

DRAFT
RECOMMENDATION

DR 2
(Inf.)

INFORMATION

Combined Revision of R 117, R 105 & R 86

Draft Recommendation R 117-1

Dynamic measuring systems for liquids
other than water.

Part 1: Metrological and technical requirements



OIML TC 8/SC 3 *Dynamic volume and mass measurement (liquids other than water)* was responsible for the revision of OIML R 117 *Measuring systems for liquids other than water* under project p1, which also included OIML R 105 *Direct mass flow measuring systems for quantities of liquids* and R 86 *Drum meters for alcohol and their supplementary devices*.

The Draft Recommendation R 117-1 dated February 2007 was submitted for direct CIML postal approval, as decided at the 41st CIML Meeting in Cape Town.

The conditions defined in OIML B 1 *OIML Convention* for this draft to be directly approved on line were not fulfilled.

A new Draft Recommendation R 117-1 (called DR 2) has therefore been drawn up and is being submitted for regular approval by the CIML at its 42nd Meeting in Shanghai. DR 2 has been drawn up by the OIML TC 8/SC 3 Secretariat on the basis of the comments received from CIML Members during the online approval process. No fundamental changes have been made, the aim being to improve the wording in order to clarify the requirements.

The results of the online approval and the synthesis of comments received from CIML Members are indicated below.

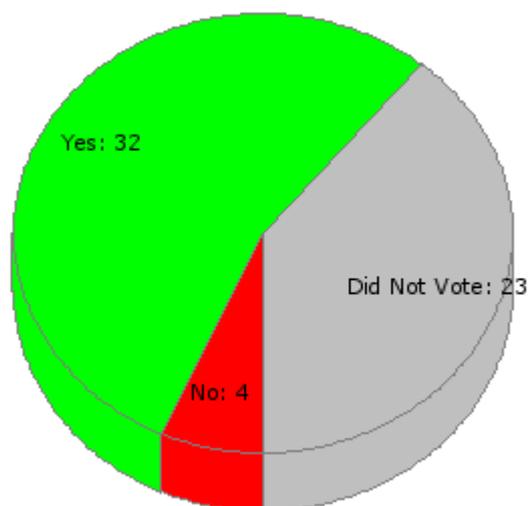


Project Number 33 ([Direct CIML online approval] - Revision OIML R 117 Measuring systems for liquids other than water. Part 1: Metrological and technical requirements)

Deadline: 2007-06-15

DENMARK voted **No** ([Comments](#))
 FRANCE voted **No** ([Comments](#))
 MONACO voted **No** ([Comments](#))
 UNITED KINGDOM voted **No** ([Comments](#))

AUSTRALIA voted **Yes**
 AUSTRIA voted **Yes** ([Comments](#))
 BELARUS voted **Yes**
 BRAZIL voted **Yes**
 CAMEROON voted **Yes**
 CANADA voted **Yes**
 CYPRUS voted **Yes**
 CZECH REPUBLIC voted **Yes** ([Comments](#))
 ETHIOPIA voted **Yes**
 FINLAND voted **Yes** ([Comments](#))
 GERMANY voted **Yes**
 HUNGARY voted **Yes**
 IRAN voted **Yes**
 JAPAN voted **Yes** ([Comments](#))
 KAZAKHSTAN voted **Yes** ([Comments](#))
 KOREA (R.) voted **Yes**
 NETHERLANDS voted **Yes** ([Comments](#))
 NEW ZEALAND voted **Yes**
 NORWAY voted **Yes** ([Comments](#))
 P.R. CHINA voted **Yes**
 POLAND voted **Yes**
 ROMANIA voted **Yes**
 RUSSIAN FEDERATION voted **Yes**
 SERBIA voted **Yes**
 SLOVAKIA voted **Yes** ([Comments](#))
 SLOVENIA voted **Yes**
 SOUTH AFRICA voted **Yes**
 SWEDEN voted **Yes** ([Comments](#))
 SWITZERLAND voted **Yes**
 TURKEY voted **Yes**
 UNITED STATES voted **Yes**
 VIET NAM voted **Yes** ([Comments](#))



Countries who did not vote (23)

ALBANIA, ALGERIA, BELGIUM, BULGARIA, CROATIA, CUBA, EGYPT, GREECE, INDIA, INDONESIA, IRELAND, ISRAEL, ITALY, KENYA, MACEDONIA, MOROCCO, PAKISTAN, PORTUGAL, SAUDI ARABIA, SPAIN, SRI LANKA, TANZANIA, TUNISIA.

OIML Draft Recommendation R 117-1 DR (dated 9 Feb 2007)
International Comments and Response (submitted with June 2007 postal ballot)
1 August 2007

Comments received from:

Austria, Canada, Czech Republic, Denmark, Finland, France, Japan, Kazakhstan, Monaco, Netherlands, Norway, Slovakia, Sweden, United Kingdom, United States, & Vietnam

Doc Section	Country	Comment	Response
Document	Secretariat	<p>This response document includes international comments received on the DR of OIML R117-1 (dated 9 Feb 2007). Over 150 comments were received from the 15 countries listed above.</p> <p>A rapid response was required so that the final (revised) DR of R117-1, including revisions based on comments listed in this response document, could be sent to CIML in advance of voting on R117-1 at the October 2007 meeting of the CIML.</p>	<p>The co-secretariats of TC8/SC3 (the US and Germany) wish to thank all of the countries that have submitted comments to improve and clarify the DR of R117-1. We also wish to thank the many individuals that have provided assistance with the short-fused responses to these international comments, especially the staff of the BIML and technical experts from Canada, France, and the Netherlands.</p> <p>In some cases, individual countries were contacted/consulted to ensure the Secretariat fully understood the submitted comment because we are now at the final stage of R117-1.</p>
Terminology, General	France	<p>The terminology is now in alphabetic order. We prefer the former thematic classification. Moreover, it has a meaning only in English: this will not help in other languages and especially in the French version of the revised IR that will be elaborated.</p> <p>We ask to go back to a terminology in an order independent from the language and to add in annex a table of correspondence as it is in the current R 117.</p> <p>In addition this leads sometimes to ambiguity, for instance for “Sensor or meter sensor”: this definition is located at “S” where it seems that “Meter sensor” is used in the text.</p>	<p>Comment understood.</p> <p>However, the general reaction to the change to an alphabetical terminology section is that it was a significant improvement to the usability of this section of the document.</p> <p>No text change.</p>
T.a.1 (new)	Netherlands	<p>Suggestion: <u>add an overview of abbreviations</u> and their meaning (example: see D 11): MMQ, E_{min}, MPE, etc.</p>	<p>Agree. See comment and response to T.a.1/Secretariat below.</p>

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T.a.1	Secretariat	<p>Editorial: New Section T.a.1 on abbreviations and acronyms used in R117-1: AC = alternating current AM = amplitude modulation DC = direct current DR = Draft Recommendation E_{min} = minimum specified quantity deviation EM = electromagnetic EMC = electromagnetic compatibility e.m.f. = electromotive force ESD = electrostatic discharge EUT = equipment under test F = frequency h = hour(s) (time unit) IEC = International Electrotechnical Committee I/O = input/output (refers to ports) ISO = International Organization for Standardization LPG = liquefied petroleum gas (also liquefied gases under pressure) MMQ = minimum measured quantity MPE = maximum permissible error N.A. = not applicable OIML = International Organization of Legal Metrology P = pressure of the liquid Q = flowrate RH = relative humidity RF = radio-frequency s = seconds (time unit) T = temperature of the liquid V = Voltage (also indicated by “U”) VIM = International Vocabulary of Basic and General Terms in Metrology</p>	<p>This responds to the Netherlands suggestion to add a section on abbreviations and acronyms.</p> <p>The addition of this section should help improve clarity and make R117-1 easier to use.</p> <p>Note: The other sections that start with the letter “a” have been re-numbered to reflect the addition of this new section.</p>

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T.a.1	Denmark	<p><u>Additional device</u> Should also mention correction device as an additional device.</p> <p>Should mention possible pulse converter between transducer and calculator, as an additional device, - or under T.t.1 pulse converter as a part of transducer. (Note: As we understand, pulse converter is not an A.M.T (T.a.8)</p>	<p>Correction device is an ancillary device. Will be added to T.a.5.</p> <p>The pulse converter is not an additional device. The pulse converter can be considered a transducer. See Sections T.t.1 and T.a.8. No text change.</p>
T.a.3 (old T.a.2)	Denmark	<p><u>Adjustment device</u> Should mention the device as mechanical (incorporated in the meter sensor) and/or electronic (incorporated in part of the calculator).</p> <p>Mention here or in 3.1.3 or annex B) If the meter consists of both a mechanical adjustment and display, precautions shall be taken to avoid different indication for the same measurement.</p>	<p>OK.</p> <p>New text in T.a.3 (old T.a.2): <u>Adjustment device</u> A device incorporated in the meter, that only allows shifting of the error curve generally parallel to itself, with a view to bringing errors within the maximum permissible errors. This device may be either mechanical or electronic.</p> <p>Comment understood. New paragraph in Annex B with a reference to Section 3.1.3 has been added.</p>
T.c.2	Sweden	<p>Technical comment: Replace construction requirements such as checking facilities with functional requirements (Example: EN1434 Heat meters)</p>	<p>This might be considered in future revisions of the document.</p>
T.c.2	Netherlands	<p>Editorial: Change title: "Checking facility" (the 1st sentence is also singular)</p>	<p>Text changed.</p>
T.c.2	Netherlands	<p>Editorial, last bullet:</p> <ul style="list-style-type: none"> • enables significant faults to <u>be</u> detected and acted upon. 	<p>Agree. Text changed.</p>
T.e.1	France	<p>Editorial: Delete the brackets but keep the words within them.</p>	<p>Disagree. Prefer parentheses included to ensure the thoughts are kept separate.</p>

