3RW Soft Starters

General data

Overview

The advantages of the SIRIUS soft starters at a glance:
- Soft starting and smooth ramp-down[1]
- 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 3RW30/31 Standard applications	SIRIUS 3RW40 Standard applications	SIRIUS 3RW44 High-Feature applications
Rated current up to 40 °C	A	3 ... 100	12.5 ... 432	29 ... 1214
Rated operational voltage	V	200 ... 575	200 ... 600	200 ... 690
Motor rating at 400 V				
• Inline circuit	kW	1.1 ... 55	5.5 ... 250	15 ... 710
• Inside-delta circuit	kW	--	--	22 ... 1200
Temperature range	°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	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		✔[2]	✔	✔
Intrinsic device protection		--	✔	✔
Motor overload protection		--	✔	✔
Thermistor motor protection		--	✔[3]	✔
Integrated remote RESET		--	✔[4]	✔
Adjustable current limiting		--	✔	✔
Inside-delta circuit		--	--	✔
Breakaway pulse		--	--	✔
Creep speed in both directions of rotation		--	--	✔
Pump ramp-down		--	--	✔[5]
DC braking		--	--	✔[5] [6]
Combined braking		--	--	✔[5] [6]
Motor heating		--	--	✔
Communication		--	--	With PROFIBUS DP (optional)
External display and operator modules		--	--	(optional)
Operating measured value display		--	--	✔
Error logbook		--	--	✔
Event list		--	--	✔
Slave pointer function		--	--	✔
Trace function		--	--	✔[7]
Programmable control inputs and outputs		--	--	✔
Number of parameter sets		1 (2 with 3RW31)	1	3
Parameterization software (Soft Starter ES)		--	--	✔
Power semiconductors (thyristors)		2 controlled phases	2 controlled phases	3 controlled phases
Spring-loaded terminals		✔ (only 3RW30 03)	✔	✔
Screw terminals		✔	✔	✔
UL/CSA		✔[8]	✔	✔
CE marking		✔	✔	✔
Soft starting under heavy starting conditions		--	--	✔[5]
Configuring support		Win-Soft Starter, electronic selection slider ruler, Technical Assistance +49 911 895 5900		

✔ Function is available; -- Function is not available.

[1] Only soft starting available for 3RW30 ..-1AA12 and 3RW31.
[2] Not available for 3RW30 03.
[3] Optional up to size S3 (device variant).
[4] Available for 3RW40 2. to 3RW40 4.; optional for 3RW40 5. and 3RW40 7..

[5] Calculate soft starter and motor with size allowance where required.
[6] Not possible in inside-delta circuit.
[7] Trace function with Soft Starter ES software.
[8] For 3RW30 03 up to 230 V.

More information can be found on the Internet at
http://www.siemens.com/softstarter

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◼ Overview

SIRIUS 3RW40 soft starters offer all the same advantages as the 3RW30 soft starters. This also applies to the integrated bypass contact system. At the same time they come with additional functions, e.g. solid-state motor overload and intrinsic device protection and adjustable current limiting, optional thermistor motor protection (up to size S3), integrated remote RESET (up to size S3), as well as a two-phase control method (Polarity Balancing) that is unique in this performance range.

SIRIUS 3RW40 soft starters are part of the SIRIUS modular system. This results in advantages such as identical sizes and a uniform connection method. 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 minimum space in the control cabinet. Configuring and mounting are carried out quickly and easily thanks to the 3-wire connection.

SIRIUS 3RW40 for three-phase motors

Soft starters rated up to 250 kW (at 400 V) for standard applications in three-phase networks. Extremely small sizes, low power losses and simple commissioning are just three of the many advantages of the SIRIUS 3RW40 soft starters.

◼ Function

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30/31 soft starters. At the same time they come with additional functions and a two-phase control method (Polarity Balancing) that is unique in the performance range up to 250 kW. Starting voltage, starting and ramp-down time of the voltage ramp and current limit are all easy to set using stepless rotary potentiometers, the same as on the SIRIUS 3RW30/31. The rated motor current, the setting of the tripping time and the resetting of the motor overload function are controlled like the SIRIUS overload relays by means of potentiometers and keys. Once again there is nothing new to get used to.

SIRIUS 3RW40 comes with the new, patented control method called "Polarity Balancing", which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the starting operation of the motor. This phenomenon cannot be influenced, but in most applications it is non-critical. Controlling the power semiconductors in the two controlled phases results not only in this asymmetry, however, but also in the previously mentioned direct current components which can cause severe noise generation on the motor at starting voltages of less than 50 %. "Polarity Balancing" reliably eliminates these direct current components during the ramp-up phase. It creates a motor ramp-up that is uniform in speed, torque and current rise. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled starting operation. This is made possible by the on-going dynamic balancing of current half-waves of different polarity during the motor ramp-up.

The SIRIUS 3RW40 is equipped with optimum functionality. An integral bypass contact system reduces the power loss of the soft starter during operation. This reliably prevents heating of the switchgear environment. Using a 4-step rotary potentiometer it is possible to set different overload tripping times. Thanks to the integral motor overload protection to IEC 60947-4-2 there is no need of an additional overload relay. Device variants with integrated thermistor motor protection (PTC type A of Thermoclick) are available as an option for the sizes S0 to S3. This saves space in the control cabinet and wiring outlay in the feeder. Internal intrinsic device protection prevents in addition the thermal overloading of the thyristors and the power section defects this can cause.

As an option the thyristors can also be protected by SITOR semiconductor fuses from short-circuiting so that the soft starter is still functional after a short-circuit (coordination type 2). And even inrush current peaks are reliably avoided thanks to adjustable current limiting. Three LEDs are used to indicate the operating state as well as possible errors, e.g. non-permissible tripping time (CLASS setting), mains or phase failure, missing load, thermal overloading or device faults.

We offer a comprehensive range of accessories for our soft starters. Examples include box terminal blocks, accessories for mechanical reset and a module for remote reset (size S6 or larger) or a sealing cover or easy-to-fit terminal covers for optimum touch protection.

- Soft starting with voltage ramp; the starting voltage setting range U_s is 40 to 100 % and the ramp time t_R can be set from 0 to 20 s.
- Smooth ramp-down with voltage ramp; the running down time t_{off} can be set between 0 s to 20 s. The switch-off voltage U_{off} is then dependent on the selected starting voltage U_s.
- Solid-state motor overload and intrinsic device protection
- Optional thermistor motor protection (up to size S3)
- Remote reset (integrated up to size S3, optional for size S6 and larger)
- Adjustable current limiting
- Integrated bypass contact system to minimize power loss
- Setting with potentiometers
- Simple mounting and commissioning
- Integrated status monitoring and fault monitoring
- Mains voltages 50/60 Hz, 200 to 600 V
- Various control voltage versions
  - sizes S0 to S3:
    24 V AC/DC and
    110 ... 230 V AC/DC
  - sizes S6 to S12:
    115 V AC and 230 V AC.
    Control by way of the internal 24 V DC supply and direct control by means of PLC possible.
- Wide temperature range from -25 to +60 °C
- Built-in auxiliary contacts ensure user-friendly control and possible further processing within the system (for status graphs see Page 6/25)

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3RW Soft Starters

■ Technical specifications

Type			3RW40 2.		3RW40 3., 3RW40 4.	
Control electronics						
Rated values	Terminal					
Rated control supply voltage	A1/A2	V	24	110 ... 230	24	110 ... 230
• Tolerance		%	±20	-15/+10	±20	-15/+10
Rated control supply current						
• STANDBY		mA	< 150	< 50	< 200	< 50
• During pick-up		mA	< 200	< 100	< 5000	< 1500
• ON without fan		mA	< 250	< 50	< 200	< 50
• ON with fan		mA	< 300	< 70	< 250	< 70
Rated frequency		Hz	50/60			
• Tolerance		%	±10			
Control inputs						
IN			ON/OFF			
Rated operational current						
• AC		mA	Approx. 12	3/6	Approx. 12	3/6
• DC		mA	Approx. 12	1.5/3	Approx. 12	1.5/3
Relay outputs						
Output 1	ON/RUN mode[1]	13/14	Operating indication (NO)			
Output 2	BYPASSED	23/24	Bypass indication (NO)			
Output 3	OVERLOAD/FAILURE	95/96/98	Overload/error indication (NC/NO)			
Rated operational current		A	3 AC-15/AC-14 at 230 V,			
		A	1 DC-13 at 24 V			
Protection against overvoltages			Protection by means of varistor through contact			
Short-circuit protection			4 A gL/gG operational class;			
			6 A quick (fuse is not included in scope of supply)			

[1] Factory default: ON mode.

