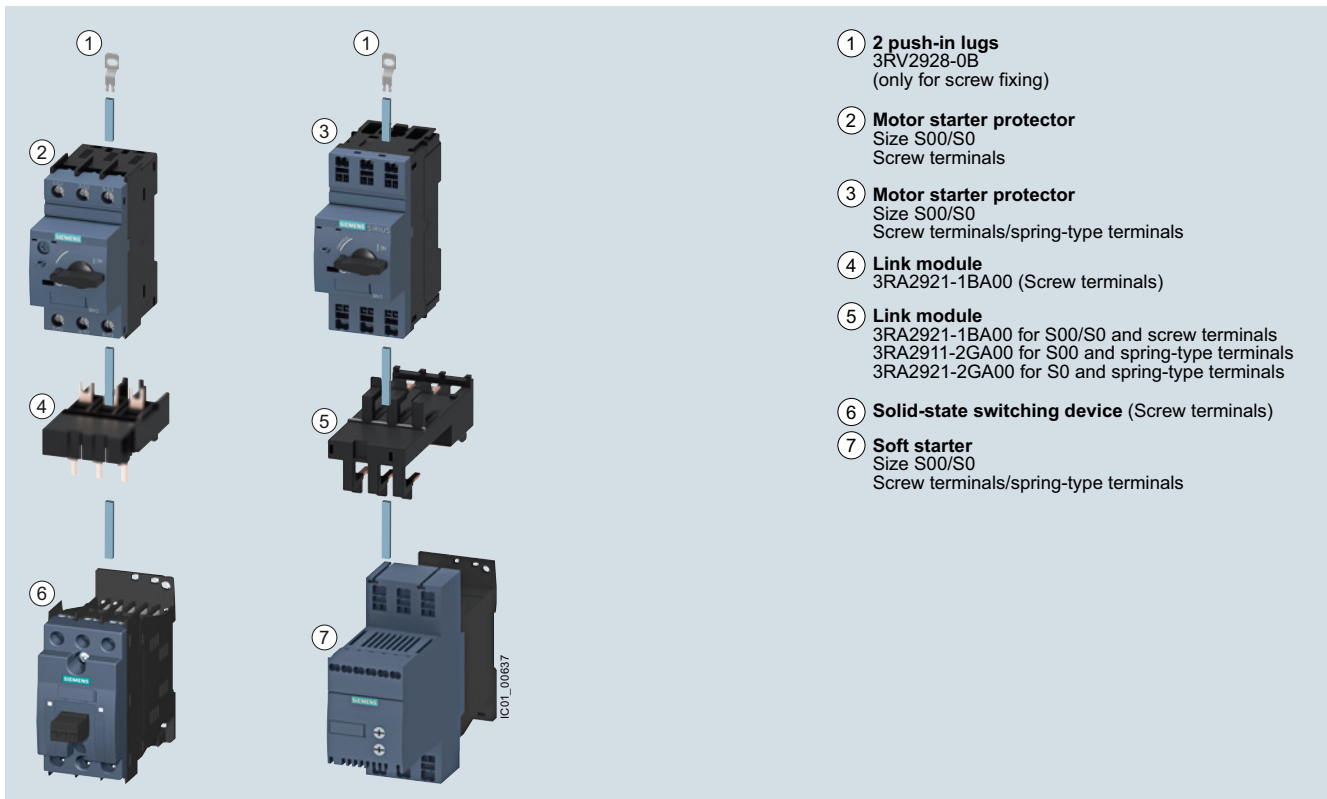
Direct-on-line starting • For standard rail mounting or screw fixing • Sizes S00 and S0



Left: 3RA21 load feeder with screw terminals

Center: 3RA21 load feeder with spring-type terminals

Right: Motor starter protector assembly with screw terminals, with contactor with spring-type terminals



Left: Motor starter protector combination with solid-state switching device with screw terminals

