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NOTE

From:	General Secretariat of the Council
To:	Permanent Representatives Committee
Subject:	Proposal for a Directive of the European Parliament and of the Council amending Directive 2014/32/EU as regards electric vehicle supply equipment, compressed gas dispensers, and electricity, gas and thermal energy meters - Analysis of the final compromise text with a view to agreement

I. INTRODUCTION

1. On 29 November 2024, the Commission submitted to the Council and the European Parliament a proposal for a Directive of the European Parliament and of the Council amending Directive 2014/32/EU as regards electric vehicle supply equipment, compressed gas dispensers, and electricity, gas and thermal energy meters. The proposal aims to address the shortcomings identified in the existing legislative framework by covering new measuring instruments such as electric vehicle supply equipment and compressed gas dispensers.

2. The draft Directive is based on Article 114 of the Treaty on the Functioning of the European Union (TFEU) (ordinary legislative procedure).

3. The European Economic and Social Committee (EESC) delivered its opinion on 22 January 2025[1]. In its opinion, the EESC unreservedly endorsed the proposal.

4. In the European Parliament, the Committee on Internal Market and Consumer Protection (IMCO) has the lead responsibility. Zala Tomašič (SI) (EPP) was appointed as rapporteur. The vote on the draft report took place at the meeting of the IMCO Committee on 25 September 2025 and the European Parliament endorsed the Committee decision at its first plenary meeting in October 2025, with a view to start interinstitutional negotiations.

5. The Permanent Representatives Committee adopted the Council's mandate on 8 October 2025.

6. The interinstitutional negotiations started with an exchange of letter between the Presidency and the IMCO Committee of the European Parliament. In this exchange of letters, both co-legislators confirmed their readiness to enter into interinstitutional negotiations. In total, 5 interinstitutional technical meetings were held.

7. The co-legislators reached a provisional agreement on a comprehensive compromise text at the interinstitutional meeting on 18 November 2025 November. The Presidency reported on the outcome of this meeting to the Permanent Representatives Committee on 21 November 2025.

8. The main elements of the compromise text are set out below. The Presidency believes that the overall compromise reached with the European Parliament is balanced.

II. ANALYSIS OF THE FINAL COMPROMISE TEXT WITH A VIEW TO AGREEMENT

9. The compromise text sets the deadline of 24 months for Member States to transpose the requirements from the amending Directive into their national law. The date of application of these national provisions has been established in 30 months following the entry into force of the amending Directive.

[1] ST 12833/25 COR1.

10. The co-legislators agreed to provide for a transitional period of 48 months following the entry into force of the amending Directive as regards the two new annexes on EVSE and compressed gas dispensers. During this period, EVSE and compressed gas dispensers may continue to be placed on the market in accordance with national law. For other measuring instruments, that are already covered by the scope of Directive 2014/32/EU, a shorter transitional period will apply, aligned to the Directive's application date (30 months following the entry into force of the amending Directive).

11. With a view to avoid delays in the rollout of measuring instruments once the new requirements start to apply, co-legislators agreed on the possibility to notify conformity assessment bodies in accordance with the new requirements prior to the date of application of the national rules transposing the amending Directive. These notified bodies are therefore, entitled to carry out conformity assessments and issue certificates for the measuring instruments defined in the instrument-specific Annexes II, III and V to the amending Directive before the date of application.

III. CONCLUSION

12. In light of the above, the Permanent Representatives Committee is invited to:

- approve the compromise text set out in the Annex, and
- instruct the Presidency to send a letter to the Chair of the IMCO Committee of the European Parliament confirming that, should the latter adopt its position at first reading, in accordance with Article 294(3) TFEU and in the exact form set out in the Annex — subject to legal-linguistic finalisation — the Council would approve, in accordance with Article 294(4) TFEU, the position of the European Parliament and the act would be adopted in the wording corresponding to the position of the European Parliament.

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ANNEX

PE-CONS No/YY - 2024/0311(COD)

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DIRECTIVE (EU) 2025/...
OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of …

amending Directive 2014/32/EU as regards electric vehicle supply equipment, compressed gas dispensers, and electricity, gas and thermal energy meters

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 114 thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national Parliaments,

Having regard to the opinion of the European Economic and Social Committee[2],

Acting in accordance with the ordinary legislative procedure,

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[2] OJ C, C/2025/1192, 21.3.2025, ELI: http://data.europa.eu/eli/C/2025/1192/oj.

Whereas:

(1) One of the objectives of Directive 2014/32/EU of the European Parliament and of the Council[3] on measuring instruments is to guarantee the proper functioning of the internal market. Pursuant to Article 6 of Directive 2014/32/EU, measuring instruments falling within the scope of that Directive are to meet the essential requirements set out in Annex I and in the relevant instrument-specific Annexes.

(2) The scope and the associated essential requirements covered by Directive 2014/32/EU were ▌ established by Directive 2004/22/EC[4], of which Directive 2014/32/EU is a recast. ***Technical requirements*** have remained unchanged for more than 20 years. In the meantime, new measuring instruments have appeared on the market that are not covered by Directive 2014/32/EU. That is notably the case for electric vehicle supply equipment and compressed gas dispensers, which are important for the successful rollout of clean mobility. Moreover, Directive 2014/32/EU does not cover ***requirements for*** thermal energy meters for cooling applications. In addition, as far as electricity and gas meters are concerned, Directive 2014/32/EU ***is*** neither ***adapted to*** the use of ***direct current,*** hydrogen and other gases that can be used as alternatives to more traditional gases, nor enables to take full advantage of smart metering which plays an important role in achieving the Union climate objectives. Therefore, it is appropriate to amend ***in a targeted way*** the scope of Directive 2014/32/EU and the essential requirements set out in the Annexes to that Directive in order to take into account technological progress. ***The placing on the market of measuring instruments should be further addressed in a systematic and comprehensive way through a general revision of Directive 2014/32/EU, including Annex I and instrument specific annexes, such as water meters, to adapt the current EU framework to the technological developments.***

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[3] 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 (OJ L 96, 29.3.2014, p. 149, ELI: http://data.europa.eu/eli/dir/2014/32/oj).

