



Document: **ISO/TC 30/SC 7 N 420**

Secretariat of ISO/TC 30/SC 7
Flow measurement in closed conduits
- Volume methods including water meters

Date: 4 April 2012

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To the Members of ISO/TC 30/SC 7

Dear Member,

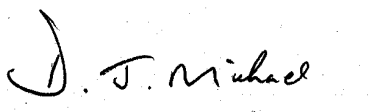
ISO/DIS 4064-1 - OIML R 49-1 Water meters intended for the metering of cold potable water and hot water — Part 1: Metrological and technical requirements

- Resolution of comments

Further to document N 411, in which the result of voting and comments on the above document were given, the comments on the draft have now been addressed as indicated in the attached compilation, following the meeting of the Joint Working Group (JWG) in Gaithersburg in November 2011 and subsequent further consultation within the JWG.

The draft has been duly revised and, in accordance with the decision of ISO/TC 30/SC 7 in Gaithersburg, will now proceed to issue as ISO/DIS 4064-1.2 (2nd DIS) for enquiry. Corresponding ballots will take place in OIML and CEN.

Yours sincerely,



D J Michael
for the Secretariat of ISO/TC 30/SC 7

Template for comments and secretariat observations

Date:2012-03

Document: ISO_DIS_4064-1 – OIML R 49-1 (2CD)

1	2	(3)	4	5	(6)	(7)
MB ¹	Clause No./ Subclause No./ Annex (e.g. 3.1)	Paragraph/ Figure/ Table/ Note (e.g. Table 1)	Type of comm ent ²	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
AU	-		ge	We wish to thank the secretariat for their time and effort in preparing these documents. They are highly professional and appear very close to completion.		Comments noted with thanks.
GB 009	General			The UK does not like that the requirements are in a separate part to the tests but if this is to be the case then part 1 should only have requirements and all references to the tests in other parts should be deleted. These references only provide opportunities for errors either now or when the standards are revised		Not agreed. The references are considered to be useful. A.5.1 to A.5.11b have been deleted.
JP			ge	We cannot accept DIS 4064-1 to proceed to FDIS as it is. We have technically important comments on amendment of measuring units and amendments in EMC tests.		The comments have been addressed below.
ISO 010	Title		ed	The "meter" concept occurs twice in the stem title	Edit to "Water meters intended for cold potable water and hot water"	Agreed (without 'intended'). See existing French title.
ISO 011	1		ed	The scope does not normally contain subclauses, since it is used as an abstract	Delete subclause numbers	Agreed.
ISO 012	1.1		ed	"ISO 4064/OIML R 49"	This is not a joint publication with OIML. Delete "OIML R 49". If necessary, explain the relationship with OIML R 49 in an introduction and list OIML R 49 in the bibliography	During the drafting stages, OIML is using this draft as well as ISO. Reference to R 49 should remain until final publication.
GB 013	1.1		te	Requirement should not be in the Scope	Remove "shall"	Agreed.
GB 014	1.2		te	Each country's Service of Legal Metrology may state their own requirements and are not bound by standards or OIML documents	Remove 1.2	Agreed (was in previous R 49-1 but does not appear to be standard text). Substitute 'NOTE. National regulations may apply in the country of use'.

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ISO 015	1.4		ed	The text does not limit the scope of DIS 4064-1 and repeats information already given in the foreword	Delete this subclause	Agreed, but it is still needed by OIML and has been added to the foreword of R49-1.
PL	1.4		ge	Part 4 and Part 5 are not the parts of OIML recommendation R49, so it is important to state that: "...there are additional technical requirements in ISO 4064 Part 4 and installation requirements in ISO 4064 Part 5".		Agreed. The change has been made in the R49-1 foreword.
PL	2		ed	Last sentence: need to remember to complete year of edition referenced documents (may be 2011 ?) Text in brackets OIML R 49-2:201x is preceded superfluous sign "≡".		Agreed. To be done.
ISO 016	3		ed	"Terminology"	The Std template names this clause "Terms and definitions". Use this title and adapt the associated preamble in the Std template to make reference to "ISO/IEC Guide 99" (formerly known as VIM) and the other documents. Indicate in each definition affected where "meter" has replaced "measuring instrument". See also Directives, Part 2, D.1.4, which specifies how to quote adapted versions of previously published definitions	Clause name and text have been adjusted. Instances where 'meter' has replaced 'measuring instrument' to be identified. In addition, in 3.5.8 'that' replaces 'which' for compatibility with OIML D 11:2004,3.18.2.
ISO 017	3		ed		To ensure terms and definitions comply with Directives, Part 2, Annex D (and specifically D.1.4 and D.3.6), check them against the ISO Concept Database, available at: http://cdb.iso.org	Check to be made.
AU	Section 3		ed	Where terminology is also given as an abbreviation or symbol, e.g. rated operation condition (ROC), the abbreviation should be bracketed and follow the terminology immediately on the same line.		Not agreed. In a terminology clause, symbols or abbreviations for a term are placed on successive lines. In 3.5.6 to 3.5.8, the text in brackets is not an

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				It is noted that 3.5.6, 3.5.7 and 3.5.8 employ such presentation of the abbreviation. Whereas all other definitions place the abbreviation or symbol on the next line.		abbreviation, but part of the term.
DE 018	3		ge/te	In ISO/DIS 4064-1 (and the other parts of this standards series) the term verification or initial verification is used. As this standards series (as EN ISO 4064) will replace the harmonised standards EN 14154-1, -2 and -3, it is important to note, that in the sense of the European Directive 2004/22/EC on measuring instruments (Measuring Instruments Directive – MID), the verification/initial verification has been replaced by an assessment of conformity.	This fact should be considered in form of a note in the foreword or the scope of all parts of the ISO 4064 series. Another (and possibly better) way could be to include the terms verification and initial verification in clause 3 Terminology of ISO/DIS 4064-1 with their definitions and with notes, which give all the relevant informations with regard to the "European situation".	Text from C Obst to be incorporated as Note in Foreword.
ID 019	3		ed	Definition of “reverse flow” is not provided	The definition of “reverse flow” needs to be provided	Not necessary.
FR 020	3.1.1			A mechanical water meter without calculator does not fit the NOTE1 that says a water meter includes at least...a calculator.		Not agreed. In a mechanical water meter the calculator is the gearing.
JP	3.1.3		ed	We propose to replace “measuring system” with “meter” as written in 3.1.2 and 3.1.4 for clarification.		Agreed.
JP	3.1.7	Note 1	ed	The last word “instrument” should be replaced with “meter” to avoid the misunderstanding with “associated measuring instrument” used on the same line.		Agreed.
DE 021	3.1.8	NOTE 2	te	Under h), a "self service device" is listed as an example for an ancillary device.	What is meant with self service device? We suggest to replace that term by "prepayment device" or "prepayment system" if we understand the term “self service” correctly.	Not agreed. Self service may not always imply prepayment.
DE 022	3.1.19 3.2.5 3.5.6		te	According to ISO/IEC Directives Part 2:2004, D.3.8, parentheses and square brackets shall be used only if they constitute part of the normal written form of the term. They		Agreed for 3.1.19. For 3.2.5, delete '(of indication)'. For 3.5.6 and 3.5.7, the

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	3.5.7			shall not be used to show alternative terms.		parentheses constitute part of the term.
GB 023	3.1.22		te	This seems to be more than a definition but also to be setting technical requirements. A note should be added to explain the restriction Q3>= 16	Restrict this item to a definition. If any requirements are to be set move them to the appropriate part of the standard if it is felt appropriate for a standard to restrict who may supply a meter.	Delete ', i.e. from ...' CO to provide Note explaining Q3 restriction
NL	3.1.22; 3.1.23 and 3.1.24		ed	Suggest not to use the word “unit” for physical entities, but use “part”, “device” or “module” where applicable and reserve “metrological unit” for reference to the specific measurement quantity like its use in the SI		Agreed. 'metrological module' has replaced 'metrological unit'.
GB 024	3.1.23		te	The note to 3.1.1 says a meter must have a calculator so why is it optional here	Delete “either an indicating device or”	Agreed
CEN Consu ltant	3.2.3	ISO-4064-1	ge	3.2.3. Primary Indication: For the purpose of the “primary indication”. This must be accessible without the use of tools by the consumer. Annex 1 , 10.5 of the MID (2004/22/EC)	The definition include a term that states the primary display should be accessible without tools	Not agreed. This is in 6.1.8.
GB 025	3.2.4		te	Note 1 says the error of indication is the difference between the indicated volume and the actual volume Note 2 should say that the error of indication is expressed as a percentage of the actual volume	Delete “generally” and add “of the actual volume” after “percentage”	Agreed
JP	3.2.4	Note 2	ed	The subscripts of V should not be written in italic but in roman. V itself should be in italic as it is.		In text this is possible. In formulae, the equation editor does not allow it. ISO Editor to advise.
NL	3.2.6		ed	MPE: There is no need observed to deviate from the definition as presented in the VIM (4.26)		Agreed.
NL	3.2.8; 3.2.9; 3.5.1; 3.5.2; 3.5.3		ed	Warning: these definitions from D11 will probably be amended. With the revision of the VIML it is the intension that the general definitions according to legal metrology will be		No change at present. OIML/TC 8/SC 5 to advise in due course.

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				implemented in the new VIML.		
AT 026	3.2.9	Note	te	The reference in the note (4.1.2) is incomprehensible to the text of this part 1.	Perhaps the reference in the note should be 4.2.1 and 4.2.2 – depending on the class	See response to next comment.
JP	3.2.9	Note	ed	“4.1.2” should be corrected to “5.1.2”		Agreed.
ISO 027	3.3.1 and throughout		ed	<p>“flowrate”</p> <p>The term and definition differ from those given in ISO 80000-4:2006:</p> <p>volume flow rate</p> <p>$q_V = dV/dt$ where V is volume and t is time</p>	<p>Adopt the term and definition from the basic standard, optionally including extra information in a note or example (see Directives, Part 2, Annex D).</p> <p>Please note also that the TC30 vocabulary, ISO 4006:1991, prefers the symbol q. If there is no danger of confusion with mass flow rate, q_m, q could be used alone</p>	<p>‘flowrate’ is commonly used in flow measurement, e.g. in ISO 5167.</p> <p>The definition has been modified.</p> <p>‘Q’ is preferred for volume flowrate for water meters: it is stamped on them.</p>
ISO 028	3.3.2		ed		Align the symbol with 3.3.1	Not required.
NL 029	3.3.2			The definition contains the words “satisfactory manner”. Without a detailed context these words are subjective.	We suggest go delete the words “satisfactory manner”.	Agreed.
ISO 030	3.3.3		ed		Align the symbol with 3.3.1	Not required.
NL 031	3.3.3			The definition contains the wording “a short period of time”.	<p>We suggest to replace the wording “a short period of time” by either:</p> <ul style="list-style-type: none"> - A specified time: e.g. 100 hours permanently or; - A specified time as declared by the manufacturer 	Not agreed. 100 hours is to simulate the effect of the flow being above Q_3 for short periods over the whole lifetime of the meter.
ISO 032	3.3.4		ed		Align the symbol with 3.3.1	Not required.

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ISO 033	3.3.5		ed		Align the symbol with 3.3.1	Not required.
ISO 034	3.3.6		ed		Align the symbol with 3.3.1	Not required.
AT 035	3.3.8		te	Also a minimum pressure may have implications for the use of the device (e.g. for correct work of the change over device a minimum pressure is necessary)	mAP(minimum Admissible Pressure) should be considered as given in EN 14154-1 clause 3.49	Not necessary – the minimum pressure is 0.03 MPa (0.3 bar) (see 6.4).
ISO 036	3.3.10 and throughout		ed	The symbol <i>P</i> , usually associated with "power", is used for "pressure"	To align with ISO 80000-4:2006, 4-15.1, use the symbol <i>p</i> . (See also 3.3.11, where a lower case <i>p</i> is already used for pressure.)	Agreed
NL 037	3.4.6			This definition is a “stand alone” in this document. The rest of the document does not contain any references to “limiting condition”	We suggest: - Delete this definition or; - Describe the requirements with pass/fail criteria including test conditions	Agreed. Delete.
CEN Consu ltant	3.4.8	ISO-4064-1	ge	3.4.8 Durability: For the purpose of Directive MID (2004/22/EC) The period for durability is defined by the manufacturer (Annex 1, 5 of the MID)	The definition should clarify who is responsible for defining the period for which the instrument must be durable.	Use durability in place of endurance throughout This document does not cover statements of manufacturer to customer.
ID 038	3.4.9		ed	Mistype of celcius degree	The degree sign (°) must be right (superscript).	Agreed.
ID 039	3.4.9		te	Need clarification on the determination of how the temperature of 3°C is obtained.	There should be an explanation on how the temperature of 3°C is obtained.	No change
JP	3.4.9		ed	The unit symbol of temperature should be corrected.		Agreed.

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NL	3.5.9		ed	Delete: “power supply device” since definition is not used. “power supply” is used which does not need to be explained in the terminology		Agreed.
NL 040	4.1.3&4.1.4			The list in 4.1.3 runs from 1 up to and including 6300. The list 4.1.4 runs from 40 up to and including to 1000. Is not described why the ratio Q3/Q1 is split up in 2 clauses.	We suggest to combine both lists in table with all the Q3/Q1 or explain why the Q3/Q1 is expressed in 2 different clauses.	No change agreed. 4.1.3 gives Q1; 4.1.4 gives Q3/Q1.
JP	4.1.4		te	The values of the ratio Q_3/Q_1 from 10 through 31.5 should be kept as they are in the ISO 4064-1:2005. There are some users who use water meters, especially hot water meters, at comparatively constant flowrates.		Not agreed. This decision was taken in Ottawa. There was further discussion in Washington.
ID 041	4.1.5		te	The ratio Q2/Q1 needs to be reviewed. If it shall be 1.6, it could influence many of technical matters	The ratio of Q_2 / Q_1 should be reviewed and explained.	Not agreed. This decision was taken many years ago.
ID 042	4.2		te	There is inconsistency of Meter Accuracy Class and Maximum Permissible Error with OIML R 49-1 2006 subclause 3.2	Meter Accuracy Class and Maximum Permissible Error need to be reviewed to be adjusted with OIML R 49-1 2006 subclause 3.2	This change was made at a previous meeting
NL 043	4.2			In the second sentence the wording “These requirements shall be met durably is” applied. This sentence does not add any value to this standard as in the clause 7.5 the requirements are listed to which criteria the meters shall be assessed.	We suggest to delete this sentence	Agreed.
ID 044	4.2.5		ed	There is inconsistency in the writing of equation of error (compared to writing of error in sub clause 3.2.4).	Equation should be given notation of percent (%) for consistency with sub clause 3.2.4. in “Definition”	Agreed.
JP	4.2.5		ed	The subscripts of V should not be in italic but in roman.		In text this is possible. In formulae, the equation editor does not allow it. ISO Editor to advise.

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PL	4.2.5		ed	The brackets in formula are unreadable.		Not agreed.
DE 045	4.2 5.2 7.2.5 A.4 A.5 B.2 B.3 B.4		te	According to ISO/IEC Directives Part 2:2004, 5.2.4, "Hanging paragraphs" shall be avoided since reference to them is ambiguous. The first paragraph of a clause shall be numbered as a subclause. The first subclause can often be named "General". Renumbering concerns also cross references.		Agreed.
ID 046	4.2.6		ed	There is an inconsistency as ISO/DIS clause 4.2.6 states that "The manufacturer shall specify whether or not the water meter is designed to measure reverse flow", while "Reverse flow meter" is written in individual sub title in ISO/DIS 4064-2 clause 7.7	Needs to be reviewed	'Reverse flow meter' is not referred to.
FR 047	4.3.3			We do not agree with the place of the new requirement in 4.3.3. This is not a requirement limited to instruments equipped with a correction.		See below.
GB 048	4.3.3		te	The sentence "Any adjustment shall be performed in such a way as to adjust the errors (of indication) of a water meter to values as close as practical to zero so that the meter may not exploit the MPE or systematically favour any party." seems out of place in the section on "Correction Device"	Re-locate this sentence which presumably refers to adjustment during manufacture possibly to 6.2	Agreed. Also delete 'The aim of a correction device is to reduce the errors (of indication) to as close to zero as possible.'
NL 049	5.1.1			We refer to the previous comment.		Agreed – delete.
AU	5.1.2		ed	In the first dot point, change "cuases" to "causes".		Agreed
GB 050	5.1.2		ed	Correct spelling of causes		Agreed

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NL	5.1.2		ed	Word missing : The following faults are not considered..... Next line: cuases should be causes		Agreed
SA	5.1.3			The last part of the clause: “except in the case of non-resettable measurements between two constant partners.”, should be clarified to ensure that if there is no checking facility to check for reverse flow some other means shall be employed to prevent it. This is important if pulses generated in a reverse direction are counted as normal direction of flow and increase the volume delivered instead of decreasing.	Suggest the following wording: “except in the case of non-resettable measurements between two constant partners where another means has been employed to prevent or detect and act upon reverse flow to prevent advance of indication.”	No change agreed.
ID 051	5.2.2		ge	The numbering of para should be consistent. Why the para does not use the numbering of sub clause such as 5.2.1 and 5.2.3 ? The numbering of other paras and clauses needs to be reviewed (some paras/cluases use numbering while others do not).	Proposed changes : 5.2.2.1 The manufacturer shall ensure that the expected lifetime of the battery is such that the meter functions correctly for at least one year longer than the operational lifetime of the meter. 5.2.2.2 A low battery or exhausted battery indicator or a meter replacement date shall be indicated on the meter. If the register display gives an indication of “low battery”, there shall be at least 180 days of useful life for the register display from the time “low battery” indication is displayed to end of life.	Agreed.
NL 052	6.1.3			We suggest to add the following sentence to this clause and delete the footnote on this page In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered in this standard: 1. This standard provides no information as to whether the product may be used without		Not agreed.

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				restriction in any state; 2. It should be noted that, while awaiting the adoption of verifiable international criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.		
SA	6.1.4			In a standard the word “suitable” should not be used unless defined or a specification and conformity assessment test given. In some meters ordinary paint is used on internal components and this comes off with a few months of use. Some approving authorities may regard this as suitable as it looks fine during a visual inspection of a new meter.		No change agreed.
SA	6.1.6			How will the approving authority decide if there is a risk of condensation forming on the underside of the window? Suggest changing last part of the sentence to: “where the window of a dry water meter indicating device is not sealed to prevent the ingress of moisture.”		Reverse sentence and replace 'elimination' by 'prevention/elimination'.
NL 053	6.1.7			A water meter shall be of such design, composition and construction that, under normal conditions of use, it is able to measure accurately and does not facilitate the perpetration of fraud.	We suggest to delete the words “under normal conditions of use”. The new sentence suggestion is “A water meter shall be of such design, composition and construction that, to measure accurately and does not facilitate the perpetration of fraud.”	Agreed. Delete 'under normal conditions of use, it is able to measure accurately and'. Accuracy is covered elsewhere.
NL	6.1.7.3			In first sentence it states: The indicating device	We suggest to modify the first sentence as	Agreed, with modification.

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054				shall be able to record the indicated volume in cubic metres corresponding to at least 1 580 hours of operation at the permanent flowrate Q3, without passing through zero. This provision is formulated in Table 5. Table 5 states a minimum of a certain m³. The sentence states “at least”. Is there a difference between “at least”of “minimum”	follows: “The indicating device shall be able to record the indicated volume in cubic metres at flowrate Q3 without passing through zero as listed in Table 5”	
NL 055	6.2.2			We suggest to add to this clause after the word fraud: as well as in compliance with clause 6.1.7.:		Comment not understood.
GB 056	6.3		te	This subject should not be dealt with in two parts of the same standard	Delete 6.3.1 to 6.3.4 and re-title 6.3.5	Not agreed.
NL 057	6.3			This clause refers to installation instructions. This specific document is applicable only to the water meter is self. Therefore installation instructions are not required in this document.	Delete clause 6.3 or change title into “Installation conditions for EUT”.	Not agreed.
GB 058	6.3.2		te	Filter is an installation requirement and if upstream is impossible to verify at type approval.	Delete the requirement from this part of the standard	Not agreed.
SA	6.3.2			The phrase “likely to be affected” is open to interpretation. The example seems ambiguous as a Waltrmann meter could be regarded as a turbine meter and it may be better to refer to jet meters. If it can’t be stated clearly when a strainer/filter shall be fitted then it is suggested that a statement be made that national regulations shall apply.		Not agreed.
GB 059	6.3.3		ed	Correct spelling of levelled		Agreed

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DK	6.3.5	Table 2 and 3	te	It is important that the meters are able to withstand influence of flow disturbances. However it is somewhat bureaucratic to introduce sensitivity classes and would prefer that the manufacturer was free to declare the necessary straight lengths/straighteners needed for his instrument. If sensitivity classes are maintained the numbers (in table 2 and 3) should be reduced. The “steps” between each class are too small.		No change agreed – much previous discussion.
NL 060	6.3.5			In this document this requirement is applicable all types of water meters. In EN 14154-3, clause 5.9 states: “Some types of water meter, e.g. volumetric water meters (that is, involving measuring chambers with mobile walls), such as oscillating piston or nutating disc meters have been shown to be insensitive to upstream installation conditions, hence this test is not applicable.” It is not clear why this document requires that all types of water meters shall be tested and EN 14154-3 excludes certain types of water meters.	We suggest: - Elucidate why alle types of meters shall be tested or: - Bring the text in line with EN 14154.	See 7.9.3 of Part 2
SE	6.3.5			It is important that the meters are able to withstand influence of flow disturbances. However it is somewhat bureaucratic to introduce sensitivity classes and would prefer that the manufacturer was free to declare the necessary straight lengths/straighteners needed for his instrument. If sensitivity classes are		See above.

1	2	(3)	4	5	(6)	(7)																				
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				maintained the numbers (in table 2 and 3) should be reduced. The “steps” between each class are too small.																						
AU	6.4		ed	Suggest replacing “Working pressure range” with “Pressure range” or similar. The clause appears to be specifying the maximum and minimum admissible pressure of the meter, not the average pressure measured at the time of testing.		Agreed																				
JP	6.5	Table 4	te	ISO shall use SI units preferably. The table should be replaced with the following table as specified in ISO 4064-1:2005: Table 4 – Pressure-loss classes <table><tr><th rowspan="2">Class</th><th colspan="2">Maximum pressure-loss</th></tr><tr><th>(MPa)</th><th>(bar)</th></tr><tr><td>ΔP_{63}</td><td>0.063</td><td>0.63</td></tr><tr><td>ΔP_{40}</td><td>0.040</td><td>0.40</td></tr><tr><td>ΔP_{25}</td><td>0.025</td><td>0.25</td></tr><tr><td>ΔP_{16}</td><td>0.016</td><td>0.16</td></tr><tr><td>ΔP_{10}</td><td>0.010</td><td>0.10</td></tr></table>	Class	Maximum pressure-loss		(MPa)	(bar)	ΔP_{63}	0.063	0.63	ΔP_{40}	0.040	0.40	ΔP_{25}	0.025	0.25	ΔP_{16}	0.016	0.16	ΔP_{10}	0.010	0.10	Add a column for MPa to the Table 4.	Agreed
Class	Maximum pressure-loss																									
	(MPa)	(bar)																								
ΔP_{63}	0.063	0.63																								
ΔP_{40}	0.040	0.40																								
ΔP_{25}	0.025	0.25																								
ΔP_{16}	0.016	0.16																								
ΔP_{10}	0.010	0.10																								
NL 061	6.5			The first sentence includes filters/ straightners. We suggest to modify this sentence as follows: The pressure loss through the water meter, including its filter and/or straightener and checkvalve (if mounted behind the seal), where either of these forms an integral part of the water meter, shall not be greater than 0.063 MPa (0.63 bar)5) between <i>Q</i> 1 and <i>Q</i> 3.		Not agreed, because not possible.																				

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1	2	(3)	4	5	(6)	(7)
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SA	6.5			1. After the word “filter” in the first and second paragraphs add “/strainer” 2. In the second paragraph: “following R 5 of ISO 3:1973” is not clear. Is this reference necessary as Table 4 is what must be complied with? 3. No mention is made of <u>integral</u> non-return valves or control valves for opening and closing the water supply in prepayment water meters. It is doubtful that the pressure loss will meet the maximum 0,063 MPa requirement with these components fitted. If there is consensus these items should be excluded when determining the pressure loss.		Agreed. Text amended. 3 - No change agreed.
ID 062	6.5, 6.6.2		ed	There is a mark of footnote 5), but there is no explanation in the footnote itself.	The explanation of 5) should be provided, or the mark 5) in text should be changed with 4).	Agreed as regards 6.5: the mark in the text has been changed to 5).
CEN Consu ltant	6.6	ISO-4064-1		6.6.1 The verification marks must be visible without dismantling the water meter. This definition does not prevent the marks becoming obscured by the addition of an ancillary device on the top of the meter	Clause 6.6.1:The requirement should include the obligation for the marks to remain visible after the addition of an ancillary.	Agreed : wording has been provided so that visibility after installation is obligatory..
CEN Consu ltant	6.6	ISO-4064-1		6.6-Verification mark. The clause 6.6 refers to a verification mark. The clause 7.2.8.1 refers to verification marks (plural). This must be clarified as the clause 6.6.1 creates an obligation for the mark or marks to be visible. Without a clearer definition of what constitutes a mark, it will not be possible to decide whether the marks are visible. It should be noted that the definition in the VIML 2000 is not exclusive and may be one or more marks	A definition of verification mark should be generated.	Not agreed, but 6.6.1 and 7.2.8.1 have been made consistent: 'mark(s)'.
ID 063	6.6.1		ed	The writing of parentheses inside of parentheses sign needs to be corrected	The writing should be : .. (.....(...)).....)....	No correction appears to be necessary.

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FR 064	6.6.2			Water meter are commonly fitted with a lid on the cap in order to protect the indicating device, thus markings are not visible. The suggestion is to replace visible by accessible without a tool.		'visible without dismantling the water meter' has replaced 'visible'.
JP	6.6.2	Paragraph 1	ed	"Instrument" on the last line should be replaced with "meter" for clarification.		Agreed.
JP	6.6.2	Note 4	ed	Year of manufacture: "2 008" should be written as "2008" without a space.		Agreed.
PL	6.6.2	Note 2	ed	Note 2 is misleading. An example of the required marks and inscriptions is presented in Note 4 on the next page 26.		Agreed.
AU	6.6.2 (f)		ed	We request that the serial number be separated from year of manufacture and listed as a new (g).		Agreed.
AU	6.6.2, 6.7.2.2 and 6.7.3.2.2			We request that listed items be designated with a letter, number or roman numeral, not dashes.		Agreed for 6.7.2.2 and 6.7.3.2.2
NL 065	6.7.1.1			The last sentence of this clause accepts that additional elements for testing and calibration are part of the indicating device.	We suggest to add the following after the last word of this sentence: ...calibration, providing that the complete water meter complies with clause 6.1.7.	Not necessary – must comply with 4.2 in any case,
PE 066	6.7.1.3		ed	The number "1580" is written separately "1 ... 580"	Write: "1580"	Has been deleted.
CEN Consu ltant	6.8.2	ISO-4064-1		6.8.2 Electronic Sealing devices: The clause allows the deletion of the record of an intervention if it is necessary for a new record to be made. These records of intervention may necessary for market surveillance authorities. The Blue Guide states that technical records must be kept for 10 years (Paragraph 5.3), so there is a reasonable expectation that market surveillance could legitimately take	Clause 6.8.2.1: This should specify the time period that the records should be maintained for	'a reasonable period of time' has become 'a period of time as defined by national regulations'.

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				place in that 10 year period and records of intervention could be asked for.		
NL 067	6.8.2.1,b			Indent b begins with: “It shall be possible for evidence of an intervention to be available for a reasonable period of time”.	Please elucidate this sentence. It is not clear what this requirement means. Furthermore “reasonable” is subjective.	See above
JP	7.1		ed	“ISO 4064-2/R 49-2” should be amended.	ISO 4064-2/OIML R 49-2	Agreed.
NL	7.2			Change title to “Type evaluation”. Type evaluation comprises the “actions”: “type examination” plus “type (evaluation) tests” The decision: “type approval” is the potential result of the type evaluation. See VIML 2.5 and 2.6		Change title to 'Type evaluation and approval'. This distinction has caused multiple changes in Parts 1 and 2. VIML definitions included at 3.4.12 and 3.4.13.
DK	7.2.2	Table 3.	te	We are against introducing 5 / 3 / 2 meters to be tested for electronic meters without checking facilities. The same number (3 / 2 / 1) should be required for all meters irrespective of construction of the meter.		Agreed - clause has been modified.
PL	7.2.2	Table 6	ed	Table 6. Why the number of electronic meters to be tested without checking facilities is greater than electronic meters to be tested with checking facilities ?		See above
SE	7.2.2			Table 3. We are against introducing 5 / 3 / 2 meters to be tested for electronic meters without checking facilities. The same number (3 / 2 / 1) should be required for all meters irrespective of		See above

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1	2	(3)	4	5	(6)	(7)
MB ¹	Clause No./ Subclause No./ Annex (e.g. 3.1)	Paragraph/ Figure/ Table/ Note (e.g. Table 1)	Type of comm ent ²	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
				construction of the meter.		
AU	7.2.3.1		ed	While it is appreciated that the flowrate ranges are given in Part 2, this section should either list the flowrate ranges in full or refer to 7.3.4 of Part 2. The errors of indication of meter will not be determined at these flowrates, but at approximations of these flowrates. While a pedantic point, as written, 7.2.3.1 is very difficult for a testing laboratory to comply with in the strictest sense.		Part 1 intentionally gives nominal flowrates, while Part 2 gives ranges.
ID 068	7.2.3.1		te	The formula for errors as given in ISO/DIS 4064-1 : a) $Q1$; b) $Q2$; c) $0.35 (Q2 + Q3)$; d) $0.7 (Q2 + Q3)$; e) $Q3$; f) $Q4$; and for combination meters: g) $0.9 Qx1$ h) $1.1 Qx2$ is inconsistent with the errors stated in ISO/DIS 4064-2 para 7.3.4 : a) Between $Q1$ and $1.1 Q1$ b) Between $Q2$ and $1.1 Q2$ c) Between $0.33 (Q2+Q3)$ and $0.37 (Q2+Q3)$ d) Between $0.67 (Q2+Q3)$ and $0.74 (Q2+Q3)$ e) Between $0.9 Q3$ and $Q3$ f) Between $0.95 Q4$ and $Q4$ and for combination meters: (g) Between $0.85 Qx1$ and $0.95 Qx1$ (h) Between $1.05 Qx2$ and $1.15 Qx2$	The formula of errors stated in ISO/DIS 4064-1 para 7.2.3.1 and should be consistent with ISO/DIS 4062-2 para 7.3.4.	See above
JP	7.2.3.1		ed	A full stop should be added in the end of the sentence.		Agreed: after the note has been moved a colon is better.

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						Move NOTE below h). In the last sentence: substitute 'four' for 'three'.
AU	7.2.3.2		ed	We strongly support the inclusion of this requirement.	Would suggest that the section be given a heading, for example "Repeatability". Partly in order to draw attention to a new requirement.	Agreed. It has become 7.2.4 Repeatability tests.
DK	7.2.4		ge	The requirement is not relevant and should be deleted		Not agreed. It was agreed in Ottawa and is wanted by others.
JP	7.2.4		ed	"water" is missing in the title.	Overload water temperature tests	Agreed
SE	7.2.4			The requirement is not relevant and should be deleted		Not agreed. It was agreed in Ottawa and is wanted by others.
ID 069	7.2.5	All paras including the title of table 7	ed	The use the word "endurance" or "durability" needs to be consistent, as para "definition" only defines the term of "durability" (3.2.10, durability)	The use of the word "endurance" or "durability" should be consistent, and if both words are needed, the both word should be defined in para "definition".	Agreed : durability is used.
JP	7.2.5.2	Table 7	ed	The second column: Except symbols <i>Q</i> , all other numbers, unit symbols and subscripts should not be written in italic but in roman. The third column: The same comment.		Agreed.
NL	7.2.6; 7.2.7		eted + ge	Omit usage of the word "tests". Part 1 concerns the requirements not the tests. Simply delete the word "test" in the heading. The second sentence is superfluous and could be deleted. All the applicable tests are mentioned in Part 2. Furthermore Part 1 should not refer to specific clauses in Part 2 (or 3) since only Part 1 is meant to be implemented in the national legislation.		Not agreed. 'tests' is used in all the equivalent sections. References to Part 2 are convenient for the user.
AU	7.2.7		te	This test is perhaps the only disturbance test		Noted for future discussion.

