Technical Construction File
EN 1434-1:2022
Thermal energy meters
Part 1: General requirements; German version EN 1434-1:2022

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Type of Review object..... :	Ultrasonic heat meter
Trademark..... :	-
Model/type reference..... :	B12 VI-B-15/ B12 VI-B-20/ B12 VI-B-25/ B12 VI-B-32/ B12 VI-B-40/ B12 VI-50/ B12 VI-65/ B12 VI-80/ B12 VI-100/ B12 VI-125/ B12 VI-150/ B12 VI-200
Rating..... :	/

Possible review case verdicts: - review case does not apply to the test object..... : N(.A.) - review object does meet the requirement..... : P(ass) - review object does not meet the requirement..... : F(ail)
General remarks:
"(see remark #)" refers to a remark appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a comma is used as the decimal separator. The review results presented in this report relate only to the object reviewed. This report shall not be reproduced except in full without the written approval of the third party.

Testing:	
Date of receipt of review item:	Jul 01,2024
Date(s) of performance of review:	Jul 01,2024 to Jul 30,2024

General product information: Ultrasonic heat meter
Summary of reviewing: This review report includes: Annex I: 4 page(s) of photo documentation.
Copy of marking plate

Ultrasonic heat meter, Model: B12 VI-B-15/ B12 VI-B-20/ B12 VI-B-25/ B12 VI-B-32/ B12 VI-B-40/ B12 VI-50/ B12 VI-65/ B12 VI-80/ B12 VI-100/ B12 VI-125/ B12 VI-150/ B12 VI-200 Zhejiang Bove Intelligent Technology Co., Ltd	Marking

EN 1434-1:2022			
4	Metrological requirements		--
4.1	Values of Q 1 , Q 2 , Q 3 , and Q 4		--
4.1.1	The flow rate characteristics of a water meter shall be defined by the values of Q 1 , Q 2 , Q 3 , and Q 4 .		P
4.1.2	A water meter shall be designated by the numerical value of Q 3 in m 3 /h and the ratio Q 3 /Q 1 .		P
4.1.3	The value of Q 3 , expressed in m 3 /h, shall be chosen from the following list: 1 1,6 2,5 4 6,3 10 16 25 40 63 100 160 250 400 630 1 000 1 600 2 500 4 000 6 300 The list may be extended to higher or lower values in the series.		P
4.1.4	The value of the ratio Q 3 /Q 1 shall be chosen from the following list: 40 50 63 80 100 125 160 200 250 315 400 500 630 800 1 000 The list may be extended to higher values in the series.		P
4.1.5	The ratio Q 2 /Q 1 shall be 1,6.		P
4.1.6	The ratio Q 4 /Q 3 shall be 1,25.		P
4.2	Accuracy class and maximum permissible error		--
4.2.1	General		--
	A water meter shall be designed and manufactured such that its errors (of indication) do not exceed the maximum permissible errors (MPEs) as defined in 4.2.2 or 4.2.3 under rated operating conditions. A water meter shall be designated as either accuracy class 1 or accuracy class 2, according to the requirements of 4.2.2 or 4.2.3. The meter manufacturer shall specify the accuracy class.		P
4.2.2	Accuracy class 1 water meters		--
	The MPE for the upper flow rate zone (Q 2 ≤ Q ≤ Q 4) is ±1 %, for temperatures from 0,1 。C to 30 。C, and ±2 % for temperatures greater than 30 ° C. The MPE for the lower flow rate zone (Q 1 ≤ Q < Q 2) is ±3 % regardless of the temperature range.		P
4.2.3	Accuracy class 2 water meters		--
	The MPE for the upper flow rate zone (Q 2 ≤ Q ≤ Q 4) is ±2 %, for temperatures from 0,1 。C to 30 。C, and ±3 % for temperatures greater than		P

