

# SIRIUS Soft Starters

## Introduction

### Overview

#### Products at a glance



3RW30/3RW31



3RW40



3RW44



Class 73/74 Enclosed

#### SIRIUS soft starters

##### for standard applications

##### SIRIUS 3RW30 soft starters

- SIRIUS 3RW30/31 soft starters for soft starting and smooth ramp-down of single-phase or three-phase asynchronous motors<sup>1)</sup>
- Rating range of up to 60 Hp at 460 V (50 °C ambient)
- Application areas:
  - Fans
  - Pumps
  - Building/construction machines
  - Presses
  - Escalators
  - Transport systems
  - Air conditioning systems
  - Ventilators
  - Assembly lines
  - Compressors and coolers
  - Operating mechanisms

3RW30, 3RW31

16-164

##### SIRIUS 3RW40 soft starters

- SIRIUS 3RW40 soft starters with integrated functions
  - solid-state motor overload and intrinsic device protection and adjustable current limiting for the soft starting and stopping of three-phase asynchronous motors
- Rating range from 75 to 300 Hp at 460 V (50 °C ambient)
- Application areas:
  - Fans
  - Pumps
  - Building/construction machines
  - Presses
  - Escalators
  - Transport systems
  - Air conditioning systems
  - Ventilators
  - Assembly lines
  - Compressors and coolers
  - Operating mechanisms

3RW40

16-165

##### for High Feature applications

##### SIRIUS 3RW44 soft starters

- In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements
- Rating range from - up to 600 Hp at 460 V in inline circuit
- Application areas:
  - Pumps
  - Ventilators
  - Compressors
  - Cooling systems
  - Industrial refrigerating systems
  - Water transport
  - Conveying systems
  - Hydraulics
  - Machine tools
  - Mills

3RW44

16-166

##### For enclosed applications

##### Enclosures in NEMA 1, 3, 4, & 12 types UL/CSA listed

- Complete starter includes 3RW40 or 3RW44 and CPT
- Combination options include circuit breaker or fusible DBC
- Application areas:
  - Compressors
  - Pumps
  - Stamping presses
  - Cooling towers
  - Molding and extruding
  - Chippers and debarkers
  - Lumber processing
  - Pulp & paper processing
  - Conveyors
  - Textiles
  - HVAC

Class 73/74

16-168/16-169

1) 3RW30 single phase devices do not have ramp down functionality.

# SIRIUS Soft Starters

## General Data

### Overview

The advantages of the SIRIUS soft starters at a glance:

- Soft starting and soft stop<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 mechanical reduced voltage starters
- Maintenance-free switching
- Very easy handling
- Fits perfectly in the SIRIUS modular system



		SIRIUS 3RW30/31 Standard applications	SIRIUS 3RW40	SIRIUS 3RW44 High Feature applications
Rated current at 50 °C	A	2.6 ... 85	117 ... 385	26 ... 1076
Rated operating voltage	V	200 ... 575	200 ... 600	200 ... 690
Motor rating at 460 V				
• Inline circuit	Hp	1.1 ... 60	75 ... 300	15 ... 950
• Inside-delta circuit	Hp	—	—	22 ... 600
Temperature range	°C	-25 ... +60	-25 ... +60	0 ... +60
Soft starting/ramp-down		✓ <sup>1)</sup>	✓	✓
Voltage ramp		✓	✓	✓
Starting/stopping voltage	%	40 ... 100	40 ... 100	20 ... 100
Starting and ramp-down time	s	0 ... 20	0 ... 20	1 ... 360
Torque control		—	—	✓
Starting/stopping torque	%	—	—	20 ... 100
Torque limit	%	—	—	20 ... 200
Ramp time	s	—	—	1 ... 360
Integral bypass contact system		✓ <sup>2)</sup>	✓	✓
Intrinsic device protection		—	✓	✓
Motor overload protection		—	✓	✓
Thermistor motor protection		—	✓	✓
Adjustable current limiting		—	✓	✓
Inside-delta circuit		—	—	✓
Breakaway pulse		—	—	✓
Creep speed in both directions		—	—	✓
Pump ramp-down		—	—	✓ <sup>6)</sup>
DC braking		—	—	✓ <sup>3) 6)</sup>
Combined braking		—	—	✓ <sup>3) 6)</sup>
Motor heating		—	—	—
Communication		—	—	with PROFIBUS DP (option)
External display and operator module		—	—	(option )
LCD Operating measured value display		—	—	✓
Error logbook		—	—	✓
Event list		—	—	✓
Slave pointer function		—	—	✓
Trace function		—	—	✓ <sup>4)</sup>
Programmable control inputs and outputs		—	—	—
Number of parameter sets		1 (2 with 3RW31)	1	3
Parameterization software (Softstarter ES)		—	—	✓
Power semiconductors (thyristors)		2 controlled phases	2 controlled phases	3 controlled phases
Spring-loaded terminals		✓ (only 3RW30 03)	✓	✓
Screw terminals		✓	✓	✓
UL/CSA		✓ <sup>5)</sup>	✓	✓
CE marking		✓	✓	✓
Soft starting under heavy starting conditions		—	—	✓ <sup>6)</sup>
Configuring support		—	—	—

