Technical specifications

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 according to DIN 19240			
Rated operational voltage			V DC	24 from internal supply dc+ or external DC supply (according to DIN 19240) through terminals and IN			
Relay outputs							
Output 1	ON/RUN mode[2]	13/14		Operating indication			
Output 2	BYPASSED	23/24		Bypass indication			
Output 3	OVERLOAD/FAILURE	95/96/97		Overload/error indication			
Rated operational current			A	3 AC-15/AC-14 at 230 V			
Rated operational voltage				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.

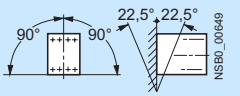
[2] Factory presetting: ON mode.

Type				3RW40 ..			
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				Off	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 presetting
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	
Reset option after tripping				Manual/automatic (MAN/AUTO)	
Recovery time			min	5	
Device protection functions					
Trips in the event of				Thermal overloading of the thyristors	
Reset option after tripping				Manual/automatic (MAN/AUTO)	
Recovery time			s	30	

3RW40
for standard applications

Type			3RW40 ..	
				Factory presetting
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		s	30	
Starting parameters				
Starting time		s	0 ... 20	7
Starting voltage		%	40 ... 100	50
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 AUTO		Off	Off
Automatic reset	LED AUTO		Yellow	
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	

Type		3RW40 ..-.BB4.	3RW40 ..-.BB5.
Power electronics			
Rated operational voltage for inline circuit	V AC	200 ... 460	400 ... 600
Tolerance	%	-15/+10	-15/+10
Rated frequency	Hz	50/60	
Tolerance	%	±10	
Continuous duty at 40 °C (% of I_e)	%	115	
Minimum load (% of set motor current I_M)	%	15	
Maximum cable length between soft starter and motor	m	200	
Permissible installation height	m	5000 (derating from 1000, see characteristic curves); higher on request	
Permissible mounting position			
Permissible ambient temperature			
Operation	°C	-25 ... +60; (derating from +40)	
Storage	°C	-40 ... +80	
Degree of protection		IP00	

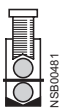
Type		3RW40 55	3RW40 56	3RW40 73	3RW40 74	3RW40 75	3RW40 76
Power electronics							
Load rating with rated operational current I_e							
• According to IEC and UL/CSA, for individual mounting, AC-53a							
- At 40 °C	A	134	162	230	280	356	432
- At 50 °C	A	117	145	205	248	315	385
- At 60 °C	A	100	125	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% 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 [1], starting time 10 s	A	134	162	230	280	356	432
- Starts per hour [2]	1/h	20	8	14	20	16	17
- Rated motor current I_M [1][3], starting time 20 s	A	134	162	230	280	356	432
- Starts per hour [2]	1/h	7	1.4	3	8	5	5
• **For heavy starting (Class 15)**							
- Rated motor current I_M [1], starting time 15 s	A	134	152	210	250	341	402
- Starts per hour [2]	1/h	11	8	11	13	11	12
- Rated motor current I_M [1][3], starting time 30 s	A	134	152	210	250	341	402
- Starts per hour [2]	1/h	1.2	1.7	1	6	2	2
• **For heavy starting (Class 20)**							
- Rated motor current I_M [1], starting time 20 s	A	124	142	200	230	311	372
- Starts per hour [2]	1/h	12	9	10	10	10	10
- Rated motor current I_M [1][3], starting time 40 s	A	124	142	200	230	311	372
- Starts per hour [2]	1/h	2	2	1	5	1	1

1) Current limit on soft starter set to 350 % I_M.

2) 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.

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

3RW40
for standard applications

Soft starter	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	mm^2	16 ... 70	70 ... 240
	• Finely stranded without end sleeve	mm^2	16 ... 70	70 ... 240
 NSB00479	• Stranded	mm^2	16 ... 70	95 ... 300
	• Ribbon cable conductors (number x width x circumference)	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 conductors, solid or stranded	AWG	6 ... 2/0	3/0 ... 600 kcmil
Rear clamping point connected	• Finely stranded with end sleeve	mm^2	16 ... 70	120 ... 185
	• Finely stranded without end sleeve	mm^2	16 ... 70	120 ... 185
 NSB00480	• Stranded	mm^2	16 ... 70	120 ... 240
	• Ribbon cable conductors (number x width x circumference)	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 conductors, solid or stranded	AWG	6 ... 2/0	250 ... 500 kcmil
Both clamping points connected	• Finely stranded with end sleeve	mm^2	Max. 1 x 50, 1 x 70	Min. 2 x 50; max. 2 x 185
	• Finely stranded without end sleeve	mm^2	Max. 1 x 50, 1 x 70	Min. 2 x 50; max. 2 x 185
 NSB00481	• Stranded	mm^2	Max. 2 x 70	Max. 2 x 70; max. 2 x 240
	• Ribbon cable conductors (number x width x circumference)	mm	Max. 2 x (6 x 15.5 x 0.8)	Max. 2 x (20 x 24 x 0.5)
	• AWG conductors, solid or stranded	AWG	Max. 2 x 1/0	Min. 2 x 2/0; max. 2 x 500 kcmil
	• Terminal screws		M10 (hexagon socket, A/F4)	M12 (hexagon socket, A/F5)
	- Tightening torque	Nm lb.in	10 ... 12 90 ... 110	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	mm^2	16 ... 120	
	• Finely stranded without end sleeve	mm^2	16 ... 120	
 NSB00479  NSB00480	• Stranded	mm^2	16 ... 120	
	• Ribbon cable conductors (number x width x circumference)	mm	Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8	
	• AWG conductors, solid or stranded	AWG	6 ... 250 kcmil	
Both clamping points connected	• Finely stranded with end sleeve	mm^2	Max. 1 x 95, 1 x 120	
	• Finely stranded without end sleeve	mm^2	Max. 1 x 95, 1 x 120	
 NSB00481	• Stranded	mm^2	Max. 2 x 120	
	• Ribbon cable conductors (number x width x circumference)	mm	Max. 2 x (10 x 15.5 x 0.8)	
	• AWG conductors, solid or stranded	AWG	Max. 2 x 3/0	
Screw terminals	**Main conductors:**			
	Without box terminal/rail connection			
	• Finely stranded with cable lug	mm^2	16 ... 95[1)]	50 ... 240[2)]
	• Stranded with cable lug	mm^2	25 ... 120[1)]	70 ... 240[2)]
	• AWG conductors, solid or stranded	AWG	4 ... 250 kcmil	2/0 ... 500 kcmil
	• Connecting bar (max. width)	mm	17	25
	• Terminal screws		M8 x 25 (A/F13)	M10 x 30 (A/F17)
	- Tightening torque	Nm lb. in	10 ... 14 89 ... 124	14 ... 24 124 ... 210

[1)] When connecting cable lugs to DIN 46235, use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm^2 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 mm^2 and more as well as DIN 46235 for conductor cross-sections of 185 mm^2 and more to keep the phase clearance.

Soft starter	Type		3RW40 ..
Conductor cross-sections			
Auxiliary conductors (1 or 2 conductors can be connected)**:**			
	Screw terminals		
	• Solid	mm^2	2 x 0.5 ... 2.5
	• Finely stranded with end sleeve	mm^2	2 x 0.5 ... 1.5
	• AWG conductors		
	- Solid or stranded	AWG	2 x 20 ... 14
	- Finely stranded with end sleeve	AWG	2 x 20 ... 16
	• Terminal screws		
	- Tightening torque	Nm lb. in	0.8 ... 1.2 7 ... 10.3
	Spring-loaded terminals		
	• Solid	mm^2	2 x 0.25 ... 1.5
	• Finely stranded with end sleeve	mm^2	2 x 0.25 ... 1.5
	• AWG conductors, solid or stranded	AWG	2 x 24 ... 16

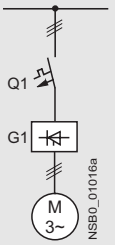
	Standard	Parameters
Electromagnetic compatibility according to EN 60947-4-2		
EMC interference immunity		
Electrostatic discharge (ESD)	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 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
EMC interference emission		
EMC interference field strength	EN 55011	Limit value of Class A at 30 ... 1000 MHz
Radio interference voltage	EN 55011	Limit value of Class A at 0.15 ... 30 MHz
Is an RI suppression filter necessary?		
Degree of noise suppression A (industrial applications)	No	

3RW40
for standard applications

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 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



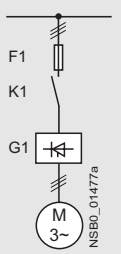
Soft starters		Circuit breakers[1]		
	Rated current	400 V +10 %	575 V +10 %	Rated current
G1 Type	A	Q1 Type	Q1 Type	A
Type of coordination "1"[2]: I_q = 65 kA at 400 V/I_q = 35 kA at 600 V[3]				
3RW40 55	134	3VL3 720-2DC36	3VL3 720-1DC36	200
3RW40 56	162	3VL3 720-2DC36	3VL3 720-1DC36	200
3RW40 73	230	3VL4 731-2DC36	3VL5 731-3DC36	315
3RW40 74	280	3VL4 731-2DC36	3VL5 731-3DC36	315
3RW40 75	356	3VL4 740-2DC36	3VL5 740-3DC36	400
3RW40 76	432	3VL5 750-2DC36	3VL5 750-3DC36	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 6/51.

3) Except 3RW40 55: I_q = 35 kA at 400 V/I_q = 12 kA at 600 V.

