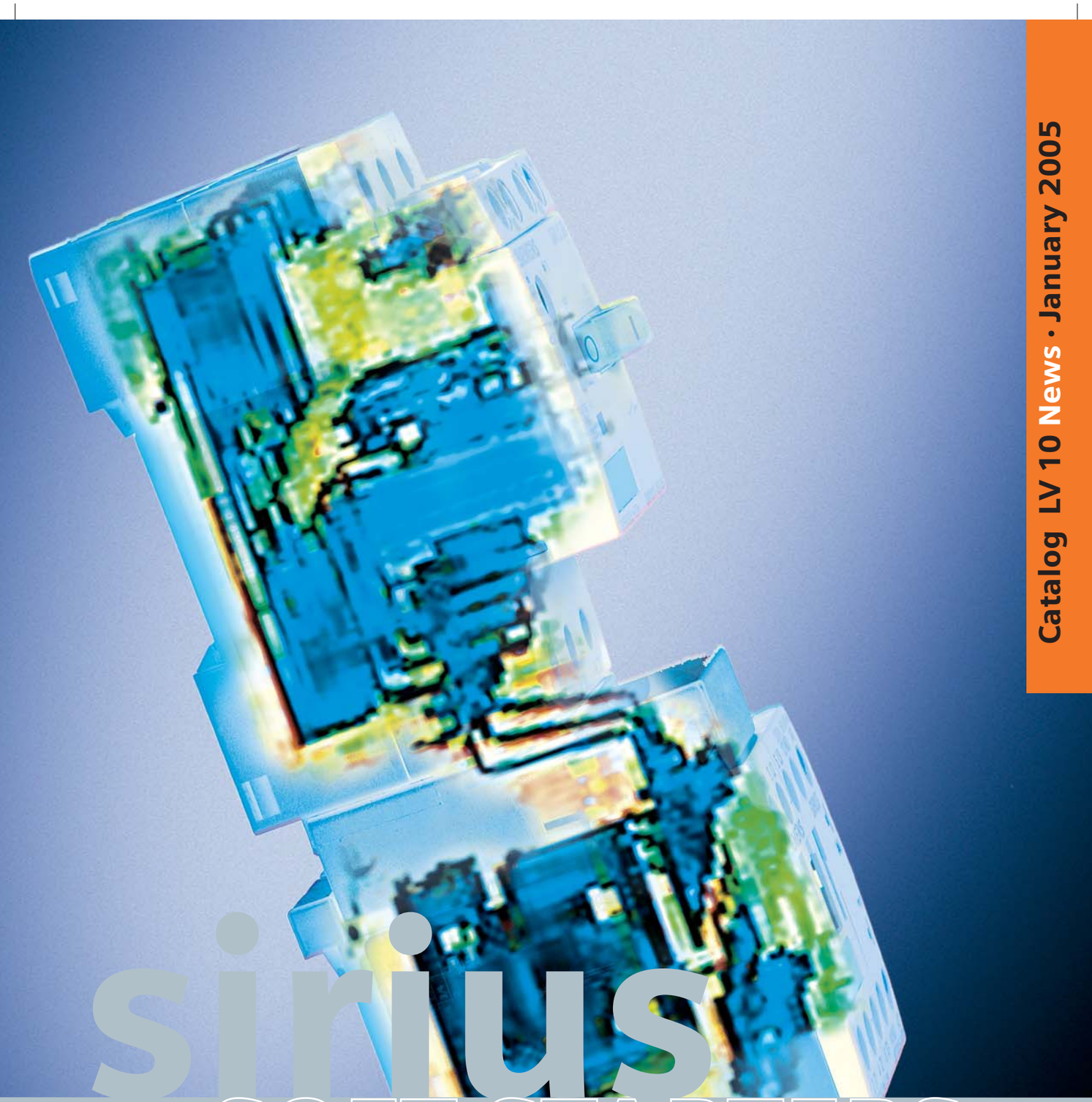


Catalog LV 10 News · January 2005

sirius

SOFT STARTERS

3RW40
3RW44

SIEMENS

Related catalogs

Contents

Low-Voltage
Controlgear for Industry
Order No.:
E86060-K1002-A101-A4-7600
LV 10

Contactors and contactor assemblies • Semiconductor controlgear, soft starters, controllers • Circuit-breakers • Overload relays • Load feeders • Switch disconnectors and fuses • SIMIREL time, monitoring, coupling relays and converters • Control and signaling devices • BETA electrical installation technology: Selected products • SIGUARD safety systems • SIDAC-T transformers • SIDAC-S power supplies • ALPHA FIX terminal blocks

Power Distribution
Products and Systems for Power Distribution
Order No.:
E86060-K1801-A101-A4-7600
LV 30

BETA protect installation equipment • Communication-BETA protect installation equipment • Communication-capable circuit-breakers • Compact circuit-breakers (MCCB) • Open-type circuit-breakers (ACB) • SENTRON switch disconnectors and fuse switch disconnectors • Switchgear, distribution systems and cabinets

Industrial Communication
Industrial Communication for Automation and Drives
Order No.:
E86060-K6710-A101-B4-7600
IK PI

Industrial Ethernet to IEEE 802.3 • PROFINET • IEEE 802.3 • PROFIBUS to IEC 61158/EN 50170 • ET 200 distributed I/O • AS-Interface • Remote operation with SINAUT ST7 • Routers • ECOFAST system

Sensor Technology
Factory Automation Sensors
Order No.:
E86060-K8310-A101-A1-7600
FS 10

BERO proximity switches • SIGUARD optical safety sensors • MOBY identification systems • SIMATIC Machine Vision

Automation & Drives
The offline A&D Mall
Order No.:
E86060-D4001-A110-C3-7600
CA 01

All the products from Automation and Drives including the products from the catalogs listed above.

A&D Mall

Internet:
http://www.siemens.com/automation/mall

All the products from Automation and Drives including the products from the catalogs listed above.

Registered trademarks

Further information about low-voltage controlgear is available on the Internet at:

http://www.siemens.com/lowvoltage

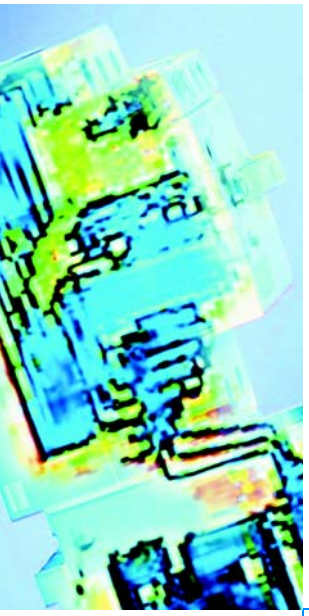
Technical Assistance

Tel.: +49 (0)911 895 59 00
Fax: +49 (0)911 895 59 07

Email: technical-assistance@siemens.com

Controlgear for Industry

Catalog LV 10 News
Soft Starters · 01/2005



The products in this catalog are also included in the CD-ROM Catalog CA 01
Order No.:
E86060-D4001-A110-C3-7600

Please contact your local Siemens office

IQNet
THE INTERNATIONAL CERTIFICATION NETWORK

The products and systems listed in this catalog are manufactured using a certified quality management system which complies with DIN EN ISO 9001 (Certificate Register Nos. can be found in the appendix). The certificates are recognized in all IQ Net countries.

SIEMENS

Explanations

Delivery times (DT)

►	Preferred type
A	2 working days
B	1 week
C	3 weeks
D	6 weeks
X	On request

Preferred types are available immediately from stock, i.e. are dispatched within 24 hours.

Normal quantities of the products are usually delivered within the specified time following receipt of your order at our branch.

In exceptional cases, the actual delivery period may differ from that specified.

The delivery periods apply up to the ramp at Siemens AG (products ready for dispatch). The transport times depend on the destination and type of shipping. The standard transport time for Germany is 1 day.

The delivery times specified here represent the state of 10/2004. They are permanently optimized. Up-to-date information can be found at http://www.siemens.com/automation/mall.

Note: With the SIDAC-T transformers, the delivery time class B applies to a maximum ordering quantity of 5 items. Delivery time class C applies instead of delivery time class B to an ordering quantity of more than 5 items.

Price units (PU)

The price unit defines the number of items, sets or meters to which the specified price and weight apply.

Packaging size (PS)

The packaging size defines the number, e.g. of items, sets or meters, for outer packaging.

Only the quantity defined by the packaging size or a multiple thereof can be ordered!

For multi-unit packaging and recyclable packaging, Catalog LV 10 · 2004, Appendix.

Price group (PG)

Each product is assigned to a price group.

Weight

The defined weight in kg refers to the price unit (PU).

Dimensions

All dimensions in mm.

Switching Devices: Soft Starters, Semiconductor Switching Devices, Control Devices, AS-Interface

3

Introduction

Overview

Products at a glance

3RW30/3RW31

3RW40

3RW44

		Order No.	Page
SIRIUS soft starters			
for standard applications			
SIRIUS 3RW30 soft starters	• SIRIUS 3RW30/31 soft starters for soft starting and smooth ramp-down of three-phase asynchronous motors • Rating range of up to 55 kW (at 400 V) • Application areas: - Fans - Pumps - Building/construction machines - Presses - Escalators - Transport systems - Air conditioning systems - Ventilators - Assembly lines - Compressors and coolers - Operating mechanisms	3RW30, 3RW31	See LV 10 · 2004, page 3/40 ... 3/52
SIRIUS 3RW40 soft starters	• SIRIUS 3RW40 soft starters with the integral functions - solid-state motor overload and intrinsic device protection and - adjustable current limiting for the soft starting and stopping of three-phase asynchronous motors • Rating range from 75 to 250 kW (at 400 V) • Application areas: - Fans - Pumps - Building/construction machines - Presses - Escalators - Transport systems - Air conditioning systems - Ventilators - Assembly lines - Compressors and coolers - Operating mechanisms	3RW40	3/4
for High Feature applications			
SIRIUS 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 • Rating range - up to 710 kW (at 400 V) in inline circuit and - up to 1200 kW (at 400 V) in inside-delta circuit • Application areas - Pumps - Ventilators - Compressors - Cooling systems - Industrial refrigerating systems - Water transport - Conveying systems - Hydraulics - Machine tools - Mills	3RW44	3/6

Overview

The advantages of the SIRIUS soft starters at a glance:

- Soft starting and smooth ramp-down [1)]
- 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
- Fits perfectly in the SIRIUS modular system

		SIRIUS 3RW30/31 Standard applications	SIRIUS 3RW40	SIRIUS 3RW44 High Feature applications
Rated current at 40 °C	A	3 ... 100	134 ... 432	29 ... 1214
Rated operating voltage	V	200 ... 575	200 ... 600	200 ... 1000
Motor rating at 400 V				
• Inline circuit	kW	1.1 ... 55	75 ... 250	15 ... 710
• Inside-delta circuit	kW	–	–	22 ... 1200
Temperature range	°C	-25 ... +60	-25 ... +60	0 ... +60
Soft starting/ramp-down		✔ [1)]	✔	✔
Voltage ramp		✔	✔	✔
Starting/stopping voltage	%	40 ... 100	40 ... 100	20 ... 100
Starting and ramp-down time	s	0 ... 20	0 ... 20	1 ... 360
Torque control		–	–	✔
Starting/stopping torque	%	–	–	20 ... 100
Torque limit	%	–	–	20 ... 200
Ramp time	s	–	–	1 ... 360
Integral bypass contact system		✔ [2)]	✔	✔
Intrinsic device protection		–	✔	✔
Motor overload protection		–	✔	✔
Thermistor motor protection		–	–	✔
Adjustable current limiting		–	✔	✔
Inside-delta circuit		–	–	✔
Breakaway pulse		–	–	✔
Creep speed in both directions		–	–	✔
Pump ramp-down		–	–	✔ [7)]
DC braking		–	–	✔ [3) 7)]
Combined braking		–	–	✔ [3) 7)]
Motor heating		–	–	✔ [4)]
Communication		–	–	with PROFIBUS DP [4)] (option)
External display and operator module		–	–	(option [4)])
Operating measured value display		–	–	✔
Error logbook		–	–	✔ [4)]
Event list		–	–	✔ [4)]
Slave pointer function		–	–	✔ [4)]
Trace function		–	–	✔ [5)]
Programmable control inputs and outputs		–	–	✔
Number of parameter sets		1 (2 with 3RW31)	1	3
Parameterization software (Softstarter ES)		–	–	✔ [4)]
Power semiconductors (thyristors)		2 controlled phases	2 controlled phases	3 controlled phases
Spring-loaded terminals		✔ (only 3RW30 03)	✔	✔
Screw terminals		✔	✔	✔
UL/CSA		✔ [6)]	✔	✔
CE marking		✔	✔	✔
Soft starting under heavy starting conditions		–	–	✔ [7)]
Configuring support		Win-SOFTSTARTER, the electronic selection slide, Technical Assistance +49 (0)911 89 55 900		

✔ Function is available
– Function not available

1) Only smooth starting available for 3RW31.
2) Not available for 3RW30 03.
3) Not possible in inside-delta circuit.
4) Start of delivery 3rd quarter 2005.
5) Trace function with Softstarter ES software.
6) For 3RW30 03 up to 230 V.
7) Calculate soft starter and motor with size allowance where required.

You can find further information on the Internet at:
http://www.siemens.com/sanftstarter

SIRIUS 3RW40 soft starters

Overview

SIRIUS 3RW40

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30/31 soft starters. At the same time they come with additional functions, e.g. solid-state motor overload and intrinsic device protection and adjustable current limiting, as well as a two-phase control method (Polarity Balancing) that is unique in this rating range.

SIRIUS 3RW40 soft starters are part of the SIRIUS modular system. This results in advantages such as identical sizes and a uniform connection system. Thanks to their particularly compact design, SIRIUS 3RW40 soft starters are only half as big as comparable star-delta starters. Hence they can be mounted in minimum space in the control cabinet. Configuring and installing are carried out quickly and easily thanks to the 3-wire connection.

SIRIUS 3RW40 for three-phase motors

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

Area of application

The SIRIUS 3RW40 solid-state soft starters are suitable for 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 star-delta starters.

Application areas

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines
- Compressors and coolers
- Operating mechanisms

Selection and ordering data

3RW40 56-6BB44

3RW40 76-6BB44

Ambient temperature 40 °C				Ambient temperature 50 °C					Size	DT	Order No.	Price per PU	PU (item, set, meter)	PS*	PG	Approx. weight per PU
Rated operating current I_e	Rated output of three-phase induction motors for rated operating voltage U_e			Rated operating current I_e	Rated output of three-phase induction motors for rated operating voltage U_e											
	230 V	400 V	500 V		200 V	230 V	460 V	575 V								
A	kW	kW	kW	A	hp	hp	hp	hp								kg
Inline circuit, rated operating voltage 200 ... 460 V [1]																
134	37	**75**	–	117	30	40	**75**	–	S6	B	**3RW40 55-□BB□4**		1	1 item	131	5.700
162	45	**90**	–	145	40	50	**100**	–		B	**3RW40 56-□BB□4**		1	1 item	131	5.700
230	75	**132**	–	205	60	75	**150**	–	S12	B	**3RW40 73-□BB□4**		1	1 item	131	7.000
280	90	**160**	–	248	75	100	**200**	–		B	**3RW40 74-□BB□4**		1	1 item	131	7.000
356	110	**200**	–	315	100	125	**250**	–		B	**3RW40 75-□BB□4**		1	1 item	131	7.000
432	132	**250**	–	385	125	150	**300**	–		B	**3RW40 76-□BB□4**		1	1 item	131	7.000
Inline circuit, rated operating voltage 400 ... 600 V [2]																
134	–	75	**90**	117	–	–	75	**100**	S6	B	**3RW40 55-□BB□5**		1	1 item	131	5.700
162	–	90	**110**	145	–	–	100	**150**		B	**3RW40 56-□BB□5**		1	1 item	131	5.700
230	–	132	**160**	205	–	–	150	**200**	S12	B	**3RW40 73-□BB□5**		1	1 item	131	7.000
280	–	160	**200**	248	–	–	200	**250**		B	**3RW40 74-□BB□5**		1	1 item	131	7.000
356	–	200	**250**	315	–	–	250	**300**		B	**3RW40 75-□BB□5**		1	1 item	131	7.000
432	–	250	**315**	385	–	–	300	**400**		B	**3RW40 76-□BB□5**		1	1 item	131	7.000

Order No. extension for connection method

- with spring-loaded terminals **2**
- with screw-type terminals **6**

Order No. extension for the rated control supply voltage U_s [3]

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

1) Soft starter with screw-type terminals: Delivery time class ▶(preferred type).

