



## COMMITTEE DRAFT 1CD OIML R 85-3

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meeting):

☒

**comments by: 15 November 2007**

☒

**vote (P-members only) and  
comments by 15 November 2007**

TITLE OF THE CD (English):

Revision OIML R 85

Automatic level gauges for measuring the level of liquid in stationary storage tanks

**Part 3: Test report format**

TITLE OF THE CD (French):

Révision OIML R 85

Jaugeurs automatiques pour le mesurage des niveaux de liquide dans les réservoirs de stockage fixes

**Partie 3: Format du rapport d'essai**

Original version in: English

### **Explanatory note**

*[Will be deleted in the final text]*

Initially, the successive drafts for the revision of OIML R 85 contained Part 1 (Metrological and technical requirements), Part 2 (Metrological control and tests), as well as Part 3 (Test report Format) in one document (file).

In that stage, the discussions were focussed on Parts 1 and 2. And Part 3 was marked “*[To be completed after Part 2 is (almost) ready]*”.

Parts 1 and 2 ready for vote now (July 2007) the time has come to prepare a formal 1 CD for Part 3 and this has been enclosed in this document.

As this is a document (the “Test Report”) within a document (R 85-3), the numbers of the paragraphs have been divided accordingly (1, 2 , etc. for the covering document) and A, B, C, etc. (for the Test Report).

This is also the reason why there are separate headings for the covering document (pages 1 - 6) and the Test report (pages 7 - 35).

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## Foreword

The International Organization of Legal Metrology (OIML) is a worldwide, intergovernmental organization whose primary aim is to harmonize the regulations and metrological controls applied by the national metrological services, or related organizations, of its Member States. The two 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; the OIML Member States shall implement these Recommendations to the greatest possible extent;
- § **International Documents (OIML D)**, which are informative in nature and intended to improve the work in the field of legal metrology;
- § **International Guides (OIML G)**, which are also informative in nature and which are intended to give guidelines for the application of certain requirements to legal metrology; and
- § **International Basic Publications (OIML B)**, which define the operating rules of the various OIML structures and systems.

OIML Draft Recommendations, Documents and Guides are developed by Technical Committees or Subcommittees, which comprise representatives from the Member States. Certain international and regional institutions also participate on a consultation basis.

Cooperative agreements have been established between the OIML and certain institutions, such as ISO and the IEC, with the objective of avoiding contradictory requirements. Consequently, manufacturers and users of measuring instruments, test laboratories, etc. may simultaneously apply OIML publications and those of other institutions.

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

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

This publication – reference OIML R 85-3, edition 200x (E) – was developed by the OIML Technical Subcommittee TC 8/SC 1 *Static volume measurement*. It was approved for final publication by the International Committee of Legal Metrology in 200x and will be submitted to the International Conference of Legal Metrology in 200x for formal sanction. It supersedes Part 2 of the previous edition of R 85 (1998).

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

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## **OIML R 85, PART 3**

### **Test Report Format for type evaluation**

Automatic level gauges for measuring the level of liquid in fixed storage tanks

#### **1 Introduction**

This *Test report format* is informative with regard to the implementation of this Recommendation in national regulations; however, in the framework of the *OIML Certificate System for Measuring Instruments*, use of the *Test report format* is mandatory.

This *Test report format* applies for any kind of electric or electronic level gauge (independent of its technology), but purely mechanical level gauges are excluded. It presents a standardized format for the results of the various tests and examinations, described in Part 2 of this Recommendation, to which a type of an automatic level gauge shall be submitted with a view to its approval based on the International recommendation OIML R 85 (XXXX).

It is recommended that all metrology services or laboratories evaluating types of automatic level gauges according to OIML R 85 or to national or regional regulations based on OIML R 85 use this *Test report format*, directly or after translation into a language other than English or French.

It is also recommended that this *Test report format* in English or in French (or in both languages) be transmitted by the country performing the tests to the relevant authorities of another country, under bi- or multi-lateral cooperation agreements.

#### **2 Applicability in the OIML Certificate System.**

In the framework of the OIML Certificate system, this Test Report Format shall be used.

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 this report (for instance electromagnetic susceptibility tests are not relevant for a an instrument without any electronics, or tests related to AC mains supply in case of an instrument powered by DC mains).

