INTERNATIONAL RECOMMENDATION

OIML R 51-2

Edition 2006 (E)

Automatic catchweighing instruments

Part 2: Test report format

Instruments de pesage trieurs-étiqueteurs à fonctionnement automatique

Partie 2: Format du rapport d'essai

ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE

INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY

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Foreword

The International Organization of Legal Metrology (OIML) is a worldwide, intergovernmental organization whose primary aim is to harmonize the regulations and metrological controls applied by the national metrological services, or related organizations, of its Member States. The main categories of OIML publications are:

International Recommendations (OIML R), which are model regulations that establish the metrological characteristics required of certain measuring instruments and which specify methods and equipment for checking their conformity. OIML Member States shall implement these Recommendations to the greatest possible extent;

International Documents (OIML D), which are informative in nature and which are intended to harmonize and improve work in the field of legal metrology;

International Guides (OIML G), which are also informative in nature and which are intended to give guidelines for the application of certain requirements to legal metrology; and

International Basic Publications (OIML B), which define the operating rules of the various OIML structures and systems.

OIML Draft Recommendations, Documents and Guides are developed by Technical Committees or Subcommittees which comprise representatives from the Member States. Certain international and regional institutions also participate on a consultation basis. Cooperative agreements have been established between the OIML and certain institutions, such as ISO and the IEC, with the objective of avoiding contradictory requirements. Consequently, manufacturers and users of measuring instruments, test laboratories, etc. may simultaneously apply OIML publications and those of other institutions.

International Recommendations, Documents, Guides and Basic Publications are published in English (E) and translated into French (F) and are subject to periodic revision.

Additionally, the OIML publishes or participates in the publication of **Vocabularies (OIML V)** and periodically commissions legal metrology experts to write **Expert Reports (OIML E)**. Expert Reports are intended to provide information and advice, and are written solely from the viewpoint of their author, without the involvement of a Technical Committee or Subcommittee, nor that of the International Conference of Legal Metrology. Thus, they do not necessarily represent the views of the OIML.

This publication - reference OIML R 51-2, Edition 2006 (E) - was developed by the OIML Technical Subcommittee TC 9/SC 2 *Automatic weighing instruments*. It was approved for final publication by the International Committee of Legal Metrology in 2006 and will be submitted to the International Conference of Legal Metrology in 2008 for formal sanction. This Edition supersedes the previous edition of OIML R 51-2 (Edition 1996).

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INTRODUCTION

This "test report format" aims at presenting, in a standardized format, the results of the various tests and examinations to which a type of an automatic catchweighing instrument shall be submitted with a view to its approval.

The test report format consists of two parts, a "checklist" and the "test report" itself.

The checklist is a summary of the examinations carried out on the instrument. It includes the conclusions of the results of the test performed, experimental or visual checks based on the requirements of Part 1. The words or condensed sentences aim at reminding the examiner of the requirements in R 51-1 without reproducing them.

The test report is a record of the results of the tests carried out on the instrument. The "test report" forms have been produced based on the tests detailed in R 51-1.

All metrology services or laboratories evaluating types of automatic catchweighing instruments accordingly to R 51 or to national or regional regulations based on this OIML Recommendation are strongly advised to use this test report format, directly or after translation into a language other than English or French. Its direct use in English or in French, or in both languages, is even more strongly recommended whenever test results may be transmitted by the country performing these tests to the approving authorities of another country, under bi- or multilateral cooperation agreements. In the framework of the *OIML Certificate System for Measuring Instruments*, the use of this test report format is mandatory.

The "information concerning the test equipment used for type evaluation" shall cover all test equipment which has been used in determining the test results given in a report. The information may be a short list containing only essential data (name, type, reference number for purpose of traceability). For example:

- Verification standards (accuracy, or accuracy class, and no.);
- Simulator for testing of modules (name, type, traceability and no.);
- Climatic test and static temperature chamber (name, type and no.);
- Electrical tests, bursts (name of the instrument, type and no.);
- Description of the procedure of field calibration for the test of immunity to radiated electromagnetic fields.

Note concerning the numbering of the following pages:

In addition to a sequential numbering at the bottom of the pages of this publication, a special place is left at the top of each page (starting with the following page) for numbering the pages of reports established following this model; in particular, some tests (e.g. metrological performance tests) shall be repeated several times, each test being reported individually on a separate page following the relevant format; in the same way, a multiple range instrument shall be tested separately for each range and a separate form (including the general information form) shall be filled out for each range. For a given report, it is advisable to complete the sequential numbering of each page by the indication of the total number of pages of the report.

Automatic catchweighing instruments
Type evaluation report

EXPLANATORY NOTES

Abbreviations and symbols

Symbol	Meaning
I	Indication
I_n	nth indication
L	Load
ΔL	Additional load to next changeover point
P	$I + 0.5\ e - \Delta L$ = Indication prior to rounding (digital indication)
E	$I - L$ or $P - L$ = Error
E_0	Error at zero load
p_i	Fraction of the MPE applicable to a module of the instrument which is examined separately.
$\bar{x}$	Mean of indicated readings
$\bar{x} - L$	Mean error
d_T	Preset tare scale interval
Temp.	Temperature
Rel. h.	Relative humidity
MPE	Maximum permissible error
MPME	Maximum permissible mean (systematic) error for automatic operation
MPSD	Maximum permissible standard deviation of the error for automatic operation
EUT	Equipment under test
SF	Significant fault
Max	Maximum capacity of the weighing instrument
Min	Minimum capacity of the weighing instrument
Max_1, Max_i, Max_r	Maximum capacity of the weighing instrument, rules for indices
U_{nom}	Nominal voltage value marked on the instrument
U_{max}	Highest value of a voltage range marked on the instrument
U_{min}	Lowest value of a voltage range marked on the instrument
DC	Direct current
AC	Alternating current

The name(s) or symbol(s) of the unit(s) used to express test results shall be specified in each form.

For each test, the "SUMMARY OF TYPE EVALUATION" and the "CHECKLIST" shall be completed according to this example:

	P	F
when the instrument has passed the test:	X	
when the instrument has failed the test:		X
when the test is not applicable:	/	/

P = Passed
F = Failed

The white spaces in boxes in the headings of the report should always be filled according to the following example:

	At start	At end	
Temp.:	20.5	21.1	°C
Rel. h.:			%
Date:	2006-01-29	2006-01-30	yyyy-mm-dd
Time:	16:00:05	16:30:25	hh:mm:ss

"Date" in the test reports refers to the date on which the test was performed.

In the disturbance tests, faults greater than *e* are acceptable provided that they are detected and acted upon, or that they result from circumstances such that these faults shall not be considered as significant; an appropriate explanation shall be given in the column "Yes (remarks)".

Section numbers in brackets refer to the corresponding subclauses of R 51-1.

GENERAL INFORMATION CONCERNING THE TYPE

Application no.: ..... Manufacturer: .....

Type designation: ..... Applicant: .....

Instrument category: .....

☐ Complete instrument ☐ Module [1]

In automatic operation, instrument weighs: ☐ dynamically ☐ statically

Accuracy class ☐ X( )

☐ Y(I) ☐ Y(II) ☐ Y(a) ☐ Y(b)

Min = ☐

e =	☐	Max =	☐	d =	☐	n =	☐
e_1 =	☐	Max_1 =	☐	d_1 =	☐	n_1 =	☐
e_2 =	☐	Max_2 =	☐	d_2 =	☐	n_2 =	☐
e_3 =	☐	Max_3 =	☐	d_3 =	☐	n_3 =	☐

$T = +$ ☐ $T = -$ ☐

U_{nom} [2] = ☐ V U_{min} = ☐ V U_{max} = ☐ V f = ☐ Hz Battery, U = ☐ V

Zero-setting device:

☐ Non-automatic
☐ Semi-automatic
☐ Automatic zero-setting
☐ Initial zero-setting
☐ Zero-tracking

Tare device:

☐ Tare balancing
☐ Tare weighing
☐ Preset tare
☐ Subtractive tare
☐ Additive tare

☐ Combined zero/tare device

Initial zero-setting range: ☐ % Temperature range: ☐ °C

Printer: ☐ Built in ☐ Connected ☐ Not present but connectable ☐ No connection

[1] The test equipment (simulator or part of a complete instrument) connected to the module shall be defined in the test form(s) used.
[2] U_{nom} is the nominal voltage marked on the instrument, or the average of a voltage range, marked on the instrument.

Instrument submitted:	.....	Load sensor:	.....
Identification no.:	.....	Manufacturer:	.....
Software version:	.....	Type:	.....
Connected equipment:	.....	Capacity:	.....
	.....	Number:	.....
Interfaces (number, nature):	.....	Classification symbol:	.....
	.....	Remarks:	.....
Evaluation period:	.....		.....
Date of report:	.....		.....
Observer:	.....		.....

Use this space to indicate additional remarks and/or information: other connected equipment, interfaces and load cells, choice of the manufacturer regarding protection against disturbances, etc.

IDENTIFICATION OF THE INSTRUMENT

Application no.:	…..…….....	Type designation:	…..…….....
Identification no.:	…..…….....	Manufacturer:	…….....
Software version:	…..…….....		
Report date:	…..…….....		

(Record as necessary to identify the equipment under test)

System or module name	Drawing number or software reference	Issue level	Serial no.
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Simulator documentation

System or module name	Drawing number or software reference	Issue level	Serial no.
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Simulator function (summary)

Simulator description and drawings, block diagram, etc. should be attached to the report if available.

Description or other information pertaining to identification of the instrument:
(*attach photograph here if available*)

INFORMATION CONCERNING THE TEST EQUIPMENT USED FOR TYPE EVALUATION

TEST EQUIPMENT

Application no.: …..……..... Type designation: …..…….....

Report date: …..……..... Manufacturer: …..…….....

