Features
- Fully IEC 61850 compliant
- Control, monitoring and protection integrated in one IED
- Extensive self-supervision including analog channels
- Six independent parameter setting groups
- Large HMI for visualization of single line diagrams
- Ethernet interface for fast and easy communication with PC
- Signal matrix for easy configuration of binary and analog signals
- Advanced multi-terminal line differential protection
- Extensive supervision of communication channels
- User management and authority handling

Pre-configured solutions
- Pre-configured and tested solutions including default settings for:
  - Single breaker with selective single or three phase tripping
  - Double breaker with selective single or three phase tripping
  - 1 1/2 circuit breaker arrangements with selective single or three-phase tripping
  - Sub-transmission high impedance earthed systems (single breaker)

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
- 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
  - 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
  – Current circuit supervision
• Frequency functions
  – Over- and under-frequency protection
  – Rate-of-change frequency protection
• Multipurpose function
  – General current and voltage protection

Logic
• Tripping logic
• Trip matrix logic
• Configurable logic blocks

Monitoring
• 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
• Small and large HMI in local language
• LED indications with 6 red and 9 yellow LEDs

Metering
• U, I, P, Q, S, f and cos φ
• Differential voltage per zone
• AC input quantities with accuracy better than 0.5%
• Inputs for mA measuring
• Energy metering function for energy statistic
• Pulse counting support for energy metering

Control functions
• Apparatus control for 8 or 15 apparatus
• Ready to use interlocking modules for different switchgear arrangements
• Several alternatives for reservation functionality
• Synchronizing, synchro-check and energizing check
• Auto-recloser
• Versatile switch with two positions
• Selector switch with up to 32 positions

Communication
• IEC 61850-8-1 including GOOSE messaging
• IEC 61850-9-2 LE Process bus
• Individually supervised redundant station bus with zero seconds recovery time
• IEC 60870-5-103
• DNP 3.0 slave protocol
• LON
• SPA
• Remote end communication for transfer of eight binary signals

Setting, configuration and disturbance handling
• Protection and control IED manager PCM600

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
• TRM module with measurement transformers
• ADM module
• Power supply modules from 24 to 250 V DC ± 20%
• Up to 14 I/O modules in 1/1 x 19" case
• Binary input module, 30 mA and 50 mA, with 16 inputs
• Binary output module with 24 outputs
• Static binary output module with 12 outputs (6 static)
• Binary input/output module, 30 mA and 50 mA, with 8 inputs and 12 outputs
• mA input module with 6 transducer channels
• Accurate time-synchronization through GTM, GPS time module, IRIG-B-module, SNTP and DNP 3.0
• Remote end data communication modules for C37.94, X21 and G.703/G.703E1
• COMBITEST test switch module

Technical details are available in the RED670 Product Guide.

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