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| INTERNATIONAL | **OIML R 76-3** |
| RECOMMENDATION | Edition 202x (E) |

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| Non-automatic weighing instruments  Part 3: Test report format |
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|  |
| Instruments de pesage à fonctionnement non automatique  Partie 3: Format du rapport d’essais |
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| OIML R 76-3 Edition 202x (E) |  |  |  |
|  |  | 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 Project Groups linked to 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 CIML. Thus, they do not necessarily represent the views of the OIML.

This publication - reference OIML R 76-3, Edition 202x - was developed by Project Group 2 of OIML TC 9/SC 1 *Non-automatic weighing instruments*. It was approved for final publication by the International Committee of Legal Metrology in 202x and supersedes the previous edition of R 76-2 (2007).

OIML Publications may be downloaded from the OIML web site in the form of PDF files. Additional information on OIML Publications may be obtained from the Organization’s headquarters:

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# Introduction

The “Test report format”, the subject of OIML R 76-3, aims at presenting, in a standardized format, the results of the various tests and examinations to which a type of a non-automatic weighing instrument shall be submitted with a view to its approval.

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 the performance test procedures (OIML R 76-2).

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 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 electromagnetic susceptibility test.

All metrology services or laboratories evaluating types of non-automatic weighing instrument according to OIML R 76-1 and -2 or to national or regional regulations based on OIML R 76-1 and -2 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 multi-lateral cooperation agreements. In the framework of the OIML Certification System (OIML‑CS), use of the “Test report format” is mandatory.

*Note concerning the numbering of the following pages*

In addition to a sequential numbering: “R 76-3 page .....” 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. weighing performance) 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.

**Test report**

# Explanatory notes

Meaning of symbols:

*I* = Indication

*In* = *n*th indication

*L* = Load

Δ*L* = Additional load to next changeover point

*P* = *I* + ½ *e* – Δ*L* = Indication prior to rounding (digital indication)

*E* = *I* – *L* or = *P* – *L* or = *I* + ½ *e* – Δ*L* – *L* = Error

*E*c = Corrected error

mpe = Maximum permissible error (absolute value)

EUT = Equipment under test

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

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | At start | At max | At end |  |
| Temp.: | 20.5 |  | 21.2 | °C |
| Rel. h.: |  |  |  | % |
| Time: |  |  |  |  |
| Bar. pres.: |  |  |  | hPa |

where:

Temp. = temperature

Rel. h. = relative humidity

Bar. pres. = barometric pressure (barometric pressure is necessary for the span stability test and when specified by IEC test provisions; in other cases it may be necessary only for class I instruments).

“Date” in the test report refers to the date on which the test was performed.

In the disturbance tests (R 76‑2, 8.3.1 - 8.3.7), 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 (see R 76-1, 3.5.5.6); an appropriate explanation shall be given in the column “Yes (remarks)”.

Numbers in brackets refer to the corresponding subclauses of OIML R 76‑2.

# Identification of the instrument

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

Documentation from the manufacturer

(Record as necessary to identify the equipment under test)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| System or module name |  | Drawing number or software reference |  | Issue level |  | Serial no. |
|  |  |  |  |  |  |  |
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Simulator documentation (if applicable)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| System or module name |  | Drawing number or software reference |  | Issue level |  | Serial no. |
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**Identification of the instrument (continued)**

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

Simulator function (summary) (if applicable)

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

**Identification of the instrument (continued)**

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

Description or other information pertaining to identification of the instrument:

(attach photograph here if available)

# General information concerning the type

|  |  |  |  |
| --- | --- | --- | --- |
| Application no.: |  | Manufacturer: |  |
| Type designation: |  | Applicant: |  |
| Instrument category: |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Complete instrument |  | Module[[1]](#footnote-1) with | error fraction *pi* = |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy class[[2]](#footnote-2): |  | classeI |  | classeII |  | classeIII |  | classeIIII |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Self-indicating |  | Semi-self-indicating |  | Non-self-indicating |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Min = |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| *e* = |  | Max = |  | *d* = |  | *n* = |  |
|  |  |  |  |  |  |  |  |
| *e*1 = |  | Max1 = |  | *d*1 = |  | *n*1 = |  |
| *e*2 = |  | Max2 = |  | *d*2 = |  | *n*2 = |  |
| *e*3 = |  | Max3 = |  | *d*3 = |  | *n*3 = |  |

|  |  |  |  |
| --- | --- | --- | --- |
| T = + |  | T = – |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *U*nom = |  | V | *U*min = |  | V | *U*max = |  | V | *f* = |  | Hz | Battery, *U*nom = |  | V |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Zero-setting device: | | Tare device: | |  |  |
|  |  |  |  |  |  |
|  | Non-automatic |  | Tare balancing |  | Combined zero/tare device |
|  |  |  |  |  |  |
|  | Semi-automatic |  | Tare weighing |  |  |
|  |  |  |  |  |  |
|  | Automatic zero-setting |  | Preset tare device |  |  |
|  |  |  |  |  |  |
|  | Initial zero-setting |  | Subtractive tare |  |  |
|  |  |  |  |  |  |
|  | Zero-tracking |  | Additive tare |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Initial zero-setting range = |  | % of Max | Temperature range: |  | °C |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Printer: |  | Built-in |  | Connected |  | Not present |  | No connection |
|  |  |  |  |  |  | but connectable |  |  |

**General information concerning the type (continued)**

Instrument submitted: …………………….……… Load cell: …...…………………….......

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: connecting equipment, interfaces and load cells, choice of the manufacturer regarding protection against disturbances (R 76-1, 6.1.3 a or 6.1.3 b), etc.

# Information concerning the test equipment used for type evaluation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Application no.: |  |  | Type designation: |  |
| Report date: |  |  | Manufacturer: |  |

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

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

# Adjustments or modifications

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Application no.: |  |  | Type designation: |  |
| Report date: |  |  | Manufacturer: |  |

Use this space for additional information relating to the identification of any authorized and agreed upon adjustments or modifications made to the sample or samples during the evaluation.

