

WELMEC

European Cooperation in Legal Metrology

Directive 2009/23/EC: Common Application

Non-automatic weighing instruments



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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Foreword

This revised guide is intended to provide guidance to all those concerned with the application of Directive 2009/23/EC of the European Parliament and of the Council of 23 April 2009 on non-automatic weighing instruments (NAWIs) (Codified version).

This Guide provides a record of the continuing work of WELMEC Working Group 2 in the area of the common application of the Directive itself and in addition seeks to provide information which is specific to individual member countries.

This Guide was previously based on the Council Directive 90/384/EEC, as amended by Directive 93/68/EEC.

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 EC 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.

The 2015 version of this guide (successor of issue 6) incorporates decisions made at meetings 35 and 36 of WELMEC WG2 and also makes some editorial corrections to the text of Issue 6. Section 3.1.33 has also been deleted to remove a contradiction with the new version of the 'Blue Guide'. Due to a decision by WG2 to change the guide structure, The 2015 version of this guide has been developed as an 'interim' guide so wholesale changes, e.g. to reflect the revised version of EN 45501, have not been made.

EN 45501 and R 76:

When Issues 1 to 5 of this guide were produced, the European Standard EN 45501 and the OIML Recommendation R 76 1 had almost identical text and section numbers. There were many references in this guide to sections of EN 45501/R 76, but a revised version of R 76 was published in 2006 and, at the time of the publication of Issue 6 of this guide, the revised version of EN 45501 has not yet been published.

References to EN 45501/R 76 in this guide were therefore replaced by just EN 45501 in Issue 6, and the references applied only to the version of EN 45501 published in 1992 and amended in 1994. This approach has been retained in the 2015 version (see above).

1 EC type approval certificate (TAC) and certificate number format

A draft document covering the requirements of Directive 2009/23/EC Annex II.1.4. is shown for the EC type-approval certificate. It is intended that the document contains the Certificate, preferably on a single page, followed by the Descriptive Annex.

The structure presented below is an example of what is considered to be a suitable format; however, other structures may be applied.

EC TYPE APPROVAL CERTIFICATE NO

(name and designation of the type)

[**Note:** although this is given further down the page, the repetition was considered an aid to clarity]

Issued by (Name of Notified Body)
(address - optional)

in accordance with (Regulation implementing Directive

issued to (manufacturer and/or authorised agent holding approval, name and address)

in respect of (name and type of instrument, brief detail of characteristics; for example, for a weighing instrument: accuracy class, Max, Min, e, temperature range (if different from -10 °C to +40 °C))

valid until (date)

The principal characteristics, approval conditions and special conditions, if any, are set out in the Appendix hereto, which forms part of the approval documents and consists of ... pages.

Signature:

Name and address of Notified Body:

DESCRIPTIVE ANNEX TO EC TYPE APPROVAL CERTIFICATE NO....

- 1 Name and type of instrument
- 2 Functional description of the instrument (including photographs, schematic views, exploded views, a list of devices etc.)
- 3 Technical data (including Table of load cells and list of drawings of mechanical construction)
- 4 Peripheral devices and interfaces
- 5 Approval conditions (for example: special inscriptions)
- 6 Special conditions for verification
- 7 Location of seals and verification marks
- 8 Location of CE mark of conformity and inscriptions

CONTENT OF DOCUMENTATION TO BE HELD BY THE NOTIFIED BODY

- 1 Product specification
Contents: Description
 Drawings
 Block diagrams
 Flow charts
 Circuit diagrams
- 2 Examination report
(including an explanation of how the Essential Requirements are to be met)
- 3 Test results

NAWI EC Type Approval Certificate Number Format

The following table shows the form of the certificate identification numbers.

Country	Number Format	Remarks
AUSTRIA	A 0445/XXXX/YYYY	(A XXXX/YY before 2006)
BELGIUM	B-YY-MMMXXX	-
BULGARIA	BG_1YYXX	BIM, NB 1957, 1 = NAWI
	BG – TAC – XXX/ D.M. YYYY	Megacommerce Ltd., NB 1863
CYPRUS	CY-YY-XX	-
CZECH REPUBLIC	TCM 128/YY-XXXX	128 = NAWI
DENMARK	DK 0199.XXXX DK 0200.XXXX	0199 & 0200 = Notified Body Number
ESTONIA	-	-
FINLAND	FI YY.1.X	1 = NAWI Before 1 January 1997 was FI X.1.YY
FRANCE	F-YY-A-XXX LNE - XXXX	(until end of 2006) LNE: A = NAWI (from beginning of 2007)
	YY.00.620.XXX.0	SDM: 00 = SDM for legal metrology; 620 = NAWI; 0 = European validity
GERMANY	D YY-09-XXX	09 = NAWI
GREECE	Φ2-XXX/YY	-
HUNGARY	Th-XXXX/Z/YY	-
ICELAND	-	-
IRELAND	IRLXXX/YY	-
ITALY	I YY-XXX	-
LATVIA	-	-
LITHUANIA	-	-
LUXEMBOURG	-	-
MALTA	MT XXX.YY	-
NETHERLANDS	TXXXX	-
NORWAY	NXX/YY	-
POLAND	PL YY XXX	-
PORTUGAL	-	-
SLOVAKIA	SK YY-XXX	-
	SK YY G-XXX	G = in case of EC unit verification
SLOVENIA	SI YY-05-XX	05 = AWI and NAWI
SPAIN	E YY-00-XXX	00 = Centro Español de Metrología (CEM)
	E YY-02-XXX	02 = Generalitat de Catalunya
SWEDEN	S-MMMM XX	-
SWITZERLAND	CH-WV-YYXXX-EE	W1 and W2 = NAWI
UK	UK XXXX	-

Note: YYYY = year; YY = last two digits of year; X→ = sequential numeric identifier; MMM = Manufacturer Number; Z = mailing or revision number, V = sub specification, EE = certificate revision number.

2 Criteria for additions to the EC type approval

2.1 Modifications

The requirements relating to modifications to the approved type are set out in 1.7 of Annex II to the Directive. The Directive requires the applicant to keep the Notified Body who issued the type approval certificate informed of any modification to the approved type.

2.2 Modifications without addition to the EC type approval certificate

Not all modifications to the approved type will require an addition to the EC type approval certificate.

2.3 Replacement of a part, device or sub-assembly

The opinion expressed by the Working Group in general terms is that any replacement of a part, device or sub-assembly etc. which has a function in the measurement path must receive additional approval i.e. load receptor to display and printout.

Where that replacement is of an analogue part this must be tested in addition to receiving approval e.g. load cells, analogue PCBs (including A/D¹ convertors). Test results previously obtained will be taken into account.

¹ A/D convertors: Analogue to Digital convertors

3 Decisions of common application

The following is a list of decisions reached of common application under the Essential Requirements.

3.1 General

Decisions

3.1.1 Stable equilibrium

3.1.1.1 Indication of unstable equilibrium

The use of a flashing units sign, as an indication that the equilibrium is unstable, is only considered acceptable on instruments not intended for direct selling to the public, and then preferably only on instruments for laboratory use.

3.1.1.2 Stable equilibrium test

The test given in Section A.4.12 of EN 45501 is open to different interpretations, and is becoming more of a problem as A/D converters become faster. The manual disturbance should be maintained during initiating the command for printing or data storage. This applies also to the tests of the stable equilibrium of the zero setting and tare devices. A check of the documentation is not considered sufficient.

3.1.2 Calculated weight

Where the indication represents an actual determination of the weight then the indication must respect the error allowance and be presented in the correct format.

When gross, net and tare are printed together, weight may be calculated from two actual determinations of weight. In the case of a multi-interval instrument it would be allowed to print a calculated value with the least significant digit which need not be rounded to the relevant scale interval.

Any printout of the calculated weight values should be identified as calculated weight values.

(See also Sections 3.1.16 and 3.1.53)

3.1.3 Class I instruments; $d < 0.1$ mg

For Class I instruments where $d < 0.1$ mg the instrument need not be marked with differentiated digits where the instruments are used for an Article 1.2(a) application other than indent 1 or indent 6. The limitation should be included in the EC type approval certificate.

3.1.4 Use of slashed zeros

The use of slashed zeros is generally acceptable so long as the presentation is unambiguous.

3.1.5 Unauthorised translations of EC type approval certificates

It is the responsibility of the manufacturer to make the EC Type Approval Certificate (TAC) available in the language necessary to enable EC verification to take place. The manufacturer may make unauthorised translations; however the official version remains the version produced by the Notified Body which granted the EC type approval.

All translations should use the terminology specified in EN 45501. Refer also to the language markings in Section 9.

3.1.6 Load cells

(Note that throughout this guide, "load cells" refers to analogue load cells rather than digital load cells unless stated otherwise.)

3.1.6.1 **Barometric pressure tests for load cells**

Where a load cell design makes it unnecessary to test for the effect of barometric pressure, the test may be declared not applicable and the test certificate shall state the reason for not testing.

3.1.6.2 **Non-humidity (NH) tested load cells**

When using the modular construction route a load cell marked NH may not be authorised for inclusion in a TAC unless humidity testing to EN 45501 has been conducted on the load cell, the complete measuring instrument or the measuring element.

3.1.6.3 **Digital load cells - compatibility forms**

Digital load cells from different manufacturers differ in their interfacing arrangements, and cannot necessarily be exchanged. At present, therefore, compatibility forms should be limited to analogue load cells. Digital load cells should only be approved in combination with their indicators.

3.1.6.4 **R 60 Certificates of Conformity**

Section 1 of Clause A.5 of WELMEC 2.4 is interpreted to mean that, for the modular approach, only R60 Certificates issued by a Notified Body responsible for type examination under Directive 2009/23/EC are acceptable, despite mutual recognition agreements having been made by some Notified Bodies with organisations outside the WELMEC area.

3.1.6.5 **Minimum output dead load return (multi-interval or multiple range)**

The requirement of Section 4.12.2 of EN 45501 is relaxed for multi-interval and multiple range instruments by applying the following formula for minimum dead load output return:

$$Z = \frac{E_{\max}}{(2 DR)} \geq \begin{array}{ll} \text{either} & \frac{\max_r}{e_1} \quad \text{for multi-interval instruments} \\ \text{or} & \frac{0.4 \max_r}{e_1} \quad \text{for multiple range instruments} \end{array}$$

3.1.6.6 **Q-factor in Compatibility forms**

The following was agreed as a possible approach to calculating the approximate Q-factor.

EN 45501 Section 4.12.1 "Maximum capacity of the load cell" states that the correction factor $Q > 1$ considers the possible effects of eccentric loading, dead load of the load receptor, initial zero-setting range and non-uniform distribution of the load. It is used to calculate whether the load cell capacity is sufficient for the purpose, ensuring that the load cell is not overloaded.

In many conventional weighing instruments, where the manufacturer has allowed 2-3 times overload security for the load cell, the Q-factor is unimportant. However, in some types of instrument, for example fork lift scales where the front end load cells can be subjected to overloading, the Q factor is essential as there is a risk of non-uniform distribution of the load. The following formula includes a component for this non-uniform distribution (NUD):

$$Q = \frac{\text{Max} + \text{deadload} + \text{additive tare} + \text{initial zero setting range} + \text{NUD}}{\text{Max}}$$

Typical values for NUD might be 50% of Max for fork lift scales and weighbridges, and 20% of Max for other conventional instruments.

For example, if:

- deadload ~ 20% of Max,
- additive tare ~ 10% of Max,
- initial zero range ~ 20% of Max,
- and NUD ~ 50% of Max (fork lift scale)

then:
$$Q = \frac{\text{Max} + 0.2 \text{Max} + 0.1 \text{Max} + 0.2 \text{Max} + 0.5 \text{Max}}{\text{Max}} = 2$$

3.1.6.7 Hermetically sealed load cells

All load cells that are not marked “NH” must undergo humidity testing, regardless of whether or not they are believed to be “hermetically sealed”.

3.1.6.8 Load cell inaccessible at verification

With many NAWIs, it is not possible to check that the correct load cell has been fitted without partially dismantling the NAWI.

For EC verification, the manufacturer declares conformity and the verifier tests. There is therefore no need for the verifier to inspect the load cell.

Periodic verification or market surveillance comes under national legislation, and conformity to type might, or might not, be covered. The instrument can be opened if there is a suspicion that the incorrect load cell is fitted.

3.1.6.9 Securing of load cell junction boxes

Analogue load cell junction boxes shall be secured, and details of the securing shall appear in the Type Approval Certificate.

Digital load cell junction boxes shall be secured if necessary.

3.1.6.10 Load cell cable length

If a junction box is used, then the load cell cable is defined as the cable from the load cell itself to the junction box, and the indicator is considered to include the cable from the indicator to the junction box.

The temperature compensation circuitry of the load cell is matched to the standard length of cable with which the load cell is manufactured. Where the load cell utilises a 4-wire cable the cable should not be cut, extended or modified, as the temperature compensation may then no longer be correct. A statement to this effect should be included in the Test Certificate (TC) for the load cell.

This guidance does not apply to digital load cells, or to 6-wire load cells used with an appropriate indicator.

3.1.6.11 Load cell cable connected to indicator by plug and socket

Section 8.5 of Annex I of Directive 2009/23/EC requires that components that may not be dismantled or adjusted by the user shall be secured against such actions.

In the case of a load receptor where

- the user does not have access to the load cell cables (realised eg. by a sealed junction box), and
- where the output cable connects to the (sealed) indicator by means of a plug and socket arrangement,

security of the connection is normally considered to be reached if tamper-evident labels are provided on both the load receptor and the indicator having a common serial number or cross reference between the indicator and load receptor that identifies the verified combination that must be used.

The TAC may contain alternative provisions to ensure continued integrity of the combination (eg mechanically coded plugs, identification chip that can be polled, or special sealing provisions).

3.1.7 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.

Note that this concept is not considered acceptable for Class III or Class IIII instruments.

3.1.8 Verification marks

3.1.8.1 Application of green M sticker and red M symbol

Refer to Sections 3 and 10 of WELMEC 2.7 guide (previously WELMEC 5 and then WELMEC 3.1) “Directive 90/384/EEC: Explanation and Interpretation” for further information.

The green M sticker need not physically be a sticker but may be of an alternative form as long as it remains clearly visible, easily legible and indelible.

3.1.8.2 “Green M” stickers, POS systems and peripherals

A weighing instrument may be connected to a POS system which itself may be connected to many devices, for example displays, keyboards, printers cash drawers and barcode scanners. Past advice was that on such a system, when verified, a single “green M” sticker, on the POS itself, would be sufficient, and that if a data storage device was connected, then this should also bear its own “green M” sticker.

However, the WELMEC 2.7 guide makes it clear that this is no longer considered to be correct, and that a single “green M” should be applied to the main weighing instrument only. “Green M” stickers should not be applied to peripherals or to POS hardware.

3.1.8.3 Indicator with “green M”

An indicator should only bear a “green M” if it is part of a verified weighing system. An indicator sold on its own should not therefore bear a “green M” and neither should an indicator being used only for non trade purposes.

3.1.9 AW/NAWI; aid to classification

The following interpretation of the definition of a non-automatic weighing instrument (NAWI) or an automatic weighing instrument (AWI) is intended to be used only when doubt exists in applying the definitions contained in Directive 2009/23/EC and the OIML recommendations.

An instrument capable of performing consecutive weighing cycles without any intervention of an operator is always regarded to be an AWI. If an instrument needs the intervention of an operator, it is regarded to be a NAWI only if the operator is required to determine or verify the weighing result.

Determining the weighing result includes any intelligent action of the operator that affects the result, such as deciding when an indication is stable or adjusting the weight of the weighed product.

Verifying the weighing result means making a decision regarding the acceptance of each weighing result on observing the indication. The weighing process allows the operator to take an action which influences the weighing result in the case where the weighing result is not acceptable.

Note: the necessity to give an instruction to start the weighing process or to release a load is not relevant in deciding the category of instrument.

A weigh-price labeller where the operator places the item on the load receptor, the instrument determines stability and prints a label automatically, and the operator then takes the label, removes the item and affixes the label, is a NAWI.

A filling instrument where the operator places the container on the weighing instrument, the fill is done automatically, and the weighing instrument then displays the filled weight allowing the operator to checkweigh and remove the container, may be considered as a NAWI or an AWI. It was agreed that the applicant should choose, and the Notified Body should then apply the appropriate legislation.

