


# sirius

## SOFT STARTERS

 3RW44  
for High-Feature  
Applications



**SIEMENS**

## Related catalogs

### Low-Voltage Controls and Distribution

SIRIUS • SENTRON • SIVACON

Order No.

Catalog

E86060-K1002-A101-A5-7600 LV 1

Technical Information

E86060-T1002-A101-A5-7600 LV 1 T



### Industrial Communication

IK PI

Industrial Communication for Automation and Drives

Order No.:

E86060-K6710-A101-B5-7600



### SICUBE

LV 50

System Cubicles and Cubicle Air-Conditioning

Order No.

E86060-K1920-A101-A3-7600



### SIDAC

LV 60

Reactors and Filters

Order No.:

E86060-K2803-A101-A3-7600



### SIVACON 8PS

LV 70

Busway systems  
CD, BD01, BD2 to 1250 A

Order No.:

E86060-K1870-A101-A2-7600



### Automation & Drives

CA 01

The A&amp;D Offline Mall

Order No.:

E86060-D4001-A110-C4-7600

DVD:

E86060-D4001-A510-C4-7600



### A&D Mail

Internet:

<http://www.siemens.com/automation/mail>


### Catalog PDF

Internet:

<http://www.automation.siemens.com/cd>


## Contents

Systems • Controls: Contactors and contactor assemblies, solid-state switching devices • Protection equipment • Load feeders, motor starters and soft starters • Monitoring and control devices • Detecting devices • Commanding and signaling devices • Transformers • Power supplies • ALPHA FIX terminal blocks • Planning and configuration with SIRIUS • SIVACON busway and cubicle systems • SENTRON switching and protection devices for power distribution: Air circuit-breakers, molded case circuit-breakers, switch disconnectors • Planning, design and management with SIMARIS • BETA modular installation devices

PROFINET/Industrial Ethernet • Industrial Mobile Communicator • PROFIBUS to IEC 61158/EN 50170 • SIMATIC ET 200 distributed I/Os • AS-Interface to EN 50295/IEC 61158 • Remote operation with SINAUT ST7 • Routers • ECOFAST system

System Cubicles • Cubicle Modifications • Cubicle Expansion • Accessories • Special Cubicles • Cubicle Solutions in Practice • Cubicle Air-Conditioning • Special Colors

Commutating reactors for converters • Mains reactors for frequency converters • Iron-core output reactors • Ferrite output reactors • Iron-core smoothing reactors • Smoothing air-core reactors • Filter reactors • Application-specific reactors • Radio interference suppression filters • dv/dt filters • Sinewave filters

Busway systems, Overview • CD system (25 A to 40 A) • BD01 system (40 A to 160 A) • BD2 system (160 A to 1250 A)

All Automation and Drives products, including those in the catalogs listed above.

All Automation and Drives products, including those in the catalogs listed above.

All catalogs for Low-Voltage Controls can be downloaded as pdf files.

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<http://www.siemens.com/lowvoltage>

## Technical Assistance



Expert technical assistance for Low-Voltage Controls and Electrical Installations.

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# Low-Voltage Controls and Distribution SIRIUS · SENTRON · SIVACON

## Catalog LV 1 News 3RW44 Soft Starters · 06/2006

Invalid:  
Catalog LV 1 News · April 2006,  
Chapter 6, Load Feeders, Motor  
Starters and Soft Starters  
Section 3RW44 Soft Starters  
for High-Feature Applications

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**SIEMENS**

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# Explanations

## Delivery times (DT)

▶ Preferred type	Preferred types are available immediately from stock, i.e. are dispatched within 24 hours.
A 2 working days	
B 1 week	Normal quantities of the products are usually delivered within the specified time following receipt of your order at our branch.
C 3 weeks	
D 6 week	
X on request	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 06/2006. They are permanently optimized. Up-to-date information can be found at [www.siemens.com/automation/mail](http://www.siemens.com/automation/mail).

## Price units (PU)

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

## Packaging sizes (PS)

The packaging size defines the number, e.g. of units, 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, see [Appendix](#) of the LV 1 catalog 2006.

## Price groups (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.

# Load Feeders, Motor Starters and Soft Starters

# 6



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# 3RW Soft Starters

## General data

### Overview

The advantages of the SIRIUS soft starters at a glance:

- Soft starting and smooth ramp-down<sup>1)</sup>
- 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



		<b>SIRIUS 3RW30/31</b> Standard applications	<b>SIRIUS 3RW40</b>	<b>SIRIUS 3RW44</b> High-Feature applications
<b>Rated current up to 40 °C</b>	A	3 ... 100	134 ... 432	29 ... 1214
<b>Rated operational voltage</b>	V	200 ... 575	200 ... 600	200 ... 690
<b>Motor rating at 400 V</b>				
• Inline circuit	kW	1.1 ... 55	75 ... 250	15 ... 710
• Inside-delta circuit	kW	--	--	22 ... 1200
<b>Temperature range</b>	°C	-25 ... +60	-25 ... +60	0 ... +60
<b>Soft starting/ramp-down</b>		✓ <sup>1)</sup>	✓	✓
<b>Voltage ramp</b>		✓	✓	✓
<b>Starting/stopping voltage</b>	%	40 ... 100	40 ... 100	20 ... 100
<b>Starting and ramp-down time</b>	s	0 ... 20	0 ... 20	1 ... 360
<b>Torque control</b>		--	--	✓
<b>Starting/stopping torque</b>	%	--	--	20 ... 100
<b>Torque limit</b>	%	--	--	20 ... 200
<b>Ramp time</b>	s	--	--	1 ... 360
<b>Integral bypass contact system</b>		✓ <sup>2)</sup>	✓	✓
<b>Intrinsic device protection</b>		--	✓	✓
<b>Motor overload protection</b>		--	✓	✓
<b>Thermistor motor protection</b>		--	--	✓
<b>Adjustable current limiting</b>		--	✓	✓
<b>Inside-delta circuit</b>		--	--	✓
<b>Breakaway pulse</b>		--	--	✓
<b>Creep speed in both directions</b>		--	--	✓
<b>Pump ramp-down</b>		--	--	✓ <sup>6)</sup>
<b>DC braking</b>		--	--	✓ <sup>3) 6)</sup>
<b>Combined braking</b>		--	--	✓ <sup>3) 6)</sup>
<b>Motor heating</b>		--	--	✓
<b>Communication</b>		--	--	with PROFIBUS DP (optional)
<b>External display and operator module</b>		--	--	(optional)
<b>Operating measured value display</b>		--	--	✓
<b>Error logbook</b>		--	--	✓
<b>Event list</b>		--	--	✓
<b>Slave pointer function</b>		--	--	✓
<b>Trace function</b>		--	--	✓ <sup>4)</sup>
<b>Programmable control inputs and outputs</b>		--	--	✓
<b>Number of parameter sets</b>		1 (2 with 3RW31)	1	3
<b>Parameterization software (Soft Starter ES)</b>		--	--	✓
<b>Power semiconductors (thyristors)</b>		2 controlled phases	2 controlled phases	3 controlled phases
<b>Spring-loaded terminals</b>		✓ (only 3RW30 03)	✓	✓
<b>Screw terminals</b>		✓	✓	✓
<b>UL/CSA</b>		✓ <sup>5)</sup>	✓	✓
<b>CE marking</b>		✓	✓	✓
<b>Soft starting under heavy starting conditions</b>		--	--	✓ <sup>6)</sup>
<b>Configuring support</b>		Win-Soft Starter, the electronic selection slider ruler, Technical Assistance ++49 911 895 5900		

✓ Function is available  
-- Function not available.

- 1) Only soft starting available for 3RW30 ...-1AA12 and 3RW31.
- 2) Not available for 3RW30 03.
- 3) Not possible in inside-delta circuit.
- 4) Trace function with Soft Starter ES.
- 5) For 3RW30 03 up to 230 V.

6) Calculate soft starter and motor with size allowance where required.  
More information can be found on the Internet at

<http://www.siemens.com/softstarter>

### Overview

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 switchgear and when servicing the machinery installed. Be it for inline circuits or inside-delta circuits – the SIRIUS 3RW44 soft starter offers savings especially in terms of size and equipment costs.

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

### 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

# 3RW Soft Starters

## 3RW44 for High-Feature applications

### Selection and ordering data



3RW44 27-1BC44



3RW44 36-6BC44



3RW44 47-6BC44



3RW44 58-6BC44

Ambient temperature 40 °C						Ambient temperature 50 °C				DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Rated operational current $I_e$	Rated output of three-phase induction motors for rated operational voltage $U_e$					Rated operational current $I_e$	Rated output of three-phase induction motors for rated operational voltage $U_e$									
		230 V	400 V	500 V	690 V		1000 V	A	200 V	230 V	460 V	575 V				
	kW	kW	kW	kW	kW		hp	hp	hp	hp						
<b>Inline circuit, rated operational voltage 200 ... 460 V<sup>1)</sup></b>																
29	5.5	<b>15</b>	--	--	--	26	7.5	7.5	<b>15</b>	--	▶	<b>3RW44 22-□BC□4</b>	1	1 unit	131	4.900
36	7.5	<b>18.5</b>	--	--	--	32	10	10	<b>20</b>	--	▶	<b>3RW44 23-□BC□4</b>	1	1 unit	131	4.900
47	11	<b>22</b>	--	--	--	42	10	15	<b>25</b>	--	▶	<b>3RW44 24-□BC□4</b>	1	1 unit	131	4.900
57	15	<b>30</b>	--	--	--	51	15	15	<b>30</b>	--	▶	<b>3RW44 25-□BC□4</b>	1	1 unit	131	4.900
77	18.5	<b>37</b>	--	--	--	68	20	20	<b>50</b>	--	▶	<b>3RW44 26-□BC□4</b>	1	1 unit	131	4.900
93	22	<b>45</b>	--	--	--	82	25	25	<b>60</b>	--	▶	<b>3RW44 27-□BC□4</b>	1	1 unit	131	4.900

#### Order No. supplement for connection methods

- With spring-loaded terminals
- With screw terminals

3  
1

113	30	<b>55</b>	--	--	--	100	30	30	<b>75</b>	--	B	<b>3RW44 34-□BC□4</b>	1	1 unit	131	7.900
134	37	<b>75</b>	--	--	--	117	30	40	<b>75</b>	--	B	<b>3RW44 35-□BC□4</b>	1	1 unit	131	7.900
162	45	<b>90</b>	--	--	--	145	40	50	<b>100</b>	--	B	<b>3RW44 36-□BC□4</b>	1	1 unit	131	7.900
203	55	<b>110</b>	--	--	--	180	50	60	<b>125</b>	--	B	<b>3RW44 43-□BC□4</b>	1	1 unit	131	10.300
250	75	<b>132</b>	--	--	--	215	60	75	<b>150</b>	--	B	<b>3RW44 44-□BC□4</b>	1	1 unit	131	10.300
313	90	<b>160</b>	--	--	--	280	75	100	<b>200</b>	--	B	<b>3RW44 45-□BC□4</b>	1	1 unit	131	10.300
356	110	<b>200</b>	--	--	--	315	100	125	<b>250</b>	--	B	<b>3RW44 46-□BC□4</b>	1	1 unit	131	10.300
432	132	<b>250</b>	--	--	--	385	125	150	<b>300</b>	--	B	<b>3RW44 47-□BC□4</b>	1	1 unit	131	10.300
551	160	<b>315</b>	--	--	--	494	150	200	<b>400</b>	--	C	<b>3RW44 53-□BC□4</b>	1	1 unit	131	50.000
615	200	<b>355</b>	--	--	--	551	150	200	<b>450</b>	--	C	<b>3RW44 54-□BC□4</b>	1	1 unit	131	50.000
693	200	<b>400</b>	--	--	--	615	200	250	<b>500</b>	--	C	<b>3RW44 55-□BC□4</b>	1	1 unit	131	50.000
780	250	<b>450</b>	--	--	--	693	200	250	<b>600</b>	--	C	<b>3RW44 56-□BC□4</b>	1	1 unit	131	50.000
880	250	<b>500</b>	--	--	--	780	250	300	<b>700</b>	--	C	<b>3RW44 57-□BC□4</b>	1	1 unit	131	50.000
970	315	<b>560</b>	--	--	--	850	300	350	<b>750</b>	--	C	<b>3RW44 58-□BC□4</b>	1	1 unit	131	50.000

#### Order No. supplement for connection methods

- With spring-loaded terminals
- With screw terminals

2  
6

#### Order No. supplement for the rated control supply voltage $U_s$ <sup>2)</sup>

- 115 V AC
- 230 V AC

3  
4

- 1) 3RW44 2., 3RW44 3., and 3RW44 4. soft starters with screw-type terminals: delivery time class ▶ (preferred type).
- 2) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

#### Note:

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  $J_{Load} < 10 \times J_{Motor}$ ; starting current 350 %  $\times I_e$  for 20 s or similar load.) For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical Specifications for information about rated currents for ambient temperatures  $> 40$  °C and operating frequency.



