Features
• Fully IEC 61850 compliant, Edition 1 and Edition 2
• Extensive I/O capability
• Protection and monitoring 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 type tested solutions including default settings for:
  – Generator main and back-up protection with 12 and with 24 analog inputs
  – Generator and block transformer main and back-up protection with 24 analog inputs

Most important protection functions
• Generator differential protection
  – Percentage bias restraint with up to 4 restraint inputs
  – Internal/external fault discriminator (negative sequence based)
  – Higher harmonic blocking
  – DC biasing
  – Suitable for split phase differential protection
• Transformer differential protection
  – High sensitivity for interturn faults
  – Fast differential protection with up to 6 restraint CT inputs
  – Automatic CT ratio matching and vector group compensation
  – Waveform and second harmonic restraint for transformer inrush
  – Fifth harmonic restraint for overexcitation
• 3-phase high impedance differential protection
• Restricted earth-fault protection
  – Extremely fast operation
  – High and/or low impedance based
• Injection-based protection using REX060 injection unit
  – 100% stator earth-fault protection
  – Sensitive rotor earth-fault protection
• Back-up underimpedance protection
• Pole slip protection
  – Detection of slips in power system from 0.2Hz to 8Hz
  – Discrimination between generating and motoring direction of rotor phase angle
  – Discrimination between local and external power swing center
  – Trip after a set number of slips
• Trip within a set rotor angle
• Loss of/under excitation
  – Positive sequence measurement
  – Two offset-mho zones
  – Directional element for zone restriction
• Directional power protection
  – Reverse power, low forward, active and reactive power protection
  – Phase angle compensation
  – Two steps (alarm/trip)
• Current
  – Rotor and stator overload protection
  – Instantaneous phase- and residual overcurrent protection
  – Four-step phase- and residual directional/ non-directional overcurrent protection with definite and inverse time characteristics
  – Negative sequence overcurrent protection for machines
  – Split phase overcurrent protection
  – Accidental energizing protection for synchronous generator
  – Pole discordance protection
  – Breaker failure protection
• Voltage
  – Two step phase- and residual overvoltage protection
  – Two step undervoltage protection
  – Overexcitation protection
  – 3rd harmonic based 100% stator earth-fault protection
  – 95% stator earth-fault protection
• Secondary system supervision
  – Fuse failure supervision
  – Fuse supervision based on voltage differential principle
  – Current circuit supervision

Power and productivity
for a better world™
• Frequency functions
  – Over- and under-frequency protection
  – Frequency time accumulation 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
  – Rotor earth-fault protection using COMBIFLEX RXTTE4 injection unit

Control functions
• Synchrocheck, energizing check and synchronizing
• Tap position reading via mA or BCD code
• Control and interlocking for up to 30 switching devices
• Selectable operator place allocation
• Software based multiple position selector switches

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
  – Up to 10 seconds of data before the trigger
  – Up to 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
• 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 statistics
• Pulse counting support for energy metering

Communication
• IEC 61850-8-1 including GOOSE messaging
• Process Bus communication IEC61850-9-2
• IEC 62439-3 parallel redundancy protocol (PRP)
• IEC 60870-5-103 serial communication
• DNP 3.0, LON, and SPA 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
• Injection units REX060, REX061, and REX062
• COMBITEST test system
• COMBIFLEX auxiliary relays
• COMBIFLEX RXTTE4 rotor earth fault injection unit
• Mounting kits

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

Technical details are available in the REG670 Product Guide.

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