



Document: **ISO/TC 30/SC 7 N 404**

Date: 9 February 2011

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

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To the Members of ISO/TC 30/SC 7

Dear Member,

ISO 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
- Draft for Committee Internal Ballot (N 396)

- Resolution of comments

Further to document N 400, in which the result of voting and comments on the above document were presented, attached is the compilation of comments with the responses of the Joint Working Group (JWG) following its meeting in Paris last April. Further consultation within the JWG resolved some remaining issues, and a summary of these is also attached.

The draft has been duly revised and will now proceed to issue as ISO/DIS 4064-1 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: April 2010

Document: ISO/CD 4064-1

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 com- ment ²	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
OIML (AU)			Ge	There appears to be a problem with the mathematical symbols and equations throughout all of the documents. The first of these instances is in Part 1, clause 3.2.1, page 10 in all three paragraphs.		Word to pdf conversion problem – noted and will be addressed.
OIML (AT)			Ge	Generally, we suggest keeping definitions, operating conditions, characteristics, specifications, and documentations in part 1, while part 2 covers all conditions and test for type approval and (initial) verification.		Generally accepted.
FR	GE		Ed	> < =		Accepted
GB	Whole Document		te	No reference is made to Pressure Loss Class referenced in Part 4 should be moved to part 1.	The UK believe that the Pressure Loss Class should be moved to Part 1 for clarity for the user.	Accepted
ID	-		ge	For this implementation should consider the exposure of sunlight & temperature & generally local condition included culture.		Noted – the reference conditions in the draft have been broadly accepted.
ID	-		ge	Part 3 : Specification of Test Report Covered in Part 2 Specification of Test Methods		Not accepted. OIML requires part 3 to be separate

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OIML (CA)	2.1.1			No need for note 2 . Combination meter is defined in 2.1.16		Accepted in part – see changes to draft
OIML (CA)	2.1.18 to 2.1.23			These definitions should be moved to Part 2. I see that you moved them to Part 1.		Not agreed – for consistency it is helpful to have all the definitions in one place
JP (+ OIML)	2.1.20		ed	Please explain the difference between a concentric meter and a cartridge meter by illustrations.		Accepted in principle – this explanation should be in Part 4
OIML (PL)	2.1.20			Wording "in Annex ? of Part 4" may be not understood; better text: "Annex ? of ISO 4064-4". It is necessary to remember to change "?" to right number of Annex.		Noted – for decision by ISO and OIML
OIML (AU)	2.1.22			Possibly due to the errors described in the above comment. Nonetheless, the option of having interchangeable inserts should not be restricted to only meters a $Q_3 = 16 \text{ m}^3/\text{h}$.		Agreed – this is a pdf conversion problem
OIML (AT)	2.1.22			To our knowledge, meters with interchangeable inserts are not restricted to $Q_3 = 16 \text{ m}^3/\text{h}$.		Agreed – see above

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FR	2.1.22		Ed	Replace « = m ³ /h » by « >= 16 m ³ /h »		Yes – see above
OIML (PL)	2.1.22			It is not sure whether Q ₃ =16 m ³ /h is correct. Former WELMEC discussion was taken Q ₃ equal or greater 16 m ³ /h.		Yes – see above
OIML (CA)	2.2.1			Should it be actual volume or reference volume. Subscript is an a		Text from Willem Kool gratefully accepted. He proposes also to change “endurance test” to “durability test” throughout the document. This should be discussed at the next meeting.
JP (+ OIML)	2.2.4; 2.2.5		ed	The relative error is used as an instrumental error of a water meter. If the present definitions are remained as they are, there would be many errors which should be strictly changed to relative errors, e.g. 2.2.7 intrinsic error, 2.2.9 fault.	Change “Error (of indication)” to “Absolute error (of indication)”. Change “Relative error (of indication)” to “Relative error (of indication) or Error”.	See above.
OIML (CA)	2.2.6			Previous reference was to VIM 5.2.1 VIM changed in 2007 will affect references in R 49-1 2006		Noted
OIML (CA)	2.4.13			Is nominal diameter referred to in Part 1??? Should it be in Part 2, 4 or 5.		Yes; so it should be defined here.