- ✓ Function is available  
 — Function not available

- 1) Soft stop not available for 3RW31.  
 2) Not available for 3RW30 03.  
 3) Not possible in inside-delta circuit.  
 4) Trace function with Softstarter ES software.

Win-SOFTSTARTER Technical Assistance 1-800-241-4453

- 5) For 3RW30 03 up to 230 V.  
 6) Calculate soft starter and motor with size allowance where required.

You can find further information on the Internet at:  
<http://sielect.sea.siemens.com>

# SIRIUS Soft Starters

## Standard Applications—SIRIUS 3RW3 Soft Starters

Selection

### Selection and ordering data



3RW30 03-2CB54



3RW30 25-1AB14



3RW30 35-1AB14



3RW30 35-1AA12

Rated operating voltage $U_e$	At ambient temperature 50 °C					Size	Order No.	List Price \$	Weight per PU approx.	
	Rated operating current $I_e$	Rated output of three-phase induction motors for rated operating voltage $U_e$								
		115 V	200 V	230 V	460 V					575 V
V	A	hp	hp	hp	hp	hp		kg		
<b>Soft starters for easy starting conditions and high operating frequency</b>										
200 ... 400	2.6	-	0.5	0.5	-	-	3RW30 03-□CB54	308.00	0.200	
<b>Order No. extension for rated connection method<sup>1)</sup></b>										
with screw-type terminals							22.5 mm	1		
with spring-loaded terminals							22.5 mm	2		
<b>Soft starters for three-phase asynchronous motors</b>										
200 ... 460	4.8	-	1	1	3	-	S00	3RW30 14-1CB□4	406.00	0.302
	7.8	-	2	2	5	-	S00	3RW30 16-1CB□4	484.00	0.305
	11	-	3	3	7.5	-	S0	3RW30 24-1AB□4	496.00	0.490
	14	-	3	3	10	-	S0	3RW30 25-1AB□4	567.00	0.481
	21	-	5	5	15	-	S0	3RW30 26-1AB□4	587.00	0.489
	27	-	7.5	7.5	20	-	S2	3RW30 34-1AB□4	763.00	0.794
	32	-	7.5	10	20	-	S2	3RW30 35-1AB□4	942.00	0.779
	38	-	10	10	25	-	S2	3RW30 36-1AB□4	1177.00	0.791
	54	-	15	20	40	-	S3	3RW30 44-1AB□4	1301.00	1.660
	64	-	20	20	40	-	S3	3RW30 45-1AB□4	1639.00	1.800
460 ... 575	85	-	25	30	60	-	S3	3RW30 46-1AB□4	1978.00	1.810
	11	-	-	-	7.5	10	S0	3RW30 24-1AB□5	668.00	0.490
	14	-	-	-	10	10	S0	3RW30 25-1AB□5	723.00	0.489
	21	-	-	-	15	15	S0	3RW30 26-1AB□5	780.00	0.489
	27	-	-	-	20	25	S2	3RW30 34-1AB□5	916.00	0.791
	32	-	-	-	20	30	S2	3RW30 35-1AB□5	1132.00	0.793
	38	-	-	-	25	30	S2	3RW30 36-1AB□5	1412.00	0.792
	54	-	-	-	40	50	S3	3RW30 44-1AB□5	1561.00	1.660
	64	-	-	-	40	60	S3	3RW30 45-1AB□5	1967.00	1.810
	85	-	-	-	60	75	S3	3RW30 46-1AB□5	2375.00	1.800
<b>Order No. extension for rated control supply voltage <math>U_s</math></b>										
AC/DC 24 V								0		
AC/DC 110 ... 230 V								1		
