Phasor Measurement Unit RES670
Relion® 670 series version 2.2

Application
• Provides accurate phasor measurement of power system voltages and currents for all voltage levels
• Accurate phasors are sent to the Phasor Data Concentrators (PDCs) and thereafter for WAMS applications
• Typically used for station wide application
• 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

Pre-configured solutions
• Pre-configured and type-tested solutions including default settings for:
  - Phasor measurement, single busbar, 3 bays
  - Phasor measurement, double busbar, 6 bays

Most important protection functions
• Impedance
  - Power swing detection
  - Pole slip protection

• Voltage functions
  - Two step phase- and residual overvoltage protection with definite and inverse time characteristics
  - Two step undervoltage protection with definite and inverse time characteristics

• Current functions
  - Four step phase- and residual directional overcurrent protection
  - Four step directional negative sequence overcurrent protection
  - Sensitive directional earth-fault protection
  - Thermal overload protection

• Power functions
  - Directional under- and overpower protection

• Secondary system supervision
  - Fuse failure supervision
  - Current circuit supervision
  - Current/Voltage/Real Value based delta supervision

• Frequency functions
  - Under- and overfrequency protection
  - Rate-of-change frequency protection
  - Frequency time accumulation 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
• Selectable operator place allocation
• Software based multi-position selector switches

Logic
• Tripping and trip matrix logic
• Extensive logic block library for application customization
Monitoring
- Phasor monitoring for up to 24 phasor values
- Adjustable breaker monitoring with capability to handle multiple breaker types
- Disturbance recorder with disturbance report
  - 100 disturbances
  - 40 analog channels (30 physical and 10 derived)
  - 352 binary channels
  - All protection settings during a disturbance
- Event list for 1000 events
- Event and trip value recorders
- Fault locator
- Event counters
- Current/Voltage based harmonic monitoring (up to 5th 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 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
- IEC 62439-3 Parallel Redundancy Protocol (PRP)
- IEC 62439-3 High-availability Seamless Redundancy (HSR)
- IEC/UCA 61850-9-2LE Process bus for up to 8 MUs
- Phasor monitoring reporting via IEEE 1344 and C37.118
- IEC 60870-5-103, DNP 3.0, SPA, LON protocols

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 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
- 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 RES670 Product Guide.