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**O‘zgaruvchan tok kuchlanishi birligi etalonini sotib olish bo‘yicha
texnik topshiriq**

Technical Specifications for the procurement of the AC voltage unit standard

Toshkent - 2026

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BO'LIM 1. UMUMIY MA'LUMOTLAR / SECTION 1. GENERAL INFORMATION

Kichik bo'lim 1.1 Nomlanishi	Subsection 1.1 Title
O'zgaruvchan tok kuchlanishi birligi etaloni	Standard unit of AC voltage
Kichik bo'lim 1.2 Etalonnin sotib olishning asosi va maqsadi	Subsection 1.2 Basis and purpose of acquisition of the standard
O'zbekiston Respublikasi Prezidentining 2026-yil 16-fevrladagi PF-25-sonli Farmoniga muvofiq: - O'zgaruvchan tok kuchlanishi birligini 0,001 V dan 1000 V gacha bo'lgan diapazonda saqlash; laboratoriyalararo solishtirishlarda ishtirok etish; neft-gaz, oziq-ovqat, kimyo, vinochilik, yoqilg'i sanoatida, qora va rangli metallurgiyada, tibbiyotda, mashinasozlikda, metallga ishlov berishda va sanoatning boshqa tarmoqlarida qo'llaniladigan barcha turdagi o'zgaruvchan tok kuchlanishi o'lchagich, manba va etalonlarini, shu jumladan etalonlarini ham kalibrlash amalga oshiriladi; - U o'zgaruvchan tok kuchlanishi birligining birlamchi etaloni sifatida ishlatiladi va barcha turdagi o'zgaruvchan tok kuchlanishi o'lchagich, manba va etalonlarini qiyoslash va kalibrlash uchun, shuningdek, xorijiy mamlakatlarning milliy metrologiya institutlari bilan laboratoriyalararo solishtirishlarni o'tkazishda ishtirok etish uchun qo'llaniladi. Ushbu texnik topshiriqda kattalik birliklari O'zbekiston Respublikasi Vazirlar Mahkamasining 2018-yil 10-yanvardagi 21-sonli qaroriga muvofiq keltirilgan.	In accordance with the Decree of the President of the Republic of Uzbekistan No. PF-25 dated February 16, 2026: - Maintaining the AC voltage unit in the range of 0,001 to 1000 V; participating in inter-laboratory comparisons; calibration of all types of AC voltage meters, sources, and standards, including reference standards used in oil and gas, food, chemical, winemaking, fuel industries, ferrous and non-ferrous metallurgy, medicine, mechanical engineering, metalworking, and other branches of industry; - It is used as a primary standard of the AC voltage unit and is applied for the verification and calibration of all types of AC voltage meters, sources, and standards, as well as for participation in inter-laboratory comparisons with the national metrology institutes of foreign countries. In this technical specification, units of measurement are given in accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 21 of 10.01.2018.
Kichik bo'lim 1.3 Yangiligi (ishlab chiqarilgan yili) haqida ma'lumot	Subsection 1.3 Information on novelty (year of production/issue of the standard)
Yetkazib beriladigan etalon yangi bo'lishi, ishlab chiqarilgan yili 2026-yildan avval bo'lmasligi lozim (ishlatilmagan, ta'mirlanmagan, tiklangan uzellar va elementlardan yig'ilmagan, tarkibiy qismlari almashtirilmagan, iste'mol xususiyatlari tiklanmagan bo'lishi kerak). Shuningdek, u ishlab chiqarish yoki yetkazib berish sifati bilan bog'liq nuqsonlarga ega bo'lmasligi, Buyurtmachiga yetkazib berilgan paytdan boshlab foydalanishga (ekspluatatsiyaga) yaroqli bo'lishi, uchinchi shaxslarning huquqlaridan xoli bo'lishi shart, ko'rgazma na'munasi yetkazib berilishiga yo'l qo'yilmaydi.	The supplied standard must be new, not earlier than 2026 (not previously used, repaired, not assembled from refurbished units and components, which has not had its components replaced, consumer properties have not been restored, and must not have defects related to the quality of manufacture or delivery (delivery), must be fit for use from the moment of delivery to the Customer and free from the rights of third parties; delivery of an exhibition sample is not permitted).
Kichik bo'lim 1.4 Ishlab chiqish / tayyorlash bosqichlari	Subsection 1.4 Development/Manufacturing Stages
Ishlab chiqaruvchi zavodning me'yoriy-texnik hujjatlariga muvofiq.	In accordance with the manufacturer's regulatory and technical documentation.

Kichik bo'lim 1.5 Ishlab chiqish / tayyorlash uchun hujjatlar	<i>Subsection 1.5 Documents for development/manufacturing</i>
Etalon, uning tarkibiy qismlari, dasturiy ta'minot, ekspluatatsion hujjatlar, qadoqlash, tashish, montaj, ishga tushirish-sozlash ishlari, metrologik attestatsiya va qabul qilish jarayonlari ushbu texnik topshiriq talablariga, O'zbekiston Respublikasining normativ-huquqiy va texnik jihatdan tartibga solish sohasidagi hujjatlariga, shuningdek, xarid predmetiga tatbiq etiladigan qismida quyidagi standartlarga muvofiq bo'lishi lozim: O'z DST ISO/IEC 17025, GOST 24297, GOST 15150, GOST 14192, GOST 23216, IEC 61010-1, IEC 61010-2-030, IEC 61326-1, IEC 60529 va/yoki boshqa umumqabul qilingan xalqaro standartlar.	The Standard, its components, software, operational documentation, packaging, transportation, installation, commissioning, metrological verification, and acceptance processes must comply with the requirements of this technical specification, the regulatory and technical standards of the Republic of Uzbekistan, as well as the following standards to the extent applicable to the subject of procurement: O'z DST ISO/IEC 17025, GOST 24297, GOST 15150, GOST 14192, GOST 23216, IEC 61010-1, IEC 61010-2-030, IEC 61326-1, IEC 60529, and/or other generally accepted international standards.
Kichik bo'lim 1.6 TIF TN kodi va amalda qo'llaniladigan boshqa xalqaro kodlar	<i>Subsection 1.6 HS Code and other international codes, if applicable</i>
TIF TN kodlari shartnoma (kontrakt) tuzish vaqtida aniqlanadi.	HS codes will be determined upon conclusion of the contract
Kichik bo'lim 1.7 Ijrochiga qo'yiladigan talablar	<i>Subsection 1.7 Requirements for the Contractor</i>
Ijrochi ishlab chiqaruvchi zavoddan sifatli birlamchi etalonni yetkazib berishi shart. Ishlab chiqaruvchi zavod bunday turdagi Etalonlarni ishlab chiqarish bo'yicha tajribaga ega bo'lishi lozim. Ijrochi taklif etilayotgan etalonning ishlab chiqaruvchisi yoki uning vakolatli rasmiy yetkazib beruvchisi (distribyutori) bo'lishi kerak. Ijrochi o'z shtatida tegishli oliy yoki o'rta maxsus ma'lumotga hamda elektr o'lchashlari, elektr kattaliklari etalonlarini kalibrlash, qiyoslash yoki ekspluatatsiya qilish sohasida kamida 3 yillik ish tajribasiga ega bo'lgan kamida 2 nafar malakali mutaxassis-metrologga ega bo'lishi yoki shartnoma asosida jalb qilishi kerak. Mutaxassislarning malakasi diplomlar, sertifikatlar, mehnat shartnomalari, fuqarolik-huquqiy shartnomalar yoki o'xshash ishlarni bajarganlik tajribasini tasdiqlovchi boshqa hujjatlar bilan tasdiqlanishi lozim.	The contractor must supply a high-quality primary standard from the manufacturer. The manufacturer must have experience in producing similar Standards. The contractor must be the manufacturer of the proposed standard, or its authorized official supplier (distributor). The Contractor must have on staff or engage on a contractual basis at least 2 qualified metrology specialists with a higher or specialized secondary relevant education and no less than 3 years of work experience in the field of electrical measurements, calibration, verification, or operation of electrical quantity standards. The qualification of the specialists must be confirmed by diplomas, certificates, employment contracts, civil-law contracts, or other documents confirming experience in performing similar work.

BO'LIM 2. QO'LLASH SOHASI / SECTION 2. SCOPE OF APPLICATION

O'zgaruvchan tok elektr kuchlanishi birligi etaloni o'zgaruvchan tok elektr kuchlanishi birligi o'lchamini takrorlash, generatsiya qilish, o'lchash, saqlash va o'lchash vositalariga uzatish uchun mo'ljallangan. Etalon tarkibiga kiruvchi texnik vositalar majmuasi O'zbekiston Respublikasida qo'llashga ruxsat etilgan va birinchi darajali/milliy etalonlarga	The AC voltage unit standard is intended for reproducing, generating, measuring, storing, and transferring the unit size of AC voltage to measuring instruments. The complex of technical equipment included in the standard must provide reproduction, generation, measurement, storage, and transfer of the AC voltage
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nisbatan tatbiq etiladigan GOST R 8.648 yoki unga tenglashtirilgan xalqaro, davlatlararo, mintaqaviy standartlar va uslubiy hujjatlar talablariga muvofiq, 0,001 V dan 1000 V gacha bo'lgan diapazonda o'zgaruvchan tok elektr kuchlanishi birligi o'lchamini takrorlash, generatsiya qilish, o'lchash, saqlash va uzatishni ta'minlashi kerak.

Bunday hujjatlar va tan olish mexanizmlariga, shu jumladan, lekin ular bilan cheklanmagan holda quyidagilar kiradi: DKD-L 02-2, DKD-R 1-1, elektr o'lchashlari va noaniqlikni baholash sohasidagi tegishli EURAMET yo'riqnomalari, laboratoriya kompetentligini tasdiqlash qismida ISO/IEC 17025, CIPM MRA, BIPM KCDB da e'lon qilingan CMC-yozuvlari, xalqaro va mintaqaviy solishtirishlar natijalari, shuningdek, SI birliklariga metrologik kuzatishni tasdiqlovchi hujjatlar.

Ushbu texnik topshiriq maqsadlari uchun milliy metrologiya institutlari va birinchi darajali/milliy etalonlarga nisbatan tatbiq etiladigan hujjatlar va tartib-taomillar, shu jumladan CIPM MRA, BIPM KCDB, CMC, xalqaro/mintaqaviy solishtirishlar va SI birliklariga metrologik kuzatishni tasdiqlash ustuvor ahamiyatga ega.

ILAC MRA faqat alohida yordamchi o'lchash vositalarining kalibrlanishini tasdiqlashning qo'shimcha mexanizmi sifatida qo'llanilishi mumkin, lekin u milliy metrologiya institutining birinchi darajali/milliy etalonini hamda CMC-imkoniyatlarini tan olishning asosiy mexanizmi sifatida qaralmasligi kerak.

unit size in the range from 0.001 V to 1000 V, in accordance with the requirements of GOST R 8.648 or equivalent international, interstate, regional standards and methodological documents applicable to primary/national standards and allowed for application in the Republic of Uzbekistan.

Such documents and recognition mechanisms include, but are not limited to: DKD-L 02-2, DKD-R 1-1, relevant EURAMET guidelines in the field of electrical measurements and uncertainty evaluation, ISO/IEC 17025 regarding laboratory competence confirmation, CIPM MRA, published CMC entries in BIPM KCDB, results of international and regional comparisons, as well as documents confirming metrological traceability to SI units.

For the purposes of this technical specification, priority is given to documents and procedures applicable to national metrology institutes and primary/national standards, including CIPM MRA, BIPM KCDB, CMCs, international/regional comparisons, and confirmation of metrological traceability to SI units.

ILAC MRA may only be used as an additional mechanism for confirming the calibration of individual auxiliary measuring instruments, but must not be considered the primary mechanism for recognizing a primary/national standard and the CMC capabilities of a national metrology institute.

