

The art of "simplicity"



Data Sheet

sentron
3WT



SIEMENS

Sentron 3WT – The Art of Simplicity.

During the last decade, with the introduction of 3WN and 3WL Circuit Breakers, Siemens introduced a new perspective in the field of Switching technology and Intelligent communication. The standards of Performance, Reliability, and Safety were further raised through the Sentron series and offered an “Art of Intelligent Simplicity”.

Siemens Sentron family of Air circuit breaker grows further and now offers an additional range of 3WT Circuit breakers for greater choice and optimized selection in LV power system.

Sentron 3WT is available with Siemens hallmark of Performance, Reliability, Safety, Ease of operation and Maintenance, and accurate protections under the banner:

Sentron 3WT “The Art of Simplicity”.

3WT is available from 630 A to 3200 Amp in two frame sizes with the following advantages:

Safety *Plus*:

- High degree of protection – IP 40.
- Interchangeable Line- Load terminals.
- Front cover can't be removed if the circuit breaker is in closed condition.
- “SAFE OFF” Suitable for isolation. Castell key can be removed only when contacts are separated.
- Locking of withdrawable circuit breaker against moving, as standard.
- Locking of the guide frame with the circuit breaker removed, as standard.
- Trip signalling switch for overload and short circuit tripping with mechanical closing lock out.
- Distinct “Ready to Close” interlocking is provided as inherent safety features. This ensures safe switching ON of ACB and eases the diagnosis.
- 3WT Conforms to isolation requirement as per IEC 60-947- 2.

Easy *Plus*:

Ease of Operation, Maintenance and Upgradation:

- Unambiguous ON- OFF indicator with auxiliary switch for signal.
- Click-fit front accessories e.g Shunt, Under Voltage, etc can be replaced without removing the breaker from the panel and needs no calibrations.
- High electrical life reduces frequency of replacement of contacts.
- Permits last minute up-gradation. e.g converting from Manual to Motorized or from fixed to draw-out.
- Built-in test features of the release permit testing of the breakers and trip circuitry without additional test kit.
- Contact erosion indicator for predictive maintenance.

Compact and Power Saver:

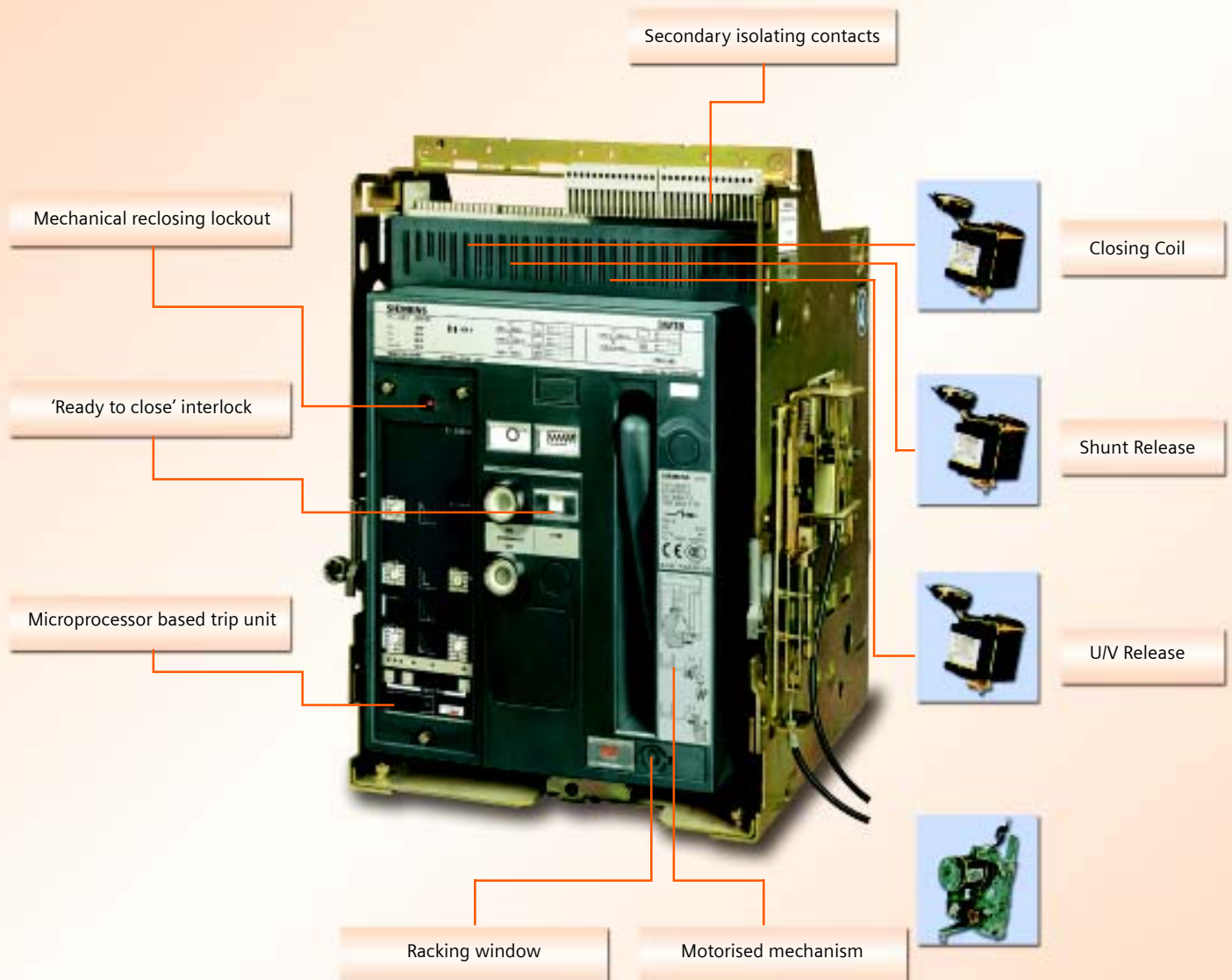
- Continues rated low consumption accessories like shunt, Motor, Under Voltage bring down the cost and size of the control transformer.
- Low power loss per poles improves the inpanel rating of the circuit breaker without increasing the circuit breaker width. 630 Amp 3WT 630 Amp fixed version has 40 watt power loss and a width of 320 mm.