# Summary of type evaluation tests

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Application no.: |  |  | Type designation: |  |
| Report date: |  |  | Manufacturer: |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Tests** | | | **Report page** | **PASSED** | **FAILED** | **Remarks** |
| **1** | Weighing performance | | Initial °C  °C  °C  °C  °C  °C  °C |  |  |  |  |
| **2** | Temperature effect on no-load indication | | |  |  |  |  |
| **3.1** | Eccentricity using weights | | |  |  |  |  |
| **3.2** | Eccentricity using a rolling load | | |  |  |  |  |
| **4.1** | Discrimination | | |  |  |  |  |
| **4.2** | Sensitivity | | |  |  |  |  |
| **5** | Repeatability | | |  |  |  |  |
| **6.1** | Zero return | | |  |  |  |  |
| **6.2** | Creep | | |  |  |  |  |
| **7** | Stability of equilibrium | Printing, storage | |  |  |  |  |
| Zero-setting, tare balancing | |  |  |  |  |
| **8** | Tilting | | |  |  |  |  |
| **9** | Tare | | |  |  |  |  |
| **10** | Warm-up time | | |  |  |  |  |
| **11** | Voltage variations | | |  |  |  |  |
| **12.1** | AC mains voltage dips and short interruptions | | |  |  |  |  |
| **12.2** | Electrical bursts | a) Mains power supply lines | |  |  |  |  |
| b) I/O circuits and communication lines | |  |  |  |  |
| **12.3** | Surges | a) AC mains power supply | |  |  |  |  |
| b) Any other kind of power supply lines | |  |  |  |  |
| **12.4** | Electrostatic discharges | a) Direct application | |  |  |  |  |
| b) Indirect application (contact discharges only) | |  |  |  |  |
| **12.5** | Immunity to radiated electromagnetic fields | | |  |  |  |  |
| **12.6** | Immunity to conducted radio-frequency fields | | |  |  |  |  |
| **12.7** | Electrical transients on instruments powered from a road vehicle power supply | a) Conduction along supply lines of external 12 V and 24 V batteries | |  |  |  |  |
| b) Capacitive and inductive coupling via lines other than supply lines | |  |  |  |  |
| **13** | Damp heat,  steady state | a) Initial test (at reference temperature) | |  |  |  |  |
| b) Test at high temperature and 85 % relative humidity | |  |  |  |  |
| c) Final test (at reference temperature) | |  |  |  |  |
| **14** | Span stability | | |  |  |  |  |
| **15** | Endurance | a) Initial test | |  |  |  |  |
| c) Final test | |  |  |  |  |

# 1 WEIGHING PERFORMANCE (R 76-2, 5.4.1) (6.3.1)

(Calculation of the error)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp.: |  |  |  | °C |
| Verification |  | Rel. h.: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres.: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

Automatic zero-setting and zero-tracking device is:

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Initial zero-setting > 20 % of Max: |  | Yes |  | No (see R 76-2, 5.2.1) |

*E* = *I* + ½ *e* – Δ*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, *E* | | Corrected error, *E*c | | mpe |
| ↓ | ↑ | ↓ | ↑ | ↓ | ↑ | ↓ | ↑ |
|  | \* |  |  |  | \* |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
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Check if |*E*c| ≤ |mpe|

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

# 2 TEMPERATURE EFFECT ON NO-LOAD INDICATION (R 76-2, 6.3.2)

|  |  |
| --- | --- |
| Application no.: | ………………………………………………………………………………….. |
| Type designation: | ………………………………………………………………………………….. |
| Date: | ………………………………………… |
| Observer: | ………………………………………… |
| Verification |  |
| scale interval, *e*: | ………………………………………… |
| Resolution during test |  |
| (smaller than *e*): | ………………………………………… |

Automatic zero-setting and zero-tracking device is:

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

*P* = *I* + ½ *e* – Δ*L*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Report  page\* |  | Date | Time | Temp.  (°C) | Zero indication,  *I* | Add. load,  Δ*L* | *P* | Δ*P* | ΔTemp. | Zero-change per … °C |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Δ*P* = 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 5 °C is smaller than *e* (class II, III or IIII)

Check if the zero-change per 1 °C is smaller than *e* (class I)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

\* Give the report page of the relevant weighing test where weighing tests and temperature effect on no-load indication test are conducted together (see R 76-2, Figure 11).

# 3 ECCENTRICITY (R 76-2, 5.7)

## 3.1 Eccentricity using weights (R 76-2, 5.7.1, 5.7.2 and 5.7.3)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp.: |  |  |  | °C |
| Verification |  | Rel. h.: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres.: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1) Test(s) performed on a mobile instrument (R 76-2,5.7.5): |  | Yes |  | No |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2) In case of “Yes” to 1): R 76-2,5.7 and R 76-2,5.7.1 to 5.7.4 have been applied: |  | Yes |  | No |

3) In case of “No” to 2): Description of eccentricity test(s) (see R 76-2,5.7.5) under “Remarks”

Location of test loads: mark on a sketch (see example below) the successive locations of test loads, using numbers which shall be repeated in the table below.

|  |  |
| --- | --- |
| **1** | **2** |
| **4** | **3** |

Also indicate in the sketch the location of the display or of another perceptible part of the instrument.

Automatic zero-setting and zero-tracking device is:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Non-existent |  | Not in operation |  | Out of working range |

*E* = *I* + ½ *e* – Δ*L* – *L*

*E*c = *E* – *E*0 with *E*0 = error calculated at or near zero\* determined prior to each measurement

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Location | Load, *L* | Indication,  *I* | Add. load,  Δ*L* | Error,  *E* | Corrected  error, *E*c | mpe |
|  | \* |  |  | \* |  |  |
| 1 |  |  |  |  |  |  |
|  | \* |  |  | \* |  |  |
| 2 |  |  |  |  |  |  |
|  | \* |  |  | \* |  |  |
| 3 |  |  |  |  |  |  |
|  | \* |  |  | \* |  |  |
| 4 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Check if |*E*c| ≤ |mpe|

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

## 3.2 Eccentricity using a rolling load (R 76-2, 5.7.4)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp.: |  |  |  | °C |
| Verification |  | Rel. h.: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres.: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number of sections of the divided load receptor |  |  |  | Undivided load receptor |

Location of test loads for each section of the load receptor: mark on a sketch (see example below) the successive locations of test loads, using numbers which shall be repeated in the table below. Also indicate in the sketch the location of the display or of another perceptible part of the instrument.

|  |  |  |
| --- | --- | --- |
| **1** | **2** | **3** |

Automatic zero-setting and zero-tracking device is:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Non-existent |  | Not in operation |  | Out of working range |

*E* = *I* + ½ *e* – Δ*L* – *L*

*E*c = *E* – *E*0 with *E*0 = error calculated at or near zero\*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Section | Direction  (🡨 / 🡪) | Location | Load, *L* | Indication,  *I* | Add. load,  Δ*L* | Error,  *E* | Corrected  error, *E*c | mpe |
|  |  |  | \* |  |  | \* |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  | \* |  |  | \* |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  | \* |  |  | \* |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  | \* |  |  | \* |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Check if |*E*c| ≤ |mpe|

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

# 4 DISCRIMINATION AND SENSITIVITY

## 4.1 Discrimination

**4.1.1 Digital indication (R 76-2, 5.8.2)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | | At start | At max | At end |  |
| Date: | …………………………………… | Temp.: |  |  |  | °C |
| Observer: | …………………………………..… | Rel. h.: |  |  |  | % |
| Verification scale interval, *e*: | ……………………………..……… | Time: |  |  |  |  |
| Scale interval, *d*: | ……………………………..……… | Bar. pres.: |  |  |  | hPa |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Load, *L* | Indication,  *I*1 | Removed load  Δ*L* | Add 1/10 *d* | Extra load,  = 1.4 *d* | Indication,  *I*2 | *I*2 – *I*1 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Check if *I*2 – *I*1 ≥ *d*

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

**4.1.2 Analogue indication (R 76-2, 5.8.1)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | | At start | At max | At end |  |
| Date: | …………………………………… | Temp.: |  |  |  | °C |
| Observer: | …………………………………..… | Rel. h.: |  |  |  | % |
| Verification scale interval, *e*: | ……………………………..……… | Time: |  |  |  |  |
| Scale interval, *d*: | ……………………………..……… | Bar. pres.: |  |  |  | hPa |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Load, *L* | Indication,  *I*1 | Extra load  = |mpe| | Indication,  *I*2 | *I*2 – *I*1 |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Check if *I*2 – *I*1 ≥ 0.7 mpe

