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NOTE

From:	Presidency
To:	Delegations
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 - Presidency compromise text on Annexes III and IV

In view of the upcoming Working Party on Technical Harmonisation (Measuring Instruments) on 21 May 2025, delegations will find in Annex to this note, a marked version of the Presidency compromise text on Annexes III and IV.

Changes in comparison to the Commission proposal, document ST 16426/24 + ADD 1, are marked in **bold underline** for additions and in ~~strikethrough~~ for deletions.

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 ~~which measures~~**designed to measure and 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, the last three rows are replaced by the following:

'f	=	the frequency of the voltage supplied to the meter, for alternating current ('AC') electrical energy meters;
f_n	=	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.';

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

'The **MPE requirements that the meter shall satisfy depending on 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 **at least**:

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

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

– $0{,}5\ inductive \leq PF \leq \mathbf{1}\ \boldsymbol{or}\ 0{,}8\ capacitive \leq \boldsymbol{PF} \leq \mathbf{1}$.

For direct current ('DC') electrical energy meters, the voltage range shall be **at least** between the lowest and the highest ~~output~~ voltage **of 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.';

(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., the second ~~and third~~ paragraph~~s~~ ~~are~~ **is** replaced by the following:

'The meter shall comply with the electromagnetic environment E2 for AC **electrical energy meters and DC** electrical energy meters~~ and E1 for DC electrical energy meters~~, as well as with the additional requirements **set out** in points 4.2. and 4.3.**';**

~~The electromagnetic environment and permissible effects reflect the situation that there are disturbances which shall not affect the accuracy beyond the critical change values and transient disturbances, which may cause a temporary degradation or loss of function or performance but from which the meter shall recover and shall not affect the accuracy beyond the critical change values';~~

(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 ~~alternating current ('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 ~~alternating current ('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}.'.

ANNEX IV

'ANNEX Va

MEASURING SYSTEMS FOR ELECTRIC VEHICLE SUPPLY EQUIPMENT (MI-003a)

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 ~~intended for residential, commercial and light industrial use~~.

By way of derogation from point 10.4. of Annex I, measuring systems for EVSE shall be designed to present the measurement result to all parties in the transaction when installed as intended.

DEFINITIONS

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

However, by way of derogation from Annex I, such measuring systems shall not be considered as utility measuring instruments.

The metrological functions in a m~~M~~easuring system~~s~~ for EVSE can also **be** ~~have their basic metrology~~ provided by **an active electrical energy meter for which a conformity assessment procedure has been successfully completed in accordance with this Directive.** ~~a separately type approved meter which has been tested for compliance with a recognised metering standard with equal or more stringent requirements.~~

I	=	the electrical current flowing through the measuring system for EVSE at the transfer point;
I_{st}	=	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);
I_{min}	=	the value of I above which the error lies within maximum permissible errors (MPEs) (**for AC,** polyphase ~~meters~~ **measuring systems** with balanced load);
I_{tr}	=	the value of I above which the error lies within the smallest MPE corresponding to the class index of the measuring system for EVSE;

I_{max}	=	the maximum value of I for which the error lies within the MPEs;
U	=	for AC, root mean square (RMS) value of the electrical voltage supplied 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;
U_n	=	the specified reference voltage(s);
F	=	the frequency of the voltage supplied to or from the measuring system for EVSE, for AC measuring systems;
f_n	=	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;
~~ripple~~	=	~~peak-to-peak deviation from the nominal voltage signal expressed as a percentage of the reference value, for DC 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, f_{nom}, for AC measuring systems;
D	=	distortion factor which is the ratio of the RMS value of the harmonic content ~~(obtained by subtracting the fundamental term from a non-sinusoidal alternating quantity)~~ to the RMS value of the fundamental term, and which is equal to the total harmonic distortion using the fundamental as the reference ~~(denominator)~~**, 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 EVSE (i.e. the charging station for electric vehicle).

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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.

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 the voltage range for DC measuring systems** that apply to the measuring system for EVSE.

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

Table 1

	AC	**AC**	**DC**	**DC**
I_{min}	$\leq I_{tr}$	$\leq I_{tr}$	$\leq I_{tr}$	$\leq I_{tr}$
I_{tr}	$\leq 5\ A$	$\leq 0{,}1 \cdot I_{max}$	$\leq 25\ A$	$\leq 0{,}1 \cdot I_{max}$
I_{max}	$\leq 80\ A$	$> 80\ A$	$\leq 500\ A$	$> 500\ A$

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

For AC measuring systems, the following shall apply:

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

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

– 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: $MMQ \leq 0{,}1\ kWh$.