3WT conforms following standards:

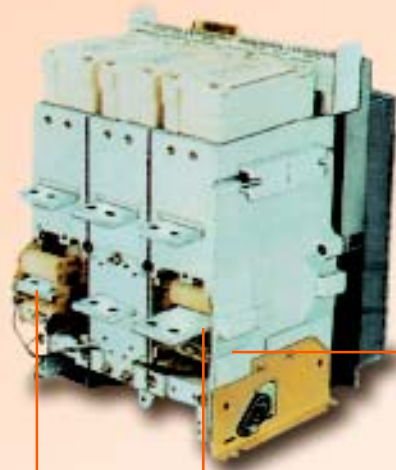
- IEC 60947 –2, IS 13947 -2
- VDE 0660 Part 101,
- GB 14048.2,
- Climate proof to IEC 60 068 –2-30,
- Approval according to maritime classification on request.



3WT – The Art of Simplicity -



Simplicity of Inspection and Operational Safety



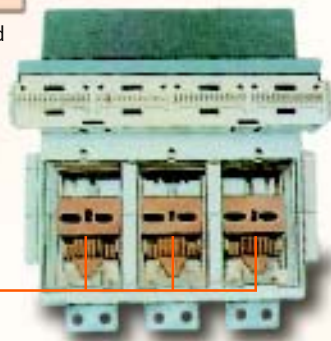
Easily approachable protection C.Ts

- Fire retardant insulating material

Insulating enclosure segregates phases completely and isolates the power contacts from the front accessible operating mechanism/auxiliaries/trip unit compartments

Contact erosion indicator

- No adjustments required after replacing power contacts



Front accessible secondary isolating contacts permit inspection and retrofitting of auxiliaries without removing the breaker from the guide frame

Metallic guide rails hold the breaker in maintenance position for inspection and retrofitting of auxiliaries

Racking window blocks access to the racking mechanism. The window opens only when the 'OFF' push button is kept depressed, preventing racking of the breaker in 'ON' condition.