Taking into account the basic changes of the edition (200x), compared to the previous R 85 (1998), it shall be noted that instruments complying with the edition (1998) can not be supposed to comply with this edition (200x), unless this compliance is confirmed by a complete series of tests and evaluations according to Part 2 of this Recommendation.

**3 The Test Report****A Authority, responsible for this report**

Name	
Address	
Report number	
Application number	
Date/period of tests	
Date of issuing this Report	
Name and signature of the responsible person	
Stamp(s) (if applicable)	

**B Synopsis of the results of the tests and evaluation**

The tested specimen fulfils ALL the applicable requirements in OIML R 85 (200x)	YES	NO
Remarks:		

**C Summary of the results of the tests and evaluation**

Sub clause	Test (with reference to requirement in Part 1)	+	-	Remarks	Page
<a href="#">E.1</a>	Constituents (4)				
<a href="#">E.2</a>	Units of measurement (5)				
<a href="#">E.3</a>	Rated operating conditions (6.1)				
<a href="#">E.4</a>	Special conditions (6.1)				
<a href="#">E.5</a>	Indicating device (7.1)				
<a href="#">E.6</a>	Printer(s) (7.1.9)				
<a href="#">E.7</a>	Movable sensor (7.2)				
<a href="#">E.8</a>	Installation (7.3)				
<a href="#">E.9</a>	Ancillary devices (7.4)				
<a href="#">E.10</a>	Markings (7.5)				
<a href="#">E.11</a>	Verification marks (7.6)				
<a href="#">E.12</a>	Mechanical sealing (7.7)				
<a href="#">E.13</a>	Electronic sealing (7.7)				
<a href="#">E.14</a>	Safeguarding integrity (7.8)				
<a href="#">F.1</a>	Accuracy (8.1.5.2)				
<a href="#">F.2</a>	Discrimination (8.1.5.3)				
<a href="#">F.3</a>	Hysteresis (8.1.5.4)				
<a href="#">F.4.1</a>	Temperature test (8.1.6.2)				
<a href="#">F.4.2</a>	Mains voltage variation (8.1.6.3 + 8.1.6.4)				
<a href="#">F.5.1</a>	Damp heat, cyclic (condensing) (8.1.7.1)				
<a href="#">F.5.2</a>	Radiated, radio-frequency, electromagnetic fields (8.1.7.2.1)				
<a href="#">F.5.3</a>	Conducted, radio-frequency, electromagnetic fields (8.1.7.2.2)				
<a href="#">F.5.4</a>	Electrostatic discharge (8.1.7.2.3)				
<a href="#">F.5.5</a>	Bursts on signal, data and control lines (8.1.7.2.4)				
<a href="#">F.5.6</a>	Surges on signal, data and control lines (8.1.7.2.5)				
<a href="#">F.5.7</a>	AC mains voltage dips, short interruptions and voltage variations (8.1.7.2.6)				
<a href="#">F.5.8</a>	Bursts on AC and DC mains (8.1.7.2.7)				
<a href="#">F.5.9</a>	Voltage dips, short interruptions and voltage variations on DC mains power (8.1.7.2.8)				
<a href="#">F.5.10</a>	Ripple on DC mains power (8.1.7.2.9)				
<a href="#">F.5.11</a>	Surges on AC and DC mains power lines (8.1.7.2.10)				
OVERALL RESULT					
Remarks:					

**D General Information****D.1 Manufacturer**

Company	
Address	

**D.2 Applicant**

Company	
Representative	
Address	
Reference	
Date of application	

Remarks:



**D.3 Test laboratories involved in the tests**

(This table to be completed for each test laboratory)

Name	
Address	
Application number	
Test by this laboratory	
Date/period of tests	
Name(s) of test engineer(s)	
Details of relevant accreditation, peer assessment or assessment by other means	
In case tests have been performed on an other location than the premises of this laboratory, give details here	
Name of the responsible person	
Date of signature	
Signature of the responsible person	

**Remarks:**

--

**D.4 General information concerning the type**

Manufacturer's trade mark / corporate name							
Type designation							
Model number							
Serial number							
Measuring range(s)							
<table><tr><td><input type="checkbox"/> Electronic</td><td><input type="checkbox"/> Static level sensor</td><td><input type="checkbox"/> Analogue display</td></tr><tr><td><input type="checkbox"/> Mechanical</td><td><input type="checkbox"/> Movable level sensor</td><td><input type="checkbox"/> Digital display</td></tr></table>		<input type="checkbox"/> Electronic	<input type="checkbox"/> Static level sensor	<input type="checkbox"/> Analogue display	<input type="checkbox"/> Mechanical	<input type="checkbox"/> Movable level sensor	<input type="checkbox"/> Digital display
<input type="checkbox"/> Electronic	<input type="checkbox"/> Static level sensor	<input type="checkbox"/> Analogue display					
<input type="checkbox"/> Mechanical	<input type="checkbox"/> Movable level sensor	<input type="checkbox"/> Digital display					