BO'LIM 3. EKSPLOATATSIYA (FOYDALANISH) SHARTLARI / SECTION 3. OPERATING CONDITIONS

Kichik bo'lim 3.1 Umumiy ekspluatatsiya shartlari	Subsection 3.1 General operating conditions
Etalonni ekspluatatsiya qilish, saqlash va qo'llash sharoitlari ishlab chiqaruvchi zavodning me'yoriy-texnik hujjatlari talablariga, metrologik laboratoriyalar uchun belgilangan talablarga, shuningdek, iqlimiy bajarilishi va joylashtirish kategoriyasi qismida GOST 15150 ning umumiy talablariga muvofiq bo'lishi kerak. Etalon uning metrologik tavsiflari barqarorligini ta'minlaydigan nazorat qilinadigan iqlim sharoitlariga ega bo'lgan yopiq laboratoriya xonasida ekspluatatsiya qilinishi lozim. Ijrochi etalonning ruxsat etilgan va tavsiya etilgan ekspluatatsiya sharoitlarini, shu jumladan atrof-muhit harorati, nisbiy namlik, xona sofliqi, elektromagnit moslashuvchanlik, tebranish (vibratsiya), yerga ulash (zazemleniye), elektr	The operating, storage, and application conditions of the standard must comply with the requirements of the manufacturer's regulatory and technical documentation, the requirements established for metrological laboratories, as well as the general requirements of GOST 15150 regarding climatic execution and placement category. The standard must be operated in an enclosed laboratory room with controlled climatic conditions that ensure the stability of the metrological characteristics of the standard. The Contractor is obliged to specify the permissible and recommended operating conditions of the standard, including requirements for ambient temperature, relative humidity, room cleanliness, electromagnetic compatibility, vibration, grounding,

ta'minoti, qizish vaqti va etalonning metrologik tavsiflariga ta'sir etuvchi boshqa shartlarga qo'yiladigan talablarni ko'rsatishi shart.	power supply, warm-up time, and other conditions affecting the metrological characteristics of the standard.
Kichik bo'lim 3.2 Qo'shimcha/maxsus ekspluatatsiya talablari	<i>Subsection 3.2 Additional/Special Operational Requirements</i>
Etalonga qo'yiladigan qo'shimcha va maxsus ekspluatatsiya talablari ishlab chiqaruvchi zavodning me'yoriy-texnik hujjatlariga muvofiq bo'lishi va etalonning ko'rsatilgan metrologik tavsiflari saqlanishini ta'minlashi kerak. Ijrochi etalonning barqaror ishlashi uchun zarur bo'lgan barcha maxsus ekspluatatsiya sharoitlarini, shu jumladan laboratoriya xonasining harorati va namligiga, elektr ta'minotiga, yerga ulashga (zazemleniye), elektromagnit xalaqitlardan himoyalashga, tebranishga (vibratsiya), uskunaning qizish vaqtiga, stoykaga joylashtirish shartlariga, kabel ulanishlariga, dasturiy ta'minot va aloqa interfeyslariga qo'yiladigan talablarni ko'rsatishi shart. Agar ko'rsatilgan aniqlik, barqarorlik yoki o'lchash noaniqligiga erishish uchun maxsus ekspluatatsiya sharoitlari talab qilinsa, bunday sharoitlar Ijrochining texnik taklifida aniq ko'rsatib o'tilishi lozim.	Additional and special operational requirements for the standard must comply with the manufacturer's regulatory and technical documentation and ensure the preservation of the declared metrological characteristics of the standard. The Contractor is obliged to specify all special operating conditions required for the stable operation of the standard, including requirements for laboratory room temperature and humidity, power supply, grounding, protection against electromagnetic interference, vibration, equipment warm-up time, rack installation conditions, cable connections, software, and communication interfaces. If special operating conditions are required to achieve the declared accuracy, stability, or measurement uncertainty, such conditions must be explicitly stated in the Contractor's technical proposal.
Kichik bo'lim 3.3 Etalonni ekspluatatsiya qilish xarajatlariga qo'yiladigan talablar	<i>Subsection 3.3 Requirements for the costs of operating the standard</i>
Ijrochi etalonning butun kafolat davri va tavsiya etilgan ekspluatatsiya davri uchun ekspluatatsiya xarajatlari to'g'risidagi ma'lumotlarni, shu jumladan elektr ta'minoti, texnik xizmat ko'rsatish, davriy kalibrlash, dasturiy ta'minot, yangilanishlar, sarflash materiallari, ehtiyot qismlar, ta'mirlash, kalibrlash yoki ta'mirlash uchun asboblarni tashish xarajatlarini, shuningdek, laboratoriya xonasi sharoitlariga qo'yiladigan talablarni taqdim etishi shart. Ijrochi etalon tarkibiga kiruvchi har bir o'lchash vositasining tavsiya etilgan kalibrlash va texnik xizmat ko'rsatish davriyligini, shuningdek, foydalanuvchi, servis tashkiloti yoki ishlab chiqaruvchi tomonidan bajariladigan ishlar ro'yxatini ko'rsatishi lozim.	The Contractor is obliged to provide information on the operating costs of the standard for the entire warranty period and the recommended period of operation, including expenses for power supply, maintenance, periodic calibration, software, updates, consumables, spare parts, repair, transportation of instruments for calibration or repair, as well as requirements for laboratory room conditions. The Contractor must specify the recommended calibration and maintenance intervals for each measuring instrument included in the standard, as well as the list of tasks to be performed by the user, service organization, or manufacturer.

BO'LIM 4. TEXNIK TALABLAR / SECTION 4. TECHNICAL REQUIREMENTS

Kichik bo'lim 4.1 Asosiy texnik talablar / Subsection 4.1 Main technical characteristics		
O'zgaruvchan tok kuchlanishi birligi etaloni — DKD-L 02-2, DKD-R 1-1 va ГОСТР 8.648 va/yoki boshqa xalqaro standartlarga muvofiq, yaxlit to'plam (tizim) ko'rinishida* <i>The AC voltage unit standard — supplied as a single, complete set (system), in accordance with DKD-L 02-2, DKD-R 1-1, and GOST R 8.648 and/or other international standards *</i>		Talab qilinadigan anqlik / Required accuracy
4.1.1	– O'zgaruvchan tok kuchlanishi birligi etaloni yagona, yaxlit komplekt (tizim) sifatida taqdim etilishi va quyidagi diapazonda ishlashi shart: kuchlanish – 0,001 V (1 mV) dan 1000 V gacha; chastota – 10 Hz dan 1 MHz gacha, jumladan, kuchlanish – 0,001 V (1 mV) dan 1000 V gacha; chastota – 10 Hz dan 10 kHz gacha, kuchlanish – 0,001 V (1 mV) dan 1000 V gacha; chastota – 10 kHz dan 1 MHz gacha, To'plam tarkibiga kiruvchi qurilmalarning soni, turi va texnologik yechimi (masalan, termoelektrik (issiqlik) o'zgartirgichlar asosidagi tizim, keng polosali raqamli o'lchov-generatsiya tizimi yoki kvant kuchlanish standarti asosidagi tizim) ta'minotchi tomonidan erkin tanlanadi. Talab faqat komplektning yaxlit holda yuqoridagi diapazonda ishlay olishi va o'ng tomondagi ustunda ko'rsatilgan anqlikka ega bo'lishiga qo'yiladi. – <i>The AC voltage unit standard shall be supplied as a single, complete set (system) and shall operate over the following range: voltage – from 0.001 V (1 mV) to 1000 V; frequency – from 10 Hz to 1 MHz.</i> <i>including: voltage — from 0.001 V (1 mV) to 1000 V; frequency — from 10 Hz to 10 kHz,</i> <i>voltage — from 0.001 V (1 mV) to 1000 V; frequency — from 10 kHz to 1 MHz</i>	Kengaytirilgan noaniqlik ($k=2$) $1 \cdot 10^{-5} \% \div 1 \cdot 10^{-1} \%$ dan yuqori bo'lmasligi kerak (butun 0,001 V – 1000 V kuchlanish va 10 Hz – 1 MHz chastota diapazoni bo'yicha yagona talab) $6 \cdot 10^{-5} \% \div 1 \cdot 10^{-3} \%$ dan yuqori bo'lmasligi kerak $1 \cdot 10^{-3} \% \div 1 \cdot 10^{-2} \%$ dan yuqori bo'lmasligi kerak <i>Expanded uncertainty ($k=2$):</i> <i>must not exceed</i> $1 \cdot 10^{-5} \% \div 1 \cdot 10^{-1} \%$ <i>(single requirement across the entire 0.001 V – 1000 V voltage and 10 Hz – 1 MHz frequency range)</i> <i>must not exceed</i> $6 \cdot 10^{-5} \% \div 1 \cdot 10^{-3} \%$ <i>must not exceed</i> $1 \cdot 10^{-3} \% \div 1 \cdot 10^{-2} \%$

	<i>The number, type, and technology of the devices comprising the set (e.g. a system based on thermoelectric (thermal) converters, a wideband digitizing measurement/generation system, or a quantum voltage standard based system) are at the Contractor's discretion. The requirement applies only to the set as a whole being able to operate over the range above with the accuracy shown in the right-hand column.</i>	
4.1.2	4.1.1-bandda ko'rsatilgan etalon (to'plam) quyidagi turdagi qurilmalarni ularning o'z to'liq kuchlanish va chastota diapazonida o'lchash va/yoki kalibrlash (solishtirish) imkoniyatiga ega bo'lishi shart. Bu funksiyalarni ta'minlash uchun zarur bo'lgan qurilma va usullar ta'minotchi tomonidan erkin tanlanadi. <i>The standard (set) specified in clause 4.1.1 above shall be capable of measuring and/or calibrating (comparing) the following types of devices over their own full voltage and frequency range. The devices and methods necessary to provide these functions are at the Contractor's discretion.</i>	Talab qilinadigan aniqlik / <i>Required accuracy</i>
4.1.2.a	– yuqori aniqlikdagi etalon termal (issiqlik) o'zgartirgich asosidagi AC-DC transfer standartlarini yoki o'zgaruvchan (AC) kuchlanishni uzatish hamda solishtirishning ekvivalent yuqori aniqlikdagi vositasi/usuli to'liq kuchlanish diapazonida (1 mV dan 1000 V gacha) va to'liq chastota diapazonida (10 Hz dan 1 MHz gacha) o'lchash va/yoki kalibrlash; – <i>measuring and/or calibrating high-accuracy reference thermal-converter-based AC-DC transfer standards or an equivalent high-precision means/method for AC voltage transfer and comparison over their full voltage range (2 mV to 1000 V) and full frequency range (10 Hz to 1 MHz);</i>	± 10 ppm dan yuqori bo'lmasligi kerak (butun 0,001 V – 1000 V kuchlanish va 10 Hz – 1 MHz chastota diapazoni bo'yicha) <i>must not exceed ±10 ppm (across the entire 0.001 V – 1000 V voltage and 10 Hz – 1 MHz frequency range)</i>
4.1.2.b	– Yuqori aniqlikdagi, masalan Fluke 5720A/5730A sinfiga teng yoki undan yuqori ko'p funksiyali kalibratorlarni to'liq kuchlanish diapazonida (1 mV dan 1000 V gacha) va to'liq chastota diapazonida (10 Hz dan 1 MHz gacha) o'lchash va/yoki kalibrlash; – <i>Measurement and/or calibration of high-precision multifunctional calibrators, equivalent to or exceeding the Fluke 5720A/5730A class, across the full voltage range (from 1 mV to 1000 V) and the full frequency range (from 10 Hz to 1 MHz);</i>	± 100 ppm dan yuqori bo'lmasligi kerak (butun 0,001 V – 1000 V kuchlanish va 10 Hz – 1 MHz chastota diapazoni bo'yicha) <i>must not exceed ±100 ppm (across the entire 0.001 V – 1000 V voltage and 10 Hz – 1 MHz frequency range)</i>

4.1.2.c	– 8½ razryadli yoki unga teng/yaxshiroq yuqori aniqlikdagi raqamli multimetrlarni (misol uchun, Keysight 3458A, Fluke 8588A va ularga o'xshash, ekvivalent boshqa yuqori aniqlikdagi voltmotr/multimetrlarni) to'liq kuchlanish diapazonida (10 mV dan 1000 V gacha) va to'liq chastota diapazonida (1 Hz dan 10 MHz gacha) o'lchash va/yoki kalibrlash; – <i>Measurement and/or calibration of 8½-digit or equivalent/superior high-precision digital multimeters (for example, Keysight 3458A, Fluke 8588A, and other similar, equivalent high-precision voltmeters/multimeters) across the full voltage range (from 10 mV to 1000 V) and the full frequency range (from 1 Hz to 10 MHz);</i>	± 200 ppm dan yuqori bo'lmashligi kerak (butun 0,01 V – 1000 V kuchlanish va 1 Hz – 10 MHz chastota diapazoni bo'yicha) <i>must not exceed ±200 ppm (across the entire 0.01 V – 1000 V voltage and 1 Hz – 10 MHz frequency range)</i>
4.1.2.d	– yuqori aniqlikdagi etalon kuchlanish bo'luvchilarini (voltage dividerlarni) yoki unga teng/yaxshiroq qurilmalarni to'liq kuchlanish diapazonida (0,001 V dan 1000 V gacha) va to'liq chastota diapazonida (10 Hz dan 1 MHz gacha) o'lchash va/yoki kalibrlash; – <i>Measurement and/or calibration of high-precision reference voltage dividers or equivalent/superior devices across the full voltage range (from 0.001 V to 1000 V) and the full frequency range (from 10 Hz to 1 MHz).</i>	± 50 ppm dan yuqori bo'lmashligi kerak (nisbat aniqligi - butun 0,001 V – 1000 V kuchlanish va 10 Hz – 1 MHz chastota diapazoni bo'yicha) <i>must not exceed ±50 ppm (ratio accuracy - across the entire 0.001 V – 1000 V voltage and 10 Hz – 1 MHz frequency range)</i>
4.1.3	Yetkazib berish komplekti va unga qo'yiladigan talablar O'zgaruvchan tok kuchlanishi birligi etaloni - yaxlit to'plam (tizim) ko'rinishida; Har bir qurilma uchun o'lchash va ulovchi kabellar to'plami; Barcha qurilmalar uchun kalibrlash sertifikatlari; O'lchashlarni avtomatlashtirish uchun dasturiy ta'minot; BIPM ma'lumotlar bazasiga CMC yozuvlarini taqdim etish uchun "O'zMMI" DM ga barcha zaruriy hujjatlar va texnik yordamni taqdim etish; To'plamdagi barcha qurilmalar uchun ekspluatatsiya (foydalanish) bo'yicha qo'llanmalar. <u>Yuqorida sanab o'tilgan barcha etalon o'lchash asboblari va manbalari o'zaro mos kelishi (compatible bo'lishi) kerak.</u> <u>Shuningdek, ushbu etalonda ko'rsatilgan asboblarni barchasi birgalikda, ushbu etalonning asosiy vazifasi bo'lgan kattalikni</u>	Scope of delivery and its requirements The AC voltage unit standard - supplied as a single, complete set (system); A set of measuring and connecting cables for each device; Calibration certificates for all devices; Software for automation of measurements; Provision of all necessary documentation and technical support to the "UzNIM" State Institution for the submission of CMC entries to the BIPM database; Operating manuals for all devices in the set. All the standard measuring instruments and sources listed above must be mutually compatible. <u>Furthermore, all instruments specified in this standard must work together to provide the quantity that is the primary function of this standard, and must simultaneously allow for the generation, measurement, and verification or comparison of other</u>