2) Soft starter with screw-type terminals: Delivery time class A.

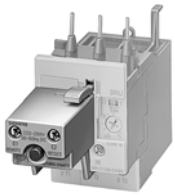
3) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

Selection of the soft starter depends on the motor's rated current.

The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-SOFTSTARTER. See technical information for information about rated currents for ambient temperatures > 40 °C.

*** This quantity or a multiple thereof can be ordered.**

Accessories

	For soft starters Type	Size	Design	DT	Order No.	Price per PU	PU (item, set, meter)	PS*	PG	Approx. weight per PU kg
Box terminal block for soft starters										
	**for round and ribbon cables**									
	3RW40 5.	S6	• up to 70 mm²	▶	**3RT19 55-4G**		1	1 item	101	0.237
			• up to 120 mm²	▶	**3RT19 56-4G**		1	1 item	101	0.270
	3RW40 7.	S12	• up to 240 mm²	▶	**3RT19 66-4G**		1	1 item	101	0.676
Covers for soft starters										
	**Terminal cover for box terminals**									
	additional touch protection to be fitted at the box terminals (2 items required per device)									
	3RW40 5.	S6		▶	**3RT19 56-4EA2**		1	1 item	101	0.028
	3RW40 7.	S12		▶	**3RT19 66-4EA2**		1	1 item	101	0.038
	Terminal cover for cable lug and busbar connection									
	3RW40 5.	S6		▶	**3RT19 56-4EA1**		1	1 item	101	0.067
	3RW40 7.	S12		▶	**3RT19 66-4EA1**		1	1 item	101	0.124
	**Sealing cover**									
	3RW40 5. and 3RW40 7.	S6, S12		▶	**3RW49 00-0PB00**		1	1 item	131	0.010
Modules for RESET										
	**Module for remote RESET, electrical**									
	Working range 0.85 ... 1.1 x U_s, power consumption AC 80 VA, DC 70 W, ON period 0.2 s ... 4 s, operating frequency 60/h									
	3RW40 5. and 3RW40 7.	S6, S12	• 24 V ... 30 V AC/DC	▶	**3RU19 00-2AB71**		1	1 item	101	0.066
			• 110 V ... 127 V AC/DC	▶	**3RU19 00-2AF71**		1	1 item	101	0.067
			• 220 V ... 250 V AC/DC	▶	**3RU19 00-2AM71**		1	1 item	101	0.066
	**Mechanical RESET comprising**									
	3RW40 5. and 3RW40 7.	S6, S12	• Resetting plunger, holder and former	▶	**3RU19 00-1A**		1	1 set	101	0.038
			• Suitable pushbutton IP65, Ø 22 mm, 12 mm stroke	B	**3SB30 00-0EA11**		1	1 item	102	0.021
			• Extension plunger	A	**3SX13 35**		1	1 item	102	0.004
	**Cable release with holder for RESET**									
	For Ø 6.5 mm holes in the control panel; max. control panel thickness 8 mm									
	3RW40 5. and 3RW40 7.	S6, S12	• Length 400 mm	▶	**3RU19 00-1B**		1	1 item	101	0.063
			• Length 600 mm	▶	**3RU19 00-1C**		1	1 item	101	0.073

Components

	For soft starters Type	Size	Design Rated control supply voltage U_s	DT	Order No.	Price per PU	PU (item, set, meter)	PS*	PG	Approx. weight per PU kg
Fans										
	**Fans for SIRIUS 3RW40 soft starters**									
	maximum 1 item per 3RW40 soft starter required									
	3RW40 5.-.BB3.	S6	115 V AC	▶	**3RW49 36-8VX30**		1	1 item	131	0.300
	3RW40 5.-.BB4.	S6	230 V AC	▶	**3RW49 36-8VX40**		1	1 item	131	0.300
	3RW40 7.-.BB3.	S12	115 V AC	▶	**3RW49 47-8VX30**		1	1 item	131	0.600
	3RW40 7.-.BB4.	S12	230 V AC	▶	**3RW49 47-8VX40**		1	1 item	131	0.500

*** This quantity or a multiple thereof can be ordered.**

SIRIUS 3RW44 soft starters

Overview

SIRIUS 3RW44

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 rating range up to 710 kW (at 400 V) in the inline circuit and up to 1200 kW (at 400 V) in the inside-delta circuit.

The SIRIUS 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 controlgear 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.

Combinations of various starting, operating and ramp-down possibilities ensure an optimum adaptation to the application-specific requirements. Operating and commissioning can be performed by means of the user-friendly keypad and a menu-prompted, multi-line graphic display with background lighting. The optimized motor ramp-up and ramp-down can be effected by means of just a few settings with a previously selected language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation.

Applicable standards

- IEC 60947-4-2
- UL/CSA

Area of application

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

Application areas, e.g.

- Pumps
- Ventilators
- Compressors
- Water transport
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills
- Saws
- Breakers
- Mixers
- Centrifuges
- Industrial cooling and refrigerating systems

Selection and ordering data

3RW44 27-1BC44

3RW44 36-6BC44

3RW44 47-6BC44

Ambient temperature 40 °C						Ambient temperature 50 °C					DT	Order No.	Price per PU	PU (item, set, meter)	PS*	PG	Approx. weight per PU
Rated operating current I_e	Rated output of three-phase induction motors for rated operating voltage U_e					Rated operating current I_e	Rated output of three-phase induction motors for rated operating voltage U_e										
	230 V	400 V	500 V	690 V	1000 V		200 V	230 V	460 V	575 V							
A	kW	kW	kW	kW	kW	A	hp	hp	hp	hp							kg
Inline circuit, rated operating voltage 200 ... 400 V [1]																	
29	5.5	**15**	–	–	–	26	7.5	7.5	**15**	–	B	**3RW44 22-□BC□4**		1	1 item	131	4.900
36	7.5	**18.5**	–	–	–	32	10	10	**20**	–	B	**3RW44 23-□BC□4**		1	1 item	131	4.900
47	11	**22**	–	–	–	42	10	15	**25**	–	B	**3RW44 24-□BC□4**		1	1 item	131	4.900
57	15	**30**	–	–	–	51	15	15	**30**	–	B	**3RW44 25-□BC□4**		1	1 item	131	4.900
77	18.5	**37**	–	–	–	68	20	20	**50**	–	B	**3RW44 26-□BC□4**		1	1 item	131	4.900
93	22	**45**	–	–	–	82	25	25	**60**	–	B	**3RW44 27-□BC□4**		1	1 item	131	4.900
Order No. extension for connection method																	
• with spring-loaded terminals												**3**					
• with screw-type terminals												**1**					
113	30	**55**	–	–	–	100	30	30	**75**	–	B	**3RW44 34-□BC□4**		1	1 item	131	7.900
134	37	**75**	–	–	–	117	30	40	**75**	–	B	**3RW44 35-□BC□4**		1	1 item	131	7.900
162	45	**90**	–	–	–	145	40	50	**100**	–	B	**3RW44 36-□BC□4**		1	1 item	131	7.900
203	55	**110**	–	–	–	180	50	60	**125**	–	B	**3RW44 43-□BC□4**		1	1 item	131	10.300
250	75	**132**	–	–	–	215	60	75	**150**	–	B	**3RW44 44-□BC□4**		1	1 item	131	10.300
313	90	**160**	–	–	–	280	75	100	**200**	–	B	**3RW44 45-□BC□4**		1	1 item	131	10.300
356	110	**200**	–	–	–	315	100	125	**250**	–	B	**3RW44 46-□BC□4**		1	1 item	131	10.300
432	132	**250**	–	–	–	385	125	150	**300**	–	B	**3RW44 47-□BC□4**		1	1 item	131	10.300
Order No. extension for connection method																	
• with spring-loaded terminals												**2**					
• with screw-type terminals												**6**					
Inline circuit, rated operating voltage 400 ... 600 V [2]																	
29	–	15	**18.5**	–	–	26	–	–	15	**20**	B	**3RW44 22-□BC□5**		1	1 item	131	4.900
36	–	18.5	**22**	–	–	32	–	–	20	**25**	B	**3RW44 23-□BC□5**		1	1 item	131	4.900
47	–	22	**30**	–	–	42	–	–	25	**30**	B	**3RW44 24-□BC□5**		1	1 item	131	4.900
57	–	30	**37**	–	–	51	–	–	30	**40**	B	**3RW44 25-□BC□5**		1	1 item	131	4.900
77	–	37	**45**	–	–	68	–	–	50	**50**	B	**3RW44 26-□BC□5**		1	1 item	131	4.900
93	–	45	**55**	–	–	82	–	–	60	**75**	B	**3RW44 27-□BC□5**		1	1 item	131	4.900
Order No. extension for connection method																	
• with spring-loaded terminals												**3**					
• with screw-type terminals												**1**					
113	–	55	**75**	–	–	100	–	–	75	**75**	B	**3RW44 34-□BC□5**		1	1 item	131	7.900
134	–	75	**90**	–	–	117	–	–	75	**100**	B	**3RW44 35-□BC□5**		1	1 item	131	7.900
162	–	90	**110**	–	–	145	–	–	100	**125**	B	**3RW44 36-□BC□5**		1	1 item	131	7.900
203	–	110	**132**	–	–	180	–	–	125	**150**	B	**3RW44 43-□BC□5**		1	1 item	131	10.300
250	–	132	**160**	–	–	215	–	–	150	**200**	B	**3RW44 44-□BC□5**		1	1 item	131	10.300
313	–	160	**200**	–	–	280	–	–	200	**250**	B	**3RW44 45-□BC□5**		1	1 item	131	10.300
356	–	200	**250**	–	–	315	–	–	250	**300**	B	**3RW44 46-□BC□5**		1	1 item	131	10.300
432	–	250	**315**	–	–	385	–	–	300	**400**	B	**3RW44 47-□BC□5**		1	1 item	131	10.300
Order No. extension for connection method																	
• with spring-loaded terminals												**2**					
• with screw-type terminals												**6**					
Order No. extension for the rated control supply voltage U_s [3]																	
• 115 V AC												**3**					
• 230 V AC												**4**					

1) Soft starter with screw-type terminals: Delivery time class ▶ (preferred type).

2) Soft starter with screw-type terminals: Delivery time class A.

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

Soft starter selection depends on the motor's rated current.

The 3RW44 solid-state soft starters are designed for normal starting (class 10). (Inertia load of the overall operating mechanism J_{Load} < 10 x J_{Motor}; starting current 350 % x I_e for 20 s or similar load.) For any other conditions of use, the devices should be selected using the selection and simulation program Win-SOFTSTARTER. See technical specifications for information about rated currents for ambient temperatures > 40 °C and operating frequency.

*** This quantity or a multiple thereof can be ordered.**

SIRIUS 3RW44 soft starters

Ambient temperature 40 °C						Ambient temperature 50 °C					DT	Order No.	Price per PU	PU (item, set, meter)	PS*	PG	Approx. weight per PU
Rated operating current I_e	Rated output of three-phase induction motors for rated operating voltage U_e					Rated operating current I_e	Rated output of three-phase induction motors for rated operating voltage U_e										
	230 V	400 V	500 V	690 V	1000 V		200 V	230 V	460 V	575 V							
A	kW	kW	kW	kW	kW	A	hp	hp	hp	hp							kg
Inline circuit, rated operating voltage 400 ... 690 V																	
29	–	15	18.5	**30**	–	26	–	–	15	**20**	B	**3RW44 22-□BC□6**		1	1 item	131	4.900
36	–	18.5	22	**37**	–	32	–	–	20	**25**	B	**3RW44 23-□BC□6**		1	1 item	131	4.900
47	–	22	30	**45**	–	42	–	–	25	**30**	B	**3RW44 24-□BC□6**		1	1 item	131	4.900
57	–	30	37	**55**	–	51	–	–	30	**40**	B	**3RW44 25-□BC□6**		1	1 item	131	4.900
77	–	37	45	**75**	–	68	–	–	50	**50**	B	**3RW44 26-□BC□6**		1	1 item	131	4.900
93	–	45	55	**90**	–	82	–	–	60	**75**	B	**3RW44 27-□BC□6**		1	1 item	131	4.900
Order No. extension for connection method																	
• with spring-loaded terminals												**3**					
• with screw-type terminals												**1**					
113	–	55	75	**110**	–	100	–	–	75	**75**	B	**3RW44 34-□BC□6**		1	1 item	131	7.900
134	–	75	90	**132**	–	117	–	–	75	**100**	B	**3RW44 35-□BC□6**		1	1 item	131	7.900
162	–	90	110	**160**	–	145	–	–	100	**125**	B	**3RW44 36-□BC□6**		1	1 item	131	7.900
203	–	110	132	**200**	–	180	–	–	125	**150**	B	**3RW44 43-□BC□6**		1	1 item	131	10.300
250	–	132	160	**250**	–	215	–	–	150	**200**	B	**3RW44 44-□BC□6**		1	1 item	131	10.300
313	–	160	200	**315**	–	280	–	–	200	**250**	B	**3RW44 45-□BC□6**		1	1 item	131	10.300
356	–	200	250	**355**	–	315	–	–	250	**300**	B	**3RW44 46-□BC□6**		1	1 item	131	10.300
432	–	250	315	**400**	–	385	–	–	300	**400**	B	**3RW44 47-□BC□6**		1	1 item	131	10.300
Order No. extension for connection method																	
• with spring-loaded terminals												**2**					
• with screw-type terminals												**6**					
Order No. extension for the rated control supply voltage U_s 1)																	
• 115 V AC													**3**				
• 230 V AC													**4**				

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

Soft starter selection depends on the motor's rated current.

The 3RW44 solid-state soft starters are designed for normal starting (class 10). (Inertia load of the overall operating mechanism J_{Load} < 10 x J_{Motor}; starting current 350 % x I_e for 20 s or similar load.) For any other conditions of use, the devices should be selected using the selection and simulation program Win-SOFTSTARTER. See technical specifications for information about rated currents for ambient temperatures > 40 °C and operating frequency.