<b>Soft starters with two-ramp control for three-phase induction motors with two speeds (double pole-reversing)</b>										
200 ... 460	11	-	3	3	7.5	-	S0	3RW31 24-1CB14	613.00	0.468
	14	-	3	3	10	-	S0	3RW31 25-1CB14	657.00	0.475
	21	-	5	5	15	-	S0	3RW31 26-1CB14	722.00	0.464
460 ... 575	11	-	-	-	7.5	10	S0	3RW31 24-1CB15	735.00	0.467
	14	-	-	-	10	10	S0	3RW31 25-1CB15	795.00	0.476
	21	-	-	-	15	15	S0	3RW31 26-1CB15	858.00	0.475
<b>Soft starters for single-phase motors</b>										
115 ... 240	21	1.5	3	3	-	-	S0	3RW30 26-1AA12	313.00	0.439
	32	2	5	5	-	-	S2	3RW30 35-1AA12	501.00	0.729
	64	5	10	10	-	-	S3	3RW30 45-1AA12	864.00	1.390

1) Units have removable terminals.

2) 3RW30 46-1AB05 soft starters (AC/DC 24 V version):  
Delivery time on request.

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

The SIRIUS 3RW3 solid-state soft starters are designed for easy starting conditions.  $J_{Load} < 10 \times J_{Motor}$ . In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger unit. Siemens recommends the use of the selection and simulation program Win-Soft starter. See Technical specifications for information about rated currents for ambient temperatures >50 °C.

# SIRIUS Soft Starters

## Standard Applications—SIRIUS 3RW40 Soft Starters

Selection

### Overview

#### SIRIUS 3RW40

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30/31 soft starters including soft start and soft stop,<sup>1)</sup> and internal bypass. At the same time they come with additional functions, i.e. selectable solid-state motor overload, intrinsic device protection and adjustable current limiting, as well as a new patented two-phase control method (Polarity Balancing) that is unique in this rating range.

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

#### SIRIUS 3RW40 for three-phase motors

Soft starters rated up to 300 Hp (at 460 V) for standard applications in three-phase power systems. Extremely small sizes, low power losses and simple commissioning are just three of the many advantages of the SIRIUS 3RW40 soft starters.

### Area of application

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

Using the patented two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time and typical direct current components are eliminated. This not only enables the two-phase starting of motors up to 300 Hp (at 460 V) but also avoids the current and torque peaks which occur i.e. with wye-delta starters or other mechanical starters.