[4] Directive 2004/22/EC of the European Parliament and of the Council of 31 March 2004 on measuring instruments (OJ L 135, 30.4.2004, p. 1, ELI: http://data.europa.eu/eli/dir/2004/22/oj).

(3) Annexes I, IV, V and VI to Directive 2014/32/EU are no longer technology neutral as they do not provide essential requirements corresponding to new technologies, which provide improved protection to consumers, and should thus be amended.

(4) Annex I to Directive 2014/32/EU should be amended in order to take into account the roll out of smart gas and electricity meters and the new measuring instruments covered by the new instrument-specific Annexes.

(5) Annex IV to Directive 2014/32/EU should be amended to take into account the growing use of hydrogen and other ***fuel*** gases that can be used as alternatives to more traditional ***fuel*** gases and the ***roll-out*** of smart gas meters.

(6) Annex V to Directive 2014/32/EU should be amended to take account of the rollout of smart electricity meters ***and to fit with the applications using direct current***.

(7) A new Annex Va to Directive 2014/32/EU should be inserted in order to address the need for harmonised essential requirements with regard to measuring systems for electric vehicle supply equipment***, irrespective of their intended application, while ensuring that no retrofitting obligations are imposed on existing charging stations***.

(8) Annex VI to Directive 2014/32/EU should be amended to include thermal energy meters for cooling applications in order to avoid additional certification of such products at national level.

(9) The increased use of compressed gases, such as hydrogen and natural gas**,** requires the insertion of a new Annex VIIa to Directive 2014/32/EU on measuring systems for compressed gas dispensers***, while ensuring that no retrofitting obligations are imposed on existing compressed gas dispensers***.

(10) Since the objective of this Directive, namely to ensure that measuring instruments on the market fulfil the requirements providing for a high level of protection of the public interests covered by this Directive while guaranteeing the functioning of the internal market, cannot be sufficiently achieved by the Member States but can rather, by reason of its scale and effects, be better achieved at Union level, the Union may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty on European Union. In accordance with the principle of proportionality, as set out in that

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Article, this Directive does not go beyond what is necessary in order to achieve that objective.

(11) In order to enable ***economic operators*** to supply stock of measuring instruments that ***are in conformity with*** Directive ***2014/32/EU***, it is necessary to provide for reasonable transitional arrangements that allow the making available on the market and putting into use of measuring instruments that have already been placed on the market in accordance with Directive 2014/32/EU before the date of application of the national measures transposing this Directive. ***Furthermore, specific transitional arrangements should be put in place to allow economic operators to prepare for the application of the harmonised requirements regarding electric vehicle supply equipment and compressed gas dispensers.***

(11a) In order to avoid any delay in the rollout of measuring instruments after the date of application of this amending Directive, it is important that, by the date of application of this amending Directive, a sufficient number of conformity assessment bodies is notified in accordance with the new requirements and is entitled to carry out conformity assessments. For the same reason such notified bodies should be able to issue certificates for the measuring instruments defined in the instrument-specific Annexes II, III and V to this amending Directive by the date of application of this amending Directive.

(12) Moreover, in order to provide sufficient time for manufacturers to adapt their products to the essential requirements set out in the Annexes to this Directive, it is also necessary to provide for reasonable transitional arrangements that allow the making available on the market and putting into use of measuring instruments that have been placed on the market in accordance with national certificates or for which a certificate was issued under Directive 2014/32/EU before the date of application of the national measures transposing this Directive, and that will fall in the scope of Directive 2014/32/EU as of the date of entry into force of this Directive.

(13) Directive 2014/32/EU should therefore be amended accordingly,

HAVE ADOPTED THIS DIRECTIVE:

Article 1

Directive 2014/32/EU is amended as follows:

(1) in Article 2, paragraph 1 is replaced by the following:

‘1. This Directive applies to the measuring instruments defined in the instrument-specific Annexes III to XII (‘instrument-specific Annexes’) concerning water meters (MI-001), gas meters and conversion devices (MI-002), active electrical energy meters (MI-003), measuring systems for electric vehicle supply equipment (MI-***011***), thermal energy meters (MI-004), measuring systems for continuous and dynamic measurement of quantities of liquids other than water (MI-005), measuring systems for compressed gas dispensers (MI-***012***), automatic weighing instruments (MI-006), taximeters (MI-007), material measures (MI-008), dimensional measuring instruments (MI-009) and exhaust gas analysers (MI-010).’;

(2) Annex I is amended in accordance with Annex I to this Directive;

(3) Annex IV is amended in accordance with Annex II to this Directive;

(4) Annex V is amended in accordance with Annex III to this Directive;

(5) Annex Va is inserted as set out in Annex IV to this Directive;

(6) Annex VI is amended in accordance with Annex V to this Directive;

(7) Annex VIIa is inserted as set out in Annex VI to this Directive.