# 3RW Soft Starters

## 3RW44 for High-Feature applications

Ambient temperature 40 °C						Ambient temperature 50 °C				DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.		
Rated operational current $I_e$	Rated output of three-phase induction motors for rated operational voltage $U_e$					Rated operational current $I_e$	Rated output of three-phase induction motors for rated operational 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								

Inline circuit, rated operational voltage 400 ... 600 V <sup>1)</sup>																	
29	--	15	<b>18.5</b>	--	--	26	--	--	15	<b>20</b>	A	<b>3RW44 22-□BC□5</b>	1	1 unit	131	4.900	
36	--	18.5	<b>22</b>	--	--	32	--	--	20	<b>25</b>	A	<b>3RW44 23-□BC□5</b>	1	1 unit	131	4.900	
47	--	22	<b>30</b>	--	--	42	--	--	25	<b>30</b>	A	<b>3RW44 24-□BC□5</b>	1	1 unit	131	4.900	
57	--	30	<b>37</b>	--	--	51	--	--	30	<b>40</b>	A	<b>3RW44 25-□BC□5</b>	1	1 unit	131	4.900	
77	--	37	<b>45</b>	--	--	68	--	--	50	<b>50</b>	A	<b>3RW44 26-□BC□5</b>	1	1 unit	131	4.900	
93	--	45	<b>55</b>	--	--	82	--	--	60	<b>75</b>	A	<b>3RW44 27-□BC□5</b>	1	1 unit	131	4.900	

Order No. supplement for connection methods																												
<ul style="list-style-type: none"> <li>• With spring-loaded terminals</li> <li>• With screw terminals</li> </ul>												<b>3</b>																
												<b>1</b>																

113	--	55	<b>75</b>	--	--	100	--	--	75	<b>75</b>	B	<b>3RW44 34-□BC□5</b>	1	1 unit	131	7.900
134	--	75	<b>90</b>	--	--	117	--	--	75	<b>100</b>	B	<b>3RW44 35-□BC□5</b>	1	1 unit	131	7.900
162	--	90	<b>110</b>	--	--	145	--	--	100	<b>125</b>	B	<b>3RW44 36-□BC□5</b>	1	1 unit	131	7.900
203	--	110	<b>132</b>	--	--	180	--	--	125	<b>150</b>	B	<b>3RW44 43-□BC□5</b>	1	1 unit	131	10.300
250	--	132	<b>160</b>	--	--	215	--	--	150	<b>200</b>	B	<b>3RW44 44-□BC□5</b>	1	1 unit	131	10.300
313	--	160	<b>200</b>	--	--	280	--	--	200	<b>250</b>	B	<b>3RW44 45-□BC□5</b>	1	1 unit	131	10.300
356	--	200	<b>250</b>	--	--	315	--	--	250	<b>300</b>	B	<b>3RW44 46-□BC□5</b>	1	1 unit	131	10.300
432	--	250	<b>315</b>	--	--	385	--	--	300	<b>400</b>	B	<b>3RW44 47-□BC□5</b>	1	1 unit	131	10.300

551	--	315	<b>355</b>	--	--	494	--	--	400	<b>500</b>	C	<b>3RW44 53-□BC□5</b>	1	1 unit	131	50.000
615	--	355	<b>400</b>	--	--	551	--	--	450	<b>600</b>	C	<b>3RW44 54-□BC□5</b>	1	1 unit	131	50.000
693	--	400	<b>500</b>	--	--	615	--	--	500	<b>700</b>	C	<b>3RW44 55-□BC□5</b>	1	1 unit	131	50.000
780	--	450	<b>560</b>	--	--	693	--	--	600	<b>750</b>	C	<b>3RW44 56-□BC□5</b>	1	1 unit	131	50.000
880	--	500	<b>630</b>	--	--	780	--	--	700	<b>850</b>	C	<b>3RW44 57-□BC□5</b>	1	1 unit	131	50.000
970	--	560	<b>710</b>	--	--	850	--	--	750	<b>950</b>	C	<b>3RW44 58-□BC□5</b>	1	1 unit	131	50.000

Order No. supplement for connection methods																												
<ul style="list-style-type: none"> <li>• With spring-loaded terminals</li> <li>• With screw terminals</li> </ul>												<b>2</b>																
												<b>6</b>																

Order No. supplement for the rated control supply voltage $U_s$ <sup>2)</sup>																												
<ul style="list-style-type: none"> <li>• 115 V AC</li> <li>• 230 V AC</li> </ul>												<b>3</b>																
												<b>4</b>																

- 1) 3RW44 2 ., 3RW44 3 . and 3RW44 4 . soft starters with screw-type terminals: delivery time class A.
- 2) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

**Note:**  
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  $J_{Load} < 10 \times J_{Motor}$ ; 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 Win-Soft Starter selection and simulation program. See Technical Specifications for information about rated currents for ambient temperatures > 40 °C and operating frequency.

# 3RW Soft Starters

## 3RW44 for High-Feature applications

Ambient temperature 40 °C						Ambient temperature 50 °C				DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.	
Rated operational current $I_e$	Rated output of three-phase induction motors for rated operational voltage $U_e$					Rated operational current $I_e$	Rated output of three-phase induction motors for rated operational 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
<b>Inline circuit, rated operational voltage 400 ... 690 V</b>																	
29	--	15	18.5	<b>30</b>	--	26	--	--	15	<b>20</b>	B	<b>3RW44 22-□BC□6</b>	1	1 unit	131	4.900	
36	--	18.5	22	<b>37</b>	--	32	--	--	20	<b>25</b>	B	<b>3RW44 23-□BC□6</b>	1	1 unit	131	4.900	
47	--	22	30	<b>45</b>	--	42	--	--	25	<b>30</b>	B	<b>3RW44 24-□BC□6</b>	1	1 unit	131	4.900	
57	--	30	37	<b>55</b>	--	51	--	--	30	<b>40</b>	B	<b>3RW44 25-□BC□6</b>	1	1 unit	131	4.900	
77	--	37	45	<b>75</b>	--	68	--	--	50	<b>50</b>	B	<b>3RW44 26-□BC□6</b>	1	1 unit	131	4.900	
93	--	45	55	<b>90</b>	--	82	--	--	60	<b>75</b>	B	<b>3RW44 27-□BC□6</b>	1	1 unit	131	4.900	

### Order No. supplement for connection methods

- With spring-loaded terminals
- With screw terminals

113	--	55	75	<b>110</b>	--	100	--	--	75	<b>75</b>	B	<b>3RW44 34-□BC□6</b>	1	1 unit	131	7.900
134	--	75	90	<b>132</b>	--	117	--	--	75	<b>100</b>	B	<b>3RW44 35-□BC□6</b>	1	1 unit	131	7.900
162	--	90	110	<b>160</b>	--	145	--	--	100	<b>125</b>	B	<b>3RW44 36-□BC□6</b>	1	1 unit	131	7.900
203	--	110	132	<b>200</b>	--	180	--	--	125	<b>150</b>	B	<b>3RW44 43-□BC□6</b>	1	1 unit	131	10.300
250	--	132	160	<b>250</b>	--	215	--	--	150	<b>200</b>	B	<b>3RW44 44-□BC□6</b>	1	1 unit	131	10.300
313	--	160	200	<b>315</b>	--	280	--	--	200	<b>250</b>	B	<b>3RW44 45-□BC□6</b>	1	1 unit	131	10.300
356	--	200	250	<b>355</b>	--	315	--	--	250	<b>300</b>	B	<b>3RW44 46-□BC□6</b>	1	1 unit	131	10.300
432	--	250	315	<b>400</b>	--	385	--	--	300	<b>400</b>	B	<b>3RW44 47-□BC□6</b>	1	1 unit	131	10.300
551	--	315	355	<b>560</b>	--	494	--	--	400	<b>500</b>	C	<b>3RW44 53-□BC□6</b>	1	1 unit	131	50.000
615	--	355	400	<b>630</b>	--	551	--	--	450	<b>600</b>	C	<b>3RW44 54-□BC□6</b>	1	1 unit	131	50.000
693	--	400	500	<b>710</b>	--	615	--	--	500	<b>700</b>	C	<b>3RW44 55-□BC□6</b>	1	1 unit	131	50.000
780	--	450	560	<b>800</b>	--	693	--	--	600	<b>750</b>	C	<b>3RW44 56-□BC□6</b>	1	1 unit	131	50.000
880	--	500	630	<b>900</b>	--	780	--	--	700	<b>850</b>	C	<b>3RW44 57-□BC□6</b>	1	1 unit	131	50.000
970	--	560	710	<b>1000</b>	--	850	--	--	750	<b>950</b>	C	<b>3RW44 58-□BC□6</b>	1	1 unit	131	50.000

### Order No. supplement for connection methods

- With spring-loaded terminals
- With screw terminals

### Order No. supplement for the rated control supply voltage $U_s$ 1)

- 115 V AC
- 230 V AC

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

### Note:

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  $J_{Load} < 10 \times J_{Motor}$ ; starting current  $350 \% \times I_e$  for 20 s or similar load.) For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical Specifications for information about rated currents for ambient temperatures  $> 40 \text{ °C}$  and operating frequency.

# 3RW Soft Starters

**3RW44**  
for High-Feature applications



3RW44 27-1BC44



3RW44 36-6BC44



3RW44 47-6BC44



3RW44 58-6BC44

Ambient temperature 40 °C						Ambient temperature 50 °C				DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.		
Rated operational current $I_e^{1)}$	Rated output of three-phase induction motors for rated operational voltage $U_e$					Rated operational current $I_e$	Rated output of three-phase induction motors for rated operational 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		
<b>Inside-delta circuits, rated operational voltage 200 ... 460 V<sup>2)</sup></b>																		
50	15	<b>22</b>	--	--	--	45	10	15	<b>30</b>	--	B	<b>3RW44 22-□BC□4</b>		1	1 unit	131	4.900	
62	18.5	<b>30</b>	--	--	--	55	15	20	<b>40</b>	--	B	<b>3RW44 23-□BC□4</b>		1	1 unit	131	4.900	
81	22	<b>45</b>	--	--	--	73	20	25	<b>50</b>	--	B	<b>3RW44 24-□BC□4</b>		1	1 unit	131	4.900	
99	30	<b>55</b>	--	--	--	88	25	30	<b>60</b>	--	B	<b>3RW44 25-□BC□4</b>		1	1 unit	131	4.900	
133	37	<b>75</b>	--	--	--	118	30	40	<b>75</b>	--	B	<b>3RW44 26-□BC□4</b>		1	1 unit	131	4.900	
161	45	<b>90</b>	--	--	--	142	40	50	<b>100</b>	--	B	<b>3RW44 27-□BC□4</b>		1	1 unit	131	4.900	
<b>Order No. supplement for connection methods</b>																		
<ul style="list-style-type: none"> <li>• With spring-loaded terminals</li> <li>• With screw terminals</li> </ul>																		
196	55	<b>110</b>	--	--	--	173	50	60	<b>125</b>	--	B	<b>3RW44 34-□BC□4</b>		1	1 unit	131	7.900	
232	75	<b>132</b>	--	--	--	203	60	75	<b>150</b>	--	B	<b>3RW44 35-□BC□4</b>		1	1 unit	131	7.900	
281	90	<b>160</b>	--	--	--	251	75	100	<b>200</b>	--	B	<b>3RW44 36-□BC□4</b>		1	1 unit	131	7.900	
352	110	<b>200</b>	--	--	--	312	100	125	<b>250</b>	--	B	<b>3RW44 43-□BC□4</b>		1	1 unit	131	10.300	
433	132	<b>250</b>	--	--	--	372	125	150	<b>300</b>	--	B	<b>3RW44 44-□BC□4</b>		1	1 unit	131	10.300	
542	160	<b>315</b>	--	--	--	485	150	200	<b>400</b>	--	B	<b>3RW44 45-□BC□4</b>		1	1 unit	131	10.300	
617	200	<b>355</b>	--	--	--	546	150	200	<b>450</b>	--	B	<b>3RW44 46-□BC□4</b>		1	1 unit	131	10.300	
748	250	<b>400</b>	--	--	--	667	200	250	<b>600</b>	--	B	<b>3RW44 47-□BC□4</b>		1	1 unit	131	10.300	
954	315	<b>560</b>	--	--	--	856	300	350	<b>750</b>	--	C	<b>3RW44 53-□BC□4</b>		1	1 unit	131	50.000	
1065	355	<b>630</b>	--	--	--	954	350	400	<b>850</b>	--	C	<b>3RW44 54-□BC□4</b>		1	1 unit	131	50.000	
1200	400	<b>710</b>	--	--	--	1065	350	450	<b>950</b>	--	C	<b>3RW44 55-□BC□4</b>		1	1 unit	131	50.000	
1351	450	<b>800</b>	--	--	--	1200	450	500	<b>1050</b>	--	C	<b>3RW44 56-□BC□4</b>		1	1 unit	131	50.000	
1524	500	<b>900</b>	--	--	--	1351	450	600	<b>1200</b>	--	C	<b>3RW44 57-□BC□4</b>		1	1 unit	131	50.000	
1680	560	<b>1000</b>	--	--	--	1472	550	650	<b>1300</b>	--	C	<b>3RW44 58-□BC□4</b>		1	1 unit	131	50.000	
<b>Order No. supplement for connection methods</b>																		
<ul style="list-style-type: none"> <li>• With spring-loaded terminals</li> <li>• With screw terminals</li> </ul>																		
<b>Order No. supplement for the rated control supply voltage <math>U_s^{3)}</math></b>																		
<ul style="list-style-type: none"> <li>• 115 V AC</li> <li>• 230 V AC</li> </ul>																		

- 1) In the selection table, the unit rated operational current  $I_e$  refers to the three-phase motor's rated operational current in the inside-delta circuit. The actual current of the unit is approx. 58 % of this value.
- 2) 3RW44 2 ., 3RW44 3 ., and 3RW44 4 . soft starters with screw-type terminals: delivery time class ▶(preferred type).
- 3) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

**Note:**

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  $J_{Load} < 10 \times J_{Motor}$ ; starting current  $350 \% \times I_e$  for 20 s or similar load.) For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical Specifications for information about rated currents for ambient temperatures  $> 40 \text{ °C}$  and operating frequency.

