

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Multifunction Relay**

with type designation(s)

Feeder Relay REF620, Machine Relay REM620 and Transformer Relay RET620

Issued to

**ABB Oy, Distribution Solutions
Vaasa, Finland**

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Issued at **Høvik** on **2018-12-11**

for **DNV GL**

This Certificate is valid until **2023-09-01**.

DNV GL local station: **Turku**

Approval Engineer: **Nicolay Horn**

**Marta Alonso Pontes
Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

a) Microprocessor based multifunction relay machine relay - **type REM620:**

Basic functions:

Motor protection, measurement, control, condition monitoring, communication, general and standard.

b) Microprocessor based multifunction relay feeder relay - **type REF620:**

Basic functions:

Feeder protection, measurement, control, condition monitoring, communication, power quality, general and standard.

c) Microprocessor based multifunction relay transformer relay - **type RET620:**

Basic functions:

Transformer protection, measurement, control, condition monitoring, communication, general and standard.

Protection functions available in REF/REM/RET 620:

ANSI Code	Protection function	REF 620	REM 620	RET 620
51P-1	Three-phase non-directional overcurrent protection, low stage	X	X	X
51P-2	Three-phase non-directional overcurrent protection, high stage	X	X	X
50P/51P	Three-phase non-directional overcurrent protection, instantaneous stage	X	X	X
51P-1_3	Three-independent-phase non-directional overcurrent protection, low stage	X		
51P-2_3	Three-independent-phase non-directional overcurrent protection, high stage	X		
50P/51P_3	Three-independent-phase non-directional overcurrent protection, instantaneous stage	X		
67-1	Three-phase directional overcurrent protection, low stage	X	X	X
67-2	Three-phase directional overcurrent protection, high stage	X	X	X
67-1_3	Directional three-independent-phase directional overcurrent protection, low stage	X		
67-2_3	Directional three-independent-phase directional overcurrent protection, high stage	X		
67Y1	Multifrequency admittance-based earth-fault protection	X		
51C/37	Three-phase overload protection for shunt capacitor banks	X		
51NC-1	Current unbalance protection for shunt capacitor banks	X		
51N-1	Non-directional earth-fault protection, low stage	X	X	X
51N-2	Non-directional earth-fault protection, high stage	X	X	X
50N/51N	Non-directional earth-fault protection, instantaneous stage	X	X	
67N-1	Directional earth-fault protection, low stage	X	X	X
67N-2	Directional earth-fault protection, high stage	X	X	X
21YN	Admittance based earth-fault protection	X		
32N	Wattmetric based earth-fault protection	X		
67NIEF	Transient / intermittent earth-fault protection	X		
51NHA	Harmonics based earth-fault protection	X		
46	Negative-sequence overcurrent protection	X		X
46PD	Phase discontinuity protection	X		
59G	Residual overvoltage protection	X	X	X
27	Three-phase undervoltage protection	X	X	X
59	Three-phase overvoltage protection	X	X	X

ANSI Code	Protection function	REF 620	REM 620	RET 620
51V	Three-phase voltage-dependent overcurrent protection	X	X	
47U+	Positive-sequence undervoltage protection	X	X	X
47O-	Negative-sequence overvoltage protection	X	X	X
81	Frequency protection	X	X	X
49F	Three-phase thermal protection for feeders, cables and distribution transformers	X		
37F	Loss of phase (undercurrent)	X		X
51BF/51NBF	Circuit breaker failure protection	X	X	X
68	Three-phase inrush detector	X		X
94/86	Master trip	X	X	X
50L/50NL	Arc protection	X	X	X
PHIZ	High impedance fault detection	X		
81LSH	Load shedding and restoration	X		X
51LR	Motor load jam protection		X	
49,66,48,51LR	Motor start-up supervision		X	
46R	Phase reversal protection		X	
49M	Thermal overload protection for motors		X	
87M	Motor differential protection		X	
87MH	High impedance/flux-based differential protection for motors		X	
24	Voltage per hertz protection			X
49T	Three-phase thermal overload protection for power transformers, two time constants			X
87T	Stabilized and instantaneous differential protection for 2-winding transformers			X
87NL	Numerical stabilized low impedance restricted earth-fault protection		X	X
87NH	High impedance based restricted earth-fault protection		X	X
MAP	Multipurpose analog protection	X	X	X
46M	Negative-sequence overcurrent protection for motors		X	
37M	Loss of load supervision		X	
27_A	Single-phase undervoltage protection, secondary side	X	X	
SOFT/21/50	Automatic switch-onto-fault logic (SOF)	X	X	X
78V	Voltage vector shift protection	X		
32Q,27	Directional reactive power undervoltage protection	X	X	
32U	Underpower protection	X	X	X
32R/320	Reverse power/directional overpower protection	X	X	X
27RT	Low-voltage ride-through protection	X	X	
87A	High-impedance differential protection for phase A	X		
87B	High-impedance differential protection for phase B	X		
87C	High-impedance differential protection for phase C	X		
CBUPS	Circuit breaker uncorresponding position start-up	X		
55TD	Shunt capacitor bank switching resonance protection, current based	X		
59A	Single-phase overvoltage protection, secondary side	X	X	
40	Three-phase underexcitation protection		X	
64R	Rotor earth-fault protection		X	

Rated primary current 0 – 6000 A on primary transformer, rated secondary current 5A, 1A and 0.2 A of the primary current transformer.

Rated voltage on the primary voltage transformer 0 – 440 kV, rated secondary voltage 100V, 110V, 115V and 120V of primary voltage transformer.

Application/Limitation

Installation of the unit is to be according to manufacturer's specifications.

- The total panel instrumentation to be in accordance with the Rules.
- Product certificate:

When the unit is used for protection purposes no product certificate is required. When the unit is used for other control purposes a product certificate acc. to Pt.4 Ch.8 Sec.1 and Pt.4 Ch.9 Sec.1 A 202 will be required. Correct configuration and set up for each delivery to be tested during commissioning after installation.

- The Type Approval covers hardware and software for the unit.
- The Type Approval does not cover application software.

The following documentation of the actual application is to be submitted for approval in each case:

- System Block Diagram
- Power supply arrangement (may be part of the system block diagram)

The Type Approval covers hardware listed under Product description.

Clause for application software control:

All changes in software are to be recorded. Major changes are to be forwarded to DNV for evaluation and approval. Major changes in the software are to be approved before installed in the computer. A certification of application functions may be required for the particular vessel.

Type Approval documentation

Technical info:

Brochures "Feeder protection and control REF620", "Motor protection and control REM620" and "Transformer protection and control RET620".

Test reports:

VTT test report, doc. nos. VTT-S-8302-11, issued 2011-11-23 & VTT-S-07239-13 issued 2013-10-23.
Nemko test report no. 227397C issued 2013-04-09. ABB Declaration of Conformity no. 1MRS757890 issued 2013-04-26. Protection Relay Functionality Test Report Id no. 1MRS082144 issued 2013-12-31.

Tests carried out

Type tests in accordance with IEC 60255, Environmental tests according to DNV Standard for Certification No. 2.4, April 2001. (EMC, dry heat, cold, damp heat and vibration.)

Marking of product

ABB – REF/REM/RET620 – Type number.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

Job Id: **262.1-016732-2**
Certificate No: **TAE000039U**

The main elements of the assessment are:

- Ensure that type approved documentation is available.
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines.
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications.
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given.
- Ensuring traceability between manufacturer's product type marking and the type approval certificate.
- Ensuring that type approved documentation is available.

Survey to be performed at 2 and 3.5 year and at renewal.

END OF CERTIFICATE