**D.5 Selection of sample(s) tested**

In case the tests and evaluation are valid for more versions, give full details of the types, versions, measuring ranges etc.:

Justification of the selection of the samples:

**D.6 Adjustments and modifications**

Adjustments and/or modifications made to the samples during the testing:



**D.10 Documentation supplied by the applicant**

Diagrams, results of previous tests etc.:

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

**E Evaluation****E.1 Constituents (4)**

<b>Date:</b>	<b>Observer:</b>
Liquid level sensor	
Transducer	
Correction sensor	
Calculator	
Indicating device(s)	
Printer	
Ancillary devices	
Checking facilities	
Others	
Remarks	

**E.2 Units of measurement (5)**

<b>Date:</b>	<b>Observer:</b>	
	Display	Print
Dip		
Ullage		
Other indication(s)		
Remarks		

**E.3 Rated operating conditions (6.1)**

(See also 9)

<b>Date:</b>	<b>Observer:</b>	
Temperature extreme values	Liquid	
	Medium above liquid	
Pressure extreme values		
Liquid characteristics		
Liquid density extreme values		
Medium characteristics		
Medium density extreme values		
Remarks		

**E.4 Special conditions (6.1)**

<b>Date:</b>	<b>Observer:</b>
Remarks	

**E.5 Indicating device (7.1)**

<b>Date:</b>	<b>Observer:</b>			
<b>Sub clause</b>	<b>Requirement</b>	<b>Remarks</b>	<b>+</b>	<b>-</b>
7.1.1	Distance between analogue scale marks			
7.1.2	Number of indicating devices			
7.1.3	Common indicating device			
7.1.4	Remote indication duly identified			
7.1.2-3-4	Other indicating devices			
7.1.2	Alarm when outside limits			
7.1.5	Default display of dip / ullage			
7.1.6	Display of measurement			
7.1.7	Symbol or name of unit present			
	Scale interval			
7.1.8	Digital display			
Remarks				

**E.6 Printer(s) (7.1.9)**

<b>Date:</b>	<b>Observer:</b>			
<b>Sub clause</b>	<b>Requirement</b>	<b>Remarks</b>	<b>+</b>	<b>-</b>
7.1.2	Number of printers			
7.1.4	Printer duly identified to ALG			
7.1.5	Default print of dip/ullage			
7.1.6	Print of measurement			
7.1.7	Symbol or name of unit present			
	Scale interval			
Remarks				

**E.7 Movable sensor (7.2)**

<b>Date:</b>		<b>Observer:</b>		
<b>Sub clause</b>	<b>Requirement</b>	<b>Remarks</b>	<b>+</b>	<b>-</b>
7.2.1	Suspension mechanism			
7.2.2	Static position			
Remarks				

**E.8 Installation (7.3)**

<b>Date:</b>		<b>Observer:</b>		
<b>Sub clause</b>	<b>Requirement</b>	<b>Remarks</b>	<b>+</b>	<b>-</b>
7.3.1.1	Accessible and legible			
7.2.1.2	Verification possible			
7.3.1.3	Gauge hatch			
7.3.1.3	No obstacles			
7.3.1.4	Affect ALG Measurement			
7.3.1.5	Influence eddies, etc.			
7.3.1.6	Compensation movement tank			
7.3.1.7	Location correction sensor(s)			
7.3.1.8	Thermal expansion			
Remarks				

**E.9 Ancillary devices (7.4)**

<b>Date:</b>		<b>Observer:</b>		
<b>Description</b>	<b>Remarks</b>		<b>+</b>	<b>-</b>
Remarks				

**E.10 Markings (7.5)**

<b>Date:</b>	<b>Observer:</b>		
<b>Requirement</b>	<b>Remarks</b>	+	-
Location of the markings			
Name of the manufacturer / trademark			
Type designation			
Serial number			
Year of manufacture			
Type approval mark (provisions)			
Ranges defining the field of operation			
Visibility			
Additional information (if required)			
Remarks			