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T.e.4.1	France	Editorial: Why introducing a new concept. Use VIM 5.20. Moreover the use of “reference” for “true” is not appropriate in the Recommendation where reference value has a specific meaning.	Not accepted. The definition is compatible with the definition of “error” in the soon-to-be-published VIM.
T.g.1 (see also 2.10)	France	<p>The definition of “gas elimination device” is maintained but detailed definitions have been deleted from the terminology and introduced in annex. Nevertheless, the corresponding requirements for the specific devices (“gas separator”, “gas extractor” (etc)) remain in the document (2.10.8 and 2.10.9 in particular). This is not consistent; we must keep these definitions in the main part of the document.</p> <p>We fundamentally disagree with the replacement of the specific term for “gas separator”, “gas extractor” (etc) by the generic term “gas elimination device” in 2.10. A gas extractor will never provide a good solution where a gas separator is necessary. It is necessary to come back to the spirit of the current R 117 and we suggest to improve it according to the previous Belgium suggestion (comments on the 2CD draft).</p> <p>We would not be against the use of gas elimination device in general (according to the decision in Paris) provided the same gas elimination device is capable to eliminate all forms of gas or air.</p>	<p>OK. See replacement for section T.g.1 (below).</p> <p>OK. See comments + responses + new text for Section 2.10.</p>

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T.g.1	France + Secretariat (revised proposal for section based on discussions at the BIML)	<p>T.g.1 Gas elimination device</p> <p>A device used to remove any air, gas, or vapor contained in the liquid. There are several different types of gas elimination devices, including gas separators, gas extractors, and special gas extractors.</p> <p style="padding-left: 40px;">T.g.1.1 Gas separator A gas elimination device used for continuously separating, and removing, any mixed air or gases contained in the liquid.</p> <p style="padding-left: 40px;">T.g.1.2 Gas extractor A gas elimination device used to extract air or gases accumulated in the supply line of the meter in the form of pockets that are no more than slightly mixed with the liquid.</p> <p style="padding-left: 40px;">T.g.1.3 Special gas extractor A gas elimination device which, like the gas separator but under less stringent operating conditions, continuously separates any air or gases contained in the liquid, and which automatically stops the flow of liquid if there is a risk of air or gases, accumulated in the form of pockets no more than slightly mixed with the liquid, entering the meter.</p> <p style="padding-left: 40px;">T.g.1.4 Condenser tank In pressurized liquefied gas measuring systems, a gas elimination device mainly consisting of a closed tank used to collect the gases contained in the liquid to be measured and to condense them before measuring.</p>	<p>Agree to move these definitions back into the main terminology section from Annex B.</p> <p>As noted, these definitions are needed to support Sections 2.10.8 and 2.10.9.</p>
T.g.1	Sweden	Change “ air elimination device” in the text to “ gas elimination device”.	Accepted. See comment T.g.1/France above.

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T.i.4	France	Editorial: We do not see the need for the words between the brackets. This is confusing because in the case of a significant fault an interruptible MS must automatically stop.	Do not agree. These words: <u>“this does not include an emergency stop”</u> are important to ensure that there is no confusion about what is (and what is not) an interruptible measuring system.
T.q.1.1	France	Editorial: Why introducing a new concept. Use the definition of true value in VIM.	Not accepted. Current DR definition agrees with the definition in the revised VIM.
T.s.3	France	Editorial: We are not sure that “sensor” is used. At least “Meter sensor” is used several times and we do not find it at “m”. If the alphabetical classification is kept (which we do not like), it should be at “M”.	Not accepted. Prefer definition listed under “s”.
T.s.3	Denmark	Suggest to add: ”A part of a...and which converts the flow into a rotation or signal aimed for the transducer”. Mention mechanical adjustment device as possibly part of the meter sensor.	Do not agree with the addition of the word “rotation” here. Prefer to think of this as either a mechanical signal or an electronic signal. Not accepted, already in T.a.2.
T.s.4.2	Sweden	Referring to the discussion at 16 th WELMEC WG10 meeting, is it still “unattended service mode” if this takes place at a manned station?	Answer is YES. However, a printed ticket is always needed even if a station is manned (in unattended service mode). Sometimes the person “manning” the station is not actually responsible for the transaction.
Throughout document	Slovakia	The unit of dynamic viscosity should be written mPa•s	Agree, text was searched and edited. Text changes for this were made in several sections.

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1.1 and 1.2	France	Editorial: Check and harmonize references to OIML Recommendations applicable to water meters. Moreover R 49 does not deal with MS but only with meters (1.1).	Agree, text revised.
1.1	Canada	Check references to other OIML documents that might cover other liquid measurements. (such as R75).	OK BIML – are there others to include here?
1.2	Netherlands	Editorial, fourth bullet: delete "and OIML R72". (R 72 was a - withdrawn- Recommendation for hot water meters)	Agree Reference to R72 deleted.
2.2.3	Canada	Editorial: 2 nd paragraph ..., it shall be verified that ...	Agree
2.3.1	France	Editorial: Are the symbols used for the viscosity valid for both dynamic and kinematic viscosities ?	Symbols for dynamic and kinematic viscosities are different. However, text only discusses the “relevant” viscosity range – so believe the symbol used is OK. (In the US, we use: “μ” for dynamic viscosity and “ν” for kinematic viscosity.) Adding these at this stage of the document could cause problems. No text change.
2.3.1	Sweden	Technical comment: Add functional conditions such as: interruptible /non-interruptible, attended/not attended, pre/post payment, blend ratio.	Comment understood. However, believe that the rated operating conditions generally specify intervals of values for the quantity being measured and for any influence quantity .

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2.4 table 1	Netherlands	Add, in Accuracy Class 1.0, a third bullet: <ul style="list-style-type: none"> used for liquids whose temperature is less than $-10\text{ }^{\circ}\text{C}$ or higher than $+50\text{ }^{\circ}\text{C}$ (without prejudice to what is stated for accuracy class 1.5). 	Not accepted, this possibility for measuring systems that normally have an accuracy class of 0.3 or 0.5 is covered in Section 2.5.5.
2.4 Table 1	Sweden	Change “without prejudice” to “with exemption for”.	Agree
2.5.1 Table 2	Vietnam	should add "±" to the value of accuracy classes at Line A and B	Disagree. Already in the text of 2.5.1.
2.5.2 Table 3	Vietnam	Repair as follows in Table 3: Measured quantity (L or kg)	Table 3 revised. See 2.5.3/Netherlands (below).
2.5.2	Kazakhstan	- Table 3: in the name of column 1 “Measured quantity” we propose to replace a word with” Measuring range “; -	Not accepted – measured quantity is the correct wording.
2.5.3	Netherlands	The present text "For MMQ less than ... Table 3, and related to line A of Table 2." contradicts with T.d.1, which defines E_{\min} as an absolute value, whereas Table 3 also includes relative values. Suggestion: Add something like: "Relative values are to be converted to absolute values."	Comment understood. Based on discussions with the Netherlands, Table 3 has been clarified in response to this comment. See revised Table 3 at the end of this document (see page 57).
2.5.4	Netherlands	Editorial: change the text: A significant fault is a fault greater than the larger of these two values: ...	Agree
2.5.4	Netherlands	Add to the first bullet: "related to Table 2 line A for measuring systems and line B for meters or measuring devices"	Disagree – Sections 2.6.1 and 2.6.2 cover this. No text change.
2.5.5	Netherlands	We would prefer to have this included in Table 1, as suggested in comment 2.4.	We prefer to leave this in 2.5.5 because it is a special case of a 0.3 or a 0.5 measuring system. (See also response to 2.4/Netherlands comment, above.) No text change.
2.6.1	Secretariat	Remove the word “note:” on the last sentence.	Agree.

