

EU RO Mutual Recognition Technical Requirements

FLOW GAUGES/TRANSMITTERS	Version	0.2
	Adoption Date:	1 July 2022
	Application Date:	1 January 2023
	Tier	5
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1. PRODUCT DESCRIPTION

1.a General description of the product

Liquid flow meters used in continuous metering applications.

- **Principle of operation:** mechanical flow meters (e.g., positive displacement meter), pressure-based flow meters (e.g., differential pressure), optical flow meters, thermal mass flow meters.
- **Power supply of electronic components (e.g., pulse transmitters):** external or internal (batteries).

1.b Application limitations

Application (medium): fuel, lubricating oil, hydraulic oil, water, liquids transported in cargo holds.

Explosion proof 'Ex' certification is not within the scope of this Technical Requirement and application of the product in fuel consumption monitoring systems have not been considered in this TR. This is not to be read as a limitation for the use of flow gauges/transmitters in fuel piping systems but requiring individual assessment of the suitability for the use in such systems.

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1.c Intended use

Measuring of liquids flow within:

- piping installations;
- machinery appliances;
- pressure vessels;
- tanks
- cargo holds;
- enclosed or open spaces;
- machinery components.

Counters are provided for indication of flow. Additional components like pulse transmitters give possibility for external measurement of flow.

1.d System context

Piping installations, machinery appliances, pressure vessels, tanks, cargo holds, enclosed or open spaces, machinery components.

2. DESIGN EVALUATION

2.a Engineering evaluation requirements

2.a i. Technical Requirements

- a) Flange connections requirements - see IACS P2.7.2;
- b) Materials used for construction of meters shall be in compliance with Standards EN-GJS-400-15 and NEN-EN-1563 (or equivalent). Other possible materials (relevant Standards are to be applied): cast steel, stainless steel, bronze;
- c) Indication units shall provide proper view of measurement, taking into account visibility in space / area;
- d) Transmitters (additional components added to meters) shall be installed in a box made from material resistant to mechanical damages and oils, or other typical marine influences, of proper IP degree (enclosure protection) and resistant to fire (see also **2.b. Type Testing Requirements**);

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- e) Transmitters shall be independent of alarm systems and safety system circuits/sensors and their failure shall not have an influence on the operation of these systems;
- f) Transmitters shall operate properly in ambient temperature up to +45°C (+55°C in case of electronic equipment) and humidity up to 100 %;

2.a.ii. Technical documents to be submitted

IMPORTANT: The English Language shall be used for all submitted documents.

- a) Dimensional and sectional views/drawings, material specifications;
- b) Technical description of operation including additional transmitters' operation details;
- c) Technical data/specification for transmitters;
- d) Electrical/electronic diagrams, connections (power supply, terminals, etc.), PCBs views/layout, views, dimensions, Test Reports (testing scope - **see 2.b. below**).
- e) For products where the function is based on software the quality management system of the manufacturer has to maintain procedures for the life cycle activities and the version control.

2.b Type testing requirements

- a) Flow meters (piping/flange/machinery components, additional transmitters or any electrical/electronic elements): acc. to IACS P2.11 - fire endurance test, pressure test, tightness test; acc. to IACS UR E10 – Inclination;
- b) Transmitters and any electrical/electronic elements - according to IACS UR E10 all presented tests;

NOTE: Power supply variations and Power supply failure only if external power supply is provided - see power supply details in a.m. 1.a.

- c) The version of each type of installed software at the time of testing is to be identified;
- d) The accuracy of the equipment shall be documented before and after the pressure test;
- e) Test specimens shall be taken from the production line or from stocks†;

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- f) 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 <http://www.euromr.org/Guidance%20for%20Mutual%20Recognition>).

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

Refer to EU RO "Product Quality Assurance (PQA)" procedure (Appendix VI of EU RO Framework Document for the Mutual Recognition of Type Approval found on <http://www.euromr.org/Guidance%20for%20Mutual%20Recognition>).

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.

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. In addition, and as a minimum, the following items to be marked at the suitable place:

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- a) Manufacturer's name or equivalent;
- b) Type No. or symbol;
- c) Serial No. and date of manufacture;
- d) Particulars or ratings (including IP degree and class of accuracy).

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) List of EMC/environmental test levels applied;
- b) Hardware, firmware [major version. minor version], software name and revision, as applicable.

6. APPROVAL DATE AND REVISION NUMBER

Date	Revision	Comment
2016-07-01	0.0	Approved by EU RO MR Advisory Board
28 December 2021	0.1	Software update (ref 18042g) and inserted new para. 2.c
2022-03-20	0.2	Updated para. 1.b to include TI006 (CRF053)

7. BACKGROUND INFORMATION / REFERENCES

- a) EU RO Framework Document for the Mutual Recognition of Type Approval;
- b) IACS P2.7.2;
- c) EN-GJS-400-15;
- d) NEN-EN-1563;
- e) IACS P2.11;

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f) IACS UR E10.

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.

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: <http://www.euomr.org/Guidance%20for%20Mutual%20Recognition>

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