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Article 2

1. By way of derogation from Article 7(2) of Directive 2014/32/EU, Member States shall not impede the making available on the market and putting into use of measuring instruments that are in conformity with ***that*** Directive ▌ on **...** [OP please insert the date = the date of 1 day before of entry into force of this ***amending*** Directive], and that have been placed on the market before **...** [OP please insert the date = ***30*** months ▌ after the date of entry into force of this ***amending*** Directive].

1a. By way of derogation from Article 7(2) of Directive 2014/32/EU, Member States shall not impede the making available on the market and putting into use of measuring instruments defined in Annexes Va and VIIa of that Directive, as amended on ... [OP please insert the date = the date of entry into force of this amending Directive], that are in conformity with national regulation of a Member State and that have been placed on the market before ... [OP please insert the date = 48 months after the date of entry into force of this amending Directive].

2. By way of derogation from Article 7(2) of Directive 2014/32/EU, certificates ▌ covering measuring instruments that fall ***within*** the scope of Directive 2014/32/EU***, as amended on ...*** [OP please insert the date = date of entry into force of this ***amending Directive] whether these are issued nationally or under*** Directive ***2014/32/EU,*** before **...** [OP please insert the date = date of ***application*** of this ***amending*** Directive], shall remain valid until the expiry of their validity, and in any case no longer than until **...** [OP please insert the date = 12 years from the date of entry into force of this ***amending*** Directive].

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Article 3

1. Member States shall adopt and publish, by **...** [Note to PO: insert exact date – ***24*** months after entry into force of this Directive] ▌, the laws, regulations and administrative provisions necessary to comply with this Directive. They shall forthwith communicate to the Commission the text of those provisions.

   They shall apply those provisions from **...** [Note to PO: insert exact date – ***30*** months after entry into force of this Directive].

   When Member States adopt those provisions, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

2. Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive.

Article 3a

By way of derogation from Directive 2014/32/EU, conformity assessment bodies which comply with that Directive, as amended on [date of entry into force of this amending Directive], may be notified prior to [date of application of this amending Directive]. Notified bodies which are notified in accordance with that Directive, as amended on [date of entry into force of this amending Directive], may carry out the conformity assessment procedures laid down in that Directive, as amended on [date of entry into force of this amending Directive] and issue certificates for measuring instruments defined in the instrument-specific Annexes II, III and V to this amending Directive in accordance with that Directive as amended on [date of entry into force of this amending Directive] prior to [date of application of this amending Directive].

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Article 4

This Directive shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

Article 5

This Directive is addressed to the Member States.

Done at ...,

For the European Parliament
The President

For the Council
The President

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ANNEX I

Annex I to Directive 2014/32/EU is amended as follows:

(1) in part 'DEFINITIONS', in the ***table,*** seventh row, ***second column, third indent*** is replaced by the following:

▌

– ***all the parties in the transaction accept the measurement result at that time and place; for measuring systems for compressed gas dispensers and for measuring systems for electric vehicle supply equipment,*** all the parties in the transaction accept the measurement result at the time the measurement is concluded***,***';

(2) point 10.2. is replaced by the following:

'10.2. 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. Easy reading of the presented result shall be permitted under normal conditions of use. Additional indications may be shown provided they cannot be confused with the metrologically controlled indications.

For gas and electricity meters, measuring systems for electric vehicle supply equipment ('EVSE') and measuring systems for compressed gas dispensers the indication of any result shall also be protected against accidental deletion or modification,';

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(3) the following points ▌ are added:

'10.6. By way of derogation from points 10.1. and 10.5., for gas ***meters*** and electricity meters, ▌ the following shall apply:

Indication of the measurement result and other data relevant to that result shall ***be accessible without tools by*** one or more of the following ***means***:

(a) ▌ a metrologically controlled ***local*** display, ***print or record***;

(b) ▌ a remote display ▌ .

By way of derogation from points 10.1. and 10.5., for measuring systems for electric vehicle supply equipment ('EVSE') and measuring systems for compressed gas dispensers, the following shall apply:

Indication of the measurement result and other data relevant to this result shall be accessible without tools by one or more of the following means:

(a) a metrologically controlled local display, print or record;

(b) a remote display;

(c) a device of the consumer or end-user.

The presented ***measurement result*** shall be traceable to the measuring instrument under metrological control. Security measures shall provide evidence of tampering.

The ***presented*** measurement result ▌ shall serve as the basis for the price to pay, ***if*** applicable.'

▌

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ANNEX II

Annex IV to Directive 2014/32/EU is amended as follows:

(1) the title is replaced by the following:

'GAS METERS AND CONVERSION DEVICES (MI-002)';

(2) the first paragraph is replaced by the following:

'The relevant requirements of Annex I, the specific requirements of this Annex and the conformity assessment procedures listed in this Annex apply to gas meters and conversion devices defined in this Annex, intended for residential, commercial and light industrial use.';

(3) in part 'DEFINITIONS', the table is amended as follows:

(a) in the first row, the ***wording in the second column*** is replaced by the following:

'An instrument designed to measure ***and to ensure the memorisation*** and display ***of*** the quantity of fuel gas (volume or mass) ▌ that has passed ***through it and, if applicable, the quantity of its energy***.';

(b) in the second row, ***the wording in the*** first column ▌ is replaced by the following:

'Volume conversion device;';

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(c) the following rows are added:

‘▌ Gas calorific value determining device	An ▌ instrument ***connected to or integrated in the energy conversion device*** for determining the calorific value of gas that has passed ***through*** it.
Energy conversion device	A device ***that converts the quantity measured to*** energy using the mass or the volume at base conditions, and the ***superior/gross*** calorific value.
Superior/gross calorific value	Amount of heat that would be released by the complete combustion with oxygen of a specified quantity of gas, in such a way that the pressure, p1, at which the reaction takes place remains constant, and all the products of combustion are returned to the same specified temperature, t1, equal to that of the reactants, all of those products being in the gaseous state except for water, which is condensed to the liquid state at t1.’;