List all test equipment used in this report
(including descriptions of the reference vehicles used for testing)

Equipment name	Manufacturer	Type no.	Serial no.	Used for (test references)
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

CONFIGURATION FOR TEST

Application no.:	…..…….....	Type designation:	…..…….....
Report date:	…..…….....	Manufacturer:	…..…….....

Use this space for additional information relating to equipment configuration, interfaces, data rates, load cells EMC protection options, etc. for the instrument and/or simulator.

SUMMARY OF TYPE EVALUATION

Application no.: ..... Type designation: .....

Report date: .....

	Tests	Report page	Passed	Failed	Remarks
1	Warm-up time				
2	Range of dynamic setting				
3	Zero-setting				
4	Tare device				
5	Eccentric loading				
6	Alternative operating speeds				
7	Stability of equilibrium				
8	**Influence factors**				
8.1	Pre-test for instruments that weigh statically				
8.2	Static temperatures				
8.3	Temperature effect on no-load indication				
8.4	Damp heat, steady state – non-condensing				
8.5	AC mains voltage variations				
8.6	DC mains voltage variations				
8.7	Battery voltage variations				
8.8	12 V or 24 V road vehicle battery voltage variations				
8.9	Tilting				
9	**Disturbances**				
9.1	AC mains short time voltage reductions				
9.2	Electrical bursts (fast transients) on mains voltage lines and on I/O circuits and communication lines				
9.3	Electrical surges on mains or other voltage supply lines and on I/O circuits and communication lines				
9.4	Electrostatic discharges				
9.5	Electromagnetic susceptibility				
9.6	Electrical transient conduction for instruments powered from 12 V or 24 V road vehicle batteries				
10	Span stability				
	Examinations				
11	Examination of the construction of the instrument				
12	Checklist				

Note: "Sample test report" sheets for including weight indication for each pass of load (up to 60 passes) are included at the end of this document. These sheets are not included in each section as they are not required for all instrument types.

Use this page to detail remarks from the summary of the type evaluation.

1 WARM-UP TIME (4.2.3, A.5.2)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Duration of disconnection before test: ..... hrs

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation[3]

$E = I + ½\ e - \Delta L - L$
E_0 = error calculated prior to each measurement at zero or near zero (unloaded)
E_L = error calculated at load (loaded)

	Time*	Load, L	Indication, I	Add. load, ΔL	Error	$E_L - E_0$
Unloaded	0 min				E_{0I} =	
Loaded					E_L =	
Unloaded	5 min				E_0 =	
Loaded					E_L =	
Unloaded	15 min				E_0 =	
Loaded					E_L =	
Unloaded	30 min				E_0 =	
Loaded					E_L =	

* Counted from the moment an indication has first appeared.

Error [4]		MPE
Initial zero-setting error,	E_{0I}	$\leq 0.25\ e$
Maximum value of error unloaded,	E_0	$\leq 0.5\ e$
Maximum value of zero variation,	$\lvert E_0 - E_{0I} \rvert$	$\leq 0.25\ e \times p$
Maximum value of error loaded,	$E_L - E_0$	$\leq \text{MPE} \times p_i$

☐ Passed ☐ Failed

Remarks:

[3] In operation only if zero operates as part of every automatic weighing cycle.
[4] Check that the error is ≤ the MPE.

2 RANGE OF DYNAMIC SETTING (3.2.3, A.5.3)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Inside set range

Class X

	Load, *L*	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation	MPSD
Close to Min						
Close to Max						

Class Y

	Load, *L*	Number of weighings	Maximum error	MPE
Close to Min				
Close to Max				

Outside set range

Class X or Y

	Load, *L*	Operation inhibited	Printing inhibited
Close to Min			
Close to Max			

☐ Passed ☐ Failed

Remarks:

3 ZERO-SETTING (3.5, A.5.4)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

3.1 Modes of zero-setting (3.5, 3.5.4, A.5.4.1)

Modes of zero-setting	Present	Range tested	Accuracy tested
Non-automatic			
Semi-automatic			
Auto zero at start of automatic operation			
Auto-zero as part of every weighing cycle			
Auto-zero after programmable interval			

3.2 Range of zero-setting (3.5.1, A.5.4.2)

3.2.1 Initial zero-setting range (A.5.4.2.1)

Positive range, L_p		Negative range, L_n		Zero setting range, $L_p + L_n$	% of Max load
Weight added	Zero yes/no	Weight added	Zero yes/no		

3.2.2 Automatic zero-setting range (A.5.2.3)

Weight added	Zero yes/no	Zero setting range	% of Max load

☐ Passed ☐ Failed

Remarks:

3.3 Accuracy of zero-setting (3.5.2)

3.3.1 Static test method (A.5.4.3)

$E = I + ½\ d - \Delta L$

$E = I - L$ or $P - L$ = Error

Zero-setting mode:	Add. load, ΔL	$E = I + ½\ d - \Delta L$	$MPE_{(zero)}$

☐ Passed ☐ Failed

Remarks:

3.4 Stability of zero and frequency of automatic zero-setting (3.5.4, A.5.4)

Maximum programmable time interval between automatic zero-setting	

Static test method (A.5.4.3)

$E = I + ½\ d - \Delta L$

$E = I - L$ or $P - L$ = Error

Zero-setting mode:	Add. load, ΔL	$E = I + ½\ d - \Delta L$	$MPE_{(zero)}$

☐ Passed ☐ Failed

Remarks:

4 TARE DEVICE (Weighing test) (3.6, A.5.6.1)

4.1 Automatic operation (A.5.6.1.1)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

First tare value		Second tare value	
Tare:		Tare:	
Tare indication:		Tare indication:	

Rate of operation (max): .....

Class X

Tare	Load	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, *s*	MPSD
First value						
First value						
Second value						
Second value						

Class Y

Tare	Load	Number of weighings	Maximum error	MPE
First value				
First value				
Second value				
Second value				

☐ Passed ☐ Failed

Remarks:

4.2 Non-automatic (static) operation (A.5.6.1.2)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Class X or Y

First tare value

Tare: ☐

Tare indication: ☐

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero*

Load, *L*	Indication, *I*		Add. load, ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
*					*				

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Second tare value

Tare: ☐

Tare indication: ☐

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero*

Load, *L*	Indication, *I* ↓	↑	Add. load, Δ*L* ↓	↑	Error ↓	↑	Corrected error, E_c ↓	↑	MPE
*					*				

☐ Passed ☐ Failed

Remarks:

5 ECCENTRIC LOADING (2.8.1, A.5.7)

5.1 Eccentric test for instruments that weigh dynamically (6.4.4, A.5.7.1)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Load ($^1/_3$ Max): .....

Location of test loads for instruments that weigh dynamically:

Band 1 ½ W ⇕ W

Direction of travel of the load →

Band 2 W ⇕ ½ W

Direction of travel of the load →

Rate of operation (max): .....

Automatic zero-setting and zero-tracking device is:

☐ Non-existent ☐ Out of working range ☐ In operation

Class X

Position	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, *s*	MPSD
Band 1					
Band 2					

Class Y

Position	Number of weighings	Maximum error	MPE
Band 1			
Band 2			

☐ Passed ☐ Failed

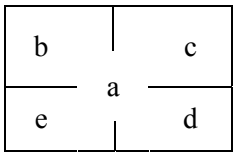
Remarks:

5.2 Eccentric test for instruments that weigh statically (6.4.4, A.5.7.2)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa
		(only class XI or Y(I))			

Load ($^1/_3$ Max): .....

Location of test loads for instruments that weigh statically



Automatic zero-setting and zero-tracking device is:

☐ Non-existent ☐ Out of working range ☐ In operation

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated prior to each measurement at or near zero*

Load, *L*	Location	Indication, *I*	Add. load, ΔL	Error	Corrected error, E_c	MPE
*				*		

☐ Passed ☐ Failed

Remarks:

6 ALTERNATIVE OPERATING SPEEDS (6.1.4, A.5.8)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Max load transport speed: .....

Alternative speed:[5] .....

Load close to Max: .....

Load close to Min: .....

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Class X

Load transport speed	Load	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD
Max	Max					
Max	Min					
Alternative	Max					
Alternative	Min					
Preset [6]	Alternative					
Preset	Alternative					

Class Y

Load transport speed	Load	Number of weighings	Maximum error	MPE
Max	Max			
Max	Min			
Alternative	Max			
Alternative	Min			
Preset	Alternative			
Preset	Alternative			

☐ Passed ☐ Failed

Remarks:

[5] Set as specified in R 51-1, 6.1.4.
[6] Preset speed(s) should only be tested where applicable.

7 STABILITY OF EQUILIBRIUM (3.4.1, A.5.9)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

In the case of printing or data storage

Load = ☐

Number	First printed or stored value after disturbance and command	Reading during 5 seconds after print-out or storage	
		Minimum	Maximum
1			
2			
3			
4			
5			

Check separately for each of the five tests if only two adjacent figures appear, one being the printed value

In the case of zero-setting or tare setting

$E = I + ½\ e - \Delta L - L$ L = zero or near zero

Number	Load, L	Indication, I	Add. load, ΔL	Error, E
Zero-setting				
1				
2				
3				
4				
5				
Tare setting				
1				
2				
3				
4				
5				

Check the accuracy according to A.5.4.5 for zero-setting and to A.5.6.2 for tare-setting

☐ Passed ☐ Failed

Remarks:

8 INFLUENCE FACTORS (2.9 and 6.4.5)

8.1 Pre-test for instruments that weigh statically (6.4.5.2, A.3.4)

8.1.1 Test 1: Maximum speed, load close to Max

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Load (see 6.1.3): ..... Speed: .....

