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WELMEC

European Cooperation in Legal Metrology

Guide for the Marking of Fuel Dispensers

For information:
This guide is available to the Working Group Measuring Instruments for future reference on the Europa Website.

WELMEC

European Cooperation in Legal Metrology

WELMEC is a cooperation between the legal metrology authorities 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 EU 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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Contents

1 Scope

This document gives guidance for the markings and inscriptions of 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. This document also gives guidance for the marking of Self Service Devices connected to dispensers (i.e.: for delayed post pay)

The here given guidance is based on the European Directive for Measuring Instruments, 2014/32/EU.

This guide does not cover markings necessary under other relevant European Directives, such as but not limited to the ATEX directive (2014/34/EU, the EMC directive (2014/30/EU) and the low-voltage directive (2014/35/EU).

Although reverification is mentioned in the guide, it is not covered by the MID. With respect to reverification national law applies. This guide does not cover those national legislations.

The articles of the MID speak of a measuring instrument but in the instrument specific annex VII (MI-005) the terminology is in relation to a measuring system. In this document we have maintained the wording of the directive and use the term fuel dispenser as a specific type of measuring system under annex VII (MI-005).

2 Definitions and abbreviations

In this document the abbreviations and definitions of the MID and OIML R117-1 apply, together with the following:

MID	directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments.
TEC	An EU-type examination certificate under Module B or an EU design examination certificate under Module H1 of the MID.
EC	Evaluation Certificate as specified by WELMEC guide 8.8.
PC	Parts Certificate as specified by WELMEC guide 8.8
NB or NOBO	Notified Body designated by a Member State in accordance with Article 23(1) of the MID.
MMQ	Minimum Measured Quantity (acronym).

3 Markings and inscriptions on the fuel dispenser

According to article 20 of the MID, the conformity of a fuel dispenser with the MID shall be indicated by the presence on it of the CE-marking and the supplementary metrology marking as specified in Article 21 of the MID following the general principle of article 30 of Regulation 765/2008 and article R11 of Decision (EC) No 768/2008.

According to article 8 of the MID, the manufacturer shall ensure that measuring instruments which they have placed on the market bear a *type*, *batch* or *serial* number or other element allowing their identification.

Manufacturers shall, according to article 8 of the MID, also indicate on the measuring instrument their name, registered trade name or registered trade mark and the postal address at which they can be contacted.

The address shall indicate a single point at which the manufacturer can be contacted. The contact details shall be in a language easily understood by end-users and market surveillance authorities.

According to article 10 of the MID importers shall indicate on the measuring instrument their name, registered trade name or registered trade mark and the postal address at which they can be contacted. The contact details shall be in a language easily understood by end-users and market surveillance authorities.

The TEC can also specify information to be inscribed on the instrument or which has to be provided by the instrument, for example but not limited to:

- Software version number and checksum[1] (may be in test mode provided the TEC describes how to get in the test mode[2]);
- Evaluation or Parts Certificate numbers[3]
- Additional markings and inscriptions as specified by the TEC, Evaluation or Parts Certificate.

Article 9 of Annex I of the MID defines the information to be borne by and to accompany the instrument. In particular section 9.8, further requires that all marks and inscriptions required under any requirement shall be clear, non-erasable, unambiguous and non-transferable.

Article 10.2 of Annex I of the MID states that the indication of any result shall be clear and unambiguous and accompanied by such marks and inscriptions necessary to inform the user of the significance of the result.

Article 10.4 of Annex I of the MID further requires that, when critical in the case of direct sale, any ticket provided to the consumer by an ancillary device not complying with the appropriate requirements of this Directive shall bear appropriate restrictive information.

4 Required information

1 See WELMEC guide 7.2 , Software Guide (Measuring Instruments Directive 2014/32/EU), for guidance on the software identifier and check of conformity, i.e. checksum or hash code and the presentation of these results, in particular the instrument specific annexes (Extension I) of guide 7.2 for liquids other than water.

2 Article 8.3 of Annex I of the MID states that the software identification shall be easily provided by the measuring instrument.

3 See WELMEC guide 8.8 for guidance on the General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring Instruments

4.1 Information on the fuel dispenser

The requirements of the MID are given in Italic, while guidance is given in the normal font.

