Relion® 615 protection and control series
Main customer benefits
New features
New generator protection REG615
Common 615 series features
Feeder protection and control REF615
Line differential protection and control RED615
Motor protection and control REM615
Transformer protection and control RET615
ABB solutions
Conclusions
Protection and control

Relion® 615 series

Products

– The 615 protection and control series of relays is a member of ABB’s Relion® product family.
– The 615 series relays are characterized by their compactness and withdrawable plug-in unit design.
Relion® 615 series
Main customer benefits
Relion® 615 series
Protection and control

Main customer benefits 1(5)

- Compact and versatile solution for utility and industrial power distribution systems with integration of protection, control, monitoring and supervision in one relay
- Wide application coverage – feeder, transformer, motor, line differential, voltage, capacitor bank as well as generator and interconnection protection and control
- Extensive protection and control functionality, either with sensors or conventional instrument transformers
- Withdrawable plug-in unit design for swift installation and testing
- Ready-made standard configurations for fast and easy setup with tailoring capabilities
Relion® 615 series
Protection and control

Main customer benefits 2(5)

- IEC 61850 Edition 2 and Edition 1 support, including HSR and PRP, GOOSE messaging and IEC 61850-9-2 LE for less wiring and supervised communication

- IEEE 1588 V2 for high-accuracy time synchronization and maximum benefit of substation-level Ethernet communication

- Large graphical display for showing customizable SLDs, accessible either locally or through a web browser-based HMI
Relion® 615 series
Protection and control

Main customer benefits 3(5)

– Extensive ground-fault protection portfolio with unique multifrequency admittance-based ground-fault protection, including integrated intermittent ground-fault protection, for higher sensitivity and selectivity based on a patented algorithm – “all-in-one” ground-fault protection
– Advanced and fast fault location of short circuits and ground faults
– Higher grid stability and reliability with advanced interconnection protection for monitoring distributed generation units, fulfilling the latest grid codes
– Green and high-tech choice for sensor-based applications in digital switchgears
Relion® 615 series
Protection and control

Main customer benefits 4(5)

– Extensive generator protection with 100% stator ground-fault, generator differential protection and out-of-step protection
– Selective unit protection as phase-segregated two-end line differential protection, also ideal for use with an in-zone transformer
– Transformer differential protection supporting various transformer neutral grounding options
Relion® 615 series
Protection and control

Main customer benefits 5(5)

- Part of the Relion® protection and control product family
- Extensive life cycle services:
  - Training, customer support, maintenance and modernization services
  - 12-year warranty
  - Global ABB sales coverage and support network
Relion® 615 series

New features
Relion® 615 series
Protection and control

IEC 61850 Edition 2

- The 615 series relays support the IEC 61850 standard for communication and interoperability of substation automation devices according to Edition 2.
- Edition 2 offers the best possible interoperability for modern substations.
- Edition 1 is still supported as Edition 2 and Edition 1 are selectable modes during the engineering phase.
- Edition 2 offers:
  - Full relay functionality modelling for substation applications
  - Zero-loss Ethernet redundancy with HSR and PRP
  - Improved device mode handling for relay testing
  - Advanced and safe station control authority
Relion® 615 series
Protection and control

IEC 61850 conformance

- IEC 61850 Certificate Level A1
- IEC 61850 Edition 2 Parts 6, 7-1, 7-2, 7-3, 7-4 and 8-1
  - Communication networks and systems in substations
- IEC 61850 First Edition Parts 6, 7-1, 7-2, 7-3, 7-4 and 8-1
  - Communication networks and systems in substations
- Complete 615 series IEC 61850 conformance by DNV-GL
Relion® 615 series
Protection and control

**Multifrequency admittance-based G/F protection 1(3)**

- Provides selective directional ground-fault protection for high-impedance grounded networks
- Operation based on multi-frequency neutral admittance measurement utilizing fundamental frequency and harmonic components in the residual voltage and current
- Special filtering algorithm enables reliable and secure fault direction also during intermittent ground faults
- Provides both reliability and sensitivity combined in one single protection function:
  - Low ohmic and higher ohmic ground faults
  - Continuous, transient and intermittent ground faults
- Easy implementation of protection scheme since dedicating different fault types to separate ground-fault protection functions and coordinating them is not necessarily required
Relion® 615 series
Protection and control