#### Application areas

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

#### Applicable standards

- IEC 60947-2
- UL/CSA #E143112



3RW40 56-6BB44



3RW40 76-6BB44

Ambient temperature 50 °C <sup>3)</sup>					Size	Order No.	List Price \$	Approx. weight per PU
Rated operating current I <sub>e</sub>	Rated output of three-phase induction motors for rated operating voltage U <sub>e</sub>							
A	200 V hp	230 V hp	460 V hp	575 V hp				
<b>Inline circuit, rated operating voltage 200 ... 460 V</b>								
117	30	40	75	–	S6	3RW40 55-□BB□4	2237.00	5.700
145	40	50	100	–		3RW40 56-□BB□4	2460.00	5.700
205	60	75	150	–	S12	3RW40 73-□BB□4	2879.00	7.000
248	75	100	200	–		3RW40 74-□BB□4	3243.00	7.000
315	100	125	250	–		3RW40 75-□BB□4	3578.00	7.000
385	125	1250	300	–		3RW40 76-□BB□4	4585.00	7.000
<b>Inline circuit, rated operating voltage 400 ... 600 V</b>								
117	–	–	75	100	S6	3RW40 55-□BB□5	2573.00	5.700
145	–	–	100	150		3RW40 56-□BB□5	2829.00	5.700
205	–	–	150	200	S12	3RW40 73-□BB□5	3321.00	7.000
248	–	–	200	250		3RW40 74-□BB□5	3735.00	7.000
315	–	–	250	300		3RW40 75-□BB□5	4115.00	7.000
385	–	–	300	400		3RW40 76-□BB□5	5278.00	7.000

#### Order No. extension for connection method

- with spring-loaded terminals
- with screw-type terminals

#### Order No. extension for the rated control supply voltage U<sub>s</sub><sup>2)</sup>

- 115 V AC
- 230 V AC

1) Soft stop not available on 3RW31.

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

3) For other temperature ratings, see the Industrial Controls catalog CPPC-06000-0806.

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

The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions.  $J_{Load} < 10 \times J_{Motor}$ . In the event of deviating conditions or increased duty cycle, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-SOFTSTARTER.

2  
6  
3  
4

# SIRIUS Soft Starters

## High Feature Applications—SIRIUS 3RW44 Soft Starters

Selection

### Overview

#### SIRIUS 3RW44

In addition to soft starting and soft stopping, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements. They cover a rating range up to 900Hp at 460 V in the inline circuit<sup>1)</sup>.

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 these high feature soft starters to be used in nearly every conceivable task. They reliably mitigate the sudden torque applications and current peaks during motor starting and stopping. This creates savings potential when calculating the size of the controlgear and when servicing the machinery installed. Be it for inline circuits or inside-delta circuits – the SIRIUS 3RW44 soft starter offers savings especially in terms of size and equipment costs.

Combinations of various starting, operating and ramp-down possibilities ensure an optimum adaptation to the application-specific requirements. Operating and commissioning can be performed by means of the user-friendly keypad and a menu-

prompted, multi-line graphic display with background lighting. The optimized motor ramp-up and ramp-down can be effected by means of just a few settings with a previously selected language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation.

#### Applicable standards

- IEC 60947-4-2
- UL/CSA #E143112

#### Area of application

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

#### Application areas, e.g.

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

1) Current range available up to 600Hp at 460 V.

