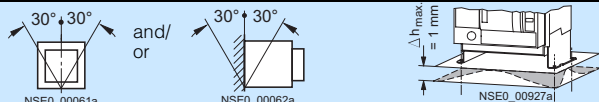


## Technical specifications

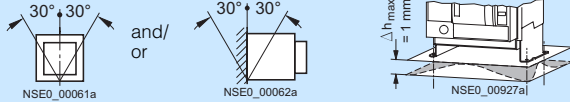
Size		I	II	III
Type		3WL51	3WL52	3WL53
Switching capacity class		S	H	H
Short-circuit breaking capacity				
Up to 480 V AC	kA	65	100	100
Up to 600 V $\Upsilon$ /347 V AC	kA	50	85 <sup>1)</sup>	85
Up to 600 V AC	kA	--	85	--
Rated short-time withstand current				
At max. delay time $t_{sd} = 0.4$ s	kA	65	85	85

<sup>1)</sup> Covered by 600 V AC (delta) test.

## Further technical specifications

Size		I	II	
Type		3WL51 10	3WL51 16	3WL52 20
<b>Rated current <math>I_n</math></b> at 40 °C, at 50/60 Hz				
Main conductor	A	Up to 1000	1600	2000
<b>Rated voltage <math>U_e</math></b> at 50/60 Hz	V AC	600 $\Upsilon$ /347	600 $\Upsilon$ /347	600
<b>Ambient temperature of the system</b>	°C	–25/+40	–25/+40	–25/+40
<b>Power loss at rated current</b>				
With AC symmetrical load				
• Fixed-mounted circuit breakers	W	100	150	180
• Withdrawable circuit breakers	W	195	350	320
<b>Operating times</b>				
• Make-time	ms	35	35	35
• Opening time	ms	38	38	34
• Electrical make-time (through activation solenoid) <sup>1)</sup>	ms	80	80	100
• Electrical opening time (through shunt trip unit)	ms	73	73	73
• Electrical opening time (instantaneous undervoltage trip unit)	ms	73	73	73
• Opening time due to ETU, instantaneous short-circuit release	ms	50	50	50
<b>Endurance</b>				
• Mechanical (without maintenance)	Operating cycles	10000	10000	10000
• Electrical (without maintenance)	Operating cycles	4000	4000	4000
<b>Switching frequency</b>	1/h	60	60	60
<b>Minimum interval</b>	ms	80	80	80
Between tripping operation by electronic trip unit and next making operation of the circuit breaker (only with automatic mechanical resetting of the lockout device)				
<b>Minimum dimension</b>				
Circuit breaker compartment 3-pole	mm	400 × 460 × 380	400 × 460 × 380	500 × 460 × 380
Width × height × depth				
<b>Mounting position</b>				
<b>Main conductor minimum cross-sections</b>	Units mm <sup>2</sup> or inches	2 6.4 × 76.2 1/4 × 3	2 6.4 × 76.2 1/4 × 3	2 6.4 × 102 1/4 × 4
<b>Auxiliary conductors (Cu)</b>	Standard connection = strain-relief clamp			
Max. number of auxiliary conductors × cross-section (solid/stranded)	• Without end sleeve • With end sleeve according to DIN 46228 Part 2 • With twin end sleeve	2 × 0.5 mm <sup>2</sup> (AWG 20) ... 2 × 1.5 mm <sup>2</sup> (AWG 16); 1 × 2.5 mm <sup>2</sup> (AWG 14) 1 × 0.5 mm <sup>2</sup> (AWG 20) ... 1 × 1.5 mm <sup>2</sup> (AWG 16) 2 × 0.5 mm <sup>2</sup> (AWG 20) ... 2 × 1.5 mm <sup>2</sup> (AWG 16)		
	optional connection = tension spring			
	• Without end sleeve • With end sleeve according to DIN 46228 Part 2	2 × 0.5 mm <sup>2</sup> (AWG 20) ... 2 × 2.5 mm <sup>2</sup> (AWG 14) 2 × 0.5 mm <sup>2</sup> (AWG 20) ... 2 × 1.5 mm <sup>2</sup> (AWG 16)		
<b>Weights</b>				
3-pole	• Fixed-mounted circuit breakers • Withdrawable circuit breakers • Guide frame	kg 43 45 25	kg 43 45 25	kg 56 60 31

<sup>1)</sup> Make-time through activation solenoid for synchronization purposes (short-time excited) 85 ms.