Multifrequency admittance-based G/F protection 2(3)

- Easy setting principles based on basic network data
- Operation characteristic valid both in compensated and ungrounded networks
- Fault direction indication both in operate direction and non-operate direction
  - Can be used during the fault location process
- Integrated transient detector to identify intermittent ground faults and distinguish them from permanent faults
Relion® 615 series
Protection and control

**Multifrequency admittance-based G/F protection 3(3)**

- Three operation modes:
  - General ground fault - for all types of ground faults
  - Intermittent ground fault
  - Alarming ground fault – for minimizing the number of events during the fault localization process
- The residual current is recommended to be measured with a cable/ring core CT.
  - Setting values available for calculated/measured residual current and voltages
- Included in REF615, standard configurations L, and N
Relion® 615 series
Protection and control

Process bus with sampled values of currents and voltages

– The relay can act as a merging unit and measure currents and voltages in the substation and send them as Sampled Measured Values (SMV) over Ethernet.
– Other relays in the substation having phase voltage-based functions can receive the SMVs over Ethernet and use them for the following purposes:
  • Instead of physically (VT or voltage sensor) measured phase voltages
  • For synchro-check
  • For voltage remanent protection
– The SMVs are transferred using the IEC 61850-9-2 LE (light edition) protocol.
– The relay uses IEEE 1588 V2 Precision Time Protocol (PTP) with Power Profile for high-accuracy time synchronization.

Benefits

• Simplicity (reduces wiring and terminals)
• Flexibility
• Improved diagnostics
• Longer maintenance cycles
Relion® 615 series

Protection and control

System example of utilizing process bus
Relion® 615 series
Protection and control

Other functional enhancements 1(3)

- IEC 61850-9-2 LE support for sending sampled values of currents
- Synchronism and energizing check with IEC 61850-9-2 LE and sensors
- Report summary via WHMI and other enhancements
- Possibility to disable rear Ethernet ports using setting parameters
- Voltage unbalance added to the power quality option
- More timer, set-reset and analog value scaling function instances added
Relion® 615 series
Current and Voltage Sensors

Supports the KECA and KEVA sensors

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</tr>
<tr>
<td></td>
<td>Electronic voltage transformers</td>
</tr>
</tbody>
</table>
Relion® 615 series
Current sensors are safer than conventional CTs

Current Sensors
Rogowski coil sensor
– Us=150 mV for 50 Hz
– Us=180 mV for 60 Hz
Proven technology which brings many benefits in various applications
Output voltage is proportional to the derivative of primary current
Output voltage is integrated by IED
Accuracy up to class 0.5
Complies with IEC 60044-8

\[ u_s(t) = M \frac{di_p(t)}{dt} \]

No Saturation! (air core)
Open CT hazard eliminated
Relion® 615 series

Current sensors - Combined accuracy class 0.5/5P630
Relion® 615 series

Voltage sensors are safer than conventional VTs

Voltage Sensors

- Resistive voltage divider sensor
- 10,000:1 transformation ratio
- Accuracy up to class 0.5
- Passive element
- Complies with IEC 60044-7

No Ferroresonance! (non-inductive)

\[ U_S = \frac{R_2}{R_1 + R_2} U_P \]
Relion® 615 series
Voltage dividers - Combined accuracy class 0.5/3P
Relion® 615 series
Protection and control

Other functional enhancements 2(3)

- RED615 (new application)
  - Standard configuration E supports Current and Voltage sensors
  - HSR and PRP-1 with fiber-optic redundant Ethernet
  - IEC 61850-9-2 LE and IEEE 1588 V2 with fiber-optic redundant Ethernet

- REF615 standard configurations L and N
  - Optional interconnection protection functions
  - Reverse power/directional overpower
  - Voltage remanent protection 27R
  - Standard configuration L for Current and Voltage sensors
  - Standard configuration N can alternatively be used for high-impedance based differential protection