<table>
<tr><td></td><td>30 ° C.
The MPE for the lower flow rate zone (Q 1 ≤ Q < Q 2) is ±5 % regardless of the temperature range.</td><td></td><td></td></tr>
<tr><td>4.2.4</td><td>Meter temperature classes</td><td></td><td>--</td></tr>
<tr><td></td><td>The meters fall under water temperature classes corresponding to the various ranges, chosen by the manufacturer from the values given in Table 1. The water temperature shall be measured at the inlet of the meter.
Table 1 — Meter temperature classes
<table>
<tr><th>Class</th><th>mAT
°C</th><th>MAT
°C</th></tr>
<tr><td>T30</td><td>0,1</td><td>30</td></tr>
<tr><td>T50</td><td>0,1</td><td>50</td></tr>
<tr><td>T70</td><td>0,1</td><td>70</td></tr>
<tr><td>T90</td><td>0,1</td><td>90</td></tr>
<tr><td>T130</td><td>0,1</td><td>130</td></tr>
<tr><td>T180</td><td>0,1</td><td>180</td></tr>
<tr><td>T30/70</td><td>30</td><td>70</td></tr>
<tr><td>T30/90</td><td>30</td><td>90</td></tr>
<tr><td>T30/130</td><td>30</td><td>130</td></tr>
<tr><td>T30/180</td><td>30</td><td>180</td></tr>
</table></td><td></td><td>P</td></tr>
<tr><td>4.2.5</td><td>Water meters with separable calculator and measurement transducer</td><td></td><td>--</td></tr>
<tr><td></td><td>The calculator (including indicating device) and the measurement transducer (including flow sensor or volume sensor) of a water meter, where they are separable and interchangeable with other calculators and measurement transducers of the same or different designs, may be the subject of separate type approvals. The MPEs of the combined indicating device and measurement transducer shall not exceed the values given in 4.2.2 or 4.2.3 according to the accuracy class of the meter.</td><td></td><td>P</td></tr>
<tr><td>4.2.6</td><td>Relative error of indication</td><td></td><td>--</td></tr>
<tr><td></td><td>The relative error (of indication) is expressed as a percentage, and is equal to:
$\frac{(V_i - V_a)}{V_a} \times 100\,\%$
where V a is as defined in 3.2.1 and V i is as defined in 3.2.2.</td><td></td><td>P</td></tr>
<tr><td>4.2.7</td><td>Reverse flow</td><td></td><td>--</td></tr>
<tr><td></td><td>The manufacturer shall specify whether or not a water meter is designed to measure reverse flow. If a meter is designed to measure reverse flow, the volume passed during reverse flow shall either be subtracted from the indicated volume or the meter shall record it separately. The MPE of 4.2.2</td><td></td><td>P</td></tr>
</table>

	or 4.2.3 shall be met for both forward and reverse flow. For meters designed to measure reverse flow, the permanent flow rate and the measuring range may be different in each direction. If a meter is not designed to measure reverse flow, the meter shall either prevent reverse flow or it shall withstand accidental reverse flow at a flow rate up to Q 3 without deterioration or change in its metrological properties for forward flow.		
4.2.8	Water temperature and water pressure		--
	The requirements relating to the MPEs shall be met for all temperature and pressure variations occurring within the rated operating conditions of a water meter		P
4.2.9	Absence of flow or of water		--
	The water meter totalization shall not change in the absence either of flow or of water.		P
4.2.10	Static pressure		--
	A water meter shall be capable of withstanding the following test pressures without leakage or damage: a) 1,6 times the maximum admissible pressure applied for 15 min; b) twice the maximum admissible pressure applied for 1 min.		P
4.3	Requirements for meters and ancillary devices		--
4.3.1	Connections between electronic parts		--
	The connections between the measurement transducer, the calculator and the indicating device shall be reliable and durable in accordance with 5.1.4 and B.2. These provisions shall also apply to connections between the primary and secondary devices of electromagnetic meters		P
4.3.2	Adjustment device		--
	A meter may be provided with an electronic adjustment device, which may replace a mechanical adjustment device.		P
4.3.3	Correction device		--
	A meter may be fitted with correction devices; such devices are always considered as an integral part of the meter. The whole of the requirements which apply to the meter, in particular the MPEs specified in 4.2, are therefore applicable to the corrected volume at metering conditions. In normal operation, non-corrected volume shall not be displayed. A water meter with correction devices shall satisfy the performance tests of A.5. All the parameters which are not measured and which are necessary for correcting shall be		P