An approved NAWI to which one or more robot operators have been added so that no human operator is now involved, is an AWI.

3.1.10 Identification of software stored on EPROM

For a complete instrument:

- conformity to type is now covered by the declaration of conformity from the manufacturer,
- there is no danger of access by the user to software on EPROM,
- there is no obligation for software identification on EPROM for a complete instrument.

Concerning modules however, there is no declaration of conformity procedure. Therefore where Test Certificates (TCs) are involved there is a need for the identification of software stored on EPROM. Refer to the "Identification of software on EPROM" section of the WELMEC 2.5 guide.

3.1.11 Visibility of CE marking

CE marking addresses the market surveillance bodies of the member states, and aims at facilitating their surveillance tasks by visibly demonstrating conformity. Visibility means that the CE marking is easily accessible for the market surveillance authorities. In exceptional circumstances due to the installation and manner of use of an instrument, this could mean that the CE marking is located on the instrument in a place accessible to the surveillance authorities and that its position is indicated clearly in the TAC.

3.1.12 Currency symbols

The currency symbols to be used on weighing instruments are of the form normally used for trade, examples being shown in Section 8 of this guide. The three letter currency codes commonly used in currency exchange transactions are not acceptable for this purpose in some countries.

3.1.13 Vehicle mounted non automatic weighing instruments

3.1.13.1 Tilt testing

Vehicle mounted non automatic weighing instruments may be tilted to a higher inclination than 5% when used on site. In this case, the requirement for immunity to tilt as set out in Section 7.1 of Annex 1 of Directive 2009/23/EC is not adequately met by an instrument which is inside the mpe only up to a tilt of 5% as required by Section 3.9.1.1 of EN 45501. EC Type Approval will therefore be issued only under the following conditions:

- The manufacturer defines the upper limit of tilting up to which the error of indication, at any load, is within the mpe.
- Tilt testing should be carried out up to 10% unless the instrument display is blanked out, and the print out and data transmission is inhibited at a lesser value. This may be achieved by means of an inclination switch (creating a switch signal at a certain degree of tilting) or an inclination sensor.
- 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. When the sensor is regarded as a module, the pi factor shall be determined at the type approval stage.

- In any case, the correct functioning of a sensor should be checked within the scope of the approval procedure and at the time of verification of every individual instrument. The tilting tests to be performed at verification shall be described within the Type Approval Certificate under "Special conditions for verification". The tests at verification should be performed with a significant load (not necessarily standard weights). The instrument shall be tilted in all four directions. No matter what the degree of tilting is, any displayed weight value shall be within the corresponding error limits. Since tilt sensors often have a non linear behaviour (eg depending on ambient temperature) it should be useful to check the correct operation of the sensor at different tilt angles but only one tilting direction even at verification.
- In the case of tilt switches which inhibit the indication and printing of weighing results it should be checked at verification that they inhibit displaying and printing weighing results when the maximum degree of tilting is exceeded. The same may be applicable to instruments using tilt sensors 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.

Note: This does not apply to retail counter scales which are used for direct sales to the public.

3.1.13.2 Waste collection vehicles

With some of these vehicles it is difficult, or impossible, to perform the normal Eccentricity (eccentric loading) test. If necessary, this test should be performed by other means (for example hanging weights) to produce testing having an effect as close as possible to the requirements of EN 45501 Section 3.6.2. It might, or might not, be possible for the Eccentricity test to be performed on two points instead of the usual four, but the Notified Body issuing the Type Approval Certificate should determine the requirements for both Type Approval and verification.

Obviously the safety of the personnel performing testing is paramount, and the safety requirements of the Machinery Directive are relevant. Directive 2009/23/EC, in Section 8.6 of the Essential Requirements, states that "Instruments shall be designed to permit ready execution of the statutory controls laid down by this Directive". This includes verification.

(See also Section 3.1.13.1)

3.1.13.3 Weighing instruments powered by vehicle supply

EN 45501 does not at present include extra electrical disturbance testing of weighing instruments (or indicators) powered by a vehicle supply. The standards ISO 7637 and ISO 11452 contain suitable susceptibility tests. Notified Bodies performing type approval can recommend that the susceptibility tests in these standards be done, but cannot insist on it.

3.1.14 More than one mode of operation (eg single range, multiple range and multi interval range)

Under 3.3 of Annex 1 of Directive 2009/23/EC, an instrument may contain different modes of operation, for example single range, multiple range and multi interval, provided that there is no interference between the different modes of operation. The following is an example:

0 to 15 kg x 5 g (single range)

0 to 6 kg x 2 g (multi interval range)

6 to 15 kg x 5 g

In this example, selection between the modes only takes place at switch on. The operative range must be clearly identified on the instrument near to, or on, the display.

3.1.15 **Max, Min, e and d, and other markings/inscriptions**

Where the inscriptions Max, Min, e and d are provided near to, or on, the display, it is not necessary for them to be additionally marked on the data plate. (Although EN 45501, in its Section 7.1.3, appears to require that all the descriptive markings be grouped together, Annex IV of the Directive 2009/23/EC solely requires the CE marking and the ID number of the Notified Body to be grouped together.)

In the following table, the different types of “presentation” are as follows:

- A = Data must be presented on a data plate (ie by hardware)
- B = Data may be presented either on a data plate (ie by hardware) or in the display (ie by software). In the latter case the data must be permanently displayed, but it is acceptable for the Max, Min, e (and d if appropriate) to be permanently displayed scrolling sequentially.
- C = Data may be presented either on a data plate (ie by hardware) or in the display (ie by software). In the latter case the data may be displayed on request of the user.

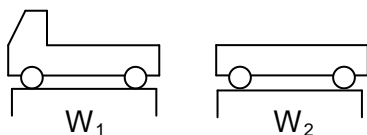
Marking / Inscription	2009/23/EC, Annex IV	Presentation
CE conformity marking	1.1 (a)	A
Year of affixing the CE marking		A
Identification No of Notified Body		A
Green 'M' sticker	1.1 (b)	A
Type Approval Certificate No	1.1 (c)	A
Manufacturer's mark or name		A
Accuracy class		B
Serial number		C
Scale interval d, if $d \neq e$		C
Max. tare effect T (additive, subtractive)		C
Max. safe load <i>Lim</i> (if $\neq Max$)		A
Special temperature limits		B
<i>Max, Min, e, (d)</i> near display	1.4	B

Software containing these markings/inscriptions must be secured from unauthorised access or changes. Details of the markings/inscriptions contained in software must be declared in the TAC.

3.1.16 **Combined and multi plate weighbridges**

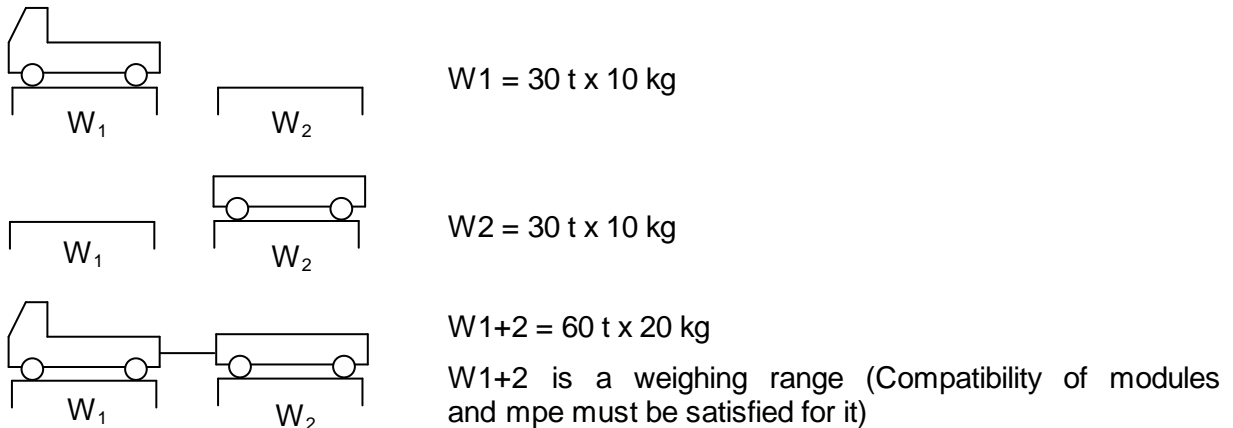
This concerns weight obtained by using adjacent weighbridges. Acceptable solutions, with examples, are shown below:

Two weighbridges, each with its own indicator:

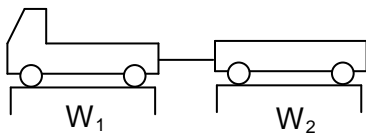


W1 = 30 t x 10 kg
 W2 = 30 t x 10 kg
 (Two indicators; simultaneous indication necessary)
 Calculated weight 60 t x 10 kg
 (mpe does not apply to calculated weight)

Multi-plate weighbridge with one indicator:



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



(See also Sections 3.1.2 and 3.1.533)

3.1.17 Type Approval Certificate - validity date and prolongation

In relation to the validity date of an EC Type Approval Certificate (normally 10 years from date of approval), this original date should remain the validity date even when any additions to, or revisions of, the TAC are issued.

When an application is made to the Notified Body for the prolongation (renewal) of a TAC, it is possible that the guidance given by WELMEC in its guides may have changed since the TAC was issued. Nevertheless, an instrument that complied with Directive 2009/23/EC when the TAC was issued, must still be regarded as complying, regardless of any subsequent WELMEC guidance. Note that for any requirement of the Directive itself that has changed, for example as in the use of Imperial units of weight (see Section 3.1.19 of this guide), the instrument must comply with the present requirement.

However, as the intention of the ten year limit on NAWI approvals was to ensure a reassessment after that time, the Notified Body performing the renewal of the certificate needs to re assess the instrument, although it is possible that this might only be a paperwork exercise.

There is no need for the Notified Body to ensure that the instrument still complies with the original technical documents, as the manufacturer has to declare conformity to the approval for every instrument brought into use. If any modifications to the instrument have been made, then these should have been approved under the existing certificate.

The form of the renewal varies between Notified Bodies. For example it might be a single sheet extending the validity of the certificate, or the entire certificate might be issued with the new validity date, or a new certificate might be issued referring to the old certificate number. Regardless of which method is used, it is essential that all the information remains available.

3.1.18 Weight barcodes

In relation to NAWIs which produce weight barcodes, this must always be in addition to the normal printout of the weight. Only when a POS forms part of a NAWI and manually entered weights (either hand entered or by barcode entry) are accepted must the customer's receipt clearly distinguish those entries from actual weighed entries.

3.1.19 *Supplementary indications*

In Directive 2009/23/EC Annex 1, paragraph 1, the units of mass shall be the legal units within the meaning of Council Directive 80/181/EEC relating to units of measurement.

Subject to compliance with this condition, the following units are permitted:

- SI units: kg; µg; mg; g; t;
- other non SI units: metric carat, if weighing precious stones

Directive 80/181/EEC (as amended) also makes provision for “supplementary indications”, which are defined in Article 3 as “one or more indications of quantity expressed in units of measurement not contained in Chapter I of the Annex accompanying an indication of quantity expressed in a unit contained in that Chapter”. Chapter I contains the SI or metric units.

For supplementary indications in Imperial units on NAWIs which are primarily metric instruments, any method is acceptable, subject to type examination, which:

- meets the requirements of predominance in Directive 80/181/EEC Article 3.4, and
- allows both indications to be seen at the same time.

The reason for the second of these is that Article 3.1 states that the supplementary indication accompanies the metric indication. The supplementary indication could not accompany the metric indication if it replaced, or was in substitution for, the metric indication, even momentarily.

According to Article 3.3 and the last sentence of Article 4 of Directive 80/181/EEC on the approximation of the laws of the member states relating to units of measurement, a member state may require that measuring instruments bear indications of quantity in a single legal unit of measurement and may require the use of legal units on the indicators of measuring instruments.

Attention of manufacturers and notified bodies is drawn to the fact that instruments with supplementary indications in imperial units may be not legally placed on the market and put into service in the member states that have such restrictions in their transposition of the units directive.

Note: It is not possible to renew EC type approval certificates for instruments that have Imperial units as the primary indication as they no longer meet the requirements of Directive 2009/23/EC.

3.1.20 *Portable weighbridges*

Portable weighbridges shall be identified as such in the Type Approval Certificate.

The manufacturer’s declared requirement for the mounting surface for the weighbridge shall be noted in the Type Approval Certificate. If relevant, the user shall be adequately informed.

Suggested additional tests to be performed during type approval:

- At a site agreed with the manufacturer:
 - to examine the evenness of the reference area (all points of support of the bridge are at the same level) and then, to perform an accuracy test and an eccentricity test
 - to realise several reference areas with some different faults in the evenness (values of these faults are to be equal to the limits given by the manufacturer) and then, to perform an eccentricity test for each configuration
- On a particular site of use:
 - to examine the conformity to the requirements for the mounting surface
 - to examine the installation and perform tests to establish conformity to the Essential Requirements of the Directive 2009/23/EC.

3.1.21 Accidental repetition of a weighed item

Some form of interlock is necessary to prevent the accidental repetition of a weighed item. Although the detection of weight disturbance is the ideal form of interlock, any alternative method, such as the necessity of re-entering the Price Look Up (PLU) code, may be acceptable but must be stated in the approval certificate.

3.1.22 Preliminary Observation of Annex I of Directive 2009/23/EC

This 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.

3.1.23 Marking of Test Certificate number on module or peripheral

The marking of the Test Certificate number on a module or peripheral is mandatory. .

Note: This is not applicable if the module or peripheral is described in the weighing instrument's Type Approval Certificate.

3.1.24 Declaration of Conformity

(See also Section 11)

3.1.24.1 Declaration of Conformity and 1.2(b) application

A manufacturer who provides a Declaration of Conformity for an instrument which can only be used for a 1.2(b) application is implying that the instrument meets the technical requirements leading to the application of the CE marking. This is misleading and incorrect, and contrary to the provisions of the Directive.

3.1.24.2 Declaration of Conformity - manufacturer's responsibility

Under the New Approach Directives such as 2009/23/EC, it is the manufacturer who draws up the Declaration of Conformity and not the Notified Body. The Declaration of Conformity is for production control and not for verification or approval.

Although, obviously, the Declaration of Conformity must relate to the type of instrument concerned, it is not necessary for it to reflect the actual type covered by revisions or additions to the Type Approval Certificate, as it might not be practical to update the Declaration of Conformity after every revision or addition.

The manufacturer may affix the CE mark, year and green M before the conformity assessment has been done, as these markings only become valid when all the conformity procedures have been completed.

The manufacturer remains responsible for completing conformity assessment.

3.1.24.3 Declaration of Conformity - compatibility documents

Each time a Type Approval Certificate is issued that takes advantage of the modular approach, the Notified Body issuing it should repeat a clear message to the manufacturer that special attention should be given to the necessary compatibility documents to be prepared.

Manufacturers need to remain aware of the responsibility they bear in this respect.

3.1.25 Weighing of liquids used in air conditioning

If a country has legislation which controls the recording of amounts of air conditioning liquid used or discarded, and if this is done by using non automatic weighing instruments, then these instruments must be controlled.

3.1.26 Sealing arrangements - footprints

Directive 2009/23/EC states that “components that may not be dismantled or adjusted by the user shall be secured against such actions.” Tamper resistant screws are not, on their own, sufficient, as the breaking of a seal should leave a “footprint”.

3.1.26.1 Securing of load receptors by unambiguous identification

In such cases the security against dismantling is to provide non removable labels on both the load receptor and the indicator having a common serial number or cross reference between the indicator and load receptor that identifies the verified combination that must be used. The deliberate opening of a connector to insert components, or the cutting of a cable, could be considered as fraud, and that no special protection against it was needed.

3.1.27 Test Certificates for software

Test Certificates for NAWI software may only be issued to the WELMEC 2.3 guide. Test Certificates for free programmable PC based POS modules including software may only be issued following software examination in accordance with the WELMEC 2.3 guide.

(The WELMEC 7.1 and 7.2 guides do not apply to NAWIs, and software examination to only the Essential Requirements of Directive 2009/23/EC is not considered sufficient.)