*** This quantity or a multiple thereof can be ordered.**

3RW44 27-1BC44

3RW44 36-6BC44

3RW44 47-6BC44

Ambient temperature 40 °C						Ambient temperature 50 °C					DT	Order No.	Price per PU	PU (item, set, meter)	PS*	PG	Approx. weight per PU
Rated operating current I_e	Rated output of three-phase induction motors for rated operating voltage U_e					Rated operating current I_e	Rated output of three-phase induction motors for rated operating voltage U_e										
	230 V	400 V	500 V	690 V	1000 V		200 V	230 V	460 V	575 V							
A	kW	kW	kW	kW	kW	A	hp	hp	hp	hp							kg
Inside-delta circuit, rated operating voltage 200 ... 400 V [1]																	
50	15	**22**	–	–	–	45	10	**15**	–	–	B	**3RW44 22-□BC□4**		1	1 item	131	4.900
62	18.5	**30**	–	–	–	55	15	**20**	–	–	B	**3RW44 23-□BC□4**		1	1 item	131	4.900
81	22	**45**	–	–	–	73	20	**25**	–	–	B	**3RW44 24-□BC□4**		1	1 item	131	4.900
99	30	**55**	–	–	–	88	25	**30**	–	–	B	**3RW44 25-□BC□4**		1	1 item	131	4.900
133	37	**75**	–	–	–	118	30	**40**	–	–	B	**3RW44 26-□BC□4**		1	1 item	131	4.900
161	45	**90**	–	–	–	142	40	**50**	–	–	B	**3RW44 27-□BC□4**		1	1 item	131	4.900
Order No. extension for connection method																	
• with spring-loaded terminals												**3**					
• with screw-type terminals												**1**					
196	55	**110**	–	–	–	173	50	**60**	–	–	B	**3RW44 34-□BC□4**		1	1 item	131	7.900
232	75	**132**	–	–	–	203	60	**75**	–	–	B	**3RW44 35-□BC□4**		1	1 item	131	7.900
281	90	**160**	–	–	–	251	75	**100**	–	–	B	**3RW44 36-□BC□4**		1	1 item	131	7.900
352	110	**200**	–	–	–	312	100	**125**	–	–	B	**3RW44 43-□BC□4**		1	1 item	131	10.300
433	132	**250**	–	–	–	372	125	**150**	–	–	B	**3RW44 44-□BC□4**		1	1 item	131	10.300
542	160	**315**	–	–	–	485	150	**200**	–	–	B	**3RW44 45-□BC□4**		1	1 item	131	10.300
617	200	**355**	–	–	–	546	150	**200**	–	–	B	**3RW44 46-□BC□4**		1	1 item	131	10.300
748	250	**400**	–	–	–	667	200	**250**	–	–	B	**3RW44 47-□BC□4**		1	1 item	131	10.300
Order No. extension for connection method																	
• with spring-loaded terminals												**2**					
• with screw-type terminals												**6**					
Inside-delta circuit, rated operating voltage 400 ... 600 V [2]																	
50	–	22	**30**	–	–	45	–	–	30	**40**	B	**3RW44 22-□BC□5**		1	1 item	131	4.900
62	–	30	**37**	–	–	55	–	–	40	**50**	B	**3RW44 23-□BC□5**		1	1 item	131	4.900
81	–	45	**45**	–	–	73	–	–	50	**60**	B	**3RW44 24-□BC□5**		1	1 item	131	4.900
99	–	55	**55**	–	–	88	–	–	60	**75**	B	**3RW44 25-□BC□5**		1	1 item	131	4.900
133	–	75	**90**	–	–	118	–	–	75	**100**	B	**3RW44 26-□BC□5**		1	1 item	131	4.900
161	–	90	**110**	–	–	142	–	–	100	**125**	B	**3RW44 27-□BC□5**		1	1 item	131	4.900
Order No. extension for connection method																	
• with spring-loaded terminals												**3**					
• with screw-type terminals												**1**					
196	–	110	**132**	–	–	173	–	–	125	**150**	B	**3RW44 34-□BC□5**		1	1 item	131	7.900
232	–	132	**160**	–	–	203	–	–	150	**200**	B	**3RW44 35-□BC□5**		1	1 item	131	7.900
281	–	160	**200**	–	–	251	–	–	200	**250**	B	**3RW44 36-□BC□5**		1	1 item	131	7.900
352	–	200	**250**	–	–	312	–	–	250	**300**	B	**3RW44 43-□BC□5**		1	1 item	131	10.300
433	–	250	**315**	–	–	372	–	–	300	**350**	B	**3RW44 44-□BC□5**		1	1 item	131	10.300
542	–	315	**355**	–	–	485	–	–	400	**500**	B	**3RW44 45-□BC□5**		1	1 item	131	10.300
617	–	355	**450**	–	–	546	–	–	450	**600**	B	**3RW44 46-□BC□5**		1	1 item	131	10.300
748	–	400	**500**	–	–	667	–	–	600	**750**	B	**3RW44 47-□BC□5**		1	1 item	131	10.300
Order No. extension for connection method																	
• with spring-loaded terminals												**2**					
• with screw-type terminals												**6**					
Order No. extension for the rated control supply voltage U_s [3]																	
• 115 V AC												**3**					
• 230 V AC												**4**					

1) Soft starter with screw-type terminals: Delivery time class ▶ (preferred type).

2) Soft starter with screw-type terminals: Delivery time class A.

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

Soft starter selection depends on the motor's rated current.

The 3RW44 solid-state soft starters are designed for normal starting (class 10). (Inertia load of the overall operating mechanism J_{Load} < 10 x J_{Motor}; starting current 350 % x I_e for 20 s or similar load.) For any other conditions of use, the devices should be selected using the selection and simulation program Win-SOFTSTARTER. See technical specifications for information about rated currents for ambient temperatures > 40 °C and operating frequency.

*** This quantity or a multiple thereof can be ordered.**

SIRIUS 3RW44 soft starters

Ambient temperature 40 °C						Ambient temperature 50 °C					DT	Order No.	Price per PU	PU (item, set, meter)	PS*	PG	Approx. weight per PU
Rated operating current I_e	Rated output of three-phase induction motors for rated operating voltage U_e					Rated operating current I_e	Rated output of three-phase induction motors for rated operating voltage U_e										
	230 V	400 V	500 V	690 V	1000 V		200 V	230 V	460 V	575 V							
A	kW	kW	kW	kW	kW	A	hp	hp	hp	hp							kg
Inside-delta circuit, rated operating voltage 400 ... 600 V																	
50	–	22	30	–	–	45	–	–	30	**40**	B	**3RW44 22-□BC□6**		1	1 item	131	4.900
62	–	30	37	–	–	55	–	–	40	**50**	B	**3RW44 23-□BC□6**		1	1 item	131	4.900
81	–	45	45	–	–	73	–	–	50	**60**	B	**3RW44 24-□BC□6**		1	1 item	131	4.900
99	–	55	55	–	–	88	–	–	60	**75**	B	**3RW44 25-□BC□6**		1	1 item	131	4.900
133	–	75	90	–	–	118	–	–	75	**100**	B	**3RW44 26-□BC□6**		1	1 item	131	4.900
161	–	90	110	–	–	142	–	–	100	**125**	B	**3RW44 27-□BC□6**		1	1 item	131	4.900
Order No. extension for connection method																	
• with spring-loaded terminals												**3**					
• with screw-type terminals												**1**					
196	–	110	132	–	–	173	–	–	125	**150**	B	**3RW44 34-□BC□6**		1	1 item	131	7.900
232	–	132	160	–	–	203	–	–	150	**200**	B	**3RW44 35-□BC□6**		1	1 item	131	7.900
281	–	160	200	–	–	251	–	–	200	**250**	B	**3RW44 36-□BC□6**		1	1 item	131	7.900
352	–	200	250	–	–	312	–	–	250	**300**	B	**3RW44 43-□BC□6**		1	1 item	131	10.300
433	–	250	315	–	–	372	–	–	300	**350**	B	**3RW44 44-□BC□6**		1	1 item	131	10.300
542	–	315	355	–	–	485	–	–	400	**500**	B	**3RW44 45-□BC□6**		1	1 item	131	10.300
617	–	355	450	–	–	546	–	–	450	**600**	B	**3RW44 46-□BC□6**		1	1 item	131	10.300
748	–	400	500	–	–	667	–	–	600	**750**	B	**3RW44 47-□BC□6**		1	1 item	131	10.300
Order No. extension for connection method																	
• with spring-loaded terminals												**2**					
• with screw-type terminals												**6**					
Order No. extension for the rated control supply voltage U_s 1)																	
• 115 V AC													**3**				
• 230 V AC													**4**				

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

Soft starter selection depends on the motor's rated current.

The 3RW44 solid-state soft starters are designed for normal starting (class 10). (Inertia load of the overall operating mechanism J_{Load} < 10 x J_{Motor}; starting current 350 % x I_e for 20 s or similar load.) For any other conditions of use, the devices should be selected using the selection and simulation program Win-SOFTSTARTER. See technical specifications for information about rated currents for ambient temperatures > 40 °C and operating frequency.

*** This quantity or a multiple thereof can be ordered.**

Accessories

	For soft starters Type	Design	DT	Order No.	Price per PU	PU (item, set, meter)	PS*	PG	Approx. weight per PU kg
Box terminal block for soft starters									
	**Box terminal block**								
	3RW44 2.	included in delivery							
	3RW44 3.	• up to 70 mm^2	▶	**3RT19 55-4G**		1	1 item	101	0.237
		• up to 120 mm^2	▶	**3RT19 56-4G**		1	1 item	101	0.270
	3RW44 3.	• up to 240 mm^2	▶	**3RT19 66-4G**		1	1 item	101	0.676
Covers for soft starters									
	**Terminal cover for box terminals**								
	additional touch protection to be fitted at the box terminals (2 items required per device)								
	3RW44 2. and 3RW44 3.		▶	**3RT19 56-4EA2**		1	1 item	101	0.028
	3RW44 4.		▶	**3RT19 66-4EA2**		1	1 item	101	0.038
	Terminal cover for cable lug and busbar connection								
	3RW44 2. and 3RW44 3.		▶	**3RT19 56-4EA1**		1	1 item	101	0.067
	3RW44 4.		▶	**3RT19 66-4EA1**		1	1 item	101	0.124

Components

	For soft starters Type	Design	DT	Order No.	Price per PU	PU (item, set, meter)	PS*	PG	Approx. weight per PU kg
Fans									
	**Fans**								
	3RW44 2. and 3RW44 3.	115 V AC	▶	**3RW49 36-8VX30**		1	1 item	131	0.300
		230 V AC	▶	**3RW49 36-8VX40**		1	1 item	131	0.300
	3RW44 4.	115 V AC	▶	**3RW49 47-8VX30**		1	1 item	131	0.500
		230 V AC	▶	**3RW49 47-8VX40**		1	1 item	131	0.500

*** This quantity or a multiple thereof can be ordered.**

SIRIUS 3RW40 soft starters

Function

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30/31 soft starters. At the same time they come with additional functions and a two-phase control method (Polarity Balancing) that is unique in the rating range up to 250 kW. Starting voltage, starting and ramp-down time of the voltage ramp and current limit are all easy to set using stepless rotary potentiometers, the same as on the SIRIUS 3RW30/31. The rated motor current, the setting of the tripping time and the resetting of the motor overload function are controlled like the SIRIUS overload relays by means of potentiometers and keys. Once again there is nothing new to get used to.

SIRIUS 3RW40 features the new, patented control method called Polarity Balancing for avoiding 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 starting operation of the motor. This phenomenon cannot be influenced, but in most applications it is non-critical. Controlling the power semi-conductors in the two controlled phases 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 %. Polarity Balancing reliably eliminates these direct current components during the starting phase. It creates a motor ramp-up that is uniform in speed, torque and current rise. As the result, the acoustic quality of the starting operation nearly attains the quality of a three-phase controlled starting operation. This is made possible by the on-going dynamic balancing of current half-waves of different polarity during the motor ramp-up.

The SIRIUS 3RW40 is 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 controlgear environment. Using a 4-step rotary potentiometer it is possible to set different overload tripping times. Thanks to the integral motor overload protection to IEC 60947-4-2 there is no need of an additional overload relay. This saves space in the control cabinet and wiring work in the feeder. Internal intrinsic device protection prevents in addition the thermal overloading of the thyristors and the power section defects this can cause.

As an option the thyristors can also be protected by SITOR semi-conductor fuses from short-circuiting. And even inrush current peaks are reliably avoided thanks to adjustable current limiting. Three LEDs are used to indicate the operating status as well as possible errors, e.g. non-permissible tripping time (CLASS setting), mains or phase failure, missing load, thermal overloading or device faults.

We supply a comprehensive range of accessories for our soft starters. Examples include box terminal blocks, accessories for mechanical reset and a module for remote reset, a sealing cover or easy-to-fit terminal covers for optimum shock-hazard protection.

- Soft starting with voltage ramp; the starting voltage adjustment range U_s is 40 to 100 % and the ramp time t_R can be set from 0 to 20 s.
- Smooth ramp-down with voltage ramp; the running down time can be set between 0 and 20 s. The switch-off voltage U_{off} is then dependent on the selected starting voltage U_s.
- Solid-state motor overload and intrinsic device protection
- Adjustable current limiting
- Integrated bypass contact system to minimize dissipated power
- Setting with three potentiometers
- Simple mounting and commissioning
- Mains voltages 50/60 Hz, 200 to 600 V
- Two control voltage versions 115 V AC and 230 V AC. Control by way of the internal 24 V DC supply and direct control by means of PLC are possible.
- Wide temperature range from -25 to +60 °C
- Built-in auxiliary contacts ensure user-friendly control and possible further processing within the system (for status graphs see page 3/21)

Technical specifications

Type				3RW40 5.		3RW40 7.	
Control electronics							
Rated values		Terminal					
Rated control supply voltage		A1/A2	V AC	115	230	115	230
• Tolerance			%	-15/+10		-15/+10	
Rated control supply current STANDBY			mA	15		15	
Rated control supply current ON [1]			mA	440	200	660	360
Rated frequency			Hz	50/60		50/60	
• Tolerance			%	±10		±10	
Control inputs							
IN				ON/OFF			
Rated operating current			mA	approx. 10 according to DIN 19240			
Rated operating voltage			V DC	24 from internal supply dc+ or external DC supply (to DIN 19240) through terminals and IN			
Relay outputs							
Output 1	ON/RUN mode [2]	13/14		Operating indication			
Output 2	BYPASSED	23/24		Bypass indication			
Output 3	OVERLOAD/ FAILURE	95/96/97		Overload/error indication			
Rated operating current			A	3 AC-15/AC-14 at 230 V 1 DC-13 at 24 V			
Rated operating voltage							
Protection against overvoltages				Protection by means of Varistor through contact			
Short-circuit protection				4 A operational class gL/gG; 6 A quick (fuse is not included in scope of supply)			

1) Values for the coil power consumption at +10 % U_n, 50 Hz.

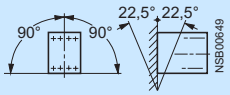
2) Factory presetting: ON mode.