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2.6.1	Netherlands	<p>Add a second note: “If the meter is provided with an adjustment and a correction device, for type approval, it is sufficient to verify that the errors meet the repeatability requirement of 3.1.2.2.”</p>	<p>Comment understood. However, this proposal represents a fundamental change to the requirements. This could be a problem at this stage of the document.</p> <p>We can discuss this change in relation to testing requirements in the R117-2 document.</p> <p>No text change.</p>
2.6.2	France	<p>2.6.2 Maximum permissible errors in line B of Table 2 apply to:</p> <ul style="list-style-type: none"> - type approval of a meter, under rated operating conditions, and - verification of the meter before the initial verification of the measuring system. <p>If the meter is provided with an adjustment or correction device, it is sufficient to verify that the error curve(s) is (are) within a range of two times the value specified in line B of Table 2 during type approval.</p> <p>The meter may be able to measure various liquids either by using a particular adjustment for each liquid or by having the same adjustment for all the various liquids. In any case, the type approval certificate shall provide appropriate information on the capability of the meter.</p>	<p>Agree.</p> <p>This (revised) Section 2.6.2 text has been heavily reviewed to ensure that it only provides clarification and NOT any real change to the requirements found in the (Feb 2007) DR.</p>

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2.6.2	Netherlands	Add a third note: If the meter is provided with an adjustment and a correction device, for type approval, it is sufficient to verify that the errors meet the repeatability requirement of 3.1.2.2.	<p>Comment understood. However, this proposal represents a fundamental change to the requirements. This could be a problem at this stage of the document.</p> <p>This change can be discussed in relation to testing requirements in the R117-2 document.</p> <p>See changes to the text of Section 2.6.2/France (above).</p>
2.6.2	Sweden	Note 1: Change to: "...approval certificate does not provide information ..."	<p>Text in Section 2.6.2 has been improved, see the comment + response to Section 2.6.2/France (above).</p> <p>Disagree. The type approval certificate should specify this information.</p> <p>----- (No longer a note.)</p>

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2.6.3	Secretariat	<p>2.6.3 When stated in the type approval certificate, the initial verification of a measuring system intended to measure two or more liquids may be carried out with one liquid only or with a liquid different from the intended liquid(s). In this case and if necessary, the type approval certificate provides information concerning the maximum permissible errors to be applied, so that 2.6.1 is fulfilled by the measuring system for all intended liquids.</p> <p>If when a meter is initially verified in two stages (as per Section 6.2.1) and when stated in the type approval certificate, the verification of a meter before the initial verification of a measuring system intended to measure two or more liquids may be carried out with one liquid only or with a liquid different from the intended liquid(s). In this case and if necessary, the type approval certificate provides information concerning the maximum permissible errors to be applied, so that 2.6.2 is fulfilled by the meter for all intended liquids.</p> <p>The above considerations may be extended to the case of a measuring system or a meter intended to measure only one liquid but verified with another liquid.</p>	<p>This change is made to improve the clarity of Section 2.6.3.</p> <p>This also responds to comment on this section by France (see below).</p>
2.6.3	France	<p>We suggest a clarification in order to distinguish “real multi-liquid meters” from meters that can measure different liquids with different adjustments by adding at the end of 2.6.3 such a sentence:</p> <p>“For the application of the above provisions, as far as applicable, the necessity or not to adjust the meter for each liquid is taken into consideration.”</p>	<p>Disagree with this suggestion because it could cause additional confusion.</p> <p>We believe the revised text in this section should address your concern. (See Section 2.6.3/Secretariat above).</p>

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2.7	Denmark	<p>Our major concern in the draft is the extra mpe given to measuring instruments fitted with conversion devices. We find that unacceptable.</p> <p>We suggest to maintain the provision in the 1995 edition.</p>	<p>Think there is a misunderstanding. There is NO extra mpe provided by the revisions to this section compared to R117 (1995).</p> <p>The calculations are based on the root-sum-squared method (quadratic addition) and not simple addition. That might be the source of the confusion.</p> <p>See also modifications to Section 2.7 based on French proposal.</p>
2.7	Norway	<p>Measuring instruments fitted with conversion devices are given an added mpe – we suggest to maintain the solution in the 1995 edition.</p>	<p>See response to Section 2.7/Denmark (above).</p>
2.7	France	<p>We agree with the principal but we have doubt that it is clearly understandable even if additional information is given in 6.1.8 and in A.9.</p> <p>See a proposal at the end of the comments that could be used for improving the provisions. This is an adaptation of what has been used in the draft on MS for gas (TC8/SC7) for which the problem is the same.</p>	<p>The original text change proposed by France on Section 2.7 has been modified after discussions with France.</p> <p>Changes to the DR based on France’s proposal are shown at the end of this document.</p> <p>Anyone wishing to see the original French proposal on this section may contact Mrs. Regine Gaucher at the BIML.</p>
2.7.2 (Tables 4.1, 4.2, and 4.3)	Kazakhstan	<p>- Tables 4.1, 4.2, .4.3: in column 1 instead of words “ Maximum permissible errors (MPE) and Significant fault, on measuring “ we ask to put a word “Parameters”</p>	<p>Disagree.</p>

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2.7.2 (Tables 4.1, 4.2, and 4.3)	Vietnam	Old text: Pressure: Between 1 and 4 MPa Recommended change: Between 1 MPa and 4 MPa	Agree. Tables edited as suggested.
2.7.2.1.2	Netherlands	Change the title of Table 4.1: “MPE <u>for indication of characteristic quantities</u> with known simulated analog inputs.”	OK. Text changed.
2.8	France	Editorial: The last sentence of 2.8 can be deleted. Taking into account the requirement on uncertainties and the uncertainty of reading, the number of scale intervals for testing a calculator results in an MPE always greater than half a scale interval.	Agree with comment. However, text will remain until R117-2 is completed.
2.9.1	UK	2.9.1 Delete ‘tons’, insert ‘tonnes’	Comment understood. In the US, the commonly used term is “metric ton” ... “tonne” is really British. To improve clarity, text changed to read: The mass shall be indicated in grams, kilograms, or metric tons (tonnes) .
2.9.1.	Sweden	Does a symbol for volume or mass exist or is the reference to the letters l and kg? Does the indication in Pascals include kPa and MPa?	Thus far, R117-1 has not used symbols for volume or mass. Yes. New text to improve clarification is: ... shall be indicated in bars or Pascals (Pa, kPa, or MPa).

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2.9.1	Vietnam	At line 8 in 2.9.1: Repaired as follows: shall be indicated in bar	See comment + response 2.9.1/Sweden (above).
2.9.1	Slovakia	In the third section, end the sentence with ... in bars or Pascals	Agree. Text changed as shown in Section 2.9.1/Sweden (above)
2.9.2, 2 nd paragraph	Netherlands	Complete this paragraph as follows: “When a measuring system is fitted with a conversion device, it shall be possible to indicate the quantity at metering conditions and the converted quantity. <u>In case of systems for direct selling to the public the indication mode (converted or unconverted) shall, in normal operation, be fixed and if necessary, protected by a seal.</u> ”	Agree with thought. Sealing requirements are covered by Section 2.20. For clarity, the new text of Section 2.9.2, 2 nd paragraph: “When a measuring system is fitted with a conversion device, it shall be possible to indicate the quantity at metering conditions and the converted quantity. In case of systems used for direct selling to the public, only the quantity used in the transaction shall be indicated in normal operation. ”

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<p>2.10 (see also comment on T.g.1)</p>	<p>France</p>	<p>France issues several important comments but the one on 2.10 is very fundamental. Our negative vote is justified only by this comment. However we consider it is a symbolic negative vote as the matter is easy to solve. We hope that a lot of our comments will result in improving the document but we will change our negative vote into a positive vote provided this point is corrected for.</p> <p>The definition of “gas elimination device” is maintained but detailed definitions have been deleted from the terminology and introduced in annex. Nevertheless the corresponding requirements for the specific devices (“gas separator”, “gas extractor” (etc)) remain in the document (2.10.8 and 2.10.9 in particular). This is not consistent; we must keep these definitions in the main part of the document.</p> <p>We fundamentally disagree with the replacement of the specific term for “gas separator”, “gas extractor” (etc) by the generic term “gas elimination device” in 2.10. A gas extractor will never provide a good solution where a gas separator is necessary. It is necessary to come back to the spirit of the current R 117 and we suggest to improve it according to the previous Belgium suggestion (comments on the 2CD).</p> <p>We would not be against the use of gas elimination device in general (according to the decision in Paris) provided the same gas elimination device is capable to eliminate all forms of gas or air.</p>	<p>Key French comment!</p> <p>Agree to move definitions for specific types of gas elimination devices back into the terminology section. See Section T.g.1/France.</p> <p>Comment understood. French proposal for this section is presented at end of this comments document (page 53).</p> <p>Agree to make these changes with minor editorial changes and a provision to allow for new gas elimination device technologies. (See Annex B.)</p> <p>This also responds to comments on this section from Monaco and Austria (see below).</p>
<p>2.10.1</p>	<p>Slovakia</p>	<p>Editorial End bullets in second paragraph with a comma not a semicolon.</p>	<p>Not accepted.</p>

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2.10.2	Monaco	Draft R117-1 is a good document in principle. However, concerning Section 2.10.2 (pumped flow) we think it is necessary to return to the R117 (1995) requirements for gas elimination devices. This is a fundamental issue which explains our negative vote.	See response to Section 2.10.2/French comment above.
2.10.2	Austria	<p>- Gas elimination devices 2.10.2, second paragraph applies for cases, in which the pressure at the pump inlet is always greater than the atmospheric pressure. But this paragraph also deals with the possibility that the supply tank becomes empty. When the pumps sucks off the supply tank, gas is introduced into the pump inlet and under this condition it is very likely that the pressure falls below atmospheric pressure. So there is a contradiction to what is said at the beginning.</p> <p>Furthermore, the context in R117:1995 between the conditions of pressure (inlet pump pressure may fall below 1 atm / inlet pump pressure always greater 1 atm and gaseous formations possible) and the applicable type of the gas elimination device (gas separator/gas extractor/special gas extractor) is not there in R117-1 any more; points 2.10. 8 und 2.10.9 only refer to the elimination capacity of the gas elimination devices.</p> <p>The problem is which type of gas elimination device to require, eg for road tankers: a gas separator? a special gas extractor ? Both types may be certified as components. How to be sure that when a special gas extractor is installed, no volume of air or gas mixed with the liquid greater than 5 % occurs (so that only a gas separator would be able to cope with this situation)?</p>	See response to Section 2.10.2/French comment above.
2.10.8	Netherlands	Complete the second sentence as follows: “A gas separator designed <u>for systems for direct selling to the public and/or</u> for a maximum flowrate lower than or equal to 20 m ³ /h shall ensure the elimination of any proportion by volume of air or gases relative to the measured liquid.”	Not accepted.