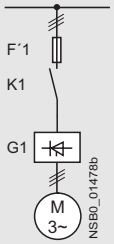
Fused version (line protection only)



Soft starters		Line protection, maximum			Line contactors (optional)	
	Rated current		Rated current	Size		
G1 Type	A	F1 Type	A		K1 Type 115 V	Type 230 V
Type of coordination "1"[1]: I_q = 65 kA at 400/600 V						
3RW40 55	134	3NA3 244-6	250	2	3RT10 55-6AF36	3RT10 55-6AP36
3RW40 56	162	3NA3 244-6	250	2	3RT10 56-6AF36	3RT10 56-6AP36
3RW40 73	230	2 x 3NA3 354-6	2 x 355	3	3RT10 65-6AF36	3RT10 65-6AP36
3RW40 74	280	2 x 3NA3 354-6	2 x 355	3	3RT10 66-6AF36	3RT10 66-6AP36
3RW40 75	356	2 x 3NA3 365-6	2 x 500	3	3RT10 75-6AF36	3RT10 75-6AP36
3RW40 76	432	2 x 3NA3 365-6	2 x 500	3	3RT10 76-6AF36	3RT10 76-6AP36

1) The types of coordination are explained in more detail under Fuseless Load Feeders on Page 6/51.

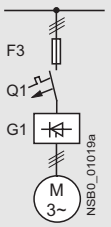
Fused version with 3NE1 SITOR fuses (semiconductor and line protection)

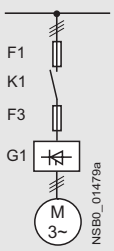


Soft starters		All-range fuses			Line contactor (optional)	
	Rated current		Rated current	Size		
G1 Type	A	F'1 Type	A		K1 Type 115 V	Type 230 V
Type of coordination "2"[1]: I_q = 65 kA at 400/600 V						
3RW40 55	134	3NE1 227-2	250	1	3RT10 55-6AF36	3RT10 55-6AP36
3RW40 56	162	3NE1 227-2	250	1	3RT10 56-6AF36	3RT10 56-6AP36
3RW40 73	230	3NE1 331-2	350	2	3RT10 65-6AF36	3RT10 65-6AP36
3RW40 74	280	3NE1 333-2	450	2	3RT10 66-6AF36	3RT10 66-6AP36
3RW40 75	356	3NE1 334-2	500	2	3RT10 75-6AF36	3RT10 75-6AP36
3RW40 76	432	3NE1 435-2	560	3	3RT10 76-6AF36	3RT10 76-6AP36

[1] The types of coordination are explained in more detail under Fuseless Load Feeders on Page 6/51.

Fused version with 3NE3 SITOR fuses (semiconductor protection by fuse, line and overload protection by circuit breaker; alternatively, installation with contactor and overload relay possible)





Soft starters		Semiconductor fuses, minimum			Semiconductor fuses, maximum			Line contactor (optional)	
	Rated current		Rated current	Size		Rated current	Size		
G1 Type	A	F3 Type	A		F3 Type	A		K1 Type 115 V	Type 230 V
Type of coordination "2"[1]: I_q = 65 kA at 400/600 V									
3RW40 55	134	3NE3 227	250	1	3NE3 335	560	2	3RT10 55-6AF36	3RT10 55-6AP36
3RW40 56	162	3NE3 227	250	1	3NE3 335	560	2	3RT10 56-6AF36	3RT10 56-6AP36
3RW40 73	230	3NE3 232-0B	400	1	3NE3 333	450	2	3RT10 65-6AF36	3RT10 65-6AP36
3RW40 74	280	3NE3 233	450	1	3NE3 336	630	2	3RT10 66-6AF36	3RT10 66-6AP36
3RW40 75	356	3NE3 335	560	2	3NE3 336	630	2	3RT10 75-6AF36	3RT10 75-6AP36
3RW40 76	432	3NE3 337-8	710	2	3NE3 340-8	900	2	3RT10 76-6AF36	3RT10 76-6AP36

Soft starters		Circuit breakers				Line protection, maximum		
	Rated current	400 V +10 %	Rated current	575 V +10 %	Rated current		Rated current	Size
G1 Type	A	Q1 Type	A	Q1 Type	A	F1 Type	A	
Type of coordination "2"[1]: I_q = 65 kA at 400/600 V								
3RW40 55	134	3VL3 720-1DC36	200	3VL3 720-1DC36	200	3NA3 244-6	250	2
3RW40 56	162	3VL3 720-1DC36	200	3VL3 720-1DC36	200	3NA3 244-6	250	2
3RW40 73	230	3VL4 731-1DC36	315	3VL5 731-1DC36	315	2 x 3NA3 354-6	2 x 355	3
3RW40 74	280	3VL4 731-1DC36	315	3VL5 731-1DC36	315	2 x 3NA3 354-6	2 x 355	3
3RW40 75	356	3VL4 740-1DC36	400	3VL5 740-1DC36	400	2 x 3NA3 365-6	2 x 500	3
3RW40 76	432	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 6/51.