



CURRENT SENSING UNIT SM

Protection Program

PZ-04025E

Application

Current sensing unit SM increases the reliability of arc protection system, because it eliminates the possibility of tripping caused by other light sources than electrical arc. Some of the sources that can generate intense light are: photo flushes, normal arc light in large circuit breakers etc. When the feeding current exceeds setting, current sensing unit SM gives current logic condition to arc monitors ZELK-2(3). This logic condition enables tripping if the arc is detected.

Functional description

Measuring inputs of current sensing unit SM are connected to current transformers with rated secondary current 1 or 5A. It is possible to apply one, two or three phase connection.

Electric arc generally affects all three phases, but the arc can occur at first in one single phase. If the arc occurs in the phase not monitored by current sensing unit, the operating time of whole arc protection can be prolonged. Because of that three phase connection is recommended.

Adjusting of the current setting $I_{>}$ is performed with potentiometer "I>" on front panel of the unit in range from 0,5 to $5 \times I_N$, (I_N is rated current 1 or 5A).

If the measured current exceeds the current setting, the unit establishes logic signal on outputs 15-16 designed for connection of arc monitors ZELK-2(3). This logic signal indicates overcurrent condition and enables tripping if electric arc is detected. In switchgears with multiple incoming feeders one current sensing unit is applied per each incoming feeder. In this case logic output from one current unit is transferred to logic "OR" circuit of the next unit, and finally the last current unit in the chain transfers logic output to the arc monitors ZELK-2(3). In this way the overcurrent in each incoming feeder can enable tripping of arc protection.

Red LED "I>" on front panel indicates that the measured current has exceeded the current setting.

Main features

- monitoring of switchgear feeding current
- current logic conditions for arc monitors ZELK-2(3) and breaker fault unit ZPM
- instantaneous overcurrent tripping
- remote indication of availability
- testing in operation
- galvanical insulation 2,5 kV between all insulated circuits
- small dimensions, and simple mounting on rail DIN EN 50022-35



figure 1. Current sensing unit SM

Yellow LED " $70\%I>$ " on front panel indicates that measured current is greater than 70% of set value. Green LED "ON" on front panel is used for power on indication. Signalling relay K1 with changeover contact (terminals 11-12-13) is used for remote indication of availability of current sensing unit. In cases when the current sensing unit SM is not available or auxiliary supply has failed, normal functionality of arc monitors ZELK-2, ZELK-3 is ensured.

Under the removable front panel of the current sensing unit there are elements designed for testing: switch S1, red LED "TEST" and potentiometer "T". This elements are used for simulation of test currents $I>$, $70\%I>$ and examining of whole arc protection system (devices ZELK-2(3) and SM).

Auxiliary power supply of current sensing unit is galvanically insulated from internal electronics.

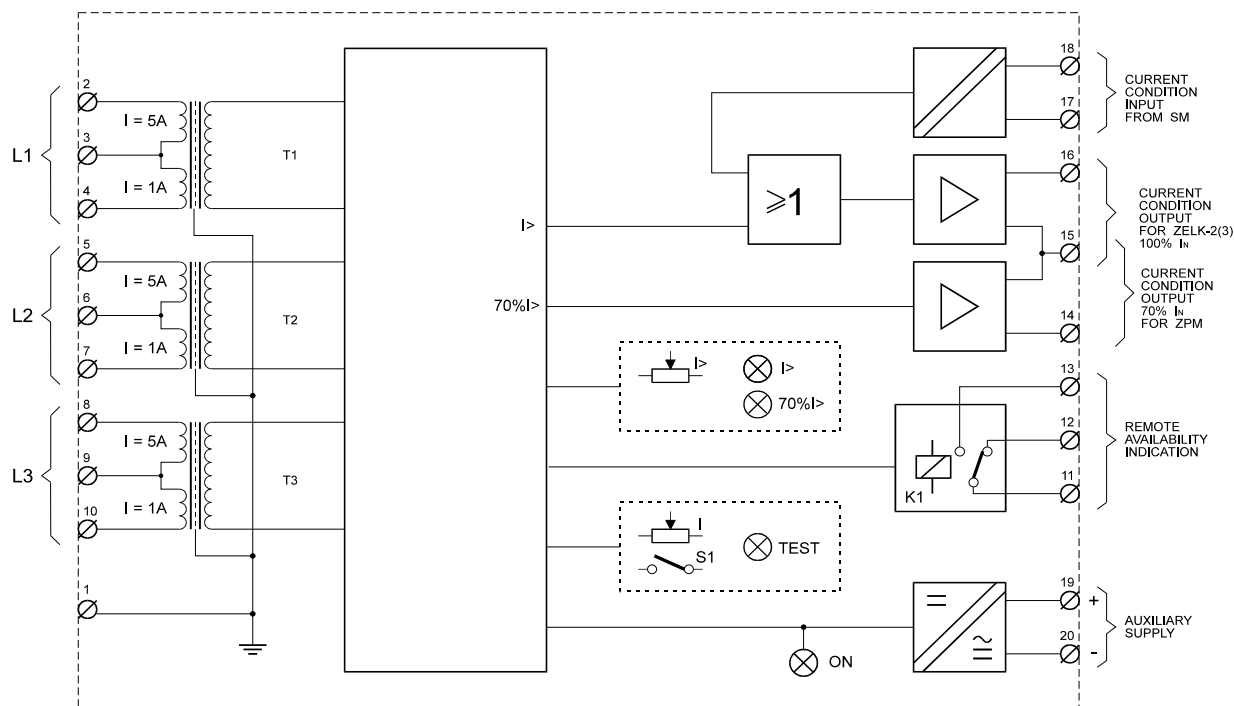


figure 2. Terminal diagram for current sensing unit SM

Specifications

measuring inputs

rated current I_N	1 or 5A
rated frequency	50/60 Hz
continuous withstand	$5 I_N$
withstand for 1s	$100 I_N$
input impedance.....	input 1A - 40m Ω input 5A - 5m Ω

measuring system

current setting $I>$	0,5 - $5 I_N$
reset ratio	95%
operating time	<7ms for 1,2 $I>$ <4ms for 2 $I>$ <1,2ms for 10 $I>$

electronical inputs and outputs

ZELK-2(3) output.....	open collector, 12V, 120mA
ZPM output.....	open collector, 12V, 20mA
SM input	galvanically insul., 12V, 20mA

indication

local	green LED (power on indication) red LED ($I>$ trip) yellow LED ($70\%I>$ trip)
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remote	signalling relay (availability) 220V AC, 300V DC, 5A 1 changeover contact
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auxiliary power supply

supply voltage.....	220V AC +10% ; -20% 24V DC +10%; -20%
power consumption.....	max. 5VA

general data

temperature range	-10 $^{\circ}$ C..+55 $^{\circ}$ C
insulation test voltage	2,5 kV, 50Hz, 1min between all insulated circuits

mechanical data

mounting	on DIN EN 50022-35 rail, or on the wall
dimensions	100x74x120 mm
terminals	2x2,5mm 2

