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Issue 1

WELMEC

European cooperation in legal metrology

Guide for Common Application of Marking of Fuel Dispensers



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WELMEC is a cooperation between the legal metrology services of the Member States of the European Union and EFTA. This document is one of a number of Guides published by WELMEC to provide guidance to manufacturers of measuring instruments and to notified bodies responsible for conformity assessment of their products. The Guides are purely advisory and do not themselves impose any restrictions or additional technical requirements beyond those contained in relevant EC Directives. Alternative approaches may be acceptable, but the guidance provided in this document represents the considered view of WELMEC as to the best practice to be followed.

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Foreword

This document is intended to provide guidance to all those concerned with the application of OIML International Recommendation R117 'Measuring Systems for Liquids other than Water'.

This document provides a guide for testing electronic calculators with an electronic conversion function or device. The indicating device is supposed to be included.

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The first pre draft of this Guide reflects the joint efforts of:

- Mr. Wim Klein, CECOD / Tokheim, The Netherlands (Chairman of the sub-group)
- Mrs. Régine Gaucher, LNE, France
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- Mr. Franz-Josef Kersting, CECOD / Gilbarco, Germany
- Mr. Wim Volmer, Nmi, The Netherlands (Secretary of the sub-group)

After a period of inactivity, in 2004 the sup-group started under the chairmanship of Mr. Wim Volmer (in 2005 replaced by Hans van Wijngaarden, Nmi) with the decision that, instead to issue one document "Marking and Sealing", the document will be divided in two guides: one for "Marking" and one for "Sealing".

The version of 2006 was discussed in the meeting of November 2005 and accepted in the meeting in Braunschweig May 2006 after an e-mail voting was send around.

Brief report of the 25 February 2004 sub group meeting:

The sub group feels that the Year of Manufacture is not relevant for COMPONENTS of a measuring system so 2.19.1 d) of R117 must be altered.

The Guide on Marking was updated, implementing the remarks made at the Teddington WG10 meeting.

The Guide on Sealing was updated, including a definition of the "purpose of sealing" and an update of the list of Fuel Dispenser components to be sealed. Also a distinction was made between the types of seals required per component (seals on parts directly affecting the metrological characteristics, seals which help showing conformity to type and seals "preventing" exchange of components). This was done to allow for national differences in sealing policy in relation to the policy on inspection / market surveillance.

A short brainstorm session was dedicated to software sealing, without real result.

Brief Report of the 25 October 2005 sub group meeting:

Based on the results of the Tallinn WG10 Meeting and the results of the E-mail questionnaire regarding the MID requirements applicable to Markings, the sub group has attempted to develop new designs for Name Plate, Data Sheet, Type Plate and Dial face as far as possible in-line with: OIML R117 (edition 1995), the MID and the second Committee Draft OIML R117-1.

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1. Scope

This document gives guidance for marking for fuel dispensers (including LPG dispensers) to be installed at filling stations which are used to dispense liquid fuel into the tanks of motor vehicles, boats, light aircraft, and portable containers.

The here given marking guidance is based on the European Directive for Measuring Instruments and the OIML recommendation R117, edition 1995. Some requirements from other relevant CE Directives were also taken into account. Please note that other CE Directives may require additional information to be inscribed on the instrument.

The contents of this document may be seen as an acceptable technical solution in-line with both the MID and R117, edition 1995.

Although re-verification is mentioned in the document, it is not covered by the European Directive for Measuring Instruments and different national laws may apply.

2. Definitions

Measuring System

A system that comprises the meter itself and all devices required to ensure correct measurement or intended to facilitate the measuring operations. (MID MI-005, OIML R117, edition 1995)

Fuel dispenser (LPG dispenser)

A measuring system intended for the refuelling of motor vehicles, small boats and small aircraft. (MID MI-005)

Self-service arrangement

An arrangement that allows the customer to use a measuring system for the purpose of obtaining liquid for his own purchase. (OIML R117, edition 1995, T.2.6)

Self-service device

A specific device that is part of a self-service arrangement and which allows one or more measuring systems to perform in this self-service arrangement.

Note: The self-service device includes all the elements and constituents that are mandatory so that a measuring system performs in a self-service arrangement. (OIML R117, edition 1995, T.2.7)

Name plate

The plate required by MID for the complete measuring system, bearing the "CE", "M" and some other mandatory inscriptions. This plate is fixed to the outside of the (common) housing of the fuel dispenser(s) and locates the position of the nozzles.

Type plate(s)

The plate(s) fixed to the (essential) component(s) of a measuring system.