Size		II		III	
Type		3WL52 25	3WL52 30	3WL53 40	3WL53 50
<b>Rated current <math>I_n</math></b> at 40 °C, at 50/60 Hz					
Main conductors	A	2500	3000	4000	5000
<b>Rated voltage <math>U_e</math></b> at 50/60 Hz		V AC	600	600	Up to 600 Y/347
<b>Ambient temperature of the system</b>		°C	-25/+40	-25/+40	-25/+40
<b>Power loss at rated current</b> with AC symmetrical load					
• Fixed-mounted circuit breakers	W	270	410	520	630
• Withdrawable circuit breakers	W	520	710	810	1050
<b>Operating times</b>					
• Make-time	ms	35	35	35	35
• Opening time	ms	34	34	34	34
• Electrical make-time (through activation solenoid) <sup>1)</sup>	ms	100	100	100	100
• Electrical opening time (through shunt trip unit)	ms	73	73	73	73
• Electrical opening time (instantaneous undervoltage trip unit)	ms	73	73	73	73
• Opening time due to ETU, instantaneous short-circuit release	ms	50	50	50	50
<b>Endurance</b>					
• Mechanical (without maintenance)	Operating cycles	10000	10000	5000	5000
• Electrical (without maintenance)	Operating cycles	4000	4000	1000	1000
<b>Switching frequency</b>		1/h	60	60	60
<b>Minimum interval</b> Between tripping operation by electronic trip unit and next making operation of the circuit breaker (only with automatic mechanical resetting of the lockout device)		ms	80	80	80
<b>Minimum dimension</b> Circuit breaker compartment					
Width x height x depth	3-pole	mm	500 x 460 x 380	500 x 460 x 380	800 x 460 x 380
<b>Mounting position</b>					
<b>Main conductor minimum cross-sections</b>		Units	2	4	4
		mm <sup>2</sup>	6.4 x 127	6.4 x 63.5	6.4 x 102
			4	4	4
			10 x 120	10 x 120	10 x 120
		or inches	1/4 x 5	1/4 x 2-1/2	1/4 x 4
			1/4 x 5 <sup>2)</sup>	1/4 x 5 <sup>2)</sup>	1/4 x 5 <sup>2)</sup>
<b>Auxiliary conductors (Cu)</b> Max. no. of auxiliary conductors x cross-section (solid/stranded)		Standard connection = strain-relief clamp	2 x 0.5 mm <sup>2</sup> (AWG 20) ... 2 x 1.5 mm <sup>2</sup> (AWG 16); 1 x 2.5 mm <sup>2</sup> (AWG 14) 1 x 0.5 mm <sup>2</sup> (AWG 20) ... 1 x 1.5 mm <sup>2</sup> (AWG 16)		
		• Without end sleeve			
		• With end sleeve according to DIN 46228 Part 2			
		• With twin end sleeve	2 x 0.5 mm <sup>2</sup> (AWG 20) ... 2 x 1.5 mm <sup>2</sup> (AWG 16)		
		Optional connection = tension spring			
		• Without end sleeve	2 x 0.5 mm <sup>2</sup> (AWG 20) ... 2 x 2.5 mm <sup>2</sup> (AWG 14)		
		• With end sleeve according to DIN 46228 Part 2	2 x 0.5 mm <sup>2</sup> (AWG 20) ... 2 x 1.5 mm <sup>2</sup> (AWG 16)		
<b>Weights</b> 3-pole					
		• Fixed-mounted circuit breakers	kg	59	64
		• Withdrawable circuit breakers	kg	63	68
		• Guide frames	kg	39	45
				82	88
				60	60

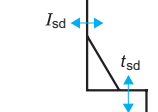
<sup>1)</sup> Make-time through activation solenoid for synchronization purposes (short-time excited) 50 ms.

<sup>2)</sup> 1/4 x 5 for fixed-mounted circuit breakers on request.

