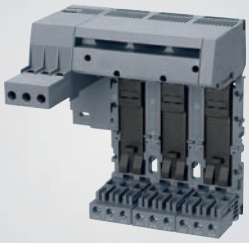


3RA6 Fuseless Compact Starters

Catalog News LV 1 N · April 2008

SIRIUS

www.siemens.com/lowvoltage

SIEMENS

General data

Overview

3RA6 fuseless compact starters and infeed system for 3RA6

Integrated functionality

The SIRIUS 3RA6 compact starters are a generation of innovative load feeders with the integrated functionality of a circuit breaker, contactor and solid-state overload relay. In addition, various functions of optional mountable accessories (auxiliary switches, surge suppressors) are already integrated in the SIRIUS compact starter.

Application

The SIRIUS compact starters can be used wherever standard induction motors up to 32 A (approx. 15 kW/400 V) are directly started.

Low equipment variance

Thanks to wide setting ranges for the rated current and wide voltage ranges, the equipment variance is greatly reduced compared to conventional load feeders.

Very high operational safety

No welding after a short-circuit release and defined shut-down when the end of service life is reached means that the SIRIUS compact starter achieves a very high level of operational safety otherwise possible only with considerable additional outlay. This sets it apart from devices with similar functionality.

Safe disconnection

The auxiliary switches of the 3RA6 compact starters are designed as mirror contacts. It is thus possible to use the devices for safe disconnection, e.g. emergency-stops, up to Category 2 (EN954-1) and together with other redundancy switching devices up to Category 3 or 4.

Communications integration through AS-Interface

To enable communications integration through AS-Interface there is an AS-i add-on module (also available as a version with two local inputs for safe disconnection) which can be mounted instead of the control circuit terminals on the SIRIUS compact starter.

The design of the AS-i add-on module permits a group of up to 62 feeders with a total of four cables to be connected to the control system. This reduces wiring work considerably compared to the parallel wiring method.

Permanent wiring / easy replacement

Using the SIRIUS infeed system for 3RA6 it is possible to carry out the wiring in advance without a compact starter needing to be connected.

A compact starter is very easily replaced simply by pulling it out of the device without disconnecting the wiring.

Even with screw connections or mounting on a standard mounting rail there is no need to disconnect any wiring (on account of the removable main and control circuit terminals) in order to replace a compact starter.

Consistent solution from the infeed to the motor feeder

The SIRIUS infeed system for 3RA6 with integrated PE bar is offered as a user-friendly possibility of feeding in summation currents up to 100 A with a maximum conductor cross-section of 70 mm^2 and connecting the motor cable directly without additional intermediate terminals.

Screw and spring-loaded connections

The SIRIUS compact starters and the SIRIUS infeed system for 3RA6 are available with screw and spring-type connections.

Note:

For fast orientation with regard to the type of connection, different colored backgrounds are assigned to the Order No. and the price in the selection and ordering data:

- Products with screw connections appear on a green background.
- Products with spring-loaded connections appear on an orange background.
- Products with different connections on the incoming and outgoing side appear on a gray background.

System configurator for engineering

A free system configurator is available to reduce further the amount of engineering work for selecting the required compact starters and matching infeed.

Types of infeed for the 3RA6 fuseless compact starters

On the whole four different infeed possibilities are available:

- Parallel wiring
- Use of 3-phase busbars (combination with SIRIUS circuit breakers and SIRIUS contactors possible)
- 8US busbar adapters
- SIRIUS infeed system for 3RA6

To comply with the clearance and creepage distances demanded according to UL508 there are the following infeed possibilities:

Type of infeed	Feeder terminal (according to UL 508, type E)	Order No.
Parallel wiring	Terminal for "Self-Protected Combination Motor Controller (Type E)"	3RV19 28-1H
3-phase busbars	3-phase infeed terminal for constructing "Type E Starters", UL 508	3RV19 25-5EB
Infeed system for 3RA6	Infeed on left, 50/70 mm^2, screw terminal with 3 sockets, outgoing terminal with screw/spring-loaded connections, including PE bar	3RA68 13-8AB (screw connection), 3RA68 13-8AC (spring-type connection)

SIRIUS 3RA6 compact starters

The SIRIUS 3RA6 compact starters are universal motor feeders according to IEC/EN 60947-6-2. As control and protective switching devices (CPS) they can connect, convey and disconnect the thermal, dynamic and electrical loads from short-circuit currents up to I_q = 53 kA, i.e. they are practically weld-free. They combine the functions of a circuit breaker, a contactor and a solid-state overload relay in a single enclosure and can be used wherever standard induction motors up to 32 A (up to approx. 15 kW at 400 V AC) are started directly. Direct-on-line and reversing starters are available as variants.

The reversing starter version comes with not only an internal electrical interlock but also with a mechanical interlock to prevent simultaneous actuation of both directions of rotation.

3RA6 fuseless compact starters are available with 5 current setting ranges and 3 control voltage ranges:

Overall width of direct-on-line starter	Overall width of reversing starter	Current setting range	At 400 V AC for induction motors up to
mm	mm	A	kW
45	90	0.1 ... 0.4	0.09
45	90	0.32 ... 1.25	0.37
45	90	1 ... 4	1.5
45	90	3 ... 12	5.5
45	90	8 ... 32	15

The 3 control voltage ranges are:
- 24 V AC/DC
- 42 ... 70 V AC/DC
- 110 ... 240 V AC/DC

Note:

Up to 100 A the 3RA1 load feeders can be used for fuseless load feeders > 32 A.

The SENTRON 3VL circuit breakers and the SIRIUS 3RT contactors can be used for fuseless load feeders > 100 A.

For information see the Catalogs LV 1 and LV 1 T.

Operating conditions

The SIRIUS 3RA6 compact starters are suitable for use in any climate. 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.

The SIRIUS compact starters are generally designed to degree of protection IP20. The permissible ambient temperature during operation is -20 ... +60 °C.

The limit short-circuit current is 53 kA at 400 V.

Note:

More technical specifications can be found in the system manual at

www.siemens.com/compactstarter.

Overload tripping times

The overload tripping time can be set on the device to less than 10 s (CLASS 10) and less than 20 s (CLASS 20 for heavy starting). As the breaker mechanism still remains closed after an overload, resetting is possible by either local manual reset or autoreset after 3 minutes cooling time.

With autoreset there is no need to open the control cabinet.

Diagnostics options

The compact starter provides the following diagnostics options:
- With LEDs:
  - connection to the control voltage
  - position of the main contacts
- With mechanical indication:
  - tripping due to overload
  - tripping due to short-circuit
  - tripping due to malfunction (end of service life reached because of worn switching contacts or a worn switching mechanism or faults in the control electronics)

These states can be evaluated in addition in the higher-level control system by means of the integrated auxiliary switches and signaling switches of the compact starter.

Four complement variants for 3RA6 compact starters
- For standard mounting rail or screw mounting:
  basic version including 1 pair of main circuit terminals and 1 pair of control circuit terminals
- For standard mounting rail or screw mounting when using the AS-i add-on module:
  without control circuit terminals because the AS-i add-on module is plugged on instead
- For use with the infeed system for 3RA6:
  without main circuit terminals because they are supplied with the infeed system and the expansion modules
- For use with the infeed system for 3RA6 and AS-i add-on module:
  without terminal complement (also for reordering when replacing the compact starter)

Benefits

The SIRIUS 3RA6 compact starters offer a number of advantages, the most important being:
- Compact design saves space in the control cabinet
- Little planning and assembly work and far less wiring thanks to a single complete unit with one order number
- Little variance through 3 wide voltage ranges and 5 wide setting ranges for the rated current mean low stock levels
- High plant availability through integrated functionalities such as prevention of main contact welding and shut-down at end of service life
- Greater productivity through automatic device reset in case of overload and differentiated detection of overload and short-circuit
- Easy checking of the wiring and testing of the motor direction prior to start-up thanks to optional control kits
- Speedy replacement of devices thanks to removable terminals with spring-loaded and screw connections in the main and control circuit
- Efficient power distribution through the related SIRIUS infeed system for 3RA6
- Direct connection of the motor feeder cable to the SIRIUS infeed system for 3RA6 thanks to integrated PE bar
- Connecting and looping through incoming feeders up to a cross-section of 70 mm^2
- When using the infeed system for 3RA6, possibility of directly connecting the motor cable without intermediate terminals
- Integration in Totally Integrated Automation thanks to the optional connection to AS-Interface

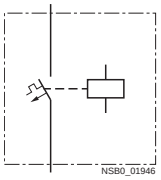
3RA61 direct-on-line starters

Selection and ordering data

3RA61 20-1CB32

3RA61 20-2EB32

Direct start



A set of 3RA69 40-0A adapters is required for screw mounting.

Standard induction motor 4-pole at 400 V AC[1] Standard output *P*	Setting range for solid-state overload release	DT[2]	**Compact starter** Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
kW	A							kg
According to IEC/EN 60947-6-2 no welding of contactor contacts at I_q = 53 kA at 400 V								
0.09	0.1 ...0.4		**3RA61 20-□A□3□**		1	1 unit	101	1.3
0.37	0.32 ... 1.25		**3RA61 20-□B□3□**		1	1 unit	101	1.3
1.5	1 ... 4		**3RA61 20-□C□3□**		1	1 unit	101	1.3
5.5	3 ... 12		**3RA61 20-□D□3□**		1	1 unit	101	1.3
15	8 ... 32		**3RA61 20-□E□3□**		1	1 unit	101	1.3

				Additional price/ Price reduction	
Order No. supplement for connection type					
• Without terminals for use with the infeed system for 3RA6 and the AS-i add-on module	**0**	**0**		x	
• With screw terminals	**1**			Without	
• With spring-loaded terminals	**2**			x	
Order No. supplement for rated control supply voltage					
• 24 V AC/DC		**B**		Without	
• 42 ... 70 V AC/DC		**E**		Without	
• 110 ... 240 V AC/DC		**P**		Without	
Order No. supplement for complement variant					
• For standard mounting rail or screw mounting: Basic version including 1 pair of main circuit terminals and 1 pair of control circuit terminals			**2**	Without	
• For use with the infeed system for 3RA6 without main circuit terminals (with control circuit terminals)			**3**	x x	For screw terminals For spring-loaded terminals
• For standard mounting rail or screw mounting when using the AS-i add-on module without control circuit terminals (with main circuit terminals)			**4**	x x	For screw terminals For spring-loaded terminals

1) Selection depends on the concrete start-up and rated data of the protected motor.

2) Delivery time class is dependent on connection type, rated control supply voltage and complement: preliminary C or X, later as a rule A or B.

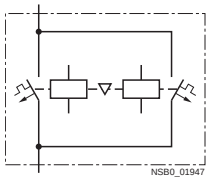
x = additional price

* You can order this quantity or a multiple thereof.

Selection and ordering data

3RA62 50-1CP32 3RA62 50-2DP32

Reversing duty



Two sets of 3RA69 40-0A adapters are required for screw mounting.

Standard induction motor 4-pole at 400 V AC[1] Standard output *P*	Setting range for solid-state overload release	DT[2]	**Compact starter** Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
kW	A							kg
According to IEC/EN 60947-6-2 no welding of contactor contacts at I_q = 53 kA at 400 V								
0.09	0.1 ...0.4		**3RA62 50-□A□3□**		1	1 unit	101	2.3
0.37	0.32 ... 1.25		**3RA62 50-□B□3□**		1	1 unit	101	2.3
1.5	1 ... 4		**3RA62 50-□C□3□**		1	1 unit	101	2.3
5.5	3 ... 12		**3RA62 50-□D□3□**		1	1 unit	101	2.3
15	8 ... 32		**3RA62 50-□E□3□**		1	1 unit	101	2.3

				Additional price/ Price reduction	
Order No. supplement for connection type					
• Without terminals for use with the infeed system for 3RA6 and the AS-i add-on module	**0**		**0**	x	
• With screw terminals	**1**			Without	
• With spring-loaded terminals	**2**			x	
Order No. supplement for rated control supply voltage					
• 24 V AC/DC		**B**		Without	
• 42 ... 70 V AC/DC		**E**		Without	
• 110 ... 240 V AC/DC		**P**		Without	
Order No. supplement for complement variant					
• For standard mounting rail or screw mounting: Basic version including 1 pair of main circuit terminals and 1 pair of control circuit terminals			**2**	Without	
• For use with the infeed system for 3RA6 without main circuit terminals (with control circuit terminals)			**3**	x x	For screw terminals For spring-loaded terminals
• For standard mounting rail or screw mounting when using the AS-i add-on module without control circuit terminals (with main circuit terminals)			**4**	x x	For screw terminals For spring-loaded terminals

1) Selection depends on the concrete start-up and rated data of the protected motor.

