MAPro105T2   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 $8I_n$ step of $0.01I_n$
-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 & circuit breaker fail detection

– Broken Conductor detection:

– Inrush Restrain

– Thermal overload

– Circuit breaker control

– Event recording (Capacity: 1000, Info.: state of D. inputs, D. outputs & LEDs. Data: event name label + time with 1ms acc.)

– Fault recording (Capacity: 50)

– Disturbance recording Capacity: 10 records,16 samples/cycle
-Pre fault time: 0.2 – 3 seconds (10 – 150 cycles)
-Post fault time: 0.2 – 5 seconds (10 – 250 cycles)
-Data: AC & digital inputs & outputs + date & time
          (with 1mSec accuracy)

Communication

- **RS485 (rear connector, twisted pair wire)**
    -Protocol: IEC 60870-5-103(Compatible with DCS)
- **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
- Logic inputs & outputs
-**Logic inputs:**   9 Independent optical isolated
        Burden <10mA, Voltage range 35 to 150Vdc
                    Recognition time <5mSec
-**Logic 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