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OIML (PL)	2.4.13			It is necessary to remember to insert right definition		Secretary to do
ID	3.1.3 and 3.1.4		te	Guidance or references interrelated to water meter specification (capacity or dimension, etc) should be included on choosing the numerical value Q3 in 3.1.3 and the value of the ratio Q3/Q1 in 3.1.4 which the value taken from the R5 and R10 lines of ISO 3 : 1973 respectively.		Not agreed for change in draft, but France and United Kingdom will provide Indonesia with some national examples
JP (+ OIML)	3.1.4		te	The values of the ratio Q ₃ /Q ₁ from 10 through 31.5 should be kept as they were in the ISO 4064-1:2005. There are some users who use water meters at comparatively constant flowrates.		Not agreed – the changes were agreed at the last meeting (Ottawa)
IL	3.2.1 [N396]	---	te	The last sentence in this clause is limiting Q ₃ ≥ 100 m ³ /h. Accurate meters with lower Q ₃ cannot be approved to Class 1 ?	To delete the last sentence in this clause = <i>Accuracy class 1 designation shall be applied only to water meters with Q₃ ≥ 100 m³/h regardless of the temperature range.</i>	Not agreed, but further discussion to be had on accuracy classes
ES	3.2.1		te	Accuracy class 1 shouldn't be limited to Q ₃ ≥ 100 m ³ /h, due to the meter manufacturer shall specify the accuracy class according 3.2	Accuracy class 1 designation shall be applied only to water meters with Q ₃ ≥ 100 m ³ /h and may be applied to water meters with values of Q ₃ < 100 m ³ /h regardless of the temperature range	Some more discussion of this is needed

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OIML (AU)	3.2.1 & 3.2.2			<p>Should Accuracy Class 1 be restricted to meters with $Q_3 = 100 \text{ m}^3/\text{h}$?</p> <p>With the potential growth of electromagnetic meters (for example) becoming available for use in domestic installations, would it be reasonable to allow any meter to be type approved as a class 1 provided that it meets the requirements? Currently, clause 3.2.1 and 3.2.2 are somewhat inconsistent with the last paragraph of clause 3.2.</p> <p>Alternatively, the last paragraph of clause 3.2 should be amended as follows:</p> <p>“Water meters shall be designated as either accuracy class 1 or accuracy class 2, according to the requirements of 3.2.1 and 3.2.2.”</p>		For further discussion – consultation will follow
OIML (AT)	3.2.1 and 3.2.2			Replace in the formulae the = to =.		pdf conversion problem – will be addressed
JP (+ OIML)	3.2.1; 3.2.2		ed	There are some misprints of signs of inequality.		Yes – see above
OIML (PL)	3.2.1 and 3.2.2			There is a mistake in brackets. Instead equity symbols it should be used appropriate inequity symbols (symbol: "less than or equal to"; "greater than or equal to"; less than" or "greater than" respectively).		Yes – see above
IL	3.2.2 [N396]	---	te	The last sentence in this clause is limiting $Q_3 < 100 \text{ m}^3/\text{h}$ or $Q_3 = 100 \text{ m}^3/\text{h}$. For many applications [in Agriculture for example] this limitation is not necessary .	To delete the last sentence in this clause = <i>Accuracy class 2 designation shall be applied to all water meters with $Q_3 < 100 \text{ m}^3/\text{h}$ and may be applied to water meters with values of $Q_3 = 100 \text{ m}^3/\text{h}$ regardless of the temperature range.</i>	Not agreed, but further discussion to be had on accuracy classes

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ES	3.2.2		te	Accuracy class 2 shouldn't be limited to $Q_3 \leq 100 \text{ m}^3/\text{h}$, due to the meter manufacturer shall specify the accuracy class according 3.2	Accuracy class 2 designation shall be applied only to water meters with $Q_3 < 100 \text{ m}^3/\text{h}$ and may be applied to water meters with values of $Q_3 \geq 100 \text{ m}^3/\text{h}$ regardless of the temperature range	For further discussion – consultation will follow
JP (+ OIML)	3.2.5		ed	The first sentence should belong to 3.2.4. Only the second sentence belongs to 3.2.5.		Agreed
GB	3.2.8		Ed	In Part 2 para 6.4, this only applies to “electronic water meters or water meters with electronic devices”. Should the requirement also only apply to electronic water meters? See also comment on Part 2 para 6.4	Insert words “This requirement only applies to electronic water meters.”	Not agreed
OIML (CA)	3.3.6			No requirement needed for detecting activity of the flow sensor.		See addition made to 5.7.3.1
FR	3.3.6		T	Needed for the leak detection by final user		See addition made to 5.7.3.1
JP (+ OIML)	3.3.6		ed	A clause about detecting activity of the flow sensor is not necessary. It is enough by the provision in 5.7.3.1.		See addition made to 5.7.3.1

