

## ***ANNEX II + III* : TECHNICAL SPECIFICATIONS + TECHNICAL OFFER**

**Contract title:** Supply of equipment for metrology and testing services.

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**Publication reference :** EuropeAid/126506/C/SUP/UA

**Column 1-2 should be completed by the Contracting Authority**

**Column 3-4 should be completed by the tenderer**

**Column 5 is reserved for the evaluation committee**

Annex III - the Contractor's technical offer

The tenderers are requested to complete the template on the next pages:

- Column 2 is completed by the Contracting Authority shows the required specifications (not to be modified by the tenderer),
- Column 3 is to be filled in by the tenderer and must detail what is offered (for example the words “compliant” or “yes” are not sufficient)
- Column 4 allows the tenderer to make comments on his proposed supply and to make eventual references to the documentation

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offered specifications.

**General requirements for all instruments:**

**Environmental conditions:** Ambient operating temperature: 15 to 35°C; ambient operating humidity: 30 to 70%; storage extremes: - 40 to 65°C .

**Documentation:** For each instrument supplied, clearly written in English and/or Russian or Ukrainian which provides the following information: instructions for routine use and maintenance; statement of the performance characteristics, e.g. accuracy, sensitivity, etc.

**Each instrument should be supplemented by a complete installation and start up kit, including cords, cables, printer paper, etc.**

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 1 – Mass Measurement</b>				
1	<p><b>Mass Comparator E1 1kg – 1 unit</b></p> <p><b>Application:</b> Calibration of mass standards of E1 class of accuracy from 100 g to 1 kg with the required accuracy.</p> <p><b>Required metrological characteristics:</b> Maximum capacity <math>\geq 1</math> kg; Readability <math>d = 0.001</math> mg; Standard deviation <math>s \leq 0.002</math> mg; Linearity – 0.02/0.5 mg/g; Stabilization time – 25 sec.</p> <p><b>Power Supply:</b> 220 V, 50 Hz</p> <p><b>Additional equipment:</b></p> <ul style="list-style-type: none"> <li>- Centrematic;</li> <li>- Draftshield;</li> <li>- Printer.</li> <li>- <i>External calibration weight 2 g/E2</i> calibrated at an accredited calibration service laboratory like DKD, UKAS, COFRAC, SCS etc;</li> <li>- <i>Climatic station</i> for the correction of air buoyancy to calibrate the weights set of OIML</li> </ul>			

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	<p>class E1. This station should have the possibility of retrieving of the stored data (2 month ago). Temperature sensor of the climatic station should have: Range: -30°C to 70°C; Resolution: 0.01 K; Reproducibility : <math>\pm 0.02</math> K; Total measurement uncertainty : 0.1 K. To be supplied with a calibration certificate from an accredited calibration service laboratory such as DKD, UKAS etc.</p> <p><i>Pressure sensor</i> of the climatic station should have: to be used at an altitude of 200 m above sea level; Range : 900 to 1050 hPa; Resolution : 0.1 hPa; Reproducibility : <math>\pm 0.5</math> %; Long term drift : <math>\pm 0.1</math> hPa per year; To be supplied with a calibration certificate from an accredited laboratory like DKD, UKAS etc. Power supply of the climatic station: 220 V, 50 Hz.</p> <p><i>Humidity sensor</i> of the climatic station should have: Range: 0 to 100 %; Resolution: 0.1 %; Reproducibility: <math>\pm 0.5</math> %; Long term drift: <math>\pm 1</math> % per year; Total measurement uncertainty: <math>\pm 1</math> %. To be supplied with a calibration certificate from an accredited laboratory like DKD, UKAS etc.</p> <p>Pressure sensor of the climatic station should have: to be used at an altitude of 200 m above sea level; Range : 900 to 1050 hPa;</p>			

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	<p>Resolution : 0.1 hPa;  Reproducibility : <math>\pm 0.5</math> %;  Long term drift : <math>\pm 0.1</math> hPa per year;  To be supplied with a calibration certificate from an accredited laboratory like DKD, UKAS etc.  Power supply of the climatic station: 220 V, 50 Hz.</p> <p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate to supplied mass comparator. For other instruments certificates are specified above.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
2	<p><b>Precision balance with continuous weighing range (full electrical range) for the determination of density of weights – 1 unit.</b></p> <p><b>Application:</b> Determination of density of weights E1 class of accuracy and lower, from 1 kg to 10 kg with the required accuracy.</p> <p><b>Required metrological characteristics:</b>  Maximum capacity Max <math>\geq 10000</math> g;  Readability <math>d = 1</math> mg; Standard deviation <math>s \leq 1</math> mg; With underfloor weighing possibility.</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p>			

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	<p><b>Additional equipment:</b></p> <p><i>Accessories:</i></p> <ul style="list-style-type: none"> <li>- Visible waterbath with control and cooling system; Capacity – 70 l; Resolution: 0.01 °C or better; Temperature: 0–200 °C; Operational temperature 20 °C.</li> <li>- Levelmatic for the balance.</li> </ul> <p><b>Certificates:</b> Producer's certificate of the product quality control and producer calibration certificate to supplied balance.</p> <p><b>Installation, commissioning and training are not required.</b></p>			
3	<p><b>Susceptometer for the determination of the magnetic properties of weights – 2 units</b></p> <p><b>Application:</b> Determination of magnetic properties of weight set E1 class of accuracy and lower up to 50 kg with the required accuracy.</p> <p><b>Required metrological characteristics:</b> Maximum capacity <math>\geq 50</math> kg; Dipole moment of the magnet <math>m \sim 0.1 \text{ A m}^2</math>; Geometry ratio of the magnet – 0.87; Field strength – 2700, 2000, 800, 360, 200 A/m; Readability <math>d = 1 \mu\text{g}</math>.</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b></p>			

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	<p><i>Accessories:</i></p> <ul style="list-style-type: none"> <li>- Software to operate the instrument;</li> <li>- Laptop suitable for running the above software, including interface cable etc.;</li> <li>- Reference magnets;</li> <li>- Reference susceptibility standard in a wooden case.</li> </ul> <p><b>Certificates:</b> Producer certificate of the product quality control and producer calibration certificate to supplied equipment. Calibration certificates from a national metrology laboratory, such as PTB or NPL, for reference magnets and reference susceptibility standard.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
4	<p><b>Mass Standards from 1 mg to 10 kg, OIML class E1 – 1 set</b></p> <p>Application: As the reference standards used for verification of weights and calibration of mass standards E2 from 1 mg to 10 kg with the required accuracy.</p> <p><b>Required metrological characteristics:</b>  Range: from 1 mg to 10 kg.  Set containing:  Wire weights from 1 mg to 500 mg;  Cylindrical weights with knob from 1 g to 10 kg;</p>			

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	<p>In wooden boxes.  Combination 1; 2; 2; 5 x 10n.  Class of accuracy: E1 carried out in accordance with OIML R 111.  Material: non-magnetic stainless steel.  Density: 8000 ± 65 kg/m<sup>3</sup>.  Magnetic susceptibility less than 0.01.  Mass standards should be accompanied by calibration certificates from a National Metrology Laboratory such as PTB, NPL etc.</p> <p><b>Additional equipment:</b>  - Suitable tweezers – 2 pcs.;  - Suitable brushes – 2 pcs.;  - Hand gloves – 2 pairs.</p> <p><b>Certificates:</b> Calibration certificate from a National Metrology Laboratory such as PTB, NPL etc.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
5	<p><b>Mass Comparator 6 g – 1 unit</b></p> <p><b>Application:</b> Calibration and verification of mass standards and weights nominal mass values from 1 mg to 5 g accuracy class E1 in conformance with OIML R111.</p> <p><b>Required metrological characteristics:</b>  Maximum capacity ≥ 6 g;</p>			