Size				I to III	
Type				3WL5	
Manual operating mechanism with mechanical closing					
Switching on/ charging store	Max. force required to operate the hand lever Required number of strokes on the hand lever	N		≤ 230 9	
Manual operating mechanism with mechanical and electrical closing					
Charging stored-energy feature					
Closing solenoid (CC)	• Operating range		%	85 ... 110	
	• Extended operating range for battery operation	At 24 V DC, 48 V DC, 60 V DC, 110 V DC, 220 V DC	%	70 ... 126	
	• Power consumption	AC/DC	VA/W	15/15	
	• Minimum command duration rated voltage for the closing solenoid		ms	60	
	• Short-circuit protection	Fuse		1 A	
Manual/motorized operating mechanism with mechanical and electrical closing					
Manual operating mechanism					
Motor	• Operating range		%	85 ... 110	
	• Extended operating range for battery operation	For 24 V DC, 48 V DC 60 V DC, 110 V DC 220 V DC	%	70 ... 126	
	• Power consumption of motor	AC/DC	VA/W	110/110	
	• Time required to charge the stored-energy mechanism at 1 × rated voltage		s	≤ 10	
Closing solenoid					
For motor and closing solenoid	• Short-circuit protection	Fuse	A	2	
	Motor and closing solenoid for the same rated control supply voltages				
	• Smallest permissible fuse	At 24 ... 30 V	A	2	
		At 48 ... 60 V	A	2	
		At 110 ... 127 V	A	1	
		At 220 ... 250 V	A	1	
Electronic trip unit signals					
Measuring accuracy of the electronic trip unit				Protection functions to UL 489 Current indication ≤ 5 %; Measurement functions base quantities ≤ 1 %; Measurement functions derived quantities ≤ 4 %	
Auxiliary trip units					
Shunt trip unit (ST) (F1, F2)/ Closing solenoid	• For continuous command (100 % ON period), locks out on momentary- contact commands	- Response value	Pickup	> 0.7 × rated voltage (circuit breaker is tripped)	
		- Operating range		%	85 ... 110
		- Extended operating range for battery operation	For 24 V DC, 48 V DC 60 V DC, 110 V DC 220 V DC	%	70 ... 126
	• Rated voltage		AC 50/60 Hz DC	V V	110; 230 24; 30; 48; 60; 110; 220
		• Power consumption	AC/DC	VA/W	15/15
		• Minimum command duration at rated voltage		ms	60
		• Opening time of the circuit breaker at rated voltage	AC/DC	ms	80
		• Short-circuit protection Smallest permissible fuse		A	1
		• With stored energy feature consisting of shunt trip unit and capacitor storage device	- Rated voltage	AC 50/60 Hz DC	V V
	- Operating range			%	85 ... 110
	- Power consumption		AC/DC	VA/W	1/1
	- Storage time/recharging time at rated voltage				Max. 5 min/min. 5 s
	- Opening time of circuit breaker, short-circuit protection			ms	80

Size				I to III
Type				3WL5
<b>Auxiliary trip units</b>				
Undervoltage trip units UVR (F3) and UVR- $t_d$ (F4)	• Response values	Pickup		$\geq 0.85 \times U_s$ (circuit breaker can be closed)
		Dropout		$0.35 \dots 0.7 \times U_s$ (circuit breaker is tripped)
	• Operating range			0.85 ... 1.1
	• Extended operating range for battery operation	At 24 V DC, 30 V DC, 48 V DC, 110 V DC, 220 V DC		0.85 ... 1.26
	• Rated control supply voltage $U_s$	AC 50/60 Hz DC	V V	110 ... 127/208 ... 240/380 ... 415 24/30/48/110/220 ... 250 <sup>1)</sup>
	• Power consumption (pickup/continuous duty)	AC DC	VA W	(200 = pickup) 5 (200 = pickup) 5
	• Opening time of circuit breaker at $U_s = 0$		ms	200
	• Version UVR (F3)			
	- Instantaneous		ms	80
	- With delay		ms	200
	• Version UVR- $t_d$ (F8)			
	- With delay, $t_d = 0.2 \dots 3.2$ s		s	0.2 ... 3.2
	- Reset through additional NC contact, direct switching-off		ms	$\leq 100$
Short-circuit protection Smallest permissible fuse				A 1
<b>Contact position-driven auxiliary switches (S1, S2, S3, S4, S7, S8)</b>				
Rated insulation voltage $U_i$			V AC/DC	300
Rated operational voltage $U_e$			V AC/DC	240
Switching capacity	• Alternating current 50/60 Hz	A 300 heavy duty	A	10
	• Direct current	P 300 heavy duty	A	10
<b>Ready-to-close signaling switch (S20) (according to UL 1054)</b>				
Switching capacity	• Rated operational voltage		V	250
	• Rated operational current		A	0.2

<sup>1)</sup> 24 V and 30 V only with undervoltage trip unit UVR (F3).

