

3WT Air Circuit Breakers up to 4000 A

Catalog LV 35 · 2009



Low-Voltage Controls and Distribution

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Contents

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Low-Voltage Controls and Distribution

3WT Air Circuit Breakers up to 4000 A

Catalog LV 35 · 2009



Invalid:
Catalog LV 35 · 2006

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Introduction

1

3WT
Air Circuit Breakers
up to 4000 A (AC)

2

Appendix

3

3WT Air Circuit Breakers.

The smart choice.

Flexibility

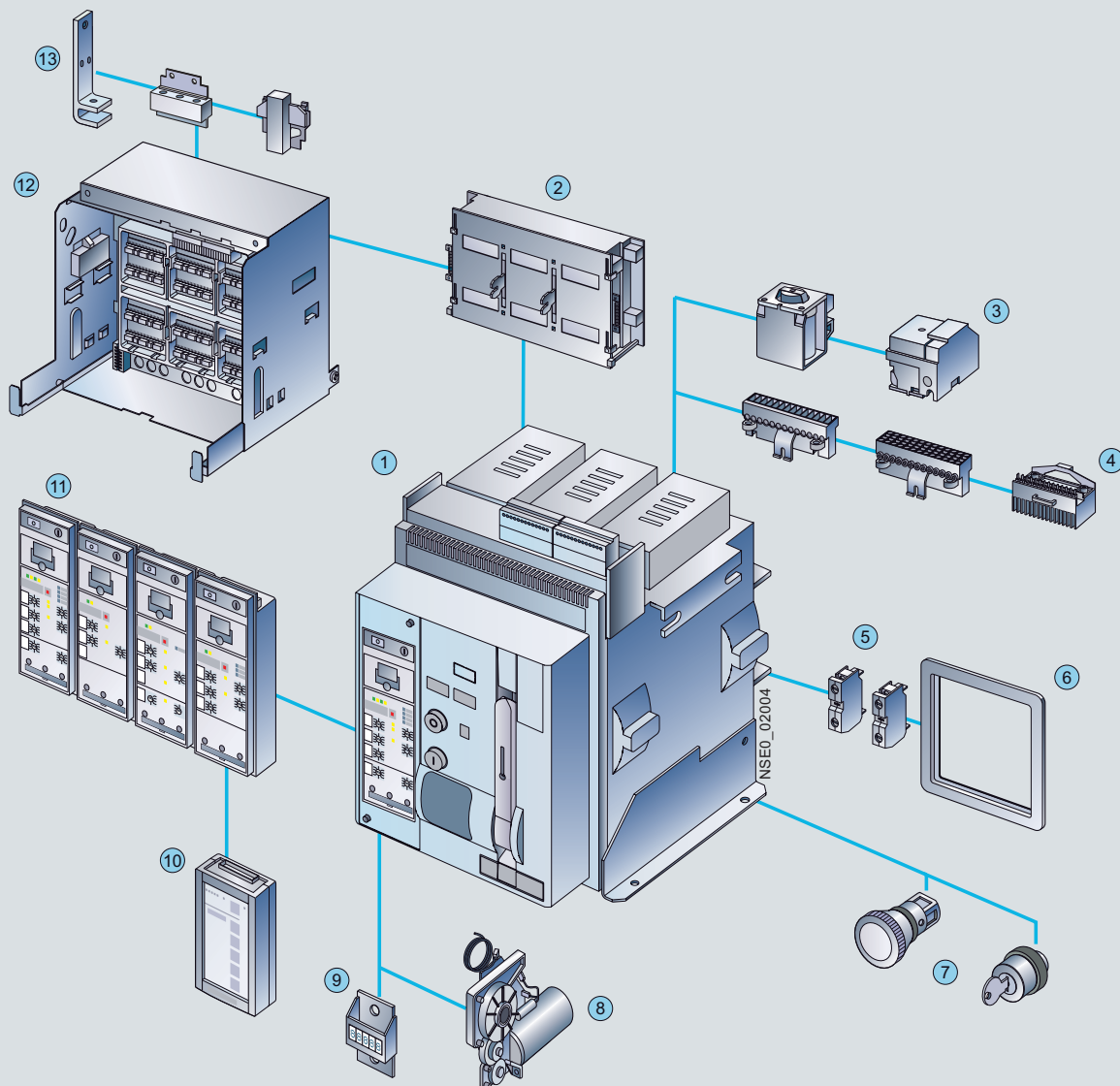
- New electronic trip units (ETU) with outstanding features.
- Only two frame sizes cover a broad range of applications from 400 A to 4000 A, up to 66 kA at 500 V, 3- or 4-pole version, fixed-mounted, withdrawable version.
- All components can be combined in a modular way.

Ease of use

- User friendliness in planning, configuration, installation and operation.
- Wide range of accessories for both frame sizes can be easily retrofitted.
- Displays for all electronic trip units (ETU).

Safety and reliability

- International and standardized processes ensure highest product quality.
- Conforms to international standards and approvals.



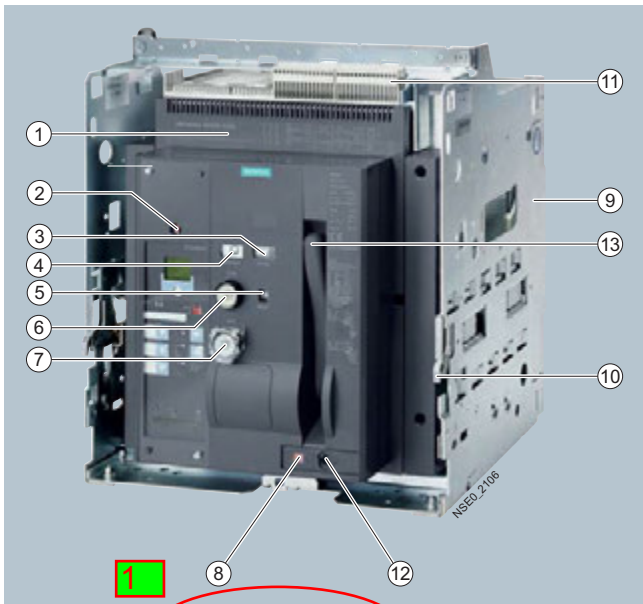
- | | |
|---|---|
| ① Circuit breaker | ⑧ Motorized operating mechanism |
| ② Shutter | ⑨ Operating cycles counter |
| ③ Closing solenoid, auxiliary trip unit | ⑩ Manual tester for electronic trip unit (ETU) |
| ④ Auxiliary conductor plug-in system | ⑪ Protective device with device holders, electronic trip unit (ETU) |
| ⑤ Auxiliary switch block | ⑫ Guide frame |
| ⑥ Door sealing frame | ⑬ Main connection, front, horizontal, vertical |
| ⑦ EMERGENCY-STOP pushbutton, key operated | |