Type			3RW40 5.		3RW40 7.	
Control electronics						
Rated values	Terminal					
Rated control supply voltage	A1/A2	V AC	115	230	115	230
• Tolerance		%	-15/+10		-15/+10	
Rated control supply current STANDBY		mA	15		15	
Rated control supply current ON[1]		mA	440	200	660	360
Rated frequency		Hz	50/60		50/60	
• Tolerance		%	±10		±10	
Control inputs						
IN			ON/OFF			
Rated operational current		mA	Approx. 10 acc. to DIN 19240			
Rated operational voltage		V DC	24 from internal supply dc+ or			
			external DC supply (acc. to DIN 19240) through terminals and IN			
Relay outputs						
Output 1	ON/RUN mode[2]	13/14	Operating indication (NO)			
Output 2	BYPASSED	23/24	Bypass indication (NO)			
Output 3	OVERLOAD/FAILURE	95/96/98	Overload/error indication (NC/NO)			
Rated operational current		A	3 AC-15/AC-14 at 230 V,			
		A	1 DC-13 at 24 V			
Protection against overvoltages			Protection by means of varistor through contact			
Short-circuit protection			4 A gL/gG operational class;			
			6 A quick (fuse is not included in scope of supply)			

[1] Values for the coil power consumption at +10 % U_n, 50 Hz.

[2] Factory default: ON mode.

Type		3RW40 2., 3RW40 3., 3RW40 4.		
Control electronics				
Operating indications	LED	**DEVICE**	**STATE/BYPASSED/FAILURE**	**OVERLOAD**
Off		Green	Off	Off
Start		Green	Green flashing	Off
Bypass		Green	Green	Off
Ramp-down		Green	Green flashing	Off
Alarm signals				
I_e/class setting not permissible		Green	Not relevant	Red flashing
Start inhibited/thyristors too hot		Yellow flashing	Not relevant	Off
Error signals				
• 24 V: $U < 0.75 \times U_s$ or $U > 1.25 \times U_s$		Off	Red	Off
• 110 ... 230 V: $U < 0.75 \times U_s$ or $U > 1.15 \times U_s$		Off	Red	Off
Non-permissible I_e/Class setting				
for edge 0 –> 1 on input IN		Green	Red	Red flashing
Motor protection shut-down		Green	Off	Red
Thermistor motor protection disconnection		Green	Off	Red flickering
Thermal overloading of the thyristors		Yellow	Red	Off
Missing mains voltage, phase failure, missing load		Green	Red	Off
Device fault		Red	Red	Off

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3RW Soft Starters

3RW40
for standard applications

Type		3RW40 5. and 3RW40 7.			
Control electronics					
Operating indications	LED	**DEVICE**	**STATE/BYPASSED**	**FAILURE**	**OVERLOAD**
Off		Green	Off	Off	Off
Start		Green	Green flashing	Off	Off
Bypass		Green	Green	Off	Off
Ramp-down		Green	Green flashing	Off	Off
Alarm signals					
I_e/class setting not permissible		Green	Not relevant	Not relevant	Red flashing
Start inhibited/thyristors too hot		Yellow flashing	Not relevant	Not relevant	Off
Error signals					
$U < 0.75 \times U_s$ or $U > 1.15 \times U_s$		Off	Off	Red	Off
Non-permissible I_e/Class setting					
for edge 0 –> 1 on input IN		Green	Off	Red	Red flashing
Motor protection shut-down		Green	Off	Off	Red
Thermal overloading of the thyristors		Yellow	Off	Red	Off
Missing mains voltage, phase failure, missing load		Green	Off	Red	Off
Device fault		Red	Off	Red	Off

Type		3RW40 . .	
			Factory default
Protection functions			
Motor protection functions			
Trips in the event of		Thermal overloading of the motor	
Trip class to IEC 60947-4-1	Class	10/15/20	10
Phase failure sensitivity	%	> 40	
Overload warning		No	
Thermistor protection acc. to IEC 60947-8, type A/IEC 60947-5-1		Yes[1]	
Reset option after tripping		Manual/automatic/remote reset[2]	
		(MAN/AUTO/REMOTE[2])	
Recovery time	min	5	
Device protection functions			
Trips in the event of		Thermal overloading of the thyristors or bypass	
Reset option after tripping		Manual/automatic/remote reset[2]	
		(MAN/AUTO/REMOTE[2])	
Recovery time			
• During overloading of the thyristors	s	30	
• During overloading of the bypass	s	60	
Control times and parameters			
Control times			
Closing delay (with connected control voltage)	ms	< 50	
Closing delay (automatic/mains contactor mode)	ms	< 300	
Recovery time (closing command in active ramp-down)	ms	100	
Mains failure bridging time			
Control supply voltage	ms	50	
Mains failure response time			
Load current circuit	ms	500	
Reclosing lockout after overload trip			
Motor protection trip	min	5	
Device protection trip			
• During overloading of the thyristors	s	30	
• During overloading of the bypass	s	60	
Starting parameters			
Starting time	s	0 ... 20	7.5
Starting voltage	%	40 ... 100	40
Starting current limit		1.3 ... 5 x I_e	5 x I_e
Ramp-down parameters			
Ramp-down time	s	0 ... 20	0
Reset mode parameters (for motor/device protection shut-down)			
Manual reset	LED	Off	Off
Automatic reset	LED	Yellow	
Remote reset (REMOTE)[2]	LED	Green	
Start-up detection		Yes	
Operating mode output 13/14			
Rising edge at	Start command		
Falling edge at	Off command	ON	ON
	Ramp-down end	RUN	

[1] Optional up to size S3 (device variant).

[2] Integrated remote reset (REMOTE) available only for 3RW40 2. to 3RW40 4.; remote reset with 3RU19 accessory module available for 3RW40 5. and 3RW40 7..

