Marine & Offshore Division

Certificate number: 41094/A0 BV
File number: ACE2/169/6
Product code: 2650H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

ABB OY, Medium Voltage Products

Vaasa - FINLAND

for the type of product

MULTIFUNCTION PROTECTION RELAYS

REF54_, REM54_, RET54_ series.

Requirements:
Bureau Veritas Rules for the Classification of Steel Ships.

EC Code: 31.

IEC 60255 (2009).

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 11 Jun 2020

For BUREAU VERITAS,
At BV HELSINKI, on 11 Jun 2015,
Tommy Andersson

BUREAU VERITAS SURVEYORS AT PARIS 1828 HELSINKI INTERNATIONAL REGISTER

This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine & Offshore Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

The **REF54_ series** are feeders terminals intended to control, operate and monitor medium voltage networks.
The **RET54_ series** are transformers terminals intended to protect and control two windings transformers, and generator transformer.
The **REM54_ series** are motor and generator terminals intended to protect and control motors, and power generators.

1.1 - Protection's range:

Protection function
Three-phase non-directional overcurrent
Three-phase directional o/c
Voltage dependent overcurrent
Three-phase high-impedance/flux-balance based diff. prot. for motors/generators
Three-phase differential protection for generators, stabilized and inst. stages
Three-phase differential protection for transformers, stabilized and inst. stages
Three-phase underimpedance protection
Non-directional earth-fault
Directional earth-fault
Directional earth-fault sensitive
High-impedance based restricted earth-fault protection
Three-phase low impedance based restricted earth-fault protection
Residual overvoltage
Negative-phase-sequence current protection
Phase discontinuity
Phase reversal protection
Three-phase overvoltage
Three-phase undervoltage
Underfrequency or overfrequency inc. rate of change
Three-phase directional overpower protection
Three-phase reverse power/ directional underpower protection
Overexcitation protection
Three-phase underexcitation protection
Auto-reclosure, 5 shots
Synchro-check/voltage check
Three-phase inrush detector
Fuse failure supervision
Three-phase non-directional undercurrent protection
Circuit breaker failure protection (integrated into other protections)
Cumulative start-up time counter
Three-phase thermal overload (feeders & cables)
Three-phase thermal overload protection for motors, generators or transformers
Thermal supervision of windings or bearings by RTDs
Motor start-up supervision, Is2 x ts
Speed switch support
Locked rotor
Motor start
Three-phase positive/negative sequence voltage protection
Electrically latched lockout relay
Three-phase overload protection for shunt capacitor banks
Current unbalance protection for shunt capacitor
Three-phase current U/B protection for H-bridge shunt capacitors
Fault Locator

Note: Functions are reliable to the product's type, and its application.

1.2 - Software list:

1.2.1 - REF 54:

Type	Software revision	Software No.
REF 541	K	1MRS110041-0__
REF 541 (with RTD1 module)	K	1MRS110042-0__
REF 543	K	1MRS110043-0__
REF 543 (with RTD1 module)	K	1MRS110044-0__
REF 545	K	1MRS110045-0__

1.2.2 - REM 54:

Type	Software revision	Software No.
REM 543	C	1MRS110022-00_
REF 543 (with RTD1 module)	B	1MRS110023-00_
REF 545	B	1MRS110024-00_
REF 545 (with RTD1 module)	B	1MRS110025-00_

1.2.3 - RET 54:

Type	Software revision	Software No.
RET 541	A	1MRS110031-0__
RET 541 (with RTD1 module)	A	1MRS110032-0__
RET 543	A	1MRS110033-0__
RET 543 (with RTD1 module)	A	1MRS110034-0__
RET 545	A	1MRS110035-0__

2. DOCUMENTS AND DRAWINGS :

Tehnical document ref. 1MRS750527-MUM, dated 29.Sept.1997.
Data sheet ref. 1MRS751818, dated Jun.2005.
Data sheet ref. 1MRS755158D, dated Feb.2010.
Technical document ref. 1MRS750915-MUM, dated 16.Oct.1998.
Data sheet ref. 1MRS755444B, dated Feb.2006.
Technical document ref. 1MRS755225, dated 20.Jan.2005.
Software document ref. 1MRS081301, dated 13.Jun.2002.
Software documents ref. 1MRS750527-MUM, 1MRS750915-MUM and 1MRS755225.

3. TEST REPORTS :

EMCEC:
- Tests report N°1000484, dated 13.Mar.2000.

SGS:
- Test report N°280101-1, dated 24.Apr.2015.

Nemko:
- Tests report N°1032178, dated 16.Apr.2004.

VTT AUTOMATION:
- Test report N°AUT46-010289, dated 25.Apr.2001.

ABB:
- Tests reports N°1MRS080726 & N°1MRS080846, both dated 08.Mar.2001.

4. APPLICATION / LIMITATION :

4.1 - BUREAU VERITAS Rules and Regulations for the Classification of Steel Ships.
4.2 - Approval valid for ships intended to be granted with the following additional class notations: **AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS.**
4.3 - BUREAU VERITAS Environmental Category, **EC Code: 31**
4.4 - The equipment fulfils the EMC requirements for installation in General Power Distribution Zones.
4.5 - Only Hardware and Firmware / Software successfully tested together in compliance with the regulations as referred to in page one, according to the declaration of the manufacturer are covered by this certificate.
4.6 - The installation shall comply with the Manufacturer's recommendation described in the above-referenced documentation.

5. PRODUCTION SURVEY REQUIREMENTS :

5.1 - The **REF54_, REM54_, RET54_ series** are to be supplied by **ABB OY, Medium Voltage Products** in compliance with the type described in this certificate.

5.2 - This type of product is within the category HBV of Bureau Veritas Rule Note NR320.

5.3 - **ABB OY, Medium Voltage Products** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR320 for HBV products :

ABB OY, Medium Voltage Products
Muottitie 2A
65101 Vaasa
FINLAND

6. MARKING OF PRODUCT :

6.1 - Trade name.

6.2 - Date of manufacture and serial number.

6.3 - Equipment type or model identification under which it was type-tested

7. OTHERS :

This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the units at any time and that **ABB OY, Medium Voltage Products**, will accept full responsibility for informing shipbuilders, shipowners or their sub-contractors of the proper methods of use and general maintenance of the units and the conditions of this approval.

*** END OF CERTIFICATE ***