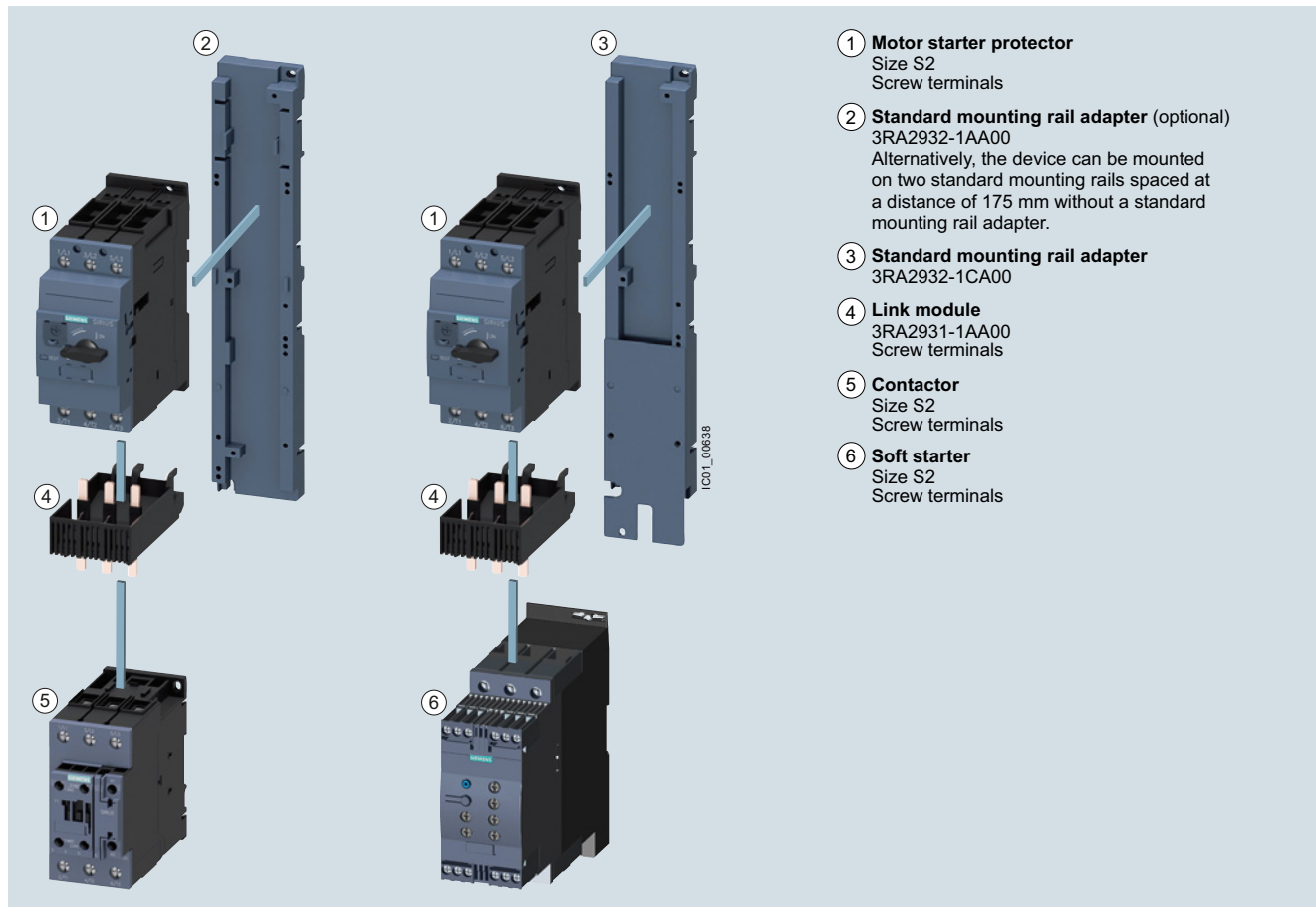
Right: Motor starter protector assembly with soft starter with spring-type terminals