Data sheet

A plate (or other carrier of information, e.g. document) stating all metrologically relevant information of individual measuring systems and components thereof.

Please note that the special data plate, mentioned in OIML R117, edition 1995, article 2.19.1, is also considered to be another form of readable information, rather than just a plate.

3. General

Fuel dispensers are required to be marked in a permanent and legible manner throughout their expected life.

These markings include identification of the equipment and the required instructions as defined in the general requirements and documents like Type or Design Examination Certificate(s).

Markings and signs shall be readily understandable and unambiguous.

Signs (pictograms) shall be used in preference to written warnings where possible.

Instructions and warnings for use shall be in the language(s) of the country in which the fuel dispenser is to be used!

Member States may require the Name Plate, Type Plate and Data Sheet (or data carrier) to be drawn up in the national language.

The information on the indicator face must be in the national language and use the national monetary unit (please note that VIML does not present another term for "indicator face").

Other information and markings complying with other Directives or national rules may be used. Conflicts and double use shall be avoided.

In the following paragraphs acceptable examples of a Name Plate and Data Sheet are presented. Information from the Data Sheet can be moved to the Name Plate. When the Data Sheet contains mandatory information, that is not present on the Name Plate, it shall be fixed in a permanent manner to the frame of the housing or a non-removable part of the housing. Removal, without destroying the Data Sheet, shall not be possible, or the Data Sheet shall be sealed to the frame of the dispenser.

Please note that the CE marking declares conformance with other Directives as well.

The CE marking and supplementary metrology marking shall be affixed by, or under the responsibility of the manufacturer. The CE marking may be affixed on the instrument during the fabrication process. (MID article 7, sub 2) (please note that the references to MID are to be checked and updated once the final text is available).

The supplementary metrology marking shall be affixed after the assessment of conformity specified in Article 9.

(Note: via the specific Annexes, Article 9 refers to Type Approval and Initial Verification)

Please note that this document intends to offer guidance for Marking Fuel Dispensers in conformity with both the MID and OIML R117, edition 1995. With respect to R117, edition 1995 two interpretations are made:

1) The opening paragraph of 2.19.2 requires the following:

2.19.2 Any information, markings or diagrams specified by this Recommendation or possibly by the pattern approval certificate, shall be clearly visible on the dial of the indicating device or within proximity to it.

Several problems arise from the requirement that all mandatory information, markings or diagrams must be clearly visible within proximity of the indicating device. 2.19.1 speaks of "Each measuring system, component or sub-system for which pattern approval has been granted shall ...". In for example Fuel Dispensers some components are covered by a housing and in larger measuring systems some components are installed at a distance from the indicating device. In both these cases some of the information, markings and diagrams are not clearly visible and in the vicinity of the indicating device. In practice this has not lead to problems because either the "missing" information, markings and diagrams are accessible to interested

parties, or because crucial parts of information, markings and diagrams is repeated in the vicinity of the indicating device. If, in contrast, the information, markings and diagrams were only present in the vicinity of the indicating device, some of the components are impossible to identify.

To eliminate this problem, the sub group reads this article as follows:

The required information, markings or diagrams must either:

- *be clearly visible on the dial of the indicating device, or*
- *be within proximity to the indicating device*

In accordance with 2.19.1 the information required under the second bullet, must be given on a special data plate and not necessarily visible.

2) Data Plate

2.19.1 Each measuring system, component or sub-system for which pattern approval has been granted shall bear, placed together legibly and indelibly either on the dial of the indicating device or on a special data plate, the following information:

R117, edition 1995, requires the presence of certain information on a "special data plate". The sub group interprets "special data plate" to be a "data carrier" thus allowing use of other media for the registration of these data like for example paper, electronics etc. The information registered on these media must be traceable to a particular measuring system using the following:

- type approval number
- manufacturer's identification mark, trademark or name
- designation selected by the manufacturer, if appropriate
- serial number

4. Name plate

A name plate shall be fixed in a permanent manner to the frame of the housing or a non-removable part of the housing, and be visible from the outside. Removal, without destroying the name plate, shall not be possible, or the name plate shall be sealed to the frame of the dispenser. (MID article 17, sub 5)

The name plate shall be marked in a legible and durable manner, taking into account possible chemical corrosion.

It is preferred to have one name plate per housing, even if it includes more than one measuring system.

The name plate can also be used to indicate the verification and/or re-verification of the fuel dispenser by use of national verification stickers.

See below for an example of a name plate.

Notes:

- The example of the name plate does not show the internal positions of the measuring instruments but only the nozzle position.
- In addition to OIML R117, edition 1995, requirements the MID also states a Mechanical and an Electromagnetic Class. For reasons of consistency these have been added to the Name Plate.
- To allow combining inscriptions from OIML R117 (edition 1995), MID and the Atex Directive the words "Ambient Temp." are used instead of "Environmental Class" and "Upper / Lower temperature limit".
- The Manufacturer fills in the numbers of the viscosity classes based on the values given in Type Approval Certificates.

Example of a name plate:

180

170

example

GILBARCO VEEDER-ROOT

Ambient Temp. -25 to +50°C
 Liquid Temp. -10 to +50°C
 Accuracy Class 0.5 Liquid / 1 LPG
 Mechanical Class
 Electromagnetic Class

1 Gilbarco GmbH & Co. KG
 D-33154 Salzkotten

Type _____

Serial No. / Year _____

2 Ex Certificate No. _____

W&M Approval No. _____

3 _____

4

5

6

Viscosity Class
 1= 0.4-1.0 mPa·s
 2= 1.1-8.0 mPa·s
 3= 8.1-17 mPa·s

	Q max. L/min		Q min. L/min		P max. bar	V min. L
1						
2						
3						
4						
5						
6						

EN13617-1/prEN14578-1

Dispenser

CE 0032

654321 123456 325820008

When filled out, certain parts of the Name Plate given above will look something like this:

Type
 SK700 6/3/6 C

Serial No. / Year
 555555 / 2002

Ex Certificate No.
 SIRA 01ATEX9035

W&M Approval No.
 2650/

Viscosity Cl.
 1=
 2=
 3=

	Q max. L/min		Q min. L/min		P max. bar	V min. L
1	40	40	4	4	1.9	2
2	40	40	4	4	1.9	2
3	40	40	4	4	2.5	2
4	70	70	4	4	3.5	5
5						
6						

L R L R

Explanation of abbreviations / symbols used:

xxxx (following "M") : Number of Notified Body which carried out Initial Verification, or the Notified Body which assessed the quality system of the manufacturer for Initial Verification (can not in all cases be filled in when the name plate is affixed to the housing)

xxxx (below "CE")	:	Number of Notified Body responsible for Safety
Type	:	Type name, which is not necessarily the name used in legal metrology (<i>metrologically speaking there can be more than one type installed in the housing</i>)
Ex Certificate No.	:	Number of Explosion Safety Approval
W&M approval No.	:	Number of Metrological Approval. In case of more than one Approval, more numbers need to be stated.
Ex II 2 G	:	an example of an inscription required for safety requirements. Please note that "II 2 G" depends on the dispenser and can vary.
EN13617-1	:	Inscription under safety legislation (is different in case of LPG)

In general it is preferred that the name plate layout is such that Safety, Metrological and common markings are logically arranged.

5. Data sheet

This document is intended to contain the technical characteristics of the fuel dispenser. Each exchange of a component shall be recorded on this document, or a new document issued.

It shall give the latest information on the configuration of the fuel dispenser(s) including the information as given below, if not stated on the Name Plate:

- the name and address of the manufacturer or his representative in the EU
- the serial number of the fuel dispenser and year of manufacture
Note ; in addition there can be a serial number for the housing including more fuel dispensers.
- the designation or type name
- the nature of the liquid to be measured
- the metrology approval number(s) of the fuel dispenser
- the accuracy class
- the ambient temperature range
- the temperature range of the dispensed liquid if it is other than the range of -10 °C to +50 °C
- minimum measured quantity
- max. flow rate Q_{max}
- min. flow rate Q_{min}
- max. pressure P_{max}
- min. pressure P_{min}
- a drawing identifying each nozzle with its associated hydraulics where necessary.

See next page for an example of the data sheet.

