



SECOND COMMITTEE DRAFT OIML R 139-3

Date: 5 September 2014

Reference number:

OIML TC 8/SC 7/P04/N067/2CD

Supersedes document:

OIML TC 8/SC 7/P04/N063/CD

OIML TC 8/SC 7

Secretariat:

The Netherlands

Title: **Project p4**

Part 3 of OIML R 139

Compressed gaseous fuel measuring systems for vehicles

Convener:

The Netherlands

Circulated to the project group P- and O-members and liaison international bodies and external organizations for:

☐

discussion at (date and place of meeting):
.....

☐

comments by:

☒

vote (P-members only) and comments by
8 December 2014

TITLE OF THE CD (English):

OIML R 139-3

Compressed gaseous fuel measuring systems for vehicles

Part 3: OIML Report format for type evaluation

TITRE DU CD (French):

OIML R 139-3

Ensembles de mesurage de gaz comprimé pour véhicules

Partie 3 : OIML format de rapport pour l'évaluation de type

Original version in english

Version original en anglais

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 139-3, Edition 201x - was developed by Technical Subcommittee TC 8/SC 7. It was approved for final publication by the International Committee of Legal Metrology in 201x and will be submitted to the International Conference of Legal Metrology in 201x for formal sanction.

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:

Bureau International de Métrologie Légale

11, rue Turgot - 75009 Paris - France

Telephone: 33 (0)1 48 78 12 82

Fax: 33 (0)1 42 82 17 27

E-mail: biml@oiml.org

Internet: www.oiml.org

OIML R 139-3

Compressed gaseous fuel measuring systems for vehicles

Part 3 - Report format for type evaluation

1 Introduction

Implementation of this Report Format is informative with regard to the implementation of OIML Recommendation R 139-1 and -2 in national regulations. However, its implementation is mandatory within the framework of the OIML Certificate System for Measuring Instruments.

Note concerning the references: All references are to the combined publication OIML R 139-1 and -2 (201~~x~~). In this Report Format this publication is referred to as "R 139".

This Report Format applies for any kind of compressed gaseous fuel measuring system for vehicles (independent of its technology). It presents a standardized format for recording the results of the various tests and examinations, described in Part 2 of R 139 (201~~x~~), to which a type of a compressed gaseous fuel measuring system for vehicles shall be submitted with a view to its approval based on this OIML Recommendation.

The use of this report format, as is, or translated into a different language is recommended to all metrology services or laboratories evaluating and/or testing types of compressed gaseous fuel measuring system for vehicles according to OIML R 139, or according to national or regional regulations based on this Recommendation. In case of a translation, it is highly recommended to leave the structure and the numbers of the clauses unchanged, thus facilitating the interpretation of most of the contents even for those readers not familiar to this specific other speech.

The available area of entry fields should be adjusted to the space required for the correct entry of the specific record. The complete deletion of an entry field should be omitted.

The Report Format, in the practical application, shall as a minimum contain the clauses A–F (where applicable) in addition to a cover page issued by the Issuing Authority

2 Applicability of this Report Format

In the framework of the *OIML Certificate System for Measuring Instruments*, and the *OIML Mutual Acceptance Arrangement* (MAA) applicable to Compressed gaseous fuel measuring systems for vehicles in conformity with R 139 (2014), the use of this report format is mandatory. It shall be made available in French and/or in English language(s) and include copies translated in the national languages of the countries issuing such certificates, when appropriate. Concerning the implementation of OIML Recommendation R 139: 201~~x~~) in national regulations this report format is informative.

3 Guidance for the application of this Report Format

Key to the symbols and expressions used in the following pages:

The “summary of the results” and the “results of the tests” shall be completed according to the following example:

Clause	Requirement or Test	Yes	No	N.A.	Meaning
#	<name>	X			Passed
#	<name>		X		Failed
#	<name>			X	Requirement or test is not applicable to this instrument

- Notes:
- (1) Unless prescribed otherwise, “Date” in the report refers to the date of testing.
 - (2) The name(s) or symbol(s) of the unit(s) used to express the test results shall be specified in each form.
 - (3) Where in a table one or several choices can be made, checkboxes are applied. In such case some or all of the columns Y, N, N/A generally are not applicable and thus presented crosshatched (see the example below)

Clause	Description	Yes	No	Not applicable	Observations
		<input type="checkbox"/>			

In case a prescribed test is not relevant for the type of instrument to be tested, the reason why the test is omitted shall be clearly stated in the field “Observations” (for instance surge tests on signal lines shorter than 30 m, tests related to AC mains supply in case of an instrument only powered by DC mains supply, or partial testing after modification of a previously tested type).

The number of the report and the page numbers shall be completed in the heading.

Pages 1 - 5 of this Test Report format may be replaced by a cover page by the Issuing authority.

4 The Evaluation Report

The format for the Report is presented on the following pages starting with space for the cover page.

Cover page
by the
Issuing Authority

in accordance with national custom or legislation

Contents of the Evaluation Report

A	References of the authority, responsible for this report	8
B	Synopsis of the results of the evaluation	8
C	Summary of the results of the evaluation (examination and tests).....	9
C.1	Examinations.....	9
C.2	Performance tests	10
D	General Information	11
D.1	Manufacturer	11
D.2	Applicant.....	11
D.3	Testing laboratories involved in the tests.....	12
D.4	General information concerning the type and the sample(s) supplied for the tests.....	13
D.5	Accessories, supplied by the applicant (if applicable)	14
D.7	Adjustments and modifications.....	15
D.8	Additional information concerning the type	15
D.9	Documentation supplied by the applicant	15
D.10	Results of previous tests that were taken into account.....	15
D.11	Information concerning the test equipment used for the type evaluation	15
E	Examinations.....	16
E.1	Presentation of the measurement result.....	16
E.2	Measuring ranges	16
E.3	Technical requirements for the measuring system.....	17
E.4	Printing device	18
E.5	Storing of measurement results	18
E.6	Data transmission interface	19
E.7	Zero-setting device.....	19
E.8	Presetting device	19
E.9	Calculator.....	19
E.10	Emergency power supply device	20
E.11	Protection against fraud.....	20
E.12	Checking facilities.....	21
E.13	Software	23
E.14	Self service arrangement	25
E.15	Installation of the measuring system.....	26
E.16	Instruction manual.....	26
E.17	Sealing.....	27
E.18	Stamping plate.....	28
E.19	Suitability for testing.....	28
E.20	Specific requirements for ancillary devices	28
E.21	Transfer point.....	28
E.22	Additional requirements for specific modules	29
E.23	Documentation for type evaluation.....	30

F	Performance tests	32
F.1	Variable flowrate.....	32
F.2	Tests with sequential control (involving 3 banks)	34
F.3	Tests without sequential control (involving only one bank)	35
F.4.	Durability test.....	37
F.5	Gas influence factors.....	38
F.6	Zero stability test (if applicable)	39
F.7	Flow disturbances (if applicable)	40
F 7.1	Preset function (if applicable).....	41
F.8	Initial test.....	42
F.8.1	Static temperature tests	43
F.9	Vibration (random).....	45
F.10	AC / DC Mains voltage variations	46
F.11	Low voltage of internal battery	47
F.12	Damp heat, cyclic (condensing)	48
F.13	RF immunity	50
F.14	Electrostatic discharges	52
F.15	Surges.....	53
F.16	AC mains voltage dips and short interruptions	55
F.17	DC mains Voltage dips, short interruptions and voltage variations.....	56
F.18	Bursts on AC and DC mains and signal lines	57
F.19	Ripple on DC mains power	58

Name	
Address	
Report number	
Application number	
Period of execution of the tests	
Date of issuing this Report	
Name and signature of the person responsible for the report and stamp(s) (if applicable)	

(To be completed by the Issuing Authority)

The evaluated specimen (or specimens) fulfils all the applicable and required criteria stated in OIML R 139-1 (2014)	
<input type="checkbox"/>	Yes
<input type="checkbox"/>	No
Observations:	

C Summary of the results of the evaluation (examination and tests)*(To be completed by the Issuing Authority)***C.1 Examinations**

For details, of the evaluation results refer to the corresponding records in clause E of this Report.

OIML R 139-1 (Sub-)clause	General requirements	Specimen(-s) comply with referred clause			details in
		Yes	No	N.A.	
5.1, 6.2	Presentation of the measured result				E.1
5.3	Measuring range				E.2
6.1	Construction				E.3
6.2.8	Printing device				E.4
6.3	Storing of measuring results (memory device; hardware)				E.5
6.4	Data transmission				E.6
6.5	Zero-setting device				E.7
6.6	Presetting device				E.8
6.7	Calculator				E.9
6.8	Emergency power supply device				E.10
6.9	Protection against fraud				E.11
6.10	Checking facilities				E.12
6.11	Software				E.13
6.12	Self-service arrangement				E.14
6.14	Installation of the measuring system				E.15
7	Markings				D.4
8	Instruction manual				E.16
9	Sealing				E.17
10	Stamping plate				E.18
11	Suitability for testing				E.19
13	Ancillary devices				E.20
14	Transfer point				E.21
15	Additional requirements for specific modules				E.22
15.1	The meter				E.22
15.2	External printers and memory devices				E.22
18.2	Documentation for the type evaluation				E.23

C.2 Performance tests

For details of the test results refer to the corresponding records in clause F of this Report

OIML R 139-2 Subclause	Performance tests	Specimen(-s) comply with referred clause			Details in
		Yes	No	N.A.	
17.2.7.1	At variable flow rate				F.1
17.2.7.2	Tests with sequential control				F.2
17.2.7.3	Tests without sequential control				F.3
17.2.7.5	Durability				F.4
17.2.7.6	Gas influence factors				F.5
17.2.7.7a	Zero stability				F.6
17.2.7.7b	Flow disturbances				F.7
18.5.3	Preset function				F.7.1
18.6.a	Use of alternative Fluid				D.11
18.6.b	Use of only one gas				D.11
18.7.1	Initial test				F.8
18.8.2	Influence of static (ambient) temperature				F.8.1
18.8.3	Influence of vibration (random)				F.9
18.8.4	Influence of mains power supply variation				F.10
18.8.5	Influence of battery power supply variation				F.11
18.9.4.1	Immunity to atmospheric disturbances				F.12
18.9.4.2	Immunity to radio frequency EM fields				F.13
18.9.4.3	Immunity to electrostatic discharges				F.14
18.9.4.4	Immunity to surges				F.15
18.9.4.5	Immunity to power source disturbances :				
→	AC mains voltage dips, short interruptions				F.16
→	DC mains voltage dips, short interruptions and voltage variations				F.17
→	Bursts (transients) on AC and DC mains and signal lines				F.18
→	Ripple on DC mains power				F.19

D General Information**D.1 Manufacturer**

Company	
Address	

D.2 Applicant

Company		
Representative		
Address		
Reference		
Date of application		
Applicant is authorized by the manufacturer (documented)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
It is verified that no application for OIML type evaluation for the same type has been made to any other OIML Issuing Authority (see OIML B 3, 3.1.2)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Observations:		

D.3 Testing laboratories involved in the tests*(This table to be completed for each test laboratory)*

Name		
Address		
Application number		
Tests by this laboratory		
Date/period of tests		
Name(s) of test engineer(s)		
Statement of compliance with the requirement of proven competence for performing the above referred tests within the scope of OIML R 139-1 &-2 (201x) (OIML B3 [5.3.1])		
Where applicable accredited for	QA standard	
	Accreditation Number:	Expires (date):
Details of relevant peer assessment or assessment by other means where applicable		
Entry area for detailed information in case tests have not been performed on the premises of this laboratory but on a different location.		
Name of the responsible person		
Date of signature		
Stamp (where applicable) and signature of the responsible person		
Observations:		

D.4 General information concerning the type and the sample(s) supplied for the tests

(as stated on the instrument / provided by the manufacturer)

OIML R 139-1 Subclause	Information presented on the instrument		Yes	No	Not applicable	Comments/observations	
7.1	Manufacturer's trade mark						
	Type/model designation/number						
	Presented or space for:	Approval marking					
		Year of manufacture					
		Serial number					
7.2	Minimum measured quantity	$MMQ =$ g ; kg					
7.3.a	Flow rate range	$Q_{\min} =$ kg/min					
		$Q_{\max} =$ kg/min					
	Minimum pressure of the gas	$P_{\min} =$ MPa					
	Maximum pressure of the gas	$P_{\max} =$ MPa					
	Maximum storage pressure	$P_{st} =$ MPa					
	Maximum fast-fill pressure	$P_v =$ MPa					
	Types of gas or mixtures of gas						
	Temperature range of the gas	$T_{\min} =$ °C					
		$T_{\max} =$ °C					
	Ambient temperature range	Ambient high (T_{ah}) = °C					
		Ambient low (T_{al}) = °C					
	Environmental classification	Exclusively non industrial					
		Generic (includes industrial)					
	7.3.b	Electrical power supply	mains AC voltage V				
			mains DC voltage V				
Battery voltage V							
7.3.d	Speed of switching between banks	ms					
7.3.c	Identification of software						
	Length of the hose	m					
7.1.e	Modules :name	:type	:serial number				
	Further observations:						

D.5 Accessories, supplied by the applicant (if applicable)

Operating instructions	
.....	
.....	
.....	
.....	
<p>Examples are: Data printer (if applicable); ancillary devices, cabling and other accessories:</p>	

D.6 Selection of specimens tested

<p>In case the tests and examinations are valid for more versions, present full details of these versions, according to the listing of parameters and type designation in the way presented in D4:</p>
<p>Justification of the selection of the specimens:</p>

The following specimens have taken part in the examination:

Specimen no.	Model	Serial no.	Year of manufacture	Q_{\max} [kg/min]	Q_{\min} [kg/min]
1					
2					
3					
4					
5					
...					

D.7 Adjustments and modifications

Adjustments, modifications, and repairs made to the specimens during the testing:

D.8 Additional information concerning the type

Additional observations and/or information (connection equipment, interfaces, etc.):

D.9 Documentation supplied by the applicant

Observations:

D.10 Results of previous tests that were taken into account

Details:

D.11 Information concerning the test equipment used for the type evaluation
(including details of simulations)

*If applicable, the laboratory is free to provide this information, instead of a complete overview here, in the appropriate chapter F.x in an extra field below the 1st table (with "Date & Time" etc.).
In that case a statement shall be made in this field.*

E Examinations*(To be completed by the Evaluating Authority)**Where specified not applicable in table C.1 the underneath related tables may be removed from this report.*

For each of the applicable requirements an explanation on the manner in which the requirement is met is presented in the column 'observations'.

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

5.1	E.1 Presentation of the measurement result				Applied units:
5.1.1	Units of measurement				
	All applied quantity values are expressed in:	SI units: <input type="checkbox"/>			
		other legal units conforming OIML D2 [2007]: <input type="checkbox"/>			
5.1.2	Scale interval				
5.1.2.1	- agrees 1×10^n , 2×10^n or 5×10^n , (n=integer)				
5.1.2.2	- is equal to or smaller than MMQ				
5.1.2.3	Non-significant figures avoided				
5.1.3	Same scale intervals multiple indications (displays and printers)				
6.2.1.1	Size of figures digital display ≥ 10 mm				
6.2.1.2	No dots or commas applied when grouping numbers in groups of 3 digits				
6.2.5	Presentation of decimal fraction at least one figure to the left of the separator and all figures to the right				

5.3	E.2 Measuring ranges				
5.3.1.1	Q_{\min} specified limited				
5.3.1.2	Q_{\max} specified limited				
	Flow rate below Q_{\min} prevented				
5.3.1.3	All elements of the system range within Q_{\min} and Q_{\max}				
5.3.2	MMQ specified:				
5.2.4	R_{MPE}				
5.2.4	E_{\min} ($=2 * \text{MMQ} * R_{\text{MPE}}$)				
5.3.1.4	Applied ratio(s): Q_{\max}/Q_{\min}			$Q_{\max}/Q_{\min} \geq 10$?	
5.3.2	$Q_{\max} \leq 4$ <input type="checkbox"/>	MMQ =		MMQ $\leq 0,5$?	
	$4 < Q_{\max} \leq 12$ <input type="checkbox"/>	MMQ =		MMQ ≤ 1 ?	
	$12 < Q_{\max} \leq 30$ <input type="checkbox"/>	MMQ =		MMQ ≤ 2 ?	
	$30 < Q_{\max} \leq 70$ <input type="checkbox"/>	MMQ =		MMQ ≤ 5 ?	
	$Q_{\max} > 70$ <input type="checkbox"/>	MMQ =		MMQ ≤ 10 ?	
		MMQ agrees 1×10^n , 2×10^n or 5×10^n , (n=integer)			
5.6.1	$E_{\min} < 0.15$ % <input type="checkbox"/>	Fault limit =		0,15 %	
	$E_{\min} \geq 0.15$ % <input type="checkbox"/>	Fault limit = E_{\min} =			

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

6	E.3 Technical requirements for the measuring system					
6.1	Construction					
6.1.1	The measuring system and, if applicable, its modules are designed for the intended purpose.					.
	The measuring system is solidly and carefully constructed in order to ensure that it maintains its metrological qualities during a reasonable period of use					explain how
6.1.2	The measuring system comprises more than 1 bank Number of banks :...					
6.1.3	The measuring system is constructed such that the opportunity for unintentional, accidental, or intentional misuse is minimized.					explain how.
6.2	Presentation of measured value					
6.2.1	Digital indicating device displays mass of the gas					
	Where a secondary (informative) indication is available the status of this informative indication is clear and unambiguous and is not misleading with respect to the actual amount.					if yes,explain how.
	Secondary indication in quantity:	Volume <input type="checkbox"/>				
		Conversion factor displayed on front face				
		Energy <input type="checkbox"/>				
		Conversion factor displayed on front face				
		Other <input type="checkbox"/>				Which quantity:
		Conversion factor displayed on front face				
	Meter is fitted with a price indicating device	Unit price and price to pay are only related to mass				
		Indications are displayed only when displaying mass				
6.2.2	Common simultaneous use of the same indicating device for several measuring systems possible	Identification on indication available				
		Identification of indicated quantity value is unchallengeable and clearly indicated				
6.2.3	Price indications fulfil the provisions applicable to mass indications					
	Other quantity indications on secondary indicating devices fulfil the provisions applicable to mass indications					
6.2.4	The totalized mass is continuously displayed during the measurement					
6.2.5	The digital indication or print consists of at least one figure					
6.2.6	Falsification of results is not possible when applying an external printing device or data storage					
	Printing or storing of data is prevented in case of occurrence of a significant fault					
	Loss of previous measurement data is prevented in case of occurrence of a significant fault					
6.2.7	Price indicating device					
6.2.7.1	The mass indicating device contains a price indicating device which displays unit price and price to be paid including the applicable monetary unit					
6.2.7.2	The unit price is displayed before the start of the measurement and valid for the whole transaction					
	The unit price is after change only effective at the moment that a new transaction may start and is adjustable	direct on the measuring system <input type="checkbox"/>				
		through peripheral equipment allowing at least 5 s to elapse between indicating the new unit price and the start of the measurement <input type="checkbox"/>				
6.2.7.3	Errors due to rounding only influence the least significant digit of the price to be paid					

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

6.2	E.4 Printing device				
6.2.8	Printing device	Internal <input type="checkbox"/>			
		External <input type="checkbox"/>			
6.2.8.1	Printing the current transaction is inhibited during a measurement				
	No change in indicated quantity during printing				
6.2.8.2	Prints identification of applicable system when more than one measuring system is, or can be connected				
6.2.8.3	Marks duplicates when copies can be produced				
6.2.8.6, a	Print permanency: readable at least 3 months				
6.2.8.6, b	Height of digits.... mm	≥ 2 mm			
6.2.8.4	Prints	Price <input type="checkbox"/>			
		Price and unit price <input type="checkbox"/>			
6.2.8.6, c		Name/symbol of units on the right of the value <input type="checkbox"/>			
		Name/symbol of units above column <input type="checkbox"/>			
6.2.8.6, d	A print failure results in	a warning <input type="checkbox"/>			
		inhibiting the measurement <input type="checkbox"/>			
6.2.8.5	Checking facilities of printer				

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

6.3	E.5 Storing of measurement results				
6.3.1	Hardware memory device	Internal <input type="checkbox"/>			
		External <input type="checkbox"/>			
6.3.1	Means available to read stored data				
	Sufficient storage capacity				
6.3.2	Permanency of stored data				
6.3.3	Modification of stored data inhibited				
6.3.3	Deletion of data				
6.3.4	Checking facilities of memory device				

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

6.4	E.6 Data transmission interface				
	Equipped with data transmission interface				
	No possibility to inadmissibly influence metrological functions				
	No possibility to falsify measuring results				

6.5	E.7 Zero-setting device				
6.5.1	Measurement system is equipped with required zero-setting device				
6.5.1.1	Only acts on indicated measurement result				
6.5.1.2	Next delivery only possible after finish of and reset to zero of previous delivery				
6.5.1.3	Measuring result during zero setting inhibited				
6.5.1.3	During zero setting no diverging indication of measured value				
6.5.1.4	Zero setting during measurement inhibited				
6.5.2	Equipped with required zero-setting of price indication				
6.5.3	Corrects for false registered massflow in case of no flow				

6.6	E.8 Presetting device				
6.6.1	Presetting device	Available	<input type="checkbox"/>		
6.6.2	Indication of pre-set before start of measurement				
6.6.3	Indication between actual measured and preset is distinguishable				How ?
6.6.4	Indication of preset value	remains unaltered	<input type="checkbox"/>		
		returns progressively to zero	<input type="checkbox"/>		
6.6.6		units according to 5.1.1			
6.6.7		scale interval same as 5.1.2			
6.6.4	Presetting device	special operation involving the preset value to change to zero before the measurement	<input type="checkbox"/>		
6.6.8		Emergency flow stop incorporated	<input type="checkbox"/>		
6.6.9		Price presetting device available	<input type="checkbox"/>		

6.7	E.9 Calculator				
6.7.2	All necessary parameters values are available at the start of the measurement				

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

6.7	E.10 Emergency power supply device				
6.8.1	Emergency power supply allows:	a) all measuring functions are safeguarded during a failure of the principal power supply <input type="checkbox"/>			
		b) data contained at the moment of a failure leading to stopping the flow are saved and displayable on an indicating device subject to legal metrology control for sufficient time to permit the conclusion of the current transaction. <input type="checkbox"/>			
6.8.2	A failure leading to stopping the flow causes the operation of the display:	a) to automatically continue for at least 15 min immediately following the failure of the principal electrical supply <input type="checkbox"/>			
		b) for a total time of at least 5 minutes in one or several periods to be controlled manually during one hour immediately following the failure. <input type="checkbox"/>			
	More than 15s power failure leads to a finishing the delivery when the power supply is re-established				

6.9	E.11 Protection against fraud				
6.9.1a	Adjustment without breaking seals inhibited				
6.9.1d	Risk on successful deliberate influence is minimized				

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

6.10	E.12	Checking facilities					
6.10.2	Checking facilities for the measurement transducer						
	Type	<input type="checkbox"/> N / <input type="checkbox"/> I / <input type="checkbox"/> P					
	Function check	a) by disconnecting the transducer,or	<input type="checkbox"/>				
		b) by interrupting one of the sensor's pulse generators, or	<input type="checkbox"/>				
		c) by interrupting the electrical supply of the transducer	<input type="checkbox"/>				
6.10.2.3	Time –out after 120 s						
6.10.3	Checking facilities for the calculator						
	Type	<input type="checkbox"/> N / <input type="checkbox"/> I / <input type="checkbox"/> P					
6.10.3.2	If of type I: Function check	Operates at least every five minutes in the course of a delivery and at least once during a delivery					
6.10.3.3	Validity check	<input type="checkbox"/> N / <input type="checkbox"/> I / <input type="checkbox"/> P					
6.10.4	Checking facilities for the indicating device						
	Type	<input type="checkbox"/> N / <input type="checkbox"/> I / <input type="checkbox"/> P					
6.10.4	If of type I: Function check	a primary indication is provided by some other device of the measuring system or, the indication can be easily determined from other primary indications					Details
6.10.4.2	Function check	automatic verification of the complete indicating device	<input type="checkbox"/>				
		Or both: - automatically the data transmitted to the indicating device and the electronic circuits used for the indicating device, excluding those to the driving circuits of the display itself, - visual check of the display itself which is of type I (each step to be at least 0,75 seconds)	<input type="checkbox"/>				
6.10.5	Checking facilities for ancillary devices						
	Type	<input type="checkbox"/> N / <input type="checkbox"/> I / <input type="checkbox"/> P					
6.10.6	Checking facilities for the associated measuring instruments						
	Type	<input type="checkbox"/> N / <input type="checkbox"/> I / <input type="checkbox"/> P					
6.10.7	Zero flow response						
	Time-out device incorporated that terminates a single batch delivery should a period of inactivity (no flow) of more than 2 minutes occur during the transaction						

Applicable software evaluation procedures:

Requirement		Evaluation procedure
A.1.1	Software identification	AD + VFTSw
A.1.2	Correctness of algorithms	AD + VFTSw
A.1.3	Fraud protection	AD + VFTSw + DFA/CIWT/SMT
	Parameter protection	AD + VFTSw + DFA/CIWT/SMT
A.2.1	Separation of electronic devices and sub-assemblies	AD
A.2.2	Separation of software parts	AD
A.2.3	Storage of data, transmission via communication systems	AD + VFTSw + CIWT/SMT
A.2.3.1	Data protection with respect to time of measurement	AD + VFTSw + SMT
A.2.4	Automatic storing	AD + VFTSw
A.2.3.4	Transmission delay	AD + VFTSw
A.2.3.5	Transmission interruption	AD + VFTSw
	Time stamp	AD + VFTSw

Abbreviation	Description	Not applicable	Related OIML R 139-1 Clause form OIML D 31:2008
AD	Analysis of the documentation and validation of the design		6.2.3.1
VFTM	Validation by functional testing of metrological functions		6.2.3.2
VFTSw	Validation by functional testing of software functions		6.2.3.3
DFA ¹⁾	Metrological data flow analysis		6.2.3.4
CIWT ¹⁾	Code inspection and walkthrough		6.2.3.5
SMT ¹⁾	Software module testing		6.2.3.6

¹⁾ The software validation methods DFA, CIWT and SMT in general are not applicable and may only be applicable in case the measuring system is designed to allow software downloading as stated in Part 2.

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s): Specimen:
					Observations
A.1	E.13 Software				
A.1.1	Software identification				
	The legally relevant parts are clearly identified.				
	The identification number is:				
	The identification is presented by means of:				
	The identification is inextricably linked to the software.				
A.1.2	Correctness of algorithms and functions				
	The measuring algorithms and functions are appropriate and functionally correct.				
A.1.3	Software protection (against fraud)				
	The legally relevant software is protected against unauthorized modification, loading or changes by swapping the memory device.				
	Only clearly documented functions can be activated by the user interface, which do not facilitate fraudulent use.				
	Parameters that fix the legally relevant characteristics are secured against unauthorized modification.				
	Displaying of current parameter settings are possible.				
	Protection/sealing makes unauthorised access impossible or evident.				
	Detection by checking facilities of significant faults is performed by the software and in the legally relevant software part.				
	A list is available of anomalies which result in a significant fault and which are detected by the software.				
A.2.1	Separation of electronic devices and sub-assemblies				
	Constituents of the meter, performing legally relevant functions, are clearly identified, defined and document.				
	Those functions cannot be inadmissibly influenced by commands received via an interface.				
	All legally relevant software parts are clearly described.				
	An interface is available between legally relevant software and other software parts, which is clearly documented. All communication is performed exclusively via this interface.				
	The interface commands are documented with a statement of completeness.				
	The legally relevant software has priority using the resources over non-relevant software. The measurement task is not delayed or blocked by other tasks.				
A.2.2	Shared indications				
	The same display is used for presenting both information from the legally relevant part and the non-legally relevant part.				
	Software for the indication of measurement results belong to the legally relevant part.				
A.2.3	Storage of data, transmission via communication system				
	The measurement value stored or transmitted is accompanied by all relevant information for future legally relevant use.				
	The data is protected to guarantee the authenticity, integrity and correctness concerning the time of measurement.				
	The memory device is fitted with a checking facility, which guarantees that irregular data is discarded or marked unusable.				
	The software module that prepares the data for storing, sending and checking after reading or receiving is part of the legally relevant software.				

	Cryptographic methods are applied. Confidentiality key-codes are kept secret and secured.				
	The measurement is not inadmissibly influenced by a transmission delay.				
	No measurement data is lost in case the network services become in available.				
	Data storage is performed automatically.				
	The storage device has sufficient permanency to ensure that the data is not corrupted under normal storage conditions.				
	There is sufficient memory storage.				
	All data necessary for the calculation is stored with the final calculated value.				
	Stored data is deleted when the transaction is settled under the following conditions: - deletion is performed in the same order as the recording order; - deletion is started automatically or after a specific manual operation.				

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

6.12	E.14 Self service arrangement				
6.12.1	GENERAL				
6.12.1.2	Individual identification of measuring systems in case of multi-measuring systems				
6.12.1.3	No indications potentially introducing confusion				
6.12.1.4	Indication of status of measuring system				
6.12.1.5	Changing type of payment and/or mode of operation inhibited before end of operation				
6.12.1.6	Indication available for consumer up to end of transaction				
6.12.2	ATTENDED SERVICE MODE				
	Information to customer				
6.12.2.1.1	Attended post payment additional indicating device consists of:	a) a printing device for the issue of a receipt to the customer, or <input type="checkbox"/>			
		b) an indicating device for the benefit of the supplier together with a display for the benefit of the customer. <input type="checkbox"/>			
6.12.2.1.2	Temporary storage incorporates	a) association of the data with the measurement is unambiguous for each measuring system when the results are recalled			
		b) the customer is informed about the identification of his measurement in the sequence of storage of measurements			
6.12.2.1.3	Temporary storage mode is inhibited and the measuring system indicating device remains the primary indication	c) when a primary indication is out of service			
		when an external device providing a mandatory primary indication for the benefit of the customer is disconnected, or when automatically a faulty operation is detected.			
6.12.3	UNATTENDED SERVICE MODE				
6.12.3.1	General				
6.12.3.1.1	Registering by additional primary indication by means of	a) a printer receipt issued for the customer, and			
		b) measurement data registered for the benefit of the supplier by a printing or memory device <input type="checkbox"/>			
6.12.3.1.2	Warning to customer before operation in case of 6.12.3.1.1 a) or b) out of service				
6.12.3.1.3	Individual volume totalizers for each registered customer; visible to the customer (in which case 6.12.3.1.1 and 6.12.3.1.2 do not apply) <input type="checkbox"/>				
6.12.3.1.4	Inhibiting of the process in case of an interference or disturbance				
6.12.3.1.5	Conservation of delivery data during power supply failure (6.8.2 applies)				
6.12.3.2	Delayed-payment				
	Printed and/or memorized indications contain sufficient information for providing proof and include the measured quantity, the price to pay and information to identify the particular transaction (e.g. the measuring system number, location, date, time).				
6.12.3.3	Pre-payment in unattended service mode				
6.12.3.3.1	Pre-paid amount and actual price of the gas delivered is printed and memorized				
		Printed/memorized indications are divided in 2 parts indicated to be related and to contain pre and past delivery information respectively <input type="checkbox"/>			
6.12.3.3.1	Fulfills pre-set requirements (6.6)				

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

6.14	E.15 Installation of the measuring system				
6.14.1	No corruption metrological behaviour by installing additional device				
6.14.2	No means provided for diversion downstream the meter during filling				
6.14.3	Design is such that delivered mass is always within $\frac{1}{2} E_{\min}$				
6.14.4	Flow limiting device is installed (applies only when there is a risk on exceeding Q_{\max})				
6.14.5	Provision available for fitting and removing a pressure gauge				

8	E.16 Instruction manual				
8.2.a	Operating instructions				
8.2.b	Rated operating conditions				
8.2.c	Warm up time				
8.2.d	Other relevant conditions				
8.2.e	Specifications power converter				
8.2.f	Compatibility ancillary equipment				
8.2.g	Any specific installation conditions like for instance a limitation of the length of signal, data, and control lines				
8.2.h	Instructions for installation, maintenance, repairs, permissible adjustments (this can be in a separate document, not meant for the user/owner)				
8.2.i	Conditions for compatibility with interfaces, sub-assemblies (modules) or other measuring instruments				
8.2.j	Minimum measured quantity MMQ				
8.2.k	Minimum flowrate, Q_{\min}				
8.2.k	Maximum flowrate, Q_{\max}				
8.2.l	Maximum pressure of the gas in the refueling station gas storage, P_{st}				
8.2.m	Maximum fast fill pressure of the gas-fuelled vehicle, P_v				
8.2.n	Minimum pressure of the gas, P_{\min}				
8.2.o	Nature and characteristics of the gases to be measured				
8.2.p	Maximum temperature of the gas, T_{\max}				
8.2.q	Minimum temperature of the gas, T_{\min}				
8.2.r	Restricted environment (not to be used in industrial environment see 5.7.1 and 5.7.2)				
8.2.s	Maximum length of the hose				

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

9	E.17 Sealing				
9.1	general				
9.1.1	Sealing/ sealing provisions available for:				
9.1.2	Adjustment of essential metrological parameters is inhibited by means of seals				
9.1.3	Hardware seals <input type="checkbox"/>				
	Electronic seals <input type="checkbox"/> (if so sub clauses 9.2 apply)				
9.1.4	Seals are easily accessible				
9.2	Electronic sealing				
9.2.1.1	a) Access is allowed only to authorized persons by using a "password" and, after changing parameters, the measuring system can be put into use "in sealed condition" again without any restriction; or <input type="checkbox"/> b) Access is allowed without restrictions (similar with the classical sealing) but, after changing parameters, the measuring system can only be put into use "in sealed condition" again by authorized persons using a password. <input type="checkbox"/>				
9.2.1.2	Password is changeable				
9.2.1.3	Mechanical sealing in case of direct selling to public				
9.2.1.4	Device does not operate or indicates so when in configuration mode until being put in sealed condition again				
9.2.1.5.a	Event logger record contains: 1) an event counter, 2) the date the parameter was changed, and 3) the new value of the parameter, and 4) an identification of the person that implemented the intervention				
9.2.1.5.b	The trackability of the last intervention is assured				
9.2.1.5.c	The event logger is capable to store at least 999 interventions				
9.2.1.5.d	The event logger applies the first- in first-out (fifo) principle in case insufficient memory capacity is left to store a new record.				
	Measuring system contains parts which may be disconnected by the user and are				
9.2.2	interchangeable <input type="checkbox"/> The access to parameters that participate in the determination of results of measurements is not possible through disconnected points (unless the provisions in 9.2.1 are fulfilled) The insertion of any device which may influence the accuracy is prevented by means of electronic and data processing securities or by mechanical means.				
9.2.3	not interchangeable <input type="checkbox"/> The access to parameters that participate in the determination of results of measurements is not possible through disconnected points (unless the provisions in 9.2.1 are fulfilled) The insertion of any device which may influence the accuracy is prevented by means of electronic and data processing securities or by mechanical means. Measuring system is provided with devices which do not allow the system to operate if the various parts are not associated according to the manufacturer's configuration.				

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

10	E.18 Stamping plate				
	(Provisions for installing) available				
	(Provisions for installing) Sealing available <input type="checkbox"/>				
	Permanently attached on a support of the measuring system <input type="checkbox"/>				
	Combined with identification plate <input type="checkbox"/>				

11	E.19 Suitability for testing				
11.1	Design permits testing according to OIML R 139-2				
11.2	Identification is possible of modules having been subject to separate type evaluation				
11.3	Design allows for initial and subsequent verification without unreasonably severe efforts				

12	E.20 Specific requirements for ancillary devices				
13.3	Optional ancillary devices which are not subject to legal control:	do not affect the correct operation of the measuring system and in particular the measuring system when connected or disconnected.			
		show a statement to the user to be out of legal control in case of displaying or printing the measurement result made available to the customer.			

14	E.21 Transfer point				
	Maximum number of transfer points foreseen :				
14.1	Transfer points are all downstream				
14.2	Any diversion of gas to other than the intended receiving receptacle(s)	cannot be readily accomplished, or is readily apparent			
14.3	Next delivery is inhibited until the indication is reset to zero				

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

15	E.22 Additional requirements for specific modules				
15.1	The meter				
15.1.1	Metrological specifications of the meter				
15.1.1.1	Metrological characteristics of the meter: Q_{\min} , Q_{\max} , P_{\max} , P_{\min} , T_{\max} and T_{\min} are specified				
15.1.1.2	The temperature range of the gas covers at least + 10 °C to + 40 °C.				
	The rated operating conditions of the meter are the same as those for the complete measurement system.				
	The ranges shall suit the conditions of use.				
15.1.2	Additional technical requirements for meters				
15.1.2.1	Reliable connections between the flow sensor and the indicating device				
	Durable connections between the flow sensor and the indicating device				
15.1.2.2	Adjustment device provided permitting modification of the ratio between the indicated mass and the actual mass of gas passing through the meter				
	by a simple command				
	in a discontinuous manner, whereby the consecutive values of the do ratio not differ by more than 0.001				
	Adjustment by means of a bypass of the meter is inhibited				
15.1.2.3	a)The meter is equipped with a correction device and b) only the corrected mass values are displayed during normal operation.				
	c) Correction device cannot be applied for creating an offset to zero or d) correcting for a theoretical pre-established value.				
	e) Correction device applies checking facilities				
15.2	Additional technical requirements for external printers and memory devices				
	(Space provided for) Permanent, non-transferable, and easily readable identification plate or label specifying:	a) manufacturer's trade mark/corporate name;			
		b) type designation / model number			
		c) type approval number			
		d) serial number			
		e) identification of the measuring instrument(s) of which the measurement results can be printed			
		f) details of the electrical power: (AC/DC voltage; frequency)			
		g) specific conditions for use (for instance specific ambient conditions);			
		identification of the software (see 6.11)			
R 139-2 17.2.7.7.	Is any flow disturbance expected critical for the measurement result?	<input type="checkbox"/> Yes <input type="checkbox"/> No			

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

18.2	E.23 Documentation for type evaluation				
18.2.1	General documentation				
a	description of its general principle of measurement;				
b	(mechanical) drawings and/or photographs;				
c	electric/electronic diagrams;				
d	lists of the essential sub-assemblies/modules, components with their essential characteristics;				
e	functional description of the various electronic devices;				
f	a flow diagram of the logic, showing the functions of the electronic devices;				
g	for measuring systems and meters fitted with correction devices: a description of how the correction parameters are determined;				
h	an assembly drawing with identification of different components;				
i	drawing(s) presenting the security sealing plan and the provisions and location for verification marks;				
j	drawing of regulatory markings;				
k	general information on the software required for the measuring instrument.				
l	test in- or outputs, their use, and their relationships to the parameters being measured;				
m	installation requirements;				
n	operating instructions that shall be provided to the user,				
o	the references of the approval certificates of the constituent elements;				
p	an overview of any purely digital elements that are considered to be replaceable (in accordance with 16.2.3.4);				
q	documents or other evidence that supports the assumption that the design and characteristics of the instrument comply with the requirements of this Recommendation.				

OIML R 139-1 Subclause	Description	Yes	No	Not applicable	Observer Name:
					Date(s):
					Specimen:
					Observations:

18.2.2	Software documentation				
a	a description of the legally relevant software and how the requirements are met: - list of software modules that belong to the legally relevant part including a declaration that all legally relevant functions are included in the description - description of the software interfaces of the legally relevant software part and of the commands and data flows via this interface including a statement of completeness;; - description of the generation of the software identification; - list of parameters to be protected and description of protection means;				
b	a description of security means of the operating system (password, etc. if applicable);				
c	a description of the (software) sealing method(s);				
d	an overview of the system hardware, e.g. topology block diagram, type of computer(s), type of network, etc. Where a hardware component is deemed legally relevant or where it performs legally relevant functions, this should also be identified;				
e	a description of the accuracy of the algorithms (e.g. filtering of A/D conversion results, price calculation, rounding algorithms, etc.);				
f	a description of the user interface, menus and dialogues;				
g	the software identification and instructions for obtaining it from an instrument in use;				
h	list of commands of each hardware interface of the measuring instrument / electronic device / sub-assembly including a statement of completeness;				
i	list of durability errors that are detected by the software and if necessary for understanding, a description of the detecting algorithms;				
j	a description of data sets stored or transmitted;				
k	if fault detection is realized in the software, a list of faults that are detected and a description of the detecting algorithm;				
l	the operating manual.				
18.2.3	Specific documentation concerning execution of performance tests				
	Validation documentation concerning the use of air instead of gas during tests				
18.2.4	Additional documentation				
	Specify id applicable				

F Performance tests**F.1 Variable flowrate**

OIML R 139-2 Sub.17.2.7.1 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:		
	Test fluid (gas, air, water, ..)						
			start	stop	Date(s):		
	Time:				Specimen:		
	Ambient temperature		°C	°C	Q_{\min} [unit/min]		
Fluid temperature		°C	°C	Q_{\max} [unit/min]			
Test 0	Fill (t)	I			Repeatability		
	Phase (p)	1	2	3	1	2	3
Initial pressure	receiver						
	low bank P_{stl}						
Quantity [unit]	reference						
	indicated						
Error [unit]							
relative error [%] ($E_{1,p}$)	phase1 (E_{11})						
	phase2 (E_{12})						
	phase3 (E_{13})						
MPE [%]		For meter ≤ 1 For system ≤ 1.5					
(E _{1,p})	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Test 0	Fill	II					
Initial pressure	Receiver						
	mid. bank P_{stm}						
Quantity [unit]	Reference						
	Indicated						
Error [unit]							
relative error [%] ($E_{2,p}$)	phase1 (E_{21})						
	phase2 (E_{22})						
	phase3 (E_{23})						
MPE [%]		For meter ≤ 1 For system ≤ 1.5					
(E _{2,p})	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Test 0	Fill	III					
Initial pressure	Receiver						
	high bank P_{st}						
Quantity [unit]	Reference						
	Indicated						
Error [unit]							
relative error [%] ($E_{3,p}$)	phase1 (E_{31})						
	phase2 (E_{32})						
	phase3 (E_{33})						
MPE [%]		For meter ≤ 1 For system ≤ 1.5					
(E _{3,p})	pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Repeatability [%]							
Repeatability	MPE [%]				For meter ≤ 0.6 For system ≤ 1		
	pass				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	fail				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notes: Reference = Indicated quantity value on reference weighing instrument at end of the filling phase – Indicated quantity value on reference weighing instrument at start of the filling phase Indicated = Indicated quantity value on EUT at end of the filling phase – Indicated quantity value on EUT at start of the filling phase.							
Sequence of the test Considering test numbering [x,t,p] where x = Test # , and t= testcycle #, p = phase # the test sequence is [0,1,1]; [0,1,2]; [0,1,3]; [0,2,1]; [0,2,2]; [0,2,3]; [0,3,1]; [0,3,2]; [0,3,3];							

Observations					
Result		Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>

F.2 Tests with sequential control (involving 3 banks)

OIML R 139-2 Sub.17.2.7.2 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:
	Test fluid (gas, air, water, ..)				
		Start	Stop	Date(s):	
	Time:			Specimen:	
	Ambient temperature	°C	°C	Q_{\min} [unit/min]	
	Fluid temperature	°C	°C	Q_{\max} [unit/min]	
Test 1	Fill	1	2	3	Nominal pressure value
Initial pressure in kPa	Receiver				0
	low bank P_l				P_{st}
	mid. bank P_m				P_{st}
	high bank P_{sth}				P_{st}
Timing	start / stop	/	/	/	
	time period	s	s	s	Minimum quantity to be totalized:
Average flow rate [unit]/min					
Quantity [unit]	Reference				(2 * MMQ [unit])
	Indicated				
Error [unit]					Repeatability
relative error [%]					
MPE [%]		For meter ≤ 1 ; For system ≤ 1.5			Meter ≤ 0.6 ; System ≤ 1
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Test 2	Fill	1	2	3	Nominal pressure value
Initial pressure	Receiver				$0.5 P_v$
	low bank P_{stl}				$0.75 P_v$
	mid. bank P_{stm}				P_v
	high bank P_{sth}				P_{st}
Timing	start / stop	/	/	/	
	time period	s	s	s	Minimum quantity to be totalized
Average flow rate [unit]/min					
Quantity [unit]	Reference				(2 * MMQ [unit])
	Indicated				
Error [unit]					Repeatability
relative error [%]					
MPE [%]		For meter ≤ 1 ; For system ≤ 1.5			Meter ≤ 0.6 ; System ≤ 1
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Test 3	Fill	1	2	3	Nominal pressure value
Initial pressure	Receiver				$0.75 P_v$
	low bank P_{stl}				$0.75 P_v$
	mid. bank P_{stm}				P_v
	high bank P_{sth}				P_{st}
Timing	start / stop	/	/	/	
	time period	s	s	s	Minimum quantity to be totalized
Average flow rate [unit]/min					
Quantity [unit]	Reference				(1 * MMQ [unit])
	Indicated				
Error [unit]					Repeatability
relative error [%]					
MPE [%]		For meter ≤ 1 ; For system ≤ 1.5			Meter ≤ 0.6 ; System ≤ 1
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Observations					
Result		Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>

F.3 Tests without sequential control (involving only one bank)

OIML R 139-2 Sub.17.2.7.3 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:
	Test fluid (gas, air, water, ..)				
	Pressure in kPa units		Start	Stop	
	Date(s):				
	Time:				Specimen:
	Ambient temperature		°C	°C	Q_{min} [unit/min]
	Fluid temperature		°C	°C	Q_{max} [unit/min]
Test 4	Fill	1	2	3	Nominal pressure value
Initial pressure	Receiver				0
	high bank				P_{st}
Timing	start / stop	/	/	/	
	time period	s	s	s	Minimum quantity to be totalized:
Average flow rate [unit]/min					
Quantity [unit]	Reference				(2 * MMQ [unit])
	Indicated				
Error [unit]					Repeatability
relative error [%]					
MPE [%]		For meter ≤ 1 ; For system ≤ 1.5			Meter ≤ 0.6 ; System ≤ 1
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Test 5	Fill	1	2	3	Nominal pressure value
Initial pressure	Receiver				$0.5 P_v$
	high bank				P_{st}
Timing	start / stop	/	/	/	
	time period	s	s	s	Minimum quantity to be totalized
Average flow rate [unit]/min					
Quantity [unit]	Reference				(2 * MMQ [unit])
	Indicated				
Error [unit]					Repeatability
relative error [%]					
MPE [%]		For meter ≤ 1 ; For system ≤ 1.5			Meter ≤ 0.6 ; System ≤ 1
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Test 6	Fill	1	2	3	Nominal pressure value
Initial pressure	Receiver				$0.75 P_v$
	high bank				P_{st}
Timing	start / stop	/	/	/	
	time period	s	s	s	Minimum quantity to be totalized
Average flow rate [unit]/min					
Quantity [unit]	Reference				N.A.
	Indicated				
Error [unit]					Repeatability
relative error [%]					
MPE [%]		For meter ≤ 1 ; For system ≤ 1.5			Meter ≤ 0.6 ; System ≤ 1
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Observations					
Result				Pass	<input type="checkbox"/>
				Fail	<input type="checkbox"/>

OIML R 139-2 Sub.17.2.7.3 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions			Observer Name:
	Test fluid (gas, air, water, ..)			
	Pressure in kPa units	Start	Stop	
	Date(s):			
	Time:			Specimen:
	Ambient temperature	°C	°C	Q_{\min} [unit/min]
	Fluid temperature	°C	°C	Q_{\max} [unit/min]
Test 7	Fill	1	2	Nominal pressure value
Initial pressure	Receiver			$0.75 P_v$
	high bank			P_{st}
Timing	start / stop	/	/	
	time period	s	s	Minimum quantity to be totalized
Average flow rate [unit]/min				
Quantity [unit]	Reference			(1 * MMQ [unit])
	Indicated			
Error [unit]				Repeatability
relative error [%]				
MPE [%]		For meter ≤ 1 ; For system ≤ 1.5		Meter ≤ 0.6 ; System ≤ 1
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Observations				
Result			Pass	<input type="checkbox"/>
			Fail	<input type="checkbox"/>

F.4. Durability test

OIML R 139-2 Sub.17.2.7.5 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:	
	Test fluid (gas, air, water, ..)		Start	Stop		
	Date(s):					
	Time:				Specimen:	
	Ambient temperature		°C	°C	Q_{min}	[unit/min]
	Fluid temperature		°C	°C	Q_{max}	[unit/min]
Test # <input type="checkbox"/> 1 / <input type="checkbox"/> 4	Fill	1	2	3	Nominal pressure value	
Initial pressure in kPa	receiver				0	
	low bank P_l				<input type="checkbox"/> P_{st} / <input type="checkbox"/> Not applicable	
	mid. bank P_m				<input type="checkbox"/> P_{st} / <input type="checkbox"/> Not applicable	
	high bank P_h				P_{st}	
Timing	start / stop	/	/	/		
	time period	s	s	s	Minimum quantity to be totalized:	
Average flow rate [unit]/min						
Quantity [unit]	reference					
	indicated				(2 * MMQ [unit])	
Error [unit]						
initial intrinsic error (% E_{ij})						
repeatability (%rep.)		==>				
% E_{ij} average		==>				
MPE		% $E_{ij} \leq 1$			%rep. ≤ 0.6	
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Date(s):		Start	Stop	Observer:	
	Time:					
	Ambient temperature		°C	°C		
	Fluid temperature		°C	°C		
Initial pressure in kPa	receiver					
	low bank P_l					
	mid. bank P_m					
	high bank P_h					
Timing	start / stop	/	/	/		
	time period	s	s	s		
Average flow rate [unit]/min						
Quantity [unit]	reference					
	indicated					
Error [unit]						
intrinsic error (% E_i)						
repeatability (%rep.)		==>				
% E_i average		==>				
% E_{ij} average - % E_i average		==>				
MPE		% $E_i \leq 1$			%rep. ≤ 0.6	
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Observations						
Result				Pass	<input type="checkbox"/>	Fail <input type="checkbox"/>

F.5 Gas influence factors

OIML R 139-2 Sub.17.2.7.6 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:	
	Test fluid (gas, air, water, ..)					
		Min	Max	Date(s):		
	Fluid density specified					
	Fluid temperature specified		°C	°C	Specimen:	
	Ambient temperature		Start	Stop	Q_{\min}	[unit/min]
	Time:					
	Ambient temperature		°C	°C	Q_{\max}	[unit/min]
	Fluid density				±	
Fluid temperature				°C ± °C		
Test # <input type="checkbox"/> 1 / <input type="checkbox"/> 4	Fill	1	2	3	Nominal pressure value	
Initial pressure in kPa	receiver				0	
	low bank P_l				<input type="checkbox"/> P_{st} / <input type="checkbox"/> Not applicable	
	mid. bank P_m				<input type="checkbox"/> P_{st} / <input type="checkbox"/> Not applicable	
	high bank P_h				P_{st}	
Timing	start / stop	/	/	/		
	time period	s	s	s	Minimum quantity to be totaled:	
Average flow rate [unit]/min						
Quantity [unit]	reference					
	indicated			(2 * MMQ [unit])		
Error [unit]						
initial intrinsic error (% E_{ii})						
repeatability (%rep.)				==>		
% E_{ii} average				==>		
MPE		% $E_{ii} \leq 1$		%rep. ≤ 0.6		
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Initial pressure in kPa	receiver					
	low bank P_l					
	mid. bank P_m					
	high bank P_h					
Timing	start / stop	/	/	/		
	time period	s	s	s		
Average flow rate [unit]/min						
Quantity [unit]	reference					
	indicated					
Error [unit]						
intrinsic error (% E_i)						
repeatability (%rep.)				==>		
% E_i average				==>		
% E_{ii} average - % E_i average				==>		
MPE		% $E_i \leq 1$		%rep. ≤ 0.6	≤ 1	
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Observations						
Result			Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>

F.6 Zero stability test (if applicable)

OIML R 139-2 Sub.17.2.7.7a [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:		
	Date:		Start	Stop	Specimen:		
	Time:						
	Ambient temperature		°C	°C	Q_{\min}	[unit/min]	
					Q_{\max}	[unit/min]	
	Measurements	1	2	3	4	5	6
	Flowrate $Q <$						
Temperature	start [°C]						
	stop [°C]						
Relative humidity [%]							
Time	start						
	stop						
Quantity [unit]	reference						
	indicated						
2 nd indication (if applicable)							
3 rd indication (if applicable)							
Error [unit]							
relative error [%] E_{ii}							
MPE [%]		For meter ≤ 1 For system ≤ 1.5					
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Observations							
Result				Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>

F.7 Flow disturbances (if applicable)

OIML R 139-2 Sub.17.2.7.7b [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:		
	Using actual test fluid				Type of fluid:		
	Date:		Start	Stop			
	Time:				Specimen:		
	Ambient temperature		°C	°C	Q_{\min}	[unit/min]	
	Fluid temperature		°C	°C	Q_{\max}	[unit/min]	
Measurements	1	2	3	4	5	6	
Flowrate Q							
Type of disturbance							
Temperature	start [°C]						
	stop [°C]						
Relative Hum. [%]							
Initial pressure							
Time	start						
	stop						
Quantity	reference						
[unit]	indicated						
2 nd indication (if applicable)							
3 rd indication (if applicable)							
Error [unit]							
relative error [%] E_{ii}							
MPE [%]		For system ≤ 1.5					
functional performance							
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Observations							
Result				Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>

F 7.1 Preset function (if applicable)

OIML R 139-2 Sub.18.5.3 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:		
	Flow	<input type="checkbox"/>	Using actual test fluid				
			Type of fluid:				
		<input type="checkbox"/>	Simulating flow using:				
	Date:		Start	Stop	$E_{\min} =$ [unit]		
Time:				Specimen:			
Ambient temperature		°C	°C	Q_{\min} [unit/min]			
Fluid temperature		°C	°C	Q_{\max} [unit/min]			
Measurements		1	2	3	4	5	6
Flowrate Q							
Type of disturbance							
Temperature	start [°C]						
	stop [°C]						
Relative Hum. [%]							
Initial pressure							
Time	start						
	stop						
Quantity [unit]	preset						
	indicated						
2 nd indication (if applicable)							
3 rd indication (if applicable)							
Error [unit]							
E_{\min} [unit]							
Error $\leq E_{\min}$	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Error $> E_{\min}$	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Observations							
Result		Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>		

F.8 Initial test

OIML R 139-2 Sub.18.7 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:		
	Flow	<input type="checkbox"/>	Using actual test fluid				
			Type of fluid:				
		<input type="checkbox"/>	Simulating flow				
			using:				
	Date:		Start	Stop			
	Time:				Specimen:		
	Ambient temperature		°C	°C	Q_{\min}	[unit/min]	
	Fluid temperature		°C	°C	Q_{\max}	[unit/min]	
	Measurements	1	2	3	4	5	6
Flowrate Q							
Temperature	start [°C]						
	stop [°C]						
Relative Hum. [%]							
Initial pressure							
Time	start						
	stop						
Quantity [unit]	reference						
	indicated						
2 nd indication (if applicable)							
3 rd indication (if applicable)							
Error [unit]							
relative error [%] E_{ii}							
MPE [%]	For meter ≤ 1 For system ≤ 1.5						
functional performance							
Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Observations							
Result				Pass	<input type="checkbox"/>	Fail <input type="checkbox"/>	

F.8.1 Static temperature tests**Reference temperature**

OIML R 139-2 Sub.18.8.2	Test conditions					Observer Name:	
	Flow	<input type="checkbox"/>	Using actual test fluid				
			Type of fluid:				
		<input type="checkbox"/>	Simulating flow				
			using:				
[unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Date:		Start	Stop			
	Time:				Specimen:		
	Ambient temperature	°C	°C	Q_{min}	[unit/min]		
	Fluid temperature	°C	°C	Q_{max}	[unit/min]		
Nom. 20 °C	Flowrate #	1	2	3	4	5	6
= Reference:	Flowrate $Q =$						
Environment temperature	start [°C]						
	stop [°C]						
Relative Hum. [%]							
Initial pressure							
Time	start						
	stop						
Quantity [unit]	reference						
	indicated						
2 nd indication (if applicable)							
3 rd indication (if applicable)							
Error [unit]							
relative error [%] E_{ii}							
MPE [%]		For meter ≤ 1 For system ≤ 1.5					
Functional performance							
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T_{ah} =	Flowrate #	1	2	3	4	5	6
High limit	Flowrate Q						
Environment temperature	start [°C]						
	stop [°C]						
Relative Hum. [%]							
Initial pressure							
Time	start						
	stop						
Quantity [unit]	reference						
	indicated						
2 nd indication (if applicable)							
3 rd indication (if applicable)							
Error [unit]							
relative error [%] E_{ii}							
MPE [%]		For meter ≤ 1 For system ≤ 1.5					
Functional performance							
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Observations							
Result		Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>		

Static temperature (continued)

OIML R 139-2 Sub.18.8.2 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:		
	Flow	<input type="checkbox"/>	Using actual test fluid				
			Type of fluid:				
		<input type="checkbox"/>	Simulating flow using:				
	Date:		Start	Stop			
Time:				Specimen:			
Ambient temperature		°C	°C	Q_{\min}	[unit/min]		
Fluid temperature		°C	°C	Q_{\max}	[unit/min]		
$T_{al} =$ = Low limit	Flowrate #	1	2	3	4	5	6
	Flowrate Q						
Environment temperature	start [°C]						
	stop [°C]						
Relative humidity [%]							
Initial pressure							
Time	start						
	stop						
Quantity [unit]	reference						
	indicated						
2 nd indication (if applicable)							
3 rd indication (if applicable)							
Error [unit]							
relative error [%] E_{ii}							
MPE [%]		For meter ≤ 1 For system ≤ 1.5					
functional performance							
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nom. 20 °C = Reference:	Flowrate #	1	2	3	4	5	6
	Flowrate $Q =$						
Environment temperature	start [°C]						
	stop [°C]						
Relative Hum. [%]							
Initial pressure							
Time	start						
	stop						
Quantity [unit]	reference						
	indicated						
2 nd indication (if applicable)							
3 rd indication (if applicable)							
Error [unit]							
relative error [%] E_{ii}							
MPE [%]		For meter ≤ 1 For system ≤ 1.5					
functional performance							
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Observations							
Result		Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>		

F.9 Vibration (random)

OIML R 139-2 Sub.18.8.3 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions						Observer Name:		
	Flow	<input type="checkbox"/>	Using actual test fluid						
			Type of fluid:						
		<input type="checkbox"/>	Simulating flow using:						
	Date:			Start	Stop				
	Time:					Specimen:			
	Ambient temperature		°C		°C	Q_{min} [unit/min]			
	Fluid temperature		°C		°C	Q_{max} [unit/min]			
	Relative humidity		%		%				
Vector		Before test	During test	After test	During test	After test	During test	After test	
X-axis	Flowrate		0			0		0	
Time	start								
	stop								
Quantity [unit]	reference								
	indicated								
Error [unit]									
relative error [%] E_{ii}			E_i		E_i		E_i		
MPE [%]		For meter ≤ 1 For system ≤ 1.5							
functional performance									
	Pass	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	Fail	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Y-axis	Flowrate		0			0		0	
Time	start								
	stop								
Quantity [unit]	reference								
	indicated								
Error [unit]									
relative error [%] E_{ii}			E_i		E_i		E_i		
MPE [%]		For meter ≤ 1 For system ≤ 1.5							
functional performance									
	Pass	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	Fail	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Z-axis	Flowrate		0			0		0	
Time	start								
	stop								
Quantity [unit]	reference								
	indicated								
Error [unit]									
relative error [%] E_{ii}			E_i		E_i		E_i		
MPE [%]		For meter ≤ 1 For system ≤ 1.5							
functional performance									
	Pass	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	Fail	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Observations									
Result					Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>	

F.10 AC / DC Mains voltage variations

OIML R 139-2 Sub.18.8.4 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions					Observer Name:		
	Flow	<input type="checkbox"/>	Using actual test fluid					
			Type of fluid:					
		<input type="checkbox"/>	Simulating flow					
			using:					
	Date:			Start	Stop			
	Time:					Specimen:		
	Ambient temperature			°C	°C	Q_{\min}	[unit/min]	
	Fluid temperature			°C	°C	Q_{\max}	[unit/min]	
	Relative humidity			%	%			
Reference:	Voltage	Nominal	High	Nominal	Low	Nominal		
	Flowrate $Q =$							
Time	start							
	stop							
Quantity [unit]	reference							
	indicated							
Error [unit]								
relative error [%]								
MPE [%]		For meter ≤ 1 For system ≤ 1.5						
functional performance								
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Observations								
Result					Pass	<input type="checkbox"/>	Fail	
						<input type="checkbox"/>		

F.11 Low voltage of internal battery

OIML R 139-2 Sub.18.8.5 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:			
	Flow	<input type="checkbox"/>	Using actual test fluid					
			Type of fluid:		Nominal battery voltage:			
		<input type="checkbox"/>	Simulating flow using:					
		Date:		Start	Stop			
		Time:				Specimen:		
		Ambient temperature		°C	°C	Q_{\min}	[unit/min]	
		Fluid temperature		°C	°C	Q_{\max}	[unit/min]	
		Relative humidity		%	%			
	Reference:	Voltage	Nominal	U_{bmin}	$0.9U_{\text{bmin}}$	Nominal	U_{bmin}	$0.9U_{\text{bmin}}$
	Flowrate $Q =$							
Time	start							
	stop							
Quantity [unit]	reference							
	indicated							
Error [unit]								
relative error [%]								
MPE [%]		For meter ≤ 1 For system ≤ 1.5						
functional performance								
	Pass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Fail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Observations								
Result					Pass	<input type="checkbox"/>	Fail <input type="checkbox"/>	

F.12 Damp heat, cyclic (condensing)

OIML R 139-2 Sub.18.9.4.1 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:	
	Flow	<input type="checkbox"/>	Using actual test fluid		Reference 25 °C	
		<input type="checkbox"/>	Type of fluid:		T _{ah} = °C	
		<input type="checkbox"/>	Simulating flow using:		T _{al} = °C	
			Start	Stop	Specimen:	
	Date:				Q _{min} [unit/min]	
Time:				Q _{max} [unit/min]		
First cycle	Cycle phase	initial	rise to T_{ah}	stabilize		
	Flowrate Q =					
Test temperature	start [°C]					
	stop [°C]					
Relative humidity	start [%]					
	stop [%]					
Fluid temperature	start [°C]					
	stop [°C]					
Time	Start	h	t _b = h	h		
	Stop (t _s)	h = t _b	h	h		
	Required: t _s =		t _b + 3 h	t _b + 12 h		
Quantity [unit]	reference					
	indicated					
2 nd indication (if applicable)						
3 rd indication (if applicable)						
Error [unit]						
relative error [%] E _{ii}						
MPE [%]		For meter ≤ 1 For system ≤ 1.5				
Pass		<input type="checkbox"/>				
Fail		<input type="checkbox"/>				
	Cycle phase	Lowering to T_{al}	stabilize	after		
	Flowrate Q =					
Test temperature	start [°C]					
	stop [°C]					
Relative humidity	start [%]					
	stop [%]					
Fluid temperature	start [°C]					
	stop [°C]					
Time	Start	h	h	h		
	Stop (t _s)	h	h	h		
	Required: t _s =	t _b + (15 ÷ 18 h)	t _b + 24 h			
Quantity [unit]	reference					
	indicated					
2 nd indication (if applicable)						
3 rd indication (if applicable)						
Error [unit]						
relative error [%] E _{ii}						
MPE [%]		For meter ≤ 1 For system ≤ 1.5				
Fault limit [%]		0.15 or E _{min} (whichever is the largest)				
Acts on fault		Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	
Significant fault		Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	
Observations						
Result		Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>	

OIML R 139-2 Sub.18.9.4.1 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:	
	Flow	<input type="checkbox"/>	Using actual test fluid		Reference 25 °C	
		<input type="checkbox"/>	Type of fluid:		T _{ah} = °C	
		<input type="checkbox"/>	Simulating flow		T _{al} = °C	
			Start	Stop	Specimen:	
	Date:				Q _{min} [unit/min]	
Time:				Q _{max} [unit/min]		
Second cycle	Cycle phase	initial	rise to T_{ah}	Stabilize		
	Flowrate Q =					
Test temperature	start [°C]					
	stop [°C]					
Relative humidity	start [%]					
	stop [%]					
Fluid temperature	start [°C]					
	stop [°C]					
Time	Start	h	t _b = h	h		
	Stop (t _s)	h = t _b	h	h		
	Required: t _s =		t _b + 3 h	t _b + 12 h		
Quantity [unit]	reference					
	indicated					
2 nd indication (if applicable)						
3 rd indication (if applicable)						
Error [unit]						
relative error [%] E _{ii}						
MPE [%]		For meter ≤ 1 For system ≤ 1.5				
	Pass	<input type="checkbox"/>				
	Fail	<input type="checkbox"/>				
	Cycle phase	Lowering to T_{al}	stabilize	after		
	Flowrate Q =					
Test temperature	start [°C]					
	stop [°C]					
Relative humidity	start [%]					
	stop [%]					
Fluid temperature	start [°C]					
	stop [°C]					
Time	Start	h	h	h		
	Stop (t _s)	h	h	h		
	Required: t _s =	t _b + (15 ÷ 18 h)	t _b + 24 h			
Quantity [unit]	reference					
	indicated					
2 nd indication (if applicable)						
3 rd indication (if applicable)						
Error [unit]						
relative error [%] E _{ii}						
MPE [%]		For meter ≤ 1 For system ≤ 1.5				
Fault limit [%]	0.15 or E _{min} (whichever is the largest)					
Acts on fault	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>		
Significant fault	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>		
Observations						
Result		Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>	

