

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

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

3RW30 soft starters

- SIRIUS 3RW30 soft starters for soft starting and smooth ramp-down of three-phase asynchronous motors
- Performance range of up to 75 Hp (at 460 V)

3RW30

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3RW40 soft starters

- SIRIUS 3RW40 soft starters with the integral functions
 - Solid-state motor overload and intrinsic device protection and
 - Adjustable current limiting
- for the soft starting and stopping of three-phase asynchronous motors
- Performance range of up to 300 Hp (at 460 V)

3RW40

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3RW soft starters for high-feature applications

- Application areas
 - Pumps
 - Compressors
 - Industrial refrigerating systems
 - Conveying systems
 - Machine tools
- Fans
- Cooling systems
- Water transport
- Hydraulics
- Mills

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
- Performance range
 - Up to 900 Hp (at 460 V) in inline circuit and
 - Up to 1600 Hp (at 460 V) in inside-delta circuit

3RW44

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For enclosed applications

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

- Complete starter includes 3RW40 or 3RW44 and CPT
- Performance Range of up to 600 Hp (at 460 V)
- Combination options include circuit breaker or fusible disconnect

Class 73/74

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- Application areas:
 - Compressors
 - Pumps
 - Stamping presses
 - Cooling towers
 - Molding and extruding
 - Chippers and debarkers
- Lumber processing
- Pulp & paper processing
- Conveyors
- Textiles
- HVAC

For Operation in the Control Cabinet

3RW Soft Starters

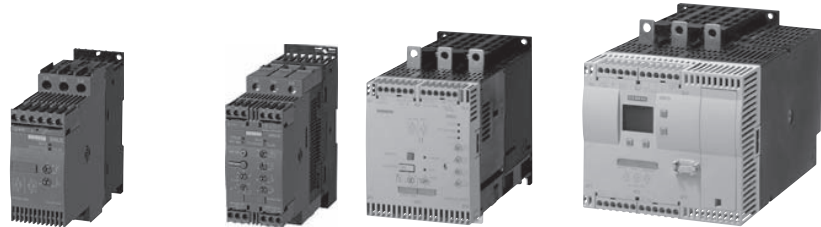
General Data

Overview

The advantages of the SIRIUS soft starters at a glance:

- Soft starting and smooth ramp-down¹⁾
- 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		✓ ¹⁾	✓	✓
Voltage ramp		✓	✓	✓
Starting/stopping voltage	%	40 ... 100	40 ... 100	20 ... 100
Starting and ramp-down time ⁷⁾	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		--	✓ ²⁾	✓
Integrated remote RESET		--	✓ ³⁾	✓
Adjustable current limiting		--	✓	✓
Inside-delta circuit		--	--	✓
Breakaway pulse		--	--	✓
Creep speed in both directions of rotation		--	--	✓
Pump ramp-down		--	--	✓ ⁴⁾
DC braking		--	--	✓ ⁴⁾ 5)
Combined braking		--	--	✓ ⁴⁾ 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		--	--	✓ ⁶⁾
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		--	--	✓ ⁴⁾

Configuring support

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

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

¹⁾ Only soft starting available for 3RW30.

²⁾ Optional up to size S3 (device variant).

³⁾ Available for 3RW40 2. to 3RW40 4., optional for 3RW40 5. and 3RW40 7..

⁴⁾ Calculate soft starter and motor with size allowance where required.

⁵⁾ Not possible in inside-delta circuit.

⁶⁾ Trace function with Soft Starter ES software.

⁷⁾ Actual motor start times are load dependent.

You can find further information on the Internet at:

www.usa.siemens.com/softstarters

For Operation in the Control Cabinet

3RW Soft Starters

3RW40
for standard applications

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Selection and ordering data



3RW40 28-1BB14



3RW40 38-1BB14



3RW40 47-1BB14

Ambient temperature 50 °C		Rated power of induction motors for rated operational voltage U_e				Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e^{1)}$										
	200 V	230 V	460 V	575 V						
A	hp	hp	hp	hp					kg	
Rated operational voltage U_e 200 ... 480 V										
• With screw terminals										
11	3	3	7.5	--	S0	3RW40 24-1BB□4		1 unit	0.770	
23	5	5	15	--	S0	3RW40 26-1BB□4		1 unit	0.770	
29	7.5	7.5	20	--	S0	3RW40 27-1BB□4		1 unit	0.770	
34	10	10	25	--	S0	3RW40 28-1BB□4		1 unit	0.770	
• With spring-type terminals										
11	3	3	7.5	--	S0	3RW40 24-2BB□4		1 unit	0.770	
23	5	5	15	--	S0	3RW40 26-2BB□4		1 unit	0.770	
29	7.5	7.5	20	--	S0	3RW40 27-2BB□4		1 unit	0.770	
34	10	10	25	--	S0	3RW40 28-2BB□4		1 unit	0.770	
• With screw or spring-type terminals										
42	10	15	30	--	S2	3RW40 36-□BB□4		1 unit	1.350	
58	15	20	40	--	S2	3RW40 37-□BB□4		1 unit	1.350	
62	20	20	40	--	S2	3RW40 38-□BB□4		1 unit	1.350	
• With screw or spring-type terminals										
73	20	25	50	--	S3	3RW40 46-□BB□4		1 unit	1.900	
98	30	30	75	--	S3	3RW40 47-□BB□4		1 unit	1.900	
Rated operational voltage U_e 400 ... 600 V										
• With screw terminals										
11	--	--	7.5	10	S0	3RW40 24-1BB□5		1 unit	0.770	
23	--	--	15	20	S0	3RW40 26-1BB□5		1 unit	0.770	
29	--	--	20	25	S0	3RW40 27-1BB□5		1 unit	0.770	
34	--	--	25	30	S0	3RW40 28-1BB□5		1 unit	0.770	
• With spring-type terminals										
11	--	--	7.5	10	S0	3RW40 24-2BB□5		1 unit	0.770	
23	--	--	15	20	S0	3RW40 26-2BB□5		1 unit	0.770	
29	--	--	20	25	S0	3RW40 27-2BB□5		1 unit	0.770	
34	--	--	25	30	S0	3RW40 28-2BB□5		1 unit	0.770	
• With screw or spring-type terminals										
42	--	--	30	40	S2	3RW40 36-□BB□5		1 unit	1.350	
58	--	--	40	50	S2	3RW40 37-□BB□5		1 unit	1.350	
62	--	--	40	60	S2	3RW40 38-□BB□5		1 unit	1.350	
• With screw or spring-type terminals										
73	--	--	50	60	S3	3RW40 46-□BB□5		1 unit	1.900	
98	--	--	75	75	S3	3RW40 47-□BB□5		1 unit	1.900	

Order No. supplement for connection types

- With screw terminals
- With spring-type terminals²⁾

Order No. supplement for rated control supply voltage U_s

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

¹⁾ Stand-alone installation without auxiliary fan.

²⁾ Power connection: screw terminals.

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Note:

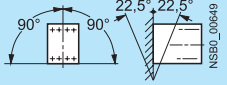
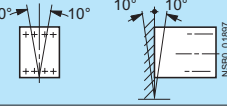
Selection of the soft starter depends on the rated motor current. The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures other than 50°C, see technical information on page 7/56

For Operation in the Control Cabinet

3RW Soft Starters

3RW40
for standard applications

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Type		3RW40 2.-.B.4, 3RW40 3.-.B.4, 3RW40 4.-.B.4	3RW40 2.-.B.5, 3RW40 3.-.B.5, 3RW40 4.-.B.5	3RW40 5.-.BB.4, 3RW40 7.-.BB.4	3RW40 5.-.BB.5, 3RW40 7.-.BB.5
Power electronics					
Rated operational voltage	V AC	200 ... 480	400 ... 600	200 ... 460	400 ... 600
Tolerance	%	-15/+10	-15/+10	-15/+10	-15/+10
Maximum blocking voltage (thyristor)	V AC	1600		1400	1800
Rated frequency	Hz	50/60			
Tolerance	%	±10			
Uninterrupted duty at 40 °C (% of I_e)	%	115			
Minimum load (% of minimum selectable rated motor current I_M)	%	20 (at least 2 A)			
Maximum cable length between soft starter and motor	m	300			
Permissible installation height	m	5000	(derating from 1000, see characteristic curves); higher on request		
Permissible mounting position					
<ul style="list-style-type: none"> With auxiliary fan (for 3RW40 2. ... 3RW40 4.) 					
<ul style="list-style-type: none"> Without auxiliary fan (for 3RW40 2. ... 3RW40 4.) 					
-- (fan integrated in the soft starter)					
Permissible ambient temperature					
Operation	°C	-25 ... +60; (derating from +40)			
Storage	°C	-40 ... +80			
Degree of protection					
IP20 for 3RW40 2.;				IP00	
IP00 for 3RW40 3. and 3RW40 4.					

Type		3RW40 24	3RW40 26	3RW40 27	3RW40 28
Power electronics					
40 °C/50 °C/60 °C					
Load rating with rated operational current I_e					
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
Smallest adjustable rated motor current I_M					
For the motor overload protection	A	5	10	17	23
Power loss					
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	2	8	13	19
• During starting with 300 % I_M (40°C)	W	17	47	55	64
Permissible rated motor current and starts per hour					
• Normal starting (Class 10)					
- Rated motor current $I_M^{(2)}$, starting time 3 s	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	50	23	23	19
- Rated motor current $I_M^{(2)4)}$, starting time 4 s	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	36	15	16	12
• Normal starting (Class 15)					
- Rated motor current $I_M^{(2)}$, starting time 4.5 s	A	11/10/9	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	49	21	18	18
- Rated motor current $I_M^{(2)4)}$, starting time 6 s	A	11/10/9	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	36	14	13	13
• Normal starting (Class 20)					
- Rated motor current $I_M^{(2)}$, starting time 6 s	A	10/9/8	21/19/17	27/24/21	31/28/25
- Starts per hour ³⁾	1/h	47	21	20	18
- Rated motor current $I_M^{(2)4)}$, starting time 8 s	A	10/9/8	21/19/17	27/24/21	31/28/25
- Starts per hour ³⁾	1/h	34	15	14	13

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

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