For DC measuring systems, the following shall apply:

– the voltage range -shall be between the lowest and the highest output voltage;

~~– while the measuring system for EVSE shall only measure energy having frequencies up to 2 kHz, the ripple produced on the output of the measuring system for EVSE shall not exceed:~~

~~– 1,5 A below 10 Hz, 6 A below 5 kHz, and 9 A below 150 kHz at maximum rated power and maximum rated current or where the output voltage and current correspond to the maximum current ripple for current; and~~

~~– ±5 V in normal operation for voltage, while the measuring system for EVSE shall only measure energy having frequencies up to 2 kHz;~~

– the MMQ range shall be: $MMQ \leq 1\ kWh$.

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** operat**ed**~~ing~~ **at** ~~under rated operating~~ **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 ~~rated operating~~ reference conditions and defined load current levels		
Current	**Power factor (only for AC)**	**A (2 %)**	**B (1 %)**	**C (0,5 %)**
$I_{st} \leq I < I_{min}$	*> 0,9*	*± 25*	*± 15*	*± 10*
$I_{min} \leq I < I_{tr}$	*> 0,9*	*± 2,5*	*± 1,5*	*± 1*

$I_{tr} \leq I < I_{max}$	*> 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~~A~~ measuring system**s** for EVSE ~~that applies corrections to compensate for energy loss introduced by parts comprising~~ **including** a cable and connector mounted between the ~~position~~ **point** at which the energy is measured and the transfer point**,** ~~shall do~~ either of the following **shall apply**:

(a) ~~ensure that~~ those ~~parts~~ **cable and connector** are not replaceable and ~~that they~~ are secured by an appropriate hardware seal; **or**

(b) if those ~~parts~~ **cable and connector** are intended to be replaceable while the measuring system for EVSE is under seal, ~~ensure, that~~ they are:

- identified in the **relevant conformity assessment** ~~type approval~~ certificate as replaceable;
- marked with information about the cable characteristics and/or that they bear a unique identification;
- sealed separately with an installer seal.

5. Permissible effects of disturbances

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.

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.

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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 cancelled;

(b) the transaction is completed correctly 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 Table**s 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 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)	$I_{tr} \leq I \leq I_{max}$	±0,1	±0,05	±0,03	AC and DC

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 I_{max}	I_{max}	±1	±0,5	±0,25	AC and DC
Conducted disturbances, low frequency	2 kHz – 150 kHz	$I_{tr} \leq I \leq I_{max}$	±3	±2	±2	AC and DC
Continuous (DC) magnetic induction of external origin	200 mT at 30 mm from magnetic core surface	$I_{tr} \leq I \leq I_{max}$	±3	±1,5	±0,75	AC and DC
Magnetic field (AC, power frequency) of external origin (ii)	400 A/m	$I_{tr} \leq I \leq I_{max}$	±2,5	±1,3	±0,5	AC and DC
Radiated, RF, electromagnetic fields	f = 80 MHz – 6000 MHz, Field strength ≤ 10 V/m	$I_{tr} \leq I \leq I_{max}$	±3	±2	±1	AC and DC
Conducted disturbances, induced by radio frequency fields (ii)	f = 0,15 MHz – 80 MHz, Amplitude ≤ 10 V	$I_{tr} \leq I \leq I_{max}$	±3	±2	±1	AC and DC
Operation of ancillary devices	Ancillary devices operated with $I = I_{tr}$ and I_{max}	$I_{tr} \leq I \leq I_{max}$	±0,7	±0,3	±0,15	AC and DC
Voltage variation (ii)	$0,9 \times U_n$ to $1,1 \times$ highest U_n	$I_{tr} \leq I \leq I_{max}$	±1	±0,7	±0,2	AC
Frequency variation of mains (ii)	Each f_n ± 2 %	$I_{tr} \leq I \leq I_{max}$	±0,8	±0,5	±0,2	AC

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Harmonics in voltage and current circuits (ii)	d < 5 % I d < 10 % U	$I_{tr} \leq I \leq I_{max}$	±1	±0,6	±0,3	AC
Reversed phase sequence (AC 3-phase only) (ii)	Any two phases interchanged	$I_{tr} \leq I \leq I_{max}$	±1,5	±1,5	±0,1	AC

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 this Directive** ~~a separately type approved meter~~, 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 ~~system~~ with-a**n** **active electrical energy meter for which a conformity assessment procedure has been successfully completed in accordance with this Directive** ~~separately type approved meter~~ if the ~~type approval~~ 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 in megawatt-hours.

7. 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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