



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **E-12328**

This is to certify that the
Multifunction Relay

with type designation(s)

Feeder Protection REF630, Motor Protection REM630, Generator Protection REG630 and Transformer Protection RET630

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

Application

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

This Certificate is valid until **2015-12-31**.

Issued at **Høvik** on **2013-05-07**

DNV local station: **Vaasa**

for **Det Norske Veritas AS**

Approval Engineer: **Nicolay Horn**

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**Marit Laumann
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.

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.

Product description

a) Microprocessor based feeder protection and control - **type REF630:**

Basic functions:

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

b) Microprocessor based motor protection and control - **type REM630:**

Basic functions:

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

c) Microprocessor based transformer protection and control - **type RET630:**

Basic functions:

Differential protection, Overcurrent protection, short circuit protection, negative or positive sequence protection, measurement, condition monitoring, communication, general and standard.

d) Microprocessor based generator protection and control - **type REG630:**

Basic functions:

Overcurrent, short circuit, thermal overload, earth fault, differential protection, measurement, condition monitoring, communication, general and standard.

Protection functions available in REF/REM/RET/REG 630:

ANSI number	Protection function	REF630	REM630	RET630	REG630
51P-1	Three-phase non-directional overcurrent protection, low stage 3I>	X	X	X	X
51P-2	Three-phase non-directional overcurrent protection, high stage 3I>>	X		X	X
50P/51P	Three-phase non-directional overcurrent protection, instantaneous stage 3I>>>	X	X	X	X
51V	Voltage dependent overcurrent protection				X
67-1	Three-phase directional overcurrent, low stage 3I> →	X		X	X
67-2	Three-phase directional overcurrent, high stage 3I>> →	X		X	X
46PD	Phase discontinuity $I_2/I_1 >$	X			
49F	Three-phase thermal overload for feeder 3Ith>F	X			
49TG	Three-phase thermal overload protection, two time constants				X
51N-1	Non directional Earth-fault protection, low stage $I_0 >$	X	X	X	X
51N-2	Non directional Earth-fault protection, high stage $I_0 >>$	X	X	X	X
50N/51N	Non-directional Earth-fault protection, instantaneous stage $I_0 >>>$	X	X		X
67N-1	Directional earth-fault, low stage $I_0 > \rightarrow$	X	X	X	X
67N-2	Directional earth-fault, high stage $I_0 >> \rightarrow$	X	X	X	X
67NIEF	Transient/intermittent earth-fault $I_0 > \rightarrow$ IEF	X			
27/59THD	Third harmonic based stator earth fault protection				X
46	Negative-sequence overcurrent $I_2 >$	X		X	
68	Three-phase current inrush detection 3I2f>	X		X	X
59	Three-phase overvoltage 3U>	X	X	X	X
27	Three-phase undervoltage 3U<	X	X	X	X

ANSI number	Protection function	REF630	REM630	RET630	REG630
47O+	Positive-sequence overvoltage $U_1 >$	X	X	X	X
47U+	Positive-sequence undervoltage $U_1 <$	X	X	X	X
47O-	Negative-sequence overvoltage $U_2 >$	X	X	X	X
59G	Residual overvoltage $U_0 >$	X	X	X	X
81R	Frequency gradient $df/dt >$	X	X	X	X
81O	Overfrequency $f >$	X	X	X	X
81U	Underfrequency $f <$	X	X	X	X
81LSH	Load shedding UFLS/R	X			
21FL	Fault locator ¹ FLOC	X			
51BF/51NBF	Circuit-breaker failure $3I >/ I_0 > BF$	X	X	X	X
79	Auto-reclosing $O \rightarrow I$	X			
94	Tripping logic $I \rightarrow O$	X	X	X	X
21, 21P, 21N	Distance protection $Z <$	X			
SOTF	Automatic switch onto fault logic SOTF	X			
LAL	Local accelerat. Logic LAL	X			
85N	Communication logic for residual OC CLN	X			
85	Scheme communic. Logic CL	X			
85CRW	Current reversal and WEI logic CLCRW	X			
85NCRW	Current reversal and WEI logic for residual OC CLCRWN	X			
49M	Three-phase thermal overload protection for motors $3I_{th} > M$		X		
37	Loss of load supervision $3I <$		X		
51LR	Motor stall protection $I_{st} >$		X		
ESTART	Emergency start ESTART		X		
49/66/48/51LR	Motor startup supervision $I_{s2t} n <$		X		
46R	Phase reversal protection $I_2 >>$		X		
46M	Negative-phase-sequence time overcurrent protection $I_2 > M$		X		X
87NL	Stabilised restricted earth-fault $dI_0 L_0 >$			X	
87NH	High impedance restricted earth-fault protection $dI_0 H_i >$			X	X
49T	Three-phase thermal overload for transformers $3I_{th} > T$			X	
87T	Transformer differential protection for two-winding transformers $3dI > T$			X	X
87M	Stabilized differential protection for motors $3dI > M$		X		X
87GH/MH	High impedance or flux balanced differential protection $3dI H_i > G/M$		X		X
32O	Directional over power protection $P >$		X		X
32U	Underpower Protection				X
40	Underexcitation protection $X <$		X		X
64R	Rotor earth-fault protection $I_0 > R$		X		X
24	Overexcitation protection $U/f >$			X	X
21GT	Underimpedance protection $Z < GT$			X	X
21YN	Admittance-based earth-fault protection $Y_0 > \rightarrow$	X			
32N	Wattmetric earth-fault protection $P_0 > \rightarrow$	X			

Rated primary current $I_1 = 9999$ A on primary transformer, rated secondary current 5A, 1A, 0,5 and 0.1 A of the primary current transformer. Rated primary voltage 0,001- 9999kV on primary transformer, rated secondary voltage 100-120 V.

Power supply $U_{aux} = 100/110/120/220/240$ V AC & $110/125/220/250$ V DC or 48/60/110/125VDC.

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:

Generator Protection and control REG630 Brochure
Generator Protection and control REG630 Application Manual
Feeder Protection and Control REF630 Brochure.
Motor Protection and control REM630 Brochure.
Transformer Protection and control RET630 Brochure.

Test reports:

ABB Generator Protection Type Test Report No 1MRS082062
630 series Type Test Certificate , doc. no. 1MRS756957 issued 2012-08-29
KEMA Type Test Certificate of Environmental Performance, doc. Nos. . 09-1015 & 09-1016 issued 2009-08-28
Nemko Test Report no. 163036A issued 2010-11-30
VTT test report No. VTT-S-02672-11, issued 2011-04-28

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, dry heat, cold, damp heat and vibration.) EMC tests in accordance with IEC 60255.

Marking of product

ABB – REF630 / REM630 / RET630 / REG630

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