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	<p>Readability <math>d = 0.0001</math> mg;  Standard deviation <math>s \leq 0.0003</math> mg;  Linearity – 0.001/2.1 mg/g;  Stabilization time – 10 sec.</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b>  <i>Standard accessories:</i>  - Data interface RS-232C;  - Draft shield.  - External calibration weight 5g / E2 calibrated at an accredited Calibration Service Laboratory such as DKD, UKAS, COFRAC, SCS etc.</p> <p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate to supplied mass comparator. For all other instruments certificates as specified above.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
6	<p><b>Mass Comparator 50g. – 1 unit</b></p> <p><b>Application:</b> Calibration and verification of mass standards and weights nominal mass values from 1 g to 50 g accuracy class E1 in conformance with OIML R111.</p> <p><b>Required metrological characteristics:</b>  Maximum capacity <math>Max \geq 50</math> g;</p>			



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	<p>Readability <math>d = 0.001</math> mg;  Standard deviation <math>s \leq 0.002</math> mg;  Range sensitivity – 0.002/0.01 mg/g;  Stabilization time – 15 sec.</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b>  <i>Standard accessories:</i>  - Data interface RS-232C, RS-423;  - Hanger for under-scale weighing;  - Draft shield.  - External calibration weight 20 g/E2 calibrated at an accredited Calibration Service Laboratory such as DKD, UKAS, COFRAC, SCS etc.</p> <p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate to supplied mass comparator. For all other instruments certificates as specified above.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
7	<p><b>Mass Comparator 1000g – 1 unit</b></p> <p><b>Application:</b> Calibration and verification of mass standards and weights nominal mass values from 100 g to 1 kg accuracy class E1 in conformance with OIML R111.</p> <p><b>Required metrological characteristics:</b></p>			

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	<p>Maximum capacity Max <math>\geq</math> 1000 g,  Readability d = 0.001 mg,  Standard deviation <math>s \leq</math> 0.002 mg,  Range sensitivity – 0.001/0.01 mg/g,  Stabilization time – 25 sec.</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b>  <i>Standard accessories:</i></p> <ul style="list-style-type: none"> <li>- Data interface RS-232C, RS-423;</li> <li>- Load alternator;</li> <li>- Centering device;</li> <li>- Draft shield.</li> <li>- External calibration weight 2 g/E2 calibrated at an accredited Calibration Service Laboratory such as DKD, UKAS, COFRAC, SCS etc.</li> </ul> <p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate to supplied mass comparator. For all other instruments certificates as specified above.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
8	<p><b>Mass Comparator 50000 g. – 1 unit</b></p> <p><b>Application:</b> Calibration and verification of mass standards and weights: - nominal mass values from 20 kg to 50 kg accuracy class E2 in</p>			

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	<p>conformance with OIML R111.</p> <p><b>Required metrological characteristics:</b>  Maximum capacity <math>\geq 50000</math> g,  Readability <math>d = 10</math> mg (higher readability on request),  Standard deviation <math>s \leq 10</math> mg,  Range sensitivity – 20/100 mg/g,  Stabilization time – 10 sec.</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b>  <i>Standard accessories:</i>  - Data interface RS-232C, RS-423;  - Load alternator;  - Centering device;  - Hanger for under-scale weighing;  - Draft shield.  - External calibration weight 20 kg/E2 calibrated at an accredited Calibration Service Laboratory such as DKD, UKAS, COFRAC, SCS etc.</p> <p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate to supplied mass comparator. For all other instruments certificates as specified above.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
9	<p><b>Mass standards from 1 mg to 20 kg, OIML class E1 – 1 set</b></p> <p><b>Application:</b> As the reference standards used for verification of weights and calibration of mass standards of accuracy class E2 from 1 mg to 20 kg with the required accuracy.</p> <p><b>Required metrological characteristics:</b>  Range: from 1 mg to 20 kg.  Set containing:  Wire weights from 1 mg to 500 mg  Cylindrical weights with knob: set of weights from 1 g to 1 x 10 kg, 2 x 20 kg.  In wooden boxes.  Combination 1; 2; 2; 5 x 10n.  Class of accuracy: E1 carried out in accordance with OIML R 111.  Material: non-magnetic stainless steel.  Density: in accordance with OIML R 111 requirements  Magnetic susceptibility:  - for weights <math>\leq 1</math> g – less than 0.25;  - for weights from 2 g to 10 g – less than 0.06;  - for weights <math>\geq 20</math> g – less than 0.02;  Mass standards are accompanied by Calibration Certificates from a National Metrology Laboratory such as PTB, NPL etc.</p> <p><b>Additional equipment:</b>  - Suitable tweezers – 2 pcs.;  - Suitable brushes – 2 pcs.;  - Hand gloves – 2 pairs.</p>			

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	<p><b>Certificates:</b> Calibration Certificate from a National Metrology Laboratory such as PTB, NPL etc.</p> <p><b>Installation, commissioning and initial operational training are not required.</b></p>			

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<b>Lot 2 – EMS/EMC Test Systems and High Frequency Equipment</b>				
1	<p><b>EMC tests system for EN 61000-4-3, EN 61326, EN61000-4-20 (RF-immunity up to 3 GHz) – 1 unit.</b></p> <p><b>Required metrological characteristics:</b> According to EN 61000-4-3, EN 61326, EN61000-4-20; Frequency Range: 0,08 – 3 GHz; Field Strength: 1 – 10 V/m.</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b> GTEM 1500, multiple connection options, supervisor build up; Signal generation 9 kHz – 3 GHz ; RF Amplifier 80 MHz – 1 GHz,100 W; Directional Coupler 80 MHz – 1 GHz, 200 W, fitting to the amplifier; RF Amplifier 800 MHz – 3 GHz, 75 W; Directional Coupler 800 MHz – 4 GHz, 100 W, fitting to the amplifier; RF-switch-board; Power Meter, 2-channel, power sensor; E-Field Probe Kit up 6 GHz; EMC Immunity Software (Compliance 3 Immunity); Control-PC, GPIB-card &amp; cables; Cable Kit.</p>			

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	<p><b>Certificates:</b> Calibration certificates from producers are required.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
2	<p><b>EMC Test System - Conducted Transient Immunity – 1 unit</b></p> <p><b>Application:</b> EMC Tests EN 61326, EN 61000-4-4, EN 61000-4-5, EN 61000-4-11, EN 61000-4-12. Enhancement for the equipment complex already installed in the recipient institution.</p> <p><b>Required metrological characteristics:</b> according to EN 61000-4-4, EN 61000-4-5, EN 61000-4-11, EN 61000-4-12.</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b>  System Mainframe, Generator Chassis, Extension Chassis  Surge Module, hybrid pulses 1.2/50µs – 8/20µs incl. CDN 1 ph,16A  Coupling assembly for data lines  Coupling assembly for telecom lines  Burst Module with 16A CDN  Coupling network, 3ph with built in Burst Coupling option, 25 A</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>IEC Coupling Clamp with interlock Telecom Surge Module 0.5/700 <math>\mu</math>s telecom pulse 6.6 kV PQT Generator Module Variable AC Source WINDOWS (as the PCs in the Beneficiary institution are running MS Windows operating systems) software package for NSG 2050 Accessories, Cabling</p> <p><b>Certificates:</b> Calibration certificates from producers.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
3	<p><b>EMC receiver for emission testing and accessories for EN 61326, EN 55011, EN 55022 – 1 unit</b></p> <p><b>Application:</b> EMC Tests for EN 61326, EN 55011, EN 55022 RF-Emission in GTEM, Disturbance Voltage and Disturbance Power Enhancement for the equipment complex already installed in the recipient institution.</p> <p><b>Required metrological characteristics:</b> According to CISPR 16-1</p>			



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	<p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b> EMI-Receiver 9 kHz – 2,75 GHz, CISPR compliant; EMC Emissions Software (Compliance 3 Emissions); LISN, 4 Line for Conducted Emission Disturbance voltage; Absorbing Clamp and Side Lane for Conducted Emission Disturbance power; Cable Kit; Control-PC, GPIB-Card &amp; Cables, National Instruments</p> <p><b>Certificates:</b> Calibration certificates from producers.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
4	<p><b>EMC Test system - Immunity to conducted disturbances, induced by RF fields IEC/EN 61000-4-6 – 1 unit</b></p> <p><b>Application:</b> EMC Tests EN 61326, EN 61000-4-6. Enhancement for the equipment complex already installed in the recipient institution.</p> <p><b>Required metrological characteristics:</b> According to EN 61000-4-6</p>			

