

ORGANISATION INTERNATIONALE
DE MÉTROLOGIE LÉGALE



INTERNATIONAL RECOMMENDATION

Direct mass flow measuring systems for quantities of liquids
Annex C: Test report format

Ensembles de mesurage massiques directs de quantités de liquides
Annexe C: Format du rapport d'essai

OIML R 105
Annex C

Edition 1995 (E)

R 105-C was superseded by R 117-3-2014

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FOREWORD

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

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DIRECT MASS FLOW MEASURING SYSTEMS for QUANTITIES of LIQUIDS

ANNEX C TEST REPORT FORMAT

Note: This Annex is informative with regard to implementation of OIML Recommendation R 105 in national regulations; however, use of the test report format is mandatory for application of the Recommendation within the OIML Certificate System.

General information concerning the pattern

Application N°: _____ Date: _____

Model designation: _____

Manufacturer: _____

Address: _____

Applicant: _____

Address: _____

Representative: _____

Telephone: _____ Fax: _____

Description of instruments or systems to be covered:

N°	Maximum flowrate	Minimum flowrate	Minimum measured quantity	Accuracy class	Application or use
1					
2					
3					
4					
5					
6					

Note: Please indicate which of the above has been submitted for test.

General information concerning the pattern (cont.)

Instrument technology: _____

Description of the system:

Method of operation:

Observer: _____

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General information concerning test conditions

Model: _____ Serial N°: _____ Date: _____

Standards:

Weighing system - Description: _____

Accuracy and uncertainty: _____

Volumetric system - Description: _____

Accuracy and uncertainty: _____

Test liquid or liquids: _____

Environmental test equipment - Description:

Temperature: _____

Humidity: _____

Disturbance tests equipment: _____

Test location: _____

Observer: _____

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Technical requirements: Checklist

Model: _____ Flowrate: _____ Serial N°: _____

Clause	Title	+	-	Remarks
6	Indicators			
6.1	Units of measurement			
6.2	Numerical value of scale interval			
6.3	Maximum value of scale interval			
6.4	Values defined			
6.5	Return to zero			
6.5.1	Resettable method of operation			
6.6	Nonresettable indicator			
6.7	Presetting device			
7	Printer			
8	Measuring systems			
8.1	Vapor elimination			
8.2	Maintenance of liquid state			
8.3	Provision for sealing			
9	Discharge lines and valves			
9.1	Diversion of measured liquid			
9.2	Directional flow valves			
9.3	Discharge valves			
9.4	Anti-drain means			
9.5	Other valves			

Note: + Complies, - Does not comply, / Not applicable

Remarks: _____

Observer: _____

Technical requirements: Checklist (cont.)

Marking requirements (clause 10)

Date: _____

Model: _____ Flowrate: _____ Serial N°: _____

Clause 10	Information to be marked	+	-
a)	Pattern approval mark		
b)	Manufacturer's name and address or trademark		
c)	Manufacturer's designation		
d)	Serial number		
e)	Maximum and minimum flowrates		
f)	Maximum working pressure		
g)	Special limits of temperature		
h)	Minimum measured quantity		
i)	Product limitations		

Note: + Present, - Not present, / Not applicable

Remarks: _____

Observer: _____

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Requirements for electronic measuring systems: Checklist

Model: _____ Flowrate: _____ Serial N°: _____

Clause	Title	+	-	Remarks
12.1	Measuring transducer			
12.2	Calculator			
12.3.1	Indicating device - unit price			
12.3.2	Indicating device - zeroing			
12.4.1	Power supply - noninterruptible systems			
12.4.2.1	Motor fuel dispensers			
12.4.2.2	Other measuring systems			
12.5	Peripheral equipment			
13.1.1	Checking feature of type N			
13.1.2 a)	Type I or P - interruptible			
13.1.2 b)	Noninterruptible			
13.1.2 c)	Information retrieval - totalized quantity			
13.1.3 a)	Checking features - motor fuel dispensers			
13.1.3 b)	Checking features - other measuring system			
13.2	Checking features - measuring transducer			
13.3.1 a)	Checking features - calculator			
13.3.1 b)	Checking features - calculator			
13.3.2	Checking calculations type P			
13.4.1	Checking feature - indicating device			
13.4.2 a)	Checking feature - indicating device			
13.4.2 b)	Checking feature - indicating device			
13.4.3	Checking feature - indicating device: operation during verification			
13.5	Checking features - peripheral equipment			