	contained in the calculator at the beginning of the measurement operation. The type approval certificate may prescribe the possibility of checking parameters which are necessary for correctness at the time of verification of the correction device. The correction device shall not allow the correction of a pre-estimated drift, e.g. in relation to time or volume. Associated measuring instruments, if any, shall comply with the applicable International Standards or OIML Recommendations. Their accuracy shall be good enough to permit the requirements on the meter to be met, as specified in 4.2. Associated measuring instruments shall be fitted with checking facilities, as specified in B.6. Correction devices shall not be used for adjusting the errors (of indication) of a water meter to values other than as close as practical to zero, even when these values are within the MPEs. Conditioning of the water at flow rates below Q 1 by means of a moving device, e.g. spring-loaded flow accelerator, shall not be permitted.		
4.3.4	Calculator		--
	All parameters necessary for the elaboration of indications that are subject to legal metrological control, such as a calculation table or correction polynomial, shall be present in the calculator at the beginning of the measurement operation. The calculator may be provided with interfaces permitting the coupling of peripheral equipment. When these interfaces are used, the hardware and software of a water meter shall continue to function correctly and the metrological functions of the meter shall not be capable of being affected.		P
4.3.5	Indicating device		--
	The indicating device shall display the volume either continuously, periodically or on demand. It shall be readily available to read.		P
4.3.6	Ancillary devices		--
	In addition to the indicating devices specified in 6.7.2, a water meter may include the ancillary devices specified in 3.1.8. Where national regulations permit, a remote reading device may be used for testing and verification and for remote reading of a water meter, provided that other means guarantee the satisfactory operation of the water meter. The addition of these devices, either temporary or permanent, shall not alter the metrological characteristics of the meter.		P
5	Water meters equipped with electronic devices		--
5.1	General requirements		--

5.1.1	A water meter equipped with electronic devices shall be designed and manufactured in such a way that significant faults do not occur when it is exposed to the disturbances specified in A.5.		P
5.1.2	A significant fault shall have a value equal to one half of the MPE in the upper flow rate zone. The following faults are not considered to be significant faults: a) faults arising from simultaneous and mutually independent causes in the meter itself or in its checking facilities; b) transitory faults, i.e. temporary variations in the indication which cannot be interpreted, memorized or transmitted as a measurement result.		P
5.1.3	A water meter with electronic devices shall be provided with the checking facilities specified in Annex B, except in the case of non-resettable measurements between two constant partners. All water meters equipped with checking facilities shall prevent or detect reverse flow, as specified in 4.2.7.		P
5.1.4	A water meter is presumed to comply with the requirements in 4.2 and 5.1.1 if it passes the design inspection and performance tests specified in 7.2.12.1 and 7.2.12.2 in the following conditions: a) the number of meters submitted is defined in 7.2.2; b) at least one of these meters is submitted to the whole set of tests; c) no meter fails any test.		P
5.2	Power supply		--
5.2.1	General		--
	Three different kinds of basic power supplies for water meters with electronic devices are covered by this International Standard: a) external power supply; b) non-replaceable battery; c) replaceable battery. These three types of power supplies may be used alone or in combination. The requirements for each type of power supply are specified in 5.2.2 to 5.2.4.		P
5.2.2	External power supply		--
5.2.3	Non-replaceable battery		--
5.2.4	Replaceable battery		--
6	Technical requirements		--
6.1	Materials and construction of water meters		--
6.1.1	A water meter shall be manufactured from materials of adequate strength and durability for the purpose for which it is to be used.		P