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(4) Part I is amended as follows:

(a) point 1.1. is replaced by the following:

'The flowrate range of the gas shall fulfil at least the following conditions:

Class	Qmax/Qmin	Qmax/Qt	Qr/Qmax
1,5	≥ 150	≥ 10	1,2
1,0	≥ 10	≥ 5	1,2

If a gas meter has multiple gas application-dependent flow rate ranges, ***such flow rate ranges*** shall be inscribed on the meter, accompanied by a clear description of the gas application.';

(b) ***in point 3.1.1.,*** the introductory sentence ▌ is replaced by the following:

'The effect of an electromagnetic disturbance on a gas meter, conversion device or gas calorific value determining device shall be such that:';

(c) in point 6, the following paragraph is added:

"Quantity of energy shall be displayed in joules or in watt-hours ***or their decimal multiples***.';

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(5) Part II is amended as follows:

(a) the title is replaced by the following:

‘SPECIFIC REQUIREMENTS

CONVERSION DEVICES’;

(b) the first ***and*** second ***paragraphs*** are replaced by the following:

‘A conversion device constitutes a sub-assembly when it is together with a measuring instrument with which it is compatible.

For a conversion device, the essential requirements for the gas meter shall apply, if applicable. ***In addition, the following requirements shall apply:’;***

(c) point 8 is amended as follows:

(i) the title is replaced by the following:

‘MPE for volume ***conversion*** devices;’;

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(ii) the note to point 8 is replaced by the following:

'Note:

The errors of the gas meter and, if applicable, of the gas calorific value determining device are not taken into account.

The conversion device shall not exploit the MPEs or systematically favour any party.';

(ca) the following point is inserted:

'8a. MPE for energy conversion devices

The MPE of the conversion calculation of energy is equal to 0,05 %.';

(6) the following Part IIa is inserted:

'PART IIa

SPECIFIC REQUIREMENTS

GAS CALORIFIC VALUE DETERMINING DEVICES

A gas calorific value determining device ***sends, locally or remotely, signals to the energy conversion device.***

For a gas calorific value determining device, the essential requirements for the gas meter shall apply, where applicable. In addition, the following requirements shall apply:

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9a. Base conditions for converted quantities

The manufacturer shall specify the following:

– the range for gas chemical composition;

– the base conditions for calorific value and converted quantities.

9b. MPE

Class	0,5	1,0
MPE	0,5 %	***1,0*** %

The gas calorific value determining device shall not exploit the MPEs or systematically favour any party.

9c. Permissible effect of disturbances

The critical change value is the greater of the two following values:

– one fifth of the magnitude of the MPE for the calorific value;

– two scale intervals of the gas calorific value determining device.

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9d. Durability

After an appropriate test, taking into account the period of time estimated by the manufacturer, has been performed, the following two criteria shall be satisfied:

– the variation of the measurement result after the durability test when compared with the initial measurement result shall not exceed half of the magnitude of the MPE; ***and***

– the error of indication after the durability test shall not exceed the MPE.

9e. Suitability

A gas calorific value determining device shall be capable of detecting when it is operating outside the operating ranges stated by the manufacturer for parameters that shall be registered for measurement accuracy. In such a case, the gas calorific value determining device shall register the following:

(a) that the gas calorific value is not relevant;

(b) that the gas calorific value determining device operates outside the operating range.

9f. Units

Calorific value shall be displayed in joules and/or watt-hours***, or their decimal multiples,*** per unit of mass or volume at base conditions.’.

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ANNEX III

Annex V to Directive 2014/32/EU is amended as follows:

(1) in part ‘DEFINITIONS’, the introductory sentence is replaced by the following:

‘An active electrical energy meter is an instrument ***designed to measure and to ensure the memorisation and display of*** the active electrical energy consumed in a circuit or transferred between circuits.’;

(2) in part ‘DEFINITIONS’, in the table, ***row three and four, and*** the last three rows are replaced by the following:

‘Ist	**=**	***the lowest declared value of I at which the meter registers active electrical energy, and, for AC, at unity power factor (polyphase measuring systems with balanced load);***
Imin	**=**	***the value of I above which the error lies within maximum permissible errors (MPEs) (for AC, polyphase meters measuring systems with balanced load);***
▌f	=	the frequency of the voltage supplied to the meter, for alternating current (‘AC’) electrical energy meters;
fn	=	the specified reference frequency, for AC electrical energy meters;
PF	=	power factor = cosφ = the cosine of the phase difference φ between I and U, for AC electrical energy meters.’;

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(3) in point 2, the last two paragraphs are replaced by the following:

'The operating ranges within which the meter shall satisfy the MPE requirements are specified in Table 2.

For AC electrical energy meters, the voltage, frequency and power factor ranges shall be:

– $0{,}9 \cdot U_n \leq U \leq 1{,}1 \cdot U_n$;

– $0{,}98 \cdot f_n \leq f \leq 1{,}02 \cdot f_n$;

– 0,5 inductive ≤ PF ≤1 and 0,8 capacitive ≤ PF ≤1.