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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 Tolerance	V AC %	200 ... 480 -15/+10	400 ... 600 -15/+10	200 ... 460 -15/+10	400 ... 600 -15/+10
Rated frequency Tolerance	Hz %	50/60 ±10			
Continuous duty at 40 °C (% of I_e)	%	115			
Minimum load (% of set motor current I_M)	%	20		15	
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					
• With auxiliary fan (for 3RW40 2. ... 3RW40 4.)					
• Without auxiliary fan (for 3RW40 2. ... 3RW40 4.)				-- (fan integrated in the soft starter)	
Permissible ambient temperature Operation Storage	 °C °C	 -25 ... +60; (derating from +40) -40 ... +80			
Degree of protection		IP20 for 3RW40 2.; IP00 for 3RW40 3. and 3RW40 4.		IP00	

Type		3RW40 24	3RW40 26	3RW40 27	3RW40 28
Power electronics					
Load rating with rated operational current I_e • Acc. to IEC and UL/CSA[1], for individual mounting, AC-53a					
- at 40 °C	A	12.5	25.3	32.2	38
- at 50 °C	A	11	23	29	34
- at 60 °C	A	10	21	26	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 current limit set to 300 % I_M (40°C)	W	17	47	55	64
Permissible rated motor current and starts per hour					
• For normal starting (Class 10)					
- rated motor current I_M[2], starting time 3 s	A	12.5	25	32	38
- starts per hour[3]	1/h	50	23	23	19
- rated motor current I_M[2][4], starting time 4 s	A	12.5	25	32	38
- starts per hour[3]	1/h	36	15	16	12
• For heavy starting (Class 15)					
- rated motor current I_M[2], starting time 4.5 s	A	11	23	30	34
- starts per hour[3]	1/h	49	21	18	18
- rated motor current I_M[2][4], starting time 6 s	A	11	23	30	34
- starts per hour[3]	1/h	36	14	13	13
• For heavy starting (Class 20)					
- rated motor current I_M[2], starting time 6 s	A	10	21	27	31
- starts per hour[3]	1/h	47	21	20	18
- rated motor current I_M[2][4], starting time 8 s	A	10	21	27	31
- starts per hour[3]	1/h	34	15	14	13

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

[2] Current limit on soft starter set to 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.

3RW Soft Starters

3RW40
for standard applications

Type		3RW40 36	3RW40 37	3RW40 38	3RW40 46	3RW40 47
Power electronics						
Load rating with rated operational current I_e						
• Acc. to IEC and UL/CSA[1], for individual mounting, AC-53a						
- at 40 °C	A	45	63	72	80	106
- at 50 °C	A	42	58	62,1	73	98
- at 60 °C	A	39	53	60	66	90
Smallest adjustable rated motor current I_M						
For the motor overload protection	A	23	26	35	43	46
Power loss						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6	12	15	12	21
• During starting with current limit set to 300 % I_M (40°C)	W	79	111	125	144	192
Permissible rated motor current and starts per hour						
• For normal starting (Class 10)						
- rated motor current I_M[2], starting time 3 s	A	45	63	72	80	106
- starts per hour[3]	1/h	38	23	22	22	15
- rated motor current I_M[2][4], starting time 4 s	A	45	63	72	80	106
- starts per hour[3]	1/h	26	15	15	15	10
• For heavy starting (Class 15)						
- rated motor current I_M[2], starting time 4.5 s	A	42	50	56	70	84
- starts per hour[3]	1/h	30	34	34	24	23
- rated motor current I_M[2][4], starting time 6 s	A	42	50	56	70	84
- starts per hour[3]	1/h	21	24	24	16	17
• For heavy starting (Class 20)						
- rated motor current I_M[2], starting time 6 s	A	38	46	50	64	77
- starts per hour[3]	1/h	30	31	34	23	23
- rated motor current I_M[2][4], starting time 8 s	A	38	46	50	64	77
- starts per hour[3]	1/h	21	22	24	16	16

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

[2] Current limit on soft starter set to 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.

Type		3RW40 55	3RW40 56	3RW40 73	3RW40 74	3RW40 75	3RW40 76
Power electronics							
Load rating with rated operational current I_e							
• Acc. to IEC and UL/CSA[1], for individual mounting, AC-53a							
- at 40 °C	A	134	162	230	280	356	432
- at 50 °C	A	117	145	205	248	315	385
- at 60 °C	A	100	125	180	215	280	335
Smallest adjustable rated motor current I_M							
For the motor overload protection	A	59	87	80	130	131	207
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	60	75	75	90	125	165
• During starting with current limit set to 350 %[2] I_M (40°C)	W	1043	1355	2448	3257	3277	3600
Permissible rated motor current and starts per hour							
• For normal starting (Class 10)							
- rated motor current I_M[2], starting time 10 s	A	134	162	230	280	356	432
- starts per hour[3]	1/h	20	8	14	20	16	17
- rated motor current I_M[2][4], starting time 20 s	A	134	162	230	280	356	432
- starts per hour[3]	1/h	7	1.4	3	8	5	5
• For heavy starting (Class 15)							
- rated motor current I_M[2], starting time 15 s	A	134	152	210	250	341	402
- starts per hour[3]	1/h	11	8	11	13	11	12
- rated motor current I_M[2][4], starting time 30 s	A	134	152	210	250	341	402
- starts per hour[3]	1/h	1.2	1.7	1	6	2	2
• For heavy starting (Class 20)							
- rated motor current I_M[2], starting time 20 s	A	124	142	200	230	311	372
- starts per hour[3]	1/h	12	9	10	10	10	10
- rated motor current I_M[2][4], starting time 40 s	A	124	142	200	230	311	372
- starts per hour[3]	1/h	2	2	1	5	1	1

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

[2] Current limit on soft starter set to 350 % I_M.

[3] For intermittent duty S4 with ON period = 70 %, 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.

3RW Soft Starters

Soft starters	Type		3RW40 2.	3RW40 3.	3RW40 4.
Conductor cross-sections					
Screw terminals	**Main conductor**				
Front clamping point connected	• Solid	mm²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947; max. 1 x 10	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)	1 x (0.75 ... 25)	1 x (2.5 ... 35)
	• Stranded	mm²	--	1 x (0.75 ... 35)	1 x (4 ... 70)
	• AWG cables				
	- solid or stranded (finely stranded)	AWG	2 x (14 ... 10)	1 x (18 ... 2)	2 x (10 ... 1/0)
	- stranded	AWG	1 x 8	--	--
Rear clamping point connected	• Solid	mm²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947; max. 1 x 10	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)	1 x (1.5 ... 25)	1 x (2.5 ... 50)
	• Stranded	mm²	--	1 x (1.5 ... 35)	1 x (10 ... 70)
	• AWG cables				
	- solid or stranded (finely stranded)	AWG	2 x (14 ... 10)	1 x (16 ... 2)	2 x (10 ... 1/0)
	- stranded	AWG	1 x 8	--	--
Both clamping points connected	• Solid	mm²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947; max. 1 x 10	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)	2 x (1.5 ... 16)	2 x (2.5 ... 35)
	• Stranded	mm²	--	2 x (1.5 ... 25)	2 x (10 ... 50)
	• AWG cables				
	- solid or stranded (finely stranded)	AWG	2 x (14 ... 10)	2 x (16 ... 2)	1 x (10 ... 2/0)
	- stranded	AWG	1 x 8	--	--
	• Tightening torque	Nm lb.in	2 ... 2.5 18 ... 22	4.5 40	6.5 58
	Tools		PZ 2	PZ 2	Allen screw 4 mm
	Degree of protection		IP20	IP20 (IP00 terminal compartment)	IP20 (IP00 terminal compartment)
Spring-loaded terminals	**Main conductor**				
	• Solid	mm²	1 ... 10	--	
	• Finely stranded with end sleeve	mm²	1 ... 6 end sleeves without plastic collar	--	
	• AWG cables				
	- solid or stranded (finely stranded)	AWG	16 ... 10	--	
	- stranded	AWG	1 x 8	--	
	Tools		DIN ISO 2380-1A0; 5 x 3	--	
	Degree of protection		IP20	--	
Busbar connections	**Main conductor**				
	• With cable lug acc. to DIN 46234 or max. 20 mm wide				
	- stranded	mm²	--		2 x (10 ... 70)
	- finely stranded	mm²	--		2 x (10 ... 50)
	• AWG cables, solid or stranded	AWG	--		2 x (7 ... 1/0)