- REF615 standard configuration P
  - Optional configuration for transfer schemes with 27R protection
Relion® 615 series
Protection and control

Other functional enhancements 3(3)

- RET615
  - Low impedance restricted ground-fault protection for low voltage side of the transformer only
  - Standard configuration F
    - Add overexcitation 24, directional elements 67P/67N, and frequency elements 81
    - Syncrocheck control

- REM615
  - Standard configuration D with Current and Voltage sensors
  - Standard configuration E with motor differential protection (Self-balancing and Restrained)
  - Voltage remanent protection 27R added to configuration B and D
New generator protection
REG615
REG615

Generator protection

Compact generator protection

- REG615 is a dedicated generator protection relay designed for protection, control, measurement and supervision of power generators in utility and industrial power distribution systems.
Generator protection (standard configurations C and D)

- Main protection for small synchronous power generators, offering full protection during start-up and normal run for both the generator and the prime mover
- Backup protection for medium-sized generators in applications where an independent and redundant protection system is required
- Main application area: small and medium-sized diesel, gas, hydroelectric, combined heat and power (CHP), and steam power plants
**REG615**

Generator protection

**Standard configurations**

- Standard configuration C – Generator protection with 100% stator ground-fault protection
  - Other main features are reverse power and directional overpower, out-of-step, underimpedance, overexcitation and underexcitation protection
  - 4CT + 5VT, and up to 16 BI / 10 BO
- Standard configuration D – Generator protection with generator differential and directional overcurrent protection and synchro-check
  - Other main features are reverse power and directional overpower, out-of-step, overexcitation and underexcitation protection
  - 7CT + 5VT, and up to 12 BI / 10 BO
REG615
Generator and interconnection protection

Functionality overview for standard configuration C
REG615

Generator and interconnection protection

Functionality overview for standard configuration D
Generator protection

Application example 1

- Diesel/gas generators connected in parallel with a common step-up transformer using standard configuration C
- Several generator units connected in parallel
  - Individually high-resistance grounded units
  - Small ground-fault current: typically 3…5 A
- Standard configuration C includes overcurrent (including voltage-dependent) and frequency, voltage and power-based protection, as well as residual current-based ground-fault protection for the generator. In addition, underexcitation and thermal overload protection are used.
Generator protection

Application example 2

- Medium-sized generator application using standard configuration C and D
- Two REG615 generator protection relays:
  - One for generator protection with 100% stator ground-fault protection (C)
  - One for generator differential protection (D)
- Standard configuration C includes overcurrent (including voltage-dependent), underimpedance and frequency, voltage and power-based protection, as well as 3rd harmonic-based stator ground-fault protection. In addition, underexcitation and thermal overload protection are used.
- Standard configuration D adds generator differential protection and provides independent backup protection for the generator.
Generator protection

**Application example 3**

- Generator in block connection with a transformer using standard configuration C and RET615 transformer differential protection relay
  - One single-phase voltage transformer connected to the generator neutral for residual overvoltage protection
  - Phase-to-ground voltages connected to the generator protection relay on the terminal side
- Standard configuration C includes overcurrent (including voltage-dependent), under-impedance and frequency, voltage and power-based protection, as well as residual overvoltage-based ground-fault protection for the generator. In addition, under- and overexcitation protection are used.
Relion® 615 series
Protection and control

**Designed for IEC 61850**

- Native support for IEC 61850 communication
- Selectable Edition 2/Edition 1 modes
- IEC 61850 enables horizontal communication between substation devices:
  - Binary and analog GOOSE
  - Sampled values over process bus
- The 615 series relays can simultaneously report events to five different clients on the station bus.
- Optional optical or galvanic redundant Ethernet solution (only optical in RED615)
- The 615 series relays support the following protocols that can be used in parallel with IEC 61850:
  - Modbus TCP/IP and RTU/ASCII
  - DNP3 TCP/IP and serial
Relion® 615 series
Protection and control

Standard conf. for rapid installation and commissioning

- Ready-made adaptations (standard configurations)
- Adjusting of standard signal configuration settings possible with the setting and configuration tool PCM600
- Rapid installation and commissioning after tailoring according to application-specific requirements
Relion® 615 series
Protection and control

**Application-specific tailoring of standard configurations**

- The support for the graphical application configuration (ACT) functionality in PCM600 enables the creation of multi-layer logics.
- By combining protection functionality with logical elements, the relay configuration can be adapted to user-specific application requirements.
- The ACT support offers improved documentation of the standard configuration when altered.