For direct current ('DC') electrical energy meters, the voltage range shall be between the lowest and the highest ▌ voltage ***that can be measured by the meter***.';

(4) in point 3, the second paragraph is replaced by the following:

'When the meter is operating within rated operating conditions, the percentage errors shall not exceed the limits given in Table 2.';

(4a) in table 2, in the fifth row, the wording 'Single phase meter; polyphase meter if operating with balanced loads' is replaced by 'Single phase meter; polyphase meter if operating with balanced loads; DC electrical energy meter';

(5) in Table 2, in the third row, fifth column, the wording '– 40 °C … – 25 °C or + 55 °C … + 70 °C' is replaced by the following:

'below – 25 °C or above + 55 °C';

(6) in point 4.1., ***first and*** second ▌ paragraphs are replaced by the following:

'As electrical energy meters are directly connected to the electrical supply and as current is also one of the measurands, a special electromagnetic environment is used for electrical energy meters.

The meter shall comply with the electromagnetic environment E2 for AC electrical energy meters and ▌ DC electrical energy meters, as well as with the additional requirements ***set out*** in points 4.2. and 4.3.'***;***

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▌

(7) point 4.2. is amended as follows:

(a) in the fifth row, first column, of Table 3, the wording 'Harmonic contents in the current circuits (^{2})' is replaced by the following:

'Harmonic contents in the current circuits (^{2}), for ***AC*** electrical energy meters**'**;

(b) in the sixth row, first column, of Table 3, the wording 'DC and harmonics in the current circuit (^{2})' is replaced by the following:

'DC and harmonics in the current circuit (^{2}), for ***AC*** electrical energy meters**'**;

(ba) in the third row, first column, of Table 3, the wording 'Reversed phase sequence' is replaced by the following:

'Reversed phase sequence, for AC electrical energy meters';

(8) points 5.4. and 5.5. are replaced by the following:

'5.4. Running with no load

When the voltage is applied without any current flowing in the current circuit, the meter shall not register any energy.

5.5. Starting

The meter shall start and continue to register at a rate of change of energy equal to the product of the smallest voltage within the rated operating conditions and I_{st}.'.

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ANNEX IV

‘ANNEX Va

MEASURING SYSTEMS FOR ELECTRIC VEHICLE SUPPLY EQUIPMENT (MI-***011***)

The relevant requirements of Annex I, the specific requirements of this Annex and the conformity assessment procedures listed in this Annex apply to measuring systems for EVSE ▌.

DEFINITIONS

A measuring system for EVSE means a system that includes all relevant metrological functions related to the ***conductive*** transfer (either ***direction***), at a specified transfer point, of ***active*** electrical energy between EVSE (such as charging stations for electric vehicles) and electric vehicles ***(such as motor vehicles, rail engines, boats, vessels and aircraft)***.

▌ Such measuring systems shall not be considered as utility measuring instruments ***as defined in Annex I***.

The metrological functions in a measuring ***system*** for EVSE can also ***be*** provided by ***an active electrical energy*** meter ***for*** which ***a conformity assessment procedure*** has been ***successfully completed in accordance with Annex V of this Directive. The result of that conformity assessment shall be taken into account when performing the conformity assessment for the measuring system for EVSE under this annex***.

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I	=	the electrical current flowing through the measuring system for EVSE at the transfer point;
Ist	=	the lowest declared value of I at which the measuring system for EVSE registers electrical energy, ***and, for AC,*** at unity power factor (polyphase measuring systems with balanced load);
Imin	=	the value of I above which the error lies within ***base*** maximum permissible errors (***BMPEs***) (***for AC,*** polyphase ***measuring systems*** with balanced load);
Itr	=	the value of I above which the error lies within the smallest ***BMPE*** corresponding to the class index of the measuring system for EVSE;
Imax	=	the maximum value of I for which the error lies within the ***BMPEs***;
U	=	for AC, root mean square (RMS) value of the electrical voltage ***applied*** to or from the measuring system for EVSE at the transfer point; for DC, value of the electrical voltage supplied to or from the measuring system for EVSE at the transfer point;
Un	=	the specified reference voltage(s);
f	=	the frequency of the voltage supplied to or from the measuring system for EVSE, for AC measuring systems;
fn	=	the specified reference frequency, for AC measuring systems;
PF	=	power factor = cosφ = the cosine of the phase difference φ between I and U, for AC measuring systems;
▌	▌	▌
harmonic	=	part of a signal that has a frequency that is an integer multiple of the fundamental frequency of the power input to the measuring system for EVSE, the fundamental frequency being, generally, the nominal frequency, ***fn***, for AC measuring systems;
d	=	distortion factor which is the ratio of the RMS value of the harmonic content ▌ to the RMS value of the fundamental term, and which is equal to the total harmonic distortion using the fundamental as the reference***, for AC measuring systems***;
MMQ	=	minimum measured quantity of energy delivered in a transaction for which the manufacturer specifies that the measuring system for EVSE will meet the MPE of the measuring system for EVSE's accuracy class;
transfer point	=	point at which an electric vehicle is connected to the ***measuring system of the EVSE***.

critical fault	**=**	***failure of the device when subjected to a disturbance in which the device appears to function correctly, but where the legally relevant data is incorrect or the shift in the accuracy measurements exceeds that specified in the tests.***
Base Maximum Permissible Error (BMPE)	**=**	***extreme values of the error (of indication) of an EVSE, when the current is varied (AC and DC EVSE) and voltage (DC EVSE) within the intervals given by the rated operating conditions, and when the EVSE is otherwise operated at reference conditions.***

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SPECIFIC REQUIREMENTS

1. Accuracy

The manufacturer shall specify the class index of the measuring system for EVSE. The class indices are defined as: Class A, B and C.

Accuracy shall be determined at the transfer point.

If energy exchanged at the transfer point is in the form of DC, then DC energy shall be the measurand; if AC energy is exchanged at the transfer point, then AC ***active*** energy shall be the measurand.