Keyless Mechanical Interlocking



Mechanical Cord

Interlocking Mechanism

- Two or three breakers can be mechanically interlocked
- Ideal for auto change over systems
- The breakers can be mounted side by side or above each other

Easy Terminations:

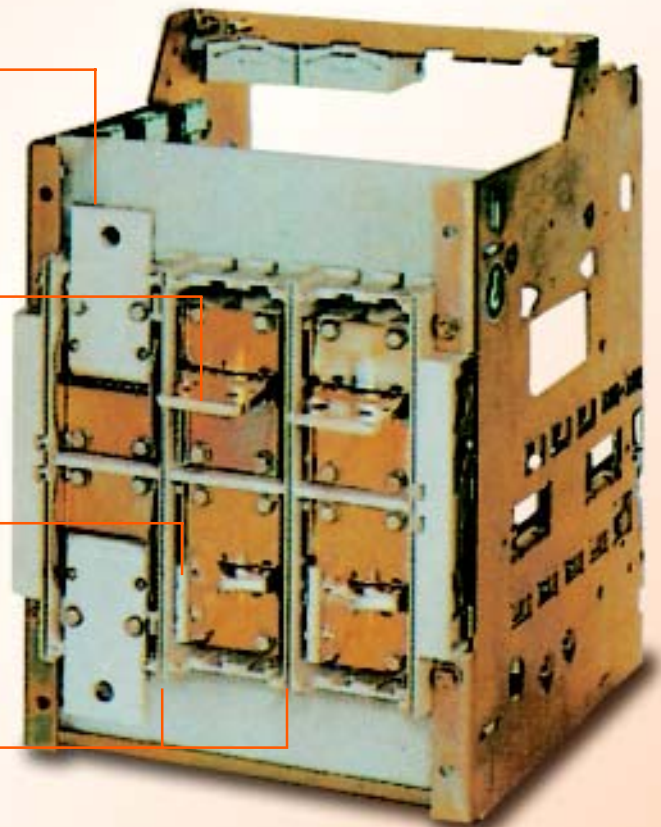
Simplified busbar and cable connections through different terminal orientation

Front accessible terminals for panels without rear access

Rear horizontal terminals for horizontal bus connections & bus couplers

Rear vertical terminals for multiple cable terminations and vertical droppers

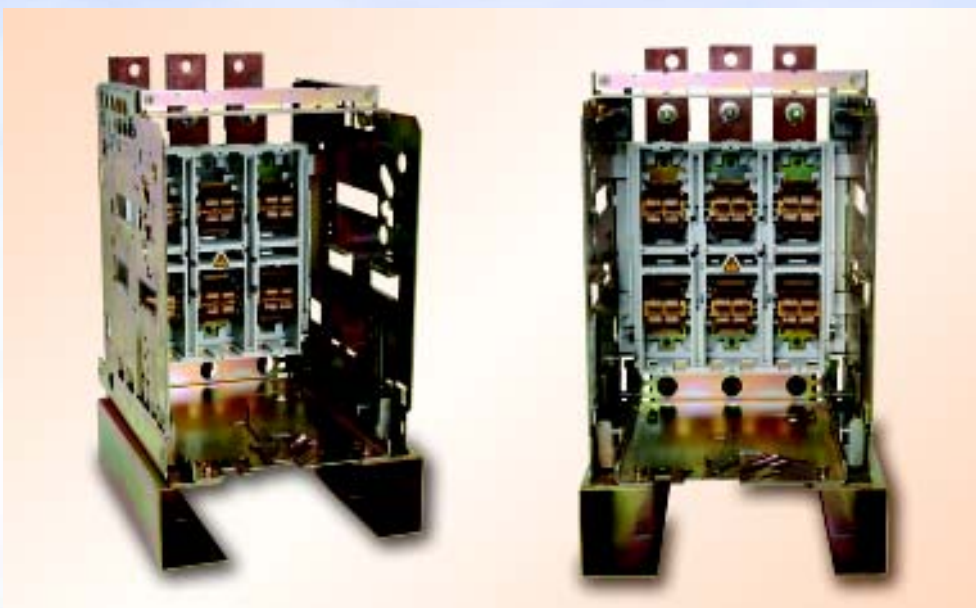
Slot for Phase barrier to prevent arc propagation in the ACB in the event of line side fault



Breakers terminals are generously designed for copper and Aluminum terminations.

Easy "Retrofit" options:

"Ready to Fit" Kit for replacing your old circuit breaker (3WE or any other make*) by 3WT without drilling a single additional hole in a existing panel to match the mounting or busbar terminations.