Type approval certificates for free-programmable NAWIs, or Test Certificates for free-programmable POS hardware, must either include details of the software or must refer to specific Test Certificates for the software. Test Certificates for POS systems should now only be issued for the combination of hardware and software, as described in the WELMEC 2.2 guide Issue 3.

3.1.28 CE marking - year of affixing

Directive 2009/23/EC, amended by Directive 93/69/EEC, says that the instrument must bear the last two digits of the year in which the CE marking was affixed.

It is not acceptable for the year to be shown as four digits.

3.1.29 Electrical testing and high resolution mode

During the disturbance tests, it is the performance of the instrument in normal operating mode that is usually the main concern. If possible, therefore, any special high resolution mode ($d < e$) should be switched off for these tests.

However, when testing an indicator, it may be advantageous to perform these tests in high resolution mode.

3.1.30 Multiple indicators in a Type Approval Certificate

It is not acceptable for an EC Type Approval Certificate to allow any unnamed indicator having a Test Certificate to be used.

It is acceptable for several different indicators (not necessarily related or even from the same manufacturer), each having its own Test Certificate, to be included in one EC Type Approval

Certificate as long as the Type Approval Certificate names the indicators and their Test Certificate numbers.

3.1.31 Disabled buttons

The tare, print, or any other approved function button may be disabled without this possibility being mentioned in the type approval certificate.

3.1.32 Non weighing weight values on print outs

If a print out includes weight values that are not the direct result of the weighing operation, then these must be clearly marked to differentiate them from the weighing results.

3.1.33 Verification - recording of results

It is common practice for the Notified Body performing testing for EC verification to record the test results, but this is not mandatory unless the Notified Body has a quality system that insists on it.

If, as a result of testing, the Notified Body decides not to complete the verification, the reason for rejection must be given to the applicant. The Notified Body should preferably also supply the test results to the applicant, although this is not mandatory.

3.1.34 Digital indicators

Annex 6 to the WELMEC 2.1 guide (Issue 4) "Computer used as indicator" should also apply to purely digital weighing indicators.

3.1.35 Multiple range NAWI automatic changeover at $Max_i + 9e$

On a multiple range NAWI, EN 45501 Section 4.10 allows automatic changeover "from a smaller to a greater weighing range when the load exceeds the maximum gross weight of the range being operative" (Max_i).

However, EN 45501 Section 4.2.3 states that "there shall be no indication above $Max + 9e$ ", obviously allowing indications up to $9e$ above Max .

Although it is preferable for a multiple range NAWI with automatic changeover to change from a smaller to a greater weighing range when the load exceeds Max_i , it is acceptable for it to change at $Max_i + 9e$ (or any intermediate value) if this is clearly stated in the Type Approval Certificate.

3.1.36 Euro price rounding

New type approvals for price computing instruments using the Euro currency should only be issued for instruments that calculate and display in 0.01 Euro increments.

Some already approved instruments have been converted from national currencies to the Euro and cannot show the price in 0.01 Euro increments. This is a national enforcement matter, but it might be considered acceptable for these instruments to be tolerated until they can either be modified or replaced.

3.1.37 Automatic self calibration

The process used by an instrument having an internal calibration weight, to calibrate itself while its load receptor is mechanically disconnected, is not considered to be zero setting, and this mechanism is therefore not considered to be an automatic zero setting device.

3.1.38 Postal NAWIs

A postal NAWI used by an organisation (eg a company) to weigh letters/parcels that are then stamped by that organisation, rather than by a postal service, are not regarded as being used in a 1.2(a) application.

3.1.38.1 Revision of a TAC to include postal NAWIs: need for testing at a Min of 5 e

The TAC for a Class III NAWI, tested and certified with a Min of 20e, can be revised to permit use of the NAWI as a postal scale, with a Min of 5e, without the need for additional metrological testing (during EC type-examination) at a Min of 5 e.

3.1.39 Number of scale intervals for NAWI and for module

When testing a complete weighing instrument, the maximum number of scale intervals authorised in the Type Approval Certificate shall be based on the results obtained during the testing of the complete instrument irrespective of the components in its manufacture. The Notified Body issuing the Type Approval Certificate shall agree with the applicant the technical documentation needed to support the application for type approval.

When using the modular approach, the number of scale intervals authorised in a Type Approval Certificate for an instrument shall not be greater than the number of intervals for which the module having the lowest number of intervals is certified.

3.1.40 Weighbridges below 10 °C

Weighing equipment must not be used at temperatures outside its approved temperature range, but it would be possible for an approval to be granted for temperatures lower than 10 °C if supported by the necessary testing.

An alternative acceptable solution is to provide load cell heaters and for the indicator to be positioned inside a heated kiosk, to ensure that all the weighing equipment remains within its approved temperature range

3.1.41 Data storage device having Test Certificate

For a data storage device having a Test Certificate, if advantage is to be taken of the modular approach of the WELMEC guides, then the following text must be in the Test Certificate:

“A data storage device (DSD) having a Test Certificate (TC) may be connected to a NAWI if, at conformity assessment for putting into service for an Article 1.2(a) application, it is checked that the requirements 6.1, 6.2, 6.4, 6.5 and 6.6 of WELMEC 2.5 are met.”

This text may also be put into the Type Approval Certificate (TAC) if thought necessary.

3.1.41.1 Data storage devices

In many cases the data storage device (DSD), and the connected software for invoicing and other things, are produced by a company other than the scale manufacturer. The NAWI may have been EC-verified and the DSD connected later on.

If the DSD is necessary at initial verification, then verification cannot be done without it. However, if the instrument is verified without the DSD, and the DSD is subsequently added, then the decision on whether this is a “new instrument” comes under national legislation.

3.1.42 Warm up time test : EN 45501 Section A.5.2

EN 45501 Section A.5.2 states that “an instrument using electric power shall be disconnected from the supply for a period of at least 8 hours prior to the test”. This period of disconnection must not be reduced to a smaller time.

Every individual measurement, taken 0, 5, 15 and 30 minutes after switch on, shall be corrected for the zero error at that time, and not for the zero error taken immediately after switch on.

3.1.43 Span stability test : EN 45501 Section B.4

It is not necessary for all of the performance tests to be done within 28 days. However, the temperature test, the damp heat test, and the two periods in which the instrument is disconnected from its supply, must all be within this 28 day period.

The minimum number of eight measurements shall be distributed fairly evenly over the 28 days, and not accumulated into one or two days.

3.1.44 Accuracy of zero and tare setting : EN 45501 Sections A.4.2 and A.4.6

These tests shall be performed by loading the instrument to an indication as close as possible to a switch over point, then initiating the zero setting or tare balancing function, and checking for accurate zero (within 0.25 e).

3.1.45 Eccentricity (eccentric loading) test : EN 45501 Section A.4.7

The indication at each measurement shall be corrected for the zero error determined immediately prior to the measurement.

3.1.46 Disturbance tests : EN 45501 Section B.3

All tests shall be conducted with only one test load, instead of two different test loads.

Prior to any test, the internal error of indication shall be set as close as possible to zero: the allowed variation of up to 1 e will then actually correspond to an analogue error of 1.5 e.

If there are interfaces on the instrument, an appropriate peripheral device shall be connected during the tests.

3.1.47 Level indicator - limiting value : EN 45501 Section 3.9.1.1

The "Note" to EN 45501 Section 3.9.1.1 shall be interpreted such that on a bubble level, the "limiting value of tilting" shall always be a displacement of 2 mm of the bubble, irrespective of the radius of a ring which might indicate the centre of the level. (R 76 already includes this interpretation.)

3.1.48 Immunity of interfaces : EN 45501 Section 5.3.6.1

No physical test procedure is available to verify compliance with the requirements of Section 5.3.6.1. Therefore a specific declaration of the manufacturer is considered sufficient.

3.1.49 Significant fault detection : EN 45501 Sections 4.14.9 and 5.2

As this is purely optional, the documentation should contain information about the form of the reaction to the detection of a fault. Confusion with other error messages, display blanking etc should be avoided.

No tests to trigger these reactions are intended.

3.1.50 Securing of access to service functions via menu

Service functions which may be used to modify metrological parameters or the adjustment of the instrument must be secured, for example by a dip switch which is secured, and may not be accessible by password unless it automatically becomes evident that a change has taken place (eg automatically displaying a new code number on switch on after each change has taken place which can be compared with a durably marked code number on the data plate representing the last set-up).

3.1.51 Marking of range of tare device : EN 45501 Section 7.1.2

If the maximum subtractive tare effect is equal to Max, or is equal to the actual range of indication (which may be up to Max + 9 e), then it need not be mentioned on the descriptive plate.

3.1.52 EMC Report lacking measuring instrument results

An EMC Test Report issued by an accredited laboratory, and submitted to a Notified Body for consideration in its examination of an instrument, should include test values, and not simply conclusions. For example, it is not sufficient for the report simply to state that the test was passed, or that the difference between the indications with and without the disturbance did not exceed e.

The scope of the accreditation must include EN 45501 and/or R 76.

It is recommended that Test Reports follow the format of R 76 2.

Note also the requirement of Section 3.1.466 for the instrument to be set into the mid point of the scale interval for these tests.

3.1.53 Vehicle weighing by summation of individual wheel load NAWIs (“axle weighers”)

If the total weight of a vehicle is calculated automatically by summing the individual weight values produced by individual wheel load NAWIs (“axle weighers”), the system is not to be regarded as being one single NAWI. The mpe does not apply to calculated weight.

(See also Sections 3.1.2 and 3.1.16)

3.1.54 Body mass indicators

Body mass indicators are used for medical diagnosis of human patients and, although primarily intended to calculate the Body Mass Index of the patient, measure and display the weight of the patient.

Body Mass Index (BMI) = the weight in kg divided by the square of the height in meters.

If a BMI indicator is used for medical diagnosis and displays and/or prints the weight, then it requires approval under the NAWI Directive. This need for approval cannot be avoided by having a label near the display of weight saying that this weight is not to be used for diagnosis.

A BMI indicator that measures the weight, but does not display or print it, is not regarded as being a weighing instrument and does not require approval under the NAWI Directive, even if it is used for medical diagnosis.

3.1.55 Display of preset tare for direct sales to the public

The EN 45501:1992 reads in the first paragraph of 4.14.4: 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.

3.1.56 GPS device to adjust calibration

The concept of a vehicle-mounted weighing instrument, using a GPS (Global Positioning System) device and a gravity database to adjust its calibration would be acceptable if the Notified Body concerned could be sure that the system is secure.

3.1.57 Retail NAWI or POS with totalisation - requirement for printer

Directive 2009/23/EC states, in its Annex 1, Clause 14:

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

...

Price computing instruments may perform functions other than per-article weighing and price computation only if all indications related to all transactions are printed clearly, unambiguously and conveniently arranged on a ticket or label for the customer.

Therefore, a price computing NAWI (or POS) used for direct sales to the public which may also perform functions other than per-article weighing and price computation, for example totalisation, must produce a printout for the customer. Section 14 of the Essential Requirements (Annex 1) of the NAWI Directive is relevant.

If the printer is unable to print out the data relating to the totalising, then the totalising feature should be inhibited.

Further clarification on this subject is provided below:

1. *According to clause 14, 4th paragraph, of directive 2009/23/EC, printing is mandatory for price-computing instruments (for direct sales) that may perform functions other than per article weighing and price computation.*
2. *The initialisation of the (mandatory) printing step can either:*
 - a. *be triggered automatically by the weighing sequence, or*
 - b. *the weighing sequence can stop before printing and wait for a manual command to print, or*
 - c. *the print-out of all weighed items and non-weighed items can be performed at the end of the transaction. A new transaction can only commence after the print-out has been completed.*

Note: the printing step can't be circumvented and must be completed, either after each weighing sequence or at the end of the transaction.
3. *'Printing' on a secondary screen or in the same screen does not fulfil the requirements because this is not "printing" (it is "displaying") and so does not achieve the objective of letting the customer review if the items and price listed are those that have been purchased.*
4. *When a POS is connected to a NAWI the requirement for mandatory printing must also be fulfilled by the POS.*

3.1.58 Retail NAWI installed in a fixed position in a checkout

A retail flush-mounted NAWI simply sitting in a well in a checkout surface without being bolted in position can be regarded as being “installed in a fixed position” (as in Section 3.9.1 of EN 45501). This is commonly done so that it can temporarily be lifted out for cleaning.

As it is regarded as being “installed in a fixed position”, it does not need to have a level indicator. However, if it does not have a level indicator it should then be verified in its fixed position in the checkout, unless the verifier (or manufacturer if declaring conformity) has a suitable procedure to ensure that verification elsewhere will result in the requirements being met when it is installed into the well.

If the manufacturer chooses not to have a level indicator, then the manufacturer must take responsibility for the instrument being installed correctly unless it has been tested and approved to an angle of 5 %.

For an instrument without a level indicator, intended to be “installed in a fixed position”, there is no requirement for tilt testing during examination for type approval. For an instrument having a level indicator, EN 45501 Section 3.9.1.1 requires that the level indicator be in a place clearly visible to the user. However, there is no such requirement in the NAWI Directive, and it is therefore acceptable for the level indicator on any NAWI to be fitted in a place where it is easily accessible but not normally visible, for example, beneath the load receptor if that can easily be removed.

3.1.59 Eccentricity test of weighbridge

If it is possible that a weighbridge might be used to weigh a range of differently-sized vehicles (or both vehicles and objects), then eccentricity testing should be performed during verification to EN 45501 and R 76 Sections A.4.7.1 or A.4.7.2 (eccentric load), and also to Section A.4.7.4 (rolling load). However, if it is documented that the weighbridge will only be used to weigh vehicles of similar size, then the test of Section A.7.4 (rolling load) is considered sufficient.

3.1.60 EN 45501 and OIML R 76

There are now some differences between the requirements of EN 45501 and OIML R 76. The purpose of EN 45501 is to support the NAWI Directive. If any requirements of R 76 exceed those of EN 45501, then testing to R 76 may be done.

3.1.61 Access to data plate and markings

Some NAWIs have their data plates hidden from view. For example, many that are flush mounted into checkout surfaces have their data plate hidden below the load receptor, it being difficult or impossible to locate it anywhere else.

This is actually a non-conformity according to the NAWI Directive, and although it is readily accepted in some countries if the position of the data plate is shown in the approval certificate, manufacturers should be aware that it might not be acceptable in other countries.

3.1.62 Battery supply – low voltage detection

If the supply to a battery-powered NAWI decreases in voltage until the instrument no longer meets its accuracy requirements, the display must not display a weight value, regardless of how fast or slow the decrease in voltage is. It is not acceptable for the instrument to show a “frozen” weight value.

3.1.63 Concealed primary indications

On some equipment, for example some incubators having a weighing function, the primary indication of weight is concealed within the housing, and is therefore not normally visible.

Although it is obviously preferable for the primary indication to be visible in normal use, it is acceptable for it to be hidden if there is easy access to it.

3.1.64 Medical weighing – tare facility

With a weighing function built into a bed, there may be a need to modify the tare without removing the patient from the bed, for example when blankets are added or removed, or during dialysis. Although this does not meet the requirements of EN 45501, it is acceptable if it meets the essential requirements of the NAWI Directive and if it is fully described in the Type Approval Certificate.

3.1.65 Use of additional weights when e not equal to d

Some instruments of a class (III) and (IIII) with a digital indication offer a possibility to be operated in a test mode with a finer resolution e.g. with an actual test interval d smaller than a verification scale interval e .

It is acceptable to carry out tests (and evaluate the error) to verify compliance with the requirements of EN 45501 during EC verification (and not only during EC type evaluation procedure) with taking advantage of test interval.

WG2 agreed that both methods can be used, although for some tests small weights might be more appropriate. In the limiting case of $d = e/5$, then it might be more useful to use small weights.

3.1.66 Indicators as modules of medical and industrial weighing instruments

Some NAWIs used for medical purposes have features useful for medical diagnosis that would not be acceptable in industrial NAWIs. These features might not meet the requirements of EN 45501, but may be acceptable for medical weighing if they meet the essential requirements of the NAWI Directive.

These conditions must be put into the approval certificate, only allowing such features for medical purposes.