Note: + Complies, - Does not comply, / Not applicable

Remarks: _____

Observer: _____

Summary of the tests

Application N°: _____ Date: _____

Model: _____ Flowrate: _____ Serial N°: _____

Certificate of conformity N°: _____ Date: _____

N°	Test description	+	-	Remarks
C.1	Flow test - A.1.4 Liquids			
	A.1.5 Flow Rates			
	A.1.6 Temperatures			
	A.1.8 Motor fuel dispensers			
C.2	Dry heat test (B.4.1)			
C.3	Cold test (B.4.2)			
C.4	Damp heat, cyclic test (B.4.3)			
C.5	Vibration test (B.4.4)			
C.6	Power supply test (B.4.5.1)			
C.7	Power reduction test (B.4.6)			
C.8	Bursts test (B.4.7)			
C.9	Electrostatic discharge test (B.4.8)			
C.10	Electromagnetic susceptibility test (B.4.9)			
C.11	Durability test (A.1.7)			
C.12	Repeatability test (A.1.3 - 3.4)			

Note: + Passed, - Failed, / Not applicable

Remarks: _____

Observer: _____

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C.1 Flow test (A.1.4, A.1.5, A.1.6 and A.1.8 if applicable)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy correction factor (f): _____

Ambient temperature: _____ Humidity: _____ Barometric pressure: _____

Test method: Gravimetric _____ or Volumetric _____

Flow rate nominal: (100 %) _____

	Test #1	Test #2	Test #3	Average
Flow rate				
Test quantity				---
Indication				
Error				
mpe				---
% error				
Liquid temperature*				
Pressure				
Repeatability (maximal difference between tests #1, #2 and #3: 0.2 %) (test quantity ≥ 5 x minimum measured quantity)				

Flow rate nominal: (80 %) _____

	Test #1	Test #2	Test #3	Average
Flow rate				
Test quantity				---
Indication				
Error				
mpe				---
% error				
Liquid temperature*				
Pressure				
Repeatability (maximal difference between tests #1, #2 and #3: 0.2 %) (test quantity ≥ 5 x minimum measured quantity)				

* Product temperature in test standard

Remarks: _____

Observer: _____

C.1 Flow test (A.1.4, A.1.5, A.1.6 and A.1.8 if applicable) (cont.)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy correction factor (f): _____

Ambient temperature: _____ Humidity: _____ Barometric pressure: _____

Test method: Gravimetric _____ or Volumetric _____

Flow rate nominal: (60 %) _____

	Test #1	Test #2	Test #3	Average
Flow rate				
Test quantity				---
Indication				
Error				
mpe				---
% error				
Liquid temperature*				
Pressure				
Repeatability (maximal difference between tests #1, #2 and #3: 0.2 %) (test quantity ≥ 5 x minimum measured quantity)				

Flow rate nominal: (40 %) _____

	Test #1	Test #2	Test #3	Average
Flow rate				
Test quantity				---
Indication				
Error				
mpe				---
% error				
Liquid temperature*				
Pressure				
Repeatability (maximal difference between tests #1, #2 and #3: 0.2 %) (test quantity ≥ 5 x minimum measured quantity)				

* Product temperature in test standard

Remarks: _____

Observer: _____

C.1 Flow test (A.1.4, A.1.5, A.1.6 and A.1.8 if applicable) (cont.)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy correction factor (f): _____

Ambient temperature: _____ Humidity: _____ Barometric pressure: _____

Test method: Gravimetric _____ or Volumetric _____

Flow rate nominal: (25 %) _____

	Test #1	Test #2	Test #3	Average
Flow rate				
Test quantity				---
Indication				
Error				
mpe				---
% error				
Liquid temperature*				
Pressure				
Repeatability (maximal difference between tests #1, #2 and #3: 0.2 %) (test quantity ≥ 5 x minimum measured quantity)				

Flow rate nominal: (10 %) _____

	Test #1	Test #2	Test #3	Average
Flow rate				
Test quantity				---
Indication				
Error				
mpe				---
% error				
Liquid temperature*				
Pressure				
Repeatability (maximal difference between tests #1, #2 and #3: 0.2 %) (test quantity ≥ 5 x minimum measured quantity)				

* Product temperature in test standard

Remarks: _____

Observer: _____

C.2 Dry heat test (B.4.1) - Maximum high temperature: 55 °C or 40 °C

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy correction factor (f): _____

