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SIRIUS

Industrial Controls

Catalog
IC 10

Edition
2018

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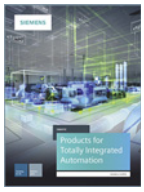

Low-Voltage Power Distribution and Electrical Installation Technology LV 10
SENTRON • SIVACON • ALPHA
Protection, Switching, Measuring and Monitoring Devices, Switchboards and Distribution Systems

PDF (E86060-K8280-A101-A4-7600)
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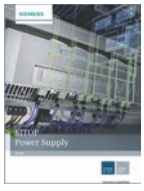
SIMOTICS GP, SD, XP, DP Low-Voltage Motors D 81.1
Type series 1FP1, 1LE1, 1MB1 and 1PC1
Frame sizes 71 to 315
Power range 0.09 to 200 kW
E86060-K5581-A111-A9-7600

SITOP KT 10.1
Power supply
SITOP

E86060-K2410-A101-B2-7600



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Interactive Catalog
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for the selection, configuration and ordering of TIA products and devices

www.siemens.com/tst

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Industrial Controls

SIRIUS

Catalog IC 10 · 2018

Supersedes:
Catalog IC 10 · 2017
Catalog Abridged IC 10 A · 03/2017 ET 200SP motor starters
Catalog Abridged IC 10 A · 04/2017 SIMOCODE pro 3UF7 Motor Management and Control Devices

Refer to the Industry Mall for current updates of this catalog:
www.siemens.com/industrymall

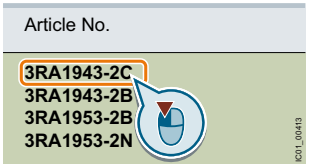
The products contained in this catalog can also be found in the Interactive Catalog CA 01.
Article No.: E86060-D4001-A510-D8-7600.

Please contact your local Siemens branch.

The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with DIN EN ISO 9001
(For Certified Registration, see www.siemens.com/system-certificates/cp).
The certificate is recognized by all IQNet countries.

NEW

Click on the Article No. in the catalog PDF to access it in the Industry Mall and get all related information.



Or directly in the Internet, e. g. www.siemens.com/product?3RA1943-2C

Introduction

Overview

More information	
Homepage, see www.siemens.com/soft-starter	Online configurator, see www.siemens.com/sirius/configurators
Industry Mall, see www.siemens.com/product?3RW	Simulation Tool for Soft Starters (STS), see page 14/5 or https://support.industry.siemens.com/cs/ww/en/view/101494917

3RW30

3RW40

3RW44

		Article No.	Page
3RW soft starters			
3RW soft starters for standard applications			
3RW30 soft starters	• SIRIUS 3RW30 soft starters for soft starting of three-phase asynchronous motors • Current range of up to 106 A • Performance range of up to 55 kW (at 400 V), up to 75 hp (at 460 V)	**3RW30**	6/8
3RW40 soft starters	• SIRIUS 3RW40 soft starters with the integral functions - electronic motor overload and intrinsic device protection and - adjustable current limiting for the soft starting and stopping of three-phase asynchronous motors • Current range of up to 432 A • Performance range of up to 250 kW (at 400 V), up to 300 hp (at 460 V)	**3RW40**	6/19
3RW soft starters for High Feature applications			
3RW44 soft starters	• In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements • Current range of up to 1 214 A • Performance range - in inline circuit: up to 710 kW (at 400 V), up to 950 hp (at 460 V) - in inside-delta circuit: up to 1 200 kW (at 400 V), up to 1 700 hp (at 460 V)	**3RW44**	6/35

SIRIUS 3RW soft starters

SIRIUS 3RW soft starters permit soft starting and soft ramp-down of three-phase asynchronous motors. Depending on the scope of functions required it is possible to choose between:

- Soft starters for standard applications
- Soft starters for High Feature applications

SIRIUS 3RW – Service-proven in many applications

Functions of the SIRIUS soft starters include:

- Soft starting and ramp-down
- Stepless starting
- Torque control and limitation

Cost-efficient operation

The advantages of SIRIUS soft starters at a glance:

- Reduction of current peaks
- Avoidance of mains voltage fluctuations during starting
- Reduced load on the power supply network
- Reduction of the mechanical load in the operating mechanism
- Considerable space savings and reduced wiring compared with conventional starters
- Maintenance-free switching
- Very easy handling
- Fit perfectly in the SIRIUS modular system (3RW30 and 3RW40)

Use of soft starters in conjunction with IE3/IE4 motors

Note:

For the use of SIRIUS 3RW soft starters in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see Application Manual "Controls with IE3/IE4 Motors", https://support.industry.siemens.com/cs/ww/en/view/94770820.

For more information see page 1/7.

More information	
Homepage, see www.siemens.com/solid-state-switching-devices	Online configurator, see www.siemens.com/sirius/configurators
Industry Mall, see www.siemens.com/product?3RF	


3RF21


3RF20


3RF22


3RF23


3RF24


3RF29


3RF34 (motor)

		Article No.	Page
SIRIUS solid-state switching devices for switching resistive/inductive loads			
Solid-state relays			
Solid-state relays	• Widths of 22.5 mm and 45 mm • Compact and space-saving design • "Zero-point switching" version • Mounting onto existing heat sinks	**3RF21** **3RF20** **3RF22**	6/65 6/70 6/74
Solid-state contactors			
Solid-state contactors	• Complete units comprising a solid-state relay and an optimized heat sink, "ready to use" • Compact and space-saving design • Versions for resistive loads "zero-point switching" and inductive loads "instantaneous switching" • Special versions "Low Noise" and "Short-Circuit Proof"	**3RF23** **3RF24**	6/78 6/88
Function modules	For extending the functionality of the 3RF21 solid-state relays and the 3RF23 solid-state contactors for many different applications:		
Converters	• For converting an analog input signal into an on/off ratio; can also be used on 3RF22 and 3RF24 three-phase switching devices	**3RF2900-0EA18**	6/99
Load monitoring	• For load monitoring of one or more loads (partial loads)	**3RF29..-0FA08, 3RF29.0-0GA..**	6/100
Heating current monitoring	• For load monitoring of one or more loads (partial loads); remote teach	**3RF29..-0JA..**	6/101
Power controllers	• For setting the current by means of a solid-state switching device depending on a setpoint value set by the power controller. There is a choice of full-wave control and generalized phase control.	**3RF29..-0KA.**	6/102
Power regulators	• For regulating the current by means of a solid-state switching device, depending on a setpoint value set by the power regulator. Closed-loop control: full-wave control or generalized phase control	**3RF29.0-0HA..**	6/103
SIRIUS solid-state switching devices for switching motors			
Solid-state contactors			
Solid-state contactors, solid-state reversing contactors	• Complete units in the insulated enclosure with integrated heat sink, "ready to use" • Compact and space-saving design • Version for motors "instantaneous switching"	**3RF34**	6/108, 6/112

Use of SIRIUS solid-state switching devices for switching motors in conjunction with IE3/IE4 motors

Note:

For the use of SIRIUS 3RF solid-state switching devices for switching motors in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see Application Manual "Controls with IE3/IE4 Motors", https://support.industry.siemens.com/cs/ww/en/view/94770820.

For more information see page 1/7.

General data

Overview

More information	
Simulation Tool for Soft Starters (STS) see https://support.industry.siemens.com/cs/ww/en/view/101494917 Industry Mall, see www.siemens.com/product?3RW	Technical Assistance: Tel.: +49 (911) 895-5900, Email: technical-assistance@siemens.com

		SIRIUS 3RW30 Standard applications	SIRIUS 3RW40 Standard applications	SIRIUS 3RW44 High Feature applications
General technical specifications				
Rated current at 40 °C	***A***	***3 ... 106***	***12.5 ... 432***	***29 ... 1214***
Rated operational voltage	V	200 ... 480	200 ... 600	200 ... 690[1]
Motor rating at 400 V				
• Inline circuit	kW	1.5 ... 55	5.5 ... 250	15 ... 710
	hp	1.5 ... 75	7.5 ... 300	15 ... 950
• Inside-delta circuit	kW	--	--	22 ... 1 200
	hp	--	--	30 ... 1 700
Ambient temperature	°C	-25 ... +60	-25 ... +60	0 ... +60
Soft starting/ramp-down		✓[2]	✓	✓
Voltage ramp		✓	✓	✓
Starting/stopping voltage	%	40 ... 100	40 ... 100	20 ... 100
Starting and ramp-down time	s	0 ... 20[2]	0 ... 20	0 ... 360
Torque control		--	--	✓
Starting/stopping torque	%	--	--	20 ... 100
Torque limit	%	--	--	20 ... 200
Integral bypass contact system		✓	✓	✓
Intrinsic device protection		--	✓	✓
Motor overload protection		--	✓[3]	✓
Thermistor motor protection		--	✓[4]	✓
Integrated remote RESET		--	✓[5]	✓
Adjustable current limiting		--	✓	✓
Inside-delta circuit		--	--	✓
Breakaway pulse		--	--	✓
Creep speed in both directions of rotation		--	--	✓
Pump stop (torque control)		--	--	✓[6]
DC braking		--	--	✓[6] [7]
Combined braking		--	--	✓[6] [7]
Motor heating		--	--	✓
Communication		--	--	PROFIBUS/PROFINET (optional)
External display and operator module		--	--	(optional)
Operating measured value display		--	--	✓
Error logbook		--	--	✓
Event list		--	--	✓
Slave pointer function		--	--	✓
Trace function		--	--	✓[8]
Programmable control inputs and outputs		--	--	✓
Number of parameter sets		1	1	3
SIRIUS Soft Starter ES (TIA Portal) parameterization software		--	--	✓
Soft Starter ES parameterization software		--	--	✓
SIRIUS 3RW44 Soft Starter block library for SIMATIC PCS 7		--	--	✓

✓ Function available, -- Function not available

1) In inside-delta circuit up to 600 V.

2) Only soft starting available for 3RW30.

3) When using the motor overload protection according to ATEX, an upstream contactor is required.

4) Optional up to size S3 (device version).

5) For 3RW402. to 3RW404.; for 3RW405. and 3RW407. optional.

6) Calculate soft starter and motor with size allowance where required.

7) Not possible in inside-delta circuit.

8) Trace function with Soft Starter ES software.



		SIRIUS 3RW30 Standard applications	SIRIUS 3RW40 Standard applications	SIRIUS 3RW44 High Feature applications
General technical specifications				
Rated current at 40 °C	***A***	***3 ... 106***	***12.5 ... 432***	***29 ... 1214***
Power semiconductors (thyristors)		2 controlled phases	2 controlled phases	3 controlled phases
Screw terminals		✓	✓	✓
Spring-type terminals		✓	✓	✓
Soft starting under heavy starting conditions		--	--	✓[1]
UL/CSA		✓	✓	✓
CE marking		✓	✓	✓
Selection aid for soft starters				
Normal starting (CLASS 10)				
Pumps		●	●	●
Pumps with special pump stop (to prevent water hammer)				●
Heat pumps		●	●	●
Hydraulic pumps		❍	●	●
Presses		❍	●	●
Conveyor belts		❍	●	●
Roller conveyors		❍	●	●
Screw conveyors		❍	●	●
Escalators			●	●
Piston compressors			●	●
Screw compressors			●	●
Small fans[2]			●	●
Centrifugal blowers			●	●
Bow thrusters			●	●
Heavy starting (CLASS 20)				
Stirrers			❍	●
Extruders			❍	●
Lathes			❍	●
Milling machines			❍	●
Very heavy starting (CLASS 30)				
Large fans[3]				●
Circular saws/bandsaws				●
Centrifuges				●
Mills				●
Crushers				●

✓ Function available
-- Function not available
● Recommended soft starter
❍ Possible soft starter

[1] Calculate soft starter and motor with size allowance where required.
[2] The mass inertia of the fan is <10 times the mass inertia of the motor.
[3] The mass inertia of the fan is ≥10 times the mass inertia of the motor.

General data

Boundary conditions

The motor ratings listed in the selection and ordering data are rough guide values. The soft starter should always be designed on the basis of the required rated operational current of the motor. 3RW soft starters are designed for easy starting conditions.

For selection of soft starters in the selection and ordering data, a current load of 300% was defined for all 3RW soft starters as the boundary condition for normal starting (CLASS 10). For 3RW30, a maximum number of 20 starts per hour for a maximum of 3 s starting time was defined as the boundary condition; for 3RW40 and 3RW44, a maximum number of 5 starts per hour for a maximum starting time of 10 s was defined.

In case of additional requirements, it may be necessary to choose a larger device. In some cases, however, the safety margins taken into account in the selection also permit the listed units to be used in boundary conditions which are slightly more demanding.

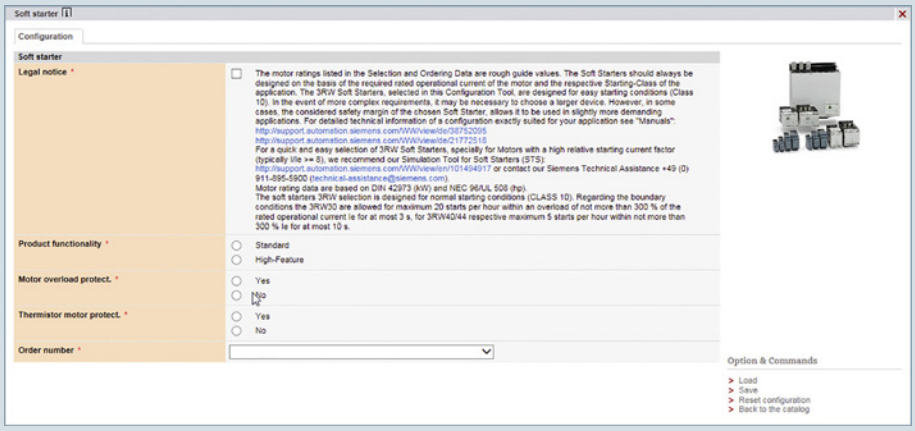
We generally recommend the Simulation Tool for Soft Starters (STS) for selection of 3RW soft starters, see page 14/5.

Motor rating data in kW and hp is based on IEC 60947-4-1.

Online Configurator

Easy and quick selection option of matching soft starters, see www.siemens.com/sirius/configurators.

For the proper dimensioning of the soft starter, you should use the Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917.



Article No. scheme

Product versions		Article number													
Device type	**Soft starters**	**3RW30**	☐	☐	–	☐	☐	☐	☐	☐	–	☐	☐	☐	☐	For standard applications
		3RW40	☐	☐	–	☐	☐	☐	☐	☐	–	☐	☐	☐	☐	For standard applications
		3RW44	☐	☐	–	☐	☐	☐	☐	☐	–	☐	☐	☐	☐	For High Feature applications
Size	e.g. 2 = S0 (for 3RW30/40)		☐													
Rated operational current I_e	e.g. 6 = 25 A (for 3RW30/40)			☐												
Connection type	e.g. 1 = screw terminal (for 3RW30)					☐										
Soft starter functionality	e.g. BB = with integrated bypass, controlled in two phases (for 3RW)						☐	☐								
Rated control supply voltage U_s	24 V AC/DC								**0**							Up to size S3 for 3RW30/40
	110 … 230 V AC/DC								**1**							Up to size S3 for 3RW30/40
	115 V AC								**3**							For 3RW40/44
	230 V AC								**4**							For 3RW40/44
	24 ... 230 V AC/DC								**5**							For 3RW3003
Rated operational voltage U_e	e.g. 4 = 200 ... 480 V (for 3RW30/40)									☐						
Special versions												☐	☐	☐	☐	
Example		**3RW40**	**2**	**6**	**–**	**1**	**B**	**B**	**1**	**4**						

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

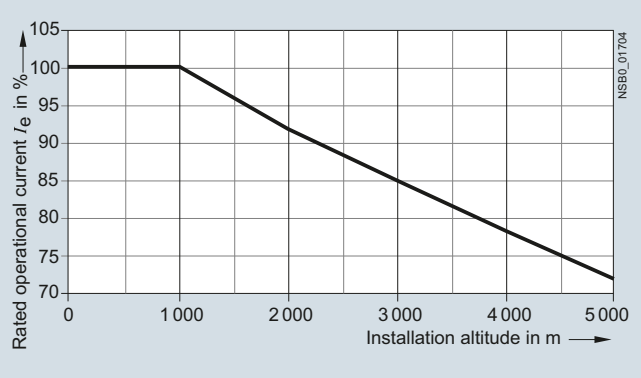
For your orders please use the article numbers quoted in the selection and ordering data.

Benefits

- Soft starting and ramp-down (only soft starting available for 3RW30)
- Stepless starting
- Reduction of current peaks
- Avoidance of mains voltage fluctuations during starting
- Reduced load on the power supply network
- Reduction of the mechanical load in the operating mechanism
- Considerable space savings and reduced wiring compared with conventional starters
- Maintenance-free switching
- Very easy handling
- Seamless compatibility with the SIRIUS modular system

Technical specifications

Permissible installation altitude



Installation altitude for SIRIUS 3RW30/3RW40/3RW44 soft starters

At an installation altitude above 2 000 m, max. permissible operational voltage is reduced to 480 V.

General data

Overview

More information

Homepage, see www.siemens.com/soft-starter
Industry Mall, see www.siemens.com/product?3RW
Online configurator, see www.siemens.com/sirius/configurators
Simulation Tool for Soft Starters (STS), see page 14/5 or https://support.industry.siemens.com/cs/ww/en/view/101494917

SIRIUS 3RW30 soft starters

The SIRIUS 3RW30 soft starters reduce the motor voltage through variable phase control and increase it in ramp-like mode from a selectable starting voltage up to mains voltage. During starting, these devices limit the torque as well as the current and prevent the shocks which arise during direct starts or wye-delta starts. In this way, mechanical loads and mains voltage dips can be reliably reduced.

Soft starting reduces the stress on the connected equipment and results in lower wear and therefore longer periods of trouble-free production. The selectable start value means that the soft starters can be adjusted individually to the requirements of the application in question and unlike wye-delta starters are not restricted to two-stage starting with fixed voltage ratios.

The SIRIUS 3RW30 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that no power losses occur at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

Various versions of the SIRIUS 3RW30 soft starters are available:

- Standard version for fixed-speed three-phase motors, sizes S00, S0, S2 and S3, with integrated bypass contact system
- Version for fixed-speed three-phase motors in a 22.5 mm enclosure without bypass

Soft starters rated up to 55 kW (at 400 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple commissioning are just three of the many advantages of this soft starter.

Functionality

The space required by the compact SIRIUS 3RW30 soft starter is often only about one third of that required by a contactor assembly for wye-delta starting of comparable rating. This not only saves space in the control cabinet and on the standard mounting rail but also does away completely with the wiring work needed for wye-delta starters. This is notable in particular for higher motor ratings which are only rarely available as fully wired solutions.

At the same time the number of cables from the starter to the motor is reduced from six to three. Compact dimensions, short start-up times, easy wiring and fast commissioning make themselves felt as clear-cut cost advantages.

The bypass contacts of these soft starters are protected during operation by an integrated solid-state arc quenching system. This prevents damage to the bypass contacts in the event of a fault, e.g. brief disconnection of the control voltage, mechanical shocks or life-related component defects on the coil operating mechanism or main contact spring.

The series of devices comes with the "polarity balancing" control method, which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the motor ramp-up. This phenomenon cannot be influenced, but in most applications it is non-critical.

Controlling the power semiconductors results not only in this asymmetry, however, but also in the previously mentioned direct current components, which can cause severe noise generation on the motor at starting voltages of less than 50%. The control method used for these soft starters eliminates these direct current components during the ramp-up phase and prevents the braking torque which they can cause.

It creates a motor ramp-up that is uniform in speed, torque and current rise, thus permitting a particularly gentle, two-phase starting of the motors. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled soft starter. This is made possible by the on-going dynamic harmonizing and balancing of current half-waves of different polarity during the motor ramp-up. Hence the name "polarity balancing".

- Soft starting with voltage ramp; setting range:
  - Starting voltage U_s from 40% to 100%
  - Ramp time t_R from 0 to 20 s
- Integrated bypass contact system to minimize power loss
- Setting with two potentiometers
- Simple mounting and commissioning
- Mains voltages 50/60 Hz, 200 to 480 V
- Two control voltage versions 24 V AC/DC and 110 to 230 V AC/DC
- Wide temperature range from -25 to +60 °C
- User-friendly control and possible further processing within the system (for status graphs, see page 6/15).

Application

The 3RW30 soft starters are suitable for soft starting of three-phase asynchronous motors.

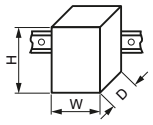
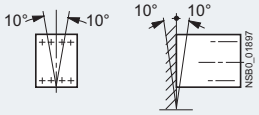
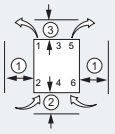
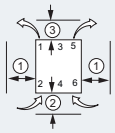
Due to two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time. Due to continuous voltage influencing, the current and torque peaks which are unavoidable in the case of wye-delta starters for instance do not occur.

Application areas

See "Selection aid for soft starters", page 6/5.

Technical specifications

More information	
Manual "SIRIUS 3RW30/3RW40 soft starters", see https://support.industry.siemens.com/cs/ww/en/view/38752095 FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16213/faq	Catalog LV 10, see www.siemens.com/lowvoltage/lv10

Type			3RW301.	3RW302.	3RW303.	3RW304.
Mechanics and environment						
Mounting dimensions (W x H x D) • Screw terminals • Spring-type terminals		mm mm	45 x 95 x 151 45 x 117 x 151	45 x 125 x 151 45 x 150 x 151	55 x 144 x 168 55 x 144 x 168	70 x 160 x 186 70 x 160 x 186
Permissible ambient temperature During operation During storage		 °C °C	 -25 ... +60; (derating from +40) -40 ... +80			
Weight		kg	0.58	0.69	1.20	1.71
Permissible mounting position[1] (auxiliary fan not available)						
Installation type[1]	Stand-alone installation		 ① ≥ 15 mm (≥ 0.59 in) ② ≥ 40 mm (≥ 1.56 in) ③ ≥ 60 mm (≥ 2.36 in)		 ① ≥ 30 mm (≥ 1.18 in) ② ≥ 40 mm (≥ 1.56 in) ③ ≥ 60 mm (≥ 2.36 in)	
Permissible installation altitude		m	5 000 (Derating from 1 000, see characteristic curves, page 6/7); higher on request			
Degree of protection			IP20 for 3RW301. and 3RW302.; IP00 for 3RW303. and 3RW304.			

[1] In the case of deviations, please observe derating, see manual in the chapter "Configuring".

Type	Terminal		3RW301., 3RW302.		3RW303., 3RW304.	
Control electronics						
Rated values Rated control supply voltage • Tolerance	A1/A2	V %	24 ± 20	110 ... 230 -15/+10	24 ± 20	110 ... 230 -15/+10
Rated frequency • Tolerance		Hz %	50/60 ± 10			

Type		3RW301.	3RW302.	3RW303.	3RW304.
Power electronics					
Rated operational voltage Tolerance	V AC %	200 ... 480 -15/+10			
Rated frequency Tolerance	Hz %	50/60 ± 10			
Uninterrupted duty at 40 °C (% of I_e)	%	115			
Minimum load (% of I_e)	%	10 (at least 1 A)			
Maximum cable length between soft starter and motor	m	300			

General data

Type		3RW3013	3RW3014	3RW3016	3RW3017	3RW3018
Power electronics						
Load rating with rated operational current I_e						
• According to IEC and UL/CSA[1], for individual mounting, AC-53a						
- At 40 °C	A	3.6	6.5	9	12.5	17.6
- At 50 °C	A	3.3	6	8	12	17
- At 60 °C	A	3	5.5	7	11	14
Power loss						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	0.25	0.5	1	2	4
• During starting with 300% I_M (40 °C)	W	24	52	80	80	116
Permissible rated motor current and starts per hour						
• For normal starting (CLASS 10) at 40 °C / 50 °C						
- Rated motor current I_M[2], ramp-up time 3 s	A	3.6/3.3	6.5/6.0	9/8	12.5/12.0	17.6/17.0
- Starts per hour[3]	1/h	200/150	87/60	50/50	85/70	62/46
- Rated motor current I_M[2], ramp-up time 4 s	A	3.6/3.3	6.5/6.0	9/8	12.5/12.0	17.6/17.0
- Starts per hour[3]	1/h	150/100	64/46	35/35	62/47	45/32

1) Measurement at 60 °C according to UL/CSA not required.

2) At 300% I_M, T_u = 40 °C / 50 °C.

3) For intermittent duty S4 with ON period = 30%, T_u = 40 °C / 50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Type		3RW3026	3RW3027	3RW3028
Power electronics				
Load rating with rated operational current I_e				
• According to IEC and UL/CSA[1], for individual mounting, AC-53a				
- At 40 °C	A	25.3	32.2	38
- At 50 °C	A	23	29	34
- At 60 °C	A	21	26	31
Power loss				
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	8	13	19
• During starting with 300% I_M (40 °C)	W	188	220	256
Permissible rated motor current and starts per hour				
• For normal starting (CLASS 10) at 40 °C / 50 °C				
- Rated motor current I_M[2], ramp-up time 3 s	A	25/23	32/29	38/34
- Starts per hour[3]	1/h	23/23	23/23	19/19
- Rated motor current I_M[2], ramp-up time 4 s	A	25/23	32/29	38/34
- Starts per hour[3]	1/h	15/15	16/16	12/12

1) Measurement at 60 °C according to UL/CSA not required.

2) At 300% I_M, T_u = 40 °C / 50 °C.

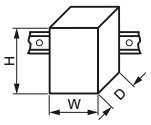
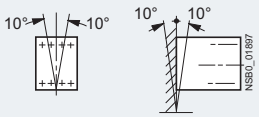
3) For intermittent duty S4 with ON period = 30%, T_u = 40 °C / 50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode. Factors for permissible switching frequency with deviating mounting position, direct mounting, side-by-side mounting, see manual in the chapter: "Configuring".

Type		3RW3036	3RW3037	3RW3038	3RW3046	3RW3047
Power electronics						
Load rating with rated operational current I_e						
• According to IEC and UL/CSA[1], for individual mounting, AC-53a						
- At 40 °C	A	45	65	72	80	106
- At 50 °C	A	42	58	62.1	73	98
- At 60 °C	A	39	53	60	66	90
Power loss						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6	12	15	12	21
• During starting with 300% I_M (40 °C)	W	316	444	500	576	768
Permissible rated motor current and starts per hour						
• For normal starting (CLASS 10) at 40 °C / 50 °C						
- Rated motor current I_M[2], ramp-up time 3 s	A	45/42	63/58	72/62	80/73	106/108
- Starts per hour[3]	1/h	38/38	23/23	22/22	22/22	15/15
- Rated motor current I_M[2], ramp-up time 4 s	A	45/42	63/58	72/62	80/73	106/98
- Starts per hour[3]	1/h	26/26	15/15	15/15	15/15	10/10

1) Measurement at 60 °C according to UL/CSA not required.

2) At 300% I_M, T_u = 40 °C / 50 °C.

3) For intermittent duty S4 with ON period = 30%, T_u = 40 °C / 50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Type			3RW3003-1CB54	3RW3003-2CB54
Mechanics and environment				
Mounting dimensions (W x H x D) 				
• Screw terminals		mm	22.5 x 100 x 120	--
• Spring-type terminals		mm	--	22.5 x 101.6 x 120
Permissible ambient temperature				
During operation		°C	-25 ... +60; (derating from +40)	
During storage		°C	-40 ... +80	
Weight		kg	0.207	0.188
Permissible mounting position				
Permissible installation altitude		m	5 000 (Derating from 1 000, see characteristic curves, page 6/7); higher on request	
Degree of protection acc. to IEC 60529			IP20 (IP00 terminal compartment)	
Control electronics				
Rated values				
Rated control supply voltage		V	24 ... 230 AC/DC	
• Tolerance		%	± 10	
Rated frequency at AC		Hz	50/60	
• Tolerance		%	± 10	
Power electronics				
Rated operational voltage		V AC	200 ... 400	
Tolerance		%	± 10	
Rated frequency		Hz	50/60	
Tolerance		%	± 10	
Uninterrupted duty (% of I_e)		%	100	
Minimum load[1] (% of I_e); at 40 °C		%	9	
Maximum conductor length between soft starter and motor		m	100[2]	
Load rating with rated operational current I_e				
• According to IEC and UL/CSA for individual mounting at 40/50/60 °C, AC-53a		A	3/2.6/2.2	
• According to IEC and UL/CSA for side-by-side-mounting at 40/50/60 °C, AC-53a		A	2.6/2.2 /1.8	
Power loss				
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.		W	6.5	
• At utilization of maximum switching frequency		W	3	
Permissible starts per hour (cannot be increased by using a fan)				
• For intermittent duty S4 T_u = 40 °C, stand-alone installation vertical		1/h	1 500	
• ON period = 70% for 300% I_e		1/s	0.2	
Dead time after uninterrupted duty				
With I_e before restart		s	0	

1) The rated motor current (specified on the motor's name plate) should at least amount to the specified percentage of the SIRIUS soft starter unit's rated operational current I_e.

2) If this value is exceeded, problems with line capacities may arise, which can result in false firing.

General data

Motor feeders with soft starters

The type of coordination according to which the motor feeder with soft starter is mounted depends on the application-specific requirements. Normally, fuseless mounting (combination of motor starter protector and soft starter) is sufficient.

If type of coordination "2" is to be fulfilled, then semiconductor fuses must be fitted in the motor feeder.

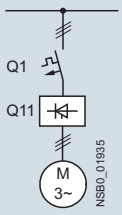
ToC 1 Type of coordination "1" according to IEC 60947-4-1: After a short-circuit incident, the unit is defective and therefore unsuitable for further use (protection of persons and system guaranteed).

ToC 2 Type of coordination "2" according to IEC 60947-4-1: After a short-circuit incident the unit is suitable for further use (protection of persons and system guaranteed).

The type of coordination refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

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

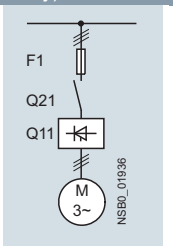
Fuseless version



Soft starters ToC 1		Motor starter protectors[1]		
	Rated current	400 V + 10%		Rated current
Q11		Q1	I_q	
Type	A	Type	kA	A
Type of coordination "1"				
3RW3003	3	3RV2011-1EA	50	4
3RW3013	3.6	3RV2011-1FA	5	5
3RW3014	6.5	3RV2011-1HA	5	8
3RW3016	9	3RV2011-1JA	5	10
3RW3017	12.5	3RV2011-1KA	5	12.5
3RW3018	17.6	3RV2021-4BA	5	20
3RW3026	25	3RV2021-4DA	55	25
3RW3027	32	3RV2021-4EA	55	32
3RW3028	38	3RV2021-4FA	55	40
3RW3036	45	3RV2031-4WA10	10	45
3RW3037	63	3RV2031-4JA10	10	63
3RW3038	72	3RV2031-4KA10	10	75
3RW3046	80	3RV2042-4RA10	11	84
3RW3047	106	3RV2042-4MA10	11	100

[1] The rated motor current must be considered when selecting the devices.

Fused version (line protection only)



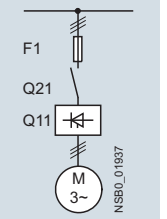
Soft starters ToC 1		Line protection, maximum			Line contactor
	Rated current		Rated current	Size	(optional)
Q11 Type	A	F1 Type	A		Q21 Type
Type of coordination "1"[1]: I_q = 65 kA at 480 V + 10%					
3RW3003[2]	3	3NA3805[3]	20	000	3RT2015
3RW3013	3.6	3NA3803-6	10	000	3RT2015
3RW3014	6.5	3NA3805-6	16	000	3RT2015
3RW3016	9	3NA3807-6	20	000	3RT2016
3RW3017	12.5	3NA3810-6	25	000	3RT2018
3RW3018	17.6	3NA3814-6	35	000	3RT2026
3RW3026	25	3NA3822-6	63	00	3RT2026
3RW3027	32	3NA3824-6	80	00	3RT2027
3RW3028	38	3NA3824-6	80	00	3RT2028
3RW3036	45	3NA3130-6	100	1	3RT2036
3RW3037	63	3NA3132-6	125	1	3RT2037
3RW3038	72	3NA3132-6	125	1	3RT2038
3RW3046	80	3NA3136-6	160	1	3RT2038
3RW3047	106	3NA3136-6	160	1	3RT2046

1) The type of coordination "1" refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

2) I_q = 50 kA at 400 V.

3) 3NA3805-1 (NH00), 5SB261 (DIAZED), 5SE2201-6 (NEOZED).

Fused version with 3NE1 SITOR fuses (semiconductor and line protection)



For matching fuse bases, see Catalog LV 10:

- "Fuse systems" → "SITOR Semiconductor Fuses" or www.siemens.com/sitor
- "Switch disconnectors"

Soft starters ToC 2		All-range fuses			Line contactor
	Rated current		Rated current	Size	(optional)
Q11 Type	A	F'1 Type	A		Q21 Type
Type of coordination "2"[1]: I_q = 65 kA at 480 V + 10%					
3RW3003[2]	3	3NE1813-0[3]	16	000	3RT2015
3RW3013	3.6	3NE1813-0	16	000	3RT2015
3RW3014	6.5	3NE1813-0	16	000	3RT2015
3RW3016	9	3NE1813-0	16	000	3RT2016
3RW3017	12.5	3NE1813-0	16	000	3RT2018
3RW3018	17.6	3NE1814-0	20	000	3RT2026
3RW3026	25	3NE1803-0	35	000	3RT2026
3RW3027	32	3NE1020-2	80	00	3RT2027
3RW3028	38	3NE1020-2	80	00	3RT2028
3RW3036	45	3NE1020-2	80	00	3RT2036
3RW3037	63	3NE1820-0	80	000	3RT2037
3RW3038	72	3NE1820-0	80	000	3RT2038
3RW3046	80	3NE1021-0	100	00	3RT2038
3RW3047	106	3NE1022-0	125	00	3RT2046

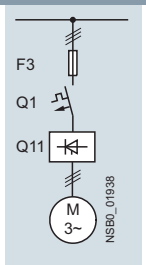
1) The type of coordination "2" refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

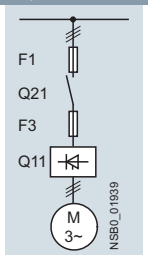
2) I_q = 50 kA at 400 V.

3) No SITOR fuse required!
Alternatively: 3NA3803 (NH00), 5SB221 (DIAZED), 5SE2206 (NEOZED).

General data

Fused version with 3NE3 SITOR fuses (semiconductor protection by fuse, line and overload protection by motor starter protector; alternatively, installation with contactor and overload relay possible)





For matching fuse bases, see Catalog LV 10:
- "Fuse systems" → "SITOR Semiconductor Fuses" or www.siemens.com/sitor
- "Switch disconnectors"

Soft starters ToC 2		Semiconductor fuses, minimum			Semiconductor fuses, minimum			Semiconductor fuses, minimum		
	Rated current		Rated current	Size		Rated current	Size		Rated current	Size
Q11 Type	A	F3 Type	A		F3 Type	A		F3 Type	A	
Type of coordination "2"[1]: I_q = 65 kA at 480 V + 10%										
3RW3003[2]	3	--	--	--				3NE8015-1	25	00
3RW3013	3.6	--	--	--	3NE4101	32	0	3NE8015-1	25	00
3RW3014	6.5	--	--	--	3NE4101	32	0	3NE8015-1	25	00
3RW3016	9	--	--	--	3NE4101	32	0	3NE8015-1	25	00
3RW3017	12.5	--	--	--	3NE4101	32	0	3NE8015-1	25	00
3RW3018	17.6	--	--	--	3NE4101	32	0	3NE8003-1	35	00
3RW3026	25	--	--	--	3NE4102	40	0	3NE8017-1	50	00
3RW3027	32	--	--	--	3NE4118	63	0	3NE8018-1	63	00
3RW3028	38	--	--	--	3NE4118	63	0	3NE8020-1	80	00
3RW3036	45	--	--	--	3NE4120	80	0	3NE8020-1	80	00
3RW3037	63	--	--	--	3NE4121	100	0	3NE8021-1	100	00
3RW3038	72	3NE3221	100	1	--	--	--	3NE8022-1	125	00
3RW3046	80	3NE3222	125	1	--	--	--	3NE8022-1	125	00
3RW3047	106	3NE3224	160	1	--	--	--	3NE8024-1	160	00

Soft starters ToC 2		Cylindrical fuses		Line contactor	Motor starter protectors		Line protection, maximum		
	Rated current		Rated current	(optional)	400 V + 10%	Rated current		Rated current	Size
Q11 Type	A	F3 Type	A	Q21	Q1 Type	A	F1 Type	A	
Type of coordination "2"[1]: I_q = 65 kA at 480 V + 10%									
3RW3003[2]	3	3NC1010	10	3RT2015	3RV2011-1EA	4	3NA3805[3]	20	000
3RW3013	3.6	3NC2220	20	3RT2015	3RV2011-1FA	5	3NA3803-6	10	000
3RW3014	6.5	3NC2220	20	3RT2015	3RV2011-1HA	8	3NA3805-6	16	000
3RW3016	9	3NC2220	20	3RT2016	3RV2011-1JA	10	3NA3807-6	20	000
3RW3017	12.5	3NC2250	50	3RT2018	3RV2011-1KA	12.5	3NA3810-6	25	000
3RW3018	17.6	3NC2263	63	3RT2026	3RV2021-4BA	20	3NA3814-6	35	000
3RW3026	25	3NC2263	63	3RT2026	3RV2021-4DA	25	3NA3822-6	63	00
3RW3027	32	3NC2280	80	3RT2027	3RV2021-4EA	32	3NA3824-6	80	00
3RW3028	38	3NC2280	80	3RT2028	3RV2021-4FA	40	3NA3824-6	80	00
3RW3036	45	3NC2280	80	3RT2036	3RV2031-4WA10	45	3NA3130-6	100	1
3RW3037	63	--	--	3RT2037	3RV2031-4JA10	63	3NA3132-6	125	1
3RW3038	72	--	--	3RT2038	3RV2031-4KA10	75	3NA3132-6	125	1
3RW3046	80	--	--	3RT2038	3RV2042-4RA10	84	3NA3136-6	160	1
3RW3047	106	--	--	3RT2046	3RV2042-4MA10	100	3NA3136-6	160	1

1) The type of coordination "2" refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.
2) I_q = 50 kA at 400 V.
3) 3NA3805-1 (NH00), 5SB261 (DIAZED).

More information

Application examples for normal starting (CLASS 10)

Normal starting CLASS 10 (up to 20 s with 300% $I_{n\ Motor}$ one start per hour)
The soft starter rating can be selected to be as high as the rating of the motor used

Application		Conveyor belts	Roller conveyors	Compressors	Small fans[1)]	Pumps	Hydraulic pumps
Starting parameters							
• Voltage ramp and current limiting							
- Starting voltage	%	70	60	50	40	40	40
- Starting time	s	10	10	20	20	10	10

[1)] The mass inertia of the fan is <10 times the mass inertia of the motor.

Note:
This table presents sample set values and device dimensions. They are intended for information purposes only and are not binding. The set values depend on the application in question and must be optimized during commissioning.
The soft starter dimensions should be checked where necessary with the help of Technical Assistance.

Configuration

The 3RW solid-state motor controllers are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device.

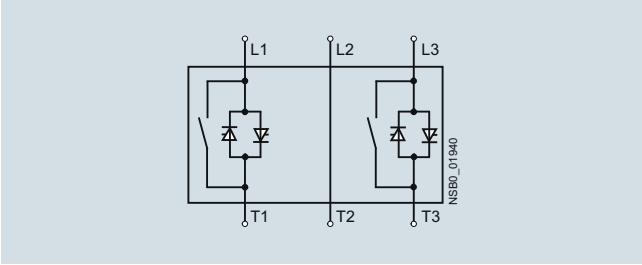
If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

No capacitive elements are permitted in the motor feeder between the SIRIUS 3RW soft starter and the motor (e.g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses, controls and overload relays) should be dimensioned for direct-on-line starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

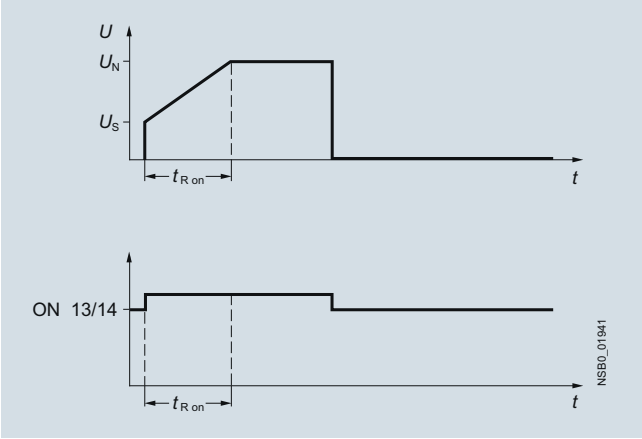
Note:
When three-phase motors are switched on, voltage drops occur as a rule on starters of all types (direct-on-line starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Schematic circuit diagram of power electronics



A bypass contact system is already integrated in the 3RW30 soft starter and therefore does not have to be ordered separately.

Status graphs



SIRIUS 3RW30 soft starters

SIRIUS 3RW30 for easy starting conditions ***IE3/IE4* ready**

Selection and ordering data


3RW301.


3RW302.


3RW303.


3RW304.