6.1.2	A water meter shall be manufactured from materials which shall not be adversely affected by the water temperature variations, within the working temperature range (see 6.4).		P
6.1.3	All parts of a water meter in contact with the water flowing through it shall be manufactured from materials which are conventionally known to be non-toxic, non-contaminating, and biologically inert. Attention is drawn to national regulations		P
6.1.4	The complete water meter shall be manufactured from materials which are resistant to internal and external corrosion or which are protected by a suitable surface treatment.		P
6.1.5	A water meter indicating device shall be protected by a transparent window. A cover of a suitable type may also be provided as additional protection.		P
6.1.6	Where there is a risk of condensation forming on the underside of the window of a water meter indicating device, the water meter shall incorporate devices for prevention or elimination of condensation.		P
6.1.7	A water meter shall be of such design, composition, and construction that it does not facilitate the perpetration of fraud.		P
6.1.8	A water meter shall be fitted with a metrologically controlled display. The display shall be readily accessible to the customer, without requiring the use of a tool.		P
6.1.9	A water meter shall be of such design, composition, and construction that it does not exploit the MPE or favour any party.		P
6.2	Adjustment and correction		--
6.2.1	A water meter may be fitted with an adjustment device, and/or a correction device. Any adjustment shall be performed in such a way as to adjust the errors (of indication) of the water meter to values as close as practical to zero so that the meter may not exploit the MPE or systematically favour any party.		P
6.2.2	If these devices are mounted on the outside of the water meter, provision for sealing shall be made (see 6.8.2).		P
6.3	Installation conditions		--
6.3.1	The water meter shall be installed such that it is completely filled with water under normal conditions.		P
6.3.2	Under specific installation conditions, a strainer or filter, fitted at the inlet of a meter or in the upstream pipeline, may be required. Installation engineers should note that solid particles collect in a water meter, e.g. following		P

<table>
<tr><td></td><td>work on the pipework upstream from the meter.</td><td></td><td></td></tr>
<tr><td>6.3.3</td><td>Provision may be made on a water meter to allow it to be correctly levelled during installation.</td><td></td><td>P</td></tr>
<tr><td>6.3.4</td><td>If the accuracy of a water meter is affected by disturbances in the upstream or downstream pipeline (e.g. due to the presence of bends, valves or pumps), the water meter shall be provided with a sufficient number of straight pipe lengths, with or without a flow straightener, as specified by the manufacturer, so that the indications of the installed water meter meet the requirements of 4.2.2 or 4.2.3 with respect to MPEs and according to the accuracy class of the meter.</td><td></td><td>P</td></tr>
<tr><td>6.3.5</td><td>A water meter shall be able to withstand the influence of disturbed velocity fields as defined in the test procedures in ISO 4064-2|OIML R 49-2. During the application of these flow disturbances, the error (of indication) shall meet the requirements of 4.2.2 or 4.2.3.
A meter manufacturer shall specify the flow profile sensitivity class in accordance with Tables 2 and 3. Any specific flow conditioning section, including straightener and/or straight lengths, to be used shall be prescribed by the manufacturer.
Table 2 — Sensitivity to irregularity in the upstream velocity field classes (U)
<table>
<tr><th>Class</th><th>Required straight length ×DN</th><th>Straightener needed</th></tr>
<tr><td>U0</td><td>0</td><td>No</td></tr>
<tr><td>U3</td><td>3</td><td>No</td></tr>
<tr><td>U5</td><td>5</td><td>No</td></tr>
<tr><td>U10</td><td>10</td><td>No</td></tr>
<tr><td>U15</td><td>15</td><td>No</td></tr>
<tr><td>U0S</td><td>0</td><td>Yes</td></tr>
<tr><td>U3S</td><td>3</td><td>Yes</td></tr>
<tr><td>U5S</td><td>5</td><td>Yes</td></tr>
<tr><td>U10S</td><td>10</td><td>Yes</td></tr>
</table>
Table 3 — Sensitivity to irregularity in the downstream velocity fields classes (D)
<table>
<tr><th>Class</th><th>Required straight length ×DN</th><th>Straightener needed</th></tr>
<tr><td>D0</td><td>0</td><td>No</td></tr>
<tr><td>D3</td><td>3</td><td>No</td></tr>
<tr><td>D5</td><td>5</td><td>No</td></tr>
<tr><td>D0S</td><td>0</td><td>Yes</td></tr>
<tr><td>D3S</td><td>3</td><td>Yes</td></tr>
</table></td><td></td><td>P</td></tr>
<tr><td>6.4</td><td>Rated operating conditions</td><td></td><td>--</td></tr>
<tr><td></td><td>The rated operating conditions for a water meter shall be as follows.
Flow rate range: Q 1 to Q 3 inclusive.
Ambient temperature range: +5 。C to +55 。C.
Water temperature range: refer to Table 1.
Ambient relative humidity range: 0 % to 100 %, except for remote indicating devices where the range shall be 0 % to 93 %.
Pressure range: 1) 0,03 MPa (0,3 bar) to at least 1 MPa (10 bar), except for meters of DN ≥ 500, where the maximum admissible pressure (MAP) shall be at least 0,6 MPa (6 bar).</td><td></td><td>P</td></tr>
<tr><td>6.5</td><td>Pressure loss</td><td></td><td>--</td></tr>
</table>

<table>
<tr><td></td><td>The pressure loss 1) through a water meter, including its filter or strainer and/or straightener, where either of these forms an integral part of the water meter, shall not be greater than 0,063 MPa (0,63 bar) between Q 1 and Q 3 .
The pressure loss class is selected by the manufacturer from the values in Table 4 (which follow ISO 3, [4] R 5): for a given pressure loss class, the pressure loss through a water meter, including its filter or strainer and/or straightener, where either of these forms an integral part of the water meter, shall not be greater than the specified maximum pressure loss between Q 1 and Q 3 .
A concentric meter, of any type and measuring principle, shall be tested together with its respective manifold.
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></td><td></td><td>P</td></tr>
<tr><td>6.6</td><td>Marks and inscriptions</td><td></td><td>--</td></tr>
<tr><td>6.6.1</td><td>A place shall be provided for affixing the verification mark(s) (see OIML V 1:2013, 3.04), which shall be visible without dismantling the water meter after it has been placed on the market or put into use</td><td></td><td>P</td></tr>
<tr><td>6.6.2</td><td>A water meter shall be clearly and indelibly marked with the following information, either grouped or distributed, on the casing, the indicating device dial, an identification plate or the meter cover, if it is not detachable. These markings shall be visible without dismantling the water meter after the instrument has been placed on the market or put into use.
1) The unit bar may be used where national regulations permit.
NOTE In the case of a combination meter, the markings in the following refer to the combination meter considered as a single meter.
a) Unit of measurement.
b) Accuracy class, where it differs from accuracy class 2.
c) Numerical value of Q 3 and the ratio Q 3 /Q 1 : if the meter measures reverse flow and the values of Q 3 and the ratio Q 3 /Q 1 are different in the two directions, both values of Q 3 and Q 3 /Q 1 shall be
inscribed; the direction of flow to which each pair of values refers shall be clear. The ratio Q 3 /Q 1</td><td></td><td>P</td></tr>
</table>

	may be expressed as R, e.g. “R160”. If the meter has different values of Q 3 /Q 1 in horizontal and vertical positions, both values of Q 3 /Q 1 shall be inscribed, and the orientation to which each value refers shall be clear. d) Type approval sign according to national regulations. e) Name or trademark of the manufacturer. f) Year of manufacture, the last two digits of the year of manufacture, or the month and year of manufacture. g) Serial number (as near as possible to the indicating device). h) Direction of flow, by means of an arrow (shown on both sides of the body or on one side only provided the direction of flow arrow is easily visible under all circumstances). i) Maximum admissible pressure (MAP) 1) if it exceeds 1 MPa (10 bar) or 0,6 MPa (6 bar) for DN ≥500. j) Letter V or H, if the meter can only be operated in the vertical or horizontal position. k) The temperature class as specified in Table 1 where it differs from T30. l) The pressure loss class where it differs from Δp 63. m) The installation sensitivity class where it differs from U0/D0. For a water meter with electronic devices, the following additional inscriptions shall be applied where appropriate. n) For an external power supply: the voltage and frequency. o) For a replaceable battery: the latest date by which the battery shall be replaced. p) For a non-replaceable battery: the latest date by which the meter shall be replaced. q) Environmental classification. r) Electromagnetic environmental class. The environmental classification and electromagnetic environmental class may be given on a separate datasheet, unambiguously related to the meter by a unique identification, and not on the meter itself. An example of the required marks and inscriptions for a meter without electronic devices follows. EXAMPLE A meter with the following characteristics: — Q 3 = 2,5 m 3 /h ; — Q 3 /Q 1 = 200; — horizontal mounting; — temperature class 30 ;		

