

1. -----IND- 2018 0299 CZ- EN- ----- 20180711 --- --- PROJET

Executive summary for the European Commission (*not part of this legislation*)

instruments and systems measuring the flow volume of liquids other than water or liquefied gases - dispensers of the aqueous urea solution AdBlue, are placed on the market and put into use in the Czech Republic in accordance with Directive 2014/32/EU (the Measuring Instruments Directive – MID). Once they have been put into use, they become subject to national metrology regulation – verification at specified intervals. This notified legislation only applies to the verification of measuring instruments that have already been put into use. It does not concern placing them on the market or putting them into use.

The requirements imposed on these measuring instruments when in use are fully compatible with the MID and are also based on OIML Recommendation 117.

Some parameters listed in this document are properties of the measuring instruments when they are new; they are listed herein only because the preservation of these properties when the instruments are in use is subject to visual or other checks during verification.

(End of executive summary.)

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PUBLIC NOTICE

As the authority with substantive and territorial jurisdiction in the matter of laying down metrological and technical requirements for legally controlled measuring instruments and stipulating the testing methods for type approval and verification of legally controlled measuring instruments pursuant to § 14(1) of Act No 505/1990 on metrology, as amended (hereinafter referred to as the ‘Metrology Act’), and in accordance with the provisions of § 172 et seq. of Act No 500/2004, the Administrative Procedure Code (hereinafter referred to as the ‘APC’), the Czech Metrology Institute (hereinafter referred to as the ‘CMI’) commenced ex officio proceedings on 2 February 2017 pursuant to § 46 APC, and, on the basis of supporting documents, issues the following:

I.

DRAFT GENERAL MEASURE

number: 0111-OOP-C082-17

laying down the metrological and technical requirements for legally controlled measuring instruments, including testing methods for type approval and verification of the following legally controlled measuring instruments:

instruments and systems measuring the flow volume of liquids other than water or liquefied gases - dispensers of the aqueous urea solution AdBlue

This general measure stipulates the metrological and technical requirements for instruments and systems for measuring the flow volume of liquids other than water or liquefied gases, specifically AdBlue dispensers, that are applied after they are placed on the market or put into use during their verification. These requirements are in accordance with the requirements of Government Regulation No 120/2016 on the conformity assessment of measuring instruments when being placed on the market, as amended (hereinafter referred to as the ‘Government Regulation on measuring instruments’)¹.

For AdBlue dispensers with type approval under the Metrology Act, as amended effective up to 30 October 2006, i.e. prior to the transposition of Directive 2004/22/EC of the European Parliament and of the Council, as amended, into Czech law, verification is subject to the metrological requirements that were applicable when they were placed into circulation.

This general measure does not apply to instruments for measuring the flow of fuel, cryogenic liquids, compressed natural gas (CNG), liquefied mixtures of hydrocarbon gases (LPG) and windscreen washer fluid.

1 Basic definitions

For the purposes of this general measure, terms and definitions pursuant to VIM and VIML² as well as the terms and definitions stated below shall apply.

1.1 instruments and systems for measuring the flow volume of liquids other than water or liquefied gases

instruments for measuring the flow volume or weight of various liquids other than water and liquefied gases

1.2 dispenser of the aqueous urea solution AdBlue (hereinafter referred to as an ‘AdBlue dispenser’)

a measuring system for refilling AdBlue in vehicles with internal combustion engines using this technology

1.3 dispensing nozzle

a manually operated component of the dispenser that regulates the flow of liquid while it is being dispensed; it includes a nozzle and an automatic shut-off mechanism

¹ This government regulation implements 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.

² TNI 01 0115 International Vocabulary of Metrology – Basic and General Concepts and Associated Terms (VIM) and International Vocabulary of Legal Metrology (VIML) are part of the technical harmonisation compendium ‘Terminology in the field of metrology’, which is publicly available at www.unmz.cz.

1.4 interruptible measuring system

a measuring system can be considered interruptible if the flow of liquid can be easily and quickly stopped

1.5 commercial transaction

a contractual relationship where the result of measurement serves as a basis for the price to be paid and where one of the parties involved in the transaction related to the measurement is the customer and all parties accept the result of the measurement obtained at the given time and place

2 Metrological requirements

Metrological requirements are based on requirements of the Government Regulation on measuring instruments and on requirements of OIML R 117-1³.

During verification, measuring instruments are subject to the metrological requirements that were applicable when they were placed into circulation.

2.1 Rated operating conditions**2.1.1 Ambient temperature range**

AdBlue dispensers must work properly over a range of ambient temperatures specified by the manufacturer as the operating temperature range, which must be at least -10 °C to +55 °C.

