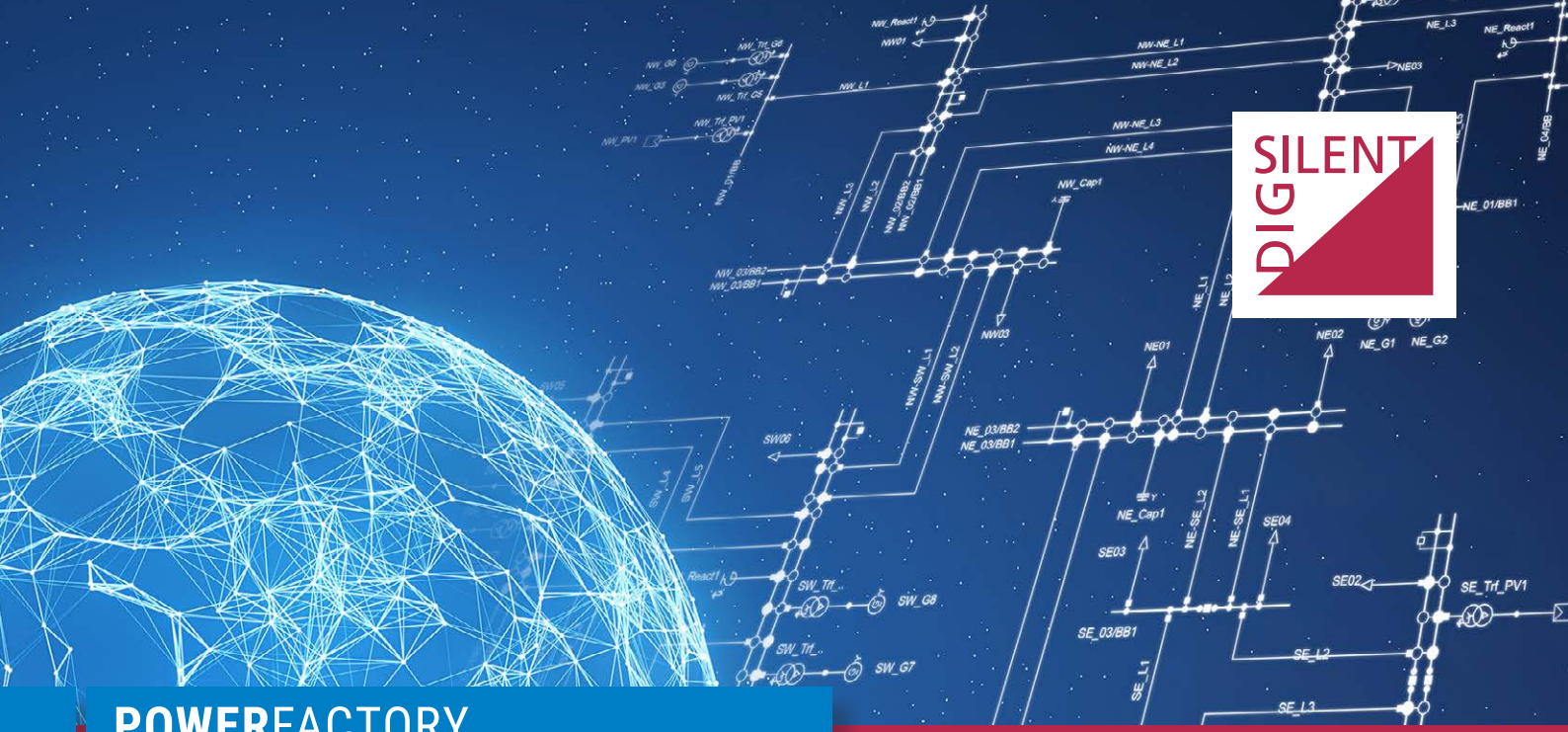

POWERFACTORY

PowerFactory 2021

Technical Reference

Terasaki TemBreak 2

PF2021

POWER SYSTEM SOLUTIONS

MADE IN GERMANY

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Contents

Disclaimer

DIgSILENT 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 Terasaki

Model TemBreak 2

Variants The Terasaki TemBreak 2 series contains thermal-magnetic trip units and electronic trip units for circuit breakers *"TemBreak 2"* based on the information given in [1]. Each combination of model and available sensor rating is a dedicated type.

2 General description

The electronic trip unit is modelled as LSIG. 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 Thermal-magnetic trip unit

The thermal-magnetic trip unit consists of two phase current stages. Thermal characteristics consist of minimum and maximum tripping curves and are digitalised according to information given in [1]. The magnetic curves are modelled as ideal minimum and maximum tripping curves.

Address	Relay Setting	Model Unit	Model Parameter	Note
	Pick-up Ir	Thermal	Pickup Current	adjustable
	Time Delay tr	Thermal	Time Setting	
	Pick-up Ii	Magnetic	Pickup Current	adjustable
	Time Delay ti	Magnetic	Time Setting	

4 Electronic trip unit

The electronic trip unit consists of four 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. Please note, that all settings depend on the selected characteristic in the real device. In the model the settings are independent of the characteristic.

Address	Relay Setting	Model Unit	Model Parameter	Note
	Long time setting	Long time	Pickup Current	
	Characteristics	Long time	Characteristic	see 1)
	Short time pickup Isd	Short time	Pickup Current	
	Short time delay tsd	Short time	Short Setting	total clearing time +50 ms
	Instantaneous Ii	Instantaneous	Pickup Current	see 2)
	Instantaneous delay	Instantaneous	Time Setting	
	Instantaneous Ii	Instantaneous Max	Pickup Current	see 2)
	Instantaneous delay	Instantaneous Max	Time Setting	
	Ground fault pickup Ig	Ground fault	Pickup Current	see 3)
	Ground fault delay tg	Ground fault	Time Setting	total clearing time +50 ms

Notes:

1) – Characteristic only for long time unit

2) – Two phase current stages model the instantaneous function:
   - *"Instantaneous"* setting depending on Ir
   - *"Instantaneous Max"* setting depending on In

3) – Sensor ratings In < 400 A without ground fault unit

5 Variants

Type	Sensor rating	Trip unit
S125-NJ	20; 32; 50; 63; 100; 125 A	Thermal-magnetic
S160-NJ	20; 32; 50; 63; 100; 125; 160 A	Thermal-magnetic
S250-NJ	160; 200; 250 A	Thermal-magnetic
S400-NJ	250; 400 A	Thermal-magnetic
S800-NJ	630; 800 A	Thermal-magnetic

Type	Sensor rating	Trip unit
x250-NE	40; 125; 160; 250 A	Electronic
x400-NE	250; 400 A	Electronic
x630-NE	630 A	Electronic
x800-NE	630; 800 A	Electronic
x1000-NE	1000 A	Electronic
x1250-NE	1250 A	Electronic
x1600-NE	1600 A	Electronic

6 References

[1] TERASAKI ELECTRIC, 7-2-10 Hannancho, Abenoku, Osaka, JAPAN. *TemBreak2 & TemBreak MCCB Catalogue*. CAT REF. 16-I61EU.