

# Motor Starters, Soft Starters and Load Feeders

## Introduction

### Overview



3RW30



3RW40



3RW44



Class 73/74 Enclosed

Order No. Page

#### 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

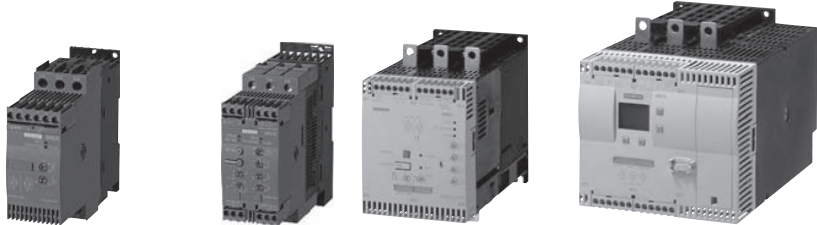
## 3RW Soft Starters

### 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

### 3RW40

#### for standard applications

##### Overview

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

The SIRIUS 3RW40 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that minimal power 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.

At the same time this soft starter comes with additional integrated functions such as adjustable current limiting, motor overload and intrinsic device protection, and optional thermistor motor protection on some models.

Internal intrinsic device protection prevents the thermal overloading of the thyristors and the power section defects this can cause. As an option the thyristors can also be protected by semiconductor fuses from short-circuiting.

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

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

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

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

See "Appendix" → "Standards and approvals" → "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".

##### Application

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

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

##### **Application areas**

- Pumps
- Heat pumps
- Hydraulic pumps
- Presses
- Conveyors
- Roller conveyor
- Screw conveyors
- Escalators
- Small fans
- Centrifugal blowers
- Bow thrusters
- Stirrers
- Extruders
- Lathes
- Milling machines

# For Operation in the Control Cabinet

## 3RW Soft Starters

**3RW40**  
for standard applications



3RW40 56-6BB44



3RW40 76-6BB44

Ambient temperature 50 °C					Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e$ <sup>1)</sup>	Rated power of induction motors for rated operational voltage $U_e$								
	200 V	230 V	460 V	575 V					
A	hp	hp	hp	hp					kg
Rated operational voltage $U_e$ 200 ... 460 V									
• With screw or spring-type terminals									
117	30	40	75	--	S6	3RW40 55-□BB□4		1 unit	4.900
145	40	50	100	--		3RW40 56-□BB□4		1 unit	6.900
• With screw or spring-type terminals									
205	60	75	150	--	S12	3RW40 73-□BB□4		1 unit	8.900
248	75	100	200	--		3RW40 74-□BB□4		1 unit	8.900
315	100	125	250	--		3RW40 75-□BB□4		1 unit	8.900
385	125	150	300	--		3RW40 76-□BB□4		1 unit	8.900
Rated operational voltage $U_e$ 400 ... 600 V									
• With screw or spring-type terminals									
117	--	--	75	100	S6	3RW40 55-□BB□5		1 unit	4.900
145	--	--	100	150		3RW40 56-□BB□5		1 unit	6.900
• With screw or spring-type terminals									
205	--	--	150	200	S12	3RW40 73-□BB□5		1 unit	8.900
248	--	--	200	250		3RW40 74-□BB□5		1 unit	8.900
315	--	--	250	300		3RW40 75-□BB□5		1 unit	8.900
385	--	--	300	400		3RW40 76-□BB□5		1 unit	8.900

### Order No. supplement for connection types<sup>2)</sup>

- With screw terminals
- With spring-type terminals

### Order No. supplement for the rated control supply voltage $U_s$ <sup>3)</sup>

- 115 V AC
- 230 V AC

<sup>1)</sup> Stand-alone installation.

<sup>2)</sup> Power connection: busbar connection.