# 3RW Soft Starters

## 3RW44 for High-Feature applications

Ambient temperature 40 °C					Ambient temperature 50 °C				DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Rated operational current $I_e^{1)}$	Rated output of three-phase induction motors for rated operational voltage $U_e$					Rated operational current $I_e$	Rated output of three-phase induction motors for rated operational voltage $U_e$								
		230 V	400 V	500 V	690 V		1000 V	A	200 V	230 V	460 V	575 V			
	kW	kW	kW	kW	kW		hp	hp	hp	hp					

Inside-delta circuits, rated operational voltage 400 ... 600 V <sup>2)</sup>																
50	--	22	<b>30</b>	--	--	45	--	--	30	<b>40</b>	B	<b>3RW44 22-□BC□5</b>	1	1 unit	131	4.900
62	--	30	<b>37</b>	--	--	55	--	--	40	<b>50</b>	B	<b>3RW44 23-□BC□5</b>	1	1 unit	131	4.900
81	--	45	<b>45</b>	--	--	73	--	--	50	<b>60</b>	B	<b>3RW44 24-□BC□5</b>	1	1 unit	131	4.900
99	--	55	<b>55</b>	--	--	88	--	--	60	<b>75</b>	B	<b>3RW44 25-□BC□5</b>	1	1 unit	131	4.900
133	--	75	<b>90</b>	--	--	118	--	--	75	<b>100</b>	B	<b>3RW44 26-□BC□5</b>	1	1 unit	131	4.900
161	--	90	<b>110</b>	--	--	142	--	--	100	<b>125</b>	B	<b>3RW44 27-□BC□5</b>	1	1 unit	131	4.900

### Order No. supplement for connection methods

- With spring-loaded terminals
- With screw terminals

196	--	110	<b>132</b>	--	--	173	--	--	125	<b>150</b>	B	<b>3RW44 34-□BC□5</b>	1	1 unit	131	7.900
232	--	132	<b>160</b>	--	--	203	--	--	150	<b>200</b>	B	<b>3RW44 35-□BC□5</b>	1	1 unit	131	7.900
281	--	160	<b>200</b>	--	--	251	--	--	200	<b>250</b>	B	<b>3RW44 36-□BC□5</b>	1	1 unit	131	7.900
352	--	200	<b>250</b>	--	--	312	--	--	250	<b>300</b>	B	<b>3RW44 43-□BC□5</b>	1	1 unit	131	10.300
433	--	250	<b>315</b>	--	--	372	--	--	300	<b>350</b>	B	<b>3RW44 44-□BC□5</b>	1	1 unit	131	10.300
542	--	315	<b>355</b>	--	--	485	--	--	400	<b>500</b>	B	<b>3RW44 45-□BC□5</b>	1	1 unit	131	10.300
617	--	355	<b>450</b>	--	--	546	--	--	450	<b>600</b>	B	<b>3RW44 46-□BC□5</b>	1	1 unit	131	10.300
748	--	400	<b>500</b>	--	--	667	--	--	600	<b>750</b>	B	<b>3RW44 47-□BC□5</b>	1	1 unit	131	10.300
954	--	560	<b>630</b>	--	--	856	--	--	750	<b>950</b>	C	<b>3RW44 53-□BC□5</b>	1	1 unit	131	50.000
1065	--	630	<b>710</b>	--	--	954	--	--	850	<b>1050</b>	C	<b>3RW44 54-□BC□5</b>	1	1 unit	131	50.000
1200	--	710	<b>800</b>	--	--	1065	--	--	950	<b>1200</b>	C	<b>3RW44 55-□BC□5</b>	1	1 unit	131	50.000
1351	--	800	<b>900</b>	--	--	1200	--	--	1050	<b>1350</b>	C	<b>3RW44 56-□BC□5</b>	1	1 unit	131	50.000
1524	--	900	<b>1000</b>	--	--	1351	--	--	1200	<b>1500</b>	C	<b>3RW44 57-□BC□5</b>	1	1 unit	131	50.000
1680	--	1000	<b>1200</b>	--	--	1472	--	--	1300	<b>1650</b>	C	<b>3RW44 58-□BC□5</b>	1	1 unit	131	50.000

### Order No. supplement for connection methods

- With spring-loaded terminals
- With screw terminals

### Order No. supplement for the rated control supply voltage $U_s^{3)}$

- 115 V AC
- 230 V AC


- 1) In the selection table, the unit rated operational current  $I_e$  refers to the three-phase motor's rated operational current in the inside-delta circuit. The actual current of the unit is approx. 58 % of this value.
- 2) 3RW44 2 .., 3RW44 3 .. and 3RW44 4 .. soft starters 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.

### Note:

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  $J_{Load} < 10 \times J_{Motor}$ ; starting current 350 %  $\times I_e$  for 20 s or similar load.) For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical Specifications for information about rated currents for ambient temperatures > 40 °C and operating frequency.

## Accessories

For soft starters	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Type								
<b>Soft Starter ES 2006 PC communication program</b>								
	<b>Soft Starter ES 2006 Smart</b>		▶	<b>3ZS1 313-1CC10-0YA0</b>	1	1 unit	131	0.230
	Parameterization and service software for SIRIUS 3RW44 soft starters for parameterizing through the system interface on the device. Executes on PC/PG under Windows 2000/XP, without PC cable Type of supply: CD, single license							
3ZS1 313-1CC10-0YA0	<b>Soft Starter ES 2006 Professional</b>		A	<b>3ZS1 313-2CC10-0YA0</b>	1	1 unit	131	0.230
Parameterization and service software for SIRIUS 3RW44 soft starters for parameterizing through the system interface on the device and PROFIBUS DP interface (PROFIBUS as optional communication module necessary). Executes on PC/PG under Windows 2000/XP, without PC cable Type of supply: CD, single license								

# 3RW Soft Starters

## 3RW44 for High-Feature applications

For soft starters	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
<b>PC cables</b>								
	<b>For PC/PG communication with SIRIUS 3RW44 soft starters</b> through the system interface, for connecting to the serial interface of the PC/PG	B	<b>3UF7 940-0AA00-0</b>		1	1 unit	131	0.150
<b>Box terminal blocks for soft starters</b>								
	<b>Box terminal blocks</b> 3RW44 2. Included in delivery 3RW44 3. • Up to 70 mm <sup>2</sup> • Up to 120 mm <sup>2</sup> 3RW44 3. • Up to 240 mm <sup>2</sup>		▶ <b>3RT19 55-4G</b> ▶ <b>3RT19 56-4G</b> ▶ <b>3RT19 66-4G</b>		1 1 1	1 unit 1 unit 1 unit	101 101 101	0.237 0.270 0.676
<b>PROFIBUS Communication module</b>								
	Module to be plugged into the soft starter to connect the soft starter to the PROFIBUS net.	A	<b>3RW4 900-0KC00</b>		1	1 unit	131	0.320
<b>External display and operation module</b>								
	to show and operate the functions supplied by the soft starter via externally mounted display and operation module (for example in the cubicle door)	A	<b>3RW4 900-0AC00</b>		1	1 unit	131	0.320
<b>Connection cable</b>								
	from serial interface of 3RW44 soft starter to external display and operation module	B	<b>3UF7 932-0AA00-0</b>		1	1 unit	131	0.020
	• Length 0,5 m, flat	A	<b>3UF7 932-0BA00-0</b>		1	1 unit	131	0.050
	• Length 0,5 m, round	A	<b>3UF7 937-0BA00-0</b>		1	1 unit	131	0.100
	• Length 1,0 m, round	A	<b>3UF7 937-0BA00-0</b>		1	1 unit	131	0.100
	• Length 2,5 m, round	A	<b>3UF7 933-0BA00-0</b>		1	1 unit	131	0.150
<b>Covers for soft starters</b>								
	<b>Terminal covers for box terminals</b> Additional touch protection to be fitted at the box terminals (2 units required per device)		▶ <b>3RT19 56-4EA2</b> ▶ <b>3RT19 66-4EA2</b>		1 1	1 unit 1 unit	101 101	0.028 0.038
	<b>Terminal covers for cable lugs and busbar connections</b> 3RW44 2. and 3RW44 3. 3RW44 4.		▶ <b>3RT19 56-4EA1</b> ▶ <b>3RT19 66-4EA1</b>		1 1	1 unit 1 unit	101 101	0.067 0.124
<b>Spare parts</b>								
For soft starters	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
<b>Fans</b>								
	3RW44 2. and 3RW44 3.	115 V AC 230 V AC	▶ <b>3RW49 36-8VX30</b> ▶ <b>3RW49 36-8VX40</b>		1 1	1 unit 1 unit	131 131	0.300 0.300
	3RW44 4.	115 V AC 230 V AC	▶ <b>3RW49 47-8VX30</b> ▶ <b>3RW49 47-8VX40</b>		1 1	1 unit 1 unit	131 131	0.500 0.500
	3RW44 5.	115 V AC 230 V AC	▶ <b>3RW49 57-8VX30</b> ▶ <b>3RW49 57-8VX40</b>		1 1	1 unit 1 unit	131 131	0.800 0.800

\* You can order this quantity or a multiple thereof.

# 3RW Soft Starters

## 3RW44 for High-Feature applications

### 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. Motor starting and deceleration are optimized quickly, easily and safely with just a few settings in 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. Measurement values and operating values as well as warning messages and fault indications are output continuously on the front panel during operation and when control voltage is applied. 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 switchgear environment. The SIRIUS 3RW44 soft starters have internal intrinsic device protection. This prevents thermal overloading of the power section's thyristors, e.g. due to unacceptably high closing operations.

Wiring 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 and 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
- 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
- External display and operator module
- System voltages from 200 to 690 V, 50 to 60 Hz
- Applicable up to 60 °C (derating from 40 °C)

### Technical specifications

Type	Terminal		3RW44 ..-BC3.	3RW44 ..-BC4.
<b>Control electronics</b>				
<b>Rated values</b>				
Rated control supply voltage	A1/A2/PE	V	115 AC -15/+10	230 AC -15/+10
• Tolerance		%		
Rated control supply current STANDBY		mA	30	20
Rated control supply current ON				
• 3RW44 2.		mA	300	170
• 3RW44 3.		mA	500	250
• 3RW44 4.		mA	750	400
• 3RW44 5.		mA	450	200
Maximum current (pickup bypass)				
• 3RW44 2.		mA	1000	500
• 3RW44 3.		mA	2500	1250
• 3RW44 4.		mA	6000	3000
• 3RW44 5.		mA	4500	2500
Rated frequency		Hz	50 ... 60	50 ... 60
• Tolerance		%	±10	±10

Type	Terminal		3RW44 ..	Factory presetting
<b>Control electronics</b>				
<b>Control inputs</b>				
Input 1	IN1			Start motor right parameter set 1 No action No action Trip reset
Input 2	IN2			
Input 3	IN3			
Input 4	IN4			
Supply	L+/L-			
• Rated operational current		mA	Approx. 10 per input to DIN 19240 Internal voltage: 24 V DC from internal supply through terminal L+ to IN1 ... IN4. Maximum load at L+ approx. 55 mA External voltage: DC external voltage (to DIN19240) through terminals L- and IN1 ... IN4 (min. 12 V DC, max. 30 V DC)	
• Rated operational voltage	L+			
	L-			
<b>Thermistor motor protection input</b>				
Input	T1/T2		PTC type A or Thermoclick	Deactivated
<b>Relay outputs (floating auxiliary contacts)</b>				
Output 1	13/14			ON period No action No action Group fault
Output 2	23/24			
Output 3	33/34			
Output 4	95/96/98			
<b>Switching capacity of the relay outputs</b>				
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 gL/gG operational class; 6 A quick (fuse is not included in scope of supply)	
<b>Protective functions</b>				
<b>Motor protection functions</b>				
Trips in the event of			Thermal overloading of the motor	10
Trip class to IEC 60947-4-1		Class	5/10/15/20/30	
Phase failure sensitivity		%	> 40	
Overload warning			yes	
Reset and recovery			Manual/Automatic	Manual
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	1 ... 30	1
<b>Device protection functions</b>				
Trips in the event of			Thermal overloading of the thyristors	Manual
Reset option after tripping			Manual/Automatic	
Recovery time		min.	0.5	

# 3RW Soft Starters

## 3RW44 for High-Feature applications

Type	3RW44 ..			Factory presetting
<b>Control times and parameters</b>				
<b>Control times</b>				
Closing delay (with connected control voltage)	ms	< 50		
Closing delay (automatic mode)	ms	< 4000		
Recovery time (closing command in active ramp-down)	ms	< 100		
<b>Mains failure bridging time</b>				
Control supply voltage	ms	100		
<b>Mains failure response time</b>				
Load current circuit	ms	100		
<b>Reclosing lockout after overload trip</b>				
Motor protection trip	min.	1 ... 30		1
Device protection trip	s	30		
<b>Setting options for starting</b>				
Voltage ramp for starting voltage	%	20 ... 100		30
Torque control for starting torque	%	20 ... 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
<b>Creep mode Left/Right running</b>				
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
<b>Setting options for ramp-down</b>				
Torque control for stopping torque	%	10 ... 100		10
Ramp-down time	s	0 ... 360		10
Dynamic braking torque	%	20 ... 100		50
DC braking torque	%	20 ... 100		50
<b>Operating indications</b>				
		Test voltage		
		Test mains phases		
		Ready to start		
		Start active		
		Motor running		
		Ramp-down active		
<b>Warnings/error signals</b>				
		Mains voltage missing		
		Leading-edge phase error		
		Phase failure		
		• L1		
		• L2		
		• L3		
		Missing load phase		
		• T1		
		• T2		
		• T3		
		Failure		
		• Contact element 1 (thyristor)		
		• Contact element 2 (thyristor)		
		• Contact element 3 (thyristor)		
		Flash memory faulty		
		Supply voltage		
		• 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 voltage too high		
		Device not named		
		Wrong naming version		
		Current range exceeded		
		Motor blocking – shutdown		
		Current limit exceeded		
		Power section		
		• Overheated		
		• Overtemperature		
		Emergency active		

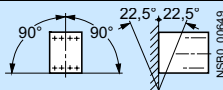


Type	3RW44 ..	Factory presetting
<b>Control times and parameters</b>		
<b>Warnings/error signals</b> (contd.)	<ul style="list-style-type: none"> <li>Temperature sensor                             <ul style="list-style-type: none"> <li>• Overload</li> <li>• Open-circuit</li> <li>• Short-circuit</li> </ul> </li> <li>Ground fault                             <ul style="list-style-type: none"> <li>• Detected</li> <li>• Shutdown</li> </ul> </li> <li>Connection abort in manual mode</li> <li>Max. number of starts exceeded</li> <li><math>I_e</math> limit value overshoot/undershoot</li> <li>Cooling time                             <ul style="list-style-type: none"> <li>• Motor active</li> <li>• Switch block active</li> </ul> </li> <li>Heat sink sensor                             <ul style="list-style-type: none"> <li>• Open-circuit</li> <li>• Short-circuit</li> </ul> </li> <li>Quick-stop function</li> <li>Switch block faulty</li> <li><math>I_e</math>/class setting not permissible</li> </ul>	
<b>Control inputs</b> Input 1 Input 2 Input 3 Input 4 Parameterizing options for control inputs 1 ... 4	No action Local manual mode Emergency start Creep speed Quick-stop Trip reset Motor right parameter set 1 Motor left parameter set 1 <sup>1)</sup> Motor right parameter set 2 Motor left parameter set 2 <sup>1)</sup> Motor right parameter set 3 Motor left parameter set 3 <sup>1)</sup>	Motor right parameter set 1 No action No action Trip reset
<b>Relay outputs</b> Output 1 Output 2 Output 3 Output 4 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 Fan DC braking contactor Group warning Group fault Bus fault Device error Power on Ready to start	ON period No action No action Group fault
<b>Motor temperature sensors</b>	Deactivated Thermoclick PTC type A	Deactivated

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

# 3RW Soft Starters

## 3RW44 for High-Feature applications

Type		3RW44 ...BC.4	3RW44 ...BC.5	3RW44 ...BC.6
<b>Power electronics</b>				
<b>Rated operational voltage for inline circuit</b>	V	200 ... 460 AC	400 ... 600 AC	400 ... 690 AC
Tolerance	%	-15/+10	-15/+10	-15/+10
<b>Rated operational voltage for inside-delta circuit</b>	V	200 ... 460 AC	400 ... 600 AC	400 ... 600 AC
Tolerance	%	-15/+10	-15/+10	-15/+10
<b>Rated frequency</b>	Hz	50 ... 60		
Tolerance	%	±10		
<b>Continuous operation at 40 °C (% of <math>I_e</math>)</b>	%	115		
<b>Minimum load (% of set motor current <math>I_M</math>)</b>	%	8		
<b>Maximum conductor length between soft starter and motor</b>	m	200		
<b>Permissible installation height</b>	m	5000 (derating from 1000, see characteristics); higher on request		
<b>Permissible mounting position</b>				
<b>Permissible ambient temperature</b>		0 ... +60; (derating from +40)		
Operation	°C	0 ... +60; (derating from +40)		
Storage	°C	-25 ... +80		
<b>Degree of protection</b>		IP00		

Type		3RW44 22	3RW44 23	3RW44 24	3RW44 25	3RW44 26	3RW44 27
<b>Power electronics</b>							
<b>Rated operational current <math>I_e</math></b>		29	36	47	57	77	93
<b>Load rating with rated operational current <math>I_e</math></b>							
• 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	93/82/72
<b>Smallest adjustable rated motor current <math>I_M</math></b> for the motor overload protection	A	5	7	9	11	15	18
<b>Power loss</b>							
• In operation after completed ramp-up with uninterrupted rated operational 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
<b>Permissible rated motor current and starts per hour</b>							
<b>• Normal starting (Class 5)</b>							
- Rated motor current $I_M^{1)}$ , starting time 5 s	A	29	36	47	57	77	93
- Starts per hour <sup>2)</sup>	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 <sup>2)</sup>	1/h	20	15	20	20	20	20
<b>• Normal starting (Class 10)</b>							
- Rated motor current $I_M^{1)}$ , starting time 10 s	A	29	36	47	57	77	93
- Starts per hour <sup>2)</sup>	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 <sup>2)</sup>	1/h	10	6	10	10	8	8
<b>• Normal starting (Class 15)</b>							
- Rated motor current $I_M^{1)}$ , starting time 15 s	A	29	36	47	57	77	93
- Starts per hour <sup>2)</sup>	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 <sup>2)</sup>	1/h	6	4	6	6	6	6
<b>• For heavy starting (Class 20)</b>							
- Rated motor current $I_M^{1)}$ , starting time 20 s	A	29	36	47	57	73	88
- Starts per hour <sup>2)</sup>	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 <sup>2)</sup>	1/h	4	2	4	5	1.8	0.8
<b>• For very heavy starting (Class 30)</b>							
- Rated motor current $I_M^{1)}$ , starting time 30 s	A	29	36	44	57	65	77
- Starts per hour <sup>2)</sup>	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 <sup>2)</sup>	1/h	1.8	0.8	3.3	1.5	2	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, stand-alone installation 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
<b>Power electronics</b>				
<b>Rated operational current <math>I_e</math></b>		113	134	162
<b>Load rating with rated operational current <math>I_e</math></b>				
• Acc. to IEC and UL/CSA for individual mounting, AC-53a				
- at 40 °C	A	113	134	162
- at 50 °C	A	100	117	145
- at 60 °C	A	88	100	125
<b>Smallest adjustable rated motor current <math>I_M</math></b> for the motor overload protection	A	22	26	32
<b>Power loss</b>				
• In operation after completed ramp-up with uninterrupted rated operational current (40 °C) approx.	W	64	76	95
• During starting with current limit set to 350 % $I_M$ (40 °C)	W	1350	1700	2460
<b>Permissible rated motor current and starts per hour</b>				
<b>• Normal starting (Class 5)</b>				
- Rated motor current $I_M^{1)}$ , starting time 5 s	A	113	134	162
- Starts per hour <sup>2)</sup>	1/h	41	39	41
- Rated motor current $I_M^{1)3)}$ , starting time 10 s	A	113	134	162
- Starts per hour <sup>2)</sup>	1/h	20	15	20
<b>• Normal starting (Class 10)</b>				
- Rated motor current $I_M^{1)}$ , starting time 10 s	A	113	134	162
- Starts per hour <sup>2)</sup>	1/h	20	15	20
- Rated motor current $I_M^{1)3)}$ , starting time 20 s	A	113	134	162
- Starts per hour <sup>2)</sup>	1/h	9	6	7
<b>• Normal starting (Class 15)</b>				
- Rated motor current $I_M^{1)}$ , starting time 15 s	A	113	134	162
- Starts per hour <sup>2)</sup>	1/h	13	9	12
- Rated motor current $I_M^{1)3)}$ , starting time 30 s	A	113	134	162
- Starts per hour <sup>2)</sup>	1/h	6	6	1
<b>• For heavy starting (Class 20)</b>				
- Rated motor current $I_M^{1)}$ , starting time 20 s	A	106	125	147
- Starts per hour <sup>2)</sup>	1/h	9	9	10
- Rated motor current $I_M^{1)3)}$ , starting time 40 s	A	106	125	147
- Starts per hour <sup>2)</sup>	1/h	1.5	2	1
<b>• For very heavy starting (Class 30)</b>				
- Rated motor current $I_M^{1)}$ , starting time 30 s	A	91	110	120
- Starts per hour <sup>2)</sup>	1/h	6	6	6
- Rated motor current $I_M^{1)3)}$ , starting time 60 s	A	91	110	120
- Starts per hour <sup>2)</sup>	1/h	2	2	2

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

2) For intermittent duty S4 with ON period = 70 %,  $T_U = 40$  °C, stand-alone installation vertical. The quoted operating frequencies do not apply for automatic mode.

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

# 3RW Soft Starters

## 3RW44 for High-Feature applications

Type		3RW44 43	3RW44 44	3RW44 45	3RW44 46	3RW44 47
<b>Power electronics</b>						
<b>Rated operational current <math>I_e</math></b>		203	250	313	356	432
<b>Load rating with rated operational current <math>I_e</math></b>						
• Acc. to IEC and UL/CSA for individual mounting, AC-53a						
- at 40 °C	A	203	250	313	356	432
- at 50 °C	A	180	215	280	315	385
- at 60 °C	A	156	185	250	280	335
<b>Smallest adjustable rated motor current <math>I_M</math></b> for the motor overload protection	A	40	50	62	71	86
<b>Power loss</b>						
• In operation after completed ramp-up with uninterrupted rated operational 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
<b>Permissible rated motor current and starts per hour</b>						
<b>• Normal starting (Class 5)</b>						
- Rated motor current $I_M^{1)}$ , starting time 5 s	A	203	250	313	356	432
- Starts per hour <sup>2)</sup>	1/h	41	41	41	41	39
- Rated motor current $I_M^{1)3)}$ , starting time 10 s	A	203	250	313	356	432
- Starts per hour <sup>2)</sup>	1/h	20	20	19	17	16
<b>• Normal starting (Class 10)</b>						
- Rated motor current $I_M^{1)}$ , starting time 10 s	A	203	250	313	356	432
- Starts per hour <sup>2)</sup>	1/h	20	20	19	17	16
- Rated motor current $I_M^{1)3)}$ , starting time 20 s	A	203	250	313	356	432
- Starts per hour <sup>2)</sup>	1/h	9	10	6	4	5
<b>• Normal starting (Class 15)</b>						
- Rated motor current $I_M^{1)}$ , starting time 15 s	A	203	240	313	325	402
- Starts per hour <sup>2)</sup>	1/h	13	13	10	13	11
- Rated motor current $I_M^{1)3)}$ , starting time 30 s	A	203	240	313	325	402
- Starts per hour <sup>2)</sup>	1/h	3	6	1	2	1
<b>• For heavy starting (Class 20)</b>						
- Rated motor current $I_M^{1)}$ , starting time 20 s	A	195	215	275	285	356
- Starts per hour <sup>2)</sup>	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 <sup>2)</sup>	1/h	1	5	1	3	1
<b>• For very heavy starting (Class 30)</b>						
- Rated motor current $I_M^{1)}$ , starting time 30 s	A	162	180	220	240	285
- Starts per hour <sup>2)</sup>	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 <sup>2)</sup>	1/h	3	3	3	2	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, stand-alone installation 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 53	3RW44 54	3RW44 55	3RW44 56	3RW44 57	3RW44 58
<b>Power electronics</b>							
<b>Rated operational current <math>I_e</math></b>		551	615	693	780	880	970
<b>Load rating with rated operational current <math>I_e</math></b>							
• Acc. to IEC and UL/CSA for individual mounting, AC-53a							
- at 40 °C	A	551	615	693	780	880	970
- at 50 °C	A	494	551	615	693	780	850
- at 60 °C	A	438	489	551	615	693	760
<b>Smallest adjustable rated motor current <math>I_M</math></b> for the motor overload protection	A	110	123	138	156	176	194
<b>Power loss</b>							
• In operation after completed ramp-up with uninterrupted rated operational current (40 °C) approx.	W	159	186	220	214	250	270
• During starting with current limit set to 350 % $I_M$ (40 °C)	W	7020	8100	9500	11100	13100	15000
<b>Permissible rated motor current and starts per hour</b>							
<b>• Normal starting (Class 5)</b>							
- Rated motor current $I_M^{1)}$ , starting time 5 s	A	551	615	693	780	880	970
- Starts per hour <sup>2)</sup>	1/h	41	41	37	33	22	17
- Rated motor current $I_M^{1)3)}$ , starting time 10 s	A	551	615	693	780	880	970
- Starts per hour <sup>2)</sup>	1/h	20	20	16	13	8	5
<b>• Normal starting (Class 10)</b>							
- Rated motor current $I_M^{1)}$ , starting time 10 s	A	551	615	693	780	880	970
- Starts per hour <sup>2)</sup>	1/h	20	20	16	13	8	5
- Rated motor current $I_M^{1)3)}$ , starting time 20 s	A	551	615	693	780	880	970
- Starts per hour <sup>2)</sup>	1/h	10	9	6	4	0.3	0.3
<b>• Normal starting (Class 15)</b>							
- Rated motor current $I_M^{1)}$ , starting time 15 s	A	551	615	666	723	780	821
- Starts per hour <sup>2)</sup>	1/h	13	13	11	9	8	8
- Rated motor current $I_M^{1)3)}$ , starting time 30 s	A	551	615	666	723	780	821
- Starts per hour <sup>2)</sup>	1/h	6	4	3	1	0.4	0.5
<b>• For heavy starting (Class 20)</b>							
- Rated motor current $I_M^{1)}$ , starting time 20 s	A	551	591	633	670	710	740
- Starts per hour <sup>2)</sup>	1/h	10	10	7	8	8	9
- Rated motor current $I_M^{1)3)}$ , starting time 40 s	A	551	591	633	670	710	740
- Starts per hour <sup>2)</sup>	1/h	4	2	1	1	0.4	1
<b>• For very heavy starting (Class 30)</b>							
- Rated motor current $I_M^{1)}$ , starting time 30 s	A	500	525	551	575	600	630
- Starts per hour <sup>2)</sup>	1/h	6	6	6	6	6	6
- Rated motor current $I_M^{1)3)}$ , starting time 60 s	A	500	525	551	575	600	630
- Starts per hour <sup>2)</sup>	1/h	2	1	1	1	1.5	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, stand-alone installation vertical. The quoted operating frequencies do not apply for automatic mode.