3RW3003-2CB54

3RW ambient temperature 40 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	3RW ambient temperature 50 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 200 V	230 V	460 V	575 V	Size	SD[1]	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	kW	kW	kW	A	hp	hp	hp	hp		d					
Rated operational voltage U_e 200 ... 480 V															
3.6	0.75	**1.5**	--	3	0.5	0.5	**1.5**	--	**S00**	2	**3RW3013-□BB□4**		1	1 unit	42G
6.5	1.5	**3**	--	6	1	1	**3**	--	**S00**	2	**3RW3014-□BB□4**		1	1 unit	42G
9	2.2	**4**	--	8	2	2	**5**	--	**S00**	2	**3RW3016-□BB□4**		1	1 unit	42G
12.5	3	**5.5**	--	12	3	3	**7.5**	--	**S00**	2	**3RW3017-□BB□4**		1	1 unit	42G
17.6	4	**7.5**	--	17	3	3	**10**	--	**S00**	2	**3RW3018-□BB□4**		1	1 unit	42G
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	2	**3RW3026-□BB□4**		1	1 unit	42G
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S0**	2	**3RW3027-□BB□4**		1	1 unit	42G
38	11	**18.5**	--	34	10	10	**25**	--	**S0**	2	**3RW3028-□BB□4**		1	1 unit	42G
45	11	**22**	--	42	10	15	**30**	--	**S2**	2	**3RW3036-□BB□4**		1	1 unit	42G
63	18.5	**30**	--	58	15	20	**40**	--	**S2**	2	**3RW3037-□BB□4**		1	1 unit	42G
72	22	**37**	--	62	20	20	**40**	--	**S2**	2	**3RW3038-□BB□4**		1	1 unit	42G
80	22	**45**	--	73	20	25	**50**	--	**S3**	2	**3RW3046-□BB□4**		1	1 unit	42G
106	30	**55**	--	98	30	30	**75**	--	**S3**	2	**3RW3047-□BB□4**		1	1 unit	42G

Article No. supplement for connection types

- With screw terminals **1**
- With spring-type terminals[2] **2**

Article No. supplement for rated control supply voltage U_s

- 24 V AC/DC **0**
- 110 ... 230 V AC/DC **1**

Soft starters for easy starting conditions and high switching frequency, rated operational voltage U_e 200 ... 400 V, rated control supply voltage U_s 24 ... 230 V AC/DC															
3	0.55	**1.1**	--	2.6	0.5	**0.5**	--	--	22.5 mm						
• With screw terminals										►	**3RW3003-1CB54**		1	1 unit	42G
• With spring-type terminals										►	**3RW3003-2CB54**		1	1 unit	42G

[1] Soft starter U_e 200 to 480 V with screw terminals: Standard delivery time SD = 1 day.

[2] Main connection from size S2: screw terminals.

Note:

The listed motor ratings are rough guide values. The soft starter should always be designed on the basis of the required rated operational current of the motor.

The SIRIUS 3RW30 solid-state soft starters are designed for easy starting conditions. The selection and ordering data were determined for the following boundary conditions (see also the notes on page 6/5):

- Maximum starting time in s: 3
- Maximum starting current in % of motor current I_e: 300
- Maximum number of starts per hour in 1/h: 20
- Stand-alone installation (side-by-side, see manual)

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 20, we recommend our Simulation Tool for Soft Starters (STS); see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Accessories

More information

Manual "SIRIUS 3RW30/3RW40 soft starters", see https://support.industry.siemens.com/cs/ww/en/view/38752095.

Three-phase infeed terminals

Conductor cross-section: Solid or stranded	Conductor cross-section: Finely stranded with end sleeve	Conductor cross-section: AWG cables, solid or stranded	Tightening torque	For soft starters size	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
mm²	mm²	AWG	Nm		d					
2.5 … 25	2.5 … 16	10 ... 4	3 ... 4	S00 (3RW301.) S0 (3RW302.)	▶	**3RV2925-5AB**		1	1 unit	41E


3RV2925-5AB

Auxiliary terminals

For soft starters: Type	For soft starters: Size	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
		d					
Auxiliary terminals, 3-pole							
3RW304.	**S3**	5	**3RT2946-4F**		1	1 unit	41B


3RT2946-4F

Covers for soft starters

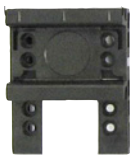
Terminal covers for box terminals Additional touch protection to be fitted at the box terminals (2 units required per device)							
3RW303.	**S2**	2	**3RT2936-4EA2**		1	1 unit	41B
3RW304.	**S3**	▶	**3RT2946-4EA2**		1	1 unit	41B
Terminal covers for cable lugs and busbar connections For complying with the voltage clearances and as touch protection if box terminal is removed (2 units required per device)							
3RW304.	**S3**	5	**3RT1946-4EA1**		1	1 unit	41B


3RT2936-4EA2


3RT1946-4EA1

Mounting rails for mounting contactors for the customer assembly of 3RA21 load feeders with busbar adapters for 60 mm systems

For motor starter protectors: Size	For soft starters: Size	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
			d					
--	**S0**	For the discrete configuration of direct-on-line starters, an additional mounting rail is needed for the contactor in addition to the existing mounting rail on the busbar adapter for the motor starter protector. For pushing onto the device adapter, including fixing screws	2	**8US1998-7CB45**		1	10 units	14O


8US1998-7CB45

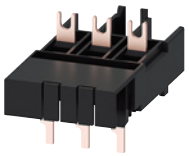
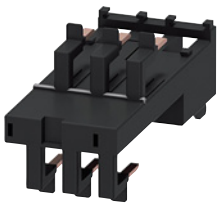
Standard mounting rail adapters

For mechanical fixing of motor starter protector and soft starter; for snapping onto standard mounting rail or for screw fixing								
S2	**S2**	**Single-unit packaging**	▶	**3RA2932-1CA00**		1	1 unit	41B


3RA2932-1CA00

Accessories

Link modules to motor starter protectors[1)]

For soft starters Type	Size	Motor starter protectors Size	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 3RA2921-1BA00								
• With screw terminals				**Screw terminals**				
3RW301.	**S00**	**S00**	2	**3RA2921-1BA00**		1	1 unit	41B
3RW302.	**S0**	**S00/S0**	2	**3RA2921-1BA00**		1	1 unit	41B
3RW3036.	**S2**	**S2**	▶	**3RA2931-1AA00**		1	1 unit	41B
3RW3046., 3RW3047.	**S3**	**S3**	▶	**3RA1941-1AA00**		1	1 unit	41B
 3RA2921-2GA00								
• With spring-type terminals				**Spring-type terminals**				
3RW301.	**S00**	**S00**	▶	**3RA2911-2GA00**		1	1 unit	41B
3RW302.	**S0**	**S0**	▶	**3RA2921-2GA00**		1	1 unit	41B

1) Can be used in size S0 up to maximum 32 A.
Can be used in size S2 up to maximum 65 A in combination with 3RA2932-1CA00 standard mounting rail adapter (specially for soft starters).
Can be used in size S3 only on mounting plate.

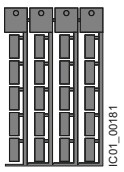
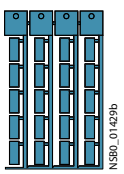
Covers and push-in lugs (only for 3RW3003)

Version	Functionality Functions	Use	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 3RP1902								
Sealable covers	For securing against unauthorized adjustment of setting knobs	For devices with 1 or 2 CO contacts	5	**3RP1902**		1	5 units	41H
 3RP1903								
Push-in lugs for screw fixing		For devices with 1 or 2 CO contacts	5	**3RP1903**		1	10 units	41H

Tools for opening spring-type terminals in sizes S00 and S0

Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
 3RA2908-1A						
		Spring-type terminals				
Screwdrivers For all SIRIUS devices with spring-type terminals Length approx. 200 mm, size 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit	41B

Blank labels

 3RT2900-1SB20						
Unit labeling plates[1)] For SIRIUS devices						
• 20 mm x 7 mm, titanium gray	20	**3RT2900-1SB20**	100	340 units		41B
 3RT1900-1SB20						
• 20 mm x 7 mm, pastel turquoise	20	**3RT1900-1SB20**	100	340 units		41B

1) PC labeling systems for individual inscription of unit labeling plates are available from: murrplastik Systemtechnik GmbH, see page 16/15.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

More information

Homepage, see www.siemens.com/soft-starter
Industry Mall, see www.siemens.com/product?3RW
Online configurator, see www.siemens.com/sirius/configurators
Simulation Tool for Soft Starters (STS), see page 14/5 or https://support.industry.siemens.com/cs/ww/en/view/101494917

SIRIUS 3RW40 soft starters

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30 soft starters.

The SIRIUS 3RW40 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that no power losses occur at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

At the same time this soft starter comes with additional integrated functions such as adjustable current limiting, motor overload and intrinsic device protection, and optional thermistor motor protection. The higher the motor rating, the more important these functions, because they make it unnecessary to purchase and install protection equipment such as overload relays.

Internal intrinsic device protection prevents the thermal overloading of the thyristors and the power section defects this can cause. As an option the thyristors can also have semiconductor fuses to protect them against short-circuiting.

Thanks to integrated status monitoring and fault monitoring, this compact soft starter offers many different diagnostics options. Up to four LEDs and relay outputs permit differentiated monitoring and diagnostics of the operating mechanism by indicating the operating state as well as for example mains or phase failure, missing load, non-permissible tripping time/CLASS setting, thermal overloading or device faults.

Soft starters rated up to 250 kW (at 400 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple start up are just three of the many advantages of the SIRIUS 3RW40 soft starters.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RW40 soft starter sizes S0 to S12 are suitable for the starting of explosion-proof motors with "increased safety" type of protection EEx e.

Functionality

The space required by the compact SIRIUS 3RW40 soft starter is often only about one third of that required by a contactor assembly for wye-delta starting of comparable rating. This not only saves space in the control cabinet and on the standard mounting rail but also does away completely with the wiring work needed for wye-delta starters.

This is notable in particular for higher motor ratings which are only rarely available as fully wired solutions.

At the same time the number of cables from the starter to the motor is reduced from six to three. Compact dimensions, short start-up times, easy wiring and fast commissioning make themselves felt as clear-cut cost advantages.

The bypass contacts of these soft starters are protected during operation by an integrated solid-state arc quenching system. This prevents damage to the bypass contacts in the event of a fault, e.g. brief disconnection of the control voltage, mechanical shocks or life-related component defects on the coil operating mechanism or main contact spring.

The starting current of particularly powerful operating mechanisms can place an unjustifiable load on the local supply system. Soft starters reduce this starting current by means of their voltage ramp. Thanks to the adjustable current limiting, the SIRIUS 3RW40 soft starter takes even more pressure off the supply system. It leaves the set start ramp during the ramp-up – the ramp gradient is fixed by the starting voltage and the ramp time – as soon as the selected current limit is reached.

From this moment the voltage of the soft starter is controlled so that the current supplied to the motor remains constant. This process is ended either by completion of the motor ramp-up or by tripping by the intrinsic device protection or the motor overload protection. As the result of this function the actual motor ramp-up can well take longer than the ramp time selected on the soft starter.

Thanks to the integrated motor overload protection according to IEC 60947-4-2 there is no need for an additional overload relay on the new soft starters. The rated motor current, the setting of the overload tripping time (CLASS times) and the RESET of the motor overload protection function can be adjusted easily and quickly. Using a 4-step rotary potentiometer it is possible to set different overload tripping times on the soft starter. In addition to CLASS 10, 15 and 20 it is also possible to switch off the motor overload protection if a different motor management control device is to be used for this function, e.g. with connection to PROFIBUS.

Device versions with thermistor motor protection evaluation are available up to a rating of 55 kW (at 400 V). A "Thermoclick" measuring probe can be connected directly, as can a PTC of type A. Thermal overloading of the motor, open circuits and short circuits in the sensor circuit all result in the direct disconnection of the soft starter. And if ever the soft starter trips, various RESET options are available the same as with intrinsic device protection and motor load protection: manually with the RESET button, automatically or remotely through brief disconnection of the control voltage.

General data

The series of devices comes with the "polarity balancing" control method, which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the motor ramp-up. This phenomenon cannot be influenced, but in most applications it is non-critical.

Controlling the power semiconductors results not only in this asymmetry, however, but also in the previously mentioned direct current components, which can cause severe noise generation on the motor at starting voltages of less than 50%.

The control method used for these soft starters eliminates these direct current components during the ramp-up phase and prevents the braking torque which they can cause. It creates a motor ramp-up that is uniform in speed, torque and current rise, thus permitting a particularly gentle, two-phase starting of the motors. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled soft starter. This is made possible by the on-going dynamic harmonizing and balancing of current half-waves of different polarity during the motor ramp-up. Hence the name "polarity balancing".

Application

The SIRIUS 3RW40 solid-state soft starters are used for the soft starting and stopping of three-phase asynchronous motors.

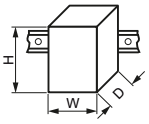
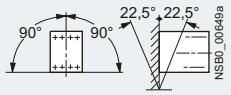
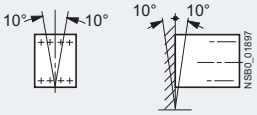
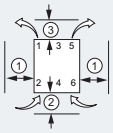
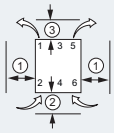
Due to two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time and disturbing direct current components are eliminated in addition. This not only enables the two-phase starting of motors up to 250 kW (at 400 V) but also avoids the current and torque peaks which occur e.g. with wye-delta starters.

Application areas

See "Selection aid for soft starters" on page 6/5.

Technical specifications

More information	
Manual "SIRIUS 3RW30/3RW40 soft starters", see https://support.industry.siemens.com/cs/ww/en/view/38752095	Catalog LV 10, see www.siemens.com/lowvoltage/lv10
FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16213/faq	

Type			3RW402.	3RW403.	3RW404.	3RW405.	3RW407.
Mechanics and environment							
Mounting dimensions (W x H x D)							
• Screw terminals		mm	45 x 125 x 154	55 x 144 x 170	70 x 160 x 188	120 x 198 x 250	160 x 230 x 278
• Spring-type terminals		mm	45 x 150 x 154	55 x 144 x 170	70 x 160 x 188	120 x 198 x 250	160 x 230 x 278
Permissible ambient temperature							
During operation		°C	-25 ... +60; (derating from +40)				
During storage		°C	-40 ... +80				
Weight		kg	0.77	1.35	1.9	4.9 (3RW4055) 6.9 (3RW4056)	8.9
Permissible mounting position[1]							
• With auxiliary fan (for 3RW402. ... 3RW404.)							
• Without auxiliary fan (for 3RW402. ... 3RW404.)						-- (fan integrated in the soft starter)	
Installation type[1]	Stand-alone installation		3RW402.  ① ≥ 15 mm (≥ 0.59 in) ② ≥ 40 mm (≥ 1.56 in) ③ ≥ 60 mm (≥ 2.36 in)			3RW405., 3RW407. ① ≥ 5 mm (≥ 0.2 in) ② ≥ 75 mm (≥ 3 in) ③ ≥ 100 mm (≥ 4 in)	
				3RW403., 3RW404.  ① ≥ 30 mm (≥ 1.18 in) ② ≥ 40 mm (≥ 1.56 in) ③ ≥ 60 mm (≥ 2.36 in)			
Permissible installation altitude		m	5 000 (Derating from 1 000, see characteristic curves, page 6/7); higher on request				
Degree of protection			IP20 for 3RW402.; all others IP00				

[1] In the case of deviations, please observe derating, see manual in the chapter "Configuring".

Type	Terminal		3RW402., 3RW403., 3RW404.		3RW405., 3RW407.	
Control electronics						
Rated values						
Rated control supply voltage	A1/A2	V	24 DC/AC	110 ... 230 AC/DC	115 AC	230 AC
• Tolerance		%	± 20	-15/+10		
Rated frequency		Hz	50/60			
• Tolerance		%	± 10			

Type			3RW402.-..B.4, 3RW403.-..B.4, 3RW404.-..B.4	3RW402.-..B.5, 3RW403.-..B.5, 3RW404.-..B.5	3RW405.-.BB.4, 3RW407.-.BB.4	3RW405.-.BB.5, 3RW407.-.BB.5
Power electronics						
Rated operational voltage		V AC	200 ... 480	400 ... 600	200 ... 460	400 ... 600
Tolerance		%	-15/+10			
Maximum blocking voltage (thyristor)		V AC	1 600		1 400	1 800
Rated frequency		Hz	50/60			
Tolerance		%	± 10			
Uninterrupted duty at 40 °C (% of I_e)		%	115			
Minimum load (% of smallest adjustable rated motor current I_M)		%	20 (at least 2 A)			
Maximum cable length between soft starter and motor		m	300			

Type		3RW4024	3RW4026	3RW4027	3RW4028
Power electronics					
Load rating with rated operational current I_e					
• According to IEC and UL/CSA[1], for individual mounting, AC-53a					
- At 40 °C	A	12.5	25.3	32.2	38
- At 50 °C	A	11	23	29	34
- At 60 °C	A	10	21	26	31
Smallest adjustable rated motor current I_M					
For the motor overload protection	A	5	10	17	23
Power loss					
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	2	8	13	19
• During starting with current limit set to 300% I_M (40 °C)	W	68	188	220	256
Permissible rated motor current and starts per hour at 40 °C / 50 °C					
• **For normal starting (CLASS 10)**					
- Rated motor current I_M[2], ramp-up time 3 s	A	12.5/11	25/23	32/29	38/34
- Starts per hour[3]	1/h	50/50	23/23	23/23	19/19
- Rated motor current I_M[2], ramp-up time 4 s	A	12.5/11	25/23	32/29	38/34
- Starts per hour[3]	1/h	36/36	15/15	16/16	12/12
• **For heavy starting (CLASS 15)**					
- Rated motor current I_M[2], ramp-up time 4.5 s	A	11/10	23/21	30/27	34/31
- Starts per hour[3]	1/h	49/49	21/21	18/18	18/18
- Rated motor current I_M[2], ramp-up time 6 s	A	11/10	23/21	30/27	34/31
- Starts per hour[3]	1/h	36/36	14/14	13/13	13/13
• **For heavy starting (CLASS 20)**					
- Rated motor current I_M[2], ramp-up time 6 s	A	10/9	21/19	27/24	31/28
- Starts per hour[3]	1/h	47/47	21/21	20/20	18/18
- Rated motor current I_M[2], ramp-up time 8 s	A	10/9	21/19	27/24	31/28
- Starts per hour[3]	1/h	34/34	15/15	14/14	13/13

1) Measurement at 60 °C according to UL/CSA not required.

2) Current limit on soft starter set to 300% I_M, T_u = 40 °C / 50 °C. Maximum adjustable rated motor current I_M dependent on CLASS setting.

3) For intermittent duty S4 with ON period = 30%, T_u = 40 °C / 50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode. Factors for permissible switching frequency in other mounting position, direct mounting, side-by-side mounting, and implementation of optional auxiliary fan, see manual in the chapter "Configuring".

General data

Type		3RW4036	3RW4037	3RW4038	3RW4046	3RW4047
Power electronics						
Load rating with rated operational current I_e						
• According to IEC and UL/CSA[1], for individual mounting, AC-53a						
- At 40 °C	A	45	63	72	80	106
- At 50 °C	A	42	58	62.1	73	98
- At 60 °C	A	39	53	60	66	90
Smallest adjustable rated motor current I_M						
For the motor overload protection	A	23	26	35	43	46
Power loss						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6	12	15	12	21
• During starting with current limit set to 300% I_M (40 °C)	W	316	444	500	576	768
Permissible rated motor current and starts per hour at 40 °C / 50 °C						
• **For normal starting (CLASS 10)**						
- Rated motor current I_M[2], ramp-up time 3 s	A	45/42	63/58	72/62	80/73	106/98
- Starts per hour[3]	1/h	38/38	23/23	22/22	22/22	15/15
- Rated motor current I_M[2], ramp-up time 4 s	A	45/42	63/58	72/62	80/73	106/98
- Starts per hour[3]	1/h	26/26	15/15	15/15	15/15	10/10
• **For heavy starting (CLASS 15)**						
- Rated motor current I_M[2], ramp-up time 4.5 s	A	42/38	50/46	56/52	70/64	84/77
- Starts per hour[3]	1/h	30/30	34/34	34/34	24/24	23/23
- Rated motor current I_M[2], ramp-up time 6 s	A	42/38	50/46	56/52	70/64	84/ 77
- Starts per hour[3]	1/h	21/21	24/24	24/24	16/16	17/17
• **For heavy starting (CLASS 20)**						
- Rated motor current I_M[2], ramp-up time 6 s	A	38/34	46/42	50/46	64/58	77/70
- Starts per hour[3]	1/h	30/30	31/31	34/34	23/23	23/23
- Rated motor current I_M[2], ramp-up time 8 s	A	38/34	46/42	50/46	64/58	77/70
- Starts per hour[3]	1/h	21/21	22/22	24/24	16/16	16/16

1) Measurement at 60 °C according to UL/CSA not required.

2) Current limit on soft starter set to 300% I_M, T_u = 40 °C / 50 °C. Maximum adjustable rated motor current I_M dependent on CLASS setting.

3) For intermittent duty S4 with ON period = 30%, T_u = 40 °C / 50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode. Factors for permissible switching frequency in other mounting position, direct mounting, side-by-side mounting, and implementation of optional auxiliary fan, see manual in the chapter "Configuring".

Type		3RW4055	3RW4056	3RW4073	3RW4074	3RW4075	3RW4076
Power electronics							
Load rating with rated operational current I_e							
• According to IEC and UL/CSA[1], for individual mounting, AC-53a							
- At 40 °C	A	134	162	230	280	356	432
- At 50 °C	A	117	145	205	248	315	385
- At 60 °C	A	100	125	180	215	280	335
Smallest adjustable rated motor current I_M							
For the motor overload protection	A	59	87	80	130	131	207
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	60	75		90	125	165
• During starting with current limit set to 350%[2] I_M (40 °C)	W	1043	1355	2448	3257	3277	3600
Permissible rated motor current and starts per hour at 40 °C / 50 °C							
• **For normal starting (CLASS 10)**							
- Rated motor current I_M[2], ramp-up time 10 s	A	134/117	162/145	230/205	280/248	356/315	432/385
- Starts per hour[3]	1/h	20/20	8/8	14/14	20/20	16/16	17/17
- Rated motor current I_M[2], ramp-up time 20 s	A	134/117	162/145	230/205	280/248	356/315	432/385
- Starts per hour[3]	1/h	7/7	1.4/1.4	3/3	8/8	5/5	5/5
• **For heavy starting (CLASS 15)**							
- Rated motor current I_M[2], ramp-up time 15 s	A	134/117	152/140	210/200	250/220	341/315	402/385
- Starts per hour[3]	1/h	11/11	8/8	11/11	13/13	11/11	12/12
- Rated motor current I_M[2], ramp-up time 30 s	A	134/117	152/140	210/200	250/220	341/315	402/385
- Starts per hour[3]	1/h	1.2/1.2	1.7/1.7	1/1	6/6	2/2	2/2
• **For heavy starting (CLASS 20)**							
- Rated motor current I_M[2], ramp-up time 20 s	A	124/112	142/132	200/185	230/205	311/280	372/340
- Starts per hour[3]	1/h	12/12	9/9	10/10	10/10	10/10	10/10
- Rated motor current I_M[2], ramp-up time 40 s	A	124/112	142/132	200/185	230/205	311/280	372/340
- Starts per hour[3]	1/h	2/2	2/2	1/1	5/5	1/1	1/1

1) Measurement at 60 °C according to UL/CSA not required.

2) Current limit on soft starter set to 350% I_M, T_u = 40 °C / 50 °C. Maximum adjustable rated motor current I_M dependent on CLASS setting.

3) For intermittent duty S4 with ON period = 70%, T_u = 40 °C / 50 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Motor feeders with soft starters

The type of coordination according to which the motor feeder with soft starter is mounted depends on the application-specific requirements. Normally, fuseless mounting (combination of motor starter protector and soft starter) is sufficient.

If type of coordination "2" is to be fulfilled, then semiconductor fuses must be fitted in the motor feeder.

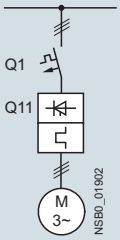
ToC 1 Type of coordination "1" according to IEC 60947-4-1: After a short-circuit incident, the unit is defective and therefore unsuitable for further use (protection of persons and system guaranteed).

ToC 2 Type of coordination "2" according to IEC 60947-4-1: After a short-circuit incident the unit is suitable for further use (protection of persons and system guaranteed).

The type of coordination refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

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

Fuseless version

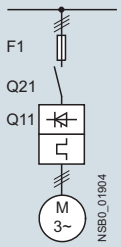


Soft starters ToC 1		Motor starter protectors[1]		
	Rated current	400 V + 10%		Rated current
Q11		Q1	I_q	
Type	A	Type	kA	A
Type of coordination "1"				
3RW4024	12.5	3RV2021-4AA/ 3RV2011-4AA (in size S00)	55	16
3RW4026	25	3RV2021-4DA	55	25
3RW4027	32	3RV2021-4EA	55	32
3RW4028	38	3RV2021-4FA	55	40
3RW4036	45	3RV2031-4WA10	10	45
3RW4037	63	3RV2031-4JA10	10	63
3RW4038	72	3RV2031-4KA10	10	75
3RW4046	80	3RV2042-4RA10	11	84
3RW4047	106	3RV2042-4MA10	11	100
3RW4055	134	3VA2216-5MN32	55	160
3RW4056	162	3VA2220-5MN32	55	200
3RW4073	230	3VA2325-7MN32	100	250
3RW4074	280	3VA2440-7MN32	110	400
3RW4075	356	3VA2450-7MN32	110	500
3RW4076	432	3VA2450-7MN32	110	500

[1] The rated motor current must be considered when selecting the devices.

General data

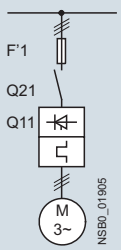
Fused version (line protection only)



Soft starters ToC 1		Line protection, maximum			Line contactor
	Rated current		Rated current	Size	(optional)
Q11 Type	A	F1 Type	A		Q21 Type
Type of coordination "1"[1]: I_q = 65 kA at 600 V + 5%					
3RW4024	12.5	3NA3820-6	50	00	3RT2025/ 3RT2018 (in size S00)
3RW4026	25	3NA3822-6	63	00	3RT2026
3RW4027	32	3NA3824-6	80	00	3RT2027
3RW4028	38	3NA3824-6	80	00	3RT2028
3RW4036	45	3NA3130-6	100	1	3RT2036
3RW4037	63	3NA3132-6	125	1	3RT2037
3RW4038	72	3NA3132-6	125	1	3RT2038
3RW4046	80	3NA3136-6	160	1	3RT2038
3RW4047	106	3NA3136-6	160	1	3RT2046
3RW4055	134	3NA3244-6	250	2	3RT1055-6A.36
3RW4056	162	3NA3244-6	250	2	3RT1056-6A.36
3RW4073	230	2 x 3NA3354-6	2 x 355	3	3RT1065-6A.36
3RW4074	280	2 x 3NA3354-6	2 x 355	3	3RT1066-6A.36
3RW4075	356	2 x 3NA3365-6	2 x 500	3	3RT1075-6A.36
3RW4076	432	2 x 3NA3365-6	2 x 500	3	3RT1076-6A.36

[1] The type of coordination "1" refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

Fused version with 3NE1 SITOR fuses (semiconductor and line protection)



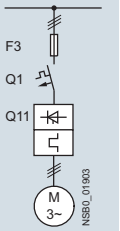
For matching fuse bases, see Catalog LV 10:

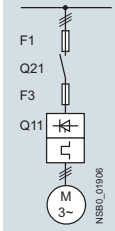
- "Fuse systems" → "SITOR Semiconductor Fuses" or www.siemens.com/sitor
- "Switch disconnectors"

Soft starters ToC 2		All-range fuses			Line contactor
	Rated current		Rated current	Size	(optional)
Q11 Type	A	F'1 Type	A		Q21 Type
Type of coordination "2"[1]: I_q = 65 kA at 600 V + 5%					
3RW4024	12.5	3NE1814-0	20	000	3RT2025/ 3RT2018 (in size S00)
3RW4026	25	3NE1803-0	35	000	3RT2026
3RW4027	32	3NE1020-2	80	00	3RT2027
3RW4028	38	3NE1020-2	80	00	3RT2028
3RW4036	45	3NE1020-2	80	00	3RT2036
3RW4037	63	3NE1820-0	80	000	3RT2037
3RW4038	72	3NE1820-0	80	000	3RT2038
3RW4046	80	3NE1021-0	100	00	3RT2038
3RW4047	106	3NE1022-0	125	00	3RT2046
3RW4055	134	3NE1227-2	250	1	3RT1055-6A.36
3RW4056	162	3NE1227-2	250	1	3RT1056-6A.36
3RW4073	230	3NE1331-2	350	2	3RT1065-6A.36
3RW4074	280	3NE1333-2	450	2	3RT1066-6A.36
3RW4075	356	3NE1334-2	500	2	3RT1075-6A.36
3RW4076	432	3NE1435-2	560	3	3RT1076-6A.36

[1] The type of coordination "2" refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

Fused version with 3NE3 SITOR fuses (semiconductor protection by fuse, line and overload protection by motor starter protector; alternatively, installation with contactor and overload relay possible)





For matching fuse bases, see Catalog LV 10:

- "Fuse systems" → "SITOR Semiconductor Fuses" or www.siemens.com/sitor
- "Switch disconnectors"

Soft starters	ToC 2	Semiconductor fuses, minimum			Semiconductor fuses, minimum			Semiconductor fuses, minimum		
Q11 Type	Rated current A	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
Type of coordination "2"[1]: I_q = 65 kA at 600 V + 5%										
3RW4024	12.5	--	--	--	3NE4101	32	0	3NE8015-1	25	00
3RW4026	25	--	--	--	3NE4102	40	0	3NE8017-1	50	00
3RW4027	32	--	--	--	3NE4118	63	0	3NE8018-1	63	00
3RW4028	38	--	--	--	3NE4118	63	0	3NE8020-1	80	00
3RW4036	45	--	--	--	3NE4120	80	0	3NE8020-1	80	00
3RW4037	63	--	--	--	3NE4121	100	0	3NE8021-1	100	00
3RW4038	72	3NE3221	100	1	--	--	--	3NE8022-1	125	00
3RW4046	80	3NE3222	125	1	--	--	--	3NE8022-1	125	00
3RW4047	106	3NE3224	160	1	--	--	--	3NE8024-1	160	00
3RW4055	134	3NE3227	250	1	--	--	--	--	--	--
3RW4056	162	3NE3227	250	1	--	--	--	--	--	--
3RW4073	230	3NE3232-0B	400	1	--	--	--	--	--	--
3RW4074	280	3NE3233	450	1	--	--	--	--	--	--
3RW4075	356	3NE3335	560	2	--	--	--	--	--	--
3RW4076	432	3NE3337-8	710	2	--	--	--	--	--	--

Soft starters	ToC 2	Cylindrical fuses		Line contactor	Motor starter protectors		Line protection, maximum		
Q11 Type	Rated current A	F3 Type	Rated current A	(optional) Q21 Type	400 V + 10% Q1 Type	Rated current A	F1 Type	Rated current A	Size
Type of coordination "2"[1]: I_q = 65 kA at 600 V + 5%									
3RW4024	12.5	3NC2240	40	3RT2025/ 3RT2018 (in size S00)	3RV2021-4AA/ 3RV2011-4AA (in size S00)	16	3NA3820-6	50	00
3RW4026	25	3NC2263	63	3RT2026	3RV2021-4DA	25	3NA3822-6	63	00
3RW4027	32	3NC2280	80	3RT2027	3RV2021-4EA	32	3NA3824-6	80	00
3RW4028	38	3NC2280	80	3RT2028	3RV2021-4FA	40	3NA3824-6	80	00
3RW4036	45	3NC2280	80	3RT2036	3RV2031-4WA10	45	3NA3130-6	100	1
3RW4037	63	--	--	3RT2037	3RV2031-4JA10	63	3NA3132-6	125	1
3RW4038	72	--	--	3RT2038	3RV2031-4KA10	75	3NA3132-6	125	1
3RW4046	80	--	--	3RT2038	3RV2042-4RA10	84	3NA3136-6	160	1
3RW4047	106	--	--	3RT2046	3RV2042-4MA10	100	3NA3136-6	160	1
3RW4055	134	--	--	3RT1055-6A.36	3VA2216-5MN32	160	3NA3244-6	250	2
3RW4056	162	--	--	3RT1056-6A.36	3VA2220-5MN32	200	3NA3244-6	250	2
3RW4073	230	--	--	3RT1065-6A.36	3VA2325-7MN32	250	2 x 3NA3354-6	2 x 355	3
3RW4074	280	--	--	3RT1066-6A.36	3VA2440-7MN32	400	2 x 3NA3354-6	2 x 355	3
3RW4075	356	--	--	3RT1075-6A.36	3VA2450-7MN32	500	2 x 3NA3365-6	2 x 500	3
3RW4076	432	--	--	3RT1076-6A.36	3VA2450-7MN32	500	2 x 3NA3365-6	2 x 500	3

[1] The type of coordination "2" refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

More information

Application examples for normal starting (CLASS 10)

Normal starting CLASS 10 (up to 20 s with 350% $I_{n\ Motor}$, one start per hour)
The soft starter rating can be selected to be as high as the rating of the motor used.

Application		Conveyor belts	Roller conveyors	Compressors	Small fans[1)]	Pumps	Hydraulic pumps
Starting parameters							
• Voltage ramp and current limiting							
- Starting voltage	%	70	60	50	40	40	40
- Starting time	s	10	10	10	10	10	10
- Current limiting value		5 x I_M	5 x I_M	4 x I_M	4 x I_M	4 x I_M	4 x I_M
Stopping time	s	5	5	0	0	10	0

1) The mass inertia of the fan is <10 times the mass inertia of the motor.

Application examples for heavy starting (CLASS 20)

Heavy starting CLASS 20 (up to 40 s with 350% $I_{n\ Motor}$, one start per hour)
The soft starter has to be selected at least one performance class higher than the motor used.

Application		Stirrers	Centrifuges
Starting parameters			
• Voltage ramp and current limiting			
- Starting voltage	%	40	40
- Starting time	s	20	20
- Current limiting value		4 x I_M	4 x I_M
Stopping time	s	0	0

Note:

These tables present sample set values and device dimensions. They are intended for information purposes only and are not binding. The set values depend on the application in question and must be optimized during commissioning.

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 20, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

Configuration

The solid-state 3RW soft starters are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device.

Where long starting times are involved, the integrated electronic overload relay for heavy starting should not be disconnected. PTC sensors are recommended. This also applies for the smooth ramp-down because during the ramp-down time an additional current loading applies in contrast to free ramp-down.

In the case of high switching frequencies in S4 mode, Siemens recommends the use of PTC sensors. For corresponding device versions with integrated thermistor motor protection or separate thermistor evaluation devices, see page 10/157.

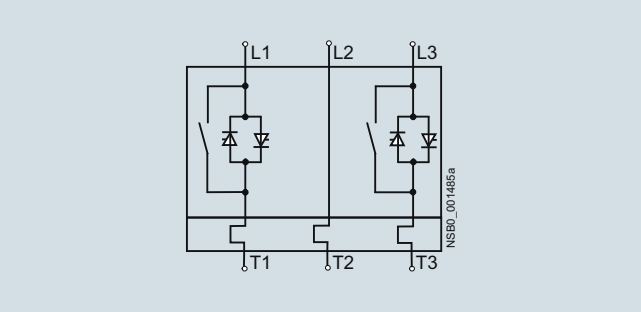
No capacitive elements are permitted in the motor feeder between the SIRIUS 3RW soft starter and the motor (e.g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct-on-line starting, following the load short-circuit conditions. Fuses and switching devices must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

Note:

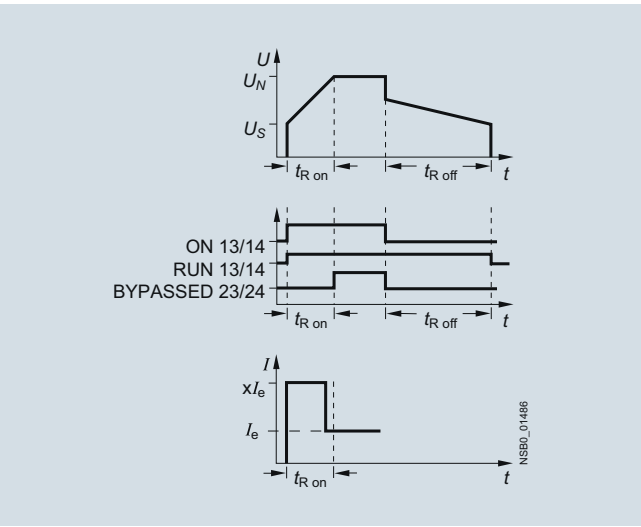
When three-phase motors are switched on, voltage drops occur as a rule on starters of all types (direct-on-line starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Schematic circuit diagram of power electronics



A bypass contact system and electronic overload relay are already integrated in the 3RW40 soft starter and therefore do not have to be ordered separately.

Status graphs



SIRIUS 3RW40 soft starters

SIRIUS 3RW40 for normal starting (CLASS 10) *IE3/IE4* ready

Selection and ordering data


3RW402.


3RW403.


3RW404.

3RW ambient temperature 40 °C Rated values of three-phase motors				3RW ambient temperature 50 °C Rated values of three-phase motors					Size	SD[1]	**Normal starting (CLASS 10)**	PU (UNIT, SET, M)	PS*	PG
Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	Operational current I_e	Rating at operational voltage U_e 200 V	230 V	460 V	575 V			Article No. / Price per PU			
A	kW	kW	kW	A	hp	hp	hp	hp		d				
Rated operational voltage U_e 200 ... 480 V														
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S0**	2	**3RW4024-□BB□4**	1	1 unit	42G
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	2	**3RW4026-□BB□4**	1	1 unit	42G
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S0**	2	**3RW4027-□BB□4**	1	1 unit	42G
38	11	**18.5**	--	34	10	10	**25**	--	**S0**	2	**3RW4028-□BB□4**	1	1 unit	42G
45	11	**22**	--	42	10	15	**30**	--	**S2**	2	**3RW4036-□BB□4**	1	1 unit	42G
63	18.5	**30**	--	58	15	20	**40**	--	**S2**	2	**3RW4037-□BB□4**	1	1 unit	42G
72	22	**37**	--	62	20	20	**40**	--	**S2**	2	**3RW4038-□BB□4**	1	1 unit	42G
80	22	**45**	--	73	20	25	**50**	--	**S3**	2	**3RW4046-□BB□4**	1	1 unit	42G
106	30	**55**	--	98	30	30	**75**	--	**S3**	2	**3RW4047-□BB□4**	1	1 unit	42G
Rated operational voltage U_e 400 ... 600 V														
12.5	--	5.5	**7.5**	11	--	--	7.5	**10**	**S0**	5	**3RW4024-□BB□5**	1	1 unit	42G
25	--	11	**15**	23	--	--	15	**20**	**S0**	5	**3RW4026-□BB□5**	1	1 unit	42G
32	--	15	**18.5**	29	--	--	20	**25**	**S0**	5	**3RW4027-□BB□5**	1	1 unit	42G
38	--	18.5	**22**	34	--	--	25	**30**	**S0**	5	**3RW4028-□BB□5**	1	1 unit	42G
45	--	22	**30**	42	--	--	30	**40**	**S2**	5	**3RW4036-□BB□5**	1	1 unit	42G
63	--	30	**37**	58	--	--	40	**50**	**S2**	5	**3RW4037-□BB□5**	1	1 unit	42G
72	--	37	**45**	62	--	--	40	**60**	**S2**	5	**3RW4038-□BB□5**	1	1 unit	42G
80	--	45	**55**	73	--	--	50	**60**	**S3**	5	**3RW4046-□BB□5**	1	1 unit	42G
106	--	55	**75**	98	--	--	75	**75**	**S3**	5	**3RW4047-□BB□5**	1	1 unit	42G

Article No. supplement for connection types

- With screw terminals
- With spring-type terminals[2]

Article No. supplement for rated control supply voltage U_s

- 24 V AC/DC
- 110 ... 230 V AC/DC

1 2

0 1

[1] Soft starter U_e 200 to 480 V with screw terminals: Standard delivery time SD = 1 day.

[2] Main connection from size S2: screw terminals.

Note:

The listed motor ratings are rough guide values. The soft starter should always be designed on the basis of the required rated operational current of the motor.

The 3RW40 soft starters are designed for easy starting conditions. The selection and ordering data were determined for the following boundary conditions (see also the notes on page 6/6):

- Maximum starting time in s: 10
- Maximum starting current in % of motor current I_e: 300
- Maximum number of starts per hour in 1/h: 5
- Stand-alone installation without auxiliary fan (side-by-side, see manual, increased switching frequency possible using auxiliary fans)

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 20, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

IE3/IE4 ready **SIRIUS 3RW40 for normal starting (CLASS 10)**


3RW402.


3RW403.


3RW404.

3RW ambient temperature 40 °C Rated values of three-phase motors				3RW ambient temperature 50 °C Rated values of three-phase motors					Size	SD[1]	**Normal starting (CLASS 10)**		PU (UNIT, SET, M)	PS*	PG
Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	Operational current I_e	Rating at operational voltage U_e 200 V	230 V	460 V	575 V			Article No.	Price per PU			
A	kW	kW	kW	A	hp	hp	hp	hp		d					
Rated operational voltage U_e 200 ... 480 V, with thermistor motor protection, rated control supply voltage U_s 24 V AC/DC															
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S0**	5	**3RW4024-□TB04**		1	1 unit	42G
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	5	**3RW4026-□TB04**		1	1 unit	42G
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S0**	5	**3RW4027-□TB04**		1	1 unit	42G
38	11	**18.5**	--	34	10	10	**25**	--	**S0**	5	**3RW4028-□TB04**		1	1 unit	42G
45	11	**22**	--	42	10	15	**30**	--	**S2**	5	**3RW4036-□TB04**		1	1 unit	42G
63	18.5	**30**	--	58	15	20	**40**	--	**S2**	5	**3RW4037-□TB04**		1	1 unit	42G
72	22	**37**	--	62	20	20	**40**	--	**S2**	5	**3RW4038-□TB04**		1	1 unit	42G
80	22	**45**	--	73	20	25	**50**	--	**S3**	5	**3RW4046-□TB04**		1	1 unit	42G
106	30	**55**	--	98	30	30	**75**	--	**S3**	5	**3RW4047-□TB04**		1	1 unit	42G
Rated operational voltage U_e 400 ... 600 V, with thermistor motor protection, rated control supply voltage U_s 24 V AC/DC															
12.5	--	5.5	**7.5**	11	--	--	7.5	**10**	**S0**	5	**3RW4024-□TB05**		1	1 unit	42G
25	--	11	**15**	23	--	--	15	**20**	**S0**	5	**3RW4026-□TB05**		1	1 unit	42G
32	--	15	**18.5**	29	--	--	20	**25**	**S0**	5	**3RW4027-□TB05**		1	1 unit	42G
38	--	18.5	**22**	34	--	--	25	**30**	**S0**	5	**3RW4028-□TB05**		1	1 unit	42G
45	--	22	**30**	42	--	--	30	**40**	**S2**	5	**3RW4036-□TB05**		1	1 unit	42G
63	--	30	**37**	58	--	--	40	**50**	**S2**	5	**3RW4037-□TB05**		1	1 unit	42G
72	--	37	**45**	62	--	--	40	**60**	**S2**	5	**3RW4038-□TB05**		1	1 unit	42G
80	--	45	**55**	73	--	--	50	**60**	**S3**	5	**3RW4046-□TB05**		1	1 unit	42G
106	--	55	**75**	98	--	--	75	**75**	**S3**	5	**3RW4047-□TB05**		1	1 unit	42G

Article No. supplement for connection types

- With screw terminals **1**
- With spring-type terminals[2] **2**

[1] Soft starter U_e 200 to 480 V with screw terminals: Standard delivery time SD = 1 day.