Load Feeders and Motor Starters for Use in the Control Cabinet

SIRIUS 3RA2 Load Feeders

General data

Direct-on-line starting • For standard rail mounting • Size S2



Left: 3RA21 load feeder with screw terminals

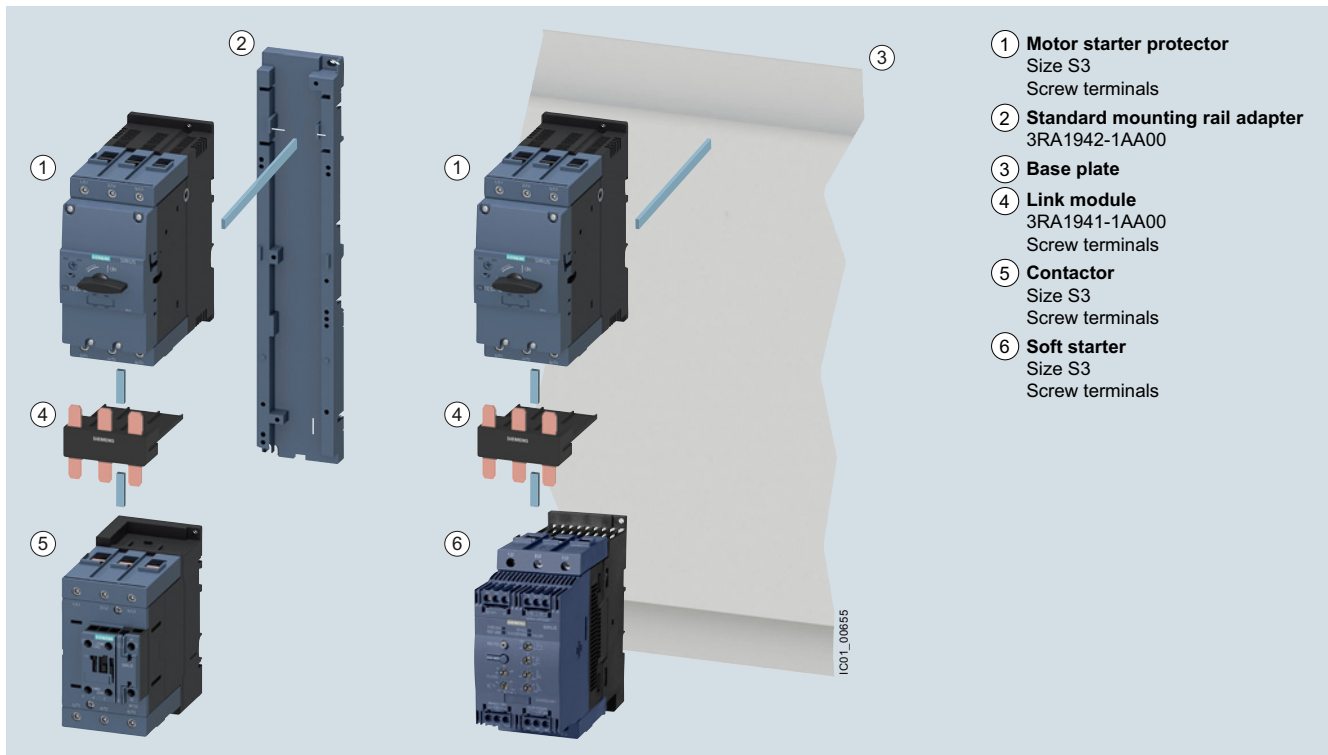
Right: Motor starter protector assembly with soft starter with screw terminals