3.1.67 WELMEC Guide 2.4, A.3 – Meaning of “identical load cells”

WELMEC Guide 2.4 Annex A.3, dot 3 mentions “identical” load cells. That could lead to the assumption that they have to be of the same accuracy class.

WG2 decided that individual load cells in an instrument may be replaced by load cells that are identical but with the same or a better accuracy class. Load cells, identical except for their accuracy class, may be used together. In that case in the calculation of compatibility the accuracy class of the cell with the lowest accuracy class must be taken.

3.1.68 NAWI – Question about Preset Tare – Is a “cumulative mode” allowed?

Example: five small boxes and five large boxes are weighed together on a pallet. The operator uses the “Tare Look Up” facility to tare off the small boxes and then the large boxes, and finally the pallet, to determine the net weight of goods in the boxes. This is not intended for direct sales to the public.

WG2 concluded that this concept is unacceptable. Cumulative rounding errors with the several preset tares could easily result in large errors in the net weight,

3.1.69 Hold function

WG2 concluded that for medical instruments a “hold function” which operates as follows is not correct:

Press “Hold” key, indication freezes, remove weight (for example a baby) put on next weight, the indication remains the same and so on.

WG2 decided that the Hold function shall be disabled after a certain time limit or after removing the weight. The TAC shall describe the function.

3.1.70 Variable tare

This case treats the case of entering a tare as a percentage value of the determined (gross) weight.

Example: the user of the weighing instrument knows about a percentage of water which a fish can pick up (during production process). This relative tare value is then laid down in the PLU of the fish. In addition a preset tare value for the packaging is entered.

WG2 decided that the printed Net weight must be the effective Net weight of the product. The weight value cannot be modified by a calculation. For market surveillance reasons it must be possible to repeat the measurement and to compare the declared weight with the effective weight. Next to the information required by the Directive 2009/23/EC Annex I No 14 a calculated price a reduction due to the accumulated water in the product can be added.

3.1.71 Vehicle mounted instruments

Vehicle mounted instruments present some problems to pay attention to.

EN 45501 requires that a NAWI must be verified by means of weights. On some vehicle mounted instruments it is difficult to put weights, further with the use of weights the centre of gravity is not the same as with the product.

Notified bodies shall pay attention when establishing a TAC for vehicle mounted instruments that means shall be foreseen to apply weights on the load receptor and that a verification method is described in the handbook.

3.1.72 Information on data plate for instruments used under Art 1.2 b)

WG2 concluded that instruments that are brought on the market on which the conformity assessment have not been completely carried out shall not bear the Green M as well as the number of NB for NAWI.

3.1.73 Self Service Weighbridges

WG2 decided that on self-service Weighbridges the user must know whether the instrument indicates zero or not. If considered necessary, the printout could identify that the result has been gathered by a self-service weighbridge. It shall be taken care that the vehicle is correctly on the load receptor and whether the operating station is accessible from the vehicle.

3.1.74 Drawings of the main board

WG2 decided that for type approval, the Notified Body needs all information of all layers. The notified body shall be able to respond on question of market surveillance authorities for identifying an instrument to be in conformity to type.

3.1.75 CE-Marking Bringing an instrument on the market in two stages

WG2 concluded that an instrument that needs to be adjusted on the place of use may be delivered without bearing the green M sticker to the final user. The manufacturer must inform the user that the conformity assessment on the instrument must be completed before he can use the instrument. The green sticker is applied by the manufacturer or his representative after completion of the second stage.

3.1.76 Temperature range

WG2 concluded that an instrument must be tested in the complete temperature range to be declared in conformity with the requirements of the Directive.

Example: It is not allowed to extend the temperature range of an instrument, which is approved for a temperature range $-10\text{ °C} \dots 40\text{ °C}$, to $-20\text{ °C} \dots 40\text{ °C}$ based on a test for the temperature range $-20\text{ °C} \dots 20\text{ °C}$.

3.1.77 Multi-interval instruments with subtractive tare

For a multi-interval instrument with subtractive tare the requirement in Directive 2009/23/EC, Annex I, para. 9, "Indication shall be impossible above the maximum capacity (Max), increased by 9 e." can be interpreted as $\text{Max} + 9 e_N$ where "N" is the number of partial weighing ranges.

3.1.78 Auxiliary indicating devices (ct).

The Directive 2009/23/EC, Annex I specifies in 2.2.3:

For instruments with auxiliary indicating devices the following conditions apply:

$$e = 1 \times 10^k \text{ g,}$$

$$d < e \leq 10 d,$$

except for instruments of class I with $d < 10^{-4} \text{ g}$, for which $e = 10^{-3} \text{ g}$.

For the metric carat the following is acceptable:

$$e = 1 \times 10^{k+1} \text{ ct,}$$

$$d < e \leq 10 d,$$

except for instruments of class I with $d < 10^{-3}$ ct, for which $e = 10^{-2}$ ct.

For instruments that are able to display in both units if the Max, Min and e values are on a label then they must be marked on the instrument in both units. If the values are shown on a display then they can be switched.

3.1.79 Point of Sale (POS) devices - indication of Zero between two operations

It is not necessary for a Non-automatic Weighing Instruments (NAWI) connected to a Point of Sale (POS) device to indicate "0" between two (consecutive) operations.

3.1.80 Content of a type approval certificate (NAWI)

In the EC type approval certificate it should be stated if the requirements of the harmonised standard EN 45501 have been met or not. Where applicable, any deviations from EN 45501 should be described in the TAC.

The TAC shall also contain information regarding special applications of the instrument.

3.1.81 Unmanned ("automated") weighbridges

An unmanned ("automated") weighbridge which includes an Automatic Number Plate Recognition (ANPR) and a traffic light "control" system, may be considered an AWI where it operates in the following mode of operation.

The vehicle is driven onto the weighbridge and the vehicle stops at the red light, the registration is read by the ANPR and is then transmitted to a PC controlling the weighbridge.

When the weight is stable, the weight value is transmitted to the PC and the traffic light changes to green. There is no operator controlling the weighing sequence and the driver has no interaction with the weighing operation, other than to stop the vehicle on the weighbridge and to drive off the weighbridge on completion of the weighing sequence (determined by the PC controlling the weighbridge and the traffic light).

However, the instrument can be considered to be a NAWI if the weighing instrument requires the intervention of an operator (e.g. the driver) during weighing. This could include acceptance, or rejection, of the weighing results based on a primary indication of the weight value.

3.1.82 NAWIs installed in ships

3.1.82.1 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.

3.1.82.2 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.

3.1.82.3 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).

3.1.82.4 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.

3.1.82.5 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].

Note 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/s^2 and to $+3 \text{ m/s}^2$ with test load close to Max with appropriate frequency ($\leq 0,3 \text{ Hz}$)

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

3.2 EURO currency in price indication where a Member State is introducing the EURO (transition period)

This relates to weighing instruments with price indication and price printing during a transition period where a Member State is introducing the EURO

In the meeting on 3/4 February 1998, WELMEC WG2 agreed that it is not necessary to amend existing Type Approval Certificates (TACs) to accommodate the EURO in line with the rules given hereafter, unless an additional display not already covered by the TAC is necessary.

It was also agreed that new TACs, or amendments to TACs, may be granted to reflect the use of the EURO.

Basic notes regarding the conversion to EURO may be gathered from the Council regulation (EC) No. 1103/97 of 17 June 1997 on certain provisions relating to the introduction of the EURO (articles 4 and 5). Additional information may be obtained via the internet address <http://ec.europa.eu/euro>. Details, however, are subject to the national regulations of the individual member states.

Along with other things, the member states may also determine the beginning and end of a transition period during which, most likely, price indications and cash payments will be permitted in both currencies.

As regards weighing instruments with price indication and price printing, the WELMEC member states would accept the following arrangements during the transition period:

(NCU = National Currency Unit)

3.2.1 Basic principles

3.2.1.1 Prices

Prices (unit prices, prices to pay, totals) may be indicated in either NCU, EURO or in NCU and EURO.

3.2.1.2 Conversion rate

Use or indication of the official conversion rate with 6 significant digital places (eg 1 EURO = 1,23456 NCU).

3.2.1.3 Stored conversion rate

The conversion rate stored in the weighing instrument shall be correct. The security requirements of No 8.5 of Annex 1 of Directive 2009/23/EC need not be applied to the conversion rate.

3.2.1.4 Calculation

Calculation with this conversion rate according to the following rules:

EURO amount = NCU amount divided by the official conversion rate

NCU amount = EURO amount multiplied by the official conversion rate

3.2.1.5 Rounding

Accurate rounding of the converted EURO amount to 1 Cent (1/100 EURO) according to article 5 of the above mentioned EC regulation. If the said rounding falls exactly in the middle it shall be rounded up. This applies equally to the rounding of a converted NCU amount.

(See Section 3.1.36 for converted instruments.)

3.2.1.6 Expressing the unit

The recommended way of expressing the unit of currency is the symbol “€” or “EUR” or “EURO”. NAWIs that are modified to express the unit of currency may use “EURO”, “Euro”, “EUR”, “Eur” or “€”.

3.2.2 Indicating devices

3.2.2.1 Switching currencies

The indicating device may be so designed as to permit the switching between both currencies (NCU and EURO). Alternatively, an additional indicating device for the second currency may be provided.

3.2.2.2 Same currencies

When switching over between NCU and EURO, it shall not be possible to display the unit price and price to pay with different currency units. If the unit price is also indicated in the informative currency, the price to pay in that currency is calculated from that unit price.

3.2.2.3 Additional indicating device

If an additional indicating device is provided it will suffice if only the price to pay or the price total is additionally indicated in the other currency.

3.2.2.4 Recognition of the currency

For the purchaser, the currency in which the prices are indicated must be clearly recognisable. The following alternative possibilities as regards the indication of the currency symbol would be permitted:

- Indicated directly in the display.
- Marking next to the display and control by a related indicator (eg LED).
- If the NCU/kg and NCU symbol is permanently affixed to the display, a note shall appear in the text indication (or if necessary in the weight display field): “Indication in EURO” or simply “EURO”. In case of 7 segment displays the abbreviation “E” instead of EURO is also allowed to be displayed together with the unit price and the price to pay.

3.2.3 Printing

For printouts, there is the choice between NCU and EURO. If only one of the two currencies is printed, it must be the one in which the prices were also indicated by the weighing instrument.

If the prices are printed in both currencies, the following applies:

3.2.3.1 Unit price

The unit price must be printed out in addition to the price to pay in at least one of the two currencies.

3.2.3.2 Other price indications

Next to the unit price and the price to pay in the one currency, the price to pay and/or the total may be printed in addition in the other currency. If the unit price is printed in both currencies, the prices to pay are to be computed on the basis: weight multiplied by the relevant unit price.

3.2.3.3 Currency symbols

The currency symbols must be printed out so that they can be ascribed unambiguously to all unit prices and prices to pay and price totals shown.

3.2.3.4 Second currency

If only the price total is printed in the second currency, that total is to be calculated on the basis of the total indicated in the first currency.

3.2.3.5 Single values and totals of single values

If single values and totals of single values are printed out in both currencies, the single values in the second currency are to be calculated from the single values in the first currency. Totals are to be calculated from the related single values in each of the two currencies.

3.2.3.6 Printout of conversion rate

A printout of the conversion rate is permitted but is not mandatory. If printed out, this must be done in the form of, for example "1 EURO = 1,23456 NCU" (or "EURO 1 = NCU 1,23456"), with all 6 official digital places. Instead of "EURO", the official abbreviations recommended may also be used (see 3.2.1.6).

3.2.4 Weighing instrument for direct sales to the public with two (or more) currencies

When the EURO is introduced in a country, according to WELMEC 2 No. 3.2 it is possible during the transition period to have both currencies EURO and national currency unit. Is it also possible, independent from a transition period, to have more than one currency to be changed on manual command?

The requirements of WELMEC 2 No. 3.2 are considered to be fulfilled (enabled currency is clearly indicated, currency of print-out is the same as displayed currency, etc). Such a weighing instrument is meant to be used near national borders, where the instrument could be moved from one country to another easily and where it could be possible that customers bring several currencies. Germany stressed that the intention was not to change currency during a transaction, but only to set the currency appropriate to the place of use. The WELMEC 2 guide Section 3.2 appears to be relevant, but only mentions its use during a currency transition period.

Although doubts were expressed because of the possibilities of fraudulent use, it was agreed that this was acceptable in principle if implemented satisfactorily. However, in some member states, for example France, this instrument could not be used legally, so it is necessary to check national legislation.

3.3 Gravity zones

The intention of this section of the guide is to allow anyone, including manufacturers and member states, to devise gravity zones that, if designed correctly, should be acceptable to any member state.

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

3.3.1 **Preliminary remarks**

3.3.1.1 **Gravity zones**

The issue of geographical zones (called "gravity zones") for weighing instruments that are sensitive to gravity variations has been discussed several times within WELMEC WG2 since the 10th meeting in May 1995. The major objective was to find a harmonised way of marking/identifying gravity values/zones in all WELMEC member states that is acceptable to both manufacturers and Notified Bodies. As an outcome of the 3 years of discussion the principles described hereafter have been agreed upon by all WELMEC WG 2 members.

3.3.1.2 **Gravity concept**

The legal basis of the new "gravity concept" is Directive 2009/23/EC, Annex II, No 5.1 and 5.2. It mentions that gravity zones may be established by the member states on their territories. Existing national regulations with regard to gravity marking/identifying are not intended to be repealed by the new concept described in Section 3.3.2. The new harmonised concept should however be regarded as equivalent to existing national regulations.

3.3.1.3 **EC Verification**

The new concept primarily aims at EC verification² performed at a location - e.g. the manufacturer's works- other than the intended place of use of the instrument. The EC verification - and hence the final adjustment of the instrument - may, of course, be carried out at the actual place of use. In either case these regulations must be in conformity with Directive 2009/23/EC, in particular, the error introduced by the estimated value of gravity at the place of use should not lead to a total error that exceeds the maximum permissible error (mpe) on EC verification (see Section 3.3.2.3).

3.3.1.4 **Gravity identification/markings**

The new gravity concept is intended to provide an **optional system** for identifying/markings gravity values/zones for a weighing instrument. If this option is chosen by a manufacturer, however, it will normally be accepted in all WELMEC member states in view of EC verification.

3.3.2 **The new gravity concept**

3.3.2.1 **Error of indication**

A weighing instrument that is sensitive to gravity shall indicate within the mpe on EC verification at the time of EC verification - whether in one or two stages, carried out either by a Notified Body or the manufacturer himself.

3.3.2.2 **Place of verification different than the place of use**

If the EC verification 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 centre of a specified gravity zone encompassing the intended place of use.

3.3.2.3 **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

² EC verification in this document is used as a generic term for all comparable procedures mentioned in Directive 2009/23/EC Annex II.

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 EC 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 EC verification at any place of use within the chosen zone:

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

with:

$$\Delta g_\varphi = 1/2 |g(\varphi_1, a_m) - g(\varphi_2, a_m)| \quad \text{max. variation due to a change in } \varphi^4$$

$$a_m = 1/2 (a_1 + a_2) \quad \text{mean value of altitude } a$$

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

$$\varphi_m = 1/2 (\varphi_1 + \varphi_2) \quad \text{mean value of latitude } \varphi$$

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

$$n = \text{number of verification scale intervals } e \text{ of the weighing instrument}$$

$$mpe = \text{maximum permissible error on EC verification at } Max, \text{ expressed in } e$$

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:

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

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

and

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

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

The same applies by analogy to the other accuracy classes.

3.3.2.4 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).

3.3.2.5 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

³⁾ 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.

⁴⁾ 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.

- (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),

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.

3.3.2.6 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.