3WT Air Circuit Breakers up to 4000 A (AC)

General data

Overview

2



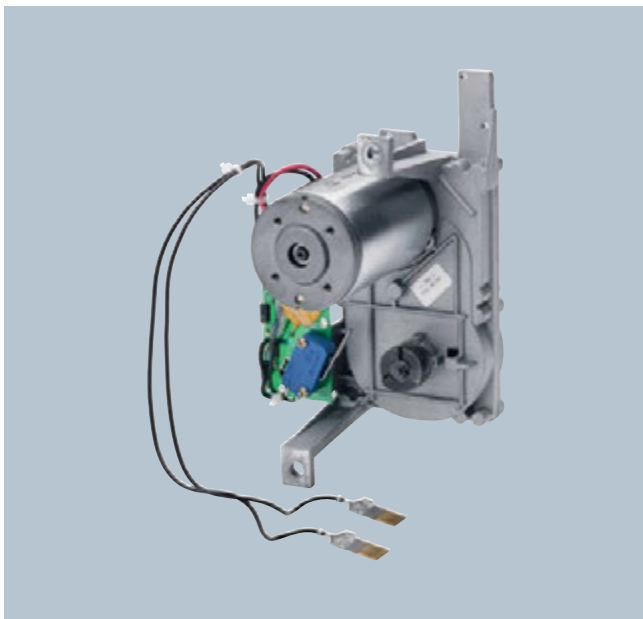
3WT circuit breaker, **Withdrawable Version** size II, 3-pole



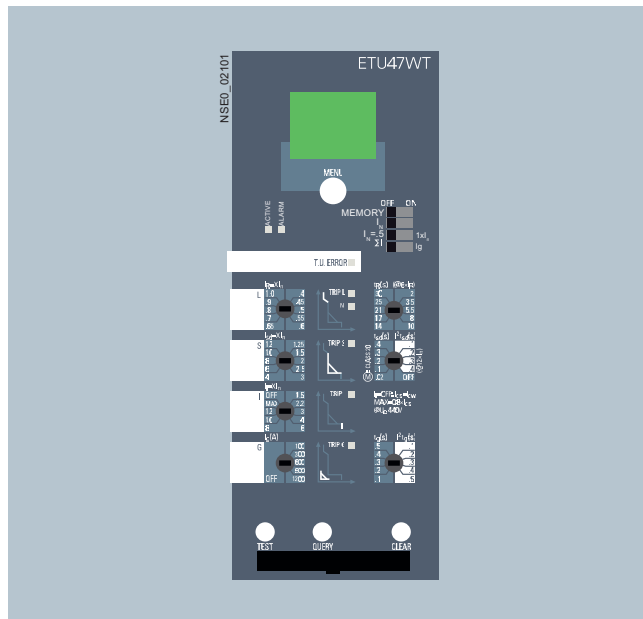
3WT circuit breaker, **Fixed-Mounted** version, size II, 3-pole

- ① Withdrawable circuit breaker
- ② Indication and reset button after tripping for
- tripped signaling switch and
- mechanical closing lockout
- ③ Spring charge indicator
- ④ Contact position indicator
- ⑤ Ready-to-close indicator
- ⑥ ON button, mechanical
- ⑦ OFF button, mechanical
- ⑧ Indication of circuit breaker position
- ⑨ Guide frame
- ⑩ Guide rails
- ⑪ Auxiliary circuit plug-in system
- ⑫ Crank hole
- ⑬ Hand lever

2



Motorized operating mechanism



Electronic trip unit

3WT Air Circuit Breakers up to 4000 A (AC)

General data

Benefits

Safety and reliability

- High degree of protection with door sealing frame in the case of exclusively local operation of the circuit breaker
- Infeed supply from above or below, as required
- Locking of the withdrawable circuit breaker against moving, as standard
- Locking of the guide frame with the circuit breaker removed, as standard
- Signaling switch for overload and short-circuit tripping with mechanical closing lockout
- High degree of protection with cover IP55
- Mechanical closing lockout after overload or short-circuit tripping as standard
- The circuit breaker is always equipped with the required number of auxiliary supply connectors

Easy to operate

- Unambiguous ON-OFF indicator with auxiliary switch for signal
- Ready-to-close indicator with signaling switch as safety standard.

Modular

Many components, such as auxiliary releases, motorized operating mechanisms, electronic trip units and current transformers can be replaced or retrofitted to adapt the circuit breaker to changing requirements.

Minimal power loss and therefore low energy consumption

The low power consumption of the electrical components also saves money when it comes to purchasing the control-power transformers. Where space is at a premium or ventilation is limited.

Application

Specifications

IEC 60947-2,
GB 14048.2,
CCC Approval,
climate-proof to IEC 60068-2-30,
Approval according to maritime classification
on request.

Operating conditions

The 3WT circuit breakers are climate-proof in accordance with IEC 60068-2-30.

They are intended for use in enclosed areas where no severe operating conditions (e.g. dust, corrosive vapors, damaging gases) are present.

When installed in dusty or damp areas, suitable enclosures must be provided. If damaging gases (e.g. hydrogen sulfide) are present in the surrounding air, sufficient incoming fresh air must be supplied.

The permissible ambient temperatures and the associated rated currents are listed in the technical specifications.

Design

Versions

Breaking capacity: 55/66 kA at 500 V
Rated current: from 400 A to 4000 A
Rated operating voltage: AC 500 V

The 3WT circuit breakers are supplied complete with an operating mechanism, electronic trip unit and auxiliary switches and are fitted with auxiliary releases.