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2.20.2.1.3	Netherlands	Complete the text as follows: “In case of direct selling to the public, the use of only a "password" is not allowed and the measuring system shall be provided with <u>either</u> a mechanical sealing device, e.g. access cover protected switch or key switch, <u>or a combination of a "password" and a non-erasable logfile storing proof of a sufficient number of interventions (see 2.20.2.1.5).”</u>	Comment understood. However, this represents a fundamental change to the document’s section on electronic sealing devices. It is too late to make this change in R117-1. Work is proceeding on this topic in OIML TC 5/SC 2.
3.1.2.4	Slovakia	We recommend deletion of the word “second.”	Disagree. The second formula in section 2.5.3 is specifically for the meter or measuring device which <u>is</u> the applicable formula for Section 3.1.2.4.
3.1.3	Secretariat	(based on a suggestion from Denmark, add the following in Annex B for clarification on Section 3.1.3) (Annex B) If the meter consists of both a mechanical adjustment and display, precautions shall be taken to avoid different indication for the same measurement	OK. See Section B.3.1.3 (Annex B)
3.1.4.5	Slovakia	In the third paragraph, first two bullets should be completed with a semi-colon.	Agree. Text modified.
3.1.4.6	Netherlands	Suggested editorial change: “The correction device shall not allow the correction of a pre-estimated drift <u>(e.g. in relation to time or total quantity).”</u>	OK, text changed.
3.1.4.7	Netherlands	Add clarifying note: “Associated measuring devices <u>intended for correction only</u> need <u>not necessarily</u> meet the requirements given in paragraph 2.7.”	Comment understood. However, adding this note could add confusion instead of clarify the issue. No text change.

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3.1.5.4	Secretariat	<p>3.1.5.4 If the system is provided with a programmable or adjustable “low-flow cut-off” feature, a “zero-offset adjustment” feature, or any other adjustable feature relied upon to comply with a test requirement throughout the rated operating conditions, the feature(s) shall be sealable. Clear instructions for the proper setting of the feature(s) shall be provided by the manufacturer. The limitations and setting of the feature(s) shall be detailed in the Type Approval Certificate.</p> <p>“Low-flow cut-off” features shall not be set at flow rates higher than 20% of the application-defined minimum flow rate.</p> <p>“The error caused by the zero-offset of the meter, related to the minimum flowrate, shall not exceed the value specified in line C of Table 2.”</p>	<p>This change effectively responds to several comments in Sections 3.1.5 through 3.1.9.</p> <p>Sections 3.1.6.3, 3.1.7.3, 3.1.9.3, 3.1.9.4 will now be deleted as these requirements are now covered in 3.1.5.4.</p>
3.1.5.4, 3.1.6.3, 3.1.7.3 and 3.1.9	France	<p>We are not against the spirit, but in general a Low-flow cut-off device is used to hide a malfunction (or a non expected aspect) such as a zero offset.</p> <p>We have a requirement on the Low-flow cut-off device in 3.1.5.4 and a requirement on the zero offset in 3.1.6.3, 3.1.7.3 and 3.1.9.</p> <p>We should have both for all meters.</p>	<p>Comment understood. Low-flow cut-off (3.1.5.4) is already applicable to all meter types.</p> <p>See 3.1.5.4/Secretariat above.</p>
3.1.6.1; 3.1.7.1; 3.1.8.1; 3.1.9.1	Vietnam	<p>Old text: The requirements in 3.1.5.1 to 3.1.5.4 apply.</p> <p>Repaired as follow: The requirements in 3.1.5.1 to 3.1.5.4 shall be applied.</p>	<p>Prefer existing text.</p>

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3.1.6.3	Netherlands	<p>"Maximum zero-offset" is a confusing term (unless well defined). A zero-offset has the dimension of flowrate and therefore need not be related to a duration of Q_{min}. As written, one would allow twice the MPE. Therefore we propose to change the text as follows:</p> <p>"The error caused by the zero-offset of the electromagnetic meter, related to the minimum flowrate, shall not exceed the MPE's given in Line C of Table 2."</p>	<p>Agree that "maximum zero-offset" is confusing. Text change made in 3.1.5.4.</p> <p>See 3.1.5.4/ Secretariat above. (Requirements of Section 3.1.6.3 now in 3.1.5.4)</p>
3.1.7.3	Netherlands	<p>"Maximum zero-offset" is a confusing term (unless well defined). A zero-offset has the dimension of flowrate and therefore need not be related to a duration of Q_{min}. As written, one would allow twice the MPE. Therefore we propose to change the text as follows:</p> <p>"The error caused by the zero-offset of the ultrasonic meter, related to the minimum flowrate, shall not exceed the MPE's given in Line C of Table 2."</p>	<p>Agree that "maximum zero-offset" is confusing. Text changed in 3.1.5.4.</p> <p>See 3.1.5.4/ Secretariat above.</p>
3.1.9.3	Netherlands	<p><u>Zero flow setting shall be protected by seal(s).</u> This requirement should also apply to electromagnetic and ultrasonic flow meters.</p>	<p>Agree. See 3.1.5.4/ Secretariat above.</p>
3.1.9.4	Netherlands	<p>"Maximum zero-offset" is a confusing term (unless well defined). A zero-offset has the dimension of flowrate and therefore need not be related to a duration of Q_{min}. As written, one would allow twice the MPE. The offset is an installation effect, on top of meter curve offset and therefore should be less than the MPE. Therefore we propose to change the text as follows:</p> <p>"The error caused by the zero-offset of the mass flow meter, related to the minimum flowrate, shall not exceed the MPE's given in Line C of Table 2."</p>	<p>See 3.1.5.4/ Secretariat above.</p>
3.1.10.1	Slovakia	<p>In this section, "n" is an exponent, not a coefficient.</p>	<p>Agree. Changes made.</p>

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3.1.10.3	Netherlands	Add a note: "Without prejudice to T.c.5 and paragraph 2.7, these requirements apply also to other measuring principles."	Agree with comment. New text: 3.1.10.3 The conversion device to determine the volume of ethanol belonging to a drum meter shall function in accordance with the International Recommendation OIML R 22 "International alcoholometric tables" (1975). The reference temperature for the alcohol measurement is 20 °C. The conversion may be applied mechanically or electronically. These requirements also apply to other measuring principles. (See also Sections T.c.5 and 2.7).
3.2.4.2	Denmark	Suggest to add: "Zero setting must be completed, before any measurement of liquid is possible"	We think we understand this comment. However, Section 3.2.4.2 is a general section on the electronic <u>indicating</u> device. This proposal would require an additional device – a requirement that should not be added at this stage of the document. The requirements of Section 3.2.4.5 already covers your proposal in the case of direct selling to the public.
3.3.2.1	Slovakia	The change of unit price is usually carried out by the remote control, but this fact is not stated in the definition of ancillary devices T.a.5.	Believe the current text of 3.3.2.1 already addresses this comment.

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3.3.2.2	US	<p>The intent of this section was to not require simultaneous display of price and volume like on a dispenser ... not necessarily to wait until the delivery is complete to enter the price.</p> <p>Suggested text change:</p> <p>3.3.2.2 (This section is not applicable to fuel dispensers.) In the case of price indicating devices for measuring systems other than fuel dispensers, it is permitted to display only the quantity before and during the delivery. Neither unit price nor total price is displayed before and during the delivery. After the measurement operation is complete, the unit price is selected (or keyed in) to process the total price calculation to conclude the transaction; this unit price shall be valid for the whole transaction.</p> <p>The unit price may be selected (or keyed in) before or after the measurement operation. If selected before, the unit price and total price during the delivery do not have to be displayed. If the unit price is selected (or keyed in) before the measurement operation, the unit price may be changed at the end of the measurement operation before the transaction is complete. In all cases, the final unit price and total price calculation applies to the whole transaction.</p>	<p>Text changed to improve clarity:</p> <p>3.3.2.2 (This section is a different option from Section 3.3.2.1, and is not applicable to fuel dispensers.) In the case of price indicating devices for measuring systems other than fuel dispensers, it is permitted to display only the quantity before and during the delivery. Neither unit price nor total price is displayed before and during the delivery. After the measurement operation is complete, the unit price is selected (or keyed in) to process the total price calculation to conclude the transaction; this unit price shall be valid for the whole transaction.</p> <p>In case of direct selling to the public, the unit price shall be displayed or printed.</p>
3.4.7	France	<p>Editorial: Delete "transaction". Only price or price to pay are used in other parts of the document.</p>	<p>Prefer current text.</p>

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3.5.4	US	<p>Current text of this section is:</p> <p>“3.5.4 After Section 3.5.3 requirements are fulfilled and when the storage is full, it is permitted to delete memorized data when both the following conditions are met:</p> <ul style="list-style-type: none"> • data are deleted in the same order as the recording order and the rules established for the particular application are respected, • deletion is carried out after a special manual operation.” <p>The devices, in this case electronic registers, will have a set amount of memory. What is needed is the ability to have the memory storage “oldest out when newest written” <u>automatically</u> happen. This will maintain the most current transaction records.</p>	<p>Fulfilling section 3.5.3 requirements ensures that all transactions involved are “settled.”</p> <p>Agree with comment. Deletion should be allowed to occur automatically.</p> <p>New text for Section 3.5.4 is:</p> <p>“3.5.4 After Section 3.5.3 requirements are fulfilled and when the storage is full, it is permitted to delete memorized data when both the following conditions are met:</p> <ul style="list-style-type: none"> • data are deleted in the same order as the recording order and the rules established for the particular application are respected, • deletion is carried out either automatically or after a special manual operation.”
3.6.1	Sweden	Where, only on the pre-setting device or also on the indicating device (of the fuel dispenser)?	<p>The 3.6.1 requirement applies to all measuring systems with a pre-setting device.</p> <p>Sections 3.6.4 to 3.6.8 further define the indication requirements.</p> <p>No text change.</p>
3.6.6	Sweden	Add “deviation” at end of text in the first bullet.	Agree. Text changed.
3.7	Denmark	<p>Conversion:</p> <p>Suggest to maintain provisions from OIML R117-1995</p>	<p>Not positive exactly which sentences in Section 3.7 are the concern.</p> <p>Believe responses to your concerns in Section 2.7 cover this. See also other comments + responses on individual sections in 3.7 (below)</p>