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

# 3RW Soft Starters

## 3RW44 for High-Feature applications

Type		3RW44 2.	3RW44 3., 3RW44 4.	3RW44 5.	
<b>Conductor cross-sections</b>					
<b>Screw terminals with box terminal</b> <b>Front clamping point connected</b> 	<b>Main conductors:</b> <ul style="list-style-type: none"> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Stranded</li> <li>Ribbon cable conductors (number x width x thickness)</li> <li>AWG conductors, solid or stranded</li> </ul>	mm <sup>2</sup> 16 ... 70 mm <sup>2</sup> 16 ... 70 mm <sup>2</sup> 16 ... 70 mm min. 3 x 9 x 0.8, max. 6 x 15.5 x 0.8 AWG 6 ... 2/0	3RT19 55-4G (55 kW) 3RT19 66-4G 70 ... 240 70 ... 240 95 ... 300 min. 6 x 9 x 0.8 max. 20 x 24 x 0.5 3/0 ... 600 kcmil		
	<b>Rear clamping point connected</b> 	<ul style="list-style-type: none"> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Stranded</li> <li>Ribbon cable conductors (number x width x thickness)</li> <li>AWG conductors, solid or stranded</li> </ul>	mm <sup>2</sup> 16 ... 70 mm <sup>2</sup> 16 ... 70 mm <sup>2</sup> 16 ... 70 mm min. 3 x 9 x 0.8, max. 6 x 15.5 x 0.8 AWG 6 ... 2/0	120 ... 185 120 ... 185 120 ... 240 min. 6 x 9 x 0.8 max. 20 x 24 x 0.5 250 ... 500 kcmil	
	<b>Both clamping points connected</b> 	<ul style="list-style-type: none"> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Stranded</li> <li>Ribbon cable conductors (number x width x thickness)</li> <li>AWG conductors, solid or stranded</li> </ul>	mm <sup>2</sup> max. 1 x 50, 1 x 70 mm <sup>2</sup> max. 1 x 50, 1 x 70 mm <sup>2</sup> max. 2 x 70 mm max. 2 x (6 x 15.5 x 0.8) AWG max. 2 x 1/0	min. 2 x 50; max. 2 x 185 min. 2 x 50; max. 2 x 185 max. 2 x 70; max. 2 x 240 max. 2 x (20 x 24 x 0.5)	
	<b>Screw terminals with box terminal</b> <b>Front or rear clamping point connected</b>  	<b>Main conductors:</b> <ul style="list-style-type: none"> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Stranded</li> <li>Ribbon cable conductors (number x width x thickness)</li> <li>AWG conductors, solid or stranded</li> </ul>	mm <sup>2</sup> 16 ... 120 mm <sup>2</sup> 16 ... 120 mm <sup>2</sup> 16 ... 120 mm min. 3 x 9 x 0.8 max. 6 x 15.5 x 0.8 AWG 6 ... 250 kcmil	3RT19 56-4G 3RT19 66-4G	
<b>Both clamping points connected</b> 	<ul style="list-style-type: none"> <li>Finely stranded with end sleeve</li> <li>Finely stranded without end sleeve</li> <li>Stranded</li> <li>Ribbon cable conductors (number x width x thickness)</li> <li>AWG conductors, solid or stranded</li> </ul>	mm <sup>2</sup> max. 1 x 95, 1 x 120 mm <sup>2</sup> max. 1 x 95, 1 x 120 mm <sup>2</sup> max. 2 x 120 mm max. 2 x (10 x 15.5 x 0.8) AWG max. 2 x 3/0			
<b>Screw terminals</b>	<b>Main conductors:</b> <u>Without box terminal/rail connection</u> <ul style="list-style-type: none"> <li>Finely stranded with cable lug</li> <li>Stranded with cable lug</li> <li>AWG conductors, solid or stranded</li> <li>Connecting bar (max. width)</li> <li>Terminal screws</li> <li>- Pickup torque</li> </ul>	mm <sup>2</sup> 16 ... 95 <sup>1)</sup> mm <sup>2</sup> 25 ... 120 <sup>1)</sup> AWG 4 ... 250 kcmil mm 17 NM M8 x 25 (A/F13) 10 ... 14 lb.in 89 ... 124	50 ... 240 <sup>2)</sup> 70 ... 240 <sup>2)</sup> 2/0 ... 500 kcmil 25 M10 x 30 (A/F17) 14 ... 24 124 ... 210	50 ... 240 <sup>2)</sup> 70 ... 240 <sup>2)</sup> 1/0 ... 500 kcmil 60 M12 x 40 20 ... 35 177 ... 310	

- When connecting cable lugs to DIN 46235 use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm<sup>2</sup> to ensure phase spacing.
- When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for conductor cross-sections of 240 mm<sup>2</sup> and more as well as DIN 46235 for conductor cross-sections of 185 mm<sup>2</sup> and more to keep the phase clearance.

Soft starters	Type	3RW44 ..	
<b>Conductor cross-sections</b>			
<b>Auxiliary conductors</b> (1 or 2 conductors can be connected):			
<b>Screw terminals</b>			
• Solid	mm <sup>2</sup>	2 x 0.5 ... 2.5	
• Finely stranded with end sleeve	mm <sup>2</sup>	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 lb.in	0.7 ... 0.9 7 ... 8	
<b>Spring-loaded terminals</b>			
• Solid	mm <sup>2</sup>	2 x 0.25 ... 2.5	
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x 0.25 ... 1.5	
• AWG conductors, solid or stranded	AWG	2 x 24 ... 14	
		Standard	Parameters
<b>Electromagnetic compatibility acc. to EN 60947-4-2</b>			
<i>EMC interference immunity</i>			
<b>Electrostatic discharge (ESD)</b>		EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
<b>Electromagnetic RF fields</b>		EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 3, 10 V/m
<b>Conducted RF interference</b>		EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
<b>RF voltages and RF currents on conductors</b>			
Burst		EN 61000-4-4	±2 kV/5 kHz
Surge		EN 61000-4-5	±1 kV line to line ±2 kV line to ground
<i>EMC interference emission</i>			
<b>EMC interference field strength</b>		EN 55011	Limit value of Class A at 30 ... 1000 MHz
<b>Radio interference voltage</b>		EN 55011	Limit value of Class A at 0.15 ... 30 MHz
<i>Is an RI suppression filter necessary?</i>			
<b>Degree of noise suppression A</b> (industrial applications)			no

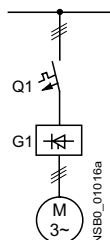
# 3RW Soft Starters

## 3RW44 for High-Feature applications

### Fuse assignment

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

#### Inline circuit fuseless version



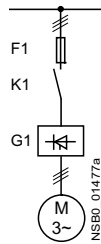
Soft starters		Motor starter protectors/circuit-breakers <sup>1)</sup>	
G1 Type	Rated current A	440 V +10 % Q1 Type	Rated current A
<b>Type of coordination <sup>2)</sup>: 3RW44 22 ... 3RW44 27: <math>I_q = 32</math> kA; 3RW44 34 and 3RW44 35: <math>I_q = 16</math> kA; 3RW44 36 ... 3RW44 57: <math>I_q = 65</math> kA</b>			
3RW44 22	29	3RV10 42-4HA10	50
3RW44 23	36	3RV10 42-4JA10	63
3RW44 24	47	3RV10 42-4KA10	75
3RW44 25	57	3RV10 42-4LA10	90
3RW44 26	77	3RV10 42-4MA10	100
3RW44 27	93	3RV10 42-4MA10	100
3RW44 34	113	3VL17 16-2DD36	160
3RW44 35	134	3VL17 16-2DD36	160
3RW44 36	162	3VL37 25-2DC36	250
3RW44 43	203	3VL47 31-3DC36	315
3RW44 44	250	3VL47 31-3DC36	315
3RW44 45	313	3VL47 40-3DC36	400
3RW44 46	356	3VL47 40-3DC36	400
3RW44 47	432	3VL57 50-3DC36	500
3RW44 53	551	3VL67 80-3DE36	800
3RW44 54	615	3VL67 80-3DE36	800
3RW44 55	693	3VL67 80-3DE36	800
3RW44 56	780	3VL77 10-3AB36	1000
3RW44 57	880	3VL77 10-3AB36	1000
3RW44 58	970	3VL77 12-3AB36	1200

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

2) The types of coordination are explained in more detail in the Technical information LV 1 T under – Fuseless Load Feeders.



**Inline circuit fused version** (line protection only)



Soft starters G1 Type	Rated current A	Line protections			Line contactors up to 400 V (optional) K1 Type	Braking contactors <sup>1)2)</sup> (for typical circuit see page 6/33)	
		690 V +5 % F1 Type	Rated current A	Size		K2 Type	K3 Type
<b>Type of coordination 1<sup>3)</sup>: I<sub>q</sub> = 65 kA</b>							
<b>3RW44 22</b>	29	3NA3 820-6	50	00	3RT10 34	3RT15 26	--
<b>3RW44 23</b>	36	3NA3 822-6	63	00	3RT10 35	3RT15 26	--
<b>3RW44 24</b>	47	3NA3 824-6	80	00	3RT10 36	3RT15 35	--
<b>3RW44 25</b>	57	3NA3 830-6	100	00	3RT10 44	3RT15 35	--
<b>3RW44 26</b>	77	3NA3 132-6	125	1	3RT10 45	3RT10 24	3RT10 35
<b>3RW44 27</b>	93	3NA3 136-6	160	1	3RT10 46	3RT10 25	3RT10 36
<b>3RW44 34</b>	113	3NA3 244-6	250	2	3RT10 54	3RT10 34	3RT10 44
<b>3RW44 35</b>	134	3NA3 244-6	250	2	3RT10 55	3RT10 36	3RT10 45
<b>3RW44 36</b>	162	3NA3 365-6	500	3	3RT10 56	3RT10 44	3RT10 45
<b>3RW44 43</b>	203	2 x 3NA3 354-6	2 x 355	3	3RT10 64	3RT10 44	3RT10 54
<b>3RW44 44</b>	250	2 x 3NA3 354-6	2 x 355	3	3RT10 65	3RT10 44	3RT10 55
<b>3RW44 45</b>	313	2 x 3NA3 365-6	2 x 500	3	3RT10 75	3RT10 54	3RT10 56
<b>3RW44 46</b>	356	2 x 3NA3 365-6	2 x 500	3	3RT10 75	3RT10 54	3RT10 56
<b>3RW44 47</b>	432	2 x 3NA3 365-6	2 x 500	3	3RT10 76	3RT10 55	3RT10 64
<b>3RW44 53</b>	551	2 x 3NA3 365-6	2 x 500	3	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7
<b>3RW44 54</b>	615	2 x 3NA3 365-6	2 x 500	3	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7
<b>3RW44 55</b>	693	2 x 3NA3 365-6	2 x 500	3	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7
<b>3RW44 56</b>	780	2 x 3NA3 365-6	2 x 500	3	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7
<b>3RW44 57</b>	880	2 x 3NA3 365-6	2 x 500	3	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7
<b>3RW44 58</b>	970	3 x 3NA3 365-6	3 x 500	3			

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

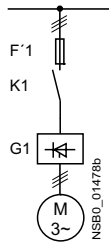
2) Additional auxiliary relay K4:  
 LZX:RT4A4T30  
 (3RW44 soft starter with rated control supply voltage 230 V AC),  
 LZX:RT4A4S15  
 (3RW44 soft starter with rated control supply voltage 115 V AC).

3) The types of coordination are explained in more detail in the Technical information LV 1 T under – Fuseless Load Feeders.

