

Features

- Protects capacitor banks by supervising the unbalance current
- Low set current stage for alarm
- Higher set trip stage disconnects the battery before healthy units are damaged
- Both current stages definite time delayed for selective functioning
- Measuring principle insensitive to harmonics

Application

Capacitor banks are made up of individual units which are series and parallel connected. Each unit is made up of several series and parallel connected elements. If one element is short-circuited or disconnected by internal fuses, the load on the remaining elements increases. The unbalance protection is connected to a current transformer which measures the current flowing between two

normally balanced parts of the capacitor bank. Under normal conditions, no current flows in the interconnection. A low set current stage gives alarm when elements are damaged and current flows in the interconnection. The trip stage is set to disconnect the bank before healthy elements become overloaded and damaged.

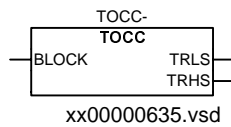
Functionality

The current measuring element continuously measures the unbalance current and compares it to the set operate value for the two current stages. A filter ensures immunity to disturbances and harmonic currents. The output relay for the low current (alarm) stage operates if the current becomes higher than the set operate value I_{Low} during a time exceeding

the set time delay t_{Low} . If the current becomes higher than the set operate value I_{High} during a time exceeding the set time delay t_{High} , the output relay for the high current stage operates.

The input signal BLOCK blocks both the low set and the high set functions.

Function block



Input and output signals

Table 1: Input signals for the TOCC (TOCC-) function block

Signal	Description
BLOCK	Blocks the unbalance protection function

Path in local HMI: ServiceReport/Functions/CapUnbalance/FuncOutputs

Table 2: Output signals for the TOCC (TOCC-) function block

Signal	Description
TRLS	Alarm from the low set current stage
TRHS	Trip from the high set current stage

Technical data

Table 3: TOCC - Unbalance protection

Function	Setting range	Accuracy	
		50/60 Hz	16 2/3 Hz
Operate current of low set stage I>Low	(2-100) % of I5b in steps of 1%	+/- 3.0 % of I _r	+/- 5 % of I _r
Time delay tLow of current stage I>Low	(0.000-60.000) s in steps of 1ms	+/- 0.5 % +/- 10 ms	+/- 0.5 % +/- 10 ms
Operate current of high set stage I>High	(2-200) % of I5b in steps of 1%	+/- 3.0 % of I _r at I ≤ I _r +/- 3.0 % of I at I > I _r	+/- 5 % of I _r at I ≤ I _r +/- 5 % of I at I > I _r
Time delay tHigh of current stage I>High	(0.000-60.000) s in steps of 1ms	+/- 0.5 % +/- 10 ms	+/- 0.5 % +/- 10 ms

Manufacturer

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