Protection functions Parameterization by		ETU25B	ETU45B
Functional overview of the electronic trip unit system		D	D & S
	<b>L</b>	<b>Overload protection</b>	✓
		Function can be switched on/off	--
		Setting range $I_R = I_n \times \dots$	0.4-0.45-0.5-0.55-0.6-0.65-0.7-0.8-0.9-1
		Switchable overload protection ( $I^2t$ or $I^1t$ -dependent function)	✓
		Setting range for time-lag class $t_R$ at $I^2t$	10 s fixed
		Setting range for time-lag class $t_R$ at $I^1t$	2-3-5-5.5-8-10-14-17-21-25-30 s
		Thermal image can be switched on/off	1-2-3-4-5 s
		Phase failure sensitivity	✓
		At $t_{sd} = 20$ ms (M)	At $t_{sd} = 20$ ms (M)
		--	✓
	<b>S</b>	<b>Short-time delayed short-circuit protection</b>	✓
		Function can be switched on/off	✓
		Setting range $I_{sd} = I_n \times \dots$	1.25-1.5-2-2.5-3-4-6-8-10-12
		Setting range for delay time $t_{sd}$	0-M-100-200-300-400 ms
	<b>I</b>	<b>Instantaneous short-circuit protection</b>	✓
		Function can be switched on/off	✓
		Setting range $I_i = I_n \times \dots$	Fixed for $I_i \geq 20 \times I_n$ , max. 50 kA
		--	1.5-2-2.3-4-6-8-10-12-0.8 $\times I_{cs}$
	<b>G</b>	<b>Ground-fault protection</b>	✓
		Tripping and alarm function	✓
		Tripping function can be switched on/off	✓
		Alarm function can be switched on/off	--
		Detection of the ground-fault current through summation current formation with internal or external neutral conductor transformer	✓
		Detection of ground-fault current through ext. transformer	✓
		Setting range of the operating current $I_g$ for release	A-B-C-D-E
		Setting range of the operating current $I_g$ for alarm	A-B-C-D-E
		Setting range of the delay time $t_g$	100-200-300-400-500 ms
		Switchable ground-fault protection characteristic curve ( $I^2t$ dependent function)	✓
		Setting range for delay time $t_g$ at $I^2t$	100-200-300-400-500 ms
		Zone Selective Interlocking ground-fault protect. function	By <b>Cubicle</b> BUS-Modul
		<b>Parameter set switchover</b>	
		Switchable between parameter set A and B	--
		<b>LCD</b>	
		Alphanumeric LCD (4-line)	--
		Graphical LCD (24 V, external power supply required)	--
		<b>Communication</b>	
		<b>Cubicle</b> BUS integrated	✓
		Communication-capable through PROFIBUS DP	✓
		<b>Measurement function</b>	
		Measurement function <i>Plus</i>	--
		<b>LED display</b>	
		Electronic trip unit active	✓
		Alarm	✓
		ETU fault	✓
		L-release	✓
		S-release	✓
		I-release	✓
		N-release	✓
		G-release	✓ (only with ground-fault protection module)
		G-alarm	✓ (only with ground-fault protection module)
		Release through extended protection function	✓
		Communication	✓
		<b>Signals from signaling switches with external CubicleBUS module (relay)</b>	
		Overload warning	✓
		Load shedding, load receiving	✓
		Leading signal overload trip 200 ms	✓
		Temperature alarm	✓
		Phase unbalance	✓
		Instantaneous short-circuit release	✓
		Short-time delayed short-circuit release	✓
		Overload trip	✓
		Neutral conductor release	✓
		Ground-fault protection release	✓ (only with ground-fault protection module)
		Ground-fault alarm	✓ (only with ground-fault protection module)
		Auxiliary relay	✓
		ETU fault	✓

Delay time figures given in ms.

M = motor protection, corresponds to 20 ms.

D = rotary coding switch

D & S = rotary coding and slide switch

✓ Available.

-- Not available.

□ Optional.

#### Setting range of the operating current $I_g$

	Size I and size II	Size III
A	100 A	400 A
B	300 A	600 A
C	600 A	800 A
D	900 A	1000 A
E	1200 A	1200 A

For tripping characteristics and dimensions as well as "3WL Air Circuit Breakers/Non-Automatic Air Circuit Breakers up to 6300 A (AC)", see pages 15/30 to 15/39.