

# WELMEC

European Cooperation in Legal Metrology

Measuring Instruments Directive 2014/32/EU  
Automatic Catchweighers  
Corresponding Tables  
OIML R 51-1:2006 – Annex VIII (MID-006) Chapter II



# WELMEC

European Cooperation in Legal Metrology

WELMEC is a cooperation between the legal metrology authorities of the Member States of the European Union and EFTA.

This document is one of a number of Guides published by WELMEC to provide guidance to manufacturers of measuring instruments and to Notified Bodies responsible for conformity assessment of their products.

The Guides are purely advisory and do not themselves impose any restrictions or additional technical requirements beyond those contained in relevant EU Directives.

Alternative approaches may be acceptable, but the guidance provided in this document represents the considered view of WELMEC as to the best practice to be followed.

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## Automatic Catchweighing Instruments Corresponding Table 2014/32/EU vs. OIML R 51-1:2006 (E)

### Notes:

1. The column “Comments” indicates, if necessary, the relevant text of OIML R 51-1 and related explanations concerning the compliance with the relevant requirements of Directive 2014/32/EU.
2. The column “Conclusion” gives the conclusion on the compliance between OIML R 51-1 and the relevant requirements of Directive 2014/32/EU.

The indication “Covered” means that:

- the requirement of OIML R 51-1 is identical to the one of Directive 2014/32/EU, or
- the requirement of OIML R 51-1 is more severe than the one of Directive 2014/32/EU, or
- all the requirements of OIML R 51-1 fulfil the requirements of Directive 2014/32/EU (even when Directive 2014/32/EU allows other alternatives),
- The indication “Partially covered” means that the requirement is not fully covered or R 51 allows possibilities which are not foreseen in the directive.

The indication “Not Covered” means that the requirement in Directive 2014/32/EU is either not compatible with the relevant OIML R 51-1 requirement or not included in OIML R 51-1.

The indication “Not Relevant” means that the requirement in Annex I of Directive 2014/32/EU is not relevant for automatic catchweighing instruments.

The text in *italic* is an extract from the relevant clause of the OIML Recommendation.

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)		OIML R 51-1:2006(E)	Comments	Conclusion
<b>ANNEX 1</b>				
1.1	<p>Allowable Errors</p> <p>Under rated operation conditions and in absence of a disturbance, the error of measurement shall not exceed the maximum permissible error (MPE) value as laid down in the appropriate instrument-specific requirements.</p> <p>Unless stated otherwise in the instrument-specific annexes, MPE is expressed as a bilateral value of the deviation from the true measurement value.</p>	T.4.3.1, T.4.3.7, 2.5, 2.6, 4.1.1		Covered
1.2	<p>Under rated operating conditions and in presence of a disturbance, the performance requirement shall be as laid down in the appropriate instrument-specific requirements.</p> <p>Where the instrument is intended to be used in a specified permanent continuous electromagnetic field the permitted performance during the radiated electromagnetic field-amplitude modulated test shall be within MPE.</p>	4.1.3, 4.1.6, 4.2.2		Covered
1.3	<p>The manufacturer shall specify the climatic, mechanical and electromagnetic environments in which the instrument is intended to be used, power supply and other influence quantities likely to affect its accuracy, taking into account of the requirements laid down in the appropriate instrument-specific annexes.</p>	5.2.1	See comments for requirements 1.3.1, 1.3.2, 1.3.3 and 1.3.4	Partially covered

<p style="text-align: center;"><b>Directive 2014/32/EU</b> <b>Essential requirements of Annex I and Annex VIII</b> <b>Automatic Weighing Instruments (MI-006)</b></p>	<p style="text-align: center;"><b>OIML R 51-1:2006(E)</b></p>	<p style="text-align: center;"><b>Comments</b></p>	<p style="text-align: center;"><b>Conclusion</b></p>															
<p>1.3.1 Climatic environments The manufacturer shall specify the upper temperature limit and the lower temperature limit from any of the values in Table 1 unless otherwise specified in the Annexes III to XII, and indicate whether the instrument is designed for condensing or non-condensing humidity as well as the intended location for the instrument, i.e. open or closed.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="5" style="text-align: center;">Temperature limits:</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Upper temperature limit</td> <td style="padding: 2px;">30 °C</td> <td style="padding: 2px;">40 °C</td> <td style="padding: 2px;">55 °C</td> <td style="padding: 2px;">70 °C</td> </tr> <tr> <td style="padding: 2px;">Lower temperature limit</td> <td style="padding: 2px;">5 °C</td> <td style="padding: 2px;">-10 °C</td> <td style="padding: 2px;">-25 °C</td> <td style="padding: 2px;">-40 °C</td> </tr> </tbody> </table>	Temperature limits:					Upper temperature limit	30 °C	40 °C	55 °C	70 °C	Lower temperature limit	5 °C	-10 °C	-25 °C	-40 °C	<p>2.9.1.1</p>       <p>2.9.1.2</p>	<p>These values are the same as those specified in the specific annex VIII Chapter I §1.3 and Chapter II §7.3. Covered except that condensing / non-condensing and open / closed is not covered</p>	<p>Partially covered</p>
Temperature limits:																		
Upper temperature limit	30 °C	40 °C	55 °C	70 °C														
Lower temperature limit	5 °C	-10 °C	-25 °C	-40 °C														

