

Technical specifications

Type	Terminal		3RW44 ...BC3.	3RW44 ...BC4.
Control electronics				
Rated values				
Rated control supply voltage	A1/A2/PE	V	115 AC	230 AC
• Tolerance		%	-15/+10	-15/+10
Rated control supply current STANDBY		mA	30	20
Rated control supply current ON				
• 3RW44 2.		mA	300	170
• 3RW44 3.		mA	500	250
• 3RW44 4.		mA	750	400
• 3RW44 5.		mA	450	200
Maximum current (pickup bypass)				
• 3RW44 2.		mA	1000	500
• 3RW44 3.		mA	2500	1250
• 3RW44 4.		mA	6000	3000
• 3RW44 5.		mA	4500	2500
Rated frequency		Hz	50 ... 60	50 ... 60
• Tolerance		%	±10	±10

Type	Terminal		3RW44 ..	Factory presetting
Control electronics				
Control inputs				
Input 1	IN1			Start motor right parameter set 1
Input 2	IN2			No action
Input 3	IN3			No action
Input 4	IN4			Trip reset
Supply	L+/L-			
• Rated operational current		mA	Approx. 10 per input to DIN 19240	
• Rated operational voltage	L+		Internal voltage: 24 V DC from internal supply through terminal L+ to IN1 ... IN4. Maximum load at L+ approx. 55 mA	
	L-		External voltage: DC external voltage (according to DIN 19240) through terminals L- and IN1 ... IN4 (min. 12 V DC, max. 30 V DC)	
Thermistor motor protection input				
Input	T1/T2		PTC type A or Thermoclick	Deactivated
Relay outputs (floating auxiliary contacts)				
Output 1	13/14			ON period
Output 2	23/24			No action
Output 3	33/34			No action
Output 4	95/96/98			Group fault
Switching capacity of the relay outputs				
230 V/AC-15		A	3 at 240 V	
24 V/DC-13		A	1 at 24 V	
Protection against overvoltages			Protection by means of varistor through relay contact	
Short-circuit protection			4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)	
Protection functions				
Motor protection functions				
Trips in the event of			Thermal overloading of the motor	
Trip class to IEC 60947-4-1		Class	5/10/15/20/30	10
Phase failure sensitivity		%	>40	
Overload warning			Yes	
Reset and recovery			Manual/Automatic	Manual
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	1 ... 30	1
Device protection functions				
Trips in the event of			Thermal overloading of the thyristors	
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	0.5	

3RW Soft Starters

3RW44 for high-feature applications

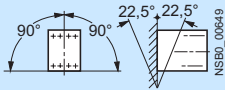
Type	3RW44 ..			Factory presetting
Control times and parameters				
Control times				
Closing delay (with connected control voltage)	ms	<50		
Closing delay (automatic mode)	ms	<4000		
Recovery time (closing command in active ramp-down)	ms	<100		
Mains failure bridging time				
Control supply voltage	ms	100		
Mains failure response time				
Load current circuit	ms	100		
Reclosing lockout after overload trip				
Motor protection trip	min.	1 ... 30	1	
Device protection trip	s	30		
Setting options for starting				
Voltage ramp for starting voltage	%	20 ... 100	30	
Torque control for starting torque	%	20 ... 100	50	
Torque control for limit torque	%	20 ... 200	150	
Starting time	s	0 ... 360	20	
Maximum starting time	s	1 ... 1000	Deactivated	
Current limit value	%	125 ... 550	450	
Breakaway voltage	%	40 ... 100	80	
Breakaway time	s	0 ... 2	Deactivated	
Motor heat output	%	0 ... 100	0	
Creep mode Left/Right running				
Speed factor as function of rated speed ($n = n_{rated}/factor$)		3 ... 21	7	
Creep torque (reference variable depends on the motor used but is always smaller than the rated torque of the motor)	%	20 ... 100	50	
Setting options for ramp-down				
Torque control for stopping torque	%	10 ... 100	10	
Ramp-down time	s	0 ... 360	10	
Dynamic braking torque	%	20 ... 100	50	
DC braking torque	%	20 ... 100	50	
Operating indications				
		Test voltage		
		Test mains phases		
		Ready to start		
		Start active		
		Motor running		
		Ramp-down active		
Warnings/error signals				
		Mains voltage missing		
		Leading-edge phase error		
		Phase failure		
		• L1		
		• L2		
		• L3		
		Missing load phase		
		• T1		
		• T2		
		• T3		
		Failure		
		• Contact element 1 (thyristor)		
		• Contact element 2 (thyristor)		
		• Contact element 3 (thyristor)		
		Flash memory faulty		
		Supply voltage		
		• Below 75 %		
		• Below 85 %		
		• Over 110 %		
		Current unbalance exceeded		
		Thermal motor model overload		
		Prewarning limit exceeded		
		• Motor heating		
		• Time-related trip reserve		
		Bypass elements defective		
		Mains voltage too high		
		Device not named		
		Wrong naming version		
		Current range exceeded		
		Motor blocking – disconnection		
		Current limit exceeded		
		Power section		
		• Overheated		
		• Overheating		
		Emergency start active		

