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WORKING DOCUMENT

From:	FI and SE delegations
To:	Working Party on Technical Harmonisation (Measuring instruments)
Subject:	Directive amending Directive on measuring instruments (2014/32/EU) - FI and SE joint preliminary proposal – a "clean" version of Annex Va with subassemblies

FI and SE joint preliminary proposal – a "clean" version of Annex Va with subassemblies

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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.

DEFINITIONS

Measuring system for electric vehicle supply equipment (EVSE)	A system that includes all relevant metrological functions related to the transfer (either way), at a specified transfer point, of *active* electrical energy between EVSE (such as charging stations for electric vehicles) and electric vehicles. A measuring system for EVSE is either a complete instrument or a combined instrument consisting of the sub-assemblies, meter, calculator as well as conversion and connecting devices, as defined in Article 4(2), or a combination thereof.
Meter sub-assembly	A sub-assembly of the measuring system for EVSE that measures the quantities related to the transfer (either way) of *active* electrical energy between EVSE (such as charging stations for electric vehicles) and electric vehicles.
Calculator sub-assembly	A sub-assembly of the measuring system for EVSE that receives information from other sub-assemblies and establishes the measurement result.
Conversion and connecting devices sub-assembly	A sub-assembly of the measuring system for EVSE consisting of all parts between the meter sub-assembly and the transfer point.
Minimum measured quantity (MMQ)	The minimum measured quantity for which the complete instrument or the sub-assembly satisfies the requirements of its accuracy class.
Transfer point	Point at which an electric vehicle is connected to the measuring system for EVSE.

SPECIFIC REQUIREMENTS

1. Accuracy

The manufacturer shall specify the class index of the complete instrument or the sub-assemblies.

The class indices are defined as: Class A, B and C.

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 energy shall be the measurand.

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2. Rated operating conditions

The manufacturer shall specify the rated operating conditions of the complete instrument or the sub-assemblies.

The rated operating conditions of the complete instrument or the meter sub-assembly for active electrical energy shall comply with Annex V point 2.

3. MPEs

3.1 When the meter sub-assembly is operating within rated operating conditions, the percentage errors of the meter sub-assembly shall not exceed the limits given in Annex V Table 2.

3.2 When the calculator sub-assembly is operating within rated operating conditions, the percentage errors of the calculator sub-assembly shall not exceed one-tenth of the limits given for the meter sub-assembly in point 3.1.

3.3 When the conversion and connection devices sub-assembly is operating within rated operating conditions, the percentage errors of the conversion and connection devices sub-assembly shall not exceed one-sixth of the limits given for the meter sub-assembly in point 3.1.

3.4 When the sub-assemblies are not used, and when the complete instrument is operating within rated operating conditions, the percentage errors of the complete instrument shall not exceed 1.27 times the limits given for the meter sub-assembly in point 3.1.

Comment: *The value 1,27 is the sum of the one, one-tenth and one-sixth of MPE. Consequently, the result is the same, whether sub-assemblies are used or not.*

4. Permissible effects of disturbances

4.1. *General*

The sub-assemblies or, if sub-assemblies are not used, the complete instrument shall comply with requirements in points 4.2. and 4.3.

When there is a foreseeable high risk due to lightning or where overhead supply networks are predominant, the metrological characteristics of the sub-assemblies or, if sub-assemblies are not used, the complete instrument shall be protected.

4.2. *Effect of disturbances*

Comment : *Some of these requirements affect only some, not all sub-assemblies. Where it is guaranteed by design of the sub-assembly that the sub-assembly in question does not influence compliance with a specific requirement, the harmonised standard will not require a test.*

4.2.1 The effect of disturbances on the meter sub-assembly shall not exceed the critical change values defined in Annex V Table 3.

4.2.2 The effect of disturbances on the calculator sub-assembly shall not exceed one-tenth of the critical change values defined for the meter sub-assembly in point 4.2.1.

4.2.3 The effect of disturbances on the conversion and connection devices sub-assembly shall not exceed one-sixth the critical change values defined for the meter sub-assembly in point 4.2.1.

4.2.4 If sub-assemblies are not used, the effect of disturbances on the complete instrument shall not exceed 1,27 times the critical change values for the meter sub-assembly in point 4.2.1.

4.3 *Permissible effect of transient electromagnetic phenomena*

4.3.1 The effect of transient electromagnetic phenomena on the meter sub-assembly, or, if sub-assemblies are not used, the complete instrument shall be such that during and immediately after a disturbance:

— any output intended for testing the accuracy of the sub-assembly, or, if sub-assemblies are not used, the complete instrument does not produce pulses or signals corresponding to an energy of more than the critical change value,

and in reasonable time after the disturbance the meter sub-assembly, or, if sub-assemblies are not used, the complete instrument shall:

— recover to operate within the MPE limits, and

— have all measurement functions safeguarded, and

— allow recovery of all measurement data present prior to the disturbance, and

— not indicate a change in the registered energy of more than the critical change value.

The critical change value in kWh is $m \cdot U_n \cdot I_{max} \cdot 10^{-6}$

(m being the number of measuring elements of the meter, U_n in Volts and I_{max} in Amps).

For overcurrent the critical change value is 1,5 %.

4.3.2 The effect of transient electromagnetic phenomena on the calculator sub-assembly and the conversion and connection devices sub-assembly shall be such that in reasonable time after the disturbance the sub-assembly shall:

— recover to operate within the MPE limits, and

— have all measurement functions safeguarded, and

— allow recovery of all measurement data present prior to the disturbance, and

— not indicate a change in the registered measurement data.

5. **Suitability**

Comment: This section is an addition to the COM proposal. The wording is the same as the annex V only adjusted to the sub-assembly approach. Some of these requirements affect only some, not all sub-assemblies.

5.1. Below the rated operating voltage, the positive error of any sub-assembly or, if sub-assemblies are not used, the complete instrument shall not exceed 10 %.

5.2. The display of the total energy shall have a sufficient number of digits to ensure that when any sub-assembly or, if sub-assemblies are not used, the complete instrument is operated for 4 000 hours at full load the indication does not return to its initial value and shall not be able to be reset during use.

5.3. In the event of loss of electricity in the circuit, the measurement data shall remain available for reading during a period of at least 4 months.

5.4. *Running with no load*

When the voltage is applied without any current flowing in the current circuit, any sub-assembly or, if sub-assemblies are not used, the complete instrument shall not register any energy.

5.5. *Starting*

Any sub-assembly or, if sub-assemblies are not used, the complete instrument 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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6. **Units**

The electrical energy measured shall be displayed in kilowatt-hours or in megawatt-hours.

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 and

- the measuring system for EVSE is appropriate for the accurate measurement of electrical energy that is foreseen or foreseeable.

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.'.

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