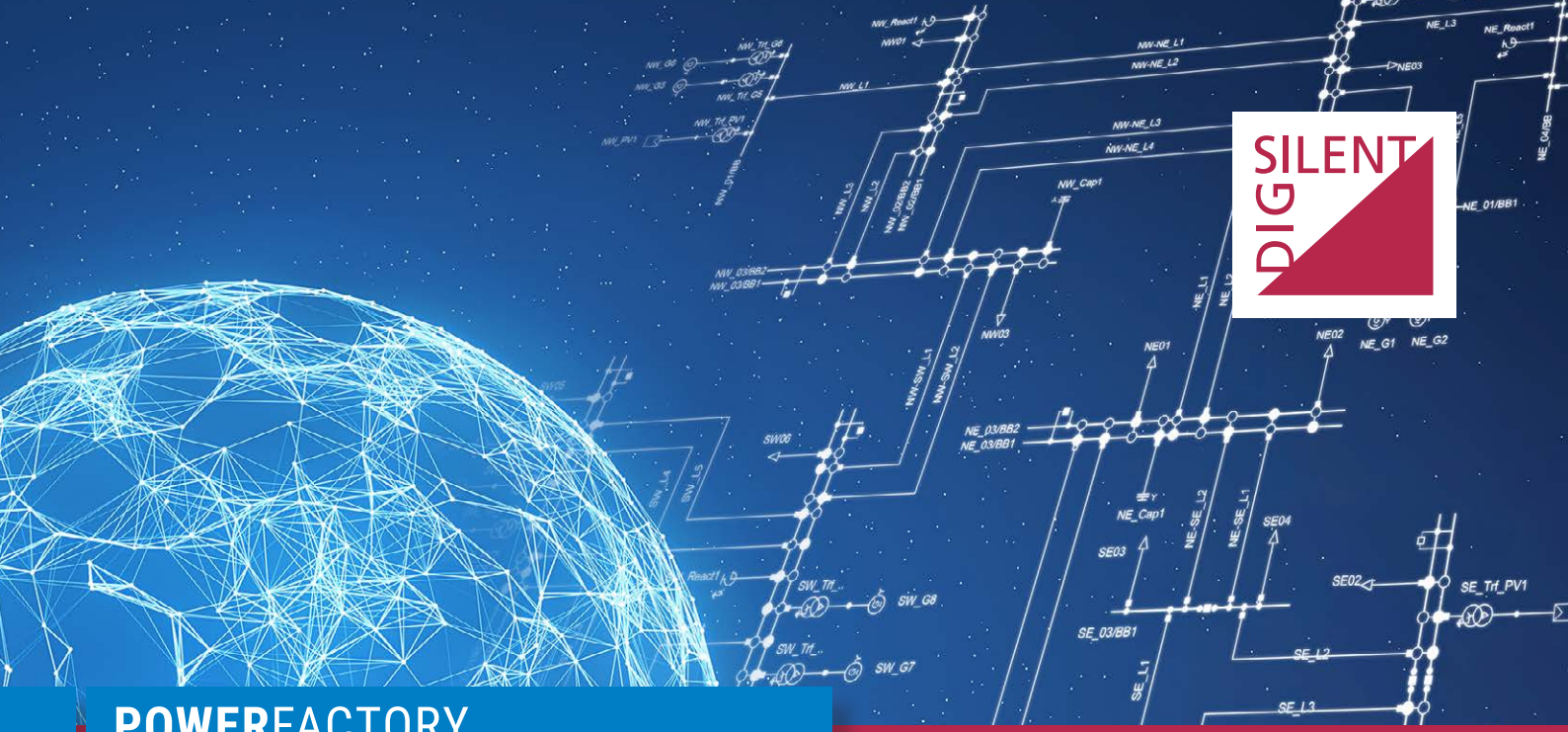

POWERFACTORY

PowerFactory 2021

Technical Reference

DIgSILENT F49 Thermal image Generic Relay

PF2021

POWER SYSTEM SOLUTIONS

MADE IN GERMANY

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1 F49 Thermal image

1.1 Intent

To simulate a complete set of thermal image elements with negative sequence contribution.

1.2 Functionality

The *F49 Thermal image* relay model simulates two thermal image (F49) elements. Two thermal image elements are used for instance in the transformer protection to take care of the different time constant of the windings ('cooper') and of the magnetic circuit ('iron'). The currents evaluated by the thermal image elements are equal to the phase current plus the negative sequence current multiplied by a 'k' factor. This feature is requested to protect the rotating machines where a negative sequence current produces a field rotating at a speed which twice the system frequency with greater heating effect. The thermal status of both thermal element is monitored and used to set an alarm signal if greater than a given threshold. Two relay input signals can be used to block the protective elements. Each protective element can be set to ignore the blocking input or to ignore the blocking input after that a user's definable time has expired after the element trip ("Blocking" tab page). The output logic can be customized in the relay output logic block.

1.3 Inputs

- One 3 phase CT ("Phase Ct" block, *StaCt* class).
- Two blocking signals (*iblock_1* blocking the "Ith1>" element, and *iblock_2* blocking the"Ith2>" element).

1.4 Available Units

Measurement

- One 3phase measurement element ("Measurement" block, *RMS Calculation* enabled, *Filter* disabled [RelMeasure class]).

Protective elements

- Two thermal image elements ("Ith1>", and "Ith2>" block, [*RelToc* class]).
- Two logic blocks composing the currents evaluated by the thermal image elements ("K1" and "K2" block [*RelLogdip* class]).
- Two thermal alarm threshold element ("Ith1> Alarm" and "Ith2> Alarm" block [*RelChar* class]).

Output logic

- One relay trip element ("Output logic" block, *RelLogdip* class).

1.5 Outputs

- *yout* associated by default to any protective element trip.
- *y_s* associated by default to any protective element start.
- *yout1* associate to the trip of the first thermal image element.
- *yout2* associate to the trip of the second thermal image element.

The output logic can be configured in the ”Logic” tab page of the ”Output Logic” block.