**E.11 Verification marks (7.6)**

<b>Date:</b>	<b>Observer:</b>		
	<b>Remarks</b>	+	-
Location			
Fit for easy application			
Impossible to remove without damage			
Remarks			

**E.12 Mechanical sealing (7.7)**

<b>Date:</b>	<b>Observer:</b>		
	<b>Remarks</b>	+	-
Data plate			
Other components			
Impossible to remove without damage			
Remarks			



**E.13 Electronic sealing (7.7)**

<b>Date:</b>	<b>Observer:</b>			
	<b>Remarks</b>	+	-	
Access				
Password changeable				
Configuration mode				
Event counter				
Date of change parameter				
Value of parameter				
Identification authorized person				
Traceability last intervention				
Remarks				

**E.14 Safeguarding the integrity of the measurement (7.8)**

<b>Date:</b>		<b>Observer:</b>				
<b>Sub clause</b>	<b>Requirement</b>	<b>Remarks</b>			+	-
7.8.1	Possibility testing checking facility					
	Checking facility type I or P					
7.8.2.1	Checking facility disturbances	YES	NO			
7.8.2.3	Durability protection facility	YES	NO			
7.8.2.5	Action by checking facility					
7.8.3.1	Protection of data					
7.8.3.2	Integrity of permanent stored instructions					
7.8.3.3	Transfer/storage of data					
7.8.3.4	Checking facility calculator					
7.8.3.5	Checking facility indicating device					
7.8.3.6	Checking facility ancillary device					
Remarks						

**F Performance tests****F.1 Accuracy (8.1.5.2)**

<b>Date of test:</b>	<b>Observer:</b>
----------------------	------------------

<b>Test conditions</b>	<b>Begin</b>	<b>End</b>
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

<b>Observations in mm: upwards</b>					
<b>Level</b>	<b>Indication</b>	<b>Error</b>	<b>MPE</b>	<b>+</b>	<b>-</b>

Remarks:

Observations in mm: downwards					
Level	Indication	Error	MPE	+	-
Remarks					

**F.2 Discrimination (8.1.5.3)**

<b>Date of test:</b>	<b>Observer:</b>
----------------------	------------------

<b>Test conditions</b>	<b>Begin</b>	<b>End</b>
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

<b>Discrimination</b>	<b>Level</b>	<b>Indication</b>	<b>Level change</b>	<b>Indication change</b>	<b>+</b>	<b>-</b>
Upwards						
Downwards						

**Remarks:**

In case of an ALG without a movable liquid level detecting element, this test can be skipped.  
In that case, this justification shall be mentioned here.

**F.3 Hysteresis (8.1.5.4)**

<b>Date of test:</b>	<b>Observer:</b>
----------------------	------------------

<b>Test conditions</b>	<b>Begin</b>	<b>End</b>
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

<b>Upwards</b>	Level 1	Level 2	Level 3	Maximum hysteresis	MPE	+	-
Level up							
Indication							
Level down							
Indication							
Hysteresis							

<b>Downwards</b>	Level 1	Level 2	Level 3	Maximum hysteresis	MPE	+	-
Level down							
Indication							
Level up							
Indication							
Hysteresis							

**Remarks:**

In case of an ALG without a movable liquid level detecting element, this test can be skipped.  
In that case, this justification shall be mentioned here.

**F.4 Influence factor tests****F.4.1 Static environmental temperatures (8.1.6.2)**

<b>Date of test:</b>	<b>Observer:</b>
----------------------	------------------

<b>Test conditions</b>	<b>Begin</b>	<b>End</b>
Time:		
Relative humidity	%	%
Atmospheric pressure	hPa	hPa

**F.4.1.1 Dry heat (8.1.6.2.1)**

Temperature		Level	Indication	Error	MPE	+	-
Reference temperature	°C						
High temperature	°C						
Reference temperature	°C						

**F.4.1.2 Cold (8.1.6.2.2)**

Temperature		Level	Indication	Error	MPE	+	-
Reference temperature	°C						
Low temperature	°C						
Reference temperature	°C						

Remarks:

**F.4.2 Mains voltage variations (8.1.6.3 and 8.1.6.4)**

<b>Date of test:</b>	<b>Observer:</b>
----------------------	------------------

Test conditions	Begin	End
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

☐ DC mains voltage variation (8.1.6.3)