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Class Y

Test	Indication	Error	Test	Indication	Error	Test	Indication	Error
1			21			41		
2			22			42		
3			23			43		
4			24			44		
5			25			45		
6			26			46		
7			27			47		
8			28			48		
9			29			49		
10			30			50		
11			31			51		
12			32			52		
13			33			53		
14			34			54		
15			35			55		
16			36			56		
17			37			57		
18			38			58		
19			39			59		
20			40			60		

Maximum error = ... Maximum permissible error = ...

☐ Passed ☐ Failed

Remarks:

Class X

Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD

☐ Passed ☐ Failed

Remarks:

8.1.2 Test 2: Maximum speed, load close to Min

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Load (see 6.1.3): ..... Speed: .....

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Class Y

Test	Indication	Error	Test	Indication	Error	Test	Indication	Error
1			21			41		
2			22			42		
3			23			43		
4			24			44		
5			25			45		
6			26			46		
7			27			47		
8			28			48		
9			29			49		
10			30			50		
11			31			51		
12			32			52		
13			33			53		
14			34			54		
15			35			55		
16			36			56		
17			37			57		
18			38			58		
19			39			59		
20			40			60		

Maximum error = ... Maximum permissible error = ...

☐ Passed ☐ Failed

Remarks:

Class X

Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD

☐ Passed ☐ Failed

Remarks:

8.1.3 Test 3: Alternative speed, load close to Max

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Load (see 6.1.3): ..... Speed: .....

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Class Y

Test	Indication	Error	Test	Indication	Error	Test	Indication	Error
1			21			41		
2			22			42		
3			23			43		
4			24			44		
5			25			45		
6			26			46		
7			27			47		
8			28			48		
9			29			49		
10			30			50		
11			31			51		
12			32			52		
13			33			53		
14			34			54		
15			35			55		
16			36			56		
17			37			57		
18			38			58		
19			39			59		
20			40			60		

Maximum error = ... Maximum permissible error = ...

☐ Passed ☐ Failed

Remarks:

Class X

Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD

☐ Passed ☐ Failed

Remarks:

8.1.4 Test 4: Alternative speed, load close to Min

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Load (see 6.1.3): ..... Speed: .....

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Class Y

Test	Indication	Error	Test	Indication	Error	Test	Indication	Error
1			21			41		
2			22			42		
3			23			43		
4			24			44		
5			25			45		
6			26			46		
7			27			47		
8			28			48		
9			29			49		
10			30			50		
11			31			51		
12			32			52		
13			33			53		
14			34			54		
15			35			55		
16			36			56		
17			37			57		
18			38			58		
19			39			59		
20			40			60		

Maximum error = ... Maximum permissible error = ...

☐ Passed ☐ Failed

Remarks:

Class X

Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD

☐ Passed ☐ Failed

Remarks:

8.2 Static temperatures (2.9.1, A.6.2.1)

8.2.1 Automatic operation (6.1)

8.2.1.1 Static temperature, reference (20 °C)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Initial zero-setting > 20 % of Max: ☐ Yes ☐ No (see R 51-1, A.5.1.3)

Rate of operation (max): .....

Class X

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex A used to record the individual weight readings.

	Load, L	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD
Close to Min						
Critical point 1[7]						
Critical point 2						
Close to Max						

Class Y

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex B used to record the individual errors.

	Load, L	Number of weighings	Maximum error	MPE
Close to Min				
Critical point 1				
Critical point 2				
Close to Max				

☐ Passed ☐ Failed

Remarks:

[7] Load values at which the maximum permissible error changes (R 51-1, 6.1.1).

8.2.1.2 Static temperature, specified high (..... °C)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Initial zero-setting > 20 % of Max: ☐ Yes ☐ No (see R 51-1, A.5.1.3)

Rate of operation (max): .....

Class X

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex A used to record the individual weight readings.

	Load, L	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD
Close to Min						
Critical point 1[8]						
Critical point 2						
Close to Max						

Class Y

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex B used to record the individual errors.

	Load, L	Number of weighings	Maximum error	MPE
Close to Min				
Critical point 1				
Critical point 2				
Close to Max				

☐ Passed ☐ Failed

Remarks:

[8] Load values at which the maximum permissible error changes (R 51-1, 6.1.1).

8.2.1.3 Static temperature, specified low (..... °C)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Initial zero-setting > 20 % of Max: ☐ Yes ☐ No (see R 51-1, A.5.1.3)

Rate of operation (max): .....

Class X

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex A used to record the individual weight readings.

	Load, L	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD
Close to Min						
Critical point 1[9]						
Critical point 2						
Close to Max						

Class Y

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex B used to record the individual errors.

	Load, L	Number of weighings	Maximum error	MPE
Close to Min				
Critical point 1				
Critical point 2				
Close to Max				

☐ Passed ☐ Failed

Remarks:

[9] Load values at which the maximum permissible error changes (R 51-1, 6.1.1).

8.2.1.4 Static temperature (5 °C if within the specified range)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Initial zero-setting > 20 % of Max: ☐ Yes ☐ No (see R 51-1, A.5.1.3)

Rate of operation (max): .....

Class X

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex A used to record the individual weight readings.

	Load, L	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD
Close to Min						
Critical point 1[10]						
Critical point 2						
Close to Max						

Class Y

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex B used to record the individual errors.

	Load, L	Number of weighings	Maximum error	MPE
Close to Min				
Critical point 1				
Critical point 2				
Close to Max				

☐ Passed ☐ Failed

Remarks:

[10] Load values at which the maximum permissible error changes (R 51-1, 6.1.1).

8.2.1.5 Static temperature (reference 20 °C)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Initial zero-setting > 20 % of Max: ☐ Yes ☐ No (see R 51-1, A.5.1.3)

Rate of operation (max): .....

Class X

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex A used to record the individual weight readings.

	Load, L	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD
Close to Min						
Critical point 1[11]						
Critical point 2						
Close to Max						

Class Y

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex B used to record the individual errors.

	Load, L	Number of weighings	Maximum error	MPE
Close to Min				
Critical point 1				
Critical point 2				
Close to Max				

☐ Passed ☐ Failed

Remarks:

[11] Load values at which the maximum permissible error changes (R 51-1, 6.1.1).

8.2.2 Non-automatic (static) operation (6.2)

8.2.2.1 Static temperature (reference 20 °C)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test:	.....	Bar. pres.:			hPa
(smaller than *e*)		(only class XI or Y(I))			

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Initial zero-setting > 20 % of Max: ☐ Yes ☐ No (see R 51-1, A.5.1.3)

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero*

Load, *L*	Indication, *I*		Add. load, ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
*					*				

☐ Passed ☐ Failed

Remarks:

8.2.2.2 Static temperature (specified high ..... °C)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Initial zero-setting > 20 % of Max: ☐ Yes ☐ No (see R 51-1, A.5.1.3)

Class X or Y

$E = I + ½\, e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero*

Load, *L*	Indication, *I* ↓	↑	Add. load, Δ*L* ↓	↑	Error ↓	↑	Corrected error, E_c ↓	↑	MPE
*					*				

☐ Passed ☐ Failed

Remarks:

8.2.2.3 Static temperature (specified low ..... °C)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Initial zero-setting > 20 % of Max: ☐ Yes ☐ No (see R51-1, A.5.1.3)

Class X or Y

$E = I + ½\, e - \Delta L - L$

$E_c = E - E_o$ with E_o = error calculated at or near zero*

Load, *L*	Indication, *I* ↓	↑	Add. load, Δ*L* ↓	↑	Error ↓	↑	Corrected error, E_c ↓	↑	MPE
*					*				

☐ Passed ☐ Failed

Remarks:

8.2.2.4 Static temperature (5 °C, if within the specified range)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Initial zero-setting > 20 % of Max: ☐ Yes ☐ No (see R 51-1, A.5.1.3)

Class X or Y

$E = I + ½\, e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero*

Load, *L*	Indication, *I*		Add. load, ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
*					*				

☐ Passed ☐ Failed

Remarks:

8.2.2.5 Static temperature (reference 20 °C)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Initial zero-setting > 20 % of Max: ☐ Yes ☐ No (see R 51-1, A.5.1.3)

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero*

Load, *L*	Indication, *I* ↓	↑	Add. load, Δ*L* ↓	↑	Error ↓	↑	Corrected error, E_c ↓	↑	MPE
*					*				

☐ Passed ☐ Failed

Remarks:

8.3 Temperature effect on no-load indication (2.9.1.3, A.6.2.2)

Application no.: .....

Type designation: .....

Observer: .....

Verification scale interval, *e*: .....

Resolution during test (smaller than *e*): .....

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

$P = I + ½\ e - \Delta L$

Report page [12]	Date	Time	Temp. (°C)	Zero indication, I	Add. load, ΔL	P	ΔP	ΔTemp	Zero change per ..... °C

ΔP = difference of P for two consecutive tests at different temperatures
ΔTemp = difference of temperature for two consecutive tests at different temperatures
Check if the zero-change per 1 °C is smaller than *e* for class XI or Y(I)
Check if the zero-change per 5 °C is smaller than *e* for all other classes

☐ Passed ☐ Failed

Remarks:

[12] Give the report page of the relevant weighing test where weighing tests and temperature effect on no-load indication test are conducted together.

8.4 Damp heat, steady state – non-condensing (4.1.2, A.6.2.3)

8.4.1 Reference temperature of 20 °C and 50 % humidity

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero*

Load, *L*	Indication, *I*		Add. load, ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
*					*				

☐ Passed ☐ Failed

Remarks:

8.4.1.2 Upper limit temperature (..... °C) and 85 % humidity

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero*

Load, *L*	Indication, *I*		Add. load, ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
*					*				

☐ Passed ☐ Failed

Remarks:

8.4.1.3 Reference temperature of 20 °C and 50 % humidity

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero*

Load, *L*	Indication, *I* ↓	↑	Add. load, Δ*L* ↓	↑	Error ↓	↑	Corrected error, E_c ↓	↑	MPE
*					*				

☐ Passed ☐ Failed

Remarks:

8.5 AC mains voltage variations (2.9.2, A.6.2.4)

8.5.1 Automatic operation (A.5.1.1)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Rate of operation (max): ..... Selected dynamic load: .....