Load Feeders and Motor Starters for Use in the Control Cabinet

SIRIUS 3RA2 Load Feeders

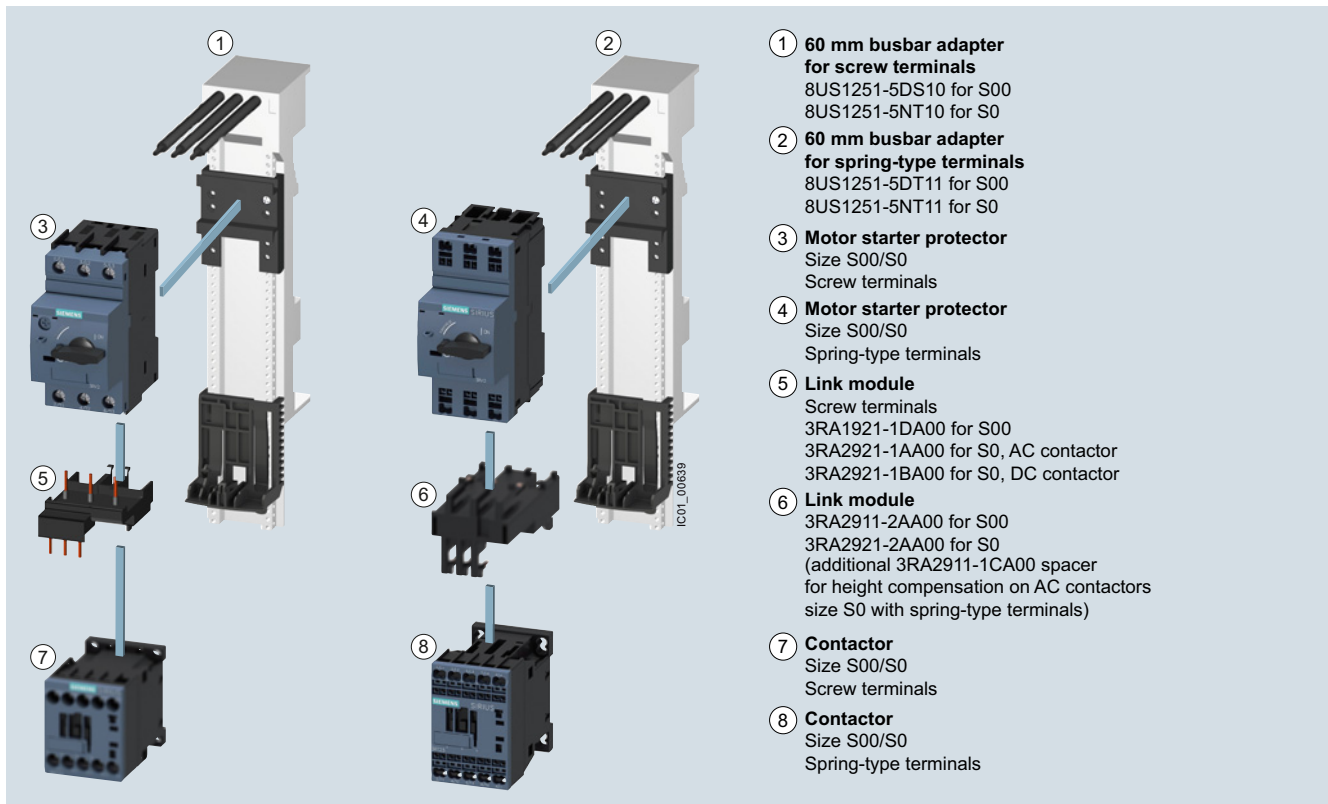
General data

Direct-on-line starting • For standard rail mounting • Size S3



Load feeder for direct-on-line starting and standard rail mounting in size S3 (the version with screw terminals is shown in the picture)

Direct-on-line starting • For 60 mm busbar systems • Sizes S00 and S0



Left: 3RA21 load feeder for direct-on-line starting with busbar adapter with screw terminals