[2] Main connection from size S2: screw terminals.

Note:

The listed motor ratings are rough guide values. The soft starter should always be designed on the basis of the required rated operational current of the motor.

The 3RW40 soft starters are designed for easy starting conditions. The selection and ordering data were determined for the following boundary conditions (see also the notes on page 6/6):

- Maximum starting time in s: 10
- Maximum starting current in % of motor current I_e: 300
- Maximum number of starts per hour in 1/h: 5
- Stand-alone installation without auxiliary fan (side-by-side, see manual, increased switching frequency possible using auxiliary fans)

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 20, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

SIRIUS 3RW40 for normal starting (CLASS 10) *IE3/IE4* ready

3RW405.

3RW407.

3RW ambient temperature 40 °C Rated values of three-phase motors				3RW ambient temperature 50 °C Rated values of three-phase motors					Size	SD[1]	**Normal starting (CLASS 10)**	PU (UNIT, SET, M)	PS*	PG
Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	Operational current I_e	Rating at operational voltage U_e 200 V	230 V	460 V	575 V			Article No. / Price per PU			
A	kW	kW	kW	A	hp	hp	hp	hp		d				
Rated operational voltage U_e 200 ... 460 V														
134	37	**75**	--	117	30	40	**75**	--	**S6**	5	**3RW4055-□BB□4**	1	1 unit	42G
162	45	**90**	--	145	40	50	**100**	--		5	**3RW4056-□BB□4**	1	1 unit	42G
230	75	**132**	--	205	60	75	**150**	--	**S12**	5	**3RW4073-□BB□4**	1	1 unit	42G
280	90	**160**	--	248	75	100	**200**	--		5	**3RW4074-□BB□4**	1	1 unit	42G
356	110	**200**	--	315	100	125	**250**	--		5	**3RW4075-□BB□4**	1	1 unit	42G
432	132	**250**	--	385	125	150	**300**	--		5	**3RW4076-□BB□4**	1	1 unit	42G
Rated operational voltage U_e 400 ... 600 V														
134	--	75	**90**	117	--	--	75	**100**	**S6**	5	**3RW4055-□BB□5**	1	1 unit	42G
162	--	90	**110**	145	--	--	100	**150**		5	**3RW4056-□BB□5**	1	1 unit	42G
230	--	132	**160**	205	--	--	150	**200**	**S12**	5	**3RW4073-□BB□5**	1	1 unit	42G
280	--	160	**200**	248	--	--	200	**250**		5	**3RW4074-□BB□5**	1	1 unit	42G
356	--	200	**250**	315	--	--	250	**300**		5	**3RW4075-□BB□5**	1	1 unit	42G
432	--	250	**315**	385	--	--	300	**400**		5	**3RW4076-□BB□5**	1	1 unit	42G

Article No. supplement for connection types[2]

- With spring-type terminals **2 6**
- With screw terminals **3 4**

Article No. supplement for rated control supply voltage U_s[3]

- 115 V AC
- 230 V AC

1) Soft starter U_e 200 to 460 V with screw terminals: Standard delivery time SD = 1 day, soft starter U_e 400 to 600 V with screw terminals: Standard delivery time SD = 2 days.

2) Main circuit connection: busbar connection.

3) Control by way of the internal 24 V DC supply and direct control via PLC possible.

Note:

The listed motor ratings are rough guide values. The soft starter should always be designed on the basis of the required rated operational current of the motor.

The 3RW40 soft starters are designed for easy starting conditions. The selection and ordering data were determined for the following boundary conditions (see also the notes on page 6/6):

- Maximum starting time in s: 10
- Maximum starting current in % of motor current I_e: 300
- Maximum number of starts per hour in 1/h: 5
- Stand-alone installation (side-by-side, see manual)

In case of additional requirements, it may be necessary to choose a larger device. In some cases, however, the safety margins taken into account in the selection also permit the listed units to be used in boundary conditions which are slightly more demanding. Detailed technical information for a configuration which is tailored exactly to the application, see manual.

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 20, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

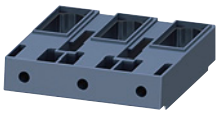
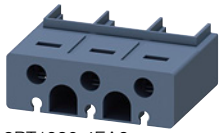
*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Selection and ordering data

More information

Manual "SIRIUS 3RW30/3RW40 soft starters", see https://support.industry.siemens.com/cs/ww/en/view/38752095.

	Conductor cross-section			Tightening torque	For soft starters size	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	Solid or stranded	Finely stranded with end sleeve	AWG cables, solid or stranded								
	mm²	mm²	AWG	Nm		d					
Three-phase infeed terminals											
 3RV2925-5AB	2.5 … 25	2.5 … 16	10 … 4	3 … 4	**S0** (3RW402.)	▶	**3RV2925-5AB**		1	1 unit	41E

	For soft starters Type	Size	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
				d					
Box terminal blocks for soft starters									
 3RT1956-4G	**For round and ribbon cables** (2 units required for each device)								
	3RW405.	**S6**	• Up to 70 mm²	▶	**3RT1955-4G**		1	1 unit	41B
			• Up to 120 mm²	▶	**3RT1956-4G**		1	1 unit	41B
			Auxiliary conductor connection for box terminals	5	**3TX7500-0A**		1	1 unit	41B
	3RW407.	**S12**	• Up to 240 mm² (with auxiliary conductor connection)	▶	**3RT1966-4G**		1	1 unit	41B
Auxiliary terminals									
 3RT2946-4F	**Auxiliary terminals, 3-pole**								
	3RW404.	**S3**		5	**3RT2946-4F**		1	1 unit	41B
Covers for soft starters									
 3RT1936-4EA2	**Terminal covers for box terminals** Additional touch protection to be fitted at the box terminals (2 units required per device)								
	3RW403.	**S2**		2	**3RT2936-4EA2**		1	1 unit	41B
	3RW404.	**S3**		▶	**3RT2946-4EA2**		1	1 unit	41B
	3RW405.	**S6**		▶	**3RT1956-4EA2**		1	1 unit	41B
	3RW407.	**S12**		▶	**3RT1966-4EA2**		1	1 unit	41B
 3RT1956-4EA1	**Terminal covers for cable lugs and busbar connections**								
	3RW404.	**S3**	For complying with the voltage clearances and as touch protection if box terminal is removed (2 units required per device)	5	**3RT1946-4EA1**		1	1 unit	41B
	3RW405.	**S6**		▶	**3RT1956-4EA1**		1	1 unit	41B
	3RW407.	**S12**		▶	**3RT1966-4EA1**		1	1 unit	41B
	Also fits in case of S6 and S12 on mounted box terminals								
 3RW4900-0PB00	**Sealing covers**								
	3RW402. to 3RW404.	**S0, S2, S3**		▶	**3RW4900-0PB10**		1	1 unit	42G
	3RW405. and 3RW407.	**S6, S12**		▶	**3RW4900-0PB00**		1	1 unit	42G

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

Standard mounting rail adapters


3RA2932-1CA00

For motor starter protectors Size	For soft starters Size	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
		For mechanical fixing of motor starter protector and soft starter; for snapping onto standard mounting rail or for screw fixing						
S2	**S2**	**Single-unit packaging**	▶	**3RA2932-1CA00**		1	1 unit	41B

Modules for RESET[1)]


3RU1900-2A.71

For soft starters Type	Size	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
		Modules for remote RESET, electrical						
		Operating range 0.85 ... 1.1 x U_s, Power consumption 80 VA AC, 70 W DC, ON time 0.2 ... 4 s, Switching frequency 60/h						
3RW405. and 3RW407.	**S6, S12**	• 24 ... 30 V AC/DC	2	**3RU1900-2AB71**		1	1 unit	41F
		• 110 ... 127 V AC/DC	2	**3RU1900-2AF71**		1	1 unit	41F
		• 220 ... 250 V AC/DC	2	**3RU1900-2AM71**		1	1 unit	41F


Mechanical RESET

		Mechanical RESET comprising						
3RW405. and 3RW407.	**S6, S12**	• Resetting plungers, holders and formers	▶	**3RU1900-1A**		1	1 unit	41F
		• Matching pushbutton IP65, Ø 22 mm, 12 mm stroke	5	**3SB3000-0EA11**		1	1 unit	41J
		• Extension plungers	2	**3SX1335**		1	1 unit	41J


3RU1900-1.

		Cable releases with holder for RESET						
		For Ø 6.5 mm holes in the control panel; max. control panel thickness 8 mm						
3RW405. and 3RW407.	**S6, S12**	• Length 400 mm	▶	**3RU1900-1B**		1	1 unit	41F
		• Length 600 mm	▶	**3RU1900-1C**		1	1 unit	41F

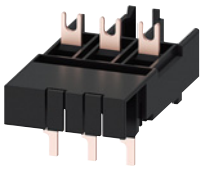
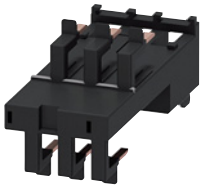
[1)] Remote RESET already integrated in the 3RW402. to 3RW404. soft starters.

Fans (to increase switching frequency and for device mounting in positions different to the standard position)

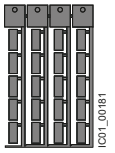
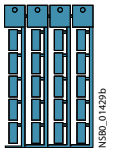

3RW4928-8VB00, 3RW4947-8VB00

For soft starters Type	Size	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
3RW402.	**S0**	▶	**3RW4928-8VB00**		1	1 unit	42G
3RW403., 3RW404.	**S2, S3**	▶	**3RW4947-8VB00**		1	1 unit	42G

* You can order this quantity or a multiple thereof.
Illustrations are approximate

For soft starters Type	Size	Motor starter protectors Size	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
			d					
Link modules to motor starter protectors[1]								
 3RA2921-1BA00								
• With screw terminals								
3RW402.	**S0**	**S00/S0**	2	**3RA2921-1BA00**		1	1 unit	41B
3RW4036.	**S2**	**S2**	▶	**3RA2931-1AA00**		1	1 unit	41B
3RW4046., 3RW4047.	**S3**	**S3**	▶	**3RA1941-1AA00**		1	1 unit	41B
 3RA2921-2GA00								
• With spring-type terminals								
3RW402.	**S0**	**S0**	▶	**3RA2921-2GA00**		1	1 unit	41B

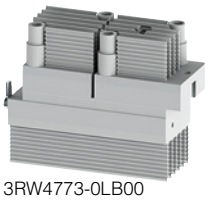
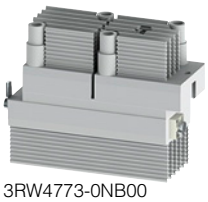
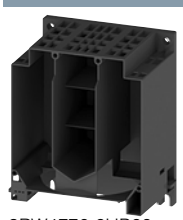
[1] Can be used in size S0 up to maximum 32 A.
Can be used in size S2 up to maximum 65 A in combination with 3RA2932-1CA00 standard mounting rail adapter (specially for soft starters).
Can be used in size S3 only with mounting plate.

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Tools for opening spring-type terminals in sizes S00 and S0						
		Spring-type terminals				
 3RA2908-1A **Screwdrivers** For all SIRIUS devices with spring-type terminals Length approx. 200 mm, size 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit	41B
Blank labels						
 3RT2900-1SB20 **Unit labeling plates**[1] For SIRIUS devices						
• 20 mm x 7 mm, titanium gray	20	**3RT2900-1SB20**		100	340 units	41B
 3RT1900-1SB20 • 20 mm x 7 mm, pastel turquoise	20	**3RT1900-1SB20**		100	340 units	41B

[1] PC labeling systems for individual inscription of unit labeling plates are available from: murrplastik Systemtechnik GmbH see page 16/15.

Spare parts

Selection and ordering data

For soft starters Type	Size	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Power semiconductor modules								
 3RW4773-0LB00								
3RW4073	S12	600 V, 230 A	1	**3RW4773-0LB00**		1	1 unit	42G
3RW4074	S12	600 V, 280 A	1	**3RW4774-0LB00**		1	1 unit	42G
3RW4075	S12	600 V, 356 A	1	**3RW4775-0LB00**		1	1 unit	42G
3RW4076	S12	600 V, 432 A	1	**3RW4776-0LB00**		1	1 unit	42G
NTC power semiconductor modules								
 3RW4773-0NB00								
3RW4073	S12	600 V, 230 A	1	**3RW4773-0NB00**		1	1 unit	42G
3RW4074	S12	600 V, 280 A	1	**3RW4774-0NB00**		1	1 unit	42G
3RW4075	S12	600 V, 356 A	1	**3RW4775-0NB00**		1	1 unit	42G
3RW4076	S12	600 V, 432 A	1	**3RW4776-0NB00**		1	1 unit	42G
Control units with screw terminals								
 3RW4755-6SB40								
3RW4055-.BB3.	S6	115 V	1	**3RW4755-6SB30**		1	1 unit	42G
3RW4055-.BB4.	S6	230 V	1	**3RW4755-6SB40**		1	1 unit	42G
3RW4056-.BB3.	S6	115 V	1	**3RW4756-6SB30**		1	1 unit	42G
3RW4056-.BB4.	S6	230 V	1	**3RW4756-6SB40**		1	1 unit	42G
3RW4073-.BB3.	S12	115 V	1	**3RW4773-6SB30**		1	1 unit	42G
3RW4073-.BB4.	S12	230 V	1	**3RW4773-6SB40**		1	1 unit	42G
3RW4074-.BB3.	S12	115 V	1	**3RW4774-6SB30**		1	1 unit	42G
3RW4074-.BB4.	S12	230 V	1	**3RW4774-6SB40**		1	1 unit	42G
3RW4075-.BB3.	S12	115 V	1	**3RW4775-6SB30**		1	1 unit	42G
3RW4075-.BB4.	S12	230 V	1	**3RW4775-6SB40**		1	1 unit	42G
3RW4076-.BB3.	S12	115 V	1	**3RW4776-6SB30**		1	1 unit	42G
3RW4076-.BB4.	S12	230 V	1	**3RW4776-6SB40**		1	1 unit	42G
Firing printed circuit boards								
 3RW4756-0VB70								
3RW405-.BB4.	S6	460 V	2	**3RW4756-0VB70**		1	1 unit	42G
3RW405-.BB5.	S6	600 V	2	**3RW4756-0VB80**		1	1 unit	42G
3RW407-.BB4.	S12	460 V	2	**3RW4776-0VB70**		1	1 unit	42G
3RW407-.BB5.	S12	600 V	2	**3RW4776-0VB80**		1	1 unit	42G
Fans								
 3RW4936-8VX.0, 3RW4947-8VX.0								
3RW405.-.BB3.	S6	115 V	▶	**3RW4936-8VX30**		1	1 unit	42G
3RW405.-.BB4.	S6	230 V	▶	**3RW4936-8VX40**		1	1 unit	42G
3RW407.-.BB3.	S12	115 V	▶	**3RW4947-8VX30**		1	1 unit	42G
3RW407.-.BB4.	S12	230 V	▶	**3RW4947-8VX40**		1	1 unit	42G
Removable control terminals								
 3RW4776-6HB00								
With spring-type terminals								
3RW40	--	2 blocks each with 6 terminals	1	**3RW4776-2HB00**		1	1 unit	42G
With screw terminals								
3RW40	--	2 blocks each with 6 terminals	1	**3RW4776-6HB00**		1	1 unit	42G
Enclosure base								
 3RW4776-0UB00								
3RW407.	S12	--	3	**3RW4776-0UB00**		1	1 unit	42G

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

More information

Homepage, see www.siemens.com/soft-starter
Industry Mall, see www.siemens.com/product?3RW
Online configurator, see www.siemens.com/sirius/configurators
Simulation Tool for Soft Starters (STS), see page 14/5 or https://support.industry.siemens.com/cs/ww/en/view/101494917

3RW44 soft starter with PROFINET communication module

In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements. They cover a performance range up to 710 kW (at 400 V) in the inline circuit and up to 1 200 kW (at 400 V) in the inside-delta circuit.

The 3RW44 soft starters are characterized by a compact design for space-saving and clearly arranged control cabinet layouts. For optimized motor starting and stopping the innovative SIRIUS 3RW44 soft starters are an attractive alternative with considerable savings potential compared to applications with a frequency converter. The new torque control and adjustable current limiting enable the High Feature soft starters to be used in nearly every conceivable task. They guarantee the reliable avoidance of sudden torque applications and current peaks during motor starting and stopping. This creates savings potential when calculating the size of the switchgear and when servicing the machinery installed. Be it for inline circuits or inside-delta circuits – the SIRIUS 3RW44 soft starter offers savings especially in terms of size and equipment costs.

The bypass contacts already integrated in the soft starter bypass the thyristors after a motor ramp-up is detected. This results in a further great reduction in the heat loss occurring during operation of the soft starter at rated value.

Combinations of various starting, operating and ramp-down possibilities ensure an optimum adaptation to the application-specific requirements.

Applicable standards

- IEC 60947-4-2
- UL/CSA

Functionality

Equipped with modern, ergonomic user prompting the 3RW44 soft starters can be commissioned quickly and easily using a keypad and a menu-prompted, multi-line graphic display with background lighting. The optimized motor ramp-up and ramp-down can be effected quickly, easily and reliably by means of just a few settings with a selectable language. Four-key operation and plain-text displays for each menu item guarantee full clarity at every moment of the parameterization and operation. During operation and when control voltage is applied, the display field continuously presents measured values and operating values as well as warnings and fault messages. An external display and operator module can be connected by means of a connection cable to the soft starter, thus enabling active indications and the like to be read directly from the control cabinet door.

The SIRIUS 3RW44 soft starters are equipped with optimum functionality. An integral bypass contact system reduces the power loss of the soft starter during operation.
This reliably prevents heating of the switchgear environment. The SIRIUS 3RW44 soft starters have internal intrinsic device protection. This prevents thermal overloading of the power section's thyristors, e.g. due to unacceptably high closing operations.

Wiring outlay for installing an additional motor overload relay is no longer needed as the SIRIUS 3RW44 soft starters perform this function too. In addition they offer adjustable trip classes and a thermistor motor protection function. As an option the thyristors can also be protected by SITOR semiconductor fuses from short-circuiting so that the soft starter is still functional after a short circuit (type of coordination "2"). And even inrush current peaks are reliably avoided thanks to adjustable current limiting.

Optionally, SIRIUS 3RW44 soft starters can be upgraded with a PROFIBUS DP or PROFINET module. Thanks to their communication capability and their programmable control inputs and relay outputs the SIRIUS 3RW44 soft starters can be very easily and quickly integrated in higher-level controllers.

In addition a creep speed function is available for positioning and setting jobs. With this function the motor can be controlled in both directions of rotation with reduced torque and an adjustable, low speed.

On the other hand the SIRIUS 3RW44 soft starters offer a new, combined DC braking function for the fast stopping of driving loads.

General data

Highlights

- Soft starting with breakaway pulse, torque control or voltage ramp, adjustable torque or current limiting as well as any combination of these, depending on load type
- Integrated bypass contact system to minimize power loss
- Various setting options for the starting parameters such as starting torque, starting voltage, ramp-up and ramp-down time, and much more in three separate parameter sets
- Start-up detection
- Inside-delta circuit for savings in terms of size and equipment costs
- Various ramp-down modes selectable: coasting down and torque-controlled ramp-down, pump stop, combined DC braking
- Electronic motor overload and intrinsic device protection
- Thermistor motor protection
- Keypad with a menu-prompted, multi-line graphic display with background lighting
- Interface for communication with the PC for more accurate setting of the parameters as well as for control and monitoring
- Simple integration to the motor feeder
- Simple mounting and commissioning
- Display of operating states and fault messages
- Connection to PROFIBUS and PROFINET with optional PROFIBUS DP or PROFINET module
- External display and operator module
- Mains voltages from 200 to 690 V, 50 to 60 Hz
- Can be used up to 60 °C (derating from 40 °C)

Simulation Tool for Soft Starters

A convenient way of designing soft starters using a simple, quick and easy-to-use interface is possible with the Simulation Tool for Soft Starters (STS), see page 14/5. Entering the motor and load data will simulate the application and prompt suggestions for suitable soft starters.

SIRIUS Soft Starter ES and SIRIUS Soft Starter ES (TIA Portal) software programs

Both of these programs enable the quick and easy parameterization, monitoring and diagnostics of SIRIUS 3RW44 High Feature soft starters for service purposes, see pages 14/6 and 14/9.

SIRIUS 3RW44 Soft Starter block library for SIMATIC PCS 7

The SIRIUS 3RW44 Soft Starter PCS 7 block library can be used for simple and easy integration of SIRIUS 3RW44 soft starters into the SIMATIC PCS 7 process control system, see page 14/11.

Application

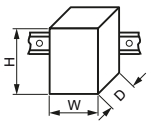
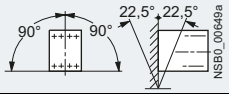
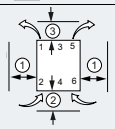
The SIRIUS 3RW44 solid-state soft starters are suitable for the torque-controlled soft starting and ramp-down as well as braking of three-phase asynchronous motors.

Application areas

See "Selection aid for soft starters" on page 6/5.

Technical specifications

More information	
Manual "SIRIUS 3RW44 soft starters" see https://support.industry.siemens.com/cs/ww/en/view/21772518	Catalog LV 10, see www.siemens.com/lowvoltage/lv10
FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16214/faq	

Type			3RW442.	3RW443.	3RW444.	3RW445.	3RW446.
Mechanics and environment							
Mounting dimensions (W x H x D)							
• Screw terminals		mm	170 x 184 x 270	170 x 198 x 270	210 x 230 x 298	510 x 638.5 x 290	576 x 667 x 290
• Spring-type terminals		mm	170 x 184 x 270	170 x 198 x 270	210 x 230 x 298	510 x 638.5 x 290	576 x 667 x 290
Permissible ambient temperature							
During operation		°C	0 ... +60; (derating from +40)				
During storage		°C	-25 ... +80				
Weight		kg	6.5	7.9	11.5	50	78
Permissible mounting position							
Installation type			Stand-alone installation	① ≥ 5 mm (≥ 0.2 in) ② ≥ 75 mm (≥ 3 in) ③ ≥ 100 mm (≥ 4 in)			
Permissible installation altitude		m	5 000 (derating from 1 000, see characteristic curves, page 6/7); higher on request				
Degree of protection			IP00				

Type	Terminal		3RW44..-.BC3.	3RW44..-.BC4.
Control electronics				
Rated values				
Rated control supply voltage	A1/A2/PE	V	115 AC	230 AC
• Tolerance		%	-15/+10	
Rated frequency		Hz	50 ... 60	
• Tolerance		%	± 10	

Type		3RW44..-.BC.4	3RW44..-.BC.5	3RW44..-.BC.6
Power electronics				
Rated operational voltage for inline circuit[1]	V AC	200 ... 460	400 ... 600	400 ... 690
Tolerance	%	-15/+10		
Maximum blocking voltage (thyristor)	V AC	1 400	1 800	
Rated operational voltage for inside-delta circuit	V AC	200 ... 460	400 ... 600	
Tolerance	%	-15/+10		
Rated frequency	Hz	50 ... 60		
Tolerance	%	± 10		
Uninterrupted duty at 40 °C (% of I_e)	%	115		
Minimum load (% of set motor current I_M)	%	8		
Maximum cable length between soft starter and motor	m	500[2]		

1) 3RW44 soft starters may be used in isolated supply networks (IT systems) up to 600 V AC.

2) At the project configuration stage, it is important to make allowance for the voltage drop on the motor cable up to the motor connection. If necessary, higher values for the rated operational voltage or current must be calculated accordingly for the soft starter.

General data

Type		3RW4422	3RW4423	3RW4424	3RW4425	3RW4426	3RW4427
Power electronics							
Rated operational current I_e	A	29	36	47	57	77	93
Load rating with rated operational current I_e							
• according to IEC and UL/CSA[1], for individual mounting, AC-53a							
- At 40/50/60 °C	A	29/26/23	36/32/29	47/42/37	57/51/45	77/68/59	93/82/72
Smallest adjustable rated motor current I_M For the motor overload protection	A	5	7	9	11	15	18
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40/50/60 °C) approx.	W	8/7.5/7	10/9/8.5	32/31/29	36/34/31	45/41/37	55/51/47
• During starting with current limit set to 350% I_M (40/50/60 °C)	W	400/345/290	470/410/355	600/515/440	725/630/525	940/790/660	1160/980/830
Permissible rated motor current and starts per hour at 40/ 50/60 °C							
• For normal starting (CLASS 5)							
- Rated motor current I_M[2], ramp-up time 5 s	A	29/26/23	36/32.5/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour[3]	1/h	41	34	41	41	41	41
- Rated motor current I_M[2], ramp-up time 10 s	A	29/26/23	36/32.5/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour[3]	1/h	20	15	20	20	20	20
• For normal starting (CLASS 10)							
- Rated motor current I_M[2], ramp-up time 10 s	A	29/26/23	36/32.5/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour[3]	1/h	20	15	20	20	20	20
- Rated motor current I_M[2], ramp-up time 20 s	A	29/26/23	36/32.5/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour[3]	1/h	10	6	10	10	8	8
• For normal starting (CLASS 15)							
- Rated motor current I_M[2], ramp-up time 15 s	A	29/26/23	36/32.5/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour[3]	1/h	13	9	13	13	13	13
- Rated motor current I_M[2], ramp-up time 30 s	A	29/26/23	36/32.5/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour[3]	1/h	6	4	6	6	6	6
• For heavy starting (CLASS 20)							
- Rated motor current I_M[2], ramp-up time 20 s	A	29/26 /23	36/32.5/29	47/42/37	57/51/45	77/68/59	88/80/72
- Starts per hour[3]	1/h	10	6	10	10	10	10
- Rated motor current I_M[2], ramp-up time 40 s	A	29/26/23	36/32.5/29	47/42/37	57/51/45	77/68/59	88/80/72
- Starts per hour[3]	1/h	4	2	4	5	1.8	0.8
• For very heavy starting (CLASS 30)							
- Rated motor current I_M[2], ramp-up time 30 s	A	29/26/23	36/32.5/29	47/42/37	57/51/45	65/60/54	77/70/63
- Starts per hour[3]	1/h	6	4	6	6	6	6
- Rated motor current I_M[2], ramp-up time 60 s	A	29/26/23	36/32.5/29	47/42/37	57/51/45	65/60/54	77/70/63
- Starts per hour[3]	1/h	1.8	0.8	3.3	1.5	2	1

1) Measurement at 60 °C according to UL/CSA not required.

2) Current limit on soft starter set to 350% I_M, ON period = 70%. Maximum adjustable rated motor current I_M dependent on CLASS setting.

3) For intermittent duty S4 with ON period = 70%, T_u = 40/50/60 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Type		3RW4434	3RW4435	3RW4436
Power electronics				
Rated operational current I_e	A	113	134	162
Load rating with rated operational current I_e				
• According to IEC and UL/CSA[1], for individual mounting, AC-53a				
- At 40/50/60 °C	A	113/100/88	134/117/100	162/145/125
Smallest adjustable rated motor current I_M	A	22	26	32
For the motor overload protection				
Power loss				
• In operation after completed run-up with uninterrupted rated operational current (40/50/60 °C) approx.	W	64/58/53	76/67/58	95/83/71
• During starting with current limit set to 350% I_M (40/50/60 °C)	W	1 350/1 140/970	1 700/1 400/1 140	2 460/1 980/1 620
Permissible rated motor current and starts per hour at 40/50/60 °C				
• For normal starting (CLASS 5)				
- Rated motor current I_M[2], ramp-up time 5 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour[3]	1/h	41	39	41
- Rated motor current I_M[2], ramp-up time 10 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour[3]	1/h	20	15	20
• For normal starting (CLASS 10)				
- Rated motor current I_M[2], ramp-up time 10 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour[3]	1/h	20	15	20
- Rated motor current I_M[2], ramp-up time 20 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour[3]	1/h	9	6	7
• For normal starting (CLASS 15)				
- Rated motor current I_M[2], ramp-up time 15 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour[3]	1/h	13	9	12
- Rated motor current I_M[2], ramp-up time 30 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour[3]	1/h	6	6	1
• For heavy starting (CLASS 20)				
- Rated motor current I_M[2], ramp-up time 20 s	A	106/97/88	125/113/100	147/134/122
- Starts per hour[3]	1/h	9	9	10
- Rated motor current I_M[2], ramp-up time 40 s	A	106/97/88	125/113/100	147/134/122
- Starts per hour[3]	1/h	1.5	2	1
• For very heavy starting (CLASS 30)				
- Rated motor current I_M[2], ramp-up time 30 s	A	91/84/76	110/100/90	120/110/100
- Starts per hour[3]	1/h	6	6	6
- Rated motor current I_M[2], ramp-up time 60 s	A	91/84/76	110/100/90	120/110/100
- Starts per hour[3]	1/h	2	2	2

1) Measurement at 60 °C according to UL/CSA not required.

2) Current limit on soft starter set to 350% I_M,
ON period = 70%. Maximum adjustable rated motor current I_M dependent on CLASS setting.

3) For intermittent duty S4 with ON period = 70%, T_u = 40/50/60 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

General data

Type		3RW4443	3RW4444	3RW4445	3RW4446	3RW4447
Power electronics						
Rated operational current I_e	A	203	250	313	356	432
Load rating with rated operational current I_e						
• According to IEC and UL/CSA[1], for individual mounting, AC-53a						
- At 40/50/60 °C	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
Smallest adjustable rated motor current I_M	A	40	50	62	71	86
For the motor overload protection						
Power loss						
• In operation after completed run-up with uninterrupted rated operational current (40/50/60 °C) approx.	W	89/81/73	110/94/83	145/126/110	174/147/126	232/194/159
• During starting with current limit set to 350% I_M (40/50/60 °C)	W	3350/2600/2150	4000/2900/2350	4470/4000/3400	5350/4050/3500	5860/5020/4200
Permissible rated motor current and starts per hour at 40/50/60 °C						
• **For normal starting (CLASS 5)**						
- Rated motor current I_M[2], ramp-up time 5 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour[3]	1/h	41	41	41	41	39
- Rated motor current I_M[2], ramp-up time 10 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour[3]	1/h	20	20	19	17	16
• **For normal starting (CLASS 10)**						
- Rated motor current I_M[2], ramp-up time 10 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour[3]	1/h	20	20	19	17	16
- Rated motor current I_M[2], ramp-up time 20 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour[3]	1/h	9	10	6	4	5
• **For normal starting (CLASS 15)**						
- Rated motor current I_M[2], ramp-up time 15 s	A	203/180/156	240/215/185	313/280/250	325/295/265	402/385/335
- Starts per hour[3]	1/h	13	13	10	13	11
- Rated motor current I_M[2], ramp-up time 30 s	A	203/180/156	240/215/185	313/280/250	325/295/265	402/385/335
- Starts per hour[3]	1/h	3	6	1	2	1
• **For heavy starting (CLASS 20)**						
- Rated motor current I_M[2], ramp-up time 20 s	A	195/175/155	215/195/180	275/243/221	285/263/240	356/326/295
- Starts per hour[3]	1/h	10	10	10	10	10
- Rated motor current I_M[2], ramp-up time 40 s	A	195/175/155	215/195/180	275/243/221	285/263/240	356/326/295
- Starts per hour[3]	1/h	1	5	1	3	1
• **For very heavy starting (CLASS 30)**						
- Rated motor current I_M[2], ramp-up time 30 s	A	162/148/134	180/165/150	220/201/182	240/223/202	285/260/235
- Starts per hour[3]	1/h	6	6	6	6	6
- Rated motor current I_M[2], ramp-up time 60 s	A	162/148/134	180/165/150	220/201/182	240/223/202	285/260/235
- Starts per hour[3]	1/h	3	3	3	2	1

[1] Measurement at 60 °C according to UL/CSA not required.

[2] Current limit on soft starter set to 350% I_M, ON period = 70%. Maximum adjustable rated motor current I_M dependent on CLASS setting.

[3] For intermittent duty S4 with ON period = 70%, T_u = 40/50/60 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Type		3RW4453	3RW4454	3RW4455	3RW4456	3RW4457	3RW4458	3RW4465	3RW4466
Power electronics									
Rated operational current I_e	A	551	615	693	780	880	970	1076	1214
Load rating with rated operational current I_e									
• According to IEC and UL/CSA[1], for individual mounting, AC-53a									
- At 40/50/60 °C	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760	1076/970/880	1214/1076/970
Smallest adjustable rated motor current I_M For the motor overload protection	A	110	123	138	156	176	194	215	242
Power loss									
• In operation after completed run-up with uninterrupted rated operational current (40/50/60 °C) approx.	W	159/135/113	186/156/130	220/181/152	214/176/146	250/204/168	270/215/179	510/420/360	630/510/420
• During starting with current limit set to 350% I_M									
- At 40 °C	W	7 020	8 100	9 500	11 100	13 100	15 000	15 000	17 500
- At 50 °C	W	6 111	7 020	8 100	9 500	11 000	12 500	13 000	15 000
- At 60 °C	W	5 263	5 996	7 020	8 100	8 100	10 700	11 500	13 000
Permissible rated motor current and starts per hour at 40/ 50/60 °C									
• For normal starting (CLASS 5)									
- Rated motor current I_M[2], ramp-up time 5 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760	1076/970/880	1214/1076/970
- Starts per hour[3]	1/h	41	41	37	33	22	17	30	20
- Rated motor current I_M[2], ramp-up time 10 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760	1076/970/880	1214/1076/970
- Starts per hour[3]	1/h	20	20	16	13	8	5	10	6
• For normal starting (CLASS 10)									
- Rated motor current I_M[2], ramp-up time 10 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760	1076/970/880	1214/1076/970
- Starts per hour[3]	1/h	20	20	16	13	8	5	11	6
- Rated motor current I_M[2], ramp-up time 20 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760	1076/970/880	1214/1076/970
- Starts per hour[3]	1/h	10	9	6	4	0.3	0.3	3	0.5
• For normal starting (CLASS 15)									
- Rated motor current I_M[2], ramp-up time 15 s	A	551/494/438	615/551/489	666/615/551	723/693/615	780/710/650	821/755/693	1020/950/850	1090/1000/920
- Starts per hour[3]	1/h	13	13	11	9	8	8	7	5
- Rated motor current I_M[2], ramp-up time 30 s	A	551/494/438	615/551/489	666/615/551	723/693/615	780/710/650	821/755/693	1020/950/850	1090/1000/920
- Starts per hour[3]	1/h	6	4	3	1	0.4	0.5	1	1
• For heavy starting (CLASS 20)									
- Rated motor current I_M[2], ramp-up time 20 s	A	551/494/438	591/551/489	633/615/551	670/634/576	710/650/590	740/685/630	970/880/810	1030/940/860
- Starts per hour[3]	1/h	10	10	7	8	8	9	7	5
- Rated motor current I_M[2], ramp-up time 40 s	A	551/494/438	591/551/489	633/615/551	670/634/576	710/650/590	740/685/630	970/880/810	1030/940/860
- Starts per hour[3]	1/h	4	2	1	1	0.4	1	1	1
• For very heavy starting (CLASS 30)									
- Rated motor current I_M[2], ramp-up time 30 s	A	500/480/438	525/489/455	551/520/480	575/540/490	600/550/500	630/580/530	880/810/740	920/850/780
- Starts per hour[3]	1/h	6	6	6	6	6	6	6	6
- Rated motor current I_M[2], ramp-up time 60 s	A	500/480/438	525/489/455	551/520/480	575/540/490	600/550/500	630/580/530	880/810/740	920/850/780
- Starts per hour[3]	1/h	2	1	1	1	1.5	1	1	1

1) Measurement at 60 °C according to UL/CSA not required.

2) Current limit on soft starter set to 350% I_M, ON period = 70%. Maximum adjustable rated motor current I_M dependent on CLASS setting.

3) For intermittent duty S4 with ON period = 70%, T_u = 40/50/60 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

General data

Motor feeders with soft starters

The type of coordination according to which the motor feeder with soft starter is mounted depends on the application-specific requirements. Normally, fuseless mounting (combination of motor starter protector and soft starter) is sufficient.

If type of coordination "2" is to be fulfilled, then semiconductor fuses must be fitted in the motor feeder.

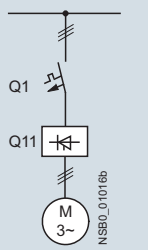
ToC 1 Type of coordination "1" according to IEC 60947-4-1: After a short-circuit incident, the unit is defective and therefore unsuitable for further use (protection of persons and system guaranteed).

ToC 2 Type of coordination "2" according to IEC 60947-4-1: After a short-circuit incident the unit is suitable for further use (protection of persons and system guaranteed).

The type of coordination refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

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

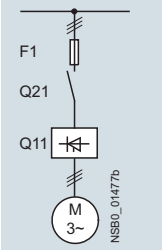
Inline circuit fuseless version



Soft starters ToC 1		Motor starter protectors[1]		
	Rated current	400 V + 10%		Rated current
Q11		Q1	I_q	
Type	A	Type	kA	A
Type of coordination "1"				
3RW4422	29	3RV2021-4EA10	42	32
3RW4423	36	3RV2021-4FA10	42	40
3RW4424	47	3RV2031-4WA10	32	52
3RW4425	57	3RV2031-4JA10	32	65
3RW4426	77	3RV2031-4RA10	32	80
3RW4427	93	3RV2042-4MA10	32	100
3RW4434	113	3VA2216-5MN32	55	160
3RW4435	134	3VA2216-5MN32	55	160
3RW4436	162	3VA2220-7MN32	55	200
3RW4443	203	3VA2325-7MN32	110	250
3RW4444	250	3VA2325-7MN32	110	250
3RW4445	313	3VA2440-7MN32	110	400
3RW4446	356	3VA2450-7MN32	110	500
3RW4447	432	3VA2450-7MN32	110	500
3RW4453	551	3VL6780-3SB36	65	800
3RW4454	615	3VL6780-3SB36	65	800
3RW4455	693	3VL6780-3SB36	65	800
3RW4456	780	3VL7710-3SB36	65	1 000
3RW4457	880	3VL7710-3SB36	65	1 000
3RW4458	970	3VL7712-3SB36	65	1 250
3RW4465	1 076	3VL7712-3SB36	65	1 250
3RW4466	1 214	3VL7712-3SB36	65	1 250

[1] The rated motor current must be considered when selecting the devices.

Inline circuit fused version (line protection only)



Soft starters ToC 1		Line protection, maximum			Line contactors up to 400 V	Braking contactors[1)2)]	
	Rated current	690 V + 5%	Rated current	Size	(optional)	(example circuit see manual 3RW44)	
Q11 Type	A	F1 Type	A		Q21 Type	Q91 Type	Q92 Type
Type of coordination "1"[3]: I_q = 65 kA							
3RW4422	29	3NA3820-6	50	00	3RT2027	3RT2526	--
3RW4423	36	3NA3822-6	63	00	3RT2028	3RT2526	--
3RW4424	47	3NA3824-6	80	00	3RT2036	3RT2535	--
3RW4425	57	3NA3830-6	100	00	3RT2037	3RT2535	--
3RW4426	77	3NA3132-6	125	1	3RT2038	3RT2024	3RT2035
3RW4427	93	3NA3136-6	160	1	3RT2046	3RT2025	3RT2036
3RW4434	113	3NA3244-6	250	2	3RT1054	3RT2027	3RT2037
3RW4435	134	3NA3244-6	250	2	3RT1055	3RT2036	3RT2038
3RW4436	162	3NA3365-6	500	3	3RT1056	3RT2037	3RT2038
3RW4443	203	2 x 3NA3354-6	2 x 355	3	3RT1064	3RT2037	3RT1054
3RW4444	250	2 x 3NA3354-6	2 x 355	3	3RT1065	3RT2037	3RT1055
3RW4445	313	2 x 3NA3365-6	2 x 500	3	3RT1075	3RT1054	3RT1056
3RW4446	356	2 x 3NA3365-6	2 x 500	3	3RT1075	3RT1054	3RT1056
3RW4447	432	2 x 3NA3365-6	2 x 500	3	3RT1076	3RT1055	3RT1064
3RW4453	551	2 x 3NA3365-6	2 x 500	3	3TF68	3RT1064	3RT1066
3RW4454	615	2 x 3NA3365-6	2 x 500	3	3TF68	3RT1064	3RT1075
3RW4455	693	2 x 3NA3365-6	2 x 500	3	3TF69	3RT1065	3RT1075
3RW4456	780	2 x 3NA3365-6	2 x 500	3	3TF69	3RT1065	3RT1075
3RW4457	880	2 x 3NA3365-6	2 x 500	3	--	3RT1075	3RT1076
3RW4458	970	3 x 3NA3365-6	3 x 500	3	--	3RT1075	3RT1076
3RW4465	1 076	3 x 3NA3365-6	3 x 500	3	--	3RT1075	3TF68
3RW4466	1 214	3 x 3NA3365-6	3 x 500	3	--	3RT1076	3TF68

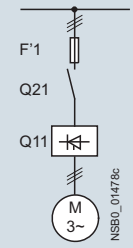
1) If the ramp-down function "Combined braking" is selected, no braking contactor is required.
If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (type, see table).
For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) the function "DC braking" is recommended.

2) Additional auxiliary relay K4:
LZS:RT4A4T30
(3RW44 soft starter with rated control supply voltage 230 V AC),
LZS:RT4A4S15
(3RW44 soft starter with rated control supply voltage 115 V AC).

