

EU RO Mutual Recognition Technical Requirements

ELECTRICAL/ELECTRONIC RELAYS	Version	5
	Adoption Date	1 January 2022
	Application Date	1 July 2022
	Tier	2
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1. PRODUCT DESCRIPTION

1.a General description of the product

Relays means:

- devices designed to produce sudden, predetermined changes in one or more electrical output circuits when certain conditions are fulfilled in the electrical input circuit controlling the device;
- thermal electrical relays which protect equipment from electrical thermal damage by the measurement of current flowing in the protection equipment;
- measuring relays (including time relays) and protection equipment including any combination of devices for power system protection such as control, monitoring and process interface equipment.

1.b Application limitations†

- Restricted to LV relays according to IEC 60947-5-1 and IEC 60255 installed onboard ships with exceptions as per SOLAS Ch. I, Reg. 3;
- Installation on board ships within locations with climatic, biological, chemically active, mechanically active and mechanical environmental conditions not exceeding those for which performance has been proved according to IEC 60721-3-6 (1987) + A2 (1997);
- The requirements are not applicable for relays to be installed in areas where explosive gases or vapor atmospheres may occur.

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† The EU MR type approved product is generally not used as a stand-alone product, but integrated as component in a sub-system or system. When a product is presented with an EU RO MR Type Approval Certificate for given application, its acceptability with regards to conditions defined in 1b, 1c and 1d of this Technical Requirement will be evaluated by the EU RO in charge of classing the ship or being in charge of the unit/system certification.

1.c Intended use

- a) Power supply system characteristics as per IEC 60092-101; 2.8;
- b) Environment category 6K4, 6B2, 6C2, 6S2 and 6M3 according to IEC 60721-3-6 or conditions specified in IEC 60947-1 Annex Q.

1.d System context

See 1.c

2. DESIGN EVALUATION

2.a Engineering evaluation requirements

2.a.i. Technical Requirements

Type, ratings and characteristics of relays for intended applications shall be evaluated. In general, IEC 60947 and IEC 60255 series shall be observed.

2.a.ii. Technical documents to be submitted

Prior to tests:

- a) Proposed test program and test schedule;
- b) Description of test specimens and explanation of the selected test sample(s) providing evidence that the selected sample meets the most rigorous and demanding requirements;
- c) Product descriptions, manuals, data sheets, assembly drawings, dimension drawings, etc. clearly identifying the product;
- d) Complete accreditation certificate of the Test laboratory;
- e) Details of production sites;
- f) Product specification;
- g) Application, working area;

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- h) Instructions on fitting, assembly and operation;
- i) QM-certificate according to ISO 9001 or equivalent by an accredited certifying body;
- j) For products where the function of the product is based on software the quality management system of the manufacturer has to maintain procedures for the life cycle activities and the version control.

After completion of tests:

On completion of tests, a report shall be issued, identified by number and date, which accurately, clearly and unambiguously presents the test results and all other relevant information.

Test report(s) shall include the following information:

- k) Type of product, with type number / serial number(s) and quantity tested;
- l) version of each type of installed software at the time of testing is to be identified;
- m) Test specification for the product identified by number, revision and date;
- n) Details of test equipment and measuring instruments stating serial numbers and calibration certificates;
- o) Names of the test engineer and the engineer approving the report;
- p) Ambient environmental conditions during the test;
- q) The test results with a description of any failures encountered;
- r) Conclusion.

Test report(s) shall be signed by the test personnel and verified by an EU RO or the agreed independent representative witnessing the tests.

The complete product test report(s) shall be submitted to the Type Approval Centre.

2.b Type testing requirements

The following tests specified in IACS UR E10 or IEC 60947-1 shall be performed:

- a) Visual Inspection;
- b) Performance test (acc. to IEC 60947-1 or IEC 60255 and IEC 60947-4-1 for thermal relays);
- c) External power supply failure;
- d) Power supply variations;
- e) Dry heat;

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- f) Damp heat;
- g) Vibration;
- h) Inclination;
- i) Insulation resistance;
- j) High Voltage;
- k) Cold;
- l) Flammability;
- m) Salt mist for relays installed on weather exposed areas. EMC tests are required in case of digital relays;
- n) Test specimens shall be taken from the production line or from stocks †;
- o) Tests shall be carried out in the presence of the EU RO Surveyor. In cases where the tests are conducted at Nationally Accredited Laboratories, the presence of the EU RO surveyor may be omitted †.