### Selection and ordering data



3RW44 27-1BC44



3RW44 36-6BC44



3RW44 47-6BC44



Ambient temperature 50 °C <sup>1)</sup>					Order No.	List Price \$	Approx. weight per PU kg
Rated operating current $I_e$	Rated output of three-phase induction motors for rated operating voltage $U_e$						
A	200 V hp	230 V hp	460 V hp	575 V hp			
<b>Inline circuit, rated operating voltage 200 ... 460 V</b>							
26	7.5	7.5	15	–	3RW44 22-@BC@4	2337.00	4.900
32	10	10	20	–	3RW44 23-@BC@4	2472.00	4.900
42	10	15	25	–	3RW44 24-@BC@4	2494.00	4.900
51	15	15	30	–	3RW44 25-@BC@4	2963.00	4.900
68	20	20	50	–	3RW44 26-@BC@4	3109.00	4.900
82	25	25	60	–	3RW44 27-@BC@4	3735.00	4.900
<b>Order No. extension for connection method</b>					3 1		
• with spring-loaded terminals							
• with screw-type terminals							
100	30	30	75	–	3RW44 34-@BC@4	4406.00	7.900
117	30	40	75	–	3RW44 35-@BC@4	4652.00	7.900
145	40	50	100	–	3RW44 36-@BC@4	6039.00	7.900
180	50	60	125	–	3RW44 43-@BC@4	6565.00	10.300
215	60	75	150	–	3RW44 44-@BC@4	6922.00	10.300
280	75	100	200	–	3RW44 45-@BC@4	7503.00	10.300
315	100	125	250	–	3RW44 46-@BC@4	8342.00	10.300
385	125	150	300	–	3RW44 47-@BC@4	9282.00	10.300
494	150	200	400	–	3RW44 53-@BC@4	10959.00	50.000
551	150	200	450	–	3RW44 54-@BC@4	12580.00	50.000
615	200	250	500	–	3RW44 55-@BC@4	13979.00	50.000
693	200	250	550	–	3RW44 56-@BC@4	15656.00	50.000
780	250	300	600	–	3RW44 57-@BC@4	19570.00	50.000
<b>Order No. extension for connection method</b>					2 6		
• with spring-loaded terminals							
• with screw-type terminals							
<b>Order No. extension for the rated control supply voltage <math>U_s</math></b>					3 4		
• 115 V AC							
• 230 V AC							

1) For other temperature ratings, see technical information in 2006 Industrial Catalog CPPC-06000-0106.

# SIRIUS Soft Starters

## High Feature Applications—SIRIUS 3RW44 Soft Starters

Selection

### Selection and ordering data



3RW44 27-1BC44

3RW44 36-6BC44

3RW44 47-6BC44

Ambient temperature 50 °C <sup>2)</sup>					Order No.	List Price \$	Approx. weight per PU kg
Rated operating current $I_e$	Rated output of three-phase induction motors for rated operating voltage $U_e$						
A	200 V	230 V	460 V	575 V			
	hp	hp	hp	hp			
<b>Inline circuit, rated operating voltage 400 ... 600 V</b>							
26	–	–	15	20	3RW44 22-□BC□5	2695.00	4.900
32	–	–	20	25	3RW44 23-□BC□5	2852.00	4.900
42	–	–	25	30	3RW44 24-□BC□5	2874.00	4.900
51	–	–	30	40	3RW44 25-□BC□5	3410.00	4.900
68	–	–	50	50	3RW44 26-□BC□5	3578.00	4.900
82	–	–	60	75	3RW44 27-□BC□5	4305.00	4.900

### Order No. extension for connection method

- with spring-loaded terminals
- with screw-type terminals

100	–	–	75	75	3RW44 34-□BC□5	5077.00	7.900
117	–	–	75	100	3RW44 35-□BC□5	5356.00	7.900
145	–	–	100	125	3RW44 36-□BC□5	6945.00	7.900
180	–	–	125	150	3RW44 43-□BC□5	7559.00	10.300
215	–	–	150	200	3RW44 44-□BC□5	7962.00	10.300
280	–	–	200	250	3RW44 45-□BC□5	8633.00	10.300
315	–	–	250	300	3RW44 46-□BC□5	9595.00	10.300
385	–	–	300	400	3RW44 47-□BC□5	10680.00	10.300
494	–	–	400	500	3RW44 53-□BC□4	12603.00	50,000
551	–	–	450	550	3RW44 54-□BC□4	14470.00	50,000
615	–	–	500	600	3RW44 55-□BC□4	16081.00	50,000
693	–	–	550	700	3RW44 56-□BC□4	18004.00	50,000
780	–	–	600	800	3RW44 57-□BC□4	22510.00	50,000

### Order No. extension for connection method

- with spring-loaded terminals
- with screw-type terminals

### Order No. extension for the rated control supply voltage $U_s$ <sup>1)</sup>

- 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.

2) For other temperature ratings, see technical information in the Industrial Controls Catalog CPPC-06000-0803.

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 selection and simulation program Win-SOFTSTARTER. See technical specifications for information about rated currents for ambient temperatures > 40 °C and operating frequency.