☐ AC main voltage variation (8.1.6.4)

Voltage		Level	Indication	Error	MPE	+	-
Reference voltage	V						
High voltage	V						
Low voltage	V						
Reference voltage	V						

Remarks

**F.5 Disturbance tests****F.5.1 Damp heat, cyclic (condensing) (8.1.7.1)**

<b>Observer:</b>
------------------

Test conditions	Begin	End
Date		
Time		
Atmospheric pressure	hPa	hPa

Cycle no.	Time	Low temp. °C	Humidity % RH	Time	High temp. °C	Humidity % RH
1						
2						

Level	Indication	Error	MPE	Action Checking facility	+	-

Remarks:



**F.5.2 Radiated, radio-frequency, electromagnetic fields (8.1.7.2.1)**

<b>Date of test:</b>	<b>Observer:</b>
----------------------	------------------

<b>Test conditions</b>	<b>Begin</b>	<b>End</b>
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

EM field		Level	Indication	Error	MPE	Action Checking facility	+	-
Frequency	Field strength							
MHz	V/m							
MHz	V/m							
MHz	V/m							
MHz	V/m							
MHz	V/m							

Remarks

**F.5.3 Conducted, radio-frequency, electromagnetic fields (8.1.7.2.2)**

<b>Date of test:</b>	<b>Observer:</b>
----------------------	------------------

<b>Test conditions</b>	<b>Begin</b>	<b>End</b>
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

Field injected on port(s):	
----------------------------	--

EM field		Level	Indication	Error	MPE	Action Checking facility	+	-
Frequency	Amplitude							
MHz	V							
MHz	V							
MHz	V							
MHz	V							
MHz	V							

Remarks

**F.5.4 Electrostatic discharge (8.1.7.2.3)**

<b>Date of test:</b>	<b>Observer:</b>
----------------------	------------------

Test conditions	Begin	End
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

<input type="checkbox"/> Contact discharge	<input type="checkbox"/> Direct application	Test voltage:	<input type="text" value="kV"/>
<input type="checkbox"/> Air discharge	<input type="checkbox"/> Indirect application	Number of discharges:	<input type="text"/>

Discharge applied on	Level	Indication	Error	MPE	Action Checking facility	+	-

Remarks





**F.5.7 AC mains voltage dips, short interruptions and voltage variations (8.1.7.2.6)**

<b>Date of test:</b>	<b>Observer:</b>
----------------------	------------------

Test conditions	Begin	End
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

Mains voltage and frequency	V	Hz
-----------------------------	---	----

Test	Reduction to	Duration [cycles]	Level	Indication	Error	MPE	Action Checking facility	+	-
Dips a	V  %								
Dips b	V  %								
Dips c	V  %								
Dips d	V  %								
Dips e	V  %								
Short interrup- tion	V  %								
Remarks									



**F.5.9 Voltage dips, short interruptions and voltage variations on DC mains (8.1.7.2.8)**

<b>Date of test:</b>	<b>Observer:</b>
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<b>Test conditions</b>	<b>Begin</b>	<b>End</b>
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

Test	Reduction to	Duration	Level	Indication	Error	MPE	Action Checking facility	+	-
Voltage Dips	40 %	0,1 s							
	70 %	0,1 s							
Short interruption	0 %	0,01 s							
Voltage variations	85 %	10 s							
	120 %	10 s							

Remarks



**F.5.10 Ripple on DC mains power (8.1.7.2.9)**

<b>Date of test:</b>	<b>Observer:</b>
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<b>Test conditions</b>	<b>Begin</b>	<b>End</b>
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

Frequency:	Hz
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Test time:	min
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Level	Indication	Error	Diff.	MPE	Action Checking facility	+	-

Remarks

**F.5.11 Surges on AC and DC mains power lines (8.1.7.2.10)**

<b>Date of test:</b>	<b>Observer:</b>
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<b>Test conditions</b>	<b>Begin</b>	<b>End</b>
Time:		
Environmental temperature	°C	°C
Relative humidity	% RH	% RH
Atmospheric pressure	hPa	hPa

	Angle	Voltage and Polarity	Number of surges	Level	Indication	Error	MPE	Action Checking facility	+	-
Line to line	0 °									
	90 °									
	180 °									
	270 °									
Line to earth	0 °									
	90 °									
	180 °									
	270 °									
Remarks										