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	<p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b>            Compact Generation 9 kHz – 1 GHz            Integrated 4 channel Power Meter            Integrated RF Amplifier 150 kHz – 230 MHz, 75 W            Integrated Directional coupler fitting the amplifier            Cable Kit, Attenuator 6 dB, 75 W            EM Clamp with Calibration Adapter, BNC/N Adapter, 50 Ohm Attenuator            CDN M2 with Calibration Adapter in Suitcase            CDN M3 with Calibration Adapter in Suitcase            CDN S1 with Calibration Adapter in Suitcase            TBD Optional CDNs for other application            Attenuation Clamps</p> <p><b>Certificates:</b> Calibration certificates from producers.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
5	<p><b>Triple-Loop Antenna – 1 unit</b></p> <p><b>Application:</b> Calibration of magnetic field metering devices</p> <p><b>Required metrological characteristics:</b>            Frequency range 9 kHz to 30 MHz</p>			

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	<p>Loops: switchable between X, Y and planes  Transducer factor of current probe: 0 dB referred to 1 S  RF connector: N female: 50 <math>\Omega</math>  Dimensions (W x H x D), weight (not exceeds)  Loops set up, reduced height: 2,49 m x 2,09 m x 2,07 m  Transport crate : 2,68 m x 2,32 m x 2,57 m  Adapter pedestal 0,9 m x max 0,5 m x 0,9 m; 30 kg</p> <p><b>Additional equipment:</b> Automated calibration management software</p> <p><b>Certificates:</b> Calibration certificate from a national metrology laboratory such as PTB, NPL, etc.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
6	<p><b>Test System for RF Metering Devices – 1 unit</b></p> <p><b>Application:</b> Calibration of magnetic field metering devices</p> <p><b>Required metrological characteristics:</b>  Frequency range 150 kHz to 1 GHz  Max. RF input power: 100 W CW at 40 °C  150 W CW at 25 °C, max. 5 min  245 W PEP at 80 % AM and 40 °C  Input impedance 50 <math>\Omega</math></p>			

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	<p>Size of uniform area: 500 mm x 500 mm  RF input power for 10 V/m to EN 61000-4-3, 8/97: 36 dBm typ.  Shielding effectiveness: <math>\geq 75</math> dB (up to 500 MHz); <math>\geq 60</math> dB (above 500 MHz)  <b>Mechanical data:</b> Dimensions (W x H x D): 1512 mm x 1192 mm x 1121 mm  Door opening (W x H): Not exceeding 1100 mm x 650 mm  Inner dimensions of test cell (W x H x D): 950 mm x 704 mm x 982 mm  RF connector: N female  Weight not exceeding 210 kg</p> <p><b>Power Supply:</b> 220 V - 230 V</p> <p><b>Certificates:</b> Calibration certificate from a national metrology laboratory such as PTB, NPL, etc.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
7	<p><b>TV Analyser – 1 unit</b></p> <p><b>Application:</b> Spectrum analysis with highest dynamic range and universal analysis of digitally modulated signals.</p> <p><b>Required metrological characteristics:</b>  Frequency range from 100 kHz to 3.0 GHz</p>			

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	<p>Resolution bandwidths from 100 Hz to 1 MHz  Total measurement error up to 3.0 GHz &lt; 1.5 dB  Low phase noise (at 30 kHz from carrier &lt; 90 dB  Tracking generator. TV demodulator.  Digital filters and AM, FM measurement.</p> <p><b>Power Supply:</b> 220 V - 230 V</p> <p><b>Additional equipment:</b>  Antenna, Cable DTF, Antenna Spectrum.  Software for "Microsoft Windows XP" (this  operating system is installed at the PCs in the  Beneficiary institution)</p> <p><b>Certificates:</b> Producer certificate of the product  quality control and calibration certificate from a  National Metrology Institute such as PTB, NPL.</p> <p><b>Installation, commissioning and initial  operational training</b> in Russian/Ukrainian (or in  English with interpretation into Russian or  Ukrainian) are required.</p>			
8	<p><b>System for control of proper radiations (EMI)  – 1 unit</b></p> <p><b>Application:</b> For conducting measurements of  proper radiations of electro technical and radio  technical instruments of different destinations.</p> <p><b>Required metrological characteristics:</b>  Bench model. Voltage range 0.01 <math>\mu</math>V to 30 V;  Error limit of voltage measurement: <math>\pm 0.5</math> % to  <math>\pm 10</math> %</p>			

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	<p>Intensity of electromagnetic field: 0 to 180 dB<math>\mu</math>V/m;  Error limit of intensity measurement: <math>\pm</math>0.1 dB to <math>\pm</math>2 dB  Frequency range: 10 kHz to 18 GHz  Error limit of frequency measurement: <math>\pm</math>10 (-6) to <math>\pm</math>10 (-4)</p> <p><b>Power Supply:</b> 220 V - 230 V</p> <p><b>Additional equipment:</b>  Complete antenna and cable.  Software Test System. Lap top wire program "Microsoft Windows XP" (this operating system is installed at the PCs in the Beneficiary Institution).</p> <p><b>Certificates:</b> Producer's certificate of the product quality control or producer calibration certificate to the supplied system.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
9	<p><b>Test System for EMS Radiated and Immunity - 1 unit</b></p> <p><b>Application:</b> Radiated and conducted EMS measurements in line with commercial, automotive and MIL standards. For conducting measurements of electromagnetic sensitivity of</p>			

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	<p>electrotechnical and radio technical instruments of different destinations.</p> <p><b>Required metrological characteristics:</b>  Bench model. Voltage range: -20 dB/ <math>\mu</math>V to + 150 dB/<math>\mu</math>V;  Error limit of voltage measurement: <math>\pm</math>0.1 dB to <math>\pm</math>2 dB  Frequency range: 10 kHz to 5 GHz  Error limit of frequency measurement: <math>\pm</math>10 (-6) to <math>\pm</math>10 (-4)</p> <p><b>Power Supply:</b> 220 V - 230 V</p> <p><b>Additional equipment:</b> Complete antenna and cable. Software Test System. Lap top wire program "Microsoft Windows XP" (this operating system is installed at the PCs in the Beneficiary Institution).</p> <p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate to the supplied EMS Test System.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			

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<b>Lot 3: Humidity Calibration</b>				
1	<p><b>Humidity Calibration System for Humidity Analysers – 1 unit</b></p> <p><b>Application:</b> Humidity analyzers calibration, tests and verification</p> <p><b>Required metrological characteristics:</b> Gas humidity (Dew point (DP) temperature) from minus 80 to 20 °C. Measurement uncertainty: <math>\pm (0,05 - 0,15)</math> DP °C (k = 2)</p> <p><b>Power Supply:</b> 230 V, 50 Hz (single phase)</p> <p><b>Additional equipment:</b> Complex of Humidity calibration system:</p> <ul style="list-style-type: none"> <li>- Two stage push-button dew point generator for operation in the range (minus 100 to 20) DP °C with 10 predetermined dew point levels;</li> <li>- supported precision hygrometer (precision <math>\pm 0.05 - 0.1</math> DP °C);</li> <li>- wheeled rack;</li> <li>- pressure cell;</li> <li>- calibration chamber;</li> <li>- computer with printer and software;</li> <li>- dryer of air on the input of generator (gas output below minus 100 DP °C)</li> </ul> <p>To be supplied with a calibration certificate from a National Metrology Institute such as PTB, NPL</p>			



