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DATASHEET

Busbar protection REB670

Relion® 670 series version 2.2

Application

- Low impedance differential protection for busbars, T-connections and meshed corners for up to 6 zones
- Fast, selective and reliable with low requirements on CTs
- Flexible, software based dynamic zone selection for easy and fast adaptation to various busbar arrangements
- Currents can be from conventional CTs or via merging units and all are provided with a restraint feature
- Easy integration to conventional or digital substations

Features

- Fully IEC 61850 compliant, Edition 1 and Edition 2
- Extensive I/O capability
- Protection, monitoring and control of several primary objects 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 SA system
- Large number of Ethernet ports to support several system topologies and redundancy methods
- 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 using Microsoft Active Directory

Pre-configured solutions

- Pre- configured, and type-tested solutions including default settings for:
  - 2 zones, 3 phase for 4 or 8 bays
  - 2 zones, 1 phase for 12 or 24 bays

Most important protection functions

- Fast operation with minimum tripping times of 8 ms
- Correct operation for all types of evolving faults
- Differential protection
  - Six zones, single phase 24 bays
  - Two zones, single phase 24 bays
  - Two zones, three phase 8 bays
  - Sensitive differential protection level
  - Automatic detection and selective busbar protection blocking for troubles in CT secondary circuits
  - Full stability for all external faults regardless of CT saturation
  - Station matrix for easy overview of the zones/bays
  - Apparatus status for every connected disconnector or breaker
- Overall check zone
- Integrated, software driven zone selection (i.e. disconnector replica)
- Selective tripping for busbar and breaker failure protection
- Summation principle with additional auxiliary CTs
- Voltage functions
  - Two step phase- and residual overvoltage protection with definite and inverse time characteristics
  - Voltage three-phase differential protection for capacitor banks
  - Loss of voltage check
- Current functions
  - Four step phase- and residual directional overcurrent protection
  - Four step directional negative sequence overcurrent protection
  - Thermal overload protection
  - Breaker failure protection
  - Capacitor bank protection
- Power functions
  - Directional under- and overpower protection
- Secondary system supervision
  - Fuse failure supervision
  - Fuse supervision based on voltage differential
  - Current circuit supervision
  - Current/Voltage/Real Value based delta supervision
- Frequency functions
  - Under- and over frequency 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. Sub-Synchronous Resonance (SSR)
  - General current and voltage protection

Control functions

- Auto recloser for single or multiple breakers
- Synchronizing, synchro check and energizing check
- Control and interlocking for up to 30 switching devices
- Selectable operator place allocation
- Software based multi-position selector switches

Logic
- Tripping and trip matrix logic
- Extensive math and logic block library for application customization

Monitoring
- Adjustable breaker monitoring with capability to handle multiple breaker types
- Monitoring and reporting of currents and voltages during faults
- Disturbance recorder with disturbance report supporting COMTRADE 1999 and 2013 formats
  - 200 disturbances
  - 40 analog channels (30 physical and 10 derived)
    - 352 binary channels
  - All protection settings during a disturbance
- Event list for 5000 process and 10240 security events
- Event and trip value recorders
- Fault locator
- Event counters
- Current/Voltage based harmonic monitoring (up to 9th order) including total harmonic distortion
- Running hour meter
- Supervision of AC and mA input quantities
- Large HMI with virtual keyboard, function push buttons, and three colors 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
- IEC 62439-3 Parallel Redundancy Protocol (PRP)
- IEC 62439-3 High-availability Seamless Redundancy (HSR)
- IEEE 802.1D Rapid Spanning Tree Protocol (RSTP)
- IEC/UCA 61850-9-2LE Process bus for up to 8 MUs
- IEC 60870-5-103, DNP 3.0, SPA, LON protocols
- Remote end communication for signal transfer
  - 64 kbps: 3 analogs & 8 binary or 192 binary
  - 2 Mbps: 9 analogs & 192 binary

Engineering, testing, commissioning and maintenance
- Protection and control IED manager, PCM600, for configuration, parameterization, Ethernet port/ protocol configuration, 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 modules each with 12 analog inputs protection class and optionally measurement
- 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 heavy-duty 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 or ring-lug
- Accurate time-synchronization through PTP (IEC/IEEE 61850-9-3), GPS, SNTP, DNP 3.0, IEC 60870-5-103 or IRIG-B
- Remote end data communication modules for C37.94, galvanic X.21 up to 10 m, fiber for direct connection up to 110 km or via multiplexer
- Up to six Ethernet ports (optical LC or RJ45) that can be freely configured as single or redundant pairs

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 REB670 Product Guide.

Hitachi Energy
Grid Automation Products
721 59 Västerås, Sweden
Phone: +46 10 738 00 00

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