† For further clarification of witnessing of tests and sampling the test specimen(s), refer to paragraphs 6, 7 and 8 of the EU RO "Design Evaluation Scheme" procedure (Appendix V of EU RO Framework Document for the Mutual Recognition of Type Approval found on <https://www.euromr.org/technical-requirements>).

2.c Type testing requirement for certificate renewal

- a) The manufacturer is to notify the RO of any modification or changes to the manufacturing specifications that may affect the MR TA to be renewed.
- b) If the specified standard(s) is(are) amended or revised, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply.
- c) The Software history to be provided for review.

3. PRODUCTION REQUIREMENTS

3.a General requirements

Refer to EU RO "Product Quality Assurance (PQA)" procedure (Appendix VI of EU RO Framework Document for the Mutual Recognition of Type Approval).

3.b Special requirements

- a) Routine test according to relevant IEC 60947 series or IEC 60255 series;
- b) Production certification according to ISO 9001 or equivalent by an accredited certifying body;

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- c) QM/QS audit (annual) to be submitted to the EU RO for review (similar to MED);
- d) Production of the equipment shall be limited to the facilities listed on EU RO certificate;
- e) Production and environmental requirements according to EU directives (for the consideration of the technical steering group);
- f) Changes to the product will invalidate the EU RO certification. Changes to the embedded software (firmware/ system software), if software changes of relevance will void the EU RO certification. The EU RO shall be kept informed of all new version numbers including a description and impacts of change;
- g) RO. shall be granted access to all manufacturing and testing facilities, and provided with all the information necessary to perform its duties;
- h) General terms and conditions of EU RO shall be observed.

4. MARKING REQUIREMENTS

Manufacturers of the approved equipment are, in principle, to mark the product before shipment for identification of approved equipment as per referenced standard i.e. IEC 60947 item 5.2 or IEC 60255-1 item 6.1.

5. TYPE APPROVAL CERTIFICATE CONTENT

The EU RO MR Type Approval Certificate shall contain the minimum information as defined in the "EU RO Framework Document for the Mutual Recognition of Type Approval" - see Appendix I EU RO MR Type Approval Certificate Information.

The following information is specifically applicable to products relevant to this technical requirement and shall be included on the relevant EU RO MR Type Approval Certificate:

- a) Type designations and dimensions of enclosures/boxes;
- b) Product description;
- c) Environmental category (including additional tests where applicable);
- d) Range of application;
- e) Test standards with the date and/or No. of edition;
- f) Firmware/ Operational System Software Version: [major version. minor version].

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6. APPROVAL DATE AND REVISION NUMBER

Date	Revision	Comment
2013-04-30	0.0	Accepted by Advisory Board
2014-01-31	0.1	CRF008 - Reference to EU RO Framework Document for the Mutual Recognition of Type Approval added.
2015-01-31	0.2	CRF018 – Revision to par. 2.a.ii - Test results to be in English; CRF020 – Revision to par. 5 - 'Type Approval Certificate Content'.
1 April 2016	0.3	CRF024 – Revision to par.1.b a) & 2.b b) by replacing referenced standards; CRF025 – Updated to new MR TR document format incl. par. 8; CRF026/026a – Witness testing & control of test specimen; CRF028 – Addition of 6-month application clause.
1 July 2018	0.4	CRF032 - Corrected reference to standard IEC 60721-3-6 (1987) + A2 (1997)
28 December 2021	0.5	Software update (18042g)

7. BACKGROUND INFORMATION / REFERENCES

- a) IEC 60947-1 Low-voltage switchgear and control gear - Part 1: General rules;
- b) IEC 60947 item 5.2;
- c) IEC 60255 series Measuring relays and protection equipment;
- d) IEC 60255-1 item 6.1;
- e) IEC 60721-3-6 (1987) + A2 (1997);
- f) IACS UR E10 "Test specification for Type Approval";
- g) EU RO Framework Document for the Mutual Recognition of Type Approval.

8. MAINTENANCE / CLARIFICATION OF TECHNICAL REQUIREMENTS

Anyone wishing to propose changes to this document or request clarification of technical issues should contact the EU RO MR Group Secretariat in the first instance:

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Secretariat@euomr.org.

Review and approval of change requests shall follow the EU RO MR Maintenance Process detailed in the EU RO Framework Document for the Mutual Recognition of Type Approval: <https://www.euomr.org/technical-requirements>.

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