2.1.2 Flow range

The flow range of a measuring system specified by the manufacturer must be within the limits of the flow range of each of its components, especially the flow meter.

[The minimum required flow ratio $Q_{\max}:Q_{\min}$ of an AdBlue dispenser is 4:1.

2.1.3 Measured liquid

The measured liquid must be specified by a name or type whose physical properties are specified and generally known, or must be specified directly by stating the range of relevant physical properties with which manufacturers supply these liquids, e.g. example density or viscosity range, temperature range, or pressure range.

2.2 Measuring range**2.2.1 Flow measurement range**

AdBlue dispensers must meet requirements for the maximum permissible error over the entire flow measurement range specified by the manufacturer.

2.2.2 Minimum measured quantity (*mmq*)

The minimum measured quantity of liquid, which the measuring system is intended to measure, is expressed in the form 1×10^n , 2×10^n or 5×10^n units of volume or weight, where n is a positive or negative whole number, or zero.

An AdBlue dispenser's minimum measured quantity must not be smaller than the largest of the minimum measured quantities of any of its components.

³ OIML R 117-1 'Dynamic measuring systems for liquids other than water. Part 1: Metrological and technical requirements' – publicly accessible at www.oiml.org

2.3 AdBlue dispenser accuracy classification

2.3.1 AdBlue dispenser accuracy class

For dispensing AdBlue, dispensers of accuracy class 0.5 are used, given by the maximum permissible error of the measurement system.

2.3.2 Maximum permissible errors

Table 1 states the maximum permissible errors for volumes of two litres or more.

Table 1 – Maximum permissible errors for $V \leq 2$ litres

---	Maximum permissible error
Measuring systems (A) (AdBlue dispensers)	0.5 %
Measuring instruments (B) (independent measuring instruments as components to be used in an AdBlue dispenser)	0.3 %

Table 2 states the maximum permissible errors for volumes less than two litres.

Table 2 – Maximum permissible errors for $V < 2$ litres

Measured volume V	Maximum permissible error
$V < 0.1$ L	$4 \times$ the value in Table 1 used for 0.1 L
$0.1 \text{ L} \geq V < 0.2$ L	$4 \times$ the value in Table 1
$0.2 \text{ L} \geq V < 0.4$ L	$2 \times$ the value in Table 1 used for 0.4 L
$0.4 \text{ L} \geq V < 1$ L	$2 \times$ the value in Table 1
$1 \text{ L} \geq V < 2$ L	the value in Table 1 used for 2 L

Regardless of the measured amount, the size of the maximum permissible error is the larger of the following two values:

- the absolute value of the maximum permissible error listed in Table 1 or Table 2,
- the absolute value of the maximum permissible error for the smallest measured quantity E_{\min} .

For the smallest measurements equal to two litres or more, the following conditions shall apply:

Condition 1: E_{\min} must meet the following condition: $E_{\min} \leq 2R$, where R is the smallest increment value on the indicator.

Condition 2: E_{\min} is given by the following formula: $E_{\min} = (2 \cdot mmq) \times (A/100)$, where mmq is the smallest dispensed amount, and A is the numerical value for measuring systems (A) in Table 1.

For the smallest dispensed amounts, less than two litres, condition 1 above applies, and E_{\min} equals double the value given in Table 2 for measuring systems (A) from Table 1.

For a measuring system and individual measuring instruments, the maximum permissible error must not be misused, nor may one of the parties be given a systematic advantage.

3 Technical requirements

Technical requirements are based on the requirements of the Government Regulation on measuring instruments and on the requirements of OIML R 117-1³.

During verification, measuring instruments are subject to the technical requirements that were applicable when they were placed into circulation.

3.1 AdBlue dispenser design

A measuring system that comprises an AdBlue dispenser shall consist of the following main components as a minimum:

- a flow meter;
- a counter;
- an indicator;
- a point of separation, usually the dispensing nozzle;
- a hydraulic circuit.

For proper operation, the following may need to be connected to the measuring system:

- a filter;
- a pump;
- a gas separator.

The measuring system may be equipped with other auxiliary and additional devices required for proper AdBlue dispenser operation.

3.2 AdBlue dispenser design requirements

Other auxiliary devices may be part of the dispenser or measuring instrument counter or they may be connected to the counter via an interface.

The dispenser may have its own supply of the measured liquid or it may be intended for installation into a central supply system. If the AdBlue dispenser has its own supply, a gas separator must be installed immediately in front of the measuring instrument inlet.

AdBlue dispensers must be equipped with a volume counter zeroing device.

