

# EU RO Mutual Recognition Technical Requirements

<b>PILOT DEVICES</b>	Version	0.3
	Adoption Date:	1 March 2021
	Application Date:	1 October 2021
	Tier	5
This document is subject to controlled issue and can be found here: <a href="http://www.euromr.org/technical-requirements">http://www.euromr.org/technical-requirements</a> <b>*** Uncontrolled if downloaded or printed ***</b>		

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## 1. PRODUCT DESCRIPTION

### 1.a General description of the product

**Pilot devices** are devices which communicate between human operators and machines using the following control circuit devices and switching elements.

- manual control switches, e.g. push-buttons, rotary switches, joystick etc.;
- associated control circuit equipment, e.g. indicator lights, etc.

**Note1:** A control switch includes (a) switching element(s) and an actuating system.

**Note2:** A switching element may be a contact element or a semiconductor element

### 1.b Application limitations†

- a) The rated voltage of pilot devices shall be up to 1000V a.c. (50/60 Hz) or 600V d.c. according to IEC60947-5-1;
- b) The following devices, which are not relating to human operation, are excluded from these technical requirements:
  - **pilot switches**, for example pressure switches, temperature sensitive switches (thermostats), programmers, etc.;
  - **electromagnetically operated control switches**, either time-delayed or instantaneous, for example contactor relays
  - **position switches**, for example control switches operated by part of a machine or mechanism.

**Note:** pilot switches are non-manual control switches actuated in response to specified conditions of an actuating quantity. (IEV 441-14-48)

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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**

Pilot devices are used for marine applications, e.g. electric motor control gears, switchboards, distribution boards, control panels, etc.

## **1.d System context**

See 1.c above.

## **2. DESIGN EVALUATION**

### **2.a Engineering evaluation requirements**

#### **2.a i. Technical Requirements**

- a) Pilot devices shall be complied with the requirements of IEC 60947-5-1;
- b) Emergency stop devices with mechanical latching function shall be complied with IEC60947-5-5;
- c) Type, ratings and characteristics of pilot devices for intended applications shall be evaluated;
- d) Dependency of external control power shall be evaluated.

#### **2.a.ii. Technical documents to be submitted**

##### **Prior to tests:**

- a) Proposed test program and test schedule;
- b) Description of the test specimens and explanation of the selected test sample(s) providing evidence that the selected sample meets the most rigorous and demanding requirements;

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- c) Product descriptions, data sheets, assembly drawings, dimension drawings etc. clearly identifying the product;
- d) Functional block diagrams of the article with indication of input and output signals, feedbacks, self - monitoring system, etc.;
- e) Complete accreditation certificate of the Test laboratory (prior the first test only; changes in the scope of accreditation shall also be advised);
- f) Details of production sites;
- g) Product specification;
- h) Application, working area;
- i) Instructions on fitting, assembly and operation;
- j) QM-certificate according to ISO 9001.

## ***After completion of tests:***

- k) The test report with an identification number shall contain all relevant data and test results including place and date of the tests, the names of the responsible personnel carrying out the test;
- l) Type references and serial numbers of the products tested;
- m) Test reports and test records shall be signed by the personnel members in charge of the test and are to be confirmed by the EU RO by signing and marking the test report.

## ***2.b Type testing requirements***

- a) In general, the type test plan is to be agreed between the Manufacturer and the RO based on the characteristics of the product subject to testing;
- b) The type tests are intended to demonstrate the performance of the prototype according to the requirements of the applicable International Standards and the relevant Manufacturer's specification;
- c) The ability of the product to function as intended under the testing conditions specified in the latest revision of IACS UR E10 shall also be verified. Testing procedures according to the International Standards mentioned in this TR may be accepted by the RO, in lieu of those indicated in the IACS UR E10, provided that the test severity conditions set by the IACS UR E10 are fulfilled as a minimum;
- d) Performance type tests according to the Manufacturer's specification and the applicable International Standards shall be carried out;

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- e) Type test shall be carried out in accordance with IEC 60947-5-1 sub-clause 8.1.2 and, IEC 60947-5-5 sub-clause 7 for the emergency stop device with mechanical latching function;
- f) Special tests shall be carried out in accordance with IEC 60947-5-1 sub-clause 8.1.5 and Annex C Special tests – Durability tests;
- g) Compass safe distance test shall be carried out in accordance with IEC60945 sub-clause 11.2 when the pilot devices are to be installed in the vicinity of the ship's standard or steering compasses;
- h) Electromagnetic compatibility (EMC) to be tested in accordance with UR E10 (test item according to IEC 60533, and test parameters and performance criteria according to UR E10); or in accordance with IEC 60947-5-1 product standards (test parameters and performance criteria according to UR E10), plus additional test required by UR E10 (test item according to IEC 60533);
- i) All tests to be performed on agreed test samples. Test specimens shall be selected from production line or at random from stocks†;
- j) 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>).

## 3. PRODUCTION REQUIREMENTS

- a) Refer to EU RO "Product Quality Assurance (PQA)" procedure (Appendix VI of EU RO Framework Document for the Mutual Recognition of Type Approval);
- b) Routine test according to IEC 60947-5-1 sub-clause 8.1.3;
- c) Production certification according to ISO 9001 by accredited certification bodies;
- d) QM/QS audit (annual) shall be submitted to EU RO for review;
- e) Production of the equipment is limited to those facilities listed on the EU RO certificate;
- f) Changes to the product will void the EU RO certification. The EU RO shall be kept informed of all new version numbers including a description of change;

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- g) The EU RO shall be granted access to all manufacturing and testing facilities, and to be provided with all the information necessary to perform its duties;
- h) General terms and conditions of the EU RO shall be observed.

## 4. MARKING REQUIREMENTS

Marking as required by IEC 60947-5-1 sub-clause 5.2.

## 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 of 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 EU RO MR Type Approval Certificate:

- a) Technical data according to IEC marking;
- b) Reference to approved technical documents;
- c) Application and limitations.

## 6. APPROVAL DATE AND REVISION NUMBER

Date	Revision	Comment
1 July 2016	0.0	Accepted by EU RO MR Advisory Board
1 July 2018	0.1	CRF032 / CRF035 - Revision of par. 2.b – Type testing requirements (Alignment of Electrical TRs) Corrected reference to standard IEC 60721-3-6 (1987) + A2 (1997)
July 2019	0.2	CRF039, Alignment of TRs (Position Switches)
1 March 2021	0.3	Harmonised EMC testing requirements (18042h)

## 7. BACKGROUND INFORMATION / REFERENCES

- a) EU RO Framework Document for the Mutual Recognition of Type Approval;
- b) IEV 441-14-48;
- c) IEC 60947-1;

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- d) IEC 60947-5-1;
- e) IEC 60947-5-5;
- f) IEC 60721-3-6 (1987) + A2 (1997);
- g) ISO 9001;
- h) ISO 17025.

## 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:  
[Secretariat@euomr.org](mailto: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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