	ta'minlashi kerak va bir vaqtning o'zida hosil qilish (generatsiyalash), o'lchash hamda boshqa asboblarni, masalan, AC-DC o'tkazish/o'zgartirgich etalonlari, yuqori barqarorlikdagi dasturlashtiriladigan o'zgaras va o'zgaruvchan kuchlanish manbalari/kalibratorlar, yuqori aniqlikdagi induktiv/rezistiv kuchlanish bo'luvchilari va hokazolarni qiyoslash yoki solishtirish imkonini berishi kerak. Tender vaqtida 4.1.1, 4.1.2-bandlarda ko'rsatilgan diapazonlarda eng yaxshi aniqlikka yoki eng kam xatolikka (noaniqlikka) ega bo'lgan qurilmalarga eng yuqori ball beriladi. Yuqorida zikr etilgan etalonning har bir qurilmasi uchun, ko'rsatilgan diapazon bo'yicha aniq diapazon hamda o'lchash/o'zgartirish/generatsiyalash xatolliklari (noaniqliklari) aniq ko'rsatilishi kerak. Bunda aniqlik har qanday ikkilanishli yoki chalg'ituvchi qiymatlarsiz ppm yoki % da ko'rsatilishi lozim. Yuqorida ko'rsatilgan talabga muvofiq, etalonning prinsipi – o'lchash aniqligi yuqori bo'lishi uchun o'zgaruvchan kuchlanish qiymatini o'zgaras kuchlanish qiymati bilan solishtirish imkonini berishi va zarur bo'lganda o'zgaruvchan kuchlanishni va uning xarakteristikalarini $1 \cdot 10^{-5} \% \div 1 \cdot 10^{-1} \%$ dan yuqori bo'lmagan aniqlik bilan o'lchash xususiyatiga ega bo'lishi kerak.	instruments, such as AC-DC transfer standards, high-stability programmable DC and AC voltage sources/calibrators, high-accuracy inductive/resistive voltage dividers, etc. During the tender, the highest points will be awarded to devices that have the best accuracy or the lowest error (uncertainty) in the ranges specified in sections 4.1.1 and 4.1.2. For each device of the aforementioned standard, the exact range and measurement/transfer/generation errors (uncertainties) for the specified range must be clearly indicated. In this regard, accuracy must be indicated in ppm or % without any ambiguous or misleading values. In accordance with the requirements stated above, the principle of the standard must allow for the comparison of an AC voltage value with a DC voltage value to ensure high measurement accuracy, and where necessary, it must be capable of measuring AC voltage and its characteristics with an accuracy not exceeding $1 \cdot 10^{-5} \% \div 1 \cdot 10^{-1} \%$.
* Yuqorida qayd etilgan texnik xususiyatlar va komplektatsiya tavsiyaviy xarakterga ega bo'lib, loyiha vazifalaridan kelib chiqqan holda, yana-da yaxshiroq analogik parametrlarga va komplektatsiyalarga ega ekvivalent etalonlarga ruxsat beriladi (yo'l qo'yiladi). Agar xalqaro standartlarda yanada yuqori aniqlik talablari belgilansa, ushbu standartlarda keltirilgan talablar qo'llanilishi shart.		* The technical specifications and configuration mentioned above are advisory in nature; depending on the project objectives, equivalent standards with even better analogous parameters and configurations are permitted (allowed). If international standards specify higher accuracy requirements, the requirements set forth in those standards must be applied.
4.1.4	O'lchash jarayonini avtomatlashtirish uchun dasturiy ta'minot Barcha signallarni qabul qilish, ularni qayta ishlash va talab qilinadigan natijani berish uchun maxsus dasturiy ta'minotni sozlash kerak. Barcha signallar dasturiy ta'minot yordamida qayta ishlanishi va yakunida talab qilingan yagona qiymat olinishi lozim. Maxsus dasturiy ta'minot quyidagilarni ta'minlashi kerak: Etalon tarkibiga kiruvchi	Software for measurement process automation Specialized software must be configured to receive all signals, process them, and provide the required result. All signals must be processed using the software to ultimately obtain a single required value. The specialized software must ensure: the collection and primary processing of measurement and control data from all primary converters and control instruments

	barcha birlamchi o'zgartirgichlar (preobrazovatellar) va nazorat vositalaridan o'lchov va nazorat ma'lumotlarini yig'ish va birlamchi qayta ishlashni, shuningdek, kalibrlash uchun Etalonn qiyoslash (kalibrlash) jarayonini avtomatik tartibga solish va boshqarishni. 1. Etalonda quyidagi funksional imkoniyatlar nazarda tutilishi (ko'zda tutilishi) kerak: – Qiyoslanayotgan (kalibrlanayotgan) asboblarni (O'V) kalibrlash (qiyoslash) jarayonini vizuallashtirish – Asboblarni kalibrlash (qiyoslash) usulini tanlash – O'lchash tartibi (uslubiyati) ni belgilash – natijalarni qayta ishlash va zarur bo'lganda kalibrlash va qiyoslash bayonnomalarini chop etish (nashrga chiqarish); 2. Etaloning ishlashi uchun jarayonlarni vizuallashtirish, ma'lumotlarni baholash va arxivlash, shuningdek, sinov hisobotlarini chop etish imkonini beruvchi dasturiy ta'minot (DT). DT natijalarni statistik baholash bilan, shuningdek, ma'lumotlar jurnallari (loglari) va shunga o'xshash boshqa funksiyalar bilan jihozlangan bo'lishi mumkin. Sinov natijalari, tarmoqda parallel saqlash, zaxira nusxasini olish yoki bayonnoma shaklida avtomatik chop etish imkoniyati bilan kompyuter ma'lumotlar bazasida saqlanishi kerak. Taklif etilayotgan operatsion tizim etalon sotib olingan paytdagi dolzarb (aktual) versiya bo'lishi lozim. – Dasturiy ta'minot buyurtmachi resurslariga joriy qilingan sanadagi dolzarb (aktual) versiya bo'lishi va etalon ishga tushirilgan (ekspluatatsiyaga kiritilgan) paytdan boshlab kamida 3 yil muddatga kafolatli va texnik qo'llab-quvvatlashga ega bo'lishi kerak.	included in the standard, as well as the automatic regulation and management of the standard's verification (calibration) process. 1. The standard must provide the following functional capabilities: – Visualization of the calibration (verification) process of the instruments under test (IUT); – Selection of the instrument calibration (verification) method; – Specification of the measurement procedure (methodology); – Processing of results and, if necessary, printing (publishing) calibration and verification protocols; 2. Software (SW) that allows for process visualization, data evaluation, and archiving, as well as the ability to print test reports for the operation of the standard. The SW may be equipped with statistical evaluation of results, as well as data logs and other similar functions. Test results must be stored in a computer database with the possibility of parallel network storage, backup, or automatic printing in the form of a protocol. The proposed operating system must be the current version at the time of the standard's purchase. The software must be the current version as of the date of implementation into the customer's resources and must have warranty and technical support for a period of at least 3 years from the moment the standard is put into operation (commissioned).
4.1.5	Etalonn montaj qilish uchun ustun (stoyka) Etalon ustunga montaj qilinishi kerak va Etaloning ishlashi uchun zarur bo'lgan termik (issiqlik) rejimini ta'minlash maqsadida shamollatish (ventilyatsiya) tizimi nazarda tutilishi lozim.	<i>Rack for mounting the standard</i> The standard must be mounted on a rack, and a ventilation system must be provided to ensure the thermal conditions necessary for the operation of the standard.

	Yetkazib berish to'plami: Etalonni montaj qilish uchun ustun (stoyka) Shamollatish (Ventilyatsiya) tizimi	Delivery set Rack for mounting the standard Ventilation system
4.1.6	Etalonni montaj qilish, ishga tushirish-sozlash ishlari va xodimlarni o'qitish Ijrochi yetkazib berilgan Etalonning shefmontajini O'zMMI laboratoriyasida o'tkazishga majbur. Ijrochi yetkazib berilgan Etalonni ekspluatatsiya qilish va unga xizmat ko'rsatish bo'yicha 4 nafar xodimni o'qitishi zavur. O'qitish ishlab chiqaruvchi, uning vakolatli o'quv markazi, milliy metrologiya instituti yoki shunga o'xshash etalonlarni ishlatish va (yoki) kalibrlash bo'yicha tasdiqlangan tajribaga ega bo'lgan boshqa ixtisoslashtirilgan tashkilot tomonidan amalga oshiriladi. Xodimlarni o'qitish va tayyorlash muddatlari etalonlarning ekspluatatsiya bo'yicha qo'llanmasiga muvofiq bo'lishi kerak.	Installation, commissioning, and personnel training of the standard The Contractor is obliged to perform the supervision of installation (shef-montage) of the delivered standard at the UzNIM laboratory. The Contractor is required to train 4 personnel on the operation and maintenance of the supplied Standard. The training shall be conducted by the manufacturer, its authorized training center, a national metrology institute, or another specialized organization with proven experience in operating and/or calibrating similar standards. The duration of the personnel training and preparation must be in accordance with the operating manual of the standards.
4.1.7	Dasturiy ta'minotni o'rnatish (Installatsiya) Ijrochi dasturiy ta'minotni O'zMMI tomonidan taqdim etilgan kompyuterga o'rnatishni (installatsiyasini) Etalon komplektining fizik ulanishi bilan birga amalga oshirishi, dasturiy ta'minot va Etalonning to'liq o'zaro ishlashini (o'zaro ta'sirini) ta'minlashi shart.	Software Installation The Contractor must perform the installation of the software on the computer provided by UzNIM, along with the physical connection of the standard set, and must ensure the full interoperability (interaction) between the software and the standard.
Kichik bo'lim 4.2 Asosiy texnik-iqtisodiy va ekspluatatsion ko'rsatkichlar /		Subsection 4.2 Main technical-economic and operational indicators
Ijrochi texnik taklif tarkibida taklif etilayotgan etalonning asosiy texnik-iqtisodiy va ekspluatatsiya ko'rsatkichlarini, shu jumladan uskunaning xizmat ko'rsatish muddatini, kafolat muddatini, tavsiya etilgan kalibrlashlararo intervalni, texnik xizmat ko'rsatish davriyligini, quvvat sarfini, elektr ta'minotiga qo'yiladigan talablarni, harorat, namlik va laboratoriya xonasi sharoitlariga qo'yiladigan talablarni, yerga ulash (zazemleniye) va elektromagnit moslashuvchanlikka qo'yiladigan talablarni, sarflash materiallari va ehtiyot qismlar ro'yxatini, dasturiy ta'minotga va uni qo'llab-quvvatlash muddatiga qo'yiladigan talablarni, taxminiy ekspluatatsiya xarajatlarini, xodimlarning malakasiga qo'yiladigan talablarni, nosozlik yuz berganda ishga layoqatlilikni tiklashning o'rtacha vaqtini, servis xizmati ko'rsatish va texnik qo'llab-quvvatlash shartlarini taqdim etishi shart.		The Contractor is obliged to submit as part of the technical proposal the main technical, economic, and operational indicators of the offered standard, including the service life of the equipment, warranty period, recommended calibration interval, maintenance frequency, power consumption, power supply requirements, requirements for temperature, humidity, and laboratory room conditions, grounding and electromagnetic compatibility requirements, list of consumables and spare parts, requirements for software and its support period, estimated operating expenses, personnel qualification requirements, mean time to recovery in case of failure, as well as terms of service maintenance and technical support. The specified information must be confirmed by the manufacturer's regulatory and technical documentation, the Contractor's