3.3.3 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 EC 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

$$g (\text{Braunschweig}) = 9.812\,484 \text{ m s}^{-2}$$

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 3.3.2.3 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,

$$\begin{aligned} \varphi_m &= 1/2 (\varphi_1 + \varphi_2) \\ &= 60^\circ \end{aligned}$$

$$\begin{aligned} a_m &= 1/2 (a_1 + a_2) \\ &= 250 \text{ m} \end{aligned}$$

and the maximum variations

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

$$\begin{aligned}\Delta g_a &= 1/2 |g(\varphi_m, a_1) - g(\varphi_m, a_2)| \\ &= 0.000\ 771\ \text{m s}^{-2}\end{aligned}$$

and the reference value

$$\begin{aligned}g_R &= g(\varphi_m, a_m) \\ &= 9.818\ 399\ \text{m s}^{-2}\end{aligned}$$

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

$$\begin{aligned}n (\Delta g_{\varphi} + \Delta g_a) / g_R &\leq mpe / 3e \\ 3000 (0.000\ 785 + 0.000\ 771) / 9.818\ 399 &\leq 1.5 e / 3 e \\ 0.48 &\leq 0.5\end{aligned}$$

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

3.3.4 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

3.4 Software securing (sealing)

The term "software securing" (sometimes also called "software sealing") is often used in different connections. In order to avoid misunderstandings it is stated that in the following it is exclusively used in the sense of Directive 2009/23/EC, Annex I, No 8.5, and EN 45501, No 4.1.2.4, respectively, thus meaning provisions for securing components and pre-set controls to which access or adjustment is prohibited.

In order to harmonise EC type approvals with regard to software securing methods which, completely or partially, replace conventional "hardware" securing measures (eg wire and lead, or control marks), the following principles and guidelines are proposed:

3.4.1 Legal status of the instrument

By analogy with conventional sealing methods, the legal status of the instrument must be recognisable to the user or any other person responsible at the instrument itself.

Examples of acceptable technical solutions:

- a. An event counter, ie. a non-resettable¹⁾ counter, that increments each time a protected operational mode of the instrument is entered and one or more changes are made to device-specific parameters (see also WELMEC 2.3 guide). The reference number of the counter at the time of (initial or subsequent) verification is fixed and secured by appropriate hardware means at the instrument itself.

¹⁾ The term "non resettable" implies that if the counter has reached its maximum number it will not continue to zero without the intervention of an authorised person.

or

- b. An event logger, ie. a file containing a series of records where each record contains at least the number from the event counter and the date corresponding to the change of a device-

specific parameter (see also WELMEC 2.3). Optionally, further information may be recorded, eg. the identification of the parameter that was changed and the new value of the parameter. The reference number of the counter or the date at the time of (initial or subsequent) verification is fixed and secured by appropriate hardware means at the instrument itself.

Note:

The indication that an unauthorised change of protected device specific parameters has happened need not necessarily be shown on or near the instrument's display. The latter method may, however, be chosen as an additional option. It is sufficient if the weighing instrument can, by a simple procedure, present the relevant actual data for comparison with the reference data recorded at the last verification in order to inform the user or any other person responsible about the legal status of the instrument. **Details have to be described in the operating manual, and in either the Type Approval Certificate of the instrument or the Test Certificate of its module (indicator).**

3.4.2 Protection of software securing

Software securing methods must guarantee a sufficient protection and long term storage of the data registered.

The following protection measures are considered to be adequate for event counters and event loggers:

- All entries (the counter number in case of an event counter or the data registered by an event logger) must be protected against intentional and unintentional changes in the sense of WELMEC 2.3. It is guaranteed by appropriate means that the event counter (event logger) automatically increments (registers) each time a protected operational mode of the instrument is entered and a device specific parameter is changed, and there is no possibility to fraudulently change the counter (registered data) in either mode, and
- the hardware medium used for storing these data must be protected against unauthorised replacement, or an unauthorised replacement is obvious or can be made evident by appropriate means.

Example of an acceptable technical solution:

The chip for storing the event counter (event logger) data is soldered onto the circuit board inside the instrument and the board itself is protected against unauthorised exchange.

Note:

As a rule, the hard disk of a PC is not considered to provide sufficient protection of event counter or event logger data.

3.4.3 Reference data for software securing

An instrument making use of a software securing method shall have adequate facilities either for affixing of the reference data on or near the main plate by an authorised person or body, or for showing this data on the instrument's display on demand.

The following then apply:

3.4.3.1 Reference data on or near the main plate

Examples of acceptable technical solutions:

- a. Inscription of the reference number (data) on or near the main plate in accordance with Directive 2009/23/EC, Annex IV, 1.2.
- b. Adjustable (hardware) counter that is firmly mounted to the instrument and that can be secured after it has been adjusted to the actual counter number at the time of (initial or subsequent) verification.

3.4.3.2 Reference data displayed

Where this displayed data can be altered by means of software access, the instrument must have adequate facilities within a protected log to hold, at least, the following data:

Relevant reference data and changes, date and time of intervention, identity of authorised person or body.

This data must be saved in the instrument for a period of time commensurate with the requirements of the member state. The identity of the authorised person or body must be guaranteed.

4 BCR inter-comparison on Non-automatic Weighing Instruments (NAWI)

In about 1992, the BCR 172 Working Group produced a list of recommendations following the BCR inter-comparison exercise. Those recommendations, previously listed separately in this section of Issues 1 to 3 of this guide, have been incorporated into Section 3.

The recommendations were included in OIML R 76 1 by Amendment 1, and are in the current version. However, at the time of publishing this guide EN 45501 has not yet been amended.

The reference of the BCR Report for the project is EUR 15303 EN.

5 Guides and decisions on modular assessment

The WELMEC 2.5 guide gives details of the Modular Approach, and of the testing of PCs and other digital peripheral devices.

Testing Indicators

The WELMEC 2.1 guide covers the testing of an indicator as a module. It deals with the scope, purpose of the tests, specifications to be considered, the test set-up, the metrological and technical requirements met and the certification of the test results.

Testing Point of Sale (POS) Devices

The WELMEC 2.2 guide covers the testing of a POS device as a module. It deals with the scope, test set up, documentation, technical requirements, tests, securing, certification of test results and tests for verification.

WG2 requests the Notified Bodies that have done Test Certificates for hardware alone to tie them to software.

Note that Type Approval Certificates for free-programmable NAWIs, or Test Certificates for free-programmable POS hardware, must either include details of the software or must refer to specific Test Certificates for the software (see Section 3.1.27).

Examining Software

The WELMEC 2.3 guide covers the examination of software for free programmable, PC based modules or peripheral devices which are linked to, or form part of, a NAWI. It deals with the scope, terminology, software requirements, report on software examination and required specifications in Certificates. In addition, test certificates can be issued provided that the software examination is carried out in accordance with WELMEC 2.3.

Testing load cells

The WELMEC 2.4 guide covers load cells as modules.

6 Classification

Member States are not restricted to a common application in relation to the classification of instruments therefore the class of instrument required or permitted in one Member State may be different from that in another Member State.

For permitted uses the classification may take one of the following forms:

- Any class
- Any class other than Class I
- Any class other than Class III
- Only Class I and II

Other methods of restricting the use of instruments may be imposed by Member States eg limiting the maximum verification scale interval.

7 Language markings

The information in this section is provided as a guide to markings and legends that are commonly used in member countries. The list is neither exhaustive nor exclusive. Alternatives may be required to be used.

For Austria, see German.

For Belgium, see Dutch, French or German as appropriate for the part of Belgium.

For Cyprus, see Greek.

For Ireland, see English.

For Luxembourg, see French or German.

For Malta, see English or Maltese.

For Switzerland, see French or German or Italian as appropriate for the part of Switzerland.

The use of 'pictograms' is permitted in most member countries. For many of the markings and legends listed, 'pictograms' have been developed by CECIP (European Committee for Constructors of Weighing Instruments) and are shown in their publication "Pictograms for Scales".

Note: Language markings for Turkey will be included when the text is provided.

English	Bulgarian	Croatian	Czech
Not to be used for direct sale to the public	Забранена за директна продажба	Ne smije se koristiti za neposrednu prodaju u javnosti	Nesmí se používat pro přímý prodej veřejnosti
For postal use only	За определяне на пощенски тарифи	Samo za poštansku uslugu	Pouze pro určování přepravního tarifu na poštách
Weight	Маса	Masa	Závaží
Unit price	Единична цена	Jedinična cijena	Jednotková cena
Price to pay	Цена за плащане	Iznos za plaćanje	Cena k zaplacení
Total, sub-total	Обща сума, междинна сума	Iznos, međuiznos	Součet, mezi-součet
Gross, net	Бруто, нето	Bruto, neto	Brutto, netto
Tare, preset tare	Тара, предварително зададена тара	Tara, postavljena tara	Tára, předvolená tara
Zero	Нула	Nula	Nula
Print	Печат	Ispis	Tisk
Set point	Точка на настройване	Zadana vrijednost	Nastavovací bod
Date, time	Дата, време	Datum, vrijeme	Datum, čas
Unstable weight	Нестабилно измерване	Nestabilna masa	Nestabilní zátěž
Weight below Min	Измерване под Min	Masa manja od Min	Zatížení pod Min
No weight change	Не променена маса	Nepromjenjiva masa	Žádná změna zatížení
Error	Грешка	Greška	Chyba
Cash, cheque, credit, change	Плащане в брой, с чек, кредит, обмяна	Gotovina, ček, kredit, povrat	Hotovost, šek, kredit, k vrácení
Transactions	Продажби, транзакции	Transakcije	Transakce
Customer	Клиент	Kupac	Zákazník
Vendor, operator	Продавач, оператор	Prodavač, operater	Prodávající, obsluha
Non-weighed article	Неизмерен артикул	Neizvagana roba	Nevážené zboží
Weighed article	Измерен артикул	Izvagana roba	Vážené zboží
Clear	Изчистване	Brisanje	Výmaz
Weighing range	Измервателен обхват	Raspon vaganja	Vážicí rozsah

English	Danish	Dutch	Estonian
Not to be used for direct sale to the public	Ikke tilladt til direkte salg til publikum	Niet voor rechtstreekse verkoop aan het publiek	Mitte kasutada kaupade otsemüügil
For postal use only	Må kun anvendes til postekspedition	Uitsluitend gebruik voor de Post	Ainult postiteenuse osutamiseks
Weight	Vægt	Gewicht	Mass
Unit price	Enhedspris	Eenheidsprijs	Ühiku hind
Price to pay	Pris	Te betalen	Makstav summa
Total, sub-total	Ialt, delresultat	Totaal, sub-totaal	Summa, kokku
Gross, net	Brutto, netto	Bruto, netto	Bruto, Neto
Tare, preset tare	Tara, indkodet tara	Tarra, voorinstel-tarra	Taara
Zero	Nul	Nul	Null
Print	Print	Afdruk	Trüki (Trükk)
Set point	Sætpunkt	Instelpunt	Sättepunkt
Date, time	Dato, tidspunkt	Datum, tijd	Kuupäev, Aeg
Unstable weight	Ustabilt vejeresultat	Instabiele aanwijzing	Ebastabiilne koormus
Weight below Min	Vejning under Min	Gewicht beneden Min	Koormus on väiksem kui Min
No weight change	Ingen ændring af vejeresultat	Geen verandering van gewicht	Muutumatu kaalutis
Error	Fejl	Fout	Viga
Cash, cheque, credit, change	Kontant, check, kredit, byttepenge	Contant, cheque, creditcard, wisselgeld	Sularaha, tšekk, krediit, raha tagasi
Transactions	Transaktioner	aantal transacties	Tehing
Customer	Kunde	Klant	Klient
Vendor, operator	Sælger, Operatør	Verkoper	Müüja, Operaator
Non-weighed article	ikke vejjet produkt	Niet gewogen artikel	Kaalumata toode
Weighed article	vejjet produkt	Gewogen artikel	Kaalatud toode
Clear	slet	Uitwissen	Kustuta, Tühista
Weighing range	vejeområde	Weegbereik	Mõõtepiirkond

English	Finnish	French	German
Not to be used for direct sale to the public	Ei saa käyttää myytäessä suoraan kuluttajalle	Interdit pour la vente directe au public	Nicht zulässig in *offenen Verkaufsstellen *In Austria: öffentlichen
For postal use only	Ainoastaan postimaksujen määräämiseen	Réservé à l'usage postal	Nur für Postzwecke
Weight	Paino	Poids	Gewicht
Unit price	Yksikköhinta	Prix unitaire	Grundpreis
Price to pay	Maksu	Prix à payer	Verkaufspreis
Total, sub-total	Summa, välisumma	Total, sous-total	Summe, Teilsumme
Gross, net	Brutto, netto	Brut, net	Brutto, Netto
Tare, preset tare	Taara, esiaseteltava taara	Tare, tare prédéterminée	Tara, Taraeingabewert
Zero	Nolla	Zéro	Null
Print	Tulostus	Impression	Abdruck, Druck
Set point	Asetusarvo	Point de consigne	Schaltpunkt
Date, time	Päivämäärä, kellonaika	Date, heure	Datum, Zeit
Unstable weight	Epävakaa kuorma	Poids instable	Kein Gleichgewicht
Weight below Min	Paino alle Min	Poids inférieur à Min	Gewicht kleiner als Min
No weight change	Muuttumaton paino	Poids inchangé	Kein Gewichtswechsel, Ohne Gewichtswechsel
Error	Virhe	Erreur	Messabweichung, Fehler
Cash, cheque, credit, change	Käteinen, shekki, luotto, vaihtoraha/takaisin	Comptant, chèque, carte (ou crédit), rendu	Bargeld, Scheck, Kredit, Wechselgeld
Transactions	Kauppatapahtuma	Transactions	Vorgang
Customer	Asiakas	Client	Kunde
Vendor, operator	Käyttäjä	Vendeur, opérateur	Verkäufer, Bediener
Non-weighed article	Punnitsematon tuote	Article non pesé	Nicht gewogene Artikel
Weighed article	Punnittu tuote	Article pesé	Gewogener Artikel
Clear	Korjaus	Effacer	Löschen
Weighing range	Punnitusalue	Etendue de pesage	Wägebereich

English	Greek	Hungarian	Icelandic
Not to be used for direct sale to the public	ΑΠΑΓΟΡΕΥΕΤΑΙ Η ΧΡΗΣΗ ΓΙΑ ΤΗΝ ΑΜΕΣΗ ΠΩΛΗΣΗ ΠΡΟΣ ΤΟ ΚΟΙΝΟ	Vásárlók közvetlen kiszolgálására nem használható	Ekki til nota við beina sölu til almennings
For postal use only	ΜΟΝΟ ΓΙΑ ΤΑΧΥΔΡΟΜΙΚΗ ΧΡΗΣΗ	Csak postai használatra	Aðeins til vigtunar á pósti
Weight	ΒΑΡΟΣ	Tömeg	Þyngd
Unit price	ΤΙΜΗ ΜΟΝΑΔΑΣ	Egységár	Einingarverð
Price to pay	ΠΛΗΡΩΤΕΟ ΠΙΟΣΟ	Fizetendő ár	Verð
Total, sub-total	ΣΥΝΟΛΟ, ΜΕΡΙΚΟ ΣΥΝΟΛΟ	Összeg, részösszeg	Samtals, alls
Gross, net	ΜΕΙΚΤΟ ΒΑΡΟΣ, ΚΑΘΑΡΟ ΒΑΡΟΣ	Bruttó, nettó	Brúttó, nettó
Tare, preset tare	ΑΠΟΒΑΡΟ, ΠΡΟΚΑΘΟΡΙΣΜΕΝΟ ΑΠΟΒΑΡΟ	Tára, beadott tara	Tara, forstillt tara
Zero	ΜΗΔΕΝ	Nulla	Núll
Print	ΕΚΤΥΠΩΣΗ	Nyomtatás	Prenta
Set point	ΣΗΜΕΙΟ ΡΥΘΜΙΣΗΣ ΒΑΡΟΥΣ	Kapcsolási pont	Stillgildi
Date, time	ΗΜΕΡΟΜΗΝΙΑ, ΩΡΑ	Dátum, idő	Dags., tími
Unstable weight	ΑΣΤΑΘΗΣ ΕΝΔΕΙΞΗ ΒΑΡΟΥΣ	Tömegkijelzés nem stabil	Óstöðug þyngd
Weight below Min	ΒΑΡΟΣ ΜΙΚΡΟΤΕΡΟ ΑΠΟ ΤΗΝ ΕΛΑΧΙΣΤΗ ΔΥΝΑΜΙΚΟΤΗΤΑ Min	A terhelés Min alatt van	Undir lágmarksþyngd
No weight change	ΚΑΜΙΑ ΑΛΛΑΓΗ ΒΑΡΟΥΣ	Tömeg változatlan	Óbreytt þyngd
Error	ΣΦΑΛΜΑ	Hiba	Villa
Cash, cheque, credit, change	ΜΕΤΡΗΤΑ, ΕΠΙΤΑΓΗ, ΠΙΣΤΩΣΗ, ΡΕΣΤΑ	Készpénz, csekk, hitel, aprópénz	Staðgreitt, tékki, greiðslukort, til baka
Transactions	ΣΥΝΑΛΛΑΓΕΣ	Tranzakció	Færslur
Customer	ΠΕΛΑΤΗΣ	Vevő	Viðskiptavinur
Vendor, operator	ΧΡΗΣΤΗΣ	Eladó	Sölumaður, starfsmaður
Non-weighed article	ΜΗ ΖΥΓΙΖΟΜΕΝΟ ΕΙΔΟΣ	Méretlen tétel	Ekki vegin vara
Weighed article	ΖΥΓΙΖΟΜΕΝΟ ΕΙΔΟΣ	Mért tétel	Selt eftir vigt
Clear	ΔΙΟΡΘΩΣΗ	Törlés	Eyða
Weighing range	ΠΕΡΙΟΧΗ ΖΥΓΙΣΗΣ	Mérési tartomány	Vigtarsvið