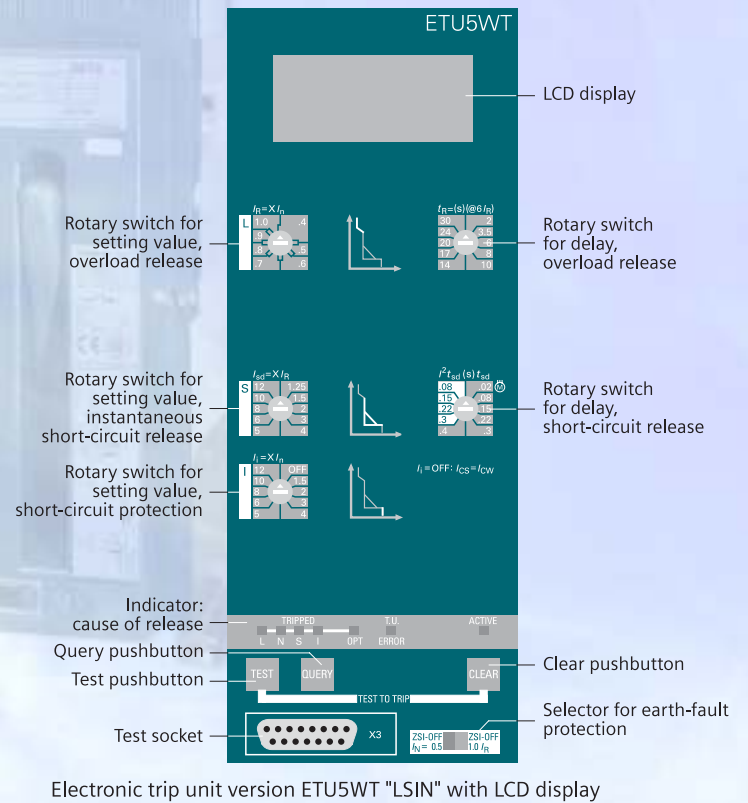
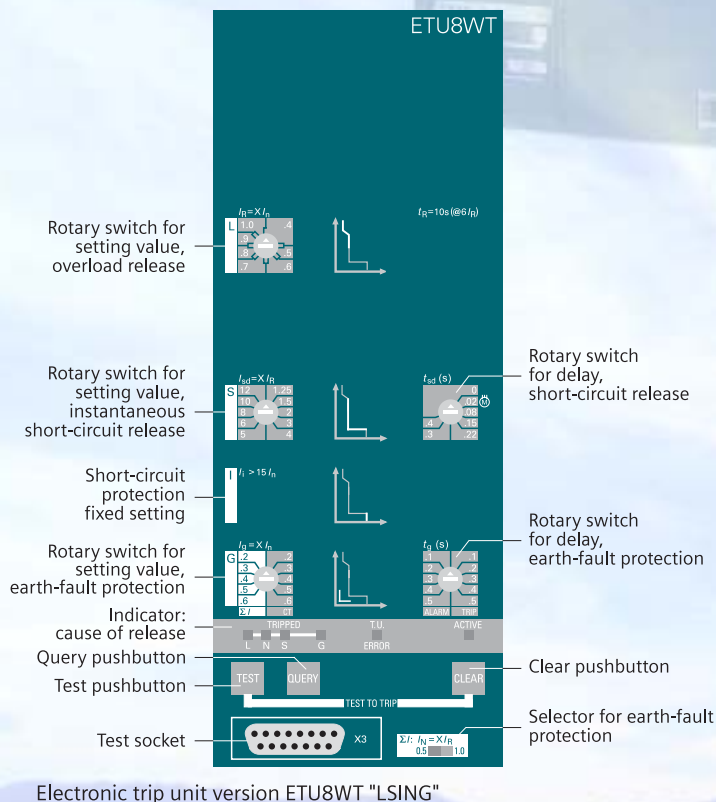
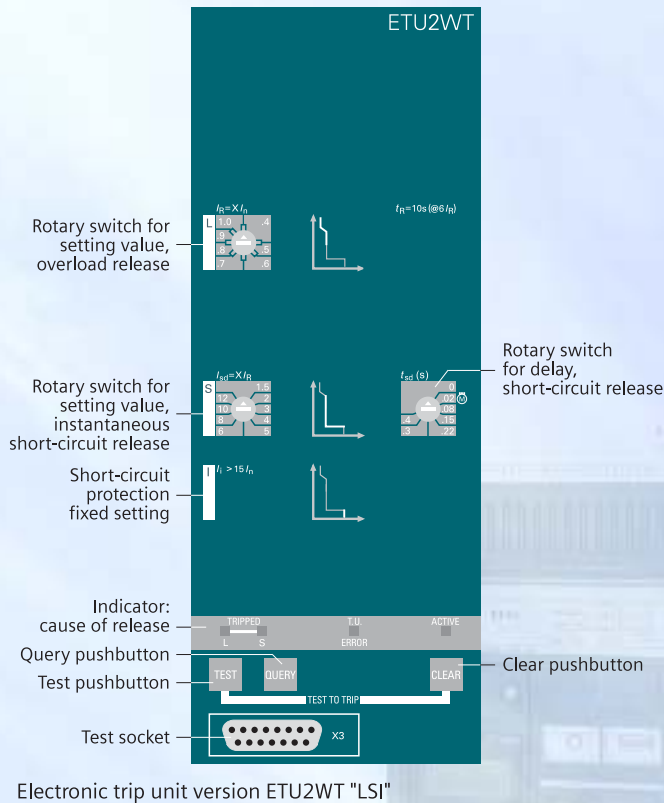