For the purposes of Annex I, the overall maximum permissible error (MPE) shall be determined as the root of the quadratic sum of BMPE and the allowable error shifts for variations in frequency, voltage and temperature.

2. Rated operating conditions

The manufacturer shall specify the rated operating conditions of the measuring system for EVSE, in particular, the values of f_n, U_n, I_{st}, I_{min}, I_{tr} and I_{max}***, the temperature range, and, for DC*** measuring ***systems, also the output voltage range***.

For the current values specified, the measuring system for EVSE shall fulfil the conditions given in Table 1:

Table 1

	Class A	***Class B***	***Class C***
I_{st}	***≤ 0,05 x I_{tr}***	***≤ 0,04 x I_{tr}***	***≤ 0,04 x I_{tr}***
I_{min}	***≤ 0,5 x I_{tr}***	***≤ 0,5 x I_{tr}***	***≤ 0,3 x I_{tr}***
I_{max}	***≥ 10 x I_{tr}***	***≥ 10 x I_{tr}***	***≥ 10 x I_{tr}***

The voltage, frequency and power factor ranges within which the measuring system for EVSE shall satisfy the ***BMPE*** requirements are specified in Table 2.

For AC measuring systems, the following shall apply:

– the voltage range shall be: $0,9 \cdot Un \leq U \leq 1,1 \cdot U_n$;

– the frequency range shall be: $0,98 \cdot f_n \leq f \leq 1,02 \cdot fn$;

– the power factor range shall be: $PF \geq 0,9$;

– the measuring system for EVSE shall operate correctly when the supply voltage distortion is less than 10 % and the load current distortion is less than 3 % at all harmonics indices;

– the MMQ range shall be: MMQ≤0,1 kWh.

For DC measuring systems, the following shall apply:

– the ***output*** voltage range shall be between the lowest and the highest ***rated*** output voltage ***of the EVSE measuring system***;

– the MMQ range shall be: MMQ≤1 kWh .

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3. Base MPEs (BMPEs)

When current (AC and DC measuring systems) and voltage (DC measuring systems) is varied within the intervals given by the rated operating conditions, and when the measuring system for EVSE is ***otherwise operated at reference*** conditions, the percentage errors shall not exceed the limits given in Table 2 for the specified class index.

Table 2

		BMPEs in percent at ***reference*** conditions and defined load current levels		
Current	Power factor ***(only for AC)***	A (2 %)	B (1 %)	C (0,5 %)
Ist ≤ I < Imin	> 0,9	± 25	± 15	± 10
Imin ≤ I < Itr	> 0,9	± 2,5	± 1,5	± 1
Itr ≤ I < Imax	> 0,9	± 2	± 1	± 0,5

The measuring system for EVSE shall not exploit the BMPEs or systematically favour any party.

4. Operating requirements

For measuring ***systems*** for EVSE ***including*** a cable ***with*** connector mounted between the ***point*** at which the energy is measured and the transfer point***,*** either of the following ***shall apply***:

(a) ***the cable with connector is*** not replaceable and ***is*** secured by an appropriate hardware seal; ***or***

(b) if ***the cable with connector is*** intended to be replaceable while the measuring system for EVSE is under seal, ***it shall be***:

– identified in the ***relevant conformity assessment of the measuring system for EVSE as interchangeable and the measuring system for EVSE shall be marked with the characteristics of compatible cables with connectors***;

– marked with ***its*** characteristics ***and*** unique identification; ***and its replacement units shall also bear such marking; and***

– sealed separately ***in such a way that the replacement does not require access to, or breaking of, the metrologically sealed parts of the measuring system***.

The replacement of the cable with connector shall not affect the metrological properties of the measuring system for EVSE.

5. Permissible effects

5.1. General

Measuring system for EVSE shall be designed and manufactured in such a way that when exposed to disturbances critical faults do not occur ***and shifts in accuracy do not exceed the values given in 5.2 and 5.3***.

When there is a foreseeable high risk due to lightning or where overhead supply networks are predominant, the metrological characteristics of the measuring system for EVSE shall be protected.

5.2. Effect of ***disturbances***

In case of disturbances, the legally relevant data shall be correct or the shift in the accuracy measurements shall not exceed 1,0 BMPE even if the measuring system for EVSE appears to function correctly. Ceasing to function is not a critical fault. If a disturbance interrupts a transaction, either of the following shall apply:

(a) the transaction is ***concluded when the disturbance occurs***;

(b) the transaction ***continues*** when the disturbance is removed.

5.3. Effect of influence quantities

When the load current is held constant at a point within the rated operating range with the measuring system for EVSE otherwise operated at reference conditions, and when any single influence quantity is varied from its value at reference conditions to its extreme values defined in Tables 3 and 4, the variation of error shall be such that the additional percentage error is not outside the values for error shift specified in ***Tables 3 and*** 4. The measuring system for EVSE shall continue to function after the completion of each of those tests.