If they also contain price counters, it must be possible to zero them.

Price and volume counter zeroing devices must be arranged so that the zeroing of one counter automatically leads to the zeroing of the other.

It must be impossible to zero the volume and price counter during the dispensing process.

It shall not be possible to start a new measurement until the counters have been reset to zero.

If the AdBlue dispenser has its own supply of the measured liquid powered by an electrical motor, it must be equipped with a device that, after the electrical motor stops, prevents any more AdBlue from being dispensed until the volume counter has been zeroed.

If only one nozzle can be used during the dispensing process and in order to finish said process, it must then be put back in the dispenser; subsequent dispensing must be suspended until the indicator has been zeroed.

If two or more nozzles can be used simultaneously or alternately, and then the nozzles must be replaced, subsequent dispensing must be suspended until the indicator has been zeroed.

The above requirements do not apply if an auxiliary hand pump is used.

If the measuring system is equipped with a printer, it must be connected to the volume counter zeroing device. This arrangement shall make it possible to check the printed delivery sheet by comparing it with the information on the counter. The amount displayed on the indicator must not change during printing.

AdBlue dispensers must be designed to allow interruptible activity.

In the event of a power cut, the electronic display shall continue running:

- continuously and automatically for at least 15 minutes after the main power supply fails, or
- for a total of at least 5 minutes in one or several phases controlled manually for one hour after the failure.

The AdBlue dispenser must be designed so that after a power cut of more than 15 seconds, interrupted dispensing cannot resume.

3.3 Self-service arrangement with AdBlue dispensers

Information provided by the dispenser must remain available to the parties involved in the sales transaction until it has been settled.

If a self-service arrangement is for two or more AdBlue dispensers, each one must have an identification number that is part of each piece of information provided by the self-service dispenser. In a self-service arrangement, the data on the indicator of the dispenser, the printer and the memory device display must be the same.

If data transmission between the dispenser and the self-service facility is in the form of impulses, all data provided by the self-service facility must not display any mutual differences for any measured value related to the same measurement. Data provided by the self-service facility must not differ from any of the pieces of information from the dispenser by more than one increment or by the greater of two increments, if different.

The printer in the self-service arrangement shall not reproduce information from the dispenser as the difference between two printed values.

The payment method and/or operating mode must not change prior to the end of the current measurement. The self-service arrangement, including conditions clearly specifying operating methods, must be designed so that the customer has access to at least one primary piece of information from the dispenser for the customer, at least until the end of the transaction, so that the customer can check the dispensed amount and price. If the self-service arrangement summarises dispensed volumes of liquid on an ongoing basis for various registered customers, the value of the increment used for these sums must not have an effect on the smallest measured quantity.

3.4 Attended service mode

If the measured information is displayed only on the dispenser indicator, this indicator must be labelled with information clearly visible to the customer to the effect that this dispenser may be made available only by the operator after the current sales transaction has been completed, and that in the case of a dispute, the information on the indicator is considered to be correct.

In attended service mode, the transaction shall be settled prior to the customer leaving the site of delivery. The measurement operation ends when the transaction has been settled.

3.5 Protection against unauthorised tampering

The AdBlue dispenser has the required number of places for official marks.

The dispenser is designed so that the measuring instrument or indicator cannot be tampered with in a way that could affect the accuracy of measurement without visible damage to an official mark.

4 Markings

4.1 Marking of the AdBlue dispenser

Each dispenser must have a special identification plate stating at least the following information:

- a) the manufacturer's name or trade mark;
- b) identification of the dispenser type;
- c) the serial number and year of production;
- d) the minimum flow Q_{\min} and maximum flow Q_{\max} ;
- e) the minimum (if needed) and maximum operating pressure;
- f) the smallest measured volume (V_{\min});
- g) the name or type of measured liquid, or the range of relevant characteristics;
- h) the minimum and maximum temperature of the measured liquid;
- i) the minimum and maximum ambient temperature;
- j) the mechanical and electromagnetic class of the ambient environment;
- k) the nominal AC and the limit DC voltage;
- l) the accuracy class;
- m) the number of the type approval certificate, if available, or indication of conformity;
- n) identification of the positions of individual dispensing locations.

This identification plate must be firmly affixed to the chassis of the AdBlue dispenser in a visible location and sealed.

All data on the AdBlue dispenser's identification plate must be legible.

4.2 Marking of AdBlue dispenser components

Each separate metrologically relevant component of a dispenser, such as the flow sensor, measurement converter, counter or gas separator must state at least (e.g. on another label) the following information:

- the serial number;
- the manufacturer's name or trade mark;
- the number of the type approval certificate, if available;
- other relevant characteristics for the specific device type.