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				<p>primarily intended to mitigate the likelihood of fraud – the use of a magnet to affect the performance of the meter.</p> <p>While, it is important to determine that mechanical meters are immune to the effect of a static magnetic field, any such immunity is likely to exist regardless of the strength of the introduced field. That is, all the moving components are made of plastic or composite materials.</p> <p>However, with regards to electronic meters (or meters with electronic components) any such immunity and subsequent effect on performance could be relative to the strength of the introduced magnetic field.</p> <p>The magnet proscribed in the test procedure is readily available today. The test as stated merely provides a minimum starting point for those wishing to facilitate fraud via the use of a magnet; it doesn't ensure that an electronic meter is immune from the influence of magnetic fields regardless of the strength of such a field.</p> <p>This topic is raised for discussion at the next meeting. If there is concern regarding the use of magnets to facilitate fraud, then perhaps it would</p>		

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				<p>be more appropriate to state that electronic meters should be fitted with detectors and alarms that alert the relevant authority to the presence of a magnetic field greater than that specified in this test.</p> <p>This would obviously represent a substantial change to the requirements of the Standard/Recommendation at this stage. As such, any discussion, requirements or recommendations on this topic would perhaps be appropriate as an informative NOTE only.</p>		
NL	7.2.7			The applicable magnetic flux density level which the meter shall withstand shall be mentioned in the requirement.		Not agreed.
NL 070	7.2.8.1	, third indent		The third indent states the follows: “a list of the parts with a description of their constituent materials when these parts have a metrological influence”.	We suggest to modify the text in this indent as follows: “a list of the parts with a description of their constituent materials”	Not agreed. It is the parts that have metrological influence with which this document is concerned.
NL 071	7.2.9			This clause contains the contents of type approval certificate.	<p>We suggest to modify the first sentence as follows:</p> <p>“The following information shall appear on the type approval certificate for the recipient or in its annexes providing that there are not other requirements to comply with.” (E.g. Third party certification of MID requirements within the EU)</p>	Not agreed.
NL	7.2.11		ed	Change “Type approval” in title to “Type evaluation” argument see comment NL on 7.2		Agreed

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JP	7.2.11.2	a) and b)	ed	“equipment” cannot be understood. It should be replaced with “meter” for clarification.		Agreed
JP	7.2.11.3	Paragraph 3	ed	“ancillary equipment” seems to mean “ancillary devices” of 3.1.8. If so, it should be corrected to “ancillary devices” for clarification.		Agreed
GB 072	7.3.1		te	First paragraph In general implies there are special cases where this is not the case.	Delete "In general"	Not agreed
GB 073	7.3.1	Second paragraph	te	Nothing to do with initial verification and not a standard requirement	Should be deleted.	Agreed
JP	7.3.2	Paragraph 2	ed	“ISO 4064-2/R 49-2” should be amended.	ISO 4064-2/OIML R 49-2	Agreed
JP	7.3.3		ed	“ISO 4064-2/R 49-2” should be amended.	ISO 4064-2/OIML R 49-2	Agreed
PL	7.3.3		ed	We suggest the reference to ISO 4064-2/R 49-2, 10.1.3 4) to write as: "ISO 4064-2/R 49-2, 10.1.3 point 4)".		Agreed
JP	7.3.4	Paragraph 3	ed	“ISO 4064-2/R 49-2” should be amended.	ISO 4064-2/OIML R 49-2	Agreed
AU	7.3.4		ed	It is suggested that the flowrate ranges should be given here. See reasoning given in AU’s comment on 7.2.3.1. In addition, “nominal flowrate” is not defined, what does the term mean?		Not agreed – see above
PL	7.3.4		ed	As the previous comment, consequently we suggest to write "ISO 4064-2/R 49-2, 10.1.3 point 5)". We also suggest to add the same note like in 7.2.3.1: "NOTE See ISO 4064-2/OIML R49-2, 10.1.3 point 7) for the permitted flowrate		Agreed Agreed.

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				ranges".		
FR 074	7.3.6			The rule proposed is not correct as it comes back to the same wording that we discussed in the past for gas meters which do not guarantee anything. The manufacturer could have one point at a non significant flowrate which is within half of MPE and all the rest of the points greater than half the mpe so exploiting the mpe and in addition to the benefit of one party only. (This is exactly what we don't want in Europe)		Text changed as agreed by consultation within the JWG.
GB 075	7.3.6		te	Same sign rule is no longer a European requirement	Re-consider this clause in the interest of harmonisation of the European Standard which is harmonised with the MID	
FR 076	Missing 7.4			We maintain that in such an OIML recommendation we miss a chapter about subsequent verification giving at least a list of examination and controls to be performed		'Subsequent verification' referred to in annex C.
NL	Annex A	Annex A	ge	Annex A is part of Part 1 Therefore it should in principle not concern the "performance tests" but the "performance requirements".		Not agreed.
JP	A.5	Table A.1	ed	A.5.7: In 8.8 of Part 2, only the test of severity level 2 applies.	Change "2 or 3" to "2".	Agreed
JP	A.5	Table A.1	ed	A.5.10.b: There is not severity level 4 in OIML D 11.	Change "3 or 4" to "2 or 3".	Agreed
NL	A.5		ge	When implemented in Part 1 this table should not mention the nature of the quantity nor the reference to D11. It should further indicate the applicable maximum value of the influence quantities in terms of the rated operating		Delete D 11 clause column – substitute reference to Part 2 clause. Delete A.5.N references in left hand column. Homework: follow Morayo