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3.7.4	France	<p>The requirement in the first § is not clear: we do not understand if it allows an additional error due to the location of the AMS (what we consider too much) or if the given figure is supposed to include the errors due to the intrinsic performance of the AMS and of its location (what is difficult to check in general). We suggest the following.</p> <p>“The uncertainty on the actual characteristic of the liquid in the measuring device due to the location of the AMS shall be smaller than or equal to the value defined in table 4.1 (and not 4.2). AMS located at a distance smaller than or equal to 1 m from the measuring device are supposed to fulfil this provision.”</p>	<p>Believe that changes in Section 2.7 based on the French proposal cover your comments in Section 3.7.4.</p> <p>Also, will add the following information in Annex B (with a reference to Section 3.7.4) based on discussions at the BIML.</p> <p>Annex B – “3.7.4 The relevant quantities to be considered are those corresponding to the characteristics of the liquid in the meter (pressure, temperature, etc.)”</p>
3.7.5	Netherlands	<p>The original text might possibly be interpreted that it is mandatory for many retrofitted conversion devices to be fitted with a legally controlled display (or printer) despite the fact that this display is only used during Verification / Inspection and is not accessible to the general public. Therefore, we ask to add at the end of the first paragraph:</p> <p>Add: [at the end of the first paragraph] “The device(s) used exclusively to print or indicate these non-measured parameters are considered to be non-critical and are only subject to tests showing their capability to correctly indicate or print these values.”</p>	<p>OK. Believe this is really a clarification on this issue.</p>
3.7.5	Sweden	<p>4th paragraph Change text to be more clear according to changes in 3.1.4.5.</p>	<p>Section checked. See also response to 3.7.5/Netherlands (above).</p>

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3.7.6	Netherlands	<p>The first paragraph in Section 3.7.6 states:</p> <p>“In addition to the quantity at metering conditions and the volume at base conditions or the mass, which shall be displayed according to 2.9.2, the values of other measured quantities (density, pressure, temperature) shall be accessible for testing purposes.”</p> <p>We are concerned that this original text might possibly be interpreted that the devices used for accessing and indicating the values of other measured quantities (density, pressure, temperature) must be subjected to a full testing procedure despite the fact that they are only used during Verification / Inspection and are not accessible to system users.</p> <p>Therefore, we ask to add at the end of the first paragraph:</p> <p>Add to the 1st paragraph :</p> <p>“When only used for testing or inspection purposes, the device(s) used to access and indicate these values are considered to be non-critical, and are only subject to tests showing their capability to correctly indicate or print these values.”</p>	<p>OK. Believe this is really a clarification on this issue.</p> <p>See also Section 3.7.5/Netherlands (above).</p>

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4.1.1	Netherlands	<p>Add a note: “For manufactured measuring systems, national or regional regulations may foresee that continuing to operate under rated operating conditions is the responsibility of the manufacturer. This may allow the manufacturer to replace purely digital elements, which can not influence the characteristics and/or the performance of the measuring systems by other equivalent elements without having to demonstrate that the MI continues operating as designed.”</p> <p>Argumentation: The requirement in 4.1.1 can be read as applying to all measuring systems at Type Approval, Initial Verification and to in-service instruments. Manufacturers use more and more IT-equipment (video monitors, ...) to design measuring systems. The requirement in 4.1.1 should apply at Type Approval but as it is, it may be interpreted as necessitating a re-evaluation of the system by the Body in charge of Type Approval each time the manufacturer changes the type of IT equipment, in order to check that the metrological functions are safeguarded (for instance the measuring system continues to indicate under rated operating conditions). This is not realistic and should be avoided. The note could solve that problem. (Remark: comment made by France during WG10 meeting).</p>	<p>(this issue is related to the MID)</p> <p>New text inserted, based on discussions at the BIML.</p> <p>Note: “National or regional regulations may allow the manufacturer to be responsible for the continuation of operation under rated operating conditions. These regulations shall define the conditions of this responsibility and the information required on the type approval certificate. [See also Section 6.1.2.]</p> <p>This may allow the manufacturer to replace purely digital elements (elements that can not influence the characteristics or the performance of the measuring systems) by other functionally-equivalent elements without having to demonstrate that the measuring system continues to operate as designed.”</p>
4.1.1	Secretariat	<p>Based on the above comment, the following might belong back in 6.1.2.2 and 6.1.2.3 –</p> <p>Require manufacturer to list (may list) components that are able to be swapped out in accordance with (interchangeable components).</p>	Agree.

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4.1.1	Austria & Czech Republic & Finland & Norway & Sweden	- In relation with digital equipment: Add a note to 4.1.1: Note: For manufactured measuring instruments, national or regional regulations may foresee that continuing to operate under rated operating conditions is the responsibility of the manufacturer. This may allow the manufacturer to replace purely digital elements which cannot influence the characteristics and/or the performance of the measuring instruments by other equivalent elements without having to demonstrate that the measuring instrument continues operating as designed.	See response to Section 4.1.1/Netherlands (above).
4.1.1.2	Sweden	Change “A.4” to “A.11.3 to A.11.11 and A.12.3”.	Comment understood. Text of 4.1.1.2 changed to: ... when they are exposed to the disturbances specified in <u>Annex A</u> .
5.1.14	Slovakia	We recommend replacing “may start after” with “starts after.”	Do not agree -- “may start after” is the proper wording here because the display may have started before the hidden quantity was reached.
5.1.15	Japan	The purpose of 5.1.15 seems to be ambiguous and we wonder if it falls outside of the legal metrology. Therefore, we propose that it should be based on national regulations of each country and it would be more appropriate to delete 5.1.15.	Comment understood. However, this section has now been internationally accepted in two drafts. Originally it was a proposal from South Africa to help prevent a type of fraud in that county. Of course, national regulations would not need to make this a requirement. No text change.

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5.5.1	Netherlands	This is in contradiction with 2.3.3.3, unless on-site (installed) flow rate is intended. If on-site intended, please mention so explicitly. Lower than 5 unacceptable as general requirement.	Agree. New text follows and is consistent with the text requirements in 5.1.1. New text of 5.5.1 follows: Requirements in 5.1.1, 5.1.5, 5.1.6, 5.1.8 to 5.1.15, 5.4.1, and 5.4.2 are applicable to LPG dispensers for motor vehicles. Where installed , the ratio between the maximum flowrate and the minimum flowrate may be smaller than five provided that it is not less than 2.5.
5.5.2	Japan	In 5.5.2 it is specified that pressure maintenance devices shall be provided to maintain LPG in liquid state, however, in 5.4.2 it is specified that the design of measuring system shall ensure that LPG remains in liquid state. As “The provision shall be made to ensure that the LPG in the measuring system remains in the liquid state. This is usually accomplished through a pressure-maintaining device” in 5.5.2 is for a limited method, we propose to clearly specify it or to quote the sentence in brackets to show it as an example for not setting limits to other methods or move it to Annex B.	Comment understood. New text of Section 5.5.2 follows: 5.5.2 Provisions shall be made to ensure that the LPG in the measuring system remains in the liquid state. Often , this is usually accomplished through a pressure-maintaining device.
5.10.1.2	Netherlands	Delete "number".	Agree.
5.10.2	Netherlands	Editorial: “If the dispenser indicating device provides the only primary indication, <u>it</u> shall ...”	Agree
6.1.1	Kazakhstan	- The second paragraph of 6.1.1 we ask to state in next edition: “In addition, the constituent elements of a measuring system mainly those listed below, the subsystems which include several of these elements and have certain metrological characteristics, are the subject of the separate type approval”;	Comment understood. Agree this can be discussed in the next revision of the document.