F.14 Electrostatic discharges

OIML R 139-2 Sub.18.9.4.3 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:			
	Flow	<input type="checkbox"/>	Using actual test fluid			contact 6 kV air 8 kV RF voltage Ve.m.f. discharges		
		<input type="checkbox"/>	Type of fluid:					
			Simulating flow			Specimen:		
			using:			Q_{min} [unit/min]		
	Date:		Start		Stop		Q_{max} [unit/min]	
	Time:							
	Ambient temperature		°C		°C			
	Fluid temperature		°C		°C			
	Relative humidity		%		%			
	Cycle phase	Initial		During exposure		After		
	Flowrate $Q =$							
Time	Start							
	Stop							
Quantity [unit]	reference							
	indicated							
2 nd indication (if applicable)								
3 rd indication (if applicable)								
Error [unit]								
relative error [%] E_{ii}								
MPE [%]		For meter ≤ 1 For system ≤ 1.5						
	Pass	<input type="checkbox"/>				<input type="checkbox"/>		
	Fail	<input type="checkbox"/>				<input type="checkbox"/>		
Observed faults during exposure								
Fault limit [%]		0.15 or E_{min} (whichever is the largest)						
Exposed surface	Discharge type			Fault/ Deviation	Significant		Acts on fault	
	Air	Contact	Level		Yes	No	Yes	No
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
</								

F.15 Surges

OIML R 139-2 Sub.18.9.4.4 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions surges on mains power lines					Observer Name:	
	Flow	<input type="checkbox"/>	Using actual test fluid			Line to line 1 kV	
		<input type="checkbox"/>	Type of fluid:			Line to earth 2 kV	
	Date:			Start	Stop	Specimen:	
	Time:					Q_{\min} [unit/min]	
	Ambient temperature		°C	°C	Q_{\max} [unit/min]		
	Fluid temperature		°C	°C			
	Relative humidity		%	%			
	Cycle phase		Initial	During exposure	After		
	Flowrate $Q =$						
Time	Start						
	Stop						
Quantity [unit]	reference						
	indicated						
2 nd indication (if applicable)							
3 rd indication (if applicable)							
Error [unit]							
relative error [%] E_{ii}							
MPE [%]		For meter ≤ 1 For system ≤ 1.5					
Pass		<input type="checkbox"/>		<input type="checkbox"/>			
Fail		<input type="checkbox"/>		<input type="checkbox"/>			
Observed faults after exposure							
Fault limit [%]		0.15 or E_{\min} (whichever is the largest)					
Phase angle		Fault/Deviation		Significant		Acts on fault	
0°	90°	180°	270°	Yes	No	Yes No	
Line to line							
3x ↑ ■				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
	3x ↑ ■			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
		3x ↑ ■		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
			3x ↑ ■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
3x ↓ ■				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
	3x ↓ ■			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
		3x ↓ ■		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
			3x ↓ ■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
Line to earth							
3x ↑ ■				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
	3x ↑ ■			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
		3x ↑ ■		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
			3x ↑ ■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
3x ↓ ■				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
	3x ↓ ■			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
		3x ↓ ■		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
			3x ↓ ■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
Observations							
Result							
		Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>		

OIML R 139-2 Sub.18.9.4.4 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions Surges on signal, data and control lines					Observer Name:	
	Flow	<input type="checkbox"/>	Using actual test fluid				
			Type of fluid:			Line to line 1 kV	
	Flow	<input type="checkbox"/>	Simulating flow			Line to earth 2 kV	
			using:				
	Cable:					<input type="checkbox"/> Balanced line	
	Date:			Start	Stop	<input type="checkbox"/> Unbalanced line	
	Time:						
	Ambient temperature		°C		°C	Specimen:	
	Fluid temperature		°C		°C	Q_{\min} [unit/min]	
Relative humidity		%		%	Q_{\max} [unit/min]		
Cycle phase		Initial		During exposure		After	
Flowrate $Q =$							
Time	Start						
	Stop						
Quantity [unit]	reference						
	indicated						
2 nd indication (if applicable)							
3 rd indication (if applicable)							
Error [unit]							
relative error [%] E_{ii}							
MPE [%]				For meter ≤ 1 For system ≤ 1.5			
Pass		<input type="checkbox"/>				<input type="checkbox"/>	
Fail		<input type="checkbox"/>				<input type="checkbox"/>	
Observed faults after exposure							
Fault limit [%]		0.15 or E_{\min} (whichever is the largest)					
Phase angle		Fault/Deviation		Significant		Acts on fault	
0°	90°	180°	270°		Yes	No	Yes
Line to line (N/A for balanced)							No
3x↑■					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3x↑■				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		3x↑■			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			3x↑■		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3x↓■					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3x↓■				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		3x↓■			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			3x↓■		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Line to earth							
3x↑■					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3x↑■				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		3x↑■			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			3x↑■		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3x↓■					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3x↓■				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		3x↓■			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			3x↓■		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Observations							
Result							
				Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>

F.16 AC mains voltage dips and short interruptions

OIML R 139-2 Sub.18.9.4.2 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:	
	Flow	<input type="checkbox"/>	Using actual test fluid		Repetition: 10 times	
			Type of fluid:			
		<input type="checkbox"/>	Simulating flow using:			
	Date:		Start	Stop	Specimen:	
	Time:				Q_{\min} [unit/min]	
	Ambient temperature		°C	°C	Q_{\max} [unit/min]	
	Fluid temperature		°C	°C		
Relative humidity		%	%			
Frequency cycle	Cycle phase	Initial	During exposure		After	
	Flowrate $Q =$					
Time	Start					
	Stop					
Quantity [unit]	reference					
	indicated					
2 nd indication (if applicable)						
3 rd indication (if applicable)						
Error [unit]						
relative error [%] E_{ji}						
MPE [%]		For meter ≤ 1 For system ≤ 1.5				
	Pass	<input type="checkbox"/>			<input type="checkbox"/>	
	Fail	<input type="checkbox"/>			<input type="checkbox"/>	
Observed faults during exposure						
Fault limit [%]		0.15 or E_{\min} (whichever is the largest)				
Reduction to [% U_{nom}]	Duration [cycles]	Fault/Deviation	Significant		Acts on fault	
			Yes	No	Yes	No
0	0.5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0	1		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40	10 / 12		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
70	25 / 30		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80	250 / 300		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Observations						
Result		Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>	

F.18 Bursts on AC and DC mains and signal lines

OIML R 139-2 Sub.18.9.4.5 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions					Observer Name:		
	Flow	<input type="checkbox"/>	Using actual test fluid					
			Type of fluid:					
		<input type="checkbox"/>	Simulating flow			Line	Level [kV]	
			using:			index	<input type="checkbox"/> (2)	<input type="checkbox"/> (3)
	Cable:					mains	1	2
	Date:			Start	Stop	signal	0.5	1
	Time:					Repetition: 5 kHz		
	Ambient temperature			°C	°C	Specimen:		
	Fluid temperature			°C	°C	Q_{min} [unit/min]		
Relative humidity			%	%	Q_{max} [unit/min]			
Cycle phase		Initial		During exposure		After		
Flowrate $Q =$								
Time	Start							
	Stop							
Quantity [unit]	reference							
	indicated							
2 nd indication (if applicable)								
3 rd indication (if applicable)								
Error [unit]								
relative error [%] E_{ii}								
MPE [%]				For meter ≤ 1 For system ≤ 1.5				
Pass		<input type="checkbox"/>				<input type="checkbox"/>		
Fail		<input type="checkbox"/>				<input type="checkbox"/>		
Observed faults during exposure								
Fault limit [%]		0.15 or E_{min} (whichever is the largest)						
		Fault/Deviation		Significant		Acts on fault		
Line	Pol.			Yes	No	Yes	No	
phase	\uparrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\downarrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
neutral	\uparrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\downarrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Protective earth	\uparrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\downarrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Port 1 ^(*)	\uparrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\downarrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Port 2 ^(*)	\uparrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\downarrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Port 3 ^(*)	\uparrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\downarrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Port 4 ^(*)	\uparrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	\downarrow <input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(*) Description of the Ports: Port 1: Port 2: Port 3: Port 4:		Observations						
Result				Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>	

F.19 Ripple on DC mains power

OIML R 139-2 Sub.18.9.4.5 [unit] <input type="checkbox"/> [g]; <input type="checkbox"/> [kg]; <input type="checkbox"/> [t]	Test conditions				Observer Name:	
	Flow	<input type="checkbox"/>	Using actual test fluid		DC voltage V	
		<input type="checkbox"/>	Type of fluid:		Ripple 2 % (peak peak)	
			Simulating flow using:			
	Date:		Start	Stop	Specimen:	
	Time:				Q_{\min}	[unit/min]
	Ambient temperature		°C	°C	Q_{\max}	[unit/min]
	Fluid temperature		°C	°C		
	Relative humidity		%	%		
	Frequency cycle	Cycle phase	Initial	During exposure	After	
Flowrate $Q =$						
Time	Start					
	Stop					
Quantity [unit]	reference					
	indicated					
2 nd indication (if applicable)						
3 rd indication (if applicable)						
Error [unit]						
relative error [%] E_{ii}						
MPE [%]		For meter ≤ 1 For system ≤ 1.5				
	Pass	<input type="checkbox"/>		<input type="checkbox"/>		
	Fail	<input type="checkbox"/>		<input type="checkbox"/>		
Observed faults during exposure						
Fault limit [%]		0.15 or E_{\min} (whichever is the largest)				
Test	Duration	Fault/Deviation	Significant		Acts on fault	
			Yes	No	Yes No	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
Observations						
Result		Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>	