Ko'rsatilgan ma'lumotlar ishlab chiqaruvchi zavodning me'yoriy-texnik hujjatlari, Ijrochining texnik taklifi, ekspluatatsiya hujjatlari, servis hujjatlari yoki etalonni ekspluatatsiya qilish, unga xizmat ko'rsatish va metrologik qo'llash imkoniyatini tasdiqlovchi boshqa hujjatlar bilan tasdiqlanishi kerak. Taqdim etilgan ma'lumotlar ekspluatatsiya sharoitlarini, unga egalik qilish qiymatini baholash hamda ishtirokchilarning takliflarini solishtirish uchun ishlatiladi va uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.	technical proposal, operational documentation, service documentation, or other documents confirming the possibility of operation, maintenance, and metrological application of the standard. The provided information is used to evaluate operating conditions, cost of ownership, and compare participants' proposals, and shall not be construed as a requirement for a specific manufacturer, model, or equipment design.
Kichik bo'lim 4.3 Ishonchlilikka qo'yiladigan talablar	<i>Subsection 4.3 Reliability requirements</i>
O'zgaruvchan tok elektr kuchlanishi birligi etaloni ishlab chiqaruvchi hujjatlarida ko'rsatilgan ekspluatatsiya qilish, texnik xizmat ko'rsatish va kalibrlash shartlariga rioya qilingan holda, belgilangan xizmat muddati davomida elektr kuchlanishi birligi o'lchamining barqaror qayta tiklanishini (vosproizvedeniye), generatsiya qilinishini, o'lchanishini, saqlanishini va uzatilishini ta'minlashi kerak. Etalonning aniqligi, xatoligi, barqarorligi va kengaytirilgan o'lchash noaniqligi ushbu texnik topshiriq talablariga muvofiq bo'lishi hamda ishlab chiqaruvchining texnik hujjatlari, metrologik tavsiflar jadvali va SI birliklariga metrologik kuzatishga ega bo'lgan kalibrlash sertifikatlari bilan tasdiqlanishi lozim. Ijrochi texnik taklif tarkibida uskunaning tayinlangan xizmat muddati, kafolat muddati, tavsiya etilgan kalibrlashlararo intervali, belgilangan davr uchun metrologik tavsiflarning barqarorligi, texnik xizmat ko'rsatish davriyligi, ishonchlilik ko'rsatkichlari, nosozlik yuz berganda ishga layoqatlilikni tiklashning o'rtacha vaqti, servis xizmati ko'rsatish shartlari, ehtiyot qismlar, sarflash materiallari hamda dasturiy ta'minot yangilanishlarining mavjudligi to'g'risidagi ma'lumotlarni taqdim etishi shart. Ijrochi, shuningdek, ishonchlilik va barqarorlikning ko'rsatilgan ko'rsatkichlari ta'minlanadigan sharoitlarni: harorat, namlik, elektr ta'minoti, yerga ulash (zazemleniye), elektromagnit moslashuvchanlik, qizish vaqti, xona hamda xodimlarning malakasiga qo'yiladigan talablarni ko'rsatishi kerak. Ko'rsatilgan ma'lumotlar ishonchlilikni, ekspluatatsiya sharoitlarini, metrologik tavsiflarning barqarorligini va etalonga egalik	The AC voltage unit standard shall ensure stable reproduction, generation, measurement, storage, and transfer of the size of the electric voltage unit throughout the established service life, subject to compliance with the operating, maintenance, and calibration conditions specified in the manufacturer's documentation. The accuracy, error, stability, and expanded measurement uncertainty of the standard must comply with the requirements of this technical terms of reference and be confirmed by the manufacturer's technical documentation, a table of metrological characteristics, and calibration certificates with metrological traceability to SI units. The Contractor is obliged to submit as part of the technical proposal information regarding the designated service life of the equipment, warranty period, recommended calibration interval, stability of metrological characteristics over an established period, maintenance frequency, reliability indicators, mean time to recovery in case of failure, service maintenance conditions, availability of spare parts, consumables, and software updates. The Contractor must also specify the conditions under which the declared reliability and stability indicators are provided: requirements for temperature, humidity, power supply, grounding, electromagnetic compatibility, warm-up time, premises, and personnel qualifications. The specified information shall be used to evaluate reliability, operating conditions, stability of metrological characteristics, and cost of ownership of the standard, and shall not be

qilish qiymatini baholash uchun ishlatilishi lozim hamda uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.	construed as a requirement for a specific manufacturer, model, or equipment design.
Kichik bo'lim 4.4 Konstruksiyaga, montaj-texnik talablar	<i>Subsection 4.4 Construction and installation-technical requirements</i>
O'zgaruvchan tok elektr kuchlanishi birligi etalonining konstruktiv bajarilishi buyurtmachi laboratoriyasi sharoitida etalon majmuasining barcha komponentlarini xavfsiz joylashtirish, ulash, ekspluatatsiya qilish, texnik xizmat ko'rsatish va metrologik qo'llashni ta'minlashi kerak. Ijrochi texnik taklif tarkibida etalonning konstruktiv bajarilishi, asosiy blok va modullar tarkibi, montaj qilish usuli, montaj stoykasi, javon (shkaf) yoki ish joyiga qo'yiladigan talablar, uskunaning o'lchamlari (gabaritlari) va massasi, ventilatsiya hamda issiqlik rejimiga, elektr ta'minotiga, yerga ulashga (zazemleniye), kabel tashkil etilishiga, ulash interfeyslariga, asboblarni joylashtirishga, xizmat ko'rsatish uchun kirish yo'llariga va montaj hamda ekspluatatsiya qilishdagi xavfsizlik choralariga qo'yiladigan talablar to'g'risidagi ma'lumotlarni taqdim etishi shart. Ijrochi xonaga, ish zonasiga, xizmat ko'rsatish uchun masofalarga, o'rnatish shartlariga, mebel/stoyka/polga ruxsat etilgan yuklamaga, laboratoriya ichida tashish shartlariga, shuningdek montaj va ishga tushirish-sozlash ishlari boshlanishidan oldin buyurtmachi tomonidan bajarilishi lozim bo'lgan tayyorgarlik ishlarining ro'yxatiga qo'yiladigan talablarni ko'rsatishi kerak. Etalonning barcha komponentlari konstruktiv va funksional jihatdan o'zaro mos bo'lishi, tutashtiruvchi kabellar, kommutatsiya qurilmalari, aloqa interfeyslari, quvvat bloklari, stoykalar, mahkamlagichlar va boshqa elementlar etalonning ishonchli ishlashini, ko'rsatilgan metrologik tavsiflarning saqlanishini, ekspluatatsiya xavfsizligini hamda texnik xizmat ko'rsatish qulayligini ta'minlashi lozim. Ko'rsatilgan ma'lumotlar ishlab chiqaruvchi zavodning me'yoriy-texnik hujjatlari, ekspluatatsiya hujjatlari, ulash sxemalari, montaj qilish talablari hamda etalonni buyurtmachi laboratoriyasida joylashtirish, ulash va ekspluatatsiya qilish imkoniyatini baholash uchun zarur bo'lgan boshqa hujjatlar bilan tasdiqlanishi kerak.	The structural design of the AC voltage unit standard shall ensure safe placement, connection, operation, maintenance, and metrological application of all components of the reference complex within the Customer's laboratory environment. The Contractor is obliged to submit as part of the technical proposal information regarding the structural design of the standard, composition of the main units and modules, installation method, requirements for the mounting rack, cabinet, or workstation, equipment dimensions and weight, requirements for ventilation and thermal conditions, power supply, grounding, cable management, connection interfaces, instrument layout, service access, and safety measures during installation and operation. The Contractor must specify the requirements for the room, working area, clearance distances for servicing, installation conditions, permissible load on furniture/rack/floor, internal laboratory transportation conditions, as well as a list of preparatory work to be completed by the Customer prior to the commencement of installation and commissioning operations. All components of the standard must be structurally and functionally compatible with each other, and connecting cables, switching devices, communication interfaces, power supply units, racks, mountings, and other elements must ensure reliable operation of the standard, preservation of the declared metrological characteristics, operational safety, and maintenance convenience. The specified information must be confirmed by the manufacturer's regulatory and technical documentation, operational documentation, wiring diagrams, installation requirements, and other documents necessary to evaluate the feasibility of placing, connecting, and operating the standard in the Customer's laboratory. The provided information shall be used to evaluate installation and technical conditions,

Taqdim etilgan ma'lumotlar montaj-texnik sharoitlarni, uskunaning mosligini hamda buyurtmachi laboratoriyasining etalonni joylashtirishga tayyorligini baholash uchun ishlatiladi va uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.	equipment compatibility, and the readiness of the Customer's laboratory for housing the standard, and shall not be construed as a requirement for a specific manufacturer, model, or equipment design.
Kichik bo'lim 4.5 Tashqi muhit omillari ta'sirida barqarorlik va parametrlarga qo'yiladigan talablar	<i>Subsection 4.5 Requirements for stability and parameters under the influence of environmental factors</i>
O'zgaruvchan tok elektr kuchlanishi birligi etaloni ishlab chiqaruvchi va ushbu texnik topshiriq tomonidan belgilangan ekspluatatsiya shartlariga rioya qilingan holda, ko'rsatilgan metrologik tavsiflar, barqarorlik va kengaytirilgan o'lchash noaniqligining saqlanishini ta'minlashi kerak. Ijrochi texnik taklif tarkibida tashqi muhit va etalonni ekspluatatsiya qilish sharoitlariga qo'yiladigan talablarni, shu jumladan ruxsat etilgan harorat diapazoni, harorat o'zgarishining ruxsat etilgan tezligi, nisbiy namlik, laboratoriya xonasining tozali xususiyatlariga, ventilyatsiyasiga, issiqlik rejimiga, vibratsiyadan himoyalashiga, elektromagnit xalaqitlar ta'siriga, elektr ta'minoti sifatiga, yerga ulashga (zazemleniye), ekranlashga, uskunani joylashtirishga, o'lchashlar boshlanishidan oldin qizish va barqarorlashuv vaqtiga qo'yiladigan talablarni taqdim etishi shart. Ijrochi qanday tashqi muhit sharoitlarida qamrov koeffitsienti, misol uchun $k=2$ bo'lgandagi ko'rsatilgan aniqlik, barqarorlik, xatolik va kengaytirilgan o'lchash noaniqligi U qiymatlari ta'minlanishini ko'rsatishi kerak. Agar ko'rsatilgan metrologik tavsiflarga erishish uchun xonaning maxsus sharoitlari, klimat-kontrol, barqarorlashtirilgan elektr ta'minoti, alohida yerga ulash, ekranlash, vibroizolyatsiya, elektromagnit xalaqitlarni cheklash yoki boshqa tayyorgarlik tadbirlari talab etilsa, Ijrochi ushbu talablarni texnik taklifda ko'rsatishi shart. Ko'rsatilgan ma'lumotlar ishlab chiqaruvchi zavodning me'yoriy-texnik hujjatlari, ekspluatatsiya hujjatlari hamda etalonni buyurtmachi laboratoriyasida joylashtirish va ekspluatatsiya qilish imkoniyatini baholash uchun zarur bo'lgan boshqa hujjatlar bilan tasdiqlanishi kerak. Taqdim etilgan ma'lumotlar ekspluatatsiya sharoitlarini, metrologik tavsiflarning barqarorligini hamda buyurtmachi	The AC voltage unit standard shall ensure the preservation of the declared metrological characteristics, stability, and expanded measurement uncertainty, subject to compliance with the operating conditions established by the manufacturer and this technical terms of reference. The Contractor is obliged to submit as part of the technical proposal requirements for ambient environmental and operating conditions of the standard, including the permissible temperature range, permissible rate of temperature change, relative humidity, requirements for laboratory room cleanliness, ventilation, thermal conditions, vibration protection, immunity to electromagnetic interference, power supply quality, grounding, shielding, equipment placement, warm-up, and stabilization time before commencing measurements. The Contractor must specify under which ambient environmental conditions the declared values of accuracy, stability, error, and expanded measurement uncertainty U at coverage factor, e.g. $k=2$ are ensured. If special room conditions, climate control, stabilized power supply, dedicated grounding, shielding, vibration isolation, limitation of electromagnetic interference, or other preparatory measures are required to achieve the declared metrological characteristics, the Contractor is obliged to specify these requirements in the technical proposal. The specified information must be confirmed by the manufacturer's regulatory and technical documentation, operational documentation, and other documents necessary to evaluate the feasibility of placing and operating the standard in the Customer's laboratory. The provided information shall be used to evaluate operating conditions, stability of