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6.1.2.2	Secretariat	<p>Based on the comment on Section 4.1.1/Netherlands, Section 4.1.1 now contains the following new text:</p> <p>“This may allow the manufacturer to replace purely digital elements (elements that can not influence the characteristics or the performance of the measuring systems) by other functionally-equivalent elements without having to demonstrate that the measuring system continues to operate as designed.”</p> <p>Section 6.1.2.2 should require the manufacturer to list the purely digital elements that are considered replaceable.</p>	<p>Agree.</p> <p>Text for Section 6.1.2.2, new 3rd bullet:</p> <ul style="list-style-type: none"> • A list of any purely-digital elements that are considered to be replaceable (in accordance with Section 4.1.1);
6.1.2.1 and 6.1.2.2	Sweden	Add “The description shall be specific enough to uniquely identify the construction.”	<p>Comment understood. First bullet in Section 6.1.2.1 modified as follows:</p> <ul style="list-style-type: none"> • a specific description giving the technical characteristics and the principle of operation,
6.1.2.3	Sweden	Change “6.1.5.2.4” to “6.2.1” or “A.6.x”.	Agree.
6.1.3	Sweden	<p>Add a description of what is approved (components, configurations etc).</p> <p>What documents accompanying the pattern approval certificate; test report, drawings...?</p>	<p>Believe that “what is approved” is covered in section 6.1.1 and sections 6.1.5 through 6.1.11.</p> <p>Yes, test reports and drawings should accompany the type approval certificate.</p>

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6.1.4.3	Czech Republic	<p>(first paragraph):</p> <p>In this case the body will issue a document in this respect (to declare this fact to other bodies).</p> <p><i>Explanation: When the body having approved the initial type judges that the modifications or additions are not likely to influence the measurement results, this body allows the modified instruments to be presented for initial verification without granting a supplementary type approval. But this fact knows only two subjects: applicant and approval body. If the manufacturer put the device into operation in another region (other country), nobody recognizes (without some official document), if the modifications were checked by approval body, or not.</i></p>	<p>General remark, related to the MID, and will effect all OIML Recommendations.</p> <p>Will be considered by TC3/SC5 when revising OIML B3.</p> <p>No text change in R117.</p>
6.1.5	France	<p>Editorial:</p> <p>Some references to the old numbering of terminology remain. Check other possible remaining.</p>	<p>Agree – new terminology sections are now referenced.</p>
6.1.5	Sweden	<p>Update 3 references to the Terminology chapter.</p>	<p>Agree. See response to 6.1.5/France above.</p>
2.7 and 6.1.8	France	<p>Editorial:</p> <p>We do not understand saying that a conversion device is verified as “part of a complete MS” as it is always tested separately. Probably it is meant a “complete part of a MS”.</p>	<p>Discussed under Sections 2.7 & 2.8. However, in an attempt to make the text of Section 6.1.8 more like Section 2.7 the following text change has been made:</p> <p>There are two approaches to verify a conversion device complies with the requirements of Section 2.7. The first approach verifies the conversion device as part of a complete measuring system. In this approach, the associated measuring devices, the calculator, and the indicating device are verified (together). The second approach allows for separate verification of the individual components of a conversion device.</p>
6.1.91	Sweden	<p>Change Section 2.9.5 to 2.9.4.</p>	<p>Agree. Reference changed.</p>

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6.1.10	Secretariat	<p>Changes to Section 6.1.10, Note 3:</p> <p>Note 3.</p> <p>Section 3.7.7 requires that the measuring system temperature sensor shall respond rapidly to temperature changes in the liquid. This requirement is considered to be met when the sensor is able to respond to at least 90% of the variation in the temperature of the liquid within a 15 second time period time corresponding to the time needed to deliver a quantity twice the MMQ when the measuring system is operating at its highest flow rate.</p>	<p>This change is made because it was pointed out that the original 15-second requirement was appropriate for fuel dispensers, but not always appropriate for other measuring systems.</p> <p>The revised wording in Note 3 will actually translate to approximately 15 seconds for fuel dispensers, but would allow a more realistic response time for other measuring systems.</p> <p>(WELMEC was consulted on this response.)</p>
6.1.11.1	Sweden	Delete the design inspection, testing is sufficient.	<p>Comment understood. Believe this proposal follows from the MID. Type approval process in any case includes design inspection in order to check conformity to the type approval application before testing.</p> <p>This requirement has been part of R117 since the 1995 version.</p> <p>No text change.</p>
6.2	Denmark	<p>Initial verification Suggest adding a more detailed description of how to perform an initial verification.</p> <p>Maybe in Annex B or as bullet 8.</p>	<p>Section 6.2 is really only the general requirements for initial verification.</p> <p>Additional details on this should be part of the effort of developing R117-2 – Test Methods.</p>

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6.2.2	Secretariat	<p>Comments were received on Section 6.2.2.1 (third bullet) -- improved text was needed. (Related to 2.10)</p> <p>Text of the applicable bullet in Section 6.2.2.1 is modified as follows:</p> <ul style="list-style-type: none"> an operational test of the gas elimination device is desired, if possible and if there is one, with no need to verify that the maximum errors applicable to this device (specified in Section 2.10) are met. Frequently, however, such a test is either not possible or not practical. 	Agree. Believe this text provides clarification.
Annex A	Denmark	Suggest to add test description for Gas elimination device	Related to 2.10. Description of this testing will be discussed in the development of R117-2 – your assistance on this is desired.
A. 4	Netherlands	<p>a.) Fixed volume and flowrate: these values should be defined more precisely; in case inputs are simulated pulses, a fixed amount of pulses shall be mentioned. (possibly for R117-2?)</p> <p>b.) Editorial: in the 1st sentence, remove the word “should”.</p>	<p>a.) This issue will be discussed in the development of R117-2.</p> <p>b.) Agree. Text changed as suggested.</p>
A.4	Netherlands	MMQ: there is no MMQ when the pulse input is simulated, only a minimum amount of pulses.	Comment understood. However, text change will be deferred to the discussions on R117-2.
A.7.2	Netherlands	Change “should” in “shall”	Not accepted. “Should” is the proper wording because it is not always possible to test with the most severe liquid depending on the test facility.
A.7.5	Netherlands	To keep in line with R118, article 3.7: Carry out the accuracy test after the endurance test at least three flowrates and define them in R117-2 (Q1, Q4 and Q6).	This issue will be addressed in test procedures in R117-2.

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A.8	Netherlands	Editorial: change the title "... on an electronic ..."	Agree.
A.8.2 & A.8.3	Secretariat	<p>New proposals for A.8.2 and A.8.3</p> <p>A.8.2 When the calculator carries out calculations for a conversion device, tests specified in Section A.8.1 are performed for the calculation of volume at base conditions or mass. The maximum permissible errors are those fixed in 2.7.2.1.3.</p> <p>A.8.3 Accuracy tests also include an accuracy test on the measurement of each characteristic quantity of the liquid. For this purpose, the error obtained on the indication of each of these characteristic quantities (these indications are mandatory considering 3.7.6) is calculated by considering the true value as that provided by the standard connected to the inputs of the calculator and which simulates the corresponding associated measuring device. For the indication of each of these quantities, the maximum permissible errors fixed in 2.7.2.1.1 or 2.7.2.1.2 shall be applied depending on the type of the inputs the calculator is fitted with.</p>	This responds to Netherlands comments below and is really just an editorial change to reflect the correct references.
A.8.2	Netherlands	Like A.8.1, so with simulated converted volume or mass? Why are the MPE's for associated measuring devices mentioned here?	See new wording of this section (above).
A.8.3	Netherlands	Please add how many test have to be performed. We propose 3 tests: minimum, middle and maximum.	This will be addressed in the development of R117-2.
A.8.3	Netherlands	MPE's are according 2.7.2.1.1 or 2.7.2.1.2 depending the output of the associated measuring device is digital or analogue.	Agree. See response above.
A.9	Netherlands	For which values of the characteristic quantities test shall be performed? Proposal: for each quantity the minimum, middle and maximum value during influence tests and at middle value during disturbances.	To be defined in R117-2.

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A.10 – A.11	Netherlands	Testing at different characteristic quantities?	To be defined in R117-2.
A.10.4	Netherlands	<p>Addition in Description of M2: ... conveyor belts, <u>equipment on road or rail tankers</u>, etc.</p> <p>But as M1 and M2 are not applied in this Recommendation, A.10.4 might be deleted, or a note added which Class(es) is/are not applied in this Recommendation. But see also our remark A.10.8.</p>	<p>Disagree. Equipment on road + rail tankers should be M3 (severity level 2).</p> <p>See edits to the A.10.4 table at the end of this document – because vibration is not included in Annex A testing.</p>
A.10.5	Netherlands	Move last sentence ((*) This test procedure) to clause A.10.1 General.	<p>Agree – makes sense.</p> <p>Also added this thought to A.11.1.</p>
A.10.7	Netherlands	<p>Although this test being an “influence test” in this Recommendation, is in contradiction with OIML D 11 (where it is a disturbance), it has been agreed in WELMEC to regard this as an influence.</p> <p>So may be it is worth considering to add a note that this “influence” is deviating, with good reasons, from OIML D 11.</p> <p>Furthermore we have the following remarks for the present text:</p> <ul style="list-style-type: none"> * In the present text, there is an inconsistency between the Object of the test (“... under conditions ...”) and the last paragraph of the test procedure in brief (“After the application ...”). * Another inconsistency: <ul style="list-style-type: none"> • “This test is applicable only for outdoor equipment” But severity level 1 “applies to enclosed locations” (see A.10.3) * In the present text of the draft, it is unclear whether power should be on or off during the Humidity Test. 	<p>Agree, there are some “inconsistencies” in the wording of Section A.10.7. Decision to leave current wording and resolve issues by consensus on R117-2.</p>