6

3RW Soft Starters

3RW40
for standard applications

Soft starters	Type		3RW40 5.	3RW40 7.
Conductor cross-sections				
Screw terminals	**Main conductors:**			
With box terminal			3RT19 55-4G (55 kW)	3RT19 66-4G
Front clamping point connected	• Finely stranded with end sleeve	mm²	16 ... 70	70 ... 240
	• Finely stranded without end sleeve	mm²	16 ... 70	70 ... 240
	• Stranded	mm²	16 ... 70	95 ... 300
	• Ribbon cable conductors (number x width x thickness)	mm	Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8	Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5
	• AWG cables, solid or stranded	AWG	6 ... 2/0	3/0 ... 600 kcmil
Rear clamping point connected	• Finely stranded with end sleeve	mm²	16 ... 70	120 ... 185
	• Finely stranded without end sleeve	mm²	16 ... 70	120 ... 185
	• Stranded	mm²	16 ... 70	120 ... 240
	• Ribbon cable conductors (number x width x thickness)	mm	Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8	Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5
	• AWG cables, solid or stranded	AWG	6 ... 2/0	250 ... 500 kcmil
Both clamping points connected	• Finely stranded with end sleeve	mm²	Max. 1 x 50, 1 x 70	Min. 2 x 50; max. 2 x 185
	• Finely stranded without end sleeve	mm²	Max. 1 x 50, 1 x 70	Min. 2 x 50; max. 2 x 185
	• Stranded	mm²	Max. 2 x 70	Max. 2 x 70; max. 2 x 240
	• Ribbon cable conductors (number x width x thickness)	mm	Max. 2 x (6 x 15.5 x 0.8)	Max. 2 x (20 x 24 x 0.5)
	• AWG cables, solid or stranded	AWG	Max. 2 x 1/0	Min. 2 x 2/0 Max. 2 x 500 kcmil
	• Terminal screws - tightening torque	Nm lb.in	M10 (hexagon socket, A/F4) 10 ... 12 90 ... 110	M12 (hexagon socket, A/F5) 20 ... 22 180 ... 195
Screw terminals	**Main conductors:**			
With box terminal			3RT19 56-4G	
Front or rear clamping point connected	• Finely stranded with end sleeve	mm²	16 ... 120	
	• Finely stranded without end sleeve	mm²	16 ... 120	
	• Stranded	mm²	16 ... 120	
	• Ribbon cable conductors (number x width x thickness)	mm	Min. 3 x 9 x 0.8 max. 6 x 15.5 x 0.8	
	• AWG cables, solid or stranded	AWG	6 ... 250 kcmil	
Both clamping points connected	• Finely stranded with end sleeve	mm²	Max. 1 x 95, 1 x 120	
	• Finely stranded without end sleeve	mm²	Max. 1 x 95, 1 x 120	
	• Stranded	mm²	Max. 2 x 120	
	• Ribbon cable conductors (number x width x thickness)	mm	Max. 2 x (10 x 15.5 x 0.8)	
	• AWG cables, solid or stranded	AWG	Max. 2 x 3/0	
Screw terminals	**Main conductors:**			
	Without box terminal/busbar connection			
	• Finely stranded with cable lug	mm²	16 ... 95[1]	50 ... 240[2]
	• Stranded with cable lug	mm²	25 ... 120[1]	70 ... 240[2]
	• AWG cables, solid or stranded	AWG	4 ... 250 kcmil	2/0 ... 500 kcmil
	• Connecting bar (max. width)	mm	17	25
	• Terminal screws - tightening torque	Nm lb.in	M8 x 25 (A/F13) 10 ... 14 89 ... 124	M10 x 30 (A/F17) 14 ... 24 124 ... 210

[1] When connecting cable lugs to DIN 46235, use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm² to ensure phase spacing.

[2] When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for conductor cross-sections of 240 mm² and more as well as DIN 46235 for conductor cross-sections of 185 mm² and more to keep the phase clearance.

Soft starters	Type		3RW40 ..
Conductor cross-sections			
Auxiliary conductors (1 or 2 conductors can be connected)**:**			
	Screw terminals		
	• Solid	mm²	2 x (0.5 ... 2.5)
	• Finely stranded with end sleeve	mm²	2 x (0.5 ... 1.5)
	• AWG cables - solid or stranded - finely stranded with end sleeve	AWG AWG	2 x (20 ... 14) 2 x (20 ... 16)
	• Terminal screws - tightening torque	Nm lb.in	0,8 ... 1.2 7 ... 10.3
	Spring-loaded terminals		
	• Solid - 3RW40 2. ... 3RW40 4. - 3RW40 5., 3RW40 7.	mm² mm²	2 x (0.25 ... 2.5) 2 x (0.25 ... 1.5)
	• Finely stranded with end sleeve	mm²	2 x (0.25 ... 1.5)
	• AWG cables, solid or stranded	AWG	2 x (24 ... 14) for 3RW40 2. ... 3RW40 4.; 2 x (24 ... 16) for 3RW40 5. and 3RW40 7.

3RW40
for standard applications

	Standard	Parameters
Electromagnetic compatibility acc. to EN 60947-4-2		
EMC interference immunity		
Electrostatic discharge (ESD)	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 3: 10 V/m
Conducted RF interference	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
RF voltages and RF currents on cables		
• Burst	EN 61000-4-4	±2 kV/5 kHz
• Surge	EN 61000-4-5	±1 kV line to line ±2 kV line to earth
EMC interference emission		
EMC interference field strength	EN 55011	Limit value of Class A at 30 ... 1000 MHz, limit value of Class B with 3RW40 2. 24 V AC/DC
Radio interference voltage	EN 55011	Limit value of Class A at 0.15 ... 30 MHz, limit value of Class B with 3RW40 2. 24 V AC/DC
Is an RI suppression filter necessary?		
Degree of noise suppression A (industrial applications)	No	
Degree of noise suppression B (applications for residential areas) Control voltage • 230 V AC/DC • 24 V AC/DC	Not available[1] No for 3RW40 2.; yes for 3RW40 3. and 3RW40 4.	

[1] Degree of noise suppression B cannot be obtained through the use of filters as the strength of the electromagnetic field is not attenuated by the filter.
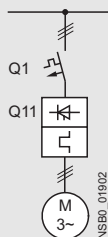
3RW Soft Starters

Fuse assignment

The type of coordination to which the motor feeder with soft starter is mounted depends on the application-specific requirements. Normally, fuseless mounting (combination of motor starter protector/circuit breaker and soft starter) is sufficient. If type of coordination "2" is to be fulfilled, semiconductor fuses must be fitted in the motor feeder.
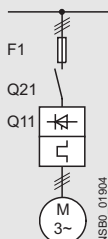
Fuseless version

Soft starters		Motor starter protectors/circuit breakers[1]						
	Rated current	400 V +10 %			Rated current	575 V +10 %		Rated current
Q11		Q1	$I_{q\,max}$			Q1	$I_{q\,max}$	
Type	A	Type	kA	A		Type	kA	A
Type of coordination "1"[2])								
3RW40 24	12.5	3RV1 031-4AA10	55	16		--	--	--
3RW40 26	25	3RV1 031-4DA10	55	25		--	--	--
3RW40 27	32	3RV1 031-4EA10	55	32		--	--	--
3RW40 28	38	3RV1 031-4FA10	55	40		--	--	--
3RW40 36	45	3RV1 031-4GA10	20	45		--	--	--
3RW40 37	63	3RV1 041-4JA10	20	63		--	--	--
3RW40 38	72	3RV1 041-4KA10	20	75		--	--	--
3RW40 46	80	3RV1 041-4LA10	11	90		--	--	--
3RW40 47	106	3RV1 041-4MA10	11	100		--	--	--
3RW40 55	134	3VL3 720-2DC36	35	200		3VL3 720-1DC36	12	200
3RW40 56	162	3VL3 720-2DC36	35	200		3VL3 720-1DC36	12	200
3RW40 73	230	3VL4 731-2DC36	65	315		3VL5 731-3DC36	35	315
3RW40 74	280	3VL4 731-2DC36	65	315		3VL5 731-3DC36	35	315
3RW40 75	356	3VL4 740-2DC36	65	400		3VL5 740-3DC36	35	400
3RW40 76	432	3VL5 750-2DC36	65	500		3VL5 750-3DC36	35	500

[1] The rated motor current must be considered when selecting the devices.

[2] The types of coordination are explained in more detail under "Fuseless Load Feeders" on Page 6/58.
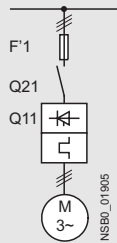
Fused version (line protection only)

Soft starters		Line protection, maximum			Line contactor	
	Rated current		Rated current	Size	(optional)	
Q11		F1			Q21	
Type	A	Type	A			
Type of coordination "1"[1]): I_q = 65 kA at 600 V +5 %						
3RW40 24	12.5	3NA3 820-6	50	00	3RT10 24	
3RW40 26	25	3NA3 822-6	63	00	3RT10 26	
3RW40 27	32	3NA3 824-6	80	00	3RT10 34	
3RW40 28	38	3NA3 824-6	80	00	3RT10 35	
3RW40 36	45	3NA3 130-6	100	1	3RT10 36	
3RW40 37	63	3NA3 132-6	125	1	3RT10 44	
3RW40 38	72	3NA3 132-6	125	1	3RT10 45	
3RW40 46	80	3NA3 136-6	160	1	3RT10 45	
3RW40 47	106	3NA3 136-6	160	1	3RT10 46	
3RW40 55	134	3NA3 244-6	250	2	3RT10 55-6A.36	
3RW40 56	162	3NA3 244-6	250	2	3RT10 56-6A.36	
3RW40 73	230	2 x 3NA3 354-6	2 x 355	3	3RT10 65-6A.36	
3RW40 74	280	2 x 3NA3 354-6	2 x 355	3	3RT10 66-6A.36	
3RW40 75	356	2 x 3NA3 365-6	2 x 500	3	3RT10 75-6A.36	
3RW40 76	432	2 x 3NA3 365-6	2 x 500	3	3RT10 76-6A.36	

[1] The types of coordination are explained in more detail under "Fuseless Load Feeders" on Page 6/58.

Fused version with 3NE1 SITOR fuses (semiconductor and line protection)


Soft starters		All-range fuses			Line contactor
	Rated current		Rated current	Size	(optional)
Q11 Type	A	F'1 Type	A		Q21
Type of coordination "2"[1]: I_q = 65 kA at 600 V +5 %					
3RW40 24	12.5	3NE1 814-0	20	000	3RT10 24
3RW40 26	25	3NE1 803-0	35	000	3RT10 26
3RW40 27	32	3NE1 020-2	80	00	3RT10 34
3RW40 28	38	3NE1 020-2	80	00	3RT10 35
3RW40 36	45	3NE1 020-2	80	00	3RT10 36
3RW40 37	63	3NE1 820-0	80	000	3RT10 44
3RW40 38	72	3NE1 820-0	80	000	3RT10 45
3RW40 46	80	3NE1 021-0	100	00	3RT10 45
3RW40 47	106	3NE1 022-0	125	00	3RT10 46
3RW40 55	134	3NE1 227-2	250	1	3RT10 55-6A.36
3RW40 56	162	3NE1 227-2	250	1	3RT10 56-6A.36
3RW40 73	230	3NE1 331-2	350	2	3RT10 65-6A.36
3RW40 74	280	3NE1 333-2	450	2	3RT10 66-6A.36
3RW40 75	356	3NE1 334-2	500	2	3RT10 75-6A.36
3RW40 76	432	3NE1 435-2	560	3	3RT10 76-6A.36

[1] The types of coordination are explained in more detail under "Fuseless Load Feeders" on Page 6/58. The type of coordination "2" refers only to soft starters, not to any components in the feeder.

3RW Soft Starters

3RW40
for standard applications

Fused version with 3NE3 SITOR fuses (semiconductor protection by fuse, line and overload protection by motor starter protector/circuit breaker; alternatively, installation with contactor and overload relay possible)
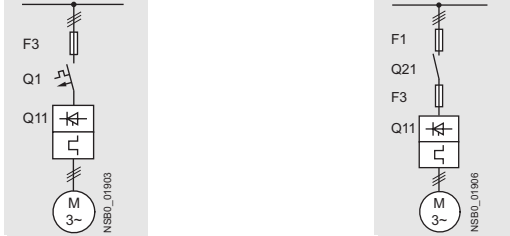
Soft starters		Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses, minimum		
Q11 Type	Rated current A	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
Type of coordination "2"[1]: I_q = 65 kA at 600 V +5 %										
3RW40 24	12.5	--	--	--	--	--	--	3NE4 101	32	0
3RW40 26	25	--	--	--	3NE3 221	100	1	3NE4 102	40	0
3RW40 27	32	--	--	--	3NE3 224	160	1	3NE4 118	63	0
3RW40 28	38	--	--	--	3NE3 224	160	1	3NE4 118	63	0
3RW40 36	45	--	--	--	3NE3 224	160	1	3NE4 120	80	0
3RW40 37	63	--	--	--	3NE3 225	200	1	3NE4 121	100	0
3RW40 38	72	3NE3 221	100	1	3NE3 227	250	1	--	--	--
3RW40 46	80	3NE3 222	125	1	3NE3 225	200	1	--	--	--
3RW40 47	106	3NE3 224	160	1	3NE3 231	350	1	--	--	--
3RW40 55	134	3NE3 227	250	1	3NE3 335	560	2	--	--	--
3RW40 56	162	3NE3 227	250	1	3NE3 335	560	2	--	--	--
3RW40 73	230	3NE3 232-0B	400	1	3NE3 333	450	2	--	--	--
3RW40 74	280	3NE3 233	450	1	3NE3 336	630	2	--	--	--
3RW40 75	356	3NE3 335	560	2	3NE3 336	630	2	--	--	--
3RW40 76	432	3NE3 337-8	710	2	3NE3 340-8	900	2	--	--	--

Soft starters		Semiconductor fuses max.			Semiconductor fuses min.			Semiconductor fuses max.			Cylindrical fuses	
Q11 Type	Rated current A	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A
Type of coordination "2"[1]: I_q = 65 kA at 600 V +5 %												
3RW40 24	12.5	3NE4 117	50	0	3NE8 015-1	25	00	3NE8 017-1	50	00	3NC2 240	40
3RW40 26	25	3NE4 117	50	0	3NE8 017-1	50	00	3NE8 021-1	100	00	3NC2 263	63
3RW40 27	32	3NE4 118	63	0	3NE8 018-1	63	00	3NE8 022-1	125	00	3NC2 280	80
3RW40 28	38	3NE4 118	63	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW40 36	45	3NE4 120	80	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW40 37	63	3NE4 121	100	0	3NE8 021-1	100	00	3NE8 024-1	160	00	--	--
3RW40 38	72	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW40 46	80	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW40 47	106	--	--	--	3NE8 024-1	160	00	3NE8 024-1	160	00	--	--
3RW40 55	134	--	--	--	--	--	--	--	--	--	--	--
3RW40 56	162	--	--	--	--	--	--	--	--	--	--	--
3RW40 73	230	--	--	--	--	--	--	--	--	--	--	--
3RW40 74	280	--	--	--	--	--	--	--	--	--	--	--
3RW40 75	356	--	--	--	--	--	--	--	--	--	--	--
3RW40 76	432	--	--	--	--	--	--	--	--	--	--	--