The non-automatic circuit breakers are supplied without electronic trip unit

Standard version

- Electronic trip unit with LSI protection, LCD display with backlight, LEDs for the cause of tripping, LED status indicator, query and test button
- Auxiliary supply connector: The circuit breaker is equipped with the required number of connectors
- Mechanical ON and OFF pushbutton
- Door sealing frame IP40
- Tripped signaling switch (1 NO)
- Ready-to-close indicator with signaling switch
- Spring charge indicator
- Auxiliary switches (2 NO + 2 NC)
- Rear horizontal main circuit connections for fixed mounted and withdrawable versions
- For 4-pole circuit breakers, the fourth pole (N) is installed on the left and is 100 % loadable
- Indication and reset button after tripping for
 - tripped signaling switch and
 - mechanical closing lockout
- User manual in English/Chinese/Spanish/Russian/Portuguese/German/Turkish

Additional features of the withdrawable version:

- Main contacts: Laminated receptacles in the guide frame, penetration blades on the withdrawable circuit breaker
- Position indicator in the control panel of the withdrawable circuit breaker
- Guide frame with guide rails for easy moving of the withdrawable circuit breaker
- The withdrawable circuit breaker can be locked to prevent it being pushed out of position

Standard version for non-automatic circuit breaker

- Same features as the circuit breaker, see "Standard version" but
- No electronic trip unit

3WT Air Circuit Breakers up to 4000 A (AC)

General data

Function

Operating mechanisms

(see illustration "Motorized operating mechanism")

The circuit breakers are available with various optional operating mechanisms:

- Manual operating mechanism with memory, with mechanical closing
- Manual operating mechanism with mechanical and electrical closing
- Motorized operating mechanism that can also be operated manually, with mechanical and electrical closing.

The operating mechanisms with electrical closing can be used for synchronization tasks.

EMERGENCY-STOP facility

The 3WT circuit breakers can be used as an EMERGENCY-STOP facility to DIN VDE 0113 if the circuit breaker is equipped with an undervoltage release and is used in conjunction with an EMERGENCY-STOP control device.

Auxiliary and signaling switches

- Ready-to-close
If all the conditions are fulfilled, so that the circuit breaker is ready to close, this is indicated visually on the operator panel as well as by means of an indicator switch (S7).
- Contact position-independent auxiliary switches
The circuit breakers are supplied with 2 NO and 2 NC contacts or with 2 NO and 2 NC and 2 CO contacts according to order.
- "Tripped" signaling switch and mechanical closing lockout
As standard, the circuit breaker is equipped with an S11 signaling switch and a mechanical closing lockout for the common overload and short-circuit signal and, depending on the setting and version of the electronic trip unit, the ground-fault signal.
The tripped signal and the standard mechanical mechanism to prevent closing remain active until the reset button is operated on the circuit breaker. When the circuit breaker has tripped, this is indicated by the protruding reset button.
If the circuit breaker has to be ready to close immediately after tripping, an automatic mechanical reset mechanism is available, but this does not reset the electrical signal from the "tripped" switch S11. The "tripped" signal then has to be reset by operating the Reset button.

Auxiliary supply connections

The type of connection for the auxiliary switches depends on the type of installation:

- Withdrawable version:
The internal auxiliary switches are connected to the male connector on the circuit breaker side. When fully inserted, the connector makes a connection with the sliding module in the guide frame.
- Fixed mounting:
In this case the auxiliary supply connectors are engaged directly onto the circuit breaker.

Fixed-mounted and withdrawable version

Fixed-mounted and withdrawable circuit breakers

- Protective measures against arcing gases
For 3WT circuit breakers with voltages up to AC 500 V, screening from vertical busbars is not necessary. Electrical add-on devices on the side of the circuit breaker must be separately covered. Also see notes under "Project planning aids", "Dimensional drawings".
- Operator panel
The operator panel is designed to protrude from a cutout in the door providing access to all operator controls and displays with the door closed.
The operator panels for all circuit breakers (fixed-mounted/withdrawable versions, 3-pole, 4-pole) are identical. The operator panel ensures degree of protection IP41.
- Door sealing frame
The door sealing frame seals the cabinet door with the operator panel. With the cabinet door closed, the IP degree of protection is achieved for the circuit breaker.

Withdrawable circuit breaker

The withdrawable version comprises a withdrawable circuit breaker, a guide frame and a hand crank for moving the withdrawable circuit breaker. The guide frames are fitted with guide rails as standard for easy handling of the withdrawable circuit breaker.

- Auxiliary supply connections
The auxiliary supply connections make contact automatically when the circuit breaker slides into the guide frame (test position, connected position).
- Switch positions in the guide frame
The withdrawable version has three switch positions in the switchgear cabinet behind the cabinet door:
 - Connected position
(main circuit and auxiliary circuit ready)
 - Test position
(main circuit disconnected, auxiliary circuit ready)
 - Disconnected position
(main circuit and auxiliary circuit disconnected)

In the disconnected position, the withdrawable circuit breaker complies with the "isolation condition" with a visible isolating distance in the main circuit and auxiliary circuit.

The circuit breaker must always be switched off before it is moved. The "OFF" button must be held down when the slide in the crank hole is opened.

3WT Air Circuit Breakers up to 4000 A (AC)

General data

Guide frames

Closing of the crank hole is only possible in the circuit breaker positions (connected, test or disconnected position). The circuit breaker position is shown on a display on the circuit breaker.

The circuit breaker is moved with the help of a hand crank. The connected position as well as the disconnected position is achieved by moving the circuit breaker to the end stop.

- **Shutters**
Inadvertent touching of live main contacts or busbars is prevented by covering with a shutter. The shutter is constructed in two parts and allows the upper or lower connection areas to be opened separately for the purpose of checking that they are not live. The divided shutter can be interlocked in the open or closed position and two padlocks can be fitted.

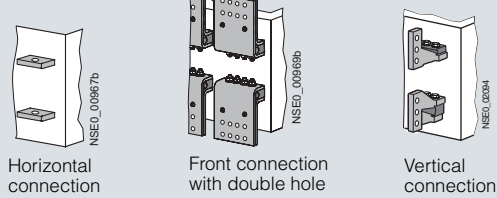
Main circuit connections

All circuit breakers are equipped with horizontal main circuit connections on the rear for up to 3200 A as standard (horizontal connection to busbars). Exception: Circuit breakers of size II with max. rated current 4000 A. They are equipped with vertical main connections (for upright busbars).