2) Delivery time class is dependent on connection type, rated control supply voltage and complement: preliminary C or X, later as a rule A or B.

x = additional price

* You can order this quantity or a multiple thereof.

Accessories

For 3RA6 direct-on-line and reversing starters

Overview

Accessories for SIRIUS 3RA6 compact starters

The following accessories are available specially for the 3RA6 compact starters:

- AS-i add-on module: For communication of the compact starter with the control system using AS-Interface; also available as a version with two local inputs for safe disconnection
- Addressing unit for addressing the AS-i add-on module
- External auxiliary switch blocks: Snap-on auxiliary switch as versions 2 NO, 2 NC and 1 NO +1 NC with screw or spring-type connections; the contacts of the auxiliary switch block open and close jointly with the main contacts of the compact starter. The NC contacts are designed as mirror contacts.
- Control kit: aid for manually closing the main contacts in order to check the wiring and motor direction under conditions of short-circuit protection
- Adapter for screw mounting the compact starter, including push-in lugs
- Main conductor terminal: available with screw and spring-loaded connection

Accessories for parallel wiring

The terminal block for "Self-Protected Combination Motor Controller", type E is available for complying with the clearance and creepage distances demanded according to UL 508.

Accessories for infeed using 3-phase busbar systems

The 3-phase busbars can be used as an easy, time-saving and clearly arranged means of feeding SIRIUS 3RA6 compact starters with screw connection. Circuit breaker sizes S00 and S0 can also be integrated.

The busbars are suitable for between 2 and 5 devices. However, any kind of extension up to a maximum summation current of 63 A is possible by clamping the tags of an additional busbar (rotated by 180°) underneath the terminals of the respective last circuit breaker.

A connecting piece is required for the combination with circuit breaker size S00. The circuit breakers are supplied by appropriate feeder terminals. Special feeder terminals are required for constructing "Type E Starters" according to UL/CSA.

The 3-phase busbar systems are finger-safe but empty connection tags must be fitted with covers. They are designed for any short-circuit stress which can occur at the output side of connected SIRIUS 3RA6 compact starters or circuit breakers.

Busbar adapters for 60 mm systems

The compact starters are mounted directly with the aid of busbar adapters on busbar systems with 60 mm center-to-center clearance in order to save space and to reduce infeed times and costs. These feeders are suitable for copper busbars with a width from 12 to 30 mm. The busbars can be 4 to 5 mm or 10 mm thick.

The 8US busbar system can be loaded with a maximum summation current of 630 A.

The "reversing starter" version requires a device holder along side the busbar adapter for lateral mounting.

The compact starters are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

For more accessories such as incoming and outgoing terminals, flat copper profiles etc., see LV1, Chapter 14, "8US Busbar Systems, 60 mm Busbar System".

Accessories for operation with closed control cabinet doors

Door-coupling rotary operating mechanisms for standard and emergency-stop applications are available for operating the compact starter with closed control cabinet doors.

Selection and ordering data

	Type	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories specially for 3RA6 compact starters								
 3RA69 70-3A	**AS-i add-on modules for compact starters** For communication of the compact starter with the control system using AS-Interface	►	**3RA69 70-3A**		1	1 unit	101	0.045
	AS-i add-on modules with two local inputs for safe disconnection	►	**3RA69 70-3B**		1	1 unit	101	0.045
 3RK19 04-2AB01	**Addressing units for AS-i add-on modules** • For active AS-Interface modules, intelligent sensors and actuators • According to AS-Interface Version 2.1 • Including expanded addressing mode • Scope of supply - 1 addressing unit - 1 operating manual (German, English, French, Spanish, Italian) - 1 addressing cable (1.5 m, with jack plug)	►	**3RK19 04-2AB01**		1	1 unit	121	0.540
 3RA69 50-0A	**Control kits** For mechanical actuation of the compact starter	►	**3RA69 50-0A**		1	1 unit	101	0.004
 3RA69 40-0A	**Adapters for screw mounting the compact starter** (set including push-in lugs Direct-on-line starters require 1 set, reversing starters 2 sets.	A	**3RA69 40-0A**		1	1 unit	101	0.152

6

* You can order this quantity or a multiple thereof.

Accessories

For 3RA6 direct-on-line and reversing starters

	Type	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories specially for 3RA6 compact starters with screw connection									
 3RA6911-1A	**Auxiliary switch blocks for compact starters**								
		2 NO	A	**3RA69 11-1A**		1	1 unit	101	0.018
		2 NC	A	**3RA69 12-1A**		1	1 unit	101	0.018
		1 NO +1 NC	A	**3RA69 13-1A**		1	1 unit	101	0.018
 3RA6920-1A	**Main circuit terminals** (incoming and outgoing side)		►	**3RA69 20-1A**		1	2 units	101	0.038
Accessories specially for 3RA6 compact starters with spring-loaded connection									
 3RA6911-2A	**Auxiliary switch blocks for compact starters**								
		2 NO	A	**3RA69 11-2A**		1	1 unit	101	0.018
		2 NC	A	**3RA69 12-2A**		1	1 unit	101	0.018
		1 NO + 1 NC	A	**3RA69 13-2A**		1	1 unit	101	0.018
 3RA6920-2A	**Main circuit terminals** (incoming and outgoing side)		►	**3RA69 20-2A**		1	2 units	101	0.049

	Type	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Terminals for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508 for infeed through parallel wiring with compact starters								
 3RV19 28-1H	Note: UL 508 demands for "Combination Motor Controller Type E" 1-inch clearance and 2-inch creepage distance at line side. Terminal blocks are not required for use according to CSA. With size S0, these terminal blocks cannot be used in combination with 3RV19 .5 three-phase busbars.							
	Terminal blocks type E S0 For extended clearance and creepage distances (1 and 2 inch)	►	**3RV19 28-1H**		1	1 unit	101	0.083

* You can order this quantity or a multiple thereof.

For 3RA6 direct-on-line and reversing starters

3-phase busbars for infeed with 3RA6

For feeding several compact starters and circuit breakers with screw terminals, mounted side by side on standard mounting rails, insulated, with touch protection.

Number of compact starters and circuit breakers that can be connected without lateral accessories	Modular spacing	Rated current I_n at 690 V	For circuit breakers size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	mm	A								kg
2	45	63	S00, S0[1]	▶	**3RV19 15-1AB**		1	1 unit	101	0.044
3			S00, S0[1]	▶	**3RV19 15-1BB**		1	1 unit	101	0.071
4			S00, S0[1]	▶	**3RV19 15-1CB**		1	1 unit	101	0.099
5			S00, S0[1]	▶	**3RV19 15-1DB**		1	1 unit	101	0.124


3RV19 15-1AB


3RV19 15-1BB


3RV19 15-1CB


3RV19 15-1DB

[1] Not suitable for 3RV11 motor starter protectors with overload relay function. Common clamping of S00 and S0 motor starter protectors is not possible, due to the different modular spacings and terminal heights.
The 3RV19 15-5DB connecting piece is available for connecting busbars from size S0 to size S00.

Connecting pieces for 3-phase busbars

Version	Modular spacing	For circuit breakers size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	mm								kg
For connecting 3-phase busbars for compact starters and circuit breakers of size S0 (left) to size S00 (right)	45	S00, S0	▶	**3RV19 15-5DB**		1	1 unit	101	0.042


3RV19 15-5DB

Covers for connection tags of the 3-phase busbars

Touch protection for empty positions	S00, S0	▶	**3RV19 15-6AB**		1	10 units	101	0.003


3RV19 15-6AB

3-phase line-side terminals for 3-phase busbars

Conductor cross-section: Solid or stranded	Conductor cross-section: Finely stranded with end sleeve	Conductor cross-section: AWG cables, solid or stranded	For compact starters and circuit breakers size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
mm²	mm²	AWG								kg
Connection from top										
2.5 ... 25	4 ... 16	12-4	S0	▶	**3RV19 25-5AB**		1	1 unit	101	0.041
Connection from below[1]										
2.5 ... 25	4 ... 16	12-4	S00, S0	▶	**3RV19 15-5B**		1	1 unit	101	0.110


3RV19 25-5AB


3RV19 15-5B

3-phase line-side terminals for constructing "Type E Starters" according to UL 508 for 3-phase busbars

Connection from top										
2.5 ... 25	4 ... 16	10-4	S0	C	**3RV19 25-5EB**		1	1 unit	101	0.055

[1] This terminal is connected in place of a switch, please take the space requirement into account.

* You can order this quantity or a multiple thereof.

Accessories

For 3RA6 direct-on-line and reversing starters

Busbar adapters for 60 mm systems

8US12 11-1NS10

Type	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
For flat copper profiles according to DIN 46433 Width: 12 ... 30 mm Thickness: 4 ... 5 mm or 10 mm		**8US12 11-1NS10**					

Device holders for lateral mounting along side the busbar adapter for 60 mm systems

8US12 50-1AA10

Type	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Required in addition to the busbar adapter for mounting a reversing starter		**8US12 50-1AA10**					

Door-coupling rotary operating mechanisms for operating the compact starter with closed control cabinet doors

3RV19 26-0B

The door-coupling rotary operating mechanisms consist of a knob, a coupling driver and an extension shaft of 130/330 mm in length (5 mm x 5 mm). The door-coupling rotary operating mechanisms are designed to degree of protection IP65. The door interlocking prevents accidental opening of the control cabinet door in the ON position of the motor starter protector. The OFF position can be locked with up to 3 padlocks.

Type	Color of handle	Version of extension shaft mm	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Door-coupling rotary operating mechanisms	Black	130	►	**3RV19 26-0B**		1	1 unit	101	0.111
EMERGENCY-STOP door-coupling rotary operating mechanisms	Red/ Yellow	130	►	**3RV19 26-0C**		1	1 unit	101	0.110

Tools for spring-loaded terminals

8WA2 803

Version	Size/Color	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Screwdrivers 3.5 mm x 0.5 mm, suitable for a max. conductor cross-section of 2.5 mm^2	Length approx. 175 mm; green	A	**8WA2 803**		1	1 unit	041	0.024

Documentation

Type	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
System manuals • German: SIRIUS compact starter and accessories	X	**3RA69 91-0A**		1	1 unit	101	0,460
• English: SIRIUS compact starter and accessories	X	**3RA69 92-0A**		1	1 unit	101	0,460

* You can order this quantity or a multiple thereof.

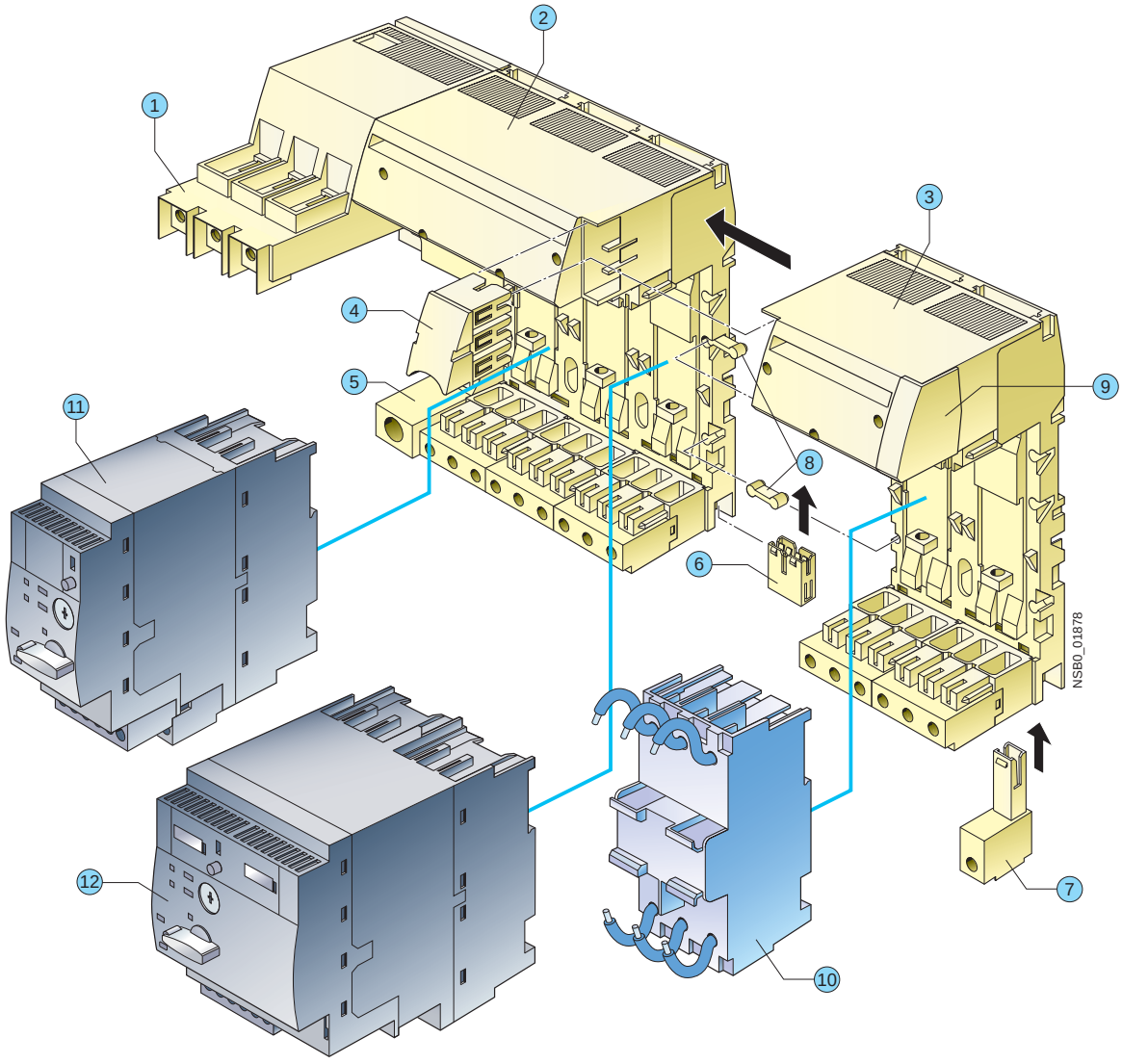
Overview

The infeed system for 3RA6 compact starters enables far less wiring in the main circuit and, thanks to the easy exchangeability of the compact starters, reduces the usual downtimes for maintenance work during the plant's operating phase.