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OIML (PL)	3.3.6			"Do we want a clause about detecting activity of the flow sensor?" - Yes, we want.		See addition made to 5.7.3.1
GB	4.1.3 & 4.1.4		ed	These section are virtual duplications and could be far clearer, especially for the case of meters with checking facilities, where the number of meters to be tested is not defined.	4.1.3 Water meters are presumed to comply with the requirements in 3.2 and 4.1.1 if they pass the design inspection and performance tests specified in 6.2.14.1 and 6.2.14.2 in the following conditions: a) Meter not equipped with checking facilities: • five identical meters are submitted at pattern approval; • at least one of these five meters is submitted to the whole set of tests; and • no meter fails any test. b) Meter equipped with checking facilities: • the number of meters submitted is defined in section 6.2.2 • at least one of these meters is submitted to the whole set of tests; and • no meter fails any test. Delete section 4.1.4.	Accept in principle – number of meters in 6.2.2.
JP (+ OIML)	4.1.3; 4.1.4		ed	6.2.14.1 and 6.2.14.2 should read as 6.2.12.1 and 6.2.12.2.		Accepted
OIML (CA)	4.1.4			Refers to 6.2.14.1 and 6.2.1.14.2 but these sections have been deleted.		Agreed – see above

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OIML (CA)	4.1.4			Following conditions should be removed since they refer to test methods or procedures and not technical requirements. Already partially addressed in Part 2, Section 8.1.2		Not agreed																				
GB	4.1.4		te	See te UK comment on 6.2.2	Remove “five identical meters are submitted for pattern approval”	See response below																				
GB	4.1.4	Table 5	te	If the above comment is rejected then consider this alternative proposal to clarify the number of meters of required and remove the excessive number of larger diameters meters required.	Change Table 5 to <table><tr><td></td><td colspan="3">Minimum number of meters</td></tr><tr><td>Meter designation Q3 (m3/h)</td><td>Non Electronic Meters</td><td>Electronic Meters without checking facilities</td><td>Electronic Meters with checking facilities</td></tr><tr><td>Q3 ≤160</td><td>3</td><td>5</td><td>3</td></tr><tr><td>160 < Q3 ≤ 1600</td><td>2</td><td>3</td><td>2</td></tr><tr><td>1 600 < Q3</td><td>1</td><td>2</td><td>1</td></tr></table>		Minimum number of meters			Meter designation Q3 (m3/h)	Non Electronic Meters	Electronic Meters without checking facilities	Electronic Meters with checking facilities	Q3 ≤160	3	5	3	160 < Q3 ≤ 1600	2	3	2	1 600 < Q3	1	2	1	Change to table accepted I presume that the consequence of this change is to delete 8.1.2 of Part 2: the number of meters required should only be stated once.
	Minimum number of meters																									
Meter designation Q3 (m3/h)	Non Electronic Meters	Electronic Meters without checking facilities	Electronic Meters with checking facilities																							
Q3 ≤160	3	5	3																							
160 < Q3 ≤ 1600	2	3	2																							
1 600 < Q3	1	2	1																							
KZ	4.1.4			In the Item 4.1.4 the number of counters to be submitted for testing it is necessary to reduce up to three samples		See response above																				
OIML (PL)	4.1.4			In this point should be 6.2.12.1 and 6.2.12.2 as right reference.		Agreed																				

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GB	4.1.5		te	It does not allow for dot matrix style of graphical displays in common use today, it assumes the seven segment type of display.	The meter shall also provide visual checking of the entire display which shall have the following sequence: — for seven segment type displaying all the elements (e.g. an “eights” test); and — for seven segment type blanking all the elements (a “blanks” test). — for graphical displays an equivalent test to demonstrate that display faults cannot result in any digit being misinterpreted. Each step of the sequence shall last at least one second.	Agreed.
GB	4.2.1.3		Ed	Not specific enough – could be interpreted to mean the plug on the wall!	Insert words so: The power supply <u>connections at the meter</u> shall be capable of being secured from tampering.	Agreed
FR	4.2.2		T	The life time of a non repleacable battery depends of the conditions of use		Agreed – change made
OIML (AU)	4.2.2 & 4.2.3.2			The actual lifetime of a battery will vary depending on a range of factors, some of which have been indicated in the NOTE. Some meters may display the current battery life via an electronic display as this provides a more accurate and up-to-date indication of battery life. A note should be added to indicate that this acceptable alternative. Possible wording: “Meters that indicate the estimated replacement date of the battery/meter via an electronic display (either permanently or available upon request) are considered to satisfy the requirements of clause 4.2.x.”		Agreed – change made

