



Presentation activities in EM field of designated institute of Ukraine – State Enterprise “Ukrmetrteststandard”

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National Standards of Electrical Quantities



- Creation of all national standards of SE “Ukrmetrteststandard” **from 1999 to 2020** occurs through the implementation of special scientific projects within the framework of the State Scientific Programs for the development of the national standard base.
- The SE “Ukrmetrteststandard” keeping **10 national standards** of electrical quantities.
- Special scientific projects are also carried out annually to study the metrological characteristics of each national standard.
- Within the framework of these projects, comparisons of national standards of regional metrological organizations are carried out.



National Standards of Electrical Quantities



- National primary standard of the unit of electrical DC voltage in the range from 1 kV to 180 kV (DETU 08-04-99).



National Standards of Electrical Quantities



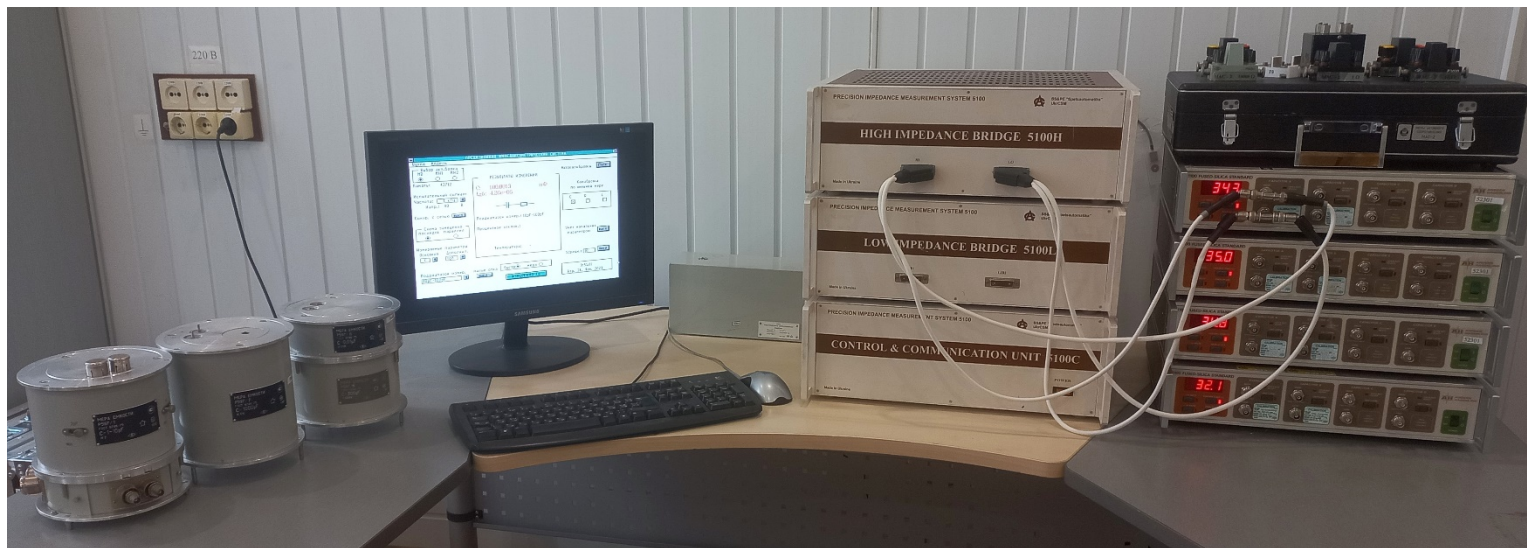
- National primary standard of units of AC electric voltage in the range from 1 to $1,2 \cdot 330 / \sqrt{3}$ kV and coefficient of scale transformation of electric voltage at frequency 50 Hz (DETU 08-05-99).



National Standards of Electrical Quantities



- National primary standard of capacitance and dissipation factor units (DETU 08-06-01).