Type		3RW40 ..			
Control electronics					
Operating indications	LED	**DEVICE**	**STATE/BYPASSED**	**FAILURE**	**OVERLOAD**
Off		green	off	off	off
Start		green	green flashing	off	off
Bypass		green	green	off	off
Ramp-down		green	green flashing	off	off
Alarm indications					
I_e/class setting not permissible		off	not relevant	not relevant	red flashing
Start inhibited/thyristors too hot		yellow flashing	not relevant	not relevant	off
Fault indications					
U < 0.75 x U_s or U > 1.15 x U_s		off	off	red	off
Non-permissible I_e/class setting for edge 0 –> 1		green	off	red	red flashing
Motor protection shut-down		green	off	off	red
Thermal overloading of the thyristors		yellow	off	red	off
Missing load		green	off	red	off
Device error		red	off	red	off
Protective functions					
Motor protection functions					
Trips in the event of		thermal overloading of the motor			
Trip class to IEC 60947-4-1	Class	10/15/20			
Phase loss sensitivity	%	> 40			
Overload warning		no			
Reset option after tripping		Manual/automatic (MAN/AUTO)			
Recovery time	min	5			
Device protection function					
Trips in the event of		thermal overloading of the thyristors			
Reset option after tripping		Manual/automatic (MAN/AUTO)			
Recovery time	s	30			

Type		3RW40 ..
Control times and parameters		
Control times		
Closing delay (with connected control voltage)	ms	< 50
Closing delay (automatic/mains contactor mode)	ms	< 300
Recovery time (closing command in active ramp-down)	ms	100
Mains failure bridging time		
Control supply voltage	ms	50
Mains failure response time		
Load current circuit	ms	500
Reclosing lockout after overload trip		
Motor protection trip	min	5
Device protection trip	s	30
Starting parameters		
Starting time	s	0 ... 20
Starting voltage	%	40 ... 100
Starting current limit	%	1.3 ... 5 x I_e
Ramp-down parameters		
Ramp-down time	s	0 ... 20
Reset mode parameters (for motor/device protection shut-down)		
Manual reset LED AUTO		off
Automatic reset LED AUTO		yellow
Start-up detection		yes

SIRIUS 3RW40 soft starters

3

Type		3RW40 ..-.BB4.	3RW40 ..-.BB5.
Power electronics			
Rated operating voltage for inline circuit	V AC	200 ... 460	400 ... 600
Tolerance	%	-15/+10	-15/+10
Rated frequency	Hz	50/60	
Tolerance	%	±10	
Continuous operation at 40 °C (% of I_e)	%	115	
Minimum load (% of I_e)	%	20	
Maximum conductor length between soft starter and motor	m	200	
Permissible installation height	m	2000 (derating from 1000); higher on request	
Permissible mounting position			
Permissible ambient temperature			
Operation	°C	-25 ... +60; (derating from +40)	
Storage	°C	-40 ... +80	
Degree of protection		IP00	

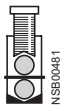
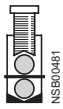
Type		3RW40 55	3RW40 56	3RW40 73	3RW40 74	3RW40 75	3RW40 76
Power electronics							
Load rating with rated operating current I_e							
Acc. to IEC and UL/CSA for individ. mounting at 40/50/60 °C, AC-53a	A	134/117/100	162/145/125	230/205/180	280/248/215	356/315/280	432/385/335
Smallest adjustable rated motor current I_M							
for the motor overload protection	A	59	87	80	130	131	207
Power loss							
At continuous rated operating current (40 °C) approx.	W	60	75	75	90	125	165
For current limiting at 350% I_M (40 °C)	W	1043	1355	2448	3257	3277	3600
Permissible rated motor current and starts per hour							
• **For normal starting (Class 10)**							
- Rated motor current I_M [1], starting time 10 s	A	134	162	230	280	356	432
- Starts per hour [2]	1/h	20	8	20	14	16	17
- Rated motor current I_M* [1] [3], starting time 20 s	A	134	162	230	280	356	432
- Starts per hour [2]	1/h	7	1.4	9	3	5	5
• **For heavy starting (Class 15)**							
- Rated motor current I_M [1], starting time 15 s	A	134	152	230	250	341	402
- Starts per hour [2]	1/h	11	8	13	12	11	12
- Rated motor current I_M* [1] [3], starting time 30 s	A	134	152	230	250	341	402
- Starts per hour [2]	1/h	1.2	1.7	5	2	1.5	2
• **For heavy starting (Class 20)**							
- Rated motor current I_M [1], starting time 20 s	A	124	142	230	230	311	372
- Starts per hour [2]	1/h	12	9		9	10	10
- Rated motor current I_M* [1] [3], starting time 40 s	A	124	142	230	230	311	372
- Starts per hour [4]	1/h	3	3	1	1	0.1	1

1) Current limit on soft starter set to 350 % I_M.

2) For intermittent duty S4 with ON period = 70 %, T_u = 40 °C, individual mounting vertical. The quoted operating frequencies do not apply for automatic mode.

3) Maximum adjustable rated motor current I_M, dependent on CLASS setting.

4) For intermittent duty S4 with ON period = 30 %, T_u = 40 °C, individual mounting vertical. The quoted operating frequencies do not apply for automatic mode.

Soft starter	Type		3RW40 5.	3RW40 7.
Conductor cross-sections				
Screw terminals	**Main conductor:**			
with box terminal			3RT19 55-4G (55 kW)	3RT19 66-4G
front clamping point connected	• finely stranded with end sleeve	mm^2	16 ... 70	70 ... 240
	• finely stranded without end sleeve	mm^2	16 ... 70	70 ... 240
	• stranded	mm^2	16 ... 70	95 ... 300
 NSB00479	• ribbon cable conductors (number x width x thickness)	mm	min. 3 x 9 x 0.8, max. 6 x 15.5 x 0.8	min. 6 x 9 x 0.8 max. 20 x 24 x 0.5
	• AWG conductor, solid or stranded	AWG	6 ... 2/0	3/0 ... 600 kcmil
rear clamping point connected	• finely stranded with end sleeve	mm^2	16 ... 70	120 ... 185
	• finely stranded without end sleeve	mm^2	16 ... 70	120 ... 185
	• stranded	mm^2	16 ... 70	120 ... 240
 NSB00480	• ribbon cable conductors (number x width x thickness)	mm	min. 3 x 9 x 0.8, max. 6 x 15.5 x 0.8	min. 6 x 9 x 0.8 max. 20 x 24 x 0.5
	• AWG conductor, solid or stranded	AWG	6 ... 2/0	250 ... 500 kcmil
both clamping points connected	• finely stranded with end sleeve	mm^2	max. 1 x 50, 1 x 70	min. 2 x 50; max. 2 x 185
	• finely stranded without end sleeve	mm^2	max. 1 x 50, 1 x 70	min. 2 x 50; max. 2 x 185
	• stranded	mm^2	max. 2 x 70	max. 2 x 70; max. 2 x 240
 NSB00481	• ribbon cable conductors (number x width x thickness)	mm	max. 2 x (6 x 15.5 x 0.8)	max. 2 x (20 x 24 x 0.5)
	• AWG conductor, solid or stranded	AWG	max. 2 x 1/0	min. 2 x 2/0; max. 2 x 500 kcmil
	• terminal screws - pickup torque		M10 (hexagon socket, A/F4) 10 ... 12 90 ... 110	M12 (hexagon socket, A/F5) 20 ... 22 180 ... 195
Screw terminals	**Main conductor:**			
with box terminal			3RT19 56-4G	
front or rear clamping point connected	• finely stranded with end sleeve	mm^2	16 ... 120	
	• finely stranded without end sleeve	mm^2	16 ... 120	
	• stranded	mm^2	16 ... 120	
 NSB00479  NSB00480	• ribbon cable conductors (number x width x thickness)	mm	min. 3 x 9 x 0.8 max. 6 x 15.5 x 0.8	
	• AWG conductor, solid or stranded	AWG	6 ... 250 kcmil	
both clamping points connected	• finely stranded with end sleeve	mm^2	max. 1 x 95, 1 x 120	
	• finely stranded without end sleeve	mm^2	max. 1 x 95, 1 x 120	
	• stranded	mm^2	max. 2 x 120	
 NSB00481	• ribbon cable conductors (number x width x thickness)	mm	max. 2 x (10 x 15.5 x 0.8)	
	• AWG conductor, solid or stranded	AWG	max. 2 x 3/0	
Screw terminals	**Main conductor:**			
	Without box terminal/rail connection			
	• finely stranded with cable lug	mm^2	16 ... 95 [1]	50 ... 240 [2]
	• stranded with cable lug	mm^2	25 ... 120 [1]	70 ... 240 [2]
	• AWG conductor, solid or stranded	AWG	4 ... 250 kcmil	2/0 ... 500 kcmil
	• connecting bar (max. width)	mm	17	25
	• terminal screws		M8 x 25 (A/F13)	M10 x 30 (A/F17)
	- Pickup torque	Nm	10 ... 14	14 ... 24
		lb.in	89 ... 124	124 ... 210

1) When connecting cable lugs to DIN 46235 use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm^2 to ensure phase spacing.

2) When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for conductor cross-sections of 240 mm^2 and more as well as DIN 46235 for conductor cross-sections of 185 mm^2 and more to keep the phase clearance.

Soft starter	Type		3RW40 ..
Conductor cross-sections			
Auxiliary conductors (1 or 2 conductors can be connected)**:**			
	Screw terminals		
	• solid	mm^2	2 x 0.5 ... 2.5
	• finely stranded with end sleeve	mm^2	2 x 0.5 ... 1.5
	• AWG cables		
	- solid or stranded	AWG	2 x 20 ... 14
	- finely stranded with end sleeve	AWG	2 x 20 ... 16
	• terminal screws		
	- pickup torque	Nm	0.7 ... 0.9
		lb.in	7 ... 8
	Spring-loaded terminals		
	• solid	mm^2	2 x 0.25 ... 2.5
	• finely stranded with end sleeve	mm^2	2 x 0.25 ... 1.5
	• AWG conductor, solid or stranded	AWG	2 x 24 ... 14

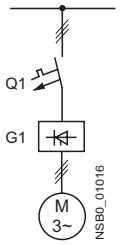
SIRIUS 3RW40 soft starters

	Standard	Parameters
Electromagnetic compatibility acc. to EN 60947-4-2		
EMC interference immunity		
Electrostatic discharge (ESD)	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 3: 10 V/m
Conducted RF interference	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
RF voltages and RF currents on conductors		
Burst	EN 61000-4-4	±2 kV/5 kHz
Surge	EN 61000-4-5	±1 kV line to line
EMC interference emission		
EMC interference field strength	EN 55011	Limit value of Class A at 30 ... 1000 MHz
Radio interference voltage	EN 55011	Limit value of Class A at 0.15 ... 30 MHz
Is an RI suppression filter necessary?		
Degree of noise suppression A (industrial applications)	no	

Fuse assignment

The coordination type to which the motor feeder with soft starter is mounted depends on the application-specific requirements. Normally, fuseless mounting is sufficient (combination of circuit-breaker + soft starter). If type 2 coordination is to be fulfilled, semiconductor fuses must be fitted in the motor feeder.

Fuseless version



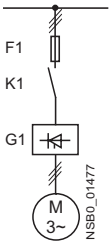
Soft starter		Circuit-breakers [1]		
	Rated current	400 V +10 %	575 V +10 %	Rated current
G1 Type	A	Q1 Type	Q1 Type	A
Type of coordination 1 [2]: I_q = 65 kA at 400 V/I_q = 35 kA at 600 V [3]				
3RW40 55	134	3VL3 720-2DC36	3VL3 720-1DC36	200
3RW40 56	162	3VL3 720-2DC36	3VL3 720-1DC36	200
3RW40 73	230	3VL4 731-2DC36	3VL5 731-3DC36	315
3RW40 74	280	3VL4 731-2DC36	3VL5 731-3DC36	315
3RW40 75	356	3VL4 740-2DC36	3VL5 740-3DC36	400
3RW40 76	432	3VL5 750-2DC36	3VL5 750-3DC36	500

1) The rated motor current must be considered when selecting the units.

2) The types of coordination are explained in more detail in catalog LV 10 · 2004, page 6/59 (Load Feeders –> Fuseless Load Feeders).

3) Except 3RW40 55: I_q = 35 kA at 400 V/I_q = 12 kA at 600 V.

Fused version (line protection only)

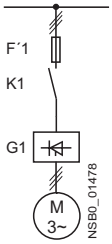


Soft starter		Line protection			Line contactor	
	Rated current		Rated current	Size	(option)	
G1 Type	A	F1 Type	A		K1 Type 115 V	Type 230 V
Type of coordination 1 [1]: I_q = 65 kA at 400/600 V						
3RW40 55	134	3NA3 244-6	250	2	3RT10 55-6AF36	3RT10 55-6AP36
3RW40 56	162	3NA3 244-6	250	2	3RT10 56-6AF36	3RT10 56-6AP36
3RW40 73	230	2 x 3NA3 354-6	2 x 355	3	3RT10 65-6AF36	3RT10 65-6AP36
3RW40 74	280	2 x 3NA3 354-6	2 x 355	3	3RT10 66-6AF36	3RT10 66-6AP36
3RW40 75	356	2 x 3NA3 365-6	2 x 500	3	3RT10 75-6AF36	3RT10 75-6AP36
3RW40 76	432	2 x 3NA3 365-6	2 x 500	3	3RT10 76-6AF36	3RT10 76-6AP36

1) The types of coordination are explained in more detail in catalog LV 10 · 2004, page 6/59 (Load Feeders –> Fuseless Load Feeders).

SIRIUS 3RW40 soft starters

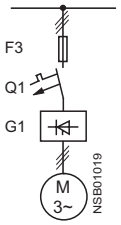
Fused version with 3NE1 SITOR fuses (semiconductor and line protection)

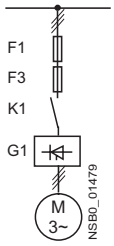


Soft starter		All-range fuse			Line contactor (option)	
	Rated current		Rated current	Size		
G1 Type	A	F'1 Type	A		K1 Type 115 V	Type 230 V
Type of coordination 2 [1]: I_q = 65 kA at 400/600 V						
3RW40 55	134	3NE1 227-2	250	1	3RT10 55-6AF36	3RT10 55-6AP36
3RW40 56	162	3NE1 227-2	250	1	3RT10 56-6AF36	3RT10 56-6AP36
3RW40 73	230	3NE1 331-2	350	2	3RT10 65-6AF36	3RT10 65-6AP36
3RW40 74	280	3NE1 333-2	450	2	3RT10 66-6AF36	3RT10 66-6AP36
3RW40 75	356	3NE1 334-2	500	2	3RT10 75-6AF36	3RT10 75-6AP36
3RW40 76	432	3NE1 435-2	560	3	3RT10 76-6AF36	3RT10 76-6AP36

1) The types of coordination are explained in more detail in catalog LV 10 · 2004, page 6/59 (Load Feeders –> Fuseless Load Feeders).