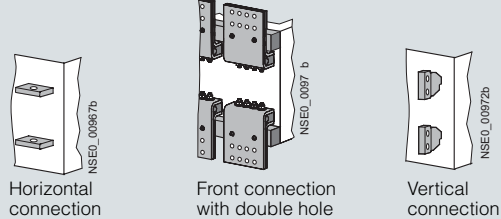
The following options are available, with combinations of top and bottom connections possible:

- Accessible from the front, double hole (holes according to DIN 43673) (for vertically installed busbars)
- At the rear, vertical (for vertically installed busbars)

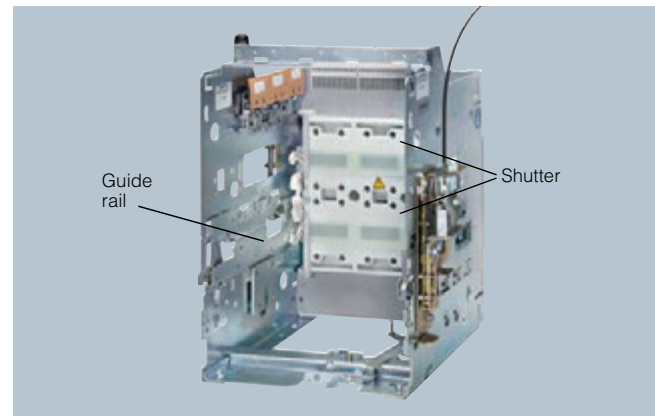
Fixed-mounted circuit breakers



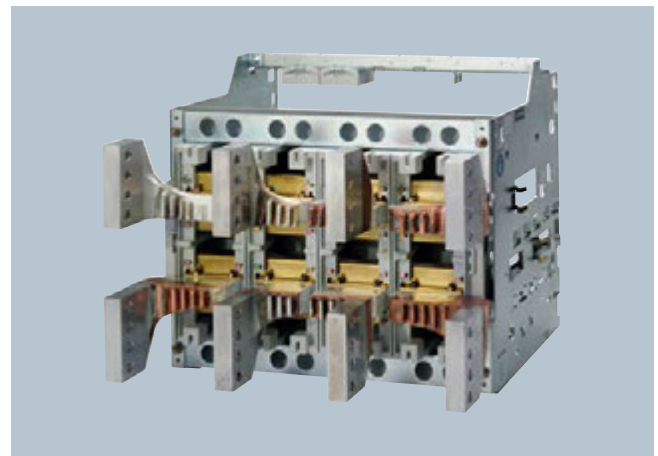
Withdrawable circuit breaker, withdrawable guide frame



Main circuit connections



Guide frame



Vertical busbars, up to 3800 A

3WT Air Circuit Breakers up to 4000 A (AC)

General data

Opening, closing and locking devices

- ON and OFF buttons
 - Mechanical ON button
In the standard version, the mechanical ON button is a pushbutton. As an alternative to a pushbutton, a safety lock (CES) can also be supplied.
If the key is removed in the "0" position, it is no longer possible to close the circuit breaker mechanically.
 - Mechanical OFF button
In the standard version, the mechanical OFF button is a pushbutton.
- Locking device against moving the withdrawable circuit breaker
Access to the crank hole and application of the crank is prevented by means of one or more padlocks. This also prevents movement of the withdrawable circuit breaker in the guide frame.

Auxiliary trip units

Up to two auxiliary trip units can be installed at the same time. The following are available:

- 1 shunt trip unit or
- 1 undervoltage trip unit or
- 2 shunt trip unit or
- 1 shunt trip unit +
- 1 undervoltage trip unit.

Undervoltage trip unit

The undervoltage trip unit causes the circuit breaker to be opened if the operational voltage falls below a certain value or is not applied. The circuit breaker cannot be closed manually or by means of an electrical ON command if the undervoltage trip unit is not connected to the operational voltage. The undervoltage trip unit has no delay as standard. A delay can be set by the customer in the range between $t_d < 80$ ms and $t_d < 200$ ms.

In addition, an undervoltage trip unit with a delay in the range from 0.2 to 3.2 s is available.

Closing solenoid

The closing solenoid is used to close the circuit breaker electrically by means of a local electrical ON command or by a remote unit.

Motorized operating mechanisms

The operating mechanism is used to load the storage spring automatically.

The operating mechanism is activated if the storage spring has been unloaded and the control voltage is available.

It is switched off automatically after loading. This does not affect manual operation of the storage spring.

Indicators, signals and control elements

Operating cycles counter

The motorized operating mechanism can be supplied with a 5-digit operating cycles counter. The display is incremented by "1" as soon as the storage spring is fully loaded.

Electronic trip units - ETU



Electronic trip units – ETU35WT, ETU37WT, ETU45WT, ETU47WT

The electronic trip unit is controlled by a microprocessor and operates independently of an auxiliary voltage. It enables systems to be adapted to the different protection required of distribution systems, motors, transformers and generators.

In all electronic trip units, the following high-grade features are always included as standard:

- Display with back light
- LSI protection as minimum configuration
- Integrated function test
The test button can be used to test the electronic trip unit using an integrated test function with or without tripping of the circuit breaker (the solid-state trip unit, trip solenoid and breaker mechanism are tested).
- Active LED
Correct operation of the electronic trip unit is indicated by the "heartbeat" of a green flashing LED.
When the operating current exceeds the response threshold of the overload protection, this is indicated by rapid flashing.
- Cause of tripping
The cause of tripping can be queried locally and displayed (by pressing the "Query" button).
- T. U. Error
A microprocessor fault or overtemperature inside of the electronic trip unit is signaled by a warning indicator LED.

3WT Air Circuit Breakers up to 4000 A (AC)

General data

Test device for Electronic trip unit ETU



Test device

The handheld test device is used to verify the proper operation of the electronic trip unit, the energy transformers and current transformers as well as the tripping solenoid F5 and the data display.

Ground-fault protection

Description

Ground-fault releases "G" sense fault currents that flow to ground and that can cause fire in the plant. Multiple circuit breakers connected in series can have their delay times adjusted so as to provide time-graded discrimination.

The reason for tripping is indicated by means of an LED when the query button is activated.

Measurement method

Vectorial summation current formation (measurement method 1)

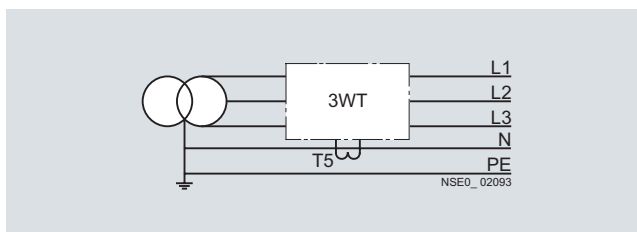
The three phase currents and the N-conductor current are measured directly.

The electronic trip unit determines the ground-fault current by means of vectorial summation current formation for the three phase currents and the N-conductor current.

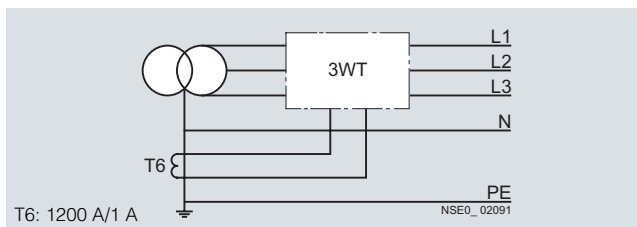
Direct measurement of the ground-fault current (measurement method 2)

A standard transformer with the following data is used for measurement of the ground-fault current:

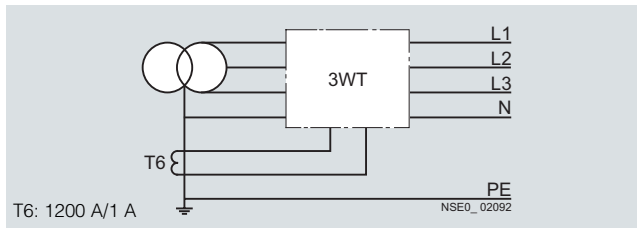
1200 A/1 A, Class 1 (the internal load of 3WT is 0.11 Ω). The transformer can be installed directly in the grounded neutral point of a transformer.



3-pole circuit breakers, current transformers in the neutral conductor



3-pole circuit breakers, current transformers in the grounded neutral point of the transformer



4-pole circuit breakers, current transformers in the grounded neutral point of the transformer

Setting

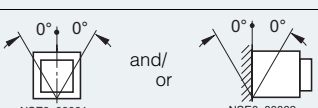
How the ground fault protection is set depends on the measurement method used (see above):

Measurement method 1: in position ΣI .

Measurement method 2: in position I_g .

3WT Air Circuit Breakers up to 4000 A (AC)

General data

Size		II					
Type			3WT82 0	3WT82 5	3WT83 2	3WT84 0	
Rated current I_n at 50 °C, at 50/60 Hz ⁶⁾	Main conductor	A	2000	2500	3200	3800 (withdrawable)	4000 (fixed-mounted)
	Neutral conductor (only on 4-pole version)	A	2000	2500	3200	3800 (withdrawable)	4000 (fixed-mounted)
Rated operating voltage U_e at 50/60 Hz		AC V	up to 500				
Rated impulse withstand voltage U_{imp}	Main circuits ⁵⁾	kV	8				
	Auxiliary circuits	kV	4				
Utilization category			B				
Rated short-circuit making capacity I_{cm} (peak value)	up to 500 V AC ecoline	kA	--				
	standard	kA	145				
Rated service short-circuit breaking capacity I_{cs} (rms value)	up to 500 V AC ecoline	kA	--				
	standard	kA	66				
Rated ultimate short-circuit breaking capacity I_{cu} (rms value)	up to 500 V AC ecoline	kA	--				
	standard	kA	66				
Permissible ambient temperatures	Operation	°C	-20 ... +70				
	Storage	°C	-40 ... +80				
Rated short-time withstand current I_{cw} at 50/60 Hz	0.5 s	kA	66				
	1 s	kA	66				
	2 s	kA	55				
	3 s	kA	45				
	4 s	kA	35				
Permissible load for fixed-mounted and withdrawable circuit breakers at cabinet interior temperature ¹⁾²⁾	up to 50 °C ⁶⁾	A	2000	2500	3200	3800 ⁷⁾	4000 ⁸⁾
	at 60 °C	A	1950	2150	2900		
	at 70 °C	A	1800	1950	2700		
Rated rotor operating voltage U_{er}		V	2000				
Power loss at I_n with 3-phase symmetr. load (without line-side busbars and metal components ²⁾)	Fixed-mounted circuit breaker	W	170	325	420	--	902
	Withdrawable circuit breaker including guide frame	W	310	535	760	1050	--
Service life without maintenance	mechanical	Operating cycles	6000				
	electrical ⁴⁾	Operating cycles	2000				
with maintenance ³⁾	mechanical	Operating cycles	12000				
	electrical ⁴⁾	Operating cycles	4000				
Operating frequency		1/min	1				
Minimum interval 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				
Service position							
Degree of protection			Circuit breaker IP20, when fitted in cabinet or frame Operator panel with door sealing frame IP40				
Main conductor minimum cross-sections	Copper bars, bare	Qty, mm ²	2 x 100 x 10	3 x 100 x 10	3 x 100 x 10	4 x 120 x 10	4 x 120 x 10
	Copper bars, painted black	Qty, mm ²	2 x 80 x 10	2 x 100 x 10	3 x 100 x 10	4 x 100 x 10	4 x 100 x 10
Auxiliary conductors (Cu)	Max. no. of aux. conductors x cross-section	solid and finely stranded with end sleeves	1 x 0.5 ... 2.5 mm ² ; 1 x AWG 14 2 x 1.0 mm ²				
Weights	3-pole circuit-breakers	Fixed-mounted circuit breaker approx. kg	57	57	61	--	92 ⁹⁾
		Withdrawable circuit breaker approx. kg	59	59	63	64	--
		Guide frame approx. kg	35	35	37	54 ⁹⁾	--
	4-pole circuit-breakers	Fixed-mounted circuit breaker approx. kg	70	70	74	--	106 ⁹⁾
		Withdrawable circuit breaker approx. kg	72	72	76	77	--
		Guide frame approx. kg	46	46	48	64 ⁹⁾	--

1) The temperatures apply to the air surrounding the upper third of the circuit breaker.