National Standards of Electrical Quantities



- National primary standard of electrical power and power factor units (DETU 08-08-02).



National Standards of Electrical Quantities



- National primary standard unit of electrical voltage from 0.1 V to 1000 V AC in the frequency range from 10 Hz to 1 MHz (DETU 08-07-02).



National Standards of Electrical Quantities



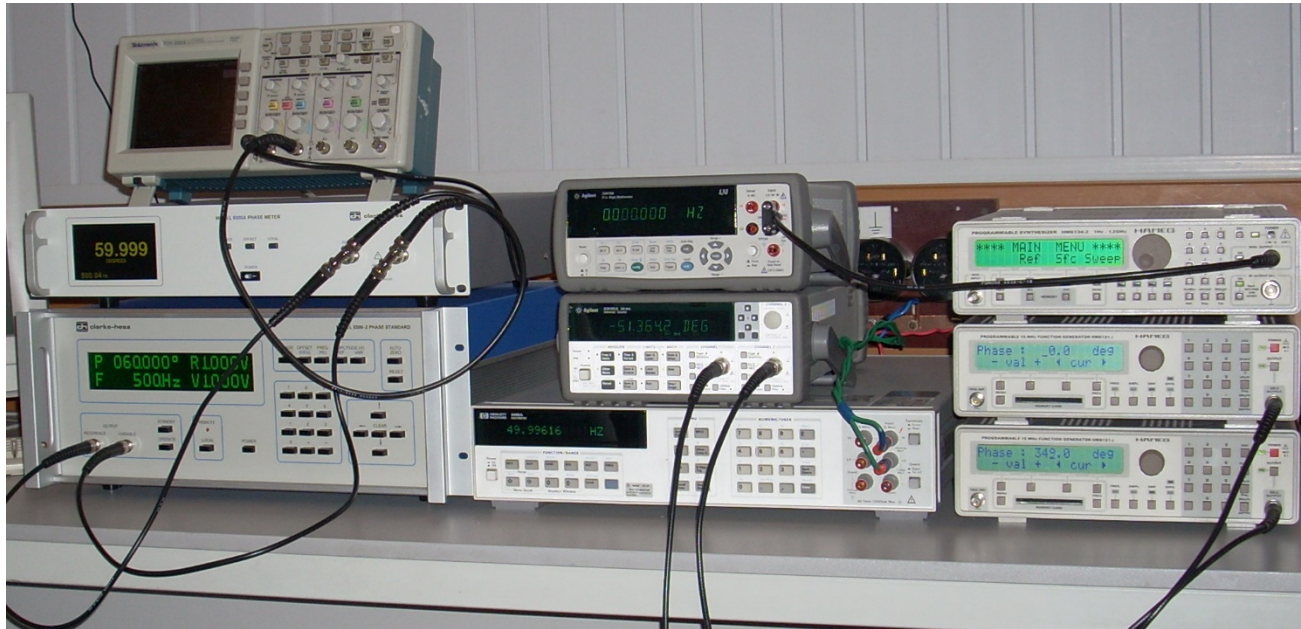
- National primary standard of inductance and dissipation factor units (DETU 08-09-09).



National Standards of Electrical Quantities



- National primary standard of the phase angle between two voltages units (DETU 08-07-11).



National Standards of Electrical Quantities



- National primary standard of a unit of coefficient of scale transformation of electric voltage to $1,2 \cdot 750 / \sqrt{3}$ kV (NDETU EM-01-2019).



National Standards of Electrical Quantities



- National primary standard of a unit of alternative current (NDETU EM-02-2019).



National Standards of Electrical Quantities



- National primary standard of a unit of coefficient of scale transformation of AC current of industrial frequency (NDETU EM-03-2020).



Key and Supplementary Comparisons



- SE “Ukrmetrteststandard” has demonstrated competence by participation in international comparisons organized by regional metrology organizations **EURAMET, COOMET** and **GULFMET (5 key and 11 supplementary comparisons) from 2005 to 2022.**
- In comparisons COOMET.EM-K4, COOMET.EM-K5, COOMET.EM-K6.a, COOMET.EM-S2, COOMET.EM-S4, COOMET.EM-S5, COOMET.EM-S13, COOMET.EM-S14, GULFMET.EM-S4, GULFMET.EM-S5, GULFMET.EM-S5.1, GULFMET.EM-S6, GULFMET.EM-S7 (**3 key and 10 supplementary comparisons**) SE “Ukrmetrteststandard” was a pilot laboratory.



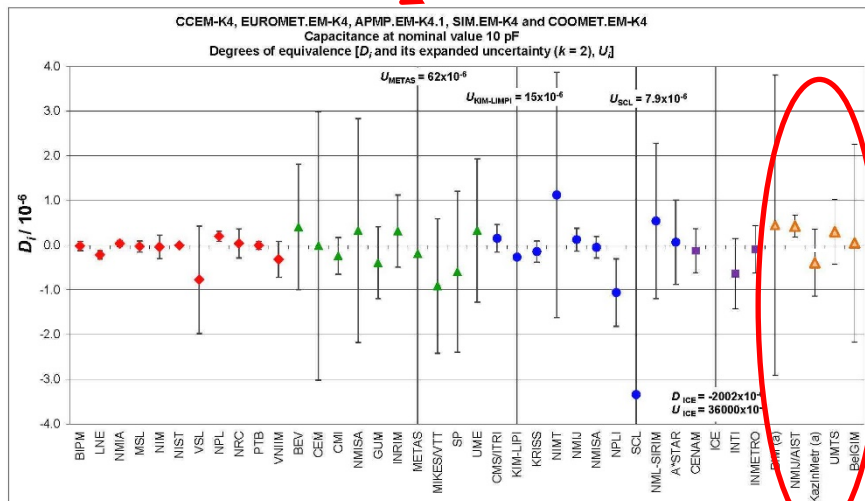
Key and Supplementary Comparisons



Capacitance:

- COOMET.EM-K4, COOMET Key Comparison of Capacitance at 10 pF;
- COOMET.EM-S4, COOMET Supplementary Comparison of Capacitance at 100 pF;
- COOMET.EM-S13, COOMET Supplementary Comparison of Capacitance at 10 pF and 100 pF.

Pilot laboratory



Measurements derived from R_{20} for BIPM, LNE and NPL

Red diamonds : participants in CCEM-K4

Blue circles : participants in APMP.EM-K4.1*

a) Measurements made at 1000 Hz

Green triangles : participants in EUROMET.EM-K4*

Purple squares : participants in SIM.EM-K4*

Orange triangles : participants in COOMET.EM-K4*

* linking laboratories to CCEM-K4 are not included



Key and Supplementary Comparisons



Inductance:

- EURAMET.EM-S26, Supplementary Comparison Inductance Measurements of 100 mH at 1 kHz;
- COOMET.EM-S14, COOMET Supplementary Comparison of Inductance for 10 mH and 100 mH at 1 kHz;
- GULFMET.EM-S4, GULFMET Supplementary Comparison of Inductance for 10 mH and 100 mH at 1 kHz.



Key and Supplementary Comparisons



AC power and energy:

- EURAMET.EM-K5.2018, Key Comparison of 50/60 Hz power;
- EURAMET.EM-K5.1, Key Comparison of 50/60 Hz power;
- COOMET.EM-S2, COOMET Supplementary Comparison of 50/60 Hz Power;
- COOMET.EM-K5, COOMET Key Comparison of Power;
- GULFMET.EM-S5, GULFMET supplementary comparison of AC energy;
- GULFMET.EM-S5.1, GULFMET supplementary comparison of AC energy.