The infeed system provides the possibility of completely prewiring the main circuit without a compact starter needing to be connected at the same time. As the result of the removable terminals in the main circuit, compact starters can be integrated in an infeed system in easy manner (without the use of tools).

In addition, the integrated PE bar means it is optionally possible to connect the motor cable directly to the infeed system without additional intermediate terminals. The infeed system for 3RA6 compact starters is designed for summation currents up to 100 A with a maximum 70 mm² conductor cross-section on the feeder terminal block.

The infeed system can be mounted on a standard mounting rail or flat surfaces.



① Feeder terminal
② Three-socket expansion module
③ Two-socket expansion module
④ Expansion plug
⑤ PE infeed
⑥ PE expansion plug
⑦ PE pick-off
⑧ Connecting plates
⑨ End cover
⑩ 45 mm adapter for SIRIUS motor starter protector size S00/S0
⑪ 3RA61 direct-on-line starter
⑫ 3RA62 reversing starter

Infeed systems for 3RA6

① Infeed

The 3-phase infeed is available with screw connection (25/35 mm^2 up to 63 A or 50/70 mm^2 up to 100 A) and spring-loaded connection (25/35 mm^2 up to 63 A).

The infeed with spring-loaded terminal can be fitted on the left as well on as the right to an expansion module.

The infeed with screw terminal is supplied only with a 3-socket expansion module and permanently fitted on the left side.

The infeeds with screw connection enable connection of the main conductors (L1, L2, L3) either from above or from below.

The infeed with screw connection is supplied complete with 1 end cover, the infeed with spring-load connection complete with 2 end covers.

② Three-socket expansion modules

The expansion module with 3 sockets for compact starters is available with screw connection and with spring-loaded connection.

Expansion modules enable the infeed system to be expanded and can be fitted to each other in any number.

Two expansion modules are held together with the help of 2 connecting plates and 1 expansion plug. These assembly parts are included in the scope of supply of the respective expansion module.

When the infeed system for 3RA6 is used, the compact starters (plug-in modules) are easily mounted and removed even when live.

Optional possibilities:
- PE connection on motor outgoing side
- Outfeed for external auxiliary devices
- Connection to 3RV19 infeed system
- Integration of SIRIUS motor starter protectors size S00 and S0 in mixed constructions (using 3RA68 90-0BA adapter)

③ Two-socket expansion modules

If only 2 instead of 3 additional sockets are required, then the 2-socket expansion module is the right choice. It has the same functionality as the 3-socket expansion module.

④ Expansion plug

Two expansion modules can be connected together using the expansion plug. Flexible expansion of the infeed system is thus possible.

⑤ PE infeeds

This module enables a PE cable to be connected.

The PE infeed can be ordered with screw connection and spring-loaded connection (35 mm^2) and can be fitted on the right or left to the expansion block.

⑥ PE expansion plug

The PE expansion plug is inserted from below and enables two PE bars to be connected.

⑦ PE pick-off

The PE pick-off is available with screw connection and spring-loaded connection (6/10 mm^2). It is snapped into the infeed system from below.

⑧ Connecting plates

Two connecting plates are used to hold together 2 expansion blocks.

⑨ End covers

On the last expansion module of a row, the socket provided for the expansion plug can be covered by inserting the end cover.

⑩ 45 mm adapters for SIRIUS motor starter protectors

SIRIUS motor starter protectors size S0/S00 with screw connection can be fitted to the adapter, enabling them to be plugged into the infeed system.

Terminal blocks

Using the terminal block the 3 phases can be fed out of the system; this means that single-phase, 2-phase and 3-phase components can also be integrated in the system.

After the end cover is pulled out, the terminal block can be plugged onto an expansion module.

Expansion plug for SIRIUS 3RV19 infeed systems

After the end cover is pulled out, the expansion plug for the SIRIUS 3RV19 infeed system can be plugged onto an expansion module. It connects the infeed system for 3RA6 with the SIRIUS 3RV19 infeed system.

Maximum rated operational current

The following maximum rated operational currents apply for the components of the infeed system for 3RA6:

Component	Maximum rated operational current
	A
Infeed with screw connection 50/70 mm^2	100
Infeed with screw connection 25/35 mm^2	63
Infeed with spring-type connection 25/35 mm^2	63
Expansion plugs	63

In a row of several expansion blocks, the maximum rated operational current from the 2nd expansion block to the end of the row is 63 A.

Proposal for upstream short-circuit protection devices

The following short-circuit data apply for the components of the infeed system for 3RA6:

Conductor cross-section	Inscriptions	Proposal for upstream short-circuit protection device
mm^2		
Short-circuit protection for infeed block (25 mm² / 35 mm²) with screw connection		
0.75 ... 35	$I_{d,max}$ = 19 kA, I^2t = 440 kA^{2}s	3RV10 41-4JA10
Short-circuit protection for infeed block (50 mm² / 70mm²) with screw connection		
2.5 ... 70	$I_{d,max}$ = approx. 22 kA	3RV10 42-4MA10
Short-circuit protection for infeed block with spring-loaded connection		
4	$I_{d,max}$ = 9.5 kA, I^2t = 85 kA^{2}s	3RV10 21-4DA10
6	$I_{d,max}$ = 12.5 kA, I^2t = 140 kA^{2}s	3RV10 31-4EA10
10	$I_{d,max}$ = 15 kA, I^2t = 180 kA^{2}s	3RV10 31-4HA10
16 / 25	$I_{d,max}$ = 19 kA, I^2t = 440 kA^{2}s	3RV10 42-4JA10
Short-circuit protection for terminal block		
1.5	$I_{d,max}$ = 7.5 kA	5SY... [1]
2.5	$I_{d,max}$ = 9.5 kA	
4	$I_{d,max}$ = 9.5 kA	
6	$I_{d,max}$ = 12.5 kA	

[1] To prevent the possibility of short-circuits, the cables on the terminal block must be installed so that they are short-circuit resistant according to EN 60439-1 Section 7.5.5.1.2.

Selection and ordering data

	Type		Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
3-phase infeeds and expansion modules								
 3RA68 12-8AB	**Infeed with screw connection 25/35 mm² on left** with permanently fitted **3-socket expansion module with screw connection** on outgoing side and integrated PE bar Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter	▶	**3RA68 12-8AB**		1	1 unit	101	0.957
 3RA68 12-8AC	**Infeed with screw connection 25/35 mm² on left** with permanently fitted **3-socket expansion module with spring-loaded connection** on outgoing side and integrated PE bar Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter	▶	**3RA68 12-8AC**		1	1 unit	101	0.957
 3RA68 13-8AB	**Infeed with screw connection 50/70 mm² on left** with permanently fitted **3-socket expansion module with screw connection** on outgoing side and integrated PE bar Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter suitable for UL duty according to UL 508 Type E	▶	**3RA68 13-8AB**		1	1 unit	101	1.146
 3RA68 13-8AC	**Infeed with screw connection 50/70 mm² on left** with permanently fitted **3-socket expansion module with spring-loaded connection** on outgoing side and integrated PE bar Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter suitable for UL duty according to UL 508 Type E	▶	**3RA68 13-8AC**		1	1 unit	101	1.146
 3RA68 30-5AC	**Infeed with spring-type connection 25/35 mm² on left or on right** up to 63 A	▶	**3RA68 30-5AC**		1	1 unit	101	0.283

* You can order this quantity or a multiple thereof.

Infeed Systems

Infeed systems for 3RA6

	Type		Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Expansion modules								
 3RA68 22-0AB	**2-socket expansion modules with screw connection** and integrated PE bar with 2 sockets for 2 direct-on-line starters or 1 reversing starter Expansion plug and 2 connecting plates are included in the scope of supply.	►	**3RA68 22-0AB**		1	1 unit	101	0.505
 3RA68 23-0AB	**3-socket expansion modules with screw connection** and integrated PE bar with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter Expansion plug and 2 connecting plates are included in the scope of supply.	►	**3RA68 23-0AB**		1	1 unit	101	0.717
 3RA68 22-0AC	**2-socket expansion modules with spring-loaded connection** and integrated PE bar with 2 sockets for 2 direct-on-line starters or 1 reversing starter Expansion plug and 2 connecting plates are included in the scope of supply.	►	**3RA68 22-0AC**		1	1 unit	101	0.527
 3RA68 23-0AC	**3-socket expansion modules with spring-loaded connection** and integrated PE bar with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter Expansion plug and 2 connecting plates are included in the scope of supply.	►	**3RA68 23-0AC**		1	1 unit	101	0.750

* You can order this quantity or a multiple thereof.

Infeed systems for 3RA6

	Type	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories for infeed systems for 3RA6								
 3RA68 60-6AB	**PE infeed 25/35 mm² with screw connection**	►	**3RA68 60-6AB**		1	1 unit	101	0.060
 3RA68 60-5AC	**PE infeed 25/35 mm² with spring-loaded connection**	►	**3RA68 60-5AC**		1	1 unit	101	0.070
 3RA68 70-4AB	**PE pick-off 6/10 mm² with screw connection**	►	**3RA68 70-4AB**		1	1 unit	101	0.019
 3RA68 70-3AC	**PE pick-off 6/10 mm² with spring-loaded connection**	►	**3RA68 70-3AC**		1	1 unit	101	0.017
 3RA68 90-0EA	**PE expansion plug**	►	**3RA68 90-0EA**		1	5 units	101	0.008
 3RA68 90-1AB	**Expansion plug** between 2 expansion modules Is included in the scope of supply of the expansion modules.	►	**3RA68 90-1AB**		1	1 unit	101	0.029
 3RA68 90-1AA	**Expansion plug for SIRIUS 3RV19 infeed system** Connects infeed system for 3RA6 to 3RV19 infeed system	►	**3RA68 90-1AA**		1	1 unit	101	0.079

* You can order this quantity or a multiple thereof.

Infeed Systems

Infeed systems for 3RA6

	Type	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
 3RA68 90-0BA	**45 mm adapters for SIRIUS circuit breakers** Size S0/S00 with screw connection	►	**3RA68 90-0BA**		1	1 unit	101	0.152
 3RV19 17-5D	**Terminal blocks** With spring-type connection for integration of single-phase, 2-phase and 3-phase components	A	**3RV19 17-5D**		1	1 unit	101	0.050

	Version	Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Tools for spring-loaded terminals									
 8WA2 803	**Screwdrivers** 3.5 mm x 0.5 mm, suitable for a max. conductor cross-section of 2.5 mm^2	Length approx. 175 mm; green	A	**8WA2 803**		1	1 unit	041	0.024

6

* You can order this quantity or a multiple thereof.

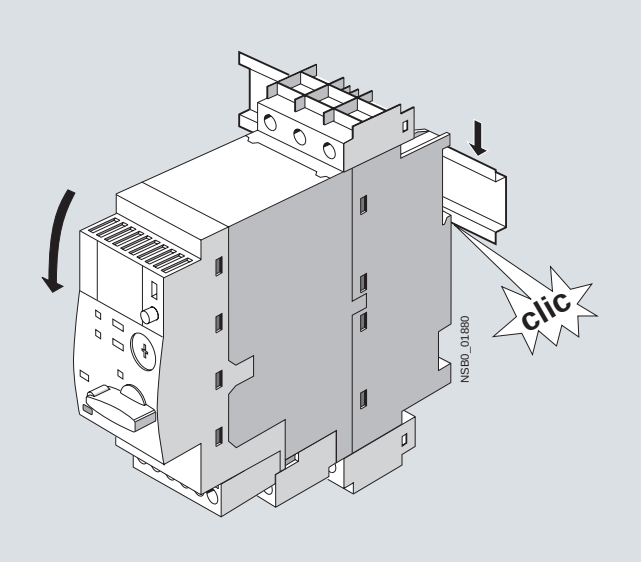
Design

Mounting

The 3RA6 compact feeders can be fastened in 4 ways:

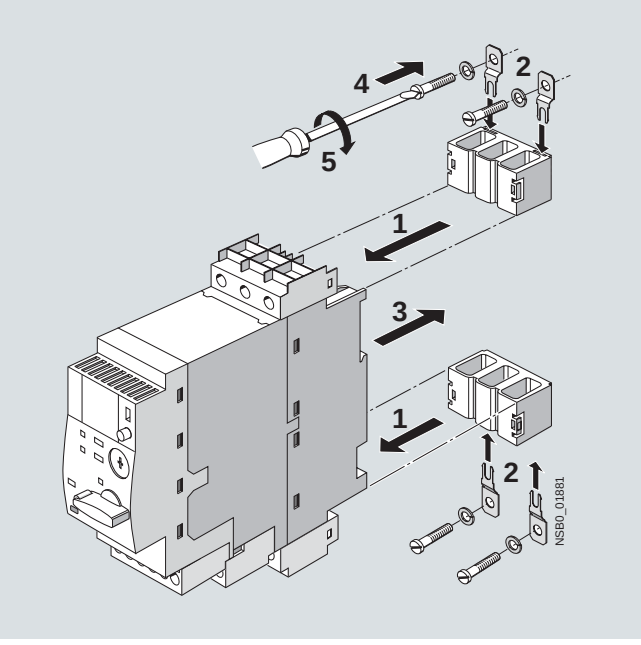
1) By snapping onto a standard mounting rail

The SIRIUS compact feeders can be snapped onto a standard mounting rail according to EN 60715 with a width of 35 mm.



2) By screw fixing to a flat surface

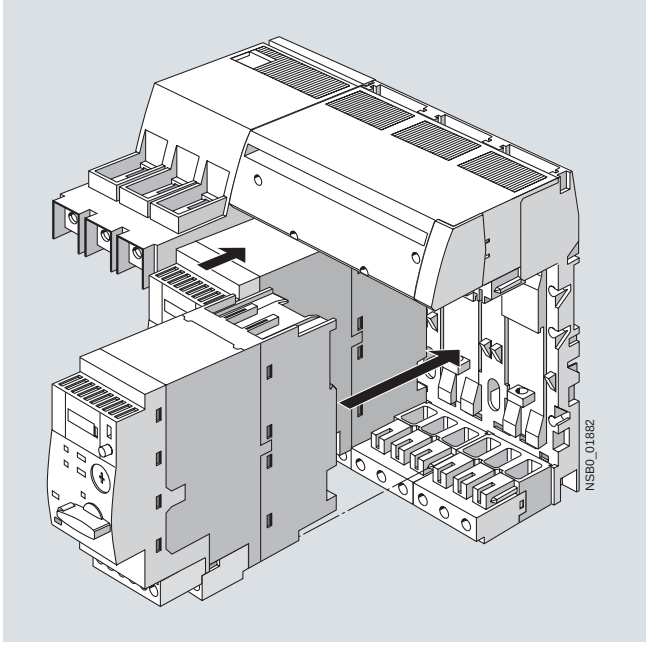
The SIRIUS compact feeders are suitable for screw fixing to a flat surface. One set of 3RA69 40-0A adapters (including push-in lugs) is required per direct-on-line starter, two sets are required per reversing starter.



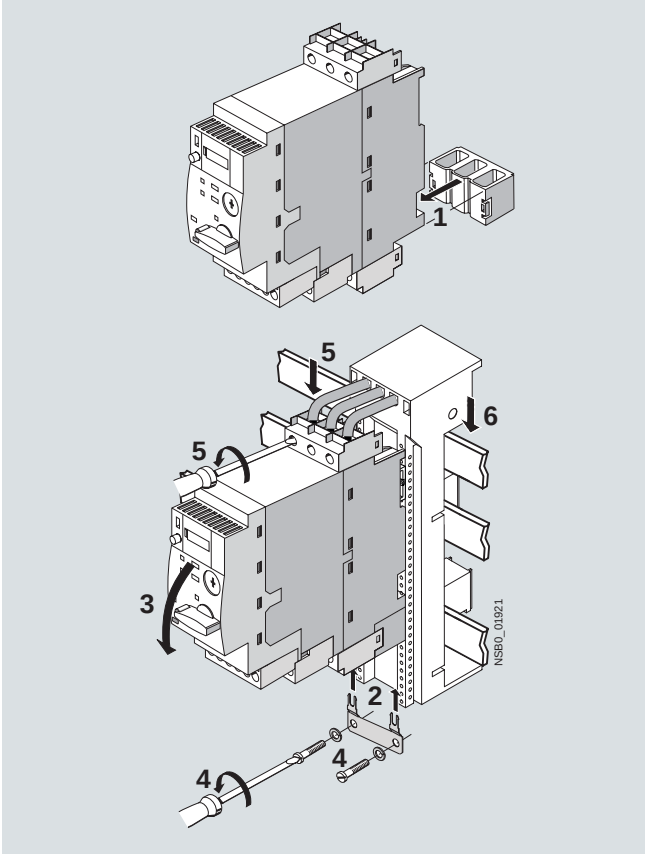
1 ... 5: order of mounting steps

3) By integrating in the infeed system for 3RA6

The SIRIUS compact feeders can be assembled with the infeed system for 3RA6 (see "Infeed system for 3RA6").



4) By using the 8US busbar adapter on busbar systems with 60 mm busbar center-to-center clearance



1 ... 6: order of mounting steps

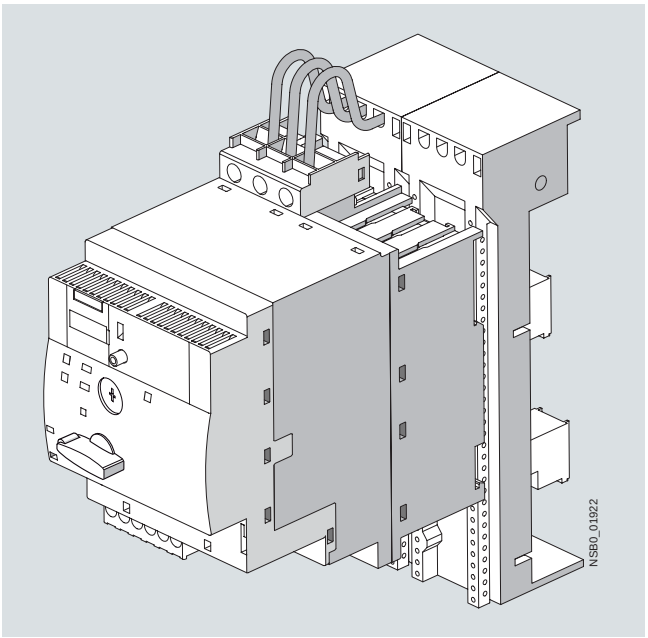
6

3RA61 direct-on-line starters, 3RA62 reversing starters

4a) By using an additional device holder in the case of reversing starters

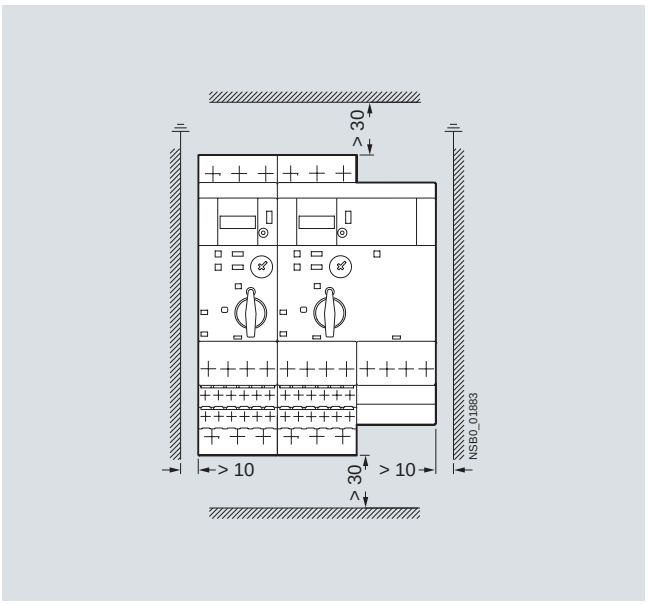
When the 8US busbar adapter is used on busbar systems with 60 mm busbar center-to-center clearance, a device holder is needed in addition for a reversing starter on account of its double width.

The reversing starter is mounted in the same way as the direct-on-line starter on the busbar adapter. Then the device holder is snapped on alongside the busbar adapter.



Mounting regulations

The module can be installed horizontally or vertically. For the different installations attention must be paid however to limit values for safe isolation according to IEC/EN 60947-2 of the compact feeders (for details see the "Technical specifications").



The following distances must be observed when mounting the compact feeders:

- Lateral distance to grounded components: 10 mm
- Arcing space at top and bottom: 30 mm

Function

Trip units

The SIRIUS 3RA6 compact feeders are equipped with the following trip units:
- Inverse-time delayed solid-state overload release
- Instantaneous electronic trip unit (electromagnetic short-circuit release)

The overload releases can be adjusted in accordance with the load current.

The electronic trip units are permanently set to a value 13 times the maximum rated current and thus enable trouble-free starting of motors.

Trip classes

The trip classes of electronically delayed trip units are based on the tripping time (t_A) at 7.2 times the set current in the cold state (excerpt from IEC 60947-4):

CLASS 10: 4s < t_A < 10 s

CLASS 20: 6s < t_A < 20 s (for heavy starting)

The compact feeder must have tripped within this time!

Disconnection due to malfunction

The following malfunctions can be detected:
- End of service life
  - Worn switching contacts (for electrical endurance see "Technical specifications")
  - Worn switching mechanisms (for mechanical endurance see "Technical specifications")
- Faults in the control electronics

Short-circuit protection

If a short-circuit occurs, the short-circuit releases of the SIRIUS 3RA6 compact feeders isolate the faulty load feeder from the network and thus prevent further damage. The short-circuit releases are factory-set to 13 times the value of the maximum rated current I_n of the device.

The SIRIUS compact feeders have a short-circuit breaking capacity of 50 kA at a voltage of 400 V AC. Higher short-circuit currents are not to be expected in practice.

Overload relay function

In the event of an overload, the compact feeder switches off without the breaker mechanism being opened.

The overload trip can be signaled to the higher-level control system through an integrated signal switch (1 CO).

The overload signal can be reset automatically or by means of a manual reset.

Control through AS-Interface

For control through AS-Interface, the AS-i add-on module is mounted instead of the two control circuit terminals on the SIRIUS 3RA6 compact feeders (direct-on-line starters and reversing starters).

The AS-i auxiliary voltage and the AS-i data line are installed on the AS-i add-on module easily and quickly without tools by means of two plug-in connector blocks with insulation displacement connection.

The AS-i add-on module is equipped with the latest A/B technology and has an addressing socket onboard.

An addressing unit can be ordered for addressing the AS-i add-on module.

Bit assignment (see below) is similar to that for the SIRIUS motor starters, which means that the same programming can be used here.

DI 0.0 Ready
DI 0.1 Motor on
DI 0.2 Group fault
DI 0.3 Group warning

DO 0.0 Motor on or motor clockwise
DO 0.1 Motor counterclockwise

A 24 V DC PELV power supply unit according to VDE 010 safety class III is required for the auxiliary voltage.

The AS-i data line is supplied with voltage by means of an AS-i power supply unit and is controlled by means of the AS-i master.

