



Relion® 615 series

# Voltage protection and control REU615

Compact and versatile solution for utility  
and industrial power distribution systems

Power and productivity  
for a better world™



# Compact voltage protection and automatic voltage regulation

**REU615 is a voltage protection and control relay for voltage and frequency-based protection in utility and industrial power distribution systems, including networks with distributed power generation. REU615 is also ideal for voltage regulation.**

## Application

REU615 is available in two standard configurations, both of which can be tailored to meet application-specific requirements using the IEC 61850-compliant Protection and Control IED Manager PCM600. One has been exclusively designed for busbar under- and overvoltage supervision, load-shedding (disconnection) and restoration (reconnection) applications. It can also be used for over- and underfrequency protection of power generators and other AC equipment such as capacitor banks. In generator and motor applications, REU615 provides supplementary protection by detecting any deviation from the permitted frequency and voltage values. An integrated synchro-check function ensures a safe connection of the equipment to the network.

The other of the two standard configurations has been exclusively designed for automatic and manual voltage regulation of power transformers with a motor-driven on-load tap-changer. In small substations with a single power transformer and in substations with two or more power transformers operating in parallel, REU615 can be used for load-side voltage regulation. The standard configuration also includes protection functionality.

To minimize the effects of an arc fault, REU615 can be equipped with high-speed outputs decreasing the operate time by four to six milliseconds compared to conventional binary outputs.

## Human-machine interface

As a member of the Relion® product family, REU615 shares the same human-machine interface (HMI) look and feel as the other Relion protection and control relays and IEDs. The same look and feel includes the location of a push button with a certain function and the menu structure.

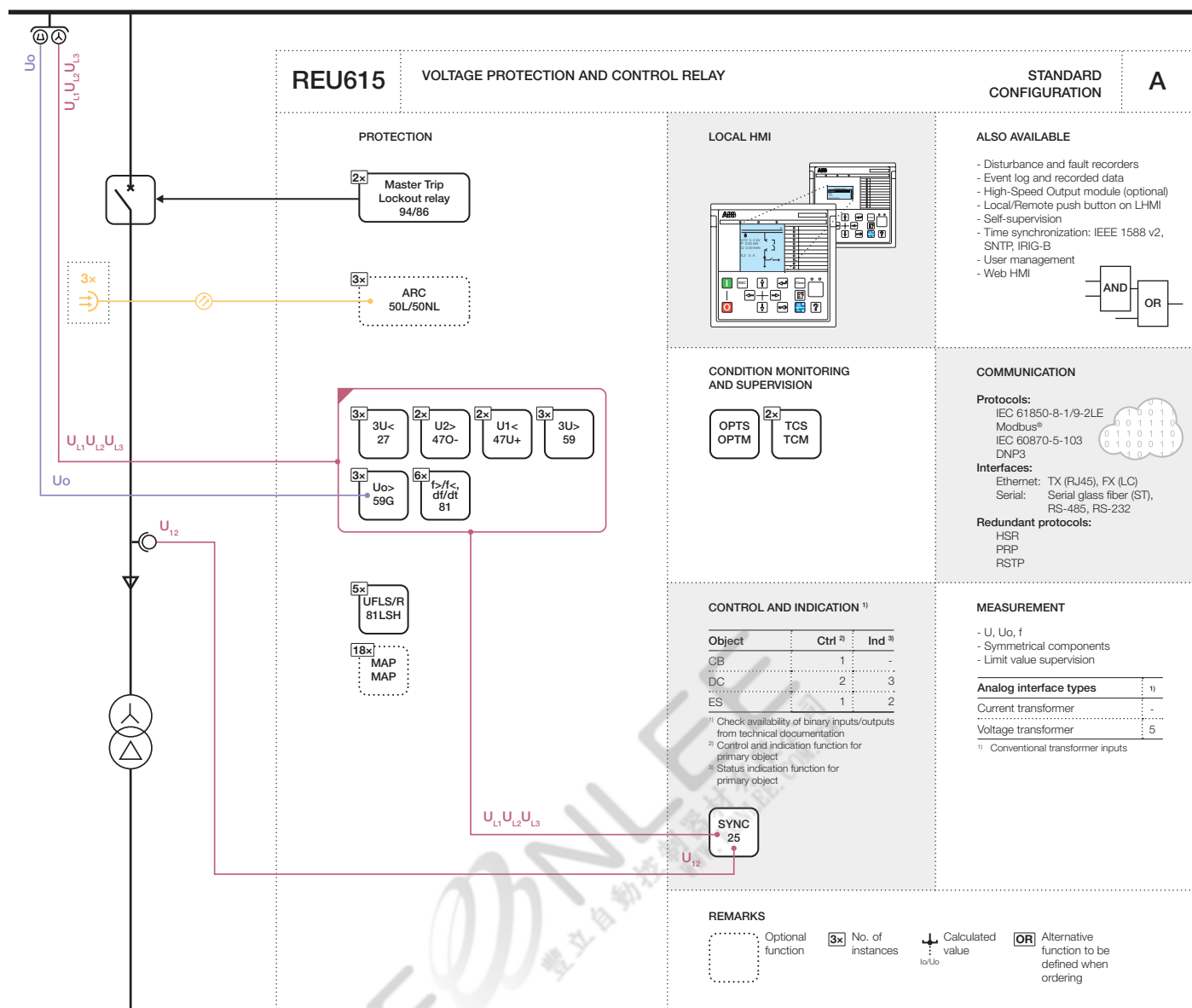
REU615 is equipped with a large graphical display which can show customizable single-line diagrams (SLD) with position indication for the circuit breaker, disconnectors and the earthing switch. Also measured values provided by the chosen standard configuration can be displayed. The SLDs are customized using PCM600 and can have multiple pages for easy access to selected information. The SLDs can be accessed not only locally but also via the web browser-based HMI that has now been enriched with a number of usability enhancing features.