*Note! The utilization of the analog channels is defined by the standard configuration and cannot be changed using ACT.*
Relion® 615 series

Protection and control

**Control of primary devices with dedicated push-buttons**

- Control of primary devices via the relay's human-machine interface (HMI) or a remote control system
- Forcing of local/remote switch to local position via a binary input prohibits remote control during, for example, maintenance, with increased safety on site as a result.
- Interlocking schemes
- Optional multishot auto-reclosing of one CB
Relion® 615 series
Protection and control

**Patented and compact plug-in unit design**

- Speeds up installation, maintenance and testing of the protection
- Shortened MTTR (mean time to repair) due to the plug-in unit design and modularity (with spare modules/units in stock)
- Allows the cases to be installed and wired before the plug-in units are inserted
- Mechanical coding system for preventing insertion of the wrong plug-in unit in a case
- Sealable and screw-secured pull-out handle to prevent accidental (or unauthorized) withdrawal of the plug-in unit
Relion® 615 series
Protection and control

Disturbance recorder for in-depth analysis

- Up to 100 recordings can be recorded
- Flexible setting of sampling rate and channels enables maximizing the recording of user-relevant data
- Example:
  - 40 recordings of 500 ms with the highest sampling rate and maximum number of channels
Relion® 615 series
Protection and control

**Operation traceability for pre and post-fault analysis**

- Critical data stored in the non-volatile memory to prevent loss of data in case of a power failure:
  - Disturbance recorder data
  - Events including time stamps
  - User audit trail
  - Recorded data
  - Circuit-breaker conditioning monitoring values
  - Thermal loading level
  - Operation indications and alarm LEDs show the status of the relay
  - Trip lock-out
  - Relay setting values
  - Relay configuration
Relion® 615 series

Condition monitoring for ensured protection availability

**Condition monitoring for ensured protection availability**

- Circuit-breaker condition monitoring provides information for scheduling CB maintenance.
- Runtime counter for machines and devices enables scheduling of time-based maintenance of the motor or transformer.
- Continuous supervision of the state of the relay hardware and software ensures operational availability of the protection.
Relion® 615 series
Protection and control

**Authorized relay access control**

- Individual user accounts with role-based access control protects the relay from unauthorized access.
- Four access levels: viewer, operator, engineer and administrator
- Applies to:
  - Front-panel user interface
  - Web browser-based user interface
  - PCM600
- Passwords programmable by the administrator
Relion® 615 series
Protection and control

Versatile tools supporting engineering and operation

- PCM600
  - One single tool for managing settings, signal configuration and disturbance handling
- Web browser-based user interface
  - Local or remote relay access using a web browser
  - Internet Explorer versions 8.0, 9.0, 10.0 and 11.0 are verified
- Relay-specific connectivity packages
  - For automatic configuration via MicroSCADA Pro SYS600, Substation Management Unit COM600 or PCM600
- Substation Management Unit COM600
- MicroSCADA Pro
- PCM600 2.6 (with Rollup 20150626) or later
Relion® 615 series
Protection and control

Single-line diagrams (SLD) for bay-level overview

- Pre-defined multipage SLD for fast commissioning of the relay
- Position indication for associated primary equipment
- Shows related measuring values
- Independent of role-based access control
- Optional local/remote access using web browser-based HMI
- Customizable according to user requirements
Relion® 615 series
Protection and control

