

WELMEC

European Cooperation in Legal Metrology

Directives 2014/31/EU and 2014/32/EU: Common Application Non-automatic Weighing Instruments (NAWI) Automatic Weighing Instruments (AWI) Multi-dimensional Measuring Instruments (MDMI)



For information:
This guide is available to the Working Group Measuring
Instruments for future reference on the Europa Website.

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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1 Foreword

This Guide is intended to provide guidance to all those concerned with the application of Directive 2014/31/EU of the European Parliament and of the Council of 26 February 2014 on non-automatic weighing instruments (NAWIs) and the related harmonised standard EN 45501:2015, and Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on measuring instruments (MID) in relation to automatic weighing instruments (AWIs) and multi-dimensional measuring instruments (MDMIs).

The decisions recorded in WELMEC Guide 2:2015 remain valid unless a new decision on a specific item has been included into this new WELMEC Guide 2:2020.

This Guide provides a record of the continuing work of WELMEC Working Group 2 in the area of the common application of the Directives themselves. This Guide aligns with the structure (although not the numbering) of the two Directives to aid with the referencing of decisions.

Horizontal issues concerning these Directives are addressed in other WELMEC Guides that have been developed by other Working Groups.

This Guide 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.

2 Decisions of common application for 2014/31/EU (Non-automatic Weighing Instruments Directive)

The following is a list of decisions reached by WELMEC WG2 of common application under Directive 2014/31/EU, in respect of:

- Chapters 1 to 6 (for Articles that are specific to non-automatic weighing instruments only)
- Annex I, Essential Requirements
- Annex III, Inscriptions

2.1 Chapters 1 to 6

2.1.1 Article 16, Clause 2

EC type-approval certificates issued under Directive 2009/23/EC and that reference the 'Green M' do not need to be revised to make reference to the new Directive and/or the 'supplementary metrology marking' specified under Directive 2014/31/EU.

2.2 Annex I – Essential Requirements

2.2.1 Preliminary observation

2.2.1.1 Printing or recorded:

The English version of the Directive states that:

“Where an instrument includes or is connected to more than one indicating or printing device used for the applications listed in Article 1 2(a), those devices which repeat the results of the weighing operation and which cannot influence the correct functioning of the instrument shall not be subject to the Essential Requirements if the weighing results are printed or recorded correctly and indelibly by a part of the instrument which meets the Essential Requirements and the results are accessible to both parties concerned by the measurement. However, in the case of instruments used for direct sales to the public, display and printing devices for the vendor and the customer must fulfil the Essential Requirements.”

In this, it is not clear whether the text “...correctly and indelibly by a part of the instrument which meets the Essential Requirements...” refers to “printed or recorded” or just to “recorded”.

It shall be understood to refer to “printed or recorded”, so that either the printing or the recording (or both) must be performed by a part (or parts) which meet the Essential Requirements.

(Supersedes 3.1.22 of WELMEC 2: 2015)

2.2.2 Metrological requirements

2.2.2.1 Units of mass

No guidance.

2.2.2.2 Accuracy classes

2.2.2.2.1 Scale intervals

A display which shows a permanent indication of the weight to a higher resolution, e.g. 0.1 e, next to the primary weight indication is not permitted. A weighing result in a higher resolution is not considered to be a secondary indication.

2.2.2.3 Classification

No guidance.

2.2.2.4 Accuracy

No guidance.

2.2.2.5 Repeatability and reproducibility

No guidance.

2.2.2.6 Sensitivity

No guidance.

2.2.2.7 Influence quantities and time

Gravity zones

The intention of this section of the guide is to describe a procedure on how the gravity value at the place of putting into service can be taken into consideration, see article 7.1 of Directive 2014/31/EU.

Gravity information for each of the WELMEC countries is given on the WELMEC website: www.welmec.org.

The new gravity concept

A weighing instrument that is sensitive to gravity shall indicate within the MPE after a conformity assessment procedure - whether in one or two stages, carried out either by a Notified Body or the manufacturer himself.