Type	3RW44 ..	Factory presetting
Control times and parameters		
Warnings/error signals (continued)	Temperature sensor • Overload • Open-circuit • Short-circuit Ground fault • Detected • Disconnection Connection abort in manual operating mode Max. number of starts exceeded I_e limit value overshoot/undershoot Cooling time • Motor active • Switch block active Heat sink sensor • Open-circuit • Short-circuit Quick-stop active Switch block defective I_e /class setting not permissible	
Control inputs Input 1 Input 2 Input 3 Input 4 Parameterizing options for control inputs 1 ... 4	No action Local manual mode Emergency start Creep speed Quick-stop Trip reset Motor right parameter set 1 Motor left parameter set 1 ¹⁾ Motor right parameter set 2 Motor left parameter set 2 ¹⁾ Motor right parameter set 3 Motor left parameter set 3 ¹⁾	Motor right parameter set 1 No action No action Trip reset
Relay outputs Output 1 Output 2 Output 3 Output 4 Parameterizing options for relay outputs 1 ... 3	No action PAA output 1 PAA output 2 Input 1 Input 2 Input 3 Input 4 Starting Operation/Bypass Ramp-down ON period Command motor on Fan DC braking contactor Group warning Group fault Bus fault Device fault Power on Ready to start	ON period No action No action Group fault
Motor temperature sensor	Deactivated Thermoclick PTC type A	Deactivated

¹⁾ Parameter motor left possible only in conjunction with creep mode.

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Type		3RW44 ...-BC.4	3RW44 ...-BC.5	3RW44 ...-BC.6
Power electronics				
Rated operational voltage for inline circuit	V	200 ... 460 AC	400 ... 600 AC	400 ... 690 AC
Tolerance	%	-15/+10	-15/+10	-15/+10
Rated operational voltage for inside-delta circuit	V	200 ... 460 AC	400 ... 600 AC	400 ... 600 AC
Tolerance	%	-15/+10	-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)	%	8		
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		0 ... +60; (derating from +40)		
Operation	°C			
Storage	°C	-25 ... +80		
Degree of protection		IP00		

Type		3RW44 22	3RW44 23	3RW44 24	3RW44 25	3RW44 26	3RW44 27
Power electronics							
Rated operational current I_e		29	36	47	57	77	93
Load rating with rated operational current I_e							
• According to IEC and UL/CSA, for individual mounting, AC-53a							
- At 40 °C	A	29	36	47	57	77	93
- At 50 °C	A	26	32	42	51	68	82
- At 60 °C	A	23	29	37	45	59	72
Smallest adjustable rated motor current I_M	A	5	7	9	11	15	18
For the motor overload protection							
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	8	10	32	36	45	55
• During starting with current limit set to 350 % I_M (40 °C)	W	400	470	600	725	940	1160
Permissible rated motor current and starts per hour							
• Normal starting (Class 5)							
- Rated motor current $I_M^{1)}$, starting time 5 s	A	29	36	47	57	77	93
- Starts per hour ²⁾	1/h	41	34	41	41	41	41
- Rated motor current $I_M^{1)3)}$, starting time 10 s	A	29	36	47	57	77	93
- Starts per hour ²⁾	1/h	20	15	20	20	20	20
• Normal starting (Class 10)							
- Rated motor current $I_M^{1)}$, starting time 10 s	A	29	36	47	57	77	93
- Starts per hour ²⁾	1/h	20	15	20	20	20	20
- Rated motor current $I_M^{1)3)}$, starting time 20 s	A	29	36	47	57	77	93
- Starts per hour ²⁾	1/h	10	6	10	10	8	8
• Normal starting (Class 15)							
- Rated motor current $I_M^{1)}$, starting time 15 s	A	29	36	47	57	77	93
- Starts per hour ²⁾	1/h	13	9	13	13	13	13
- Rated motor current $I_M^{1)3)}$, starting time 30 s	A	29	36	47	57	77	93
- Starts per hour ²⁾	1/h	6	4	6	6	6	6
• For heavy starting (Class 20)							
- Rated motor current $I_M^{1)}$, starting time 20 s	A	29	36	47	57	73	88
- Starts per hour ²⁾	1/h	10	6	10	10	10	10
- Rated motor current $I_M^{1)3)}$, starting time 40 s	A	29	36	47	57	73	88
- Starts per hour ²⁾	1/h	4	2	4	5	1.8	0.8
• For very heavy starting (Class 30)							
- Rated motor current $I_M^{1)}$, starting time 30 s	A	29	36	44	57	65	77
- Starts per hour ²⁾	1/h	6	4	6	6	6	6
- Rated motor current $I_M^{1)3)}$, starting time 60 s	A	29	36	44	57	65	77
- Starts per hour ²⁾	1/h	1.8	0.8	3.3	1.5	2	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.