Fused version with 3NE3 SITOR fuses (semiconductor protection by fuse, lead and overload protection by circuit-breaker; alternatively, installation with contactor and overload relay possible)





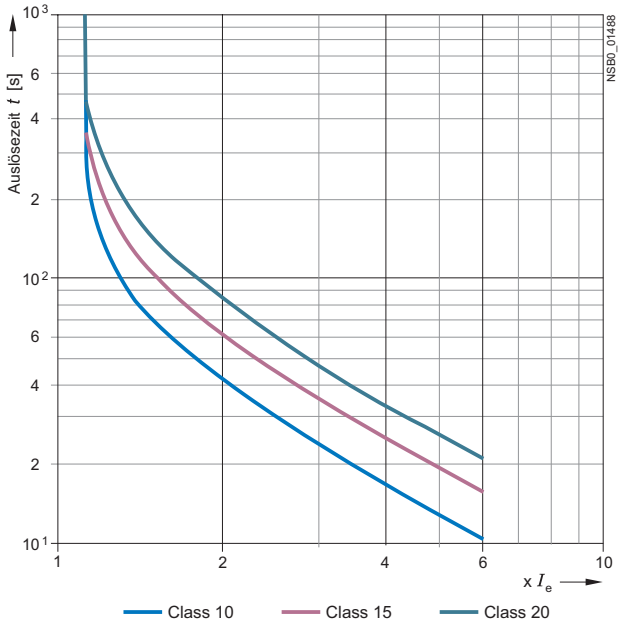
Soft starter		Semiconductor fuse, minimum			Semiconductor fuse, maximum			Line contactor (option)	
	Rated current		Rated current	Size		Rated current	Size		
G1 Type	A	F3 Type	A		F3 Type	A		K1 Type 115 V	Type 230 V
Type of coordination 2 [1]: I_q = 65 kA at 400/600 V									
3RW40 55	134	3NE3 227	250	1	3NE3 335	560	2	3RT10 55-6AF36	3RT10 55-6AP36
3RW40 56	162	3NE3 227	250	1	3NE3 335	560	2	3RT10 56-6AF36	3RT10 56-6AP36
3RW40 73	230	3NE3 232-0B	400	1	3NE3 333	450	2	3RT10 65-6AF36	3RT10 65-6AP36
3RW40 74	280	3NE3 233	450	1	3NE3 336	630	2	3RT10 66-6AF36	3RT10 66-6AP36
3RW40 75	356	3NE3 335	560	2	3NE3 336	630	2	3RT10 75-6AF36	3RT10 75-6AP36
3RW40 76	432	3NE3 337-8	710	2	3NE3 340-8	900	2	3RT10 76-6AF36	3RT10 76-6AP36

Soft starter		Circuit-breakers				Line protection		
	Rated current	400 V +10 %	Rated current	575 V +10 %	Rated current		Rated current	Size
G1 Type	A	Q1 Type	A	Q1 Type	A	F1 Type	A	
Type of coordination 2 [1]: I_q = 65 kA at 400/600 V								
3RW40 55	134	3VL3 720-2DC36	200	3VL3 720-1DC36	200	3NA3 244-6	250	2
3RW40 56	162	3VL3 720-2DC36	200	3VL3 720-1DC36	200	3NA3 244-6	250	2
3RW40 73	230	3VL4 731-2DC36	315	3VL5 731-3DC36	315	2 x 3NA3 354-6	2 x 355	3
3RW40 74	280	3VL4 731-2DC36	315	3VL5 731-3DC36	315	2 x 3NA3 354-6	2 x 355	3
3RW40 75	356	3VL4 740-2DC36	400	3VL5 740-3DC36	400	2 x 3NA3 365-6	2 x 500	3
3RW40 76	432	3VL5 750-2DC36	500	3VL5 750-3DC36	500	2 x 3NA3 365-6	2 x 500	3

1) The types of coordination are explained in more detail in catalog LV 10 · 2004, page 6/59 (Load Feeders –> Fuseless Load Feeders).

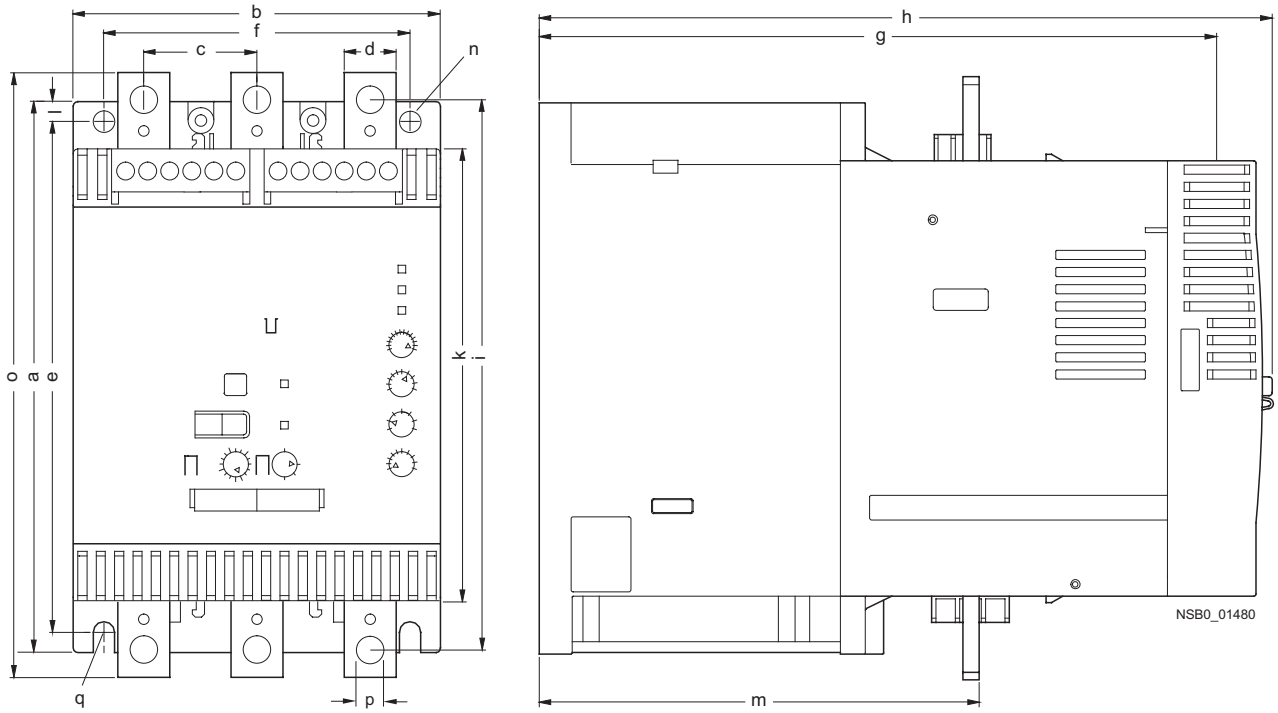
Characteristic curves

Motor protection tripping characteristic curves for 3RW40 (with symmetry)



Dimensional drawings

3RW40



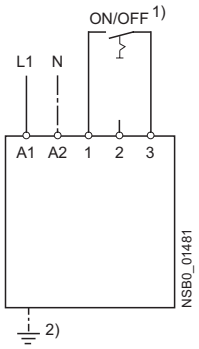
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q
3RW40 5.	180	120	37	17	167	100	223	250	180	148	6.5	153	7	198	9	M6, 10 Nm
3RW40 7.	210	160	48	25	190	140	240	278	205	166	10	166	9	230	11	M8, 15 Nm

SIRIUS 3RW40 soft starters

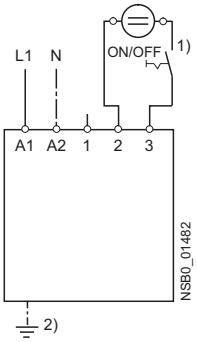
Schematics

Connection examples for control

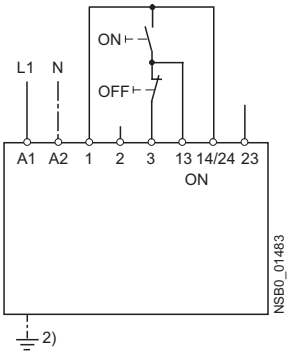
Control by means of switch through internal 24 V DC supply



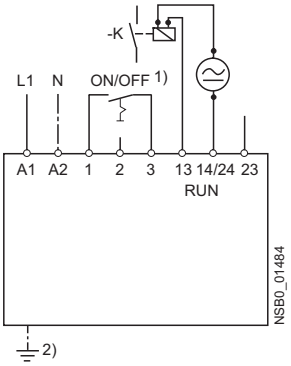
external voltage supply



Control with button

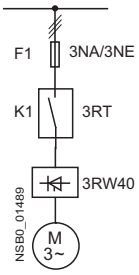


of a main contactor

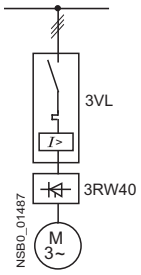


Connection examples for main circuit [3)]

3RW40 – 3-phase motor with 3NA/3NE fuse



3VL circuit-breaker



1) **Caution: Risk of restarting!**
When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 3.

2) Grounding necessary for fan connection to 3RW40 5....

3) As an alternative, the motor feeder can also be installed as a fuseless or as a fused version. Fuse and switching device coordination, see page 3/17 to page 3/18. The wiring diagrams are provided only as examples.

Further information

Configuring

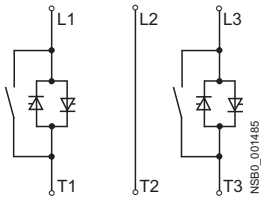
The 3RW solid-state soft starters are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the selection and simulation program Win-SOFTSTARTER (Version 2.0 or higher) can be used.

If necessary, an overload relay for heavy-starting must be selected where long starting times are involved. PTC thermistor detectors are recommended. This also applies for the soft ramp-down because during the ramp-down time an additional current loading applies in contrast to free ramp-down.

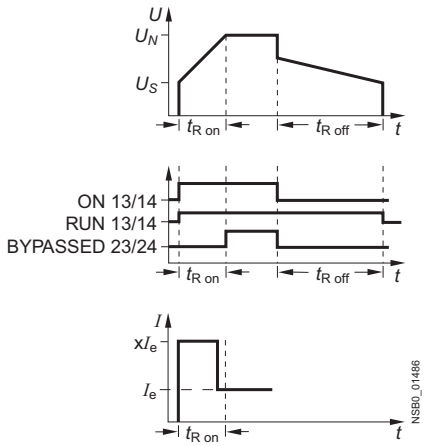
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e.g. no compensation equipment). In addition, active filters (e.g. for reactive-power compensation) must not be operated in parallel during use of the soft starter.

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

Power electronics circuit diagram



Status graphs



Win-SOFTSTARTER selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

You can order the CD-ROM under the following order number:

Order No.: E20001-D1020-P302-V2-7400.

You can find further information on the Internet at:
http://www.siemens.com/sanftstarter

SIRIUS 3RW44 soft starters

Function

Equipped with modern, ergonomic user prompting the SIRIUS 3RW44 soft starters can be commissioned quickly and easily using a keypad and a menu-prompted, multi-line 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 point guarantee full clarity at every moment of the parameterization and operation. During operation and when control voltage is applied, the front panel continuously presents measured values and operating values as well as warnings and alarm indications. An external display and operator module can be connected by means of a connecting 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 controlgear 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 work 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 semi-conductor fuses from short-circuiting. And even inrush current peaks are reliably avoided thanks to adjustable current limiting.

As a further option the SIRIUS 3RW44 soft starters can be upgraded with a PROFIBUS DP 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.

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 dissipated power
- 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: free ramp-down, torque-controlled pump stopping, combined DC braking
- Solid-state motor overload and intrinsic device protection
- Thermistor motor protection
- Keypad with a menu-controlled, 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 (start of delivery of the software: 3rd quarter 2005)
- Simple adaptation to the motor feeder
- Simple mounting and commissioning
- Display of operating states and fault signals
- Connection to PROFIBUS with optional PROFIBUS DP module (start of delivery: 3rd quarter 2005).
- External display and operator module (start of delivery: 3rd quarter 2005).
- System voltages from 200 to 1000 V, 50 to 60 Hz
- Applicable up to 60 °C (derating from 40 °C)

Technical specifications

Type	Terminal		3RW44 ..-.BC3.	3RW44 ..-.BC4.
Control electronics				
Rated values				
Rated control supply voltage	A1/A2/PE	V	AC 115	AC 230
• Tolerance		%	-15/+10	-15/+10
Rated control supply current STANDBY		mA	30	20
Rated control supply current ON				
• 3RW442.		mA	300	170
• 3RW443.		mA	500	250
• 3RW444.		mA	750	400
Maximum current (pickup bypass)				
• 3RW442.		mA	1000	500
• 3RW443.		mA	2500	1250
• 3RW444.		mA	6000	3000
Rated frequency		Hz	50 ... 60	50 ... 60
• Tolerance		%	±10	±10

Type	Terminal		3RW44 ..	Factory presetting
Control electronics				
Control inputs				
Input 1	IN1			Start motor right parameter set 1
Input 2	IN2			no action
Input 3	IN3			no action
Input 4	IN4			Trip reset
Supply	L+/L-			
• Rated operational current		mA	approx. 10 per input to DIN 19240	
• Rated operating voltage	L+		Internal voltage: 24 V DC from internal supply through terminal L+ to IN1 ... IN4. Maximum load at L+ approx. 55 mA	
	L-		External voltage: DC external voltage (to DIN 19240) through terminals L- and IN1 ... IN4 (min. 12 V DC, max. 30 V DC)	
Thermistor motor protection input				
Input	T1/T2		PTC type A or Thermoclick	deactivated
Relay outputs (floating auxiliary contacts)				
Output 1	13/14			ON period
Output 2	23/24			no action
Output 3	33/34			no action
Output 4	95/96/98			Group fault
Switching capacity of the relay outputs				
230 V/AC-15		A	3 at 240 V	
24 V/DC-13		A	1 at 24 V	
Protection against overvoltages			Protection by means of Varistor through relay contact	
Short-circuit protection			4 A operational class gL/gG; 6 A quick (fuse is not included in scope of supply)	
Protective functions				
Motor protection functions				
Trips in the event of			thermal overloading of the motor	
Trip class to IEC 60947-4-1		Class	5/10/15/20/30	10
Phase loss sensitivity		%	> 40	
Overload warning			yes	
Reset and recovery			Manual/Automatic	Manual
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	2 ... 30	2
Device protection functions				
Trips in the event of			thermal overloading of the thyristors	
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	0.5	

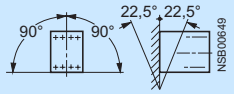
SIRIUS 3RW44 soft starters

Type		3RW44 ..	Factory presetting
Control times and parameters			
Control times			
Closing delay (with connected cotrol voltage	ms	< 50	
Closing delay (automatic mode)	ms	< 4000	
Recovery time (closing command in active ramp-down)	ms	< 100	
Mains failure bridging time			
Control supply voltage	ms	100	
Mains failure response time			
Load current circuit	ms	100	
Reclosing lockout after overload trip			
Motor protection trip	min.	1 ... 30	1
Device protection trip	min.	0.5	
Setting options for starting			
Voltage ramp for starting voltage	%	20 ... 100	40
Torque control for starting torque	%	10 ... 100	50
Torque control for limit torque	%	20 ... 200	150
Starting time	s	0 ... 360	20
Maximum starting time	s	1 ... 1000	deactivated
Current limit value	%	125 ... 550	450
Breakaway voltage	%	40 ... 100	80
Breakaway time	s	0 ... 2	deactivated
Motor heat output	%	0 ... 100	0
Creep mode Left/Right running			
Speed factor as function of rated speed ($n = n_{rated}$/factor)		3 ... 21	7
Creep torque (reference variable depends on the motor used but is always smaller than the rated torque of the motor)	%	20 ... 100	50
Setting options for ramp-down			
Torque control for stopping torque	%	10 ... 100	40
Ramp-down time	s	0 ... 360	10
Combined braking	%	20 ... 100	50
DC braking	%	20 ... 100	50
Operating indications		Test voltage Test mains phases Ready to start Start active Motor running Ramp-down active	
Warnings/error signals		Mains voltage missing Wrong direction of phase rotation Wrong start condition Phase failure • L1 • L2 • L3 Missing load phase • L1 • L2 • L3 Failure • Contact element 1 (thyristor) • Contact element 2 (thyristor) • Contact element 3 (thyristor) Flash memory faulty Power supply • below 75 % • below 85 % • over 110 % Current unbalance exceeded Thermal motor model overload Prewarning limit exceeded • Motor heating • Time-related trip reserve Bypass elements defective Mains overvoltage Current range exceeded Motor blocking - shutdown Current limit exceeded Power section overheated Power section overtemperature Temperature sensor - Overload - Wire break - Short-circuit Ground fault detected Ground fault shutdown Connection abort in manual mode	

Type	3RW44 ..	Factory presetting
Control times and parameters		
Control inputs		
Input 1		Motor right parameter set 1
Input 2		no action
Input 3		no action
Input 4		Trip reset
Parameterizing options for control inputs 1 ... 4	no action Local manual mode Creep speed Trip reset Motor right parameter set 1 Motor left parameter set 1 [1] Motor right parameter set 2 Motor left parameter set 2 [1] Motor right parameter set 3 Motor left parameter set 3 [1]	
Relay outputs		
Output 1		ON period
Output 2		no action
Output 3		no action
Output 4		Group fault
Parameterizing options for relay outputs 1 ... 3	no action PAA output 1 PAA output 2 Input 1 Input 2 Input 3 Input 4 Ramp-up Operation/Bypass Ramp-down ON period Command motor on DC braking contactor Group warning Group fault Device error Power on Ready to start	
Motor temperature sensor	deactivated Thermoclick PTC type A	deactivated

1) Parameter motor left possible only in conjunction with creep mode.