# 3RW Soft Starters

## 3RW44 for High-Feature applications

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



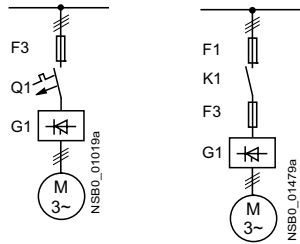
Soft starters		All-range fuses				Line contactors up to 400 V	Braking contactors <sup>1)2)</sup>	
G1 Type	Rated current A	F'1 Type	Rated current A	Voltage V	Size	(optional) K1 Type	(for typical circuit see page 6/33) K2 Type K3 Type	
<b>Type of coordination 2<sup>3)</sup>: I<sub>q</sub> = 65 kA</b>								
<b>3RW44 22</b>	29	3NE1 020-2	80	690 +5 %	00	3RT10 34	3RT15 26	--
<b>3RW44 23</b>	36	3NE1 020-2	80	690 +5 %	00	3RT10 35	3RT15 26	--
<b>3RW44 24</b>	47	3NE1 021-2	100	690 +5 %	00	3RT10 36	3RT15 35	--
<b>3RW44 25</b>	57	3NE1 022-2	125	690 +5 %	00	3RT10 44	3RT15 35	--
<b>3RW44 26</b>	77	3NE1 022-2	125	690 +5 %	00	3RT10 45	3RT10 24	3RT10 35
<b>3RW44 27</b>	93	3NE1 024-2	160	690 +5 %	1	3RT10 46	3RT10 25	3RT10 36
<b>3RW44 34</b>	113	3NE1 225-2	200	690 +5 %	1	3RT10 54	3RT10 34	3RT10 44
<b>3RW44 35</b>	134	3NE1 227-2	250	690 +5 %	1	3RT10 55	3RT10 36	3RT10 45
<b>3RW44 36</b>	162	3NE1 227-2	250	690 +5 %	1	3RT10 56	3RT10 44	3RT10 45
<b>3RW44 43</b>	203	3NE1 230-2	315	600 +10 %	1	3RT10 64	3RT10 44	3RT10 54
<b>3RW44 44</b>	250	3NE1 331-2	350	460 +10 %	2	3RT10 65	3RT10 44	3RT10 55
<b>3RW44 45</b>	313	3NE1 333-2	450	690 +5 %	2	3RT10 75	3RT10 44	3RT10 56
<b>3RW44 46</b>	356	3NE1 334-2	500	690 +5 %	2	3RT10 75	3RT10 54	3RT10 56
<b>3RW44 47</b>	432	3NE1 435-2	560	690 +5 %	3	3RT10 76	3RT10 55	3RT10 64
<b>3RW44 53</b>	551	2 x 3NE1 334-2	500	690 +10 %	2	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7
<b>3RW44 54</b>	615	2 x 3NE1 334-2	500	690 +10 %	2	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7
<b>3RW44 55</b>	693	2 x 3NE1 334-2	500	690 +10 %	2	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7
<b>3RW44 56</b>	780	2 x 3NE1 435-2	560	690 +10 %	3	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7
<b>3RW44 57</b>	880	2 x 3NE1 435-2	560	690 +10 %	3	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7
<b>3RW44 58</b>	970	2 x 3NE1 435-2	560	690 +10 %	3			

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 also be used (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).

3) The types of coordination are explained in more detail in the Technical information LV 1 T under – Fuseless Load Feeders.

**Inline circuit fused version with 3NE or 3NC SITOR semiconductor fuse**  
(semiconductor protection by fuse, lead and overload protection by circuit-breaker)



Soft starters		Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
G1 Type	Rated current A	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
<b>Type of coordination 2<sup>3)</sup>: I<sub>q</sub> = 65 kA</b>										
3RW44 22	29	3NE4 120	80	0	3NE4 121	100	0	3NC2 280	80	22 x 58
3RW44 23	36	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 24	47	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 25	57	3NE4 122	125	0	3NE4 124	160	0			
3RW44 26	77	3NE4 124	160	0	3NE4 124	160	0			
3RW44 27	93	3NE3 224	160	1	3NE3 333	450	2			
3RW44 34	113	3NE3 225	200	1	3NE3 335	560	2			
3RW44 35	134	3NE3 225	200	1	3NE3 335	560	2			
3RW44 36	162	3NE3 227	250	1	3NE3 333	450	2			
3RW44 43	203	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 44	250	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 45	313	3NE3 233	450	1	3NE3 336	630	2			
3RW44 46	356	3NE3 333	450	2	3NE3 336	630	2			
3RW44 47	432	3NE3 335	560	2	3NE3 338-8	800	2			
3RW44 53	551	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 54	615	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 55	693	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 56	780	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 57	880	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 58	970	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			

Soft starters		Line contactors up to 400 V (optional)	Braking contactors <sup>1)2)</sup> (for typical circuit see page 6/33)		Motor starter protectors/ circuit-breakers 440 V +10 %		Max. line protection 690 V +5 %		
G1 Type	Rated current A	K1 Type	Type	Type	Q1 Type	Rated current A	F1 Type	Rated current A	Size
<b>Type of coordination 2<sup>3)</sup>: 3RW44 22 ... 3RW44 27: I<sub>q</sub> = 32 kA; 3RW44 34 and 3RW44 35: I<sub>q</sub> = 16 kA; 3RW44 36 ... 3RW44 57: I<sub>q</sub> = 65 kA</b>									
3RW44 22	29	3RT10 34	3RT15 26	--	3RV10 41-4HA10	50	3NA3 820-6	50	00
3RW44 23	36	3RT10 35	3RT15 26	--	3RV10 41-4JA10	63	3NA3 822-6	63	00
3RW44 24	47	3RT10 36	3RT15 35	--	3RV10 41-4KA10	75	3NA3 824-6	80	00
3RW44 25	57	3RT10 44	3RT15 35	--	3RV10 41-4LA10	90	3NA3 830-6	100	00
3RW44 26	77	3RT10 45	3RT10 24	3RT10 35	3RV10 41-4MA10	100	3NA3 132-6	125	1
3RW44 27	93	3RT10 46	3RT10 25	3RT10 36	3RV10 41-4MA10	100	3NA3 136-6	160	1
3RW44 34	113	3RT10 54	3RT10 34	3RT10 44	3VL17 16-1DD36	160	3NA3 244-6	250	2
3RW44 35	134	3RT10 55	3RT10 36	3RT10 45	3VL17 16-1DD36	160	3NA3 244-6	250	2
3RW44 36	162	3RT10 56	3RT10 44	3RT10 45	3VL37 25-1DC36	250	3NA3 365-6	500	3
3RW44 43	203	3RT10 64	3RT10 44	3RT10 54	3VL47 31-1DC36	315	2 x 3NA3 354-6	2 x 355	3
3RW44 44	250	3RT10 65	3RT10 44	3RT10 55	3VL47 31-1DC36	315	2 x 3NA3 354-6	2 x 355	3
3RW44 45	313	3RT10 75	3RT10 54	3RT10 56	3VL47 40-1DC36	400	2 x 3NA3 365-6	2 x 500	3
3RW44 46	356	3RT10 75	3RT10 54	3RT10 56	3VL47 40-1DC36	400	2 x 3NA3 365-6	2 x 500	3
3RW44 47	432	3RT10 76	3RT10 55	3RT10 64	3VL57 50-1DC36	500	2 x 3NA3 365-6	2 x 500	3
3RW44 53	551	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7	3VL67 80-1AB36	800	2 x 3NA3 365-6	2 x 500	3
3RW44 54	615	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7	3VL67 80-1AB36	800	2 x 3NA3 365-6	2 x 500	3
3RW44 55	693	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7	3VL67 80-1AB36	800	2 x 3NA3 365-6	2 x 500	3
3RW44 56	780	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7	3VL77 10-1AB36	1000	2 x 3NA3 365-6	2 x 500	3
3RW44 57	880	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7	3VL77 10-1AB36	1000	2 x 3NA3 365-6	2 x 500	3
3RW44 58	970	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7	3VL77 12-1AB36	1200	3 x 3NA3 365-6	3 x 500	3

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

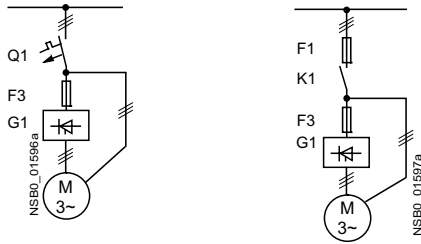
2) Additional auxiliary relay K4:  
LZX:RT4A4T30  
(3RW44 soft starter with rated control supply voltage 230 V AC),  
LZX:RT4A4S15  
(3RW44 soft starter with rated control supply voltage 115 V AC).

3) The types of coordination are explained in more detail in the Technical information LV 1 T under – Fuseless Load Feeders.

# 3RW Soft Starters

## 3RW44 for High-Feature applications

**Inside-delta circuit fused version with 3NE or 3NC SITOR fuses**  
(semiconductor protection by fuse, lead and overload protection by circuit-breaker)



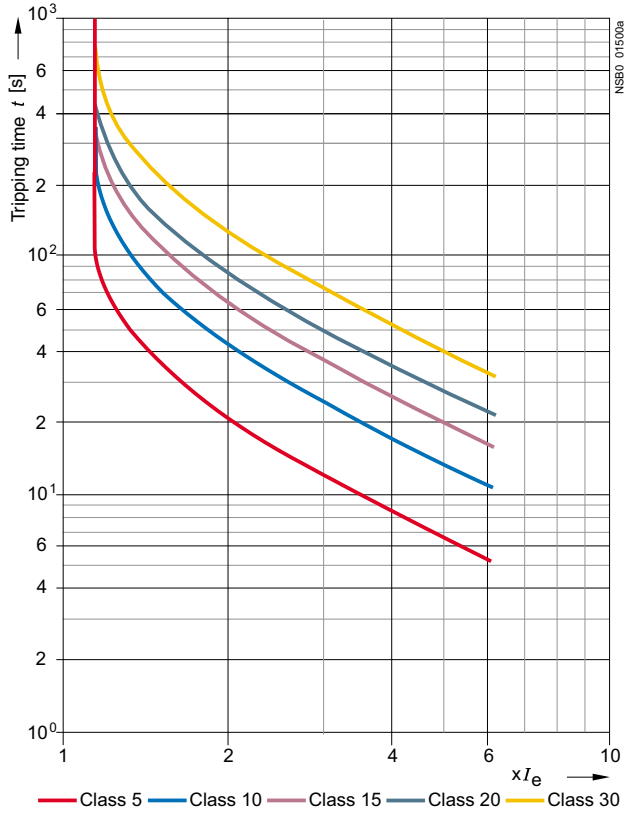
Soft starters		Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
G1 Type	Rated current A	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
<b>Type of coordination 2<sup>1)</sup></b>										
3RW44 22	50	3NE4 120	80	0	3NE4 121	100	0	3NC2 280	80	22 x 58
3RW44 23	62	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 24	81	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 25	99	3NE4 122	125	0	3NE4 124	160	0			
3RW44 26	133	3NE4 124	160	0	3NE4 124	160	0			
3RW44 27	161	3NE3 224	160	1	3NE3 333	450	2			
3RW44 34	196	3NE3 225	200	1	3NE3 335	560	2			
3RW44 35	232	3NE3 225	200	1	3NE3 335	560	2			
3RW44 36	281	3NE3 227	250	1	3NE3 333	450	2			
3RW44 43	352	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 44	433	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 45	542	3NE3 233	450	1	3NE3 336	630	2			
3RW44 46	617	3NE3 333	450	2	3NE3 336	630	2			
3RW44 47	748	3NE3 335	560	2	3NE3 338-8	800	2			
3RW44 53	954	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 54	1065	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 55	1200	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 56	1351	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 57	1524	2 x 3NE3 336	630	2	3 x 3NE3 340-8	900	2			
3RW44 58	1680	2 x 3NE3 336	630	2	3 x 3NE3 340-8	900	2			

Soft starters		Line contactors up to 400 V (optional)		Motor starter protectors/circuit-breakers 440 V +10 %		Line protections 690 V +5 %		
G1 Type	Rated current A	K1 Type	Q1 Type	Rated current A	F1 Type	Rated current A	Size	
<b>Type of coordination 2<sup>1)</sup></b>								
3RW44 22	50	3RT10 36-1AP04	3RV10 4.-4KA10	75	3NA3 824-6	80	00	
3RW44 23	62	3RT10 44-1AP04	3RV10 4.-4LA10	90	3NA3 830-6	100	00	
3RW44 24	81	3RT10 46-1AP04	3RV10 4.-4MA10	100	3NA3 132-6	125	1	
3RW44 25	99	3RT10 54-1AP36	3VL27 16-.DC36	160	3NA3 136-6	160	1	
3RW44 26	133	3RT10 55-6AP36	3VL27 16-.DC36	160	3NA3 240-6	200	2	
3RW44 27	161	3RT10 56-6AP36	3VL37 20-.DC36	200	3NA3 244-6	250	2	
3RW44 34	196	3RT10 64-6AP36	3VL37 25-.DC36	250	3NA3 360-6	400	3	
3RW44 35	232	3RT10 65-6AP36	3VL47 31-.DC36	315	3NA3 360-6	400	3	
3RW44 36	281	3RT10 66-6AP36	3VL47 40-.DC36	400	2 x 3NA3 360-6	2 x 400	3	
3RW44 43	352	3RT10 75-6AP36	3VL47 40-.DC36	400	2 x 3NA3 365-6	2 x 500	3	
3RW44 44	433	3RT10 76-6AP36	3VL57 50-.DC36	500	2 x 3NA3 365-6	2 x 500	3	
3RW44 45	542	3TF68 44-OCM7	3VL57 63-.DC36	800	3 x 3NA3 365-6	3 x 500	3	
3RW44 46	617	3TF68 44-OCM7	3VL67 80-.AB36	800	3 x 3NA3 365-6	3 x 500	3	
3RW44 47	748	3TF69	3VL67 80-.AB36	1000	3 x 3NA3 365-6	3 x 500	3	
3RW44 53	954	2 x 3TF68 44-OCM7	3VL77 10-.AB36	1000	3 x 3NA3 365-6	3 x 500	3	
3RW44 54	1065	2 x 3TF68 44-OCM7	3VL77 12-.AB36	1250	3 x 3NA3 365-6	3 x 500	3	
3RW44 55	1200	2 x 3TF69 44-OCM7	3VL87 16-.AB36	1600	3 x 3NA3 365-6	3 x 500	3	
3RW44 56	1351	2 x 3TF69 44-OCM7	3VL87 16-.AB36	1600	3 x 3NA3 372	3 x 630	3	
3RW44 57	1524	2 x 3TF69 44-OCM7	3VL87 16-.AB36	1600	3 x 3NA3 372	3 x 630	3	
3RW44 58	1680		3VL12 20	2000	2 x 3NA3 480	2 x 1000	4	