Class X

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex A used to record the individual weight readings.

Voltage conditions [13]	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD
U_{nom}					
110 % of U_{max}					
85 % of U_{min}					
U_{nom}					

Class Y

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex B used to record the individual errors.

Voltage conditions	Number of weighings	Maximum error	MPE
U_{nom}			
110 % of U_{max}			
85 % of U_{min}			
U_{nom}			

☐ Passed ☐ Failed

Remarks:

[13] a) U_{nom} is the voltage marked on the instrument, or the average of a range (U_{max}, U_{min}), in which case the test shall be performed at U_{max} and at U_{min}.
b) In the case of three-phase mains voltage supply, the voltage variations shall apply for each phase successively.

8.5.2 Non-automatic (static) operation (A.5.1.2)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero

Voltage conditions[14]	Load, L	Indication, I	Add. load, ΔL	Error, E	Corrected error, E_c	MPE
U_{nom}						
110 % of U_{max}						
85 % of U_{min}						
U_{nom}						

☐ Passed ☐ Failed

Remarks:

[14] Test shall be performed at U_{max} and at U_{min}.

8.6 DC mains voltage variations (2.9.2, A.6.2.5)

8.6.1 Automatic operation (A.5.1.1)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Rate of operation (max): ..... Selected dynamic load: .....

Class X

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex A used to record the individual weight readings.

Voltage conditions[15]	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD
U_{nom}					
120 % of U_{max}					
Minimum operating voltage					
U_{nom}					

[15] DC mains voltage supply including external or plug-in voltage supply device, including rechargeable battery voltage if (re)charging of batteries during the operation of the instrument is possible.

Test shall be performed at U_{max} and at the minimum operating voltage (R 51-1, 2.9.2).

Class Y

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex B used to record the individual errors.

Voltage conditions	Number of weighings	Maximum error	MPE
U_{nom}			
120 % of U_{max}			
Minimum operating voltage			
U_{nom}			

☐ Passed ☐ Failed

Remarks:

8.6.2 Non-automatic (static) operation (A.5.1.2)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero

Voltage conditions[16]	Load, L	Indication, I	Add. load, ΔL	Error, E	Corrected error, E_c	MPE
U_{nom}						
120 % of U_{max}						
Minimum operating voltage						
U_{nom}						

☐ Passed ☐ Failed

Remarks:

[16] Test shall be performed at U_{max} and at the minimum operating voltage (R 51-1, 2.9.2).

8.7 Battery voltage variations (4.2.6, A.6.2.6)

8.7.1 Automatic operation (A.5.1.1)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Rate of operation (max): ..... Selected dynamic load: .....

Class X

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex A used to record the individual weight readings.

Voltage conditions[17]	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD
U_{nom}					
Minimum operating voltage					
U_{nom}					

Class Y

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex B used to record the individual errors.

Voltage conditions	Number of weighings	Maximum error	MPE
U_{nom}			
Minimum operating voltage			
U_{nom}			

☐ Passed ☐ Failed

Remarks:

[17] Battery voltage supply including non-rechargeable battery voltage (DC), if (re)charging of batteries during the operation of the instrument is not possible. Test shall be performed at the minimum operating voltage (R 51-1, 2.9.2).

8.7.2 Non-automatic (static) operation (A.5.1.2)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero

Voltage conditions[18]	Load, L	Indication, I	Add. load, ΔL	Error, E	Corrected error, E_c	MPE
U_{nom}						
Minimum operating voltage						
U_{nom}						

☐ Passed ☐ Failed

Remarks:

[18] Test shall be performed at the minimum operating voltage (R 51-1, 2.9.2).

8.8 12 V or 24 V road vehicle battery voltage variations (2.9.2, A.6.2.7)

8.8.1 Automatic operation (A.5.1.1)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Rate of operation (max): ..... Selected dynamic load: .....

Class X

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex A used to record the individual weight readings.

Voltage conditions, U_{nom}[19]	Test limits	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, *s*	MPSD
12 V	U_{max} = 16 V					
	U_{min} = 9 V					
24 V	U_{max} = 32 V					
	U_{min} = 16 V					

Class Y

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex B used to record the individual errors.

Voltage conditions, U_{nom}	Test limits	Number of weighings	Maximum error	MPE
12 V	U_{max} = 16 V			
	U_{min} = 9 V			
24 V	U_{max} = 32 V			
	U_{min} = 16 V			

☐ Passed ☐ Failed

Remarks:

[19] The nominal voltage, U_{nom}, of the vehicle's electrical system is usually 12 V or 24 V. However, the practical voltage at the battery terminals of a road vehicle can vary considerably. Test shall be performed at U_{max} and at the minimum operating voltage (R 51-1, 2.9.2).

8.8.2 Non-automatic (static) operation (A.5.1.2)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero

Voltage conditions, U_{nom}[20]	Test limits	Load, L	Indication, I	Add. load, ΔL	Error, E	Corrected error, E_c	MPE
12 V	U_{max} = 16 V						
	U_{min} = 9 V						
24 V	U_{max} = 32 V						
	U_{min} = 16 V						

☐ Passed ☐ Failed

Remarks:

[20] Test shall be performed at U_{max} and at the minimum operating voltage.

8.9 Tilting (2.9.3, A.6.2.8)

8.9.1 Automatic operation

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

☐ Tilting 5 % not required for fixed installation

☐ Tilting 5 % not required, can be adjusted to 1 % or *t* %[21]

☐ Tilting 5 % if no level indicator on instrument liable to be tilted

Vehicle mounted catchweighers:

☐ Tilting 10 %

☐ Tilting *t* %

Automatic zero-setting and zero-tracking device is:

☐ Non-existent ☐ Out of working range ☐ In operation

Class X

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex A used to record the individual weight readings.

Tilting position	Load, L	Mean of indicated readings, $\bar{x}$	Mean error, $\bar{x} - L$	MPME	Standard deviation, s	MPSD
Reference						
Longitudinally forward						
Longitudinally backwards						
Transversely forward						
Transversely backwards						
Reference						

[21] *t* % = limiting value of tilt limiting device.

Class Y

This table shall be used to summarize the test results for automatic operation, with the result sheet in Annex B used to record the individual errors.

Tilting position	Load, *L*	Number of weighings	Maximum error	MPE
Reference				
Longitudinally forward				
Longitudinally backwards				
Transversely forward				
Transversely backwards				
Reference				

☐ Passed ☐ Failed

Remarks:

8.9.2 Non-automatic (static) operation

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

☐ Tilting 5 % not required for fixed installation

☐ Tilting 5 % not required, can be adjusted to 1 % or *t* %[22]

☐ Tilting 5 % if no level indicator on instrument liable to be tilted

Vehicle mounted catchweighers:

☐ Tilting 10 %

☐ Tilting *t* %

Automatic zero-setting and zero-tracking device is:

☐ Non-existent ☐ Out of working range ☐ In operation

Class X or Y

$E = I + ½\ e - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero

Tilting position	Load, *L*	Indication, *I*	Add. load, ΔL	Error, *E*	Corrected error, E_c	MPE
Reference						
Longitudinally forward						
Longitudinally backwards						
Transversely forward						
Transversely backwards						
Reference						

☐ Passed ☐ Failed

Remarks:

[22] *t* % = limiting value of tilt limiting device.

9 DISTURBANCES (4.1.3, A.6.3)

9.1 AC mains short time voltage reductions (A.6.3.1)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Load	Disturbance				Result		
	Amplitude (% of U_{nom}[23])	Duration (cycles)	Number of disturbances (≥ 10)	Repetition interval (s)	Indication, *I*	Significant fault (>1 *e*)	
						No	Yes (remarks)
	without disturbance						
	0	0.5					
	0	1					
	40	10					
	70	25					
	80	250					
	0	250					

☐ Passed ☐ Failed

Note: If significant faults are detected and acted upon, or if the EUT fails, the test point at which this occurs shall be recorded.

Remarks:

[23] If a voltage range is marked, use the average value as reference U_{nom}.

9.2 Bursts (transients) on the mains voltage lines and on I/O circuits and communication lines (A.6.3.2)

9.2.1 AC and DC mains voltage

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Mains voltage lines: test voltage 1.0 kV (peak), duration of the test >1 minute at each amplitude and polarity.

Load	Connection			Polarity	Result		
	L	N	PE		Indication, *I*	Significant fault (>1 *e*)	
	↓ ground	↓ ground	↓ ground			No	Yes (remarks)
	without disturbance						
	X	X	X	pos			
				neg			
	without disturbance						
	X	X	X	pos			
				neg			
	without disturbance						
	X	X	X	pos			
				neg			

L = phase, N = neutral, PE = protective earth

☐ Passed ☐ Failed

Remarks:

9.2.2 I/O circuits and communication lines

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

I/O signals, data and control lines: test voltage 0.5 kV (peak), duration of the test >1 minute at each amplitude and polarity.

Load	Cable/Interface	Polarity	Result		
			Indication, *I*	Significant fault (>1 *e*)	
				No	Yes (remarks)
without disturbance					
		pos			
		neg			
without disturbance					
		pos			
		neg			
without disturbance					
		pos			
		neg			
without disturbance					
		pos			
		neg			
without disturbance					
		pos			
		neg			
without disturbance					
		pos			
		neg			

Explain or make a sketch indicating where the clamp is located on the cable; if necessary, add additional page.

