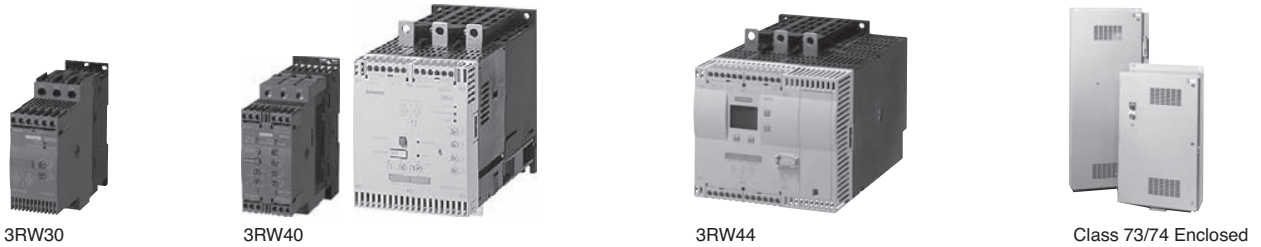


# Motor Starters, Soft Starters and Load Feeders

## Introduction

### Overview



#### For operation in the control cabinet

##### 3RW soft starters for standard applications

	<ul style="list-style-type: none"> <li>Application areas                             <ul style="list-style-type: none"> <li>- Fans</li> <li>- Building/construction machines</li> <li>- Escalators</li> <li>- Air conditioning systems</li> <li>- Assembly lines</li> <li>- Operating mechanisms</li> </ul> </li> <li>- Pumps</li> <li>- Presses</li> <li>- Transport systems</li> <li>- Fans</li> <li>- Compressors and coolers</li> </ul>		
<b>3RW30 soft starters</b>	<ul style="list-style-type: none"> <li>SIRIUS 3RW30 soft starters for soft starting and smooth ramp-down of three-phase asynchronous motors</li> <li>Performance range of up to 75 Hp (at 460 V)</li> </ul>	<b>3RW30</b>	7/4
<b>3RW40 soft starters</b>	<ul style="list-style-type: none"> <li>SIRIUS 3RW40 soft starters with the integral functions                             <ul style="list-style-type: none"> <li>- Solid-state motor overload and intrinsic device protection and</li> <li>- Adjustable current limiting</li> </ul> </li> <li>for the soft starting and stopping of three-phase asynchronous motors</li> <li>Performance range of up to 300 Hp (at 460 V)</li> </ul>	<b>3RW40</b>	7/8

##### 3RW soft starters for high-feature applications

	<ul style="list-style-type: none"> <li>Application areas                             <ul style="list-style-type: none"> <li>- Pumps</li> <li>- Compressors</li> <li>- Industrial refrigerating systems</li> <li>- Conveying systems</li> <li>- Machine tools</li> </ul> </li> <li>- Fans</li> <li>- Cooling systems</li> <li>- Water transport</li> <li>- Hydraulics</li> <li>- Mills</li> </ul>		
<b>3RW44 soft starters</b>	<ul style="list-style-type: none"> <li>In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements</li> <li>Performance range                             <ul style="list-style-type: none"> <li>- Up to 900 Hp (at 460 V) in inline circuit and</li> <li>- Up to 1600 Hp (at 460 V) in inside-delta circuit</li> </ul> </li> </ul>	<b>3RW44</b>	7/16

#### For enclosed applications

<b>Enclosures in NEMA 1, 3, 4, &amp; 12 types UL/CSA listed</b>	<ul style="list-style-type: none"> <li>Complete starter includes 3RW40 or 3RW44 and CPT</li> <li>Performance Range of up to 600 Hp (at 460 V)</li> <li>Combination options include circuit breaker or fusible disconnect</li> </ul>	<b>Class 73/74</b>	7/83
	<ul style="list-style-type: none"> <li>Application areas:                             <ul style="list-style-type: none"> <li>- Compressors</li> <li>- Pumps</li> <li>- Stamping presses</li> <li>- Cooling towers</li> <li>- Molding and extruding</li> <li>- Chippers and debarkers</li> </ul> </li> <li>- Lumber processing</li> <li>- Pulp &amp; paper processing</li> <li>- Conveyors</li> <li>- Textiles</li> <li>- HVAC</li> </ul>		