4.1.1 Article 9.1 of Annex I of the MID

According to article 9.1 of Annex I of the MID the following information shall be on the measuring instrument.

a) Manufacturer's name, registered trade name or registered trade mark;

- Also postal address of the manufacturer shall be on the instrument (see article 8.6 of the MID).
  A fuel dispenser would not be considered to be an instrument of dimensions too small or of too sensitive a composition to allow it to bear the relevant information.
- Also name, registered trade name or registered trade mark and the postal address of the importer shall be on the instrument or, where that is not possible, in a document accompanying the measuring instrument and on its packaging, if any, in accordance with point 9.2 of Annex I, if the manufacturer is not located in the EU (See article 10.3 of the MID).
  Manufacturer in this respect does not mean manufacturing site or country.
  Furthermore the data of the manufacturer and importer does not have to be together on the same plate or document.

b) Information in respect of its accuracy;

- Minimum measured quantity (MMQ);
- Accuracy class, typically this is stated on the data plate.

and, where applicable:

c) Information in respect of the conditions of use;

- Name or type of the liquid or its relevant characteristics, when an indication of the name or type of liquid is not sufficient to characterize the liquid, for example:
  - the ambient temperature range
  - the maximum pressure of the liquid[4];
  - the relevant viscosity range or class limited by the minimum viscosity of the liquid and the maximum viscosity of the liquid,
  - the density range limited by the minimum density of the liquid, ρ_{min}, and the maximum density of the liquid, ρ_{max}[5], if applicable.
- If different from the above mentioned ambient temperature range, the minimum temperature range of the measured liquid, T_{min} and the maximum temperature of the liquid, T_{max},
- Severity levels which correspond to the climatic, electrical, and mechanical environment conditions to which the measuring system is designed to be exposed (see Annex A of OIML R117-1, edition 2007) as specified in article 1.3.2.(a) and 1.3.3.(a) of Annex I of the MID, the M1 and E1are the minimal required severities levels but a manufacturer can specify wider limits
- Nominal value of the AC voltage supply and/or limits of DC voltage supply.

d) Measuring capacity;

- Not applicable

e) Measuring range;

- Flowrate range limited by the minimum flowrate, Qmin, and the maximum flowrate, Qmax.

f) Identity marking;

- Type, batch or serial number or other element allowing their identification.

g) Number of the EU-type examination certificate or the EU design examination certificate;

- In the case of the voluntary modular approach, the modules which have an Evaluation or Parts Certificate should be marked with the Evaluation or Parts Certificate number.

[4] See Annex VII (MI-005), article 1.2

[5] See Annex VII (MI-005), article 1.2 and OIML R117, 2007, article 2.3.1

h) *Information as to whether or not additional devices providing metrological results comply with the provisions of this Directive on legal metrological control.*
   - When critical in the case of direct sales, any ticket provided to the consumer by an ancillary device not complying with the appropriate requirements of this Directive shall bear appropriate restrictive information.

4.1.2 Article 10.2 of Annex I of the MID

The indication of any result shall be clear and unambiguous and accompanied by such marks and inscriptions necessary to inform the user of the significance of the result.

The scale interval for a measured value shall be in the form 1 × 10^n, 2 × 10^n, or 5 × 10^n, where n is any integer or zero. The unit of measurement or its symbol shall be shown close to the numerical value[6].

The units of measurement used, and their symbols shall be in accordance with the provisions of Union legislation on units of measurement and their symbols[7].

Typically, the units of measurements[8] used for Fuel dispensers are litres but in the case of LNG sometimes kilograms.

The name of the unit or its symbol shall appear in the immediate vicinity of the indication. Please note that Directive 80/181/EEC on units of measurements allows both the symbols L and l to be used for litre.

For mass, according to the case, the name of the unit or its symbol shall be accompanied by the term “mass” (actual mass) or “conventional mass” (comparison to weights).”

The use of the same display for the indications of quantities at metering conditions and converted indications is permitted provided that the nature of the displayed quantity is clearly identifiable[9].

When volume at base conditions is indicated, the result of measurement shall be accompanied with information with respect to the base conditions, for example:
“at 15 ºC” or “@15 °C”.

In the case of a fuel dispenser, it is not necessary to add the atmospheric pressure.

In the case of price calculation, the national monetary unit should be used for the price per unit and price to pay (Nothing to do with markings).

6 Article 9.5 of Annex I of the MID
7 Article 9.7 of Annex I of the MID
8 See also article 8 of Annex VII (MI-005) of the MID
9 See CT-005, 2010 Measuring system for the continuous and dynamic measurement for quantities of liquids other then water, OIML R 117-1, 2007 - 2004/22/EC MI-005

4.2 Information provided by the fuel dispenser

According to Article 8.3 of Annex I of the MID the software identification shall be easily provided by the measuring instrument[10].