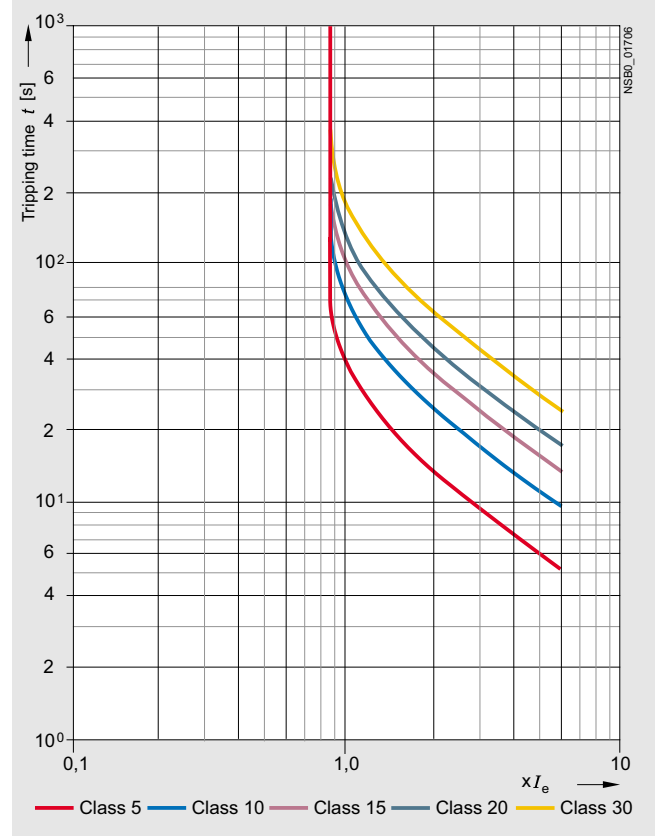
1) The types of coordination are explained in more detail in the Technical information LV 1 T under – Fuseless Load Feeders. The type of coordination 2 only refers to soft starters, not to feeder components ( $I_q = 65 \text{ kA}$ ).

## Characteristic curves

**Motor protection tripping characteristics for 3RW44 (with symmetry)**



**Motor protection characteristics for 3RW44 (with phase unbalance)**



## Admissible mounting height



The admissible operational voltage is reduced to 460 V with a mounting height of more than 2000 m.

# 3RW Soft Starters

## 3RW44 for High-Feature applications

### 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 belts	Roller conveyors	Compressors	Small ventilators	Pumps	Hydraulic pumps
<b>Starting parameters</b>						
• Voltage ramp and current limiting						
- Starting voltage	70	60	50	30	30	30
- Starting time	10	10	10	10	10	10
- Current limit value	Deactivated	Deactivated	$4 \times I_M$	$4 \times I_M$	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)
<b>Ramp-down mode</b>	Smooth ramp-down	Smooth ramp-down	Free ramp-down	Free ramp-down	Pump ramp-down	Free ramp-down

Application examples for heavy 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	Stirrers	Centrifuges	Milling machines
<b>Starting parameters</b>			
• Voltage ramp and current limiting			
- Starting voltage	30	30	30
- Starting time	30	30	30
- Current limit value	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• 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)
<b>Ramp-down mode</b>	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 ventilators	Mills	Breakers	Circular saw/bandsaws
<b>Starting parameters</b>				
• Voltage ramp and current limiting				
- Starting voltage	30	50	50	30
- Starting time	60	60	60	60
- Current limit value	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• 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)
<b>Ramp-down mode</b>	Free ramp-down	Free ramp-down	Free ramp-down	Free ramp-down

**Note:**

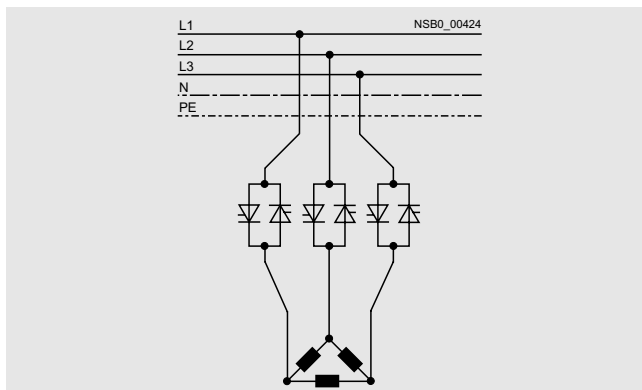
These tables present sample setting values and device sizes. They are intended only for the purposes of information and are not binding. The setting values depend on the application in question and must be optimized during commissioning. The soft starter dimensions should be checked where necessary with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

### Circuit concept

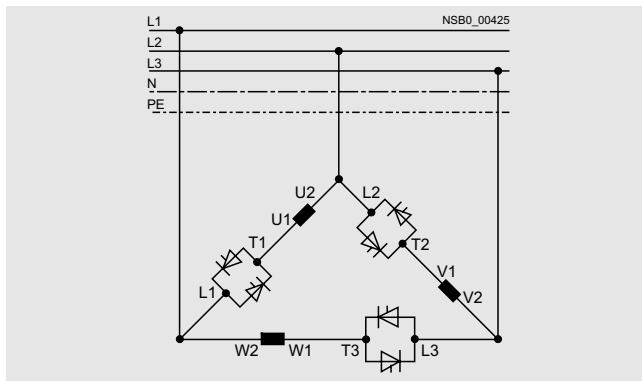
The SIRIUS 3RW44 soft starters can be operated in two different types of circuit.

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

### Comparison of the types of circuit



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



Inside-delta circuit:  
Rated current  $I_e$  corresponds to approx. 58 % of the rated motor current  $I_n$ ,  
6 leads to the motor (as with wye-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 choosing the operational mode 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.

### Configuration

The 3RW44 solid-state soft starters are designed for normal starting. In case of heavy starting or increased starting frequency, a larger device 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 smooth 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 SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e.g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct 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 motor starter protectors (selection of release).

### Note:

*When switching on three-phase current motors voltage drops normally will occur with all types of starters (direct starters, star-delta starters, soft starters). On principle the feeding transformer must be configured such that when starting the motor the voltage drop must occur within the admissible tolerance. When the feeding transformer is designed quite scarce the control voltage (being independent of the main voltage) should be supplied with a separate circuit in order to prevent the soft starter from switching off.*

### Serial PC interface, PROFIBUS DP communication module and parameterizing and operating software Soft Starter ES

The solid-state 3RW44 soft starters have a PC interface for communicating with the Soft Starter ES 2006 Smart software or to be connected to an external operating and monitoring module. When using the optional communication module PROFIBUS the 3RW44 soft starter can be connected to the PROFIBUS net and can communicate via GSD file or software Soft Starter ES 2006 Professional.

### Manual for SIRIUS 3RW44

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

### Win-Soft Starter 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.

More information can be found on the Internet at <http://www.siemens.com/softstarter>

# 3RW Soft Starters

## 3RW44 for High-Feature applications

### *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.

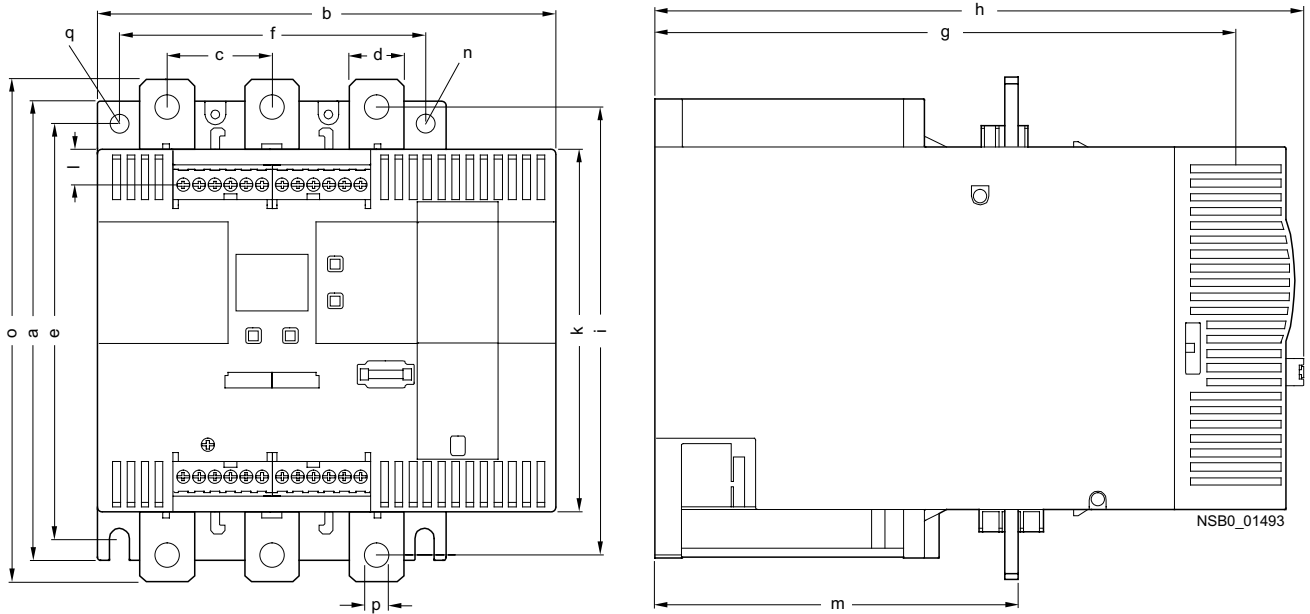
Please direct enquiries and applications to:

A&D PT 4 (Trainings-Center Erlangen)  
Werner-von-Siemens-Str. 65  
D-91052 Erlangen  
Telefon: ++49 9131 729262  
Telefax: ++49 9131 728172  
sibrain.industry@siemens.com  
[http:// www.siemens.com/sitrain](http://www.siemens.com/sitrain)



## Dimensional drawings

3RW44 2., 3RW44 3. and 3RW44 4. for High-Feature applications

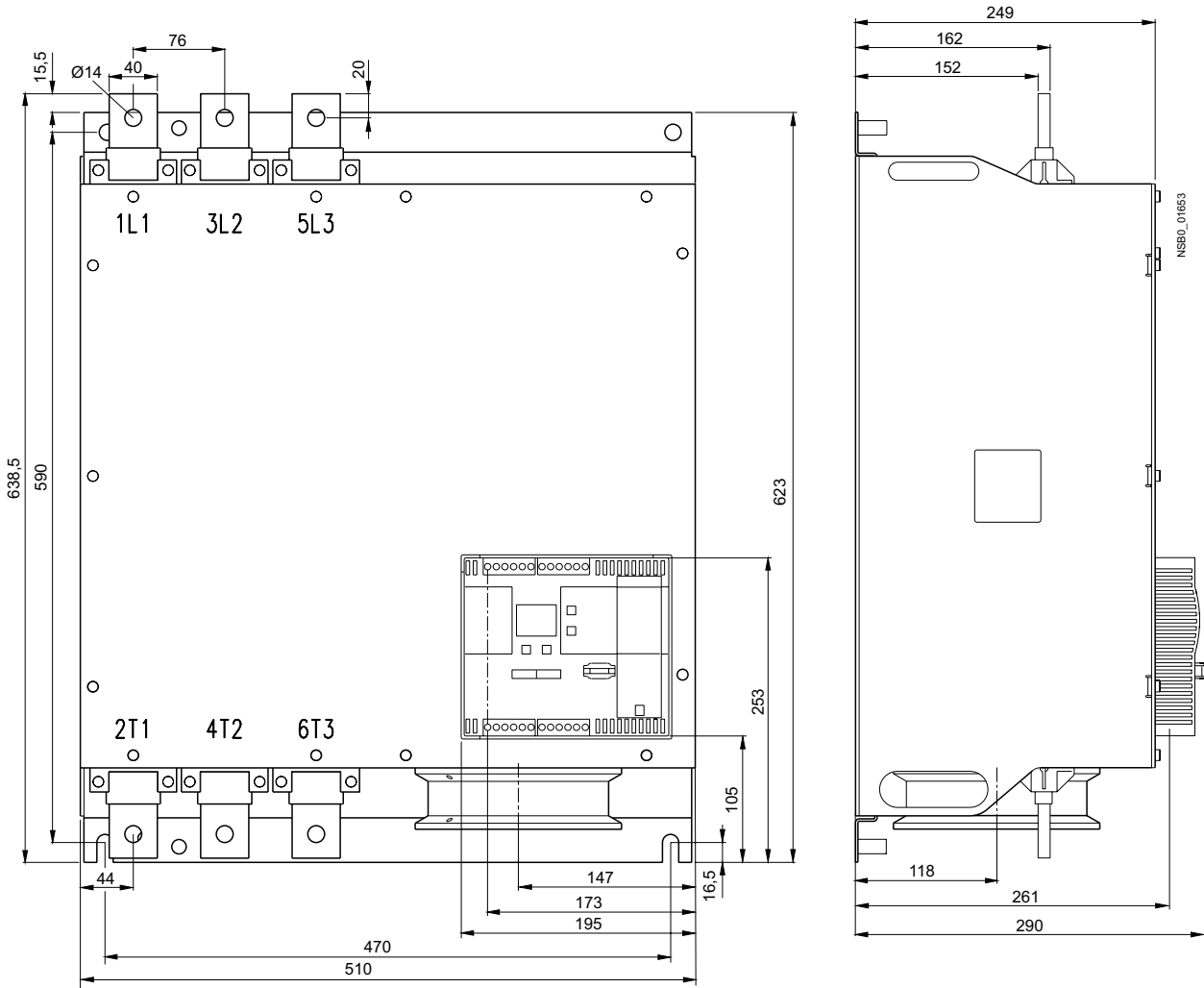


Type/Dimension (mm)	a	b	c	d	e	f	g	h	l	k	l	m	n	o	p	q
3RW44 2.	180	170	37	11	167	100	240	270	180	148	7,5	153	7	184	6,6	M6, 10 Nm
3RW44 3.	180	170	37	17	167	100	240	270	180	148	7,5	153	7	198	9	M6, 10 Nm
3RW44 4.	210	210	48	25	190	140	269	298	205	166	16	166	9	230	11	M8, 15 Nm