	<p>etc.</p> <p><b>Certificates:</b> To be supplied with a calibration certificate from a National Metrology Institutes such as PTB, NPL etc.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
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1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 4 – Measurement of Electrical Quantities</b>				
1	<p><b>Multifunction Precision Calibrator 5720A – 1 unit</b></p> <p><b>Application:</b> Calibration of working standards of electric value with the required accuracy. An extension for the equipment complex already installed in the recipient institution.</p> <p><b>Required metrological characteristics:</b> Direct voltage: (0 – 1100) V with traceable uncertainty <math>\pm 3,25</math> ppm  Alternating voltage (Frequency 10 Hz - 1,2 MHz): (220 <math>\mu</math>V - 1100 V) with traceable uncertainty <math>\pm 55</math> ppm  Resistance: (1 <math>\Omega</math> - 100 M<math>\Omega</math>) with traceable uncertainty <math>\pm 9</math> ppm  Direct current: (0 – 11) A with traceable uncertainty <math>\pm 9</math> ppm  Alternating current (Frequency 10 Hz - 1,2 kHz): (9 <math>\mu</math>A - 11 A) with traceable uncertainty <math>\pm 140</math> ppm</p> <p><b>Power Supply:</b> 220 V - 230 V</p> <p><b>Additional equipment:</b>  Wideband AC voltage option  Amplifier for 11 A current  low thermal cable set  portable artifact cal package  Shielded IEEE-488 cable, 2 m</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>Plus automated calibration management software and laptop with characteristics sufficient for running this software.</p> <p><b>Certificates:</b> Calibration certificate from a national metrology laboratory such as PTB, NPL, etc.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
2	<p><b>Multi-Product Calibrator with Oscilloscope Calibration Option – 1 unit</b></p> <p><b>Application:</b> Calibration of multimeters and analog-digital oscilloscopes with the required accuracy. An extension for the equipment complex already installed in the recipient institution.</p> <p><b>Required metrological characteristics:</b> Direct voltage: (0 – 1020) V with uncertainty <math>\pm 0,0012</math> % of output;  Alternating voltage (Frequency for 500 kHz): (1 mV - 1020 V) with uncertainty <math>\pm 0,012</math> % of output;  Resistance: (1 - 1100 M<math>\Omega</math>) with uncertainty <math>\pm 0,0028</math> % of output;  Direct current: (0 – 20,5) A with uncertainty <math>\pm 0,01</math> % of output;  Alternating current (Frequency 10 Hz - 30 kHz):</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>(29 <math>\mu</math>A – 20,5 A) with uncertainty <math>\pm 0,06</math> % of output;  Frequency (0,01 Hz – 2,0 MHz) with uncertainty <math>\pm 0,00025</math> % of output;  Capacitance: 0,19 nF – 110 <math>\mu</math>F with uncertainty <math>\pm 0,25</math> % of output;  Phase: (0 – <math>\pm 179,99</math> 0) frequency (10 Hz – 30 kHz) with uncertainty <math>\pm 0,07</math> % of output;  DC Power: 10,9 <math>\mu</math>W – 20,5 kW with uncertainty <math>\pm 0,023</math> % of output;  AC Power: 10,9 <math>\mu</math>W – 20,5 kW (Frequency 45 Hz – 65 Hz) with uncertainty <math>\pm 0,08</math> % of output;  Temperature Calibration (thermocouple): minus 250 0C – 2316 0C (11 types) with uncertainty <math>\pm 0,14</math> 0C of output;  Temperature Calibration (RTD): minus 200 0C – 630 0C (8 types) with uncertainty <math>\pm 0,03</math> 0C of output;  Oscilloscope Calibration: 300 MHz  direct voltage: (0 to 2,2) V (50 <math>\Omega</math>) with uncertainty +0,25 % of output;  alternating voltage:  +1,8 mV to +2,2 V p-p (50 <math>\Omega</math>) with uncertainty +0,25 % of output;  +1,8 mV to +105 V p-p (1M<math>\Omega</math>) with uncertainty +0,25 % of output;  short front 4,5 mV to 75 V p-p (50 <math>\Omega</math>), rise time &lt; 1 ns;  smoothed sinusoid 50 kHz to 300 MHz, smoothing + 1,5%  time marker 5 s to 2 ns, sawtooth pulse, sinusoid, with uncertainty + 25 ppm;  wave generator 1,8 mV to 55 V p-p (1 M<math>\Omega</math>); 1,8</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>mV to 2,2 V p-p (50 <math>\Omega</math>); 10 Hz to 100 kHz; square, sinusoid, triangle, with uncertainty +3 % of output.</p> <p><b>Power Supply:</b> 220 V - 230 V</p> <p><b>Additional equipment:</b> Automated calibration management software.</p> <p><b>Certificates:</b> Calibration certificate from a national metrology laboratory such as PTB, NPL, etc.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
3	<p><b>AC-DC Transfer Standard – 1 unit</b></p> <p><b>Application:</b> Calibration of working standards of alternating current and voltage with the required accuracy.</p> <p><b>Required metrological characteristics:</b>  Voltage : 22 mV with tolerance 5 % + 5,3 mV  220 mV with tolerance 5 % + 760 <math>\mu</math> V  700 mV with tolerance 5 % + 500 <math>\mu</math> V  2,2 V with tolerance 10 % + 300 <math>\mu</math> V  7 V with tolerance 10 % + 300 <math>\mu</math> V  22 V with tolerance 10 % + 300 <math>\mu</math> V  70 V with tolerance 10 % + 300 <math>\mu</math> V  220 V with tolerance 10 % + 300 <math>\mu</math> V  1000 V with tolerance 10 % + 300 <math>\mu</math> V</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>Frequency: 10 Hz – 1 MHz Best ac/dc difference: <math>\pm 10</math> ppm per year</p> <p><b>Power Supply:</b> 220 V - 230 V</p> <p><b>Additional equipment:</b> 1000 V Range resistor; Transfer switch; Current shunt adapter; Current shunts: 10 mA, 20 mA, 30 mA, 50 mA, 100 mA, 200 mA, 300 mA, 500 mA, 1 A, 2 A, 3 A, 5 A, 10 A, 20 A with max. uncertified AC/DC difference from <math>\pm 0,02</math> % to <math>\pm 0,05</math> % Output cable for current shunt; connects the output of the current shunt to the adapter; Input cable for current shunts.</p> <p><b>Certificates:</b> Calibration certificate from a national metrology laboratory such as PTB, NPL, etc.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
4	<p><b>Electricity Power Meter Source – 1 unit</b></p> <p><b>Application:</b> Electricity Power Meter Source</p> <p><b>Required metrological characteristics:</b> Current outputs: Current Range 0.12 – 0.24 – 0.6 – 3 – 6 - 15 - 30 – 60 A, 1 % to 100 %</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>Stability: better than 0.2 % / 8h  Voltage outputs:  Voltage range 80 –160 – 320 V 50 % to 100 %  (phase-neutral)  Stability: better than 0.2 % / 8h  Power supply: 100 to 240 VAC, +10 %, +15 %  Frequency:  Range: 40 to 70 Hz quartz controlled  Accuracy: better than 0.002 %  Phase angle:  Phase angle range: (U – I) 0° to 360°  Stability: better than 0.2° / 8h  DC- measurement inputs:  Range: -20 mA +20 mA / -10 V to +10 V  Max. power consumption: 330 W  Interfaces:  RS 232-C interface for remote control by PC or  TPZ 303  IEEE 488- interface  To be supplied with a calibration certificate from  a National Metrology Institute such as PTB, NPL,  etc.  <b>Power Supply:</b> 220 V, 50 Hz.  <b>Additional equipment:</b> Software to operate the  device.  <b>Certificates:</b> Producer certificate of the product  and Calibration Certificate from a National  Metrology Institute like PTB, NPL, etc.  <b>Installation, commissioning and initial</b></p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	operational training are not required.			
5	<p><b>Standard High Voltage Capacitor – 1 unit</b></p> <p><b>Application:</b> Metrological ensurance of AC voltage scale conversion coefficient measurement, electrical capacity and tangent of dielectrical losses under high voltages.</p> <p><b>Required metrological characteristics:</b>  Capacity (nominal value) 50 pF.  Voltage drift <math>3 \times 10^{-5}</math>  Tangens <math>\delta 1 \times 10^{-5}</math>  Accuracy 0,05 %  Voltage max 600 kV</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b> Measurement cables.</p> <p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate to supplied equipment.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			
6	<p><b>Universal testing station 5520A Work Station – 1 unit</b></p> <p><b>Application:</b> An enhancement for the equipment complex already installed in the recipient institution. Calibration and metrological</p>			