- See WELMEC guide 7.2 for additional guidance regarding software identification, specifically concerning the conditions for the use of an imprint of the software identifier under certain conditions.

The software identification can either be permanently displayed or shown on demand, provided the TEC describes how to obtain this information.

In the case of software securing according to article 8.3 of Annex I of the MID, the measuring instrument should show evidence of an intervention.

- In case of an event counter the current count can be displayed on demand and can be compared with the initial value of the counter that was registered before putting the measuring instrument into use or at the last official verification respectively and is indelibly labelled on the instrument, with a mark of the manufacturer[11] and date,
- In case of an event logger the values can be displayed on demand,
- In case of a CRC to protect the software, the CRC value can be displayed on demand,

provided the TEC describes how to obtain this information.

note: although a CRC is enough to identify software, but it is common practice to provide both the version-number and CRC, making subsequent verification easier, by looking up the version reference in the TEC, then checking that the CRC is in correspondence.

[10] See WELMEC guide 7.2, Software Guide (Measuring Instruments Directive 2014/32/EU), for guidance on the software identifier and check of conformity, i.e. checksum or hash code and the presentation of these results, in particular the instrument specific annexes (Extension I) for liquids other than water of guide 7.2.

[11] See WELMEC guide 8.21, Directive 2004/22/EC common application, article 2.1

4.3 Information accompanying the fuel dispenser

According to Article 9.3 of Annex I of the MID the instrument shall be accompanied by information on its operation, unless the simplicity of the measuring instrument makes this unnecessary.

Information shall be easily understandable and shall include where relevant:

This means that the information is in a language easily understood by end-users and market surveillance authorities.

- *Rated operating conditions;*
- *Mechanical and electromagnetic environment classes;*
- *The upper and lower temperature limit, whether condensation is possible or not, open or closed location;*
- *Instructions for installation, maintenance, repairs, permissible adjustments;*
- *Instructions for correct operation and any special conditions of use;*
- *Conditions for compatibility with interfaces, sub-assemblies or measuring instruments.*

According to article 7.6 of Annex I of the MID *a measuring instrument shall be designed so as to allow the control of the measuring tasks after the instrument has been placed on the market and put into use.*

If necessary, special equipment or software for this control shall be provided by the manufacture.

- The functioning of the special equipment of software shall be described in the operation manual or a special brochure for owner/enforcers and referred to in the TEC.

4.4 Information required by the TEC

The TEC can also specify information to be inscribed on the instrument or which has to be provided by the instrument, for example but not limited to:

- Software version number and checksum[12] (may be on demand provided the TEC describes how to get this information, see also 4.2 of this guide[13])
- Evaluation or Parts Certificate numbers[14],
- Additional markings and inscriptions as specified by the TEC, Evaluation or Parts Certificate.

Typically, the following markings are placed on the parts:

- Producers name
- Serial number
- Certificate number, if applicable
- Relevant characteristics (e.g. minimum pressure), if applicable
- Special product names, if applicable (eg Ethanol, …)

Note:

- For the measurement transducer additional information (Q_{max}, Q_{min}, P_{max}) has to be indicated as given in R117-1, edition 2007, clause 3.1.1.1, if so required by the TEC;

- For the gas elimination device additional information (Q_{max}, P_{max}, P_{min}) has to be given as in R117-1, edition 2007, clause 2.10.7.2, if so required by the TEC;

- With respect to the Self Service Device (SSD) the connected fuel dispensers should be added to the inscriptions if so required by the TEC, (see 5.4).

A tool to facilitate the placing on the market or market surveillance of the measuring instrument is the data sheet that contains the technical characteristics of the fuel dispenser when it was placed on the market (first made available).

An example of a data sheet is given in chapter 5.3.

12 See WELMEC guide 7.2 , Software Guide (Measuring Instruments Directive 2014/32/EU), for guidance on the software identifier and check of conformity, i.e. checksum or hash code and the presentation of these results, in particular the instrument specific annexes (Extension I) of guide 7.2 for liquids other than water.

13 Article 8.3 of Annex I of the MID states that the software identification shall be easily provided by the measuring instrument.

