

# EU RO Mutual Recognition Technical Requirements

## Technical Interpretation (MR TI)

MR TI Ref: TI002	Relating to: <b>MR TECHNICAL REQUIREMENTS FOR 'SENSORS' (Rev. 0.2 released 17/04/15)</b>	MR TI Version	0.0
		MR TI Status	Released
		MR TI Date of Issue	22/12/2015
		Tier	1
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### Background:

A manufacturer of electrical and electronic sensors for marine use sought clarification of the following requirements within the MR Technical Requirement (MR TR) for SENSORS:

#### **2.1.1.1.2 (now 2.1.1.1.b) - Humidity 100%**

With a humidity of 100% condensation is likely to occur if there are slight temperature variations. The manufacturer normally states that their electronic pressure transmitter has a humidity of "max. 98%RH without condensation" and in the standard cyclic damp-heat test with 55°C, condensation is excluded too. Clarification is sought from the manufacturer as to whether the 100%RH is explicitly including or excluding condensing water conditions.

#### **2.1.1.1.3 (now 2.1.1.1.c) - Severe vibration conditions 10g, 600°C**

The manufacturer confirms that for their pressure transmitter they normally test 5.100Hz, 4g and 10.2000Hz, 10g or 20g, but they have a maximum service temperature of 125°C so cannot test at 600°C at the same time.

### EU RO MR Technical Committee Response:

The EU RO MR Technical Committee confirms the following:

#### **2.1.1.1.2 (now 2.1.1.1.b) - Humidity 100%**

This a statement under 'Design of electrical and electronic sensors' rather than 'Type testing requirements', which is covered by a separate paragraph i.e. 2.2. 'Type Testing Requirements'.

The type testing shall be conducted in accordance with IACS UR E10.

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Test no. 6 'Damp heat' shall be conducted starting with 25°C and at least 95% H.

Following the test cycle condensation may be expected, which the EU ROs consider as proof that the given design criterion has been met, unless the test fails. The test is to be conducted with condensation. Absence of condensation would not demonstrate the capability of the electrical device to work under conditions of high humidity.

IEC 60068-2-30 mentions the case of small components where it is difficult to produce condensation and recommends the use of an alternative procedure i.e.:

Quote:

*IEC 60068-2-30 § 1*

*'For small, low mass specimens, it may be difficult to produce condensation on the surface of the specimen using this procedure; users should consider the use of an alternative procedure such as that given to IEC 60068-2-38.'*

Unquote

### **2.1.1.1.3 (now 2.1.1.1.c) - Severe vibration conditions 10g, 600°C**

This comment from the manufacturer appears to have been taken from IACS E10. 10g and 600°C relates to equipment intended to use in severe conditions only e.g. sensors for exhaust gas manifolds.

Sensors may be tested in other conditions, as allowed by the relevant MR TR. In this case, appropriate restrictions will be indicated in MR Type Approval Certificate (MR TAC).

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See controlled version of the relevant MR TR here:

<http://www.euromr.org/technical-requirements>

### MR TI APPROVAL DATE AND REVISION NUMBER

Date	Revision	Comment
21/12/2015	0.0	Approved by the Advisory Board