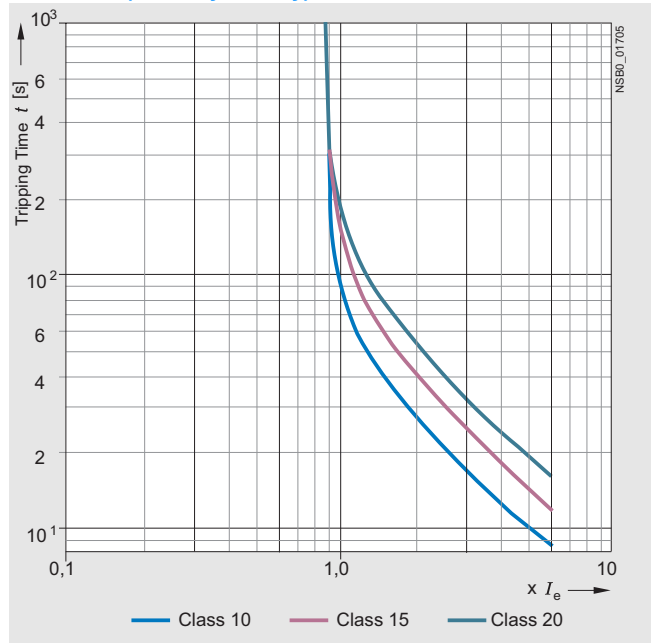| Soft starters		Line contactor (optional)	Motor starter protectors/circuit breakers				Line protection, maximum		
Q11 Type	Rated current A	Q21	400 V +10 % Q1 Type	Rated current A	575 V +10 % Q1 Type	Rated current A	F1 Type	Rated current A	Size
Type of coordination "2"[1]: I_q = 65 kA at 600 V +5 %									
3RW40 24	12.5	3RT10 24	3RV1 031-4AA10	55	--	--	3NA3 820-6	50	00
3RW40 26	25	3RT10 26	3RV1 031-4DA10	55	--	--	3NA3 822-6	63	00
3RW40 27	32	3RT10 34	3RV1 031-4EA10	55	--	--	3NA3 824-6	80	00
3RW40 28	38	3RT10 35	3RV1 031-4FA10	55	--	--	3NA3 824-6	80	00
3RW40 36	45	3RT10 36	3RV1 031-4GA10	20	--	--	3NA3 130-6	100	1
3RW40 37	63	3RT10 44	3RV1 041-4JA10	20	--	--	3NA3 132-6	125	1
3RW40 38	72	3RT10 45	3RV1 041-4KA10	20	--	--	3NA3 132-6	125	1
3RW40 46	80	3RT10 45	3RV1 041-4LA10	11	--	--	3NA3 136-6	160	1
3RW40 47	106	3RT10 46	3RV1 041-4MA10	11	--	--	3NA3 136-6	160	1
3RW40 55	134	3RT10 55-6A.36	3VL3 720-1DC36	200	3VL3 720-1DC36	200	3NA3 244-6	250	2
3RW40 56	162	3RT10 56-6A.36	3VL3 720-1DC36	200	3VL3 720-1DC36	200	3NA3 244-6	250	2
3RW40 73	230	3RT10 65-6A.36	3VL4 731-1DC36	315	3VL5 731-1DC36	315	2 x 3NA3 354-6	2 x 355	3
3RW40 74	280	3RT10 66-6A.36	3VL4 731-1DC36	315	3VL5 731-1DC36	315	2 x 3NA3 354-6	2 x 355	3
3RW40 75	356	3RT10 75-6A.36	3VL4 740-1DC36	400	3VL5 740-1DC36	400	2 x 3NA3 365-6	2 x 500	3
3RW40 76	432	3RT10 76-6A.36	3VL5 750-1DC36	500	3VL5 750-1DC36	500	2 x 3NA3 365-6	2 x 500	3

[1] The types of coordination are explained in more detail under "Fuseless Load Feeders" on Page 6/58. The type of coordination "2" refers only to soft starters, not to any components in the feeder.
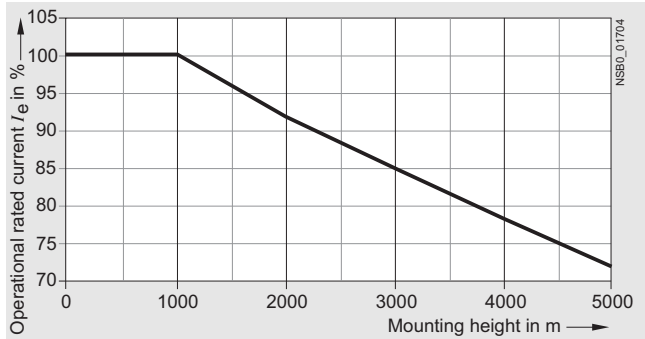
3RW Soft Starters

■ Characteristic curves

Motor protection tripping characteristics for 3RW40 (with symmetry)

NSB0_01488a

Tripping time *t* [s] / x I_e

Class 10 Class 15 Class 20
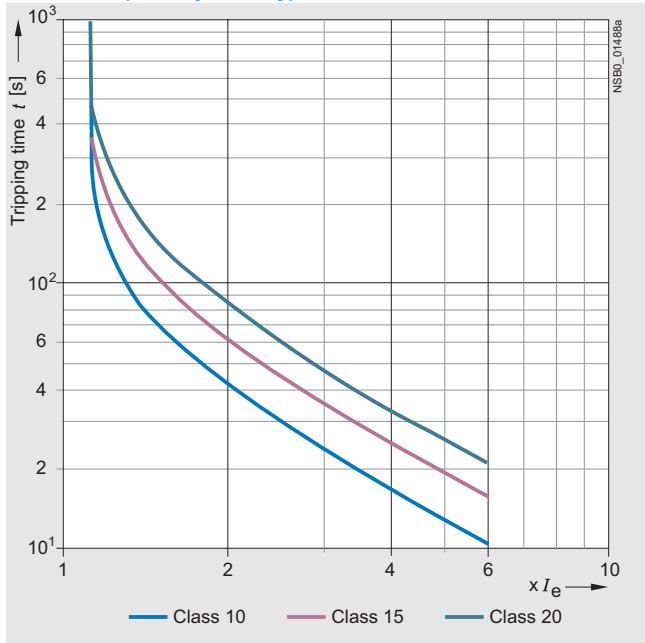
Motor protection tripping characteristics for 3RW40 (with asymmetry)

NSB0_01705

Tripping Time *t* [s] / x I_e

Class 10 Class 15 Class 20

Permissible installation height

NSB0_01704

Operational rated current I_e in % / Mounting height in m

At an installation height above 2000 m, the max. permissible operational voltage is reduced to 460 V.