Simulated test: _____ or Operational test: _____

Test #1 (20 °C)					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

Test #2 (maximum high temperature: _____ °C)					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

Test #3 (20 °C)					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

C.3 Cold test (B.4.2) - Minimum low temperature: - 10 °C or - 25 °C

Test #1 (20 °C)					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

Test #2 (minimum low temperature: _____ °C)					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

Test #3 (20 °C)					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

* Chamber or ambient temperature

Observer: _____

C.4 Damp heat, cyclic test (B.4.3)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy correction factor (f): _____

Simulated test: _____ or Operational test: _____

Before damp heat test:

Test #1					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

After damp heat test:

Test #2					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

Observer: _____

C.5 Vibration test (B.4.4)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy correction factor (f): _____

Simulated test: _____ or Operational test: _____

Before vibration test:

Test #1					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

After vibration test:

Test #2					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

* Chamber or ambient temperature

Observer: _____

C.6 Power supply test (B.4.5.1)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy
correction factor (f): _____

Simulated test: _____ or Operational test: _____

Mains voltage (+ 10 %): _____

Test #1					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

Mains voltage (- 15 %): _____

Test #2					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

Observer: _____

C.7 Power reduction test (B.4.6)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy
correction factor (f): _____

Simulated test: _____ or Operational test: _____

100 % Reduction

Test #1						
Flow rate	Temperature*	Test Quantity	Indication	Error	Error at R/C	Diff. or S/F

50 % Reduction

Test #2						
Flow rate	Temperature*	Test Quantity	Indication	Error	Error at R/C	Diff. or S/F

* Chamber or ambient temperature

R/C = Reference condition; Diff. or S/F = difference or significant fault

Observer: _____

C.8 Bursts test (B.4.7)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy correction factor (f): _____

Simulated test: _____ or Operational test: _____

Power supply lines: test voltage 1 kV, duration of the test 1 minute at each polarity

Measured quantity	Connection			Result			
	L ↓ ground	N ↓ ground	PE ↓ ground	Polarity	Indication	Significant fault (T.20)	
						No	Yes (Remarks)
	without disturbance						
	X			pos			
				neg			
	without disturbance						
		X		pos			
				neg			
	without disturbance						
			X	pos			
				neg			
	without disturbance						
	X			pos			
				neg			
	without disturbance						
		X		pos			
				neg			
	without disturbance						
			X	pos			
				neg			

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

Passed: _____ Failed: _____

Remarks: _____

Observer: _____

C.8 Bursts test (B.4.7) (cont.)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy
correction factor (f): _____

Simulated test: _____ or Operational test: _____

I/O signals, data and control lines: test voltage 0.5 kV, duration of test 1 minute at each polarity.

Measured quantity	cable interface			Result			
				Polarity	Indication	Significant fault (T.20)	
						No	Yes (remarks)
	without disturbance						
	X			pos			
				neg			
	without disturbance						
		X		pos			
				neg			
	without disturbance						
			X	pos			
				neg			
	without disturbance						
	X			pos			
				neg			
without disturbance							
	X		pos				
			neg				
without disturbance							
		X	pos				
			neg				

Passed: _____ Failed: _____

Remarks: _____

Observer: _____

C.9 Electrostatic discharge (B.4.8)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy correction factor (f): _____

Simulated test: _____ or Operational test: _____

Contact discharges

Paint penetration

Air discharges

Polarity (*): pos neg

Measured quantity	Discharges			Result		
	Test voltage (kV)	Number of discharges ≥ 10	Repetition interval(s)	Indication	Significant fault (>e)	
					No	Yes (remarks)
	without disturbance					
	2					
	4					
	6					
	8 (air discharges)					
	without disturbance					
	2					
	4					
	6					
	8 (air discharges)					

Passed: _____ Failed: _____

Remarks: _____

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

Observer: _____

(*) IEC 801-2 specifies that the test shall be conducted with the most sensitive polarity.

C.11 Durability test (A.1.7)

Model: _____ Serial N°: _____ Date: _____

Test liquid density (kg/m³): _____ at _____ °C Air buoyancy correction factor (f): _____

Before durability test:

Test #1					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

After durability test:

Test #2					
Flow rate	Temperature*	Test quantity	Indication	Error	mpe

* Chamber or ambient temperature

Observer: _____

C.12 Repeatability test (A.1.3.1 and 3.4)

The determination of compliance to this requirement can be made from the flow tests conducted under C.1.

Repeatability error (not greater than 0.2 %): _____

Observer: _____

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