If the conformity assessment procedure, other than a Module B, is carried out at a location other than the intended place of use, the instrument must be finally adjusted to the g value of that place of use.

Alternatively the instrument may be finally adjusted to the (fictitious) reference value in the center of a specified gravity zone encompassing the intended place of use.

Specified gravity zone

A gravity zone is defined by the boundaries for both the geographical latitude

φ (boundary values φ_1 and φ_2) and the altitude above sea level, a (boundary values a_1 and a_2). The boundary values shall be chosen as integer multiples of 1° (exceptionally $0,5^\circ$ is also allowed) and 100 m, respectively.

Gravity zones may be chosen by the manufacturer such that the differences of gravity acceleration, Δg_φ and Δg_a , between the value of any place of use within that zone and the reference value of gravity, g_R , for that zone, will not result in an absolute value of variation of any indication of the instrument greater than $1/3$ of the mpe on EU verification. The manufacturer will adjust the instrument, using the gravity formula in eq. (2) and one of the appropriate conditions, eq. (1a), (1b) or (1c), such that it respects the mpe on EU verification at any place of use within the chosen zone:

$$n (\Delta g_{\varphi} + \Delta g_a) / g_R \leq mpe / (3e) \quad (1a)$$

with: $\Delta g_{\varphi} = 1/2 |g(\varphi_1, a_m) - g(\varphi_2, a_m)|$ max. variation due to a change in φ ²⁾

$a_m = 1/2 (a_1 + a_2)$ mean value of altitude a

$\Delta g_a = 1/2 |g(\varphi_m, a_1) - g(\varphi_m, a_2)|$ maximum variation due to a change in a

$\varphi_m = 1/2 (\varphi_1 + \varphi_2)$ mean value of latitude φ

$g_R = g(\varphi_m, a_m)$ reference value of gravity in the zone

$n =$ number of verification scale intervals e of the weighing instrument

$mpe =$ maximum permissible error on EU verification at Max , expressed in e

Condition (1a) is, strictly speaking, valid only for $1000 \leq n \leq 2000$ and $n \geq 3000$ (class III instruments), where $n = Max / e$. In the other cases, condition (1a) has to be modified:

$$500 (\Delta g_{\varphi} + \Delta g_a) / g_R \leq 0,5e / (3e)$$

$$\Leftrightarrow (\Delta g_{\varphi} + \Delta g_a) / g_R \leq 1 / 3000 \text{ if } 500 \leq n < 1000 \quad (1b)$$

and

$$2000 (\Delta g_{\varphi} + \Delta g_a) / g_R \leq 1,0e / (3e)$$

$$\Leftrightarrow (\Delta g_{\varphi} + \Delta g_a) / g_R \leq 1 / 6000 \text{ if } 2000 < n < 3000 \quad (1c)$$

The same applies by analogy to the other accuracy classes.

Reference value

For the calculation of the reference value, g_R , and the maximum variations, Δg_{φ}

and Δg_a , and for the final adjustment of the weighing instrument, depending on the actual g value at the place of EC verification, the "standardised" gravity formula according to /1/ in combination with the theoretical vertical gradient of gravitational acceleration in free air /2/ is used:

$$g = 9,780\,318 (1 + 0,005\,3024 \sin^2 \varphi - 0,000\,0058 \sin^2 2\varphi) - 0,000\,003085 a \quad \text{m s}^{-2} \quad (2)$$

In this formula, the latitude φ must be entered in degrees ($^{\circ}$) and the altitude a in meters (m).

Identification

With an instrument adjusted to a gravity zone, a suitable identification of that zone shall be provided. The identification may be either

(i) the reference value, g_R , of the gravity zone, together with the lower and upper limits of gravity values for the zone, or

(ii) a code designation in the form $\varphi_1 - \varphi_2 \equiv a_1 - a_2$ (alternatively $\varphi_1 - \varphi_2 : a_1 - a_2$) that is used uniformly for all WELMEC member states,

e.g. 49-52 \equiv 0-200 (alternatively 49-52:0-200),

¹⁾ Relative deviations of real gravity values from the gravity values calculated with eq. (2) are not taken into account, because they do normally not exceed 5×10^{-5} and can be neglected.