Type		3RW44 34	3RW44 35	3RW44 36
Power electronics				
Rated operational current I_e		113	134	162
Load rating with rated operational current I_e				
• According to IEC and UL/CSA, for individual mounting, AC-53a				
- At 40 °C	A	113	134	162
- At 50 °C	A	100	117	145
- At 60 °C	A	88	100	125
Smallest adjustable rated motor current I_M	A	22	26	32
For the motor overload protection				
Power loss				
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	64	76	95
• During starting with current limit set to 350 % I_M (40 °C)	W	1350	1700	2460
Permissible rated motor current and starts per hour				
• Normal starting (Class 5)				
- Rated motor current $I_M^{1)}$, starting time 5 s	A	113	134	162
- Starts per hour ²⁾	1/h	41	39	41
- Rated motor current $I_M^{1)3)}$, starting time 10 s	A	113	134	162
- Starts per hour ²⁾	1/h	20	15	20
• Normal starting (Class 10)				
- Rated motor current $I_M^{1)}$, starting time 10 s	A	113	134	162
- Starts per hour ²⁾	1/h	20	15	20
- Rated motor current $I_M^{1)3)}$, starting time 20 s	A	113	134	162
- Starts per hour ²⁾	1/h	9	6	7
• Normal starting (Class 15)				
- Rated motor current $I_M^{1)}$, starting time 15 s	A	113	134	162
- Starts per hour ²⁾	1/h	13	9	12
- Rated motor current $I_M^{1)3)}$, starting time 30 s	A	113	134	162
- Starts per hour ²⁾	1/h	6	6	1
• For heavy starting (Class 20)				
- Rated motor current $I_M^{1)}$, starting time 20 s	A	106	125	147
- Starts per hour ²⁾	1/h	9	9	10
- Rated motor current $I_M^{1)3)}$, starting time 40 s	A	106	125	147
- Starts per hour ²⁾	1/h	1.5	2	1
• For very heavy starting (Class 30)				
- Rated motor current $I_M^{1)}$, starting time 30 s	A	91	110	120
- Starts per hour ²⁾	1/h	6	6	6
- Rated motor current $I_M^{1)3)}$, starting time 60 s	A	91	110	120
- Starts per hour ²⁾	1/h	2	2	2

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

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3RW44 for high-feature applications

Type		3RW44 43	3RW44 44	3RW44 45	3RW44 46	3RW44 47	
Power electronics							
Rated operational current I_e		203	250	313	356	432	
Load rating with rated operational current I_e							
• According to IEC and UL/CSA, for individual mounting, AC-53a							
- At 40 °C	A	203	250	313	356	432	
- At 50 °C	A	180	215	280	315	385	
- At 60 °C	A	156	185	250	280	335	
Smallest adjustable rated motor current I_M		A	40	50	62	71	86
For the motor overload protection							
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.		W	89	110	145	174	232
• During starting with current limit set to 350 % I_M (40 °C)		W	3350	4000	4470	5350	5860
Permissible rated motor current and starts per hour							
• Normal starting (Class 5)							
- Rated motor current $I_M^{1)}$, starting time 5 s	A	203	250	313	356	432	
- Starts per hour ²⁾	1/h	41	41	41	41	39	
- Rated motor current $I_M^{1)3)}$, starting time 10 s	A	203	250	313	356	432	
- Starts per hour ²⁾	1/h	20	20	19	17	16	
• Normal starting (Class 10)							
- Rated motor current $I_M^{1)}$, starting time 10 s	A	203	250	313	356	432	
- Starts per hour ²⁾	1/h	20	20	19	17	16	
- Rated motor current $I_M^{1)3)}$, starting time 20 s	A	203	250	313	356	432	
- Starts per hour ²⁾	1/h	9	10	6	4	5	
• Normal starting (Class 15)							
- Rated motor current $I_M^{1)}$, starting time 15 s	A	203	240	313	325	402	
- Starts per hour ²⁾	1/h	13	13	10	13	11	
- Rated motor current $I_M^{1)3)}$, starting time 30 s	A	203	240	313	325	402	
- Starts per hour ²⁾	1/h	3	6	1	2	1	
• For heavy starting (Class 20)							
- Rated motor current $I_M^{1)}$, starting time 20 s	A	195	215	275	285	356	
- Starts per hour ²⁾	1/h	10	10	10	10	10	
- Rated motor current $I_M^{1)3)}$, starting time 40 s	A	195	215	275	285	356	
- Starts per hour ²⁾	1/h	1	5	1	3	1	
• For very heavy starting (Class 30)							
- Rated motor current $I_M^{1)}$, starting time 30 s	A	162	180	220	240	285	
- Starts per hour ²⁾	1/h	6	6	6	6	6	
- Rated motor current $I_M^{1)3)}$, starting time 60 s	A	162	180	220	240	285	
- Starts per hour ²⁾	1/h	3	3	3	2	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.