	— pressure loss class Δp 63 ; — maximum admissible pressure: 1 MPa (10 bar); — flow profile sensitivity class U0/D0 — serial number: 123456 ; — year of manufacture: 2008 ; — manufacturer ABC, would be marked as follows: Q 3 2,5; R200; H; → ; 123456; 08; ABC		
6.7	Indicating device		--
6.7.1	General requirements		--
6.7.2	Types of indicating device		--
	Any of the following types shall be used.		--
6.7.3	Verification devices — First element of an indicating device — Verification scale interval		--
6.8	Protection devices		--
6.8.1	General		--
	A water meter shall include protection devices which can be sealed so as to prevent, both before and after correct installation of the water meter, dismantling or modification of the meter, its adjustment device or its correction device, without damaging these devices. In the case of combination meters, this requirement applies to both meters. The display of the total quantity supplied or the displays from which the total quantity supplied can be derived shall not be resettable while the meter is in service to a single customer.		P
6.8.2	Electronic sealing devices		--
7	Metrological controls		--
7.1	Reference conditions		--
	All influence quantities, except for the influence quantity being tested, shall be held to their reference conditions. The reference conditions (including their tolerances) are given in ISO 4064-2:2014|OIML R 49-2:2013, Clause 4. Values are specified for flow rate, water temperature, water pressure, ambient temperature, ambient relative humidity, and ambient atmospheric pressure.		P
7.2	Type evaluation and approval		--
7.2.1	External examination		--
	Before undergoing type evaluation tests, each type of water meter submitted shall be examined externally to ensure that it complies with the provisions of the relevant preceding clauses of this part of ISO 4064|OIML R 49.		P
7.2.2	Number of samples		--

	The evaluation tests shall be made on the minimum number of samples of each type shown in Table 6 as a function of the water meter designation Q 3 of the type presented. The body responsible for type evaluation may request further specimens. **Table 6 — Minimum number of water meters to be tested** See table below The requirements of 4.2.2 or 4.2.3 shall apply to all the meters tested, according to the accuracy class of the meter. For type approval of a water meter with electronic devices, five samples shall be supplied for the tests specified in Annex A, which may be different samples from those supplied for other testing, with at least one meter being subjected to all the appropriate tests. The same meter shall be subjected to all testing, except in circumstances where not doing so can be justified by the organization performing the type evaluation.		P
7.2.3	Errors (of indication)		--
	The errors (of indication) of a water meter (in the measurement of the actual volume) shall be determined at least at the following nominal flow rates: a) Q 1 ; b) Q 2 ; c) 0,35 (Q 2 + Q 3); d) 0,7 (Q 2 + Q 3); e) Q 3 ; f) Q 4 ; and for combination meters: g) 0,9 Q x1 ; h) 1,1 Q x2 . The errors (of indication) observed for each of the above flow rates shall not exceed the MPEs given in 4.2.2 or 4.2.3. NOTE See ISO 4064-2:2014|OIML R 49 -2:2013, 7.4.4 for the permitted flow rate ranges and ISO 4064-2:2014|OIML R 49 -2:2013, 7.4.4 and 7.4.5 for the required number of measurements at each flow rate. If all the relative errors (of indication) of a water meter have the same sign, at least one of the errors shall not exceed one half of the MPE. In all cases this requirement shall be applied equitably with respect to the water supplier and the consumer (see also 4.3.3, paragraphs 3 and 8). If a meter is marked as only operating in certain orientations, then the meter shall be tested in these orientations.		P

Meter designation Q_3 m³/h	Minimum number of meters to be tested for all meter types, excluding the tests required for meters with electronic devices
$Q_3 \leq 160$	3
$160 < Q_3 \leq 1\,600$	2
$1\,600 < Q_3$	1