Table 3

Influence quantity	Current	Limits for temperature coefficient (%/K) for ***measuring system for*** EVSE of class			Type of Current
		A (2 %)	B (1 %)	C (0,5 %)	
Temperature coefficient, c, over any interval of the temperature range, which is not less than 15 K and not greater than 23 K (i)	Itr ≤ I ≤ Imax	±0,1	±0,05	±0,03	AC and DC

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Table 4

Influence quantity	Value	Current	Maximum permissible error shift (%) for measuring system for EVSE of class			Type of Current
			A (2 %)	B (1 %)	C (0,5 %)	
Self-heating	Continuous current at Imax	Imax	±1	±0,5	±0,25	AC and DC
Conducted disturbances, low frequency	2 kHz – 150 kHz	Itr ≤ I ≤ Imax	±3	±2	±2	AC and DC
Continuous (DC) magnetic induction of external origin	200 mT at 30 mm from magnetic core surface	Itr ≤ I ≤ Imax	±3	±1,5	±0,75	AC and DC
Magnetic field (AC, power frequency) of external origin (ii)	400 A/m	Itr ≤ I ≤ Imax	±2,5	±1,3	±0,5	AC and DC

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Radiated, RF, electromagnetic fields	f = 80 MHz – 6000 MHz, Field strength ≤ 10 V/m	Itr ≤ I ≤ Imax	±3	±2	±1	AC and DC
Conducted disturbances, induced by radio frequency fields (ii)	f = 0,15 MHz – 80 MHz, Amplitude ≤ 10 V	Itr ≤ I ≤ Imax	±3	±2	±1	AC and DC
Operation of ancillary devices	Ancillary devices operated with I = Itr and Imax	Itr ≤ I ≤ Imax	±0,7	±0,3	±0,15	AC and DC
Voltage variation (ii)	0,9 × Un to 1,1 × highest Un	Itr ≤ I ≤ Imax	±1	±0,7	±0,2	AC
Frequency variation of mains (ii)	Each fn ± 2 %	Itr ≤ I ≤ Imax	±0,8	±0,5	±0,2	AC
Harmonics in voltage and current circuits (ii)	d < 5 % I d < 10 % U	Itr ≤ I ≤ Imax	±1	±0,6	±0,3	AC
Reversed phase sequence (AC 3-phase only) (ii)	Any two phases interchanged	Itr ≤ I ≤ Imax	±1,5	±1,5	±0,1	AC

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Table notes:

(i) In case of a measuring system for EVSE with ***an active electrical energy*** meter ***for which a conformity assessment procedure has been successfully completed in accordance with Annex V of this Directive***, the temperature test can be limited to a check of correct functioning at the extreme temperatures foreseen in the measuring system for EVSE enclosure.

(ii) Not required for ***a*** measuring ***system*** for EVSE ***with an active electrical energy*** meter ***for which a conformity assessment procedure has been successfully completed in accordance with Annex V of this Directive*** if the ▌ specifications meet or exceed those of the accuracy class specified by the manufacturer.

6. Units

The electrical energy measured shall be displayed in kilowatt-hours or ***their decimal multiples***.

7. Putting into use

▌ The Member State shall ensure that the intended use determines the foreseen and foreseeable practical working conditions, namely the rated operating conditions, so that the measuring system for EVSE is suitable for its use.

CONFORMITY ASSESSMENT

The conformity assessment procedures referred to in Article 17 that the manufacturer can choose between are:

B + F or B + D or ***G or*** H1.'.

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ANNEX V

Annex VI to Directive 2014/32/EU is amended as follows:

(1) the part 'DEFINITIONS' is amended as follows:

(a) the first paragraph is replaced by the following:

'A thermal energy meter is an instrument designed to measure the energy which in a heat-exchange circuit is absorbed (cooling) and/or given up (heating) by a liquid called the thermal energy-conveying liquid.';

(b) in the table, the fourth row is replaced by the following:

'$\Delta\theta$	=	the temperature difference θin - θout with $\Delta\theta \geq 0$ for heating and $\Delta\theta \leq 0$ for cooling';

(2) point 1.1. is replaced by the following:

'1.1. For the temperature of the liquid: θ_{max}, θ_{min},

– for the temperature differences: $\Delta\theta_{max}$, $\Delta\theta_{min}$, subject to the following restrictions:

$\Delta\theta max / \Delta\theta min \geq 10$

with the exception of cooling applications;

$\Delta\theta_{min}$ is a whole number in the range of 1 K and 10 K';

(3) point 1.3. is replaced by the following:

'1.3. For the flow rates of the liquid: q_s, q_p, q_i, where the values of q_p and q_i are subject to the following restriction: $q_p / q_i \geq 5$.'.

ANNEX VI

‘ANNEX VIIa

MEASURING SYSTEMS FOR COMPRESSED GAS DISPENSERS (MI-***012***)

The relevant requirements of Annex I, the specific requirements of this Annex and the conformity assessment procedures listed in this Annex apply to measuring systems intended for the continuous and dynamic measurement of quantities (mass ***and, if applicable,*** energy) of compressed gas.

Such measuring systems shall not be considered as utility measuring instruments ***as defined in Annex I***.

DEFINITIONS

Meter	An instrument designed to measure continuously ***and to ensure the memorisation*** and display ***of*** the quantity ***of gas,*** at metering conditions***,*** flowing through the measurement transducer in a closed, fully charged conduit.
Calculator	A part of a meter that receives the output signals from the measurement transducers and possibly, from associated measuring instruments and displays the measurement results.
Associated measuring instrument	An instrument connected to the calculator for measuring certain quantities, which are characteristic of the gas, with a view to make a correction and/or conversion.
Conversion device	A part of the calculator, which by taking into account the characteristics of the gas, automatically converts the mass of the gas into the amount of energy delivered or received.
Measuring system	A system that comprises, in addition to the meter itself, a transfer point, gas piping and all devices required to ensure correct measurement or intended to facilitate the measuring operations.
Compressed gas (‘CG’) dispenser	A measuring system intended for the fuelling of ***motor*** vehicles, rail engines, boats, vessels and aircraft with compressed gaseous fuel.
Transfer point	Physical location at which the gas is defined as being delivered or received.
Self-service arrangement	An arrangement that allows customers to use a measuring system for the purpose of obtaining gas for their own use.