laboratoriyasining etalonni joylashtirishga tayyorligini baholash uchun ishlatiladi va uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.	metrological characteristics, and the readiness of the Customer's laboratory for housing the standard, and shall not be construed as a requirement for a specific manufacturer, model, or equipment design.
Kichik bo'lim 4.6 Elektr/energiya ta'minotiga qo'yiladigan talablar	<i>Subsection 4.6 Power supply requirements</i>
O'zgaruvchan tok elektr kuchlanishi birligi etalonining va uning tarkibiga kiruvchi barcha komponentlarning elektr ta'minoti O'zbekiston Respublikasining amaldagi me'yoriy hujjatlari talablariga, elektr xavfsizligi talablariga, shuningdek ishlab chiqaruvchi zavodning me'yoriy-texnik va ekspluatatsiya hujjatlariga muvofiq bo'lishi kerak. Ijrochi texnik taklif tarkibida etalon va uning komponentlarining elektr ta'minotiga qo'yiladigan barcha talablarni, shu jumladan ta'minot tarmog'ining nominal kuchlanishini, tarmoq chastotasini, kuchlanish va chastotaning ruxsat etilgan og'ishlarini, har bir asosiy komponent va umuman tizim bo'yicha quvvat sarfini, elektr ta'minoti sifatiga, himoya yerga ulashga (zazemleniye), potentsiallarni tenglashtirishga, elektromagnit moslashuvchanlikka, kuchlanish sakrashlaridan, ortiqcha yuklanishlardan va qisqa tutashuvlardan himoyalashga qo'yiladigan talablarni taqdim etishi shart. Ijrochi etalonning to'g'ri ishlashi uchun uzluksiz quvvat manbai (UQM-UPS), kuchlanish barqarorlashtirgichi, tarmoq filtrlari, galvanik ajratish (razvyazka), alohida elektr ta'minoti liniyasi, alohida yerga ulash konturi yoki boshqa himoya va elektr ta'minoti sifatini ta'minlash vositalarini qo'llash talab etilishi yoki etilmasligini ko'rsatishi kerak. Ijrochi, shuningdek, elektr ta'minotining qaysi parametrlarida ko'rsatilgan metrologik tavsiflar, barqarorlik va qamrov koeffitsienti, misol uchun $k=2$ bo'lgandagi kengaytirilgan o'lchash noaniqligi U ta'minlanishini ko'rsatishi lozim. Ko'rsatilgan ma'lumotlar ishlab chiqaruvchi zavodning me'yoriy-texnik hujjatlari, ekspluatatsiya hujjatlari, ulash sxemalari va buyurtmachi laboratoriyasining etalonni joylashtirish, ulash hamda ekspluatatsiya qilishga tayyorligini baholash uchun zarur bo'lgan boshqa hujjatlar bilan tasdiqlanishi kerak. Taqdim etilgan ma'lumotlar elektr ta'minotiga qo'yiladigan talablarni, funksional moslikni, xavfsizlikni, o'lchash jarayonining avtomatlashtirilishini va etalonning	The power supply of the AC voltage unit standard and all its constituent components must comply with the requirements of the applicable regulatory documents of the Republic of Uzbekistan, electrical safety requirements, as well as the manufacturer's regulatory, technical, and operational documentation. The Contractor is obliged to submit as part of the technical proposal all power supply requirements for the standard and its components, including the nominal mains voltage, mains frequency, permissible voltage and frequency deviations, power consumption for each main component and for the system as a whole, power quality requirements, protective grounding, equipotential bonding, electromagnetic compatibility, protection against voltage surges, overloads, and short circuits. The Contractor must specify whether the correct operation of the standard requires the use of an uninterruptible power supply (UPS), voltage stabilizer, line filters, galvanic isolation, dedicated power supply line, dedicated grounding loop, or other means of protection and power quality assurance. The Contractor must also specify under which power supply parameters the declared metrological characteristics, stability, and expanded measurement uncertainty U at coverage factor, e.g. $k=2$ are ensured. The specified information must be confirmed by the manufacturer's regulatory and technical documentation, operational documentation, wiring diagrams, and other documents necessary to evaluate the readiness of the Customer's laboratory for housing, connecting, and operating the standard. The provided information shall be used to evaluate power supply requirements, functional compatibility, safety, measurement process automation, and operational readiness of the standard, and shall not be construed as a requirement for a specific manufacturer, model, or equipment design.

ekspluatatsiyaga tayyorligini baholash uchun ishlatiladi hamda uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.	
Kichik bo'lim 4.7 Nazorat-o'lchov asboblari va avtomatikaga qo'yiladigan talablar	<i>Subsection 4.7 Requirements for instrumentation and automation</i>
O'zgaruvchan tok elektr kuchlanishi birligi etaloni tarkibiga kiruvchi nazorat-o'lchov asboblari va avtomatlashtirish vositalari (NO'A va AV) ishlab chiqaruvchi zavodning me'yoriy-texnik hujjatlari talablariga, ushbu texnik topshiriq talablariga, shuningdek metrologiya, elektr xavfsizligi, elektromagnit moslashuvchanlik, dasturiy ta'minot va o'lchash ma'lumotlariga ishlov berish sohasidagi tegishli standartlar hamda uslubiy hujjatlarga muvofiq bo'lishi kerak. Tegishli hujjatlar sirasiga GOST R 8.648, DKD-L 02-2, DKD-R 1-1, ISO/IEC 17025, GUM/JCGM 100, o'lchash noaniqligini baholash bo'yicha hujjatlar, shuningdek taklif etilayotgan etalon tarkibiga tatbiq etiladigan va O'zbekiston Respublikasida qo'llashga ruxsat berilgan boshqa xalqaro, davlatlararo, mintaqaviy yoki milliy hujjatlar kirishi mumkin. Ijrochi texnik taklif tarkibida nazorat-o'lchov asboblari va avtomatlashtirish vositalarining tarkibi, ularning vazifasi, o'lchash va generatsiya diapazonlari, metrologik tavsiflari, qamrov koeffitsienti, misol uchun $k=2$ bo'lgandagi kengaytirilgan o'lchash noaniqligi U, barqarorligi, kalibrlashlararo intervali, ulash interfeyslari, ma'lumot almashish bayonnomalari, etalonning dasturiy ta'minoti bilan mosligi hamda o'lchash jarayonini avtomatlashtirilgan boshqarish tartibi to'g'risidagi ma'lumotlarni taqdim etishi shart. Ijrochi o'lchash ma'lumotlarini avtomatlashtirilgan tarzda yig'ish, ularga ishlov berish, saqlash va eksport qilish tartibini, tuzatmalarni va o'lchash noaniqligini hisoblash tartibini, hisobotlar, bayonnomalar hamda o'lchash jurnallarini shakllantirish tartibini, shuningdek uskunaning holatini nazorat qilish, foydalanuvchi harakatlarini jurnalga qayd etish, ma'lumotlarni muhofaza qilish, sozlamalarni zaxiralash va tiklash funksiyalarining mavjudligini ko'rsatishi kerak. Ijrochi montaj, ishga tushirish-sozlash ishlari hamda dasturiy ta'minot o'rnatilgandan so'ng NO'A va AV va avtomatlashtirilgan tizimning ishga layoqatliligini tekshirish tartibining tavsifini, shu jumladan tekshiriladigan funksiyalar ro'yxatini, sinov o'lchashlarini, tekshirish bayonnomasini, qabul qilish mezonlarini	Instrumentation and automation equipment included in the AC voltage unit standard must comply with the requirements of the manufacturer's regulatory and technical documentation, the requirements of this technical terms of reference, as well as applicable standards and methodological documents in the fields of metrology, electrical safety, electromagnetic compatibility, software, and measurement data processing. Applicable documents may include GOST R 8.648, DKD-L 02-2, DKD-R 1-1, ISO/IEC 17025, GUM/JCGM 100, documents on the evaluation of measurement uncertainty, as well as other international, interstate, regional, or national documents applicable to the composition of the offered standard and permitted for use in the Republic of Uzbekistan. The Contractor is obliged to submit as part of the technical proposal information regarding the composition of instrumentation and automation equipment, their purpose, measurement and generation ranges, metrological characteristics, expanded measurement uncertainty U at coverage factor, e.g. $k=2$, stability, calibration interval, connection interfaces, data exchange protocols, compatibility with the standard's software, and the procedure for automated management of the measurement process. The Contractor must specify the procedure for automated collection, processing, storage, and export of measurement data, the procedure for calculating corrections and measurement uncertainty, the procedure for generating reports, protocols, and measurement logs, as well as the availability of functions for equipment status monitoring, logging user actions, data protection, backup, and restoration of settings. The Contractor is obliged to submit a description of the procedure for checking the operability of instrumentation and automation equipment and the automated system following installation, commissioning, and software setup, including a list of verified functions, test

va aniqlangan nomuvofiqliklarni bartaraf etish tartibini taqdim etishi shart. Ko'rsatilgan ma'lumotlar ishlab chiqaruvchining texnik, ekspluatatsiya, metrologik va dasturiy hujjatlari, kalibrlash sertifikatlari, dasturiy ta'minot tavsifi, ulash sxemalari hamda funksional moslikni, o'lchash jarayonining avtomatlashtirilishini va etalonning ekspluatatsiyaga tayyorligini baholash uchun zarur bo'lgan boshqa hujjatlar bilan tasdiqlanishi kerak. Taqdim etilgan ma'lumotlar NO'A va AV tarkibini, funksional moslikni, avtomatlashtirishni, o'lchash ma'lumotlarining ishonchligini hamda etalonning ekspluatatsiyaga tayyorligini baholash uchun ishlatiladi va uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.	measurements, verification protocol, acceptance criteria, and the procedure for rectifying identified discrepancies. The specified information must be confirmed by the manufacturer's technical, operational, metrological, and software documentation, calibration certificates, software description, wiring diagrams, and other documents necessary to evaluate functional compatibility, measurement process automation, and operational readiness of the standard. The provided information shall be used to evaluate the composition of instrumentation and automation equipment, functional compatibility, automation, reliability of measurement data, and operational readiness of the standard, and shall not be construed as a requirement for a specific manufacturer, model, or equipment design.
Kichik bo'lim 4.8 Tarkibiy qismlarga, boshlang'ich va ekspluatatsion xomashyo va materiallarga, shuningdek tayyor mahsulotga qo'yiladigan talablar	<i>Subsection 4.8 Requirements for components, raw materials, and operational materials, as well as the finished product</i>
Barcha tarkibiy qismlar, asosiy va yordamchi komponentlar, ekspluatatsiya materiallari, sarflash materiallari, ehtiyot qismlar, dasturiy ta'minot va umuman tayyor buyum ushbu texnik topshiriq talablariga, ishlab chiqaruvchi zavodning me'yoriy-texnik hujjatlariga muvofiq bo'lishi hamda o'zgaruvchan tok elektr kuchlanishi birligi etalonining to'laqonli ishlashini ta'minlashi kerak. Ijrochi texnik taklif tarkibida etalon komponentlarining to'liq ro'yxatini, shu jumladan asosiy o'lchash vositalari, kuchlanish manbalari va kalibratorlari, AC-DC transfer standards, termoelektr o'zgartirgichlar yoki AC-DC transfering ekvivalent vositalari, qo'shimcha rezistorlar, kuchlanish bo'lgichlari, nanovoltmetrlar, multimetrlar, kommutatsiya qurilmalari, quvvat bloklari, kabellar, ulagichlar (raz'yomlar), o'tkazgichlar (perexodniklar), past termo-EYUshli (termo-EDS) tutashtiruvchi simlar, dasturiy ta'minot, litsenziyalar, ehtiyot qismlar, sarflash materiallari, asbob-uskunalar va etalonni ekspluatatsiya qilish, unga xizmat ko'rsatish, kalibrlash hamda ishga layoqatligini tekshirish uchun zarur bo'lgan boshqa tegishli jihozlarni taqdim etishi shart. Ijrochi har bir komponentning vazifasini, sonini, qo'llanilishi mumkin bo'lgan hollarda texnik va metrologik tavsiflarini, etalon majmuasining boshqa komponentlari bilan	All constituent parts, main and auxiliary components, operational materials, consumables, spare parts, software, and the finished product as a whole must comply with the requirements of this technical terms of reference, the manufacturer's regulatory and technical documentation, and ensure the full-fledged operation of the AC voltage unit standard. The Contractor is obliged to submit as part of the technical proposal a complete list of components of the standard, including main measuring instruments, voltage sources and calibrators, AC-DC transfer standards, thermoelectric converters or equivalent AC-DC transfer means, multiplier resistors, voltage dividers, nanovoltmeters, multimeters, switching devices, power supply units, cables, connectors, adapters, low thermo-EMF connecting wires, software, licenses, spare parts, consumables, tools, and other accessories required for the operation, maintenance, calibration, and operability verification of the standard. The Contractor must specify the purpose of each component, quantity, technical and metrological characteristics where applicable, compatibility with other components of the reference complex, storage requirements, service life, replacement frequency, availability

mosligini, saqlashga qo'yiladigan talablarni, xizmat muddatini, almashtirish davriyligini, sarflash materiallarining mavjudligini, ehtiyot qismlarni yetkazib berish shartlarini hamda ularni kafolatli va kafolatdan keyingi davrlarda xarid qilish imkoniyatini ko'rsatishi kerak.

Kabellar, ulagichlar, o'tkazgichlar, qo'shimcha rezistorlar, kuchlanish bo'lgichlari, kommutatsiya qurilmalari va boshqa yordamchi elementlar etalon komponentlarining ishonchli ulanishini, termoelementning minimallashtirilishini, o'lchash zanjirlarining barqarorligini, ekspluatatsiya xavfsizligini hamda ko'rsatilgan metrologik tavsiflarning saqlanishini ta'minlashi lozim. Etalon tarkibiga kiruvchi dasturiy ta'minot etalon majmuasining barcha komponentlari bilan mos bo'lishi va o'lchash jarayonini boshqarishni, o'lchash ma'lumotlarini yig'ish, ularga ishlov berish, saqlash va eksport qilishni, bayonnomalar hamda hisobotlarni shakllantirishni, shuningdek sozlamalar va o'lchash natijalarining saqlanishini ta'minlashi kerak.

Ko'rsatilgan ma'lumotlar ishlab chiqaruvchining texnik, ekspluatatsiya, metrologik, servis va dasturiy hujjatlari, yetkazib berish spetsifikatsiyasi, ehtiyot qismlar va sarflash materiallari ro'yxati, shuningdek jamlanmalikni, moslikni, ekspluatatsiyaga yaroqlilikni hamda etalonga egalik qilish qiymatini baholash uchun zarur bo'lgan boshqa hujjatlar bilan tasdiqlanishi kerak.

Taqdim etilgan ma'lumotlar jamlanmalikni, moslikni, ekspluatatsiyaga yaroqlilikni, texnik xizmat ko'rsatish imkoniyatini va etalonga egalik qilish qiymatini baholash uchun ishlatiladi hamda uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.

of consumables, terms of delivery for spare parts, and the possibility of purchasing them during warranty and post-warranty periods.