The AS-i add-on modules are available in the following two versions:
- AS-i add-on modules for compact feeders
- AS-i add-on modules for compact feeders with two local inputs for safe disconnection of the "clockwise rotation" or "counterclockwise rotation" outputs

Integrated auxiliary switches

The control circuit terminals of the SIRIUS 3RA6 compact feeders have the following connections:
- A1/A2 for control voltage
- "Overload" signal switch
- "Fault" signal switch, e.g. "short-circuit"
- Internal auxiliary switch for position of the main contacts (in case of direct-on-line starters: 1 NO + 1 NC with mirror contact to the main contact; in case of reversing starters: 2 NO)

Technical specifications

Type			**3RA61**	**3RA62**
Size			**S0**	
Number of poles			**3**	
General data				
Device standard			IEC/EN 60947-6-2	
Max. rated current $I_{n\,max}$	0.1 ... 0.4 A	A	0.4	
(= max. rated operational current I_e)	0.32 ...1.25 A	A	1.25	
for the respective setting range	1 ... 4 A	A	4	
	4 ... 12 A	A	12	
	8 ... 32 A	A	32	
Permissible ambient temperature				
• During operation	according to IEC/EN 60721-3-3	°C	-20 ... +60, with restriction up to +70	
• For installation in SIRIUS infeed system for 3RA6		°C	-20 ... +40	
• During storage	IEC / EN 60732-3-1	°C	-55 ... +80	
• During transport	IEC / EN 60721-3-2	°C	-55 ... +80	
Permissible rated current of the compact feeder, when several compact feeders are mounted side-by-side on a vertical standard mounting rail or in the infeed system for 3RA6				
• For a control cabinet inside temperature of	+40 °C	%	100	
• For a control cabinet inside temperature of	+60 °C	%	80	
Relative air humidity		%	10 ... 90	
Installation altitude		m	Up to 2000 above sea level without restriction	
Rated operational voltage U_e		V	690	
Rated frequency		Hz	50/60	
Rated insulation voltage U_i (degree of pollution 3)		V	690	
Rated impulse withstand voltage U_{imp}		kV	6	
Trip class (CLASS)	according to IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)		10/20	
Rated short-circuit current I_q at AC 50/60 Hz 400 V	according to IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)	kA	50 kA	
Types of coordination	according to IEC 60947-6-2, EN 60947-6-2 (VDE 0660 Part 102)		2 and in addition weld-free according to IEC 60947-6-2	
Power loss $P_{v\,max}$ of all main current paths	up to 0.4 A	mW	2	
Dependent on the rated current I_n	0.32 ... 1.25 A	mW	19.1	
(upper setting range)	1 ... 4 A	W	0.2	
	3 ... 12 A	W	0.7	
	8 ... 32 A	W	2.3	
Compact feeder endurance				
• Mechanical endurance		Operating cycles	10 000 000	
• Electrical endurance	*at* $I_e = 0.9\ I_n$	Operating cycles	1 520 000	
Max. switching frequency	AC-41	1/h	750	
	AC-43	1/h	250	
	AC-44	1/h	15	
Drive losses				
Active power	at 24 V			
	• Up to 12 A	W	2.7	
	• 8 ... 32 A	W	2.95	
	at 42 ... 70 V AC/DC			
	• Up to 12 A	W	2.5	
	• 8 ... 32 A	W	3.0	
	at 110 ... 240 V AC/DC			
	• Up to 12 A	W	3.4	
	• 8 ... 32 A	W	3.8	
Overload function				
Ratio of lower to upper current mark			1:4	
Shock resistance (sine-wave pulse)			a = 60 m/s² = 6g with 10 ms; for every 3 shocks in all axes	
Vibratory load			f =1 ... 6 Hz; d =15 mm 10 cycles f =150 Hz; a = 2 g	
Degree of protection	according to IEC 60947-1		IP20	
Touch protection	according to DIN VDE 0106, Part 100		Finger-safe	
Isolating features of the compact feeder	according to IEC/EN 60947-3		Yes	
Main and EMERGENCY-STOP switch characteristics of the compact feeder and accessories	according to IEC/EN 60204		Yes	

Type			**3RA61**	**3RA62**
Size			**S0**	
Number of poles			**3**	
General data				
Safe isolation	according to IEC 60947-2			
Control circuit to auxiliary circuit				
• Horizontal standard mounting rail		V	Up to 400	
• Other mounting position		V	Up to 250	
Auxiliary circuit to auxiliary circuit				
• Horizontal standard mounting rail		V	Up to 400	
• Other mounting position		V	Up to 250	
Main circuit to auxiliary circuit				
• Any mounting position		V	Up to 400	
EMC interference immunity	according to IEC 60947-1		Corresponds to degree of severity 3	
Conductor-related interference	BURST according to IEC 61000-4-4	kV	4	
Conductor-related interference	SURGE according to IEC 61000-4-5			
• Conductor - Ground		kV	4	
• Conductor - Conductor		kV	1	
Electrostatic discharge	according to IEC 61000-4-2	kV	8	
ESD		kV	6	
Field-related interference	according to IEC 61000-4-3	V/m	10	
Auxiliary switches				
• Integrated			2 NO, 1 NC, 1 CO	3 NO, 1 CO
• Expandable			1 x auxiliary switch	1 x auxiliary switch per direction of rotation
			2 NO, 2 NC, 1 NO + 1 NC	2 NO, 2 NC, 1 NO + 1 NC
Surge suppressors			integrated (Varistor)	
Degree of pollution			3	
Depth from standard mounting rail		mm	160	
Electromagnetic operating mechanisms				
Control voltage		V	24 AC/DC	
		V	42 ... 70	
		V	110 ... 240	
Frequency	at AC	Hz	50/60 (±5 %)	
Operating range			0.7 ... 1.25 U_s	
No-load switching frequency		1/h	3600	
Opening delay time		ms	Max. 70	
Closing delay time		ms	Max. 120	
Max. pick-up current at 24 V DC	at 12 A	mA	250	
	at 32 A	mA	350	
Max. hold current at 24 V DC	at 12 A	mA	100	
	at 32 A	mA	150	
Max. pick-up power at 24 V DC	at 12 A	W	6.0	
	at 32 A	W	8.4	
Max. hold power at 24 V DC	at 12 A	W	2.4	
	at 32 A	W	3.6	
Hold current and hold power valid for 24 V operating range				
	24 V, AC operation			
	• Up to 12 A			
Hold current		mA	132	
Active power		W	2.7	
Apparent power		VA	3.15	
p.f.			0.86	
	• 8 ... 32 A			
Hold current		mA	144	
Active power		W	3.0	
Apparent power		VA	3.45	
p.f.			0.86	
	24 V, DC operation			
	• Up to 12 A			
Hold current		mA	100	
Active power		W	2.45	
Apparent power		VA	2.75	
p.f.			0.88	
	• 8 ... 32 A			
Hold current		mA	116	
Active power		W	2.8	
Apparent power		VA	3.3	
p.f.			0.85	

3RA61, 3RA62 Compact Feeders

3RA61 direct-on-line starters, 3RA62 reversing starters

Type			3RA61	3RA62
Size			S0	
Number of poles			3	
Electromagnetic operating mechanisms				
Hold current and hold power valid for operating range 42 V ... 70 V				
	42 V, AC operation			
	• Up to 12 A			
Hold current		mA	75	
Active power		W	2.35	
Apparent power		VA	3.2	
p.f.			0.734	
	• 8 ... 32 A			
Hold current		mA	84	
Active power		W	2.7	
Apparent power		VA	3.6	
p.f.			0.73	
	42 V, DC operation			
	• Up to 12 A			
Hold current		mA	55	
Active power		W	2.3	
Apparent power		VA	2.7	
p.f.			0.853	
	• 8 ... 32 A			
Hold current		mA	63	
Active power		W	2.7	
Apparent power		VA	3.35	
p.f.			0.85	
	70 V, AC operation			
	• Up to 12 A			
Hold current		mA	54	
Active power		W	2.5	
Apparent power		VA	3.8	
p.f.			0.654	
	• 8 ... 32 A			
Hold current		mA	58.5	
Active power		W	2.7	
Apparent power		VA	4	
p.f.			0.65	
	70 V, DC operation			
	• Up to 12 A			
Hold current		mA	33	
Active power		W	2.35	
Apparent power		VA	2.9	
p.f.			0.813	
	• 8 ... 32 A			
Hold current		mA	37	
Active power		W	2.6	
Apparent power		VA	3.0	
p.f.			0.81	
Hold current and hold power valid for operating range 110 V ... 240 V				
	110 V, AC operation			
	• Up to 12 A			
Hold current		mA	38	
Active power		W	2.8	
Apparent power		VA	4.2	
p.f.			0.67	
	• 8 ... 32 A			
Hold current		mA	42.5	
Active power		W	3.2	
Apparent power		VA	4.7	
p.f.			0.68	
	110 V, DC operation			
	• Up to 12 A			
Hold current		mA	22.5	
Active power		W	2.5	
Apparent power		VA	3.75	
p.f.			0.67	
	• 8 ... 32 A			
Hold current		mA	25.5	
Active power		W	2.9	
Apparent power		VA	4.65	
p.f.			0.62	
	240 V, AC operation			
	• Up to 12 A			
Hold current		mA	36	
Active power		W	3.6	
Apparent power		VA	8.8	
p.f.			0.41	
	• 8 ... 32 A			
Hold current		mA	39	
Active power		W	3.9	
Apparent power		VA	9.3	
p.f.			0.42	

Type			**3RA61**	**3RA62**
Size			**S0**	
Number of poles			**3**	
Electromagnetic operating mechanisms				
Hold current and hold power valid for operating range 110 V ... 240 V				
	240 V, DC operation			
	• Up to 12 A			
Hold current		mA	12.5	
Active power		W	3.0	
Apparent power		VA	6.35	
p.f.			0.47	
	• 8 ... 32 A			
Hold current		mA	14	
Active power		W	3.35	
Apparent power		VA	6.55	
p.f.			0.51	
Switching capacity at 400 V		kA	53	
Switching capacity at 690 V		kA	3	
Line protection	at 10 kA	mm^2	2.5	
	at 50 kA	mm^2	4	
Shock resistance				
• Breaker mechanism OFF		*g*	25	
• Breaker mechanism ON		*g*	15	
Normal switching duty				
Making capacity			12 x I_n	
Breaking capacity			10 x I_n	
Switching capacity dependent on rated current	up to 12 A	kW	5.5	
	up to 32 A	kW	15	
Endurance in operating cycles				
• Mechanical endurance			10 000 000	
• Electrical endurance	at I_e = 0.9 x I_n		1 520 000	

Type			**3RA61**	**3RA62**
Size			**S0**	
Number of poles			**3**	
Control circuit				
Rated operational voltage				
• External auxiliary switch block		V	400/690	
• Internal auxiliary switch		V	400/690	
• Short-circuit signal switch		V	400	
• Overload signal switch		V	400	
Switching capacity				
• External auxiliary switch block	AC-15			
	• At U_e = 230 V	A	6	
	• At U_e = 400 V	A	3	
	• At U_e = 289/500 V	A	2	
	• At U_e = 400/690 V	A	1	
	DC-13			
	• At U_e = 24 V	A	6	
	• At U_e = 60 V	A	0.9	
	• At U_e = 125 V	A	0.55	
	• At U_e = 250 V	A	0.27	
• Internal auxiliary switch	AC-15			
	• At U_e = 230 V	A	6	
	• At U_e = 400 V	A	3	
	• At U_e = 289/500 V	A	2	
	• At U_e = 400/690 V	A	1	
	DC-13			
	• At U_e = 24 V	A	10	
	• At U_e = 60 V	A	2	
	• At U_e = 125 V	A	1	
	• At U_e = 250 V	A	0.27	
	• At U_e = 480 V	A	0.1	
• Signal switch	AC-15			
	• At U_e = 230 V	A	3	
	• At U_e = 400 V	A	1	
	DC-13			
	• At U_e = 24 V	A	2	
	• At U_e = 250 V	A	0.11	