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A.10.8	Netherlands	<p>In the present text, there is an inconsistency between the Object of the test (“... under conditions ...”) and the last paragraph of the test procedure in brief (“After the application”).</p> <p>After the application of the influence factor and recovery the EUT shall be tested at a minimum of one flow rate. <u>Simulated inputs are permitted.</u></p> <p>Test severities: <u>One of</u> the following severity levels shall be specified: <u>1 for M2 and 2 for M3</u></p> <table border="1"> <thead> <tr> <th>1</th> <th>2</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>10-150</td> <td>10-150</td> <td>Hz</td> </tr> <tr> <td>1.6</td> <td>7</td> <td>m.s⁻²</td> </tr> <tr> <td>0.05</td> <td>1</td> <td>m².s⁻³</td> </tr> </tbody> </table> <p>etc. See also our remark A.10.4</p>	1	2	Unit	10-150	10-150	Hz	1.6	7	m.s ⁻²	0.05	1	m ² .s ⁻³	<p>Agree. See new table for A.10.8 at the end of this document (allows for severity level 1).</p> <p>See also comment on A.10.4</p> <p>In R117-2, there will be more detail on this.</p>
1	2	Unit													
10-150	10-150	Hz													
1.6	7	m.s ⁻²													
0.05	1	m ² .s ⁻³													
A.11.2.1	Netherlands	<p>As this test is, for instance, also not applicable in case of power by DC mains supply or internal battery, we propose to change note 1): “1) This test is only applicable to equipment powered by AC mains supply.”</p>	Repetitive – in the title												
A.11.2.2	Netherlands	<p>As this test is, for instance, also not applicable in case of power by AC mains supply or internal battery, we propose to change note 1): “1) This test is only applicable to equipment powered by DC mains supply.”</p>	Repetitive – in the title												
A.11.3	Netherlands	<p>As this test is, for instance, also not applicable in case of power by DC mains supply or internal battery, we propose to change note 1): “1) This test is only applicable to equipment powered by AC mains supply.”</p>	Agree												

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A.11.3	Netherlands	<p>a.) Unfortunately, there seems to be an inconsistency for this test in OIML D 11 (2004) between Table 8.4/2 (preferred level 1 and 2) and 13.4 (preferred level 2 and 3). At the moment this problem is considered by the secretary of OIML TC5/SC1, responsible for D 11. We propose to apply severity level 1 or 2 (not 2 or 3) in this Recommendation.</p> <p>b.) The voltage interruption part of this A.11.3 testing is not necessary because all requirements related to a 5-second interruption of the power are already contained in the paragraphs of Section 4.2.</p>	<p>a.) We agree that there is an inconsistency between the two sections of D-11. We would think the testing table in D-11 (13.4) takes priority over D-11 (8.4/2). So we decide to keep severity levels 2 and 3 for voltage reduction.</p> <p>b.) Agree, requirements for both interruptible and non-interruptible measuring systems related to a 5-second interruption are addressed by Section 4.2 requirements and do not need to be addressed by Annex A. Voltage interruption lines on the table for this test will be removed. (See also Austria, Czech, and Finland comment on this issue, below.)</p>
A.11.3	Secretariat	In table, add Voltage Reduction to (Dips) ---- % (For added clarity)	OK
A.11.3	Austria & Czech Republic & Finland	- Annex A.11.3: Delete the reduction/interruption for a time of 250/300 cycles. This is a power-loss test. This test is described in article 4.2.2.	OK. See response to A.11.3/Netherlands (above).
A.11.4	Netherlands	Delete note 2) for signal lines (is part of A.11.6)	<p>Agree. Also table row concerning signal lines removed (covered by A.11.6). Also modified the objective of the test as follows:</p> <p>To verify compliance with the provisions in 4.1.1 under conditions where electrical bursts are superimposed on the mains voltage. and, if applicable, on input/output and communication ports.</p>

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A.11.7	France	<p>The notes in the table are not consistent with 8.4.5 of OIML D 11 which requests the surge test to be performed:</p> <ul style="list-style-type: none"> - On indoors signal, data and control cables if their length exceeds 30 meters; - Regardless of their length, on signal, data and control cables as soon as they are partially or fully installed outdoors. 	<p>Disagree. Text in the DR (Section A.11.7) complies with the new IEC document 61000-6-2 (2005-01), Table 2, note d.</p> <p>No text change.</p>
A.11.7	Secretariat	<p>Modify objective of A.11.7 to read:</p> <p>To verify compliance with the provisions in 4.1.1 under conditions where electrical surges are superimposed on input/output and communication ports.</p>	<p>Agree. Removes “mains voltage” from the objective – covered in A.11.10. testing.</p>
A.11.8	Netherlands	<p>As this test is, for instance, also not applicable in case of power by AC mains supply or internal battery, we propose to change note 2):</p> <p>“2) This test is only applicable to equipment powered by DC mains supply.”</p>	<p>OK – but repetitive</p>
A.11.9	Netherlands	<p>As this test is, for instance, also not applicable in case of power by AC mains supply or internal battery (not being under charge), we propose to change note 2):</p> <p>“2) This test is only applicable to equipment powered by DC mains supply</p>	<p>OK – but repetitive</p>
A.11.10	Czech Republic	<p>This item is extensively discussed; the final statement was made during the 14th Welmec meeting but is already included in the last update (CD2) of the R117-1.</p>	<p>Comment noted.</p>

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A.11.10	Secretariat	<p>In test procedure of A.11.10, modify text:</p> <p>On AC mains supply lines, at least 3 positive and 3 negative surges shall be applied synchronously with AC supply voltage in angles 0°, 90°, 180° and 270°. On DC mains supply lines, at least 3 positive and 3 negative surges shall be applied asynchronously. The injection network depends on the lines the surge is coupled into and is defined in the referenced standard.</p>	Agree, this provides clarification on this test.
A.11.10	Netherlands	<p>For the European countries, WELMEC WG10 decided that instruments powered by outdoor DC power lines are tested according level 2. Therefore, we propose to add in the table: Level 2, 0,5 kV (line to line) and 1,0 kV (line to ground)</p>	<p>After discussions with the Netherlands, this proposal on Section A.11.10 has been modified.</p> <p>The surge test on DC mains will remain level 3. This is consistent with both OIML D-11 & R137-1.</p> <p>Additionally, the following notes are added concerning this test:</p> <ul style="list-style-type: none"> • It does not apply to indoor networks; • It does not apply to cables shorter than 30 meters; • It does not apply to devices powered by a road vehicle battery; • Human intervention (such as a fuse replacement) is allowed after the test; • After the test (and any human intervention), no significant faults shall occur.

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A.11.11	Netherlands	In our opinion, it is to be preferred for these instruments to prescribe 10 V/m for the entire frequency range, so in A.11.11.1 the reference to severity level 2 can be deleted. In that case, A.11.11.1 and A.11.11.2 can be easily combined: Frequency range 26 - 2000 MHz (note 2) Frequency range 80 - 2000 MHz (note 1) Severity level 10 V/m (Severity level 3)	Leave as is in DR. Let manufacturer decide on the severity level – keep both levels
A.11.11.2	Netherlands	Double text (bottom page 111): ‘During tests, rate’	Accepted
A.12	Netherlands	The sub clauses seem to be based on an old draft of OIML D 11 (including mistakes in that draft!) and on superseded DIS / FDIS of the standards referred to. So please consult and apply the actual OIML D 11 and ISO standards: OIML D 11 (2004) ISO 16750 (2003) ISO 7637-1 (2002) ISO 7637-2 (2004) ISO 7637-3 (1995) with Correction 1 (1995)	Agree – these references will be double-checked before final publication of R117-1.
A.12.1 and A.12.2	Netherlands	A.12.1 reads: “.... for disturbances A.12.2” But please note that, according to D 11, variation in supply voltage (12.2) is not a disturbance but an influence (see Table 9.2.1/1 in OIML D 11). Furthermore, test A.12.2 is not based on the series ISO 7637, but on ISO 16750-2 (see 14.2.1 in OIML D 11), formally published in 2003.	OK – these references will be double-checked before final publication of R117-1.
A.12.2	Netherlands	There is no relation between this test and ISO 7637 (see also D 11).	OK – these references will be double-checked before final publication of R117-1.
A.12.x	Netherlands	Add test “A.12.4 Electrical transient conduction via lines other than supply lines, for external 12 V and 24 V batteries” (see OIML D11, 14.2.3)	Not possible to add a test at the DR stage in R117-1, maybe this can be discussed for R117-2 or the next revision.

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Doc Section	Country	Comment	Response
Annex B	Secretariat	Annex B numbering system should be improved.	Agree. Sections in Annex B now have the letter “B” in front of the Section in the main text to which they refer.
Annex B	UK	General Comment on Annex B; Ensure all text reflects the informative nature of the annex.	We agree that there is prescriptive wording in Annex B that could be interpreted as other-than-informative. Added new text at the beginning of Annex B: General: Information provided in Annex B is to not to be considered mandatory or a requirement.
Annex B	Sweden	Ensure all of these sections reference Annex B. 2.16.3 4.2.1 4.2.2 4.3.2.1 4.3.2.2 4.3.4 4.3.4.3 5.1.3 5.4.2 5.10.2.1 6.1.5.2.4	Agree – document needs to be double-checked before final publication.
Annex B ref to T.u.1	France	Editorial: Components of uncertainties due to...	agree
Annex B (ref to 3.7.4)	France	3.7.4 The relevant quantities to be considered are those corresponding to the characteristics of the liquid in the meter (pressure, temperature, etc.).	agree
Annex B (ref to 5.1.3.1 and 2.2)	UK	Editorial: Delete ‘submerge’, insert ‘submerged’	agree