3) The type of coordination "1" refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

General data

Inline circuit fused version with 3NE1 SITOR all-range fuse (semiconductor and line protection)



For matching fuse bases, see Catalog LV 10:

- "Fuse systems" → "SITOR Semiconductor Fuses" or www.siemens.com/sitor
- "Switch disconnectors"

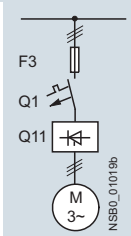
Soft starters ToC 2		All-range fuses				Line contactors up to 400 V	Braking contactors[1)2)]	
	Rated current		Rated current	Voltage	Size	(optional)	(example circuit see manual 3RW44)	
Q11 Type	A	F'1 Type	A	V		Q21 Type	Q91 Type	Q92 Type
Type of coordination "2"[3)]: I_q = 65 kA								
3RW4422	29	3NE1020-2	80	690 + 5%	00	3RT2027	3RT2526	--
3RW4423	36	3NE1020-2	80	690 + 5%	00	3RT2028	3RT2526	--
3RW4424	47	3NE1021-2	100	690 + 5%	00	3RT2036	3RT2535	--
3RW4425	57	3NE1022-2	125	690 + 5%	00	3RT2037	3RT2535	--
3RW4426	77	3NE1022-2	125	690 + 5%	00	3RT2038	3RT2024	3RT2035
3RW4427	93	3NE1224-2	160	690 + 5%	1	3RT2046	3RT2025	3RT2036
3RW4434	113	3NE1225-2	200	690 + 5%	1	3RT1054	3RT2027	3RT2037
3RW4435	134	3NE1227-2	250	690 + 5%	1	3RT1055	3RT2036	3RT2038
3RW4436	162	3NE1227-2	250	690 + 5%	1	3RT1056	3RT2037	3RT2038
3RW4443	203	3NE1230-2	315	600 + 10%	1	3RT1064	3RT2037	3RT1054
3RW4444	250	3NE1331-2	350	460 + 10%	2	3RT1065	3RT2037	3RT1055
3RW4445	313	3NE1333-2	450	690 + 5%	2	3RT1075	3RT1054	3RT1056
3RW4446	356	3NE1334-2	500	690 + 5%	2	3RT1075	3RT1054	3RT1056
3RW4447	432	3NE1435-2	560	690 + 5%	3	3RT1076	3RT1055	3RT1064
3RW4453	551	2 x 3NE1334-2	500	690 + 10%	2	3TF68	3RT1064	3RT1066
3RW4454	615	2 x 3NE1334-2	500	690 + 10%	2	3TF68	3RT1064	3RT1075
3RW4455	693	2 x 3NE1334-2	500	690 + 10%	2	3TF69	3RT1065	3RT1075
3RW4456	780	2 x 3NE1435-2	560	690 + 10%	3	3TF69	3RT1065	3RT1075
3RW4457	880	2 x 3NE1435-2	560	690 + 10%	3	--	3RT1075	3RT1076
3RW4458	970	2 x 3NE1435-2	560	690 + 10%	3	--	3RT1075	3RT1076
3RW4465	1 076	3 x 3NE1334-2	500	690 + 10%	2	--	3RT1075	3TF68
3RW4466	1 214	3 x 3NE1435-2	560	690 + 10%	3	--	3RT1076	3TF68

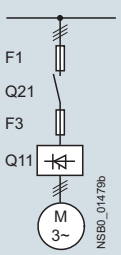
1) If the ramp-down function "Combined braking" is selected, no braking contactor is required.
If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (type, see table).
For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) the function "DC braking" is recommended.

2) Additional auxiliary relay K4:
LZS:RT4A4T30
(3RW44 soft starter with rated control supply voltage 230 V AC),
LZS:RT4A4S15
(3RW44 soft starter with rated control supply voltage 115 V AC).

3) The type of coordination "2" refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

Inline circuit fused version with 3NE or 3NC SITOR semiconductor fuse
(semiconductor protection by fuse, line and overload protection by motor starter protector)





For matching fuse bases, see Catalog LV 10:
- "Fuse systems" → "SITOR Semiconductor Fuses" or www.siemens.com/sitor
- "Switch disconnectors"

Soft starters	ToC 2	Semiconductor fuses, minimum			Semiconductor fuses (cylinder)		
	Rated current	690 V + 10%	Rated current	Size		Rated current	Size
Q11 Type	A	F3 Type	A		F3 Type	A	
Type of coordination "2"[1]: I_q = 65 kA							
3RW4422	29	3NE4120	80	0	3NC2280	80	22 x 58
3RW4423	36	3NE4121	100	0	3NC2200	100	22 x 58
3RW4424	47	3NE4121	100	0	3NC2200	100	22 x 58
3RW4425	57	3NE4122	125	0	--	--	--
3RW4426	77	3NE4124	160	0	--	--	--
3RW4427	93	3NE3224	160	1	--	--	--
3RW4434	113	3NE3225	200	1	--	--	--
3RW4435	134	3NE3225	200	1	--	--	--
3RW4436	162	3NE3227	250	1	--	--	--
3RW4443	203	3NE3230-0B	315	1	--	--	--
3RW4444	250	3NE3230-0B	315	1	--	--	--
3RW4445	313	3NE3233	450	1	--	--	--
3RW4446	356	3NE3333	450	2	--	--	--
3RW4447	432	3NE3335	560	2	--	--	--
3RW4453	551	2 x 3NE3335	560	2	--	--	--
3RW4454	615	2 x 3NE3335	560	2	--	--	--
3RW4455	693	2 x 3NE3335	560	2	--	--	--
3RW4456	780	2 x 3NE3336	630	2	--	--	--
3RW4457	880	2 x 3NE3336	630	2	--	--	--
3RW4458	970	2 x 3NE3336	630	2	--	--	--
3RW4465	1 076	2 x 3NE3340-8	900	2	--	--	--
3RW4466	1 214	2 x 3NE3340-8	900	2	--	--	--

Soft starters	ToC 2	Line contactors up to 400 V	Braking contactors[2][3]		Motor starter protectors		Line protection, maximum		
	Rated current	(optional)	(example circuit see manual 3RW44)		400 V + 10%	Rated current	690 V + 5%	Rated current	Size
Q11 Type	A	Q21 Type	Q91 Type	Q92 Type	Q1 Type	A	F1 Type	A	
Type of coordination "2"[1]: I_q = 65 kA									
3RW4422	29	3RT2027	3RT2526	--	3RV2021-4EA10	32	3NA3820-6	50	00
3RW4423	36	3RT2028	3RT2526	--	3RV2021-4FA10	40	3NA3822-6	63	00
3RW4424	47	3RT2036	3RT2535	--	3RV2031-4WA10	52	3NA3824-6	80	00
3RW4425	57	3RT2037	3RT2535	--	3RV2031-4JA10	65	3NA3830-6	100	00
3RW4426	77	3RT2038	3RT2024	3RT2035	3RV2031-4RA10	80	3NA3132-6	125	1
3RW4427	93	3RT2046	3RT2025	3RT2036	3RV2042-4MA10	100	3NA3136-6	160	1
3RW4434	113	3RT1054	3RT2027	3RT2037	3VA2216-5MN32	160	3NA3244-6	250	2
3RW4435	134	3RT1055	3RT2036	3RT2038	3VA2216-5MN32	160	3NA3244-6	250	2
3RW4436	162	3RT1056	3RT2037	3RT2038	3VA2220-7MN32	200	3NA3365-6	500	3
3RW4443	203	3RT1064	3RT2037	3RT1054	3VA2325-7MN32	250	2 x 3NA3354-6	2 x 355	3
3RW4444	250	3RT1065	3RT2037	3RT1055	3VA2325-7MN32	250	2 x 3NA3354-6	2 x 355	3
3RW4445	313	3RT1075	3RT1054	3RT1056	3VA2440-7MN32	400	2 x 3NA3365-6	2 x 500	3
3RW4446	356	3RT1075	3RT1054	3RT1056	3VA2450-7MN32	500	2 x 3NA3365-6	2 x 500	3
3RW4447	432	3RT1076	3RT1055	3RT1064	3VA2450-7MN32	500	2 x 3NA3365-6	2 x 500	3
3RW4453	551	3TF68	3RT1064	3RT1066	3VL6780	800	2 x 3NA3365-6	2 x 500	3
3RW4454	615	3TF68	3RT1064	3RT1075	3VL6780	800	2 x 3NA3365-6	2 x 500	3
3RW4455	693	3TF69	3RT1065	3RT1075	3VL6780	800	2 x 3NA3365-6	2 x 500	3
3RW4456	780	3TF69	3RT1065	3RT1075	3VL7710	1 000	2 x 3NA3365-6	2 x 500	3
3RW4457	880	--	3RT1075	3RT1076	3VL7710	1 000	2 x 3NA3365-6	2 x 500	3
3RW4458	970	--	3RT1075	3RT1076	3VL7712	1 250	3 x 3NA3365-6	3 x 500	3
3RW4465	1 076	--	3RT1075	3TF68	3VL7712	1 250	3 x 3NA3365-6	3 x 500	3
3RW4466	1 214	--	3RT1076	3TF68	3VL7712	1 250	3 x 3NA3365-6	3 x 500	3

[1] The type of coordination "2" refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.

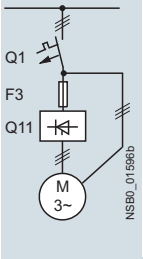
[2] If the ramp-down function "Combined braking" is selected, no braking contactor is required. If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (type, see table).

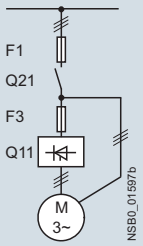
For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) the function "DC braking" is recommended.

[3] Additional auxiliary relay K4:
LZS:RT4A4T30
(3RW44 soft starter with rated control supply voltage 230 V AC),
LZS:RT4A4S15
(3RW44 soft starter with rated control supply voltage 115 V AC).

General data

Inside-delta circuit fused version with 3NE or 3NC SITOR fuses
(semiconductor protection by fuse, line and overload protection by motor starter protector)





For matching fuse bases, see Catalog LV 10:
- "Fuse systems" → "SITOR Semiconductor Fuses" or www.siemens.com/sitor
- "Switch disconnectors"

Soft starters	ToC 2	Semiconductor fuses, minimum			Semiconductor fuses (cylinder)		
Q11 Type	Rated current A	690 V +10% F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
Type of coordination "2" [1]							
3RW4422	50	3NE4120	80	0	3NC2280	80	22 x 58
3RW4423	62	3NE4121	100	0	3NC2200	100	22 x 58
3RW4424	81	3NE4121	100	0	3NC2200	100	22 x 58
3RW4425	99	3NE4122	125	0	--	--	--
3RW4426	133	3NE4124	160	0	--	--	--
3RW4427	161	3NE3224	160	1	--	--	--
3RW4434	196	3NE3225	200	1	--	--	--
3RW4435	232	3NE3225	200	1	--	--	--
3RW4436	281	3NE3227	250	1	--	--	--
3RW4443	352	3NE3230-0B	315	1	--	--	--
3RW4444	433	3NE3230-0B	315	1	--	--	--
3RW4445	542	3NE3233	450	1	--	--	--
3RW4446	617	3NE3333	450	2	--	--	--
3RW4447	748	3NE3335	560	2	--	--	--
3RW4453	954	2 x 3NE3335	560	2	--	--	--
3RW4454	1 065	2 x 3NE3335	560	2	--	--	--
3RW4455	1 200	2 x 3NE3335	560	2	--	--	--
3RW4456	1 351	2 x 3NE3336	630	2	--	--	--
3RW4457	1 524	2 x 3NE3336	630	2	--	--	--
3RW4458	1 680	2 x 3NE3336	630	2	--	--	--
3RW4465	1 864	2 x 3NE3340-8	900	2	--	--	--
3RW4466	2 103	2 x 3NE3340-8	900	2	--	--	--

Soft starters	ToC 2	Line contactors up to 400 V	Motor starter protectors		Line protection, maximum		
Q11 Type	Rated current A	(optional) Q21 Type	400 V +10% Q1 Type	Rated current A	690 V +5% F1 Type	Rated current A	Size
Type of coordination "2" [1]							
3RW4422	50	3RT2036-1AP04	3RV2032-4VA10	45	3NA3824-6	80	00
3RW4423	62	3RT2037-1AP04	3RV2032-4JA10	65	3NA3830-6	100	00
3RW4424	81	3RT2038-1AP04	3RV2042-4YA10	93	3NA3132-6	125	1
3RW4425	99	3RT1054-1AP36	3RV2042-4MA10	100	3NA3136-6	160	1
3RW4426	133	3RT1055-6AP36	3VA2216-.MS32-0AA0	160	3NA3240-6	200	2
3RW4427	161	3RT1056-6AP36	3VA2220-.MS32-0AA0	200	3NA3244-6	250	2
3RW4434	196	3RT1064-6AP36	3VA2325-.MS32-0AA0	250	3NA3360-6	400	3
3RW4435	232	3RT1065-6AP36	3VA2325-.MS32-0AA0	250	3NA3360-6	400	3
3RW4436	281	3RT1066-6AP36	3VA2440-.MS32-0AA0	400	2 x 3NA3360-6	2 x 400	3
3RW4443	352	3RT1075-6AP36	3VA2440-.MS32-0AA0	400	2 x 3NA3365-6	2 x 500	3
3RW4444	433	3RT1076-6AP36	3VA2450-.MS32-0AA0	500	2 x 3NA3365-6	2 x 500	3
3RW4445	542	3TF6844-0CM7	3VL5763	630	3 x 3NA3365-6	3 x 500	3
3RW4446	617	3TF6844-0CM7	3VL6780	800	3 x 3NA3365-6	3 x 500	3
3RW4447	748	3TF69	3VL6780	800	3 x 3NA3365-6	3 x 500	3
3RW4453	954	--	3VL7710	1 000	3 x 3NA3365-6	3 x 500	3
3RW4454	1 065	--	3VL7712	1 250	3 x 3NA3365-6	3 x 500	3
3RW4455	1 200	--	3VL8716	1 600	3 x 3NA3365-6	3 x 500	3
3RW4456	1 351	--	3VL8716	1 600	3 x 3NA3372	3 x 630	3
3RW4457	1 524	--	3VL8716	1 600	3 x 3NA3372	3 x 630	3
3RW4458	1 680	--	3WL1220	2 000	2 x 3NA3480	2 x 1 000	4
3RW4465	1 864	--	3WL1225	2 500	2 x 3NA3482	2 x 1 250	4
3RW4466	2 103	--	3WL1225	2 500	2 x 3NA3482	2 x 1 250	4

[1] The type of coordination "2" refers to soft starters in combination with the stipulated protective device (motor starter protector/fuse), not to any additional components in the feeder.
If the F3 semiconductor fuse is not used, the type of coordination "2" is reduced to type of coordination "1" for soft starters in combination with the stipulated protective device.

More information

Application examples for normal starting (CLASS 10)

Normal starting CLASS 10 (up to 20 s with 350% $I_{n\ Motor}$, one start per hour)
The soft starter rating can be selected to be as high as the rating of the motor used

Application		Conveyor belts	Roller conveyors	Compressors	Small fans[1)]	Pumps	Hydraulic pumps
Starting parameters							
• Voltage ramp and current limiting							
- Starting voltage	%	70	60	50	30	30	30
- Starting time	s	10	10	10	10	10	10
- Current limiting value		Deactivated	Deactivated	4 x I_M	4 x I_M	Deactivated	Deactivated
• Torque ramp							
- Start torque	%	60	50	40	20	10	10
- Final torque	%	150	150	150	150	150	150
- Starting time	s	10	10	10	10	10	10
• Breakaway pulse		Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
Ramp-down mode		Soft stop	Soft stop	Free ramp-down	Free ramp-down	Pump stop	Free ramp-down

1) The mass inertia of the fan is <10 times the mass inertia of the motor.

Application examples for heavy starting (CLASS 20)

Heavy starting CLASS 20 (up to 40 s with 350% $I_{n\ Motor}$, one start per hour)
The soft starter has to be selected one performance class higher than the motor used

Application		Stirrers	Centrifuges	Milling machines
Starting parameters				
• Voltage ramp and current limiting				
- Starting voltage	%	30	30	30
- Starting time	s	30	30	30
- Current limiting value		4 x I_M	4 x I_M	4 x I_M
• Torque ramp				
- Start torque	%	30	30	30
- Final torque	%	150	150	150
- Starting time	s	30	30	30
• Breakaway pulse		Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
Ramp-down mode		Free ramp-down	Free ramp-down	Free ramp-down or DC braking

Application examples for very heavy starting (CLASS 30)

Very heavy starting CLASS 30 (up to 60 s with 350% $I_{n\ Motor}$, one start per hour)
The soft starter has to be selected two power classes higher than that of the implemented motor.

Application		Large fans[1)]	Mills	Crushers	Circular saws/bandsaws
Starting parameters					
• Voltage ramp and current limiting					
- Starting voltage	%	30	50	50	30
- Starting time	s	60	60	60	60
- Current limiting value		4 x I_M	4 x I_M	4 x I_M	4 x I_M
• Torque ramp					
- Start torque	%	20	50	50	20
- Final torque	%	150	150	150	150
- Starting time	s	60	60	60	60
• Breakaway pulse		Deactivated (0 ms)	80%; 300 ms	80%; 300 ms	Deactivated (0 ms)
Ramp-down mode		Free ramp-down	Free ramp-down	Free ramp-down	Free ramp-down

1) The mass inertia of the fan is ≥10 times the mass inertia of the motor.

Note:

These tables present sample set values and device dimensions. They are intended for information purposes only and are not binding. The set values depend on the application in question and must be optimized during commissioning.

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 20, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

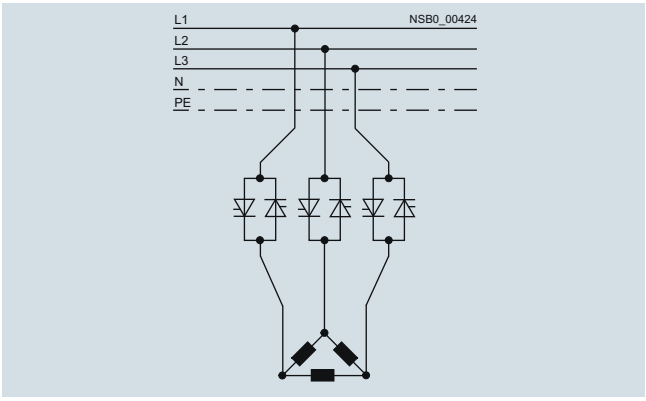
General data

Circuit concept

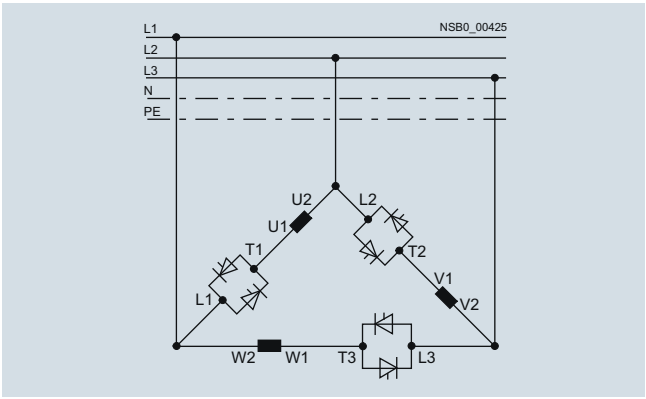
The SIRIUS 3RW44 soft starters can be operated in two different types of circuit:

- Inline circuit
  The controls for isolating and protecting the motor are simply connected in series with the soft starter. The motor is connected to the soft starter with three leads.
- Inside-delta circuit
  The wiring is similar to that of wye-delta starters. The phases of the soft starter are connected in series with the individual motor windings. The soft starter then only has to carry the phase current, amounting to about 58% of the rated motor current (conductor current).

Comparison of the types of circuit:



Inline circuit: Rated current I_e corresponds to the rated motor current I_n, three cables to the motor



Inside-delta circuit: Rated current I_e corresponds to approx. 58% of the rated motor current I_n, six cables to the motor (as for wye-delta starters)

Which circuit?

Using the inline circuit involves the lowest wiring outlay. If the soft starter to motor connections are long, this circuit is preferable.

The wiring complexity is twice as high when using the inside-delta circuit, but a smaller device can be used with the same rating. Thanks to the choice of operating mode between the inline circuit and inside-delta circuit, it is always possible to select the most favorable solution.

The braking function is possible only in the inline circuit.

Configuration

The solid-state 3RW44 soft starters are designed for normal starting. In case of heavy starting or increased starting frequency, a larger unit must be selected. 3RW44 soft starters may be used in isolated supply networks (IT systems) up to 600 V AC.

For long starting times it is recommended to have a PTC sensor in the motor. This also applies for the torque control, pump stop and DC braking ramp-down modes, because during the ramp-down time in these modes, an additional current loading applies in contrast to free ramp-down.

No capacitive elements are permitted in the motor feeder between the SIRIUS 3RW soft starter and the motor (e.g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct-on-line starting, following the load short-circuit conditions. Fuses and switching devices must be ordered separately. A bypass contact system and solid-state overload relay are already integrated in the 3RW44 soft starter and therefore do not have to be ordered separately. The harmonic component load for starting currents must be taken into consideration for the selection of motor starter protector (selection of release).

Note:

When three-phase motors are switched on, voltage drops occur as a rule on starters of all types (direct-on-line starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

For dimensioning soft starters, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917
or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

Simulation Tool for Soft Starters

A convenient way of designing soft starters using a simple, quick and easy-to-use interface is possible with the Simulation Tool for Soft Starters (STS), see page 14/5. Entering the motor and load data will simulate the application and prompt suggestions for suitable soft starters.

Device interface, PROFIBUS DP/ PROFINET communication module, SIRIUS Soft Starter ES and SIRIUS Soft Starter ES (TIA Portal) parameterizing and operating software

The solid-state 3RW44 soft starters have a device interface for communicating with the SIRIUS Soft Starter ES and SIRIUS Soft Starter ES (TIA Portal) software or for connecting the external display and operator module. If the optional PROFIBUS/ PROFINET communication module is used, the 3RW44 soft starter can be integrated in the PROFIBUS/PROFINET network and communicate using the GSD file or Soft Starter ES Premium software, see pages 14/6 and 14/9.

SIRIUS 3RW44 Soft Starter block library for SIMATIC PCS 7

The SIRIUS 3RW44 Soft Starter PCS 7 block library can be used for simple and easy integration of SIRIUS 3RW44 soft starters into the SIMATIC PCS 7 process control system, see page 14/11. The SIRIUS 3RW44 Soft Starter PCS 7 block library contains the diagnostics and driver blocks corresponding with the SIMATIC PCS 7 diagnostics and driver concept as well as the elements (symbols and faceplates) required for operator control and process monitoring.

Selection and ordering data

3RW442.

3RW443.

3RW444.

3RW445.

3RW446.

3RW ambient temperature 40 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	690 V	3RW ambient temperature 50 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 200 V	230 V	460 V	575 V	SD[1]	Normal starting (CLASS 10) in inline circuit Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	kW	kW	kW	kW	A	hp	hp	hp	hp	d					
Inline circuit, rated operational voltage 200 ... 460 V															
29	5.5	**15**	--	--	26	7.5	7.5	**15**	--	5	**3RW4422-□BC□4**		1	1 unit	42H
36	7.5	**18.5**	--	--	32	10	10	**20**	--	5	**3RW4423-□BC□4**		1	1 unit	42H
47	11	**22**	--	--	42	10	15	**25**	--	5	**3RW4424-□BC□4**		1	1 unit	42H
57	15	**30**	--	--	51	15	15	**30**	--	5	**3RW4425-□BC□4**		1	1 unit	42H
77	18.5	**37**	--	--	68	20	20	**50**	--	5	**3RW4426-□BC□4**		1	1 unit	42H
93	22	**45**	--	--	82	25	25	**60**	--	5	**3RW4427-□BC□4**		1	1 unit	42H
Article No. supplement for connection types • With screw terminals • With spring-type terminals											**1** **3**				
113	30	**55**	--	--	100	30	30	**75**	--	5	**3RW4434-□BC□4**		1	1 unit	42H
134	37	**75**	--	--	117	30	40	**75**	--	5	**3RW4435-□BC□4**		1	1 unit	42H
162	45	**90**	--	--	145	40	50	**100**	--	5	**3RW4436-□BC□4**		1	1 unit	42H
203	55	**110**	--	--	180	50	60	**125**	--	5	**3RW4443-□BC□4**		1	1 unit	42H
250	75	**132**	--	--	215	60	75	**150**	--	5	**3RW4444-□BC□4**		1	1 unit	42H
313	90	**160**	--	--	280	75	100	**200**	--	5	**3RW4445-□BC□4**		1	1 unit	42H
356	110	**200**	--	--	315	100	125	**250**	--	5	**3RW4446-□BC□4**		1	1 unit	42H
432	132	**250**	--	--	385	125	150	**300**	--	5	**3RW4447-□BC□4**		1	1 unit	42H
551	160	**315**	--	--	494	150	200	**400**	--	15	**3RW4453-□BC□4**		1	1 unit	42H
615	200	**355**	--	--	551	150	200	**450**	--	15	**3RW4454-□BC□4**		1	1 unit	42H
693	200	**400**	--	--	615	200	250	**500**	--	15	**3RW4455-□BC□4**		1	1 unit	42H
780	250	**450**	--	--	693	200	250	**600**	--	15	**3RW4456-□BC□4**		1	1 unit	42H
880	250	**500**	--	--	780	250	300	**700**	--	15	**3RW4457-□BC□4**		1	1 unit	42H
970	315	**560**	--	--	850	300	350	**750**	--	15	**3RW4458-□BC□4**		1	1 unit	42H
1 076	355	**630**	--	--	970	350	400	**850**	--	15	**3RW4465-□BC□4**		1	1 unit	42H
1 214	400	**710**	--	--	1 076	350	450	**950**	--	15	**3RW4466-□BC□4**		1	1 unit	42H
Article No. supplement for connection types • With spring-type terminals • With screw terminals											**2** **6**				
Article No. supplement for rated control supply voltage U_s[2] • 115 V AC • 230 V AC											**3** **4**				

[1] 3RW442. to 3RW444. soft starters with screw terminals: Standard delivery time SD = 1 day.

[2] Control by way of the internal 24 V DC supply and direct control via PLC possible.

Note:

The listed motor ratings are rough guide values. The soft starter should always be designed on the basis of the required rated operational current of the motor.

The solid-state SIRIUS 3RW44 soft starters are designed for easy starting conditions. The selection and ordering data were determined for the following boundary conditions (see also the notes on page 6/6):

- Maximum starting time in s: 10
- Maximum starting current in % of motor current I_e: 300
- Maximum number of starts per hour in 1/h: 5

In case of additional requirements, it may be necessary to choose a larger device. In some cases, however, the safety margins taken into account in the selection also permit the listed units to be used in boundary conditions which are slightly more demanding. Detailed technical information for a configuration which is tailored exactly to the application, see manual.

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 30, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

SIRIUS 3RW44 for normal starting (CLASS 10) in inline circuit

3RW ambient temperature 40 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	690 V	3RW ambient temperature 50 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 200 V	230 V	460 V	575 V	SD[1]	**Normal starting (CLASS 10) in inline circuit** Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	kW	kW	kW	kW	A	hp	hp	hp	hp	d					
Inline circuit, rated operational voltage 400 ... 600 V															
29	--	15	**18.5**	--	26	--	--	15	**20**	5	**3RW4422-□BC□5**		1	1 unit	42H
36	--	18.5	**22**	--	32	--	--	20	**25**	5	**3RW4423-□BC□5**		1	1 unit	42H
47	--	22	**30**	--	42	--	--	25	**30**	5	**3RW4424-□BC□5**		1	1 unit	42H
57	--	30	**37**	--	51	--	--	30	**40**	5	**3RW4425-□BC□5**		1	1 unit	42H
77	--	37	**45**	--	68	--	--	50	**50**	5	**3RW4426-□BC□5**		1	1 unit	42H
93	--	45	**55**	--	82	--	--	60	**75**	5	**3RW4427-□BC□5**		1	1 unit	42H
Article No. supplement for connection types • With screw terminals • With spring-type terminals											**1** **3**				
113	--	55	**75**	--	100	--	--	75	**75**	5	**3RW4434-□BC□5**		1	1 unit	42H
134	--	75	**90**	--	117	--	--	75	**100**	5	**3RW4435-□BC□5**		1	1 unit	42H
162	--	90	**110**	--	145	--	--	100	**125**	5	**3RW4436-□BC□5**		1	1 unit	42H
203	--	110	**132**	--	180	--	--	125	**150**	5	**3RW4443-□BC□5**		1	1 unit	42H
250	--	132	**160**	--	215	--	--	150	**200**	5	**3RW4444-□BC□5**		1	1 unit	42H
313	--	160	**200**	--	280	--	--	200	**250**	5	**3RW4445-□BC□5**		1	1 unit	42H
356	--	200	**250**	--	315	--	--	250	**300**	5	**3RW4446-□BC□5**		1	1 unit	42H
432	--	250	**315**	--	385	--	--	300	**400**	5	**3RW4447-□BC□5**		1	1 unit	42H
551	--	315	**355**	--	494	--	--	400	**500**	15	**3RW4453-□BC□5**		1	1 unit	42H
615	--	355	**400**	--	551	--	--	450	**600**	15	**3RW4454-□BC□5**		1	1 unit	42H
693	--	400	**500**	--	615	--	--	500	**700**	15	**3RW4455-□BC□5**		1	1 unit	42H
780	--	450	**560**	--	693	--	--	600	**750**	15	**3RW4456-□BC□5**		1	1 unit	42H
880	--	500	**630**	--	780	--	--	700	**850**	15	**3RW4457-□BC□5**		1	1 unit	42H
970	--	560	**710**	--	850	--	--	750	**900**	15	**3RW4458-□BC□5**		1	1 unit	42H
1 076	--	630	**800**	--	970	--	--	850	**1 100**	15	**3RW4465-□BC□5**		1	1 unit	42H
1 214	--	710	**900**	--	1 076	--	--	950	**1 200**	15	**3RW4466-□BC□5**		1	1 unit	42H
Article No. supplement for connection types • With spring-type terminals • With screw terminals											**2** **6**				
Article No. supplement for rated control supply voltage U_s[2] • 115 V AC • 230 V AC											**3** **4**				

[1] Soft starter with screw terminals:
3RW442. to 3RW444. Standard delivery time SD = 2 days,
3RW445. to 3RW446. Standard delivery time SD = 5 days.

[2] Control by way of the internal 24 V DC supply and direct control via PLC possible.

Note:

The listed motor ratings are rough guide values. The soft starter should always be designed on the basis of the required rated operational current of the motor.

The solid-state SIRIUS 3RW44 soft starters are designed for easy starting conditions. The selection and ordering data were determined for the following boundary conditions (see also the notes on page 6/6):

- Maximum starting time in s: 10
- Maximum starting current in % of motor current I_e: 300
- Maximum number of starts per hour in 1/h: 5

In case of additional requirements, it may be necessary to choose a larger device. In some cases, however, the safety margins taken into account in the selection also permit the listed units to be used in boundary conditions which are slightly more demanding. Detailed technical information for a configuration which is tailored exactly to the application, see manual.

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 30, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

IE3/IE4 ready **SIRIUS 3RW44 for normal starting (CLASS 10) in inline circuit**

3RW ambient temperature 40 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	690 V	3RW ambient temperature 50 °C Rated values of three-phase motors Operational current I_e	Rating at operational voltage U_e 200 V	230 V	460 V	575 V	SD	Normal starting (CLASS 10) in inline circuit Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	kW	kW	kW	kW	A	hp	hp	hp	hp	d					
Inline circuit, rated operational voltage 400 ... 690 V															
29	--	15	18.5	**30**	26	--	--	15	**20**	5	**3RW4422-☐BC☐6**		1	1 unit	42H
36	--	18.5	22	**37**	32	--	--	20	**25**	5	**3RW4423-☐BC☐6**		1	1 unit	42H
47	--	22	30	**45**	42	--	--	25	**30**	5	**3RW4424-☐BC☐6**		1	1 unit	42H
57	--	30	37	**55**	51	--	--	30	**40**	5	**3RW4425-☐BC☐6**		1	1 unit	42H
77	--	37	45	**75**	68	--	--	50	**50**	5	**3RW4426-☐BC☐6**		1	1 unit	42H
93	--	45	55	**90**	82	--	--	60	**75**	5	**3RW4427-☐BC☐6**		1	1 unit	42H
Article No. supplement for connection types • With screw terminals • With spring-type terminals											**1** **3**				
113	--	55	75	**110**	100	--	--	75	**75**	5	**3RW4434-☐BC☐6**		1	1 unit	42H
134	--	75	90	**132**	117	--	--	75	**100**	5	**3RW4435-☐BC☐6**		1	1 unit	42H
162	--	90	110	**160**	145	--	--	100	**125**	5	**3RW4436-☐BC☐6**		1	1 unit	42H
203	--	110	132	**200**	180	--	--	125	**150**	5	**3RW4443-☐BC☐6**		1	1 unit	42H
250	--	132	160	**250**	215	--	--	150	**200**	5	**3RW4444-☐BC☐6**		1	1 unit	42H
313	--	160	200	**315**	280	--	--	200	**250**	5	**3RW4445-☐BC☐6**		1	1 unit	42H
356	--	200	250	**355**	315	--	--	250	**300**	5	**3RW4446-☐BC☐6**		1	1 unit	42H
432	--	250	315	**400**	385	--	--	300	**400**	5	**3RW4447-☐BC☐6**		1	1 unit	42H
551	--	315	355	**560**	494	--	--	400	**500**	15	**3RW4453-☐BC☐6**		1	1 unit	42H
615	--	355	400	**630**	551	--	--	450	**600**	15	**3RW4454-☐BC☐6**		1	1 unit	42H
693	--	400	500	**710**	615	--	--	500	**700**	15	**3RW4455-☐BC☐6**		1	1 unit	42H
780	--	450	560	**800**	693	--	--	600	**750**	15	**3RW4456-☐BC☐6**		1	1 unit	42H
880	--	500	630	**900**	780	--	--	700	**850**	15	**3RW4457-☐BC☐6**		1	1 unit	42H
970	--	560	710	**1 000**	850	--	--	750	**900**	15	**3RW4458-☐BC☐6**		1	1 unit	42H
1 076	--	630	800	**1 100**	970	--	--	850	**1 100**	15	**3RW4465-☐BC☐6**		1	1 unit	42H
1 214	--	710	900	**1 200**	1 076	--	--	950	**1 200**	15	**3RW4466-☐BC☐6**		1	1 unit	42H
Article No. supplement for connection types • With spring-type terminals • With screw terminals											**2** **6**				
Article No. supplement for rated control supply voltage U_s 1) • 115 V AC • 230 V AC											**3** **4**				

1) Control by way of the internal 24 V DC supply and direct control via PLC possible.

Note:

3RW44 soft starters may be used in isolated supply networks (IT systems) up to 600 V AC.

The listed motor ratings are rough guide values. The soft starter should always be designed on the basis of the required rated operational current of the motor.

The solid-state SIRIUS 3RW44 soft starters are designed for easy starting conditions. The selection and ordering data were determined for the following boundary conditions (see also the notes on page 6/6):

- Maximum starting time in s: 10
- Maximum starting current in % of motor current I_e: 300
- Maximum number of starts per hour in 1/h: 5

In case of additional requirements, it may be necessary to choose a larger device. In some cases, however, the safety margins taken into account in the selection also permit the listed units to be used in boundary conditions which are slightly more demanding. Detailed technical information for a configuration which is tailored exactly to the application, see manual.

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 30, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

SIRIUS 3RW44 for normal starting (CLASS 10) in inside-delta circuit *IE3/IE4* ready

Selection and ordering data


3RW442.


3RW443.


3RW444.


3RW445.


3RW446.

3RW ambient temperature 40 °C, Rated values of three-phase motors: Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	690 V	3RW ambient temperature 50 °C, Rated values of three-phase motors: Operational current I_e	Rating at operational voltage U_e 200 V	230 V	460 V	575 V	SD[1]	Normal starting (CLASS 10) in inside-delta circuit: Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	kW	kW	kW	kW	A	hp	hp	hp	hp	d					
Inside-delta circuit, rated operational voltage 200 ... 460 V															
50	15	**22**	--	--	45	10	15	**30**	--	5	**3RW4422-□BC□4**		1	1 unit	42H
62	18.5	**30**	--	--	55	15	20	**40**	--	5	**3RW4423-□BC□4**		1	1 unit	42H
81	22	**45**	--	--	73	20	25	**50**	--	5	**3RW4424-□BC□4**		1	1 unit	42H
99	30	**55**	--	--	88	25	30	**60**	--	5	**3RW4425-□BC□4**		1	1 unit	42H
133	37	**75**	--	--	118	30	40	**75**	--	5	**3RW4426-□BC□4**		1	1 unit	42H
161	45	**90**	--	--	142	40	50	**100**	--	5	**3RW4427-□BC□4**		1	1 unit	42H
Article No. supplement for connection types															
• With screw terminals											**1**				
• With spring-type terminals											**3**				
196	55	**110**	--	--	173	50	60	**125**	--	5	**3RW4434-□BC□4**		1	1 unit	42H
232	75	**132**	--	--	203	60	75	**150**	--	5	**3RW4435-□BC□4**		1	1 unit	42H
281	90	**160**	--	--	251	75	100	**200**	--	5	**3RW4436-□BC□4**		1	1 unit	42H
352	110	**200**	--	--	312	100	125	**250**	--	5	**3RW4443-□BC□4**		1	1 unit	42H
433	132	**250**	--	--	372	125	150	**300**	--	5	**3RW4444-□BC□4**		1	1 unit	42H
542	160	**315**	--	--	485	150	200	**400**	--	5	**3RW4445-□BC□4**		1	1 unit	42H
617	200	**355**	--	--	546	150	200	**450**	--	5	**3RW4446-□BC□4**		1	1 unit	42H
748	250	**400**	--	--	667	200	250	**600**	--	5	**3RW4447-□BC□4**		1	1 unit	42H
954	315	**560**	--	--	856	300	350	**750**	--	15	**3RW4453-□BC□4**		1	1 unit	42H
1 065	355	**630**	--	--	954	350	400	**850**	--	15	**3RW4454-□BC□4**		1	1 unit	42H
1 200	400	**710**	--	--	1 065	350	450	**950**	--	15	**3RW4455-□BC□4**		1	1 unit	42H
1 351	450	**800**	--	--	1 200	450	500	**1 050**	--	15	**3RW4456-□BC□4**		1	1 unit	42H
1 524	500	**900**	--	--	1 351	450	600	**1 200**	--	15	**3RW4457-□BC□4**		1	1 unit	42H
1 680	560	**1 000**	--	--	1 472	550	650	**1 300**	--	15	**3RW4458-□BC□4**		1	1 unit	42H
1 864	630	**1 100**	--	--	1 680	650	750	**1 500**	--	15	**3RW4465-□BC□4**		1	1 unit	42H
2 103	710	**1 200**	--	--	1 864	700	850	**1 700**	--	15	**3RW4466-□BC□4**		1	1 unit	42H
Article No. supplement for connection types															
• With spring-type terminals											**2**				
• With screw terminals											**6**				
Article No. supplement for rated control supply voltage U_s[2]															
• 115 V AC											**3**				
• 230 V AC											**4**				

[1] 3RW442. to 3RW444. soft starters with screw terminals: Standard delivery time SD = 1 day.

[2] Control by way of the internal 24 V DC supply and direct control via PLC possible.

Note:

The listed motor ratings are rough guide values. The soft starter should always be designed on the basis of the required rated operational current of the motor.

The solid-state SIRIUS 3RW44 soft starters are designed for easy starting conditions. The selection and ordering data were determined for the following boundary conditions (see also the notes on page 6/6):

- Maximum starting time in s: 10
- Maximum starting current in % of motor current I_e: 300
- Maximum number of starts per hour in 1/h: 5

In the selection table, the unit rated current I_e in the inside-delta circuit refers to the three-phase motor's rated operational current. The actual current of the device is approx. 58% of this value.

In case of additional requirements, it may be necessary to choose a larger device. In some cases, however, the safety margins taken into account in the selection also permit the listed units to be used in boundary conditions which are slightly more demanding. Detailed technical information for a configuration which is tailored exactly to the application, see manual.

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 30, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

IE3/IE4 ready **SIRIUS 3RW44 for normal starting (CLASS 10) in inside-delta circuit**

3RW ambient temperature 40 °C Rated values of three-phase motors					3RW ambient temperature 50 °C Rated values of three-phase motors					SD[1]	**Normal starting (CLASS 10) in inside-delta circuit**	PU (UNIT, SET, M)	PS*	PG
Operational current I_e	Rating at operational voltage U_e 230 V	400 V	500 V	690 V	Operational current I_e	Rating at operational voltage U_e 200 V	230 V	460 V	575 V		Article No. / Price per PU			
A	kW	kW	kW	kW	A	hp	hp	hp	hp	d				
Inside-delta circuit, rated operational voltage 400 ... 600 V														
50	--	22	**30**	--	45	--	--	30	**40**	5	**3RW4422-□BC□5**	1	1 unit	42H
62	--	30	**37**	--	55	--	--	40	**50**	5	**3RW4423-□BC□5**	1	1 unit	42H
81	--	45	**45**	--	73	--	--	50	**60**	5	**3RW4424-□BC□5**	1	1 unit	42H
99	--	55	**55**	--	88	--	--	60	**75**	5	**3RW4425-□BC□5**	1	1 unit	42H
133	--	75	**90**	--	118	--	--	75	**100**	5	**3RW4426-□BC□5**	1	1 unit	42H
161	--	90	**110**	--	142	--	--	100	**125**	5	**3RW4427-□BC□5**	1	1 unit	42H
196	--	110	**132**	--	173	--	--	125	**150**	5	**3RW4434-□BC□5**	1	1 unit	42H
232	--	132	**160**	--	203	--	--	150	**200**	5	**3RW4435-□BC□5**	1	1 unit	42H
281	--	160	**200**	--	251	--	--	200	**250**	5	**3RW4436-□BC□5**	1	1 unit	42H
352	--	200	**250**	--	312	--	--	250	**300**	5	**3RW4443-□BC□5**	1	1 unit	42H
433	--	250	**315**	--	372	--	--	300	**350**	5	**3RW4444-□BC□5**	1	1 unit	42H
542	--	315	**355**	--	485	--	--	400	**500**	5	**3RW4445-□BC□5**	1	1 unit	42H
617	--	355	**450**	--	546	--	--	450	**600**	5	**3RW4446-□BC□5**	1	1 unit	42H
748	--	400	**500**	--	667	--	--	600	**750**	5	**3RW4447-□BC□5**	1	1 unit	42H
954	--	560	**630**	--	856	--	--	750	**950**	15	**3RW4453-□BC□5**	1	1 unit	42H
1 065	--	630	**710**	--	954	--	--	850	**1 050**	15	**3RW4454-□BC□5**	1	1 unit	42H
1 200	--	710	**800**	--	1 065	--	--	950	**1 200**	15	**3RW4455-□BC□5**	1	1 unit	42H
1 351	--	800	**900**	--	1 200	--	--	1 050	**1 350**	15	**3RW4456-□BC□5**	1	1 unit	42H
1 524	--	900	**1 000**	--	1 351	--	--	1 200	**1 500**	15	**3RW4457-□BC□5**	1	1 unit	42H
1 680	--	1 000	**1 200**	--	1 472	--	--	1 300	**1 650**	15	**3RW4458-□BC□5**	1	1 unit	42H
1 864	--	1 100	**1 350**	--	1 680	--	--	1 500	**1 900**	15	**3RW4465-□BC□5**	1	1 unit	42H
2 103	--	1 200	**1 500**	--	1 864	--	--	1 700	**2 100**	15	**3RW4466-□BC□5**	1	1 unit	42H

Article No. supplement for connection types

- With screw terminals **1**
- With spring-type terminals **3**

Article No. supplement for connection types

- With spring-type terminals **2**
- With screw terminals **6**

Article No. supplement for rated control supply voltage U_s[2]

- 115 V AC **3**
- 230 V AC **4**

1) Soft starter with screw terminals:
3RW442. to 3RW444. Standard delivery time SD = 2 days,
3RW445. to 3RW446. Standard delivery time SD = 5 days.