1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>certification numerical and analog voltmeters, ammeters, measuring instruments of capacity, measuring instruments of resistance, frequency meters, measuring instruments power, measuring instruments phase</p> <p>Required metrological characteristics:</p> <p>Fluke 5520  <math>U = \pm 1020 \text{ V} (\pm 12 \text{ ppm})</math>  <math>I = \pm 20,5 \text{ A} (\pm 100 \text{ ppm})</math>  <math>R = 1100 \text{ M}\Omega (\pm 28 \text{ ppm})</math>  <math>U \approx 1 \text{ mV} - \pm 1020 \text{ V} (\pm 120 \text{ ppm})</math>  <math>f = 10 \text{ Hz} - 500 \text{ kHz}</math>  <math>I \approx 29 \text{ mA} - 20,5 \text{ A} (\pm 0,06 \%)</math>  <math>f = 10 \text{ Hz} - 30 \text{ kHz}</math>  <math>C = 0,19 \text{ nF} - 110 \text{ mF} (\pm 0,25 \%)</math>  <math>P = 0,9 \text{ W} - 20,5 \text{ kW} (\pm 0,023 \%)</math>  <math>P \approx 10,9 \mu\text{W} - 20,5 \text{ kW} (\pm 0,08 \%)</math>  <math>f = 45 - 65 \text{ Hz}, \text{PF} = -1</math>  <math>\Delta\phi = 0 - 179,99 \text{ }^\circ</math>  <math>f = 0,01 \text{ Hz} - 2,0 \text{ MHz} (\pm 25 \text{ ppm})</math></p> <p>Fluke 8508A/01  <math>U = 0 - \pm 1050 \text{ V} (\pm 3 \text{ ppm})</math>  <math>I = 0 - \pm 20 \text{ A} (\pm 12 \text{ ppm})</math>  <math>R = 0 - 20 \text{ G}\Omega (\pm 765 \text{ ppm})</math>  <math>U \approx 2 \text{ mV} - \pm 1050 \text{ V} (\pm 65 \text{ ppm})</math>  <math>f = 1 \text{ Hz} - 1 \text{ MHz}</math>  <math>I \approx 2 \mu\text{A} - 20 \text{ A} (\pm 250 \text{ ppm})</math>  <math>f = 1 \text{ Hz} - 100 \text{ kHz}</math></p> <p>Fluke 8846A  <math>U = 100 \text{ mV} - 1000 \text{ V} (\pm 0,0005 \%)</math>  <math>U \approx 100 \text{ mV} - 1000 \text{ V} (\pm 0,003 \%)</math>  <math>f = 3 \text{ Hz} - 300 \text{ kHz}</math></p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>R = 10 Ω – 1 GΩ (± 0,001 %)  I = 100 μA – 10 A (± 0,005 %)  I ≈ 100 mA – 10 A (± 0,04 %)  f = 3 Hz – 1 MHz (± 0,01 %)  F = 1 nF – 0,1 F (± 1 %)  Without oscilloscope option</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b>  Accessories:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Interface cable IEEE-488</li> <li><input type="checkbox"/> Test lead kit</li> <li><input type="checkbox"/> Workstation including connecting cables for 8508A/01 and 8846A</li> <li><input type="checkbox"/> MET/CAL – calibration software</li> </ul> <p><b>Certificates:</b> Producer certificate of the product quality control and certificate from accredited calibration service laboratory of an EU Member State.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			
7	<p><b>Capacitance standard – 1 unit</b></p> <p><b>Application:</b> Calibration of measuring devices of electric values (capacity; blocks of capacity; bridges of alternating current).</p> <p><b>Required metrological characteristics:</b> Standard Frame with two Fused-Silica capacitances. Capacitance values 10 pF and 100 pF.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>Accuracy of initial setting: <math>(2 + 1/C)</math> ppm at 1 kHz where "C" is the value of the capacitance in pF.  Stability in ppm per year: <math>(0.3 + 1/C)</math> ppm/year  Temperature coefficient relative to a change in ambient temperature: 0.01 ppm/°C  Hysteresis from temperature cycling: 0.05 ppm  Hysteresis from mechanical shock: 0.05 ppm  AC voltage coefficient: 0.003 ppm/volt rms at 1 kHz  DC voltage coefficient: 0.0001 ppm/volt  Sensitivity to power line voltage changes: 0.0003 ppm per 1 % change in power line voltage  Dissipation factor: less than 0.000 003 tan delta  Maximum allowable applied voltage: 250 volts peak  Warm up time from power-on: 30 minutes  Operating temperature range: 10 °C to 40 °C  Storage temperature range: -40 °C to +75 °C  Humidity: 0 to 85 % relative humidity, non-condensing  Power requirements: 40 watts max. during power-on, 20 watts after power-on  Power frequency: 48 to 440 Hz  Power voltage ranges: 85 to 115, 102 to 138, 187 to 253 and 204 to 276 volts rms.  To be supplied with a calibration certificate from a National Metrology Institute like PTB, NPL, etc.</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b> None.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p><b>Certificates:</b> Producer certificate of the product quality and Calibration Certificate from a National Metrology Institute such as PTB, NPL, etc.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			
8	<p><b>Amplifier Fluke 5725A for existing Fluke calibrator – 1 unit</b></p> <p><b>Application:</b> To increase the accuracy and frequency range under calibration of measuring instruments used for AC voltage according to the industrial demand.</p> <p>Required metrological characteristics:  0,1 – 20 V; 10 Hz – 1 MHz; 40 – 800 ppm  above 20 to 30 V; 10 Hz – 700 kHz; 50 – 200 ppm  above 30 to 100 V; 10 Hz – 200 kHz; 50 – 300 ppm  above 100 to 200 V; 10 Hz – 100 kHz; 50 – 400 ppm  above 200 to 750 V; 40 Hz – 100 kHz; 50 – 300 ppm  above 750 to 1000 V; 40 Hz – 30 kHz; 60 – 500 ppm</p> <p><b>Power Supply:</b> 230V, 50 Hz (single phase)</p> <p><b>Additional equipment</b> - None</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p><b>Certificates:</b> Calibration certificate from an accredited calibration service laboratory, like DKD, UKAS etc.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 5 Flow Measurement</b>				
1	<p><b>Koriolis Meter – 1 unit</b></p> <p><b>Application:</b> Transfer standard package for flow test facilities comparisons and flow unit dissemination.</p> <p><b>Required metrological characteristics:</b> Total measuring range (for complete package) – 0,02 to 200 m<sup>3</sup>/h,  Maximum measurement error  - for mass flow rate: <math>\pm 0,1 \% \pm [(zero\ point\ stability/measured\ value) \times 100] \%</math>  - volume flow rate: <math>\pm 0,15 \% \pm [(zero\ point\ stability/measured\ value) \times 100] \%</math>  - density: <math>\pm 0.05\ kg/m^3</math>  - temperature: <math>\pm 0,5\ ^\circ C \pm 0.005\ T</math>, where T is the liquid temperature  Repeatability: less then 0,05 %</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b>  Standard accessories:  - power cables, considering electric supply in Ukraine;  - interconnections cables;  - service modem and dedicated software for maintenance of flowmeters.</p> <p><b>Certificates:</b> Calibrating certificates from a</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	National Metrology Laboratory such as PTB, NPL etc.  <b>Installation, commissioning and initial operational training</b> are not required.			
2	<b>Transportable Prover with Critical Nozzles – 1 unit</b>  <b>Application:</b> Providing traceability of secondary and working gas flow standards to primary standard  <b>Required metrological characteristics:</b> Flow range 0.016 to 16 m <sup>3</sup> /h Uncertainty of measurement ≤ 0.15 %  <b>Power Supply:</b> 220 V - 230 V  <b>Additional equipment:</b> None  <b>Certificates:</b> Producer certificate of the product quality control and producer calibration certificates  <b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.			
3	<b>Transfer Standard Gas Flow Meters – 2 units</b>  <b>Application:</b> Providing traceability of secondary and working gas flow standards to primary standard			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p><b>Required metrological characteristics:</b>  Flow range:  1) 0.25 – 25 m<sup>3</sup>/h (G16)  2) 2 – 400 m<sup>3</sup>/h (G250)  Uncertainty of measurement ≤ 0.15 %  Reproducibility ≤ 0.05 %</p> <p><b>Additional equipment:</b> Pipes with corresponding DN of each gas meter</p> <p><b>Certificates:</b> Producer certificate of the product quality control and producer calibration certificate.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
4	<p><b>Wet Test Gas Meter (drum type) – 1unit</b></p> <p><b>Application:</b> Providing traceability of secondary and working gas flow standards to primary standard</p> <p><b>Required metrological characteristics:</b>  Flow range 0.02 - 1.2 m<sup>3</sup>/h  Uncertainty of measurement ≤ 0.15 %</p> <p><b>Power Supply:</b> 220 V - 230 V</p> <p><b>Additional equipment:</b>  1. Precision sealing liquid level meter  2. Pulse generator (high frequency) to use it with PC</p>			



1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p><b>Certificates:</b> Producer certificate of the product quality control and producer calibration certificate</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 6 Length &amp; Dimensional Measurement and GPS Surveying Systems</b>				
1	<p><b>Set of gauge blocks (L = 0,5 - 100 mm – 1 set of 122 pieces</b></p> <p><b>Application:</b> As output standards used for calibrating standards of the unit of length in the range 0,5 mm to 100 mm with the required accuracy</p> <p><b>Required metrological characteristics:</b> Accuracy class K, L: 0,5; 1,0005; 1,001-1,009; 1,0-1,49; 1,5-2,0; 2,5-4,5; 5,0-8,0; 8,5-9,5; 10,0-18,0; 18,5-24,0; 24,5-25,0; 30,0; 40,0; 50,0; 60,0; 70,0; 75,0; 80,0; 90,0; 100,0. L in mm</p> <p><b>Power Supply:</b> Not needed</p> <p><b>Additional equipment:</b> None</p> <p><b>Certificates:</b> Calibration certificate from a National Metrology Institute such as PTB, NPL etc. Calibration accuracy to be certified: Q(10, 0.1L) nm, L in mm, P = 0,95.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			
2	<p><b>Set of gauge blocks (L = 125 - 1000 mm) – 1 set of 16 pieces</b></p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p><b>Application:</b> As output standards used for calibrating standards of the unit of length in the range 125 mm to 1000 mm with the required accuracy</p> <p><b>Required metrological characteristics:</b> Accuracy class K, L in mm: 125; 150; 175; 200; 250; 300; 350; 400; 450; 500; 600; 700; 750; 800; 900; 1000.</p> <p><b>Power Supply:</b> Not needed</p> <p><b>Additional equipment:</b> Block gauge maintenance kit, plan glass plate</p> <p><b>Certificates:</b> Calibration certificate from a National Metrology Institute such as PTB, NPL etc. Calibration accuracy to be certified: Q(20, 0.06•L) nm, L in mm, P = 0,95.</p> <p><b>Documentation:</b> For each instrument supplied, clearly written in English language (preference is given to manuals both in English and Russian or Ukrainian languages) which provides the following information: instructions for routine use and maintenance; statement of the performance characteristics, e.g. accuracy, sensitivity, etc; health and safety information.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
3	<p><b>GPS Surveying Systems – 2 units</b></p> <p><b>Application:</b> For providing the calibration of GNSS receivers and creating new gravigeodesic complex to be used in the system of ecological monitoring and for metrological assurance. The introduction of up-to-date GNSS technology will</p> <ul style="list-style-type: none"> <li>- approach the safety conditions of the operation of aircraft transport including international routes on the territory of Ukraine;</li> <li>- reduce the cost of cartographic and geodesic as well as gravimetric work;</li> <li>- promote the improvement of the system of ecological monitoring.</li> </ul> <p><b>Required metrological characteristics:</b>  Receiver type: Dual-frequency, GNSS, geodetic, real-time RTK receiver  Summary of measuring, modes and applications: Static, rapid static, kinematic On the fly L1 + L2, code, phase Real-time RTK standard Post processing DGPS/RTCM standard  Survey, geodetic and real-time RTK applications  Accuracy (rms) with post processing  Static (phase), long lines, long observations, choke ring antenna  Static and rapid static (phase) with standard antenna)  Kinematic (phase), in moving mode after initialization  Code only  With LEICA Geo Office L1/L2 processing</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>software.            GLONASS processing option also needed to process GLONASS data            Horizontal: 3 mm + 0.5 ppm            Vertical: 6 mm + 0.5 ppm            Horizontal: 5 mm + 0.5 ppm            Vertical: 10 mm + 0.5 ppm            Horizontal: 10 mm + 1 ppm            Vertical: 20 mm + 1ppm            Galileo prepared : yes            Accuracy (rms) with real-time/RTK            RTK capability            Rapid static (phase),            Static mode after initialization            Kinematic (phase), moving mode after initialization            Code only            DGPS / RTCM Standard            Horiz: 5 mm + 0.5 ppm            Vertical: 10 mm + 0.5 ppm            Horiz: 10 mm + 1 ppm            Vertical: 20 mm + 1 ppm            Accuracy of post processing code: Typically 25 cm</p> <p><b>Power Supply:</b> Internal battery, battery charger            220-230V / 50Hz</p> <p><b>Additional equipment:</b> Standard survey antenna (SmartTrack+), Choke-ring antenna (GPS/GLONASS microstrip)</p> <p><b>Certificates:</b> Producer certificate of the product</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>quality control or producer calibration certificate to each supplied instrument.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
4	<p><b>Comparator device for calibration of gauge blocks – 1 unit</b></p> <p><b>Application:</b> For calibration of high-precision gauge blocks which are used for control service instruments at industrial enterprises in Ukraine</p> <p><b>Required metrological characteristics:</b>  Accuracy: <math>(0,02 + 0,1 \times L) \mu\text{m}</math>, <math>L =</math> measuring length (m)  Measuring range: 0,1 – 100 mm</p> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b> Suitable PC, printer and software to operate the device.</p> <p><b>Certificates:</b> Producer certificate of the product quality control and Calibration Certificate from Accredited Calibration Laboratories such as DKD, UKAS, COFRAC etc</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 7 - Thermometry</b>				
1	<p><b>Precision thermometry bridge – 1 unit</b></p> <p><b>Application:</b> For use in the national primary standard of the unit of temperature .</p> <p><b>Required metrological characteristics:</b> Electrical resistance of the standard platinum thermometers in the range of 0 to 130 Ohm is liable to measurement by means of measuring relative resistance in the range of 0 to 1.299999999. The required accuracy is 0.02 ppm or better. Carrier frequency (nominal): low – 25 Hz, high – 75 Hz.</p> <p><b>Power Supply:</b> 230V, 50 Hz (single phase)</p> <p><b>Additional equipment:</b> Standard resistors for calibration of the bridge: 10 Ohm and 100 Ohm with required accuracy 0.01 ppm or better; software to operate the system and a laptop with characteristics sufficient for running this software.</p> <p><b>Certificates:</b> Producer certificate of the product quality. Calibration certificates for the bridge, resistors from a National Metrology Institute such as PTB, NPL etc.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	English with interpretation into Russian or Ukrainian) are required.			
2	<p><b>Fixed point of nickel (1455 °C) – 1 unit</b></p> <p><b>Application:</b> For calibrating type B platinum-rhodium thermocouples and type A-2, A-3 tungsten-rhenium thermocouples.</p> <p><b>Required metrological characteristics:</b> The calibration of thermocouples is performed in the fixed points of temperature from the freezing point of aluminium to the freezing point of nickel (660.323 °C - 1455 °C). An accuracy of reproducing the temperature of the fixed point of nickel in closed cell (Ua) 0.02 °C or better is required.</p> <p><b>Power Supply:</b> 230V, 50 Hz (single phase)</p> <p><b>Additional requirements:</b> Purity of Ni 99.9999 %;</p> <p><b>Additional equipment:</b> Suitable furnace for high temperature with long-term stability of 0.5 °C is required for above mentioned fixed point of nickel.</p> <p><b>Certificates:</b> Producer certificate of the product quality and calibration certificate from a National Metrology Institute like PTB, NPL etc.</p>			