IEC 61850 communication with analog GOOSE messaging

- IEC 61850 GOOSE messaging enables fast transfer of analog values between relays.
- Measured values can be shared over the station bus.
- Analog GOOSE messaging can, for example, be employed for control schemes of parallel running transformers, thus saving on hardwiring costs.
- By sharing measured values, the need for separate transducers for values such as ambient temperature is reduced.
Relion® 615 series
Protection and control

Thermal overload protection with RTD/mA measuring

- Prevents premature aging of the motor or transformer and reducing the risk of costly thermal overload failures
- Contributes to an optimal life span of the motor or transformer
- Measurements:
  • Motor bearing temperature
  • Stator winding temperature
  • Oli temperature
  • Ambient temperature
  • Pressure
  • Tap-changer position
Extended control of primary network devices

– In addition to circuit-breaker control, the relays feature:
  • Two control blocks for control of motor-operated disconnectors or a circuit-breaker truck and their position indications
  • A control block for control of a motor-operated grounding switch and its position indication
– The number of controllable devices depends on the number of available I/Os in the selected configuration.
– Devices can be controlled via the relay’s local HMI or a remote control system.
– The single-line diagram indicates the position of the primary devices.
Relion® 615 series
Protection and control

Recording and event capabilities – overview
Relion® 615 series

Protection and control

Parallel protocols

- Support for parallel use of the following protocols:
  - IEC 61850 and Modbus®
  - IEC 61850 and DNP3
- Flexibility to change communication protocol
- Enables connection of two substation systems with different communication protocols
Relion® 615 series
Protection and control

Redundancy solutions

- Redundant Ethernet solutions
  - High availability seamless redundancy (HSR)
  - Parallel redundancy protocol (PRP)
  - IEC 61850 supports both HSR and PRP

- HSR
  - The nodes are connected via two ports to the network.
  - HSR is used in a ring topology.
  - Data is sent from both ports in both directions in a ring.

- PRP
  - Each network node is connected to two parallel local area networks, LANA and LANB.
  - The same data is sent to both local area networks.
Relion® 615 series
Protection and control

IEC 61850 Ethernet redundancy – HSR

- Optional second fiber-optic or galvanic port (only fiber-optic for RED615)
- Enables redundant Ethernet communication controlled by a managed switch with IEC 61850 HSR protocol support
- Avoids single point of failure without any delay
- Secures highly critical communication between devices
  - Communication downtime is eliminated.
  - If the ring is broken, messages will still arrive over the intact path.
  - A broken ring is easily detected since duplicate messages are no longer received
Relion® 615 series
Protection and control

IEC 61850 Ethernet redundancy HSR - operation principle
Relion® 615 series
Protection and control

IEC 61850 Ethernet redundancy – PRP

- Optional second fiber-optic or galvanic port (only fiber-optic for RED615)
- Enables redundant Ethernet communication controlled by a managed switch with IEC 61850 standard PRP support
- Avoids single point of failure without any delay
- Secures highly critical communication between devices
  - Communication downtime is eliminated.
  - The communication network is fully duplicated.
  - If only one packet is received, the receiver knows the other path is broken.
Relion® 615 series
Protection and control

Self-healing Ethernet ring – RSTP

- Optional second fibre-optic or galvanic port on the communication module
- Enables the creation of a cost-efficient self-healing Ethernet communication ring controlled by a managed switch with rapid spanning tree protocol (RSTP) support
- Avoids single point of failure concerns
- Secures critical communication between devices
- Reduces communication downtime
Relion® 615 series
Protection and control

High-speed outputs for time-critical applications

- High-speed output (HSO) module for time-critical applications such as arc fault protection
- Three high-speed hybrid outputs
  - 4-6 ms faster than conventional power outputs but with same rating of output contacts
- One master trip function available per high-speed output
- Can be configured for any protection requiring a short operate time
- Available as an option
Load profile recorder

- Capturing and storing of longer history of measurement values in the non-volatile memory:
  - Currents
  - Voltages
  - Power
- Up to 12 quantities can be selected
- Adjustable time interval of 1 to 180 minutes
- Average value of the quantity over the selected time interval
- The total load profile recording length depends on the number of quantities and the time interval:
  - 6 quantities, 60min interval ~ 1 year
  - 12 quantities, 10min interval ~1 month
- The load profile record is stored in COMTRADE format in the relay.
- The load profile can be read using the load profile tool in PCM600.
Relion® 615 series
Protection and control