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

**4.1.3 Non-self-indicating instrument (R 76-2, 5.8.1)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp.: |  |  |  | °C |
|  |  | Rel. h.: |  |  |  | % |
|  | ………………………………………… | Time: |  |  |  |  |
|  | ………………………………………… | Bar. pres.: |  |  |  | hPa |

|  |  |  |  |
| --- | --- | --- | --- |
| Load, *L* | Indication,  *I* | Extra load,  = 0.4 |mpe| | Visible displacement\* |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

\* Mark a visible displacement by “+”

Check if there is a visible displacement

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

## 4.2 Sensitivity (non-self-indicating instrument) (R 76-2, 5.9)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application No.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp: |  |  |  | °C |
|  |  | Rel. h: |  |  |  | % |
|  | ………………………………………… | Time: |  |  |  |  |
|  | ………………………………………… | Bar. pres: |  |  |  | hPa |

|  |  |  |
| --- | --- | --- |
| Load L | Extra load  = |mpe| | Permanent displacement of  indicating element |
|  |  | mm |
|  |  | mm |
|  |  | mm |

Check if the permanent displacement is equal to or greater than:

1 mm for an instrument of accuracy class I or II

2 mm for an instrument of accuracy class III or IIII with Max ≤ 30 kg

5 mm for an instrument of accuracy class III or IIII with Max > 30 kg

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

# 5 REPEATABILITY (R 76-2, 5.10)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp.: |  |  |  | °C |
| Verification |  | Rel. h.: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres.: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

Automatic zero-setting and zero-tracking device is:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Non-existent |  | In operation |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Load (weighing 1-10) |  | Load (weighing 11-20) |  |  |

*E*= *I* + 1/2 *e* – Δ*L* – *L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Indication  of load, *I* | Add. load,  Δ*L* | *E* |  |  | Indication  of load, *I* | Add. load,  Δ*L* | *E* |
| 1 |  |  |  | 11 |  |  |  |
| 2 |  |  |  | 12 |  |  |  |
| 3 |  |  |  | 13 |  |  |  |
| 4 |  |  |  | 14 |  |  |  |
| 5 |  |  |  | 15 |  |  |  |
| 6 |  |  |  | 16 |  |  |  |
| 7 |  |  |  | 17 |  |  |  |
| 8 |  |  |  | 18 |  |  |  |
| 9 |  |  |  | 19 |  |  |  |
| 10 |  |  |  | 20 |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *E*max – *E*min (weighing 1-10) |  |  | *E*max – *E*min (weighing 11-20) |  |  |
|  | | | | | |
| mpe |  |  | mpe |  |  |

Check if a) *E*≤ mpe (5.5.3 of R 76-1)

b) *E*max – *E*min ≤ absolute value of mpe (5.5.4 of R 76-1)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

# 6 TIME-DEPENDENCE

## 6.1 Zero return (R 76-2, 5.11.2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp: |  |  |  | °C |
| Verification |  | Rel. h: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

Automatic zero-setting and zero-tracking device is:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Non-existent |  | Not in operation |  | Out of working range |

*P* = *I* + ½ *e* – Δ*L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time of reading | | Load,  *L*0 | Indication  of zero, *I*0 | Add. load,  Δ*L* | *P* | |  |  |
| 0 min |  |  |  |  | *P*0 = | |  |  |
|  | |  |  |  |  | |  |  |
| Load during 30 minutes = | |  |  |  |  | |  |  |
|  | | |  |  |  | | Change after 30 minutes: | |
| 30 min |  |  |  |  | *P*30 = | | |Δ(*P*30 – *P*0)| = |  |
|  | |  |  |  |  | |  |  |
| For multiple range instruments keep instrument unloaded for further 5 minutes: | | | | | |  | Change 5 minutes later: | |
| 35 min |  |  |  |  | *P*35 = | | |Δ(*P*35 – *P*30) | = |  |

Check if a) |Δ(*P*30 – *P*0)| ≤ 0.5 *e*

b) |Δ(*P*35 – *P*30)| ≤ *e*1 (for multiple range instruments only)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

## 6.2 Creep (R 76-2, 5.11.1)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp: |  |  |  | °C |
| Verification |  | Rel. h: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

*P* = *I* + ½ *e* – Δ*L*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Time of reading | | Load,  *L* | Indication,  *I* | Add. load,  Δ*L* | *P* | Δ*P* |
|  | 0 min |  |  |  |  |  |
|  | 5 min |  |  |  |  |
|  | 15 min |  |  |  |  |
|  | 30 min\* |  |  |  |  |
|  | | | | | | |
|  | 1 h |  |  |  |  |  |
|  | 2 h |  |  |  |  |
|  | 3 h |  |  |  |  |
|  | 4 h |  |  |  |  |

Δ*P* = difference between *P* at the start (0 min) and *P* at a given time.

\* If condition a) is met, the test is terminated. If not, the test shall be continued for the next 3.5 hours and   
condition b) shall be met.

Condition a): Δ*P* ≤ 0.5 *e* after 30 minutes; and

Δ*P* ≤ 0.2 *e* between the indication obtained at 15 minutes and that at 30 minutes

Condition b): Δ*P* ≤ absolute value of mpe during the period of 4 hours

Check if condition a) or b) is fulfilled

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

# 7 STABILITY OF EQUILIBRIUM (R 76-2, 5.12)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp: |  |  |  | °C |
| Verification |  | Rel. h: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

Automatic zero-setting and zero-tracking device is:

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

In the case of printing or data storage:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Load (about 50 % of Max) | First printed or stored weight value after disturbance and command | Reading during 5 s after print-out or storage | |
| minimum value | maximum value |
| 1 |  |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Check if the first printed or stored weight value does not deviate more than 1 *e* from the readings during 5 seconds after print-out or storage (only two adjacent values allowed) | | | | |
|  | Passed |  | Failed |

In the case of zero-setting or tare balancing:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Zero-setting** | | | *E*0 = *I*0 + ½ *e* – Δ*L* – *L*0 | | | |
| No.\* | Zero-load (< 4 % of Max) | Load, *L*0\*\*(10 *e*) | | Indication, *I*0 after zero-setting | Add. load, Δ*L* | Error, *E*0 |
| 1 |  |  | |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |
|  |  |  | |  |  |  |
| **Tare balancing** | | | *E*0 = *I*0 + ½ *e* – Δ*L* – *L*0 | | | |
| No.\* | Tare load (about 30 % of Max) | Load, *L*0 \*\*(10 *e*) | | Indication, *I*0,after tare balancing | Add. load, Δ*L* | Error, *E*0 |
| 1 |  |  | |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |

\* Apply the zero or tare load, disturb the equilibrium and immediately release zero-setting or tare, apply *L*0 if necessary and calculate the error according to 5.2.3/5.6.2 of R 76-2. Perform this five times.