All information on the label affixed to the component must be indelible, irremovable and legible.

4.3 Marking of the indicator

The indicator must contain the following information:

- 'litre(s)' or 'L', 'l' or 'dm³' after the indicated amount;
- the national currency unit (CZK) near the indication of the price to be paid;
- 'CZK/l', 'CZK/litre', or 'CZK/dm³' near the indication of the unit price;
- information regarding the minimum measured quantity.

5 Type approval of the measuring instrument

AdBlue dispensers are placed on the market and into use with a conformity assessment pursuant to the Government Regulation on measuring instruments¹, and are thus not subject to type approval.

6 Initial verification

AdBlue dispensers are placed on the market and into use with a conformity assessment pursuant to the Government Regulation on measuring instruments,¹ and are thus not subject to initial verification.

7 Subsequent verification

7.1 General

Subsequent verification shall consist of the following actions and tests:

- a) a visual inspection;
- b) an accuracy test;
- c) tests of auxiliary and additional devices.

For dispensers with several independent dispensing locations, all dispensing locations are tested separately, and these tests are evaluated individually. AdBlue dispensers with two ranges are first verified for the lower range and then the test is extended by a test of the highest achievable flow rate.

In the case of two flow sensors being installed in parallel, both flow sensors are first tested separately, and then a test of the entire system is conducted (parallel connection) at all three stipulated flow rates.

Dispensers with one hydraulic measuring part and several dispensing (satellite) locations will be tested according to a regular testing programme. Finally, a test at the maximum achievable flow rate will be performed from each other dispensing location (from each satellite dispensing nozzle).

AdBlue dispensers are tested with the liquid they are intended to measure.

7.2 Test equipment

Test equipment used to perform accuracy tests must have an extended uncertainty of measurement of less than 1/5 of the maximum permissible error pursuant to Article 2.3.2, Table 1.

7.3 Visual inspection

The following are assessed during the visual inspection of an AdBlue dispenser:

- whether the measuring instrument submitted for verification and its components conform to the approved type or with the design of a measuring instrument for which conformity has been declared as part of its placement on the market; attention must be paid when checking markings pursuant to Chapter 4;
- whether the measuring instrument and its components, including rubber hoses, are physically damaged or whether metal parts show signs of corrosion.

If the measuring instrument fails to meet visual inspection requirements, no further tests are performed.

7.4 AdBlue dispenser accuracy test

An accuracy test of a dispenser and its measuring instruments is performed using the volume method, by dispensing a specified amount of liquid into a standard graduated container at a specified flow rate.

Test flow rates are specified according to the following formulae:

$$Q_1 = (1 \text{ to } 1.1) \times Q_{\min},$$

$$Q_2 = (0.22 \text{ to } 0.28) \times Q_{\max},$$

$$Q_3 = (0.6 \text{ to } 1) \times Q_{\max}.$$

At each of the three test flow rates, measurement errors for the tested AdBlue dispenser are calculated.

The expanded volume determination uncertainty during measurement may not exceed 1/3 of the maximum permissible error specified in Article 2.3.2.

The amount of liquid used during the accuracy test must be at least 1 000 times the increment on the counter.

The dispenser has passed the accuracy test if none of the relative deviations of the indicated volume exceed the maximum permissible error listed in Article 2.3.2.

If all true measurement errors have the same sign, in order to meet the requirements of Article 2.3.2, at least one of the measurement errors at a typical flow rate between $0.25 Q_{\max}$ and Q_{\max} must be less than half the maximum permissible error.

7.5 Tests of auxiliary and additional devices

The correct functioning of auxiliary and additional devices is checked, if the dispenser is equipped with them. The relevant test is to be conducted only once. Tests of auxiliary and additional devices may be combined with the accuracy test. The following tests are performed if relevant to the dispenser and the device is used to fulfil contractual obligations.

7.5.1 Zeroing test

The volume counter values and, if applicable, the price values are read after the dispenser has been zeroed.

The residual indication after zeroing shall not be greater than half the minimum specified volume deviation E_{\min} for counters with continuous display.

Counters with discontinuous display shall indicate zero after having been zeroed, without any ambiguity.

7.5.2 Aggregate counter test

The difference between the figure on the aggregate counter and the figure on the indicator that applies to the same measurement is specified. The indication of the aggregate counter is determined as the difference between the initial and final values.

The difference between these figures must not be more than one increment of the aggregate counter.

7.5.3 Price counter test

For dispensers with a mechanical counter, the test must be performed for at least two unit prices at maximum and minimum counter rotation rates.