Type		3RW44 53	3RW44 54	3RW44 55	3RW44 56	3RW44 57	3RW44 58
Power electronics							
Rated operational current I_e		551	615	693	780	880	970
Load rating with rated operational current I_e							
• According to IEC and UL/CSA, for individual mounting, AC-53a							
- At 40 °C	A	551	615	693	780	880	970
- At 50 °C	A	494	551	615	693	780	850
- At 60 °C	A	438	489	551	615	693	760
Smallest adjustable rated motor current I_M	A	110	123	138	156	176	194
For the motor overload protection							
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.		W	159	186	220	214	250
• During starting with current limit set to 350 % I_M (40 °C)		W	7020	8100	9500	11100	13100
270							15000
Permissible rated motor current and starts per hour							
• Normal starting (Class 5)							
- Rated motor current $I_M^{1)}$, starting time 5 s	A	551	615	693	780	880	970
- Starts per hour ²⁾	1/h	41	41	37	33	22	17
- Rated motor current $I_M^{1)3)}$, starting time 10 s	A	551	615	693	780	880	970
- Starts per hour ²⁾	1/h	20	20	16	13	8	5
• Normal starting (Class 10)							
- Rated motor current $I_M^{1)}$, starting time 10 s	A	551	615	693	780	880	970
- Starts per hour ²⁾	1/h	20	20	16	13	8	5
- Rated motor current $I_M^{1)3)}$, starting time 20 s	A	551	615	693	780	880	970
- Starts per hour ²⁾	1/h	10	9	6	4	0.3	0.3
• Normal starting (Class 15)							
- Rated motor current $I_M^{1)}$, starting time 15 s	A	551	615	666	723	780	821
- Starts per hour ²⁾	1/h	13	13	11	9	8	8
- Rated motor current $I_M^{1)3)}$, starting time 30 s	A	551	615	666	723	780	821
- Starts per hour ²⁾	1/h	6	4	3	1	0.4	0.5
• For heavy starting (Class 20)							
- Rated motor current $I_M^{1)}$, starting time 20 s	A	551	591	633	670	710	740
- Starts per hour ²⁾	1/h	10	10	7	8	8	9
- Rated motor current $I_M^{1)3)}$, starting time 40 s	A	551	591	633	670	710	740
- Starts per hour ²⁾	1/h	4	2	1	1	0.4	1
• For very heavy starting (Class 30)							
- Rated motor current $I_M^{1)}$, starting time 30 s	A	500	525	551	575	600	630
- Starts per hour ²⁾	1/h	6	6	6	6	6	6
- Rated motor current $I_M^{1)3)}$, starting time 60 s	A	500	525	551	575	600	630
- Starts per hour ²⁾	1/h	2	1	1	1	1.5	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.

3RW Soft Starters

3RW44 for high-feature applications

Type			3RW44 2.	3RW44 3.	3RW44 4.	3RW44 5.
Conductor cross-sections						
Screw terminals With box terminal	Main conductors:					
 NSB00479	• Finely stranded with end sleeve	mm ²	2.5 ... 35	3RT19 55-4G (55 kW)	3RT19 66-4G	--
	• Finely stranded without end sleeve	mm ²	4 ... 50	16 ... 70	70 ... 240	--
	• Solid	mm ²	2.5 ... 16	--	--	--
	• Stranded	mm ²	4 ... 70	16 ... 70	95 ... 300	--
	• Ribbon cable conductors (number x width x circumference)	mm	6 x 9 x 0.8	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	10 ... 2/0	6 ... 2/0	3/0 ... 600 kcmil	--	
 NSB00480	• Finely stranded with end sleeve	mm ²	2.5 ... 50	16 ... 70	120 ... 185	--
	• Finely stranded without end sleeve	mm ²	10 ... 50	16 ... 70	120 ... 185	--
	• Solid	mm ²	2.5 ... 16	--	--	--
	• Stranded	mm ²	10 ... 70	16 ... 70	120 ... 240	--
	• Ribbon cable conductors (number x width x circumference)	mm	6 x 9 x 0.8	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	10 ... 2/0	6 ... 2/0	250 ... 500 kcmil	--	
 NSB00481	• Finely stranded with end sleeve	mm ²	2 x (2.5 ... 35)	Max. 1 x 50, 1 x 70	Min. 2 x 50 Max. 2 x 185	--
	• Finely stranded without end sleeve	mm ²	2 x (4 ... 35)	Max. 1 x 50, 1 x 70	Min. 2 x 50 Max. 2 x 185	--
	• Solid	mm ²	2 x (2.5 ... 16)	--	--	--
	• Stranded	mm ²	2 x (4 ... 50)	Max. 2 x 70	Max. 2 x 70 Max. 2 x 240	--
	• Ribbon cable conductors (number x width x circumference)	mm	2 x (6 x 9 x 0.8)	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	2 x (10 ... 1/0)	Max. 2 x 1/0	Min. 2 x 2/0 Max. 2 x 500 kcmil	--
	• Terminal screws		M6 (hexagon socket, A/F4)	M10 (hexagon socket, A/F4)	M12 (hexagon socket, A/F5)	--
	- Tightening torque	Nm lb.in	4 ... 6 36 ... 53	10 ... 12 90 ... 110	20 ... 22 180 ... 195	--
	Screw terminals With box terminal	Main conductors:		--	3RT19 56-4G	--
 NSB00479	• Finely stranded with end sleeve	mm ²	--	16 ... 120	--	--
	• Finely stranded without end sleeve	mm ²	--	16 ... 120	--	--
	• 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	--	--
 NSB00481	• 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	--	--
	• 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: <u>Without box terminal/rail connection</u>					
	• Finely stranded with cable lug	mm ²	--	16 ... 95 ¹⁾	50 ... 240 ²⁾	50 ... 240 ²⁾
	• Stranded with cable lug	mm ²	--	25 ... 120 ¹⁾	70 ... 240 ²⁾	70 ... 240 ²⁾
	• AWG conductors, solid or stranded	AWG	--	4 ... 250 kcmil	2/0 ... 500 kcmil	2/0 ... 500 kcmil
	• Connecting bar (max. width)	mm	--	17	25	60
	• Terminal screws		--	M8 x 25 (A/F13)	M10 x 30 (A/F17)	M12 x 40
	- Tightening torque	Nm lb.in	--	10 ... 14 89 ... 124	14 ... 24 124 ... 210	20 ... 35 177 ... 310