Cables, connectors, adapters, multiplier resistors, voltage dividers, switching devices, and other auxiliary elements must ensure reliable connection of the standard's components, minimization of thermal EMF, stability of measuring circuits, operational safety, and preservation of declared metrological characteristics. Software included in the standard must be compatible with all components of the reference complex and ensure measurement process control, collection, processing, storage, and export of measurement data, generation of protocols and reports, as well as preservation of settings and measurement results.

The specified information must be confirmed by the manufacturer's technical, operational, metrological, service, and software documentation, delivery specification, list of spare parts and consumables, as well as other documents necessary to evaluate the completeness, compatibility, operational suitability, and cost of ownership of the standard.

The provided information shall be used to evaluate completeness, compatibility, operational suitability, maintainability, and cost of ownership of the standard, and shall not be construed as a requirement for a specific manufacturer, model, or equipment design.

Kichik bo'lim 4.9 Markirovkaga (belgilashga) qo'yiladigan talablar	<i>Subsection 4.9 Marking requirements</i>
Markirovka (belgilash) GOST 22261-94 ning 4.16-bandi talablariga va/yoki unga zid kelmaydigan hamda undan qolishmaydigan boshqa xalqaro standartlar talablariga mos kelishi kerak.	Marking must comply with the requirements of clause 4.16 of GOST 22261-94 and/or other international standards that do not contradict it and are not inferior to it.
Kichik bo'lim 4.10 O'lchamlar va o'rashga qo'yiladigan talablar	<i>Subsection 4.10 Requirements for dimensions and packaging</i>

Qadoqlash (Upakovka) Etalonning tashish, yuklash-tushirish ishlarida va o'rnatish joyiga ko'chirishda butunligini ta'minlashi kerak. Qadoqlash O'zbekiston Respublikasi davlat standartlari va xalqaro umume'tirof etilgan standartlar talablariga mos kelishi lozim. Qadoqlash Etalonning markirovkasiga (belgilashiga) qat'iy mos kelishi kerak. Qadoqlashda mexanik shikastlanishlar va noqulay iqlim sharoitlari ta'siri izlari bo'lmasligi lozim. Tashish vaqtida ishlab chiqaruvchi zavodning MTHda ko'rsatilgan Etalonn qadoqlash va tashish talablariga rioya qilish zarur.	Packaging must ensure the integrity of the standard during transportation, loading and unloading operations, and movement to the installation site. Packaging must comply with the requirements of the state standards of the Republic of Uzbekistan and generally recognized international standards. Packaging must strictly correspond to the marking of the standard. Packaging must show no signs of mechanical damage or the effects of unfavorable climatic conditions. During transportation, it is necessary to comply with the requirements for packaging and transporting the standard specified in the manufacturer's regulatory and technical documentation.
Kichik bo'lim 4.11 Ehtiyot qismlar, asboblari va anjomlar (ЗИП) ga va tez eskiradigan qismlarga qo'yiladigan talablar	<i>Subsection 4.11 Requirements for spare parts, tools, and accessories (SPTA) and wear parts</i>
Ijrochi texnik taklif tarkibida o'zgaruvchan tok elektr kuchlanishi birligi etalonini montaj qilish, ishga tushirish-sozlash, ekspluatatsiya qilish, texnik xizmat ko'rsatish, kalibrlash, diagnostika qilish va ishga layoqatlilikini tiklash uchun zarur bo'lgan ehtiyot qismlar, asboblari, tegishli jihozlar, sarflash va tez yeyiladigan qismlar ro'yxatini taqdim etishi shart. Ro'yxatda har bir pozitsiyaning nomi, vazifasi, soni, o'lchov birligi, etalonning muayyan komponentiga tatbiq etilishi, tavsiya etilgan almashtirish davriyligi, xizmat muddati yoki resursi, saqlash shartlari, yetkazib berish shartlari, kafolatli va kafolatdan keyingi davrlarda xarid qilish imkoniyati, shuningdek qo'llanilishi mumkin bo'lgan hollarda o'zaro almashtiriluvchanligi to'g'risidagi ma'lumotlar ko'rsatilgan bo'lishi kerak. ZIP (ehtiyot qismlar, asboblari va anjomlar), asbob-uskunalar va tegishli jihozlar sirasiga, shu jumladan, lekin ular bilan cheklanmagan holda: tutashtiruvchi kabellar, past termo-EYUshli (termo-EDS) simlar, ulagichlar (raz'yomlar), o'tkazgichlar (perexodniklar), kommutatsiya elementlari, diapazon rezistorlari, saqlagichlar (predoxranitel), quvvat bloklari, yordamchi o'lchash jihozlari, servis asboblari, sarflash materiallari, dasturiy ta'minot tashuvchilari, litsenziya kalitlari, sozlamalarning zaxira nusxalari va etalonning ishga layoqatlilikini ushlab turish uchun zarur bo'lgan boshqa elementlar kirishi mumkin.	The Contractor is obliged to submit as part of the technical proposal a list of spare parts, tools, accessories, consumables, and wear parts required for the installation, commissioning, operation, maintenance, calibration, diagnostics, and recovery of operability of the AC voltage unit standard. The list must specify the name of each item, purpose, quantity, unit of measurement, applicability to a specific component of the standard, recommended replacement frequency, service life or resource, storage conditions, delivery terms, possibility of purchase during warranty and post-warranty periods, as well as information on interchangeability where applicable. Spare parts, tools, and accessories may include, but are not limited to: connecting cables, low thermo-EMF wires, connectors, adapters, switching elements, range resistors, fuses, power supply units, auxiliary measuring accessories, service tools, consumables, software media, license keys, backup copies of settings, and other elements necessary to maintain the operability of the standard. The Contractor must specify the minimum recommended spare parts kit for the warranty period and the recommended spare parts kit for post-warranty operation, as well as the terms of availability of spare parts and the procedure for their delivery.

Ijrochi kafolatli davr uchun tavsiya etilgan minimal ZIP to'plamini va kafolatdan keyingi ekspluatatsiya uchun tavsiya etilgan ZIP to'plamini, shuningdek ehtiyot qismlarning mavjud bo'lish muddatlari hamda ularni yetkazib berish tartibini ko'rsatishi kerak.

ZIP, asboblari, tegishli jihozlar, sarflash va tez yeyiladigan qismlar yetkazib berilayotgan etalon bilan mos bo'lishi, xavfsiz qo'llanilishini, ko'rsatilgan metrologik tavsiflarning saqlanishini hamda ishlab chiqaruvchining hujjatlariga muvofiq texnik xizmat ko'rsatishni bajarish imkoniyatini ta'minlashi lozim.

Ko'rsatilgan ma'lumotlar ishlab chiqaruvchining me'yoriy-texnik, ekspluatatsiya va servis hujjatlarini, yetkazib berish spetsifikatsiyasi, ZIP ro'yxati hamda ekspluatatsiyaga yaroqlilikni, ta'mirlashga yaroqlilikni, ehtiyot qismlarning mavjudligini va etalonga egalik qilish qiymatini baholash uchun zarur bo'lgan boshqa hujjatlar bilan tasdiqlanishi kerak.

Taqdim etilgan ma'lumotlar ekspluatatsiyaga yaroqlilikni, ta'mirlashga yaroqlilikni, servis bilan ta'minlanganlikni hamda etalonga egalik qilish qiymatini baholash uchun ishlatiladi va uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.

Mazkur texnik topshiriqda keltirilgan etalonning tarkibi va texnik yechimlari ishtirokchining ekvivalent yoki yanada takomillashtirilgan texnik yechimni taklif etish huquqini cheklamaydi, bunda bunday yechim belgilangan vazifalar, o'lchash diapazonlari, aniqlik, kengaytirilgan noaniqlik $U(k=2)$, metrologik kuzatuvchanlik, ishonchlilik va xavfsizlik bo'yicha barcha talablarning bajarilishini ta'minlashi shart.

Texnik, metrologik, funksional va ekspluatatsion xususiyatlari mazkur texnik topshiriq talablariga mos keladigan yoki ulardan yuqori bo'lgan o'xshash yoki ekvivalent etalon uskunasi taklif etishga ruxsat etiladi.

Yetkazib beriladigan etalon montaj va ishga tushirish-sozlash ishlari bajarilgandan so'ng belgilangan maqsadda foydalanishga tayyor bo'lgan yagona, to'liq komplektlangan va ishga yaroqli tizim bo'lishi lozim. Yetkazib berish komplekti etalondan to'liq foydalanish uchun zarur bo'lgan barcha asosiy va yordamchi qurilmalar, ulash elementlari, kabellar, aksessuarlar, dasturiy

Spare parts, tools, accessories, consumables, and wear parts must be compatible with the supplied standard, ensure safe application, preservation of declared metrological characteristics, and the capability to perform maintenance in accordance with the manufacturer's documentation.

The specified information must be confirmed by the manufacturer's regulatory, technical, operational, and service documentation, delivery specification, list of spare parts, and other documents necessary to evaluate operational suitability, maintainability, availability of spare parts, and cost of ownership of the standard.

The provided information shall be used to evaluate operational suitability, maintainability, service support capability, and cost of ownership of the standard, and shall not be construed as a requirement for a specific manufacturer, model, or equipment design.

The composition and technical solutions of the standard specified in this Technical Specification shall not restrict the participant's right to propose an equivalent or more advanced technical solution, provided that such solution ensures compliance with all established requirements relating to the intended purpose, measurement ranges, accuracy, expanded uncertainty $U(k=2)$, metrological traceability, reliability, and safety.

The participant may propose similar or equivalent reference standard equipment whose technical, metrological, functional, and operational characteristics comply with or exceed the requirements of this Technical Specification.

The reference standard to be supplied shall constitute a single, fully complete and operational system, ready for its intended use after completion of installation and commissioning works. The scope of supply shall include all main and auxiliary devices, connection elements, cables, accessories, software, technical and operating documentation, calibration certificates, and any other components necessary for the full operation of the reference standard, without requiring the Customer to purchase any additional mandatory components.

ta'minot, texnik va ekspluatatsion hujjatlar, kalibrlash sertifikatlari hamda boshqa zarur komponentlarni Buyurtmachi tomonidan qo'shimcha majburiy komponentlarni xarid qilish zaruratisiz o'z ichiga olishi lozim.

Taklif etilayotgan texnik yechim, agar bozorda texnik va metrologik jihatdan mos keladigan analoglar mavjud bo'lsa, faqat bitta ishlab chiqaruvchining uskunalari, dasturiy ta'minoti, aksessuarlari yoki boshqa komponentlaridan foydalanishga asossiz bog'liqlikni yuzaga keltirmasligi lozim. Mazkur talab muayyan komponentlardan foydalanish moslikni, talab etiladigan aniqlikni, metrologik kuzatuvchanlikni, xavfsizlikni yoki kafolat majburiyatlarining saqlanishini ta'minlash uchun obyektiv zarur bo'lgan hollarga tatbiq etilmaydi.

The proposed technical solution shall not create an unjustified dependency on equipment, software, accessories, or other components from a single manufacturer, where technically and metrologically compatible alternatives are available on the market. This requirement shall not apply where the use of specific components is objectively necessary to ensure compatibility, required accuracy, metrological traceability, safety, or the validity of warranty obligations.

BO'LIM 5. Topshirish va qabul qilish qoidalariga qo'yiladigan talablar / SECTION 5. Requirements for delivery and acceptance rules

Kichik bo'lim 5.1 Topshirish va qabul qilish tartibi	<i>Subsection 5.1 Delivery and acceptance procedure</i>
Etalonni yetkazib berish, qabul qilish va foydalanishga topshirish bosqichma-bosqich quyidagi muddatlarda amalga oshiriladi: 1. Uskunani yetkazib berish joyigacha yetkazib berish – shartnomada belgilangan muddatda, lekin umumiy yetkazib berish muddatidan kechiktirmay. 2. Tovarni miqdori va jamlanmaligi bo'yicha birinchi darajali qabul qilish – uskuna Buyurtmachining omboriga/laboratoriyasiga yetkazib berilgan sanadan boshlab 1 ish kuni ichida. 3. O'ram, markirovka, transport hujjatlari, o'rash varaqalari, spetsifikatsiya, jamlanmalik hamda ko'rinib turgan shikastlanishlar yo'qligini tekshirish – tovar yetkazib berilgan sanadan boshlab 1 ish kuni ichida. 4. Etalonning barcha komponentlarini montaj qilish va fizik ulanishini ta'minlash – birinchi darajali qabul qilish yakunlangach va Buyurtmachining xonasi tayyor bo'lgandan keyin 5 ish kuni ichida. 5. Dasturiy ta'minotni o'rnatish va sozlash – uskunani montaj qilish yakunlangach 1 ish kuni ichida. 6. Ishga tushirish-sozlash ishlari va etalonning barcha komponentlari o'zaro ta'sirini tekshirish – uskuna va dasturiy	Delivery, acceptance, and commissioning of the standard shall be carried out in stages within the following timeframes: 1. Delivery of the equipment to the place of delivery – within the period established by the contract, but no later than the general delivery deadline. 2. Initial acceptance of the goods by quantity and completeness – within 1 working days from the date of delivery of the equipment to the Customer's warehouse/laboratory. 3. Verification of packaging, marking, transport documents, packing lists, specification, completeness, and absence of visible damage – within 1 working days from the date of delivery of the goods. 4. Installation and physical connection of all components of the standard – within 5 working days after completion of the initial acceptance and readiness of the Customer's premises. 5. Installation and configuration of the software – within 1 working days after completion of the equipment installation. 6. Commissioning operations and verification of the interaction between all components of the standard – within 1 working days after completion of the equipment and software installation.

ta'minotni o'rnatish yakunlangach 1 ish kuni ichida.