English	Italian	Latvian	Maltese
Not to be used for direct sale to the public	Vietato per la vendita diretta al pubblico	Nav lietojami tirdzniecības vietās	Mhux għall-bejgħ lill-pubbliku dirett
For postal use only	Esclusivamente per uso postale	Pasta svāri	Għal użu postali biss
Weight	Peso	Svars	Piż
Unit price	Prezzo unitario	Vienības cena	Prezz ta' unita'
Price to pay	Importo	Samaksa	Hlas
Total, sub-total	Totale, sub totale	Summa	Total, total parzjali
Gross, net	Lordo, netto	Bruto, neto	Gross, nett
Tare, preset tare	Tara, tara predeterminata	Tara, taras svara uzstāde	Piż tal-vojt, piż tal-vojt prideterminat
Zero	Zero	Nulle	Żero
Print	Stampa	Izdruka	Stampa
Set point	Punto di regolazione	Uzstādes punkts	Punt tal-bidu
Date, time	Data, ora	Datums, laiks	Data, ħin
Unstable weight	Peso instabile	Nestabils svars	Piż instabbli
Weight below Min	Peso inferiore a Min	Svars mazāks par <i>Min</i>	Piż inqas mill-minimu
No weight change	Peso stabile	Nemainīgs svars	Piż stabbli
Error	Errore	Kļūda	Żball
Cash, cheque, credit, change	Contante, assegno, credito resto	Skaidra nauda, čekss, kredīts, atlikums	Flus kontanti, čekks, kreditu, bqija
Transactions	Transazione	Darījums	Transazzjoni
Customer	Cliente	Pircējs	Klijent
Vendor, operator	Venditore, operatore	Pārdevējs, operators	Bejjiegħ, operator
Non-weighed article	Articolo non pesato	Nesvērta gabalprece	Ogġett mhux mwiežen
Weighed article	Articolo pesato	Svērta gabalprece	Ogġett mwiežen
Clear	Correzione	Izdzēsts	Korrezzjoni
Weighing range	Campo di pesatura	Svēršanas diapazons	Limiti ta' l-užin

English	Norwegian	Polish	Portuguese
Not to be used for direct sale to the public	Ulovlig ved salg direkte til publikum	Waga nie może być stosowana w bezpośrednim obrocie handlowym	Interdito para a venda directa ao público
For postal use only	Kun lovlig ved postveiling	Tylko do opłat pocztowych	Só para uso postal
Weight	Lodd	Masa	Peso
Unit price	Enhetspris	Cena	Preço unitario
Price to pay	Pris å betale	Należność	Preço a pagar
Total, sub-total	Sum, del sum	Należności całkowita, Należność częściowa	Total, sub-total
Gross, net	Brutto, netto	Brutto, netto	Bruto, liquido
Tare, preset tare	Tara, Forhåndsinnstilt tara	Tara, Tara zadana	Tara, tara pré determinada
Zero	Null	Zero	Zero
Print	Utskrift	Wydruk	Impressao
Set point	Set pimlt	Punkt włączenia	Ponto do ajuste
Date, time	Data, tid	Data, czas	Data, hora
Unstable weight	Usabil vekt	Niestabilne położenie równowagi	Peso instavel
Weight below Min	Last under Min	Masa poniżej Min	Peso abaixo de Min
No weight change	Ingen endring ov veieresultatet	Stabilne położenie równowagi	Peso estavel
Error	Feil	Błąd	Erro
Cash, cheque, credit, change	Kontant, sjekk, krcdit, vkscl	Gotówka, czek, karta kredytowa, reszta	Dinheiro, cheque, crédito
Transactions	Transaksjon	Umowa sprzedaży	Transacções
Customer	Kunde	Kupujący	Cliente
Vendor, operator	Selger, operatør	Sprzedawca	Vendedor, operador
Non-weighed article	Ikke veid vare	Artykuł nieważony	Artigo nao pesado
Weighed article	Veid vare	Artykuł ważony	
Clear	Slett	Kasowanie	Corrigir
Weighing range	Vciemråde	Zakres ważenia	Gama de pesagem

English	Romanian	Slovak	Slovene
Not to be used for direct sale to the public	Interzisă utilizarea pentru vânzarea directă la public	Neprípustné používať na priamy predaj verejnosti	Ne sme se uporabljati za neposredno prodajo v javnosti
For postal use only	Numai pentru utilizare poștală	Len na poštové účely	Samo za poštno uporabo
Weight	Masă	Hmotnosť / Zaťaženie	Masa
Unit price	Preț unitar	Jednotková cena	Cena
Price to pay	Preț de plată	Predajná cena	Znesek
Total, sub-total	Total, subtotal	Súčet, medzisúčet	Seštevek, delni seštevek
Gross, net	Brut, net	Brutto, netto	Bruto, neto
Tare, preset tare	Tară, tară predeterminată	Tara, predvolená tara	Tara, prednastavljena tara
Zero	Zero	Nula	Ničla
Print	Imprimare	Tlač	Tiskanje
Set point	Punct de reglare	Bod nastavenia	Nastavljiva vrednost
Date, time	Data, oră	Dátum, čas	Datum, čas
Unstable weight	Masă instabilă	Nestabilné zaťaženie	Nestabilna meritev
Weight below Min	Masă mai mică decât Min	Zaťaženie pod Min	Masa manjša od Min
No weight change	Masă neschimbată	Bez zmeny zaťaženia	Stabilna meritev
Error	Eroare	Chyba	Napaka / Pogrešek
Cash, cheque, credit, change	Numerar, cec, carte de credit, rest	Hotovosť, šek, kredit, vydať	Gotovina, ček, kredit, vračilo
Transactions	Tranzacții	Transakcia	Postopek / Transakcija
Customer	Client	Zákazník	Stranka
Vendor, operator	Vânzător, operator	Predávajúci, obsluha	Prodajalec, operater
Non-weighed article	Articol necântărit	Nevážený druh tovaru	Netehtano blago
Weighed article	Articol cântărit	Vážený druh tovaru	Tehtano blago
Clear	Ștergere	Vymazať	Brisanje
Weighing range	Domeniu de cântărire	Vážiaci rozsah	Območje tehtanja

English	Spanish	Swedish	Turkish
Not to be used for direct sale to the public	Prohibido para la venta directa al público	Får inte användas vid försäljning direkt till enskild konsument	Doğrudan halka satışta kullanılmayan
For postal use only	Uso postal exclusivo	Endast för postalt bruk	Sadece posta için
Weight	Peso	Vikt	Ağırlık
Unit price	Precio unitario	Enhetspris	Birim fiyat
Price to pay	Importe	Betalpris	Ödenecek miktar
Total, sub-total	Total-subtotal	Total sub-total	Toplam, ara toplam
Gross, net	Bruto, neto	Brutto, netto	Brüt, net
Tare, preset tare	Tara, tara predeterminada	Tara, förinställd tara	Dara, ...
Zero	Cero	Noll	Sfır
Print	Impresión	Utskrift	Çıktı
Set point	Punto de ajuste	Inställningsvärde	Ayar noktası
Date, time	Fecha, hora	Datum, tid	Tarih, zaman
Unstable weight	Peso inestable	Ostabil viktvärde	Stabil olmayan ağırlık
Weight below Min	Peso por debajo de Min	Vikt under Min	...min den daha küçük değerler
No weight change	Peso estable	Ingen viktändring	Tartım sonucu görülemez
Error	Error	Fel	Hata
Cash, cheque, credit, change	En efectivo, cheque (talón), crédito (tarjeta), cambio	Kontant, check kredit växel	Nakit, çek, kredi kartı
Transactions	Transacciones	Transaktioner	Geçişler
Customer	Cliente	Kund	Müşteri
Vendor, operator	Vendedor, operario	Försäljare, operatör	Tedarikçi, operatör
Non-weighed article	Artículo no pesado	Icke-vägd vara	Tartılmamış ürün
Weighed article	Artículo pesado	Vägd vara	Tartılmış ürün
Clear	Corrección (borrado)	Korrigering	Açık - net
Weighing range	Rango de pesaje	Vägningsområde	Tartım aralığı

8 Currency markings

At the time of publication of this version of this guide, the following countries were using the Euro currency: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia and Spain.

EURO CURRENCY

For the indication and printing of the EURO currency, both during and after a transition period, refer to Section 3.1.77 of this guide.

Monetary divisions commonly in use:

Currency:	Euro
Divisions:	1 € is divided into 100 cent
Unit price:	0.01 €/kg
Price to pay:	0.01 €
Separator:	comma “,” or point “.”

The € symbol may be placed before or after the amount (eg € 1.23 or 1.23 €)

(See Section 3.1.36 on Euro price rounding)

BULGARIA

Currency:	BG Lev (or Лев, лв.)
Divisions:	1 BG Lev is divided into 100 stotinki (or стотинки).
Unit price:	0,01 лв./kg
Price to pay:	0,01 лв.
Separator	comma.

CROATIA

Currency:	“Hrvatska Kuna”
Monetary symbols:	kn and lp The symbol may be placed above, below or to the right of the figures
Divisions:	1 kn is divided into 100 lipa (lp)
Unit price:	0,01 kn/kg
Price to pay:	0,01 kn
Separator:	comma

CZECH REPUBLIC

Currency:	Česká koruna
Monetary symbols:	Kč
Unit price:	0,01 Kč/kg
Price to pay:	0,01 Kč
Separator:	comma

The symbols are placed to the right, above or under the numerical values.

DENMARK

Currency:	Kroner
Monetary symbols:	“Kr” or “kr” and øre (no abbreviation exists).
Divisions:	1 krone is divided in 100 øre (1 øre = 0,01 kr). The smallest value is 50 øre.
Unit price:	0,00 kr/kg or 0,00 kr/100 g.
Price to pay:	0,00 kr.

Symbols may be placed above, below or to the right of the figures.

HUNGARY

Currency:	Forint
Monetary symbols:	Ft, international HUF
Unit price	du=1Ft
Price to pay	dp=1Ft

ICELAND

Currency:	“Krónur”
Monetary symbols:	Kr or KR and “aurar”
Divisions:	1 Kr is divided into 100 “aurar” (100 aurar = 1 Kr). No monetary symbol or abbreviation for aurar.
The smallest coin:	1 Kr.
Unit price:	0,01 Kr/”mass unit”.
Price to pay:	1.00 Kr (rounded to the nearest Kr)

NORWAY

Currency:	"krone" and "øre".
Monetary symbols:	kr, øre (There no abbreviation for øre)
Divisions:	1 krone is divided in 100 øre. The smallest value is 50 øre.
Unit price:	0,01 kr (1 øre)
Price to pay:	0.50 kr (50 øre)

The price symbols on the display of a weighing instrument could be placed immediately before, after or above the figures.

POLAND

Currency:	złoty
Monetary symbols:	zł
Divisions:	1 zł is divided into 100 gr (1 zł = 100 gr) “gr” abbreviation for “grosz”
Unit price:	0,01 zł/kg
Price to pay:	0,01 zł
Separator:	comma

The symbols are placed to the right, above or under the numerical values.

ROMANIA

Currency:	Leu (plural: Lei)
Divisions:	1 Leu is divided into 100 bani.
Unit price:	0,01 Lei/kg
Price to pay:	0,01 Lei/kg
Separator:	comma

SWEDEN

Currency:	"krona" and "öre".
Monetary symbols:	"kr" or "KR" (if only capital letters are possible) Öre (Shall not be abbreviated if it is used).
Divisions:	1 krona is divided in 100 öre. The smallest value is 50 öre.
Unit price:	0,01 kr/kg
Price to pay:	0,50 kr

The price symbols on the display of a weighing instrument could be placed immediately before, after or above the figures.

SWITZERLAND

Currency:	Franken, Rappen, franc, centime, franco, centesimo
Monetary symbols:	Fr., Rp, fr., ct., CHF
Divisions:	1 Fr. = 100 Rp. 1 fr. = 100 ct.1 fr. = 100 ct.
Unit price:	CHF/kg, CHF/100g, CHF/Stück, CHF/pièce, CHF/pezzo
Price to pay:	Fr. 0.05 or fr. 0.05 or CHF 0.05
Separator	is comma or point

The price interval of the total sum of one or more transactions shall be 5 Rp./ct. (0,05 Fr./fr./CHF).

The interval of unit price and price to pay can be on special request 1 Rp./ct. (0.01 Fr./fr./CHF), but is usually 5 Rp/ct (0,05 Fr./fr./CHF).

TURKEY

Currency:	"Türk lirası"
Monetary symbols:	₺
Divisions:	1 Türk lirası is divided into 100 Kuruş
Unit price:	0,01 ₺/kg
Price to pay:	0,01 ₺
Separator:	comma

UNITED KINGDOM

Currency: Pound, pence
 Monetary Symbols: £ (pound); p (pence)
 Unit Price 0.01 £/kg; 0.01 £ per kg; 0.01 £/100 g; 0.01 £/item
 1 p/kg; 1 p per kg; 1 p/100 g; 1 p/item

The symbols in relation to numeric data may be above, below or alongside the value. Where the symbol is alongside it should be in the following form:

£ 0.01/kg; 1 p/kg

Where fractional pricing is used then it is acceptable to present the data on the display in the following form:

£ per	p per
0.01	1
• •	• •
kg 100 g	kg 100 g

Minimum unit price interval £0.01; 1p

Maximum value ∞ ; 999p

Price to Pay: The symbols in relation to numeric data may be above, below or alongside the value. Where the symbol is alongside it should be in the following form:

£X.XX; Xp

The price to pay must be presented as a single interval not multi-interval.

Price to pay interval £0.01; 1p

Maximum value ∞ ; 999p

9 Contents and structure of the documentation (EC type examination)

This section describes the contents and the structure of the documentation to be submitted for EC type examination of a non-automatic weighing instrument.

The structure follows Annex III of Directive 2009/23/EC. Numbers in slashes /../ refer to EN 45501. These references are however not exhaustive.