For dispensers with an electronic counter, the test is performed for a maximum unit price. The price indicated is compared to the price calculated as the product of the indicated volume and the unit price.

During dispenser verification, the test is performed only for the unit price currently in use.

The difference between the price displayed and the price calculated from the unit price and the indicated amount must not be greater than the price corresponding to E_{\min} .

7.5.4 Additional volume counter test

Figures indicated by additional volume counters are compared with figures on the indicator that apply to the same measurement.

The figures must not differ from each other by more than one increment of the scale that is the largest of the increments of scales of devices being compared.

7.5.5 Pre-set test

A measurement is made using a pre-set volume or price and the difference between the pre-set quantity and the quantity indicated by the volume or price indicator at the end of the measurement is determined.

For measuring instruments in pre-pay or pre-order mode, this difference must not exceed the smallest specified volume deviation E_{\min} or price corresponding to this deviation.

7.5.6 Self-service facility test

A measurement is made using the self-service facility and the difference between the pre-set quantity and the quantity indicated by the volume or price counter at the end of the measurement is determined.

The results must not differ from each other. For measuring instruments in prepaid or pre-ordered mode, pre-set requirements also apply to the self-service facility.

7.5.7 Printer test

Figures from the printer are compared with figures on the indicator that apply to the same measurement.

These figures must not differ from each other by more than one increment of the indicator.

8 Examination of the measuring instrument

When examining measuring instruments pursuant to § 11a of the Metrology Act at the request of a person who may be affected by an incorrect measuring instrument, please proceed according to Chapter 7; the last sentence of Article 7.3 shall not apply. Two times the maximum permissible errors pursuant to Chapter 7 shall be applied as the maximum permissible error.

9 Notified standards

For the purposes of specifying the metrological and technical requirements for measuring instruments and specifying the testing methods for their type approval and verification stemming from this general measure, the CMI shall notify Czech technical standards, other technical standards or technical documents of international or foreign organisations, or other technical documents containing more detailed technical requirements (hereinafter referred to as ‘notified standards’). The CMI shall publish a list of these notified standards attached to the relevant measures, together with the general measure, in a manner accessible to the public (on www.cmi.cz).

Compliance with notified standards or parts thereof is considered, to the extent and under the conditions stipulated by a general measure, to be compliance with the requirements stipulated by this measure to which these standards or parts thereof apply.

Compliance with notified standards is one way of demonstrating compliance with the requirements. These requirements may also be met by using another technical solution guaranteeing an equivalent or higher level of protection of legitimate interests.

II.**G R O U N D S**

The CMI issues, pursuant to § 14(1)(j) of the Metrology Act, for the implementation §§ 6(2), 9(1) and (9) as well as 11a(3) of the Metrology Act, this general measure laying down the metrological and technical requirements for legally controlled and testing methods for verification of the following legally controlled measuring instruments: instruments and systems for measuring the flow volume of liquids other than water or liquefied gases – dispensers of the aqueous urea solution AdBlue.

Implementing Decree No 345/2002 specifying measuring instruments for mandatory verification and measuring instruments subject to type approval, as amended, classifies the measuring instruments under item 1.3.12 in the annex entitled 'List of legally controlled measuring instruments' as measuring instruments subject to type approval and mandatory verification.

This legislation (general measure) will be notified in accordance with Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services.

III. INSTRUCTIONS

In accordance with § 172(1), in conjunction with § 39(1) APC, the CMI has stipulated a time limit for comments of 30 days as of the date of posting on the official notice board. Comments submitted after this time limit will not be considered.

The persons concerned are hereby invited to comment on this draft general measure. With a view to the provisions of § 172(4) APC, the comments shall be submitted in writing and meet the requirements for submissions in accordance with § 37 APC.

The comments shall include the particulars referred to in § 37(2) APC and clearly state the following: who is making the comments; which general measure they concern; to what extent the comments challenge the measure; how the general measure runs contrary to legislation or how the general measure or the procedure that preceded it is inaccurate; which matters the comments concern and what is being proposed. Said comments must also identify the administrative authority to which they are addressed and be signed by the person making them.

The supporting documents for this draft general measure may be consulted at the Czech Metrology Institute, Legal Metrology Department, Okružní 31, 638 00 Brno, after making arrangements by telephone.

This general measure shall be posted for 15 days.

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Pavel Klenovský
Director-General

Person responsible for accuracy: Tomáš Hendrych

Posted on: 12 April 2018

Signature of the authorised person confirming posting:

Removed on:

Signature of the authorised person confirming removal: