Line distance protection REL670
Relion® 670 series Ver. 2.1

Features
• Fully IEC 61850 compliant, Edition 1 and Edition 2
• Extensive I/O capability
• Protection, monitoring and control integrated in one IED
• Extensive self-supervision including analog channels
• Six independent parameter setting groups
• Ethernet interface for fast and easy communication with PC and Substation Automation System
• Large HMI for visualization of single line diagrams
• Settings via IEC 61850 for some protections
• Cyber security support for compliance to NERC CIP and IEC 62351-8 with Centralized Account Management
• Protection of several primary objects with a single IED

Pre-configured solutions
• Pre-configured and type-tested solutions for:
  – Single breaker with single phase tripping
  – Single breaker with three-phase tripping
  – Multi-breaker with single phase tripping
  – Multi-breaker with three-phase tripping
  – Single breaker for high impedance earthed systems
  – Pole discordance protection
  – Voltage controlled/restraint overcurrent protection

Most important protection functions
• 6 zone full-scheme high-speed line distance protection
  – Quadrilateral characteristic
  – Mho characteristic
  – Series compensated lines
  – Scheme communication logic
  – Load encroachment discrimination
  – Selective phase selection and automatic switch on to fault logic
  – Current reversal and weak end infeed logic
  – Power swing detection and blocking
  – Phase preference logic
  – Pole slip protection
• 3-phase high impedance differential protection for tee-feeders
• Current
  – Instantaneous phase overcurrent protection
  – Instantaneous residual overcurrent protection
  – Four step phase overcurrent protection with definite and inverse time characteristics
  – Four step residual directional overcurrent protection with definite and inverse time characteristics
  – Four step directional negative sequence overcurrent protection
  – Directional residual overcurrent protection with scheme communication logic
  – Sensitive directional earth-fault protection
  – Broken conductor check
  – Thermal overload protection
  – Breaker failure protection
  – Stub protection
• Power functions
  – Directional under- and overpower protection
• Voltage
  – Two step phase- and residual overvoltage protection with definite and inverse time characteristics
  – Two step undervoltage protection with definite and inverse time characteristics
  – Radial feeder protection
  – Overexcitation
  – Loss of voltage check
• Power system supervision
  – Loss of voltage check configured based on undervoltage protection
  – Dead line detection included in fuse failure supervision and switch on to fault logic
• Secondary system supervision
  – Fuse failure supervision
  – Fuse supervision based on voltage differential principle
  – Current circuit supervision
• Frequency functions
  – Under- and overfrequency protection
  – Rate-of-change frequency protection
• Multi-purpose function
  – Multi-purpose filter with possibility to detect, alarm, and trip for special operating conditions, e.g. SSR
- General current and voltage protection
- Voltage controlled/restraint overcurrent protection

Logic
- Tripping logic
- Trip matrix logic
- Extensive logic block library for application customization

Monitoring
- Adjustable breaker monitoring with capability to handle multiple breaker types
- Disturbance recorder and disturbance report
  - 100 disturbances
  - 40 analog channels (30 physical and 10 derived)
  - 128 binary channels
- Event list for 1000 events
- Event and trip value recorders
- Fault locator
- Event counters
- Running hour meter
- Supervision of AC and mA input quantities
- Large HMI with virtual keyboard, function push buttons, and three color LED indications with alarm descriptions

Measurements
- U, I, P, Q, S, f and cos ϕ
- Frequency measurement with accuracy of ± 2 mHz
- Inputs for mA measuring

Metering
- Energy metering function for energy statistics
- Pulse counting support for energy metering

Control functions
- Autorecloser for single or multiple breakers
- Synchronizing, synchrocheck and energizing check
- Control and interlocking for up to 15 switching devices
- Selectable operator place allocation
- Several alternatives for reservation functionality
- Software based multiple position selector switches

Communication
- IEC 61850-8-1 including GOOSE messaging
- IEC 62439-3 parallel redundancy protocol (PRP)
- IEC 61850-9-2 LE Process bus
- IEC 60870-5-103 serial communication
- DNP 3.0, SPA, LON protocols
- Remote communication for transfer of up to 192 binary signals in each direction

Engineering, testing, commissioning, and maintenance
- Protection and control IED manager PCM600 for configuration, parameterization, online debugging and disturbance handling
- Forcing of binary inputs and outputs for faster and easier test and commissioning
- Flexible product naming by mapping utility IEC 61850 model to that of 670 series model

Hardware
- 1/1 x 19", 3/4 x 19" or 1/2 x 19", 6U height case selected according to the number of required I/O modules
- Power supply modules from 24 to 250 V DC ± 20%

TRM input module with 12 analog inputs and optional measurement transformers
- Up to 14 I/O modules in 1/1 x 19" case
- Binary input module with 16 inputs
- Binary output module with 24 outputs
- Static binary output module with 6 static and 6 change-over outputs
- Binary input/output module with 8 inputs and 12 outputs
- mA input module with 6 transducer channels
- Connector types: compression type or ring-lug type
- Accurate time-synchronization through GPS, SNTP, DNP 3.0, IEC 60870-5-103, or IRIG-B
- Remote end data communication modules for C37.94, direct fiber up to 130 km or via multiplexer
- Supports highest EMC requirements
- Independent laboratory certified

Accessories
- COMBITEST test system
- COMBIFLEX auxiliary relays
- Mounting kits

Documentation
- Role based documentation for high efficiency in engineering, commissioning, operations and maintenance

Technical details are available in the REL670 Product Guide.

For more information please contact:

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