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	3RW44 ..	
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	AWG	2 x 20 ... 14	
- Solid or stranded	AWG	2 x 20 ... 16	
- Finely stranded with end sleeve			
• Terminal screws	Nm	0.8 ... 1.2	
- Tightening torque	lb.in	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			
<i>EMC interference immunity</i>			
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		EN 61000-4-4	±2 kV/5 kHz
• Burst		EN 61000-4-5	±1 kV line to line
• Surge			±2 kV line to ground
<i>EMC interference emission</i>			
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
<i>Is an RI suppression filter necessary?</i>			
Degree of noise suppression A (industrial applications)		No	

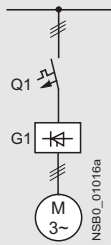
3RW Soft Starters

3RW44 for high-feature 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 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.

Inline circuit fuseless version

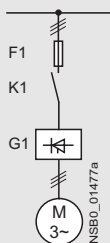


Soft starters		Motor starter protectors/circuit breakers ¹⁾	
G1 Type	Rated current A	440 V +10 % Q1 Type	Rated current A
Type of coordination "1" ²⁾ : 3RW44 22 ... 3RW44 27: $I_q = 32 \text{ kA}$; 3RW44 34 and 3RW44 35: $I_q = 16 \text{ kA}$; 3RW44 36 ... 3RW44 57: $I_q = 65 \text{ kA}$			
3RW44 22	29	3RV10 42-4HA10	50
3RW44 23	36	3RV10 42-4JA10	63
3RW44 24	47	3RV10 42-4KA10	75
3RW44 25	57	3RV10 42-4LA10	90
3RW44 26	77	3RV10 42-4MA10	100
3RW44 27	93	3RV10 42-4MA10	100
3RW44 34	113	3VL17 16-2DD36	160
3RW44 35	134	3VL17 16-2DD36	160
3RW44 36	162	3VL37 25-2DC36	250
3RW44 43	203	3VL47 31-3DC36	315
3RW44 44	250	3VL47 31-3DC36	315
3RW44 45	313	3VL47 40-3DC36	400
3RW44 46	356	3VL47 40-3DC36	400
3RW44 47	432	3VL57 50-3DC36	500
3RW44 53	551	3VL67 80-3AB36	800
3RW44 54	615	3VL67 80-3AB36	800
3RW44 55	693	3VL67 80-3AB36	800
3RW44 56	780	3VL77 10-3AB36	1000
3RW44 57	880	3VL77 10-3AB36	1000
3RW44 58	970	3VL77 12-3AB36	1200

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.

Inline circuit fused version (line protection only)



Soft starters		Line protection, maximum			Line contactors up to 400 V	Braking contactors ¹⁾²⁾	
G1 Type	Rated current A	690 V +5 % F1 Type	Rated current A	Size	(optional) K1 Type	(for typical circuit see page 6/49) K2 Type K3 Type	
Type of coordination "1" ³⁾ : I _q = 65 kA							
3RW44 22	29	3NA3 820-6	50	00	3RT10 34	3RT15 26	--
3RW44 23	36	3NA3 822-6	63	00	3RT10 35	3RT15 26	--
3RW44 24	47	3NA3 824-6	80	00	3RT10 36	3RT15 35	--
3RW44 25	57	3NA3 830-6	100	00	3RT10 44	3RT15 35	--
3RW44 26	77	3NA3 132-6	125	1	3RT10 45	3RT10 24	3RT10 35
3RW44 27	93	3NA3 136-6	160	1	3RT10 46	3RT10 25	3RT10 36
3RW44 34	113	3NA3 244-6	250	2	3RT10 54	3RT10 34	3RT10 44
3RW44 35	134	3NA3 244-6	250	2	3RT10 55	3RT10 36	3RT10 45
3RW44 36	162	3NA3 365-6	500	3	3RT10 56	3RT10 44	3RT10 45
3RW44 43	203	2 x 3NA3 354-6	2 x 355	3	3RT10 64	3RT10 44	3RT10 54
3RW44 44	250	2 x 3NA3 354-6	2 x 355	3	3RT10 65	3RT10 44	3RT10 55
3RW44 45	313	2 x 3NA3 365-6	2 x 500	3	3RT10 75	3RT10 54	3RT10 56
3RW44 46	356	2 x 3NA3 365-6	2 x 500	3	3RT10 75	3RT10 54	3RT10 56
3RW44 47	432	2 x 3NA3 365-6	2 x 500	3	3RT10 76	3RT10 55	3RT10 64
3RW44 53	551	2 x 3NA3 365-6	2 x 500	3	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7
3RW44 54	615	2 x 3NA3 365-6	2 x 500	3	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7
3RW44 55	693	2 x 3NA3 365-6	2 x 500	3	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7
3RW44 56	780	2 x 3NA3 365-6	2 x 500	3	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7
3RW44 57	880	2 x 3NA3 365-6	2 x 500	3	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7
3RW44 58	970	3 x 3NA3 365-6	3 x 500	3			

