[F1SCHEDULE 1G

Regulations 2 and 39(1)

AUTOMATIC WEIGHING INSTRUMENTS (MI-006) (Annex VIII to the Directive)

Textual Amendments

F1 Schs. 1A-1K inserted (E.W.S.) (31.12.2020) by The Product Safety and Metrology etc. (Amendment etc.) (EU Exit) Regulations 2019 (S.I. 2019/696), reg. 1, **Sch. 27 para. 49** (with Sch. 27 para. 50(a)) (as amended by S.I. 2020/676, regs. 1(1), 2); 2020 c. 1, Sch. 5 para. 1(1)

The relevant essential requirements of Schedule 1A, the specific requirements of this Schedule and the conformity assessment procedures listed in Chapter I of this Schedule, apply to automatic weighing instruments defined below, intended to determine the mass of a body by using the action of gravity on that body.

DEFINITIONS

Automatic weighing instrument	An instrument that determines the mass of a product without the intervention of an operator and follows a predetermined programme of automatic processes characteristic of the instrument.
Automatic catchweigher	An automatic weighing instrument that determines the mass of pre-assembled discrete loads (for example prepackages) or single loads of loose material.
Weight labeller	An automatic catchweigher that labels individual articles with the weight value.
Weight/price labeller	An automatic catchweigher that labels individual articles with the weight value, and price information.
Automatic gravimetric filling instrument	An automatic weighing instrument that fills containers with a predetermined and virtually constant mass of product from bulk.
Discontinuous totaliser (totalising hopper weigher)	An automatic weighing instrument that determines the mass of a bulk product by dividing it into discrete loads. The mass of each discrete load is determined in sequence and summed. Each discrete load is then delivered to bulk.
Continuous totaliser	An automatic weighing instrument that continuously determines the mass of a bulk product on a conveyor belt, without systematic subdivision of the product and without interrupting the movement of the conveyor belt.
Rail-weighbridge	An automatic weighing instrument having a load receptor inclusive of rails for conveying railway vehicles.

SPECIFIC REQUIREMENTS

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CHAPTER I

Requirements common to all types of automatic weighing instruments

Rated Operating Conditions

1. The manufacturer shall specify the rated operating conditions for the instrument as follows:

1.1. For the measurand:

The measuring range in terms of its maximum and minimum capacity.

1.2. For the electrical supply influence quantities:

In case of AC voltage supply :	the nominal AC voltage supply, or the AC voltage limits.
In case of DC voltage supply :	the nominal and minimum DC voltage supply, or the DC voltage limits.

1.3. For the mechanical and climatic influence quantities:

The minimum temperature range is 30 °C unless specified otherwise in the following chapters of this Schedule.

The mechanical environment classes according to Schedule 1A, paragraph 1.3.2 are not applicable. For instruments which are used under special mechanical strain, e.g. instruments incorporated into vehicles, the manufacturer shall define the mechanical conditions of use.

1.4 For other influence quantities (if applicable):

The rate(s) of operation.

The characteristics of the product(s) to be weighed.

2. Permissible effect of disturbances — Electromagnetic environment

The required performance and the critical change value are given in the relevant Chapter of this Schedule for each type of instrument.

Suitability

3

3.1. Means shall be provided to limit the effects of tilt, loading and rate of operation such that maximum permissible errors (MPEs) are not exceeded in normal operation.

3.2. Adequate material handling facilities shall be provided to enable the instrument to respect the MPEs during normal operation.

3.3. Any operator control interface shall be clear and effective.

3.4. The integrity of the display (where present) shall be verifiable by the operator.

3.5. Adequate zero setting capability shall be provided to enable the instrument to respect the MPEs during normal operation.

3.6. Any result outside the measurement range shall be identified as such, where a printout is possible.

Conformity assessment

   4. The conformity assessment procedures specified in the modules in Schedule 1B applicable to automatic weighing instruments that the manufacturer can choose between are:

   (a) For mechanical systems:

      (i) B and D;

      (ii) B and E;

      (iii) B and F;

      (iv) D1;

      (v) F1;

      (vi) G; or

      (vii) H1.

   (b) For electromechanical instruments:

      (i) B and D;

      (ii) B and E;

      (iii) B and F;

      (iv) G; or

      (v) H1.

   (c) For electronic systems or systems containing software:

      (i) B and D;

      (ii) B and F;

      (iii) G; or

      (iv) H1.

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CHAPTER II

Automatic Catchweighers

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   1. These categories are divided into four accuracy classes:
Y(I), Y(II), Y(a) & Y(b)

which shall be specified by the manufacturer.

MPE

  2

   2.1. MPE Category Y instruments

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Table 1

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Net Load (m) in verification scale intervals (e)				*Maximum permissible mean error*	*Maximum permissible error*
Y(I)	*Y(II)*	*Y(a)*	*Y(b)*	*Static*	*Automatic*
$0 < m \leq 50,000$	$0 < m \leq 5,000$	$0 < m \leq 500$	$0 < m \leq 50$	$\pm\ 0.5\ e$	$\pm\ 1\ e$

50,000 < m ≤ 200,000	5,000 < m ≤ 20,000	500 < m ≤ 2,000	50 < m ≤ 200	± 1.0 e	± 1.5 e
200,000 < m	20,000 < m ≤ 100,000	2,000 < m ≤ 10,000	200 < m ≤ 1,000	± 1.5	± 2 e

Verification scale interval — single interval instruments

Table 2

Accuracy classes		Verification scale interval	Number of verification scale intervals $n = Max/e$	
			Minimum	**Maximum**
			Minimum	Maximum
XI	Y(I)	$0.001\ g \leq e$	50,000	
XII	Y(II)	$0.001\ g \leq e \leq 0.05\ g$	100	100,000
		$0.1\ g \leq e$	5,000	100,000
XIII	Y(a)	$0.1\ g \leq e \leq 2\ g$	100	10,000
		$5\ g \leq e$	500	10,000
XIIII	Y(b)	$5\ g \leq e$	100	1,000

Verification scale interval — multi-interval instruments

Table 3

Verification scale interval		Number of verification scale intervals $n = Max/e$	
		Minimum value[1] $n = Max_i /e_{(i+1)}$ For i = r the corresponding column of Table 2 applies with e replaced by e_r.	**Maximum value** $n = Max_i /e_i$
Y(I)	$0.001\ g \leq e_i$	50,000	
Y(II)	$0.001\ g \leq e_i \leq 0.05\ g$	5,000	100,000
	$0.1\ g \leq e_i$	5,000	100,000
Y(a)	$0.1\ g \leq e_i$	500	10,000
Y(b)	$5\ g \leq e_i$	50	1 000

[1] For i = r the corresponding column of Table 2 applies with e replaced by e_r.

Where:

i =	1, 2, … r
i =	partial weighing range
r =	total number of partial ranges

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Measurement Range

3. In specifying the measurement range for class Y instruments the manufacturer shall take account that the minimum capacity shall not be less than:

class Y(I)	:	100 e
class Y(II)	:	20 e for 0.001 g ≤ e ≤ 0.05 g, and 50 e for 0.1 g ≤ e
class Y(a)	:	20 e
class Y(b)	:	10 e
Scales used for grading, e.g. postal scales and garbage weighers	:	5 e

Dynamic Setting

4

4.1. The dynamic setting facility shall operate within a load range specified by the manufacturer.

4.2. When fitted, a dynamic setting facility that compensates for the dynamic effects of the load in motion shall be inhibited from operating outside the load range, and shall be capable of being secured.

Performance Under Influence Factors And Electromagnetic Disturbances

5

5.1. The MPEs due to influence factors are:

5.1.1. For category Y instruments

— For each load in automatic operation; as specified in Table 1,

— For static weighing in non-automatic operation; as specified in Table 1.

5.1.2. The critical change value due to a disturbance is one verification scale interval.

5.2. Temperature range:

— For class Y(I) the minimum range is 5 °C,

— For class Y(II) the minimum range is 15 °C.

CHAPTER III

Automatic Gravimetric Filling Instruments

Accuracy classes

1

1.1. The manufacturer shall specify both the reference accuracy class Ref(x) and the operational accuracy class(es) X(x).