## Standardized communication and redundancy

REU615 fully supports the IEC 61850 standard for communication and interoperability of substation automation devices, including fast GOOSE messaging and IEC 61850-9-2 LE, and can now also benefit from the extended interoperability provided by Edition 2. The voltage relay further supports both the parallel redundancy protocol (PRP) and the high-availability seamless redundancy (HSR) protocol, together with the DNP3, IEC 60870-5-103 and Modbus® protocols. With the protocol adapter SPA-ZC 302, Profibus DVP1 can also be used. REU615 is able to use two communication protocols simultaneously.

For redundant Ethernet communication, REU615 offers either two optical or two galvanic Ethernet network interfaces. A third port with a galvanic Ethernet network interface provides connectivity of any other Ethernet device to an IEC 61850 station bus inside a switchgear bay. The redundant Ethernet solution can be built on the Ethernet-based IEC 61850, Modbus® and DNP3 protocols.

The implementation of the IEC 61850 standard in REU615 covers both vertical and horizontal communication, including GOOSE messaging with both binary and analog signals as well as parameter setting according to IEC 61850-8-1. Also IEC 61850-9-2 LE process bus with sending sampled values of not only analog voltages but now also currents, in addition to receiving sampled values of voltages, is supported. The sampled values can now be used for synchro-check as well to ensure safe interconnection of two networks. For process bus applications, which require high-accuracy time synchronization, IEEE 1588 V2 is used, with a time stamp resolution of not more than four microseconds. IEEE 1588 V2 is supported in all variants with a redundant Ethernet communication module. In addition, REU615 supports synchronization over Ethernet using SNTP or over a separate bus using IRIG-B.



Function overview of REU615 standard configuration A

### Main benefits

- Withdrawable plug-in unit design for swift installation and testing
- Extensive range of protection and control functionality for busbar voltage supervision, load-shedding and restoration, including over- and underfrequency protection for power generators and other AC equipment
- Ready-made standard configurations for fast and easy setup with tailoring capabilities
- Automatic voltage regulation of power transformers with a motor-driven on-load tap-changer
- 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

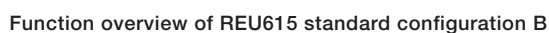
### 615 series

REU615 is a member of ABB's Relion product family and part of its 615 protection and control series of relays, characterized by compactness and withdrawable plug-in unit design. In addition to REU615, the 615 series includes the following relays:

- REF615 Feeder protection and control
- RED615 Line differential protection and control
- RET615 Transformer protection and control
- REM615 Motor protection and control
- REV615 Capacitor bank protection and control
- REG615 Generator and interconnection protection

### Life cycle services

ABB offers full support for all protection and control relays throughout their entire lifecycle. Our extensive life cycle services include training, customer support, maintenance and modernization.