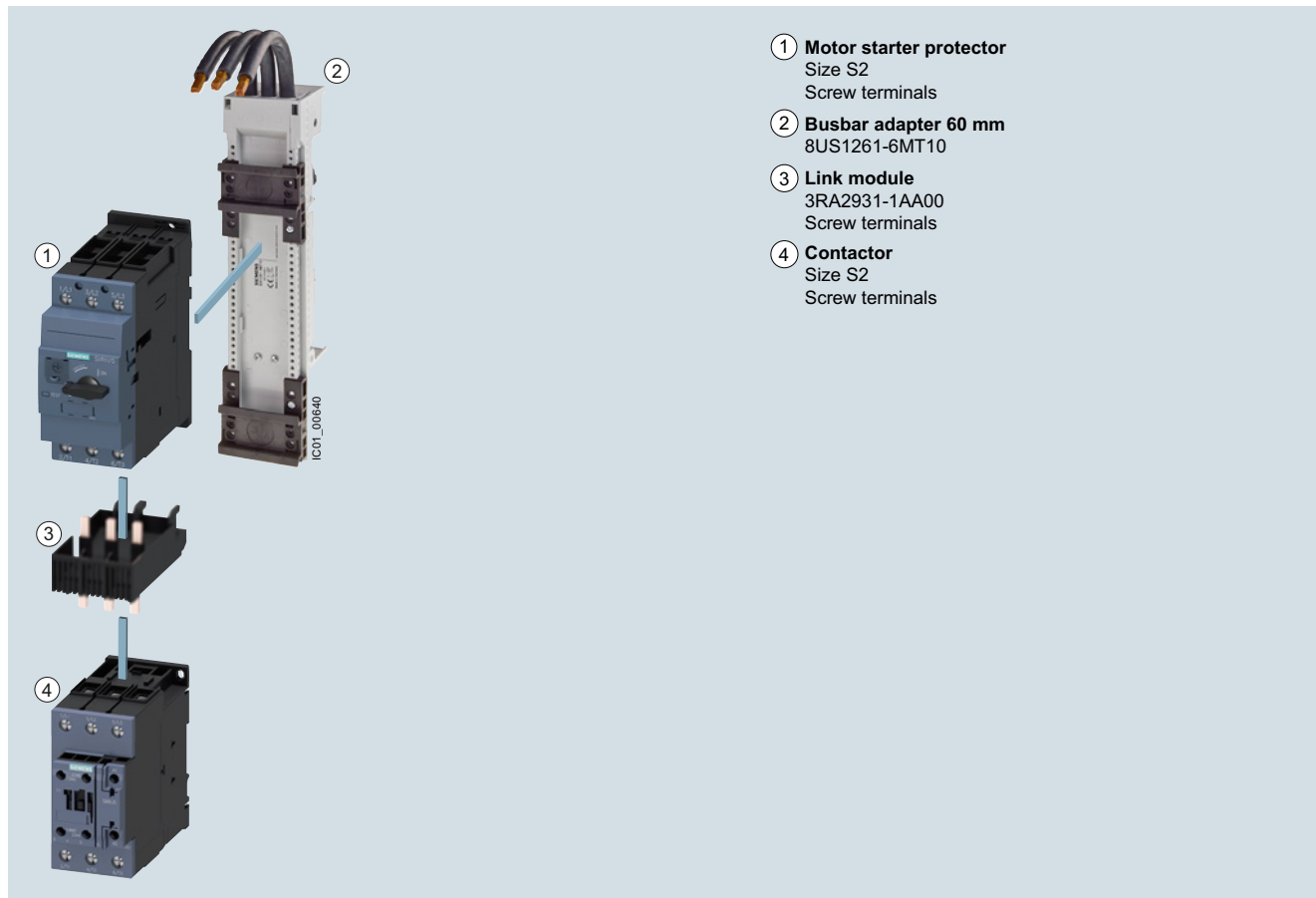
Right: 3RA21 load feeder for direct-on-line starting with busbar adapter with spring-type terminals