\*\* *L*0 (10 *e*) shall be applied only if an automatic zero-setting or zero-tracking device is in operation. *L*0 shall be applied after releasing tare or zero-setting, immediately after zero is displayed the first time.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Check if *E*0 ≤ 0.25 *e* | | | | |
|  | Passed |  | Failed |

Remarks:

# 8 TILTING (R 76-2, 6.1, 6.1.1-6.1.3)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp.: |  |  |  | °C |
| Verification |  | Rel. h.: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres.: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

|  |  |
| --- | --- |
|  | Instrument with leveling device and level indicator |
|  |  |
|  | Instrument with automatic tilt sensor |
|  |  |
|  | Instrument without level indicator or automatic tilt sensor |
|  |  |
|  | Mobile instrument with automatic tilt sensor |
|  |  |
|  | Mobile instrument with Cardanic suspension |

|  |  |
| --- | --- |
| Limiting value of tilting = |  |

Give (if appropriate on a separate sheet) a sketch of the load receptor showing the location of the level indicator or direction of the tilting, if provided.

Automatic zero-setting and zero-tracking device is:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Non-existent |  | Not in operation |  | Out of working range |

*Ev* = *Iv* + ½ *e* – Δ*Lv* – *L* (*v* = 1, 2, 3, 4, 5), *Iv* = Indication, Δ*Lv* = additional load

*E*c *v* = *Ev* – *Ev* 0 with *Ev* 0 = error calculated at or near zero

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Load, *L* |  | Reference position |  | Tilted position with the limiting value of tilting | | | |  |  |
|  |  |  | Niveau bas | Niveau haut | Niveau gauche | Niveau droite |  |  |
|  | 1 |  | 2 | 3 | 4 | 5 |  |  |
|  |  |  |  |  |  |  |  |  |  |
| unloaded | *Iv* = |  |  |  |  |  |  |  |  |
|  | Δ*Lv* = |  |  |  |  |  |  | 2 *e* = |  |
| *Ev*0 = |  |  |  |  |  |  | |*E*1 0 – *Ev* 0|max = |  |
|  |  |  |  |  |  |  |  |  |  |
| *L* = | *Iv* = |  |  |  |  |  |  |  |  |
|  | Δ*Lv* = |  |  |  |  |  |  |  |  |
| *Ev* = |  |  |  |  |  |  | mpe = |  |
| *E*c *v* = |  |  |  |  |  |  | |*E*c 1 – *E*c v|max = |  |
|  |  |  |  |  |  |  |  |  |  |
| (Max) | *Iv* = |  |  |  |  |  |  |  |  |
|  | Δ*Lv* = |  |  |  |  |  |  |  |  |
| *Ev* = |  |  |  |  |  |  | mpe = |  |
| *E*c *v* = |  |  |  |  |  |  | |*E*c 1 – *E*c *v*|max = |  |

Check if the differences are

a) ≤ 2 *e* for the unloaded instrument (not valid for class II instruments, if they are not used for direct sales to the public)

b) ≤ absolute value of mpe for the loaded instrument

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Passed |  |  | Failed |

Remarks:

# 9 TARE (WEIGHING TEST) (R 76-2, 5.6.1)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp.: |  |  |  | °C |
| Verification |  | Rel. h.: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres.: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

Automatic zero-setting and zero-tracking device is:

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

*E* = *I* + ½ *e* – Δ*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, *E* | | Corrected error, *E*c | | mpe |
|  |  | ↓ | ↑ | ↓ | ↑ | ↓ | ↑ | ↓ | ↑ |
| First  tare load |  |  | \* |  |  |  | \* |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Second  tare load |  |  | \* |  |  |  | \* |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

Check if |*E*c| ≤ |mpe|

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

# 10 WARM-UP TIME (R 76-2, 6.2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp.: |  |  |  | °C |
| Verification |  | Rel. h.: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres.: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

Automatic zero-setting and zero-tracking device is:

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

|  |  |  |
| --- | --- | --- |
| Duration of disconnection before test: |  | hours |

*E* = *I* + ½ *e* – Δ*L* – *L*

*E*0 = error calculated prior to each measurement at or near zero (unloaded)

*E*L = error calculated at load (loaded)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Time\* | | Load, *L* | Indication,  *I* | Add. load,  Δ*L* | Error,  *E* | *E*L – *E*0 | mpe = |
|  |  |  |  |  |  |  |  |  |
| Unloaded |  | 0 min |  |  |  |  |
| Loaded |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Unloaded |  | 5 min |  |  |  |  |
| Loaded |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Unloaded |  | 15 min |  |  |  |  |
| Loaded |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Unloaded |  | 30 min |  |  |  |  |
| Loaded |  |  |  |  |  |  |

\* counted from the moment an indication has first appeared.

Check if |*E*L – *E*0| ≤ |mpe|

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

# 11 VOLTAGE VARIATIONS (R 76-2, 6.4)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application no.: | …………………………………………………. | |  |  |  |  |
| Type designation: | …………………………………………………. | |  |  |  |  |
| Date: | ………………………………………… |  | At start | At max | At end |  |
| Observer: | ………………………………………… | Temp.: |  |  |  | °C |
| Verification |  | Rel. h.: |  |  |  | % |
| scale interval, *e*: | ………………………………………… | Time: |  |  |  |  |
| Resolution during test |  | Bar. pres.: |  |  |  | hPa |
| (smaller than *e*): | ………………………………………… | (only class I) | |  |  |  |

|  |  |
| --- | --- |
|  | Mains power supply (AC), R 76-2, 6.4.1 |
|  |  |
|  | External or plug-in power supply device (AC or DC), R 76-2, 6.4.2 |
|  |  |
|  | Rechargeable battery power supply, (re)charge during the operation of the instrument is possible, R 76-2, 6.4.2 |
|  |  |
|  | Non-rechargeable and rechargeable battery power supply, (re)charge during the operation of the instrument is not |
|  | possible, R 76-2, 6.4.3 |
|  |  |
|  | 12 V or 24 V road vehicle battery power supply, R 76-2, 6.4.4 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *U*nom = |  | V | *U*min = |  | V | *U*max = |  | V |

Calculate lower and upper limits of applied voltages according to R 76-2, 6.4.4. If a voltage-range (*U*min / *U*max) is marked, use the average value as reference value.

Automatic zero-setting and zero-tracking device is:

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

Category of power supply (if an instrument has more than one power supply): ...............................................................

*E* = *I* + ½ *e* – Δ*L* – *L* *E*c = *E* – *E*0 with *E*0 = error calculated at or near zero

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Voltage | *U*,  (V) | Load,  *L* | Indication,  *I* | Add. load,  Δ*L* | Error,  *E* | Corrected  error, *E*c | mpe |
| Reference value |  | 10 *e* = |  |  |  |  |  |
|  |  |  |  |  |  |
| Lower limit |  | 10 *e* = |  |  |  |  |  |
|  |  |  |  |  |  |
| Upper limit |  | 10 *e* = |  |  |  |  |  |
|  |  |  |  |  |  |

Category of power supply (if an instrument has more than one power supply): ..................................................................