1.2. An instrument type is designated a reference accuracy class, Ref(x), corresponding to the best possible accuracy for instruments of the type. After installation, individual instruments are designated for one or more operational accuracy classes, X(x), having taken account of the specific

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products to be weighed. The class designation factor (x) shall be ≤ 2, and in the form 1×10^k, 2×10^k or 5×10^k where k is a negative whole number or zero.

1.3. The reference accuracy class, Ref(x) is applicable for static loads.

1.4. For the operational accuracy class X(x), X is a regime relating accuracy to load weight and (x) is a multiplier for the limits of error specified for class X(1) in paragraph 2.2.

MPE

2

Static weighing error

2

2.1.1. For static loads under rated operating conditions, the MPE for reference accuracy class Ref(x), shall be 0.312 of the maximum permissible deviation of each fill from the average; as specified in Table 5; multiplied by the class designation factor (x).

2.1.2. For instruments where the fill may be made up from more than one load (e.g. cumulative or selective combination weighers) the MPE for static loads shall be the accuracy required for the fill as specified in paragraph 2.2 (i.e. not the sum of the maximum permissible deviation for the individual loads).

Deviation from average fill

Table 4

Value of the mass, m (g), of the fills	Maximum permissible deviation of each fill from the average for class X(1)
m ≤ 50	7.2 %
50 < m ≤ 100	3.6 g
100 < m ≤ 200	3.6 %
200 < m ≤ 300	7.2 g
300 < m ≤ 500	2.4 %
500 < m ≤ 1,000	12 g
1,000 < m ≤ 10,000	1.2 %
10,000 < m ≤ 15,000	120 g
15,000 < m	0.8 %

Note:

The calculated deviation of each fill from the average may be adjusted to take account for the effect of material particle size.

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Error relative to pre-set value (setting error)

2.3. For instruments where it is possible to pre-set a fill weight; the maximum difference between the pre-set value and the average mass of the fills shall not exceed 0.312 of the maximum permissible deviation of each fill from the average, as specified in Table 4.

Performance Under Influence Factor And Electromagnetic Disturbance

3

3.1. The MPE due to influence factors shall be as specified in paragraph 2.1.

3.2. The critical change value due to a disturbance is a change of the static weight indication equal to the MPE as specified in paragraph 2.1 calculated for the rated minimum fill, or a change that would give equivalent effect on the fill in the case of instruments where the fill consists of multiple loads. The calculated critical change value shall be rounded to the next higher scale interval (d).

3.3. The manufacturer shall specify the value of the rated minimum fill.

CHAPTER IV

Discontinuous Totalisers

1. Accuracy Classes

Instruments are divided into four accuracy classes as follows: 0.2; 0.5; 1; 2.

2. MPEs

Table 5

Accuracy class	*MPE of totalised load*
0.2	± 0.10 %
0.5	± 0.25 %
1	± 0.50 %
2	± 1.00 %

Totalisation scale interval

3. The totalisation scale interval (dt) shall be in the range: $0.01 \% \text{ Max} \leq d_t \leq 0.2 \% \text{ Max}$

Minimum Totalised Load ($^\Sigma_{min}$)

4. The minimum totalised load ($^\Sigma_{min}$) shall be not less than the load at which the MPE is equal to the totalisation scale interval (dt) and not less than the minimum load as specified by the manufacturer.

Zero Setting

5. Instruments that do not tare weigh after each discharge shall have a zero setting device. Automatic operation shall be inhibited if zero indication varies by:

— 1 d_t on instruments with automatic zero setting device;

— 0.5 d_t on instruments with a semi-automatic, or non-automatic, zero setting device

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Operator Interface

6. Operator adjustments and reset function shall be inhibited during automatic operation.

Printout

7. On instruments equipped with a printing device, the reset of the total shall be inhibited until the total is printed. The printout of the total shall occur if automatic operation is interrupted.

Performance under influence factors and electromagnetic disturbances

8

8.1. The MPEs due to influence factors shall be as specified in Table 6.

Table 6

Load (m) in totalisation scale intervals (d_t)	MPE
$0 < m \le 500$	$\pm\ 0.5\ d_t$
$500 < m \le 2{,}000$	$\pm\ 1.0\ d_t$
$2{,}000 < m \le 10{,}000$	$\pm\ 1.5\ d_t$

8.2. The critical change value due to a disturbance is one totalisation scale interval for any weight indication and any stored total.