SIRIUS 3RW44 soft starters

Type		3RW44 ..-.BC.4	3RW44 ..-.BC.5	3RW44 ..-.BC.6
Power electronics				
Rated operating voltage for inline circuit	V	AC 200 ... 460	AC 400 ... 600	AC 400 ... 690
Tolerance	%	-15/+10	-15/+10	-15/+10
Rated operating voltage for inside-delta circuit	V	AC 200 ... 460	AC 400 ... 600	AC 400 ... 600
Tolerance	%	-15/+10	-15/+10	-15/+10
Rated frequency	Hz	50 ... 60		
Tolerance	%	±10		
Continuous operation at 40 °C (% of I_e)	%	115		
Minimum load (% of I_e)	%	20		
Maximum conductor length between soft starter and motor	m	200		
Permissible installation height	m	2000 (derating from 1000); higher on request		
Permissible mounting position				
Permissible ambient temperature				
Operation	°C	0 ... +60; (derating from +40)		
Storage	°C	-25 ... +80		
Degree of protection		IP00		

Type		3RW44 22	3RW44 23	3RW44 24	3RW44 25	3RW44 26	3RW44 27
Power electronics							
Rated operating current I_e		29	36	47	57	77	93
Load rating with rated operational current I_e							
• Acc. to IEC and UL/CSA for individual mounting, at 40/50/60 °C, AC-53a	A	29/26/23	36/32/29	47/42/37	57/51/45	77/68/59	98/82/72
Power loss							
• In operation after completed ramp-up with continuous rated operating current (40 °C) approx.	W	8	10	32	36	45	55
• During starting with current limit set to 350 % I_M (40 °C)	W	400	470	600	725	940	1160
Permissible rated motor current and starts per hour							
• **Normal starting (Class 5)**							
- Rated motor current I_M [1], starting time 5 s	A	29	36	47	57	77	93
- Starts per hour [2]	1/h	41	34	41	41	41	41
- Rated motor current I_M* [1) 3)], starting time 10 s	A	29	36	47	57	77	93
- Starts per hour [2]	1/h	20	15	20	20	20	20
• **Normal starting (Class 10)**							
- Rated motor current I_M [1], starting time 10 s	A	29	36	47	57	77	93
- Starts per hour [2]	1/h	20	15	20	20	20	20
- Rated motor current I_M* [1) 3)], starting time 20 s	A	29	36	47	57	77	93
- Starts per hour [2]	1/h	10	6	10	10	8	8
• **Normal starting (Class 15)**							
- Rated motor current I_M [1], starting time 15 s	A	29	36	47	57	77	93
- Starts per hour [2]	1/h	13	9	13	13	13	13
- Rated motor current I_M* [1) 3)], starting time 30 s	A	29	36	47	57	77	93
- Starts per hour [2]	1/h	6	4	6	6	6	6
• **For heavy starting (Class 20)**							
- Rated motor current I_M [1], starting time 20 s	A	29	36	47	57	73	88
- Starts per hour [2]	1/h	10	6	10	10	10	10
- Rated motor current I_M* [1) 3)], starting time 40 s	A	29	36	47	57	73	88
- Starts per hour [2]	1/h	4	2	4	5	1.8	0.8
• **For very heavy starting (Class 30)**							
- Rated motor current I_M [1], starting time 30 s	A	29	36	44	57	65	77
- Starts per hour [2]	1/h	6	4	6	6	6	6
- Rated motor current I_M* [1) 3)], starting time 60 s	A	29	36	44	57	65	77
- Starts per hour [2]	1/h	1.8	0.8	3.3	1.5	2	1
Smallest adjustable operating current I_M	A	5	7	9	11	15	18

1) Current limit on soft starter set to 350 % I_M.

2) For intermittent duty S4 with ON period = 70 %, T_u = 40 °C, individual mounting vertical. The quoted operating frequencies do not apply for automatic mode.

3) Maximum adjustable rated motor current I_M, dependent on CLASS setting.

Type		3RW44 34	3RW44 35	3RW44 36
Power electronics				
Rated operating current I_e		113	134	162
Load rating with rated operational current I_e				
• Acc. to IEC and UL/CSA for individual mounting, at 40/50/60 °C, AC-53a	A	113/100/88	134/117/100	162/145/125
Power loss				
• In operation after completed ramp-up with continuous rated operating current (40 °C) approx.	W	64	76	95
• During starting with current limit set to 350 % I_M (40 °C)	W	1350	1700	2460
Permissible rated motor current and starts per hour				
• **Normal starting (Class 5)**				
- Rated motor current I_M [1], starting time 5 s	A	113	134	162
- Starts per hour [2]	1/h	41	39	41
- Rated motor current I_M* [1] [3], starting time 10 s	A	113	134	162
- Starts per hour [2]	1/h	20	15	20
• **Normal starting (Class 10)**				
- Rated motor current I_M [1], starting time 10 s	A	113	134	162
- Starts per hour [2]	1/h	20	15	20
- Rated motor current I_M* [1] [3], starting time 20 s	A	113	134	162
- Starts per hour [2]	1/h	9	6	7
• **Normal starting (Class 15)**				
- Rated motor current I_M [1], starting time 15 s	A	113	134	162
- Starts per hour [2]	1/h	13	9	12
- Rated motor current I_M* [1] [3], starting time 30 s	A	113	134	162
- Starts per hour [2]	1/h	6	6	6
• **For heavy starting (Class 20)**				
- Rated motor current I_M [1], starting time 20 s	A	106	125	147
- Starts per hour [2]	1/h	9	9	10
- Rated motor current I_M* [1] [3], starting time 40 s	A	106	125	147
- Starts per hour [2]	1/h	1.5	2	0.5
• **For very heavy starting (Class 30)**				
- Rated motor current I_M [1], starting time 30 s	A	91	110	120
- Starts per hour [2]	1/h	6	6	6
- Rated motor current I_M* [1] [3], starting time 60 s	A	91	110	120
- Starts per hour [2]	1/h	2	2	0.5
Smallest adjustable operating current I_M	A	22	26	32

1) Current limit on soft starter set to 350 % I_M.

2) For intermittent duty S4 with ON period = 70 %, T_u = 40 °C, individual mounting vertical. The quoted operating frequencies do not apply for automatic mode.

3) Maximum adjustable rated motor current I_M, dependent on CLASS setting.

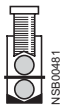
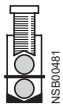
SIRIUS 3RW44 soft starters

Type		3RW44 43	3RW44 44	3RW44 45	3RW44 46	3RW44 47
Power electronics						
Rated operating current I_e		203	250	313	356	432
Load rating with rated operating current I_e						
• Acc. to IEC and UL/CSA for individual mounting, at 40/50/60 °C, AC-53a	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
Power loss						
• In operation after completed ramp-up with continuous rated operating current (40 °C) approx.	W	89	110	145	174	232
• During starting with current limit set to 350 % I_M (40 °C)	W	3350	4000	4470	5350	5860
Permissible rated motor current and starts per hour						
• **Normal starting (Class 5)**						
- Rated motor current I_M [1], starting time 5 s	A	203	250	313	356	432
- Starts per hour [2]	1/h	41	40	41	41	39
- Rated motor current I_M* [1] [3], starting time 10 s	A	203	250	313	356	432
- Starts per hour [2]	1/h	20	20	20	17	16
• **Normal starting (Class 10)**						
- Rated motor current I_M [1], starting time 10 s	A	203	250	313	356	432
- Starts per hour [2]	1/h	20	20	20	17	16
- Rated motor current I_M* [1] [3], starting time 20 s	A	203	250	313	356	432
- Starts per hour [2]	1/h	10	8	8	4	5
• **Normal starting (Class 15)**						
- Rated motor current I_M [1], starting time 15 s	A	203	240	313	325	402
- Starts per hour [2]	1/h	13	11	13	13	11
- Rated motor current I_M* [1] [3], starting time 30 s	A	203	240	313	325	402
- Starts per hour [2]	1/h	6	6	6	6	6
• **For heavy starting (Class 20)**						
- Rated motor current I_M [1], starting time 20 s	A	195	215	275	285	356
- Starts per hour [2]	1/h	10	10	10	10	10
- Rated motor current I_M* [1] [3], starting time 40 s	A	195	215	275	285	356
- Starts per hour [2]	1/h	4	1.5	3	3	1.8
• **For very heavy starting (Class 30)**						
- Rated motor current I_M [1], starting time 30 s	A	162	180	220	240	285
- Starts per hour [2]	1/h	6	6	6	6	6
- Rated motor current I_M* [1] [3], starting time 60 s	A	162	180	220	240	285
- Starts per hour [2]	1/h	4.3	1.8	3	2	1.6
Smallest adjustable operating current I_M	A	40	50	62	71	86

1) Current limit on soft starter set to 350 % I_M.

2) For intermittent duty S4 with ON period = 70 %, T_u = 40 °C, individual mounting vertical. The quoted operating frequencies do not apply for automatic mode.

3) Maximum adjustable rated motor current I_M, dependent on CLASS setting.

Type			3RW44 2.	3RW44 3., 3RW44 4.
Conductor cross-sections				
Screw terminals	**Main conductor:**			
with box terminal			3RT19 55-4G (55 kW)	3RT19 66-4G
front clamping point connected	• finely stranded with end sleeve	mm^2	16 ... 70	70 ... 240
	• finely stranded without end sleeve	mm^2	16 ... 70	70 ... 240
	• stranded	mm^2	16 ... 70	95 ... 300
 NSB00479	• ribbon cable conductors (number x width x thickness)	mm	min. 3 x 9 x 0.8, max. 6 x 15.5 x 0.8	min. 6 x 9 x 0.8 max. 20 x 24 x 0.5
	• AWG conductor, solid or stranded	AWG	6 ... 2/0	3/0 ... 600 kcmil
rear clamping point connected	• finely stranded with end sleeve	mm^2	16 ... 70	120 ... 185
	• finely stranded without end sleeve	mm^2	16 ... 70	120 ... 185
	• stranded	mm^2	16 ... 70	120 ... 240
 NSB00480	• ribbon cable conductors (number x width x thickness)	mm	min. 3 x 9 x 0.8, max. 6 x 15.5 x 0.8	min. 6 x 9 x 0.8 max. 20 x 24 x 0.5
	• AWG conductor, solid or stranded	AWG	6 ... 2/0	250 ... 500 kcmil
both clamping points connected	• finely stranded with end sleeve	mm^2	max. 1 x 50, 1 x 70	min. 2 x 50; max. 2 x 185
	• finely stranded without end sleeve	mm^2	max. 1 x 50, 1 x 70	min. 2 x 50; max. 2 x 185
	• stranded	mm^2	max. 2 x 70	max. 2 x 70; max. 2 x 240
 NSB00481	• ribbon cable conductors (number x width x thickness)	mm	max. 2 x (6 x 15.5 x 0.8)	max. 2 x (20 x 24 x 0.5)
	• AWG conductor, solid or stranded	AWG	max. 2 x 1/0	min. 2 x 2/0; max. 2 x 500 kcmil
	• terminal screws - Pickup torque		M10 (hexagon socket, A/F4) 10 ... 12 90 ... 110	M12 (hexagon socket, A/F5) 20 ... 22 180 ... 195
Screw terminals	**Main conductor:**			
with box terminal			3RT19 56-4G	
front or rear clamping point connected	• finely stranded with end sleeve	mm^2	16 ... 120	
	• finely stranded without end sleeve	mm^2	16 ... 120	
	• stranded	mm^2	16 ... 120	
 NSB00479  NSB00480	• ribbon cable conductors (number x width x thickness)	mm	min. 3 x 9 x 0.8 max. 6 x 15.5 x 0.8	
	• AWG conductor, solid or stranded	AWG	6 ... 250 kcmil	
both clamping points connected	• finely stranded with end sleeve	mm^2	max. 1 x 95, 1 x 120	
	• finely stranded without end sleeve	mm^2	max. 1 x 95, 1 x 120	
	• stranded	mm^2	max. 2 x 120	
 NSB00481	• ribbon cable conductors (number x width x thickness)	mm	max. 2 x (10 x 15.5 x 0.8)	
	• AWG conductor, solid or stranded	AWG	max. 2 x 3/0	
Screw terminals	**Main conductor:**			
	Without box terminal/rail connection			
	• finely stranded with cable lug	mm^2	16 ... 95 [1]	50 ... 240 [2]
	• stranded with cable lug	mm^2	25 ... 120 [1]	70 ... 240 [2]
	• AWG conductor, solid or stranded	AWG	4 ... 250 kcmil	2/0 ... 500 kcmil
	• connecting bar (max. width)	mm	17	25
	• terminal screws		M8 x 25 (A/F13)	M10 x 30 (A/F17)
	- pickup torque	Nm	10 ... 14	14 ... 24
		lb.in	89 ... 124	124 ... 210

1) When connecting cable lugs to DIN 46235 use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm^2 to ensure phase spacing.

2) When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for conductor cross-sections of 240 mm^2 and more as well as DIN 46235 for conductor cross-sections of 185 mm^2 and more to keep the phase clearance.

Soft starter	Type		3RW40 ..
Conductor cross-sections			
Auxiliary conductors (1 or 2 conductors can be connected)**:**			
	Screw terminals		
	• solid	mm^2	2 x 0.5 ... 2.5
	• finely stranded with end sleeve	mm^2	2 x 0.5 ... 1.5
	• AWG cables		
	- solid or stranded	AWG	2 x 20 ... 14
	- finely stranded with end sleeve	AWG	2 x 20 ... 16
	• terminal screws		
	- pickup torque	Nm	0.7 ... 0.9
		lb.in	7 ... 8
	Spring-loaded terminals		
	• solid	mm^2	2 x 0.25 ... 2.5
	• finely stranded with end sleeve	mm^2	2 x 0.25 ... 1.5
	• AWG conductor, solid or stranded	AWG	2 x 24 ... 14

SIRIUS 3RW44 soft starters

	Standard	Parameters
Electromagnetic compatibility acc. to EN 60947-4-2		
EMC interference immunity		
Electrostatic discharge (ESD)	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 3, 10 V/m
Conducted RF interference	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
RF voltages and RF currents on conductors Burst Surge	 EN 61000-4-4 EN 61000-4-5	 ±2 kV/5 kHz ±1 kV line to line ±2 kV line to ground
EMC interference emission		
EMC interference field strength	EN 55011	Limit value of Class A at 30 ... 1000 MHz
Radio interference voltage	EN 55011	Limit value of Class A at 0.15 ... 30 MHz
Is an RI suppression filter necessary?		
Degree of noise suppression A (industrial applications)	no	

Component design feeder (inline circuit)

Soft starter	Rated current	Circuit-breakers		Line protection			Full-range protection			
			Current		Size	Current		Size	Current	Voltage
G1 Type	Soft starter A	Q1 Type	 A	F1 Type		 A	F1' Type		 A	 V
3RW44 22	29	3RV10 42-4HA10	50	3NA3 820-6	00	50	3NE1 020-2	00	80	690 +5 %
3RW44 23	36	3RV10 42-4JA10	63	3NA3 822-6	00	63	3NE1 020-2	00	80	690 +5 %
3RW44 24	47	3RV10 42-4KA10	75	3NA3 824-6	00	80	3NE1 021-2	00	100	690 +5 %
3RW44 25	57	3RV10 42-4LA10	90	3NA3 830-6	00	100	3NE1 022-2	00	125	690 +5 %
3RW44 26	77	3RV10 42-4MA10	100	3NA3 132-6	1	125	3NE1 022-2	00	125	690 +5 %
3RW44 27	93	3RV10 42-4MA10	100	3NA3 136-6	1	160	3NE1 224-2	1	160	690 +5 %
3RW44 34	113	3VL37 20-2DC36	200	3NA3 244-6	2	250	3NE1 225-2	1	200	690 +5 %
3RW44 35	134	3VL37 20-2DC36	200	3NA3 244-6	2	250	3NE1 227-2	1	250	690 +5 %
3RW44 36	162	3VL37 25-2DC36	250	3NA3 365-6	3	500	3NE1 227-2	1	250	690 +5 %
3RW44 43	203	3VL47 31-3DC36	315	2 x 3NA3 354-6	3	2 x 355	3NE1 331-2	2	350	460 +10 %
3RW44 44	250	3VL47 31-3DC36	315	2 x 3NA3 354-6	3	2 x 355	3NE1 331-2	2	350	460 +10 %
3RW44 45	313	3VL47 40-3DC36	400	2 x 3NA3 365-6	3	2 x 500	3NE1 333-2	2	450	690 +5 %
3RW44 46	356	3VL47 40-3DC36	400	2 x 3NA3 365-6	3	2 x 500	3NE1 334-2	2	500	690 +5 %
3RW44 47	432	3VL57 50-3DC36	500	2 x 3NA3 365-6	3	2 x 500	3NE1 435-2	3	560	690 +5 %

Component design feeder (inline circuit)

Soft starter	Rated current	Semiconductor fuse, minimum			Semiconductor fuse, maximum			Line contactor up to 400 V (option)	Braking contactor [1) 2)]	
			Size	Current		Size	Current			
G1 Type	Soft starter A	F3 Type		 A	F3 Type		 A	K1 Type	K2 Type	K3 Type
3RW44 22	29	3NE4 120	0	80	3NE4 121	0	100	3RT10 34	3RT15 26	–
3RW44 23	36	3NE4 121	0	100	3NE4 122	0	125	3RT10 35	3RT15 26	–
3RW44 24	47	3NE4 121	0	100	3NE4 122	0	125	3RT10 36	3RT15 35	–
3RW44 25	57	3NE4 122	0	125	3NE4 124	0	160	3RT10 44	3RT15 35	–
3RW44 26	77	3NE4 124	0	160	3NE4 124	0	160	3RT10 45	3RT10 24	3RT10 35
3RW44 27	93	3NE3 224	1	160	3NE3 333	2	450	3RT10 46	3RT10 25	3RT10 36
3RW44 34	113	3NE3 225	1	200	3NE3 335	2	560	3RT10 54	3RT10 34	3RT10 44
3RW44 35	134	3NE3 225	1	200	3NE3 335	2	560	3RT10 55	3RT10 36	3RT10 45
3RW44 36	162	3NE3 227	1	250	3NE3 333	2	450	3RT10 56	3RT10 44	3RT10 45
3RW44 43	203	3NE3 230-0B	1	315	3NE3 333	2	450	3RT10 64	3RT10 44	3RT10 54
3RW44 44	250	3NE3 230-0B	1	315	3NE3 333	2	450	3RT10 65	3RT10 44	3RT10 55
3RW44 45	313	3NE3 233	1	450	3NE3 336	2	630	3RT10 75	3RT10 54	3RT10 56
3RW44 46	356	3NE3 333	2	450	3NE3 336	2	630	3RT10 75	3RT10 54	3RT10 56
3RW44 47	432	3NE3 335	2	560	3NE3 338-8	2	800	3RT10 76	3RT10 55	3RT10 64

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 (see table for type)
For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) we recommend the function "DC braking".

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

Component design feeder (inside-delta circuit)

Soft starter	Rated current	Circuit-breakers		Line protection		
		440 V +10 %	Current	690 V +10 %	Size	Current
G1	Soft starter	Q1		F1		
Type	A	Type	A	Type		A
3RW44 22	50	3RV10 42-4KA10	75	3NA3 824-6	00	80
3RW44 23	62	3RV10 42-4LA10	90	3NA3 830-6	00	100
3RW44 24	81	3RV10 42-4MA10	100	3NA3 132-6	1	125
3RW44 25	99	3VL27 16-2DC36	160	3NA3 136-6	1	160
3RW44 26	133	3VL37 20-2DC36	200	3NA3 240-6	2	200
3RW44 27	161	3VL37 20-2DC36	200	3NA3 244-6	2	250
3RW44 34	196	3VL37 25-2DC36	250	3NA3 360-6	3	400
3RW44 35	232	3VL47 31-3DC36	315	3NA3 360-6	3	400
3RW44 36	281	3VL47 40-3DC36	400	2 x 3NA3 360-6	3	2 x 400
3RW44 43	352	3VL47 40-3DC36	400	2 x 3NA3 365-6	3	2 x 500
3RW44 44	433	3VL57 50-3DC36	500	2 x 3NA3 365-6	3	2 x 500
3RW44 45	542	3WL12 08-.EB..-....	800	3 x 3NA3 365-6	3	3 x 500
3RW44 46	617	3WL12 08-.EB..-....	800	3 x 3NA3 365-6	3	3 x 500
3RW44 47	748	3WL12 10-.EB..-....	1000	3 x 3NA3 365-6	3	3 x 500

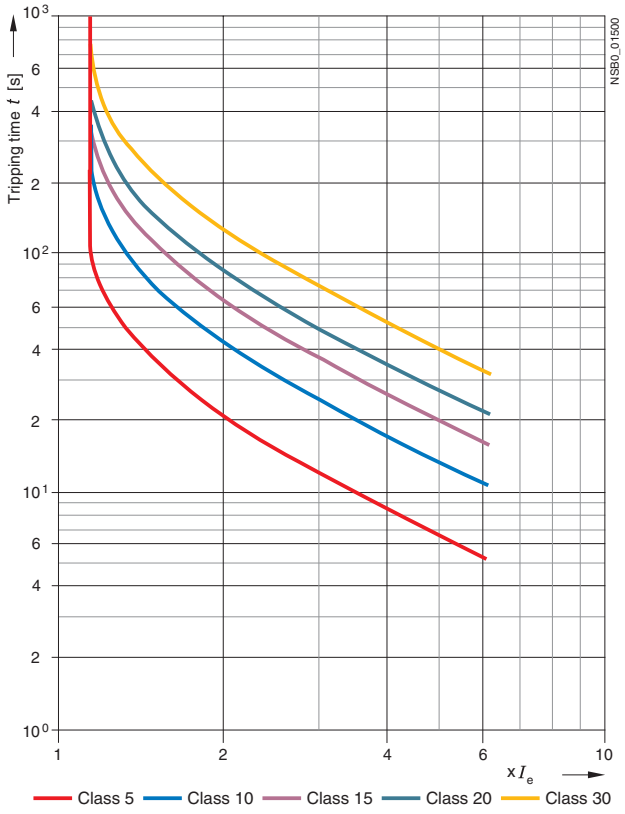
Component design feeder (inside-delta circuit)

Soft starter	Rated current	Semiconductor fuse, minimum			Semiconductor fuse, maximum			Mains contactor up to 400 V (option)
	Soft starter		Size	Current		Size	Current	
G1		F3			F3			K1
Type	A	Type		A	Type		A	Type
3RW44 22	50	3NE4 120	0	80	3NE4 121	0	100	3RT10 36-1AP04
3RW44 23	62	3NE4 121	0	100	3NE4 122	0	125	3RT10 44-1AP04
3RW44 24	81	3NE4 121	0	100	3NE4 122	0	125	3RT10 45-1AP04
3RW44 25	99	3NE4 122	0	125	3NE4 124	0	160	3RT10 54-1AP36
3RW44 26	133	3NE4 124	0	160	3NE4 124	0	160	3RT10 55-6AP36
3RW44 27	161	3NE3 224	1	160	3NE3 333	2	450	3RT10 56-6AP36
3RW44 34	196	3NE3 225	1	200	3NE3 335	2	560	3RT10 64-6AP36
3RW44 35	232	3NE3 225	1	200	3NE3 335	2	560	3RT10 65-6AP36
3RW44 36	281	3NE3 227	1	250	3NE3 333	2	450	3RT10 66-6AP36
3RW44 43	352	3NE3 230-0B	1	315	3NE3 333	2	450	3RT10 75-6AP36
3RW44 44	433	3NE3 230-0B	1	315	3NE3 333	2	450	3RT10 76-6AP36
3RW44 45	542	3NE3 233	1	450	3NE3 336	2	630	3TF68 44-0CM7
3RW44 46	617	3NE3 333	2	450	3NE3 336	2	630	3TF68 44-0CM7
3RW44 47	748	3NE3 335	2	560	3NE3 338-8	2	800	3TF69

SIRIUS 3RW44 soft starters

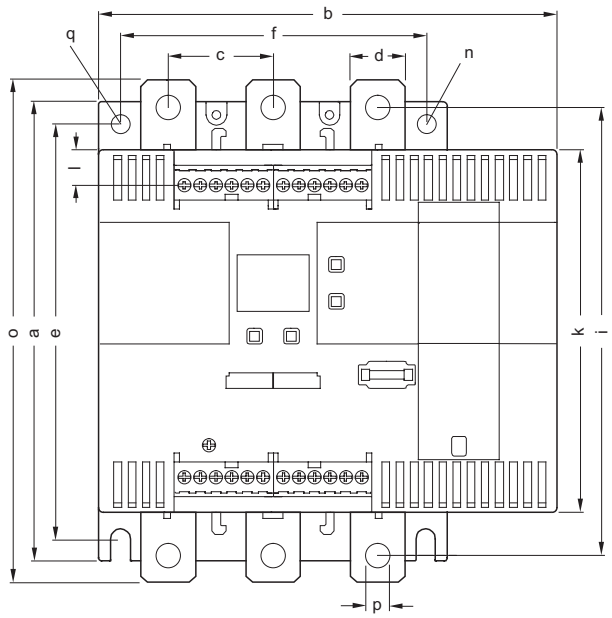
Characteristic curves

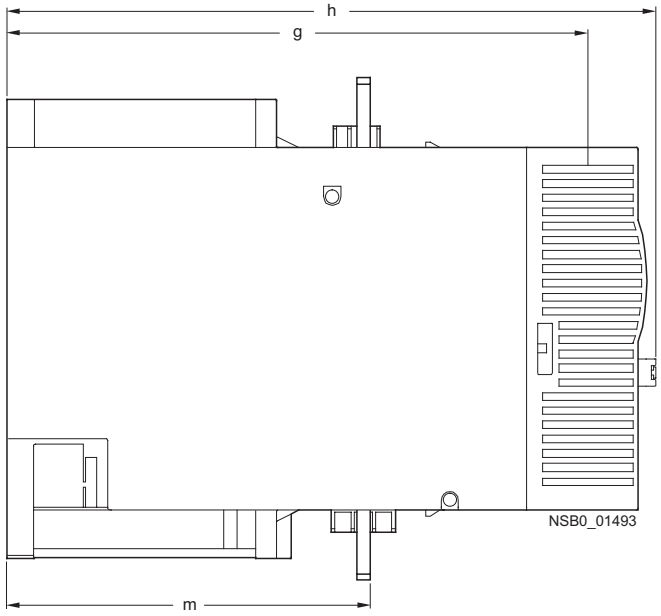
Motor protection tripping characteristic curves for 3RW44 (with symmetry)



Dimensional drawings

3RW44 ..





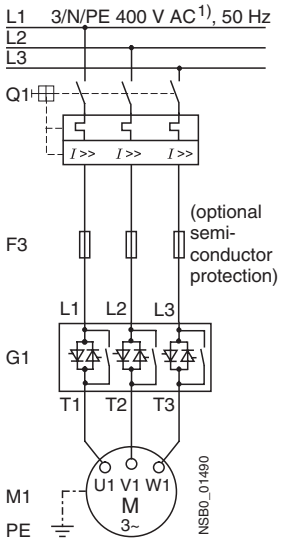
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q
3RW44 2.	180	170	37	11	167	100	240	270	180	148	7.5	153	7	184	6.6	M6, 10 Nm
3RW44 3.	180	170	37	17	167	100	240	270	180	148	7.5	153	7	198	9	M6, 10 Nm
3RW44 4.	210	210	48	25	190	140	269	298	205	166	16	166	9	230	11	M8, 15 Nm

Schematics

Connection examples for main and control circuits

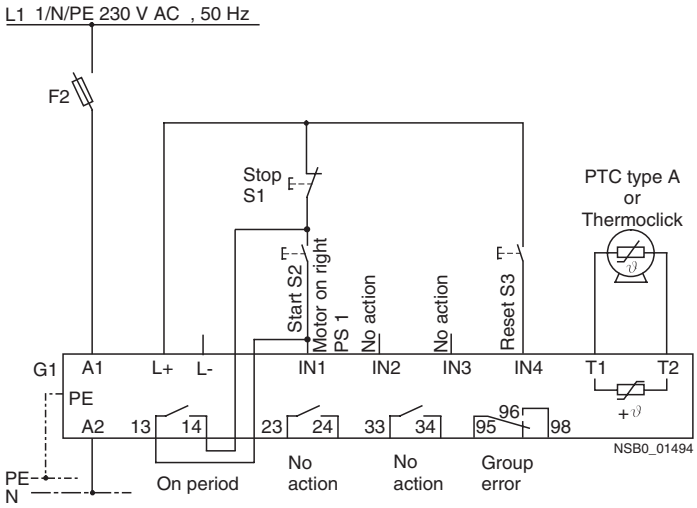
Main circuit

Possibility 1a:
Inline circuit with circuit-breaker and SITOR fuse
(semiconductor protection only)



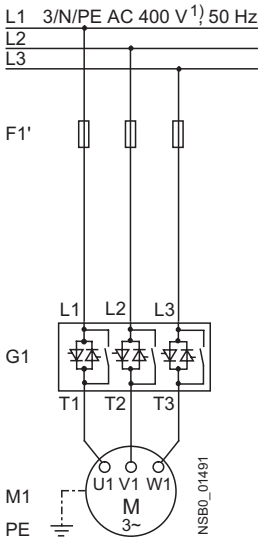
Control circuit

Possibility 1:
Control by pushbutton

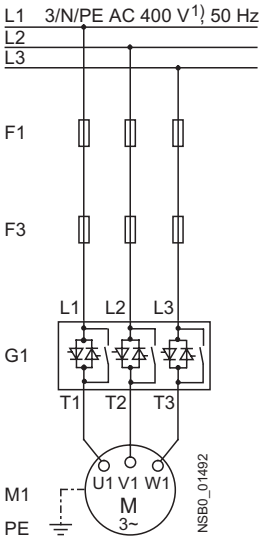


Main circuit

Possibility 1b:
Inline circuit with full-range protection
(line and semiconductor protection)



Possibility 1c:
Inline circuit with line and SITOR fuse
(semiconductor protection only)

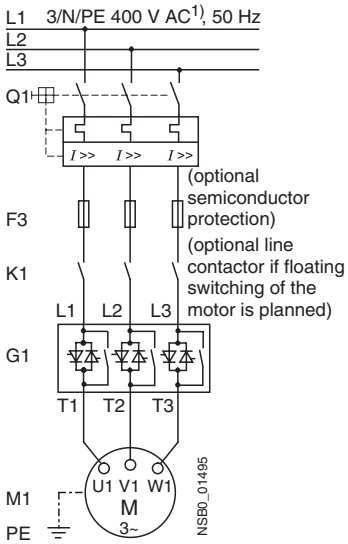


1) Permissible values for main and control voltage, see Technical Information, page 3/23 to 3/31.