¹⁾ If the ramp-down function "Combined braking" is selected, no braking contactor is required.
If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type).
For applications with large centrifugal masses ($J_{\text{Load}} > J_{\text{Motor}}$) we recommend the function "DC braking".

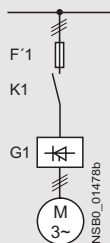
²⁾ Additional auxiliary relay K4:
LZX:RT4A4T30
(3RW44 soft starter with rated control supply voltage 230 V AC),
LZX:RT4A4S15
(3RW44 soft starter with rated control supply voltage 115 V AC).

³⁾ The types of coordination are explained in more detail under Fuseless Load Feeders on page 6/51.

3RW Soft Starters

3RW44 for high-feature applications

Inline circuit fused version with 3NE1 SITOR all-range fuse (semiconductor and line protection)



Soft starters		All-range fuses				Line contactors up to 400 V (optional)	Braking contactors ¹⁾²⁾ (for typical circuit see page 6/49)	
G1 Type	Rated current A	F'1 Type	Rated current A	Voltage V	Size	K1 Type	K2 Type	K3 Type
Type of coordination "2"³⁾: $I_q = 65 \text{ kA}$								
3RW44 22	29	3NE1 020-2	80	690 +5 %	00	3RT10 34	3RT15 26	--
3RW44 23	36	3NE1 020-2	80	690 +5 %	00	3RT10 35	3RT15 26	--
3RW44 24	47	3NE1 021-2	100	690 +5 %	00	3RT10 36	3RT15 35	--
3RW44 25	57	3NE1 022-2	125	690 +5 %	00	3RT10 44	3RT15 35	--
3RW44 26	77	3NE1 022-2	125	690 +5 %	00	3RT10 45	3RT10 24	3RT10 35
3RW44 27	93	3NE1 024-2	160	690 +5 %	1	3RT10 46	3RT10 25	3RT10 36
3RW44 34	113	3NE1 225-2	200	690 +5 %	1	3RT10 54	3RT10 34	3RT10 44
3RW44 35	134	3NE1 227-2	250	690 +5 %	1	3RT10 55	3RT10 36	3RT10 45
3RW44 36	162	3NE1 227-2	250	690 +5 %	1	3RT10 56	3RT10 44	3RT10 45
3RW44 43	203	3NE1 230-2	315	600 +10 %	1	3RT10 64	3RT10 44	3RT10 54
3RW44 44	250	3NE1 331-2	350	460 +10 %	2	3RT10 65	3RT10 44	3RT10 55
3RW44 45	313	3NE1 333-2	450	690 +5 %	2	3RT10 75	3RT10 54	3RT10 56
3RW44 46	356	3NE1 334-2	500	690 +5 %	2	3RT10 75	3RT10 54	3RT10 56
3RW44 47	432	3NE1 435-2	560	690 +5 %	3	3RT10 76	3RT10 55	3RT10 64
3RW44 53	551	2 x 3NE1 334-2	500	690 +10 %	2	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7
3RW44 54	615	2 x 3NE1 334-2	500	690 +10 %	2	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7
3RW44 55	693	2 x 3NE1 334-2	500	690 +10 %	2	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7
3RW44 56	780	2 x 3NE1 435-2	560	690 +10 %	3	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7
3RW44 57	880	2 x 3NE1 435-2	560	690 +10 %	3	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7
3RW44 58	970	2 x 3NE1 435-2	560	690 +10 %	3			

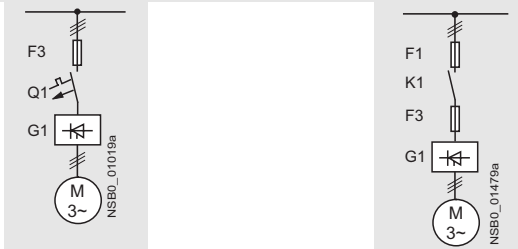
¹⁾ If the ramp-down function "Combined braking" is selected, no braking contactor is required.
If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type).
For applications with large centrifugal masses ($J_{\text{Load}} > J_{\text{Motor}}$) we recommend the function "DC braking".

²⁾ Additional auxiliary relay K4:
LZX:RT4A4T30
(3RW44 soft starter with rated control supply voltage 230 V AC),
LZX:RT4A4S15
(3RW44 soft starter with rated control supply voltage 115 V AC).