2) Control by way of the internal 24 V DC supply and direct control via PLC possible.

Note:

The listed motor ratings are rough guide values. The soft starter should always be designed on the basis of the required rated operational current of the motor.

The solid-state SIRIUS 3RW44 soft starters are designed for easy starting conditions. The selection and ordering data were determined for the following boundary conditions (see also the notes on page 6/6):

- Maximum starting time in s: 10
- Maximum starting current in % of motor current I_e: 300
- Maximum number of starts per hour in 1/h: 5

In the selection table, the unit rated current I_e in the inside-delta circuit refers to the three-phase motor's rated operational current. The actual current of the device is approx. 58% of this value.

In case of additional requirements, it may be necessary to choose a larger device. In some cases, however, the safety margins taken into account in the selection also permit the listed units to be used in boundary conditions which are slightly more demanding. Detailed technical information for a configuration which is tailored exactly to the application, see manual.

For dimensioning soft starters under other boundary conditions, also for heavy starting up to CLASS 30, we recommend our Simulation Tool for Soft Starters (STS), see https://support.industry.siemens.com/cs/ww/en/view/101494917 or our Technical Assistance:
Phone: +49 911 895-5900,
email: technical-assistance@siemens.com.

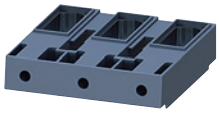
Selection and ordering data

More information

Manual "SIRIUS 3RW44 Soft Starter", see
https://support.industry.siemens.com/cs/ww/en/view/21772518

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
		d					
Software							
 Simulation Tool for Soft Starters	**Simulation Tool for Soft Starters** A convenient way of designing soft starters using a simple, quick and easy-to-use interface is possible with the STS, see page 14/5.						
 3ZS1320-4CC10-0YA5	**SIRIUS Soft Starter ES (TIA Portal)** The SIRIUS Soft Starter ES (TIA Portal) software permits quick and easy parameterization, monitoring and diagnostics of SIRIUS 3RW44 High Feature soft starters for service purposes, see page 14/6						
 3ZS1313-4CC10-0YA5	**SIRIUS Soft Starter ES** SIRIUS Soft Starter ES software program is used for the parameterization, monitoring and service diagnostics of SIRIUS 3RW44 High Feature soft starters, see page 14/9.						
 3ZS1633-1XX00-0YA0	**SIRIUS 3RW44 Soft Starter block library for SIMATIC PCS 7** The SIRIUS 3RW44 High Feature soft starters can be integrated simply and conveniently into the SIMATIC PCS 7 process control system using the block library with its integrated AS blocks and faceplates, see page 14/23.						

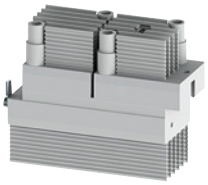
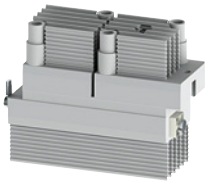
* You can order this quantity or a multiple thereof.
Illustrations are approximate

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
		d					
USB PC cables							
 3UF7941-0AA00-0	**For PC/PG communication with SIRIUS 3RW44 soft starters** Through the system interface, for connecting to the USB interface of the PC/PG	►	**3UF7941-0AA00-0**		1	1 unit	42J
Communication modules							
 3RW4900-0KC00	**PROFIBUS communication module** For 3RW44 soft starter integration in the PROFIBUS network with DPV1 slave functionality. With firmware version E04 and higher (or date of manufacture 01.05.2009 and later) of the module, DPV1 operation of the soft starter on a Y-link is also possible (only DPV0 operation possible with < E04).	►	**3RW4900-0KC00**		1	1 unit	42H
 3RW4900-0NC00	**PROFINET communication module** For 3RW44 soft starter integration in the PROFINET network, suitable for devices with firmware version E12 or higher	►	**3RW4900-0NC00**		1	1 unit	42H
External display and operator module							
 3RW4900-0AC00	For indicating and operating the functions provided by the soft starter using an externally mounted display and operator module in degree of protection IP54 (e.g. in the control cabinet door)	►	**3RW4900-0AC00**		1	1 unit	42H
	Connection cables From the device interface (serial) of the 3RW44 soft starter to the external display and operator module						
	• Length 0.5 m, flat	►	**3UF7932-0AA00-0**		1	1 unit	42J
	• Length 0.5 m, round	►	**3UF7932-0BA00-0**		1	1 unit	42J
	• Length 1.0 m, round	►	**3UF7937-0BA00-0**		1	1 unit	42J
	• Length 2.5 m, round	►	**3UF7933-0BA00-0**		1	1 unit	42J
Box terminal blocks for soft starters							
 3RT1956-4G	**Box terminal block** (2 units are required for each device)						
	3RW442. Included in the scope of supply						
	3RW443. • Up to 70 mm²	►	**3RT1955-4G**		1	1 unit	41B
	• Up to 120 mm²	►	**3RT1956-4G**		1	1 unit	41B
	Auxiliary conductor connection for box terminals	5	**3TX7500-0A**		1	1 unit	41B
	3RW444. • Up to 240 mm² (with auxiliary conductor connection)	►	**3RT1966-4G**		1	1 unit	41B
Covers for soft starters							
	Terminal covers for box terminals Additional touch protection to be fitted at the box terminals (2 units required per device)						
	3RW442. and 3RW443.	►	**3RT1956-4EA2**		1	1 unit	41B
	3RW444.	►	**3RT1966-4EA2**		1	1 unit	41B
 3RT1956-4EA1	**Terminal covers for cable lugs and busbar connections**						
	3RW442. and 3RW443. For complying with the voltage clearances and as touch protection (2 units required per contactor) Also fits on mounted box terminals.	►	**3RT1956-4EA1**		1	1 unit	41B
	3RW444.	►	**3RT1966-4EA1**		1	1 unit	41B

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Spare parts

Selection and ordering data

For soft starters Type	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Power semiconductor modules							
 3RW4743-0LC00							
3RW4443	690 V, 203 A (2 units required per device)	1	**3RW4743-0LC00**		1	1 unit	42H
3RW4444, 3RW4445	690 V, 313 A (2 units required per device)	1	**3RW4745-0LC00**		1	1 unit	42H
3RW4446	690 V, 356 A (2 units required per device)	1	**3RW4746-0LC00**		1	1 unit	42H
3RW4447	690 V, 432 A (2 units required per device)	1	**3RW4747-0LC00**		1	1 unit	42H
3RW4453, 3RW4454, 3RW4455	690 V, 693 A (2 units required per device)	3	**3RW4755-0LC00**		1	1 unit	42H
3RW4456, 3RW4457, 3RW4458	690 V, 970 A (2 units required per device)	3	**3RW4758-0LC00**		1	1 unit	42H
3RW4465, 3RW4466	690 V, 1 214 A (2 units required per device)	3	**3RW4766-0LC00**		1	1 unit	42H
NTC power semiconductor modules							
 3RW4743-0NC00							
3RW4443	690 V, 203 A	1	**3RW4743-0NC00**		1	1 unit	42H
3RW4444, 3RW4445	690 V, 313 A	1	**3RW4745-0NC00**		1	1 unit	42H
3RW4446	690 V, 356 A	1	**3RW4746-0NC00**		1	1 unit	42H
3RW4447	690 V, 432 A	1	**3RW4747-0NC00**		1	1 unit	42H
3RW4453, 3RW4454, 3RW4455	690 V, 693 A	3	**3RW4755-0NC00**		1	1 unit	42H
3RW4456, 3RW4457, 3RW4458	690 V, 970 A	3	**3RW4758-0NC00**		1	1 unit	42H
3RW4465, 3RW4466	690 V, 1 214 A	3	**3RW4766-0NC00**		1	1 unit	42H
Bypass units							
 3RW4755-0KC00							
3RW4453, 3RW4454, 3RW4455		2	**3RW4755-0KC00**		1	1 unit	42H
3RW4456, 3RW4457		2	**3RW4766-0KC00**		1	1 unit	42H
3RW4458, 3RW4465, 3RW4466		2	**3RW4766-0KC01**		1	1 unit	42H
Control units with screw terminals							
 3RW4722-1SC44							
3RW4422-.BC4.	230 V	1	**3RW4722-1SC44**		1	1 unit	42H
3RW4423-.BC4.	230 V	1	**3RW4723-1SC44**		1	1 unit	42H
3RW4424-.BC4.	230 V	1	**3RW4724-1SC44**		1	1 unit	42H
3RW4425-.BC4.	230 V	1	**3RW4725-1SC44**		1	1 unit	42H
3RW4426-.BC4.	230 V	1	**3RW4726-1SC44**		1	1 unit	42H
3RW4427-.BC4.	230 V	1	**3RW4727-1SC44**		1	1 unit	42H
3RW4434-.BC4.	230 V	1	**3RW4734-6SC44**		1	1 unit	42H
3RW4435-.BC4.	230 V	1	**3RW4735-6SC44**		1	1 unit	42H
3RW4436-.BC4.	230 V	1	**3RW4736-6SC44**		1	1 unit	42H
3RW4443-.BC4.	230 V	1	**3RW4743-6SC44**		1	1 unit	42H
3RW4444-.BC4.	230 V	1	**3RW4744-6SC44**		1	1 unit	42H
3RW4445-.BC4.	230 V	1	**3RW4745-6SC44**		1	1 unit	42H
3RW4446-.BC4.	230 V	1	**3RW4746-6SC44**		1	1 unit	42H
3RW4447-.BC4.	230 V	1	**3RW4747-6SC44**		1	1 unit	42H
3RW4453-.BC4.	230 V	1	**3RW4753-6SC44**		1	1 unit	42H
3RW4454-.BC4.	230 V	1	**3RW4754-6SC44**		1	1 unit	42H
3RW4455-.BC4.	230 V	1	**3RW4755-6SC44**		1	1 unit	42H
3RW4456-.BC4.	230 V	1	**3RW4756-6SC44**		1	1 unit	42H
3RW4457-.BC4.	230 V	1	**3RW4757-6SC44**		1	1 unit	42H
3RW4458-.BC4.	230 V	1	**3RW4758-6SC44**		1	1 unit	42H
3RW4465-.BC4.	230 V	1	**3RW4765-6SC44**		1	1 unit	42H
3RW4466-.BC4.	230 V	1	**3RW4766-6SC44**		1	1 unit	42H

* You can order this quantity or a multiple thereof.
Illustrations are approximate

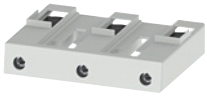
For soft starters	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Type		d					
TSE printed circuit boards							
 3RW4756-0WC70							
3RW4453.-.BC.4, 3RW4454.-.BC.4, 3RW4455.-.BC.4, 3RW4456.-.BC.4	460 V	2	**3RW4756-0WC70**		1	1 unit	42H
3RW4457.-.BC.4, 3RW4458.-.BC.4, 3RW4465.-.BC.4, 3RW4466.-.BC.4	460 V	2	**3RW4766-0WC70**		1	1 unit	42H
3RW4453.-.BC.5, 3RW4453.-.BC.6, 3RW4454.-.BC.5, 3RW4454.-.BC.6, 3RW4455.-.BC.5, 3RW4455.-.BC.6, 3RW4456.-.BC.5, 3RW4456.-.BC.6	690 V	2	**3RW4756-0WC50**		1	1 unit	42H
3RW4457-.BC.5, 3RW4457-.BC.6, 3RW4458-.BC.5, 3RW4458-.BC.6, 3RW4465-.BC.5, 3RW4465-.BC.6, 3RW4466-.BC.5, 3RW4466-.BC.6	690 V	2	**3RW4766-0WC50**		1	1 unit	42H
Firing printed circuit boards							
 3RW4727-0VC70							
3RW442.-.BC.4	460 V	2	**3RW4727-0VC70**		1	1 unit	42H
3RW443.-.BC.4, 3RW4443-.BC.4	460 V	2	**3RW4743-0VC70**		1	1 unit	42H
3RW4444-.BC.4, 3RW4445-.BC.4	460 V	2	**3RW4745-0VC70**		1	1 unit	42H
3RW445.-.BC.4, 3RW446.-.BC.4	460 V	2	**3RW4766-0VC70**		1	1 unit	42H
3RW4446-.BC.4, 3RW4447-.BC.4	460 V	2	**3RW4747-0VC70**		1	1 unit	42H
3RW442.-.BC.5	600 V	2	**3RW4727-0VC80**		1	1 unit	42H
3RW443.-.BC.5, 3RW4443-.BC.5	600 V	2	**3RW4743-0VC80**		1	1 unit	42H
3RW442.-.BC.6	690 V	2	**3RW4727-0VC50**		1	1 unit	42H
3RW443.-.BC.6, 3RW4444-.BC.5, 3RW4445-.BC.5	690 V	2	**3RW4745-0VC50**		1	1 unit	42H
3RW4443-.BC.6, 3RW4446-.BC.5, 3RW4447-.BC.5, 3RW4447-.BC.6	690 V	2	**3RW4746-0VC50**		1	1 unit	42H
3RW4444-.BC.6, 3RW4445-.BC.6, 3RW4446-.BC.6	690 V	2	**3RW4747-0VC50**		1	1 unit	42H
3RW445.-.BC.5, 3RW445.-.BC.6, 3RW446.-.BC.5, 3RW446.-.BC.6	690 V	2	**3RW4766-0VC50**		1	1 unit	42H
Fans							
 3RW4957-8VX.0, 3RW4966-8VX.0							
3RW442.-.BC3.[1], 3RW443.-.BC3.	115 V	►	**3RW4936-8VX30**		1	1 unit	42G
3RW442.-.BC4.[1], 3RW443.-.BC4.	230 V	►	**3RW4936-8VX40**		1	1 unit	42G
3RW444.-.BC3.	115 V	►	**3RW4947-8VX30**		1	1 unit	42G
3RW444.-.BC4.	230 V	►	**3RW4947-8VX40**		1	1 unit	42G
3RW445.-.BC3., 3RW446.-.BC3.[2]	115 V	►	**3RW4957-8VX30**		1	1 unit	42H
3RW445.-.BC4., 3RW446.-.BC4.[2]	230 V	►	**3RW4957-8VX40**		1	1 unit	42H
3RW446.-.BC3.[3]	115 V	►	**3RW4966-8VX30**		1	1 unit	42H
3RW446.-.BC4.[3]	230 V	►	**3RW4966-8VX40**		1	1 unit	42H

[1] The 3RW4422 and 3RW4423 soft starters do not need fans. These devices are adequately designed for natural convection.

[2] 3RW446. mounting on output side.

[3] For mounting on front side.

Spare parts

	For soft starters Type	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Removable control terminals								
				Screw terminals				
	With screw terminals							
 3RW4766-6HC00	3RW44	4 blocks each with 6 terminals	1	**3RW4766-6HC00**		1	1 unit	42H
				Spring-type terminals				
	With spring-type terminals							
	3RW44	4 blocks each with 6 terminals	1	**3RW4766-2HC00**		1	1 unit	42H
Box terminal block								
 3RW4727-0RC00	3RW442.		5	**3RW4727-0RC00**		1	10 units	42H
Enclosure base								
 3RW4747-0UC00	3RW444.		3	**3RW4747-0UC00**		1	1 unit	42H

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

More information	
Homepage, see www.siemens.com/solid-state-switching-devices Industry Mall, see www.siemens.com/product?3RF	Online configurator, see www.siemens.com/sirius/configurators

SIRIUS 3RF solid-state switching devices

Three-phase solid-state contactor and single-phase solid-state relay

The SIRIUS 3RF2 solid-state switching devices reliably switch a wide range of different loads with alternating voltages in 50 and 60 Hz systems.

SIRIUS 3RF2 solid-state switching devices for resistive/inductive loads:

- Solid-state relays
- Solid state contactors
- Function modules

SIRIUS 3RF2 – for almost unending activity

Conventional electromechanical switchgear is often overtaxed by the rise in the number of switching operations. A high switching frequency results in frequent failure and short replacement cycles. However, this does not have to be the case, because with the latest generation of our SIRIUS 3RF2 solid-state switching devices we provide you with solid-state relays and contactors with a particularly long endurance – for almost unending activity even under the toughest conditions and under high mechanical load, but also in noise-sensitive areas.

Proven time and again in service

SIRIUS 3RF2 solid-state switching devices have firmly established themselves in industrial applications. They are used above all in applications where loads are switched frequently – mainly with resistive load controllers, with the control of electrical heat or the control of valves and motors in conveyor systems. In addition to its use in areas with high switching frequencies, their silent switching means that SIRIUS is also ideally suited for use in noise-sensitive areas, such as offices or hospitals.

The most reliable solution for any application

Compared to mechanical controlgear, our SIRIUS 3RF2 solid-state switching devices stand out due to their considerably longer service life. Thanks to the high product quality, their switching is extremely precise, reliable and, above all, insusceptible to faults. With its variable connection methods and a wide spread of control voltages, the SIRIUS 3RF2 family is universally applicable. Depending on the individual requirements of the application, our modular controlgear can also be quite easily expanded by the addition of standardized function modules.

Always on the sunny side with SIRIUS

Because SIRIUS 3RF2 offers even more:

- The space-saving and compact side-by-side mounting ensures reliable operation up to an ambient temperature of +60 °C.
- Thanks to fast configuration and the ease of mounting and start up, you save not only time but also expenses.

Also for switching motors (see page 6/104)

In order to achieve higher productivity, the switching frequency is continuously increased. It is no problem for our SIRIUS solid-state contactors to switch motors. With induction motors up to 7.5 kW, they can reliably withstand even the highest switching frequencies. Even a continuous change in the direction of rotation is possible with the solid-state reversing contactors. Both versions can be perfectly combined with components from the SIRIUS modular system. Connecting with SIRIUS motor starter protectors or SIRIUS overload relays can be implemented without any further steps.

SIRIUS 3RF3 solid-state switching devices for switching motors:

- Solid state contactors
- Solid-state reversing contactors

Connection methods

The solid-state switching devices are available with screw terminals (box terminals), spring-type terminals or ring terminal lugs.

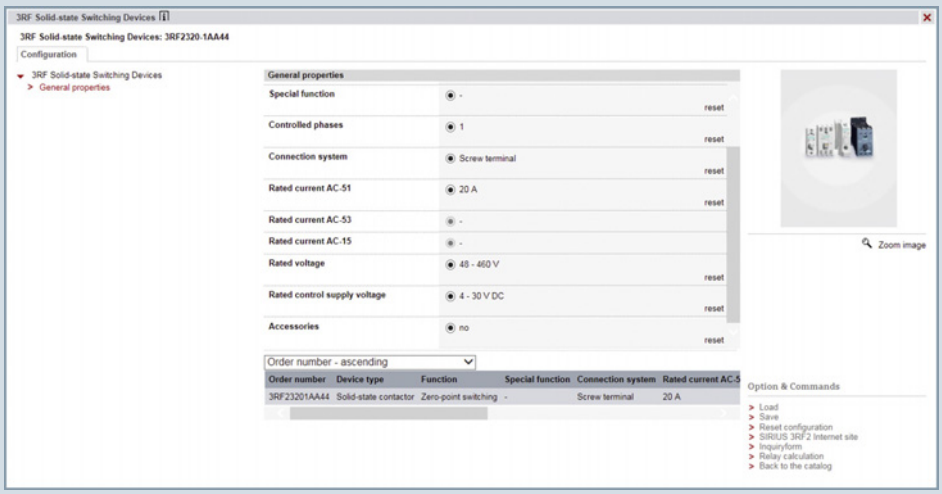
	Screw terminals
	Spring-type terminals
	Ring terminal lug connection
	The terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

General data

Online Configurator

- Simple selection of individual solid-state switching devices by means of technical characteristics (e.g. zero-point switching, spring-type terminal and rated current)
- Once configuration is complete, you receive the article numbers corresponding to the products

see
www.siemens.com/sirius/configurators



Article No. scheme

Product versions		Article number								
Device type	**Solid-state relays**	**3RF20**	☐	☐	–	☐	☐	☐	☐	Single-phase, 45-mm width
		3RF21	☐	☐	–	☐	☐	☐	☐	Single-phase, 22.5-mm width
		3RF22	☐	☐	–	☐	☐	☐	☐	Three-phase, 45-mm width
	Solid-state contactors	**3RF23**	☐	☐	–	☐	☐	☐	☐	Single-phase
		3RF24	☐	☐	–	☐	☐	☐	☐	Three-phase
Type current	e.g. 20 = 20 A		☐	☐						
Connection type	Screw terminals					**1**				
	Spring-type terminals					**2**				
	Ring terminal lug connection					**3**				
Switching function	Zero-point switching						**A**			
	Instantaneous switching						**B**			
	Zero-point switching						**C**			Low Noise
	Zero-point switching						**D**			Short-circuit-proof with B MCB
Single-phase or number of controlled phases	Single-phase							**A**		
	Two-phase							**B**		
	Three-phase							**C**		
	Reversing contactor							**D**		
Rated control supply voltage U_S	24 V DC								**0**	
	24 V AC/DC								**1**	
	110 ... 230 V AC								**2**	
	110 V AC								**3**	
	4 ... 30 V DC								**4**	
	230 V AC								**5**	
Rated operational voltage U_e	24 ... 230 V AC									**2**
	48 ... 460 V AC									**4**
	48 ... 600 V AC									**5**
	48 ... 600 V AC									**6** Blocking voltage 1 600 V
Example		**3RF21**	**2**	**0**	**–**	**1**	**A**	**A**	**0**	**6**

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

Overview of the SIRIUS 3RF2 solid-state switching devices

Type	Solid-state relays			Solid-state contactors		Function modules					
	Single-phase		3-phase	Single-phase	3-phase	Converters	Load monitoring		Heating current monitoring	Power controllers	Power regulators
	22.5 mm	45 mm	45 mm				Basic	Extended			
Usage											
Simple use of existing solid-state relays	❑	✓	❑	❑	❑	--	--	--	--	--	--
Complete unit "Ready to use"	❑	❑	❑	✓	✓	--	--	--	--	--	--
Space-saving	✓	--	✓	✓	✓	✓	✓	--	--	--	--
Can be extended with modular function modules	✓	--	[1]	✓	[1]	--	--	--	--	--	--
Frequent switching and monitoring of loads and solid-state relays/solid-state contactors	--	--	--	--	--	--	✓	✓	✓	✓	✓
Monitoring of up to 6 partial loads	--	--	--	--	--	--	✓	--	✓	✓	--
Monitoring of more than 6 partial loads	--	--	--	--	--	--	--	✓	--	--	--
Control of the heating power through an analog input	--	--	--	--	--	✓	--	--	--	✓	✓
Power control	--	--	--	--	--	--	--	--	--	--	✓
Startup											
Easy setting of setpoint values with "Teach" button	--	--	--	--	--	--	✓	✓	--	✓	✓
"Remote Teach" input for setting setpoints	--	--	--	--	--	--	--	--	✓	--	--
Mounting											
Mounting onto mounting rails or mounting plates	--	--	--	✓	✓	--	--	--	--	--	--
Can be snapped directly onto a solid-state relay or contactor	--	--	--	--	--	✓	✓	✓	✓	✓	✓
For use with "Coolplate" heat sink	✓	✓	✓	--	--	--	--	--	--	--	--
Cable routing											
Connection of load circuit as for controlgear	✓	--	✓	✓	✓	--	✓	✓	✓	✓	✓
Connection of load circuit from above	--	✓	--	--	--	--	--	--	--	--	--

✓ Function available

❑ Function possible

-- Function not possible

[1] The converter can also be used with three-phase devices.

Benefits

Features

- Considerable space savings thanks to a width of only 22.5 mm
- Variety of connection methods: Screw terminal, spring-type connection or ring terminal lug, there is no problem – they are all finger-safe
- Flexible for all applications with function modules for retrofitting
- Possibility of fuseless short-circuit proof design

Benefits

- Saves time and costs with fast mounting and commissioning, short start up times and easy wiring
- Extremely long life, low maintenance, rugged and reliable
- Space-saving and safe thanks to side-by-side mounting up to an ambient temperature of +60 °C
- Modular design: Standardized function modules and heat sinks can be used in conjunction with solid-state relays to satisfy individual requirements
- Safety due to lifelong, vibration-resistant and shock-resistant spring-type terminal connection method even under tough conditions

Application

Applications

Example: Plastics processing industry

Thanks to their high switching endurance SIRIUS 3RF2 solid-state switching devices are ideal for controlling electrical heat. This is because the more precise the temperature regulation process has to be, the higher the switching frequency. The accurate regulation of electrical heat is used for example in many processes in the plastics processing industry:

- Band heaters heat the extrudate to the correct temperature in plastic extruders
- Heat emitters heat plastic blanks to the correct temperature
- Heat drums dry plastic granules
- Heating channels keep molds at the correct temperature in order to manufacture different plastic parts without defects

The powerful SIRIUS 3RF2 solid-state relays and contactors can be used for the simultaneous control of several heating loads. By using a load monitoring module the individual partial loads can easily be monitored, and in the event of a failure a signal is generated to be sent to the controller.

Use in fuseless load feeders

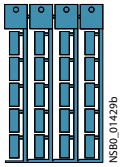
Compared with the fused configuration of load feeders, short circuit and line protection using miniature circuit breakers is easy to achieve with SIRIUS 3RF2 solid-state relays and contactors.

A special version of the solid-state contactors can be protected against damage in the case of a short circuit with a miniature circuit breaker with type B tripping characteristic. This allows the low-cost and simple design of fuseless load feeders with full protection of the switchgear.

Selection and ordering data

Inscription labels for 3RF2 series

Designation	Labeling area (W x H)	Color	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	mm x mm		d					
Blank labels								
Unit labeling plates for SIRIUS[1]	10 x 7	Pastel turquoise	15	**3RT1900-1SB10**		100	816 units	41B
	20 x 7	Pastel turquoise	20	**3RT1900-1SB20**		100	340 units	41B
Adhesive labels for SIRIUS	19 x 6	Pastel turquoise	15	**3RT1900-1SB60**		100	3 060 units	41B
	19 x 6	Zinc yellow	15	**3RT1900-1SD60**		100	3 060 units	41B



3RT1900-1SB20
(1 frame = 20 units)

[1] PC labeling systems for individual inscription of unit labeling plates are available from: murrplastik Systemtechnik GmbH, see page 16/15.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

More information

Notes on integration in the load feeders

The SIRIUS solid-state switching devices are very easy to integrate into the load feeders thanks to their industrial connection method and design.

Particular attention must however be paid to the circumstances of the installation and ambient conditions, as the performance of the solid-state switching devices is largely dependent on these. Depending on the version, certain restrictions must be observed. Detailed information in relation to solid-state contactors, e.g. on minimum spacing, and in relation to solid-state relays on the choice of heat sink can be found in the technical specifications and in the product data sheets, see https://support.industry.siemens.com/cs/ww/en/ps/16222.

Short-circuit and overload protection

Despite the rugged power semiconductors that are used, solid-state switching devices respond more sensitively to short circuits in the load feeder. Consequently, special precautions have to be taken against destruction, depending on the type of design.

Siemens generally recommends using SITOR semiconductor protection fuses. These fuses also provide protection against destruction in the event of a short circuit even when the solid-state contactors and solid-state relays are fully utilized.

Alternatively, if there is lower loading, protection can also be provided by standard fuses or miniature circuit breakers. This protection is achieved by overdimensioning the solid-state switching devices accordingly. The technical specifications and the product data sheets contain details both about the solid-state fuse protection itself and about use of the devices with conventional protection equipment.

Electromagnetic compatibility (EMC)

The solid-state switching devices are suitable for interference-free operation in industrial networks without further measures. If they are used in public networks, it may be necessary for conducted interference to be reduced by means of filters.

This does not include the solid-state contactors for resistive loads of the special type 3RF23..-.CA.. "Low Noise". These comply with the class B limit values up to a rated current of 16 A. If other versions are used, and at currents of over 16 A, standard filters can be used in order to comply with the limit values. The decisive factors when it comes to selecting the filters are essentially the current loading and the other parameters (operational voltage, design type, etc.) in the load feeder.

Suitable filters can be ordered from EPCOS AG, see page 16/15.

Product information and technical specifications

For product data sheets with detailed technical specifications, dimensional drawings and characteristic curves, see https://support.industry.siemens.com/cs/ww/en/ps/16222.

For additional information, please enter the article number of the required device under the tab "Product List".

Overview

Solid-state relays (without heat sink)

SIRIUS solid-state relays are suitable for surface mounting on existing cooling surfaces. Mounting is quick and easy, involving just two screws. The special technology of the power semiconductor ensures there is excellent thermal contact with the heat sink. Depending on the nature of the heat sink, the capacity reaches up to 88 A on resistive loads.

The solid-state relays are available in three different versions:

- 3RF21 single-phase solid-state relay with a width of 22.5 mm
- 3RF20 single-phase solid-state relay with a width of 45 mm
- 3RF22 three-phase solid-state relay with a width of 45 mm

The 3RF21 and 3RF22 solid-state relays can be expanded with various function modules to adapt them to individual applications.

Version for resistive loads "zero-point switching"

This standard version is often used for switching space heaters on and off.

Version for inductive loads "instantaneous switching"

In this version the solid-state relay is specifically matched to inductive loads. Whether it is a matter of frequent actuation of the valves in a filling plant or starting and stopping small operating mechanisms in packet distribution systems, operation is carried out safely and noiselessly.

Special "low noise" version

Thanks to a special control circuit, this special version can be used in public networks up to 16 A without any additional measures such as interference suppressor filters. As a result, in terms of emitted interference, it conforms to limit value curve class B according to IEC 60947-4-3.

Single-phase solid-state relays with a width of 22.5 mm

With its compact design and a width of just 22.5 mm, which stays the same even at currents of up to 88 A, the 3RF21 solid-state relay offers an ultra small footprint. The logical connection method, with the power infeed from above and load connection from below, ensures tidy installation in the control cabinet.

Single-phase solid-state relays with a width of 45 mm

The solid-state relays with a width of 45 mm provide for connection of the power supply lead and the load from above. This makes it easy to replace existing solid-state relays in existing arrangements. The connection of the control cable is as space-saving as the 22.5 mm design, as it is simply plugged on.

Three-phase solid-state relays with a width of 45 mm

With its compact design and a width of just 45 m, which stays the same even at currents of up to 55 A, the 3RF22 solid-state relay offers an ultra small footprint. The logical connection method, with the power infeed from above and load connection from below, ensures tidy installation in the control cabinet.

The three-phase solid-state relays are available with

- Two-phase control (suitable in particular for circuits without connection to the neutral conductor) and
- Three-phase control (suitable for star circuits with connection to the neutral conductor or for applications in which the system requires all phases to be switched)

Selection notes

When selecting solid-state relays, in addition to information about the network, the load and the ambient conditions it is also necessary to know details of the planned design. The solid-state relays can only conform to their specific technical specifications if they are mounted with appropriate care on an adequately dimensioned heat sink.

Mounting solid-state relays directly on a mounting plate made of sheet steel is inadequate in terms of heat dissipation.

The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select the relay design and choose a solid-state relay with higher rated current than the load
- Determine the thermal resistance of the proposed heat sink
- Check the correct relay size with the aid of the diagrams

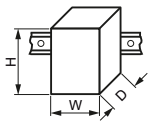
Overview

Single-phase solid-state relays (without heat sink) with a width of 22.5 mm

With its compact design and a width of just 22.5 mm, which stays the same even at currents of up to 88 A, the 3RF21 solid-state relay offers an ultra small footprint. The logical connection method, with the power infeed from above and load connection from below, ensures tidy installation in the control cabinet.

Technical specifications

More information	
System Manual "SIRIUS Modular System – System Overview", see https://support.industry.siemens.com/cs/ww/en/view/60311318	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16224/faq

Type			3RF21..-1....	3RF21..-2....	3RF21..-3....
Dimensions (W x H x D)		mm	22.5 x 85 x 48 mm	22.5 x 85 x 48 mm	22.5 x 85 x 48 mm
General data					
Ambient temperature					
• During operation, derating from 40 °C		°C	-25 ... + 60		
• During storage		°C	-55 ... + 80		
Installation altitude		m	0 ... 1 000; derating from 1 000		
Shock resistance acc. to IEC 60068-2-27		*g*/ms	15/11		
Vibration resistance acc. to IEC 60068-2-6		*g*	2		
Degree of protection			IP20		IP00 (IP20 when using the terminal cover 3RA2900-3PA88)
Electromagnetic compatibility (EMC)					
• Emitted interference					
- Conducted interference voltage acc. to IEC 60947-4-3			Class A for industrial applications		
- Emitted, high-frequency interference voltage acc. to IEC 60947-4-3			Class B for residential, business and commercial applications		
• Interference immunity					
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)		kV	Contact discharge 4; air discharge 8; behavior criterion 2		
- Induced RF fields according to IEC 61000-4-6		MHz	0.15 ... 80; 140 dBµV; behavior criterion 1		
- Burst acc. to IEC 61000-4-4		kV	2/5.0 kHz; behavior criterion 2		
- Surge acc. to IEC 61000-4-5		kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2		
Mounting					
• Screws (not included in the scope of supply)			2 x M4		
• Tightening torque		Nm	1.5		
Connection type			**Screw terminals**	**Spring-type terminals**	**Ring terminal lug connection**
Connection, main contacts					
• Conductor cross-sections					
- Solid		mm^2	2 x (1.5 ... 2.5)[1], 2 x (2.5 ... 6)[1]	2 x (0.5 ... 2.5)	--
- Finely stranded with end sleeve		mm^2	2 x (1 ... 2.5)[1], 2 x (2.5 ... 6)[1], 1 x 10	2 x (0.5 ... 1.5)	--
- Finely stranded without end sleeve		mm^2	--	2 x (0.5 ... 2.5)	--
- Solid or stranded, AWG cables		AWG	2 x (14 ... 10)	2 x (18 ... 14)	--
• Terminal screws			M4	--	M5
• Tightening torques		Nm	2 ... 2.5	--	2.5 ... 2
		lb.in	7 ... 10.3	--	10.3 ... 7
• Cable lugs					
- According to DIN 46234			--	--	5-2.5, 5-6, 5-10, 5-16, 5-25
- According to JIS C 2805			--	--	R 2-5, R 5.5-5, R 8-5, R 14-5
- Width, maximum		mm	--	--	12
Connection, auxiliary/control contacts					
• Conductor cross-sections		mm	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)	0.5 ... 2.5	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)
		AWG	20 ... 12	20 ... 12	20 ... 12
• Stripped length		mm	7	10	7
• Terminal screw			M3	--	M3
• Tightening torques		Nm	0.5 ... 0.6	--	0.5 ... 0.6
		lb.in	4.5 ... 5.3	--	4.5 ... 5.3

[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

SIRIUS 3RF21 solid-state relays, single-phase, 22.5 mm

Type	I_{max} [1] at R_{thha}/T_u = 40 °C		I_e acc. to IEC 60947-4-3 at R_{thha}/T_u = 40 °C		I_e acc. to UL/CSA at R_{thha}/T_u = 50 °C		Power loss at I_{max}	Minimum load current	Off-state current
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF2120-.....	20	2.0	20	1.7	20	1.3	28.6	0.1	10
3RF2130-1....	30	1.1	30	0.79	30	0.56	44.2	0.5	10
3RF2150-1....	50	0.68	50	0.48	50	0.33	66	0.5	10
3RF2150-2....	50	0.68	20	2.6	20	2.9	66	0.5	10
3RF2150-3....	50	0.68	50	0.48	50	0.33	66	0.5	10
3RF2170-1....	70	0.40	50	0.77	50	0.6	94	0.5	10
3RF2190-1....	88	0.33	50	0.94	50	0.85	118	0.5	10
3RF2190-2....	88	0.33	20	2.8	20	3.5	118	0.5	10
3RF2190-3....	88	0.33	88	0.22	83	0.19	118	0.5	10

[1] The current I_{max} provides information about the performance of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

Note:

The required heat sinks for the corresponding load currents can be determined from the characteristic curves (see page 6/63, "More Information"). The minimum thickness values for the mounting surface must be observed.

Type	Rated peak withstand current I_{tsm}	I^2t value
	A	A^2s
Main circuit		
3RF2120-.....	200	200
3RF2130-..A.2	300	450
3RF2130-..A.4	300	450
3RF2130-..A.5	300	450
3RF2130-..A.6	400	800
3RF2150-.....	600	1 800
3RF2170-..A.2	1 200	7 200
3RF2170-..A.4	1 200	7 200
3RF2170-..A.5	1 200	7 200
3RF2170-..A.6	1 150	6 600
3RF2190-.....	1 150	6 600

Type		3RF21..-....2	3RF21..-....4	3RF21..-....5	3RF21..-....6
Main circuit					
Rated operational voltage U_e	V AC	24 ... 230	48 ... 460		
• Operating range	V AC	20 ... 253	40 ... 506	40 ... 660	
• Rated frequency	Hz	50/60 ± 10%			
Rated insulation voltage U_i	V	600			
Blocking voltage	V	800	1 200		1 600
Rate of voltage rise	V/µs	1 000			

Type		3RF21..-...0.	3RF21..-...1.		3RF21..-...2.	3RF21..-...4.
Control circuit						
Method of operation		DC operation	AC/DC operation		AC operation	DC operation
Rated control supply voltage U_s	V	24	24 AC	24 DC	110 ... 230	4 ... 30
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10%	--	50/60 ± 10%	--
Control supply voltage, max.	V	30	26.5 AC	30 DC	253	30
Typical actuating current	mA	20 / Low Power: 6.5[1]	20		15	20
Response voltage	V	15	14 AC	15 DC	90	4
Drop-out voltage	V	5	5 AC	5 DC	40	1
Operating times						
• ON-delay	ms	1 + max. one half-wave[2]	10 + max. one half-wave[2]		40 + max. one half-wave[2]	1 + max. one half-wave[2]
• OFF-delay	ms	1 + max. one half-wave	15 + max. one half-wave		40 + max. one half-wave	1 + max. one half-wave

[1] Applies to the "Low Power" version 3RF21..-.AA..-**0KN0**.
[2] Only for zero-point switching devices.

Selection and ordering data

Single-phase solid-state relays (without heat sink) with a width of 22.5 mm

3RF2120-1AA02

Type current/ performance capacity[1]	Rated control supply voltage U_s	SD	Screw terminals[2] Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	V	d					
Zero-point switching, rated operational voltage U_e 24 ... 230 V AC							
20	24 DC	2	**3RF2120-1AA02**		1	1 unit	41C
30		2	**3RF2130-1AA02**		1	1 unit	41C
50		2	**3RF2150-1AA02**		1	1 unit	41C
70		2	**3RF2170-1AA02**		1	1 unit	41C
90		5	**3RF2190-1AA02**		1	1 unit	41C
20	110 ... 230 AC	2	**3RF2120-1AA22**		1	1 unit	41C
30		2	**3RF2130-1AA22**		1	1 unit	41C
50		5	**3RF2150-1AA22**		1	1 unit	41C
70		5	**3RF2170-1AA22**		1	1 unit	41C
90		5	**3RF2190-1AA22**		1	1 unit	41C
20	4 ... 30 DC	2	**3RF2120-1AA42**		1	1 unit	41C
30		2	**3RF2130-1AA42**		1	1 unit	41C
Zero-point switching, rated operational voltage U_e 48 ... 460 V AC							
20	24 DC	2	**3RF2120-1AA04**		1	1 unit	41C
30		2	**3RF2130-1AA04**		1	1 unit	41C
50		2	**3RF2150-1AA04**		1	1 unit	41C
70		2	**3RF2170-1AA04**		1	1 unit	41C
90		2	**3RF2190-1AA04**		1	1 unit	41C
20	24 AC/DC	5	**3RF2150-1AA14**		1	1 unit	41C
20	110 ... 230 AC	2	**3RF2120-1AA24**		1	1 unit	41C
30		2	**3RF2130-1AA24**		1	1 unit	41C
50		5	**3RF2150-1AA24**		1	1 unit	41C
70		2	**3RF2170-1AA24**		1	1 unit	41C
90		5	**3RF2190-1AA24**		1	1 unit	41C
Zero-point switching, rated operational voltage U_e 48 ... 600 V AC							
70	24 DC Low Power	5	**3RF2170-1AA05-0KN0**		1	1 unit	41C
20	4 ... 30 DC	5	**3RF2120-1AA45**		1	1 unit	41C
30		5	**3RF2130-1AA45**		1	1 unit	41C
50		5	**3RF2150-1AA45**		1	1 unit	41C
70		2	**3RF2170-1AA45**		1	1 unit	41C
90		5	**3RF2190-1AA45**		1	1 unit	41C
Zero-point switching · Blocking voltage 1 600 V, rated operational voltage U_e 48 ... 600 V AC							
30	24 DC	2	**3RF2130-1AA06**		1	1 unit	41C
50		2	**3RF2150-1AA06**		1	1 unit	41C
70		5	**3RF2170-1AA06**		1	1 unit	41C
90		5	**3RF2190-1AA06**		1	1 unit	41C
30	110 ... 230 AC	5	**3RF2130-1AA26**		1	1 unit	41C
50		5	**3RF2150-1AA26**		1	1 unit	41C
70		5	**3RF2170-1AA26**		1	1 unit	41C
90		5	**3RF2190-1AA26**		1	1 unit	41C

[1] The type current provides information about the performance capacity of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

[2] Please note that this version can only be used for a rated current of up to approx. 50 A and a conductor cross-section of 10 mm^2.

