Generator protection REG670
Relion® 670 series Ver. 1.2

Features

- Fully IEC 61850 compliant
- Generator and transformer protection integrated in one IED
- Protection, monitoring and control integrated in one IED
- Extensive self-supervision including analog channels
- Six independent parameter setting groups
- Signal matrix for easy configuration of binary and analog signals
- Ethernet interface for fast and easy communication with PC
- Large HMI for visualization of single line diagrams

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
  - Differential currents calculated based on fundamental frequency and negative sequence
  - Percentage bias restraint
  - Internal/external fault discriminator (negative sequence based)
  - Higher harmonic block for 2nd and 5th
  - DC biasing
  - Suitable for split phase differential protection applications
- Transformer differential protection
  - Percentage bias restraint
  - Waveform and second harmonic restraint for transformer inrush
  - Fifth harmonic restraint for overexcitation
  - Automatic CT ratio matching and vector group compensation
  - High sensitivity for interturn faults
  - Open CT detection incorporated
- High impedance differential protection
- Restricted earth-fault protection
  - Extremely fast operation
  - High and low impedance based
- Injection-based protection
  - 100% stator earth-fault protection using REX060 injection unit
  - Sensitive rotor earth-fault protection using REX060 injection unit
- Back-up underimpedance protection
  - Full-scheme distance protection with Mho characteristic
- 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 zones Z1 and Z2 with independent block and trip
  - 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
  - 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
  - Thermal overload protection
  - Breaker failure protection
  - Pole discordance protection

- Power functions
  - Directional under- and over power protection
- Voltage
  - Two step phase- and residual over-voltage protection with definite and inverse time characteristics
  - Two step undervoltage protection with definite and inverse time characteristics
  - Overexcitation protection
  - 3rd harmonic based 100% stator earth-fault protection
  - 95% stator earth-fault protection
- 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
  - Voltage controlled/restraint overcurrent protection
  - Rotor earth-fault protection using COMBIFLEX RXTTE4 injection unit

Control functions

- Apparatus control for up to 30 apparatus
- Synchrocheck, energizing check and synchronizing
- Selectable operator place allocation
- Versatile switch with two positions
- Selector switch with up to 32 positions

Logic

- Tripping logic
- Trip matrix logic
- Configurable logic blocks

Monitoring

- 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 r ecorders
- Event counters
- Supervision of AC and mA input quantities
- Small and large HMI
- LED indications with 6 red and 9 yellow LEDs

Measurements

- U, I, P, Q, S, f and cos φ
- Accuracy of AC input quantities, class 1.0 or 0.5
- 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
- IEC 60870-5-103
- LON
- SPA
- DNP 3.0
- Remote end communication for transfer of 192 binary signals

Setting, configuration and disturbance handling

- Protection and control IED manager PCM600
  - Installation and commission tool module for injection-based protection

Hardware

- Full 19“ case, 6U height with 24 analog inputs and up to 11 I/O modules
- Half 19“ case, 6U height with 12 analog inputs and up to 3 I/O modules
- Power supply modules from 24 to 250 V DC ± 20%
- Metering class input CTs
- Binary input module with 16 inputs
- Binary output module with 24 outputs
- Binary input/output module with 8 inputs and 12 outputs
- mA input module with 6 transducer channels
- GPS or IRIG-B time synchronization module
- Remote-end data communication modules
- Accessories

Technical details are available in the REG670 Product Guide.

For more information please contact:

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