# 3RW Soft Starters

## Project planning aids

3RW44 5. for High-Feature applications



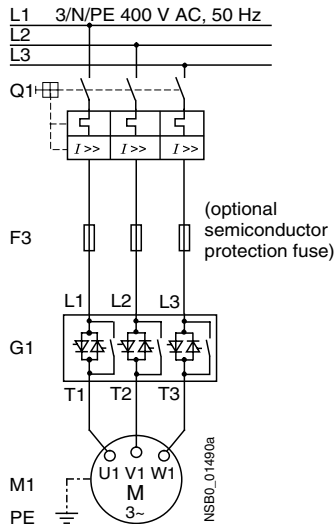
6

### Schematics

#### 3RW44 connection examples for main and control circuits

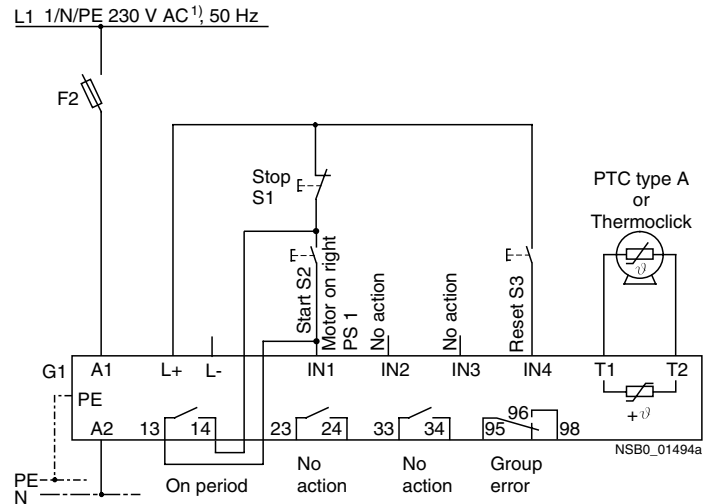
##### Main circuit

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



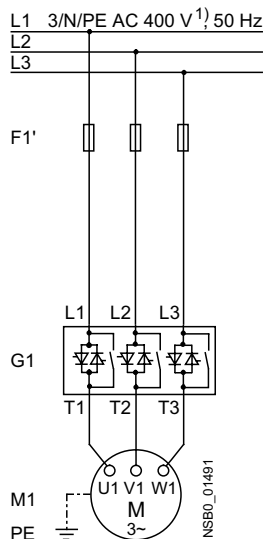
##### Control circuit

Possibility 1:  
Control by pushbutton

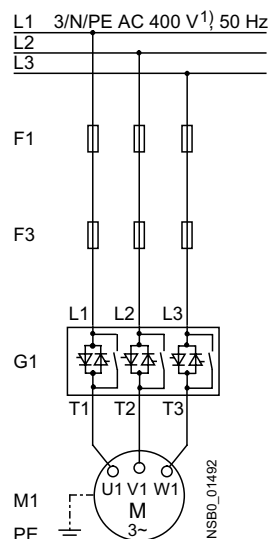


##### Main circuit

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



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



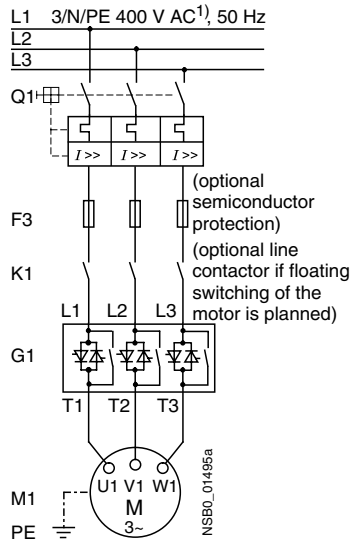
1) Permissible values for main and control voltage,  
see Technical Specifications.

# 3RW Soft Starters

## Project planning aids

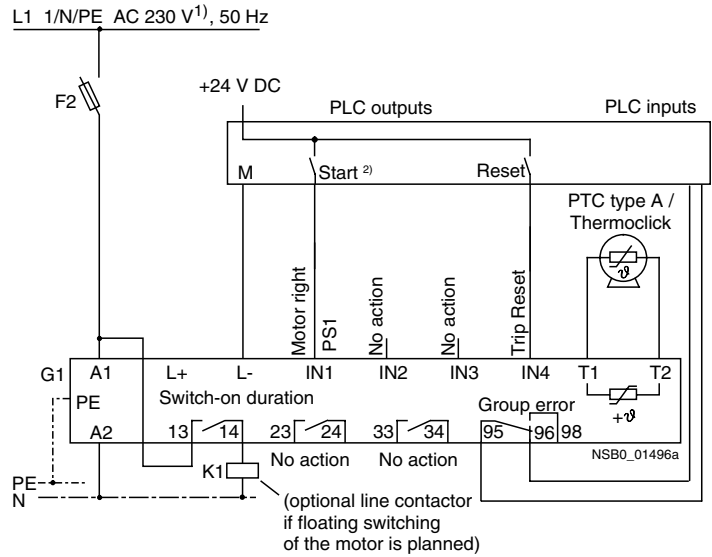
### Main circuit

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 Specifications.

### 2) Caution. Risk of restarting!

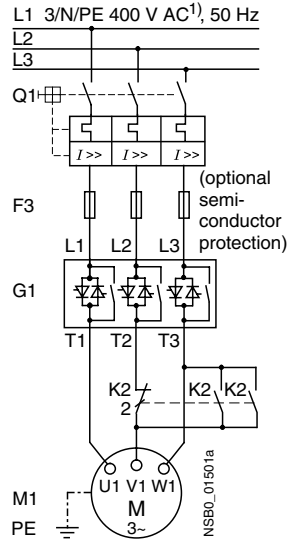
The start command (e.g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping.

For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

## Project planning aids

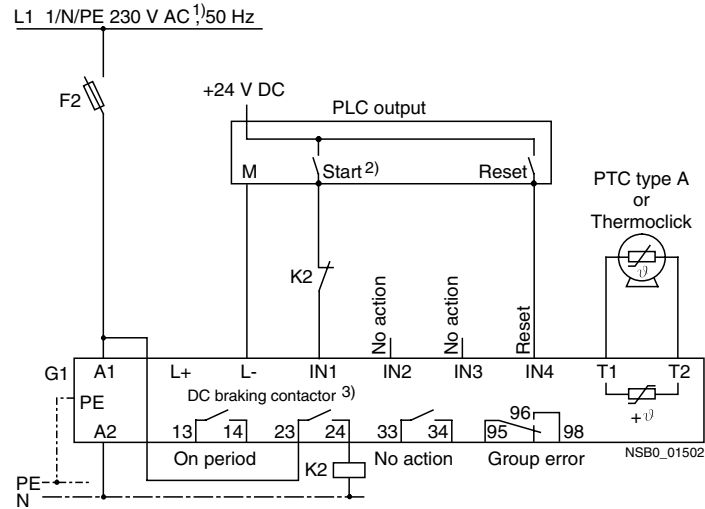
### Main circuit

Possibility 3a:  
 Inline circuit with ramp-down function DC braking<sup>3)</sup>  
 (for device types 3RW44 22 to 3RW44 25)



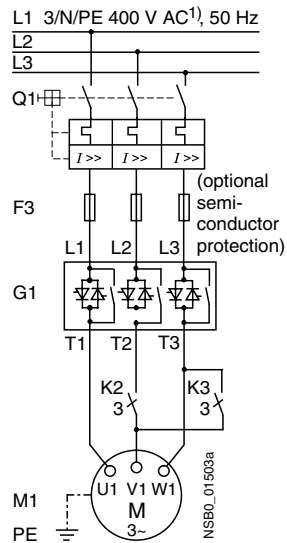
### Control circuit

Possibility 3a:  
 Control of the braking contactor<sup>3)</sup>



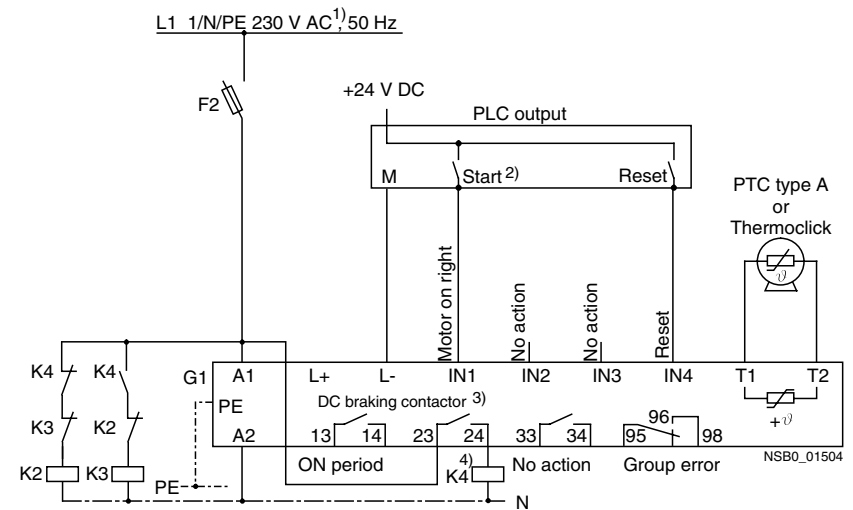
### Main circuit

Possibility 3b:  
 Inline circuit with ramp-down function DC braking<sup>3)</sup>  
 (for device types 3RW44 26 to 3RW44 47)



### Control circuit

Possibility 3b:  
 Control of the braking contactor<sup>3)</sup>



1) Permissible values for main and control voltage, see Technical Specifications.

#### 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 Fuse Coordination (inline circuit) on pages 6/21 to 6/23. 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.:  
 LZ:RT4A4T30 (230 V AC rated control supply voltage),  
 LZ:RT4A4S15 (115 V AC rated control supply voltage).

# 3RW Soft Starters

## Notes

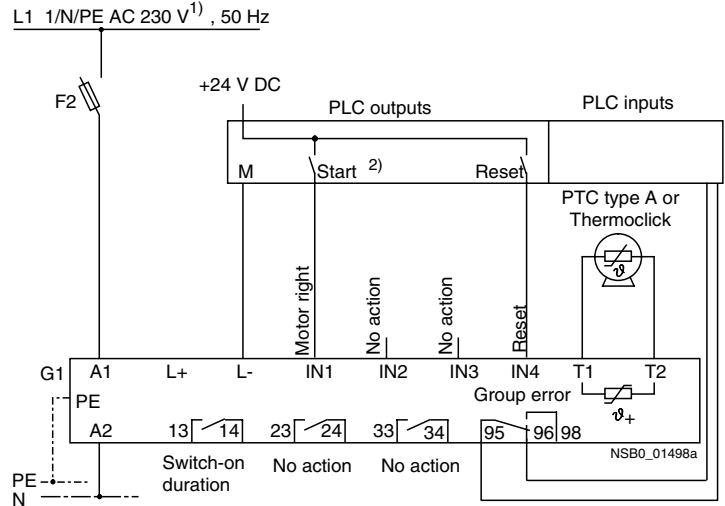
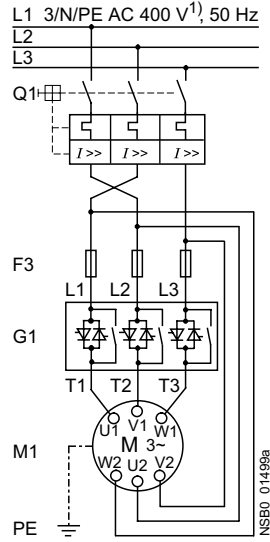
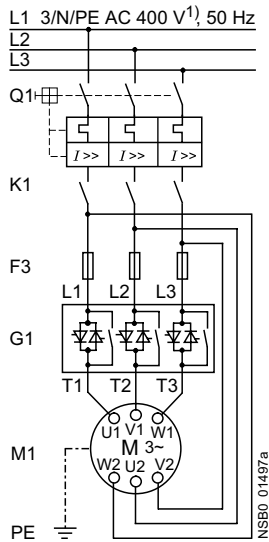
### Main circuit

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 Specifications.

### 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.

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