Load Feeders and Motor Starters for Use in the Control Cabinet

SIRIUS 3RA2 Load Feeders

General data

Direct-on-line starting • For 60 mm busbar systems • Size S2



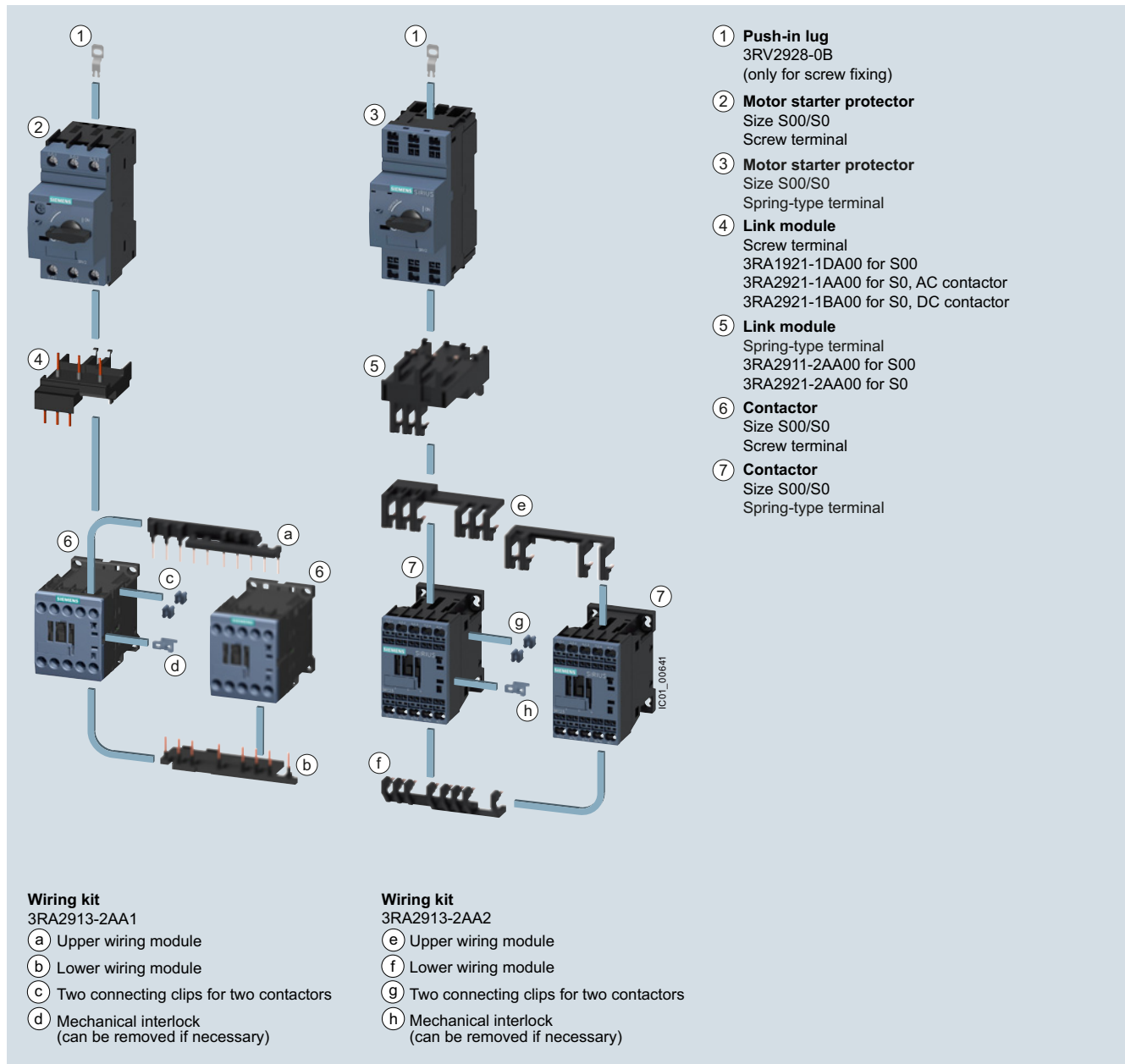
3RA21 load feeder for direct-on-line starting with busbar adapter with screw terminals

Load Feeders and Motor Starters for Use in the Control Cabinet

SIRIUS 3RA2 Load Feeders

General data

Reversing duty • For standard rail mounting or screw fixing • Size S00



Left: 3RA22 load feeder with screw terminals with push-in lugs with two contactors for reversing duty and wiring kit 3RA2913-2AA1 for connecting the contactors (including mechanical interlocking and connecting clips)

Right: 3RA22 load feeder with spring-type terminals with push-in lugs with two contactors for reversing duty and wiring kit 3RA2913-2AA2 (including mechanical interlocking and connecting clips)