²⁾ In order to be correct even for unusual applications, it is mentioned that if the gravity zone includes the equator ($\varphi = 0^{\circ}$) the maximum variation due to φ must be calculated from $\Delta g_{\varphi} = 1/2 [g(\varphi_{\max}, a_m) - g(\varphi=0, a_m)]$, with φ_{\max} equal to φ_1 or φ_2 whichever is the greater value.

which would indicate that the weighing instrument had been adjusted for a mean g value in the zone between latitudes 49° and 52° and altitudes 0 m to 200 m, the fictitious reference "point" being at the latitude $\varphi_m = 50.5^\circ$ and the altitude $a_m = 100$ m.

Note 1: a_1 may exceptionally be a negative number. In that particular case a code designation of eg. 49-52 \equiv -100-200 would indicate that the weighing instrument had been adjusted for a mean g value in the zone between latitudes 49° and 52° and altitudes -100 m to +200 m.

Note 2: In addition to the code designation in the form $\varphi_1 - \varphi_2 \equiv a_1 - a_2$ a manufacturer is allowed to present additional qualifying information concerning the place (region) of use (eg. a defined city or the administrative territory like a department, province, region, etc) provided that the latter is completely located in the gravity zone specified by the latitude and altitude values φ_1 , φ_2 and a_1 , a_2 , respectively.

The identification may be presented by an inscription or any document accompanying the weighing instrument, or be available on the display by a procedure described in the operating manual.

Requirements for securing of adjustment devices

Existing requirements for securing of adjustment devices apply equally to gravity compensating or correcting devices, including the indication of the gravity information on the display. Details are to be mentioned in the type approval certificate of the weighing instrument.

Practical Procedure, Example

- Given the following weighing instrument to be EC verified:
Retail scale, Class III, $Max = 15$ kg, $e = d = 5$ g, $n = 3000$, $mpe (Max) = 1.5 e$
- The EU verification shall be carried out in one stage at the manufacturer's works that are assumed to be located in Braunschweig, $\varphi = 52.3^\circ$, $a = 80$ m, the g value for Braunschweig being
 g (Braunschweig) = $9.812\ 484$ m s⁻²
calculated with Eq. (2).
- The designated place of use shall be Uppsala in Sweden with $\varphi = 59.9^\circ$
and $a = 150$ m (estimated values using a map).
- The manufacturer chooses the following gravity zone according to the rules mentioned in Section **Error! Reference source not found.** which comprises the designated place of use:

$$59-61 \equiv 0-500$$

Therefore, the boundary values are $\varphi_1 = 59^\circ$, $\varphi_2 = 61^\circ$, $a_1 = 0$ m, $a_2 = 500$ m.

- With the mean values of geographical latitude and altitude,

$$\begin{aligned}\varphi_m &= 1/2 (\varphi_1 + \varphi_2) \\ &= 60^\circ \\ a_m &= 1/2 (a_1 + a_2) \\ &= 250 \text{ m}\end{aligned}$$

and the maximum variations

$$\begin{aligned}\Delta g_\varphi &= 1/2 |g(\varphi_1, a_m) - g(\varphi_2, a_m)| \\ &= 0.000\ 785 \text{ m s}^{-2} \\ \Delta g_a &= 1/2 |g(\varphi_m, a_1) - g(\varphi_m, a_2)|\end{aligned}$$

= 0.000 771 m s⁻²
and the reference value

$$g_R = g(\varphi_m, a_m)$$

$$= 9.818 399 \text{ m s}^{-2}$$

it is confirmed that condition (1a) is met:

$$n (\Delta g_p + \Delta g_a) / g_R \leq mpe / 3e$$

$$3000 (0.000 785 + 0.000 771) / 9.818 399 \leq 1.5 e / 3 e$$

$$0.48 \leq 0.5$$

- Finally, in the last phase of the EU verification in Braunschweig, the retail scale is adjusted to the calculated reference value g_R .

References

/1/Bulletin OIML No 94, 1984, 23-25; supplemented by:
Bulletin OIML No 127, 1992, 45

/2/Kohlrausch, F.: Praktische Physik, Band 1, 24. Aufl., Stuttgart: Teubner 1996

2.2.3 Design and construction

NAWI's installed in ships

Additional sensors

Specially designed gravity compensated scales may incorporate two load cells. The additional load-cell, if any, shall not necessarily be identical to that of the NAWI. The equipment shall be such that requirements about 'g' variations are fulfilled. The same principle applies for tilt compensation and for acceleration.

g-compensation

Minimum value for g-compensation is $\pm 3 \text{ m/s}^2$ unless the instrument display is blanked out, and the print-out and data transmission is inhibited at a lesser value.

g-test:

- g-test is performed dynamically;
- with test loads near zero, near Max and if the number of scale divisions is higher than 500 e, at a load near but lower than 500 e;
- If no limiting value for g-compensation is specified, g-test should be carried out up to $\pm 3 \text{ m/s}^2$ or, where the instrument display is blanked out at a lower value, g-test should be carried out up to this limited value, and
- g-test shall be performed with a frequency that doesn't exceed 0.3 Hz.
During g-test, accuracy of zero setting and tare setting devices shall be tested.

Minimum value for tilt – Tilt test

Tilt testing should be carried out up to 25% (15 degrees) unless the instrument display is blanked out, and the print-out and data transmission is inhibited at a lesser value. When a tilt-sensor is regarded as a module, the pi factor shall be determined at the type approval stage.

Where a sensor (measuring the tilt angle) is used to compensate the effect of tilting on the weighing result, the sensor is regarded as an essential part of the weighing instrument. It should therefore be submitted to the essential tests such as temperature, humidity and EMC, during the approval procedure.

Tilt tests shall be introduced into "standard" tests as follows:

- at each temperature, at each step of humidity test, the equipment shall also be tested to a tilted position; only one direction of tilt is necessary; 3 test loads shall be applied, i.e. near zero, near Max and if the number of scale divisions is higher than 500 e, at a load near but lower than 500 e.
- EMC tests are performed with one tilted position with one load near 500 e, not necessary with a small test load (to optimize tests costs and duration)
- If no limiting value for tilt is specified, tilt-tests should be carried out up to 25% (15 degrees) or, where the instrument display is blanked out at a lower value, tilt-tests should be carried out up to this limited value.

Remark: As EMC tests may only be performed with tilted position with greater test load, there is a risk that the cause of a failed test is not known (i.e. either the weighing device or the tilt compensation device).

Test of behaviour of tilt compensation device in dynamic mode

A test of behaviour of tilt compensation device in dynamic mode shall be performed in the following conditions:

- with 3 test loads, i.e. near Min, near Max and with a load near to but lower than 500 e
- with an amplitude of the dynamic tilt of 25% or the limiting value once in transversal direction and once in longitudinal direction
- with a frequency between 0,03 Hz and 0,3 Hz.

Tare weighing test in dynamic mode

A tare weighing test shall be performed during g-test in dynamic mode with a tare value close to 1/3 of Max with tests loads of [Max-T] and if applicable with tests loads of [500 e -T].

Additional examination and testing for EC declaration of type conformity or for EC verification shall be:

- correct operation of the tilt sensor at different tilt angles but only one tilting direction
- In case of tilt switch which inhibit the indication and printing of weighing results it should be checked inhibition of displaying and printing weighing results when the maximum degree of tilting is exceeded. The same may be applicable to instruments using a tilt sensor if the indicator uses the signal of the sensor not only to compensate errors but also to decide whether the maximum tilting is exceeded and thus the displayed weight value has to be blanked out.
- tilt test like in R76/2006 A.5.1.3 or if available as described within the type approval certificate
- dynamic test with acceleration close to - 3 m/s² and to + 3 m/s² with test load close to Max with appropriate frequency ($\leq 0,3$ Hz).