	In the absence of such marks a meter shall be tested in at least four orientations.		
7.2.4	Repeatability		--
	A meter shall be repeatable: the standard deviation of three measurements at the same flow rate shall not exceed one-third of the MPEs given in 4.2.2 or 4.2.3. Tests shall be carried out at nominal flow rates of Q 1 , Q 2 , and Q 3		P
7.2.5	Overload water temperature		--
	A water meter with MAT ≥ 50 。C shall be capable of withstanding a water temperature of MAT + 10 。C for 1 h. The test is specified in ISO 4064-2:2014|OIML R 49-2:2013, 7.6.		P
7.2.6	Durability		--
7.2.7	Interchange error		--
	It shall be demonstrated that cartridge meters and exchangeable metrological modules for water meters with exchangeable metrological modules are independent of the connection interfaces they are made for as far as their metrological performance is concerned. The cartridge meters and exchangeable metrological modules shall be tested in accordance with the test laid down in ISO 4064-2:2014|OIML R 49-2:2013, 7.4.6. The orientation(s) of a meter on test shall be set with reference to the meter orientation(s) claimed by the manufacturer.		P
7.2.8	Static magnetic field		--
	It shall be demonstrated that a water meter is not affected by a static magnetic field. A test shall apply to all water meters where the mechanical components may be influenced by a magnetic field, and for all meters with electronic components. The test is specified in ISO 4064-2:2014|OIML R 49-2:2013, 7.12. The purpose of the test is to ensure compliance with the provisions of 4.2 in the presence of static magnetic fields.		P
7.2.9	Documentation		--
7.2.10	Type approval certificate		--
	The following information shall appear on the type approval certificate or in its annexes: a) name and address of the recipient of the certificate; b) name and address of the manufacturer, if it is not the recipient; c) type and/or commercial designation; d) sufficient information to identify the meter type, e.g. drawing, photograph or description; e) principal metrological and technical characteristics;		P

	f) type approval mark; g) period of validity; h) environmental classification, if applicable (see A.2); i) information on the location of marks for type approval, initial verification and sealing (e.g. a picture or drawing); j) list of documents accompanying the type approval certificate; k) specific remarks. When applicable, the version of the metrological part of the evaluated software shall be indicated in the type approval certificate or in its annexes (technical file).		
7.2.11	Modification of an approved type		--
7.2.12	Type evaluation of a water meter with electronic devices		--
7.3	Initial verification		--
7.3.1	In general, only water meters which have been approved either as complete meters or as separately approved calculator (including indicating device) and measurement transducer (including flow or volume sensor), subsequently assembled into a combined meter, shall be eligible for initial verification. Any special requirements for initial verification testing, detailed in the type approval certificate, shall be applied.		P
7.3.2	A water meter shall undergo the initial verification tests indicated in the following. This verification shall be carried out after type approval has been granted. 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 min (ISO 4064-2:2014|OIML R 49- 2:2013, 10.1.2).		P
7.3.3	Water meters of the same size and the same type may be tested in series; however, in this case the requirement of ISO 4064-2:2014|OIML R 49-2:2013, 10.1.3, step d) concerning water meter outlet pressure shall be met for each water meter and there shall be no significant interaction between water meters. Upstream and downstream straight lengths (and straighteners if required) shall be in accordance with the flow profile sensitivity class of the meter.		P
7.3.4	The errors (of indication) of a water meter in the measurement of actual volume shall be determined for at least the following nominal flow rates: a) Q 1 ; b) Q 2 ; c) Q 3 ; d) for combination meters, 1, 1 Q x2 .		P

	NOTE See ISO 4064-2:2014|OIML R 49 -2:2013, 10.1.3, step g) for the permitted flow rate ranges. However, depending on the shape of the error curve, additional flow rates may be specified in the type approval certificate. During a test, the water temperature shall be as required in ISO 4064-2:2014|OIML R 49-2:2013, 10.1.3,step e). All other influence factors shall be held within the rated operating conditions.		
7.3.5	The errors (of indication) determined at each of the above flow rates shall not exceed the MPEs given in 4.2.2 or 4.2.3.		P
7.3.6	If all the errors (of indication) of a water meter have the same sign, at least one of the errors shall not exceed one half of the MPE. If all the errors (of indication) of a water meter determined for initial verification have the same sign, but none of them is within half the MPE, additional errors at other flow rate(s) as specified in 7.2.3 shall be obtained: if one of these errors is within half the MPE or of the opposite sign, this criterion is deemed fulfilled.		P

- End of Review Report -