



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. E-9945

This Certificate consists of 4 pages

This is to certify that the

Multifunction Relay

with type designation(s)

**Feeder Protection REF610, Motor Protection REM610 and
Voltage Protection REU610**

Manufactured by

ABB Oy, Distribution Automation

VAASA, Finland

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det
Norske Veritas' Offshore Standards

IEC 60255

Application

For installations inside switchboard/enclosures onboard ships and offshore units.

Place and date

Høvik, 2009-12-02

for **DET NORSKE VERITAS AS**

for
Marit Laumann
Marit Laumann
Head of Section



Local Office
DNV Helsinki

This Certificate is valid until

2013-12-31

Nicolay Horn
Nicolay Horn
Surveyor

**Notice: 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.**

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Cert. No.: E-9945
 File No.: 824.11
 Job Id: 262.1-003095

Product description

a) Microprocessor based feeder protection IED - type REF610:

Basic functions:

Overcurrent, thermal overload, short circuit, earth fault, phase discontinuity, multi-shot auto-reclosing, trip circuit protection and communication, general and standard.

b) Microprocessor based motor protection IED - type REM610:

Basic functions:

Motor startup, short circuit, thermal overload, undercurrent, unbalance, earth fault, phase reversal, measurement, condition monitoring, communication, general and standard.

c) Microprocessor based voltage protection IED - type REU610:

Basic functions:

Overvoltage protection, undervoltage protection, negative or positive sequence protection, measurement, condition monitoring, communication, general and standard.

Protection functions available in REF/REM/REU 610:

ANSI number	Protection function	REF610	REM610	REU610
51	Three-phase overcurrent protection I>	x		
50/51	Three-phase overcurrent protection I>>	x		
50	Three-phase overcurrent protection I>>>	x		
46	Phase discontinuity $\Delta I >$	x		
49F	Three-phase thermal overload for cables $\Theta >$	x		
51N	Non directional Earth-fault protection $I_0 >$	x		
50N / 51N	Non directional Earth-fault protection $I_0 >>$	x		
50/50=NL	Arc protection	x		
79	Auto reclosing 0->1	x		
49M	Thermal overload protection for motors		x	
48 / 14	Motor startup supervision $I_s^2 \times t_s$		x	
51 / 14	Definite time over current protection I>		x	
14	Speed switch support		x	
66	Cumulative startup time counter		x	
50 / 51	Short circuit protection I>>		x	
37	Undercurrent protection I<		x	
46	Unbalance protection $I_2 >$		x	
(46R)	Phase reversal protection		x	
50N / 51N	Non-directional earth-fault protection $I_0 >$		x	
49 / 38	Temperature protection using RTD sensors or thermistors		x	
59P-1	Overvoltage protection U>			x
59P-2	Overvoltage protection U>>			x
47	Negative phase sequency protection $U_2 >$			x



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ANSI number	Protection function	REF610	REM610	REU610
27P-1	Undervoltage protection $U <$			x
27P-2	Undervoltage protection $U <<$			x
27D	Positive phase sequency protection $U_1 <$			x
59N-1	Residual voltage protection $U_0 >$			x
59N-2	Residual voltage protection $U_0 >>$			x
62BF	Circuit breaker failure protection	x	x	x

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

Power supply $U_{aux} = 100/110/120/220$ V AC & $110/125/220$ V DC.

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:

Feeder Protection Relay REF610 Technical Reference Manual.



Cert. No.: E-9945
 File No.: 824.11
 Job Id: 262.1-003095

Motor Protection Relay REM610 Technical Reference Manual.
 Voltage Relay REU610 Technical Reference Manual.

Test reports:

REF 610 Feeder Protection Relay – Type Test Report no. 1MRS081575 dated 2007-01-31,
 REM 610 Motor Protection Relay – Type Test Report no. 1MRS081574 dated 2007-01-31,
 REF 610 Feeder Protection Relay – Type Test Report no. 1MRS081680 dated 2006-03-17.
 VTT Sine Vibration Test doc. NO. VTT-S-04755-09 dated 2009-06-23.
 ABB Type Test Report for RE_610 no. 1MRS081903 dated 2009-09-03.

Tests carried out

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

Marking of product

ABB Oy – REF610 / REM610 / REU 610

Certificate retention survey

The scope of the retention/renewal survey 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.

The main elements of the survey 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 least every second year.

END OF CERTIFICATE