*E* = *I* + ½ *e* – Δ*L* – *L* *E*c = *E* – *E*0 with *E*0 = error calculated at or near zero

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Voltage | *U*,  (V) | Load,  *L* | Indication,  *I* | Add. load,  Δ*L* | Error,  *E* | Corrected  error, *E*c | mpe |
| Reference value |  | 10 *e* = |  |  |  |  |  |
|  |  |  |  |  |  |
| Lower limit |  | 10 *e* = |  |  |  |  |  |
|  |  |  |  |  |  |
| Upper limit |  | 10 *e* = |  |  |  |  |  |
|  |  |  |  |  |  |

Check if |*E*c| ≤ |mpe|

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

# 12 ELECTRICAL DISTURBANCES

## 12.1 AC mains voltage dips and short interruptions (R 76-2, 8.3.1)

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Mains power supply voltage: | *U*nom | V | *U*min | V | *U*max | V |  |
|  |  |  |  |  |  |  |  |
| Power supply voltage for the test: | *U*test | V | = *U*nom or the average value of *U*min and *U*max | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Load | Disturbance | | | | Result | | |
| Amplitude of *U*test | Duration / number of cycles | Number of disturbances ≥ 10 | Repetition interval (s) ≥ 10 s | Indication, *I* | Significant fault (> *e*) or detection and reaction | |
| No | Yes (see remarks) |
|  | Without disturbance | | | |  |  |  |
| 0 % | 0.5 |  |  |  |  |  |
| 0 % | 1 |  |  |  |  |  |
| 40 % | 10 |  |  |  |  |  |
| 70 % | 25 |  |  |  |  |  |
| 80 % | 250 |  |  |  |  |  |
| 0 % | 250 |  |  |  |  |  |

Check if a significant fault occurred

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

## 12.2 Electrical bursts (R 76-2, 8.3.2)

**a) Mains power supply lines**

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Mains power supply voltage: | *U*nom | V | *U*min | V | *U*max | V |  |
|  |  |  |  |  |  |  |  |
| Power supply voltage for the test: | *U*test | V | = *U*nom or the average value of *U*min and *U*max | | | | |
|  |  |  |  |  |  |  |  |
| Repetition frequency: |  | Hz |  | | | | |

Test voltage (bursts) on each connection of the mains power supply lines: 1 kV

Duration of the test at connection and each polarity: 1 min

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Load | Disturbance | | | | Result | | |
| Bursts on connection | | | Polarity | Indication, *I* | Significant fault (> *e*) or detection and reaction | |
| L  ↓  ground | N  ↓  ground | PE  ↓  ground |
| No | Yes (see remarks) |
|  |  | Without disturbance | | |  |  |  |
| X |  |  | positive |  |  |  |
| negative |  |  |  |
|  | Without disturbance | | |  |  |  |
|  | X |  | positive |  |  |  |
| negative |  |  |  |
|  | Without disturbance | | |  |  |  |
|  |  | X | positive |  |  |  |
| negative |  |  |  |

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

Check if a significant fault occurred

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

**b) I/O circuits and communication lines**

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

Test voltage (bursts) on each cable/interface (I/O signals, data and control lines): 0.5 kV

Duration of the test at each cable/interface and each polarity: 1 min

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Load | Disturbance | | Result | | |
| Bursts on cable/interface (Type, nature) | Polarity/ disturbance | Indication, *I* | Significant fault (> *e*) or detection and reaction | |
| No | Yes (see remarks) |
|  | 1 | Without disturbance |  |  |  |
| positive |  |  |  |
| negative |  |  |  |
| 2 | Without disturbance |  |  |  |
| positive |  |  |  |
| negative |  |  |  |
| 3 | Without disturbance |  |  |  |
| positive |  |  |  |
| negative |  |  |  |
| 4 | Without disturbance |  |  |  |
| positive |  |  |  |
| negative |  |  |  |
| 5 | Without disturbance |  |  |  |
| positive |  |  |  |
| negative |  |  |  |
| 6 | Without disturbance |  |  |  |
| positive |  |  |  |
| negative |  |  |  |
| 7 | Without disturbance |  |  |  |
| positive |  |  |  |
| negative |  |  |  |
| 8 | Without disturbance |  |  |  |
| positive |  |  |  |
| negative |  |  |  |
| 9 | Without disturbance |  |  |  |
| positive |  |  |  |
| negative |  |  |  |

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

Check if a significant fault occurred

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

## 12.3 Surges (R 76-2, 8.3.3)

**a) AC mains power supply**

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

**Surges on AC mains power supply lines**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Load | Disturbance | | | | | | Result | | |
| 3 positive and 3 negative surges synchronously with AC supply voltage | | | | | Polarity | Indication, *I* | Significant fault (> *e*) or detection and reaction | |
| amplitude/  apply on | angle | | | |
| 0° | 90° | 180° | 270° | No | Yes (see remarks) |
|  | 0.5 kV  L  ↓  N | Without disturbance | | | | |  |  |  |
| X |  |  |  | pos |  |  |  |
| neg |  |  |  |
|  | X |  |  | pos |  |  |  |
| neg |  |  |  |
|  |  | X |  | pos |  |  |  |
| neg |  |  |  |
|  |  |  | X | pos |  |  |  |
| neg |  |  |  |
| 1 kV  L  ↓  PE | Without disturbance | | | | |  |  |  |
| X |  |  |  | pos |  |  |  |
| neg |  |  |  |
|  | X |  |  | pos |  |  |  |
| neg |  |  |  |
|  |  | X |  | pos |  |  |  |
| neg |  |  |  |
|  |  |  | X | pos |  |  |  |
| neg |  |  |  |
| 1 kV  N  ↓  PE | Without disturbance | | | | |  |  |  |
| X |  |  |  | pos |  |  |  |
| neg |  |  |  |
|  | X |  |  | pos |  |  |  |
| neg |  |  |  |
|  |  | X |  | pos |  |  |  |
| neg |  |  |  |
|  |  |  | X | pos |  |  |  |
| neg |  |  |  |

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

Check if a significant fault occurred

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

**b) Any other kind of power supply**

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

|  |  |
| --- | --- |
| Kind or type of power supply |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | DC |  | Other form |  | Voltage |  |

**Surges on other power supply lines**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Load | Disturbance | | | Result | | |
| 3 positive and 3 negative surges | | Polarity | Indication, *I* | Significant fault (> *e*) or detection and reaction | |
| apply on | amplitude |
| No | Yes (see remarks) |
|  | L  ↓  N | Without disturbance | |  |  |  |
| 0.5 kV | pos |  |  |  |
| neg |  |  |  |
| L  ↓  PE | Without disturbance | |  |  |  |
| 1 kV | pos |  |  |  |
| neg |  |  |  |
| N  ↓  PE | Without disturbance | |  |  |  |
| 1 kV | pos |  |  |  |
| neg |  |  |  |