* Conditions apply

Electronic trip units

The Microprocessor based releases which measures TRUE RMS current are provided with following standard features:

- **Integrated Test Features:**
The test button test the healthiness of solid –state trip units, trip solenoid and breaker mechanism with or without tripping of the circuit breaker. This eliminates external test unit to check the healthiness of the protection measuring system.
- **Active LED to show healthiness of ETU:**
Correct operation of the electronic trip unit is indicated by the “heartbeat” of a green flashing LED. Rapid flashing of LED will indicate whenever load current exceeds the threshold value of overload protections.
- **Fault Clarity and Fault History:**
The LEDs shows the reason for tripping of the breaker. Fault history is also recorded and can be recovered by QUERY button.



- **Microprocessor Bypass circuit:**
If a microprocessor fault occur, the alarm will activate red LED "MP". This alarm indicates that the overload protection functions are not currently active. However, with the internal bypass circuit, ETU guarantees protection against short-circuit.

Comprehensive Additional Functions for High Uptime:

Comprehensive additional functions – in accordance with the design of the electronic trip unit, e.g.:



- Short time-delay short-circuit release with I^2t -dependent delay for improved discrimination to the downstream fuses
- LCD operating current display

Ground-fault protection

- Description

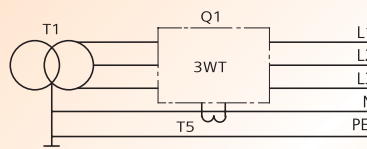
Ground-fault releases "G" sense fault currents that flow to ground and that can cause fire in the plant. Multiple circuit-breakers connected in series can have their delay times adjusted so as to provide time-graded discrimination.

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

- Measurement methods
 - Vectorial summation formation with current transformer in neutral conductor

The neutral conductor current is measured directly and is evaluated for neutral conductor overload protection.

The electronic trip unit determines the ground-fault current by means of vectorial summation of current in all three phases and the N-conductor current.



Three-pole circuit-breakers, current transformers in the neutral conductor suitable for asymmetrical loading of the phases.

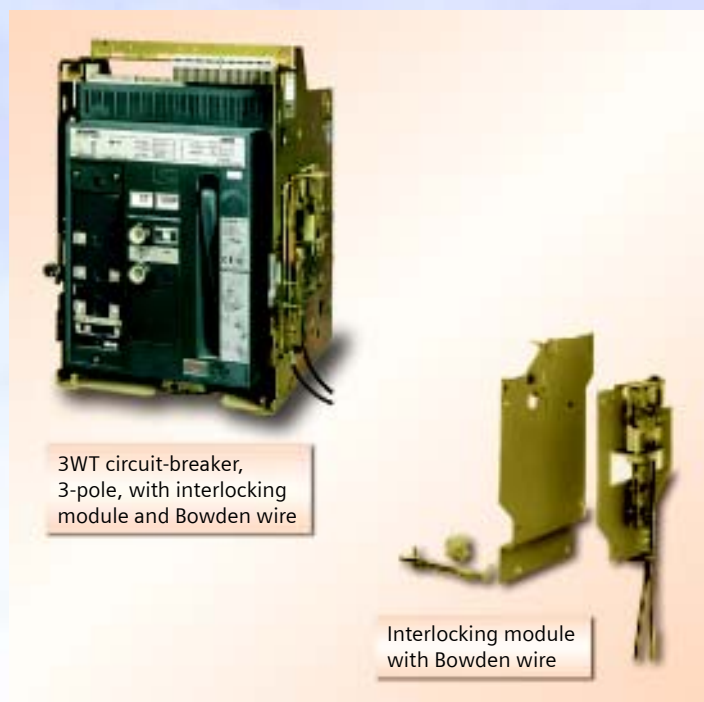
Electronic trip unit version	Current transformer T5 must be connected to auxiliary current connection
------------------------------	--

- | | |
|------------------|------------------|
| • ETU5WT, ETU8WT | 400.13
400.14 |
|------------------|------------------|

For 4-pole circuit-breakers, the fourth current transformer for the N-conductor is installed internally.