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

### Note:

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

*The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions.  $J_{Load} < 10 \times J_{Motor}$ . In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40° C, see technical information on page 7/56*

# For Operation in the Control Cabinet

## 3RW Soft Starters

• Revised •  
07/20/15

### Enclosed 3RW40



#### 3RW40 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550 %
- Internal overload class 10, 15, or 20
- Internal self protection
- Fault monitoring

#### Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW40 is designed for normal starting applications (Class 10 applications).
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/59.
- For dimensional drawings see page 7/95.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control circuit transformer
- Line side power terminal block
- Reset button

Ideal applications for 3RW40 enclosed softstarters:

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines

Class 73 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

## 3RW40 for Standard Applications

### Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 10 Light Duty (350% * Im for 10s) <sup>②</sup>									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
117	30	40	75	—	56	3RW4055-6BB34	73AS3_BFA		73AS3_DFA		73AS3_0FA		73AS3_EFA		73AS3_WFA
145	40	50	100	—	75	3RW4056-6BB34	73BS3_BFA		73BS3_DFA		73BS3_0FA		73BS3_EFA		73BS3_WFA
205	60	75	150	—	112	3RW4073-6BB34	73CS3_BFA		73CS3_DFA		73CS3_0FA		73CS3_EFA		73CS3_WFA
248	75	100	200	—	149	3RW4074-6BB34	73DS3_BFA		73DS3_DFA		73DS3_0FA		73DS3_EFA		73DS3_WFA
315	100	125	250	—	186	3RW4075-6BB34	73ES3_BFA		73ES3_DFA		73ES3_0FA		73ES3_EFA		73ES3_WFA
385	125	150	300	—	224	3RW4076-6BB34	73FS3_BFA		73FS3_DFA		73FS3_0FA		73FS3_EFA		73FS3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
117	—	—	75	100	—	3RW4055-6BB35	73AS35BFA		73AS35DFA		73AS350FA		73AS35EFA		73AS35WFA
145	—	—	100	150	—	3RW4056-6BB35	73BS35BFA		73BS35DFA		73BS350FA		73BS35EFA		73BS35WFA
205	—	—	150	200	—	3RW4073-6BB35	73CS35BFA		73CS35DFA		73CS350FA		73CS35EFA		73CS35WFA
248	—	—	200	250	—	3RW4074-6BB35	73DS35BFA		73DS35DFA		73DS350FA		73DS35EFA		73DS35WFA
315	—	—	250	300	—	3RW4075-6BB35	73ES35BFA		73ES35DFA		73ES350FA		73ES35EFA		73ES35WFA
385	—	—	300	400	—	3RW4076-6BB35	73FS35BFA		73FS35DFA		73FS350FA		73FS35EFA		73FS35WFA

### Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP <sup>①</sup>				KW	Class 20 Severe Duty (350% * Ie for 20s) <sup>②</sup>									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
112	30	40	75	—	56	3RW4055-6BB34	73AS3_BFA		73AS3_DFA		73AS3_0FA		73AS3_EFA		73AS3_WFA
132	40	50	100	—	75	3RW4056-6BB34	73BS3_BFA		73BS3_DFA		73BS3_0FA		73BS3_EFA		73BS3_WFA
185	60	60	125	—	93	3RW4073-6BB34	73CS3_BFA		73CS3_DFA		73CS3_0FA		73CS3_EFA		73CS3_WFA
205	60	75	150	—	112	3RW4074-6BB34	73DS3_BFA		73DS3_DFA		73DS3_0FA		73DS3_EFA		73DS3_WFA
280	75	100	200	—	149	3RW4075-6BB34	73ES3_BFA		73ES3_DFA		73ES3_0FA		73ES3_EFA		73ES3_WFA
340	100	125	250	—	186	3RW4076-6BB34	73FS3_BFA		73FS3_DFA		73FS3_0FA		73FS3_EFA		73FS3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
112	—	—	75	75	—	3RW4055-6BB35	73AS35BFA		73AS35DFA		73AS350FA		73AS35EFA		73AS35WFA
132	—	—	100	125	—	3RW4056-6BB35	73BS35BFA		73BS35DFA		73BS350FA		73BS35EFA		73BS35WFA
185	—	—	125	150	—	3RW4073-6BB35	73CS35BFA		73CS35DFA		73CS350FA		73CS35EFA		73CS35WFA
205	—	—	150	200	—	3RW4074-6BB35	73DS35BFA		73DS35DFA		73DS350FA		73DS35EFA		73DS35WFA
280	—	—	200	250	—	3RW4075-6BB35	73ES35BFA		73ES35DFA		73ES350FA		73ES35EFA		73ES35WFA
340	—	—	250	300	—	3RW4076-6BB35	73FS35BFA		73FS35DFA		73FS350FA		73FS35EFA		73FS35WFA

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor.

HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.