☐ Passed ☐ Failed

Remarks:

9.3 Electrical surges on mains or other voltage supply lines and on I/O circuits and communication lines (A.6.3.3)

9.3.1 AC and DC mains voltage lines

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Mains voltage lines: test voltage 0.5 kV (line to line) and 1.0 kV (line to earth), duration of test >1 minute at each amplitude and polarity.

Load, *L*	Disturbance						Result		
	3 positive and 3 negative surges synchronously with AC supply voltage						Indication	Significant fault (>*e*) or detection and reaction	
	Amplitude/ apply on	Angle				Polarity		No	Yes (remarks)
		0°	90°	180°	270°				
	0.5 kV live ↓ neutral	without disturbance							
		X				pos			
						neg			
			X			pos			
						neg			
				X		pos			
						neg			
					X	pos			
						neg			
	1 kV live ↓ protective earth	without disturbance							
		X				pos			
						neg			
			X			pos			
						neg			
				X		pos			
						neg			
					X	pos			
						neg			
	1 kV neutral ↓ protective earth	without disturbance							
		X				pos			
						neg			
			X			pos			
						neg			
				X		pos			
						neg			
					X	pos			
						neg			

☐ Passed ☐ Failed

Remarks:

9.3.2 Any other kind of voltage supply and /or I/O circuits and communication lines

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Kind or type of voltage supply:

DC ☐ Other form ☐ Voltage ☐

Other kind of voltage supply and /or I/O circuits and communication lines: test voltage 0.5 kV (line to line) and 1.0 kV (line to earth), duration of test >1 minute at each amplitude and polarity.

Load, *L*	Disturbance		Result		
	3 positive and 3 negative surges.		Indication, *I*	Significant fault (>*e*) or detection and reaction	
	Amplitude / apply on	Polarity		No	Yes (remarks)
	without disturbance				
	0.5 kV line ↓ neutral	pos			
		neg			
	without disturbance				
	1.0 kV line ↓ protective earth	pos			
		neg			
	without disturbance				
	1.0 kV neutral ↓ protective earth	pos			
		neg			

Explain or make a sketch indicating where the clamp is located on the cable; if necessary, add additional page.

☐ Passed ☐ Failed

Remarks:

9.4 Electrostatic discharges (A.6.3.4)

9.4.1 Direct application

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

☐ Contact discharges ☐ Paint penetration

☐ Air discharges Polarity[24]: ☐ pos ☐ neg

Load	Discharges			Result		
	Test voltage (kV)	Number of discharges (≥10)	Repetition interval (s)	Indication, *I*	Significant fault (>1*e*)	
					No	Yes (remarks, test points)
	without disturbance					
	2					
	4					
	6					
	8 (air discharges)					

☐ Passed ☐ Failed

Note: If the EUT fails, the test point at which this occurs shall be recorded.

Remarks:

[24] IEC 61000-4-2 specifies that the test shall be conducted with the most sensitive polarity.

9.4.2 Indirect application (contact discharges only)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Polarity[25]: ☐ pos ☐ neg

Horizontal coupling plane

Load	Discharges			Result		
	Test voltage (kV)	Number of discharges (≥10)	Repetition interval (s)	Indication, *I*	Significant fault (>1*e*)	
					No	Yes (remarks)
	without disturbance					
	2					
	4					
	6					

Vertical coupling plane

Load	Discharges			Result		
	Test voltage (kV)	Number of discharges (≥10)	Repetition interval (s)	Indication, *I*	Significant fault (>1*e*)	
					No	Yes (remarks)
	without disturbance					
	2					
	4					
	6					

☐ Passed ☐ Failed

Note: If the EUT fails, the test point at which this occurs shall be recorded.

Remarks:

[25] IEC 61000-4-2 specifies that the test shall be conducted with the most sensitive polarity.

Specification of test points of EUT (direct application), e.g. by photos or sketches

a) Direct application

Contact discharges:

Air discharges:

b) Indirect application

9.5 Electromagnetic susceptibility (A.6.3.5)

9.5.1 Radiated (A.6.3.5.1)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Rate of sweep: ☐

Load: ☐ Material load: ☐

Disturbances				Result		
Antenna	Frequency range (MHz)	Polarization	Facing EUT	Indication, *I*		Significant fault
					No	Yes (remarks)
without disturbance						
		Vertical	Front			
			Right			
			Left			
			Rear			
		Horizontal	Front			
			Right			
			Left			
			Rear			
		Vertical	Front			
			Right			
			Left			
			Rear			
		Horizontal	Front			
			Right			
			Left			
			Rear			

Test severity:

Frequency range: 80 [26]-2000 MHz

Field strength: 10 V/m

Modulation: 80 % AM, 1 kHz, sine wave

Note: If the EUT fails, the frequency and field strength at which this occurs must be recorded.

☐ Passed ☐ Failed

Remarks:

[26] For instruments having no mains or other I/O ports available so that the conducted test according to 9.5.2 cannot be applied, the lower limit of the radiation test is 26 MHz.

9.5.2 Conducted (A.6.3.5.2)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Rate of sweep: ☐

Load: ☐ Material load: ☐

Frequency range (MHz)	Cable/interface	Level (V e.m.f.)	Result		
			Indication, *I*	Significant fault (>1 *e*)	
				No	Yes (remarks)
without disturbance					
without disturbance					
without disturbance					
without disturbance					
without disturbance					
without disturbance					

Test severity:

Frequency range: 0.15-80 MHz

RF amplitude (50 ohms): 10 V (e.m.f.)

Modulation: 80 % AM, 1 kHz, sine wave

Note: If EUT fails, the frequency and field strength at which this occurs must be recorded.

☐ Passed ☐ Failed

Remarks:

Include a description of the setup of the EUT, e.g. by photos or sketches.

Radiated:

Conducted:

9.6 Electrical transient conduction for instruments powered from road vehicle batteries (A.6.3.6)

9.6.1 Conduction along supply lines of 12 V or 24 V road vehicle batteries (A.6.3.6.1)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Load: ☐

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Voltage conditions, U_{nom}	Test pulse	Pulse voltage, U_s	Result		
			Indication, *I*	Significant fault (>1 *e*)	
				No	Yes (remarks)[27]
12 V	2a	+50 V			
	2b[28]	+10 V			
	3a	–150 V			
	3b	+100 V			
	4	–7 V			
24 V	2a	+50 V			
	2b	+20 V			
	3a	–200 V			
	3b	+200 V			
	4	–16 V			

☐ Passed ☐ Failed

Remarks:

[27] Functional status of the instrument during and after exposure to test pulses.
[28] Test pulse 2b is only applicable if the instrument is connected to the battery via the main (ignition) switch of the car, i.e. if the manufacturer has not specified that the instrument is to be connected directly (or by its own main switch) to the battery.

9.6.2 Electrical transient conduction via lines other than supply lines (A.6.3.6.2)

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

Load: ☐

Marked nominal voltage, U_{nom}, or voltage range: ☐ V

Voltage conditions, U_{nom}	Test pulse	Pulse voltage, U_s	Result		
			Indication, *I*	Significant fault (>1 *e*)	
				No	Yes (remarks) [29]
12 V	a	–60 V			
	b	+40 V			
24 V	a	–80 V			
	b	+80 V			

☐ Passed ☐ Failed

Remarks:

[29] Functional status of the instrument during and after exposure to test pulses.

10 SPAN STABILITY (6.4.1, A.7)

Application no.: .....
Type designation: .....
Verification scale interval, *e*: .....
Resolution during test (smaller than *e*): .....

Automatic zero-setting and zero-tracking device is:

☐ Non-existent ☐ Out of working range ☐ In operation

Zero load: ☐ Test load: ☐

Measurement no. 1: Initial measurement

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

☐ Automatic span adjustment device activated (if existent)

$E_0 = I_0 + ½\ e - \Delta L_0 - L_0$ $E_L = I_L + ½\ e - \Delta L - L$

	Indication of zero, I_0	Add. load, ΔL_0	E_0	Indication of load, I_L	Add. load, ΔL	E_L	$E_L - E_0$	Corrected value[30]
1								
2								
3								
4								
5								

Average error = average $(E_L - E_0)$ ☐

$(E_L - E_0)_{max} - (E_L - E_0)_{min}$ = ☐

0.1 *e* = ☐

If $|(E_L - E_0)_{max} - (E_L - E_0)_{min}| \leq 0.1\ e$, one loading and reading will be sufficient for each of the subsequent measurements.

Remarks:

[30] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

Subsequent measurements

For each of the subsequent measurements (at least seven), indicate under "conditions of the measurement", as appropriate, if the measurement has been performed:

- after the temperature test, the EUT having been stabilized for at least 16 h;
- after the humidity test, the EUT having been stabilized for at least 16 h;
- after the EUT has been disconnected from the mains for at least 8 h and then stabilized for at least 5 h;
- after any change in the test location;
- under any other specific condition.