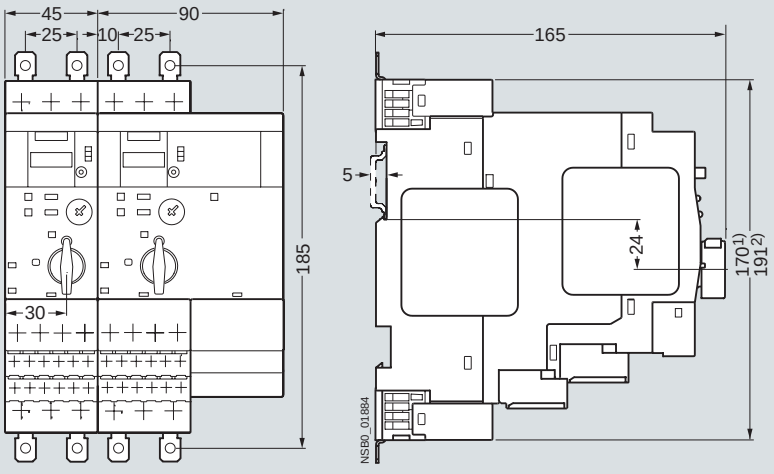
3RA61, 3RA62 Compact Feeders

3RA61 direct-on-line starters, 3RA62 reversing starters

Type			**3RA61**	**3RA62**
Size			**S0**	
Number of poles			**3**	
External auxiliary switch blocks, internal auxiliary switches				
Endurance in operating cycles				
• Mechanical endurance			10 000 000	
• Electrical endurance	AC-15, 230 V			
	• At 6 A		200 000	
	• At 3 A		500 000	
	• At 1 A		2 000 000	
	• At 0.3 A		10 000 000	
	DC-13, 24 V			
	• At 6 A		30 000	
	• At 3 A		100 000	
	• At 0.5 A		2 000 000	
	• At 0.2 A		10 000 000	
	DC-13, 110 V			
	• At 1 A		40 000	
	• At 0.55 A		100 000	
	• At 0.3 A		300 000	
	• At 0.1 A		2 000 000	
	• At 0.04 A		10 000 000	
	DC-13, 220 V			
	• At 0.3 A		110 000	
	• At 0.1 A		650 000	
	• At 0.05 A		2 000 000	
	• At 0.018 A		10 000 000	
Contact stability	at 17 V and 5 mA	Operating cycles	1 incorrect switching operation per 100 000 000	
Short-circuit protection				
• Short-circuit current $I_K \leq 1.1$ kA	Fuse links gL/gG NEOZED 5SE, DIAZED 5SB, LV HRC 3NA	A	10	
• Short-circuit current $I_K < 400$ A	Miniature circuit breaker up to 230 V with C characteristic	A	10	
Signal switches				
Endurance in operating cycles				
• Mechanical endurance			20 000	
• Electrical endurance AC-15	at 230 V and 3 A		6050	
Contact stability	at 17 V and 5 mA	Operating cycles	1 incorrect switching operation per 100 000 000	
Short-circuit protection				
• Short-circuit current $I_K \leq 1.1$ kA	Fuse links gL/gG NEOZED 5SE, DIAZED 5SB, LV HRC 3NA	A	6	
• Short-circuit current $I_K < 400$ A	Miniature circuit breaker up to 230 V with C characteristic	A	6	
Overload (short-circuit current $I_K \leq 1.1$ kA)	Fuse links gL/gG NEOZED 5SE, DIAZED 5SB, LV HRC 3NA	A	4	

Dimensional drawings

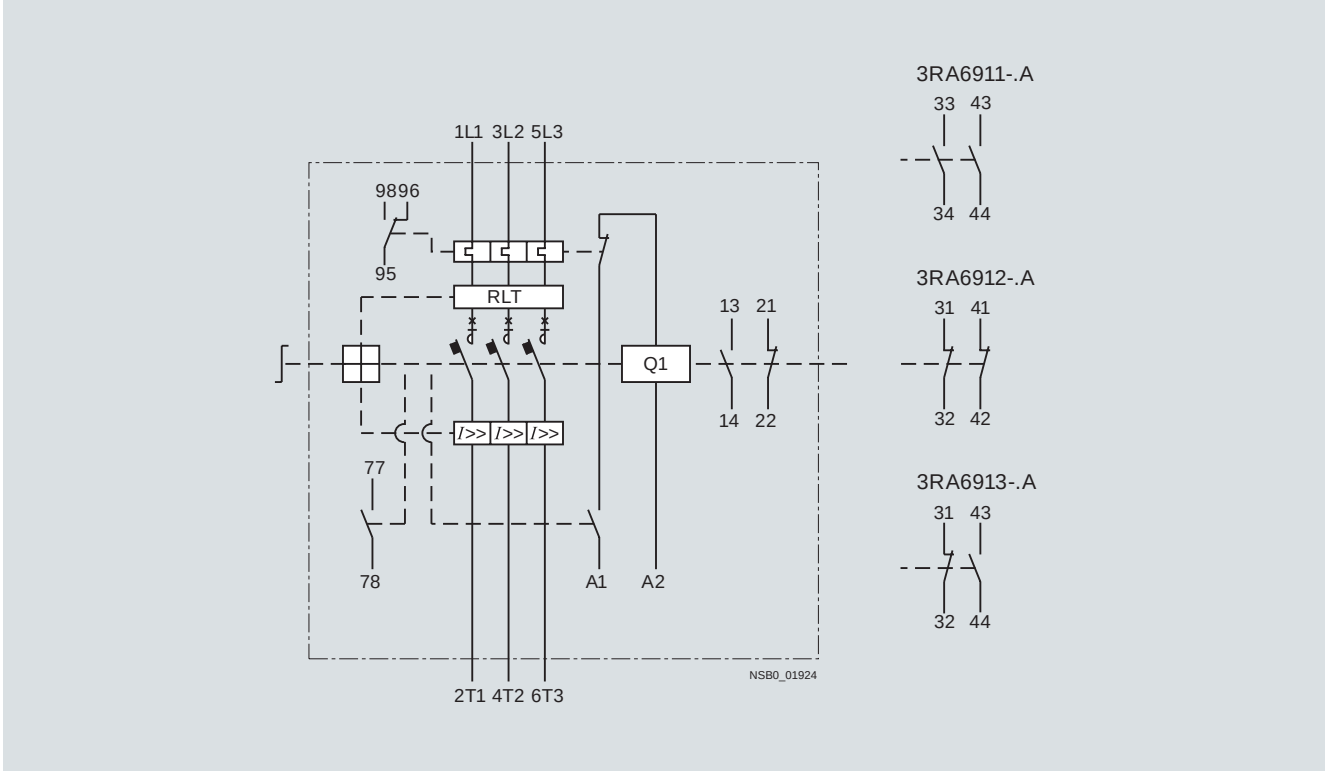
Direct-on-line starters and reversing starters



1) Screw connection
2) Spring-loaded connection

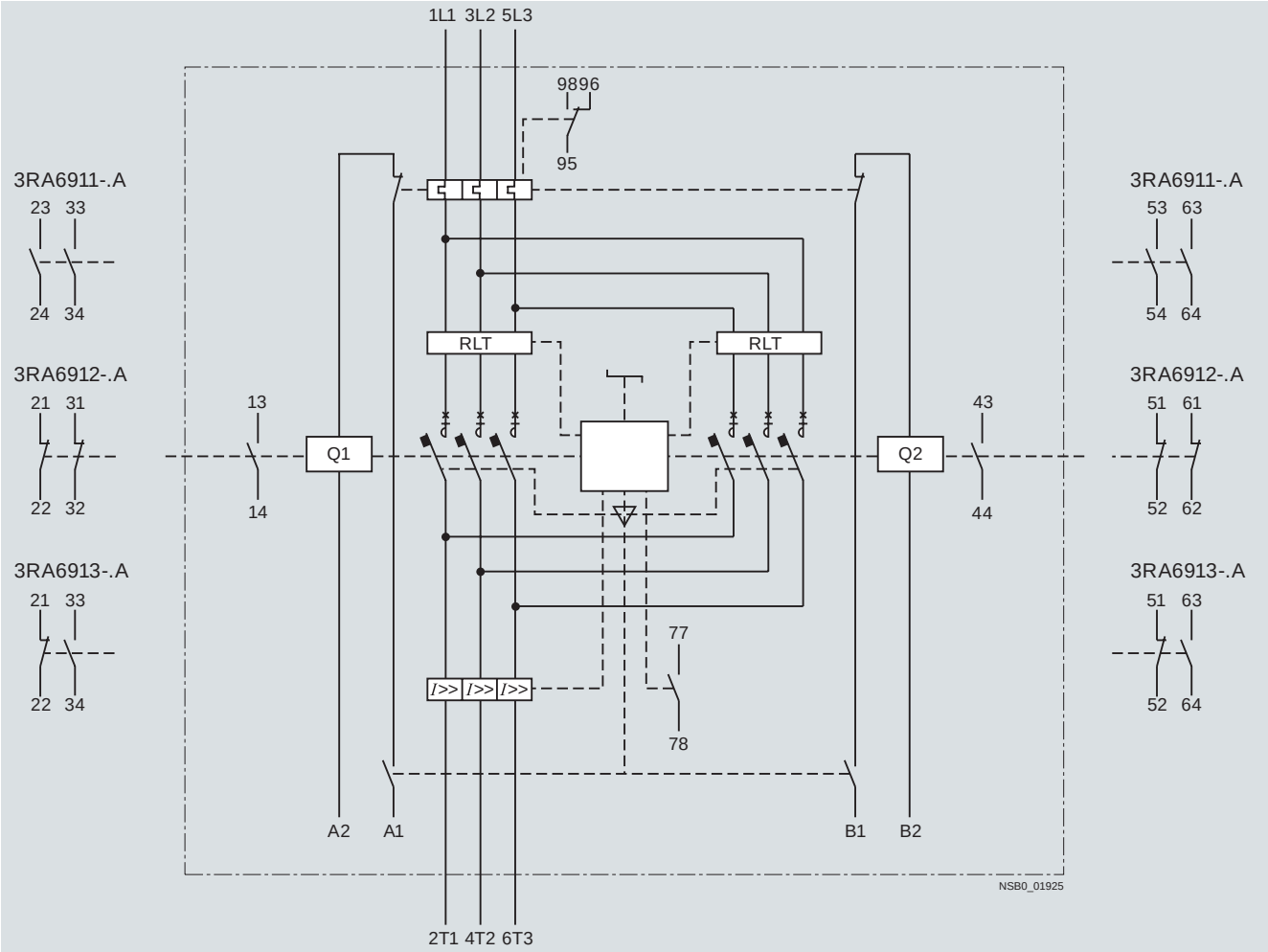
Schematics

3RA61 direct-on-line starters



Schematic for 3RA61 direct-on-line starters (main circuit)

3RA62 reversing starters



Schematic for 3RA62 reversing starters (main circuit)

Technical specifications

Connection type		Screw connection		Spring-loaded connection	
Max. rated current I_{max}		**12 A**	**32 A**	**12 A**	**32 A**
Conductor cross-sections of main circuit terminals					
Tools		Pozidriv size 2		(3.5 x 0.5) mm, 8WA2 803	
Prescribed tightening torque	Nm	2 ... 2.5		--	
Minimum/maximum conductor cross-sections					
• Solid	mm^2 mm^2 mm^2	2 x (1.5 ... 2.5) 2 x (2.5 ... 6) Max. 1 x 10	2 x (2.5 ... 6) Max. 1 x 10	2 x (1.5 ... 6) Max. 1 x 10	2 x (2.5 ... 6) Max. 1 x 10
• Finely stranded without end sleeve	mm^2	--	--	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• Finely stranded with end sleeve	mm^2 mm^2	2 x (1.5 ... 2.5) 2 x (2.5 ... 6)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• AWG cables	AWG AWG AWG	2 x (16 ...14) 2 x (14 ...10) 1 x 8	2 x (14 ...10) 1 x 8	2 x (16 ...10) 1 x 8	2 x (14 ...10) 1 x 8

Connection type		Screw connection	Spring-loaded connection
Conductor cross-sections of control circuit terminals			
Tools		Pozidriv size 2	(3.0 x 0.5) mm, DIN ISO 2380-1A
Prescribed tightening torque	Nm	0.8 ... 1.2	--
Minimum/maximum conductor cross-sections			
• Solid	mm^2 mm^2	1 x (0.5 ... 4) 2 x (0.5 ... 2.5)	2 x (0.25 ... 1.5)
• Finely stranded without end sleeve	mm^2	--	2 x (0.25 ... 1.5)
• Finely stranded with end sleeve	mm^2 mm^2	1 x (0.5 ... 2.5) 2 x (0.5 ... 1.5)	2 x (0.25 ... 1.5)
• AWG cables	AWG	2 x (20 ... 14)	2 x (24 ... 16)
Conductor cross-sections of the auxiliary switch for compact feeders			
Order No.		**3RA69 1.-1A**	**3RA69 1.-2A**
Tools		Pozidriv size 2	(2.5 x 0.4) mm, 8WA2 807
Prescribed tightening torque	Nm	0.8 ... 1.2	--
Conductor cross-sections			
• Solid	mm^2 mm^2 mm^2	2 x (0.5 ...1.5) 2 x (0.75 ... 2.5) 2 x (1 ... 4)	2 x (0.25 ... 2.5)
• Finely stranded without end sleeve	mm^2	--	2 x (0.25 ... 2.5)
• Finely stranded with end sleeve	mm^2 mm^2	2 x (0.5 ... 1.5) 2 x (0.75 ... 2.5)	2 x (0.25 ... 1.5)
• AWG cables	AWG AWG AWG	2 x (20 ... 16) 2 x (18 ... 14) 1 x 12	2 x (24 ... 14)