Module for mutual mechanical interlocking

The module for mutual mechanical interlocking can be used for one or two 3WT circuit-breakers and can be adapted easily to the corresponding versions.



The fixed-mounted and withdrawable circuit-breaker versions are fully compatible and can therefore be used in a mixed configuration in an installation.

The circuit-breakers can be mounted alongside each other or one above the other, whereby the spacing of the circuit-breakers is determined solely by the length of the Bowden cable. The Bowden cables are supplied in standard lengths of 2 m. Interlock signals are looped through via the Bowden cables. Interlocking is only effective in the connected position in the case of withdrawable circuit-breakers.

The mechanical lifetime of the Bowden cables is 8000 operating cycles.

The interlocking module is mounted on the right-hand side of the fixed-mounted circuit-breaker or the guide frame.



Functional overview of the electronic trip unit system

Function

Basic functions

Overload protection



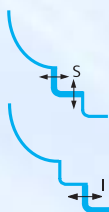
Inverse-time delayed overload release "L" for the phases

Adjustment of the current setting I_R from 40 % to 100 % I_n
Graduation 5 %
Graduation freely programmable
Time-lag class t_R = opening time at $6 \times I_R$, setting t_R
Thermal image

for the neutral conductor ¹⁾

"Phase-failure sensitivity" (reversible)
Adjustment of the current setting I_n
Time-lag class t_R of the neutral conductor as for the phases

Short-circuit protection



Short-time delayed short-circuit release "S"

Setting the operating current I_{sd}

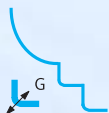
Setting the delay time t_{sd}

With $I^2 t_{sd}$ -dependent delay, delay time t_{sd}

Instantaneous short-circuit release "I"

Setting the operating current I_i

Ground-fault protection



Ground-fault release "G" ¹⁾

Setting the operating current I_g

Setting the delay time t_g

LCD display

Operating current indication

LED display

Status indication

Flashing LED when electronic trip unit activated

"Tripped" indication

"L" release

"S/I" release

"S" release

"I" release

"N" release

"G" release $\frac{I}{I_n}$

Alarm indication

T. U. ERROR

Test

Internal self-test and display via LED

Connection of the test device to test connector X3

Basic configuration

Signal by signaling switch (1 NO)

Ready-to-close

Circuit-breaker can be safely closed

"Tripped" switch

Latching; active after "L", "S", "I", "G" ²⁾ release with/without mechanical closing lockout

1) With 3-pole circuit-breakers a current transformer is required if there is asymmetrical loading of the phases. In the case of 4-pole circuit-breakers a current transformer in the neutral conductor is fitted internally in the circuit-breaker.

2) "G" release occurs with "Trip" setting on the electronic trip unit.

Electronic trip unit version (≅ 8th position of Order No.)	ETU2WT	ETU8WT	ETU5WT
	●	●	●
	10 s	10 s	2–30 s
	▲	▲	▲
		50 or 100 %	50 or 100 %
	1.5–12× I_R	1.25–12× I_R	1.25–12× I_R
	0; 20–400 ms	0; 20–400 ms	20–400 ms
			80–300 ms
	>15× I_n	>15× I_n	>1.5–12× I_n and $I_i = \infty$ with setting $I_i = \infty$ then $I_{cu} = I_{cs} = I_{cw}$ (lowest value decisive)
		0.2–0.6× I_n	
		100–500 ms	
	●	●	●
	●	●	●
	●	●	●
			●
			●
		●	●
		●	
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●

- Function available as standard
- ▲ Function active when t_d is set to 20 ms.