<p align="center"><b>Directive 2014/32/EU</b> <b>Essential requirements of Annex I and Annex VIII</b> <b>Automatic Weighing Instruments (MI-006)</b></p>	<p align="center"><b>OIML R 51-1:2006(E)</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Conclusion</b></p>
<p>1.3.2 (a) Mechanical environments are classified into classes M1 to M3 as described below</p> <p>M1: This class applies to instruments used in locations with vibration and shocks of low significance, e.g. for instruments fastened to light structures subject to negligible vibrations and shocks transmitted from local blasting or pile-driving activities, slamming doors, etc.</p> <p>M2: This class applies to instruments used in locations with significant or high levels of vibration and shock, e.g. transmitted from machines and passing vehicles in the vicinity or adjacent to heavy machines, conveyor belts, etc.</p> <p>M3: This class applies to instruments used in locations where the level of vibration and shock is high and very high, e.g. for instruments mounted directly on machines, conveyor belts, etc.</p> <p>(b) The following influence quantities shall be considered in relation with mechanical environments:</p> <ul style="list-style-type: none"> <li>- Vibration</li> <li>- Mechanical shock</li> </ul>		<p>Not relevant according to annex VIII Chapter 1 §1.3</p>	<p>Not relevant</p>
<p>1.3.3 (a) Electromagnetic environments are classified into E1, E2 or E3 as described below, unless otherwise laid down in the appropriate instrument-specific annexes.</p>		<p>Definitions of E1, E2 &amp; E3 are not mentioned in the recommendation</p>	<p>Not covered</p>
<p>E1: This class applies to instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in residential, commercial and light industrial buildings.</p>		<p>Definitions of E1, E2 &amp; E3 are not mentioned in the recommendation</p>	<p>Not covered</p>

<p align="center"><b>Directive 2014/32/EU</b>  <b>Essential requirements of Annex I and Annex VIII</b>  <b>Automatic Weighing Instruments (MI-006)</b></p>	<p align="center"><b>OIML R 51-1:2006(E)</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Conclusion</b></p>
<p>E2: This class applies to instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in other industrial buildings.</p>		<p>Definitions of E1, E2 &amp; E3 are not mentioned in the recommendation</p>	<p>Not covered</p>
<p>E3: This class applies to instruments supplied by the battery of a vehicle. Such instruments shall comply with the requirements of E2 and the following additional requirements                      - voltage reductions caused by energizing the starter-motor circuits of internal combustion engines,                      - load dump transients occurring in the event of a discharged battery being disconnected while the engine is running.</p>	<p align="center">A.6.3.6</p>	<p>Covered except for load dump requirement                      Covered on the provision D11:2013 is used                      Battery voltage variations when starting up a vehicle engine:                      OIML D11:2013 (14.2, Table 40)                      “Load dump” test:                      OIML D11:2013 (14.2, Table 41)                      Tests and severity levels in 1.3.3 (b) below shall be applied for E3, plus tests specified in A.6.3.6.</p>	<p>Partially covered</p>
<p>(b) The following influence quantities shall be considered in relation with electromagnetic environments:</p>	<p align="center">4.1.3</p>	<p>Not all quantities are covered</p>	<p>Partially covered</p>
<p>- voltage interruptions</p>	<p align="center">A.6.3.1 A.6.3.6</p>	<p>Covered for E1 &amp; E2 AC mains                      Covered for E3                      Covered on the provision that the relevant severity level specified in OIML D 11:2013 is used                      OIML D11:2013 (12.3, Table 23). For E1 use severity level 1. For E2 use severity level 2.</p>	<p>Partially covered</p>

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)	OIML R 51-1:2006(E)	Comments	Conclusion
- short voltage reductions	A.6.3.1 A.6.3.6	Covered for E1 & E2 AC mains Covered for E3 Covered on the provision that the relevant severity level specified in OIML D 11:2013 is used OIML D11:2013 (12.3). For E1 use severity level 1. For E2 use severity level 2.	Partially covered
- voltage transients on supply lines and/or signal lines	A.6.3.2 A.6.3.2	Covered for E1 & E3 Covered on the provision that the relevant severity level specified in OIML D 11:2013 is used OIML D11:2013 (12.3, Table 26). For E1 use severity level 2. For E2 use severity level 3. OIML D11:2013 (12.4, Table 28). For E1 use severity level 2. For E2 use severity level 3.	Partially covered
- electrostatic discharges	A.6.3.4		Covered
- radio frequency electromagnetic fields	A.6.3.5.1	Covered on the provision that the relevant severity level specified in OIML D 11:2013 is used OIML D11:2013 (13.2, Tables 32, 33 and 34*). For E1 use severity level 2. For E2 use severity level 3. * limit frequency range in Table 34 to 3 GHz.	Partially covered
- conducted radio frequency electromagnetic fields on supply lines and/or signal lines	A.6.3.5.2		Covered