IEEE 1588 time synchronization

- The 615 series supports IEEE 1588 V2 Precision Time Protocol (PTP) with Power Profile.
  - Provides high-accuracy time synchronization of 1 μs
- Required especially in process bus applications with sampled values using protocol IEC 61850-9-2 LE
  - Time stamp resolution of the relay: < 4 μs
- IEEE 1588 support is included in variants having a redundant Ethernet communication module and with the following protocols:
  - IEC 61850
  - Modbus®
  - DNP
IEEE 1588 time synchronization example using HSR

![Diagram showing IEEE 1588 time synchronization example using HSR]
REF 615

Feeder protection and control
REF615

Feeder protection

Description

- REF615 is a dedicated feeder protection and control relay designed for protection, control, measurement and supervision in utility and industrial power distribution systems, including radial, looped and meshed distribution networks, with or without distributed power generation.
REF615

Feeder protection

**Area of application**

- Designed for general applications requiring overcurrent and ground-fault protection
- Main application area: cable or overhead line feeders in isolated neutral, resistance-grounded, compensated or effectively-grounded distribution networks
- Optional three-channel arc protection system
**REF615**

Feeder protection

**Standard configurations 1 (2)**

- **Standard configuration D**
  Non-directional overcurrent and ground-fault protection and circuit-breaker condition monitoring (RTD option)

- **Standard configuration F**
  Directional overcurrent and ground-fault protection, voltage-based protection and measurements, and circuit-breaker condition monitoring (RTD option), *add voltage remanent protection*

- **Standard configuration L**
  Directional and non-directional overcurrent and ground-fault protection with multi-frequency neutral admittance, voltage, frequency and power-based protection and measurements, and circuit-breaker condition monitoring (sensor inputs, optional power quality, fault locator, interconnection protection, synchro-check, *and voltage remanent protection* with IEC 61850-9-2LE)
REF615

Feeder protection

Standard configurations 2(2)

- **Standard configuration N**
  Directional and non-directional overcurrent and ground-fault protection with multi-frequency neutral admittance, voltage, frequency and power-based protection and measurement, high-impedance differential protection, synchro-check and circuit-breaker condition monitoring (optional power quality, fault locator and interconnection protection), add **voltage remanent protection**

- **Standard configuration P**
  Directional phase and ground overcurrent, voltage and power directional protection and power system metering for two tie breakers with synchro-check, and voltage remanent protection
RED 615

Line differential protection and control
RED615
Line differential protection and control

Description

- RED615 is a phase-segregated, two-end, unit-type line differential protection and control relay designed for protection, control, measurement and supervision in utility and industrial power distribution systems, including radial, looped and meshed distribution networks, with or without distributed power generation.
- RED615 is also suitable for line differential applications with an in-zone transformer.
- RED615 relays communicate between substations either over a fiber-optic link or a galvanic pilot wire connection.
RED615
Line differential protection and control

Selective protection for specified zone

- Unit protection for applications requiring an entirely selective protection for a specified zone
- Main application area: two-end protection for cable and overhead line feeders
- Can also be used with an in-zone transformer
- Phase-segregated protection algorithm
- Protection communication either over a fiber-optic link or a galvanic pilot wire connection
RED615
Line differential protection and control

Line differential protection applications

- Parallel feeders
  - Looped feeder construction
  - Doubled feeders
- Two interconnected feeders between a primary substation and two secondary substations
  - Reserve connections or meshed network
- Distributed generation
  - Power generation at the remote end of the feeder
- Weak grid supplying relatively long distribution lines
RED615
Line differential protection and control

Standard configurations

- **Standard configuration D**
  Line differential protection with directional overcurrent and ground-fault protection, voltage and frequency-based protection and measurements, synchro-check and circuit-breaker condition monitoring (RTD option, optional power quality and fault locator)