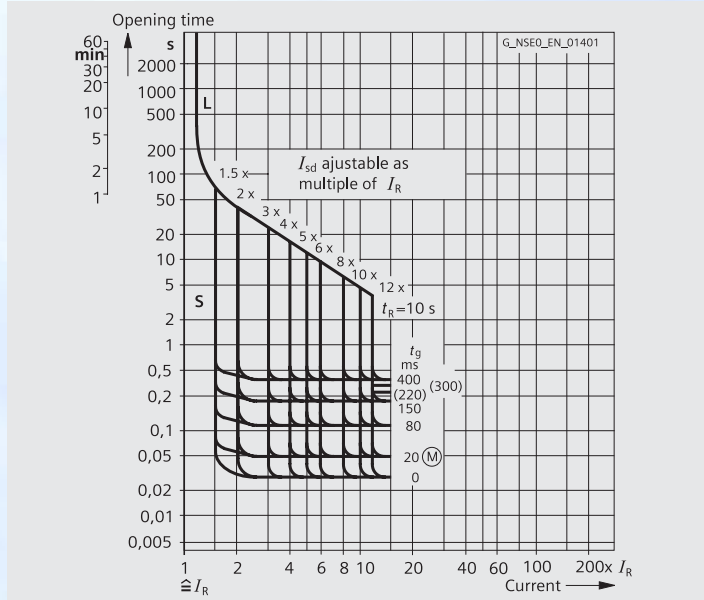


3WT Characteristics

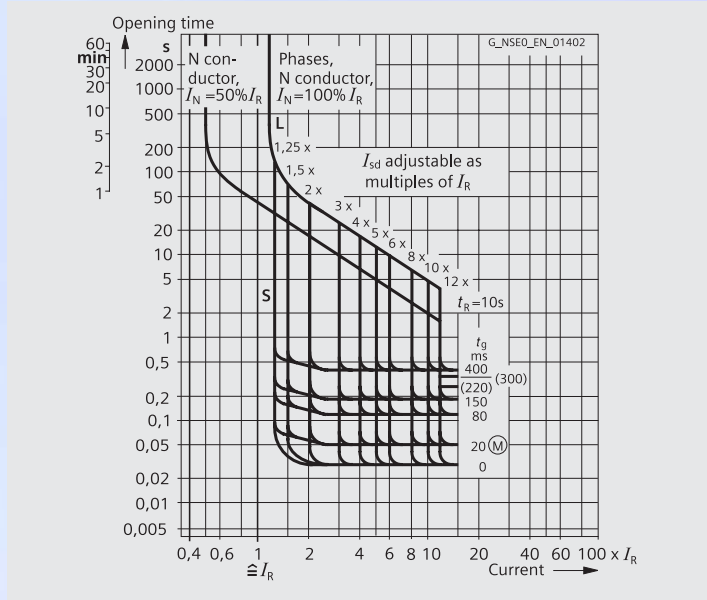
The characteristics show the behavior of the electronic trip unit when it is activated by a current that is already flowing before the tripping operation. If the overcurrent tripping occurs immediately after switch on and the electronic trip unit is yet to be activated,

the opening time is extended, depending on the level of the overcurrent by approximately 3 to 10 ms. In order to determine the total break-times of the circuit-breakers, approximately 15 ms must be added to the opening times shown for the arcing time.

Tripping characteristics "L" and "S": "S" = definite-time delayed



Tripping characteristics of electronic trip units – version ETU2WT



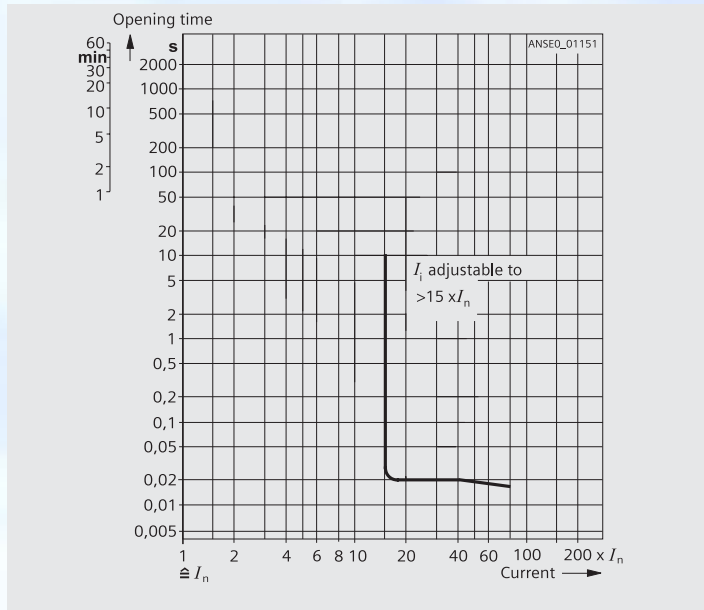
Tripping characteristics of electronic trip units – version ETU8WT