Other rated control supply voltages on request.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

SIRIUS 3RF21 solid-state relays, single-phase, 22.5 mm

Type current/ performance capacity[1]	Rated control supply voltage U_s	SD	**Screw terminals**[2] Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	V	d					
Instantaneous switching, rated operational voltage U_e 24 ... 230 V AC							
50	110 ... 230 AC	5	**3RF2150-1BA22**		1	1 unit	41C
Instantaneous switching, rated operational voltage U_e 48 ... 460 V AC							
20	24 DC	5	**3RF2120-1BA04**		1	1 unit	41C
30		5	**3RF2130-1BA04**		1	1 unit	41C
50		5	**3RF2150-1BA04**		1	1 unit	41C
70		5	**3RF2170-1BA04**		1	1 unit	41C
90		5	**3RF2190-1BA04**		1	1 unit	41C
Instantaneous switching · Blocking voltage 1 600 V, rated operational voltage U_e 48 ... 600 V AC							
50	24 DC	5	**3RF2150-1BA06**		1	1 unit	41C
Low Noise[3] · Zero-point switching, rated operational voltage U_e 48 ... 460 V AC							
70	24 DC	5	**3RF2170-1CA04**		1	1 unit	41C

1) The type current provides information about the performance capacity of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

2) Please note that this version can only be used for a rated current of up to approx. 50 A and a conductor cross-section of 10 mm^2.

3) See page 6/64.

Other rated control supply voltages on request.

Type current/ performance capacity[1]	Rated control supply voltage U_s	SD	**Spring-type terminals**[2] Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	V	d					
Zero-point switching, rated operational voltage U_e 24 ... 230 V AC							
20	24 DC	2	**3RF2120-2AA02**		1	1 unit	41C
50		5	**3RF2150-2AA02**		1	1 unit	41C
90		5	**3RF2190-2AA02**		1	1 unit	41C
20	110 ... 230 AC	5	**3RF2120-2AA22**		1	1 unit	41C
50		5	**3RF2150-2AA22**		1	1 unit	41C
90		5	**3RF2190-2AA22**		1	1 unit	41C
20	4 ... 30 DC	5	**3RF2120-2AA42**		1	1 unit	41C
Zero-point switching, rated operational voltage U_e 48 ... 460 V AC							
20	24 DC	2	**3RF2120-2AA04**		1	1 unit	41C
50		5	**3RF2150-2AA04**		1	1 unit	41C
90		5	**3RF2190-2AA04**		1	1 unit	41C
50	24 AC/DC	5	**3RF2150-2AA14**		1	1 unit	41C
20	110 ... 230 AC	5	**3RF2120-2AA24**		1	1 unit	41C
50		5	**3RF2150-2AA24**		1	1 unit	41C
90		5	**3RF2190-2AA24**		1	1 unit	41C
Zero-point switching, rated operational voltage U_e 48 ... 600 V AC							
20	4 ... 30 DC	5	**3RF2120-2AA45**		1	1 unit	41C
Zero-point switching · Blocking voltage 1 600 V, rated operational voltage U_e 48 ... 600 V AC							
50	24 DC	5	**3RF2150-2AA06**		1	1 unit	41C
90		5	**3RF2190-2AA06**		1	1 unit	41C
50	110 ... 230 AC	5	**3RF2150-2AA26**		1	1 unit	41C
90		5	**3RF2190-2AA26**		1	1 unit	41C


3RF2120-2AA02

1) The type current provides information about the performance capacity of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

2) Please note that the version with spring-type terminals can only be used for a rated current of up to approx. 20 A and a conductor cross-section of 2.5 mm^2. Higher currents can be achieved by connecting two conductors per terminal.

Other rated control supply voltages on request.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

SIRIUS 3RF21 solid-state relays, single-phase, 22.5 mm

Type current/ performance capacity[1]	Rated control supply voltage U_s	SD	Ring terminal lug connection Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	V	d					
Zero-point switching, rated operational voltage U_e 24 ... 230 V AC							
20	24 DC	5	**3RF2120-3AA02**		1	1 unit	41C
50		5	**3RF2150-3AA02**		1	1 unit	41C
90		5	**3RF2190-3AA02**		1	1 unit	41C
20	110 ... 230 AC	5	**3RF2120-3AA22**		1	1 unit	41C
50		5	**3RF2150-3AA22**		1	1 unit	41C
90		5	**3RF2190-3AA22**		1	1 unit	41C
Zero-point switching, rated operational voltage U_e 48 ... 460 V AC							
20	24 DC	5	**3RF2120-3AA04**		1	1 unit	41C
50		5	**3RF2150-3AA04**		1	1 unit	41C
90		5	**3RF2190-3AA04**		1	1 unit	41C
20	110 ... 230 AC	5	**3RF2120-3AA24**		1	1 unit	41C
50		5	**3RF2150-3AA24**		1	1 unit	41C
90		5	**3RF2190-3AA24**		1	1 unit	41C
90	4 ... 30 DC	5	**3RF2190-3AA44**		1	1 unit	41C
Zero-point switching · Blocking voltage 1600 V, rated operational voltage U_e 48 ... 600 V AC							
50	24 DC	5	**3RF2150-3AA06**		1	1 unit	41C
90		5	**3RF2190-3AA06**		1	1 unit	41C
50	110 ... 230 AC	5	**3RF2150-3AA26**		1	1 unit	41C
90		5	**3RF2190-3AA26**		1	1 unit	41C


3RF2120-3AA02

[1] The type current provides information about the performance capacity of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

Other rated control supply voltages on request.

Accessories

Version	SD	Article No. Price per PU	PU (UNIT, SET, M)	PS*	PG
	d				
Optional accessories					
		Spring-type terminals			
Screwdrivers For all SIRIUS devices with spring-type terminals Length approx. 200 mm, size 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**	1	1 unit	41B
		Ring terminal lug connection			
Terminal covers For 3RF21 solid-state relays in ring terminal lug connection (With this terminal cover, degree of protection IP20 can be achieved in the terminal compartment in the case of ring terminal lug connections. It can also be used for screw terminals after simple adaptation)	2	**3RF2900-3PA88**	1	10 units	41C
Control connectors					
		Screw terminals			
Replacement control connectors For 3RF20/21/22 Screw terminals	5	**3RF2900-1TA88**	1	50 units	41C
		Spring-type terminals			
Replacement control connectors For 3RF20/21/22 Spring-type terminals	5	**3RF2900-2TA88**	1	50 units	41C
Control connectors For 3RF20/21/22 Spring-type terminals with two clamping points per contact	5	**3RF2900-2TB88**	1	10 units	41C


3RA2908-1A


3RF2900-3PA88

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

SIRIUS 3RF20 solid-state relays, single-phase, 45 mm

Overview

Single-phase solid-state relays (without heat sink) with a width of 45 mm

The solid-state relays with a width of 45 mm provide for connection of the power supply lead and the load from above. This makes it easy to replace existing solid-state relays in existing arrangements.

The connection of the control cable is as space-saving as the 22.5 mm design, as it is simply plugged on.

Technical specifications

More information	
System Manual "SIRIUS Modular System – System Overview", see https://support.industry.siemens.com/cs/ww/en/view/60311318	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16225/faq

Type		**3RF20..-1....**	**3RF20..-4....**
Dimensions (W x H x D)	mm	45 x 58 x 48	45 x 58 x 48
General data			
Ambient temperature			
• During operation, derating from 40 °C	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
Installation altitude	m	0 ... 1 000; derating from 1 000	
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15 /11	
Vibration resistance acc. to IEC 60068-2-6	*g*	2	
Degree of protection		IP20	
Electromagnetic compatibility (EMC)			
• Emitted interference			
- Conducted interference voltage acc. to IEC 60947-4-3		Class A for industrial applications	
- Emitted, high-frequency interference voltage acc. to IEC 60947-4-3		Class B for residential, business and commercial applications	
• Interference immunity			
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2	
- Induced RF fields according to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1	
- Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 2	
- Surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2	
Mounting			
• Screws (not included in the scope of supply)		2 x M4	
• Tightening torques	Nm	1.5	
Connection type		**Screw terminals**	**Spring-type terminals**
Connection, main contacts			
• Conductor cross-sections			
- Solid	mm^2	2 x (1.5 ... 2.5)[1], 2 x (2.5 ... 6)[1]	--
- Finely stranded with end sleeve	mm^2	2 x (1 ... 2.5)[1], 2 x (2.5 ... 6)[1], 1 x 10	--
- Solid or stranded, AWG cables	AWG	2 x (14 ... 10)	--
• Terminal screw		M4	--
• Tightening torque	Nm lb.in	2 ... 2.5 7 ... 10.3	-- --
Connection, auxiliary/control contacts			
• Conductor cross-sections	mm^2 AWG	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) 20 ... 12	0.5 ... 2.5 20 ... 12
• Stripped length	mm	7	10
• Terminal screw		M3	--
• Tightening torque	Nm lb.in	0.5 ... 0.6 4.5 ... 5.3	-- --

[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Type	I_{max} [1] at R_{thha}/T_u = 40 °C		I_e acc. to IEC 60947-4-3 at R_{thha}/T_u = 40 °C		I_e acc. to UL/CSA at R_{thha}/T_u = 50 °C		Power loss at I_{max}	Minimum load current	Off-state current
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF2020-1.A..	20	2.0	20	1.7	20	1.3	28.6	0.1	10
3RF2030-1.A..	30	1.1	30	0.79	30	0.56	44.2	0.5	10
3RF2050-1.A..	50	0.68	50	0.48	50	0.33	66	0.5	10
3RF2070-1.A..	70	0.40	50	0.77	50	0.6	94	0.5	10
3RF2090-1.A..	88	0.33	50	0.94	50	0.85	118	0.5	10

1) The current I_{max} provides information about the performance of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

Note:

The required heat sinks for the corresponding load currents can be determined from the characteristic curves (see page 6/63, "More information"). The minimum thickness values for the mounting surface must be observed.

Type	Rated peak withstand current I_{tsm}	I^2t value
	A	A^2s
Main circuit		
3RF2020-1.A..	200	200
3RF2030-1.A.2	300	450
3RF2030-1.A.4	300	450
3RF2030-1.A.6	400	800
3RF2050-1.A..	600	1 800
3RF2070-1.A.2	1 200	7 200
3RF2070-1.A.4	1 200	7 200
3RF2070-1.A.5	1 200	7 200
3RF2070-1.A.6	1 150	6 600
3RF2090-1.A..	1 150	6 600

Type		3RF20.0-1.A.2	3RF20.0-1.A.4	3RF20.0-1.A.5	3RF20.0-1.A.6
Main circuit					
Rated operational voltage U_e	V AC	24 ... 230	48 ... 460	48 ... 600	
• Operating range	V AC	20 ... 253	40 ... 506	40 ... 660	
• Rated frequency	Hz	50/60 ± 10%			
Rated insulation voltage U_i	V	600			
Blocking voltage	V	800	1 200		1 600
Rate of voltage rise	V/µs	1 000			

Type		3RF20.0-1.A0.	3RF20.0-1.A2.	3RF20.0-1.A4.
Control circuit				
Method of operation		DC operation	AC operation	DC operation
Rated control supply voltage U_s	V	24	110 ... 230	4 … 30
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10%	--
Control supply voltage, max.	V	30	253	30
Typical actuating current	mA	20	15	20
Response voltage	V	15	90	4
Drop-out voltage	V	5	40	1
Operating times				
• ON-delay	ms	1 + max. one half-wave[1]	40 + max. one half-wave[1]	1 + max. one half-wave[1]
• OFF-delay	ms	1 + max. one half-wave	40 + max. one half-wave	1 + max. one half-wave

1) Only for zero-point switching devices.

SIRIUS 3RF20 solid-state relays, single-phase, 45 mm

Selection and ordering data

Single-phase solid-state relays (without heat sink) with a width of 45 mm

3RF2020-1AA02

Type current/ performance capacity[1]	Rated control supply voltage U_s	SD	Screw terminals[2]	PU (UNIT, SET, M)	PS*	PG
A	V	d	Article No.			
Zero-point switching, rated operational voltage U_e 24 ... 230 V AC						
20	24 DC	2	**3RF2020-1AA02**	1	1 unit	41C
30		2	**3RF2030-1AA02**	1	1 unit	41C
50		2	**3RF2050-1AA02**	1	1 unit	41C
70		2	**3RF2070-1AA02**	1	1 unit	41C
90		2	**3RF2090-1AA02**	1	1 unit	41C
20	110 ... 230 AC	2	**3RF2020-1AA22**	1	1 unit	41C
30		2	**3RF2030-1AA22**	1	1 unit	41C
50		5	**3RF2050-1AA22**	1	1 unit	41C
70		5	**3RF2070-1AA22**	1	1 unit	41C
90		5	**3RF2090-1AA22**	1	1 unit	41C
20	4 ... 30 DC	5	**3RF2020-1AA42**	1	1 unit	41C
30		5	**3RF2030-1AA42**	1	1 unit	41C
Zero-point switching, rated operational voltage U_e 48 ... 460 V AC						
20	24 DC	2	**3RF2020-1AA04**	1	1 unit	41C
30		2	**3RF2030-1AA04**	1	1 unit	41C
50		2	**3RF2050-1AA04**	1	1 unit	41C
70		2	**3RF2070-1AA04**	1	1 unit	41C
90		2	**3RF2090-1AA04**	1	1 unit	41C
20	110 ... 230 AC	5	**3RF2020-1AA24**	1	1 unit	41C
30		5	**3RF2030-1AA24**	1	1 unit	41C
50		5	**3RF2050-1AA24**	1	1 unit	41C
70		5	**3RF2070-1AA24**	1	1 unit	41C
90		5	**3RF2090-1AA24**	1	1 unit	41C
50	4 ... 30 DC	2	**3RF2050-1AA44**	1	1 unit	41C
Zero-point switching, rated operational voltage U_e 48 ... 600 V AC						
20	4 ... 30 DC	5	**3RF2020-1AA45**	1	1 unit	41C
50		5	**3RF2050-1AA45**	1	1 unit	41C
70		2	**3RF2070-1AA45**	1	1 unit	41C
90		5	**3RF2090-1AA45**	1	1 unit	41C
Zero-point switching · Blocking voltage 1 600 V, rated operational voltage U_e 48 ... 600 V AC						
30	24 DC	5	**3RF2030-1AA06**	1	1 unit	41C
50		5	**3RF2050-1AA06**	1	1 unit	41C
70		5	**3RF2070-1AA06**	1	1 unit	41C
90		5	**3RF2090-1AA06**	1	1 unit	41C
30	110 ... 230 AC	5	**3RF2030-1AA26**	1	1 unit	41C
50		5	**3RF2050-1AA26**	1	1 unit	41C
70		5	**3RF2070-1AA26**	1	1 unit	41C
90		5	**3RF2090-1AA26**	1	1 unit	41C
Instantaneous switching, rated operational voltage U_e 48 ... 460 V AC						
30	24 DC	5	**3RF2030-1BA04**	1	1 unit	41C

[1] The type current provides information about the performance capacity of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

[2] Please note that this version can only be used for a rated current of up to approx. 50 A and a conductor cross-section of 10 mm^2.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

SIRIUS 3RF20 solid-state relays, single-phase, 45 mm

	Type current/ performance capacity[1]	Rated control supply voltage U_s	SD	**Screw terminals + spring-type terminals** (control current side)		PU (UNIT, SET, M)	PS*	PG
	A	V	d	Article No.	Price per PU			
Zero-point switching, rated operational voltage U_e 24 ... 230 V AC								
 3RF2050-4AA02	50	24 DC	5	**3RF2050-4AA02**		1	1 unit	41C

[1] The type current provides information about the performance capacity of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

Accessories, see page 6/69.

SIRIUS 3RF22 solid-state relays, three-phase, 45 mm

Overview

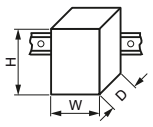
Three-phase solid-state relays (without heat sink) with a width of 45 mm

With its compact design and a width of just 45 mm, which stays the same even at currents of up to 55 A, the 3RF22 solid-state relay offers an ultra small footprint. The logical connection method, with the power infeed from above and load connection from below, ensures tidy installation in the control cabinet.

Important features:
- LED display
- Variety of connection methods
- Plug-in control connection
- Degree of protection IP20 (with ring terminal lug connection IP00)
- Zero-point switching, two- or three-phase controlled

Technical specifications

More information	
System Manual "SIRIUS Modular System – System Overview", see https://support.industry.siemens.com/cs/ww/en/view/60311318	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16226/faq

Type			3RF22..-1....	3RF22..-2....	3RF22..-3....
Dimensions (W x H x D)		mm	45 x 95 x 47	45 x 95 x 47	45 x 95 x 47
General data					
Ambient temperature					
• During operation, derating from 40 °C		°C	-25 ... +60		
• During storage		°C	-55 ... +80		
Installation altitude		m	0 ... 1 000; > 1 000 ask Technical Assistance		
Shock resistance acc. to IEC 60068-2-27		*g*/ms	15/11		
Vibration resistance acc. to IEC 60068-2-6		*g*	2		
Degree of protection			IP20		IP00
Insulation strength at 50/60 Hz (main/control circuit to floor)		V rms	4 000		
Electromagnetic compatibility (EMC)					
• Emitted interference					
- Conducted interference voltage acc. to IEC 60947-4-3			Class A for industrial applications[1]		
• Interference immunity					
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)		kV	Contact discharge 4; air discharge 8; behavior criterion 2		
- Induced RF fields according to IEC 61000-4-6		MHz	0.15 ... 80; 140 dBµV; behavior criterion 1		
- Burst acc. to IEC 61000-4-4		kV	2/5.0 kHz; behavior criterion 2		
- Surge acc. to IEC 61000-4-5		kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2		
Mounting					
• Screws (not included in the scope of supply)			2 x M4		
• Tightening torques		Nm	1.5		
Connection type			**Screw terminals**	**Spring-type terminals**	**Ring terminal lug connection**
Connection, main contacts					
• Conductor cross-sections					
- Solid		mm^2	2 x (1.5 ... 2.5)[2], 2 x (2.5 ... 6)[2]	2 x (0.5 ... 2.5)	--
- Finely stranded with end sleeve		mm^2	2 x (1 ... 2.5)[2], 2 x (2.5 ... 6)[2], 1 x 10	2 x (0.5 ... 1.5)	--
- Finely stranded without end sleeve		mm^2	--	2 x (0.5 ... 2.5)	--
- Solid or stranded, AWG cables		AWG	2 x (14 ... 10)	2 x (18 ... 14)	--
• Stripped length		mm	10	10	--
• Terminal screws			M4	--	M5
- Tightening torque, ∅ 5 ... 6 mm, PZ 2		Nm lb.in	2 ... 2.5 18 ... 22		2.5 ... 2 18 ... 22
• Cable lugs					
- According to DIN 46234			--	--	5-2.5 ... 5-25
- According to JIS C 2805			--	--	R 2-5 ... R 14-5
- Width, maximum		mm	--	--	12
Connection, auxiliary/control contacts					
• Conductor cross-sections, with or without end sleeve		mm AWG	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) 20 ... 12	0.5 ... 2.5 20 ... 12	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) 20 ... 12
• Stripped length		mm	7	10	7
• Terminal screw			M3	--	M3
- Tightening torque, ∅ 3.5, PZ 1		Nm lb.in	0.5 ... 0.6 4.5 ... 5.3		0.5 ... 0.6 4.5 ... 5.3

[1] These products were built as Class A devices. The use of these devices in residential areas could result in lead in radio interference. In this case these may be required to introduce additional interference suppression measures.

[2] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Type	I_{max} [1] at R_{thha}/T_u = 40 °C		I_e acc. to IEC 60947-4-3 at R_{thha}/T_u = 40 °C		I_e acc. to UL/CSA at R_{thha}/T_u = 50 °C		Power loss at I_{max}	Minimum load current	Max. off-state current
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF2230-1AB..	30	0.57	30	0.57	30	0.44	81	0.5	10
3RF2230-2AB..			20	1.36	20	1.15			
3RF2230-3AB..			30	0.57	30	0.44			
3RF2255-1AB..	55	0.18	50	0.27	50	0.19	151	0.5	10
3RF2255-2AB..			20	1.83	20	1.58			
3RF2255-3AB..			50	0.27	50	0.19			
3RF2230-1AC..	30	0.33	30	0.33	30	0.25	122	0.5	10
3RF2230-2AC..			20	0.86	20	0.72			
3RF2230-3AC..			30	0.33	30	0.25			
3RF2255-1AC..	55	0.09	50	0.15	50	0.1	226	0.5	10
3RF2255-2AC..			20	1.19	20	1.02			
3RF2255-3AC..			50	0.15	50	0.1			

[1] The current I_{max} provides information about the performance of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

Note:

The required heat sinks for the corresponding load currents can be determined from the characteristic curves (see page 6/63, "More information"). The minimum thickness values for the mounting surface must be observed.

Type	Rated peak withstand current I_{tsm}	I^2t value
	A	A^2s
Main circuit		
3RF2230-....5	300	450
3RF2255-....5	600	1800

Type		3RF22..-.AB.5	3RF22..-.AC.5
Main circuit			
Controlled phases		2-phase	3-phase
Rated operational voltage U_e	V AC	48 ... 600	
• Operating range	V AC	40 ... 660	
• Rated frequency	Hz	50/60 ± 10%	
Rated insulation voltage U_i	V	600	
Rated impulse withstand voltage U_{imp}	kV	6	
Blocking voltage	V	1 200	
Rate of voltage rise	V/µs	1 000	

Type		3RF22..-.A.3.	3RF22..-.A.4.
Control circuit			
Method of operation		AC operation	DC operation
Rated control supply voltage U_s	V	110	4 ... 30
Rated frequency of the control supply voltage	Hz	50/60 ± 10%	--
Control supply voltage, max.	V	121	30
Typical actuating current	mA	15	30
Response voltage	V	90	4
Drop-out voltage	V	< 40	1
Operating times			
• ON-delay	ms	40 + max. one half-wave	1 + max. one half-wave
• OFF-delay	ms	40 + max. one half-wave	1 + max. one half-wave

SIRIUS 3RF22 solid-state relays, three-phase, 45 mm

Selection and ordering data

Type current/ performance capacity[1]	Rated control supply voltage U_s	SD	**Screw terminals**[2] Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	V	d					
Zero-point switching, rated operational voltage U_e 48 ... 600 V AC							
Two-phase controlled							
30	110 AC	5	**3RF2230-1AB35**		1	1 unit	41C
55		5	**3RF2255-1AB35**		1	1 unit	41C
30	4 ... 30 DC	5	**3RF2230-1AB45**		1	1 unit	41C
55		5	**3RF2255-1AB45**		1	1 unit	41C
Three-phase controlled							
30	110 AC	5	**3RF2230-1AC35**		1	1 unit	41C
55		5	**3RF2255-1AC35**		1	1 unit	41C
30	4 ... 30 DC	2	**3RF2230-1AC45**		1	1 unit	41C
55		5	**3RF2255-1AC45**		1	1 unit	41C


3RF2230-1AB45

1) The type current provides information about the performance capacity of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

2) Please note that the version with an M4 screw connection can only be used for a rated current of up to approx. 50 A and a conductor cross-section of 10 mm^2.

Type current/ performance capacity[1]	Rated control supply voltage U_s	SD	**Spring-type terminals**[3] Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	V	d					
Zero-point switching, rated operational voltage U_e 48 ... 600 V AC							
Two-phase controlled							
30	4 ... 30 DC	5	**3RF2230-2AB45**		1	1 unit	41C
55		5	**3RF2255-2AB45**		1	1 unit	41C
Three-phase controlled							
30	4 ... 30 DC	5	**3RF2230-2AC45**		1	1 unit	41C
55		5	**3RF2255-2AC45**		1	1 unit	41C


3RF2230-2AB45

1) The type current provides information about the performance capacity of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

2) Please note that the version with spring-type terminals can only be used for a rated current of up to approx. 20 A and a conductor cross-section of 2.5 mm^2. Higher currents can be achieved by connecting two conductors per terminal.

Type current/ performance capacity[1]	Rated control supply voltage U_s	SD	**Ring terminal lug connection** Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	V	d					
Zero-point switching, rated operational voltage U_e 48 ... 600 V AC							
Two-phase controlled							
30	4 ... 30 DC	5	**3RF2230-3AB45**		1	1 unit	41C
55		5	**3RF2255-3AB45**		1	1 unit	41C
Three-phase controlled							
30	4 ... 30 DC	5	**3RF2230-3AC45**		1	1 unit	41C
55		5	**3RF2255-3AC45**		1	1 unit	41C


3RF2230-3AB45

1) The type current provides information about the performance capacity of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

For accessories, see page 6/69.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

Solid-state contactors (with integrated heat sink)

The complete units consist of a solid-state relay plus optimized heat sink, and are therefore ready to use. They offer defined rated currents to make selection as easy as possible. Depending on the version, current strengths of up to 70 A are achieved. Like all of our solid-state switching devices, one of their particular advantages is their compact and space-saving design.

With their insulated mounting foot they can easily be snapped onto a standard mounting rail, or they can be mounted on support plates with fixing screws. This insulation enables them to be used in circuits with protective extra-low voltage (PELV) or safety extra-low voltage (SELV) in building management systems. For other applications, such as for extended personal safety, the heat sink can be grounded through a screw terminal.

The solid-state contactors are available in 2 different versions:

- 3RF23 single-phase solid-state contactors
- 3RF24 three-phase solid-state contactors

Single-phase versions

The 3RF23 solid-state contactors can be expanded with various function modules to adapt them to individual applications.

Version for resistive loads "zero-point switching"

This standard version is often used for switching space heaters on and off.

Version for inductive loads "instantaneous switching"

In this version the solid-state contactor is specifically matched to inductive loads. Whether it is a matter of frequent actuation of the valves in a filling plant or starting and stopping small operating mechanisms in packet distribution systems, operation is carried out safely and noiselessly.

Special "low noise" version

Thanks to a special control circuit, this special version can be used in public networks up to 16 A without any additional measures such as interference suppressor filters. As a result, in terms of emitted interference, it conforms to limit value curve class B according to IEC 60947-4-3.

Special "Short-circuit proof" version

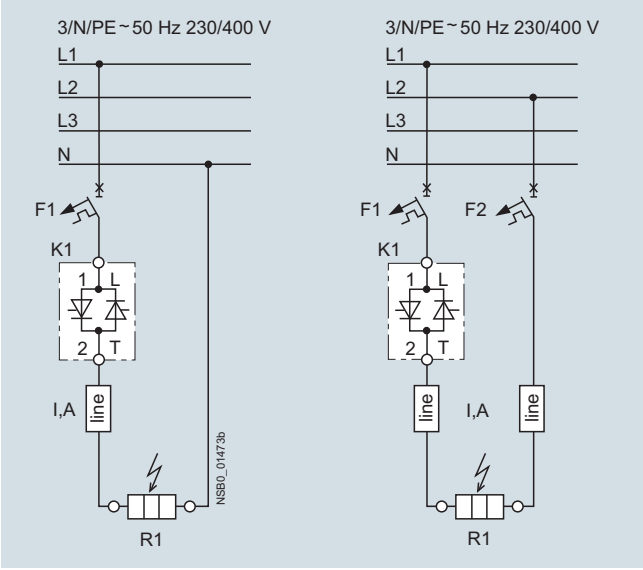
Skillful matching of the power semiconductor with the performance capacity of the solid-state contactor means that "short-circuit strength" can be achieved with a standard miniature circuit breaker. In combination with a B-type MCB or a conventional line protection fuse, the result is a short-circuit proof feeder.

In order to achieve problem-free short-circuit protection by means of miniature circuit breakers, however, certain boundary conditions must be observed. As the magnitude and duration of the short-circuit current are determined not only by the short-circuit breaking response of the miniature circuit breaker but also the properties of the wiring system, such as the internal resistance of the input to the network and damping by controls and cables, particular attention must also be paid to these parameters. The necessary cable lengths are therefore shown for the main factor, the line resistance, in the table below.

The following miniature circuit breakers with a B characteristic and 10 kA or 6 kA breaking capacity protect the 3RF23..-.DA.. solid-state contactors in the event of short-circuits on the load and the specified conductor cross-sections and lengths:

Rated current of the miniature circuit breaker	Example of type[1)]	Max. conductor cross-section	Minimum cable length from contactor to load
6 A	5SY4106-6	1 mm^2	5 m
10 A	5SY4110-6	1.5 mm^2	8 m
16 A	5SY4116-6	1.5 mm^2	12 m
		2.5 mm^2	20 m
20 A	5SY4120-6	2.5 mm^2	20 m
25 A	5SY4125-6	2.5 mm^2	26 m

1) The miniature circuit breakers can be used up to a maximum rated voltage of 480 V!



Solid-state contactor protection

The setup and installation above can also be used for the solid-state relays with an I^2t value of at least 6 600 A^{2}s.

3-phase versions

The 3-phase solid-state contactors for resistive loads up to 50 A are available with

- Two-phase control (suitable in particular for circuits without connection to the neutral conductor) and
- Three-phase control (suitable for star circuits with connection to the neutral conductor or for applications in which the system requires all phases to be switched)

The converter function module can be snapped onto both versions for the simple power control of AC loads by means of analog signals.

- Check the correct contactor size with the aid of the rated current diagram, taking account of the installation conditions

SIRIUS 3RF23 solid-state contactors, single-phase

Overview

Single-phase solid-state contactors with heat sink

Their compact design with optimized heat sink enables small complete units with currents up to 70 A. They also offer all the special features of the solid-state relay in terms of time and space savings.

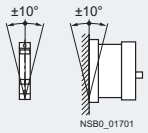
Technical specifications

More information	
System Manual "SIRIUS Modular System – System Overview", see https://support.industry.siemens.com/cs/ww/en/view/60311318	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16228/faq

Type		3RF23..-.A...	3RF23..-.B...	3RF23..-.C...	3RF23..-.D...
Dimensions (W x H x D)		See page 6/79			
General data					
Ambient temperature					
• During operation, derating from 40 °C	°C	-25 ... +60			
• During storage	°C	-55 ... +80			
Installation altitude	m	0 ... 1 000; derating from 1 000			
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15/11			
Vibration resistance acc. to IEC 60068-2-6	*g*	2			
Degree of protection		IP20 (for ring terminal lug connection when using the terminal cover 3RA2900-3PA88, otherwise IP00)			
Electromagnetic compatibility (EMC)					
• Emitted interference according to IEC 60947-4-3					
- Conducted interference voltage		Class A for industrial applications		Class A for industrial applications; Class B for residential, business and commercial applications up to 16 A, AC-51 Low Noise	Class A for industrial applications
- Emitted, high-frequency interference voltage		Class B for residential, business and commercial applications			
• Interference immunity					
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2			
- Induced RF fields according to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1			
- Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 2			
- Surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2			

Type		3RF23..-1....	3RF23..-2....	3RF23..-3....
General data				
Connection type		Screw terminals	Spring-type terminals	Ring terminal lug connection
Connection, main contacts				
• Conductor cross-section				
- Solid	mm^2	2 x (1.5 ... 2.5)[1], 2 x (2.5 ... 6)[1]	2 x (0.5 ... 2.5)	--
- Finely stranded with end sleeve	mm^2	2 x (1 ... 2.5)[1], 2 x (2.5 ... 6)[1], 1 x 10	2 x (0.5 ... 1.5)	--
- Finely stranded without end sleeve	mm^2	--	2 x (0.5 ... 2.5)	--
- Solid or stranded, AWG cables	AWG	2 x (14 ... 10)	2 x (18 ... 14)	--
• Terminal screws		M4	--	M5
• Tightening torque	Nm	2 ... 2.5	--	2 ... 2.5
	lb.in	7 ... 10.3	--	7 ... 10.3
• Cable lugs				
- According to DIN 46234		--	--	5-2.5, 5-6, 5-10, 5-16, 5-25
- According to JIS C 2805		--	--	R 2-5, R 5.5-5, R 8-5, R 14-5
- Width, maximum	mm	--	--	12
Connection, auxiliary/control contacts				
• Conductor cross-section	mm	1 x (0.5 ... 2.5)[1], 2 x (0.5 ... 1.0)	0.5 ... 2.5	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)
	AWG	20 ... 12	20 ... 12	20 ... 12
• Stripped length	mm	7	10	7
• Terminal screw		M3	--	M3
• Tightening torque	Nm	0.5 ... 0.6	--	0.5 ... 0.6
	lb.in	4.5 ... 5.3	--	4.5 ... 5.3

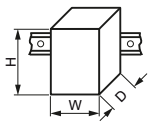
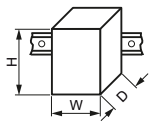
[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Type	3RF23..-1....	3RF23..-2....	3RF23..-3....
General data			
Connection type	Screw terminals	Spring-type terminals	Ring terminal lug connection
Grounding screw (not included in the scope of supply)			
• Size (standard screw)	M5		
Permissible mounting position			

Type		3RF23..-....2	3RF23..-....4	3RF23..-....5	3RF23..-....6
Main circuit					
Rated operational voltage U_e	V AC	24 ... 230	48 ... 460	48 ... 600	
• Operating range	V AC	20 ... 253	40 ... 506	40 ... 660	
• Rated frequency	Hz	50/60 ± 10%			
Rated insulation voltage U_i	V	600			
Blocking voltage	V	800	1 200		1 600
Rate of voltage rise	V/µs	1 000			

Type		3RF23..-...0.	3RF23..-...1.		3RF23..-...2.	3RF23..-...4.
Control circuit						
Method of operation		DC operation	AC/DC operation		AC operation	DC operation
Rated control supply voltage U_s	V	24 DC	24 AC	24 DC	110 ... 230 AC	4 ... 30 DC
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10%	--	50/60 ± 10%	--
Actuating voltage, max.	V	30	26.5 AC	30 DC	253	30
Typical actuating current	mA	20 / Low Power: <10[1]	20	20	15	20
Response voltage	V	15	14 AC	15 DC	90	4
Drop-out voltage	V	5	5 AC	5 DC	40	1
Operating times						
• ON-delay	ms	1 + max. one half-wave[2]	10 + max. one half-wave[2]		40 + max. one half-wave[2]	1 + max. one half-wave[2]
• OFF-delay	ms	1 + max. one half-wave	15 + max. one half-wave		40 + max. one half-wave	1 + max. one half-wave

[1] Applies to the "Low Power" version 3RF23..-.AA..-**0KN0**.
[2] Only for zero-point switching devices.

Type	**Type current/ performance capacity**[1] I_{AC-51}	**Dimensions (W x H x D)** incl. heat sink Product version up to E05	from E06[2]
			
	A	mm	mm
Main circuit			
3RF2310-.AA..	10.5	22.5 x 100 x 89	22.5 x 100 x 86
3RF2320-.AA.. **3RF2320-.CA..** **3RF2320-.DA..**	20	22.5 x 100 x 135.5	22.5 x 100 x 118.5
3RF2330-.AA.. **3RF2330-.CA..**	30	45 x 100 x 151	45 x 100 x 133.5
3RF2330-.DA..		22.5 x 100 x 135.5	22.5 x 100 x 118.5
3RF2340-.AA..	40	67.5 x 100 x 151	67.5 x 100 x 135.5
3RF2350-.AA..	50	67.5 x 100 x 151	67.5 x 100 x 135.5
3RF2370-.AA..	70	135 x 100 x 153.5	80 x 100 x 149.5

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions.
[2] Conversion of the products to product version E06 will take place from January 1, 2018; for version 3RF2370 from April 1, 2018.

SIRIUS 3RF23 solid-state contactors, single-phase

Type	Type current AC-51/performance capacity[1] at I_{max} at 40 °C	Acc. to IEC 60947-4-3 at 40 °C	Acc. to UL/CSA at 50 °C	Power loss at I_{max}	Minimum load current	Off-state current	Rated peak withstand current I_{tsm}	I^2t value
	A	A	A	W	A	mA	A	A^2s
Main circuit								
3RF2310-.AA.2 3RF2310-.AA.4 3RF2310-.AA.5	10.5	7.5	9.6	11	0.1	10	200	200
3RF2310-.AA.6							400	800
3RF2320-.AA.2 3RF2320-.AA.4 3RF2320-.AA.5 3RF2320-.AA.6	20	13.2	17.6	20	0.5	10	600	1 800
3RF2320-.CA.2 3RF2320-.CA.4						25	600	1 800
3RF2320-.DA.2 3RF2320-.DA.4						10	1 150	6 600
3RF2330-.AA.2 3RF2330-.AA.4 3RF2330-.AA.5 3RF2330-.AA.6	30	22	27	33	0.5	10	600	1 800
3RF2330-.CA.2						25	600	1 800
3RF2330-.DA.4		18.5	26	33	0.5	10	1 150	6 600
3RF2340-.AA.2 3RF2340-.AA.4 3RF2340-.AA.5	40	33	36	44	0.5	10	1 200	7 200
3RF2340-.AA.6							1 150	6 600
3RF2350-.AA.2 3RF2350-.AA.4 3RF2350-.AA.5 3RF2350-.AA.6	50	36	45	54	0.5	10	1 150	6 600
3RF2370-.AA.2 3RF2370-.AA.4 3RF2370-.AA.5 3RF2370-.AA.6	70	70	62	83	0.5	10	1 150	6 600

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions.

Type	Type current AC-51/performance capacity[1] at I_{max} at 40 °C	according to IEC 60947-4-3 at 40 °C	Acc. to UL/CSA at 50 °C	Type current AC-15/ performance capacity[1] 10 x I_e for 60 ms	Parameters	Power loss at I_{max}	Minimum load current	Off-state current	Rated peak withstand current I_{tsm}	I^2t value
	A	A	A	A		W	A	mA	A	A^2s
Main circuit										
3RF2310-.BA.2 3RF2310-.BA.4	10.5	7.5	9.6	6	1 200 1/h 50% ON period	11	0.1	10	200	200
3RF2310-.BA.6									400	800
3RF2320-.BA.2 3RF2320-.BA.4 3RF2320-.BA.6	20	13.2	17.6	12	1 200 1/h 50% ON period	20	0.5	10	600	1 800
3RF2330-.BA.2 3RF2330-.BA.4 3RF2330-.BA.6	30	22	27	15	1 200 1/h 50% ON period	33	0.5	10	600	1 800
3RF2340-.BA.2 3RF2340-.BA.4	40	33	36	20	1 200 1/h 50% ON period	44	0.5	10	1 200	7 200
3RF2340-.BA.6									1 150	6 600
3RF2350-.BA.2 3RF2350-.BA.4 3RF2350-.BA.6	50	36	45	25	1 200 1/h 50% ON period	54	0.5	10	1 150	6 600
3RF2370-.BA.2 3RF2370-.BA.4 3RF2370-.BA.6	70	70	62	27.5	1 200 1/h 50% ON period	83	0.5	10	1 150	6 600

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions.

Selection and ordering data

Selection notes

The solid-state contactors are selected on the basis of details of the network, the load and the ambient conditions. As the solid-state contactors are already equipped with an optimally matched heat sink, the selection process is considerably simpler than that for solid-state relays.

The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select a solid-state contactor with the same or higher rated current than the load

	Type current/ performance capacity[1] I_{max}	Rated control supply voltage U_s	SD	**Screw terminals**		PU (UNIT, SET, M)	PS*	PG
				Article No.	Price per PU			
	A	V	d					
Zero-point switching · Integrated heat sink, rated operational voltage U_e 24 ... 230 V AC								
 3RF2310-1	10.5	24 DC	2	**3RF2310-1AA02**		1	1 unit	41C
	20		2	**3RF2320-1AA02**		1	1 unit	41C
	30		2	**3RF2330-1AA02**		1	1 unit	41C
	40		2	**3RF2340-1AA02**		1	1 unit	41C
	50		2	**3RF2350-1AA02**		1	1 unit	41C
	20	24 DC Low Power	2	**3RF2320-1AA02-0KN0**		1	1 unit	41C
	10.5	24 AC/DC	2	**3RF2310-1AA12**		1	1 unit	41C
	10.5	110 ... 230 AC	2	**3RF2310-1AA22**		1	1 unit	41C
	20		2	**3RF2320-1AA22**		1	1 unit	41C
	30		2	**3RF2330-1AA22**		1	1 unit	41C
	40		5	**3RF2340-1AA22**		1	1 unit	41C
	50		2	**3RF2350-1AA22**		1	1 unit	41C
Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 460 V AC								
 3RF2320-1	10.5	24 DC	2	**3RF2310-1AA04**		1	1 unit	41C
	20		2	**3RF2320-1AA04**		1	1 unit	41C
	30		2	**3RF2330-1AA04**		1	1 unit	41C
	40		2	**3RF2340-1AA04**		1	1 unit	41C
	50		2	**3RF2350-1AA04**		1	1 unit	41C
	10.5	24 DC Low Power	2	**3RF2310-1AA04-0KN0**		1	1 unit	41C
	10.5	24 AC/DC	2	**3RF2310-1AA14**		1	1 unit	41C
	20		5	**3RF2320-1AA14**		1	1 unit	41C
	30		2	**3RF2330-1AA14**		1	1 unit	41C
	40		5	**3RF2340-1AA14**		1	1 unit	41C
	50		5	**3RF2350-1AA14**		1	1 unit	41C
	10.5	110 ... 230 AC	2	**3RF2310-1AA24**		1	1 unit	41C
	20		2	**3RF2320-1AA24**		1	1 unit	41C
	30		2	**3RF2330-1AA24**		1	1 unit	41C
	40		2	**3RF2340-1AA24**		1	1 unit	41C
	50		2	**3RF2350-1AA24**		1	1 unit	41C
	10.5	4 ... 30 DC	2	**3RF2310-1AA44**		1	1 unit	41C
	20		2	**3RF2320-1AA44**		1	1 unit	41C
	30		2	**3RF2330-1AA44**		1	1 unit	41C

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 6/63, "More information".

Other rated control supply voltages on request.