Load Feeders and Motor Starters for Use in the Control Cabinet

SIRIUS 3RA2 Load Feeders

General data

Reversing duty • For standard rail mounting • Size S0

RH assembly kit for reversing duty and standard rail mounting in size S0

Screw terminals
3RA2923-1BB1

Spring-type terminals
3RA2923-1BB2¹⁾

Comprising:

- Wiring kit for the main and auxiliary circuits
- Two standard mounting rail adapters
- Two connecting wedges
- Two connecting wedges
- Mechanical interlock
- Two connecting clips
- Fixing accessories

① **Motor starter protector**
Size S0
Screw terminals/spring-type terminals

② **Standard mounting rail adapters**
3RA2922-1AA00
with two connecting wedges
8US1998-1AA00

③ **Link module**
Screw terminals:
3RA2921-1AA00 for S0, AC contactor
3RA2921-1BA00 for S0, DC contactor
Spring-type terminals:
3RA2921-2AA00²⁾

④ **Contactor**
Size S0
Screw terminals/spring-type terminals

Wiring kit
Screw terminals:
3RA2923-2AA1

Spring-type terminals:
3RA2923-2AA2

(a) Upper wiring module

(b) Lower wiring module

(c) Two connecting clips for two contactors

(d) Mechanical interlock
(can be removed if necessary)

¹⁾ Contains two 3RA2911-1CA00 spacers for height compensation on AC contactors size S0 with spring-type terminals.

²⁾ Additionally two 3RA2911-1CA00 spacers for height compensation on AC contactors size S0 with spring-type terminals.

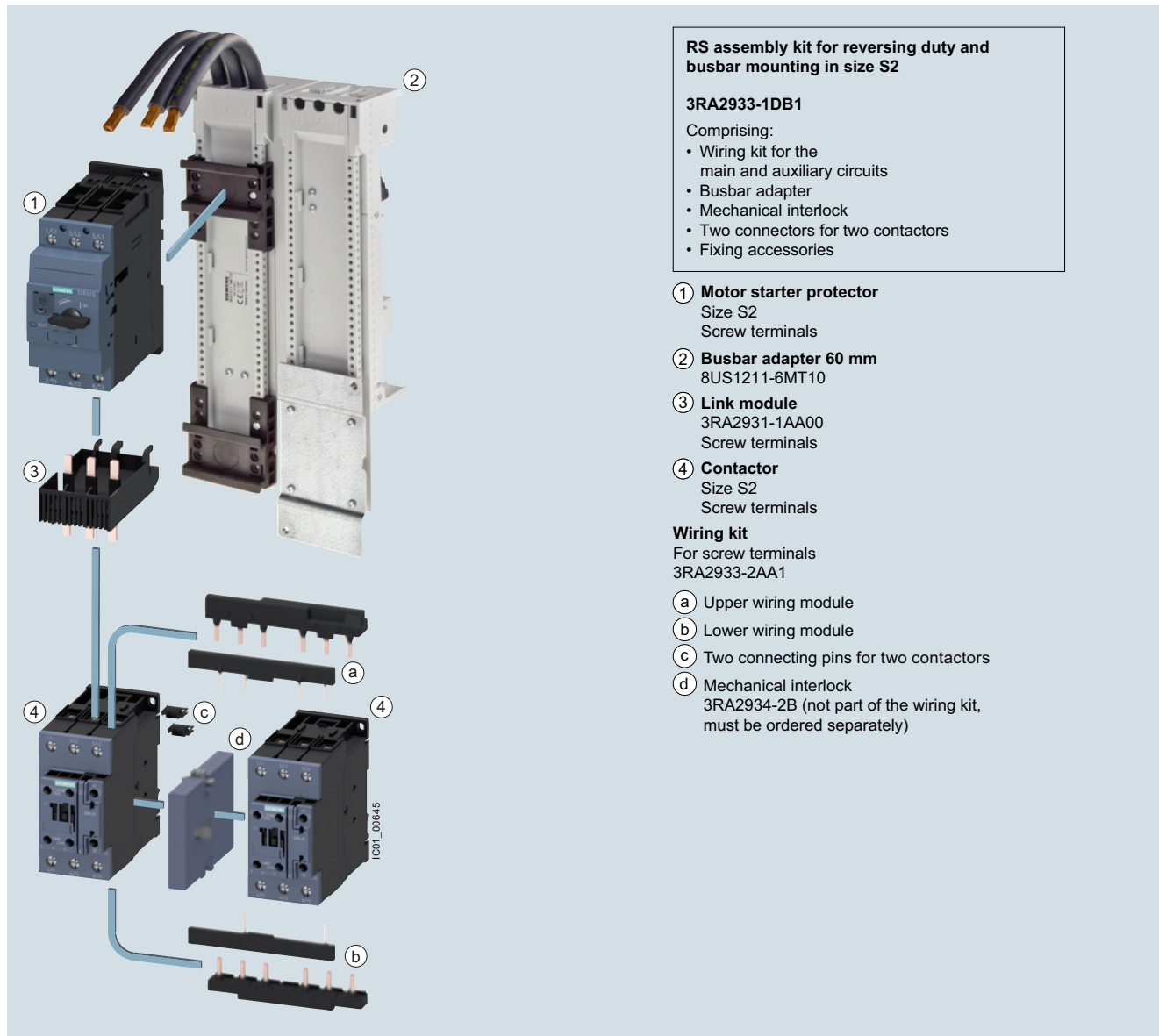
3RA22 load feeder for reversing duty and standard rail mounting in size S0 (the version with screw terminals is shown in the picture)