L = positive conductor, N = negative or neutral conductor, PE = protective earth

Check if a significant fault occurred

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

**c) Surges on signal, data and control lines**

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Cable/interface | Polarity | Result | | | |
| Load,  *L* | Indication, *I* | Significant fault (> *e*) or detection and reaction | |
| No | Yes (see remarks) |
| Without disturbance | |  |  |  |  |
| C/1,1 | positive |  |  |  |  |
| negative |  |  |  |  |
| Without disturbance | |  |  |  |  |
| C/1,2 | positive |  |  |  |  |
| negative |  |  |  |  |
| Without disturbance | |  |  |  |  |
| C/1,3 | positive |  |  |  |  |
| negative |  |  |  |  |
| Without disturbance | |  |  |  |  |
| C/1,4 | positive |  |  |  |  |
| negative |  |  |  |  |
| Without disturbance | |  |  |  |  |
| C/1,5 | positive |  |  |  |  |
| negative |  |  |  |  |
| Without disturbance | |  |  |  |  |
| C/1,6 | positive |  |  |  |  |
| negative |  |  |  |  |

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

## Remarks:12.4 Electrostatic discharges (R 76-2, 8.3.4)

**a) Direct application**

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | Contact discharge |  | Paint penetration |

|  |  |
| --- | --- |
|  | Air discharges |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Load | Discharges | | | | Result | | |
| Test  voltage  (kV) | Polarity | Number of  discharges  ≥ 10 | Repetition interval ≥ 10 s | Indication,  *I* | Significant fault (> *e*) or detection and reaction | |
| No | Yes (remarks, test points) |
|  | Without disturbance | | | |  |  |  |
| 2 | pos. |  |  |  |  |  |
| 4 | pos. |  |  |  |  |  |
| 6 | pos. |  |  |  |  |  |
| 8  (air discharges) | pos. |  |  |  |  |  |
| Without disturbance | | | |  |  |  |
| 2 | neg. |  |  |  |  |  |
| 4 | neg. |  |  |  |  |  |
| 6 | neg. |  |  |  |  |  |
| 8  (air discharges) | neg. |  |  |  |  |  |

Check if a significant fault occurred

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Passed |  | Failed | *Note:* If the EUT fails, the test point at which this occurs shall be recorded. |

Remarks:

**b) Indirect application (contact discharges only)**

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

**Horizontal coupling plane**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Load | Discharges | | | | Result | | |
| Test  voltage  (kV) | Polarity | Number of  discharges  ≥ 10 | Repetition interval ≥ 10 s | Indication,  *I* | Significant fault (> *e*) or detection and reaction | |
| No | Yes (remarks, test points) |
|  | Without disturbance | | | |  |  |  |
| 2 | pos. |  |  |  |  |  |
| 4 | pos. |  |  |  |  |  |
| 6 | pos. |  |  |  |  |  |
| Without disturbance | | | |  |  |  |
| 2 | neg. |  |  |  |  |  |
| 4 | neg. |  |  |  |  |  |
| 6 | neg. |  |  |  |  |  |

**Vertical coupling plane**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Load | Discharges | | | | Result | | |
| Test  voltage  (kV) | Polarity | Number of  discharges  ≥ 10 | Repetition interval ≥ 10 s | Indication,  *I* | Significant fault (> *e*) or detection and reaction | |
| No | Yes (remarks, test points) |
|  | Without disturbance | | | |  |  |  |
| 2 | pos. |  |  |  |  |  |
| 4 | pos. |  |  |  |  |  |
| 6 | pos. |  |  |  |  |  |
| Without disturbance | | | |  |  |  |
| 2 | neg. |  |  |  |  |  |
| 4 | neg. |  |  |  |  |  |
| 6 | neg. |  |  |  |  |  |

Check if a significant fault occurred

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Passed |  | Failed | *Note:* If the EUT fails, the test point at which this occurs shall be recorded. |

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

a) Direct application

Contact discharges:

Air discharges:

b) Indirect application

## 12.5 Immunity to radiated electromagnetic fields (R 76-2, 8.3.5)

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

|  |  |
| --- | --- |
|  | Frequency range 26-2000 MHz if the test according to R 76-2, 8.3.6 cannot be applied (no mains or I/O ports available) |
|  |  |
|  | Frequency range 80-2000 MHz if the test according to R 76-2, 8.3.6 is performed (see form no. 12.6) |

|  |  |  |  |
| --- | --- | --- | --- |
| Rate of sweep: |  | Material of load: |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Load | Disturbance | | | | Result | | |
| Antenna | Frequency  range (MHz) | Polarization | Facing  EUT | Indication,  *I* | Significant fault (> *e*) or detection and reaction | |
| 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 |  |  |  |

Frequency range: 26-2000 MHz or 80-2000 MHz

Field strength: 10 V/m

Modulation: 80 % AM, 1 kHz, sine wave

*Note:* If EUT fails, the frequency at which this occurs shall be recorded

Check if a significant fault occurred

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

**Description of the set-up of EUT, e.g. by photos or sketches:**

## 12.6 Immunity to conducted radio-frequency fields (R 76-2, 8.3.6)

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

|  |  |  |  |
| --- | --- | --- | --- |
| Rate of sweep: |  |  |  |
|  |  |  |  |
| Load: |  | Material of load: |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Cable / Interface | Frequency range (MHz) | Result | | |
| Indication,  *I* | Significant fault (> *e*) or detection and reaction | |
| No | Yes (remarks) |
|  | without disturbance |  |  |  |
|  |  |  |  |
|  | without disturbance |  |  |  |
|  |  |  |  |
|  | without disturbance |  |  |  |
|  |  |  |  |
|  | without disturbance |  |  |  |
|  |  |  |  |
|  | without disturbance |  |  |  |
|  |  |  |  |
|  | without disturbance |  |  |  |
|  |  |  |  |
|  | without disturbance |  |  |  |
|  |  |  |  |
|  | without disturbance |  |  |  |
|  |  |  |  |
|  | without disturbance |  |  |  |
|  |  |  |  |
|  | without disturbance |  |  |  |
|  |  |  |  |

Frequency range: 0.15-80 MHz RF amplitude (50 ohms): 10 V (e.m.f.) Modulation: 80 % AM, 1 kHz, sine wave

Check if a significant fault occurred.

*Note:* If the EUT fails, the frequency at which this occurs shall be recorded

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

## 12.7 Electrical transients on instruments powered from a road vehicle power supply (R 76-2, 8.3.7)

**a) Conduction along supply lines of external 12 V and 24 V batteries**

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | 12 V battery voltage |  | 24 V battery voltage |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 12 V battery voltage | | | | | |
| Load | Disturbance | | Result | | | |
| Test pulse | Conducted voltage | Indication,  *I* | Significant fault (> *e*) or detection and reaction | | |
| No | Yes (remarks) | |
|  | Without disturbance | |  |  |  | |
| 2a | +50 V |  |  |  | |
| 2b\* | +10 V |  |  |  | |
| 3a | –150 V |  |  |  | |
| 3b | +100 V |  |  |  | |
| 4 | –7 V |  |  |  | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 24 V battery voltage | | | | | |
| Load | Disturbance | | Result | | | |
| Test pulse | Conducted voltage | Indication,  *I* | Significant fault (> *e*) or detection and reaction | | |
| No | Yes (remarks) | |
|  | Without disturbance | |  |  |  | |
| 2a | +50 V |  |  |  | |
| 2b\* | +20 V |  |  |  | |
| 3a | –200 V |  |  |  | |
| 3b | +200 V |  |  |  | |
| 4 | –16 V |  |  |  | |

\* Test pulse 2b is only applicable if the measuring instrument may be connected to the battery via the main (ignition) switch of the car, i.e. if the manufacturer of the measuring instrument has **not** specified that the instrument is to be connected directly (or by its own main switch) to the battery.