³⁾ The types of coordination are explained in more detail under Fuseless Load Feeders on page 6/51.

Inline circuit fused version with 3NE or 3NC SITOR semiconductor fuse

(semiconductor protection by fuse, line and overload protection by motor starter protector/circuit breaker)



Soft starters		Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
G1 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⁾³⁾ : $I_q = 65 \text{ kA}$										
3RW44 22	29	3NE4 120	80	0	3NE4 121	100	0	3NC2 280	80	22 x 58
3RW44 23	36	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 24	47	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 25	57	3NE4 122	125	0	3NE4 124	160	0			
3RW44 26	77	3NE4 124	160	0	3NE4 124	160	0			
3RW44 27	93	3NE3 224	160	1	3NE3 333	450	2			
3RW44 34	113	3NE3 225	200	1	3NE3 335	560	2			
3RW44 35	134	3NE3 225	200	1	3NE3 335	560	2			
3RW44 36	162	3NE3 227	250	1	3NE3 333	450	2			
3RW44 43	203	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 44	250	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 45	313	3NE3 233	450	1	3NE3 336	630	2			
3RW44 46	356	3NE3 333	450	2	3NE3 336	630	2			
3RW44 47	432	3NE3 335	560	2	3NE3 338-8	800	2			
3RW44 53	551	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 54	615	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 55	693	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 56	780	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 57	880	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 58	970	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			

Soft starters		Line contactors up to 400 V		Braking contactors ¹⁾²⁾		Motor starter protectors/circuit breakers		Line protection, maximum		
G1 Type	Rated current A	(Optional) K1 Type	(For typical circuit see page 6/49)			440 V + 10 % Q1 Type	Rated current A	690 V + 5 % F1 Type	Rated current A	Size
Type of coordination ²⁾³⁾ : $I_q = 65 \text{ kA}$										
3RW44 22	29	3RT10 34	3RT15 26	--		3RV10 41-4HA10	50	3NA3 820-6	50	00
3RW44 23	36	3RT10 35	3RT15 26	--		3RV10 41-4JA10	63	3NA3 822-6	63	00
3RW44 24	47	3RT10 36	3RT15 35	--		3RV10 41-4KA10	75	3NA3 824-6	80	00
3RW44 25	57	3RT10 44	3RT15 35	--		3RV10 41-4LA10	90	3NA3 830-6	100	00
3RW44 26	77	3RT10 45	3RT10 24	3RT10 35		3RV10 41-4MA10	100	3NA3 132-6	125	1
3RW44 27	93	3RT10 46	3RT10 25	3RT10 36		3RV10 41-4MA10	100	3NA3 136-6	160	1
3RW44 34	113	3RT10 54	3RT10 34	3RT10 44		3VL17 16-1DD36	160	3NA3 244-6	250	2
3RW44 35	134	3RT10 55	3RT10 36	3RT10 45		3VL17 16-1DD36	160	3NA3 244-6	250	2
3RW44 36	162	3RT10 56	3RT10 44	3RT10 45		3VL37 25-1DC36	250	3NA3 365-6	500	3
3RW44 43	203	3RT10 64	3RT10 44	3RT10 54		3VL47 31-1DC36	315	2 x 3NA3 354-6	2 x 355	3
3RW44 44	250	3RT10 65	3RT10 44	3RT10 55		3VL47 31-1DC36	315	2 x 3NA3 354-6	2 x 355	3
3RW44 45	313	3RT10 75	3RT10 54	3RT10 56		3VL47 40-1DC36	400	2 x 3NA3 365-6	2 x 500	3
3RW44 46	356	3RT10 75	3RT10 54	3RT10 56		3VL47 40-1DC36	400	2 x 3NA3 365-6	2 x 500	3
3RW44 47	432	3RT10 76	3RT10 55	3RT10 64		3VL57 50-1DC36	500	2 x 3NA3 365-6	2 x 500	3
3RW44 53	551	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7		3VL67 80-1AB36	800	2 x 3NA3 365-6	2 x 500	3
3RW44 54	615	3TF68 44-OCM7	3TF68 44-OCM7	3TF68 44-OCM7		3VL67 80-1AB36	800	2 x 3NA3 365-6	2 x 500	3
3RW44 55	693	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7		3VL67 80-1AB36	800	2 x 3NA3 365-6	2 x 500	3
3RW44 56	780	3TF69 44-OCM7	3TF69 44-OCM7	3TF69 44-OCM7		3VL77 10-1AB36	1000	2 x 3NA3 365-6	2 x 500	3
3RW44 57	880	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7	2 x 3TF69 44-OCM7		3VL77 10-1AB36	1000	2 x 3NA3 365-6	2 x 500	3
3RW44 58	970					3VL77 12-1AB36	1200	3 x 3NA3 365-6	3 x 500	3

¹⁾ If the ramp-down function "Combined braking" is selected, no braking contactor is required.
If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type).
For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) we recommend the function "DC braking".

²⁾ Additional auxiliary relay K4:
LZX:RT4A4T30
(3RW44 soft starter with rated control supply voltage 230 V AC),
LZX:RT4A4S15
(3RW44 soft starter with rated control supply voltage 115 V AC).