Load Feeders and Motor Starters for Use in the Control Cabinet

SIRIUS 3RA2 Load Feeders

General data

Reversing duty • For 60 mm busbar systems • Size S2



Load feeder for reversing duty and 60 mm standard rail mounting in size S2
(the version with screw terminals is shown in the picture)

Load Feeders and Motor Starters for Use in the Control Cabinet

SIRIUS 3RA2 Load Feeders

Accessories

For motor starter protectors Size	For contactors Size	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
			d					

RS assembly kits for reversing duty and 60 mm busbar systems

RS assembly kits for screw terminals

For motor starter protectors Size	For contactors Size	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
S00, S0	S00	Comprising:	2	3RA2913-1DB1		1	1 unit	41B
S0	S0	• Wiring kit for main and auxiliary circuit	2	3RA2923-1DB1		1	1 unit	41B
S00	S0	• Busbar adapters • Device holders • Two connecting wedges • Mechanical interlocks • Two connecting clips for two contactors • Fixing accessories Link modules must be ordered separately.	2	3RA2923-1EB1		1	1 unit	41B
S2	S2	Comprising:	2	3RA2933-1DB1		1	1 unit	41B
		• Wiring kit for main and auxiliary circuit • Busbar adapters • Mechanical interlocks • Two connectors for two contactors • Fixing accessories Link modules must be ordered separately.						

RS assembly kits for spring-type terminals

For motor starter protectors Size	For contactors Size	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
S00	S00	Comprising:	2	3RA2913-1DB2		1	1 unit	41B
S0	S0	• Wiring kit for main and auxiliary circuit • Busbar adapters • Device holders • Two connecting wedges • Mechanical interlocks • Two connectors for two contactors • Two spacers (for size S0 only) • Fixing accessories Link modules must be ordered separately.	2	3RA2923-1DB2		1	1 unit	41B

For motor starter protectors Size	For contactors Size	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
			d					

Connecting wedges



8US1998-1AA00

		For mechanical linking of busbar adapters and device holders or of standard mounting rail adapters (2 units per combination required)	2	8US1998-1AA00		100	100 units	140
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Spacers



3RA2911-1CA00

For motor starter protectors Size	For contactors Size	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
S0	S0	Single-unit packaging	2	3RA2911-1CA00		1	1 unit	41B
S0	S0	Multi-unit packaging	2	3RA2911-1C		1	5 units	41B