Check if a significant fault occurred

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

**b) Capacitive and inductive coupling via lines other than supply lines**

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | 12 V battery voltage |  | 24 V battery voltage |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 12 V battery voltage | | | | | | |
| Kind or type of other lines (no power supply lines) | Disturbance | | | Result | | |
| Load | Test pulse | Conducted voltage | Indication,  *I* | Significant fault (> *e*) or detection and reaction | |
| No | Yes (remarks) |
|  | Without disturbance | |  |  |  |
| a | –60 V |  |  |  |
| b | +40 V |  |  |  |
|  | Without disturbance | |  |  |  |
| a | –60 V |  |  |  |
| b | +40 V |  |  |  |
|  | Without disturbance | |  |  |  |
| a | –60 V |  |  |  |
| b | +40 V |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 24 V battery voltage | | | | | | |
| Kind or type of other lines (no power supply lines) | Disturbance | | | Result | | |
| Load | Test pulse | Conducted voltage | Indication,  *I* | Significant fault (> *e*) or detection and reaction | |
| No | Yes (remarks) |
|  | Without disturbance | |  |  |  |
| a | –80 V |  |  |  |
| b | +80 V |  |  |  |
|  | Without disturbance | |  |  |  |
| a | –80 V |  |  |  |
| b | +80 V |  |  |  |
|  | Without disturbance | |  |  |  |
| a | –80 V |  |  |  |
| b | +80 V |  |  |  |

Check if a significant fault occurred.

*Note:* If EUT fails, the frequency at which this occurs shall be recorded

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

# 13 DAMP HEAT, STEADY STATE (R 76-2, 8.2)

**a) Initial test (at reference temperature)**

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

Automatic zero-setting and zero-tracking device is:

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

*E* = *I* + ½ *e* – Δ*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, *E* | | Corrected  error, *E*c | | mpe |
| ↓ | ↑ | ↓ | ↑ | ↓ | ↑ | ↓ | ↑ |
| \* |  |  |  |  | \* |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |

Check if |*E*c| ≤ |mpe|

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

**b) Test at high temperature and 85 % relative humidity**

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

Automatic zero-setting and zero-tracking device is:

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

*E* = *I* + ½ *e* – Δ*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, *E* | | Corrected  error, *E*c | | mpe |
| ↓ | ↑ | ↓ | ↑ | ↓ | ↑ | ↓ | ↑ |
| \* |  |  |  |  | (\*) |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |

Check if |*E*c| ≤ |mpe|

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

**c) Final test (at reference temperature)**

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

Automatic zero-setting and zero-tracking device is:

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

*E* = *I* + ½ *e* – Δ*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, *E* | | Corrected  error, *E*c | | mpe |
| ↓ | ↑ | ↓ | ↑ | ↓ | ↑ | ↓ | ↑ |
| \* |  |  |  |  | \* |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

Check if |*E*c| ≤ |mpe|

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

# 14 SPAN STABILITY (R 76-2, 8.4)

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

Automatic zero-setting and zero-tracking device is:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Non-existent |  | Not in operation |  | Out of working range |

|  |  |  |  |
| --- | --- | --- | --- |
| Zero load = |  | Test load = |  |

Automatic span adjustment device:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Existent |  | Non-existent |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measurement no.1: Initial measurement** | |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp.: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h.: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres.: |  |  |  | hPa |

|  |  |
| --- | --- |
|  | Automatic span adjustment device activated (if existent) |

*E*0 = *I*0 + ½ *e* – Δ*L*0 – *L*0 *E*L = *I*L + ½ *e* – Δ*L* – *L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Indication  of zero, *I*0 | Add. load,  Δ*L*0 | *E*0 | Indication  of load, *I*L | Add. load,  Δ*L* | *E*L | *E*L – *E*0 | Corrected  value\* |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |

\* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

|  |  |
| --- | --- |
| 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| ≤ 0.1 *e*, the loading and reading will be sufficient for each of the subsequent measurements; if not, five loadings and readings shall be performed at each measurement.

Remarks:

**Subsequent measurements**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measurement no.2:** |  |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp.: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h.: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres.: |  |  |  | hPa |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measurement after the temperature test |  | Measurement after the damp heat test |
|  | Measurement after disconnection from the mains |  | Measurement after change in test location |
|  | Other condition: ……………………………………………………………………………………….... | | |

|  |  |
| --- | --- |
|  | Automatic span adjustment device activated (if existent) |

*E*0 = *I*0 + ½ *e* – Δ*L*0 – *L*0 *E*L = *I*L + ½ *e* – Δ*L* – *L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Indication  of zero, *I*0 | Add. load,  Δ*L*0 | *E*0 | Indication  of load, *I*L | Add. load,  Δ*L* | *E*L | *E*L – *E*0 | Corrected  value\* |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |

\* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

|  |  |  |
| --- | --- | --- |
| If five loadings and readings have been performed: | Average error **=** average (*E*L – *E*0) = |  |

Remarks:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measurement no. 3:** |  |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp.: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h.: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres.: |  |  |  | hPa |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measurement after the temperature test |  | Measurement after the damp heat test |
|  | Measurement after disconnection from the mains |  | Measurement after change in test location |
|  | Other condition: ……………………………………………………………………………………….... | | |

|  |  |
| --- | --- |
|  | Automatic span adjustment device activated (if existent) |

*E*0 = *I*0 + ½ *e* – Δ*L*0 – *L*0 *E*L = *I*L + ½ *e* – Δ*L* – *L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Indication  of zero, *I*0 | Add. load,  Δ*L*0 | *E*0 | Indication  of load, *I*L | Add. load,  Δ*L* | *E*L | *E*L – *E*0 | Corrected  value\* |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |

\* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

|  |  |  |
| --- | --- | --- |
| If five loadings and readings have been performed: | Average error **=** average (*E*L – *E*0) = |  |

Remarks:

**Subsequent measurements**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measurement no. 4:** |  |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp.: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h.: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres.: |  |  |  | hPa |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measurement after the temperature test |  | Measurement after the damp heat test |
|  | Measurement after disconnection from the mains |  | Measurement after change in test location |
|  | Other condition: ……………………………………………………………………………………….... | | |

|  |  |
| --- | --- |
|  | Automatic span adjustment device activated (if existent) |

*E*0 = *I*0 + ½ *e* – Δ*L*0 – *L*0 *E*L = *I*L + ½ *e* – Δ*L* – *L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Indication  of zero, *I*0 | Add. load,  Δ*L*0 | *E*0 | Indication  of load, *I*L | Add. load,  Δ*L* | *E*L | *E*L – *E*0 | Corrected  value\* |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |

\* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

|  |  |  |
| --- | --- | --- |
| If five loadings and readings have been performed: | Average error **=** average (*E*L – *E*0) = |  |

Remarks:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measurement no. 5:** |  |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp.: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h.: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres.: |  |  |  | hPa |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measurement after the temperature test |  | Measurement after the damp heat test |
|  | Measurement after disconnection from the mains |  | Measurement after change in test location |
|  | Other condition: ……………………………………………………………………………………….... | | |

|  |  |
| --- | --- |
|  | Automatic span adjustment device activated (if existent) |