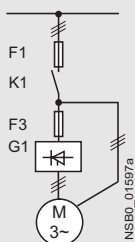
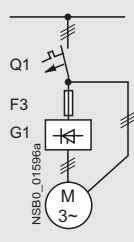
³⁾ The types of coordination are explained in more detail under Fuseless Load Feeders on page 6/51.

3RW Soft Starters

3RW44 for high-feature applications

Inside-delta circuit fused version with 3NE or 3NC SITOR fuses

(semiconductor protection by fuse, line and overload protection by motor starter protector/circuit breaker)



Soft starters		Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
G1 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⁾										
3RW44 22	50	3NE4 120	80	0	3NE4 121	100	0	3NC2 280	80	22 x 58
3RW44 23	62	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 24	81	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 25	99	3NE4 122	125	0	3NE4 124	160	0			
3RW44 26	133	3NE4 124	160	0	3NE4 124	160	0			
3RW44 27	161	3NE3 224	160	1	3NE3 333	450	2			
3RW44 34	196	3NE3 225	200	1	3NE3 335	560	2			
3RW44 35	232	3NE3 225	200	1	3NE3 335	560	2			
3RW44 36	281	3NE3 227	250	1	3NE3 333	450	2			
3RW44 43	352	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 44	433	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 45	542	3NE3 233	450	1	3NE3 336	630	2			
3RW44 46	617	3NE3 333	450	2	3NE3 336	630	2			
3RW44 47	748	3NE3 335	560	2	3NE3 338-8	800	2			
3RW44 53	954	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 54	1065	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 55	1200	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 56	1351	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 57	1524	2 x 3NE3 336	630	2	3 x 3NE3 340-8	900	2			
3RW44 58	1680	2 x 3NE3 336	630	2	3 x 3NE3 340-8	900	2			

Soft starters		Line contactors up to 400 V (Optional)		Motor starter protectors/ circuit breakers		Line protection, maximum		
G1 Type	Rated current A	K1 Type	440 V +10 %	Rated current A	690 V +5 %	Rated current A	Size	
Type of coordination "2" ¹⁾								
3RW44 22	50	3RT10 36-1AP04	3RV10 4.-4KA10	75	3NA3 824-6	80	00	
3RW44 23	62	3RT10 44-1AP04	3RV10 4.-4LA10	90	3NA3 830-6	100	00	
3RW44 24	81	3RT10 46-1AP04	3RV10 4.-4MA10	100	3NA3 132-6	125	1	
3RW44 25	99	3RT10 54-1AP36	3VL27 16-.DC36	160	3NA3 136-6	160	1	
3RW44 26	133	3RT10 55-6AP36	3VL27 16-.DC36	160	3NA3 240-6	200	2	
3RW44 27	161	3RT10 56-6AP36	3VL37 20-.DC36	200	3NA3 244-6	250	2	
3RW44 34	196	3RT10 64-6AP36	3VL37 25-.DC36	250	3NA3 360-6	400	3	
3RW44 35	232	3RT10 65-6AP36	3VL47 31-.DC36	315	3NA3 360-6	400	3	
3RW44 36	281	3RT10 66-6AP36	3VL47 40-.DC36	400	2 x 3NA3 360-6	2 x 400	3	
3RW44 43	352	3RT10 75-6AP36	3VL47 40-.DC36	400	2 x 3NA3 365-6	2 x 500	3	
3RW44 44	433	3RT10 76-6AP36	3VL57 50-.DC36	500	2 x 3NA3 365-6	2 x 500	3	
3RW44 45	542	3TF68 44-OCM7	3VL57 63-.DC36	800	3 x 3NA3 365-6	3 x 500	3	
3RW44 46	617	3TF68 44-OCM7	3VL67 80-.AB36	800	3 x 3NA3 365-6	3 x 500	3	
3RW44 47	748	3TF69	3VL67 80-.AB36	800	3 x 3NA3 365-6	3 x 500	3	
3RW44 53	954	2 x 3TF68 44-OCM7	3VL77 10-.AB36	1000	3 x 3NA3 365-6	3 x 500	3	
3RW44 54	1065	2 x 3TF68 44-OCM7	3VL77 12-.AB36	1250	3 x 3NA3 365-6	3 x 500	3	
3RW44 55	1200	2 x 3TF69 44-OCM7	3VL87 16-.AB36	1600	3 x 3NA3 365-6	3 x 500	3	
3RW44 56	1351	2 x 3TF69 44-OCM7	3VL87 16-.AB36	1600	3 x 3NA3 372	3 x 630	3	
3RW44 57	1524	2 x 3TF69 44-OCM7	3VL87 16-.AB36	1600	3 x 3NA3 372	3 x 630	3	
3RW44 58	1680		3WL12 20	2000	2 x 3NA3 480	2 x 1000	4	

¹⁾ The types of coordination are explained in more detail under Fuseless Load Feeders on page 6/51.
The type of coordination "2" refers only to soft starters, not to any components in the feeder ($I_q = 65 \text{ kA}$).