<p align="center"><b>Directive 2014/32/EU</b>  <b>Essential requirements of Annex I and Annex VIII</b>  <b>Automatic Weighing Instruments (MI-006)</b></p>	<p align="center"><b>OIML R 51-1:2006(E)</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Conclusion</b></p>
<p>- surges on supply lines and/or signal lines</p>	<p align="center">A.6.3.3 A.6.3.6</p>	<p>Covered only for E3. For E1 and E2 use D11:2013 OIML D11:2013 (12.3, Table 27). For E1 use severity level 2. For E2 use severity level 3. OIML D11:2013 (12.4, Table 29). For E1 use severity level 2. For E2 use severity level 3.</p>	<p>Partially covered</p>
<p>1.3.4 Other influence quantities to be considered, where appropriate, are:</p>		<p>See comments below</p>	<p>Partially covered</p>
<p>- voltage variation</p>	<p align="center">2.9.2, A.6.2.4, A.6.2.5, A.6.2.6 &amp; A.6.2.7</p>		<p>Covered</p>
<p>- mains frequency variation</p>		<p>Not covered by R51-1 but in D11:2013 OIML D11:2013 (12.2, Table 21).</p>	<p>Not covered</p>
<p>- power frequency magnetic fields</p>		<p>Not covered by R51-1 but in D11:2013 OIML D11:2013 (13.1, Table 30).</p>	<p>Not covered</p>
<p>- any other quantity likely to influence in a significant way the accuracy of the instrument.</p>	<p align="center">4.2.3, 6.4.3 &amp; A.5.2 2.9.3 &amp; A.6.2.8 2.9.1.3 &amp; A.6.2.2 6.1.4 &amp; A.5.8  2.8.1, 6.4.4 &amp; A.5.7</p>	<p>Warm-up time Tilt Temperature effect on no-load indication Speed of operation (alternative operating speeds) Eccentricity</p>	<p>Covered</p>

<b>Directive 2014/32/EU</b> <b>Essential requirements of Annex I and Annex VIII</b> <b>Automatic Weighing Instruments (MI-006)</b>	<b>OIML R 51-1:2006(E)</b>	<b>Comments</b>	<b>Conclusion</b>
1.4 When carrying out the tests as envisaged in this Directive, the following paragraphs apply:			
1.4.1 <i>Basic rules for testing and the determination of errors</i> Essential requirements specified in 1.1 and 1.2 shall be verified for each relevant influence quantity. Unless otherwise specified in the appropriate instrument-specific annex, these essential requirements apply when each influence quantity is applied and its effect evaluated separately, all other influence quantities being kept relatively constant at their reference value.  Metrological tests shall be carried out during or after the application of the influence quantity, whichever condition corresponds to the normal operational status of the instrument when that influence quantity is likely to occur.	A.6.1.1             Annex A	Each test of the Annex A specifies when the “metrological test” has to be performed (after/during the application of the influence quantity).	Covered          Covered
1.4.2 <i>Ambient humidity</i> - According to the climatic operating environment in which the instrument is intended to be used either the damp heat-steady state (non-condensing) or damp heat cyclic (condensing) test may be appropriate. - The damp heat cyclic test is appropriate where condensation is important or when penetration of vapour will be accelerated by the effect of breathing. In conditions where non-condensing humidity is a factor the damp-heat steady state is appropriate.	A.6.2.3         4.1.2	Covered except for the damp heat condensing test. <b><i>Damp heat, steady state - non-condensing</i></b> <i>Covered for instruments of classes Y(a), Y(b) and XIII(x), XIII(x) under the corresponding climatic environment if damp heat steady state test has been performed</i> <i>These tests are not applicable to classes XI and Y(I) instruments, or classes XII and Y(II) instruments where e is less than 1 g.</i>  <b><i>Influence factors</i></b> <i>This is not applicable to an electronic instrument of classes XI and Y(I), and of classes XII and Y(II) if e is less than 1 g.</i>	Partially covered

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)	OIML R 51-1:2006(E)	Comments	Conclusion
2 <b>Reproducibility</b> The application of the same measurand in a different location or by different user, all other conditions being the same, shall result in the close agreement of successive measurements. The difference between the measurement results shall be small when compared with the MPE.	R 51	Covered provided all requirements and tests should be performed and in accordance with R 51.	Partially covered
3 <b>Repeatability</b> The application of the same measurand under the same conditions of measurement shall result in the close agreement of successive measurements. The difference between the measurement results shall be small when compared with the MPE.	R 51	Covered provided all requirements and tests should be performed and in accordance with R 51.	Partially covered
4 <b>Discrimination and sensitivity</b> A measuring instrument shall be sufficiently sensitive and the discrimination threshold shall be sufficiently low for the intended measurement task.	R 51	Covered provided all requirements and tests should be performed and in accordance with R 51.	Partially covered
5 <b>Durability</b> A measuring instrument shall be designed to maintain an adequate stability of its metrological characteristics over a period of time estimated by the manufacturer's instruction when in the environmental conditions for which it is intended.	4.1.4, A.7, 2.10, 6.5.3, T.3.7	A.7 is not applicable to classes XI and Y(I) instruments. No test procedure	Covered
6 <b>Reliability</b> A measuring instrument shall be designed to reduce as far as possible the effect of a defect that would lead to an inaccurate measurement result, unless the presence of such a defect is obvious.	3.2.2, 4.1.3 & 4.2.2		Covered