*E*0 = *I*0 + ½ *e* – Δ*L*0 – *L*0 *E*L = *I*L + ½ *e* – Δ*L* – *L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Indication  of zero, *I*0 | Add. load,  Δ*L*0 | *E*0 | Indication  of load, *I*L | Add. load,  Δ*L* | *E*L | *E*L – *E*0 | Corrected  value\* |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |

\* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

|  |  |  |
| --- | --- | --- |
| If five loadings and readings have been performed: | Average error **=** average (*E*L – *E*0) = |  |

Remarks:

**Subsequent measurements**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measurement no. 6:** |  |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres: |  |  |  | hPa |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measurement after the temperature test |  | Measurement after the damp heat test |
|  | Measurement after disconnection from the mains |  | Measurement after change in test location |
|  | Other condition: ……………………………………………………………………………………….... | | |

|  |  |
| --- | --- |
|  | Automatic span adjustment device activated (if existent) |

*E*0 = *I*0 + ½ *e* – Δ*L*0 – *L*0 *E*L = *I*L + ½ *e* – Δ*L* – *L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Indication  of zero, *I*0 | Add. load,  Δ*L*0 | *E*0 | Indication  of load, *I*L | Add. load,  Δ*L* | *E*L | *E*L – *E*0 | Corrected  value\* |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |

\* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

|  |  |  |
| --- | --- | --- |
| If five loadings and readings have been performed: | Average error **=** average (*E*L – *E*0) = |  |

Remarks:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measurement no. 7:** |  |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres: |  |  |  | hPa |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measurement after the temperature test |  | Measurement after the damp heat test |
|  | Measurement after disconnection from the mains |  | Measurement after change in test location |
|  | Other condition: ……………………………………………………………………………………….... | | |

|  |  |
| --- | --- |
|  | Automatic span adjustment device activated (if existent) |

*E*0 = *I*0 + ½ *e* – Δ*L*0 – *L*0 *E*L = *I*L + ½ *e* – Δ*L* – *L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Indication  of zero, *I*0 | Add. load,  Δ*L*0 | *E*0 | Indication  of load, *I*L | Add. load,  Δ*L* | *E*L | *E*L – *E*0 | Corrected  value\* |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |

\* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

|  |  |  |
| --- | --- | --- |
| If five loadings and readings have been performed: | Average error **=** average (EL – E0) = |  |

Remarks:

**Subsequent measurements**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measurement no. …. :** |  |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp.: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h.: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres.: |  |  |  | hPa |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measurement after the temperature test |  | Measurement after the damp heat test |
|  | Measurement after disconnection from the mains |  | Measurement after change in test location |
|  | Other condition: ……………………………………………………………………………………….... | | |

|  |  |
| --- | --- |
|  | Automatic span adjustment device activated (if existent) |

*E*0 = *I*0 + ½ *e* – Δ*L*0 – *L*0 *E*L = *I*L + ½ *e* – Δ*L* – *L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Indication  of zero, *I*0 | Add. load,  Δ*L*0 | *E*0 | Indication  of load, *I*L | Add. load,  Δ*L* | *E*L | *E*L – *E*0 | Corrected  value\* |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |

\* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

|  |  |  |
| --- | --- | --- |
| If five loadings and readings have been performed: | Average error **=** average (*E*L – *E*0) = |  |

Remarks:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measurement no. …. :** |  |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp.: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h.: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres.: |  |  |  | hPa |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measurement after the temperature test |  | Measurement after the damp heat test |
|  | Measurement after disconnection from the mains |  | Measurement after change in test location |
|  | Other condition: ……………………………………………………………………………………….... | | |

|  |  |
| --- | --- |
|  | Automatic span adjustment device activated (if existent) |

*E*0 = *I*0 + ½ *e* – Δ*L*0 – *L*0 *E*L = *I*L + ½ *e* – Δ*L* – *L*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Indication  of zero, *I*0 | Add. load,  Δ*L*0 | *E*0 | Indication  of load, *I*L | Add. load,  Δ*L* | *E*L | *E*L – *E*0 | Corrected  value\* |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |

\* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

|  |  |  |
| --- | --- | --- |
| If five loadings and readings have been performed: | Average error **=** average (*E*L – *E*0) = |  |

Remarks:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Measurement no.** | …………………………………………………………………………………………………………… | …………………………………………………………………………………………………………… | Plot on the diagram the indication of temperature test **T** , damp heat test **D** and disconnections from the mains power supply **P** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Maximum allowable variation |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **8** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **7** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **14 SPAN STABILITY (R 76-2, 8.4)** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Failed |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **3** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |
| Application no.: | Type designation: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **2** |  |  |  |  |  |  |  |  |  |  |  |  | Passed |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **1** |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |
|  | | | |  |  | | | | |  | | | | |  | | | | |  | | | | |  | | | | |  | | | | |  |  | |
|  | | | | | +1.5 *e* | |  | | | +1 *e* | |  | | | +0.5 *e* | |  | | | 0 | |  | | | –0.5 *e* | |  | | | –1 *e* | |  | | | –1.5 *e* | |
| Average error e | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

# 15 ENDURANCE (R 76-2, clause 7)

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **a) Initial test** |  |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp.: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h.: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres.: |  |  |  | hPa |

Automatic zero-setting and zero-tracking device is:

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

*E* = *I* + ½ *e* – Δ*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, *E* | | Corrected error,  *E*c | | mpe |
| ↓ | ↑ | ↓ | ↑ | ↓ | ↑ | ↓ | ↑ |
|  | \* |  |  |  | \* |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

**b) Performance of the test**

|  |  |  |  |
| --- | --- | --- | --- |
| Number of loadings: |  | Load applied: |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **c) Final test** |  |  | At start | At max | At end |  |
| Date: | ………………………………………… | Temp.: |  |  |  | °C |
| Observer: | ………………………………………… | Rel. h.: |  |  |  | % |
| Location: | ………………………………………… | Time: |  |  |  |  |
|  |  | Bar. pres.: |  |  |  | hPa |

Automatic zero-setting and zero-tracking device is:

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

*E* = *I* + ½ *e* – Δ*L* – *L*

*E*c = *E* – *E*0 with *E*0 = error calculated at or near zero\*

Durability error due to wear and tear = |*E*c initial – *E*c final|\*\*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Load, *L* | Indication, *I* | | Add. load,  Δ*L* | | Error, *E* | | Corrected error, *E*c | | mpe | Durability error due to wear and tear\*\* |
| ↓ | ↑ | ↓ | ↑ | ↓ | ↑ | ↓ | ↑ |
| \* |  |  |  |  | \* |  |  |  |  |  |
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Check if the durability error due to wear and tear is ≤ mpe

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Remarks:

1. The test equipment (simulator or a part of a complete instrument) connected to the module shall be defined in the test form(s) used. [↑](#footnote-ref-1)
2. Please note that the class denominations used hereafter in this Recommendation do not include the oval around the number for improved clarity of the Test Report Format’s text. [↑](#footnote-ref-2)