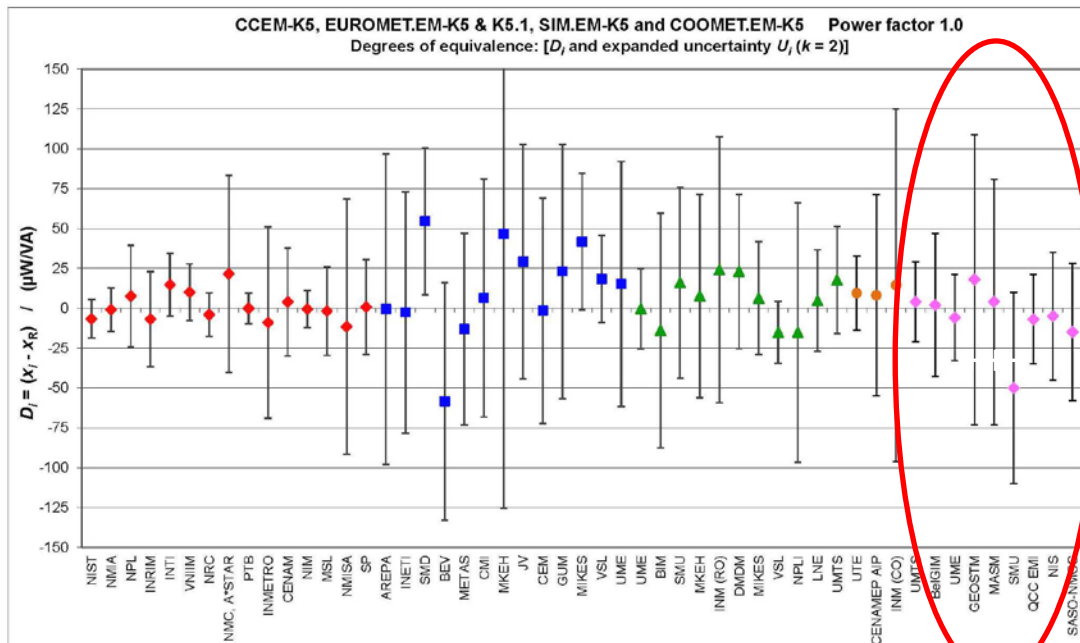


Key and Supplementary Comparisons



AC power and energy:

- COOMET.EM-K5, COOMET Key Comparison of Power.



Pilot laboratory

Red diamonds: CCEM-K5
Blue squares: EUROMET.EM-K5
Green triangles: EUROMET.EM-K5.1

Orange circles: SIM.EM-K5
Purple diamonds: COOMET.EM-K5

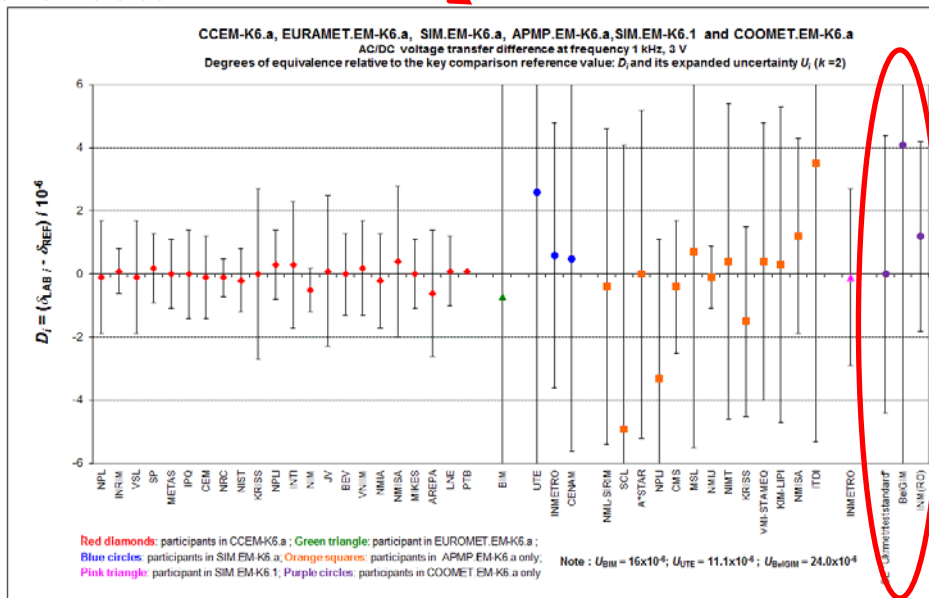


Key and Supplementary Comparisons



AC/DC voltage transfer:

- COOMET.EM-K6.a, COOMET Key Comparison of AC/DC Voltage Transfer References;
- COOMET.EM-S1, COOMET Supplementary Comparison of AC/DC Voltage Transfer References.



Pilot laboratory



Key and Supplementary Comparisons



High AC voltage and current:

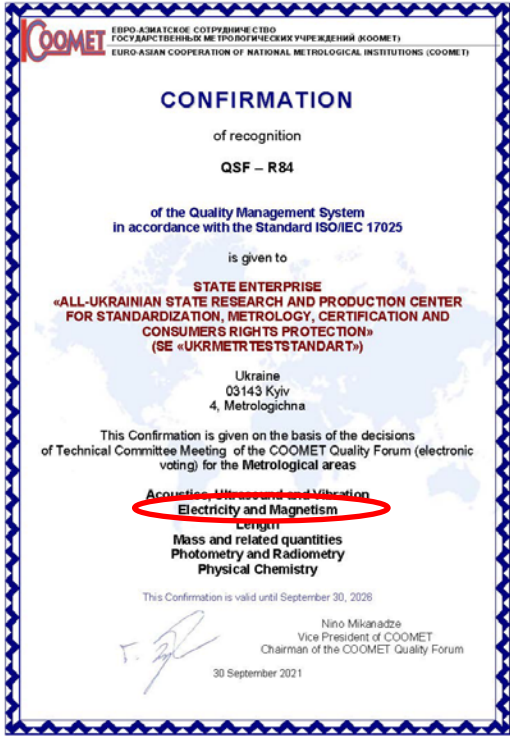
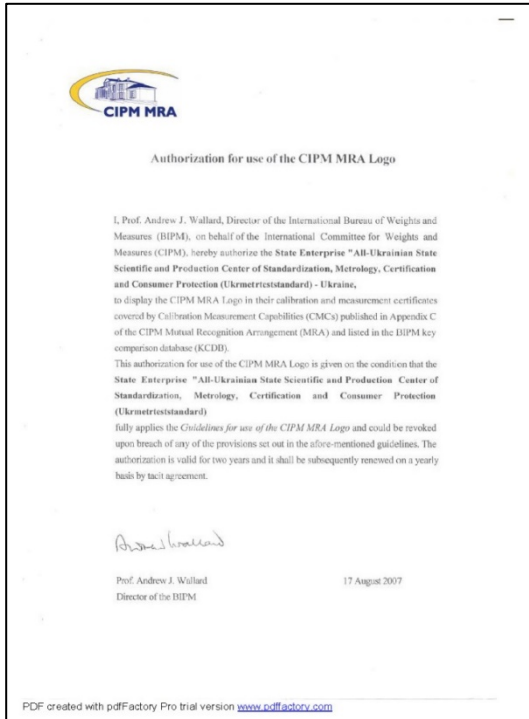
- COOMET.EM-S5, COOMET Supplementary Comparison of AC Voltage Ratio Standards;
- COOMET.EM-S22, Supplementary Comparison of AC high current ratio using measuring system for current transformers;
- GULFMET.EM-S6, Supplementary Comparison of High Voltage Transformer Measuring Systems;
- GULFMET.EM-S7, Supplementary Comparison of High Current Transformer Measuring Systems.

High DC voltage:

- COOMET 203/UA/00, COOMET Supplementary Comparison of the DC high voltage and AC voltage ratio and others.