9.1 General description of type

General description of type, explanations necessary to understand the functioning of the instrument

9.1.1 *Intended purpose of use*

Intended purpose of use, kind of instrument (e.g. platform plus-minus-scale, price labeller)

9.1.2 *General characteristics*

General characteristics (manufacturer; Class, Max, Min, e, n; single-/multi-interval, multiple range; range of temperature, voltage ...) /7.1/

9.2 List of descriptions

List of descriptions and characteristic data of all devices incorporated in the instrument

9.2.1 *Means of securing components*

Means for securing components, controls etc. /4.1.2/

Place for application of CE and related marks /7.2/

9.2.2 *Adjustment devices* /4.1.2.5/

9.2.3 *Auxiliary, or extended indicating device* /3.4, 4.4.3, 4.14.7/

9.2.4 *Multiple use of indicating devices* /4.4.4/

9.2.5 *Printing devices* /4.4.5/, *printing of weighing results* /4.6.11, 4.7.3/ *and other values* /4.15.4, 4.17/

9.2.6 *Memory storage device* /4.4.6/

9.2.7 *Zero-setting, zero-tracking devices* /4.5, 4.6.9, 4.14.2/

9.2.8 *Tare devices* /4.6, 4.10, 4.14.3/

9.2.9 *Preset tare devices* /4.7, 4.14.4/

9.2.10 *Locking devices* /4.8, 4.14.5/

9.2.11 *Levelling device and level indicator, maximum value of tilt* /3.9.1/

9.2.12 *Auxiliary verification device* /4.9/

9.2.13 *Selection of weighing ranges (on multiple range instruments)* /4.10/

9.2.14 *Devices to connect different load receptors to different load measuring devices* /4.11/

9.2.15 *Functions of price-calculating instruments*

(e.g. for direct sales to the public) /4.15/

- special applications /4.15.4/
- self-service application /4.15.5/
- price labelling /4.17/

9.2.16 Interfaces

- Type(s), intended use, immunity to external influences instructions /5.3.6/
- peripheral devices presented to be connected for the disturbance tests /5.4.2/

9.2.17 Peripheral devices,

e.g. printers, remote displays, that are to be included in the type approval certificate

9.2.18 Other devices or functions, e.g. for purposes other than determination of mass (not subject to conformity assessment)

9.3 Information concerning special cases

9.3.1 Subdivision of the instrument in modules

e.g. load cells, mechanical system, indicator, display - indicating the functions of each module and the fractions π of the maximum permissible errors.

For modules that have already been approved, reference to test certificates or type approval certificates /3.5.4/

For load cells, reference to evaluation under R 60 /4.12/

- See also point 9.8

9.3.2 Special operating conditions /3.9.5/

9.3.3 Reaction of the instrument to significant faults /5.1.1, 5.2, 4.14.9/

9.3.4 Functioning of the display after switch-on /5.3.1/

9.3.5 Any other special information

9.4 Conceptual designs, drawings and plans of components, sub-assemblies, electric circuits etc.

In particular of:

- load receptor
- lever systems and material of the levers, if not designed according to /6.3.2 - 6.3.4/
- devices to apply the force to the load cells
- electrical connection elements, e.g. for connecting load cells to the indicator
- load cells, if not presented as modules under 3.1
- indicator:
 - block diagram
 - schematic circuit
 - keyboard with function assigned to any key
- drawing of the main plate /7.1/
- samples of all intended printouts, see also point 2.5
- presentation of the instrument (drawing or photo) showing where verification and
- securing marks are to be applied
- cf. points 2.1, 2.14. Size not larger than 210 x 297 mm (DIN A4)

9.5 Declarations whether EN 45501 has been fully applied.

For deviations, reference should be made to the corresponding points in Annex I of the Directive, and in the EN, and also to the corresponding points in sections 2 and 3 of the documentation.

9.6 Results of tests performed by the manufacturer

On protocols from R 76-2, including proof of competence.

9.7 Test reports from other laboratories, as per point 6.

9.8 Certificates of other EC-type approvals or separate tests

Relating to modules or other parts mentioned in the documentation, together with test protocols where possible

- see also section 9.3.1

10 Compatibility of modules

According to EC-Directive 2009/23/EC Annex II No 3, the manufacturer who is intending to submit an instrument for EC verification must ensure and declare that the instrument is in conformity with the type as described in the EC type approval certificate and satisfies the requirements of the Directive which apply to it.

Where the EC type approval certificate covers a variety of modules and/or allows the construction of a series of weighing instruments with different maximum capacities and/or measuring ranges it is necessary for the manufacturer to demonstrate before initial verification that the incorporated modules are compatible to each other and to the weighing instrument.

The relevant quantities and characteristics identified which together establish the compatibility have been included on the following forms. These forms cover the complete instruments, the electronic indicator and the load cell(s), plus 4 conditions referred to in EN 45501 and another 6 conditions which are for technical reasons as a result of the section itself. The tables, where the data shall be entered allow for an easy decision to be taken as to whether or not they are satisfied.

The manufacturer of the weighing instrument can check and prove this compatibility by filling in the forms given in the following pages.

It is intended that the forms should be attached to the formal Declaration of Conformity or by other means held ready to be presented to a Notified Body responsible for initial verification or subsequent metrological control. They should also accompany an application for EC type examination or EC unit verification, as part of the supporting documentation.

Compatibility of modules spreadsheets have been produced by DELTA (Denmark) and by PTB (Germany), and are available in English, free of charge, from their websites at:

DELTA: www.delta.dk/weighing

PTB: www.ptb.de [follow the links to their Working Group 1.12 (weighing instruments)]

If you cannot find the spreadsheets on these websites, please contact the relevant organisation.

Both these organisations also have their spreadsheets available in French and German.

Compatibility of Modules
Data sheet
Non-automatic weighing instrument

(All data to be taken from test certificate, type approval certificate or instrument in question)

Manufacturer:

Type:

Serial number:

Number of EC-type approval certificate:

issued by:

dated:

Metrological and technical Data :

Weighing instrument	accuracy class	<i>class</i>		
	- maximum capacity (multi-interval / multiple range)	<i>Max</i> (<i>Max</i> ₁) (<i>Max</i> ₂) (<i>Max</i> ₃)		g, kg, t
	- verification scale interval (multi-interval / multiple range)	<i>e</i> (<i>e</i> ₁) (<i>e</i> ₂) (<i>e</i> ₃)		g, kg, t
	- number of verification scale intervals $n = \text{Max} / e$ (multi-interval / multiple range $n_i = \text{Max}_i / e_i$)	<i>n</i> (<i>n</i> ₁) (<i>n</i> ₂) (<i>n</i> ₃)		-
	- reduction ratio	<i>R</i>		-
	- number of load cells	<i>N</i>		-
	- correction factor	<i>Q</i>		-
	- dead load of load receptor	<i>DL</i>		g, kg, t
	- lower limit of temperature range	<i>T</i> _{min}		°C
	- upper limit of temperature range	<i>T</i> _{max}		°C
	- connecting system	<i>WS</i>		-
	- 4-wire- or 6-wire-system			
	- length of connecting cable	<i>L</i>		m
	- cross section of wire	<i>A</i>		mm ²
Electronic indicator Type :	- suitable for accuracy class of the weighing instrument	<i>class</i>		-

Manufacturer : Test Certificate N° or Type-approval N° : issued by : dated :	- maximum number of verification scale intervals	n_{ind}		-
	- load cell excitation voltage	U_{exc}		V
	- minimum input voltage per verification scale interval	ΔU_{min}		$\mu V, mV$
	- minimum load cell resistance	RL_{min}		Ω
	- maximum load cell resistance	RL_{max}		Ω
	- lower limit of temperature range	T_{min}		$^{\circ}C$
	- upper limit of temperature range	T_{max}		$^{\circ}C$
	- fraction of the maximum permissible error	ρ_{ind}		-
	4-wire-system : - maximum value of cable length per wire cross section	$(L/A)_{4max}$		m/mm^2
	6-wire-system : - maximum value of cable length per wire cross section	$(L/A)_{6max}$		m/mm^2

Load cell	- maximum capacity	E_{max}		g, kg, t
Type :	- minimum dead load	E_{min}		g, kg, t
	- accuracy class			
Manufacturer :	- rated output	C		mV/V
	- maximum number of verification scale intervals	n_{LC}		-
Test Certificate N° or Type approval N° :	- minimum verification scale interval or the ratio $Y = E_{max}/v_{min}$	v_{min} Y		g, kg,t -
	- minimum dead load output return or the ratio $Z = E_{max}/(2 \cdot DR)$	DR Z		g, kg, t -
issued by :	- input resistance of single load cell	R_{LC}		Ω
	- lower limit of temperature range	T_{min}		$^{\circ}C$
dated :	- upper limit of temperature range	T_{max}		$^{\circ}C$
	- fraction of the maximum permissible error	ρ_{LC}		

Connecting elements	- fraction of the maximum permissible error	ρ_{con}		-
---------------------	---	--------------	--	---

Condition (1)	Accuracy classes						
	Load cell(s)		Indicator	equal or better than	Weighing instrument	passed	failed
		&					

Condition (2)	Temperature limit	Load cell		Indicator		Weighing instrument	passed	failed
	T_{min}		&		\leq			
	T_{max}		&		\geq			

Condition (3)	$(p_{LC})^2$	$+ (p_{con})^2$	$+ (p_{ind})^2$	=	$\sum p_i^2$	≤ 1	passed	failed
				=				

Condition (4) Single scale interval instrument :

n_{ind}	\geq	$n = Max / e$	passed	failed

Multi-interval or multiple range instrument (i = number of range):

i	n_{ind}	\geq	$n_i = Max_i / e_i$	passed	failed

Condition (5)	Q·Max·R/N		\leq	E_{max}	passed	failed
		=				

where Q may be derived from:

$$Q = \frac{Max + \text{deadload} + \text{additive tare} + \text{initial zero setting range} + NUD}{Max}$$

and NUD is the “Non-Uniform Distribution” factor (see Section 3.1.6.6)

Condition (6a) Single scale interval instrument :

n_{LC}	\geq	$n = Max / e$	passed	failed

Multi-interval or multiple range instrument (i = number of range):

i	n_{LC}	\geq	$n_i = Max_i / e_i$	passed	failed

Condition (6b) Multi-interval instrument

DR	$Z = E_{max} / (2 \cdot DR)$	\geq	Max_r / e_1	passed	failed

($Z = n_{LC}$ if neither DR nor Z are given in the load cell test report)

Condition (6c) Multiple range instrument

DR	$Z = E_{max} / (2 \cdot DR)$	\geq	$0.4 \cdot Max_r / e_1$	passed	failed

($Z = n_{LC}$ if neither DR nor Z are given in the load cell test report)

Condition (6d)

$DL \cdot R / N$	\geq	E_{min}	passed	failed

Condition (7)

$e \cdot R / \sqrt{N}$	\geq	$v_{min} = E_{max} / Y$	passed	failed
	=			

($Y = n_{LC}$ if neither v_{min} nor Y are given in the load cell test report)

($e = e_1$ for a multi-interval instrument or for a multiple range instrument)

Condition (8)

Δu	\geq	Δu_{\min}	passed	failed

Δu calculated from following formula :

$$\Delta u = \frac{C}{E_{\max}} \cdot U_{\text{exc}} \cdot \frac{R}{N} \cdot e$$

Condition (9)

$R_{L_{\min}}$	\leq	R_{LC} / N	\leq	$R_{L_{\max}}$	passed	failed

Condition (10)

4-wire-system

L	I	A	$=$	$(L/A)_4$	\leq	$(L/A)_{4\max}$	passed	failed
	I		$=$					

6-wire-system

L	I	A	$=$	$(L/A)_6$	\leq	$(L/A)_{6\max}$	passed	failed
	I		$=$					

Proof of the compatibility of the metrological and technical data of weighing instrument, load cell(s) and electronic indicator.

- Condition (1):** Accuracy class of weighing instrument, compatible to class of indicator and load cell(s)
- Condition (2):** Temperature limits of the weighing instrument compared with the temperature limits of the load cell(s) and the electronic indicator
- Condition (3):** Sum of the squares of the fractions π of the maximum permissible errors of load cell(s), connecting elements and indicator (EN 45501, No. 3.5.4) must not exceed 1
- Condition (4):** Number of verification scale intervals of the weighing instrument must not exceed maximum number of verification scale intervals of the electronic indicator
- Condition (5):** Maximum capacity of load cell(s) must be compatible to Max of the weighing instrument (EN 45501, No 4.12.1). (Explanation of “NUD” and suggested equation for Q are given in Section 3.1.6.6)
- Condition (6a):** Compatibility of the maximum number of verification scale intervals of load cell(s) to the number of verification scale intervals of the weighing instrument (EN 45501, No 4.12.2)
- Condition (6b):** Compatibility of minimum dead load output return of the load cell to the verification scale interval of a multi interval instrument
(Condition corresponding to EN 45501, No4.12.2, as agreed by WELMEC WG2 Decision 8 dated 23 November 1994)
- Condition (6c):** Compatibility of minimum dead load output return of the load cell to the verification scale interval of a multiple range instrument
(Condition corresponding to EN 45501, No4.12.2, as agreed by WELMEC WG2 Decision 8 dated 23 November 1994)
- Condition (6d):** Compatibility of minimum dead load of the load cells to the actual dead load of the load receptor.
- Condition (7):** Minimum load cell scale interval (EN 45501 No 4.12.3) must be compatible to verification scale interval of the weighing instrument
- Condition (8):** Actual input voltage per verification scale interval must not be less than the minimum input voltage per verification scale interval for the electronic indicator
- Condition (9):** Actual load cell impedance must be within the allowed range of load cell impedance for the electronic indicator
- Condition (10):** Cable length per wire cross section of the connection cable between the junction box for the load cell(s) and the indicator must not exceed the value specified for the indicator

11 Conformity documents

This section sets out examples of conformity documents required to be presented with an instrument at various stages in the conformity assessment procedures of Annex II of Directive 2009/23/EC. **These example conformity documents are not valid after the 19 April 2016.**

Example A1

Declaration of Conformity - For completion by the manufacturer or his authorised representative if the manufacturer operates a quality system and declares conformity in accordance with Annex II.2 of Directive 2009/23/EC.

The form, which may be included in the operator's manual of the instrument, is recommended to be available at the site of installation.

In the case of EC declaration of conformity procedure in two stages, the validity of the declaration of conformity may depend on evidence (or proof) of the carrying out of the second stage of the procedure.

Example A2

Declaration of Conformity - For completion by the manufacturer or his authorised representative if the manufacturer operates a quality system and declares conformity in accordance with Annex II.2 of Directive 2009/23/EC.

The form, which may be included in the operator's manual of the instrument, is recommended to be available at the site of installation.

This is a two-stage EC declaration of conformity procedure where the validity of the declaration of conformity depends on evidence (signature) of the carrying out of the second stage of the procedure.

Example A3

Declaration of Conformity - For completion by the manufacturer or his authorised representative prior to verification following the EC verification procedure in Annex II.3 or the EC declaration of conformity procedure in two stages where the second stage is performed by a Notified Body.

The form, which may be included in the operator's manual of the instrument, is recommended to be available at the site of installation.

This declaration includes a statement indicating that it is only valid with a certificate of conformity issued by a Notified Body.

Example B1

Certificate of Conformity - For completion by the Notified Body at the time of verification (EC unit verification and EC verification) and presented to the manufacturer or his authorised representative.

The manufacturer or his authorised representative is required to make the certificate available on request.

A certificate of conformity may be used for many instruments of same type by including all serial numbers.

Example B2

Certificate of Conformity – Two stages - For completion by the Notified Body at the time of verification (EC unit verification and EC verification) and presented to the manufacturer or his authorised representative.

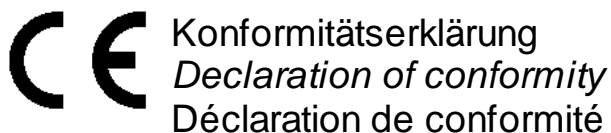
The manufacturer or his authorised representative is required to make the certificate available on request.

A certificate of conformity may be used for many instruments of same type by including all serial numbers.

Example D

Certificate on tests of the 1st stage and 2nd stage - For completion by the manufacturer or his authorised representative for performing a two-stage procedure (EC declaration of type conformity) together with example A1. This certificate must be presented with the instrument at the time of 1st and 2nd stage verification.