In service control and periodical verification shall be dealt with nationally.

(Supersedes 3.3 of WELMEC 2: 2015)

2.2.3.1 General requirements

Class I instruments – restrictions on use

Clause 4.1.2.4 of EN 45501:2015 states that: “On a class I instrument, devices to adjust sensitivity (or span) may remain unsecured.”

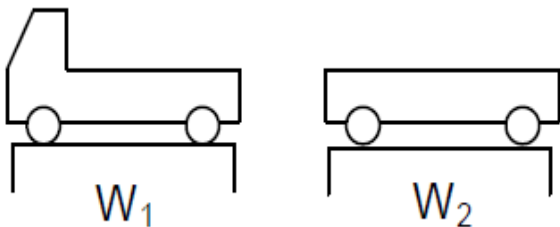
It is accepted that such an instrument complies with the essential requirements, but that a restriction on the use of such instruments for certain applications, e.g. commercial transactions, can be handled in national legislation.

2.2.3.2 Indication of weighing results and other weight values

Weight obtained by using adjacent weighbridges

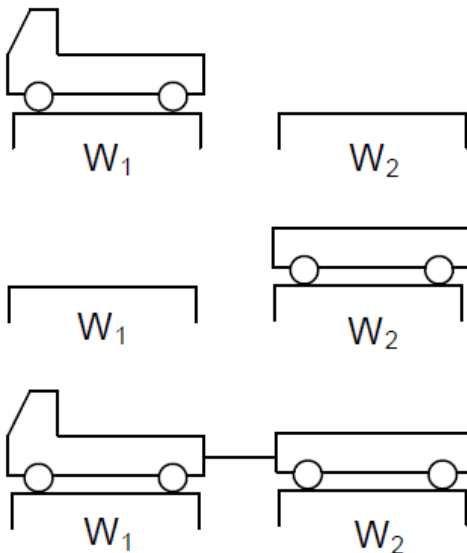
This concerns weight obtained by using adjacent weighbridges. Acceptable solutions, with examples, are shown below:

- Two weighbridges, each with its own indicator:



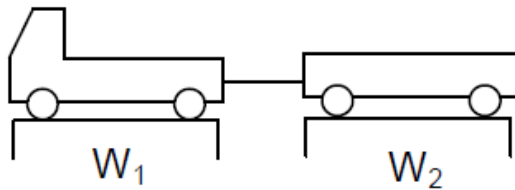
$W_1 = 30 \text{ t} \times 10 \text{ kg}$
 $W_2 = 30 \text{ t} \times 10 \text{ kg}$
 (Two indicators; simultaneous indication necessary)
 Calculated weight $60 \text{ t} \times 10 \text{ kg}$
 (mpe does not apply to calculated weight)

- Multi-plate weighbridge with one indicator:



$W_1 = 30 \text{ t} \times 10 \text{ kg}$
 $W_2 = 30 \text{ t} \times 10 \text{ kg}$
 $W_1+2 = 60 \text{ t} \times 20 \text{ kg}$
 W_1+2 is a weighing range (Compatibility of modules and mpe must be satisfied for it)

The configuration of two weighbridges, each with its own indicator is not considered to be acceptable when used in the following manner:



(Supersedes 3.1.16 of WELMEC 2: 2015)

2.2.3.3 *Printing of weighing results and other weight values*

With respect to printing under Min for instrument for direct sales to the public see the guidance given at 2.2.3.8.

2.2.3.4 *Levelling*

2.2.3.4.1 *Tilt testing of vehicle mounted NAWI*

No guidance.

2.2.3.5 *Zeroing*

No guidance.

2.2.3.6 *Tare devices and preset tare devices*

2.2.3.6.1 *Preset tare*

The EN 45501:2015 reads in the first paragraph of 4.13.4: A preset tare device may be provided if the preset tare value is indicated as a primary indication on a separate display which is clearly differentiated from the weight display.

It is not acceptable to indicate preset tare values on weighing instruments for direct sales to the public without having a separate display, even when the primary indications are shown long enough for the customer to read them properly or when all primary indications are printed clearly, unambiguously and conveniently arranged on a ticket or label for the customer.

This would be confusing to customers and would therefore not meet Essential Requirement 14 of Annex 1 of the NAWI Directive.

2.2.3.7 Instruments for direct sales to the public, with a maximum capacity not greater than 100 kg: additional requirements.

With respect to printing under Min see the guidance given at 2.2.3.8.

2.2.3.8 Price labelling instruments

Point 15 of the Annex I of the NAWI-directive 2014/31/EU states the following:

“Price labelling instruments shall meet the requirements of price indicating instruments for direct sale to the public, as far as applicable to the instrument in question. The printing of a price label shall be impossible below a minimum capacity”.

According to Annex I of the NAWI-directive the terminology used in annex I of the NAWI-directive is that of the International Organization of Legal Metrology.

According to OIML R76 the definition of a Price-labeling instrument (T1.2.9) is: A price-computing instrument that prints the weight value, unit price and price to pay for prepackages.

Therefore the essential requirement in point 15 of annex I is only applicable to non-automatic weighing instruments that print the weight value, unit price and price to pay for prepackages.

This essential requirement is not applicable to other non-automatic weighing instruments, in particular price-computing instruments used for direct sales to the public.

Related with this is the suitability for use which is typically covered by National Law. Suitability of use is typically interpreted so that a non-automatic weighing instrument should not regularly be used under Min, weighing under Min should be an exception.

2.3 Annex III – Inscriptions

2.3.1 Instruments intended to be used for the applications listed in points (a) to (f) of Article 1(2)

No guidance.

2.3.2 Instruments not intended to be used for the applications listed in points (a) to (f) of Article 1(2)

No guidance.

2.3.3 Restrictive use symbol referred to in Article 18 [Red M]

Class I and II: Mode of operation not in conformity with the directive and use of Red M

Instruments having a mode of operation not in conformity with the Essential Requirements and use of “red M”. The following example provides an acceptable solution:

Class I and II instruments which are not to be used for direct sale to the public may include an indication of weight based on a % value which does not meet the Essential Requirements provided that the restrictive use symbol (“red M”) referred to in Article 12 of the Directive is illuminated whenever the % mode is in operation.

The manufacturer declares in the operator's manual that the % mode of operation is not available for 1.2(a) applications under the Directive.
However, this concept is not considered acceptable for Class III or Class IIII instruments.

(Supersedes 3.1.7 of WELMEC 2: 2015)

3 Decisions of common application for 2014/32/EU (Measuring Instruments Directive)

The following is a list of decisions reached by WELMEC Working Group 2 (WG2) of common application under Directive 2014/32/EU, in respect to the following:

- Annex I, Essential Requirements
- Annex VIII, Chapters I to VI, Automatic Weighing Instruments (MI-006)
- Annex XI, Chapters I and IV, Multi-Dimensional Measuring Instruments (MI-009)

3.1 Annex I: Essential Requirements

3.1.1 Allowable errors

No guidance.

3.1.2 Reproducibility

No guidance.

3.1.3 Repeatability

No guidance.

3.1.4 Discrimination and sensitivity

No guidance.

3.1.5 Durability

No guidance.

3.1.6 Reliability

No guidance.

3.1.7 Suitability

No guidance.

3.1.8 Protection against corruption

No guidance.

3.1.9 Information to be borne by and to accompany the instrument

No guidance.

3.1.10 Indication of result

No guidance.

3.1.11 Further processing of data to conclude the trading transaction

No guidance.

3.1.12 Conformity evaluation

No guidance.

3.2 Annex VIII: Automatic Weighing Instruments (MI-006)

3.2.1 Definitions

When classifying an automatic weighing instrument as either an automatic Catchweigher or an automatic gravimetric filling instrument, it is important to determine if the instrument prints or stores an actual weight or if it fills to a predetermined load. Where the instrument in question prints or stores an actual weight to be used for a regulated use (for example commercial transactions) then it is an automatic catchweigher (weight labeler). Alternatively, the actual weights could be printed or stored for management purposes only, in which case the instrument would be a filling instrument provided that the bag/pack that is filled is marked with the nominal (predetermined) weight and not the actual weight.