1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
3	<p><b>Portable thermostat – 4 units</b></p> <p><b>Application:</b> Calibration and investigation of compact heatmeters, thermoconverters.</p> <p><b>Required metrological characteristics:</b>  Measuring range: -35°C to 140°C,  Maximum measuring error: ± 0.04°C  Stability: ± 0.02°C  Depth of thermostat: 160 mm</p> <p><b>Power Supply:</b> 180 - 250 V, 50 Hz.</p> <p><b>Additional equipment:</b>  <b>Standard accessories:</b>  - power cables, considering electric supply in Ukraine;  - interconnections cables;  - RS 232 interface and dedicated software.</p> <p><b>Certificates:</b> Producer calibration certificate.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			
4	<p><b>Thermostat – 2 units</b></p> <p><b>Application:</b> Calibration of thermoconverters and thermometers.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p><b>Required metrological characteristics:</b>  Total measuring range: -30°C to 300°C,  Display resolution: 0,01°C  Temperature stability: <math>\pm 0,005^\circ\text{C}</math>  Usable bath depth: 310 cm  Not visible submerged area  Size of bath open area: 200 mm x 200 mm</p> <p><b>Power Supply:</b> 180 - 250 V, 50 Hz.</p> <p><b>Additional equipment:</b>  Standard accessories:  - power cables, considering electric supply in Ukraine;  - interconnection cables.</p> <p><b>Certificates:</b> Producer calibration certificate.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 8 – Force Measurement</b>				
1	<p><b>Digital Precision Measurement Amplifier – 1 unit</b></p> <p><b>Application:</b> Calibration measurements for comparison. Measurements under difficult conditions, extreme disturbance rejection. Precision measurements using SG-transducers.</p> <p><b>Required metrological characteristics:</b> Accuracy class: 0.0005</p> <ul style="list-style-type: none"> <li>- DMP40S2: 2-channel-system, max. 16 transducers, simultaneous measurement with 2 transducers each, master / specimen</li> <li>- Resolution of signals to the physical limits &gt; 1,000,000 digits</li> <li>- 225 Hz carrier frequency method, EMC protection, CE mark</li> <li>- high-performance, digital filters</li> <li>- individual linearization</li> <li>- 100 % computer controllable (RS-232, RS-422/485, IEEE-488)</li> </ul> <p><b>Power Supply:</b> 220 V, 50 Hz.</p> <p><b>Additional equipment:</b> Standard accessories:</p> <ul style="list-style-type: none"> <li>- Printer paper;</li> <li>- software for PC data exchange data analysis (Catman or equivalent)</li> </ul>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p><b>Certificates:</b> Digital Precision Measuring Amplifier with Calibration Certificate from a National Metrology Laboratory such as PTB, NPL etc.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 9 – Optical Measurement</b>				
1	<p><b>Spectrophotometer – 1 unit</b></p> <p>Application: The national primary standard of the units of spectral coefficients of directed transmission and mirror and diffuse reflection.</p> <p><b>Required metrological characteristics</b></p> <p>Technical description:  Wavelength Range 175 nm – 3300 nm;  Stray Light at 220 nm <math>\leq 5 \cdot 10^{-5}</math> T; at 340 nm <math>\leq 2 \cdot 10^{-5}</math> T; at 370 nm <math>\leq 3 \cdot 10^{-5}</math> T; at 1420 nm <math>\leq 3.2 \cdot 10^{-5}</math> T;  Photometric Accuracy <math>\pm 0.0006</math> A;  Wavelength Accuracy <math>\pm 0.08</math> nm (UV/Vis); <math>\pm 0.30</math> nm (NIR);  Wavelength Reproducibility <math>\pm 0.005</math> nm (UV/Vis); <math>\pm 0.02</math> nm (NIR);  UV/Vis Resolution 0.05 nm;  NIR Resolution 0.20 nm;  Baseline Flatness (190 nm 3100 nm) <math>\pm 0.0007</math> A</p> <p><b>Power Supply:</b> 220 V - 230 V</p> <p><b>Additional equipment:</b>  Module 150 mm integration sphere; universal reflectance accessory for above Spectrophotometer and Base Plate.  Set of measures: spectral regular transmittance, regular and diffused reflections; chroma</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>coordinates and chromaticity coordinates.</p> <p><b>Certificates:</b> Producer certificate of the product quality control and producer calibration certificate to each supplied spectrophotometer.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			
2	<p><b>Integration sphere for spectrophotometer – 1 unit</b></p> <p><b>Application:</b> For using in secondary standard composition for calibration of work standard spectral diffuse reflectance, color coordinate; measured of high precision of whiteness of paper, flour etc. A spare part required for the existing spectrophotometer type UV-3101 PC made by SHIMADZU</p> <p><b>Required metrological characteristics:</b>  Type LISR-3100, spectral range: from 240 to 2400 nm, diameter 150 mm  Geometry: 0/d, d/0,  Low-limit of entrance of aperture: 5 mm</p> <p><b>Power Supply:</b> 220 V, 50 Hz</p> <p><b>Additional equipment:</b>  Accessories: Photometric Software; Color Measurement Software; Large Polarizer Set; BIS-3100 Sample Base Plate Integrating Sphere</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>Set, Cylindrical Cell Holder</p> <p><b>Certificates:</b> Producer certificate of the product quality control.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 10 – Pressure Measurement</b>				
1	<p><b>Gas piston pressure gage – Dead weight tester – 1 unit</b></p> <p><b>Application:</b> Verification and calibration high precision pressure converters with air as working media under upper limit of excessive pressure of 10 MPa.</p> <p><b>Required metrological characteristics:</b> Measurement range up to 10 MPa, accuracy class 0,01, working medium – Air, <math>g = 9,8105</math>, bench type model including sets of weights made from stainless steel.</p> <p><b>Additional equipment:</b> Spare parts kit (including seals).</p> <p><b>Certificates:</b> Certificate issued by National Metrology Laboratory of an EU State.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			



1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 11 – Chemical Metrology</b>				
1	<p><b>Graphite furnace system, Additional material for existing Atomic absorption spectrometer SOLAAR MKII M6 Dual Zeeman (Serial No GE650343) – 1</b> (including accessories and reference materials listed below)</p> <p><b>Application:</b> Certification of national primary certified reference materials (CRM) of the composition of chemical substances and materials by comparison via SRM from NIST (USA) or CRM from IRMM (EU).</p> <p><b>Required metrological characteristics:</b> GRAFITE FURNACE SYSTEM GF95Z.</p> <p><b>Power Supply:</b> 220 V - 230 V</p> <p><b>Additional requirements:</b> Delivered as a “turnkey” (ie ready for immediate use) - including device and all necessary accessories and the additional equipment, special tooling and special test equipment, and complete equipment for finished installation, everything to provide work of device during 1 year.</p> <p><b>Additional accessories needed:</b> Normal electrographite cuvettes (100 pcs.); Pyrolytically coated electrographite cuvettes (100 pcs.); Extended lifetime cuvettes (100 pcs.); Omega platform Extended lifetime cuvettes (100 pcs.);</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes															
	<p>Pyrolytically coated, unridged, electrographite cuvettes (100 pcs.)  Furnace head window; Contact Cone set; Contact Cone replacement tool; User spares Kit  FS95 Furnace Autosampler (with soft, spares and consumables)  VP100 Continuous Flow Vapour Accessory with EC90 Electrically heated atomization cell (with spares and consumables)  Software for SOLAAR M 10.1 or higher  System of an air conditioning for 200 m3  Lamps (coded): 20 elements (Al, Ba, Be, V, Bi, Au, Mn, As, Pd, Pt, Hg, Rb, Se, Ag, Sr, Tl, Te, Ti, Cs, Sb)</p> <p>Certified reference materials (2 pcs. of each):</p> <table border="1" data-bbox="297 858 922 1391"> <thead> <tr> <th data-bbox="297 858 562 1018">SRM from NIST (USA)</th> <th data-bbox="562 858 734 1018">Certified Value of Element, mg/g</th> <th data-bbox="734 858 922 1018">Uncertainty, mg/g</th> </tr> </thead> <tbody> <tr> <td data-bbox="297 1018 562 1114">3141a Potassium Standard Solution</td> <td data-bbox="562 1018 734 1114">10.295</td> <td data-bbox="734 1018 922 1114">0.023</td> </tr> <tr> <td data-bbox="297 1114 562 1209">3114 Copper Standard Solution</td> <td data-bbox="562 1114 734 1209">9.993</td> <td data-bbox="734 1114 922 1209">0.016</td> </tr> <tr> <td data-bbox="297 1209 562 1305">3128 Lead Standard Solution</td> <td data-bbox="562 1209 734 1305">9.98</td> <td data-bbox="734 1209 922 1305">0.03</td> </tr> <tr> <td data-bbox="297 1305 562 1391">3152a Sodium Standard Solution</td> <td data-bbox="562 1305 734 1391">9.99</td> <td data-bbox="734 1305 922 1391">0.02</td> </tr> </tbody> </table>	SRM from NIST (USA)	Certified Value of Element, mg/g	Uncertainty, mg/g	3141a Potassium Standard Solution	10.295	0.023	3114 Copper Standard Solution	9.993	0.016	3128 Lead Standard Solution	9.98	0.03	3152a Sodium Standard Solution	9.99	0.02			
SRM from NIST (USA)	Certified Value of Element, mg/g	Uncertainty, mg/g																	
3141a Potassium Standard Solution	10.295	0.023																	
3114 Copper Standard Solution	9.993	0.016																	
3128 Lead Standard Solution	9.98	0.03																	
3152a Sodium Standard Solution	9.99	0.02																	