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GB	4.2.3.2		te	The requirement to state "The replacement date of the battery shall be indicated on the meter" is impractical because often the end data is very temperature and useage dependent.	Delete: "The replacement date of the battery shall be indicated on the meter." Replace with: "A low battery or exhausted battery indicator or an replacement date, shall be indicated on the meter"	Agreed – related US comment also agreed
KZ	4.3.2.3			the item 4.3.2.3 should be completed the conductivity of the liquid material.		Agreed
ID	5.1.3		te	<i>Addition</i>	Should be added with : 5.1.3 all parts the water meter in contact with the water flowing through it shall be manufactured from materials which are conventionally known to be non-toxic, non-containing and biologically inert. <i>For water meter with nominal diameter ≤ 2" shall be used low lead brass¹ or shall be used plastic food grade² with UV protection³.</i>	Not agreed – would be too restrictive
JP (+ OIML)	5.1.8		ed	The water utility or water provider shall make available to the customer <u>without</u> any special tool	Add "without".	Agreed – change made
OIML (CA)	5.3			Are there any conflicts between this section and the proposed ISO 4064 Part 5		Please tell us if there are
OIML (PL)	5.3			It would be useful to mention, that other requirements for installation (outside of metrological scope) are presented in ISO 4064-5. The numbering of footnotes, which was in presented committee draft version of ISO/CD 4064-1 - OIML R 49-1 is correct, so is not necessary to skip it.		Agreed Agreed

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JP (+ OIML)	5.3.5		te	This item (flow profile sensitivity classes) was not included in the OIML R 49-1(2006); therefore, please delete the entire 5.3.5.		Not agreed – this was discussed and accepted in Ottawa
OIML (PL)	5.4			In specification of working pressure range should be $DN \geq 500$ (DN greater than or equal to 500)		pdf conversion problem – will be addressed
OIML (AT)	5.5			For the meter classes requiring a straightener the straightener should be an integral part of the meter to determine pressure loss.		Not accepted – the straightener is not considered part of the meter. See changes to text.
JP (+ OIML)	5.6		ed	The first sentence is not necessary. There is the same sentence in 5.8.1.		Duplication noted, but to be kept in 5.6, not 5.8.1
OIML (CA)	5.6 c)			Seems to imply that R must be used. Would also be acceptable if shown as $Q3/Q1 = 160$.		Agreed – text changed
FR	5.6. C		T	It shall added the Ratio for different postion (H or V) when it is different		Agreed – see change to text

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OIML (PL)	5.6 k)			letter k). Text in bracket (see Part 4) should be replaced: "see in ISO 4064-4".		Noted – for further consideration
JP (+ OIML)	5.6 l)		te	Delete the installation sensitivity class. See our comment on 5.3.5.		Not agreed – see response above
OIML (AU)	5.6. (n) & (o)			If the above comment (regarding 4.2.2 and 4.2.3.2) is accepted then a suitable note should be added to this section concerning the display of battery life.		See changes agreed above – no change necessary here
JP (+ OIML)	5.6	Note 1	ed	In the case of a combination meter, the markings below refer to <u>both meters of</u> the combination meter.	Add "both meters of".	NOTE 1 amended
OIML (AT)	5.6 and 5.7.1.2			Keep the old phrasing.		Not agreed – there was long debate about this in Ottawa, and R 117 text was accepted.
OIML (CA)	5.7.1.2			In first sentence of second para change "required" to "allow".		Changed to 'required or allowed'