Self-service device	A specific device that is part of a self-service arrangement and ***that*** allows one or more measuring systems to perform in that self-service arrangement.
Minimum measured quantity (‘MMQ’)	The smallest quantity of gas for which the measurement is metrologically acceptable for the measuring system.
Direct indication	The indication of mass ***and, if applicable,*** energy, corresponding to the measure and that the meter is physically capable of measuring. Note: The direct indication may be converted into another quantity using a conversion device.
Interruptible	A measuring system is considered as interruptible when the gas flow can be stopped easily and rapidly.
Non-interruptible	A measuring system is considered as non-interruptible when the gas flow cannot be stopped easily and rapidly.
Flowrate range	The range between the minimum flowrate (Qmin) and maximum flowrate (Qmax).

SPECIFIC REQUIREMENTS

1. Rated operating conditions

The manufacturer shall specify the rated operating conditions for the instrument, in particular:

1.1. The flowrate range

The flowrate range is subject to the following conditions:

(a) the flowrate range of a measuring system shall be within the flowrate range of each of its elements, in particular the meter; ***and***

(b) ▌ the ratio between the ▌ maximum ***and minimum*** flow rate shall be no less than 10.

1.2. The properties of the gas to be measured by the instrument by specifying the name, the type or the following relevant characteristics of that gas such as:

(a) temperature range;

(b) pressure range;

(c) ***the calorific*** value of the gas;

(d) the nature and characteristics of the gas to be measured.

1.3. The nominal value of the AC voltage supply and/or limits of the DC voltage supply.

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2. Accuracy classification and MPEs

2.1. The MPE on the indication of measured or converted amounts transferred at the transfer point is set out in Table 1.

Table 1

Type of compressed gas measuring systems	Accuracy Class (MPE [% of measured value])
Compressed hydrogen measuring systems	***2,0***
Other compressed gas measuring systems	1,5

The MPE on the MMQ equals twice the value stated in Table 1.

2.2. The MMQ of a measuring system shall have the form 1 × 10n, 2 × 10n, or 5 × 10n authorised units of mass or energy, where n is a positive or negative whole number, or zero.

The MMQ shall satisfy the conditions of use of the measuring system; except in exceptional cases, the measuring system shall not be used for measuring quantities less than that MMQ.

2.3. The measuring system shall not exploit the MPEs or systematically favour any party.

3. Maximum permissible effect of disturbances

3.1. The effect of an electromagnetic disturbance on a measuring system shall be one of the following:

(a) the change in the measurement result is not greater than the critical change value pursuant to point 3.2;

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(b) the indication of the measurement result shows a momentary variation that cannot be interpreted, memorised or transmitted as a measurement result; furthermore, in the case of an interruptible system, that can also mean the impossibility to perform any measurement; ***or***

(c) the change in the measurement result is greater than the critical change value pursuant to point 3.2, in which case the measuring system shall permit the retrieval of the measurement result just before the critical change value occurred and cut off the flow.

3.2. The critical change value is the greater of the following values:

– ***10%*** of the MPE;

– ***3% of*** the MMQ ▌ ; in the case of a failure of the main power source, the critical change value shall be increased by 5 % of the MMQ.

4. Durability

For systems fitted with meters with moving parts, after an appropriate test, taking into account the period of time estimated by the manufacturer, has been performed, the following criterion shall be satisfied:

The variation of the measurement result after the durability test, when compared with the initial measurement result, shall not exceed two fifths of the MPE.

5. Suitability

5.1. For any measured quantity relating to the same measurement, the indications and, if applicable, printouts provided by various devices***, including the ones that are part of a self-service arrangement,*** shall have the same scale interval and the results shall not deviate one from another.

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The scale interval of a CG measuring system shall not exceed ***1,5 % of*** the MMQ ▌.

5.2. It shall not be possible to divert the measured quantity in normal conditions of use unless it is readily apparent.

5.3. During the warm-up time of the CG measuring system, no measurements shall take place.

5.4. Instruments for direct sales

5.4.1. A measuring system for direct sales shall be provided with means for resetting the display to zero.

It shall not be possible to divert measured gas downstream of the meter during a filling operation.

5.4.2. The display of the quantity on which the transaction is based shall be permanent until all parties in the transaction have accepted the measurement result.

5.4.3. Measuring systems for direct sales shall be interruptible.

5.4.4. Measuring systems for direct sales shall display either in units of mass ***and, if applicable,*** energy.

5.5. ***Additional requirements for the display***

5.5.1. It shall not be possible to reset displays on CG dispensers to zero during a measurement.

5.5.2. The start of a new measurement shall be inhibited until the display has been reset to zero.

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5.5.3. Where a measuring system is fitted with a price display, the difference between the indicated price and the price calculated from the unit price and the indicated quantity shall not exceed the smallest currency unit. However, that difference need not be less than the smallest monetary value.

6. Power supply failure

A measuring system shall either be provided with an emergency power supply device that will safeguard all measuring functions during the failure of the main power supply device or be equipped with means to save and display the data present in order to permit the conclusion of the transaction in progress and with means to stop the flow of gas at the moment of failure of the main power supply device.

7. Units of measurement

The metered quantity shall be displayed in ▌ kilograms, ***or their decimal multiples or submultiples, and, if applicable, in joules or watt-hours, or their decimal multiples***.

CONFORMITY ASSESSMENT

The conformity assessment procedures referred to in Article 17 that the manufacturer can choose between are: B + F or B + D or H1 or G.'.

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