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Annex B ref to A.6.2 and A.6.4	France	Editorial: Check correct use of symbols of units (cubic meter in 6.2 and space between the value and the symbol in A.6.4 for angles.	Agree – see Secretariat comment below.
Annex B (ref to A.6.2)	Secretariat	<p>Annex B (ref to A.6.2)</p> <p>Testing at the limits of the rated operating conditions may not be required when these limits have a negligible effect on the specific meter technology. (For example, it would not be necessary to test: a mass flow meter at the limits of viscosity - - or a meter with a pressure-balanced measuring chamber at the limits of pressure.)</p> <p>When it is determined that the rated operating conditions will affect the accuracy of the meter, the following may be considered:</p> <ul style="list-style-type: none"> ▪ Tests at the limits of pressure are not needed if the maximum liquid pressure is equal to or below 10 bar; ▪ Tests at the limits of pressure may be conducted within ± 10 bar of the actual limit; ▪ Tests on a liquid with a viscosity up to 1 mPa•s may be used to represent liquids with viscosities up to 2 mPa•s; ▪ Tests at the limits of viscosity > 2 mPa•s may be within $\pm 20\%$ of the actual limits; ▪ Tests at the limits of liquid density may be within ± 100 kg/m³ of the actual limits. <p>Where the measuring system is intended to measure liquid quantities at temperatures from $- 5$ °C to $+ 35$ °C, only one accuracy test at one temperature between $- 5$ °C and $+ 35$ °C is suggested.</p>	<p>This secretariat change to Annex B (ref to A.6.2) responds to comments on this section from the UK and the US.</p> <p>Textual edits in this section do not represent a change in the current text of this section – rather, these edits attempt to provide clarification and make the section easier to follow.</p>

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Doc Section	Country	Comment	Response
Annex B (ref to A.6.2)	UK	<p>Temperature</p> <p>We have serious concerns about the introduction of the temperature range -5°C to +35°C for several reasons:</p> <ul style="list-style-type: none"> • R117 1995 used the range -10°C to +50°C at 6.1.5.2.2 • -5°C is not one of the temperature severity levels for the Cold test at A.10.6 • +35°C is not one of the temperature severity levels for the Dry Heat test at A.10.5 • -5°C to +35°C is not aligned with the European Measuring Instruments Directive, however, the severity levels in A.10.5 and A.10.6 are aligned. <p>We would suggest using a temperature range selected from the temperatures in the Test severities tables in A.10.5 and A.10.6. We would propose either -10°C to +40°C or -10°C to +55°C</p>	<p>We think there might be a misunderstanding on this issue.</p> <p>Tests required by A.10.5 (dry heat) and A.10.6 (cold) concern ambient air temperature. (This is consistent with both D-11 and the MID.)</p> <p>The manufacturer defines the rated operating conditions for their measuring system (Section 2.3.1). This includes the minimum and maximum liquid temperature for their system. Section A.6.2 in Annex A requires that an accuracy test be performed at these limits.</p> <p>However, testing at these liquid temperature limits is often difficult for type approval labs to perform.</p> <p>So ... Annex B (reference to A.6.2) suggests – if the standard liquid temperature operating range of the measuring system is between -5°C to +35°C – that an accuracy test at only one liquid temperature between -5°C to +35°C is allowed.</p> <p>The word “required” will be removed from this sentence in Annex B – A.6.2.</p>

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Annex B (ref to A.6.2)	UK	<p>Viscosity and Density Many test laboratories have a limited range of test fluids which have been used successfully for many years, have known characteristics, and have often been chosen because they are safe for use in a test laboratory. However, these test fluids may not meet the requirements which have appeared in the final DR. We acknowledge that Annex B is informative but the terminology used is too strong with regard to the viscosity and density requirements. We also believe the density requirement, although important for mass flow, may be too restrictive for volume meters.</p> <p>We would suggest a more general statement is added raising the importance of viscosity and density but that specific criteria are removed.</p>	<p>Agree with comment.</p> <p>Wording changed in Annex B to ensure this section reflects “suggestions” (not “requirements”) for viscosity and density.</p>
Annex C	Netherlands	<p>Add an annex “Bibliography” containing an overview of the standards etc. being referred to, and their version (year of publication). As far as IEC standards (and a few ISO standards) are concerned, these can be copied from OIML D 11, and as far as applicable from OIML E 5. In that case, the full names of the standards can be removed in the text.</p>	<p>Agree – provided in new Annex</p> <p>[Note: BIML will provide this new Annex to R117-1.]</p>

Secretariat modifications to Section 2.7 (based on French proposal for this Section)

2.7 Provisions for converted indications

There are two approaches to verify a conversion device:

The first approach verifies the conversion device **with as part of a complete measuring system.** ~~In this approach,~~ the associated measuring devices, the calculator, and the indicating device ~~are verified (together).~~ This approach applies to mechanical conversion devices and may apply to electronic conversion devices.

The second approach allows for **separate verification of the individual components** of a conversion device. ~~or its separate components, other than as part of a complete measuring system.~~ This approach allows the separate verification of associated measuring sensors, associated measuring devices (made up of an associated measuring sensor plus an associated measuring transducer), and the conversion **function.** ~~device (as part of the calculator with its indicating device).~~

In both of these approaches, for the purpose of the verification, the indication of the quantity at metering conditions is assumed to be without any error.

The approach to be applied shall be specified by the applicant for type approval.

2.7.1 **First Approach: Verification of a conversion device with the associated measuring devices, the calculator, and the indicating device (together) as part of a complete measuring system**

2.7.1.1 It is not mandatory that a conversion device indicates the quantities measured by the associated measuring devices (such as temperature, pressure, and density).

2.7.1.2 When a conversion device is verified **using the first approach,** ~~as part of the complete measuring system with which it is intended to be used,~~ the MPE allowable on the converted indication due to the conversion device (positive or negative), is the greater of:

- the value specified in line C of Table 2, or
- one half of the minimum specified quantity deviation (E_{\min}).

2.7.1.3 The value of a significant fault on converted indications (from 2.5.4) is the greater of:

- one fifth of the absolute value of the MPE for the measured quantity, or
- the minimum specified quantity deviation (E_{\min}).

2.7.2 **Second Approach: Verification of the individual components of a conversion device or its separate components (other than as part of a complete measuring system)**

[the DR text remains the same for the rest of Section 2.7]

New French Proposal for Section 2.10.2

2.10.2 Pumped flow

A gas separator shall be provided when, without prejudice of requirements in 2.10.4, the pressure at the pump inlet may, even momentarily, fall below either the atmospheric pressure or the saturated vapor pressure of the liquid, which can result in mixed air or gas.

If gaseous formations such as pockets liable to have a specific effect greater than 1 % of the minimum measured quantity can occur as well, this gas separator shall also be approved as a gas extractor.

Depending on the supply conditions, a special gas extractor can be used for that purpose if the risk of mixed air or gas is smaller than 5 % of the volume delivered at the maximum flowrate.

When applying this provision concerning gaseous formations, it is necessary to consider, in particular:

- gaseous formations are likely to occur because of thermal contraction during shutdown periods;
- air pockets are likely to be introduced into the pipe work when the supply tank is completely empty.

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A gas extractor is required when the pressure at the pump inlet is always greater than the atmospheric pressure and the saturated vapour pressure of the liquid, but gaseous formations liable to have a specific effect greater than 1 % of the minimum measured quantity can occur. When applying this provision, it is necessary to consider the same situations concerning gaseous formations as mentioned above.

No gas elimination device is required when the pressure at the pump inlet is always greater than the atmospheric pressure and the saturated vapour pressure of the liquid, and if any gaseous formation liable to have a specific effect greater than 1 % of the minimum measured quantity cannot form or enter the inlet pipe work of the meter, whatever be the conditions of use.

If the gas elimination device is installed below the level of the meter, a non-return valve shall be incorporated to prevent the pipework between the two components from emptying.

The loss of pressure caused by the flow of liquid between the gas elimination device and the meter shall be as small as possible.

If the pipework upstream of the meter incorporates several high points, it may be necessary to provide one or more automatic or manual evacuation devices.

New text in Table 3 (Section 2.5.3)

Measured quantity (MMQ)	Maximum permissible errors
from 1 to 2 L or kg	value fixed in Table 2, applied to 2 L or kg
from 0.4 to 1 L or kg	twice the value fixed in Table 2, (applied to MMQ for E_{\min} calculation)
0.2 to 0.4 L or kg	twice the value fixed in Table 2, applied to 0.4 L or kg
from 0.1 to 0.2 L or kg	quadruple the value fixed in Table 2, (applied to MMQ for E_{\min} calculation)
less than 0.1 L or kg	quadruple the value fixed in Table 2, applied to 0.1 L or kg

Secretariat input to edit A.10.4

Class	Severity level (Vibration)	Description
M1	-	This class applies to locations with vibration and shocks of low significance <ul style="list-style-type: none"> for instruments fastened to light supporting structures subject to negligible vibrations and shocks (transmitted from local blasting or pile-driving activities, slamming doors, etc.)
M2	1	This class applies to locations with significant or high levels of vibration and shock <ul style="list-style-type: none"> vibration and shock transmitted from machines and passing vehicles in the vicinity or adjacent to heavy machines, conveyor belts, etc.
M3	2	This class applies to locations where the level of vibration and shock is high and very high <ul style="list-style-type: none"> for instruments mounted directly on machines, conveyor belts etc.

New Table in A.10.8

Test severities:	The following severity level shall be specified:	
	1	2
Total frequency range	10-150	10 -150 Hz
Total RMS level	1.6	7 m.s ⁻²
ASD level 10 –20 Hz	0.05	1 m ² .s ⁻³
ASD level 20 –150 Hz	- 3 dB/octave	- 3 dB/octave
Number of axes	3	3
Duration per axis	2 minutes	2 minutes