# Standard configurations

## Standard configurations

Description	Standard configuration
Voltage and frequency based protection, synchro-check and load-shedding	A
Automatic voltage regulator	B

1, 2,... = number of included instances / I/Os  
( ) = optional

## Supported functions, codes and symbols

Functionality	IEC 61850	IEC 60617	IEC-ANSI	A	B
<b>Protection</b>					
Three-phase non-directional overcurrent protection, low stage	PHLPTOC	3I>	51P-1	-	1
Three-phase non-directional overcurrent protection, high stage	PHHPTOC	3I>>	51P-2	-	1
Three-phase non-directional overcurrent protection, instantaneous stage	PHIPTOC	3I>>>	50P/51P	-	1
Residual overvoltage protection	ROVPTOV	Uo>	59G	3	-
Three-phase overvoltage protection	PHPTOV	3U>	59	3	3
Three-phase undervoltage protection	PHPTUV	3U<	27	3	3
Positive-sequence undervoltage protection	PSPTUV	U1<	47U+	2	-
Negative-sequence overvoltage protection	NSPTOV	U2>	47O-	2	-
Frequency protection	FRPFRQ	f>/f<, df/dt	81	6	-
Three-phase thermal overload protection, two time constants	T2PTTR	3Ith>T/G/C	49T/G/C	-	1
Master trip	TRPPTRC	Master Trip	94/86	2	2
Arc protection	ARCSARC	ARC	50L/50NL	(3) <sup>1)</sup>	-
Multi-purpose protection <sup>1)</sup>	MAPGAPC	MAP	MAP	18	18
Load shedding and restoration	LSHDPPFRQ	UFLS/R	81LSH	5	-
<b>Control</b>					
Circuit-breaker control	CBXCBB	I ↔ O CB	I ↔ O CB	1	1
Disconnecter control	DCXSWI	I ↔ O DCC	I ↔ O DCC	2	2
Earthing switch control	ESXSWI	I ↔ O ESC	I ↔ O ESC	1	1
Disconnecter position indication	DCSXSWI	I ↔ O DC	I ↔ O DC	3	3
Earthing switch indication	ESSXSWI	I ↔ O ES	I ↔ O ES	2	2
Tap changer position indication	TPOSSLTC	TPOSM	84M	-	1
Tap changer control with voltage regulator	OLATCC	COLTC	90V	-	1
Synchronism and energizing check	SECRSYN	SYNC	25	1	-
<b>Condition Monitoring</b>					
Trip circuit supervision	TCSSCBR	TCS	TCM	2	2
Current circuit supervision	CCRDIF	MCS 3I	MCS 3I	-	1
Fuse failure supervision	SEQRUFUF	FUSEF	60	-	1
Runtime counter for machines and devices	MDSOPT	OPTS	OPTM	1	1

1, 2,... = number of included instances / I/Os  
( ) = optional

#### Supported functions, codes and symbols

Functionality	IEC 61850	IEC 60617	IEC-ANSI	A	B
<b>Measurement</b>					
Disturbance recorder	RDRE	DR	DFR	1	1
Load profile record	LDPMSTA	LOADPROF	LOADPROF	1	1
Fault record	FLTRFRC	FAULTREC	FAULTREC	1	1
Three-phase current measurement	CMMXU	3I	3I	-	1
Sequence current measurement	CSMSQI	I1, I2, I0	I1, I2, I0	-	1
Three-phase voltage measurement	VMMXU	3U	3V	2	1
Residual voltage measurement	RESVMMXU	Uo	Vn	1	-
Sequence voltage measurement	VSMSQI	U1, U2, U0	V1, V2, V0	1	1
Three-phase power and energy measurement	PEMMXU	P, E	P, E	-	1
RTD/mA measurement	XRGGIO130	X130 (RTD)	X130 (RTD)	-	(1)
Frequency measurement	FMMXU	f	f	1	-
IEC 61850-9-2 LE sampled value sending <sup>2) 3)</sup>	SMVSENDER	SMVSENDER	SMVSENDER	(1)	(1)
IEC 61850-9-2 LE sampled value receiving (voltage sharing) <sup>2) 3)</sup>	SMVRCV	SMVRCV	SMVRCV	(1)	(1)

<sup>1)</sup> Light only

<sup>2)</sup> Available only with IEC 61850-9-2

<sup>3)</sup> Available only with COM0031-0034

# Contact us

For more information, please refer to  
REU615 Product Guide, or contact us:

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