14 See WELMEC guide 8.8 for guidance on the General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring Instruments

5 Example of markings and inscription

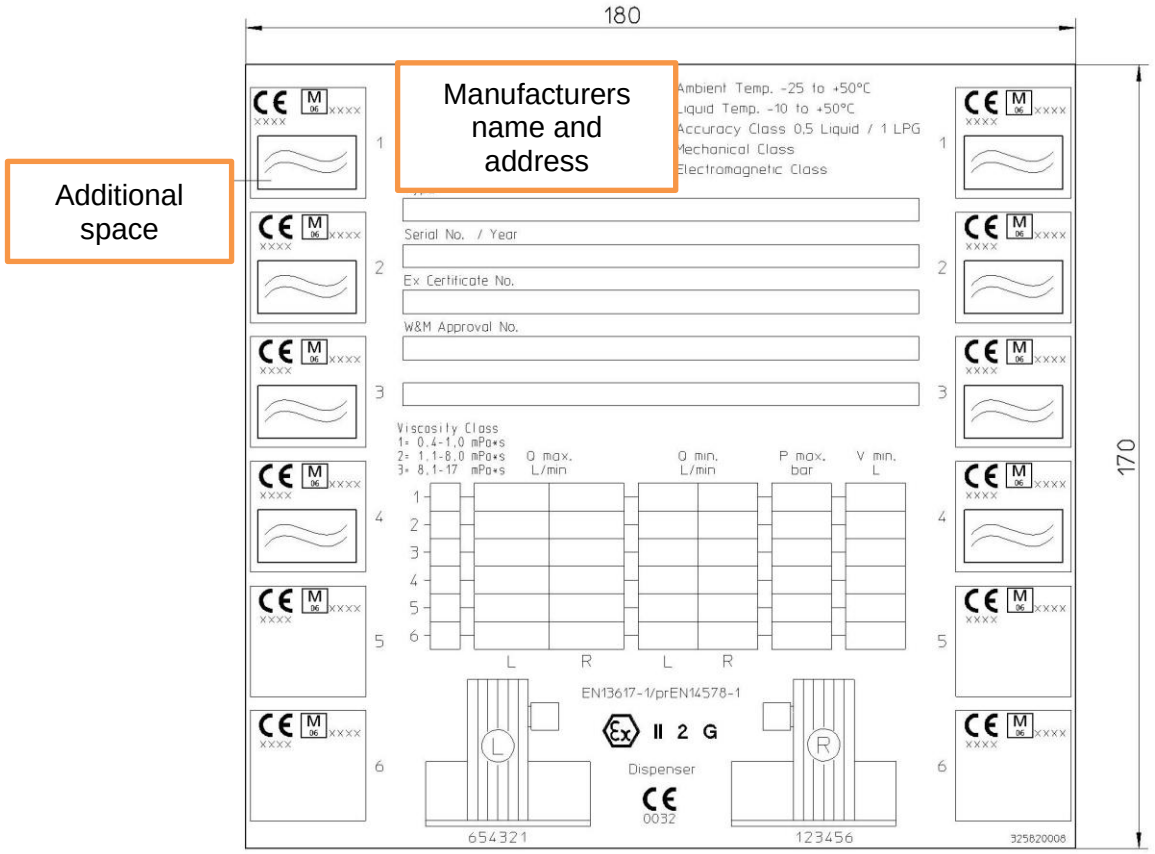
All marks and inscriptions required under any requirement shall be clear, non-erasable, unambiguous and non-transferable. It must also be indelible so that it cannot be removed under normal circumstances without leaving noticeable traces.

The markings and inscriptions can be placed on one or several data plates on a part not likely to be removed in normal conditions of use[15]. If appropriate, the terms ‘volume and L’ in these examples can be read as: ‘mass and kg’.

[15] See OIML R117-1, 2007, article 2.19.1, which according to the official journal of the European Union, 2011/C33/01, gives presumption of conformity in respect to article 9.1 of the MID.

5.1 On the instrument

This is only an example. Additional markings may be shown provided they cannot be confused or interfere with the metrologically relevant markings.



- Also postal address of the manufacturer shall be on the instrument;
- Also name, registered trade name or registered trade mark and the postal address of the importer shall be on the instrument if the instrument is imported,

see the relevant clauses of EU commission Blue Guide, rev 2016, and MID 2014/32/EU.

In this case, importer's identification plate shall be with same durability as manufacturer's plate, and affixed in the close vicinity of the manufacturer's plate.

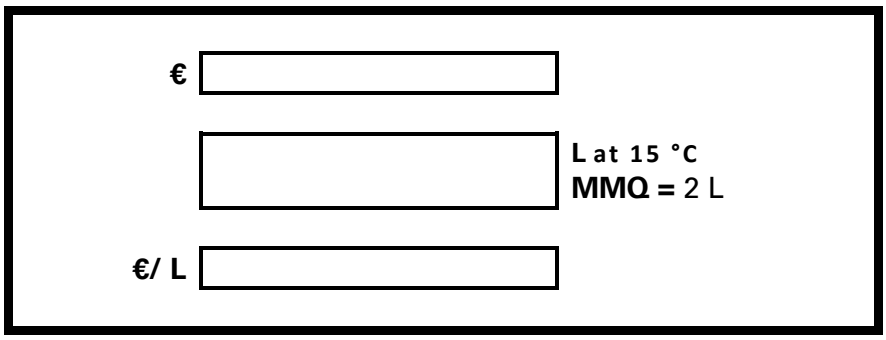
Note: Other European directives might require additional markings, however this is outside the scope of this document. For the example given above, several products are involved and therefore multiple DoCs need to be issued. This means that in the above given example each individual nozzle has its own CE M marking and therefore each of the nozzles should have a DoC covering the MID and all other applicable Directives, and 1 additional DoC for the whole product covering all relevant Directives (for example ATEX).

Additional space: *National legislation might require a place for the national markings, however this is outside the scope of this document*

5.2 Near the display

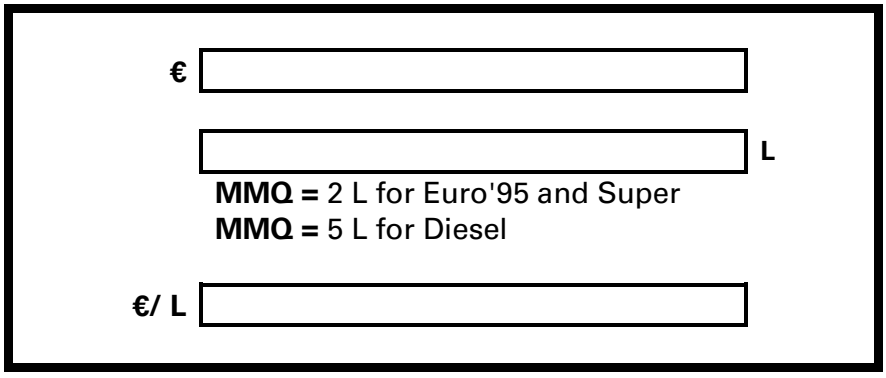
These are only examples.

In case volume at base conditions is indicated:



In case more than one MMQ is used, manufacturer might use one of the following options:

Option 1: Details of MMQ by fuel



Fuel names on dispenser dial might be adequately replaced with designative names according to Directive 2014/94/EU art 7 (EN 16942) regarding fuel identifications.
MMQ can also relate to nozzle position on dispenser when non-ambiguous.

Option 2: MMQ specific information can also be engraved/marked at nozzle position or on nozzle (or nozzle spout).

Important notes:

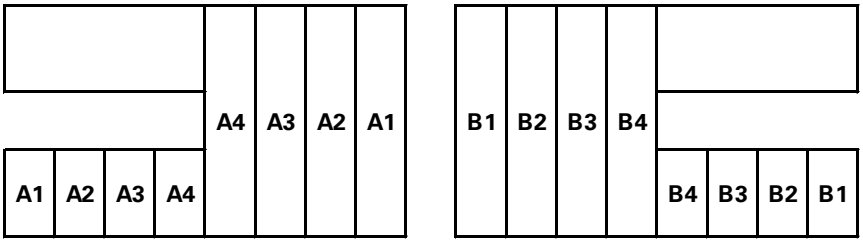
MMQ is used in the different countries according to the table below:

Language	Country Code	Description	Abbreviation	Remarks
Bulgarian	BG	Минимално измервано количество	MMQ	
Spanish	ES	Cantidad mínima medida	CMM	
Czech	CZ	Nejmenší odměr	MMQ	
Danish	DA	Mindste målte kvantum	MMQ	
Germany	DE	Kleinste Messmenge	MMQ	
Estonian	ET	Väikseim mõõdetav kogus	MMQ	
Greek	EL	Ελάχιστη μετρούμενη ποσότητα	ΕΜΠ	
English	EN	Minimum measured quantity	MMQ	
French	Fr	Quantité mesurée minimale	MMQ	
Croation	Hr	Najmanja izmjerena količina	MMQ	
Italian	It	Quantità minima misurata	QMM	
Latvian	LV	Minimālais mērāmais lielums	MML	
Lithuanian	LT	Mažiausias matuojamas kiekis	MMQ	
Hungarian	HU	Legkisebb mért mennyiség	MMQ	
Malta	MT	Kwantità minima mkejla	MMQ	
Dutch	NL	Kleinst gemeten hoeveelheid	MMQ	
Norway	NO	Minste tillatte målekvantum	MMQ	
Polish	PL	Dawka minimalna	Vmin	
Portuges	PT	Quantidade mínima medida	QMM	
Romanian	RO	Cantitate minimă măsurată	CMM	
Slovak	SK	Najmenší odmer	MMQ	found in article 2.4.1
Slovenian	SL	najmanjša količina merjenja	MMQ	found in article 2.4.1
Finish	Fi	Pienin mitattava määrä	PMM	
Swedish	SE	Minsta uppmätt mängd	MMQ	
Turkey	TR	Ölçülen Minimum Miktar	ÖMM	

5.3 Data sheet

This is only an example.

Data Sheet MPD Serial No.: 1234



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
	Type	Super+	Super+	Super+	Super+	Super+	Super+	Super+	Super+
	Test Report No.	TC3111	TC3111	TC3111	TC3111	TC3111	TC3111	TC3111	TC3111
	Serial No.	10	11	12	13	14	15	16	17
	Stamp / Sticker								
	Qmax [L/min]	130	130	130	130	130	130	130	130
	Qmin [L/min]	2	2	2	2	2	2	2	2
	Pmax [bar]	4	4	4	4	4	4	4	4
	Viscosity Class(e	1	1	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
	Type	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
	Serial No.	18	19	20	21	22	23	24	25
	Stamp / Sticker								
GAS ELIMINATION DEVICE									
	Manufacturer	Man#3	Man#3	Man#4	Man#4	Man#4	Man#4	Man#3	Man#3
	Type	ABC	ABC	DEF	DEF	DEF	DEF	ABC	ABC
	Test Report No.	TC3333	TC3333	TC3444	TC3444	TC3444	TC3444	TC3333	TC3333
	Serial No.	1	2	3	4	4	3	2	1
	Stamp / Sticker								
	Qmax [L/min]	65	65	100	100	100	100	65	65
	Qmin [L/min]	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
	Pmin [bar]	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	1
ELECTRONIC CALCULATOR / INDICATING DEVICE									
	Manufacturer	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
	Test Report No.	TC3456	TC3456	TC3456	TC3456	TC3456	TC3456	TC3456	TC3456
	Serial No.	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)

Note: viscosity classes are only needed on data sheet and plate if there are restrictions of use for certain instruments identified in the dispenser frame.

5.4 On the parts

If required by the TEC, EC or PC each component shall be marked with the information required by the certificate.

Typically, the following markings are placed on the parts:

- Producer's name
- Serial number
- Certificate number, if applicable
- Relevant characteristics (e.g. minimum pressure), if applicable
- Special product names, if applicable (e.g. Ethanol, …)

One needs to keep in mind that other directives (such as ATEX) might apply and require additional information, including additional CE marking and specific markings. However, this is outside the scope of this document, however manufacturers shall follow the relevant requirements of the applicable directives.

5.4.1 SSD marking

This is only an example of Marking on Self Service Devices:

Producer[16]	Name and address
Type	Chaplin
EC or PC No.	TC3999
Serial No.	332211
Dispensers served by SSD function	List of numbers of the dispensers: see note 1
	17

If a Self Service Device consists of more than one component, these markings are attached to its main component. On the other parts of the Self Service Device the EC or PC number is inscribed.

Note 1: This list can only be established at time of putting into use and might require adjustments during the in use time of the dispensers.

16 These markings are required under the MID as specified by the EC or PC. Other markings, such as manufacturers name and address might be required if the part is placed separately on the market. However, this guide does not cover markings necessary under other relevant European Directives, such as but not limited to the ATEX directive, the EMC directive and the low-voltage directive.

17 National legislation might require a place for the national markings, however this is outside the scope of this document.

Note 2: One needs to keep in mind that other directives (such as LV) might apply and require additional information, including additional CE marking and specific markings. Manufacturers shall follow relevant guidance for such applicable directives.
On SSD, such CE marking might connect to a different manufacturer (e.g.: when a computer is used to constitute a SSD system).
However additional information in the scope of other directives is outside the scope of this document,