Accessories

For 3RA6 direct-on-line and reversing starters

Order No.			3RA6970-3A, 3RA6970-3B,
General data of the AS-i add-on module			
Permissible ambient temperature			
• Storage	according to IEC/EN 60721-3-1	°C	-25 ... +70
• Transport	according to IEC/EN 60721-3-2	°C	-25 ... +70
Degree of protection	according to IEC/EN 60947-1		IP20
EMC interference immunity	according to EN 50295		
Conductor-related interference	BURST according to IEC/EN 61000-4-4	kV	1/2
Electrostatic discharge	according to IEC/EN 61000-4-2	kV	6/8
Field-related interference	according to IEC/EN 61000-4-3	V/m	10 (80 MHz ... 2.7 GHz)

Order No.		3RA6970-3B
Connection type		**Screw connection**
Conductor cross-sections of the AS-i add-on module		
Tools		Pozidriv size 1
Prescribed tightening torque	Nm	0.5 ... 0.6
Conductor cross-sections		
• Solid	mm^2	1 x (0.5 ... 2.5)
	mm^2	2 x (0.5 ... 1.0)
• Finely stranded with end sleeve	mm^2	1 x (0.5 ... 2.5)
	mm^2	2 x (0.5 ... 1.0)
• AWG cables	AWG	1 x (20 ... 12)

Technical specifications

Type			3RA6.	
General data				
Max. rated operational current				
• Infeed with screw connection 50/70 mm²		A	100	
• Infeed with screw connection 25/35 mm²		A	63	
• Infeed with spring-type connection 25/35 mm²		A	80	
• Expansion plugs		A	63	
Permissible ambient temperature				
• During operation		°C	-20 ... +60 (over +40 current reduction is required)	
- Permissible rated current at control cabinet inside temperature: +40 °C		%	100	
+60 °C		%	80	
• During storage/transport		°C	-55 ... +80	
Relative air humidity		%	10 ... 90	
Installation altitude		m	Up to 2000 above sea level without restriction	
Rated operational voltage U_e		V	AC 690	
Rated frequency		Hz	50/60	
Shock resistance			a = 60 m/s² = 6g with 10 ms; for every 3 shocks in all axes	
Vibratory load			f =1 ... 6 Hz; d =15 mm 10 cycles f =150 Hz; a = 2 g	
Degree of protection	according to IEC 60947-1		IP20 (IP 00 terminal compartment)	
Touch protection	according to EN 50274		Finger-safe	
Degree of pollution			3	
Short-circuit protection for infeed with screw connection (25/35 mm²) and infeed with screw connection (50/70 mm²)				Recommendation for upstream short-circuit protection device
	$I_{d,max}$	kA	< 21	3RV1041-4MA10
	I^2t	kA²s	530	LV HRC gL/gG 3NA3, 315 A
Short-circuit protection for infeed with spring-type connection				Recommendation for upstream short-circuit protection device
• Conductor cross-section 4 mm²	$I_{d,max}$	kA	< 9.5	3RV1021-4DA10
	I^2t	kA²s	85	
• Conductor cross-section 6 mm²	$I_{d,max}$	kA	< 12.5	3RV1031-4EA10
	I^2t	kA²s	140	
• Conductor cross-section 10 mm²	$I_{d,max}$	kA	< 15	3RV1031-4HA10
	I^2t	kA²s	180	
• Conductor cross-section 16 / 25 mm²	$I_{d,max}$	kA	< 19	3RV1041-4JA10
	I^2t	kA²s	440	
Short-circuit protection for terminal blocks				
• Conductor cross-section 1.5 mm²	$I_{d,max}$	kA	7.5	
• Conductor cross-section 2.5 mm²	$I_{d,max}$	kA	9.5	
• Conductor cross-section 4 mm²	$I_{d,max}$	kA	9.5	
• Conductor cross-section 6 mm²	$I_{d,max}$	kA	12.5	

Type			3RV19.	
Connection type			**Spring-loaded connection**	
Conductor cross-sections of terminal blocks				
Order No.			**3RV19 17-5D**	
Conductor cross-sections				
• Solid		mm²	1.5 ... 6	
• Finely stranded with end sleeve		mm²	1.5 ... 4	
• Finely stranded without end sleeve		mm²	1.5 ... 6	
• AWG cables, solid or stranded		AWG	15 ... 10	

Infeed Systems

Infeed systems for 3RA6

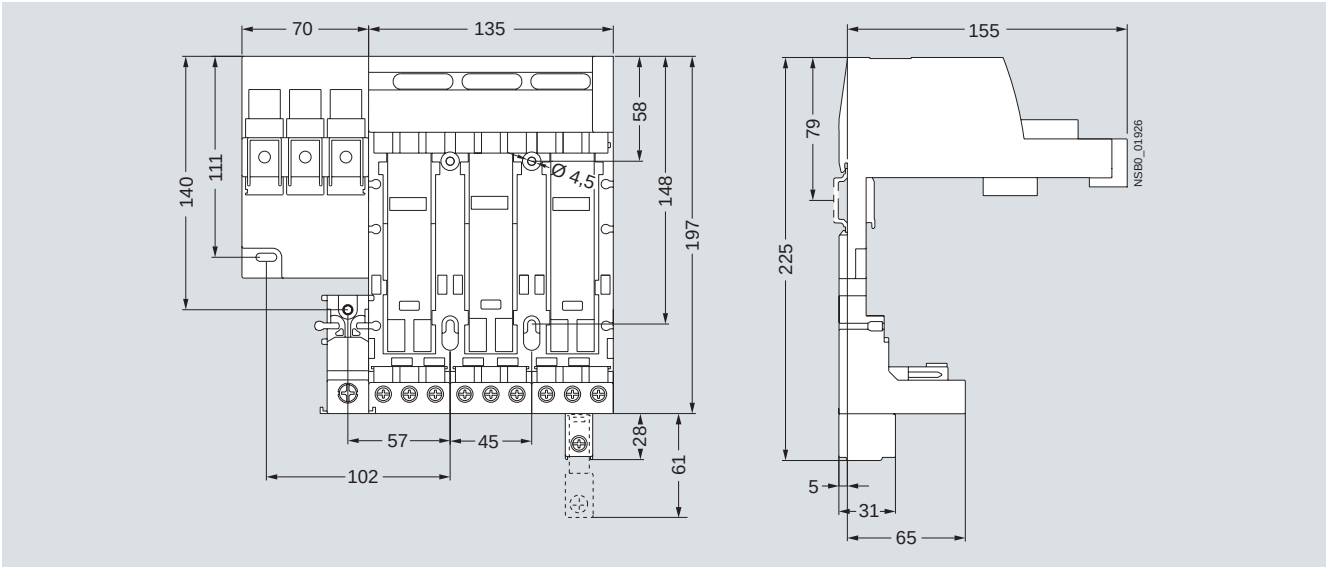
Type			**3RA6.**		
Connection type			**Screw connection**		
Conductor cross-sections of infeed with screw connection 25/35 mm² (L1, L2, L3)[1] and PE infeed 25/35 mm²					
Order No.			**3RA68 12-8AB, 3RA68 12-8AC, 3RA68 60-6AB**		
Tools		Pozidriv	Size 2		
Prescribed tightening torque		Nm	3 ... 4.5		
			 NSB00479	 NSB00480	 NSB00481
Conductor cross-sections					
• Solid		mm^2	2.6 ... 16	2.6 ... 16	max. 2 x 16
• Stranded		mm^2	2.5 ... 35	2.5 ... 35	max. 2 x 25
• Finely stranded with end sleeve		mm^2	2.5 ... 25	2.5 ... 25	max. 2 x 16
• Finely stranded without end sleeve		mm^2	2.5 ... 25	2.5 ... 25	max. 2 x 16
• AWG cables		AWG	12 ... 2	12 ... 2	max. 2 x (18 ... 2)
Connection type			**Screw connection**		
Conductor cross-sections of infeed with screw connection 50/70 mm² (L1, L2, L3)[1]					
Order No.			**3RA68 13-8AB, 3RA68 13-8AC**		
Tools		SW	4		
Prescribed tightening torque		Nm	6 ... 8		
			 NSB00479	 NSB00480	 NSB00481
Conductor cross-sections					
• Solid		mm^2	2.5 ... 16	2.5 ... 16	Max. 2 x 16
• Stranded		mm^2	4 ... 70	10 ... 70	Max. 2 x 50
• Finely stranded with end sleeve		mm^2	2.5 ... 35	2.5 ... 50	Max. 2 x 35
• Finely stranded without end sleeve		mm^2	4 ... 50	10 ... 50	Max. 2 x 35
• AWG cables		AWG	10 ... 2/0	10 ... 2/0	Max. 2 x (10 ... 1/0)
Connection type			**Spring-loaded connection**		
Conductor cross-sections of infeed with spring-type connection 25/35 mm² (L1, L2, L3)[1] and PE infeed 25/35 mm²					
Order No.			**3RA68 30-5AC, 3RA68 60-5AC**		
Tools	8WA2 806	mm	5.5 x 0.8		
Conductor cross-sections					
• Solid		mm^2	4 ... 16		
• Stranded		mm^2	4 ... 35		
• Finely stranded with end sleeve		mm^2	4 ... 25		
• Finely stranded without end sleeve		mm^2	6 ... 25		
• AWG cables		AWG	10 ... 3		

Connection type			**Screw connection**		**Spring-loaded connection**	
Conductor cross-sections of infeed with screw connection 25/35 mm² (T1, T2, T3)[2], infeed with screw connection 50/70 mm² (T1, T2, T3)[2], 2-socket and 3-socket expansion modules (T1,T2,T3)[2] and PE pick-off 6/10 mm²						
Order No.			**3RA68 12-8AB, 3RA68 13-8AB, 3RA68 22-0AB, 3RA68 23-0AB, 3RA68 70-4AB**		**3RA68 12-8AC, 3RA68 13-8AC, 3RA68 22-0AC, 3RA68 23-0AC, 3RA68 70-3AC**	
Tools			Pozidriv size 2		(3.5 x 0.5) mm, 8WA2 803	
Prescribed tightening torque		Nm	2 ... 2.5		--	
Maximum rated current		A	**12**	**32**	**12**	**32**
Conductor cross-sections						
• Solid		mm^2	2 x (1 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
		mm^2	2 x (2.5 ... 6)			
		mm^2	Max. 1 x 10	Max. 1 x 10	Max. 1 x 10	Max. 1 x 10
• Finely stranded with end sleeve		mm^2	--	--	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• Finely stranded without end sleeve		mm^2	2 x (1 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
		mm^2	2 x (2.5 ... 6)			
• AWG cables		AWG	2 x (16 ... 14)	2 x (14 ... 10)	2 x (16 ... 10)	2 x (14 ... 10)
		AWG	2 x (14 ... 10)			
		AWG	1 x 8	1 x 8	1 x 8	1 x 8

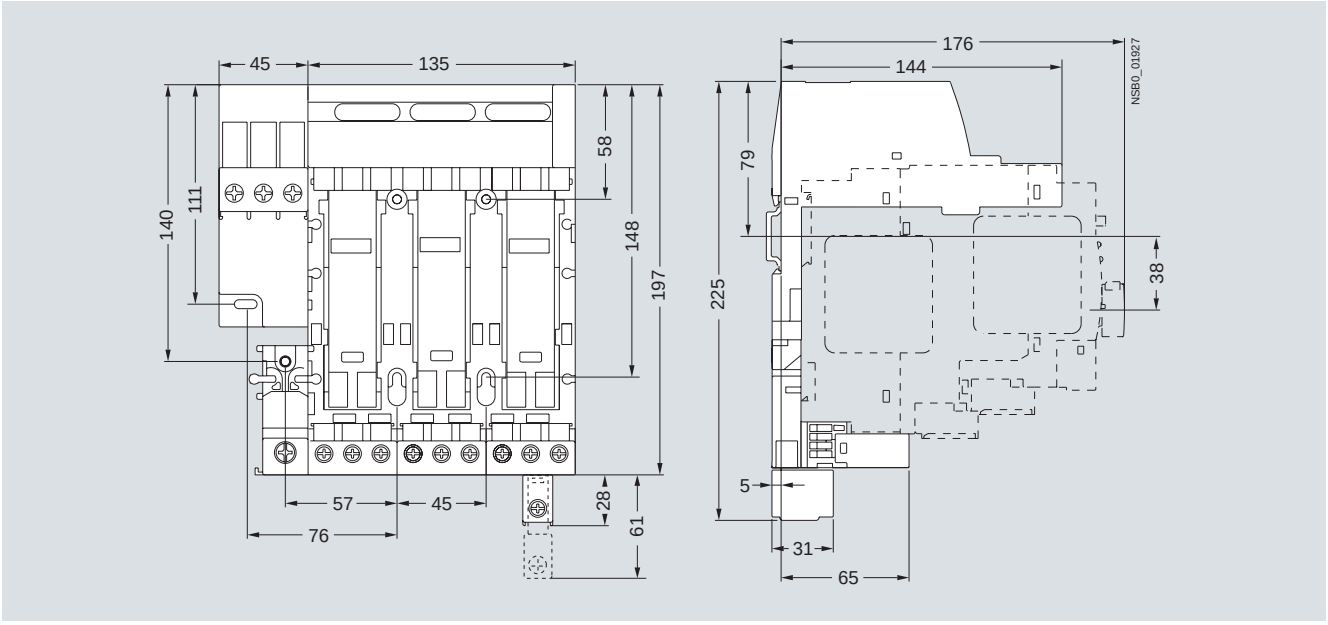
[1] L1, L2, L3 main conductors on input side.