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				<p>conditions or in terms of maximum disturbance. E.g. In terms of rated operating conditions for A.5.1 “Dry heat” should be 55 °C and e.g. in terms of maximum disturbance the level of 10 V/m.</p> <p>Moreover the severity level indexes (1, 2, 3 and 4) are not meant to be copied to a recommendation. These indexes are meant to help the TC or SC in selecting the required influence quantity value for the applicable measuring instrument.</p> <p>Like is well done for classes B, O and M, Part 1 should also indicate which influence quantity level is applicable for class E1 and which for class E2 while this concerns the requirement.</p>		Option 2.
PL	A.5	Table A.1	te	<p>Table A.1, Test A.5.10.b Conducted electromagnetic fields. Document OIML R 49-1 2CD proposes in this place to apply severity level 3 or 4. In OIML D11 severity level 4 doesn't exist.</p> <p>Also, what is more important, in OIML R 49-2 2CD we have given the levels of "3 V/m for environmental class E1 instruments" or "10 V/m for environmental class E2 instruments". We see 2 problems with these levels:</p> <ol style="list-style-type: none"> 1) values 3 or 10 refer to severity levels 2 or 3 (not 3 and 4 or "x") in OIML D11 12.1.2 2) the units of measure should rather be V, 		<p>1st comment Agreed</p> <p>Agreed (V/m is correct for radiated field; V is correct for conducted field)</p>

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				not V/m because during test we control the level of induced voltage, not the strength of magnetic field causing induction.		
NL	A5.1 –A 5.11		ge	Suggest to shift “object of the test” to Part 2 and delete all the rest of these tables while the Part 1 should not refer to specific clauses in Part 2. (Instead Part 2 may refer to Part 1)		Agreed to delete A.5.1 – A.5.11
AU	A.5.3		te	Why is the Damp Heat, Cyclic test no longer considered an influence factor? Is it due to possible combined effects of exposure to both humidity and temperature variation?		It was changed in response to D 11 discussion.
DE 077	A.5.4.a.1 to A.5.4.c A.5.8.a A.5.8.b A.5.10.a A.5.10.b A.5.11.a A.5.11.b		ed	The numbering does not conform to ISO/IEC Directives Part 2:2004, 5.2.4.		Agreed.
JP	A.5.5		te	“This test should normally apply to mobile installations only.” should be added as written in A.5.6. See also our comment of 8.7.1 to DIS 4064-2.		Agreed, but A.5.N deleted anyway.
NL	A 5.6		te	The test as specified in Part 2 is not simulating shocks experienced by mobile installations but only the dropping on the surface like when placing a measurement instrument on a table.		Deleted from Part 1.
JP	A.5 Performance tests - Table A.1		te	Test method for " <i>AC mains voltage dips, short interruptions and voltage variations</i> " required in 8.8 of Part 2 actually corresponds to the severity level 2 specified in OIML D11 (2004).		Agreed.

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	- Test A.5.7			In conformity with the requirement in 8.8 of Part 2, the severity level for test A.5.7 shall be changed from "2 or 3" to "2".		
JP	A.5 - Table A.1 - Test A.5.10.b		te	In regard to the item " A.5.10b conducted electromagnetic fields ", the severity level 4 does not exist in OIML D11 (2004). In conformity with the requirement in D11, the severity level for test A.5.10.b shall be changed from "3 or 4" to "2 or 3".		Agreed.
JP	A.5.5 Vibration and A.5.6 Mechanical shock		te	Only in <u>A.5.6 Mechanical Shock</u> , there is a phrase " <i>apply to mobile installations only</i> " and such a phrase is not written in <u>A.5.5 Vibration</u> . Meanwhile, it is stated in <u>8.6 Vibration in Part 2</u> (p.43) that " <i>NOTE Applicable only to meters for mobile installations,</i> " which is not stated in <u>8.7.1 Mechanical Shock in Part 2</u> (p.44). It is better to harmonize these expressions in Part 1 and 2 by having the same description on mobile installation for clarification. Therefore, like the expression of A.5.6, the following sentence should be added to the " <i>Object of the test</i> " of <u>A.5.5; "This test should normally apply to mobile installations only."</u>		Deleted from Part 1.
ISO 078	B.2.3		ed	The symbol <i>c</i> , usually associated with "concentration", is used for "conductivity"	To align with IEC 80000-6:2008, 6-43, use the symbol σ	Agreed
ISO 008	Biblio		ed	Entries in bibliographies are published under the responsibility of the TC or SC secretariat; ISO CS has few resources to devote to checking them all, except for	List International Standards first, with any other standards following in alphanumeric order. Any literature references should go at the end.	Bibliographical references have been listed in the order in which they are referred to in the text.

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1	2	(3)	4	5	(6)	(7)
MB¹	Clause No./ Subclause No./ Annex (e.g. 3.1)	Paragraph/ Figure/ Table/ Note (e.g. Table 1)	Type of comm ent²	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
				International Standards.	Models for presentation of literature and online references can be found in ISO 690	
PL	Bibliograph y		ed	Position [1] - We suggest to refer to VIM edition 2010, which is the 2007 edition with corrections. May be useful to place information, that VIM was also published as ISO/IEC Guide 99.		Reference to be made to ISO/IEC Guide 99 (2007).