Recognition of Quality Management System



Calibration and Measurement Capabilities



Based upon the comparisons results, **41 entries** of SE “Ukrmetrteststandard” **CMCs** for Electricity and Magnetism (EM) have been published in the **KCDB** database for:

- electrical power and energy;
- direct high voltage (up to 180 kV);
- alternating high voltage (up to 750 kV);
- large alternating current (up to 10000 A);
- alternating voltage (up to 1000 V);
- electrical capacitance and inductance;
- phase angle between two voltages.



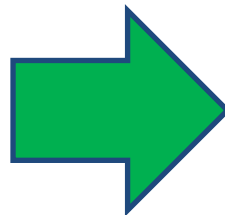
COOMET TC “Electricity and Magnetism”



Activities
from 2003 to
2022

Members of TC 1.3

Country		Contact person (TC member)	NMI
Azerbaijan	AZ	Mr. Maarif Zeynalov	AzMI
Armenia	AM	Mrs. Armenui Khachatryan	CJSC "NBSM"
Belarus	BY	Mrs. Maryna Yarmalovich	BelGIM
Bulgaria	BG	Mrs. Antoaneta Yovcheva	BIM
Bosnia and Herzegovina	BA	Mr. Vladimir Milojevic	IMBIH
Germany	DE	Dr. Johann Meisner	PTB
Georgia	GE	Mrs. Manana Gelovani	GEOSTM
Kazakhstan	KZ	Mrs. Nagima Tuymekulova	RSE "KazStandard"
China	CN	-	
DPR of Korea	KP	Mr. Jo Song Chol	CIM
Cuba	CU	Mrs. Mirta Navarro	INIMET
Kyrgyzstan	KG	Ms. Elmira Abasbekova	CSM
Lithuania	LT	Mr. Andrius Bartašiusas	FTMC
Moldova	MD	Mrs. Stella Straistari	INM-MD
Russia	RU	Dr. Sergey Kolotygin	VNIIFTRI
Romania	RO	Mr. R. Soviany	INM
Slovakia	SK	Mr. Juraj Dressler	SMU
Tajikistan	TJ	Mr. Khadiyatulloi Safar Makhmadnazarzoda	Tajikstandard
Turkey	TR	Mr. Mehedin Arifovic	UME
Uzbekistan	UZ	Mr. Djalalkhan Arifkhanov	UzNIM
Ukraine	UA	Prof. Oleh Velychko	Ukrmetteststandard



Activities from
01.02.2023



IMEKO TC4 “Measurement of Electrical Quantities”



TC4

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Miscellaneous Information



Main fields of interest

- comparison of national standards of electrical quantities



IEC TC 85 “Measuring equipment for electrical and electromagnetic quantities”



International
Electrotechnical
Commission

All participants

Title	Last Name	First Name	National Committee / Organization	Type
			All	All
Mr	Belcher	R. Allan	United Kingdom	Full Member
Mr	Böck	Andreas C.	Germany	Full Member
Mr	Feulner	Dieter	Germany	Full Member
Mr	GRUFFAZ	Franck	France	Full Member
Mr	Hackl	Dieter	Germany	Full Member
Ms	HAN	Guiju	China	Full Member
Mr	LEPRETTRE	Benoît	France	Full Member
Mr	Meinke	Markus	Germany	Full Member
Mrs	Patterson	Monika	Germany	Full Member
Mrs	Pratt	Judith	Accompanying persons	Accompanying persons
Mr	Pratt	Hugh	United Kingdom	Full Member
Mr	Rölli	Roger	Switzerland	Full Member
Mr	Schröder	Karsten	Germany	Full Member
Mr	Schüssele	Hans-Dieter	Germany	Full Member
Mr	Seliger	Bogdan	Slovenia	Full Member
Mr	Siket	Miroslav	IEC Central Office	IEC Central Office staff
Mr	SIRMAIN	Gilles	France	Full Member
Mr	Velychko	Oleg	Ukraine	Full Member
Mr	Wallace	Jim	United Kingdom	Full Member

Total participants : 18



Thank you for your attention !



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