Example A1



Kennnummer der benannten Stelle, die die EG-Überwachung nach der Richtlinie 2009/23/EG durchgeführt hat <i>Identification number of the notified body that has carried out the EC surveillance referred to the Directive 2009/23/EC</i> Numéro d'identification de l'organisme notifié, qui a effectué la surveillance CE en conformité avec la directive 2009/23/CE
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Name und Anschrift des Herstellers oder seines autorisierten Vertreters
Name and address of manufacturer or his authorised representative
 Nom et adresse du fabricant ou de son représentant autorisé

Die nichtselbsttätige Waage
The non-automatic weighing instrument
 L'instrument de pesage à fonctionnement non automatique



Hersteller: <i>Manufacturer:</i> Fabricant:	
Typ/Modell: <i>Type/Model:</i> Type/modèle:	
Nr. der EG-Bauartzulassung (gegebenenfalls): <i>No of the EC type-approval certificate (where applicable):</i> N° du certificat d'approbation CE de type (le cas échéant):	

entspricht dem in der Bescheinigung über die Bauartzulassung beschriebenen Baumuster, sowie den Anforderungen der Richtlinie 2009/23/EG in der geltenden Fassung und den Anforderungen folgender EG-Richtlinien:

corresponds to the production model described in the EC type-approval certificate and to the requirements of the Directive 2009/23/EC as amended and to the requirements of the following EC directives:

correspond au modèle décrit dans le certificat d'approbation CE de type, aux exigences de la directive 2009/23/CE modifiée et aux exigences des directives CE suivantes:

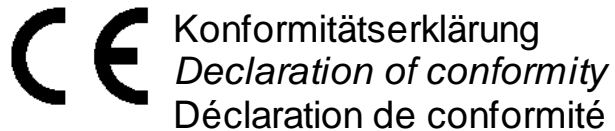
verwendete g: / <i>utilised g:/</i> valeur de g:	m/s ²
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Unterschrift <i>Signature</i> Signature	Datum <i>Date</i> Date
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Nur gültig mit einer ausgefüllten Bescheinigung über Prüfungen in der 1. und 2. Stufe
Only valid with a completed Certificate of tests on 1st stage and 2nd stage
 Seulement valable avec une attestation remplis des essais de la 1ère et 2ème étape ⁵

⁵ Only necessary for 2 stage procedure

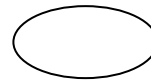
Example A2



Kennnummer der benannten Stelle, die die EG-Überwachung nach der Richtlinie 2009/23/EG durchgeführt hat <i>Identification number of the notified body that has carried out the EC surveillance referred to the Directive 2009/23/EC</i> Numéro d'identification de l'organisme notifié, qui a effectué la surveillance CE en conformité avec la directive 2009/23/CE
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Name und Anschrift des Herstellers oder seines autorisierten Vertreters
Name and address of manufacturer or his authorised representative
 Nom et adresse du fabricant ou de son représentant autorisé

Die nichtselbsttätige Waage
The non-automatic weighing instrument
 L'instrument de pesage à fonctionnement non automatique



Hersteller: <i>Manufacturer:</i> Fabricant:	
Typ/Modell: <i>Type/Model:</i> Type/modèle:	
Nr. der EG-Bauartzulassung (gegebenenfalls): <i>No of the EC type-approval certificate (where applicable):</i> N° du certificat d'approbation CE de type (le cas échéant):	
Seriennummer(n): <i>Serial number(s):</i> Numéro(s) de série:	

entspricht dem in der Bescheinigung über die Bauartzulassung beschriebenen Baumuster, sowie den Anforderungen der Richtlinie 2009/23/EG in der geltenden Fassung und den Anforderungen folgender EG-Richtlinien:

corresponds to the production model described in the EC type-approval certificate and to the requirements of the Directive 2009/23/EC as amended and to the requirements of the following EC directives:

correspond au modèle décrit dans le certificat d'approbation CE de type, aux exigences de la directive 2009/23/CE modifiée et aux exigences des directives CE suivantes:

Prüfungen und Tests nach EN 45501 Nr. 8.2 mit Ausnahme folgender Prüfungen in der 1. Stufe ausgeführt:
Performed examinations and tests referred to in EN 45501 - 8.2 on 1st stage, with the exception of the following tests:

Les examens et essais accomplis dans la 1ère étape en conformité avec la norme européenne EN 45501 - 8.2, à l'exception des essais suivants:

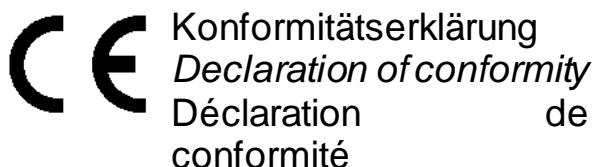
Unterschrift <i>Signature</i> Signature	Datum <i>Date</i> Date
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In der 2. Stufe ausgeführte Prüfungen:
Tests completed on 2nd stage:
 Essais accomplis dans la 2eme étape:

verwendete g: / <i>utilised g:</i> / valeur de g:	m/s ²
Unterschrift <i>Signature</i> Signature	Datum <i>Date</i> Date

Nur gültig mit 2 Unterschriften Only valid with 2 signatures Seulement valable avec 2 signatures

Example A3



Name und Anschrift des Herstellers oder seines autorisierten Vertreters

Name and address of manufacturer or his authorised representative

Nom et adresse du fabricant ou de son représentant autorisé

Die nichtselbsttätige Waage

The non-automatic weighing instrument

L'instrument de pesage à fonctionnement non automatique



Hersteller: <i>Manufacturer:</i> Fabricant:	
Typ/Modell: <i>Type/Model:</i> Type/modèle:	
Nr. der EG-Bauartzulassung (gegebenenfalls): <i>No of the EC type-approval certificate (where applicable):</i> N° du certificat d'approbation CE de type (le cas échéant):	

entspricht dem in der Bescheinigung über die Bauartzulassung beschriebenen Baumuster, sowie den Anforderungen der Richtlinie 2009/23/EG in der geltenden Fassung und den Anforderungen folgender EG-Richtlinien:

corresponds to the production model described in the EC type-approval certificate and to the requirements of the Directive 2009/23/EC as amended and to the requirements of the following EC directives:

correspond au modèle décrit dans le certificat d'approbation CE de type, aux exigences de la directive 2009/23/CE modifiée et aux exigences des directives CE suivantes:

verwendete g: / <i>utilised g:</i> / valeur de g:	m/s ²
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Unterschrift <i>Signature</i> Signature	Datum <i>Date</i> Date
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Nur gültig mit einer von einer Benannten Stelle erteilten Konformitätsbescheinigung

Only valid with a Certificate of Conformity issued by a Notified Body

Seulement valable avec une Attestation de Conformité délivré par une organisme notifié

Example B1

Konformitätsbescheinigung Certificate of conformity Attestation de conformité

Name, Anschrift und Kennnummer der benannten Stelle <i>Name, address and identification number of the notified body</i> Nom, adresse et numéro d'identification de l'organisme notifié
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Die Übereinstimmung der nichtselbsttätigen Waage
The conformity of the non-automatic weighing instrument
La conformité de l'instrument de pesage à fonctionnement non automatique



Hersteller: <i>Manufacturer:</i> Fabricant:	
Typ/Modell: <i>Type/Model:</i> Type/modèle:	
Nr. der EG-Bauartzulassung (gegebenenfalls): <i>No of the EC type-approval certificate (where applicable):</i> N° du certificat d'approbation CE de type (le cas échéant):	
Seriennummer(n): <i>Serial number(s):</i> Numéro(s) de série:	

mit den Anforderungen der Richtlinie 2009/23/EG in der geltenden Fassung wurde durch Prüfungen und Tests nach EN 45501 Nr. 8.2 festgestellt:

with the requirements of the Directive 2009/23/EC as amended was established by examinations and tests referred to in EN 45501 - 8.2:

avec les exigences de la directive 2009/23/CE modifiée a été constatée par les examens et essais en conformité avec la norme européenne EN 45501-8.2:

Die EG-Eichung wurde für folgende(n) Aufstellungsort / Gebrauchsort / Gebrauchszone durchgeführt:

The EC-verification is valid for the following place of installation / location / area of use:

La vérification CE est valide pour l'emplacement / l'endroit d'utilisation / sphère d'utilisation suivant:

verwendete g: / <i>utilised g:</i> / valeur de g:	m/s ²
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Unterschrift <i>Signature</i> Signature	Datum <i>Date</i> Date
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Example B2

Konformitätsbescheinigung Certificate of conformity Attestation de conformité

Die Übereinstimmung der nichtselbsttätigen Waage
The conformity of the non-automatic weighing instrument
 La conformité de l'instrument de pesage à fonctionnement non automatique



Hersteller: <i>Manufacturer:</i> Fabricant:	
Typ/Modell: <i>Type/Model:</i> Type/modèle:	
Nr. der EG-Bauartzulassung (gegebenenfalls): <i>No of the EC type-approval certificate (where applicable):</i> N° du certificat d'approbation CE de type (le cas échéant):	
Seriennummer(n): <i>Serial number(s):</i> Numéro(s) de série:	

mit den Anforderungen der Richtlinie 2009/23/EG in der geltenden Fassung wurde durch Prüfungen und Tests nach EN 45501 Nr. 8.2 mit Ausnahme folgender Prüfungen festgestellt:
with the requirements of Directive 2009/23/EC as amended was established by examinations and tests referred to in EN 45501 - 8.2, with the exception of the following tests:
 avec les exigences de la directive 2009/23/CE modifiée a été constatée par les examens et essais en conformité avec la norme européenne EN 45501 - 8.2, à l'exception des essais suivants:

Name, Anschrift und Kennnummer der benannten Stelle <i>Name, address and identification number of the notified body</i> Nom, adresse et numéro d'identification de l'organisme notifié
Unterschrift / <i>Signature</i> / Signature	Datum / <i>Date</i> / Date

In der 2. Stufe ausgeführte Prüfungen:
Tests completed on 2nd stage:
 Essais accomplis dans la 2eme étape:

Die EG-Eichung wurde für folgende(n) Aufstellungsort / Gebrauchsort / Gebrauchszone durchgeführt:
The EC-verification is valid for the following place of installation / location / area of use:
 La vérification CE est valide pour l'emplacement / l'endroit d'utilisation / sphère d'utilisation suivant:

verwendete g: / <i>utilised g:</i> / valeur de g:	m/s ²
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Name, Anschrift und Kennnummer der benannten Stelle <i>Name, address and identification number of the notified body</i> Nom, adresse et numéro d'identification de l'organisme notifié
Unterschrift <i>Signature</i> Signature	Datum <i>Date</i> Date

Example D

Bescheinigung über Prüfungen *Certificate on tests* Attestation des essais

Name und Anschrift des Herstellers oder seines autorisierten Vertreters
Name and address of manufacturer or his authorised representative
Nom et adresse du fabricant ou de son représentant autorisé

Kennnummer der benannten Stelle, die die EG-Überwachung nach der Richtlinie 2009/23/EG durchgeführt hat <i>Identification number of the notified body that has carried out the EC surveillance according to Directive 2009/23/EC</i> Numéro d'identification de l'organisme notifié, qui a effectué la surveillance CE en conformité avec la directive 2009/23/CE.
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Die Übereinstimmung der nichtselbsttätigen Waage
The conformity of the non-automatic weighing instrument
La conformité de l'instrument de pesage à fonctionnement non automatique



Hersteller: <i>Manufacturer:</i> Fabricant:	
Typ/Modell: <i>Type/Model:</i> Type/modèle:	
Nr. der EG-Bauartzulassung (gegebenenfalls): <i>No of the EC type-approval certificate (where applicable):</i> N° du certificat d'approbation CE de type (le cas échéant):	
Seriennummer(n): <i>Serial number(s):</i> Numéro(s) de série:	

mit den Anforderungen der Richtlinie 2009/23/EG in der geltenden Fassung wurde durch Prüfungen und Tests mit Ausnahme folgender Prüfungen festgestellt:
with the requirements of the Directive 2009/23/EC as amended was established by examinations and tests with the exception of the following tests:
 avec les exigences de la directive 2009/23/CE modifiée a été constatée par les examens et essais à l'exception des essais suivants:

Unterschrift <i>Signature</i> Signature	Datum <i>Date</i> Date
---	------------------------------

In der 2. Stufe ausgeführte Prüfungen:
Tests completed on 2nd stage:
 Essais accomplis dans la 2eme étape:

verwendete g: / <i>utilised g:</i> / valeur de g:	m/s ²
Unterschrift <i>Signature</i> Signature	Datum <i>Date</i> Date

Nur gültig mit 2 Unterschriften
Only valid with 2 signatures
 Seulement valable avec 2 signatures

12 Revisions of this guide

(Changes of previous issues not listed)

Issue	Date	Significant changes from previous issue
4	June 2004	<p>Modifications or additions to the following sections: 3.1.6.4, 3.1.7, 3.1.12, 3.1.13.1, 3.1.15, 3.1.17, 3.1.19, 3.1.20, 3.1.29.</p> <p>New sections added: 3.1.1.2, 3.1.6.7, 3.1.6.8, 3.1.6.9, 3.1.6.10, 3.1.13.2, 3.1.13.3, 3.1.24.3, 3.1.26, 3.1.27, 3.1.28, 3.1.29, 3.1.30, 3.1.31, 3.1.32, 3.1.33, 3.1.34, 3.1.35, 3.1.36, 3.1.37, 3.1.38, 3.1.39, 3.1.40, 3.1.41, 3.1.42, 3.1.43, 3.1.44, 3.1.45, 3.1.46, 3.1.47, 3.1.48, 3.1.49, 3.1.50, 3.1.51, 3.1.52, 3.1.53.</p> <p>Section 4; BCR decisions moved into Section 3.</p> <p>Additional or modified country information in Sections 1, 7, 8.</p> <p>References to “Q” and “NUD” added to Section 11.</p> <p>New map on front cover.</p>
5	May 2009	<p>Modifications or additions to the following sections:</p> <p>1 (certificate number format: Austria, Bulgaria, France, Slovakia and Switzerland).</p> <p>3.1.8.2, 3.1.9, 3.1.15, 3.1.17, 3.1.19, 3.1.24.2, 3.1.27, 3.1.28, 3.1.33, 3.3, 3.4.3, 5</p> <p>7 (languages: Bulgarian, Estonian, Latvian, Maltese, Polish, Romanian, Slovak)</p> <p>8 (currency: Bulgaria, Cyprus, Denmark, Estonia, Latvia, Malta, Romania, Slovakia, Slovenia and Switzerland).</p> <p>Section 12 has been completely rewritten, with new conformity documents.</p> <p>New sections added: 3.1.6.11, 3.1.54, 3.1.55, 3.1.56, 3.1.57, 3.1.58, 3.1.59, 3.1.60, 3.1.61, 3.1.62, 3.1.63, 3.1.64, 3.1.65.</p> <p>New map on front cover.</p> <p>Change of WELMEC Secretariat details.</p>
6	May 2014	<p>Total revision of guide</p> <p>Replacing 90/384/EEC to 2009/23/EC</p> <p>Change of WELMEC Secretariat details</p> <p>Deleted section 9 Imperial requirements and modified section 3.1.19</p> <p>Including decisions up to meeting WG2-34 (2012)</p> <p>Amended Bulgarian information (TAC, Currency and translations)</p> <p>Amended Croatian and Turkish information (Currency)</p> <p>Amended Section 5 with decision Meeting 25, Point 14</p> <p>Amended 3.1.54, 3.1.55, 3.1.56, 3.1.57, added 3.1.26.1 and 3.1.41.1</p>

Issue	Date	Significant changes from previous issue
7	May 2015	<p>Deleted Section:</p> <p style="padding-left: 40px;">3.1.33 (subsequent sections renumbered)</p> <p>Amended Sections:</p> <p style="padding-left: 40px;">3.1.6.10 with decision Meeting 36, Point 17</p> <p style="padding-left: 40px;">3.1.16 with decision Meeting 35, Point 20</p> <p style="padding-left: 40px;">3.1.19 with decision Meeting 35, Point 11, plus editorial change</p> <p style="padding-left: 40px;">3.1.53 editorial</p> <p style="padding-left: 40px;">3.2.3.6 editorial</p> <p style="padding-left: 40px;">7 addition of language information for Belgium, and Croatian and Turkish translations</p> <p style="padding-left: 40px;">8 updated currency information for Poland</p> <p>Addition of Sections:</p> <p style="padding-left: 40px;">3.1.38.1 with decision Meeting 36, Point 29</p> <p style="padding-left: 40px;">3.1.57 with decision Meeting 36, Point 25</p> <p style="padding-left: 40px;">3.1.77 with decision Meeting 36, Point 15</p> <p style="padding-left: 40px;">3.1.78 with decision Meeting 35, Point 12</p> <p style="padding-left: 40px;">3.1.79 with decision Meeting 36, Point 16</p> <p style="padding-left: 40px;">3.1.80 with decision Meeting 35, Points 14 and 17</p> <p style="padding-left: 40px;">3.1.81 with decision Meeting 36, Point 14</p> <p style="padding-left: 40px;">3.1.82 with decision Meeting 36, Point 11</p>

End of Guide