Measurement no. 2

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

☐ Automatic span adjustment device activated (if existent)

Conditions of the measurement: ……

$E_0 = I_0 + ½\ e - \Delta L_0 - L_0$ $E_L = I_L + ½\ e - \Delta L - L$

	Indication of zero, I_0	Add. load, ΔL_0	E_0	Indication of load, I_L	Add. load, ΔL	E_L	$E_L - E_0$	Corrected value[31]
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average ($E_L - E_0$):

Remarks:

[31] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

Measurement no. 3

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

☐ Automatic span adjustment device activated (if existent)

Conditions of the measurement: ……

$E_0 = I_0 + ½\ e - \Delta L_0 - L_0$ $E_L = I_L + ½\ e - \Delta L - L$

	Indication of zero, I_0	Add. load, ΔL_0	E_0	Indication of load, I_L	Add. load, ΔL	E_L	$E_L - E_0$	Corrected value[32]
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average ($E_L - E_0$): ☐

Remarks:

[32] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

Measurement no. 4

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

☐ Automatic span adjustment device activated (if existent)

Conditions of the measurement: ……

$E_0 = I_0 + ½\ e - \Delta L_0 - L_0$ $E_L = I_L + ½\ e - \Delta L - L$

	Indication of zero, I_0	Add. load, ΔL_0	E_0	Indication of load, I_L	Add. load, ΔL	E_L	$E_L - E_0$	Corrected value[33]
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average ($E_L - E_0$): ☐

Remarks:

[33] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

Measurement no. 5

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

☐ Automatic span adjustment device activated (if existent)

Conditions of the measurement: ……

$E_0 = I_0 + ½\ e - \Delta L_0 - L_0$ $E_L = I_L + ½\ e - \Delta L - L$

	Indication of zero, I_0	Add. load, ΔL_0	E_0	Indication of load, I_L	Add. load, ΔL	E_L	$E_L - E_0$	Corrected value[34]
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average ($E_L - E_0$): ☐

Remarks:

[34] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

Measurement no. 6

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

☐ Automatic span adjustment device activated (if existent)

Conditions of the measurement: ……

$E_0 = I_0 + ½\ e - \Delta L_0 - L_0$ $E_L = I_L + ½\ e - \Delta L - L$

	Indication of zero, I_0	Add. load, ΔL_0	E_0	Indication of load, I_L	Add. load, ΔL	E_L	$E_L - E_0$	Corrected value[35]
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average ($E_L - E_0$): ☐

Remarks:

[35] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

Measurement no. 7

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

☐ Automatic span adjustment device activated (if existent)

Conditions of the measurement: ……

$E_0 = I_0 + ½\ e - \Delta L_0 - L_0$ $E_L = I_L + ½\ e - \Delta L - L$

	Indication of zero, I_0	Add. load, ΔL_0	E_0	Indication of load, I_L	Add. load, ΔL	E_L	$E_L - E_0$	Corrected value[36]
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average ($E_L - E_0$): ☐

Remarks:

[36] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

Measurement no. 8

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

☐ Automatic span adjustment device activated (if existent)

Conditions of the measurement: ……

$E_0 = I_0 + ½\ e - \Delta L_0 - L_0$ $E_L = I_L + ½\ e - \Delta L - L$

	Indication of zero, I_0	Add. load, ΔL_0	E_0	Indication of load, I_L	Add. load, ΔL	E_L	$E_L - E_0$	Corrected value[37]
1								
2								
3								
4								
5								

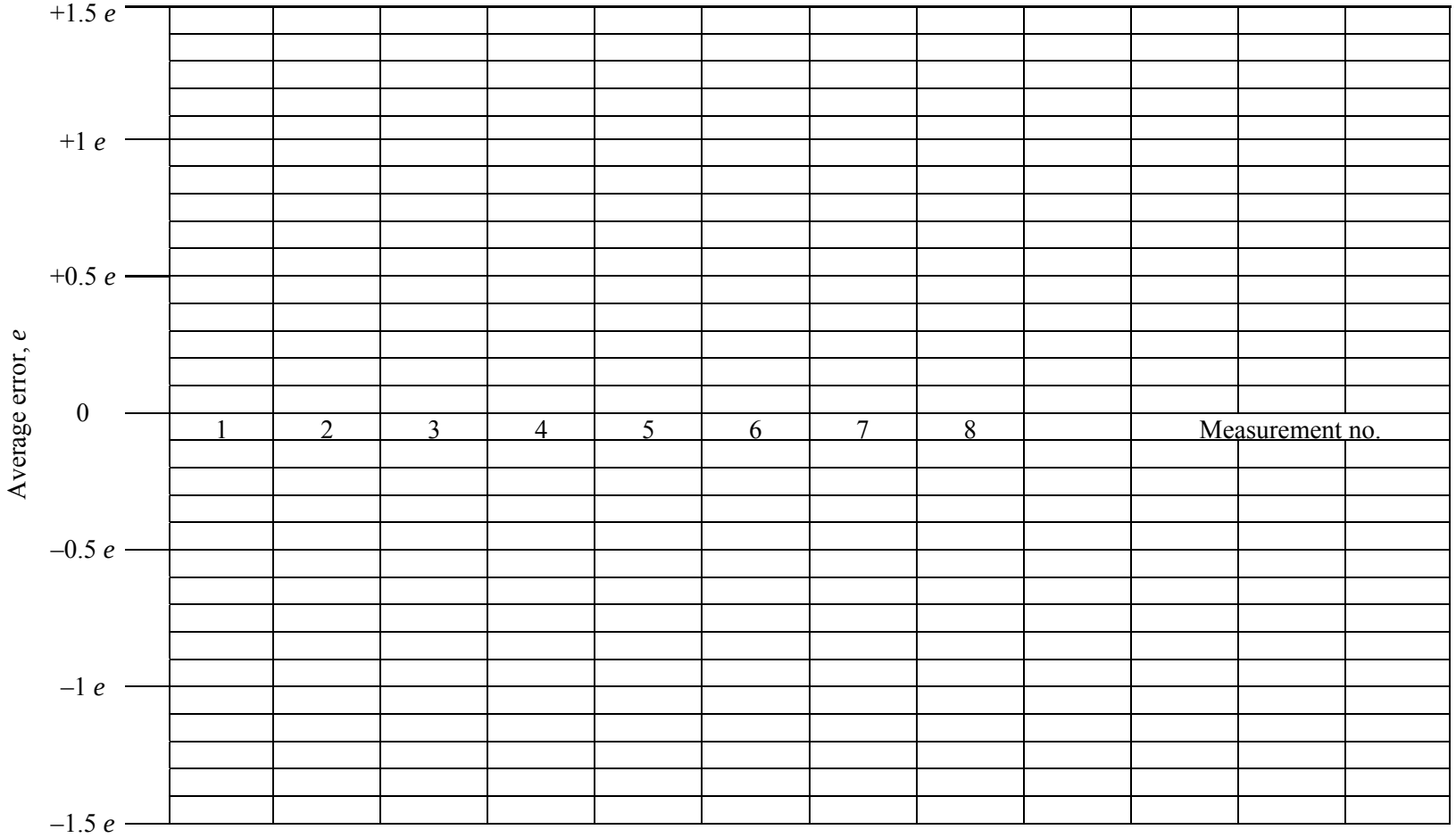
If five loadings and readings have been performed: Average error = average ($E_L - E_0$): ☐

Remarks:

[37] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

Application no.: ..... Type designation: .....

Plot on the diagram the indication of temperature test (T), damp heat test (D) and disconnections from the mains voltage supply (P)



Maximum allowable variation:

☐ Passed ☐ Failed

11 EXAMINATION OF THE CONSTRUCTION OF THE INSTRUMENT

Use this page to indicate any description or information pertaining to the instrument, additional to that already contained in this report and in the accompanying national type approval or OIML Certificate. This may include a picture of the complete instrument, a description of its main components, and any remark which could be useful for authorities responsible for the initial or subsequent verifications of individual instruments built according to the type. It may also include references to the manufacturer description.

Description:

Remarks:

12 CHECKLIST

The checklist has been developed based on the following principles:

- To include requirements that cannot be tested according to tests 1-10 above, but which shall be checked experimentally, e.g. the operating range of the tare device (3.6.3), or visually, e.g. the descriptive markings (3.11);
- To include requirements which indicate prohibitions of some functions, e.g. semi-automatic zero-setting devices shall not be operable during automatic operation (3.5.3.);
- Not to include general requirements, e.g. suitability for use (3.1);

This checklist is intended to serve as a summary of the results of examinations to be performed and not as a procedure. The items on this checklist are provided as reminders of the requirements specified in R 51-1 and they shall not be considered as a substitution for these requirements.

The requirements that are not included in this type evaluation report (tests 1-10 and checklist 12) are considered to be globally covered by the type approval or OIML Certificate (e.g. classification criteria (2.2 and 2.3), suitability for use (3.1)).

For non-mandatory devices, the checklist provides space to indicate whether or not the device exists and, if appropriate, its type. A cross in the box for “present” indicates that the device exists and that it complies with the definition given in the terminology. When indicating that a device is “not present”, also check the boxes to indicate that the tests are not applicable (see p. 5).

If appropriate, the results stated in this checklist may be supplemented by remarks given on additional pages.

Application no.: ..... Type designation: .....

Requirement (R 51-1)	Test procedure	Catchweigher checklist	Passed	Failed	Remarks
2.4		**Instrument fitted with auxiliary indicating device**	Present [ ]	Not present [ ]	
		Located to the right of the decimal sign			
		Category Y(a) and Y(b) use of auxiliary indicating device limited to testing applications only			
		Multi-interval instruments are not fitted with auxiliary indicating device			
2.5		**Maximum permissible errors**			
2.5.1.1	A.5.1.1	Maximum permissible errors for Category X			
		Maximum permissible mean (systematic) error for automatic operation			
		Maximum permissible standard deviation of the errors (random errors) for automatic operation			
2.5.1.2	A.5.1.1	Maximum permissible errors for Category Y			
		Maximum and minimum capacity in automatic operation			
		Minimum capacity			
2.6		**Maximum permissible errors for influence factor tests**			
	A.5.1.1	Category X automatic operation			
	A.5.1.2	Category X non-automatic (static) operation			
	A.5.1.1	Category Y automatic operation			
	A.5.1.2	Category Y non-automatic (static) operation			
	A.1.4	**Units of measurement**	Present	Not present	
2.7		ct mg g kg t	[ ] [ ] [ ] [ ] [ ]	[ ] [ ] [ ] [ ] [ ]	
2.8		**Permissible differences between results**			
2.8.1	A.5.7	**Effect of eccentric loading**			
		Maximum permissible errors in 2.5 are not exceeded			
2.8.2	A.5.10	**Agreement between indicating and printing devices**			
		For the same load, the difference between the weighing results from any two devices having the same scale interval is:			
		▪ zero for digital indicating or printing devices;			
		▪ not greater than the absolute value of the MPE for automatic weighing for analog devices.			

Requirement (R 51-1)	Test procedure	Catchweigher checklist	Passed	Failed	Remarks
2.9		**Influence factors**			
2.9.1	A.6.2.1	Static temperature limits			
2.9.1.2	A.6.2.2	Temperature effect on no-load indication			
2.9.2		Voltage supply			
	A.6.2.4	AC mains voltage			
	A.6.2.5	DC mains voltage			
	A.6.2.6	Battery voltage			
		12 V or 24 V road vehicle battery			
2.9.3	A.6.2.8	**Tilting**			
		Leveling device and level indicator	Present [ ]	Not present [ ]	
		If present, fixed in a clearly visible place and representative for the tilt sensitive part			
		Instrument not permanently installed with level indicator, can be set to 1 % or less, or to a limiting value as defined by marking on the level indicator			
		Vehicle mounted or incorporated instruments comply with the appropriate metrological and technical requirements when tilted (longitudinally and transversely) by 10 % or less			
3		**Technical requirements**			
3.2	A.1.4	**Security of operation**			
3.2.1		Instrument has no characteristics likely to facilitate fraudulent use			
3.2.2		Effect of accidental breakdown or maladjustment is evident			
3.2.3	A.3.3	**Dynamic setting facility**	Present [ ]	Not present [ ]	
		Access to dynamic setting automatically and non-erasably record and available			
3.2.4		**Controls**			
		Come to rest in intended positions			
		Unambiguously marked keys			
3.2.5	A.6.2.8	**Tilt limiting device**	Present [ ]	Not present [ ]	
		Inhibits operation above predetermined value of tilt			
3.2.6	A.5.11	**Means of securing**	Present [ ]	Not present [ ]	
		Form			
		Prevents access and adjustment			
		Prevents the introduction into the instrument of data that can influence the metrological properties of results			
		Any access to secured controls or functions becomes automatically self-evident			
		Span adjustment device	Present [ ]	Not present [ ]	
		External influence span adjustment device practically impossible after securing			
3.2.7		**Sorting device**	Present [ ]	Not present [ ]	
		Sub-divides loads into separate groups			

Requirement (R 51-1)	Test procedure	Catchweigher checklist		Passed	Failed	Remarks
3.3		**Indication of weighing results**				
3.3.1		**Quality of reading**				
		Reliable, easy and unambiguous under conditions of use				
		Overall inaccuracy of an analog device is ≤0.2 *e*				
		Figures forming the primary indications is of a size, shape and clarity for reading to be easy				
		Scales, numbering and printing permits the figures to be read by simple juxtaposition				
3.3.2		**Form of the indication:**				
		Results contain names and symbols of the units of mass				
		For any one indication, only one unit of mass				
		Scale interval in the form 1×10^k, 2×10^k or 5×10^k units (*k* being a positive or negative whole number or zero)				
		All indicating, printing and tare weighing devices have the same scale interval within any one weighing range				
		Digital indication displays at least one figure beginning at extreme right				
		Decimal sign to separate integer and decimal fraction				
		One zero displayed to the extreme right without a decimal sign				
		Unit of mass is such that there is not more than one non-significant zero to the right				
		Limits of indication				
3.3.3		Class X instruments:	no indication above Max + 9 *e*, or			
			Max + 3 times the appropriate MPSD from Table 4, whichever is the greater			
		Class Y instruments: no indication above Max + 9 *e*				
3.3.4		**Indication or printout for normal operation**				
		Scale interval of indication or printout of weight for normal operation is the verification scale interval *e*				
3.4		**Digital indicating and printing devices (continued)**				
3.4.1		Under continuous or temporary disturbance of stable equilibrium:				
		Printed or stored weighing values show no more than two adjacent; with one of them being the final weighing value				
		For zero or tare operations, correct operation according to 3.4.3 (printing), 3.5.3 (control of zero-setting), 3.5.4 (stability of zero-setting), 3.5.5 (zero-tracking) and 3.6.7 (tare operation) is achievable				

Requirement (R 51-1)	Test procedure	Catchweigher checklist	Passed	Failed	Remarks
3.4.2		**Extended indicating device**	Present [ ]	Not present [ ]	
		not allowed when there is an auxiliary indicating device			
		On instrument fitted with extended indicating device printing inhibited:			
		▪ while pressing key, or			
		▪ at most, 5 seconds after a manual command			
3.4.3		**Printing device**	Present [ ]	Not present [ ]	
		Clear and permanent			
		Name or symbol of unit is to the right of the value or above a column of values			
		Printing inhibited if stability criteria not fulfilled			
		At least 2 mm high			
3.4.4		**Data storage**	Present [ ]	Not present [ ]	
		Storage, transfer, totalizing inhibited when stability criteria not fulfilled			
3.4.5	A.1.1	**Software**			
		Present in such a form that alteration is not possible without breaking a seal, or automatically generating a signal by means of an identification code.			
		Legally relevant software adequately protected against accidental or intentional changes.			
		Evidence of any intervention is available until the next verification or comparable official inspection.			
		Software is assigned with a fixed version number or software identification that is adapted in the case of every software change that may affect the functions and accuracy of the instrument.			
		Software documentation with the instrument include:			
		▪ Description of the system hardware and legally relevant software environment;			
		▪ Description of the device-specific parameters that is assigned to the metrologically relevant functions;			
		▪ Description of the relevant menus and dialogues;			
		▪ The securing measures foreseen;			
		▪ Description of the data storage device(s);			
		▪ Other information regarding the legally relevant characteristics of the instrument.			
3.5	**A.5.4**	**Zero-setting, -tracking and -indicating**	Present	Not present	
		Initial zero-setting	[ ]	[ ]	
		Automatic zero-setting	[ ]	[ ]	
		Semi-automatic zero-setting	[ ]	[ ]	
		Non-automatic zero-setting	[ ]	[ ]	
		Zero-tracking - not more than one	[ ]	[ ]	
		Zero-indicating	[ ]	[ ]	

Requirement (R 51-1)	Test procedure	Catchweigher checklist	Passed	Failed	Remarks
3.5.1	A.5.4.2	**Effect of zero-setting device:**			
		Shall not alter the maximum weighing capacity			
		Overall effect of:			
		Zero-setting			= %
		Zero-tracking			= %
		Initial zero-setting			= %
3.5.2	A.5.4.3	**Accuracy of zero-setting:**			
		Deviation ≤0.25 *e*			
3.5.3	A.5.5	**Control of zero-setting:**			
		Separate from that of tare weighing device			
		Semi-automatic zero-setting: functions only:			
		▪ when the instrument is in stable equilibrium			
		▪ If it cancels any previous tare operation			
		Non-automatic or semi-automatic zero-setting:			
		Shall not be operable during automatic operation			
3.5.4	A.5.5	**Automatic zero-setting**			
		Operates only when stable equilibrium			
		Sufficiently often to maintain zero within 0.5 *e*			
		When operating as part of every weighing cycle, it is not possible to disable or set at time intervals			
		Maximum time interval is less than the value necessary to ensure zero error is not greater than 0.5 *e*			
		Automatic zero-setting:			
		▪ occurs after allocated time, or			
		▪ the instrument stops automatically so that zero setting can occur, or			
		▪ generating information to overdue zero-setting.			
3.5.5		**Zero-tracking**			
		Operates only when indication is at zero, or at negative net zero value equivalent to gross zero			
		Stability criteria is fulfilled			
		Corrections are not more than 0.5 *e*/second			
		When operates after tare, overall effect is 4 % of Max			
3.6	A.5.6	**Tare device**			
			Present	Not present	
		Tare weighing	[ ]	[ ]	
		Tare balancing	[ ]	[ ]	
		Combined zero-setting and tare balancing	[ ]	[ ]	
		Tare indicating	[ ]	[ ]	
		Type:	Additive [ ]	Subtractive [ ]	

Requirement (R 51-1)	Test procedure	Catchweigher checklist		Passed	Failed	Remarks
3.6.1		**Tare weighing device**				
		$d_T = d$ (for class Y instruments)				
3.6.2	A.5.6.2	**Accuracy:**				
		Deviation ≤ 0.25 e, with $e = e_1$ for multi-interval instruments				
3.6.3		**Operating range**				
		Prevention of operation at or below its zero effect				
		Prevention of operation above its maximum indicating effect				
3.6.4		**Visibility of operation**				
		Operation indicated				
		Net with sign "N", "NET", "Net", "net" or complete word (digital indication)				
		NET disappears if gross displayed temporarily				
		Tare with sign "T" or complete word (digital indication)				
3.6.5		**Subtracting tare**				
		Prevention of use above Max or indication that capacity is reached				
3.6.6		**Multiple range**				
		Operation effective in greater weighing ranges if switching when loaded possible				
3.6.7		**Operation weighing device**				
		Semi-automatic or automatic tare operate only when stability criteria fulfilled				
		Non-automatic or semi-automatic tare shall not be operable during automatic operation				
3.6.8		**Combined zero/tare**				
		Accuracy (3.5.2)				
		Zero-tracking (3.5.5)				
3.6.9		**Consecutive tare operations**				
		Indicated or printed tare weight values clearly designated (if tare devices operative at the same time)				
3.6.10		**Printing of weighing results**				
		Without designation				
		Designation:	by G or B (gross)			
			by N (only net printed)			
		Designation of net and tare by N and T (if net printed with gross and/or tare)				
		Instead of G, B, N and T, complete words				
		Printing separately net and tare with identification (different tare devices)				