6

3RW Soft Starters

■ **More information**

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n\,motor}$),
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	10	10	10	10
- current limit value		$5 \times I_M$	$5 \times I_M$	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
Ramp-down time	s	5	5	0	0	10	0

Application examples for heavy starting (Class 20)

Heavy starting Class 20 (up to 40 s with 350 % $I_{n\,motor}$),
The soft starter has to be selected at least one rating class higher than the motor used.

Application		Stirrer	Centrifuge
Starting parameters			
• Voltage ramp and current limiting			
- starting voltage	%	40	40
- starting time	s	20	20
- current limit value		$4 \times I_M$	$4 \times I_M$
Ramp-down time		0	0

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

6

3RW Soft Starters

Configuration

The 3RW solid-state soft starters 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.

Where long starting times are involved, the integrated solid-state overload relay for heavy starting should not be disconnected. PTC sensors are recommended. This also applies for the smooth ramp-down because during the ramp-down time an additional current loading applies in contrast to free ramp-down.

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 and controls) 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 occur as a rule 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.

Schematic circuit diagram
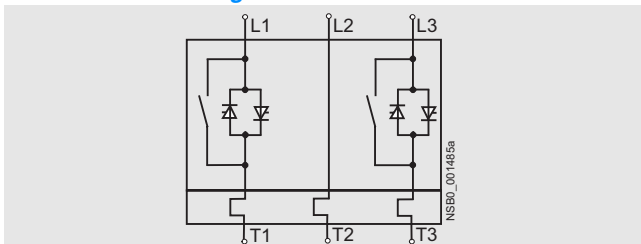
A bypass contact system and solid-state overload relay are already integrated in the 3RW40 soft starter and therefore do not have to be ordered separately.

Status graphs
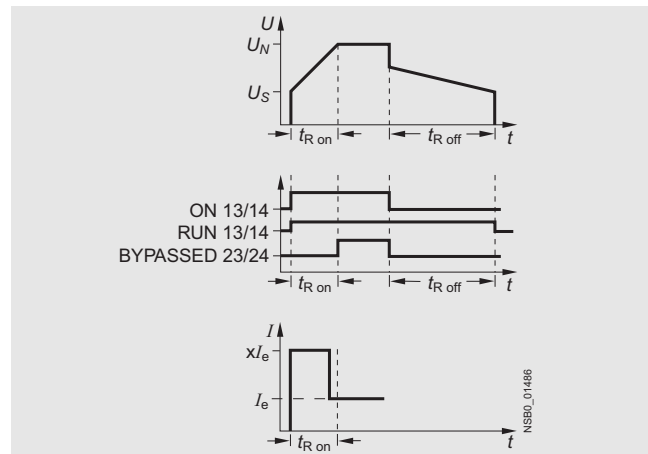
Win-Soft Starter selection and simulation program

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.

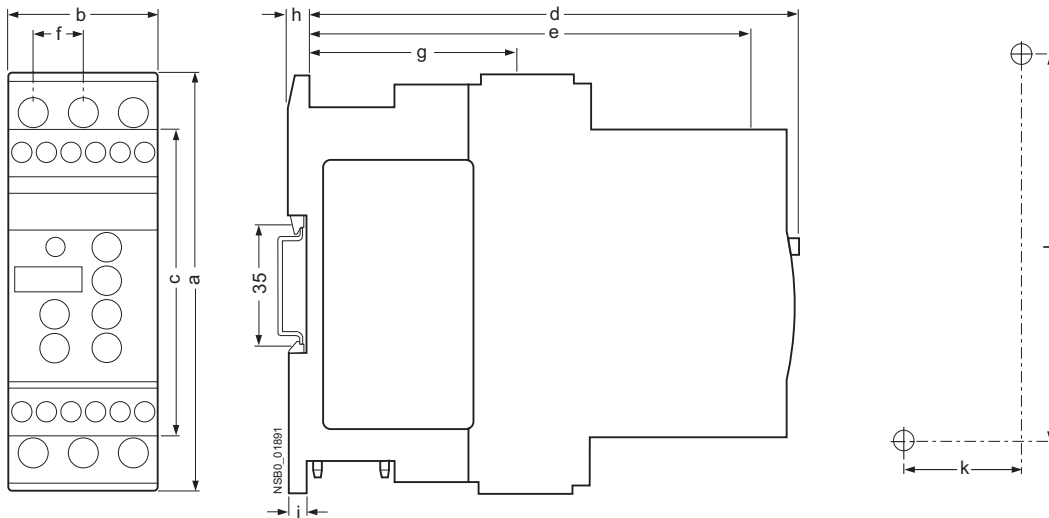You can order the CD-ROM under the following order number:

Order No. E20001-D1020-P302-V2-7400.

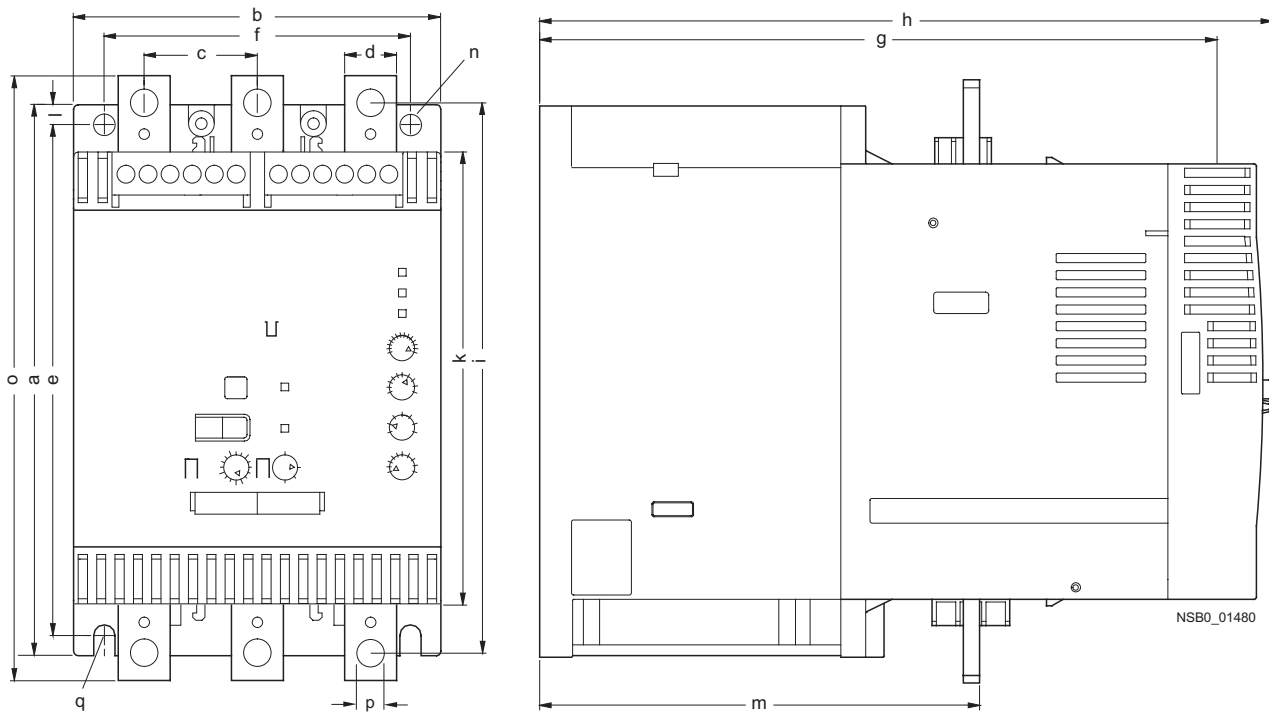More information can be found on the Internet at
http://www.siemens.com/softstarter

