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
- Large HMI for visualization of single line diagrams
- Cyber security support for compliance to NERC CIP and IEC 62351-8
- Protection of several primary objects with a single IED

Pre-configured solutions
- Pre-configured and tested solutions including default settings 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

Most important protection functions
- Line differential protection
  - Phase segregated line differential protection with charging current compensation for up to five line terminals
  - Power transformers can be included in the protected zone
  - Suitable for multiplexed, route switched, as well as dedicated fibre, communication networks using C37.94 protocol
  - Time synchronization with the echo-method or built-in GPS
  - Master-master or master-slave line differential communication arrangement
- 3-phase high impedance differential protection for tee-feeders
- Additional security logic
- Distance protection
  - Full-scheme distance protection with quadrilateral, Mho- or series compensation characteristics for up to four zones and with load encroachment
  - Power swing detection
  - Phase preference logic
  - Pole slip protection
- Current
  - Instantaneous phase- and residual overcurrent protection
  - Four-step phase- and residual directional overcurrent protection with definite and inverse time characteristics
  - Four-step negative sequence directional overcurrent protection
  - Directional residual overcurrent protection with scheme communication logic
  - Current reversal and weak end infeed logic
  - Sensitive directional earth-fault protection
  - Broken conductor
  - Thermal overload protection
  - Breaker failure protection
  - Stub protection
  - Pole discordance 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
- Voltage three-phase differential for capacitor banks
- Radial feeder protection
- Overexcitation protection
- Loss of voltage

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
  − Over- and under-frequency protection
  − Rate-of-change frequency protection
• Multipurpose 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
  − 100 disturbances
  − 40 analog channels (30 physical and 10 derived)
  − 96 binary channels
• Event list for 1000 events
• Disturbance report
• Event and trip value recorders
• Fault locator
• Event counters
• 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 statistic
• 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 end communication for transfer of up to 192 binary signals in each direction

Engineering, testing, commissioning, and maintenance
• Forcing of binary outputs
• Protection and control IED manager PCM600 for setting, configuration, and disturbance handling

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 time module, SNTP, DNP 3.0, IEC 60870-5-103, or IRIG-B-module
• 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 RED670 Product Guide.

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