1. Item Number	2. Specifications			3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	3134 Molybdenum Standard Solution	9.99	0.03			
	3131a Magnesium Standard Solution	9.99	0.02			
	3113 Cobalt Standard Solution	9.996	0.023			
	3109a Calcium Standard Solution	10.39	0.02			
	3126a Iron Standard Solution	9.97	0.02			
	3112a Chromium Standard Solution	9.96	0.03			
	3168a Zinc Standard Solution	9.99	0.02			
	3161a Tin Standard Solution	10.005	0.028			
	3108 Cadmium Standard Solution	9.116	0.025			
	3150 Silicon Standard Solution	9.34	0.04			
	3136 Nickel Standard Solution	9.738	0.022			
	3101a Aluminum	10.001	0.017			

1. Item Number	2. Specifications			3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	Standard Solution					
	3104a Barium Standard Solution	10.014	0.036			
	3105a Beryllium Standard Solution	10.83	0.07			
	3165 Vanadium Standard Solution	4.86	0.02			
	3106 Bismuth Standard Solution	10.00	0.02			
	3121 Gold Standard Solution	9.930	0.021			
	3132 Manganese Standard Solution	10.00	0.02			
	3103a Arsenic Standard Solution	9.933	0.055			
	3138 Palladium Standard Solution	9.99	0.02			
	3140 Platinum Standard Solution	9.98	0.03			
	3133 Mercury Standard Solution	9.954	0.053			
	3145a Rubidium Standard Solution	10.04	0.06			

1. Item Number	2. Specifications			3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	3149 Selenium Standard Solution	10.11	0.02			
	3151 Silver Standard Solution	10.11	0.02			
	3153a Strontium Standard Solution	9.07	0.03			
	3158 Thallium Standard Solution	9.99	0.02			
	3156 Tellurium Standard Solution	10.08	0.03			
	3162a Titanium Standard Solution	10.011	0.018			
	3111a Cesium Standard Solution	9.99	0.02			
	3102a Antimony Standard Solution	9.89	0.02			
	<p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate to each supplied item and certificate of the calibration from National Metrology Institute of producer country.</p> <p><b>Installation, commissioning and initial operational training</b> in Russian/Ukrainian (or in English with interpretation into Russian or Ukrainian) are required.</p>					

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 12 – Time &amp; Frequency Measurement</b>				
1	<p><b>CS Frequency Standard – 1 unit</b></p> <p><b>Application:</b> As the time and frequency measure of the National standard used for verification and calibration of time and frequency standards 1st class with the required accuracy.</p> <p><b>Required metrological characteristics:</b>  Optional High-Performance Tube. Benea Model.  1 PPS output.  Frequency accuracy <math>\pm 5 \times 10^{-13}</math>.  Stability for 10 S (Allan deviation) <math>&lt; 5 \times 10^{-12}</math>.  Long-term stability (5 day) <math>&lt; 1 \times 10^{-14}</math>.</p> <p><b>Power Supply:</b> 220 V - 230 V.</p> <p><b>Additional equipment:</b> None.</p> <p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate. Additional Calibration certificate from a National metrology laboratory like PTB, NPL etc.</p> <p><b>Installation, commissioning and training are not required.</b></p>			
2	<p><b>H-Maser – 1 unit</b></p> <p><b>Application:</b> As the time and frequency measure of the National standard used for verification and</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>calibration of time and frequency standards 1 class with the required accuracy.</p> <p><b>Required metrological characteristics:</b>  Frequency accuracy to <math>5 \times 10^{-13}</math>. Stability (Allan deviation) for measuring time:  10 S <math>&lt; 3 \times 10^{-14}</math>;  100 S <math>&lt; 1 \times 10^{-14}</math>;  1000 S <math>&lt; 3 \times 10^{-15}</math>;  1 day <math>&lt; 2 \times 10^{-15}</math>.</p> <p><b>Power Supply:</b> 220 V - 230 V.</p> <p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate. Additional Calibration certificate from EUROMET or from a National metrology laboratory such as PTB, NPL etc.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			
3	<p><b>Time transfer system – 1 unit</b></p> <p><b>Application:</b> Comparison of the National time scale of Ukraine with the time scale of other counters with the required accuracy (International comparisons of the National standard).</p> <p><b>Required metrological characteristics:</b>  System may be fully conformed to CCTF recommendation for common-view multi-channel, multi-system and multi-code GNSS time transfer technology.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
	<p>Time interval precision about 0.5 ns. Time transfer accuracy below 2 ns.</p> <p><b>Power Supply:</b> 220 V - 230 V.</p> <p><b>Additional equipment:</b> None.</p> <p><b>Certificates:</b> Producer certificate of the product quality control or producer calibration certificate. Additional Calibration certificate from EUROMET or from a National metrology laboratory like PTB, NPL etc.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			



1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
<b>Lot 13 – Acoustic Measurement</b>				
1	<p><b>Laboratory standard one inch condenser microphone- 4 units</b></p> <p>Application: To reproduce of pressure unit in air on the national primary measurement standard and to calibrate of standard microphones by the reciprocity technique and to take part with them in international key comparisons.</p> <p><b>Required metrological characteristics:</b>  Frequencies: from 2 Hz to 10 kHz  Nominal Open-circuit sensitivity: approx. 50 mV/Pa  Expanded uncertainty (k = 2): 0,03 dB  Capacitance: approx. 50 pF  Long time stability at 20 centigrade: &gt; 1000 years/dB</p> <p><b>Power Supply:</b> Polarization voltage (200 ± 0,05) V</p> <p><b>Additional equipment:</b> Suitable preamplifier</p> <p><b>Certificates:</b> Producer certificate of the product quality control and calibration certificate to each supplied microphone from a 17025 accredited calibration service laboratory such as DKD, UKAS etc.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			

1. Item Number	2. Specifications	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
2	<p><b>Laboratory standard half inch condenser microphone – 4 units</b></p> <p><b>Application:</b> To reproduce pressure unit in air on the national primary measurement standard and to calibrate standard microphones by the reciprocity technique and to take part with them in international key comparisons.</p> <p><b>Required metrological characteristics:</b>  Frequencies: from 10 Hz to 20 kHz  Nominal Open-circuit sensitivity: approx. 12,6 mV/Pa  Expanded uncertainty (k = 2): 0,04 dB  Capacitance: approx. 20 pF  Long time stability at 20 centigrade: &gt; 1000 years/dB</p> <p><b>Power Supply:</b> Polarization voltage (200 ± 0,05) V</p> <p><b>Additional equipment:</b> Suitable preamplifier</p> <p><b>Certificates:</b> Producer certificate of the product quality control and calibration certificate from a 17025 accredited calibration service laboratory such as DKD, UKAS etc. to each supplied microphone.</p> <p><b>Installation, commissioning and initial operational training</b> are not required.</p>			