

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.¹⁾

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.

¹⁾ Actual motor start times are load dependent.

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

Selection and ordering data



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						
A	230 V kW	400 V kW	500 V kW	A	200 V hp	230 V hp	460 V hp	575 V hp			

Rated operational voltage U_e 200 ... 480 V

• With screw terminals												
3.6	0.75	1.5	--	3	0.5	0.5	1.5	--	S00	3RW30 13-1BB□4	1 unit	0.580
6.5	1.5	3	--	4.8	1	1	3	--	S00	3RW30 14-1BB□4	1 unit	0.580
9	2.2	4	--	7.8	2	2	5	--	S00	3RW30 16-1BB□4	1 unit	0.580
12.5	3	5.5	--	11	3	3	7.5	--	S00	3RW30 17-1BB□4	1 unit	0.580
17.6	4	7.5	--	17	3	3	10	--	S00	3RW30 18-1BB□4	1 unit	0.580
• With spring-type terminals												
3.6	0.75	1.5	--	3	0.5	0.5	1.5	--	S00	3RW30 13-2BB□4	1 unit	0.580
6.5	1.5	3	--	4.8	1	1	3	--	S00	3RW30 14-2BB□4	1 unit	0.580
9	2.2	4	--	7.8	2	2	5	--	S00	3RW30 16-2BB□4	1 unit	0.580
12.5	3	5.5	--	11	3	3	7.5	--	S00	3RW30 17-2BB□4	1 unit	0.580
17.6	4	7.5	--	17	3	3	10	--	S00	3RW30 18-2BB□4	1 unit	0.580
• With screw terminals												
25	5.5	11	--	23	5	5	15	--	S0	3RW30 26-1BB□4	1 unit	0.690
32	7.5	15	--	29	7.5	7.5	20	--	S0	3RW30 27-1BB□4	1 unit	0.690
38	11	18.5	--	34	10	10	25	--	S0	3RW30 28-1BB□4	1 unit	0.690
• With spring-type terminals												
25	5.5	11	--	23	5	5	15	--	S0	3RW30 26-2BB□4	1 unit	0.690
32	7.5	15	--	29	7.5	7.5	20	--	S0	3RW30 27-2BB□4	1 unit	0.690
38	11	18.5	--	34	10	10	25	--	S0	3RW30 28-2BB□4	1 unit	0.690
• With screw-type or spring-type terminals												
45	11	22	--	42	10	15	30	--	S2	3RW30 36-□BB□4	1 unit	1.200
63	18.5	30	--	58	15	20	40	--	S2	3RW30 37-□BB□4	1 unit	1.200
72	22	37	--	62	20	20	40	--	S2	3RW30 38-□BB□4	1 unit	1.200
• With screw-type or spring-type terminals												
80	22	45	--	73	20	25	50	--	S3	3RW30 46-□BB□4	1 unit	1.710
106	30	55	--	98	30	30	75	--	S3	3RW30 47-□BB□4	1 unit	1.710

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

1
2

0
1

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	1.1	--	2.6	0.5	0.5	--	--	22.5 mm	3RW30 03-1CB54	1 unit	0.207
										3RW30 03-2CB54	1 unit	0.188

- With screw terminals
 - With spring-type terminals
- 1) Stand-alone installation.
2) 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).

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3RW Soft Starters

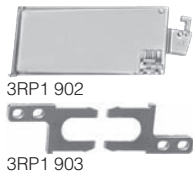
3RW30 for standard applications

Accessories

For soft starters		Motor starter protectors		Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size	Size	Size				
Auxiliary terminals							
Auxiliary terminals, 3-pole							
3RW30 4.	S3			3RT19 46-4F		1 unit	0.035
Covers for soft starters							
Terminal covers for box terminals							
Additional touch protection to be fitted at the box terminals (2 units required per device)							
3RW30 3.	S2			3RT19 36-4EA2		1 unit	0.020
3RW30 4.	S3			3RT19 46-4EA2		1 unit	0.025
Terminal covers for cable lugs and busbar connections							
For complying with the phase clearances and as touch protection if box terminal is removed (2 units required per contactor)							
3RW30 4.	S3			3RT19 46-4EA1		1 unit	0.040
Link modules to motor starter protectors							
3RW30 13, 3RW30 14, 3RW30 16, 3RW30 17, 3RW30 18				3RA19 21-1A		10 units	0.028
3RW30 26				3RA19 21-1A		10 units	0.028
3RW30 36				3RA19 31-1A		5 units	0.033
3RW30 46, 3RW30 47				3RA19 41-1A		5 units	0.072
Operating instructions¹⁾							
For soft starters							
3RW30 1.	S00			3ZX10 12-0RW30-2DA1			
3RW30 2.	S0						
3RW30 3.	S2						
3RW30 4.	S3						

¹⁾ The operating instructions are included in the scope of supply.

Version	Functionality Functions	Order No.	List Price \$ per PU	Weight per PU approx. kg
Covers and push-in lugs (only for 3RW30 03)				
Sealable covers				
For securing against unauthorized adjustment of setting knobs		3RP1 902		5 units 0.004
Push-in lugs				
For screw fixing		3RP1 903		10 units 0.002



More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 300 % $I_{n, motor}$).
The soft starter rating can be selected to be as high as the rating of the motor used.

Application	Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
Starting parameters						
• Voltage ramp and current limiting						
- Starting voltage	% 70	60	50	40	40	40
- Starting time	s 10	10	20	20	10	10

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during start-up. Actual start times are load dependent.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

Configuration

The 3RW solid-state motor controllers are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

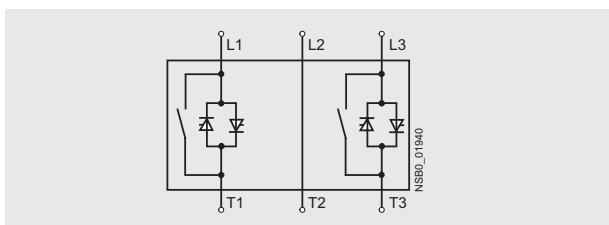
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during 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, controls and overload relays) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

Note:

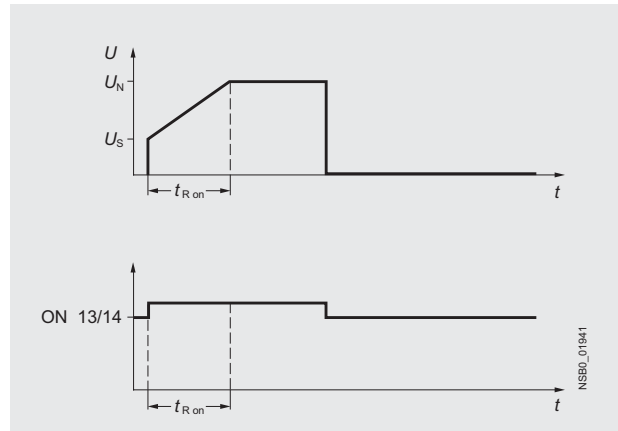
When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Power electronics schematic circuit diagram



A bypass contact system is already integrated in the 3RW30 soft starter and therefore does not have to be ordered separately.

Status graphs



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.

The Win-Soft Starter selection and simulation program can be downloaded from:

<http://www.siemens.de/sanftstarter> > Software

More information can be found on the Internet at:

<http://www.sea.siemens.com/softstarters>