<b>Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)</b>		<b>OIML R 51-1:2006(E)</b>	<b>Comments</b>	<b>Conclusion</b>
<b>7</b>	<b>Suitability</b>			
7.1	A measuring instrument shall have no feature likely to facilitate fraudulent use, whereas possibilities for unintentional misuse shall be minimal.	3.2.1, 3.2.2 & 3.2.4		Covered
7.2	A measuring instrument shall be suitable for its intended use taking account of the practical working conditions and shall not require unreasonable demands of the user in order to obtain a correct measurement result.	3.1		Covered
7.3	The errors of a utility measuring instrument at flows or currents outside the controlled range shall not be unduly biased.			Not relevant
7.4	Where a measuring instrument is designed for the measurement of values of the measurand that are constant over time, the measuring instrument shall be insensitive to small fluctuations of the value of the measurand, or shall take appropriate action.			Not relevant
7.5	A measuring instrument shall be robust and its materials of construction shall be suitable for the conditions in which it is intended to be used.	3.1		Covered
7.6	A measuring instrument shall be designed so as to allow the control of the measuring tasks after the instrument has been placed on the market and put into use. If necessary, special equipment or software for this control shall be part of the instrument. The test procedure shall be described in the operation manual.  When a measuring instrument has associated software which provides other functions besides the measuring function, the software that is critical for the metrological characteristics shall be identifiable and shall not be inadmissibly influenced by the associated software.	3.4.5, 2.11 & 6.1.5	Covered except for the description of test procedure in the operation manual and the requirements concerning software separation.	Partially covered
<b>8</b>	<b>Protection against corruption</b>			

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)	OIML R 51-1:2006(E)	Comments	Conclusion
8.1 The metrological characteristics of a measuring instrument shall not be influenced in any inadmissible way by the connection to it of another device, by any feature of the connected device itself or by any remote device that communicates with the measuring instrument.	4.2.4		Covered
8.2 A hardware component that is critical for metrological characteristics shall be designed so that it can be secured. Security measures foreseen shall provide for evidence of an intervention.	3.2.6		Covered
8.3 Software that is critical for metrological characteristics shall be identified as such and shall be secured. Software identification shall be easily provided by the measuring instrument. Evidence of an intervention shall be available for a reasonable period of time.	3.4.5		Covered
8.4 Measurement data, software that is critical for measurement characteristics and metrologically important parameters stored or transmitted shall be adequately protected against accidental or intentional corruption.	3.2.3, 3.2.4, 3.2.6& 3.4.4, 3.4.5		Covered
8.5 For utility measuring instruments the display of the total quantity supplied or the displays from which the total quantity supplied can be derived, whole or partial reference to which is the basis for payment, shall not be able to be reset during use.			Not relevant

<p align="center"><b>Directive 2014/32/EU</b> <b>Essential requirements of Annex I and Annex VIII</b> <b>Automatic Weighing Instruments (MI-006)</b></p>	<p align="center"><b>OIML R 51-1:2006(E)</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Conclusion</b></p>
<p><b>9 Information to be borne by and to accompany the instrument</b></p>			
<p>9.1 A measuring instrument shall bear the following inscriptions:  - manufacturer's mark or name  - information in respect of its accuracy, plus, when applicable  - information in respect of the conditions of use  - measuring capacity  - measuring range  - identity marking  - number of EC-type examination certificate or the EC design examination certificate  - information whether or not additional devices providing metrological results comply with the provisions of this Directive on legal metrological control.</p>	<p align="center">3.11.1 &amp; 3.11.2</p>	<p>Covered except for the indication of presence of additional device</p>	<p>Partially covered.</p>
<p>9.2 An instrument of dimensions too small or of too sensitive a composition to allow it to bear the relevant information shall have its packaging, if any, and the accompanying documents required by the provisions of this Directive suitably marked.</p>			<p>Not relevant</p>

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)	OIML R 51-1:2006(E)	Comments	Conclusion
9.3 The instrument shall be accompanied by information on its operation, unless the simplicity of the measuring instrument makes this unnecessary. Information shall be easily understandable and shall include where relevant: - rated operating conditions - mechanical and electromagnetic environment classes - the upper and lower temperature limit, whether condensation is possible or not, open or closed location - instructions for installation, maintenance, repairs, permissible adjustments - instructions for correct operation and any special conditions use - conditions for compatibility with interfaces, sub-assemblies or measuring instruments.	3.11.1, 3.11.2 & 3.11.3	Covered except for information (on its operation, installation, maintenance, repairs, permissible adjustments, correct operation), condensation, open or closed location.	Partially covered
9.4 Groups of identical measuring instruments used in the same location or used for utility measurements do not necessarily require individual instruction manuals.			Not relevant
9.5 Unless specified otherwise in an instrument-specific annex, the scale interval for a measured value shall be in the form $1 \times 10^n$ , $2 \times 10^n$ , or $5 \times 10^n$ , where n is any integer or zero. The unit of measurement or its symbol shall be shown close to the numerical value.	3.3.2		Covered
9.6 A material measure shall be marked with a nominal value or a scale, accompanied by the unit of measurement used.			Not relevant
9.7 The units of measurement used and their symbols shall be in accordance with the provisions of Community legislation on units of measurement and their symbols.	2.7		Covered
9.8 All marks and inscriptions required under any requirement shall be clear, non-erasable, unambiguous and non-transferable.	3.11.4, 3.12		Covered

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)	OIML R 51-1:2006(E)	Comments	Conclusion
10 <b>Indication of result</b>			
10.1 Indication of the result shall be by means of a display or a hard copy.	3.3, 3.4	Covered if the instrument is equipped with either a display or a printer	Partially covered
10.2 The indication of any result shall be clear and unambiguous and accompanied by such marks and inscriptions necessary to inform the user of the significance of the result. Easy reading of the present result shall be permitted under normal conditions of use. Additional indications may be shown provided they cannot be confused with the metrologically controlled indications.	3.3.1, 2.4, 3.4.2, 3.3.2		Covered
10.3 In the case of hard copy the print or record shall also be easily legible and non-erasable.	3.4.3, 3.4.4		Covered
10.4 A measuring instrument for direct sales trading transactions shall be designed to present the measurement result to both parties in the transaction when installed as intended. When critical in case of direct sales, any ticket provided to the consumer by an ancillary device not complying with the appropriate requirements of this Directive shall bear an appropriate restrictive information.			Not covered



Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)	OIML R 51-1:2006(E)	Comments	Conclusion
10.5 Whether or not a measuring instrument intended for utility measurement purposes can be remotely read it shall in any case be fitted with a metrologically controlled display accessible without tools to the customer. The reading of this display is the measurement result that serves as the basis for the price to pay.		Automatic catchweighing instruments are not utility meters.	Not relevant
11 <b>Further processing of data to conclude the trading transaction</b>			
11.1 A measuring instrument other than a utility measuring instrument shall record by a durable means the measurement result accompanied by information to identify the particular transaction, when: - the measurement is non-repeatable and - the measuring instrument is normally intended for use in the absence of one of the trading parties.	3.4.4, 3.4.3	Covered when the measuring instrument is fitted with a data storage device or a printer Most of the time, the measurement is carried out in the absence of one of the trading parties.	Partially covered
11.2 Additionally, a durable proof of the measurement result and the information to identify the transaction shall be available on request at the time the measurement is concluded.	3.4.4, 3.4.3	Covered when the measuring instrument is fitted with a data storage device or a printer	Partially covered
12 Conformity evaluation A measuring instrument shall be designed so as to allow ready evaluation of its conformity with the appropriate requirements of this Directive.	2.11, 6.1.5, 6.1.8, 5.2.2, 5.3.1		Covered

<b>Directive 2014/32/EU</b> <b>Essential requirements of Annex I and Annex VIII</b> <b>Automatic Weighing Instruments (MI-006)</b>	<b>OIML R 51-1:2006(E)</b>	<b>Comments</b>	<b>Conclusion</b>
<b>Annex VIII AUTOMATIC WEIGHING INSTRUMENTS (MI-006)</b>			
<p>The relevant essential requirements of Annex I, the specific requirements of this Annex and the conformity assessment procedures listed in Chapter I of this Annex, apply to automatic weighing instruments defined below, intended to determine the mass of a body by using the action of gravity on that body.</p>	T.1.1	Slightly different wording.	Covered

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)	OIML R 51-1:2006(E)	Comments	Conclusion
<b>DEFINITIONS</b>			
<b>Automatic weighing instrument</b> An instrument that determines the mass of a product without the intervention of an operator and follows a predetermined programme of automatic processes characteristic of the instrument.	T.1.2	Slightly different wording	Covered
<b>Automatic catchweigher</b> An automatic weighing instrument that determines the mass of pre-assembled discrete loads (for example prepackages) or single loads of loose material.	T.1.3	Slightly different wording	Covered
<b>Automatic checkweigher</b> An automatic catchweigher that subdivides articles of different mass into two or more subgroups according to the value of the difference of their mass and a nominal set-point.	T.1.3.1		Covered
<b>Weight labeller</b> An automatic catchweigher that labels individual articles with the weight value.	T.1.3.2	Slightly different wording	Covered
<b>Weight/price labeller</b> An automatic catchweigher that labels individual articles with the weight value, and price information.	T.1.3.3	Slightly different wording	Covered
<b>Automatic gravimetric filling instrument</b> An automatic weighing instrument that fills containers with a predetermined and virtually constant mass of product from bulk.			Not relevant

<p align="center"><b>Directive 2014/32/EU</b>  <b>Essential requirements of Annex I and Annex VIII</b>  <b>Automatic Weighing Instruments (MI-006)</b></p>	<p align="center"><b>OIML R 51-1:2006(E)</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Conclusion</b></p>
<p><b>Discontinuous totaliser (totalising hopper weigher)</b>                      An automatic weighing instrument that determines the mass of a bulk product by dividing it into discrete loads. The mass of each discrete load is determined in sequence and summed. Each discrete load is then delivered to bulk.</p>			<p align="center">Not relevant</p>
<p><b>Continuous totaliser</b>                      An automatic weighing instrument that continuously determines the mass of a bulk product on a conveyor belt, without systematic subdivision of the product and without interrupting the movement of the conveyor belt.</p>			<p align="center">Not relevant</p>
<p><b>Rail-weighbridge</b>                      An automatic weighing instrument having a load receptor inclusive of rails for conveying railway vehicles.</p>			<p align="center">Not relevant</p>

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)		OIML R 51-1:2006(E)	Comments	Conclusion
<b>SPECIFIC REQUIREMENTS</b>				
<b>Chapter I – Requirements common to all types of automatic weighing instruments</b>				
1	Rated Operating Conditions The manufacturer shall specify the rated operating conditions for the instrument as follows:	5.2.1		Covered
1.1	For the measurand: The measuring range in terms of its maximum and minimum capacity.	2.2.2, 2.2.1, 2.3.1 & 2.3.3 3.11.2, 5.2.1		Covered
1.2	For the electrical supply influence quantities: In case of AC voltage supply: the nominal AC voltage supply, or the AC voltage limits. In case of DC voltage supply: the nominal and minimum DC voltage supply, or the DC voltage limits.	2.9.2, 5.2.1		Covered
1.3	For the mechanical and climatic influence quantities: The minimum temperature range is 30°C unless specified otherwise in the following chapters of this Annex. The mechanical environment classes according to Annex I, paragraph 1.3.2 are not applicable. For instruments which are used under special mechanical strain, e.g. instruments incorporated into vehicles, the manufacturer shall define the mechanical conditions of use.	2.9.1.1, 2.9.1.2, 2.9.3 & 3.2.5, 5.2.1		Covered
1.4	For other influence quantities (if applicable): The rate(s) of operation. The characteristics of the product(s) to be weighed.	5.2.1, 6.1.4, 2.9.3, 3.2.3		Covered

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2	Permissible effect of disturbances – Electromagnetic environment The required performance and the critical change value are given in the relevant Chapter of this Annex for each type of instrument.			
3	Suitability			
3.1	Means shall be provided to limit the effects of tilt, loading and rate of operation such that maximum permissible errors (MPEs) are not exceeded in normal operation.	2.9.3, 3.2.3, 3.2.5		Covered
3.2	Adequate material handling facilities shall be provided to enable the instrument to respect the MPEs during normal operation.	3.1		Covered
3.3	Any operator control interface shall be clear and effective.	3.3.1 (3.3, 3.2.4, 3.6.4, 3.6.5, 3.7.3, 3.9.4)		Covered
3.4	The integrity of the display (where present) shall be verifiable by the operator.	4.2.1		Covered
3.5	Adequate zero setting capability shall be provided to enable the instrument to respect the MPEs during normal operation.	3.5, 3.6		Covered
3.6	Any result outside the measurement range shall be identified as such, where a printout is possible.	3.3.3, 3.10.3		Covered

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)	OIML R 51-1:2006(E)	Comments	Conclusion
<p>4 Conformity assessment</p> <p>The conformity assessment procedures referred to in Article 9 that the manufacturer can choose between are:</p> <p>For mechanical systems: B+D or B+E or B+F or D1 or F1 or G or H1.</p> <p>For electromechanical instruments: B+D or B+E or B+F or G or H1.</p> <p>For electronic systems or systems containing software: B+D or B+F or G or H1.</p>			Not covered
<b>Chapter II – Automatic Catchweighers</b>			
1 <i>Accuracy Classes</i>			
1.1 Instruments are divided into primary categories designated by: X or Y as specified by the manufacturer.	2.1		Covered
1.2 These primary categories are further divided into four accuracy classes: XI, XII, XIII & XIV and Y(I), Y(II), Y(a) & Y(b) which shall be specified by the manufacturer	2.1.1, 2.1.2	<i>The use of a class for a particular application may be determined by national requirements.</i>	Covered
2 <i>Category X Instruments</i>			
2.1 Category X applies to instruments used to check prepackages made up in accordance with the requirements of Council Directive 76/211/EEC of 20 January 1976 on the approximation of the laws of the Member States relating to the making-up by weight or by volume of certain prepackaged products.	2.1		Covered
2.2 The accuracy classes are supplemented by a factor ( $x$ ) that quantifies the maximum permissible standard	2.1.1	See also 4.2 below.	Covered

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)		OIML R 51-1:2006(E)	Comments	Conclusion																																																		
deviation as specified in paragraph 4.2. The manufacturer shall specify the factor (x), where (x) shall be $\leq 2$ and in the form $1 \times 10^k$ , $2 \times 10^k$ or $5 \times 10^k$ , where k is a negative whole number or zero.																																																						
3	Category Y Instruments Category Y applies to all other automatic catchweighers.	2.1, 2.1.2		Covered																																																		
<b>4 MPE</b>																																																						
4.1	Mean error Category X / MPE Category Y instruments	2.5.1.1, 2.5.1.2, A.3.9.2.2 a)		Covered																																																		
<table border="1"> <thead> <tr> <th colspan="8">Net Load (m) in verification scale intervals (e)</th> <th>Maximum permissible mean error</th> <th>Maximum permissible error</th> </tr> <tr> <th>XI</th> <th>Y(I)</th> <th>XII</th> <th>Y(II)</th> <th>XIII</th> <th>IY(a)</th> <th>XIV</th> <th>Y(b)</th> <th>X</th> <th>Y</th> </tr> </thead> <tbody> <tr> <td colspan="2"><math>0 &lt; m \leq 50\ 000</math></td> <td colspan="2"><math>0 &lt; m \leq 5\ 000</math></td> <td><math>0 &lt; m \leq 500</math></td> <td colspan="3"><math>0 &lt; m \leq 50</math></td> <td><math>\pm 0.5 e</math></td> <td><math>\pm 1 e</math></td> </tr> <tr> <td colspan="2"><math>50\ 000 &lt; m \leq 200\ 000</math></td> <td colspan="2"><math>5\ 000 &lt; m \leq 20\ 000</math></td> <td><math>500 &lt; m \leq 2\ 000</math></td> <td colspan="3"><math>50 &lt; m \leq 200</math></td> <td><math>\pm 1.0 e</math></td> <td><math>\pm 1.5 e</math></td> </tr> <tr> <td colspan="2"><math>200\ 000 &lt; m</math></td> <td colspan="2"><math>20\ 000 &lt; m \leq 100\ 000</math></td> <td><math>2\ 000 &lt; m \leq 10\ 000</math></td> <td colspan="3"><math>200 &lt; m \leq 1\ 000</math></td> <td><math>\pm 1.5 e</math></td> <td><math>\pm 2 e</math></td> </tr> </tbody> </table>		Net Load (m) in verification scale intervals (e)								Maximum permissible mean error	Maximum permissible error	XI	Y(I)	XII	Y(II)	XIII	IY(a)	XIV	Y(b)	X	Y	$0 < m \leq 50\ 000$		$0 < m \leq 5\ 000$		$0 < m \leq 500$	$0 < m \leq 50$			$\pm 0.5 e$	$\pm 1 e$	$50\ 000 < m \leq 200\ 000$		$5\ 000 < m \leq 20\ 000$		$500 < m \leq 2\ 000$	$50 < m \leq 200$			$\pm 1.0 e$	$\pm 1.5 e$	$200\ 000 < m$		$20\ 000 < m \leq 100\ 000$		$2\ 000 < m \leq 10\ 000$	$200 < m \leq 1\ 000$			$\pm 1.5 e$	$\pm 2 e$			
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Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)		OIML R 51-1:2006(E)	Comments	Conclusion																																	
4.2	<p>Standard deviation</p> <p>Maximum permissible value for the standard deviation of a class X (x) instrument is the result of the multiplication of the factor (x) by the value in Table 2 below.</p> <table border="1"> <thead> <tr> <th>Net Load (m)</th> <th>Maximum permissible standard deviation for class X(1)</th> </tr> </thead> <tbody> <tr> <td>m ≤ 50 g</td> <td>0,48 %</td> </tr> <tr> <td>50 g &lt; m ≤ 100 g</td> <td>0,24 g</td> </tr> <tr> <td>100 g &lt; m ≤ 200 g</td> <td>0,24 %</td> </tr> <tr> <td>200 g &lt; m ≤ 300 g</td> <td>0,48 g</td> </tr> <tr> <td>300 g &lt; m ≤ 500 g</td> <td>0,16 %</td> </tr> <tr> <td>500 g &lt; m ≤ 1 000 g</td> <td>0,8 g</td> </tr> <tr> <td>1 000 g &lt; m ≤ 10 000 g</td> <td>0,08 %</td> </tr> <tr> <td>10 000 g &lt; m ≤ 15 000 g</td> <td>8 g</td> </tr> <tr> <td>15 000 g &lt; m</td> <td>0,053 %</td> </tr> </tbody> </table> <p>For class XI and XII, (x) shall be less than 1 For class XIII, (x) shall be not greater than 1 For class XIV, (x) shall be greater than 1</p>	Net Load (m)	Maximum permissible standard deviation for class X(1)	m ≤ 50 g	0,48 %	50 g < m ≤ 100 g	0,24 g	100 g < m ≤ 200 g	0,24 %	200 g < m ≤ 300 g	0,48 g	300 g < m ≤ 500 g	0,16 %	500 g < m ≤ 1 000 g	0,8 g	1 000 g < m ≤ 10 000 g	0,08 %	10 000 g < m ≤ 15 000 g	8 g	15 000 g < m	0,053 %	2.5.1.1 Table 4	Figures of OIML table and MID table are the same	Covered													
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4.3	<p>Verification scale interval - single interval instruments</p> <table border="1"> <thead> <tr> <th colspan="2" rowspan="2">Accuracy classes</th> <th rowspan="2">Verification scale interval</th> <th colspan="2">Number of verification scale intervals n = Max/e</th> </tr> <tr> <th>Minimum</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td rowspan="2">XI</td> <td rowspan="2">Y(I)</td> <td rowspan="2">0.001 g ≤ e</td> <td rowspan="2">50 000</td> <td rowspan="2">–</td> </tr> <tr> </tr> <tr> <td rowspan="2">XII</td> <td rowspan="2">Y(II)</td> <td>0.001 g ≤ e ≤ 0.05 g</td> <td>100</td> <td>100 000</td> </tr> <tr> <td>0.1 g ≤ e</td> <td>5 000</td> <td>100 000</td> </tr> <tr> <td rowspan="2">XIII</td> <td rowspan="2">Y(a)</td> <td>0.1 g ≤ e ≤ 2 g</td> <td>100</td> <td>10 000</td> </tr> <tr> <td>5 g ≤ e</td> <td>500</td> <td>10 000</td> </tr> <tr> <td>XIII</td> <td>Y(b)</td> <td>5 g ≤ e</td> <td>100</td> <td>1 000</td> </tr> </tbody> </table>	Accuracy classes		Verification scale interval	Number of verification scale intervals n = Max/e		Minimum	Maximum	XI	Y(I)	0.001 g ≤ e	50 000	–	XII	Y(II)	0.001 g ≤ e ≤ 0.05 g	100	100 000	0.1 g ≤ e	5 000	100 000	XIII	Y(a)	0.1 g ≤ e ≤ 2 g	100	10 000	5 g ≤ e	500	10 000	XIII	Y(b)	5 g ≤ e	100	1 000	2.2.1 Table 1	Figures of OIML table and MID table are the same.	Covered
Accuracy classes					Verification scale interval	Number of verification scale intervals n = Max/e																															
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XI	Y(I)	0.001 g ≤ e	50 000	–																																	
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XIII	Y(a)	0.1 g ≤ e ≤ 2 g	100	10 000																																	
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Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)		OIML R 51-1:2006(E)	Comments	Conclusion																														
4.4	<p>Verification scale interval - multi-interval instruments</p> <table border="1"> <thead> <tr> <th colspan="2" rowspan="2">Accuracy classes</th> <th rowspan="2">Verification scale interval</th> <th colspan="2">Number of verification scale intervals <math>n = \text{Max}/e</math></th> </tr> <tr> <th>Minimum value(1) <math>n = \text{Max}/e(i+1)</math></th> <th>Maximum value <math>n = \text{Max}/e_i</math></th> </tr> </thead> <tbody> <tr> <td>XI</td> <td>Y(I)</td> <td><math>0.001 \text{ g} \leq e_i</math></td> <td>50 000</td> <td>–</td> </tr> <tr> <td rowspan="2">XII</td> <td rowspan="2">Y(II)</td> <td><math>0.001 \text{ g} \leq e_i \leq 0.05 \text{ g}</math></td> <td>5 000</td> <td>100 000</td> </tr> <tr> <td><math>0.1 \text{ g} \leq e_i</math></td> <td>5 000</td> <td>100 000</td> </tr> <tr> <td>XIII</td> <td>Y(a)</td> <td><math>0.1 \text{ g} \leq e_i</math></td> <td>500</td> <td>10 000</td> </tr> <tr> <td>XIII</td> <td>Y(b)</td> <td><math>5 \text{ g} \leq e_i</math></td> <td>50</td> <td>1 000</td> </tr> </tbody> </table> <p>Where:  <math>i = 1, 2, \dots, r</math>  <math>i</math> = partial weighing range  <math>r</math> = total number of partial ranges                      (1) For <math>i = r</math> the corresponding column of Table 3 applies with <math>e</math> replaced by <math>e_r</math></p>	Accuracy classes		Verification scale interval	Number of verification scale intervals $n = \text{Max}/e$		Minimum value(1) $n = \text{Max}/e(i+1)$	Maximum value $n = \text{Max}/e_i$	XI	Y(I)	$0.001 \text{ g} \leq e_i$	50 000	–	XII	Y(II)	$0.001 \text{ g} \leq e_i \leq 0.05 \text{ g}$	5 000	100 000	$0.1 \text{ g} \leq e_i$	5 000	100 000	XIII	Y(a)	$0.1 \text{ g} \leq e_i$	500	10 000	XIII	Y(b)	$5 \text{ g} \leq e_i$	50	1 000	2.2.1, 2.3	Covered except when the accuracy class is XIII or Y(a) with $0.1 \text{ g} \leq e \leq 2 \text{ g}$	Partially covered
Accuracy classes					Verification scale interval	Number of verification scale intervals $n = \text{Max}/e$																												
		Minimum value(1) $n = \text{Max}/e(i+1)$	Maximum value $n = \text{Max}/e_i$																															
XI	Y(I)	$0.001 \text{ g} \leq e_i$	50 000	–																														
XII	Y(II)	$0.001 \text{ g} \leq e_i \leq 0.05 \text{ g}$	5 000	100 000																														
		$0.1 \text{ g} \leq e_i$	5 000	100 000																														
XIII	Y(a)	$0.1 \text{ g} \leq e_i$	500	10 000																														
XIII	Y(b)	$5 \text{ g} \leq e_i$	50	1 000																														
5	<p>Measurement Range</p> <p>In specifying the measurement range for class Y instruments the manufacturer shall take account that the minimum capacity shall not be less than:</p> <p>class Y(I): 100 e                      class Y(II): 20 e for <math>0.001 \text{ g} \leq e \leq 0.05 \text{ g}</math>, and                      50 e for <math>0.1 \text{ g} \leq e</math></p> <p>class Y(a): 20 e                      class Y(b): 10 e</p> <p>Scales used for grading,                      e.g. postal scales and garbage weighers: 5 e</p>	2.2.2		Covered																														

Directive 2014/32/EU Essential requirements of Annex I and Annex VIII Automatic Weighing Instruments (MI-006)	OIML R 51-1:2006(E)	Comments	Conclusion
6 <i>Dynamic Setting</i>			
6.1 The dynamic setting facility shall operate within a load range specified by the manufacturer.	3.2.3		Covered
6.2 When fitted, a dynamic setting facility that compensates for the dynamic effects of the load in motion shall be inhibited from operating outside the load range, and shall be capable of being secured.	3.2.3		Covered
7 <i>Performance Under Influence Factors And Electromagnetic Disturbances</i>			
7.1 The MPEs due to influence factors are:			
7.1.1 For category X instruments: - For automatic operation; as specified in Tables 1, and 2, - For static weighing in non-automatic operation; as specified in Table 1.	2.6.1		Covered
7.1.2 For category Y instruments - For each load in automatic operation; as specified in Table 1, - For static weighing in non-automatic operation; as specified for category X in Table 1.	2.6.2	Figures of MID table 1 are the same as those of R 51 table 5. Figures of MID table 1 are the same as those of R 51 table 6.	Covered
7.2 The critical change value due to a disturbance is one verification scale interval.	T.4.3.9, 4.1.3		Covered
7.3 Temperature range: - For class XI and Y(I) the minimum range is 5° C, - For class XII and Y(II) the minimum range is 15° C.	2.9.1.2		Covered