7. Qabul qilish sinovlarini o'tkazish va texnik talablarga muvofiqlikni tasdiqlash – ishga tushirish-sozlash ishlari yakunlangach 1 ish kuni ichida.
8. Metrologik attestatsiyadan o'tkazish yoki etalonning metrologik tavsiflarini tasdiqlash, Etalonni tajriba-sinov ekspluatatsiyasidan o'tkazish – qabul qilish sinovlari yakunlangach 3 ish kuni ichida.
9. Buyurtmachi xodimlarini o'qitish – ishga tushirish-sozlash ishlari yakunlangach 5 ish kuni ichida yoki tomonlar kelishgan boshqa muddatda.
10. Aniqlangan e'tirozlarni bartaraf etish – agar tomonlar boshqa muddatni kelishib olmagan bo'lsa, e'tirozlar dalolatnomasi rasmiylashtirilgan sanadan boshlab 5 ish kuni ichida.
11. Etalonni yakuniy qabul qilish va yakuniy topshirish-qabul qilish dalolatnomasini imzolash – montaj, ishga tushirish-sozlash ishlari, tajriba-sinov ekspluatatsiyasi, xodimlarni o'qitish, hujjatlarning to'liq to'plamini topshirish hamda barcha aniqlangan e'tirozlar bartaraf etilgandan keyin 2 ish kuni ichida.

Etalon tomonlar tomonidan yakuniy topshirish-qabul qilish dalolatnomasi imzolangan sanadan e'tiboran tegishli tartibda yetkazib berilgan va qabul qilingan deb hisoblanadi.

Etalon Buyurtmachi tomonidan uni yetkazib berish, montaj qilish va ishga tushirish-sozlash ishlari yakunlangandan, qabul qilish sinovlari muvaffaqiyatli o'tkazilgandan, belgilangan texnik va metrologik talablarga, jumladan o'lchash diapazonlari, aniqlik, kengaytirilgan noaniqlik $U(k=2)$ va metrologik kuzatuvchanlik talablariga muvofiqligi tasdiqlangandan, texnik va ekspluatatsion hujjatlar, dasturiy ta'minot va kalibrlash sertifikatlarining to'liq to'plami topshirilgandan, shuningdek Buyurtmachi xodimlari o'qitilgandan so'ng yakuniy qabul qilingan hisoblanadi. Etalonni yakuniy qabul qilish va foydalanishga topshirish tomonlar tomonidan belgilangan tartibda imzolanadigan tegishli dalolatnoma bilan rasmiylashtiriladi.

7. Performance of acceptance testing and confirmation of compliance with technical requirements – within 1 working days after completion of commissioning operations.
8. Metrological certification or confirmation of the metrological characteristics of the standard, Trial operation of the standard – within 3 working days after completion of acceptance testing.
9. Training of the Customer's personnel – within 5 working days after completion of commissioning operations or within another period agreed upon by the parties.
10. Elimination of identified deficiencies – within 5 working days from the date of drawing up the report on deficiencies, unless another period is agreed upon by the parties.
11. Final acceptance of the standard and signing of the final acceptance certificate – within 2 working days after completion of installation, commissioning operations, trial operation, personnel training, handover of the full set of documents, and elimination of all identified deficiencies.

The standard shall be considered properly delivered and accepted from the date the final acceptance certificate is signed by both parties.

The reference standard shall be deemed finally accepted by the Customer upon completion of its delivery, installation and commissioning, successful completion of acceptance tests, confirmation of compliance with the established technical and metrological requirements, including measurement ranges, accuracy, expanded uncertainty $U(k=2)$, and metrological traceability, delivery of the complete set of technical and operating documentation, software and calibration certificates, as well as completion of the Customer's personnel training. Final acceptance and commissioning of the reference standard shall be documented by the relevant acceptance and commissioning certificate duly signed by both Parties.

Kichik bo'lim 5.2 Etalonlar yetkazib berilganda buyurtmachiga texnik va boshqa hujjatlarni topshirishga qo'yiladigan talablar	<i>Subsection 5.2 Requirements for the submission of technical and other documentation to the customer upon delivery of the Standards</i>
5.2.1. Topshiriladigan hujjatlarga qo'yiladigan umumiy talablar Ijrochi Buyurtmachiga etalonni qabul qilish, montaj qilish, ishga tushirish-sozlash, ekspluatatsiya qilish, texnik xizmat ko'rsatish, kalibrlash, ta'mirlash va kelgusida metrologik qo'llash uchun zarur bo'lgan texnik, ekspluatatsiya, metrologik, tovar-kuzatuv va boshqa hujjatlarning to'liq to'plamini topshirishi shart. 5.2.2. Metrologik hujjatlar Metrologik hujjatlar tarkibiga quyidagilar kirishi kerak: – barcha o'lchash vositalari, etalonlar, manbalar, o'zgartirgichlar, kuchlanish bo'lgichlari va etalonning metrologik tavsiflariga ta'sir etuvchi boshqa komponentlarga kalibrlash sertifikatlari; – SI birliklariga metrologik kuzatishni tasdiqlovchi hujjatlar; – etalonni kalibrlash uslubiyoti yoki etalonni qo'llash uslubiyoti; – BIPM KCDB da CMC-talabnomalarini tayyorlash uchun zarur bo'lgan hujjatlar va texnik materiallar. Kalibrlash sertifikatlarida kalibrlash natijalari, diapazonlar, kalibrlash o'tkazish sharoitlari, qamrov koeffitsienti bo'lgandagi kengaytirilgan o'lchash noaniqligi va SI birliklariga metrologik kuzatish tasdiqlangan bo'lishi kerak. Sertifikatlar milliy metrologiya instituti, tayinlangan institut yoki CIPM MRA doirasida tan olingan yoki metrologik kuzatishning boshqa tenglashtirilgan tasdiqiga ega bo'lgan boshqa vakolatli metrologik tashkilot tomonidan berilgan bo'lishi lozim. 5.2.3. BIPM KCDB da CMC-talabnomalarini tayyorlash uchun hujjatlar Ijrochi Buyurtmachiga BIPM KCDB da CMC e'lon qilish bo'yicha materiallarni tayyorlash uchun zarur bo'lgan hujjatlar va texnik yordamni, shu jumladan uskunaning texnik tavsiflari, o'lchash diapazonlari to'g'risidagi ma'lumotlar, noaniqlik Byudjetlari, uslubiy materiallar, metrologik kuzatish to'g'risidagi ma'lumotlar va CMC-talabnomasini tayyorlash uchun zarur bo'lgan boshqa ma'lumotlarni taqdim etishi shart. Bunda BIPM KCDB ga CMC-yozuvlarini kiritish	5.2.1. General Requirements for Transmitted Documentation The Contractor shall hand over to the Customer a full set of technical, operational, metrological, shipping, and other documentation required for acceptance, installation, commissioning, operation, maintenance, calibration, repair, and further metrological application of the standard. 5.2.2. Metrological Documentation The metrological documentation shall include: – calibration certificates for all measuring instruments, standards, sources, converters, voltage dividers, and other components affecting the metrological characteristics of the standard; – documents confirming metrological traceability to SI units; – calibration procedure of the standard or application procedure of the standard; – documents and technical materials required for preparing CMC claims in the BIPM KCDB. Calibration certificates must contain calibration results, ranges, calibration conditions, expanded measurement uncertainty at coverage factor, and confirmation of metrological traceability to SI units. Certificates must be issued by a national metrology institute, a designated institute, or another competent metrological organization recognized under the CIPM MRA or with other equivalent confirmation of metrological traceability. 5.2.3. Documents for Preparing CMC Claims in the BIPM KCDB The Contractor is obliged to provide the Customer with the documents and technical support required for preparing materials for declaring CMCs in the BIPM KCDB, including technical specifications of the equipment, information on measurement ranges, uncertainty budgets, methodological materials, information on metrological traceability, and other data necessary for preparing a CMC claim. In this regard, the entry of CMC records into the BIPM KCDB is carried out in accordance with established international CIPM MRA procedures and cannot be considered the sole responsibility of the Contractor.

CIPM MRA ning belgilangan xalqaro tartib-taomillariga muvofiq amalga oshiriladi va Ijrochining yagona majburiyati sifatida qaralishi mumkin emas.

5.2.4. Tovar-kuzatuv hujjatlari

Ijrochi Buyurtmachiga quyidagi tovar-kuzatuv hujjatlarini topshirishi shart:

- invoices yoki hisob-fakturaning asl nusxasi;
- nomi, massasi, yuk joylari soni, o'ram turi va TIF TN kodi ko'rsatilgan o'rash varaqasi (upakovochniy list);
- etalon pasporti yoki etalonning asosiy komponentlariga pasportlar;
- kelib chiqish mamlakati sertifikat;
- muvofiqlik va sifat sertifikatlari (qo'llanilishi mumkin bo'lsa).

5.2.5. Texnik va ekspluatatsiya hujjatlari

Ijrochi Buyurtmachiga quyidagilarni topshirishi shart:

- etalon tizimini montaj qilish, ulash va sozlash bo'yicha yo'riqnomalar;
- etalonni ekspluatatsiya qilish, texnik xizmat ko'rsatish va ta'mirlash bo'yicha qo'llanma;
- texnik vositalarga texnik xizmat ko'rsatish va ta'mirlash bo'yicha tavsiyalar;
- texnik xizmat ko'rsatish va ta'mirlash grafigi, davriyligi va hajmi;
- ulash sxemalari, montaj sxemalari va laboratoriya xonasini tayyorlashga qo'yiladigan talablar;
- elektr ta'minoti, yerga ulash (zazemleniye), ventilatsiya, ekspluatatsiya sharoitlari va kommunikatsiyalarga qo'yiladigan talablar.

5.2.6. Dasturiy ta'minot bo'yicha hujjatlar

Ijrochi Buyurtmachiga dasturiy ta'minot bo'yicha hujjatlarni, shu jumladan litsenziya shartlari, o'rnatish fayllari, o'rnatish yo'riqnomalari, sozlamalarning zaxira nusxasi, tizimni tiklash tartibi, aloqa interfeyslari tavsifi va dasturiy ta'minot bilan ishlash tartibini topshirishi shart.

5.2.7. Montaj, ishga tushirish-sozlash va o'qitish bo'yicha hujjatlar

Ijrochi Buyurtmachiga quyidagilarni topshirishi shart:

- montaj bayonnomalari;
- ishga tushirish-sozlash bayonnomalari;

5.2.4. Shipping Documents The Contractor is obliged to hand over to the Customer the following shipping documents:

- original invoice;
- packing list indicating the description, weight, number of cargo packages, type of packaging, and HS code;
- passport of the standard or passports for the main components of the standard;
- certificate of origin;
- certificates of conformity and quality, where applicable.

5.2.5. Technical and Operational Documentation

The Contractor is obliged to hand over to the Customer:

- instructions for installation, connection, and setup of the reference system;
- operation, maintenance, and repair manual for the standard;
- recommendations for maintenance and repair of technical equipment;
- schedule, frequency, and scope of maintenance and repair;
- wiring diagrams, installation diagrams, and requirements for laboratory room preparation;
- requirements for power supply, grounding, ventilation, operating conditions, and utilities.

5.2.6. Software Documentation

The Contractor is obliged to hand over to the Customer software documentation, including licensing terms, installation files, installation instructions, backup copy of settings, system recovery procedure, description of communication interfaces, and software operating procedures.

5.2.7. Documentation on Installation, Commissioning, and Training

The Contractor is obliged to hand over to the Customer:

- installation protocols;
- commissioning protocols;
- operability verification protocols for the standard;
- an acceptance act or other document confirming the training of the Customer's personnel;
- list of spare parts, tools, consumables, and wear-and-tear parts.