Requirement (R 51-1)	Test procedure	Catchweigher checklist	Passed	Failed	Remarks
3.7		**Preset tare device**	Present [ ]	Not present [ ]	
3.7.1		**Scale interval (d_T) of preset tare value**			
		$d_T \leq e$ (Category X instruments)			
		$d_T = d$ or automatically rounded to d (Category Y instruments)			
		Transferred from one range to another one with larger e_i, shall be rounded to the latter (multiple range)			
		Tare value entered is smallest e_1, and maximum tare value is less than Max_1 for the same net weight value (multi-interval) and calculated net value rounded to the scale interval for the same net weight value			
3.7.2		**Modes of operation**			
		Requirements in 3.6.9 (consecutive tare operations) applies			
		Cannot be modified/cancelled if tare operated after the preset tare is still in use			
		Operates automatically if clearly identified with load			
3.7.3		**Indication of operation**			
		3.6.4 (visibility of tare operation) applies provided that "T" is replaced by "PT"			
		Possibility to indicate preset tare			
		Requirements in 3.6.10 (printing of weighing results) applies			
		If calculated net printed then preset tare printed as well			
		Designation of preset tare by PT or complete word			
3.8		**Multiple weighing ranges**	Present [ ]	Not present [ ]	
		Range in operation clearly indicated			
3.8.1		**Manual selection**			
		Selection from smaller to greater range possible at any load			
		Selection from greater to smaller range only at no load			
		When no load, tare cancelled and zero to ±0.25 e_1 both automatically			
		Manual selection inhibited during automatic operation			
3.8.2		**Automatic selection**			
		Selection from smaller to the greater following range possible only for load ≥ Max_i of smaller range			
		Selection only from a greater to the smallest range only when no load			
		When no load, tare cancelled and zero to ±0.25 e_1 both automatically			

Requirement (R 51-1)	Test procedure	Catchweigher checklist	Passed	Failed	Remarks
3.9		**Devices for selection between load receptors, various transmitting and measuring devices**	Present [ ]	Not present [ ]	
3.9.1		Compensation for unequal no-load effect			
3.9.2		Zero-setting without ambiguity and in accordance with requirements in 3.5			
3.9.3		Weighing impossible while selection devices in use			
3.9.4		Combinations of load receptors and measuring devices easily identifiable			
3.10		**Weigh or weigh-price labeling instrument**	Present [ ]	Not present [ ]	
		At least one display for the weight			
		Actual values of unit price can be verified during automatic operation			
		Actual values of preset tare can be verified during automatic operation			
3.10.1		**Price computing**			
		Price is calculated and rounded to the nearest scale interval of price to pay			
		The interval of price to pay, and the monetary symbols complies with national regulations			
		Unit price is in the form of Price/100 g or Price/kg, or			
		Specified in accordance with national regulations for trade			
3.10.2		**Totalization**			
		Total values of totalized weight and price data are identified by a special word or symbol and are algebraic sums of all the values printed			
3.10.3		**Printing** includes weight, unit price and price to pay			
		Stored in memory: before printing			
		Stored in memory: same data not printed twice			
3.11	**A.1.4**	**Descriptive markings**			
3.11.1		**Markings shown in full**			
		Identification mark of the manufacturer			
		Identification mark of the importer (if applicable)			
		Serial number and type designation of the instrument			
		Maximum rate of operation			
		Maximum speed of load transport system (if applicable)			
		Electrical supply voltage			
		Electrical supply frequency			
		Pneumatic/hydraulic pressure (if applicable)			
		Adjustment range (referred to set point) (if applicable)			
		Temperature range (when not –10 °C to +40 °C)			
		Software identification (if applicable)			

Requirement (R 51-1)	Test procedure	Catchweigher checklist	Passed	Failed	Remarks
3.11.2		**Markings shown in code**			
		Type approval sign			
		Indication of the class of accuracy X( ) or Y( )			
		Verification scale interval			
		Scale interval			
		Maximum capacity			
		Minimum capacity			
		Maximum tare additive			
		Maximum tare subtractive			
3.11.3		**Supplementary markings**			
		Any additional markings	enter in remarks		
3.11.4		**Presentation of descriptive markings**			
		Indelible and of size, shape and clarity that allows easy reading			
		Shown in an official language in accordance with national legislation.			
		Size, shape and clarity that allows easy reading			
		Grouped together in a clearly visible place either on a descriptive plate or sticker fixed permanently near the indicating device, or on a non removable part of the instrument itself			
		Alternatively, the descriptive markings simultaneously displayed by an indicator device, and			
		▪ at least Max, Min, e, d if $d \neq e$, and X( ) or Y( ) shown permanently in one place and displayed be displayed as long as the instrument is switched on			
		▪ the other marking may be shown on manual command			
		▪ access to reprogramming of markings is automatically and non-erasably recorded, and			
		▪ made evident by an audit trail			
		In the case of a plate or sticker which is not destroyed when removed, a means of securing shall be provided			
		Plate contains type, designation of instrument, manufacturer, type approval sign, electrical supply voltage, electrical supply frequency, pneumatic/hydraulic pressure			
3.12	A.1.4	**Verification marks**			
3.12.1		Place where verification marks are located cannot be removed without damaging the marks			
		Allows easy application of marks			
		Visible without the instrument having to be removed			
3.12.2		**Mounting**			
		Verification mark support ensures conservation of the marks			
		Support is of the correct construction			

Requirement (R 51-1)	Test procedure	Catchweigher checklist	Passed	Failed	Remarks
4.2		**Functional requirements**			
4.2.1		**Indicator display test**			
		For displays other than non-segmented displays, upon switch-on all relevant signs of indicating device are active and non-active for sufficient time to be checked by operator			
4.2.2		**Acting upon significant faults**			
		Either the instrument is made inoperative automatically[38], or			
		Visual or audible indication is provided automatically and continues until the user takes action or the fault disappears			
4.2.3		**Warm-up time**			
		No indication or transmission of weighing results			
		Automatic operation is inhibited			
4.2.4		**Interfaces**	Present [ ]	Not present [ ]	
		Prevents functions and measuring data to be inadmissibly influenced by peripheral devices or other connected instrument or disturbance			
		Prevents the displaying of data which could be mistaken for a weighing result			
		Not possible to introduce data or programs through interface suitable to falsify displayed, processed, stored weighing results			
		Not possible to introduce data or programs through interface suitable to unauthorized adjustment of the instrument			
		Transmits data relating to primary indications so that peripheral devices can meet requirements			
		Functions performed or initiated through the interface meet relevant requirements of Clause 3			
4.2.5	A.5.12	**Voltage supply failure:**			
		Metrological information retained for at least 24 hours			
		Switch-over to emergency voltage supply shall not cause significant fault			
4.2.6	A.5.13	**DC voltage variations:**			
		For DC mains and battery powered instruments, whenever voltage drops below the minimum operating level, the instrument either:			
		▪ Continues to function correctly,			
		▪ Shows an error message, or			
		▪ Is automatically put out of service			

[38] Checked by verifying the compliance with documents [ ] or by simulating faults [ ]. This check does not duplicate the disturbance tests 9.1-9.6.

Requirement (R 51-1)	Test procedure	Catchweigher checklist	Passed	Failed	Remarks
5.2.1	A.1.1	**Type approval documentation includes:**			
		▪ Metrological characteristics of the instrument;			
		▪ Standard set of specifications for the instrument;			
		▪ Functional description of the components and devices;			
		▪ Drawings, diagrams and general software information (if applicable), explaining the construction and operation;			
		▪ Any document or other evidence that the design and construction of the instrument complies with the requirements of the recommendation.			
5.2.3		**Examination of:**			
		▪ Documents			
		▪ Functional checks			
		▪ Test reports from other authorities	Remarks		Remarks
6.4.5		**Mode of operation for testing:**			
		▪ Non-automatic test option used and details recorded in test report	Remarks		Remarks
		▪ Instrument weighs statically in normal operation and random errors not significant in normal operation	Remarks		Remarks

Use this space to detail remarks from the checklist

ANNEX A

Sample test report for recording individual weights

Class X instruments – automatic operation[39]

Test: .....

Test section (R 51-2): .....

Relevant section(s) of R 51-1: .....

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.: (only class XI or Y(I))			hPa

Record only the data applicable to the test

Load: .....

Eccentricity band: (if applicable) .....

Rate of operation (max): .....

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

[39] Refer to Annex A.5.1 in R 51-1 for the material test procedure.

Test	Indication	Error	Test	Indication	Error
1			16		
2			17		
3			18		
4			19		
5			20		
6			21		
7			22		
8			23		
9			24		
10			25		
11			26		
12			27		
13			28		
14			29		
15			30		
31			46		
32			47		
33			48		
34			49		
35			50		
36			51		
37			52		
38			53		
39			54		
40			55		
41			56		
42			57		
43			58		
44			59		
45			60		

Mean of indicated readings: $\overline{I} = \frac{\sum_{i=1}^{n} I_i}{n} =$ .....

Standard deviation: $s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \overline{x})^2}{n-1}} =$ .....

Remarks:

ANNEX B

Sample test report for recording individual weights

Class Y instruments - automatic operation[40]

Test: .....

Test section (R 51-2): .....

Relevant section(s) of R 51-1: .....

			At start	At end	
Application no.:	.....	Temp.:			°C
Type designation:	.....	Rel. h.:			%
Observer:	.....	Date:			yyyy-mm-dd
Verification scale interval, *e*:	.....	Time:			hh:mm:ss
Resolution during test: (smaller than *e*)	.....	Bar. pres.:			hPa

(only class XI or Y(I))
Record only the data applicable to the test

Load: .....

Eccentricity band: (if applicable) .....

Rate of operation (max): .....

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Test	Indication	Error	Test	Indication	Error
1			16		
2			17		
3			18		
4			19		
5			20		
6			21		
7			22		
8			23		
9			24		
10			25		
11			26		
12			27		
13			28		
14			29		
15			30		

Remarks:

[40] Refer to A.5.1 in R 51-1 for the material test procedure.