SIRIUS 3RF23 solid-state contactors, single-phase

Type current/ performance capacity[1] I_{max}	Rated control supply voltage U_s	SD	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	V	d					
Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 600 V AC							
30	110 ... 230 AC	5	**3RF2330-1AA25**		1	1 unit	41C
10.5	4 ... 30 DC	5	**3RF2310-1AA45**		1	1 unit	41C
20		2	**3RF2320-1AA45**		1	1 unit	41C
30		2	**3RF2330-1AA45**		1	1 unit	41C
40		2	**3RF2340-1AA45**		1	1 unit	41C
50		2	**3RF2350-1AA45**		1	1 unit	41C
Zero-point switching · Integrated heat sink, Blocking voltage 1 600 V, rated operational voltage U_e 48 ... 600 V AC							
10.5	24 DC	5	**3RF2310-1AA06**		1	1 unit	41C
20		2	**3RF2320-1AA06**		1	1 unit	41C
30		2	**3RF2330-1AA06**		1	1 unit	41C
40		5	**3RF2340-1AA06**		1	1 unit	41C
50		5	**3RF2350-1AA06**		1	1 unit	41C
10.5	110 ... 230 AC	5	**3RF2310-1AA26**		1	1 unit	41C
20		5	**3RF2320-1AA26**		1	1 unit	41C
30		5	**3RF2330-1AA26**		1	1 unit	41C
40		5	**3RF2340-1AA26**		1	1 unit	41C
50		5	**3RF2350-1AA26**		1	1 unit	41C


3RF2340-1

Low Noise[2], Zero-point switching · Integrated heat sink, rated operational voltage U_e 24 ... 230 V AC							
20	24 DC	5	**3RF2320-1CA02**		1	1 unit	41C
30		5	**3RF2330-1CA02**		1	1 unit	41C
20	110 ... 230 AC	5	**3RF2320-1CA22**		1	1 unit	41C


3RF2320-1

Low Noise[2], Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 460 V AC							
20	24 DC	5	**3RF2320-1CA04**		1	1 unit	41C
20	110 ... 230 AC	5	**3RF2320-1CA24**		1	1 unit	41C
20	4 ... 30 DC	2	**3RF2320-1CA44**		1	1 unit	41C
Short-circuit-proof with B MCB · Zero-point switching · Integrated heat sink, rated operational voltage U_e 24 ... 230 V AC							
20	24 DC	2	**3RF2320-1DA02**		1	1 unit	41C
20	110 ... 230 AC	5	**3RF2320-1DA22**		1	1 unit	41C
Short-circuit-proof with B MCB · Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 460 V AC							
20	24 DC	2	**3RF2320-1DA04**		1	1 unit	41C
20	110 ... 230 AC	5	**3RF2320-1DA24**		1	1 unit	41C
20	4 ... 30 DC	2	**3RF2320-1DA44**		1	1 unit	41C
30		2	**3RF2330-1DA44**		1	1 unit	41C


3RF2320-1

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 6/63, "More information".

[2] See page 6/77.

Other rated control supply voltages on request.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

	Type current/ perfor-mance capacity[1] I_{max}	Operational current I_e/AC-15[2]	Rated control supply voltage U_s	SD	**Screw terminals** Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	A	A	V	d					
Instantaneous switching · Integrated heat sink, rated operational voltage U_e 24 ... 230 V AC									
 3RF2310-1	10.5	6	24 DC	2	**3RF2310-1BA02**		1	1 unit	41C
	20	12		2	**3RF2320-1BA02**		1	1 unit	41C
	30	15		5	**3RF2330-1BA02**		1	1 unit	41C
	40	20		5	**3RF2340-1BA02**		1	1 unit	41C
	50	25		5	**3RF2350-1BA02**		1	1 unit	41C
	50	27.5		5	**3RF2370-1BA02**		1	1 unit	41C
	10.5	6	110 ... 230 AC	5	**3RF2310-1BA22**		1	1 unit	41C
	20	12		5	**3RF2320-1BA22**		1	1 unit	41C
	30	15		5	**3RF2330-1BA22**		1	1 unit	41C
	40	20		5	**3RF2340-1BA22**		1	1 unit	41C
	50	25		5	**3RF2350-1BA22**		1	1 unit	41C
	50	27.5		5	**3RF2370-1BA22**		1	1 unit	41C
Instantaneous switching · Integrated heat sink, rated operational voltage U_e 48 ... 460 V AC									
 3RF2320-1	10.5	6	24 DC	2	**3RF2310-1BA04**		1	1 unit	41C
	20	12		2	**3RF2320-1BA04**		1	1 unit	41C
	30	15		2	**3RF2330-1BA04**		1	1 unit	41C
	40	20		5	**3RF2340-1BA04**		1	1 unit	41C
	50	25		5	**3RF2350-1BA04**		1	1 unit	41C
	50	27.5		5	**3RF2370-1BA04**		1	1 unit	41C
	10.5	6	110 ... 230 AC	5	**3RF2310-1BA24**		1	1 unit	41C
	20	12		5	**3RF2320-1BA24**		1	1 unit	41C
	30	15		5	**3RF2330-1BA24**		1	1 unit	41C
	40	20		5	**3RF2340-1BA24**		1	1 unit	41C
	50	25		5	**3RF2350-1BA24**		1	1 unit	41C
	50	27.5		5	**3RF2370-1BA24**		1	1 unit	41C
	20	12	4 ... 30 DC	5	**3RF2320-1BA44**		1	1 unit	41C
	30	15		5	**3RF2330-1BA44**		1	1 unit	41C
	50	25		5	**3RF2350-1BA44**		1	1 unit	41C
Instantaneous switching · Integrated heat sink, Blocking voltage 1 600 V, rated operational voltage U_e 48 ... 600 V AC									
 3RF2340-1	10.5	6	24 DC	5	**3RF2310-1BA06**		1	1 unit	41C
	20	12		2	**3RF2320-1BA06**		1	1 unit	41C
	30	15		5	**3RF2330-1BA06**		1	1 unit	41C
	40	20		5	**3RF2340-1BA06**		1	1 unit	41C
	50	25		5	**3RF2350-1BA06**		1	1 unit	41C
	50	27.5		5	**3RF2370-1BA06**		1	1 unit	41C
	10.5	6	110 ... 230 AC	5	**3RF2310-1BA26**		1	1 unit	41C
	20	12		5	**3RF2320-1BA26**		1	1 unit	41C
	30	15		5	**3RF2330-1BA26**		1	1 unit	41C
	40	20		5	**3RF2340-1BA26**		1	1 unit	41C
	50	25		5	**3RF2350-1BA26**		1	1 unit	41C
	50	27.5		5	**3RF2370-1BA26**		1	1 unit	41C

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 6/63, "More information".

[2] Utilization category AC-15:
Electromagnetic loads, e.g. valves according to IEC 60947-5-1.
Parameters: max. 1 200 1/h, 50% ON period, 10-times inrush current for 60 ms.

Other rated control supply voltages on request.

SIRIUS 3RF23 solid-state contactors, single-phase

	Type current/ performance capacity[1] I_{max}	Rated control supply voltage U_s	SD	Spring-type terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	A	V	d					
Zero-point switching · Integrated heat sink, rated operational voltage U_e 24 ... 230 V AC								
 3RF2320-2	10.5	24 DC	5	**3RF2310-2AA02**		1	1 unit	41C
	20		2	**3RF2320-2AA02**		1	1 unit	41C
	10.5	110 ... 230 AC	5	**3RF2310-2AA22**		1	1 unit	41C
	20		5	**3RF2320-2AA22**		1	1 unit	41C
Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 460 V AC								
	10.5	24 DC	2	**3RF2310-2AA04**		1	1 unit	41C
	20		2	**3RF2320-2AA04**		1	1 unit	41C
	10.5	110 ... 230 AC	5	**3RF2310-2AA24**		1	1 unit	41C
	20		5	**3RF2320-2AA24**		1	1 unit	41C
Zero-point switching · Integrated heat sink, Blocking voltage 1 600 V, rated operational voltage U_e 48 ... 600 V AC								
	10.5	24 DC	5	**3RF2310-2AA06**		1	1 unit	41C
	20		2	**3RF2320-2AA06**		1	1 unit	41C
	10.5	110 ... 230 AC	5	**3RF2310-2AA26**		1	1 unit	41C
	20		5	**3RF2320-2AA26**		1	1 unit	41C
Low Noise[2], Zero-point switching · Integrated heat sink, rated operational voltage U_e 24 ... 230 V AC								
	20	24 DC	5	**3RF2320-2CA02**		1	1 unit	41C
	20	110 ... 230 AC	5	**3RF2320-2CA22**		1	1 unit	41C
Low Noise[2], Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 460 V AC								
	20	24 DC	5	**3RF2320-2CA04**		1	1 unit	41C
	20	110 ... 230 AC	5	**3RF2320-2CA24**		1	1 unit	41C
Short-circuit-proof with B MCB, Zero-point switching · Integrated heat sink, rated operational voltage U_e 24 ... 230 V AC								
	20	110 ... 230 AC	5	**3RF2320-2DA22**		1	1 unit	41C
Short-circuit-proof with B MCB, Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 460 V AC								
	20	24 DC	5	**3RF2320-2DA04**		1	1 unit	41C
	20	110 ... 230 AC	5	**3RF2320-2DA24**		1	1 unit	41C

1) The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 6/63, "More information".

2) See page 6/77.

Other rated control supply voltages on request.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

	Type current/ performance capacity[1] I_{max}	Rated control supply voltage U_s	SD	**Ring terminal lug connection** Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	A	V	d					
Zero-point switching · Integrated heat sink, rated operational voltage U_e 24 ... 230 V AC								
 3RF2350-3	10.5	24 DC	5	**3RF2310-3AA02**		1	1 unit	41C
	20		5	**3RF2320-3AA02**		1	1 unit	41C
	30		5	**3RF2330-3AA02**		1	1 unit	41C
	40		5	**3RF2340-3AA02**		1	1 unit	41C
	50		5	**3RF2350-3AA02**		1	1 unit	41C
	70		2	**3RF2370-3AA02**		1	1 unit	41C
	10.5	110 ... 230 AC	5	**3RF2310-3AA22**		1	1 unit	41C
	20		5	**3RF2320-3AA22**		1	1 unit	41C
	30		5	**3RF2330-3AA22**		1	1 unit	41C
	40		5	**3RF2340-3AA22**		1	1 unit	41C
	50		5	**3RF2350-3AA22**		1	1 unit	41C
	70		5	**3RF2370-3AA22**		1	1 unit	41C
Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 460 V AC								
 3RF2330-3, Covers optional	10.5	24 DC	5	**3RF2310-3AA04**		1	1 unit	41C
	20		5	**3RF2320-3AA04**		1	1 unit	41C
	30		2	**3RF2330-3AA04**		1	1 unit	41C
	40		5	**3RF2340-3AA04**		1	1 unit	41C
	50		2	**3RF2350-3AA04**		1	1 unit	41C
	70		2	**3RF2370-3AA04**		1	1 unit	41C
	10.5	110 ... 230 AC	5	**3RF2310-3AA24**		1	1 unit	41C
	20		5	**3RF2320-3AA24**		1	1 unit	41C
	30		5	**3RF2330-3AA24**		1	1 unit	41C
	40		5	**3RF2340-3AA24**		1	1 unit	41C
	50		5	**3RF2350-3AA24**		1	1 unit	41C
	70		5	**3RF2370-3AA24**		1	1 unit	41C
	20	4 ... 30 DC	5	**3RF2320-3AA44**		1	1 unit	41C
	30		5	**3RF2330-3AA44**		1	1 unit	41C
	50		5	**3RF2350-3AA44**		1	1 unit	41C
Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 600 V AC								
	40	4 ... 30 DC	5	**3RF2340-3AA45**		1	1 unit	41C
	70		2	**3RF2370-3AA45**		1	1 unit	41C
Zero-point switching · Integrated heat sink, Blocking voltage 1 600 V, rated operational voltage U_e 48 ... 600 V AC								
	10.5	24 DC	5	**3RF2310-3AA06**		1	1 unit	41C
	20		5	**3RF2320-3AA06**		1	1 unit	41C
	30		5	**3RF2330-3AA06**		1	1 unit	41C
	40		5	**3RF2340-3AA06**		1	1 unit	41C
	50		5	**3RF2350-3AA06**		1	1 unit	41C
	70		5	**3RF2370-3AA06**		1	1 unit	41C
	10.5	110 ... 230 AC	5	**3RF2310-3AA26**		1	1 unit	41C
	20		5	**3RF2320-3AA26**		1	1 unit	41C
	30		5	**3RF2330-3AA26**		1	1 unit	41C
	40		5	**3RF2340-3AA26**		1	1 unit	41C
	50		5	**3RF2350-3AA26**		1	1 unit	41C
	70		5	**3RF2370-3AA26**		1	1 unit	41C

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 6/63, "More information".

Other rated control supply voltages on request.

SIRIUS 3RF23 solid-state contactors, single-phase

Type current/ performance capacity[1] I_{max}	Operational current I_e/AC-15[2]	Rated control supply voltage U_s	SD	**Ring terminal lug connection** Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	A	V	d					
Instantaneous switching · Integrated heat sink, rated operational voltage U_e 24 ... 230 V AC								
70	27.5	24 DC	5	**3RF2370-3BA02**		1	1 unit	41C
70	27.5	110 ... 230 AC	5	**3RF2370-3BA22**		1	1 unit	41C
Instantaneous switching · Integrated heat sink, rated operational voltage U_e 48 ... 460 V AC								
70	27.5	24 DC	5	**3RF2370-3BA04**		1	1 unit	41C
70	27.5	110 ... 230 AC	5	**3RF2370-3BA24**		1	1 unit	41C
Instantaneous switching · Integrated heat sink, Blocking voltage 1 600 V, rated operational voltage U_e 48 ... 600 V AC								
70	27.5	24 DC	5	**3RF2370-3BA06**		1	1 unit	41C
70	27.5	110 ... 230 AC	5	**3RF2370-3BA26**		1	1 unit	41C
Short-circuit-proof with B MCB, Zero-point switching · Integrated heat sink, rated operational voltage U_e 24 ... 230 V AC								
20	--	24 DC	5	**3RF2320-3DA02**		1	1 unit	41C
20	--	110 ... 230 AC	5	**3RF2320-3DA22**		1	1 unit	41C
Short-circuit-proof with B MCB, Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 460 V AC								
20	--	24 DC	5	**3RF2320-3DA04**		1	1 unit	41C
20	--	110 ... 230 AC	5	**3RF2320-3DA24**		1	1 unit	41C

Other rated control supply voltages on request.

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 6/63, "More information".

[2] Utilization category AC-15:
Electromagnetic loads, e.g. valves according to IEC 60947-5-1.
Parameters: max. 1 200 1/h, 50% ON period, 10-times inrush current for 60 ms.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Accessories

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Optional accessories							
			Spring-type terminals				
 3RA2908-1A	**Screwdrivers** For all SIRIUS devices with spring-type terminals Length approx. 200 mm, size 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit	41B
			Ring terminal lug connection				
 3RF2900-3PA88	**Terminal covers** For 3RF23 solid-state contactors with ring terminal lug connection (With this terminal cover, degree of protection IP20 can be achieved in the terminal compartment in the case of ring terminal lug connections. It can also be used for screw terminals after simple adaptation)	2	**3RF2900-3PA88**		1	10 units	41C
	Control connectors						
			Screw terminals				
	Replacement control connectors For 3RF23/24 Screw terminals	5	**3RF2900-1TA88**		1	50 units	41C
			Spring-type terminals				
	Replacement control connectors For 3RF23/24 Spring-type terminals	5	**3RF2900-2TA88**		1	50 units	41C
	Control connector for 3RF23/24 Spring-type terminals with two clamping points per contact	5	**3RF2900-2TB88**		1	10 units	41C

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

SIRIUS 3RF24 solid-state contactors, three-phase

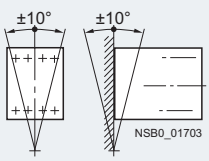
Overview

Three-phase solid-state contactors with heat sink

Their compact design with optimized heat sink enables small complete units with currents up to 50 A. They also offer all the special features of the solid-state relay in terms of time and space savings.

Technical specifications

More information	
System Manual "SIRIUS Modular System – System Overview", see https://support.industry.siemens.com/cs/ww/en/view/60311318	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16230/faq

Type		3RF24..-1....	3RF24..-2....	3RF24..-3....
Dimensions (W x H x D)		See page 6/89		
General data				
Ambient temperature				
• During operation, derating from 40 °C	°C	-25 ... +60		
• During storage	°C	-55 ... +80		
Installation altitude	m	0 ... 1 000, derating from 1 000		
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15/11		
Vibration resistance acc. to IEC 60068-2-6	*g*	2		
Degree of protection		IP20		IP00
Insulation strength at 50/60 Hz (main/control circuit to floor)	V rms	4 000		
Electromagnetic compatibility (EMC)				
• Emitted interference according to IEC 60947-4-3				
- Conducted interference voltage		Class A for industrial applications[1]		
• Interference immunity				
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2		
- Induced RF fields according to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1		
- Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 2		
- Surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2		
Connection type		**Screw terminals**	**Spring-type terminals**	**Ring terminal lug connection**
Connection, main contacts				
• Conductor cross-section				
- Solid	mm^2	2 x (1.5 ... 2.5)[2], 2 x (2.5 ... 6)[2]	2 x (0.5 ... 2.5)	--
- Finely stranded with end sleeve	mm^2	2 x (1 ... 2.5)[2], 2 x (2.5 ... 6)[2], 1 x 10	2 x (0.5 ... 1.5)	--
- Finely stranded without end sleeve	mm^2	--	2 x (0.5 ... 2.5)	--
- Solid or stranded, AWG cables	AWG	2 x (14 ... 10)	2 x (18 ... 14)	--
• Stripped length	mm	10	10	--
• Terminal screws		M4	--	M5
- Tightening torque	Nm	2 ... 2.5		2 ... 2.5
	lb.in	18 ... 22		18 ... 22
• Cable lugs				
- According to DIN 46234		--	--	5-2.5 ... 5-25
- According to JIS C 2805		--	--	R 2-5 ... R 14-5
- Width, maximum	mm	--	--	12
Connection, auxiliary/control contacts				
• Conductor cross-section	mm	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)	0.5 ... 2.5	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)
	AWG	20 ... 12	20 ... 12	20 ... 12
• Stripped length	mm	7	10	7
• Terminal screw		M3	--	M3
- Tightening torque, ∅ 3.5, PZ 1	Nm	0.5 ... 0.6	--	0.5 ... 0.6
	lb.in	4.5 ... 5.3	--	4.5 ... 5.3
Grounding screw (not included in the scope of supply)				
• Size (standard screw)		M5		
Permissible mounting position				

[1] These products were built as Class A devices. The use of these devices in residential areas could result in lead in radio interference. In this case these may be required to introduce additional interference suppression measures. The versions 3RF24..-1AC55 comply with Class B for residential, business and commercial applications.

[2] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Type	Type current/ performance capacity[1] I_{AC-51} at 40 °C	Rated operational current I_e Acc. to IEC 60947-4-3 at 40 °C	Rated operational current I_e Acc. to UL/CSA at 50 °C	Power loss at I_{AC-51}	Minimum load current	Max. off-state current	Rated peak withstand current I_{tsm}	I^2t value
	A	A	A	W	A	mA	A	A^2s
Main circuit								
3RF2410-.AB.5	10.5	7		23	0.1	10	200	200
3RF2420-.AB.5	22	15		44	0.5	10	600	1800
3RF2430-.AB.5	30	22		61	0.5	10	1200	7200
3RF2440-.AB.5	40	30		80	0.5	10	1150	6600
3RF2450-.AB.5	50	38		107	0.5	10	1150	6600
3RF2410-.AC.5	10.5	7		31	0.5	10	300	450
3RF2420-.AC.5	22	15		66	0.5	10	600	1800
3RF2430-.AC.5	30	22		91	0.5	10	1200	7200
3RF2440-.AC.5	40	30		121	0.5	10	1150	6600
3RF2450-.AC.5	50	38		160	0.5	10	1150	6600

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions.

Type	Type current I_{AC-51}	Dimensions (W x H x D) (including heat sink)
	A	mm
Main circuit		
3RF2410-.AB..	10.5	45 x 100 x 105
3RF2410-.AC..		
3RF2420-.AB..	22	67 x 100 x 112.5
3RF2420-.AC..	22	89.5 x 100 x 112.5
3RF2430-.AB..	30	

Type	Type current I_{AC-51}	Dimensions (W x H x D) (including heat sink)
	A	mm
Main circuit		
3RF2430-.AC..	30	113.5 x 100 x 121
3RF2440-.AB..	40	
3RF2440-.AC..	40	157.5 x 100 x 121
3RF2450-.AB..	50	
3RF2450-.AC..	50	157.5 x 180 x 121

Type		3RF24..-.AB.5	3RF24..-.AC.5
Main circuit			
Controlled phases		2-phase	3-phase
Rated operational voltage U_e	V AC	48 ... 600	
• Operating range	V AC	40 ... 660	
• Rated frequency	Hz	50/60 ± 10%	
Rated insulation voltage U_i	V	600	
Rated impulse withstand voltage U_{imp}	kV	6	
Blocking voltage	V	1 200	
Rate of voltage rise	V/µs	1 000	

Type		3RF24..-...3.	3RF24..-...4.	3RF24..-...5.
Control circuit				
Method of operation		AC operation	DC operation	AC operation
Rated control supply voltage U_s	V	110	4 ... 30	190 ... 230
Rated frequency of the control supply voltage	Hz	50/60 ± 10%	--	50/60 ± 10%
Actuating voltage, max.	V	121	30	253
Typical actuating current	mA	15	30	15
Response voltage	V	90	4	180
Drop-out voltage	V	< 40	< 1	< 40
Operating times				
• ON-delay	ms	40 + max. one half-wave	1 + max. one half-wave	40 + max. one half-wave
• OFF-delay	ms	40 + max. one half-wave	1 + max. one half-wave	40 + max. one half-wave

SIRIUS 3RF24 solid-state contactors, three-phase

Selection and ordering data

Type current/ performance capacity[1] I_{max}	Rated control supply voltage U_s	SD	Screw terminals		PU (UNIT, SET, M)	PS*	PG
			Article No.	Price per PU			
A	V	d					
Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 600 V AC							
Two-phase controlled							
10.5	4 ... 30 DC	2	**3RF2410-1AB45**		1	1 unit	41C
20		2	**3RF2420-1AB45**		1	1 unit	41C
30		2	**3RF2430-1AB45**		1	1 unit	41C
40		5	**3RF2440-1AB45**		1	1 unit	41C
50		2	**3RF2450-1AB45**		1	1 unit	41C
10.5	110 AC	5	**3RF2410-1AB35**		1	1 unit	41C
20		5	**3RF2420-1AB35**		1	1 unit	41C
30		5	**3RF2430-1AB35**		1	1 unit	41C
40		5	**3RF2440-1AB35**		1	1 unit	41C
50		5	**3RF2450-1AB35**		1	1 unit	41C
10.5	230 AC	5	**3RF2410-1AB55**		1	1 unit	41C
20		5	**3RF2420-1AB55**		1	1 unit	41C
30		2	**3RF2430-1AB55**		1	1 unit	41C
40		5	**3RF2440-1AB55**		1	1 unit	41C
50		5	**3RF2450-1AB55**		1	1 unit	41C
Three-phase controlled							
10.5	4 ... 30 DC	2	**3RF2410-1AC45**		1	1 unit	41C
20		2	**3RF2420-1AC45**		1	1 unit	41C
30		2	**3RF2430-1AC45**		1	1 unit	41C
40		2	**3RF2440-1AC45**		1	1 unit	41C
50		2	**3RF2450-1AC45**		1	1 unit	41C
10.5	110 AC	5	**3RF2410-1AC35**		1	1 unit	41C
20		5	**3RF2420-1AC35**		1	1 unit	41C
30		5	**3RF2430-1AC35**		1	1 unit	41C
40		5	**3RF2440-1AC35**		1	1 unit	41C
50		5	**3RF2450-1AC35**		1	1 unit	41C
10.5	230 AC	5	**3RF2410-1AC55**		1	1 unit	41C
20		5	**3RF2420-1AC55**		1	1 unit	41C
30		5	**3RF2430-1AC55**		1	1 unit	41C
40		5	**3RF2440-1AC55**		1	1 unit	41C
50		5	**3RF2450-1AC55**		1	1 unit	41C

3RF2420-1AB45

3RF2410-1AC45

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 6/63, "More information".

* You can order this quantity or a multiple thereof.
Illustrations are approximate


3RF2410-2AB45

Type current/ performance capacity[1] I_{max}	Rated control supply voltage U_s	SD	**Spring-type terminals** Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	V	d					
Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 600 V AC							
Two-phase controlled							
10	4 ... 30 DC	5	**3RF2410-2AB45**		1	1 unit	41C
20		5	**3RF2420-2AB45**		1	1 unit	41C
10	230 AC	5	**3RF2410-2AB55**		1	1 unit	41C
20		5	**3RF2420-2AB55**		1	1 unit	41C
Three-phase controlled							
10	4 ... 30 DC	5	**3RF2410-2AC45**		1	1 unit	41C
20		5	**3RF2420-2AC45**		1	1 unit	41C
10	230 AC	5	**3RF2410-2AC55**		1	1 unit	41C
20		5	**3RF2420-2AC55**		1	1 unit	41C

Type current/ performance capacity[1] I_{max}	Rated control supply voltage U_s	SD	**Ring terminal lug connection** Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	V	d					
Zero-point switching · Integrated heat sink, rated operational voltage U_e 48 ... 600 V AC							
Two-phase controlled							
50	4 ... 30 DC	5	**3RF2450-3AB45**		1	1 unit	41C
50	230 AC	5	**3RF2450-3AB55**		1	1 unit	41C
Three-phase controlled							
50	4 ... 30 DC	5	**3RF2450-3AC45**		1	1 unit	41C
50	230 AC	5	**3RF2450-3AC55**		1	1 unit	41C

[1] The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and installation conditions. For derating characteristic curves, see page 6/63, "More information".

Accessories, see page 6/87.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

General data

Overview

Function modules for SIRIUS 3RF2 solid-state switching devices

A great variety of applications demand an expanded range of functionality. With our function modules, these requirements can be met really easily. The modules are mounted simply by clicking them into place; straight away the necessary connections are made with the solid-state relay or contactor.

The plug-in connection to control the solid-state switching devices can simply remain in use. The external connections have screw terminals.

The following function modules are available:

- Converters
- Load monitoring
- Heating current monitoring
- Power controllers
- Power regulators

With the exception of the converter, the function modules can be used only with single-phase solid-state switching devices.

Recommended assignment of the function modules to the 3RF21 single-phase solid-state relays

Type	Accessories					
	Converters	Load monitoring		Heating current monitoring[1]	Power controllers[1]	Power regulators[1]
		Basic	Extended[1]			
Type current = 20 A						
3RF2120-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	--	3RF2920-0KA13	3RF2920-0HA13
3RF2120-1A.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2120-1A.22	--	--	3RF2920-0GA33	--	--	--
3RF2120-1A.24	--	--	3RF2920-0GA36	--	--	--
3RF2120-1A.42	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	--	3RF2920-0KA13	3RF2920-0HA13
3RF2120-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2120-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2120-2A.02	3RF2900-0EA18	--	--	--	--	--
3RF2120-2A.04	3RF2900-0EA18	--	--	--	--	--
3RF2120-2A.22	--	--	--	--	--	--
3RF2120-2A.24	--	--	--	--	--	--
3RF2120-2A.42	3RF2900-0EA18	--	--	--	--	--
3RF2120-2A.45	3RF2900-0EA18	--	--	--	--	--
3RF2120-3A.02	3RF2900-0EA18	--	3RF2920-0GA13	--	3RF2920-0KA13	3RF2920-0HA13
3RF2120-3A.04	3RF2900-0EA18	--	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2120-3A.22	--	--	3RF2920-0GA33	--	3RF2920-0KA13	3RF2920-0HA13
3RF2120-3A.24	--	--	3RF2920-0GA36	--	3RF2920-0KA16	3RF2920-0HA16
Type current = 30 A						
3RF2130-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2130-1A.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2130-1A.06	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2130-1A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2130-1A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2130-1A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2130-1A.42	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2130-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2130-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
Type current = 50 A						
3RF2150-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2150-1A.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2150-1A.06	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2150-1A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2150-1A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2150-1A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2150-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2150-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2150-1B.06	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2150-1B.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2150-2A.02	3RF2900-0EA18	--	--	--	--	--
3RF2150-2A.04	3RF2900-0EA18	--	--	--	--	--
3RF2150-2A.06	3RF2900-0EA18	--	--	--	--	--
3RF2150-2A.14	3RF2900-0EA18	--	--	--	--	--
3RF2150-2A.22	--	--	--	--	--	--
3RF2150-2A.24	--	--	--	--	--	--
3RF2150-2A.26	--	--	--	--	--	--
3RF2150-3A.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2150-3A.04	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2150-3A.06	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2150-3A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2150-3A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2150-3A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36

[1] For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state relays (3RF21..-....4 , -....5 or -....6).

Type	Accessories					
	Converters	Load monitoring		Heating current monitoring[1]	Power controllers[1]	Power regulators[1]
		Basic	Extended[1]			
Type current = 70 A						
3RF2170-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2170-1A.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2170-1A.05	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2170-1A.06	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2170-1A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2170-1A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2170-1A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2170-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2170-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2170-1C.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
Type current = 90 A						
3RF2190-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2190-1A.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2190-1A.06	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2190-1A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2190-1A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2190-1A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2190-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2190-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2190-2A.02	3RF2900-0EA18	--	--	--	--	--
3RF2190-2A.04	3RF2900-0EA18	--	--	--	--	--
3RF2190-2A.06	3RF2900-0EA18	--	--	--	--	--
3RF2190-2A.22	--	--	--	--	--	--
3RF2190-2A.24	--	--	--	--	--	--
3RF2190-2A.26	--	--	--	--	--	--
3RF2190-3A.02	3RF2900-0EA18	--	3RF2990-0GA13	--	3RF2990-0KA13	3RF2990-0HA13
3RF2190-3A.04	3RF2900-0EA18	--	3RF2990-0GA16	3RF2932-0JA16	3RF2990-0KA16	3RF2990-0HA16
3RF2190-3A.06	3RF2900-0EA18	--	3RF2990-0GA16	3RF2932-0JA16	3RF2990-0KA16	3RF2990-0HA16
3RF2190-3A.22	--	--	3RF2990-0GA33	--	--	3RF2990-0HA33
3RF2190-3A.24	--	--	3RF2990-0GA36	--	--	3RF2990-0HA36
3RF2190-3A.26	--	--	3RF2990-0GA36	--	--	3RF2990-0HA36
3RF2190-3A.44	3RF2900-0EA18	--	3RF2990-0GA16	3RF2932-0JA16	3RF2990-0KA16	3RF2990-0HA16

[1] For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state relays (3RF21..-....4 , -....5 or -....6).

Recommended assignment of the function modules to the 3RF22 three-phase solid-state relays

Type	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers	Power regulators
		Basic	Extended			
Type current up to 55 A						
3RF22..-1A...	3RF2900-0EA18	--	--	--	--	--
3RF22..-2A...	3RF2900-0EA18	--	--	--	--	--
3RF22..-3A...	3RF2900-0EA18	--	--	--	--	--

Recommended assignment of the function modules to the 3RF23 single-phase solid-state contactors

Type	Accessories					
	Converters	Load monitoring		Heating current monitoring[1]	Power controllers[1]	Power regulators[1]
		Basic	Extended[1]			
Type current I_e = 10.5 A						
3RF2310-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	3RF2916-0JA13	3RF2920-0KA13	3RF2920-0HA13
3RF2310-1A.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1A.06	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1A.12	3RF2900-0EA18	--	3RF2920-0GA13	3RF2916-0JA13	3RF2920-0KA13	3RF2920-0HA13
3RF2310-1A.14	3RF2900-0EA18	--	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1A.22	--	--	3RF2920-0GA33	--	--	3RF2920-0HA33
3RF2310-1A.24	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2310-1A.26	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2310-1A.44	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16

[1] For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state contactors (3RF23..-....4 , -....5 or -....6).

General data

Type	Accessories					
	Converters	Load monitoring		Heating current monitoring[1]	Power controllers[1]	Power regulators[1]
		Basic	Extended[1]			
Type current I_e = 10.5 A						
3RF2310-1B.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	3RF2916-0JA13	3RF2920-0KA13	3RF2920-0HA13
3RF2310-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1B.06	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-1B.22	--	--	3RF2920-0GA33	--	--	3RF2920-0HA33
3RF2310-1B.24	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2310-1B.26	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2310-2A.02	3RF2900-0EA18	--	--	--	--	--
3RF2310-2A.04	3RF2900-0EA18	--	--	--	--	--
3RF2310-2A.06	3RF2900-0EA18	--	--	--	--	--
3RF2310-2A.22	--	--	--	--	--	--
3RF2310-2A.24	--	--	--	--	--	--
3RF2310-2A.26	--	--	--	--	--	--
3RF2310-3A.02	3RF2900-0EA18	--	3RF2920-0GA13	3RF2916-0JA13	3RF2920-0KA13	3RF2920-0HA13
3RF2310-3A.04	3RF2900-0EA18	--	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-3A.06	3RF2900-0EA18	--	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2310-3A.22	--	--	3RF2920-0GA33	--	--	3RF2920-0HA33
3RF2310-3A.24	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2310-3A.26	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
Type current I_e = 20 A						
3RF2320-1A.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	--	3RF2920-0KA13	3RF2920-0HA13
3RF2320-1A.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1A.06	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1A.14	3RF2900-0EA18	--	3RF2920-0GA16	--	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1A.22	--	--	3RF2920-0GA33	--	--	3RF2920-0HA33
3RF2320-1A.24	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2320-1A.26	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2320-1A.44	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1A.45	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1B.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	--	3RF2920-0KA13	3RF2920-0HA13
3RF2320-1B.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1B.06	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1B.22	--	--	3RF2920-0GA33	--	--	3RF2920-0HA33
3RF2320-1B.24	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2320-1B.26	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2320-1B.44	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1C.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	--	3RF2920-0KA13	3RF2920-0HA13
3RF2320-1C.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1C.22	--	--	3RF2920-0GA33	--	--	3RF2920-0HA33
3RF2320-1C.24	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2320-1C.44	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1D.02	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA13	--	3RF2920-0KA13	3RF2920-0HA13
3RF2320-1D.04	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-1D.22	--	--	3RF2920-0GA33	--	--	3RF2920-0HA33
3RF2320-1D.24	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2320-1D.44	3RF2900-0EA18	3RF2920-0FA08	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-2A.02	3RF2900-0EA18	--	--	--	--	--
3RF2320-2A.04	3RF2900-0EA18	--	--	--	--	--
3RF2320-2A.06	3RF2900-0EA18	--	--	--	--	--
3RF2320-2A.22	--	--	--	--	--	--
3RF2320-2A.24	--	--	--	--	--	--
3RF2320-2A.26	--	--	--	--	--	--
3RF2320-2C.02	3RF2900-0EA18	--	--	--	--	--
3RF2320-2C.04	3RF2900-0EA18	--	--	--	--	--
3RF2320-2C.22	--	--	--	--	--	--
3RF2320-2C.24	--	--	--	--	--	--
3RF2320-2D.22	--	--	--	--	--	--
3RF2320-2D.24	--	--	--	--	--	--
3RF2320-3A.02	3RF2900-0EA18	--	3RF2920-0GA13	--	3RF2920-0KA13	3RF2920-0HA13
3RF2320-3A.04	3RF2900-0EA18	--	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-3A.06	3RF2900-0EA18	--	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-3A.22	--	--	3RF2920-0GA33	--	--	3RF2920-0HA33
3RF2320-3A.24	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2320-3A.26	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
3RF2320-3A.44	3RF2900-0EA18	--	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16

[1] For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state contactors (3RF23..-....4 , -....5 or -....6).

Type	Accessories					
	Converters	Load monitoring		Heating current monitoring[2]	Power controllers[2]	Power regulators[2]
		Basic[1]	Extended[2]			
Type current I_e = 20 A						
3RF2320-3D.02	3RF2900-0EA18	--	3RF2920-0GA13	--	3RF2920-0KA13	3RF2920-0HA13
3RF2320-3D.04	3RF2900-0EA18	--	3RF2920-0GA16	3RF2932-0JA16	3RF2920-0KA16	3RF2920-0HA16
3RF2320-3D.22	--	--	3RF2920-0GA33	--	--	3RF2920-0HA33
3RF2320-3D.24	--	--	3RF2920-0GA36	--	--	3RF2920-0HA36
Type current I_e = 30 A						
3RF2330-1A.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2330-1A.04	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-1A.06	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-1A.14	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-1A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2330-1A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2330-1A.25	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2330-1A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2330-1A.44	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-1A.45	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-1B.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2330-1B.04	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-1B.06	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-1B.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2330-1B.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2330-1B.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2330-1B.44	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-1C.02	3RF2900-0EA18	--	3RF2950-0GA13	--	--	3RF2950-0HA13
3RF2330-1D.44	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-3A.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2330-3A.04	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-3A.06	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
3RF2330-3A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2330-3A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2330-3A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2330-3A.44	3RF2900-0EA18	--	3RF2950-0GA16	3RF2932-0JA16	3RF2950-0KA16	3RF2950-0HA16
Type current I_e = 40 A						
3RF2340-1A.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2340-1A.04	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2340-1A.06	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2340-1A.14	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2340-1A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2340-1A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2340-1A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2340-1A.45	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2340-1B.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2340-1B.04	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA16	3RF2950-0HA16
3RF2340-1B.06	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA16	3RF2950-0HA16
3RF2340-1B.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2340-1B.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2340-1B.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2340-3A.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2340-3A.04	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2340-3A.06	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2340-3A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2340-3A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2340-3A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2340-3A.45	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
Type current I_e = 50 A						
3RF2350-1A.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2350-1A.04	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2350-1A.06	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2350-1A.14	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2350-1A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2350-1A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2350-1A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2350-1A.45	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16

1) The technical specifications must be taken into account when selecting the function modules. More combinations may be possible if the solid-state relays and contactors are not fully loaded, e.g. a load monitor for 20 A can also be operated with a solid-state contactor for 30 A if the load current during operation does not exceed 20 A.

2) For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state contactors (3RF23..-....4 , -....5 or -....6).

General data

Type	Accessories					
	Converters	Load monitoring		Heating current monitoring[1]	Power controllers[1]	Power regulators[1]
		Basic	Extended[1]			
Type current I_e = 50 A						
3RF2350-1B.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2350-1B.04	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2350-1B.06	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2350-1B.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2350-1B.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2350-1B.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2350-1B.44	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2350-3A.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2350-3A.04	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2350-3A.06	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2350-3A.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2350-3A.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2350-3A.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2350-3A.44	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
Type current I_e = 70 A						
3RF2370-1B.02	3RF2900-0EA18	--	3RF2950-0GA13	--	3RF2950-0KA13	3RF2950-0HA13
3RF2370-1B.04	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2370-1B.06	3RF2900-0EA18	--	3RF2950-0GA16	--	3RF2950-0KA16	3RF2950-0HA16
3RF2370-1B.22	--	--	3RF2950-0GA33	--	--	3RF2950-0HA33
3RF2370-1B.24	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2370-1B.26	--	--	3RF2950-0GA36	--	--	3RF2950-0HA36
3RF2370-3A.02	3RF2900-0EA18	--	3RF2990-0GA13	--	3RF2990-0KA13	3RF2990-0HA13
3RF2370-3A.04	3RF2900-0EA18	--	3RF2990-0GA16	--	3RF2990-0KA16	3RF2990-0HA16
3RF2370-3A.06	3RF2900-0EA18	--	3RF2990-0GA16	--	3RF2990-0KA16	3RF2990-0HA16
3RF2370-3A.22	--	--	3RF2990-0GA33	--	--	3RF2990-0HA33
3RF2370-3A.24	--	--	3RF2990-0GA36	--	--	3RF2990-0HA36
3RF2370-3A.26	--	--	3RF2990-0GA36	--	--	3RF2990-0HA36
3RF2370-3A.45	3RF2900-0EA18	--	3RF2990-0GA16	--	3RF2990-0KA16	3RF2990-0HA16
3RF2370-3B.02	3RF2900-0EA18	--	3RF2990-0GA13	--	3RF2990-0KA13	3RF2990-0HA13
3RF2370-3B.04	3RF2900-0EA18	--	3RF2990-0GA16	--	3RF2990-0KA16	3RF2990-0HA16
3RF2370-3B.06	3RF2900-0EA18	--	3RF2990-0GA16	--	3RF2990-0KA16	3RF2990-0HA16
3RF2370-3B.22	--	--	3RF2990-0GA33	--	--	3RF2990-0HA33
3RF2370-3B.24	--	--	3RF2990-0GA36	--	--	3RF2990-0HA36
3RF2370-3B.26	--	--	3RF2990-0GA36	--	--	3RF2990-0HA36

[1] For line voltages in the range from 110 to 230 V, the versions of the 3RF29..-0.A13 function modules can also be combined with more voltage-resistant versions of the solid-state contactors (3RF23..-....4 , -....5 or -....6).

Recommended assignment of the function modules to the 3RF24 three-phase solid-state contactors

Type	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers	Power regulators
		Basic	Extended			
Type current up to 50 A						
3RF24..-1..4.	3RF2900-0EA18	--	--	--	--	--
3RF24..-2..4.	--	--	--	--	--	--
3RF24..-3..4.	3RF2900-0EA18	--	--	--	--	--
3RF24..-...5.	--	--	--	--	--	--

Technical specifications

More information	
System Manual "SIRIUS Modular System – System Overview", see https://support.industry.siemens.com/cs/ww/en/view/60311318	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16231/faq

Type		3RF29..-0EA..	3RF29..-0FA..	3RF29..-0GA..	3RF29..-0HA..	3RF29..-0JA..	3RF29..-0KA..
Dimensions (W x H x D)	mm	22.5 x 84 x 38	22.5 x 102 x 39	45 x 112 x 44	45 x 112 x 44	45 x 112 x 44	45 x 112 x 44
General data							
Ambient temperature							
• During operation, derating from 40 °C	°C	-25 ... +60					
• During storage	°C	-55 ... +80					
Installation altitude	m	0 ... 1 000; derating from 1 000					
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15/11					
Vibration resistance acc. to IEC 60068-2-6	*g*	2					
Degree of protection		IP20					
Electromagnetic compatibility (EMC)							
• Emitted interference							
- Conducted interference voltage acc. to IEC 60947-4-3		Class A for industrial applications[1]					
- Emitted, high-frequency interference voltage acc. to IEC 60947-4-3		Class B for residential, business and commercial applications					
• Interference immunity							
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2					
- Induced RF fields according to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1					
- Burst acc. to IEC 61000-4-4		2 kV/5.0 kHz; behavior criterion 2					
- Surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2					
Connection type Auxiliary/control contacts		**Screw terminals**					
• Conductor cross-section	mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0), 1 x (AWG 20 ... 12)					
• Stripped length	mm	7					
• Terminal screw		M3					
• Tightening torque	Nm lb.in	0.5 ... 0.6 4.5 ... 5.3					
Connection type Converters		**Straight-through transformers**					
• Diameter	mm	--	7	17			

[1] Note limitations for power controller and power regulator function modules. These modules were built as Class A devices. The use of these devices in residential areas could result in lead in radio interference. In this case these may be required to introduce additional interference suppression measures.

Type		3RF29..-0EA18	3RF29..-0FA08	3RF29..-0GA.3	3RF29..-0GA.6
Main circuit					
Rated operational voltage U_e	V AC	--[1]		110 ... 230	400 ... 600
• Operating range	V AC	--		93.5 ... 253	340 ... 660
• Rated frequency	Hz	--		50/60	
Rated insulation voltage U_i	V	--		600	
Voltage measuring					
• Measuring range	V	--		93.5 ... 253	340 ... 660
Mains voltage, fluctuation compensation	%	--		20	

[1] Versions are independent of the main circuit.