Clarification from discussion at Meeting 38:

- Definitions from 2014/32/EU:
 - Automatic catchweigher: „An automatic weighing instrument that determines the mass of pre-assembled discrete loads (for example prepackages) or single loads of loose material”
 - Automatic checkweigher: “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.”
 - Automatic gravimetric filling instrument: „An automatic weighing instrument that fills containers with a predetermined and virtually constant mass of product from bulk.”
- Additional information for Automatic gravimetric filling instruments from:
 - OIML R61-1, edition 2004 (superseded in 2017, see below), No. 3.3.3, 3rd paragraph: “Any printout is for information purposes only and not for use in any commercial transaction, except preset values and number of weighing’s.”
 - This is no longer included in OIML R61-1, edition 2017.

3.2.2 Chapter I – Requirements common to all types of automatic weighing instruments

3.2.2.1 Rated operating conditions

No guidance.

3.2.2.2 Permissible effects of disturbances – Electromagnetic environment

No guidance.

3.2.2.3 Suitability

No guidance.

3.2.2.4 Conformity assessment

No guidance.

3.2.3 Chapter II – Automatic catchweighers

3.2.3.1 Accuracy classes

No guidance.

3.2.3.2 Category X instruments

No guidance.

3.2.3.3 Category Y instruments

No guidance.

3.2.3.4 MPE

No guidance.

3.2.3.5 Measurement range

No guidance.

3.2.3.6 Dynamic setting

No guidance.

3.2.3.7 Performance under influence factor and electromagnetic disturbance

No guidance.

3.2.4 Chapter III – Automatic Gravimetric Filling Instruments

3.2.4.1 Accuracy classes

No guidance.

3.2.4.2 MPE

No guidance.

3.2.4.3 Performance under influence factor and electromagnetic disturbance

No guidance.

3.2.5 Chapter IV – Discontinuous Totalisers

3.2.5.1 Accuracy classes

No guidance.

3.2.5.2 MPEs

No guidance.

3.2.5.3 Totalisation scale interval

No guidance.

3.2.5.4 Minimum totalised load (Σ_{min})

No guidance.

3.2.5.5 Zero setting

No guidance.

3.2.5.6 Operator interface

No guidance.

3.2.5.7 Printout

No guidance.

3.2.5.8 Performance under influence factor and electromagnetic disturbance

No guidance.

3.2.6 Chapter V – Continuous Totalisers

3.2.6.1 Accuracy classes

No guidance.

3.2.6.2 Measurement range

No guidance.

3.2.6.3 MPE

No guidance.

3.2.6.4 Speed of belt

No guidance.

3.2.6.5 General totalisation device

No guidance.

3.2.6.6 Performance under influence factor and electromagnetic disturbance

No guidance.

3.2.7 Chapter VI – Automatic Rail Weighbridges

3.2.7.1 Accuracy classes

No guidance.

3.2.7.2 MPE

No guidance.

3.2.7.3 Scale interval (d)

No guidance.

3.2.7.4 Measurement range

No guidance.

3.2.7.5 Performance under influence factor and electromagnetic disturbance

No guidance.

3.3 Annex XI, Chapters I and IV - Multi-dimensional Measuring Instruments (MI-009)

3.3.1 Chapter I – Requirements common to all dimensional measuring instruments

3.3.1.1 Electromagnetic immunity

No guidance.

3.3.2 Chapter IV – Multidimensional measuring instruments

3.3.2.1 Operating conditions

No guidance.

3.3.2.2 MPE

No guidance.

4 Revisions of this guide

Issue	Date	Significant changes from previous issue
7	January 2014	Total revision of the guide. Implementing the directives: 2014/31/EU and 2014/32/EU

End of Guide