



Monitoring and Protection Relays

MPS3

Motor Protection Relay



The TiC-MPS3 is the ideal protection for high voltage and low voltage motors in applications requiring comprehensive protection with advanced warning - especially in the process, chemical, marine and offshore industries. Monitoring three phase currents, voltages and up to 10 temperature inputs, it provides a most complete motor protection package. Thermal capacity and overload calculations methods are built - in and also possibility exists to introduce bias into the overload curve from current imbalance (positive/negative sequence) and temperature sensor, ensuring accurate modelling of the motor condition.

Protection Features

- Max. Start Time
- Too many starts Pre-Alarm
- Too many starts
- Undercurrent level 1
- Undercurrent level 2
- Load increase - Alarm
- Over current Level 1 - Jam
- Over current Level 2 - Short
- Thermal Overload Level 1
- Thermal Overload Level 2
- Current Imbalance Level 1
- Current Imbalance Level 2 (Positive/ Negative sequence)
- Undervoltage
- Overvoltage Level 1
- Overvoltage Level 2
- Phase Loss
- Phase sequence
- Ground Fault Level during starting
- Ground Fault Level 1
- Ground Fault Level 2
- Communication Failure
- Internal Failure
- External Fault 1 - interlock
- External Fault 2 - interlock
- External Fault 3 - interlock
- High Temp. Level 1, sensors 1-10
- High Temp. Level 2, sensors 1-10
- Under Power Level 1
- Under Power Level 2
- Low Power Factor
- Auxiliary relay closes upon detection of welded contractor status (programmable)

Level 1 & 2 can be used for Alarm & Trip or both for trip, each with individual time delays.

Protection function

Each protection can be designated as:

- Alarm Fail-safe
- Trip (or Trip Fail-Safe)
- Auto Reset
- Panel Reset
- Remote Reset

Inputs

- Control supply 120-230V, AC/CD
Optional 19-60VDC
- 3 phase voltage, directly up to 690V,
Above 690V through PT
- Three phase currents (1 or 5A)
- 10 temperature sensors, with two types:
* 10 RTD-Pt100 (or CU)
* 6RTD-Pt100 (or CU) and 4
Thermistors (Programmable as NTC
or PTC)
- 4 Programmable discrete inputs
- 4 Programmable Analogue Inputs
0/4-20mA.
Selection between 20 parameters.

Outputs

- 4 Programmable Relays 8A, 250VAC.
- Four Programmable Analogue Outputs:
 - I1, I2, I3, T1, T2 or T3 measured values
 - Motor Load Current
 - Maximum of I1, I2 and I3 values
 - Ground Current
 - Minimum of T1, T2 and T3 values
 - Thermal Capacity
 - Programming allow selection between:
0-20mA or 4-20 mA

Emergency Start (key activated)

Cancelling the thermal capacity and too many starts limits to allow emergency restart after fault.

Settings

With LCD and keypad on the front panel or through the communication port.

Simulation

Simulation of voltage, current and temperature inputs enables testing a relay as well as understanding its functions.

Measured Values

(True R.M.S. at sampling rate of 0.5msec).

- Three phase voltage (phase to phase)
- Three phase voltage (phase to neutral)
- Current, each phase
- Ground current
- Temperature / Resistance, each sensor
- Energy with programmable pulse output
- Power, Reactive power, Power factor
- Minimum & Maximum RMS Average value (three phases) for voltage, Current and Frequency

Statistical data

- Total run time
- Total number of starts
- Total number of trips
- Last start time period
- Last start current peak

Calculated Data

- Motor current (% of FLC)
- Current Imbalance
- Thermal Capacity
- Time to trip
- Time to start (after fault)
- Energy

Fault Data

- Last trip
- Last alarm
- Trip current each phase
- Trip earth fault current
- Trip voltage (each phase)
- History of last 10 trips with time stamp (date, hours, minutes)

Communication

RS-485, half duplex, MODBUS protocol at rates of 1200-19200 bits/sec. Enables parameter change, supervision and remote resetting. 20 user-selectable parameters grouping of actual data.

LCD display

Large 150mm x 30mm (6"x1") display area

LED Indication

- On
- Stopped
- Starting
- Running
- Alarm
- Trip
- Relay A (controller)
- Relay B (controller)
- Internal failure

Real Time Clock

Each fault is date, hour and minute stamped.

Dimensions & Weight

Vertical (WxHxD mm): 135x310x161, 3.3Kg