2) These values apply in the case of sinusoidal current (50/60 Hz). The heating/losses increase in the event of harmonics and higher frequencies.

3) Maintenance: replacement of the contact set and arc chute.

4) Per contact set. Disconnect. of the rated current I_n and power factor = 0.8.

5) Rated insulation voltage $U_i = 1000$ V AC.

6) At 3WT84 0: 40 °C.

7) Withdrawable circuit breakers.

8) Fixed-mounted circuit breakers.

9) Including vertical busbars.

3WT Air Circuit Breakers up to 4000 A (AC)

General data

				3WT
Operating mechanisms				
Manual operating mechanism with mechanical closing				
Closing	Max. force required to operate the hand lever		N	210
Charging stored-energy feature	Required number of strokes on the hand lever			5
Manual operating mechanism with mechanical and electrical closing				
Charging stored-energy feature				
Closing solenoid (Y1)	Operating range			see "Manual operating mechanism with mechanical closing" $0.7 \dots 1.1 \times U_s$
	Extended operating range for battery operation ¹⁾	for 24 V DC, 110 V DC, 220 V DC		$0.7 \dots 1.26 \times U_s$
	Power input	AC/DC	VA/W	15
	Minimum command duration at U_s for the activation solenoid		ms	60
	Total closing time at U_s after start of closing command for the activation solenoid, suitable for synchronizing tasks		ms	80
	Short-circuit protection			
	Smallest permissible DIAZED fuse (operational class gL)/miniature circuit breaker with C-characteristic			1 A TDz (time-lag)/1 A
Manual/motor operating mechanism with mechanical and electrical closing				
Manual operating mechanism				
see "Manual operating mechanism with mechanical closing"				
Motor	Operating range			$0.7 \dots 1.1 \times U_s$
	Extended operating range for battery operation ¹⁾	for 24 V DC, 110 V DC, 220 V DC		$0.7 \dots 1.26 \times U_s$
	Power input to motor	AC/DC	VA/W	40
	Time required to charge the stored-energy mechanism $1 \times U_s$		s	20
Closing solenoid				see "Manual operating mechanism with mechanical and electrical closing"
	Short-circuit protection			
	Motor and activation solenoid for the <u>same</u> rated control supply voltages:			
For motor and closing solenoid	Smallest permissible DIAZED fuse (operational class gL)/miniature circuit breaker with C-characteristic	at $U_s = 24$ V		2 A TDz (time-lag)/2 A
		at $U_s = 110 \dots 127$ V		1 A TDz (time-lag)/1 A
		at $U_s = 220 \dots 250$ V		1 A TDz (time-lag)/1 A
Auxiliary releases				
Shunt release "f" (F1, F2)	Operating value	pickup		$\geq 0.7 \times U_s$ (circuit breaker is tripped)
	Operating range			$0.7 \dots 1.1 \times U_s$
	For continuous command (100 % duty ratio), locks out on momentary-contact commands			
	Extended operating range for battery operation ¹⁾	for 24 V DC, 110 V DC, 220 V DC		$0.7 \dots 1.26 \times U_s$
	Rated control supply voltage U_s	AC 50/60 Hz	V	110 ... 127, 220 ... 240
		DC	V	24, 110 ... 125, 220 ... 250
	Power input	AC/DC	VA/W	15
	Minimum command duration at U_s		ms	60
	Opening time of circuit breaker at $U_s = 100$ %	AC/DC	ms	≤ 80

¹⁾ The operating range is only permissible for the specified rated voltages and corresponds to the battery charging voltage.

3WT Air Circuit Breakers up to 4000 A (AC)

General data

		3WT					
Auxiliary releases							
Undervoltage release "r" (F3) and "rc" (F8)	Operating 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		$0.85 \dots 1.1 \times U_s$				
	Extended operating range in battery operation ¹⁾	for 24 V DC, 110 V DC, 220 V DC	$0.7 \dots 1.26 \times U_s$				
	Rated control supply voltage U_s	AC 50/60 Hz	V	110 ... 127, 220 ... 240, 380 ... 415			
		DC	V	24, 110 ... 125, 220 ... 250			
	Power input	AC	VA	15			
		DC	W	15			
	<u>Opening time of circuit breaker at $U_s = 0$</u>						
	<u>Version "r" (F3)</u>						
		Instantaneous	ms	≤ 100			
		With 100 ms delay	ms	≤ 300			
<u>Version "rc" (F8)</u>							
	With delay, $t_d = 0.2 \dots 3.2$ s	s	$0.2 \dots 3.2$				
	Reset via additional NC contact – direct switching-off	ms	≤ 100				
<u>Short-circuit protection</u>							
	Smallest permissible DIAZED fuse (operational class gL) /miniature circuit breaker with C-characteristic		1 A TDz (time-lag)1 A				
Contact position-driven auxiliary switches (S1, S2, S3, S4)							
Rated insulation voltage U_i		AC/DC V	400 V				
Rated operating voltage U_e			400 V				
Switching capacity	AC, 50/60 Hz	Rated operating voltage U_e	V	up to 24	110	220/230	380/400
		Rated operating current $I_e/AC-12$	A	10	10	10	10
		Rated operating current $I_e/AC-15$	A	6	6	6	4
	DC	Rated operating voltage U_e	V	24	110	220	
		Rated operating current $I_e/DC-12$	A	10	3.5	1	
		Rated operating current $I_e/DC-13$	A	10	1.2	0.4	
Short-circuit protection²⁾			Largest permissible DIAZED fuse (operational class gL/gG)		10 A TDz, 16 A Dz		
			Largest permissible miniature circuit breaker with C-characteristic		10 A		
Ready-to-close signaling switch (S7) and "tripped" signaling switch (S11), to DIN VDE 0630							
Switching capacity	AC, 50/60 Hz	Rated operating voltage U_e	V	110	220		
		Rated operating current I_e	A	0.14	0.1		
	DC	Rated operating voltage U_e	V	24	220		
		Rated operating current I_e	A	0.2	0.1		
Short-circuit protection²⁾			Largest permissible DIAZED fuse (operational class gL)		2 A Dz (quick)		
"Tripped" signaling switch (S11)	Signal duration after tripping		continuous, until reset				

¹⁾ The operating range is only permissible for the specified rated voltages and corresponds to the battery charging voltage.