Type		3RF29..-0HA.3 3RF29..-0KA.3	3RF29..-0HA.6 3RF29..-0KA.6	3RF29..-0JA.3	3RF29..-0JA.6
Main circuit					
Rated operational voltage U_e	V AC	110 ... 230	400 ... 600	110 ... 230	400 ... 600
• Operating range	V AC	93.5 ... 253	340 ... 660	93.5 ... 253	340 ... 660
• Rated frequency	Hz	50/60			
Rated insulation voltage U_i	V	600			
Voltage measuring					
• Measuring range	V	93.5 ... 253	340 ... 660	93.5 ... 253	340 ... 660
Mains voltage, fluctuation compensation	%	20			

General data

Type		3RF29..-...0.	3RF29..-...1.	3RF29..-...3.
Control circuit				
Method of operation		DC operation	AC/DC operation	AC operation
Rated control supply voltage U_s	V	24		110
Rated control current	mA	15		
Rated frequency of the control supply voltage	Hz	--	50/60	
Actuating voltage, max.	V	30		121
Rated control current	mA	15		
At maximum voltage				
Response voltage	V	15		90
• For operating current	mA	2		
Drop-out voltage	V	5		15

Type		3RF2906-0FA08	3RF2920-0FA08	3RF2920-0GA..	3RF2950-0GA..	3RF2990-0GA..
Current measurement						
Rated operational current I_e	A	6	20		50	90
Current measurement						
• Teach range	A	0.25 ... 6	0.65 ... 20	0.56 ... 20	1.62 ... 50	2.93 ... 90
• Measuring range	A	0 ... 6.6	0 ... 22		0 … 55	0 … 99
• Minimum partial load current	A	0.25	0.65		1.6	2.9
Number of partial loads		1 ... 6		1 ... 12		

Type		3RF2920-0HA..	3RF2950-0HA..	3RF2990-0HA..	3RF2916-0JA..	3RF2932-0JA..
Current measurement						
Rated operational current I_e	A	20	50	90	16	32
Current measurement						
• Teach range	A	4 ... 20	10 ... 50	18 ... 90	0.42 ... 16	0.8 ... 32
• Measuring range	A	0 ... 22	0 ... 55	4 ... 99	0 ... 16	0 ... 32
• Minimum partial load current	A	--			0.42	0.8
Number of partial loads		--			1 ... 6	

Type		3RF2904-0KA..	3RF2920-0KA..	3RF2950-0KA..	3RF2990-0KA..
Current measurement					
Rated operational current I_e	A	4	20	50	90
Current measurement					
• Teach range	A	0.15 ... 4	0.65 ... 20	1.6 ... 50	2.9 ... 90
• Measuring range	A	0 ... 4	0 ... 22	0 ... 55	0 ... 99
• Minimum partial load current	A	--	0.65	1.6	2.9
Number of partial loads		--	1 ... 6		

Overview

Converters for 3RF2 solid-state switching devices

These modules are used to convert analog control signals, such as those output from many temperature controllers for example, into a pulse-width-modulated digital signal. The connected solid-state contactors and relays can therefore regulate the output of a load as a percentage.

Application

This function module is used for conversions from an analog input signal to an on/off ratio with time basis 1 s. The module can only be used in conjunction with 3RF21 and 3RF23 single-phase solid-state switching devices or 3RF22 and 3RF24 three-phase devices. It can be used on versions with 24 V DC and 24 V AC/DC control supply voltage.

Note:

The use of single-pole solid-state switching devices with converters, power controllers or power regulators on AC loads in full-wave control mode is not recommended. Since the function modules do not synchronize with each other, this may lead to fluctuations in the heating power; optimum compensation can no longer be ensured, especially for setpoints < 50%.

Selection and ordering data

	Rated operational current I_e	Rated operational voltage U_e	SD	**Screw terminals** ⏚		PU (UNIT, SET, M)	PS*	PG
	A	V	d	Article No.	Price per PU			
Converters								
	Rated control supply voltage 24 V AC/DC							
	--	--	2	**3RF2900-0EA18**		1	1 unit	41C

3RF2900-0EA18

Overview

Load monitoring for 3RF2 single-phase solid-state switching devices

Many faults can be quickly detected by monitoring a load circuit connected to the solid-state switching device, as made possible with this module. Examples include the failure of load elements (up to 6 in the basic version or up to 12 in the extended version), alloyed power semiconductors, a lack of voltage or a break in a load circuit. A fault is indicated by one or more LEDs and reported to the controller by way of a PLC-compatible output.

The principle of operation is based on permanent monitoring of the current intensity. This figure is continuously compared with the reference value stored once during start up by the simple press of a button. In order to detect the failure of one of several loads, the current difference must be 1/6 (in the basic version) or 1/12 (in the extended version) of the reference value. In the event of a fault, an output is actuated and one or more LEDs indicate the fault.

Application

The device is used for monitoring one or more loads (partial loads). The function module can only be used in conjunction with a 3RF21 solid-state relay or a 3RF23 solid-state contactor. The devices with spring-type terminals in the load circuit are not suitable.

Selection and ordering data

Rated operational current I_e	Rated operational voltage U_e	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG
A	V	d	Article No.			
Basic load monitoring						
Rated control supply voltage 24 V DC						
6	--	2	**3RF2906-0FA08**	1	1 unit	41C
20	--	2	**3RF2920-0FA08**	1	1 unit	41C
• With mounted 3RF2900-0RA88 cover						
6	--	2	**3RF2906-0FA08-0KH0**	1	1 unit	41C
20	--	2	**3RF2920-0FA08-0KH0**	1	1 unit	41C

3RF2920-0FA08

Extended load monitoring						
Rated control supply voltage 24 V AC/DC						
20	110 ... 230	2	**3RF2920-0GA13**	1	1 unit	41C
20	400 ... 600	2	**3RF2920-0GA16**	1	1 unit	41C
50	110 ... 230	2	**3RF2950-0GA13**	1	1 unit	41C
50	400 ... 600	2	**3RF2950-0GA16**	1	1 unit	41C
90	110 ... 230	2	**3RF2990-0GA13**	1	1 unit	41C
90	400 ... 600	2	**3RF2990-0GA16**	1	1 unit	41C
Rated control supply voltage 110 V AC						
20	110 ... 230	2	**3RF2920-0GA33**	1	1 unit	41C
20	400 ... 600	2	**3RF2920-0GA36**	1	1 unit	41C
50	110 ... 230	2	**3RF2950-0GA33**	1	1 unit	41C
50	400 ... 600	2	**3RF2950-0GA36**	1	1 unit	41C
90	110 ... 230	2	**3RF2990-0GA33**	1	1 unit	41C
90	400 ... 600	2	**3RF2990-0GA36**	1	1 unit	41C

3RF2920-0GA13

Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Optional accessories						
Sealable covers for function modules (not for converters)	5	**3RF2900-0RA88**		1	10 units	41C

3RF2900-0RA88

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

Heating current monitoring for 3RF2 single-phase solid-state switching devices

Many faults can be quickly detected by monitoring a load circuit connected to the solid-state switching device, as made possible with this module. Examples include the failure of up to six load elements, alloyed power semiconductors, a lack of voltage, or a break in the load circuit. A fault is indicated by LEDs and reported to the controller via relay output (NC).

The principle of operation is based on permanent monitoring of the current intensity. This figure is continuously compared with the reference value stored once during start up. In order to detect the failure of one of several loads, the current difference must be 1/6 of the reference value. In the event of a fault, an output is actuated and the LEDs indicate the fault.

The heating current monitoring has a teach input and therefore differs from the load monitoring. This remote teaching function enables simple adjustment to changing loads without manual intervention.

Special version:
Deviations from the standard version

3RF29..-0JA1.-1KK0

If the current is below 50% of the lower teach current during the teach routine, the device will go into "Standby" mode; the LOAD LED will flicker. The device thus detects a non-connected load, e.g. channels not required for tool heaters, and does not signal a fault. This mode can be reset by re-teaching.

Application

The device is used for monitoring one or more loads (partial loads). The function module can only be used in conjunction with a 3RF21 solid-state relay or a 3RF23 solid-state contactor. The devices with spring-type terminals in the load circuit are not suitable.

Selection and ordering data

Rated operational current I_e	Rated operational voltage U_e	SD	Screw terminals		PU (UNIT, SET, M)	PS*	PG
			Article No.	Price per PU			
A	V	d					
Heating current monitoring[1]							
Rated control supply voltage 24 V AC/DC							
16	110 ... 230	2	**3RF2916-0JA13**		1	1 unit	41C
16	110 ... 230	5	**3RF2916-0JA13-1KK0**		1	1 unit	41C
16	400 ... 600	2	**3RF2916-0JA16-1KK0**		1	1 unit	41C
32	110 ... 230	2	**3RF2932-0JA13-1KK0**		1	1 unit	41C
32	400 ... 600	2	**3RF2932-0JA16**		1	1 unit	41C
32	400 ... 600	2	**3RF2932-0JA16-1KK0**		1	1 unit	41C

3RF2932-0JA13

[1] Supplied without control connector. The control connector can be purchased from Phoenix Contact by quoting Article No. 1982 790 (2.5 HC/6-ST-5.08), see page 16/15.

Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Optional accessories						
Sealable covers for function modules (not for converters)	5	**3RF2900-0RA88**		1	10 units	41C

3RF2900-0RA88

Overview

Power controllers for 3RF2 single-phase solid-state switching devices

The power controller is a function module for the autonomous power control of complex heating systems and inductive loads.

The following functions have been integrated:

- Power controller
  for adjusting the power of the connected load. The setpoint value is selected via a rotary knob on the module as a percentage of the 100% power value stored.
- Inrush current limitation
  With the aid of an adjustable voltage ramp, the inrush current is limited by means of phase control. This is useful above all with loads such as lamps or infrared lamps which have an inrush transient current.
- Load circuit monitoring
  For detecting load failure, partial load faults, alloyed power semiconductors, lack of voltage or a break in the load circuit.

Note:

With the phase control operating mode, a partial load fault is detected by cyclic "scanning" of the load; the exact mode of operation is described in the data sheets!

Special version:
Deviations from the standard version

3RF2904-0KA13-0KC0

During the teach routine, the connected solid-state relay or contactor is not activated; i.e. no current will flow. No current reference value is stored. No part-load monitoring!

3RF29..-0KA1.-0KT0

No part-load monitoring!

Application

The power controller can be used for:

- Complex heating systems
- Inductive loads
- Loads with temperature-dependent resistor
- Loads with ageing after long-time service
- Simple indirect control of temperature

Power control

The power controller adjusts the power in the connected load by means of a solid-state switching device depending on the setpoint selection. It does not compensate for changes in the mains voltage or load resistance. The setpoint value can be predefined externally as a 0 to 10 V signal or internally by means of a potentiometer. Depending on the setting of the potentiometer (t_R), the control is carried out according to the principle of full-wave control or generalized phase control.

Note:

In the case of ohmic loads, the power is set linear to the setpoint value. During operation of inductive loads, the power control is no longer proportional and linear due to the phase shift between current and voltage.

Full-wave control

In this operating mode the output is adjusted to the required setpoint value by changing the on-to-off period. The period duration is predefined at 1 s.

See note about AC loads on page 6/99.

Generalized phase control

In this operating mode the output is adjusted to the required setpoint value by changing the current flow angle. In order to observe the limit values of the conducted interference voltage for industrial networks, at loads up to 20 kVA, the load circuit must include an additional filter, and for loads above 20 kVA, a reactor with a rating of at least 200 µH must be used.

Selection and ordering data

Rated operational current I_e	Rated operational voltage U_e	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG
A	V	d	Article No. / Price per PU			
Power controllers						
Rated control supply voltage 24 V AC/DC						
4	110 ... 230	2	**3RF2904-0KA13-0KC0**	1	1 unit	41C
4		2	**3RF2904-0KA13-0KT0**	1	1 unit	41C
20		2	**3RF2920-0KA13**	1	1 unit	41C
50		2	**3RF2950-0KA13**	1	1 unit	41C
90		2	**3RF2990-0KA13**	1	1 unit	41C
20	400 ... 600	2	**3RF2920-0KA16**	1	1 unit	41C
50		2	**3RF2950-0KA16**	1	1 unit	41C
50		2	**3RF2950-0KA16-0KT0**	1	1 unit	41C
90		2	**3RF2990-0KA16**	1	1 unit	41C

3RF2920-0KA13

Version	SD	Article No. / Price per PU	PU (UNIT, SET, M)	PS*	PG
	d				
Optional accessories					
Sealable covers for function modules (not for converters)	5	**3RF2900-0RA88**	1	10 units	41C

3RF2900-0RA88

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

Power regulators for 3RF2 single-phase solid-state switching devices

The power regulator is a function module for the autonomous power control of complex heating systems.

The following functions have been integrated:

- Power controller with proportional-action control
  For adjusting the power of the connected load. The setpoint value is selected via a rotary knob on the module as a percentage of the 100 % power value stored. Changes in the mains voltage or in the load resistance are compensated in this case.
- Inrush current limitation
  With the aid of an adjustable voltage ramp, the inrush current is limited by means of phase control. This is useful above all with loads such as lamps which have an inrush transient current.
- Load circuit monitoring
  For detecting load failure, alloyed power semiconductors, lack of voltage or a break in the load circuit. Partial load monitoring is not possible. Load fluctuations are compensated.

Application

The power regulator can be used for:

- Complex heating systems
- Heating elements with temperature-dependent resistor
- Heating elements with ageing after long-time service
- Simple indirect control of temperature

Power control

The power regulator adjusts the power in the connected load by means of a solid-state switching device depending on the taught power and the selected setpoint. Changes in the mains voltage or in the load resistance are thus compensated by the power regulator. The setpoint value can be predefined externally as a 0 to 10 V signal or internally by means of a potentiometer. Depending on the setting of the potentiometer (t_R), the adjustment is carried out according to the principle of full-wave control or generalized phase control.

Note:

In the case of ohmic loads, the power is set linear to the setpoint value. During operation of inductive loads, the power control is no longer proportional and linear due to the phase shift between current and voltage.

Full-wave control

In this operating mode the output is adjusted to the required setpoint value by changing the on-to-off period. The period duration is predefined at 1 s.

See note about AC loads on page 6/99.

Generalized phase control

In this operating mode the output is adjusted to the required setpoint value by changing the current flow angle. In order to observe the limit values of the conducted interference voltage for industrial networks, at loads up to 20 kVA, the load circuit must include an additional filter, and for loads above 20 kVA, a reactor with a rating of at least 200 µH must be used.

Selection and ordering data

Rated operational current I_e	Rated operational voltage U_e	SD	Screw terminals		PU (UNIT, SET, M)	PS*	PG
			Article No.	Price per PU			
A	V	d					
Power regulators							
Rated control supply voltage 24 V AC/DC							
20	110 ... 230	2	**3RF2920-0HA13**		1	1 unit	41C
20	400 … 600	2	**3RF2920-0HA16**		1	1 unit	41C
50	110 ... 230	2	**3RF2950-0HA13**		1	1 unit	41C
50	400 … 600	2	**3RF2950-0HA16**		1	1 unit	41C
90	110 ... 230	2	**3RF2990-0HA13**		1	1 unit	41C
90	400 … 600	2	**3RF2990-0HA16**		1	1 unit	41C
Rated control supply voltage 110 V AC							
20	110 ... 230	2	**3RF2920-0HA33**		1	1 unit	41C
20	400 … 600	2	**3RF2920-0HA36**		1	1 unit	41C
50	110 ... 230	2	**3RF2950-0HA33**		1	1 unit	41C
50	400 … 600	2	**3RF2950-0HA36**		1	1 unit	41C
90	110 ... 230	2	**3RF2990-0HA33**		1	1 unit	41C
90	400 … 600	2	**3RF2990-0HA36**		1	1 unit	41C

3RF2920-0HA13

Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Optional accessories						
Sealable covers for function modules (not for converters)	5	**3RF2900-0RA88**		1	10 units	41C

3RF2900-0RA88

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Overview

More information	
Homepage, see www.siemens.com/solid-state-switching-devices Industry Mall, see www.siemens.com/product?3RF	Online configurator, see www.siemens.com/sirius/configurators

Solid-state contactors for switching motors

Solid-state contactor for direct-on-line starting

The solid-state contactors for switching motors are intended for frequently switching on and off three-phase current operating mechanisms up to 7.5 kW and reversing up to 3.0 kW. The devices are constructed with complete insulation and can be mounted directly on SIRIUS motor starter protectors, overload relays and current monitoring relays, resulting in a very simple integration into motor feeders.

These three-phase solid-state contactors are equipped with a two-phase control which is particularly suitable for typical motor current circuits without connecting to the neutral conductor.

Important features:

- Insulated enclosure with integrated heat sink
- Degree of protection IP20
- Integrated mounting foot to snap on a standard mounting rail or for assembly onto a support plate
- Variety of connection methods
- Plug-in control connection
- Display via LEDs
- Wide voltage range for AC control supply voltage

Switching functions

The solid-state contactors for switching motors are "Instantaneous switching", because this method is particularly suited for inductive loads. By distributing the ON point over the entire sine curve of the mains voltage, disturbances are reduced to a minimum.

Connection methods

You can choose between the following connection methods for the solid-state contactors for switching motors:

Screw terminals

The screw connection system is the standard among industrial controls. Open terminals and a plus-minus screw are just two features of this technology. Two conductors of up to 6 mm^2 can be connected in just one terminal.

Spring-type terminals

This innovative technology manages without any screw connection. This means that very high vibration resistance is achieved. Two conductors of up to 2.5 mm^2 can be connected to each terminal.

Motor feeders

The devices can use a link module to directly connect to a motor starter protector. Also possible is the mounting of a 3RB30/3RB31 electronic overload relay (see page 7/94) or a 3RR2 current monitoring relay (see pages 10/64 and 10/72) using a link adapter. The simultaneous mounting of a motor starter protector and an overload or current monitoring relay is not recommend for space and heat development reasons.

Rapid-switching fuseless and fuse motor feeders can thereby be implemented in a time-saving manner.

Selecting solid-state contactors

The solid-state contactors are selected on the basis of details of the network, the load and the ambient conditions.

The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select a solid-state contactor with the same or higher rated current than the load
- Testing of the maximum permissible switching frequency based on the characteristic curves (see "More information" → "Product Information"). To do this, the starting current, the starting time and the motor loaded in in the operating phase must be known.
- If the permissible switching frequency is under the desired frequency, it is possible to achieve an increase only by overdimensioning the motor and the solid-state contactor!

Alternatively, the tool for "Selection of solid-state contactors for switching motors" can be used. The correct device size can be determined by entering the network and motor data along with the application and ambient conditions, see www.siemens.com/solid-state-switching-devices.

Short-circuit protection

Despite the rugged power semiconductors that are used, solid-state switching devices respond more sensitively to short circuits in the load feeder. Consequently, special precautions have to be taken against destruction, depending on the type of design.

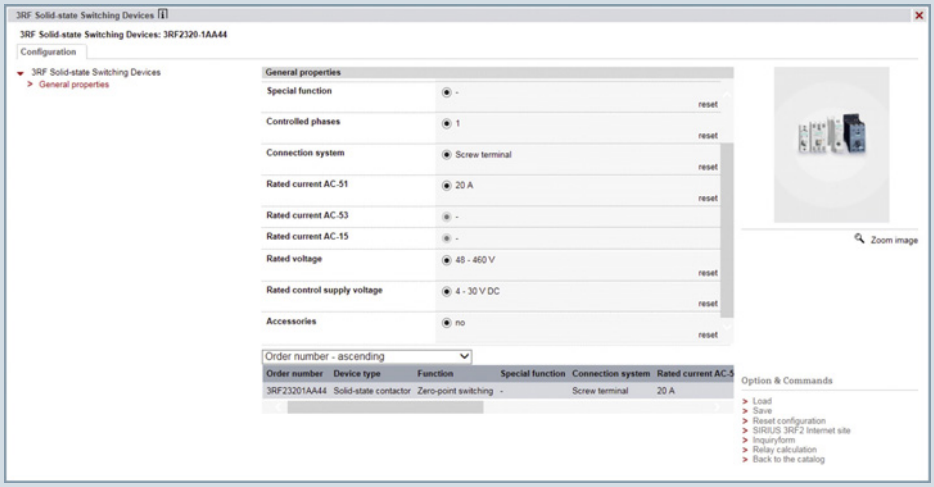
Siemens generally recommends using SITOR semiconductor fuses. These fuses also provide protection against destruction in the event of a short circuit even when the solid-state contactors and solid-state relays are fully utilized.

Alternatively, if there is lower loading, protection can also be provided by standard fuses or miniature circuit breakers. This protection is achieved by overdimensioning the solid-state switching devices accordingly.

Online Configurator

- Simple selection of individual solid-state switching devices by means of technical characteristics (e.g. zero-point switching, spring-type terminal and rated current)
- Once configuration is complete, you receive the article numbers corresponding to the products

see
www.siemens.com/sirius/configurators



Article No. scheme

Product versions		Article number										
Solid-state contactors		**3RF34**	□	□	–	□	□	□	□	□	Three-phase
Rated operational current	3.8 A		**0**	**3**							Only for reversing contactor
	5.2 A (5.4 A for reversing contactor)		**0**	**5**							
	9.2 A (7.4 A for reversing contactor)		**1**	**0**							
	12.5 A		**1**	**2**							Only for solid-state contactor
	16 A		**1**	**6**							Only for solid-state contactor
Connection type	Screw terminals					**1**					
	Spring-type terminals					**2**					
Switching function	Instantaneous switching						**B**				
Number of controlled phases	2-phase							**B**			
	Reversing contactor							**D**			
Rated control supply voltage U_s	24 V DC								**0**		
	110 ... 230 V AC								**2**		
Rated operational voltage U_e	48 ... 460 V AC									**4**	
	48 ... 600 V AC									**6**	Blocking voltage 1 600 V, solid-state contactor only
Example		**3RF34**	**1**	**0**	**–**	**1**	**B**	**B**	**0**	**4**	

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

General data

Benefits

- Units with integrated heat sink, "ready to use"
- Compact and space-saving design
- Reversing contactors with integrated interlocking

Application

Use in load feeders

There is no typical design of a load feeder with solid-state relays or solid-state contactors; instead, the great variety of connection methods and control voltages offers universal application opportunities.

SIRIUS solid-state relays and solid-state contactors can be installed in fuseless or fused feeders, as required.

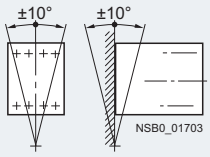
See Configuration Manual "Load feeders – Configuring the SIRIUS Modular System – Selection data for Fuseless and Fused Load Feeders", https://support.industry.siemens.com/cs/ww/en/view/39714188.

Standards and approvals

- IEC 60947-4-2
- UL 508, CSA for North America[1)]
- CE marking for Europe
- C-Tick approval for Australia
- CCC approval for China

[1)] Please note: Use overvoltage protection device; max. cut-off-voltage 6 000 V; min. energy handling capability 100 J.

Technical specifications

Type		3RF3405-1BB.. 3RF3403-1BD.., 3RF3405-1BD..	3RF3410-1BB.., 3RF3412-1BB.., 3RF3416-1BB.. 3RF3410-1BD..	3RF3405-2BB..	3RF3410-2BB.., 3RF3412-2BB.., 3RF3416-2BB..
Dimensions (W x H x D)					
• 3RF34..-1BB..	mm	45 x 95 x 96.5	90 x 95 x 96.5	45 x 95 x 96.5	90 x 95 x 96.5
• 3RF34..-1BD..	mm	45 x 95 x 108.5	90 x 95 x 108.5	--	--
General technical specifications					
Ambient temperature					
• During operation, derating from 40 °C	°C	-25 ... +60			
• During storage	°C	-55 ... +80			
Installation altitude	m	0 ... 1 000; derating over 1 000 m on request			
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15/11			
Vibration resistance acc. to IEC 60068-2-6	*g*	2			
Degree of protection		IP20			
Insulation strength at 50/60 Hz (main/control circuit to floor)	V rms	4 000			
Electromagnetic compatibility (EMC)					
• Emitted interference according to IEC 60947-4-2					
- Conducted interference voltage		Class A for industrial applications[1]			
- Emitted, high-frequency interference voltage		Class A for industrial applications			
• Interference immunity					
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge: 4; air discharge: 8; Behavior criterion 2			
- Induced RF fields according to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1			
- Burst acc. to IEC 61000-4-4	kV	2; at 5 kHz; behavior criterion 2			
- Surge acc. to IEC 61000-4-5[2]	kV	Conductor - ground: 2; conductor - conductor: 1; behavior criterion 2			
Connection type		**Screw terminals**		**Spring-type terminals**	
Operating devices		Standard screwdriver size 2 and Pozidriv 2		3.0 x 0.5 and 3.5 x 0.5	
Conductor cross-sections, main contacts					
• Solid	mm^2	2 x (1.5 ... 2.5)[3], 2 x (2.5 ... 6)[3]		2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm^2	2 x (1 ... 2.5)[3], 2 x (2.5 ... 6)[3], 1 x 10		2 x (0.5 ... 1.5)	
• Finely stranded without end sleeve	mm^2	--		2 x (0.5 ... 2.5)	
• AWG cables, solid or stranded	AWG	2 x (14 ... 10)		2 x (18 ... 14)	
Conductor cross-sections, auxiliary/control contacts					
• With/without end sleeve	mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)		0.5 ... 2.5	
• AWG cables, solid or stranded	AWG	20 ... 12		20 ... 12	
Permissible mounting position					

[1] These products were built as Class A devices. The use of these devices in residential areas could result in lead in radio interference. In this case these may be required to introduce additional interference suppression measures.

[2] The following applies for reversing contactors: To maintain the values, a 3TX7462-3L surge suppressor should be used between phases L1 and L3 as close as possible to the reversing contactor.

[3] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

More information

For more information, see

- System Manual "SIRIUS Modular System – System Overview", https://support.industry.siemens.com/cs/WW/en/view/60311318
- Manual "SIRIUS 3RF34 Solid-State Switching Devices", https://support.industry.siemens.com/cs/ww/en/view/60298187

Product information and technical specifications

For product data sheets with detailed technical specifications, dimensional drawings and characteristic curves, see https://support.industry.siemens.com/cs/ww/en/ps/16237.

For additional information, please enter the article number of the required device under the tab "Product List".

3RF34 solid-state contactors, three-phase

Overview

These two-phase controlled, instantaneous switching solid-state contactors in the insulating enclosure are offered in a width of 45 mm up to 5.2 A – and in a width of 90 mm up to 16 A. They allow the operation of motors up to 7.5 kW.[1)]

1) In accordance with the product standard IEC 60947-4-2, the motor contactors are designed for motors with maximum starting current conditions of $I/I_e \leq 8$.
For configuring motors with higher starting current conditions (typically $I/I_e \geq 8$) the data in the manual "SIRIUS 3RF34 Solid-state Switching Devices" must be taken into account, see https://support.industry.siemens.com/cs/ww/en/view/60298187.

Technical specifications

More information	
System Manual "SIRIUS Modular System – System Overview", see https://support.industry.siemens.com/cs/ww/en/view/60311318	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16239/faq
Manual "SIRIUS 3RF34 Solid-State Switching Devices", see https://support.industry.siemens.com/cs/ww/en/view/60298187	

Type		3RF3405-.BB..	3RF3410-.BB..	3RF3412-.BB..	3RF3416-.BB..
Fuseless design with 3RV2 motor starter protector, CLASS 10					
Rated operational current I_{AC-53a} [1)] acc. to IEC 60947-4-2					
• At 40 °C	A	5.2 (4.5)	9.2	12.5	16
• UL/CSA, at 50 °C	A	4.6 (4.0)	8.4	11.5	14
• At 60 °C	A	4.2 (3.5)	7.6	10.5	12.5
Power loss at I_{AC-53a}					
• At 40 °C	W	10 (8)	16	22	28
Short-circuit protection with type of coordination "1" at operational voltage U_e up to 440 V					
• Motor starter protector, type		3RV2011-1GA10	3RV2011-1JA10	3RV2011-1KA10	3RV2011-4AA10
• Current I_q	kA	50	5		3

1) The reduced values in brackets apply to a directly mounted motor starter protector and simultaneous side-by-side mounting.

Type		3RF3405-.BB.4	3RF3405-.BB.6	3RF3410-.BB..	3RF3412-.BB.4	3RF3412-.BB.6	3RF3416-.BB..
Fused design with directly connected 3RB3 overload relay							
Rated operational current I_{AC-53a} acc. to IEC 60947-4-2							
• At 40 °C	A	4		7.8	9.5		11
• UL/CSA, at 50 °C	A	3.6		7	8.5		10
• At 60 °C	A	3.2		6.2	7.6		9
Power loss at I_{AC-53a}							
• At 40 °C	W	7		13	16		18
Minimum load current	A	0.1	0.5				
Max. off-state current	mA	10					
Rated peak withstand current I_{tsm}	A	200	600		1 200	1 150	
I^2t value	A^2s	200	1 800		7 200	6 600	

Type		3RF34..-.BB.4	3RF34..-.BB.6
Main circuit			
Controlled phases		Two-phase	
Rated operational voltage U_e	V AC	48 ... 480	48 ... 600
• Operating range	V AC	40 ... 506	40 ... 660
• Rated frequency	Hz	50/60 ± 10%	
Rated insulation voltage U_i	V	600	
Rated impulse withstand voltage U_{imp}	kV	6	
Blocking voltage	V	1 200	1 600
Rate of voltage rise	V/µs	1 000	

Type		3RF34..-.BB0.	3RF34..-.BB2.
Control circuit			
Method of operation		DC operation	AC operation
Rated control supply voltage U_s	V	24	110 ... 230
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10%
Control supply voltage, max.	V	30	253
Typical actuating current	mA	20	15
Response voltage	V	15	90
Drop-out voltage	V	5	< 40
Operating times			
• ON-delay	ms	1	5
• OFF-delay	ms	1 + max. one half-wave	30 + max. one half-wave

3RF34 solid-state contactors, three-phase *IE3/IE4* ready

Selection and ordering data

More information

System Manual "SIRIUS Modular System – System Overview", see https://support.industry.siemens.com/cs/ww/en/view/60311318

Manual "SIRIUS 3RF34 Solid-State Switching Devices", see https://support.industry.siemens.com/cs/ww/en/view/60298187

Motor contactors · Instantaneous switching · Two-phase controlled

Rated operational current I_e	Rated power at I_e and U_e	Rated control supply voltage U_s	SD	**Screw terminals**	PU (UNIT, SET, M)	PS*	PG
A	400 V kW	V	d	Article No. / Price per PU			
Rated operational voltage U_e 48 ... 480 V AC							
5.2	**2.2**	24 DC	2	**3RF3405-1BB04**	1	1 unit	41C
9.2	**4.0**		5	**3RF3410-1BB04**	1	1 unit	41C
12.5	**5.5**		5	**3RF3412-1BB04**	1	1 unit	41C
16	**7.5**		5	**3RF3416-1BB04**	1	1 unit	41C
5.2	**2.2**	110 ... 230 AC	5	**3RF3405-1BB24**	1	1 unit	41C
9.2	**4.0**		5	**3RF3410-1BB24**	1	1 unit	41C
12.5	**5.5**		5	**3RF3412-1BB24**	1	1 unit	41C
16	**7.5**		5	**3RF3416-1BB24**	1	1 unit	41C


3RF3405-1BB

Rated operational voltage U_e 48 ... 600 V AC, blocking voltage 1 600 V							
5.2	**2.2**	24 DC	5	**3RF3405-1BB06**	1	1 unit	41C
9.2	**4.0**		5	**3RF3410-1BB06**	1	1 unit	41C
12.5	**5.5**		5	**3RF3412-1BB06**	1	1 unit	41C
16	**7.5**		5	**3RF3416-1BB06**	1	1 unit	41C
5.2	**2.2**	110 ... 230 AC	5	**3RF3405-1BB26**	1	1 unit	41C
9.2	**4.0**		5	**3RF3410-1BB26**	1	1 unit	41C
12.5	**5.5**		5	**3RF3412-1BB26**	1	1 unit	41C
16	**7.5**		5	**3RF3416-1BB26**	1	1 unit	41C


3RF3410-1BB

Rated operational current I_e	Rated power at I_e and U_e	Rated control supply voltage U_s	SD	**Spring-type terminals**	PU (UNIT, SET, M)	PS*	PG
A	400 V kW	V	d	Article No. / Price per PU			
Rated operational voltage U_e 48 ... 480 V AC							
5.2	**2.2**	24 DC	5	**3RF3405-2BB04**	1	1 unit	41C
9.2	**4.0**		5	**3RF3410-2BB04**	1	1 unit	41C
12.5	**5.5**		5	**3RF3412-2BB04**	1	1 unit	41C
16	**7.5**		5	**3RF3416-2BB04**	1	1 unit	41C
5.2	**2.2**	110 ... 230 AC	5	**3RF3405-2BB24**	1	1 unit	41C
9.2	**4.0**		5	**3RF3410-2BB24**	1	1 unit	41C
12.5	**5.5**		5	**3RF3412-2BB24**	1	1 unit	41C
16	**7.5**		5	**3RF3416-2BB24**	1	1 unit	41C

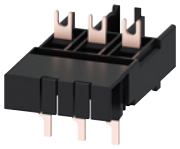
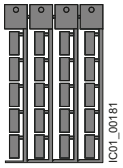

3RF3405-2BB

Rated operational voltage U_e 48 ... 600 V AC, blocking voltage 1 600 V							
5.2	**2.2**	24 DC	5	**3RF3405-2BB06**	1	1 unit	41C
9.2	**4.0**		5	**3RF3410-2BB06**	1	1 unit	41C
12.5	**5.5**		5	**3RF3412-2BB06**	1	1 unit	41C
16	**7.5**		5	**3RF3416-2BB06**	1	1 unit	41C
5.2	**2.2**	110 ... 230 AC	5	**3RF3405-2BB26**	1	1 unit	41C
9.2	**4.0**		5	**3RF3410-2BB26**	1	1 unit	41C
12.5	**5.5**		5	**3RF3412-2BB26**	1	1 unit	41C
16	**7.5**		5	**3RF3416-2BB26**	1	1 unit	41C


3RF3410-2BB

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

	Version	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Link modules between solid-state contactor and motor starter protector							
 3RA2921-1BA00	**Link modules** Between solid-state contactor and motor starter protector with screw terminals		**Screw terminals**				
	For 3RV2 motor starter protectors size S00/S0	2	**3RA2921-1BA00**		1	1 unit	41B
Link adapters between solid-state contactor and overload relay							
 3RF3900-0QA88	**Link adapters** For direct mounting of 3RB3 overload relays or 3RR2 current monitoring relays to the solid-state contactor with screw terminals						
	The adapter is snapped onto the enclosure of the 3RF34 contactor and accommodates the fixing hooks of the 3RB3 overload relays or the 3RR2 current monitoring relays for direct mounting.	2	**3RF3900-0QA88**		1	1 unit	41C
Insulation stop for securely holding back the conductor insulation, on conductors up to 1 mm²							
 3RT2916-4JA02	**Insulation stop strip** For all SIRIUS devices with spring-type terminals		**Spring-type terminals**				
	Can be inserted in cable entry of the spring-type terminal (no more than 2 strips per contactor required; removable in pairs) For terminals with a conductor cross-section up to 2.5 mm²	5	**3RT2916-4JA02**		1	20 units	41B
Tools for opening spring-type terminals							
 3RA2908-1A	**Screwdrivers** For all SIRIUS devices with spring-type terminals						
	Length approx. 200 mm, size 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	2	**3RA2908-1A**		1	1 unit	41B
Blank labels							
 3SB2900-1SB20	**Unit labeling plates** For SIRIUS devices[1]						
	• 10 mm × 7 mm, titanium gray	20	**3RT2900-1SB10**		100	816 units	41B
	• 20 mm × 7 mm, titanium gray	20	**3RT2900-1SB20**		100	340 units	41B
	Adhesive labels For SIRIUS devices						
	• 19 mm × 6 mm, titanium gray	5	**3RT2900-1SB60**		100	3 060 units	41B

1) PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH, see page 16/15.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

3RF34 solid-state reversing contactors, three-phase

Overview

The integration of four conducting paths to a reverse switch, combined in one enclosure makes this device a particularly compact solution. Compared to conventional systems, for which two contactors are required, it is possible to save up to 50% in width with the 3-phase reversing contactors. Devices with a width of 45 mm cover motors up to 2.2 kW – and those with a width of 90 mm cover motors up to 3 kW.[1)]

[1)] In accordance with the product standard IEC 60947-4-2, the motor contactors are designed for motors with maximum starting current conditions of $I/I_e \leq 8$.
For configuring motors with higher starting current conditions (typically $I/I_e \geq 8$) the data in the manual "SIRIUS 3RF34 Solid-State Switching Devices" must be taken into account, see https://support.industry.siemens.com/cs/ww/en/view/60298187.

Technical specifications

More information	
System Manual "SIRIUS Modular System – System Overview", see https://support.industry.siemens.com/cs/ww/en/view/60311318	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/16241/faq
Manual "SIRIUS 3RF34 Solid-State Switching Devices", see https://support.industry.siemens.com/cs/ww/en/view/60298187	

Type		3RF3403-.BD.4	3RF3405-.BD.4	3RF3410-.BD.4
Fuseless design with 3RV2 motor starter protector, CLASS 10				
Rated operational current I_{AC-53a}[1)] acc. to IEC 60947-4-2				
• At 40 °C	A	3.8 (3.4)	5.4 (4.8)	7.4
• UL/CSA, at 50 °C	A	3.5 (3.1)	5 (4.3)	6.8
• At 60 °C	A	3.2 (2.8)	4.6 (3.8)	6.2
Power loss at I_{AC-53a}				
• At 40 °C	W	7 (6)	9 (8)	13
Short-circuit protection with type of coordination "1" at operational voltage U_e up to 440 V				
• Motor starter protector, type		3RV2011-1FA10	3RV2011-1GA10	3RV2011-1JA10
• Current I_q	kA	50		10

[1)] The reduced values in brackets apply to a directly mounted motor starter protector and simultaneous side-by-side mounting.

Type		3RF3403-.BD.4	3RF3405-.BD.4	3RF3410-.BD.4
Fused design with directly connected 3RB3 overload relay				
Rated operational current I_{AC-53a} acc. to IEC 60947-4-2				
• At 40 °C	A	3.8	5.4	7.4
• UL/CSA, at 50 °C	A	3.5	5	6.8
• At 60 °C	A	3.2	4.6	6.2
Power loss at I_{AC-53a}				
• At 40 °C	W	6	8	16
Minimum load current	A	0.5		
Max. off-state current	mA	10		
Rated peak withstand current I_{tsm}	A	200	600	
I^2t value	A^2s	200	1 800	

Type		3RF34..-.BD.4
Main circuit		
Controlled phases		Two-phase
Rated operational voltage U_e[1]	V AC	48 ... 480
• Operating range	V AC	40 ... 506
• Rated frequency	Hz	50/60 ± 10%
Rated insulation voltage U_i	V	600
Rated impulse withstand voltage U_{imp}	kV	6
Blocking voltage	V	1 200
Rate of voltage rise	V/µs	1 000

[1] To reduce the risk of a phase short circuit due to overvoltage, we recommend using a varistor type 3TX7462-3L between the phases L1 and L3 as close as possible to the switchgear.

We recommend a design with semiconductor protection as short-circuit protection.

Type		3RF34..-.BD0.	3RF34..-.BD2.
Control circuit			
Method of operation		DC operation	AC operation
Rated control supply voltage U_s	V	24	110 ... 230
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10%
Control supply voltage, maximum	V	30	253
Typical actuating current	mA	15	10
Response voltage	V	15	90
Drop-out voltage	V	5	< 40
Operating times[1]			
• ON-delay	ms	5	20
• OFF-delay	ms	5 + max. one half-wave	10 + max. one half-wave
• Interlocking time	ms	60 ... 100	50 ... 100

[1] Caution! Risk of phase short circuit in automatic mode.
The control inputs must not be actuated until a delay of 40 ms has expired after the main voltage is applied.

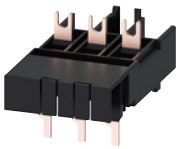
3RF34 solid-state reversing contactors, three-phase *IE3/IE4 ready*

Selection and ordering data

Reversing contactors · Instantaneous switching · Two-phase controlled

	Rated operational current I_e	Rated power at I_e and U_e	Rated control supply voltage U_s	SD	Screw terminals		PU (UNIT, SET, M)	PS*	PG
	A	400 V kW	V	d	Article No.	Price per PU			
Rated operational voltage U_e 48 ... 480 V AC									
 3RF3403-1BD	3.8	**1.5**	24 DC	2	**3RF3403-1BD04**		1	1 unit	41C
	5.4	**2.2**		5	**3RF3405-1BD04**		1	1 unit	41C
	7.4	**3.0**		5	**3RF3410-1BD04**		1	1 unit	41C
 3RF3410-1BD	3.8	**1.5**	110 ... 230 AC	5	**3RF3403-1BD24**		1	1 unit	41C
	5.4	**2.2**		5	**3RF3405-1BD24**		1	1 unit	41C
	7.4	**3.0**		5	**3RF3410-1BD24**		1	1 unit	41C

Accessories

	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
		d					
Link modules between solid-state contactor and motor starter protector							
 3RA2921-1BA00	**Link modules** Between solid-state reversing contactor and motor starter protector with screw terminals		**Screw terminals**				
	For 3RV2 motor starter protectors, size S00/S0	2	**3RA2921-1BA00**		1	1 unit	41B
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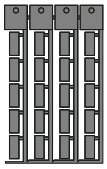
	The adapter is snapped onto the enclosure of the 3RF34 contactor and accommodates the fixing hooks of the 3RB3 overload relays or the 3RR2 current monitoring relays for direct mounting.	2	**3RF3900-0QA88**		1	1 unit	41C
Blank labels							
 3SB2900-1SB20	**Unit labeling plates** For SIRIUS devices[1]						
	• 10 mm × 7 mm, titanium gray	20	**3RT2900-1SB10**		100	816 units	41B
	• 20 mm × 7 mm, titanium gray	20	**3RT2900-1SB20**		100	340 units	41B
	Adhesive labels For SIRIUS devices						
	• 19 mm × 6 mm, titanium gray	5	**3RT2900-1SB60**		100	3 060 units	41B

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH, see page 16/15.

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