

Directive 2009/23/EC of the European Parliament and of the  
Council of 23 April 2009 on non-automatic weighing instruments  
(Codified version) (Text with EEA relevance) (repealed)

## ANNEX I

**METROLOGICAL REQUIREMENTS**

## 1. Units of mass

The units of mass used shall be the legal units within the meaning of Council Directive 80/181/EEC of 20 December 1979 on the approximation of the laws of the Member States relating to units of measurement<sup>(1)</sup>.

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

- SI units: kilogram, microgram, milligram, gram, tonne,
- imperial unit: troy ounce, if weighing precious metals,
- other non-SI unit: metric carat, if weighing precious stones.

For instruments that make use of the imperial unit of mass referred to above, the relevant essential requirements specified below shall be converted to that unit, using simple interpolation.

## 2. Accuracy classes

2.1. The following accuracy classes have been defined:

- I special
- II high
- III medium
- III ordinary

The specifications of these classes are given in Table 1.

TABLE 1

**Accuracy classes**

Class	Verification scale interval (e)		Minimum capacity (Min)	Number of verification scale intervals	
				$n = \frac{\text{Max}}{e}$	
			minimum value	minimum value	maximum value
I	0,001	$g \leq e$	100 e	50 000	—
II	0,001	$g \leq e \leq 0,05 g$	20 e	100	100 000
	0,1	$g \leq e$	50 e	5 000	100 000
III	0,1	$g \leq e \leq 2 g$	20 e	100	10 000
	5	$g \leq e$	20 e	500	10 000
III	5	$g \leq e$	10 e	100	1 000

The minimum capacity is reduced to 5 e for instruments in classes II and III for determining a conveying tariff.

## 2.2. Scale intervals

2.2.1. The actual scale interval (d) and the verification scale interval (e) shall be in the form:

$1 \times 10^k$ ,  $2 \times 10^k$ , or  $5 \times 10^k$  mass units,

k being any integer or zero.

2.2.2. For all instruments other than those with auxiliary indicating devices:

$d = e$ .

2.2.3. For instruments with auxiliary indicating devices the following conditions apply:

$e = 1 \times 10^k$  g,

$d < e \leq 10 d$ ,

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

### 3. Classification

#### 3.1. Instruments with one weighing range

Instruments equipped with an auxiliary indicating device shall belong to class I or class II. For these instruments the minimum capacity lower limits for these two classes are obtained from Table 1 by replacement in column 3 of the verification scale interval (e) by the actual scale interval (d).

If  $d < 10^{-4}$  g, the maximum capacity of class I may be less than 50 000 e.

#### 3.2. Instruments with multiple weighing ranges

Multiple weighing ranges are permitted, provided they are clearly indicated on the instrument. Each individual weighing range is classified according to point 3.1. If the weighing ranges fall into different accuracy classes the instrument shall comply with the severest of the requirements that apply for the accuracy classes in which the weighing ranges fall.

#### 3.3. Multi-interval instruments

3.3.1. Instruments with one weighing range may have several partial weighing ranges (multi-interval instruments).

Multi-interval instruments shall not be equipped with an auxiliary indicating device.

3.3.2. Each partial weighing range i of multi-interval instruments is defined by:

—	its verification scale interval $e_i$	with $e_{(i+1)} > e_i$
—	its maximum capacity $Max_i$	with $Max_r = Max$
—	its minimum capacity $Min_i$	with $Min_i = Max_{(i-1)}$ and $Min_1 = Min$

where:

i = 1, 2, ... r,

i = partial weighing range number,

r = the total number of partial weighing ranges.

All capacities are capacities of net load, irrespective of the value of any tare used.

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- 3.3.3. The partial weighing ranges are classified according to Table 2. All partial weighing ranges shall fall into the same accuracy class, that class being the instrument's accuracy class.

TABLE 2

**Multi-interval instruments**

Class	Verification scale interval (e)		Minimum capacity (Min)	Number of verification scale intervals	
			Minimum value	Minimum value <sup>a</sup> $n = \frac{Max_i}{e_{(i+1)}}$	Maximum value $n = \frac{Max_i}{e_i}$
I	0,001	$g \leq e_i$	100 e <sub>1</sub>	50 000	—
II	0,001	$g \leq e_i \leq 0,05 g$	20 e <sub>1</sub>	5 000	100 000
	0,1	$g \leq e_i$	50 e <sub>1</sub>	5 000	100 000
III	0,1	$g \leq e_i$	20 e <sub>1</sub>	500	10 000
III	5	$g \leq e_i$	10 e <sub>1</sub>	50	1 000

a For  $i = r$ , the corresponding column of Table 1 applies, with  $e$  replaced by  $e_r$ .

4. Accuracy

- 4.1. On implementation of the procedures laid down in Article 9, the error of indication shall not exceed the maximum permissible error of indication as shown in Table 3. In case of digital indication the error of indication shall be corrected for the rounding error.

The maximum permissible errors apply to the net value and tare value for all possible loads, excluding preset tare values.

TABLE 3

**Maximum permissible errors**

Load				Maximum permissible error
Class I	Class II	Class III	Class III	
$0 \leq m \leq 50\,000 e$	$0 \leq m \leq 5\,000 e$	$0 \leq m \leq 500 e$	$0 \leq m \leq 50 e$	$\pm 0,5 e$
$50\,000 e < m \leq 200\,000 e$	$5\,000 e < m \leq 20\,000 e$	$500 e < m \leq 2\,000 e$	$50 e < m \leq 200 e$	$\pm 1,0 e$
$200\,000 e < m$	$20\,000 e < m \leq 100\,000 e$	$2\,000 e < m \leq 10\,000 e$	$200 e < m \leq 1\,000 e$	$\pm 1,5 e$

- 4.2. The maximum permissible errors in service are twice the maximum permissible errors fixed in Section 4.1.
5. Weighing results of an instrument shall be repeatable, and shall be reproducible by the other indicating devices used and in accordance with other methods of balancing used.

The weighing results shall be sufficiently insensitive to changes in the position of the load on the load receptor.

6. The instrument shall react to small variations in the load.
7. Influence quantities and time
- 7.1. Instruments of classes II, III and IIII, liable to be used in a tilted position, shall be sufficiently insensitive to the degree of tilting that can occur in normal use.
- 7.2. The instruments shall meet the metrological requirements within the temperature range specified by the manufacturer. The value of this range shall be at least equal to:
- 5 °C for an instrument in class I,
  - 15 °C for an instrument in class II,
  - 30 °C for an instrument in class III or IIII.

In the absence of a manufacturer's specification, the temperature range of – 10 °C to + 40 °C applies.

- 7.3. Instruments operated from a mains power supply shall meet the metrological requirements under conditions of power supply within the limits of normal fluctuation.

Instruments operated from battery power shall indicate whenever the voltage drops below the minimum required value and shall under those circumstances either continue to function correctly or be automatically put out of service.

- 7.4. Electronic instruments, except those in class I and in class II if  $e$  is less than 1 g, shall meet the metrological requirements under conditions of high relative humidity at the upper limit of their temperature range.
- 7.5. Loading an instrument in class II, III or IIII for a prolonged period of time shall have a negligible influence on the indication at load or on the zero indication immediately after removal of the load.
- 7.6. Under other conditions the instruments shall either continue to function correctly or be automatically put out of service.

### **Design and construction**

8. General requirements
- 8.1. Design and construction of the instruments shall be such that the instruments will preserve their metrological qualities when properly used and installed and when used in an environment for which they are intended. The value of the mass must be indicated.
- 8.2. When exposed to disturbances, electronic instruments shall not display the effects of significant faults, or shall automatically detect and indicate them.

Upon automatic detection of a significant fault, electronic instruments shall provide a visual or audible alarm that shall continue until the user takes corrective action or the fault disappears.

- 8.3. The requirements of points 8.1 and 8.2 shall be met on a lasting basis during a period of time that is normal in view of the intended use of such instruments.

Digital electronic devices shall always exercise adequate control of the correct operation of the measuring process, of the indicating device, and of all data storage and data transfer.

Upon automatic detection of a significant durability error, electronic instruments shall provide a visual or audible alarm that shall continue until the user takes corrective action or the error disappears.

- 8.4. When external equipment is connected to an electronic instrument through an appropriate interface the metrological qualities of the instrument shall not be adversely influenced.

- 8.5. The instruments shall have no characteristics likely to facilitate fraudulent use, whereas possibilities for unintentional misuse shall be minimal. Components that may not be dismantled or adjusted by the user shall be secured against such actions.

- 8.6. Instruments shall be designed to permit ready execution of the statutory controls laid down by this Directive.

#### 9. Indication of weighing results and other weight values

The indication of the weighing results and other weight values shall be accurate, unambiguous and non-misleading and the indicating device shall permit easy reading of the indication under normal conditions of use.

The names and symbols of the units referred to in point 1 of this Annex shall comply with the provisions of Directive 80/181/EEC with the addition of the symbol for the metric carat which shall be the symbol 'ct'.

Indication shall be impossible above the maximum capacity (Max), increased by 9 e.

An auxiliary indicating device is permitted only to the right of the decimal mark. An extended indicating device may be used only temporarily, and printing shall be inhibited during its functioning.

Secondary indications may be shown, provided that they cannot be mistaken for primary indications.

#### 10. Printing of weighing results and other weight values

Printed results shall be correct, suitably identified and unambiguous. The printing shall be clear, legible, non-erasable and durable.

#### 11. Levelling

When appropriate, instruments shall be fitted with a levelling device and a level indicator, sufficiently sensitive to allow proper installation.

#### 12. Zeroing

Instruments may be equipped with zeroing devices. The operation of these devices shall result in accurate zeroing and shall not cause incorrect measuring results.

#### 13. Tare devices and preset tare devices

The instruments may have one or more tare devices and a preset tare device. The operation of the tare devices shall result in accurate zeroing and shall ensure correct net weighing. The operation of the preset tare device shall ensure correct determination of the calculated net value.

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

Instruments for direct sale to the public shall show all essential information about the weighing operation and, in the case of price-indicating instruments, shall clearly show the customer the price calculation of the product to be purchased.

The price to pay, if indicated, shall be accurate.

Price-computing instruments shall display the essential indications long enough for the customer to read them properly.

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 and unambiguously and are conveniently arranged on a ticket or label for the customer.

Instruments shall bear no characteristics that can cause, directly or indirectly, indications the interpretation of which is not easy or straightforward.

Instruments shall safeguard customers against incorrect sales transactions due to their malfunctioning.

Auxiliary indicating devices and extended indicating devices are not permitted.

Supplementary devices are permitted only if they cannot lead to fraudulent use.

Instruments similar to those normally used for direct sales to the public which do not satisfy the requirements of this Section must carry near to the display the indelible marking 'Not to be used for direct sale to the public'.

15. Price labelling instruments

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

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(1) [OJ L 39, 15.2.1980, p. 40.](#)