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OIML (PL)	5.7.1.3			Table 4, first column - Some strange symbols like "?" appear next to inequity character either on the screen or in printed version - needs to be correct.		pdf conversion problem to be addressed
OIML (AU)	5.7.2.2			<p>Digital indicating devices may be electronic or mechanical. The current wording of 5.7.2.2 does not appear to apply to digital <i>electronic</i> indicating devices. Suggested wording for amendment:</p> <p>“5.7.2.2 Type 2 – Digital device</p> <p>The indicated volume is given by a line of adjacent digits appearing in one or more apertures. The advance of a given digit shall be completed while the digit of the next immediately lower decade changes from 9 to 0. The apparent height of the digits shall be at least 4 mm.</p> <p>For non-electronic devices:</p> <ol style="list-style-type: none"> 1. movement of numbered roller indicators (drums) shall be upwards; and 2. if the lowest value decade has a continuous movement, the aperture shall be large enough to permit a digit to be read unambiguously. <p>For electronic devices:</p> <ol style="list-style-type: none"> 1. either permanent or non-permanent displays are permitted; for non-permanent displays the volume shall be able to be displayed at any time for at least 10 s; and 2. it shall include a feature that enables the correct operation of the display to be checked, e.g. by successive display of the various characters; each step of the sequence shall last at least 1 s.” 		Accepted, but with change to last section 2 (electronic)

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OIML (PL)	5.7.3.2.1			Again either on the screen or in printed version strange "?" appear on digit "1" in wording "10"- needs to be correct.		Noted – for correction
OIML (AT)	5.7.3.2.3			Keep the last two paragraphs as note.		Agreed to keep in Part 1 (do not just apply to testing) N.B. in Part 2, 5.3.2.6.2.3 they are only NOTES.
OIML (CA)	5.7.3.2.3			Delete as they apply to testing		See above
FR	5.7.3.2.3		T	Those paragraphs shall be in part 1		See above
JP (+ OIML)	5.7.3.2.3		ed	The last two sentences can be deleted, because they are the provisions concerning test methods.		See above
OIML (PL)	5.7.3.2.3			The last two paragraphs of this clause should be remained as they are.		See above

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OIML (PL)	6.1			Instead "ISO 4064-2/R 49-2, 3" would be better "ISO 4064-2/R 49-2, clause 3". This comment ("clause" or "sub clause") takes all later references too.		Noted – will be addressed
OIML (CA)	6.2			In general most of this section should be moved to Part 2 and the remaining parts incorporated into other sections of Part 1.		Not agreed
FR	6.2.2		T	To ensure a better representative sample of a normal production, the sampling method as described in the CEN 14154 should be used		Not agreed
GB	6.2.2		te	<p>This clause states “Additional samples are required for meters equipped with electronic devices but not equipped with checking facilities”.</p> <p>Since the majority of water meters do not require checking facilities, this clause appears to unfairly penalise electronic meters. For instance if a large diameter meter is submitted with Q3 > 1600m3/hr then, if its electronic, 5 have to be submitted, but if it is mechanical then only 1.</p> <p>This does not appear to have any technical justification, especially in the case where the electronics is an integral part of the meter construction.</p>	<p>Delete</p> <p>“Additional samples are required for meters equipped with electronic devices but not equipped with checking facilities”</p>	See change to table 5
KZ	6.2.2			First paragraph of the item 6.2.2 should be read as "The tests for type approval should be done for a minimum number of samples of each type as established in the requirements of the state metrological services".		See change to table 5

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GB	6.2.2	Para 3		Reference made to 4.1.4. If UK comment accepted for the merging of 4.1.3 and 4.1.4 then this is defunct.	Delete reference to 4.1.4 and amend to 4.1.3.	Change agreed as above – see 4.1.3/4
OIML (AU)	6.2.3.1			Suggest that the flowrates be specified as flowrate ranges (as per section 6.3.4 (1) of Part 2).		Nominal flowrates have been given with a clear cross-reference to Part 2 for flowrate ranges.
OIML (AT)	6.2.3.1			Keep the old flow rate definitions (a-i) including flow rate b of the old definition to be consistent with part 2. Keep also the rest of the text in 6.2.4 of the old version.		Change made – see above
OIML (CA)	6.2.3.1			Some values do not agree with Part 2 Section 6.3.4. Where did these values come from???		See above
FR	6.2.3.1		T	An interval for the reference flow rates shall be given (e.g +/- 5 % of a nominal value)		See above
FR	6.2.3.1.e		E	Delete the “and”		Change made