CHAPTER V

Accuracy classes

1. Instruments are divided into three accuracy classes as follows: 0.5; 1; 2.

Measurement Range

2

2.1. The manufacturer shall specify the measurement range, the ratio between the minimum net load on the weighing unit and the maximum capacity, and the minimum totalised load.

2.2. The minimum totalised load Σ_{min} shall not be less than

    800 d for class 0.5,

    400 d for class 1,

    200 d for class 2.

Where d is the totalisation scale interval of the general totalisation device.

MPE

Table 7

Accuracy class	MPE for totalised load
0.5	$\pm\ 0.25\ \%$
1	$\pm\ 0.5\ \%$

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2	± 1.0 %

Speed of the belt

4. The speed of the belt shall be specified by the manufacturer. For single-speed beltweighers, and variable-speed beltweighers having a manual speed setting control, the speed shall not vary by more than 5 % of the nominal value. The product shall not have a different speed than the speed of the belt.

General Totalisation Device

5. It shall not be possible to reset the general totalisation device to zero.

Performance under influence factors and electromagnetic disturbances

6

6.1. The MPE due to influence factor, for a load not less than the Σ_{min}, shall be 0.7 times the appropriate value specified in Table 7, rounded to the nearest totalisation scale interval (d).

6.2. The critical change value due to a disturbance shall be 0.7 times the appropriate value specified in Table 7, for a load equal to Σ_{min}, for the designated class of the beltweigher; rounded up to the next higher totalisation scale interval (d).

CHAPTER VI

Automatic Rail Weighbridges

Accuracy classes

1. Instruments are divided into four accuracy classes as follows: 0.2; 0.5; 1; 2.

MPE

2

2.1. The MPEs for weighing-in-motion of a single wagon or a total train are shown in Table 8.

Table 8

Accuracy class	*MPE*
0.2	± 0.1 %
0.5	± 0.25 %
1	± 0.5 %
2	± 1.0 %

2.2. The MPEs for the weight of coupled or uncoupled wagons weighing-in-motion shall be one of the following values, whichever is the greatest:

— the value calculated according to Table 8, rounded to the nearest scale interval;

— the value calculated according to Table 8, rounded to the nearest scale interval for a weight equal to 35 % of the maximum wagon weight (as inscribed on the descriptive markings);

— one scale interval (d).

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2.3. The MPEs for the weight of train weighing-in-motion shall be one of the following values, whichever is the greatest:

— the value calculated according to Table 9, rounded to the nearest scale interval;

— the value calculated according to Table 9, for the weight of a single wagon equal to 35 % of the maximum wagon weight (as inscribed on the descriptive markings) multiplied by the number of reference wagons (not exceeding 10) in the train, and rounded to the nearest scale interval;

— one scale interval (d) for each wagon in the train, but not exceeding 10 d.

2.4. When weighing coupled wagons; the errors of not more than 10 % of the weighing results taken from one or more passes of the train may exceed the appropriate MPE given in paragraph 2.2, but shall not exceed twice the MPE.

Scale interval (d)

3. The relationship between the accuracy class and the scale interval shall be as specified in Table 9.

Table 9

Accuracy class	*Scale interval (d)*
0.2	d ≤ 50 kg
0.5	d ≤ 100 kg
1	d ≤ 200 kg
2	d ≤ 500 kg

Measurement range

4

4.1. The minimum capacity shall not be less than 1 t, and not greater than the value of the result of the minimum wagon weight divided by the number of partial weighings.

4.2. The minimum wagon weight shall not be less than 50 d.

Performance under influence factor and electromagnetic disturbance

5

5.1. The MPE due to an influence factor shall be as specified in Table 10.

Table 10

Load (m) in verification scale intervals (d)	MPE
0 < m ≤ 500	± 0.5 d
500 < m ≤ 2,000	± 1.0 d
2,000 < m ≤ 10,000	± 1.5 d

5.2. The critical change value due to a disturbance is one scale interval.**]**