- **Standard configuration E**
  Line differential protection with directional overcurrent and ground-fault protection, voltage and frequency-based protection and measurements, and circuit-breaker condition monitoring (sensor inputs, optional power quality, fault locator and synchro-check with IEC 61850-9-2LE)
REM 615
Motor protection and control
REM615
Motor protection and control

Description

- REM615 is a dedicated motor protection and control relay designed for protection, control, measurement and supervision of asynchronous motors in the manufacturing and process industry.
REM615
Motor protection and control

Area of application

– Circuit-breaker and contactor-controlled MV motors and medium-sized and large contactor-controlled LV motors in a variety of drives.
– Contactor-controlled, medium-sized and large low-voltage (LV) motors
– Manufacturing, process and refinery industry
– Protection for a variety of drives such as:
  • Pumps and conveyors
  • Crushers and choppers
  • Mixers and agitators
  • Fans and aerators
  • Compressors
REM615

Motor protection and control

Standard configurations

Standard configuration A
- Motor protection with circuit-breaker condition monitoring (RTD option)

Standard configuration B
- Motor protection with voltage and frequency-based protection and measurements, and circuit-breaker condition monitoring (RTD option), add voltage remanent protection

Standard configuration D
- Motor protection with voltage and frequency-based protection and measurements, and circuit-breaker condition monitoring (sensor inputs), add voltage remanent protection

Standard configuration E
- Motor protection with differential (core-balance and true), overcurrent, load loss, phase and neutral voltage, frequency and RTD protection and power system metering for medium to large motors
Transformer protection and control
RET615
Transformer protection and control

Description

- RET615 is a dedicated transformer protection and control relay designed for protection, control, measurement and supervision of power transformers, including step-up transformers, and power generator-transformer blocks, in utility and industrial power distribution systems.
Transformer protection and control

Area of application

- Designed for unit protection applications requiring stabilized differential protection
- Main application area: two-winding transformers and generator-transformer blocks in power distribution networks
- Optional three-channel arc protection system
**Standard configurations**

- **Standard configuration B**
  Transformer differential with low-impedance restricted ground-fault protection on the LV side

- **Standard configuration F**
  Transformer differential with voltage protection and measurements, and low-impedance restricted ground-fault protection on the LV side, **add over-excitation, directional elements, and synchro-check**
Relion® 615 series
ABB solutions
Relion® 615 series
Protection and control

Supported ABB solutions 1(2)

- The ABB products constitute a genuine IEC 61850 solution for reliable power distribution in utility and industrial power systems.

- The native IEC 61850 support offers:
  - High communication performance
  - Continuous supervision of the protection and communication system integrity
  - No additional CPUs or adapters
  - Faster protection applications

- ABB’s Connectivity Package concept enables:
  - Streamlining of the IEC 61850 system engineering and relay configuration
  - Easy integration with COM600 and MicroSCADA Pro SYS600
  - Automated engineering, e.g. event lists and single-line diagram
  - Shortened system engineering time

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<td>MicroSCADA Pro SYS600</td>
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<td>System 800xA</td>
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<thead>
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<th>Supported ABB Edition 2 solutions</th>
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<td>Substation Management Unit COM600</td>
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<td>9.4 or later</td>
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Relion® 615 series
Protection and control

Supported ABB solutions 2(2)

- The 615 series relays supplemented with COM600 offer a variety of benefits:
  - Enhanced substation-level functionality using the data content of the bay-level relays
  - Web browser-based HMI providing single-line diagrams for switchgear bay solutions
- COM600 can be used as a local data warehouse for technical documentation and network data:
  - Extensive reporting and analyzing of network fault situations
  - Seamless connectivity to Micro SCADA Pro SYS600 and System 800xA
Relion® 615 series
Protection and control

Supported ABB solutions example
Relion® 615 series
Protection and control

Conclusions

– Native support for IEC 61850 and GOOSE messaging
– Patented plug-in unit design for flexible mounting and fast installation and commissioning
– Available in pre-defined standard configurations
– Comprehensive range of monitoring and watchdog functions
– Versatile tools including relay-specific connectivity packages
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