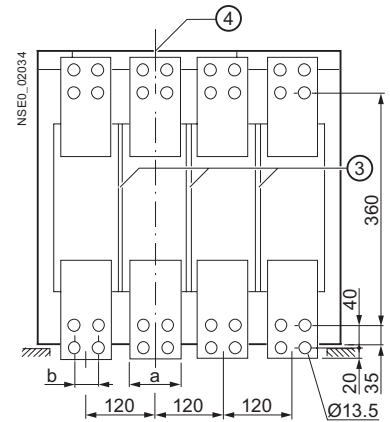
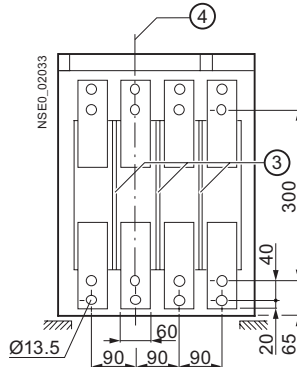
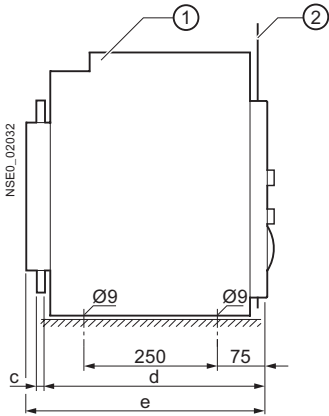
²⁾ Without any welding of the contacts only at $I_k \leq 1$ kA in accordance with DIN VDE 0660 Part 200.

3WT Air Circuit Breakers up to 4000 A (AC)

Project planning aids

3WT circuit breakers, withdrawable version, 4-pole

Front connection

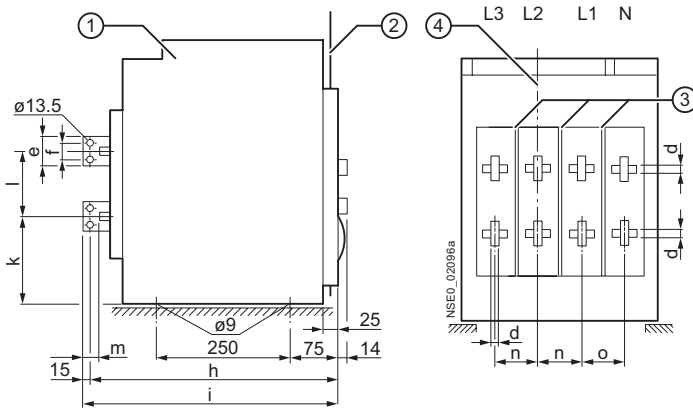


Double hole, 630 to 1600 A
Holes in bars to DIN 43673

Double hole, 2000 to 3200 A
Holes in bars to DIN 43673

Rated current A	a	b	c	d	e
630 up to 1250	60	--	8	390	408
1600	60	--	15	390	408
2000 up to 2500	80	40	20	420	445
3200	100	50	20	420	445

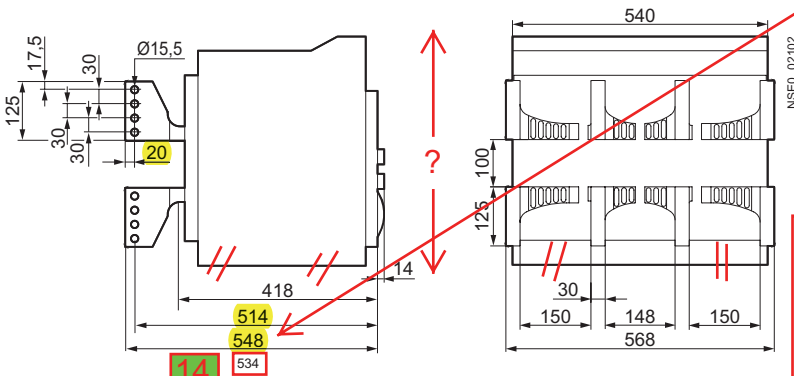
Vertical connection up to 3200 A



Rated current A	d	e	f	h	i	k	l	m	n	o
630 to 1250	8	60	30	455	470	157.5	115	37	90	90
1600	15	60	30	455	470	157.5	115	37	90	90
2000 to 2500	15	80	40	465	480	157.5	115	37	140	120
3200	30	100	50	465	480	150	130	37	140	120

Distance terminal end-centre hole - 20mm, so Front-terminal end distance should be 514+20=534, not 548. Please clarify.

Vertical connection 3800 A only



- ① Guide frame
- ② Switchboard door
- ③ Slots (6 mm deep, 3.5 mm wide) for line-side phase barriers
- ④ Center line of operator panel

For safety clearances see page 2/35.
All dimensions in mm.

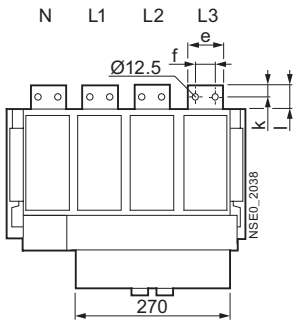
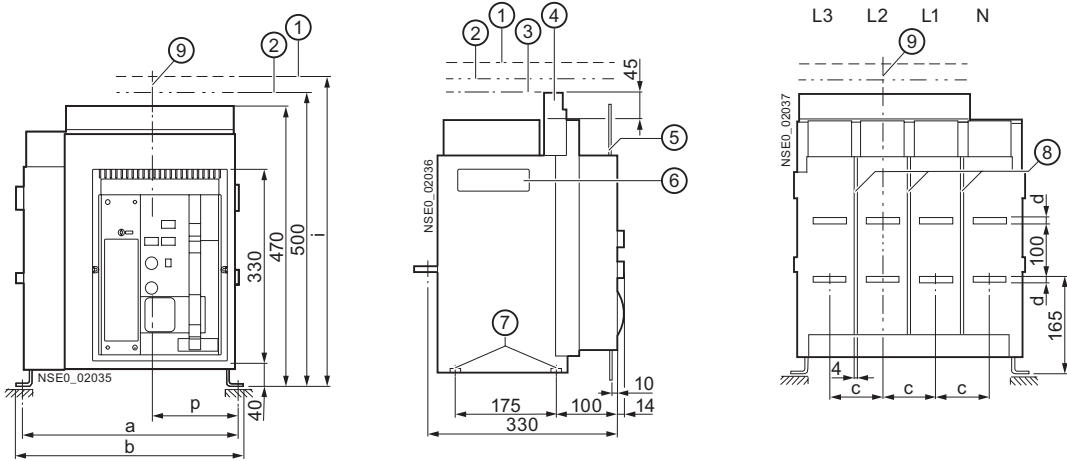
Mounting Holes (marked by II lines in the drawing) and height to be Shown. Height should be assumed to be same for all the Breakers?