SIRIUS 3RW44 soft starters

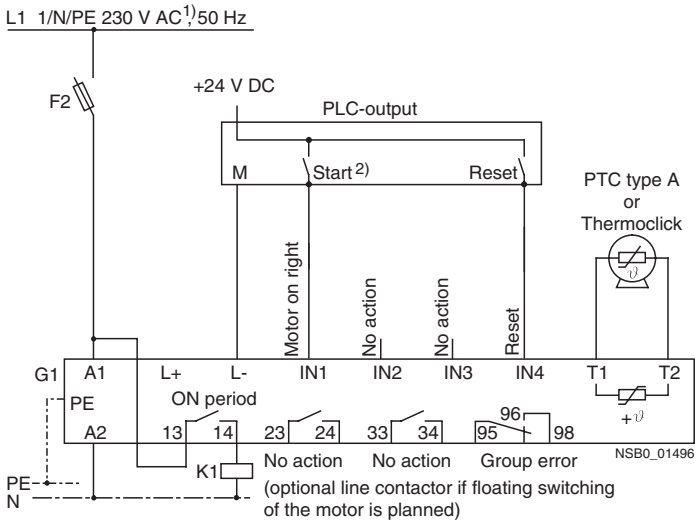
Main circuit

Possibility 2:
Inline circuit with main contactor



Control circuit

Possibility 2:
Control of a main contactor and control by means of PLC

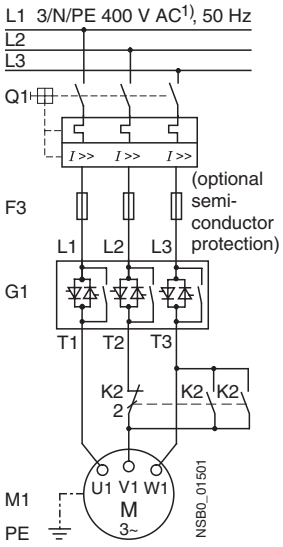


1) Permissible values for main and control voltage, see Technical Information, page 3/23 to 3/31.

2) **Caution. Risk of restarting!**
The start command (e.g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping.
For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

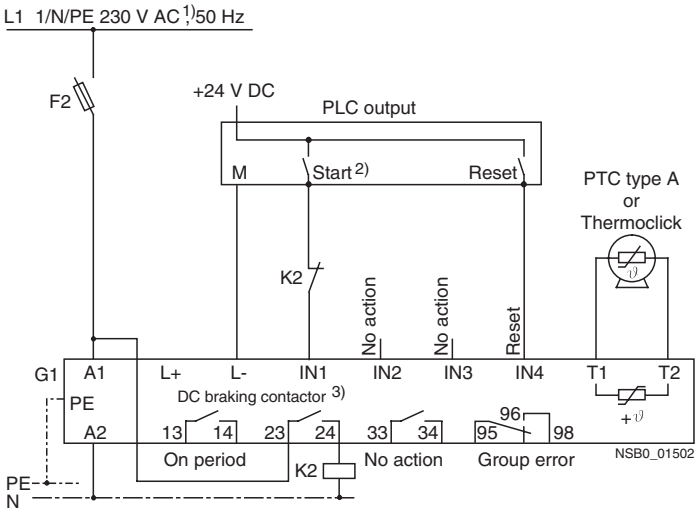
Main circuit

Possibility 3a:
Inline circuit with ramp-down function DC braking [3]
(for device types 3RW44 22 to 3RW44 25)



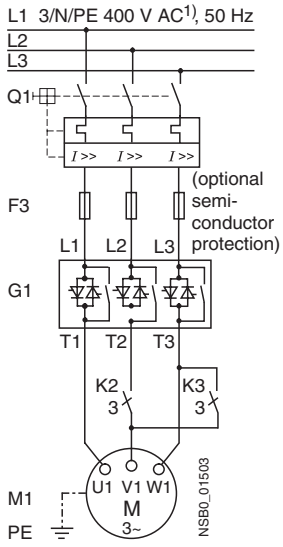
Control circuit

Possibility 3a:
Control of the braking contactor [3]



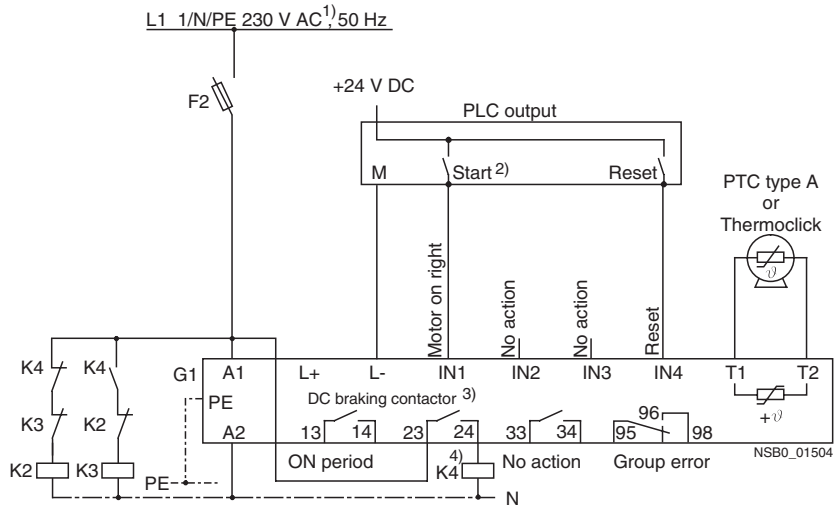
Main circuit

Possibility 3b:
Inline circuit with ramp-down function DC braking [3]
(for device types 3RW44 26 to 3RW44 47)



Control circuit

Possibility 3b:
Control of the braking contactor [3]



1) Permissible values for main and control voltage, see Technical Information, page 3/23 to 3/31.

2) **Caution. Risk of restarting!**
The start command (e.g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping.
For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

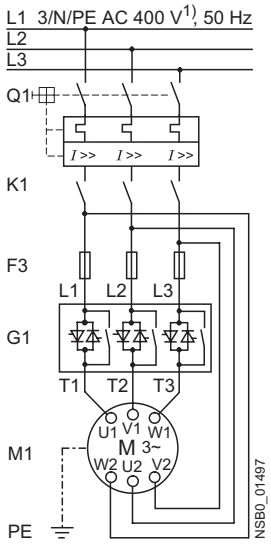
3) If the ramp-down function "Combined braking" is selected, no braking contactor is required.
If the ramp-down function"DC braking" is selected, a braking contactor must be used in addition. Type, see the table "Component design feeder (inline circuit)" on page 3/30.
For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) we recommend the function "DC braking".
The output 2 must be switched over to "DC braking contactor".

4) Auxiliary relay K4, e.g.:
LZX:RT4A4T30 (230 V AC rated control supply voltage),
LZX:RT4A4S15 (115 V AC rated control supply voltage).

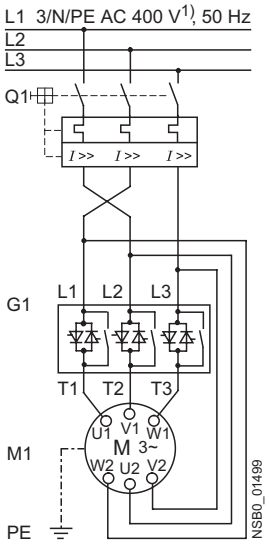
SIRIUS 3RW44 soft starters

Main circuit

Possibility 4a:
Inside-delta circuit

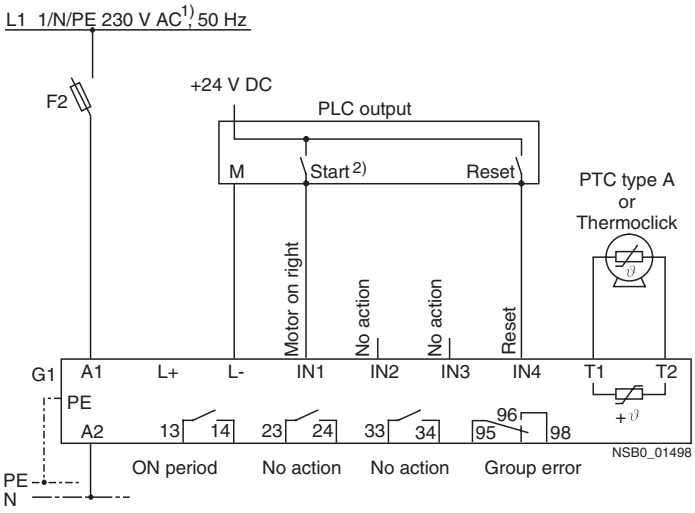


Possibility 4b:
Change of direction of rotation for inside-delta circuit



Control circuit

Possibility 4:
Control by means of PLC



1) Permissible values for main and control voltage, see Technical Information, page 3/23 to 3/31.

2) **Caution. Risk of restarting!**
The start command (e.g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping.
For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

More information

Application examples for normal starting (Class 10)

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

Application		Conveyor belt	Roller conveyor	Compressor	Small ventilator	Pump	Hydraulic pump
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 limit value		deactivated	deactivated	4 x I_M	4 x I_M	deactivated	deactivated
• Torque ramp							
- Starting torque		60	50	40	20	10	10
- End torque		150	150	150	150	150	150
- Starting time		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		Smooth ramp-down	Smooth ramp-down	Free ramp-down	Free ramp-down	Pump ramp-down	Free ramp-down

Application examples for normal starting (Class 20)

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

Application		Agitator	Centrifuge	Milling machine
Starting parameters				
• Voltage ramp and current limiting				
- Starting voltage	%	30	30	30
- Starting time	s	30	30	30
- Current limit value		4 x I_M	4 x I_M	4 x I_M
• Torque ramp				
- Starting torque		30	30	30
- End torque		150	150	150
- Starting time		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 % $I_{n\ motor}$),
The soft starter has to be selected two rating classes higher than the motor used

Application		Large ventilator	Mill	Breaker	Circular saw/bandsaw
Starting parameters					
• Voltage ramp and current limiting					
- Starting voltage	%	30	50	50	30
- Starting time	s	60	60	60	60
- Current limit value		4 x I_M	4 x I_M	4 x I_M	4 x I_M
• Torque ramp					
- Starting torque		20	50	50	20
- End torque		150	150	150	150
- Starting time		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

Note:
These tables present sample setting values which are intended only for the purposes of information and are not binding. The setting values depend on the application in question and must be optimized during commissioning.
The soft starter dimensions should be checked where necessary with the Win-SOFTSTARTER software or with the help of Technical Assistance.

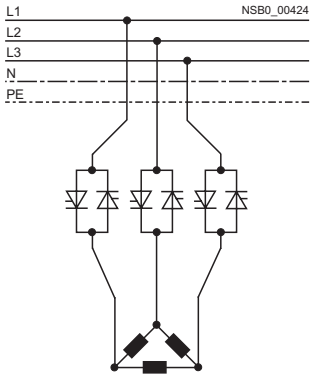
SIRIUS 3RW44 soft starters

Circuit concept

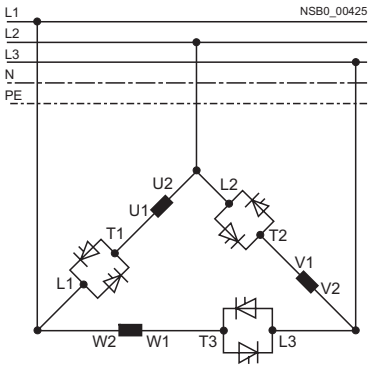
The SIRIUS 3RW44 soft starters can be operated in two different types of circuit.

- Inline circuit
  The switching devices 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 star-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 current of the motor (conductor current).

Comparison of the types of circuit



Inline circuit:
Rated current I_e corresponds to the rated motor current I_n,
3 conductors to motor



Inside-delta circuit:
Rated current I_e corresponds to approx. 58 % of the rated motor current I_n,
6 conductors to motor (as star delta starters)

Which circuit?

Using the inline circuit involves the lowest wiring complexity. If the soft starter to motor connections are long, this contact sequence is preferable.
With the inside-delta circuit there is double the wiring complexity but a smaller size of device can be used at the same rating.

Thanks to the possibility of switching between the inline circuit and inside-delta circuit, the most favorable solution can always be chosen.

The braking function is possible only in the inline circuit.

Configuring

The 3RW44 solid-state starters are designed for normal starting. In case of heavy starting or increased starting frequency, a larger unit must be selected.

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

In the motor feeder between the soft starter and the motor, no capacitive elements are permitted (e.g. compensation equipment). Active filters are not allowed to be used in connection with soft starters.

All elements of the main circuit (such as fuses and switching devices) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, switching devices and overload relays must be ordered separately.

The harmonic component load for starting currents must be taken into consideration for the selection of circuit-breakers (selection of release).

Serial PC interface RS 232 and parameterizing and operating software Softstarter ES

The solid-state 3RW44 soft starters have a PC interface for communicating with the Softstarter ES smart software and an operating and monitoring module.

Manual for SIRIUS 3RW44

Besides containing all important information on planning, commissioning and servicing, the manual also contains suggested circuits and the technical data for all devices.

Win-SOFTSTARTER selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

You can order the CD-ROM under the following order number:
Order No.: E20001-D1020-P302-V2-7400.

SIRIUS soft starter training course (SD-SIRIUSO)

Siemens offers a 2-day training course on the SIRIUS solid-state soft starters to keep customers and own personnel up-to-date on configuring, commissioning and servicing issues.

Please direct enquiries and applications to:

Training Center
I&S IS E&C TC
Werner-von-Siemens-Str.
D-91052 Erlangen
Tel.: +49 (0)91 31 72 92 62
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