# For Operation in the Control Cabinet

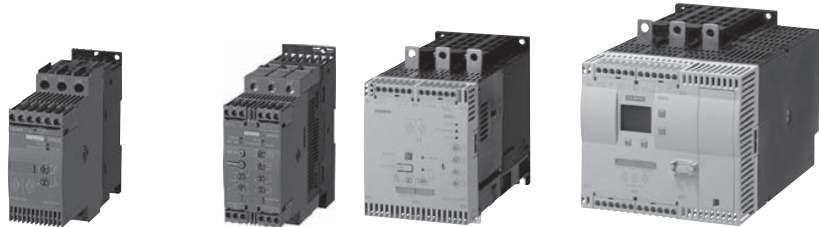
## 3RW Soft Starters

### 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



		SIRIUS 3RW30 Standard applications	SIRIUS 3RW40 Standard applications	SIRIUS 3RW44 High-Feature applications
Rated current up to 50 °C	A	3 ... 98	11 ... 385	26 ... 1076
Rated operational voltage	V	200 ... 480	200 ... 600	200 ... 690
Motor rating at 460 V				
• Inline circuit	Hp	1.5 ... 75	7.5 ... 300	15 ... 900
• Inside-delta circuit	Hp	--	--	22 ... 1600
Ambient temperature	°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 <sup>7)</sup>	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		✓	✓	✓
Intrinsic device protection		--	✓	✓
Motor overload protection		--	✓	✓
Thermistor motor protection		--	✓ <sup>2)</sup>	✓
Integrated remote RESET		--	✓ <sup>3)</sup>	✓
Adjustable current limiting		--	✓	✓
Inside-delta circuit		--	--	✓
Breakaway pulse		--	--	✓
Creep speed in both directions of rotation		--	--	✓
Pump ramp-down		--	--	✓ <sup>4)</sup>
DC braking		--	--	✓ <sup>4)</sup> 5)
Combined braking		--	--	✓ <sup>4)</sup> 5)
Motor heating		--	--	✓
Communication		--	--	With PROFIBUS DP (optional)
External display and operator module		--	--	(optional)
Operating measured value display		--	--	✓
Error logbook		--	--	✓
Event list		--	--	✓
Slave pointer function		--	--	✓
Trace function		--	--	✓ <sup>6)</sup>
Programmable control inputs and outputs		--	--	✓
Number of parameter sets		1	1	3
Parameterization software (Soft Starter ES)		--	--	✓
Power semiconductors (thyristors)		2 controlled phases	2 controlled phases	3 controlled phases
Screw terminals		✓	✓	✓
Spring-type terminals		✓	✓	✓
UL/CSA		✓	✓	✓
CE marking		✓	✓	✓
Soft starting under heavy starting conditions		--	--	✓ <sup>4)</sup>

#### Configuring support

Win-Soft Starter, Electronic Application Selector, Technical Assistance Tel.: 1-800-333-7421

✓ Function is available; -- Function is not available.

<sup>1)</sup> Only soft starting available for 3RW30.

<sup>2)</sup> Optional up to size S3 (device variant).

<sup>3)</sup> Available for 3RW40 2. to 3RW40 4.; optional for 3RW40 5. and 3RW40 7..

<sup>4)</sup> Calculate soft starter and motor with size allowance where required.

<sup>5)</sup> Not possible in inside-delta circuit.

<sup>6)</sup> Trace function with Soft Starter ES software.

<sup>7)</sup> Actual motor start times are load dependent.

You can find further information on the Internet at:

[www.usa.siemens.com/softstarters](http://www.usa.siemens.com/softstarters)

# For Operation in the Control Cabinet

## 3RW Soft Starters

### 3RW30 for standard applications

#### Overview

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

Soft starting reduces the stress on the connected equipment and results in lower wear and therefore longer periods of trouble-free production. The selectable start value means that the soft starters can be adjusted individually to the requirements of the application in question and unlike wye-delta starters are not restricted to two-stage starting with fixed voltage ratios.<sup>1)</sup>

The SIRIUS 3RW30 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that minimal power loss is used at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

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

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

Soft starters rated up to 75 Hp (at 460 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of this soft starter.

#### Application

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

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

#### Application areas

- Pumps
- Heat pumps
- Hydraulic pumps
- Presses
- Conveyors
- Roller conveyor
- Screw conveyors

<sup>1)</sup> Actual motor start times are load dependent.