Key to illustrations above:

Inverse-time delayed electronic trip unit "L"
 I_R Current setting (adjustable)
 I_N Current setting (50 or 100 % I_R) for the N conductor
 t_R Time-lag class (permanently set to 10 s)

Short-time delayed short-circuit release "S"
 I_{sd} Operating current (adjustable)
 t_{sd} Delay time (adjustable)

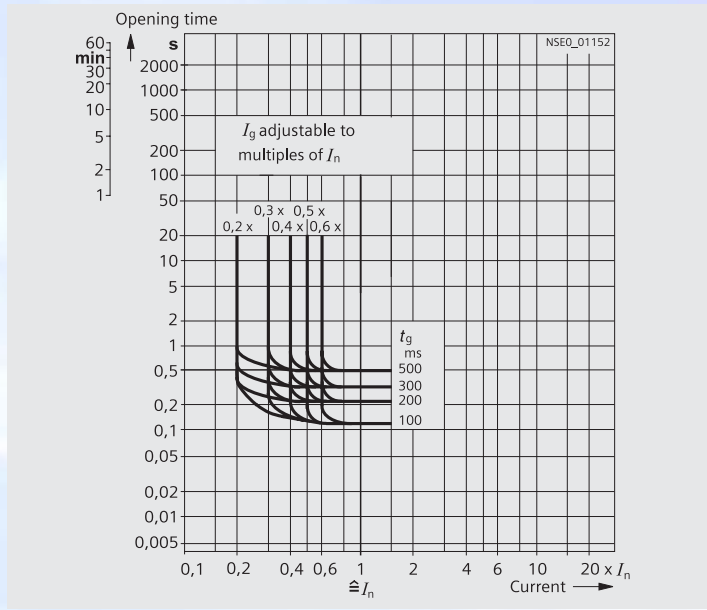
Tripping characteristics "I"



Tripping characteristics of electronic trip units – versions ETU2WT and ETU8WT

I_n Transformer primary rated current
 Instantaneous short-circuit release "I"
 I_i Operating current (permanently set)

Tripping characteristic "G": definite-time delayed

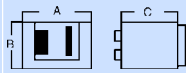


Tripping characteristics of electronic trip units – version ETU8WT

I_n Transformer primary rated current
 Ground-fault release "G"
 I_g Operating current (adjustable)
 t_g Delay time (adjustable)

Technical Specifications that blends with Indian Environment:

3WT Technical Specification Sheet

Basic Units		3WT		Size I			Size II		
Rating		3WT8 06	3WT8 08	3WT8 10	3WT8 12	3WT8 16	3WT8 20	3WT8 25	3WT8 32
Rated Current (In) 50/60 Hz at 40°C ambient temperature	Main Conductors A	630	800	1000	1250	1600	2000	2500	3200
	N Conductor A	630	800	1000	1250	1600	2000	2500	3200
Rated operational voltage Ue 50/60 Hz, 3 Ph.	V (AC)	upto 440 V							
Rated impulse withstand voltage, Uimp	Main conducting paths (kV)	8							
	Auxiliary Circuit (kV)	4							
Utilization category as per IEC 947-1 & 2		B							
Rated short circuit making capacity Icm (peak)	upto 440 V	110					143		
Rated service short circuit breaking capacity, Ics (r.m.s) (Ics = Icu)	upto 440 V	50					65		
Rated short time withstand current, Icw. For 1 Sec at 50/60 Hz	1 Sec Rating	50					60		
Permissible service temperature	Operation °C	(-20 / 70)							
Power Loss at In	Fixed- mounted	40	60	90	120	140	170	325	420
(with 3 phase symmetrical load)	Withdrawable	80	130	205	255	310	310	535	760
Durability (Operating Cycles)									
Mechanical (with maintenance)		16000					12000		
Mechanical (without Maintenance)		8000					6000		
Electrical (without Maintenance)		5000					2000		
Degree of Protection		IP 40							
Weight, 3/4 Pole ACB	Fixed (kg)	34 / 47				36 / 49	57 / 70		61 / 74
	Drawout (kg)	36 / 49				38 / 51	59 / 72		63 / 76
	Guide Frame (kg)	22 / 27				33 / 28	35 / 46		37 / 48
Dimensions		A (mm)	320/420				420 / 540		
3 / 4 Pole		B (mm)	470				470		
		C (mm)	330				330		



For dimensional details and circuit diagrams please refer catalogue no. SGR-

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SGR-

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