[2] T1, T2, T3 main conductors on output side.

Dimensional drawings

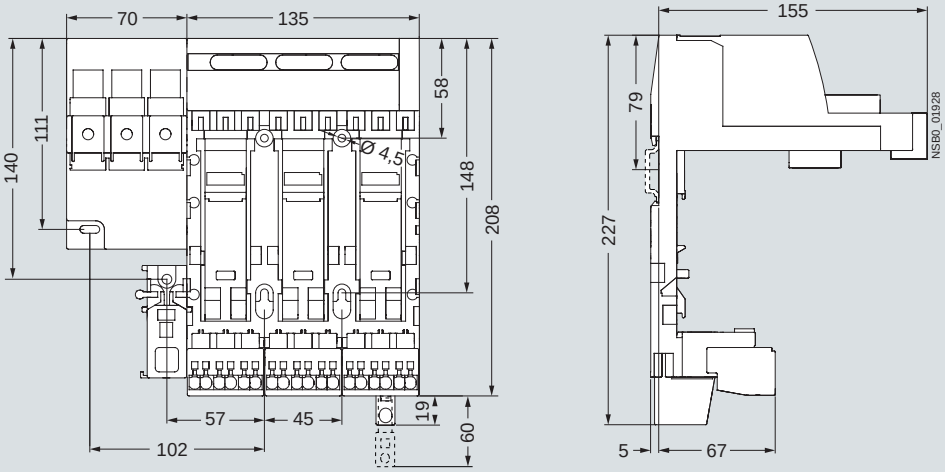


Infeed with screw connection 50/70 mm^2 on left with fixed 3-socket expansion module with outgoing screw terminals

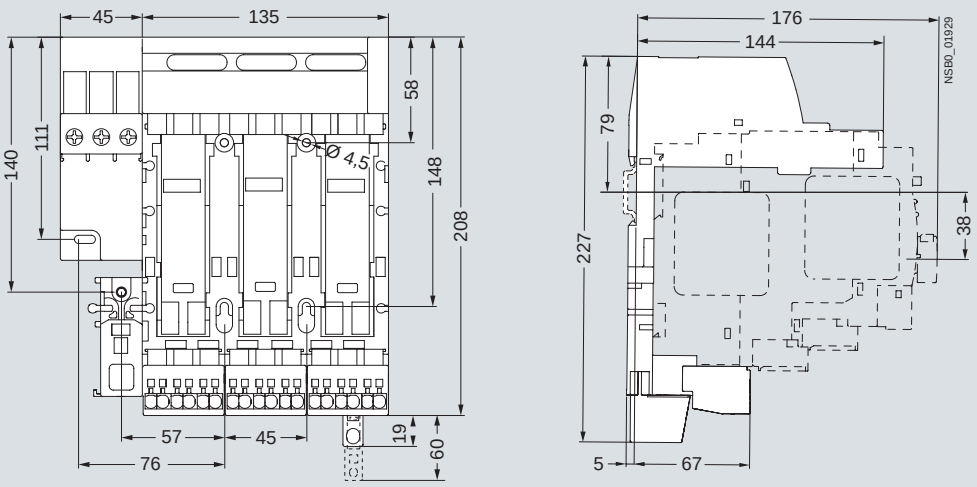


Infeed with screw connection 25/35 mm^2 on left with fixed 3-socket expansion module with outgoing screw terminals

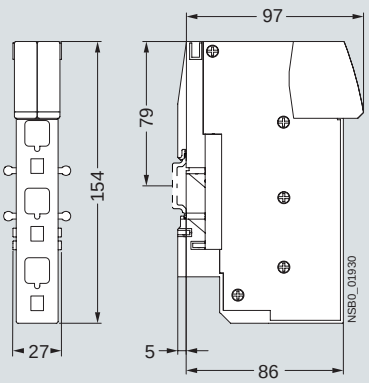
Infeed systems for 3RA6



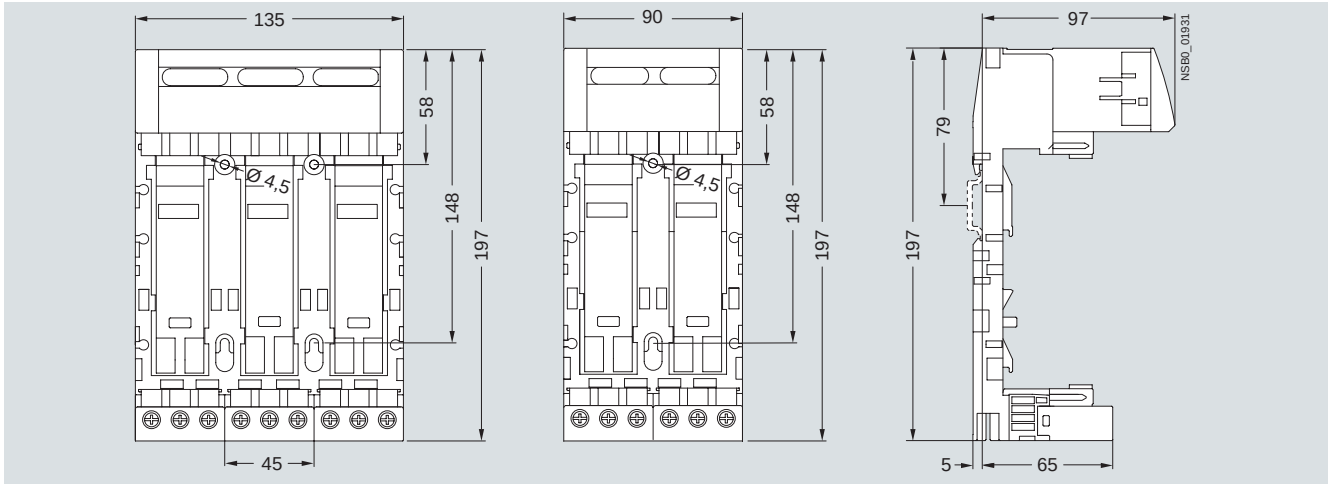
Infeed with screw connection 50/70 mm^2 on left with fixed 3-socket expansion module with outgoing spring-loaded terminals



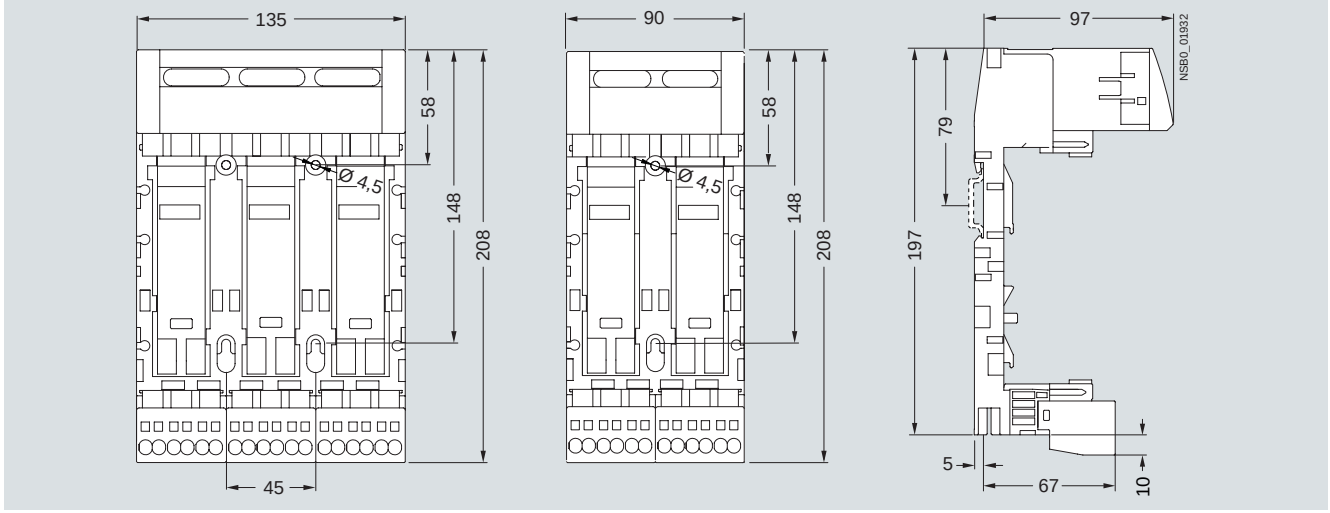
Infeed with screw connection 25/35 mm^2 on left with fixed 3-socket expansion module with outgoing spring-loaded terminals



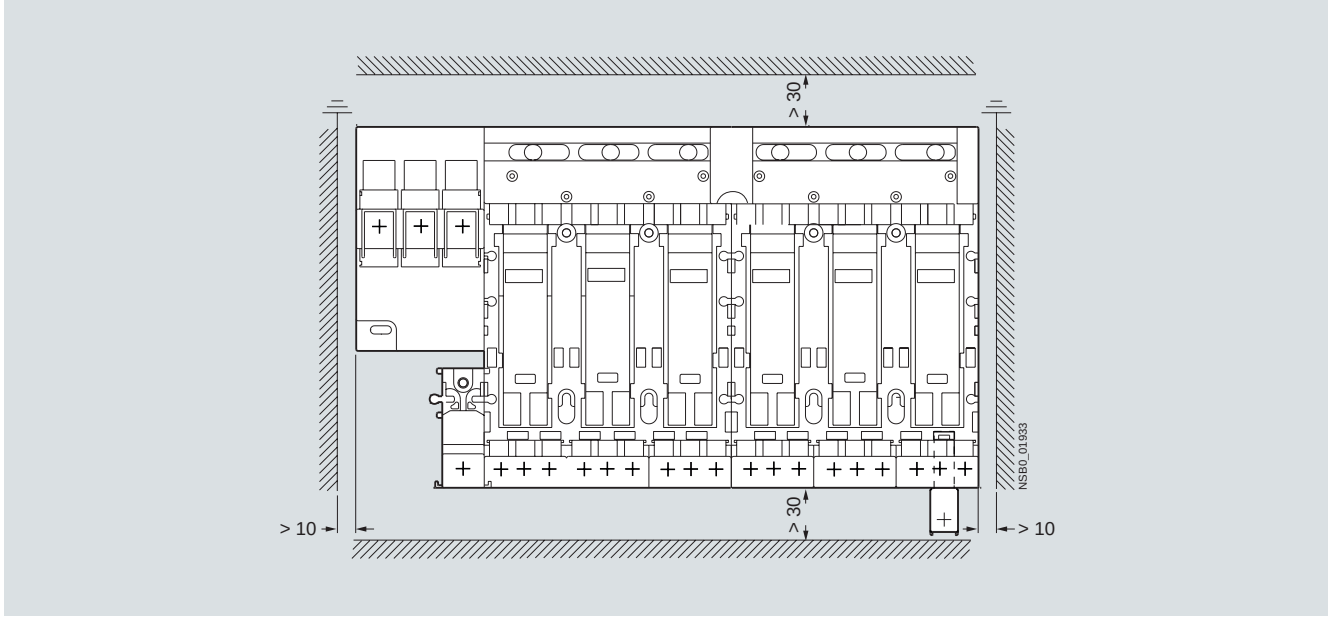
Infeed with spring-type connection



3-socket expansion module and 2-socket expansion module with outgoing screw terminals



3-socket expansion module and 2-socket expansion module with outgoing spring-loaded terminals



Minimum distances to adjacent components when using infeed system for 3RA6

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