6

3RW40 for standard applications

Type/Dimension (mm)	a	b	c	d	e	f	g	h	l	k	l
3RW40 2.	125	45	92	149	126	14.4	63	5	6.5	35	115
3RW40 3.	170	55	110	165	140	18	63	5	6.5	30	150
3RW40 4.	170	70	110	183	158	22.5	85	5	10	60	160

Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m	N	o	p	q
3RW40 5.	180	120	37	17	167	100	223	250	180	148	6.5	153	7	198	9	M6, 10 Nm
3RW40 7.	210	160	48	25	190	140	240	278	205	166	10	166	9	230	11	M8, 15 Nm

3RW Soft Starters

Project planning aids

3RW40 2. ... 3RW40 4. connection examples for control circuit

Control using switches

N(L-) L1 (L+)

ON/OFF [1]

A2 A1 1

Q11

NSB0_01914

With remote reset

N(L-) L1 (L+)

RESET

ON/OFF [1]

A2 A1 1

Q11

NSB0_01892

U_s

100 %

>1,5 s

t

NSB0_01915

Automatic mode

N(L-) L1(L+)

ON/OFF [1]

A2 A1 1

Q11

NSB0_01895

U_s

ON

OFF

>5 min

t

NSB0_01916a
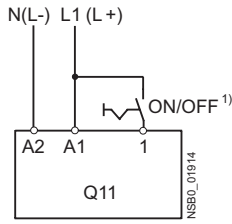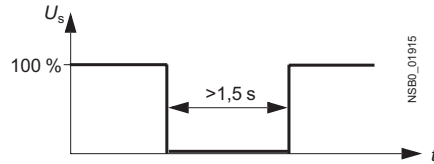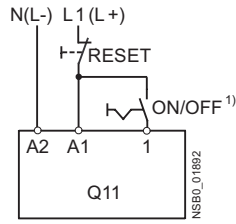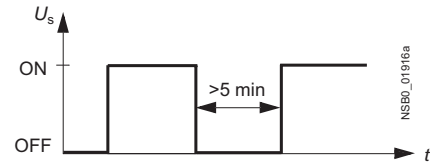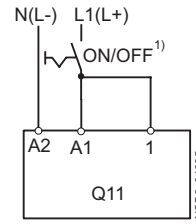
Control of 3RW40 2. ... 3RW40 4. by pushbutton

N(L-) L(L+)

OFF

ON

A1 A2 1 13 NO 14 24 NO 23

ON

Q11

NSB0_01896
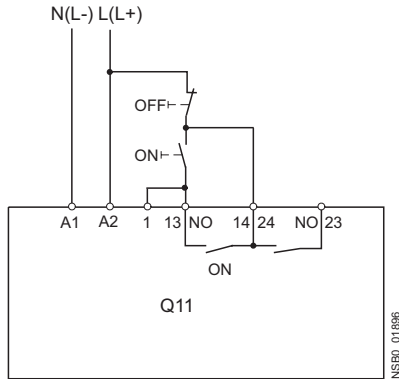
Connection example of 3RW40 2. ... 3RW40 4. for PTC sensors (thermistor motor protection)

Thermoclick
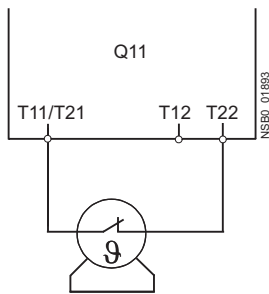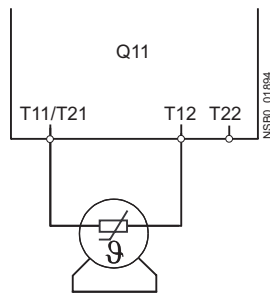
Q11

T11/T21 T12 T22

NSB0_01893
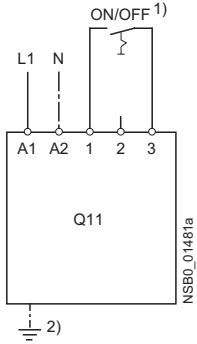
PTC type A

Q11

T11/T21 T12 T22

NSB0_01894
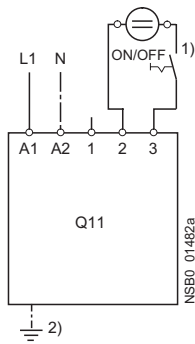
[1] **Caution: Risk of restarting**
When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 1.

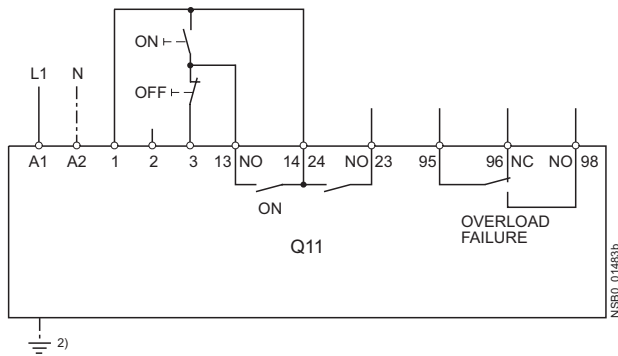## 3RW40 5. and 3RW40 7. connection examples for control circuit
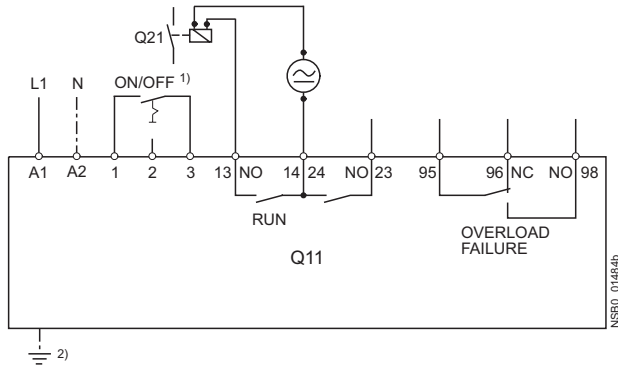
Control by switch using internal 24 V DC supply

external power supply

ON/OFF [1]

L1 N

A1 A2 1 2 3

Q11

NSB0_01481a

[2]

ON/OFF [1]

L1 N

A1 A2 1 2 3

Q11

NSB0_01482a

[2]

3RW40 connection examples for main circuit [3]

3RW40 – 3-phase motor with 3NA/3NE fuse

F1 — 3NA/3NE

Q21 — 3RT

Q11 — 3RW40

M 3~

NSB0_01489b

3RV motor starter protectors/ 3VL circuit breakers

3VL

Q11 — 3RW40

M 3~

NSB0_01487b

Control by pushbutton

ON
OFF

L1 N

A1 A2 1 2 3 13 NO 14 24 NO 23 95 96 NC NO 98

ON

OVERLOAD FAILURE

Q11

NSB0_01483b

[2]

Control of a main contactor

Q21

L1 N   ON/OFF [1]

A1 A2 1 2 3 13 NO 14 24 NO 23 95 96 NC NO 98

RUN

OVERLOAD FAILURE

Q11

NSB0_01484b
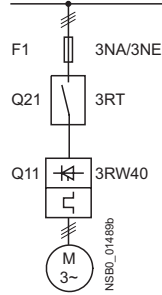
[2]

[1] **Caution: Risk of restarting**
When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 3.

[2] Grounding necessary for fan connection to 3RW40 5...

[3] As an alternative, the motor feeder can also be installed as a fuseless or as a fused version. For fuse and switching device coordination, see "Technical specifications".
The wiring diagrams are provided only as examples.

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