

MOTOR PROTECTION RELAY SELECTION GUIDE P253 BROCHURE

Transformer Differential Relay

Transformers are high capital cost assets in electrical power systems. Internal faults are a risk for all transformers, with short-circuits dissipating the highest localised energy. Unless cleared quickly, the possibility of rewinding will diminish and core damage may become irreparable.

The MiCOM Agile P642, P643 and P645 address all these issues - preserving service life and offering fast protection for transformer faults. A transient bias technique has been included, enhancing relay stability and CT requirements. CT saturation and no gap detection techniques have been included to improve the low set differential element operating time during CT saturation where the second harmonic blocking might be asserted. An external fault detection algorithm has been incorporated to prevent the CT saturation and no gap detection from affecting the second harmonic blocking when there is an external fault.

Hosted on an advanced IED platform, the P64x incorporates differential, REF, thermal, and overfluxing protection, plus backup protection for uncleared external faults. Model variants cover two and three-winding transformers (including auto-transformers), with up to five sets of 3-phase CT inputs. Large CT counts are common in ring bus/mesh corner applications, where the P64x summate currents to create each total winding current, easing application of backup protection. Backup overcurrent can be directionalised, where the user includes the optional 3-phase VT input or 2-phase VT input in their chosen model.

Protection & Control

- High-speed transformer differential protection
- Simple settings – wizard requires only nameplate data
- Novel CT saturation and no gap detection techniques enhances the low set differential element operating time
- Transient bias algorithm enhances relay stability and reduces CT requirements
- High and low impedance Restricted
- Earth Fault (REF) boosts trip sensitivity
- Voltage, frequency, thermal and overfluxing elements, CT, VT, trip circuit and self-supervision
- Patented CT supervision ensures no spurious trip for CT or wiring failures
- Integrated backup overcurrent per winding or CT input
- Fast reset (less than 1 cycle) circuit breaker failure element

Advanced Communications

- Readily interfaces with multiple automation protocols, including
- IEC 61850 (Ed 1 and Ed 2) with optional redundancy including IEC 62439 PRP,
- RSTP and software based Ethernet failover (Hot Standby)
- Wide range of supported protocols: Courier/ K-bus, IEC60870-5-103, DNP 3.0 (EAI-485 or Ethernet)

Customer Benefits

- Universal IED for all transformer configurations
- Protection, control, monitoring, measurements and recording in one device.
- Backup and logging of through faults
- Simple to configure, set, and commission
- Programmable function keys
- Programmable Scheme Logic (PSL) allows easy customization of the protection and control functions
- IEC 61850-9-2 LE process bus ready & Cyber Security with password block control

