



POWERFACTORY

PowerFactory 2021

Technical Reference

Siemens 3WL1

POWER SYSTEM SOLUTIONS
MADE IN GERMANY

F2021

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Disclaimer

DlgSILENT protection device models are developed using publicly accessible information, such as user manuals, and are not validated or tested by the respective manufacturers.

1 Model information

Manufacturer Siemens

Model 3WL1

Variants The Siemens 3WL1 series contains the electronic trip unit *"ETU45B"* available for circuit breakers 3WL1 based on the information given in [1] and [2]. Each combination of model and available sensor rating is a dedicated type.

2 General description

The electronic trip unit is modelled as LSIG which corresponds to *"ETU45B"*. The units are modelled as 3-pole without neutral. The earth fault input is calculated from the phase currents.

Current transformer

The *"CT"* slot holds the assigned ideal 3-phase current transformers which has to be modelled with a ratio of 1/1.

Measurement unit

The *"Measurement"* slot processes the transformer inputs and holds the rated current value of the circuit breaker. The zero-sequence current is determined from the phase values.

Trip logic

The *"Trip Logic"* generates the tripping signal.

3 Electronic trip unit

The electronic trip unit *"ETU45B"* consists of three phase current stages and one zero-sequence current stage. The underlying phase current stage blocks the overlying phase current stage if started, e.g. if the short-time stage is started, the long-time stage is blocked.

4 Variants

Address	Relay Setting	Model Unit	Model Parameter	Note
	Long time current setting I_r	Long time	Pickup Current	
	Long time I_{2t} time-lag class tr	Long time	Time Setting	at $6 \times I_r$
	Long time I_{4t} time-lag class tr	Long time	Time Setting	at $6 \times I_r$
	Short time current setting I_{sd}	Short time	Pickup Current	
	Short time definite tsd	Short time	Time Setting	see 1)
	Short time I_{2t} tsd	Short time	Time Setting	see 1)
	Instantaneous current setting I_i	Instantaneous	Pickup Current	see 2)
	Operating time	Instantaneous	Time Setting	fixed to 15 ms
	Ground fault pickup current I_g	Ground fault	Pickup Current	see 3)
	Ground fault definite tg	Ground fault	Time Setting	
	Ground fault I_{2t} tg	Ground fault	Time Setting	

Notes:

- 1) – Motor protection function not modelled (tsd = 0.02 s)
– Time setting at $12 \times I_n$
- 2) – Maximum setting $0.8 \times I_{cs}$ is neglected
– No logic implemented if Short time or Instantaneous unit is out of service
- 3) – Pickup setting depending of frame size:
 - * Frame size I and II: 100 to 1200 A
 - * Frame size III: 400 to 1200 A

4 Variants

Type	Sensor rating	Trip unit
3WL11	630; 800; 1000; 1250; 1600; 2000 A	Electronic
3WL12	800; 1000; 1250; 1600; 2000; 2500; 3200; 4000 A	Electronic
3WL13	4000; 5000; 6300 A	Electronic

5 References

- [1] Siemens AG, Postfach 10 09 53, 93009 Regensburg, GERMANY. *3WL1 Air Circuit Breakers Sentron - Configuration Manual Edition 04/2018*. 3ZW1012-3WI11-0AC1.
- [2] Siemens AG, Siemensstr. 10, 93055 Regensburg, GERMANY. *Siemens Circuit Breakers Sentron WL*. 3ZW1012-0WL11-0AB1.