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JP (+ OIML)	6.2.3.1		ed	The provisions by the range of test flowrates as 6.3.4 in Part 2 is better.	Harmonize with 6.3.4 in Part 2.	See response above
OIML (PL)	6.2.3.1			In practice it is impossible to keep still value of flowrate, so is necessary to get its permissible deviation. No doubts if we remain records from OIML R 49-1:2006 (like in ISO/CD 4064-2 - OIML R 49-2, clause 6.3.4). If actual proposals are maintained, it is useful to mention in this clause that permissible variation of flowrate is presented in ISO 4064-2/R 49-2, clause 6.3.2.2.7.3 Our answer for the question " <i>I have omitted old 6.2.4.3. Is this right?</i> " is that is useful to remain old 6.2.4.3 version.		See above
OIML (CA)	6.2.3.2			At meeting in Ottawa, the delegation from France volunteered to address the question of repeatability. Is this their proposal?? Further discussion in Paris.		Yes
OIML (CA)	6.2.3.2			Should this requirement be relocated to Section 3.2		No – this is for Type Approval.
FR	6.2.3.2		T	It shall be possible to measured the repeatability <u>at least</u> 3 flowrates		Agreed in principle – to be done at Q ₁ , Q ₂ & Q ₃
OIML (CA)	6.2.4			Should this requirement be relocated to Section 3.2		Agreed

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FR	6.2.4.3			Let the § 6.2.4.3 as the meter orientation is significative for the error indication		Agreed
JP (+ OIML)	Old 6.2.4.3		ed	The deletion of the old 6.2.4.3 is right.		Not agreed
OIML (CA)	6.2.5			Should this requirement be relocated to Section 3.2		Not agreed – this is Type Approval
JP (+ OIML)	6.2.5		te	Please delete this section as it was not included in the OIML R 49-1(2006).		Not agreed
OIML (AU)	6.2.6			Suggest that the final paragraph of this clause be moved to the front of section 6.2. Perhaps as a new 6.2.3. Currently it could be argued that orientation requirements only relate to endurance testing. Alternatively, do not delete clause 6.2.4.3.		6.2.4.3 to be reinstated. Last sentence of 6.2.6 to stay where it is. Also needed in 6.2.7
FR	6.2.6			Agreed with the comment : this sentence applies to the twole § 6.2		See response above

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GB	6.2.6		te	For meters >T50 and Q3 >16m ³ per hour the requirement to test at Q3 & Q4 and 0.9xMAT and even 50C is impractical for large diameter meters, e.g. DN400 No test rigs that are capable of doing this, also the investment to create such a test rig would be very large and I suspect not economic.	Add a further section in 6.2.6 Note: For families of meters, only the smallest representative diameter one is to be subjected to the endurance test.	Agree, but: section on meter families needs attention – JW to look at?
JP (+ OIML)	6.2.6		ed	There should be a title “Endurance tests”.		Agreed
OIML (PL)	6.2.6			The sentence about orientation of meters would be related to whole clause 6.2.		Not agreed – see above
OIML (PL)	6.2.6.1 and 6.2.6.2			The symbols Q in brackets should be written correctly.		pdf conversion problem to be addressed
OIML (PL)	Table 6			Note bottom of the table 6 should be this same like note bottom of the table 1 in ISO 4064-2/R 49-2		Agreed
FR	6.2.7			To add : the converters or adaptors or any additional piece of interface should not permitted		To be included in Part 4. The text here has been revised to incorporate the amendment to EN 14154.

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JP (+ OIML)	6.2.7		ed	The term “concentric meters” should be added.		Not agreed – concentric meters are already accounted for
OIML (CA)	6.2.8			This is a test and should not be in Part 1. It is covered in Pat 2, Section 7.15.		Agreed in part. The requirement to be reworded (removal of first sentence)
JP (+ OIML)	6.2.8		te	In ISO 4064 and EN 14154, this test is an influence factor test but not disturbance test. Therefore, only the provision of 3.2 should be applied, but not that of 4.1.1.		Agreed – provision in 4.1.1 to be removed
KZ	6.2.8.1			In the Item 6.2.8.1 the list of required documents we offer to complete with user guide and installation;		Agreed for inclusion as optional
ID	6.2.9.		te	<i>Addition</i>	Should be added with : 6.2.9. Starting Flow Test Minimum flowrate which is required by flow sensor of water meter to start to sensing the water that is flowing through shall be at least $0.4 \times Q_1^4$	Not agreed – there are no requirements below Q_1
KZ	6.2.10			First paragraph of the item 6.2.9 after the words "The following information should be contained in the certificate of type approval" should be added the words "and in its Appendixes";		Agreed: '...and in its annexes'

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JP (+ OIML)	6.2.9.2; 6.2.9.3		te	The provisions of 6.2.9.2 and 6.2.9.3 should be maintained here as they are in the revision.		Agreed to keep in Part 1
OIML (AT)	6.2.9 and 6.2.10			Keep both in part 1		Agreed to keep in Part 1
OIML (CA)	6.2.9 and 6.2.10			Should these sections be in this Part. How are they handled in other OIML R documents.		Agreed to keep in Part 1
OIML (PL)	6.2.9 and 6.2.10			This clause should be maintained in ISO 4064-1/R 49-1.		Agreed to keep in Part 1
FR	6.2.10			Any information allowing to identify the model of meter (e.g. drawing, photography, description, etc...)		Agreed in principle – change made
OIML (CA)	6.2.11			Are these more of a national requirement than an OIML recommendation. These requirements are already specified in Canadian W&M Regulations		OIML Recommendation – no change agreed

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OIML (AU)	6.2.11.3			Wording in the second paragraph should be "shall".		'must' changed to 'shall'
OIML (AT)	6.2.11.3			Keep must.		'must' changed to 'shall'
OIML (PL)	6.2.11.3			In last sentence: " a new or supplementary type approval must be issued ..."		'must' changed to 'shall'
JP (+ OIML)	6.2.12.1		te	The provisions should be maintained here as they are in the revision.		to stay in Part 1
OIML (PL)	6.2.12.1			This clause should be leaved in ISO 4064-1/R 49-1; it is possible to repeat it in ISO 4064-1/R 49-1.		to stay in Part 1
OIML (CA)	6.3			Again what is a requirement and what is a test. Some of this information is repeated in Pat 2 , Section 9.		this information is appropriate for Part 1

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OIML (AU)	6.3.3			Suggest that the flowrates be specified as flowrate ranges (as per section 9.1.3 (7) of Part 2).		Same response as for 6.2.3.1 – nominal flowrates to be reinstated
OIML (AT)	6.3.3			Keep the old flow rate definitions		See response above
FR	6.3.3			An interval for the reference flow rates shall be given (e.g +/- 5 % of a nominal value)		See above
JP (+ OIML)	6.3.3		ed	The provision by the range of test flowrates as 9.1.3 in Part 2 is better.		See above
OIML (PL)	6.3.3			In practice it is impossible to keep still value of flowrate, so it is necessary to get its permissible deviation. No doubts if we present the values of flowrates like in OIML R 49-1:2006. (see comments to 6.2.3.1).		See above
FR	6.3.5			Delete the last sentence because it is already addressed in 5.7.3.2.3		Agreed

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JP (+ OIML)	6.3.5		te	The second sentence should be deleted.		Agreed
OIML (PL)	6.3.5			The sentence "When a test is conducted, the error arising from the resolution of the meter under test shall not exceed the values given in 5.7.3.2.3" is not necessary. It does not bring any additional condition; required resolution is given directly in sub clause 5.7.3.2.3. In OIML R 49-1 (version 2006) this sentence doesn't exist.		Agreed
FR	6.4.4			The meter water tightness shall ensured during the initial verification test by an appropriate test.		This issue needs further discussion
JP (+ OIML)	A.1, Table A.1	A.5.7	te	The severity level of A.5.7 should be 1 according to OIML D 11.		For OIML/TC 8/SC 5 (MA) to check
JP (+ OIML)	A.1, Table A.1	A.5.10.b)	te	The test of A.5.10.b) on digital radio telephones should be deleted according to EN 14154-3:2005.		Not agreed – this was decided in Ottawa
JP (+ OIML)	A.1, Table.A.1	A.5.11 a)	te	The severity level of A.5.11.a) should be 0 or 3 according to EN 14154-3:2005.		For OIML/TC 8/SC 5 (MA) to check

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JP (+ OIML)	A.1, Table A.1	A.5.11. b)	te	A.5.11 b) should be divided to DC and AC. The severity level of DC should be 2, and AC should be 3 or 4 according to EN 14154-3:2005.		For OIML/TC 8/SC 5 (MA) to check
OIML (PL)	A.4.1			Reference to 3.2.4 is not correct, because 3.2.4 states that calculator may be the subject of separate type approval. The correct reference is 3.2.5.		Agreed
OIML (PL)	Table A.1 and A.5.3			In OIML R 49-1:2006 damp heat cycling was "influence factor"; so for this factor we check the intrinsic errors. In this committee draft version of ISO/CD 4064-1 - OIML R 49-1 damp heat cycling is "disturbance" (see table A1); so the reference to provisions 4.1.1 is correct. But in this case it is necessary to change appropriate sentences in ISO 4064-2/R 49-2 (for disturbance we check significant faults). The content of appropriate clause ISO 4064-2/R 49-2 (clause 7.4) is similar like content of clause 7.4 OIML recommendation R 49-2:2006 and is valid when damp heat cycling is "influence factor". Generally, it is necessary to analyse whether "dump heat cycling" is the "influence factor" or the "disturbance" and then to prepare appropriate clauses of both parts of this documents in coherent manner.		Incorrectly given as an influence factor - it is a disturbance
JP (+ OIML)	A.5.4.a.1		ed	"(if relevant)" in the title should be deleted because of double writing.		Agreed
JP (+ OIML)	A.5.4.c		ed	"(if relevant)" in the title should be deleted because of double writing.		Agreed

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JP (+ OIML)	A.5.5		ed	As it is a disturbance test, the provision of 4.1.1 should be applied but not 3.2.	Change 3.2 to 4.1.1.	Agreed
OIML (PL)	A.5.5 and A.5.6			According table A1, vibration (random) and mechanical shock are disturbance, so associated clause 4.1.1 it is necessary to check significant faults. The reference to clause 3.2 is not consistent. Generally, it is necessary to analyse this problem again and then to prepare appropriate clauses of both parts of this documents in coherent manner.		Agreed
JP (+ OIML)	A.5.6		ed	As it is a disturbance test, the provision of 4.1.1 should be applied but not 3.2.	Change 3.2.to 4.1.1.	Agreed
JP (+ OIML)	A.5.8.a		ed	“on the mains voltage and if applicable” should be deleted.		Agreed
JP (+ OIML)	A.5.8.b		ed	“and if applicable on input/output and communication ports” should be deleted.		Agreed
JP (+ OIML)	A.5.10		te	The second test (digital radio telephone) should be deleted. See our comment on Table.A.1, A.5.10.b).		Not agreed – this was decided in Ottawa (see above)

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OIML (PL)	B.2.3			It is necessary to right typing formula of $L=....$. It should be skip "?" from formula of $k=....$.		pdf conversion problem to be addressed
OIML (AT)	Annex C			Is it really intended to put the maximum permissible error in service only informative?		Yes – this was agreed in Ottawa
GB	Annex C		Ge	This should be removed because: 1. as it says, it is not within the scope of the document 2. it does not put any bounds on under what conditions this should be the case – for example no time or consumption limits are indicated. 3. This should really be a case for National regulation, e.g. in UK legislation (SI1268) we have tighter limits (6%/2.5%) for revenue meters. 4. In many cases, particularly for Accuracy Class 1 meters, it could be difficult to establish in service performance in situ to a sufficient level of uncertainty.	Remove Annex C	Not agreed

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Convenor's Summary of changes made in response to questionnaire answers

Part 1

3.2.1 The last sentence in this clause 'Accuracy class 1 designation shall be applied only to water meters with $Q_3 \geq 100 \text{ m}^3/\text{h}$ regardless of the temperature range.' has been deleted and following the Australian comment the last sentence in 3.2.2 has also been deleted.

6.3 The following has been added after 6.3.2: 'The water meter shall be shown to be capable of withstanding the following test pressure without leakage or damage: 1.6 times the maximum admissible pressure applied for 1 minute (ISO 4064-2/R 49-2 9.1.2).'

Part 2

6.10.2.3 The words 'of 6.10.1.3' have been added after 'at step 1' in 7).

6.10.3 and Test 13 in Table 3 have been deleted. Test numbers in the text of 8.2 have been altered for consistency. 'or at $Q = 2 \times Q_{x2}$ ' has been added to Test 10. In Test 13 (previously Test 14) '6.10.2.3 3) c)' has become '6.10.2'.

Note 4) of Table 3 has been deleted. In 6.10.2.3 5) 'each' has been replaced by 'the' and 'test' by 'test(s)'. This gives consistency with 6.10.2.3 3) and with 5.9.2 of R49-3.

7.12.3 The NMO text (as inserted in the draft) has been accepted.