

MAPro105 Numerical 3phase over current + earth fault relay

Protection Functions

– Phase over current:

- Phase current protection is based on fundamental frequency.
- Phase current setting range: 0.1 to $25I_n$ step of $0.01I_n$
- Thresholds: 3 independent levels, $I_>$, $I_>>$, $I_>>>$
- $I_>$ setting range: 0.1 to $25I_n$
- $I_>>$ setting range: 0.1 to $25I_n$
- $I_>>>$ setting range: 0.5 to $40I_n$
- Reset ratio: 95%
- Shortest operation time: <50 mSec
(Instantaneous operation)
- Drop out time: <50 mSec
- Definite time delay(trip & reset): 0-600 Sec step of 0.01Sec

- IDMT curves for trip: IEC: Short time Inverse (STI)
Standard (normally) Inverse (SI)
Very Inverse (VI)
Extremely Inverse (EI)
Long Time Inverse (LTI)
IEEE: Moderately Inverse (IMI)
Very Inverse (IVI)
Extremely Inverse (IEI)
- IDMT curves for reset (Option): IEEE Moderately Inverse (IMI)
IEEE Very Inverse (IVI)
IEEE Extremely Inverse (IEI)
- Time multiplier setting:
Trip: 0.025 to 1.5 step of 0.001
Reset (Option): 0.025 to 3.2 step of 0.001

– Neutral/Earth fault protection

- Earth current protection is based on fundamental frequency.
- Earth current setting range: 0.02 to $8I_{en}$ step of $0.01I_{en}$
- Thresholds: 3 independent levels, $I_{e>}$, $I_{e>>}$, $I_{e>>>}$
- $I_{e>}$ setting range: 0.02 to $8I_{en}$ step of 0.01
- $I_{e>>}$ setting range: 0.02 to $8I_{en}$ step of 0.01
- $I_{e>>>}$ setting range: 0.02 to $8I_{en}$ step of 0.01
- Reset ratio: 95%
- Shortest operation time: <50 mSec (Instantaneous operation)
- Drop out time: <50 mSec
- Definite time delay (trip & reset): 0-600 Sec step of 0.01Sec
- IDMT curves for trip: Same as phase over current curves
- IDMT curves for reset: Same as phase over current
- Time multiplier setting: Trip: 0.025 to 1.5 step of 0.001
Reset: 0.025 to 3.2 step of 0.001

– Under current protection

- This protection is based on fundamental frequency.
- Phase under current setting range ($I_<$):
0.02 to $1I_n$ step of 0.01
- Time delay setting range: 0 to 150 Sec step of 0.01 Sec
- Reset ratio: 105%

– Negative sequence over current protection

- This protection is based on fundamental frequency.
- Current threshold setting range: 0.1 to $25I_n$ step of 0.01
- IDMT curves for trip: Same as phase over current curves
- Time multiplier setting: 0.025 to 1.5 step of 0.001
- DMT: 0 to 600 Sec step of 0.01 Sec
- Reset time (definite): 0 to 600 Sec step of 0.01 Sec

Automation Functions For Protection

- Cold Load Pick up
- Multi shot Auto Re closer
- Trip Circuit Supervision
- Broken Conductor
- Inrush Restrain
- Event recording (capacity: 75)
- Fault recording (capacity: 10)
- Disturbance recording
 - Capacity: 10 records
 - Record sampling rate: 16 samples/cycle
 - Pre fault time: 200mSec (10 cycles)
 - Post fault time: 200mSec to 3Sec.s
 - Data: AC inputs + date & time (1mSec accuracy)

Communication

- RS485 (rear connector, twisted pair wire)
 - Protocol: MODBUS RTU
- USB (front connector)

Inputs & outputs

- AC inputs
 - Phase current inputs: 1A & 5A by connection
(Specified in setting)
 - Earth current input: 1A & 5A by connection
(Specified in setting)
 - Frequency: 50 Hz
- Digital inputs & outputs
 - Digital inputs: 5 Independent optical isolated
Burden <10mA
Voltage range 35 to 150Vdc
Recognition time <5mSec
 - Digital outputs: 8+WD dry contacts
Contact ratings:
AC max 10A/250V, 50W resistive, 25W
Inductive with L/R 40mSec
DC max 0.3A/135V, 40W L/R 30mSec
Contact operation time:
<10mSec
Contact electrical & mechanical operate lifetime:
>100000 times (at rated load)
- Power supply
 - Aux. voltage range: 55 to 160Vac/dc
 - Ripple: <8%
 - Burden: 3W min, 6.8W max with all output relays energized.

Accuracy

- O.C. thresholds & measurements: +/- 0.5%
- Trip time:
 - Definite time: +/-1%, min: 10mSec
 - Inverse curves: +/-3% for STI, SI, VI, IMI, IVI
+/-5% for LTI, EI, IE