## Selection and ordering data



3RW30 18-1BB14



3RW30 28-1BB14



3RW30 38-1BB14



3RW30 47-1BB14



3RW30 03-2CB54

Ambient temperature 40 °C				Ambient temperature 50 °C				Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage $U_e$			Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage $U_e$							
	230 V	400 V	500 V		200 V	230 V	460 V	575 V				
A	kW	kW	kW	A	hp	hp	hp	hp				

Rated operational voltage  $U_e$  200 ... 480 V

## • With screw terminals

3.6	0.75	<b>1.5</b>	--	3	0.5	0.5	<b>1.5</b>	--	<b>S00</b>	<b>3RW30 13-1BB□4</b>	1 unit	0.580
6.5	1.5	<b>3</b>	--	4.8	1	1	<b>3</b>	--	<b>S00</b>	<b>3RW30 14-1BB□4</b>	1 unit	0.580
9	2.2	<b>4</b>	--	7.8	2	2	<b>5</b>	--	<b>S00</b>	<b>3RW30 16-1BB□4</b>	1 unit	0.580
12.5	3	<b>5.5</b>	--	11	3	3	<b>7.5</b>	--	<b>S00</b>	<b>3RW30 17-1BB□4</b>	1 unit	0.580
17.6	4	<b>7.5</b>	--	17	3	3	<b>10</b>	--	<b>S00</b>	<b>3RW30 18-1BB□4</b>	1 unit	0.580

## • With spring-type terminals

3.6	0.75	<b>1.5</b>	--	3	0.5	0.5	<b>1.5</b>	--	<b>S00</b>	<b>3RW30 13-2BB□4</b>	1 unit	0.580
6.5	1.5	<b>3</b>	--	4.8	1	1	<b>3</b>	--	<b>S00</b>	<b>3RW30 14-2BB□4</b>	1 unit	0.580
9	2.2	<b>4</b>	--	7.8	2	2	<b>5</b>	--	<b>S00</b>	<b>3RW30 16-2BB□4</b>	1 unit	0.580
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## • With screw terminals

25	5.5	<b>11</b>	--	23	5	5	<b>15</b>	--	<b>S0</b>	<b>3RW30 26-1BB□4</b>	1 unit	0.690
32	7.5	<b>15</b>	--	29	7.5	7.5	<b>20</b>	--	<b>S0</b>	<b>3RW30 27-1BB□4</b>	1 unit	0.690
38	11	<b>18.5</b>	--	34	10	10	<b>25</b>	--	<b>S0</b>	<b>3RW30 28-1BB□4</b>	1 unit	0.690

## • With spring-type terminals

25	5.5	<b>11</b>	--	23	5	5	<b>15</b>	--	<b>S0</b>	<b>3RW30 26-2BB□4</b>	1 unit	0.690
32	7.5	<b>15</b>	--	29	7.5	7.5	<b>20</b>	--	<b>S0</b>	<b>3RW30 27-2BB□4</b>	1 unit	0.690
38	11	<b>18.5</b>	--	34	10	10	<b>25</b>	--	<b>S0</b>	<b>3RW30 28-2BB□4</b>	1 unit	0.690

## • With screw-type or spring-type terminals

45	11	<b>22</b>	--	42	10	15	<b>30</b>	--	<b>S2</b>	<b>3RW30 36-□BB□4</b>	1 unit	1.200
63	18.5	<b>30</b>	--	58	15	20	<b>40</b>	--	<b>S2</b>	<b>3RW30 37-□BB□4</b>	1 unit	1.200
72	22	<b>37</b>	--	62	20	20	<b>40</b>	--	<b>S2</b>	<b>3RW30 38-□BB□4</b>	1 unit	1.200

## • With screw-type or spring-type terminals

80	22	<b>45</b>	--	73	20	25	<b>50</b>	--	<b>S3</b>	<b>3RW30 46-□BB□4</b>	1 unit	1.710
106	30	<b>55</b>	--	98	30	30	<b>75</b>	--	<b>S3</b>	<b>3RW30 47-□BB□4</b>	1 unit	1.710

## Order No. supplement for connection types

- With screw terminals
- With spring-type terminals<sup>2)</sup>

Order No. supplement for rated control supply voltage  $U_s$ 

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

Soft starters for easy starting conditions and high switching frequency,  
rated operational voltage  $U_e$  200 ... 400 V,  
rated control supply voltage  $U_s$  24 ... 230 V AC/DC

3	0.55	<b>1.1</b>	--	2.6	0.5	<b>0.5</b>	--	--	22.5 mm	<b>3RW30 03-1CB54</b>	1 unit	0.207
										<b>3RW30 03-2CB54</b>	1 unit	0.188

- With screw terminals
  - With spring-type terminals
- <sup>1)</sup> Stand-alone installation.  
<sup>2)</sup> Power connection: screw terminals.

## Note:

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

The SIRIUS 3RW30 solid-state soft starters are designed for easy starting conditions.  $J_{Load} < 10 \times J_{Motor}$ . In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device.

Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40 °C, see technical specifications (see technical information on page 7/44).