Data Sheet MPD Serial No.: 1234												
				A4	A3	A2	A1					
A1	A2	A3	A4						B1	B2	B3	B4
								B4	B3	B2	B1	
Remark: a sketch, giving the location of the various components, may be presented in the manual (MID, Annex 1, 9.3) instead of the data sheet.												
		A1	A2	A3	A4	B1	B2	B3	B4			
MEASUREMENT TRANSDUCER												
VOLUME SENSOR												
Manufacturer	Man#2	Man#2	Man#2	Man#2	Man#2	Man#2	Man#2	Man#2	Man#2			
Type	Super+	Super+	Super+	Super+	Super+	Super+	Super+	Super+	Super+			
Test Report No.	TC3111	TC3111	TC3111	TC3111	TC3111	TC3111	TC3111	TC3111	TC3111			
Serial No.	10	11	12	13	14	15	16	17	17			
Stamp / Sticker												
Qmax [L/min]	130	130	130	130	130	130	130	130	130			
Qmin [L/min]	2	2	2	2	2	2	2	2	2			
Pmax [bar]	4	4	4	4	4	4	4	4	4			
Viscosity Class(es)	1	1	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1	1			
PULSER												
Manufacturer	Man#2	Man#2	Man#2	Man#2	Man#2	Man#2	Man#2	Man#2	Man#2			
Type	Super++	Super++	Super++	Super++	Super++	Super++	Super++	Super++	Super++			
Test Report No.	07-TR32-NL	07-TR32-NL	07-TR32-NL	07-TR32-NL	07-TR32-NL	07-TR32-NL	07-TR32-NL	07-TR32-NL	07-TR32-NL			
Serial No.	18	19	20	21	22	23	24	25	25			
Stamp / Sticker												
GAS ELIMINATION DEVICE												
Manufacturer	Man#3	Man#3	Man#4	Man#4	Man#4	Man#4	Man#4	Man#3	Man#3			
Type	ABC	ABC	DEF	DEF	DEF	DEF	DEF	ABC	ABC			
Test Report No.	TC3333	TC3333	TC3444	TC3444	TC3444	TC3444	TC3444	TC3333	TC3333			
Serial No.	1	2	3	4	4	3	2	1	1			
Stamp / Sticker												
Qmax [L/min]	65	65	100	100	100	100	65	65	65			
Qmin [L/min]	2	2	2	2	2	2	2	2	2			
Pmax [bar]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5			
Pmin [bar]	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5			
Viscosity Class(es)	1	1	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1	1			
ELECTRONIC CALCULATOR / INDICATING DEVICE												
Manufacturer	Man#4	Man#4	Man#4	Man#4	Man#4	Man#4	Man#4	Man#4	Man#4			
Type	XYZ	XYZ	XYZ	XYZ	XYZ	XYZ	XYZ	XYZ	XYZ			
Test Report No.	TC3456	TC3456	TC3456	TC3456	TC3456	TC3456	TC3456	TC3456	TC3456			
Serial No.	112233	112233	112233	112233	112233	112233	112233	112233	112233			
Stamp / Sticker												
Viscosity Classes: 1, 0.4 - 1.0 mPa.s; 2, 1.1 - 8.0 mPa.s; 3, 8.1 - 17 mPa.s @ 20 °C (must be identical to Name Plate)												

Notes:

- (1) The liquid temperature range needs only be indicated, if different from -10 °C to +50 °C.
- (2) The serial numbers of the gas elimination device, volume sensor, pulser and calculator need only be noted if exchange of these components is not protected by (a) seal(s) (To be discussed after finalising Sealing; possibly delete this note and remove serial numbers from the Data Sheet).
- (3) Currently, for each of the components of the measuring system, space is reserved for stamps / stickers. Depending on the national legislation applicable to (re-)verification, inspection and control, that space may be used by accredited companies to show if they worked on a particular component.
- (4) At this moment much information is repeated. This is done to allow for as much variation in the individual measuring systems as possible. However, in practice for example all eight pulsers will be from the same manufacturer and type. In cases of repetition of information the table cells can be merged and the information stated only once.
- (5) The pictogram giving the location of the hydraulic units and hoses is included as an example. In some cases it may be more practical to give a top view or other form of presentation.
- (6) Assuming the example Name Plate is used, as given in the previous paragraph, all mandatory information is stated on the Name Plate. Therefore, the Data Sheet no longer contains any mandatory information, which in turn means it need not be permanently attached / sealed to the fuel dispenser.

6. Type plate

A type plate shall be used on each main component.

The main components are:

- measurement transducer
- pulser, where separate
- gas elimination device
- calculator / indicating device
- indicator, where separate

This plate shall bear at least the following information:

- serial number
- metrology approval number, if relevant
- relevant characteristics (e.g. minimum pressure), if applicable
- special product names, if applicable (eg Ethanol, ...)

All other relevant data can be retrieved either from the Data Sheet and/or the Approval document (also see OIML R117, edition 1995, 2.19.1).

Note:

For the measurement transducer additional information (Q_{max} , Q_{min} , P_{max}) has to be indicated as given in R117, edition 1995, clause 3.1.1.1.

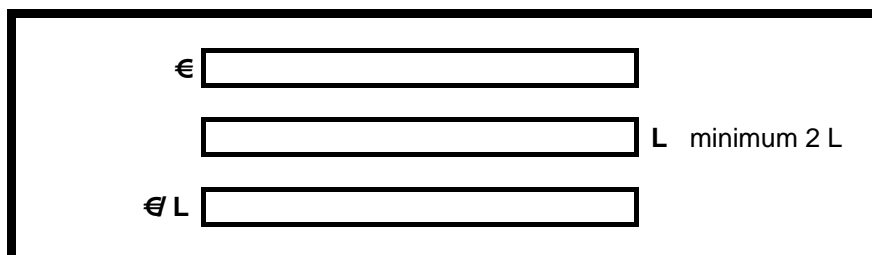
For the gas elimination device additional information (Q_{max} , P_{max} , P_{min}) has to be given as in R117, edition 1995, clause 2.10.7.2

7. Marking on the indicator face

The face of the indicating device shall have:

- the relevant currency sign or abbreviation in front of or after the currency indications,
- after the volume indication the ℓ or L for litre or the word Litre
- information regarding the minimum measured quantity

Example of indicator face:

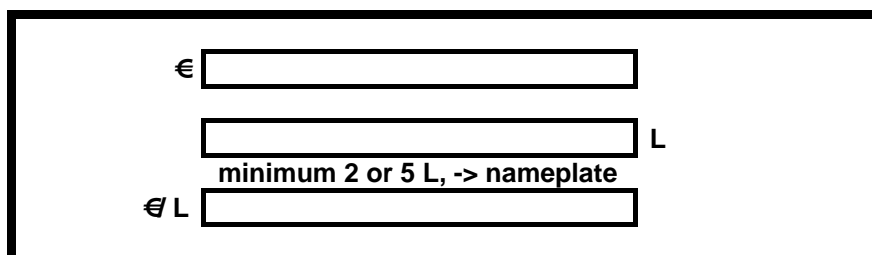


Explanation for the example given above:

- to limit the problems with national languages, the number of words on the face is reduced
- instead of inscriptions such as “amount to pay” and “volume” accompanied by the appropriate unit, only the unit is inscribed on the indicator face
- in case of different minimum measured quantities for different fuel dispensers, sharing one common housing / indicating device, more explanation is required; example#1, see drawing below:

Please note that VIML allows both the symbols L and ℓ to be used for litre.

Example#1 of indicator face, in case of more than one minimum measured quantity:



From R117-1 2CD, 2.19.1: "At least the information related to the minimum measured quantity and the verification marks shall be visible in normal conditions of use."

- in case of different minimum measured quantities for different fuel dispensers, sharing one common housing / indicating device, more explanation is required; example#2:
"minimum 2 L for hoses 1, 2, 3 and 5 L for hose 4", or "minimum 2 L for Euro'95 and Super, 5 L for Diesel"
example#3:
no text on the indicator face, but something like “minimum 2 L” or “minimum 5 L” on or near each nozzle. Please note that this is in-line with MID, but not with OIML R117, edition 1995

8. Marking on Self Service Arrangements / Self Service Devices

MID does not forbid components of a complete measuring system / instrument to be tested separately. Especially for a conversion device, parts are stated which can be tested separately. This paragraph aims to apply Markings onto Self Service Devices, which allows separate marking, testing and issue of Test Reports of such devices, without contradicting the MID. For the purpose of this guide, only Self Service Devices are considered which are under legal control.

In general peripheral equipment may be connected to a legally controlled measuring instrument/system, if it does not affect the operation of that instrument/system. When under legal control, markings are required. To allow (re-) Verification and legal control of the Self Service Device separately, at least the following markings must be present on the Self Service Device:

- Manufacturer
- Type
- SSD Metrology approval / Test Report number
- serial number
- identification of the connected fuel dispenser(s)
- place for (re-)Verification stamp/sticker

Please note that the combination of specific Self Service Devices with specific Fuel Dispensers must be subject to Type examination or evaluation and documented in a EC type examination certificate.

Please note that at present it is not known how a possible voluntary form of Certification of SSD's is to be performed. An official separate Certification of SSD's under MID is not possible.

Example of Marking on Self Service Devices:

Manufacturer	Charlie
Type	Chaplin
Approval No. / Test Report No.	TC3999
Serial No.	332211
Connected Fuel Dispensers	e.g: N° 1, 2, 3 at night; N° 1, 2, 3, 4, 5 at daytime
Place for legal Stamp / Sticker	

If a Self Service Device consists of more than one component, this plate is attached to its main component. On the other parts of the Self Service Device the Approval No. is inscribed.