3WT Air Circuit Breakers up to 4000 A (AC)

Project planning aids

3WT fixed-mounted circuit breakers, 4-pole

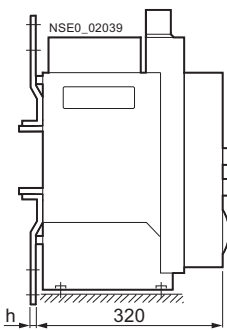
Horizontal connection



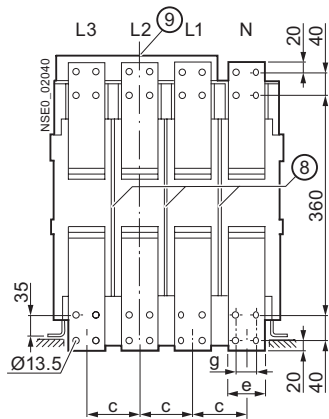
- ① Clearance for lifting out the arc chute
- ② Space for auxiliary supply connectors
- ③ Space above arc chute
- ④ Auxiliary supply connectors
- ⑤ Switchboard door
- ⑥ Recessed grip
- ⑦ Nut M 8
- ⑧ Slots (4 mm deep) for line-side phase barriers
- ⑨ Center line of operator panel

For safety clearances see page 2/35.
All dimensions in mm.

Front connection



Double hole
Holes in bars to DIN 43673

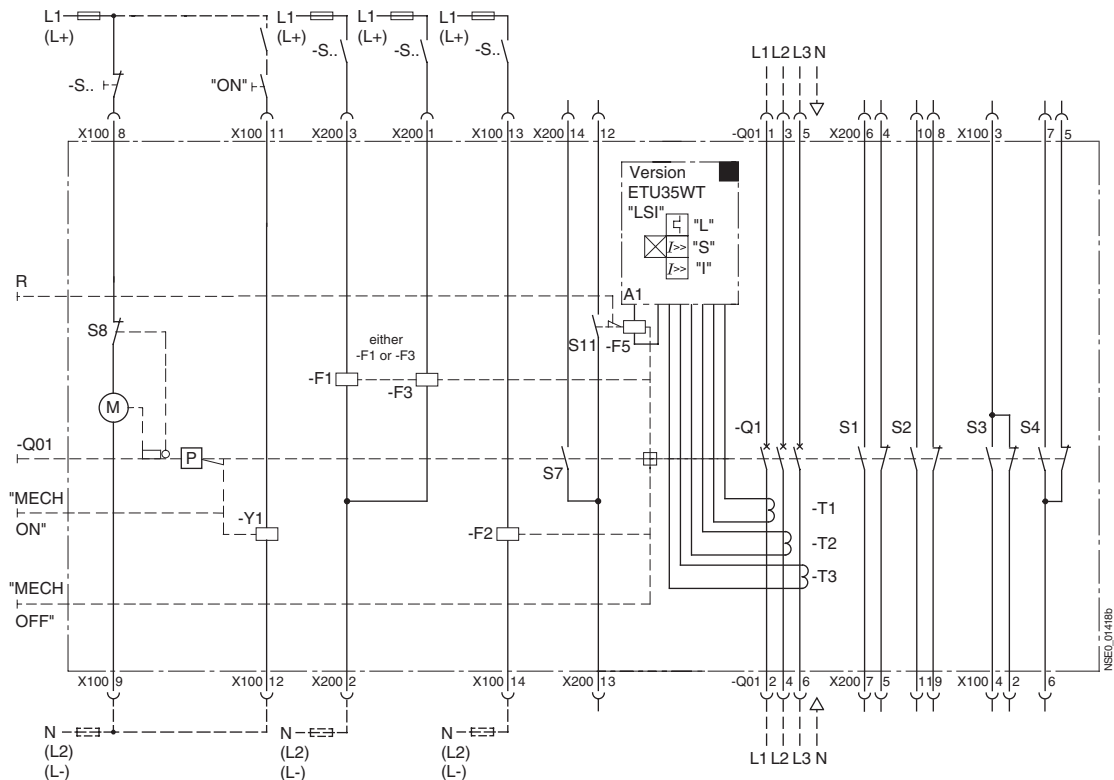


Rated current A	a	b	c	d	e	f	g	h	i	k	l	p
630 up to 1250	390	410	90	8	60	30	--	8	530	18	40	150
1600	390	410	90	15	60	30	--	15	530	18	40	150
2000 up to 2500	520	540	120	15	80	40	40	20	560	22	44	200
3200	520	540	120	30	80	40	40	20	560	22	44	200

Schematics

Example of an overall circuit diagram

Motor/manual operating mechanism, with ready-to-close signaling switch, with electronic trip unit version ETU35WT "LSI", with overvoltage release "r" (F3) or shunt release "f" (F1), with shunt release "f" (F2), with "tripped" signaling switch, with auxiliary switch 2 NO + 2 NC + 2 CO, with motor switch



A1	Electronic trip unit
S1/S2	1st auxiliary switch block
S3/S4	2nd auxiliary switch block
S7	Ready-to-close signaling switch
S8	Storage spring contact
S11	"Tripped" switch
F1	1st shunt release "f"
F2	2nd shunt release "f"
F3	Undervoltage release "r"
F5	Trip solenoid
M1	Motor for "charging store"
P	Storage spring
Q01	Hand-operated lever for "charging store"
Q1	Main contacts
T1/T2/T3	Current transformer
X100/X200	Terminals
Y1	Closing solenoid
R	Indication and reset button for overcurrent tripping

Further information

For planning guides with further descriptions relating to design, operating principle, installation and retrofitting see manual "3WT circuit breakers for low voltage"
Order No. on request.