– etalonning ishga layoqatligini tekshirish bayonnomalari; – Buyurtmachi xodimlari o‘qitilganligini tasdiqlovchi dalolatnoma yoki boshqa hujjat; – ehtiyot qismlar, asboblari va anjomlar (ZIP), sarflash materiallari va tez yeyiluvchi qismlar ro‘yxati. 5.2.8. Hujjatlarni taqdim etish shakli va tili Barcha hujjatlar Buyurtmachiga qog‘oz va elektron shaklda topshirilishi kerak. Hujjatlar o‘zbek yoki rus tilida taqdim etilishi yoki ushbu tillardan biriga qilingan tarjima bilan birga kuzatilishi lozim.	5.2.8. Form and Language of Document Provision All documents must be handed over to the Customer in hard copy and electronic format. Documents must be presented in Uzbek or Russian, or accompanied by a translation into one of these languages.
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BO‘LIM 6. TASHISHGA (TRANSPORTIROVKA) QO‘YILADIGAN TALABLAR /
SECTION 6. REQUIREMENTS FOR TRANSPORTATION

O‘lchash vositalarini tashish ishlab chiqaruvchi zavodning me‘yoriy-texnik hujjatlariga muvofiq amalga oshirilishi kerak. Konteynerlarda tashilayotgan o‘lchov vositalarini transport idishiga (tarasiga) qadoqlamaslikka ruxsat beriladi. O‘lchov vositalarini ko‘p martalik ishlatiladigan idishdan foydalangan holda yuklarni tashish qoidalariga muvofiq qadoqlashga ruxsat beriladi.	The transportation of measuring instruments must be carried out in accordance with the regulatory and technical documentation of the manufacturing plant. It is permitted not to pack measuring instruments transported in containers into transport shipping containers (tare). It is permitted to pack measuring instruments using reusable containers in accordance with the rules for the transportation of goods.
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BO‘LIM 7. SAQLASHGA QO‘YILADIGAN TALABLAR /
SECTION 7. REQUIREMENTS FOR STORAGE

Ishlab chiqaruvchi zavodning me‘yoriy-texnik hujjatlariga muvofiq.	In accordance with the regulatory and technical documentation of the manufacturing plant.
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BO‘LIM 8. KAFOLATLAR HAJMIGA VA/YOKI MUDDATIGA QO‘YILADIGAN TALABLAR
SECTION 8. REQUIREMENTS FOR THE SCOPE AND/OR DURATION OF WARRANTIES

Etalonga, uning asosiy komponentlariga, dasturiy ta‘minotiga va jamlovchi buyumlariga kafolat muddati etalon foydalanishga topshirilgan va yakuniy topshirish-qabul qilish dalolatnomasi imzolangan sanadan e‘tiboran kamida 24 oyni tashkil etishi kerak. Ijrochining kafolat majburiyatlari kamchiliklarni, nosozliklarni, texnik talablarga nomuvofiqliklarni bartaraf etishga, shuningdek, agar bunday nuqsonlar Buyurtmachining aybi bilan yuzaga kelmagan bo‘lsa va etalonni	The warranty period for the standard, its main components, software, and accessories must be no less than 24 months from the date of commissioning the standard and signing the final acceptance certificate. The Contractor's warranty obligations shall cover the elimination of defects, malfunctions, non-conformities with technical requirements, as well as the replacement of faulty components, provided that such defects did not arise through the fault of the Customer and are not associated with a violation of the operating, storage, or application conditions of the standard.
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ekspluatatsiya qilish, saqlash yoki qo'llash shartlarining buzilishi bilan bog'liq bo'lmasa, nosoz komponentlarni almashtirishga tatbiq etilishi kerak.

Kafolat muddati davomida Ijrochi Buyurtmachining yozma bildirishnomasini olgan sanadan e'tiboran ko'pi bilan 20 kalendar kun ichida nosozlikni diagnostika qilishni, nosoz uskunani yoki uning komponentlarini ta'mirlashni yoki almashtirishni ta'minlashi shart (nosozlik xususiyati hamda uskunani ishlab chiqaruvchiga yoki vakolatli servis tashkilotiga yuborish zarurati hisobga olingan holda tomonlar boshqa muddatni kelishib olmagan bo'lsa).

Ijrochi kafolatli xizmat ko'rsatish tartibini, Buyurtmachi murojaatiga munosabat bildirish muddatlarini, masofaviy texnik qo'llab-quvvatlash tartibini, mutaxassisning tashrif buyurish shartlarini, uskunani yoki uning komponentlarini ta'mirlash uchun tashish tartibini, shuningdek kafolatli ta'mirlash yoki almashtirish bilan bog'liq xarajatlarning taqsimlanishini ko'rsatishi shart.

Ta'mirlashdan, komponentlar almashtirilgandan yoki etalonning metrologik tavsiflariga ta'sir ko'rsatishi mumkin bo'lgan ishlar bajarilgandan so'ng, Ijrochi etalonning ishga layoqatliligini tekshirishni va zarur hollarda qayta kalibrlashni yoki metrologik tavsiflarini tasdiqlashni ta'minlab, tegishli hujjatlarni Buyurtmachiga taqdim etishi shart.

Ijrochi kafolat muddati davomida kafolat majburiyatlarini, kafolat muddatini, kafolatli xizmat ko'rsatish shartlarini va Buyurtmachining murojaat qilish tartibini tasdiqlovchi kafolat xati yoki boshqa hujjatni taqdim etishi shart.

During the warranty period, the Contractor is obliged to ensure fault diagnostics, repair, or replacement of defective equipment or its components within no more than 20 calendar days from the date of receiving written notification from the Customer, unless another timeframe is agreed upon by the parties taking into account the nature of the malfunction and the need to send the equipment to the manufacturer or an authorized service organization.

The Contractor is obliged to specify the procedure for warranty service, response times to the Customer's requests, remote technical support procedures, conditions for specialist visits, transportation procedures for equipment or its components for repair, as well as the distribution of expenses associated with warranty repair or replacement.

After repair, component replacement, or execution of work that may affect the metrological characteristics of the standard, the Contractor is obliged to ensure verification of operability and, if necessary, recalibration or reconfirmation of the metrological characteristics of the standard, providing the relevant documents to the Customer.

The Contractor is obliged to provide a warranty letter or another document confirming the warranty obligations, warranty period, warranty service conditions, and the procedure for Customer inquiries during the warranty period.

BO'LIM 9. TA'MIRLASHGA YAROQLILIKKA QO'YILADIGAN TALABLAR SECTION 9. REQUIREMENTS FOR MAINTAINABILITY

Etalon tarkibiga kiruvchi barcha o'lchash vositalari, asboblari, qurilmalar, dasturiy ta'minot va jamlovchi buyumlar ekspluatatsiya sharoitida ta'mirlashga yaroqli bo'lishi yoki

All measuring instruments, devices, equipment, software, and components included in the standard must be maintainable under operating conditions or serviceable through the

ishlab chiqaruvchi, vakolatli servis markazi yoki boshqa vakolatli servis tashkiloti orqali xizmat ko'rsatiladigan bo'lishi kerak.

Ijrochi nosozliklarni diagnostika qilish tartibi, etalonning asosiy komponentlarini ta'mirlashga yaroqliligi, servis qo'llab-quvvatlashning mavjudligi, ishlab chiqaruvchi, vakolatli servis markazi yoki servis vakilining mavjudligi, kafolatli va kafolatdan keyingi ta'mirlash tartibi, ehtiyot qismlarni yetkazib berish muddatlari, ehtiyot qismlar, asboblari va anjomlar (ZIP), sarflash materiallari hamda tez yeyiluvchi qismlar ro'yxati to'g'risidagi ma'lumotlarni taqdim etishi shart.

Ijrochi uskunaning yoki uning komponentlarining ishga layoqatliligini tiklashning tavsiya etilgan muddatlarini, uskunani yoki uning komponentlarini ta'mirlashga yuborish tartibini, transportda tashish shartlarini, nosoz komponentlarni almashtirish tartibini, shuningdek foydalanuvchi, servis tashkiloti yoki ishlab chiqaruvchi tomonidan bajarilishi mumkin bo'lgan ishlar ro'yxatini ko'rsatishi lozim.

Ta'mirlashdan, komponentlar almashtirilgandan yoki etalonning metrologik tavsiflariga ta'sir ko'rsatishi mumkin bo'lgan ishlar bajarilgandan so'ng, Ijrochi qayta kalibrlash, ishga layoqatlilikni tekshirish yoki etalonning metrologik tavsiflarini tasdiqlash tartibini ko'rsatishi shart.

Taqdim etilgan ma'lumotlar etalonning ekspluatatsiya yaroqliligi, ta'mirlashga yaroqliligi, tiklash muddatlari va unga egalik qilish qiymatini baholash uchun ishlatiladi hamda uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.

manufacturer, an authorized service center, or another competent service organization.

The Contractor is obliged to provide information on the procedure for fault diagnostics, maintainability of the main components of the standard, availability of service support, presence of the manufacturer, authorized service center, or service representative, warranty and post-warranty repair procedures, delivery times for spare parts, list of spare parts, tools, consumables, and wear-and-tear parts.

The Contractor must specify the recommended recovery times for the operability of the equipment or its components, the procedure for sending equipment or its components for repair, transportation conditions, procedure for replacing defective components, as well as a list of tasks that can be performed by the user, service organization, or manufacturer.

After repair, component replacement, or execution of work that may affect the metrological characteristics of the standard, the Contractor is obliged to specify the procedure for recalibration, operability verification, or confirmation of the metrological characteristics of the standard.

The provided information is used to evaluate the operational suitability, maintainability, recovery times, and cost of ownership of the standard, and shall not be construed as a requirement for a specific manufacturer, model, or equipment design.

BO'LIM 10. XIZMAT KO'RSATISHGA QO'YILADIGAN TALABLAR

SECTION 10. REQUIREMENTS FOR SERVICE

Kichik bo'lim 10.1 Xizmat ko'rsatishga qo'yiladigan talablar	<i>Subsection 10.1 Requirements for maintenance</i>
Etalonga texnik xizmat ko'rsatish ishlab chiqaruvchi zavodning me'yoriy-texnik hujjatlariga, texnik topshiriq talablariga, etalonni ekspluatatsiya qilish shartlariga va Ijrochi tomonidan Buyurtmachiga topshirilgan hujjatlarga muvofiq amalga oshirilishi kerak.	Maintenance of the standard must be carried out in accordance with the manufacturer's regulatory and technical documentation, the requirements of the technical terms of reference, the operating conditions of the standard, and the documents handed over by the Contractor to the Customer.

Ijrochi etalonga texnik xizmat ko'rsatish tartibi to'g'risida ma'lumotlarni, shu jumladan reglament ishlar ro'yxatini, xizmat ko'rsatish davriyligini, kalibrlashlararo intervalni, xodimlarning malakasiga qo'yiladigan talablarni, zarur sarflash materiallari, ehtiyot qismlar, tez yeyiluvchi komponentlar, dasturiy ta'minot va yangilanishlar ro'yxatini taqdim etishi shart.

Ijrochi xizmat ko'rsatishning qaysi turlari Buyurtmachi xodimlari tomonidan bajarilishi mumkinligini, qaysi ishlar ishlab chiqaruvchi, vakolatli servis markazi yoki boshqa vakolatli servis tashkiloti tomonidan bajarilishi lozimligini, shuningdek bajarilgan ishlarni hujjatli tasdiqlash tartibini ko'rsatishi kerak.

Ijrochi etalonni ekspluatatsiya qilish jarayonida uning ko'rsatilgan metrologik tavsiflarini saqlab qolish bo'yicha tavsiyalarni, shu jumladan laboratoriya xonasi sharoitlariga, elektr ta'minotiga, yerga ulashga (zazemleniye), haroratga, namlikka, elektromagnit moslashuvchanlikka, qizish vaqtiga, dasturiy ta'minotga va davriy kalibrlashga qo'yiladigan talablarni taqdim etishi shart.

Taqdim etilgan ma'lumotlar etalonning ekspluatatsiya yaroqliligi, xizmat ko'rsatish shartlari, ishga layoqatliligini tiklash muddatlari va unga egalik qilish qiymatini baholash uchun ishlatiladi hamda uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.

Kichik bo'lim 10.2 Servis xizmatiga qo'yiladigan talablar

Etalonga kafolatli va servis xizmati ko'rsatish ishlab chiqaruvchi, rasmiy servis markazi, ishlab chiqaruvchining vakolatli vakili, mintaqaviy servis markazi yoki yetkazib berilayotgan uskunaga xizmat ko'rsatish huquqiga va texnik imkoniyatiga ega bo'lgan boshqa vakolatli servis tashkiloti tomonidan amalga oshirilishi kerak.

Ijrochi kafolatli va kafolatdan keyingi servis xizmatini tashkil etish tartibini, shu jumladan servis xizmatining aloqa ma'lumotlarini, Buyurtmachi murojaatiga munosabat bildirish muddatlarini, masofaviy

The Contractor is obliged to provide information on the maintenance procedure for the standard, including a list of routine maintenance operations, maintenance intervals, calibration intervals, personnel qualification requirements, and a list of necessary consumables, spare parts, wear-and-tear components, software, and updates.

The Contractor must specify which types of maintenance can be performed by the Customer's personnel, which work must be carried out by the manufacturer, an authorized service center, or another competent service organization, as well as the procedure for documentary confirmation of the performed work.

The Contractor is obliged to provide recommendations for preserving the declared metrological characteristics of the standard during operation, including requirements for laboratory room conditions, power supply, grounding, temperature, humidity, electromagnetic compatibility, warm-up time, software, and periodic calibration.

The provided information is used to evaluate the operational suitability, maintenance conditions, recovery times, and cost of ownership of the standard, and shall not be construed as a requirement for a specific manufacturer, model, or equipment design.

Subsection 10.2 Requirements for service maintenance

Warranty and service maintenance of the standard must be carried out by the manufacturer, an official service center, an authorized representative of the manufacturer, a regional service center, or another competent service organization having the right and technical capability to service the supplied equipment.

The Contractor is obliged to specify the procedure for organizing warranty and post-warranty service maintenance, including contact details of the service department, response times to the Customer's request, remote technical

texnik qo'llab-quvvatlash tartibini, mutaxassisning tashrif buyurish shartlarini, nosozliklarni diagnostika qilish, ta'mirlash, komponentlarni almashtirish va ehtiyot qismlarni yetkazib berish tartibini ko'rsatishi shart.	support procedures, conditions for specialist visits, procedures for fault diagnostics, repair, component replacement, and supply of spare parts.
O'zbekiston Respublikasi hududida rasmiy servis markazi mavjud bo'lmagan taqdirda, Ijrochi ishlab chiqaruvchi, vakolatli mintaqaviy servis markazi yoki rasmiy vakil orqali servis xizmatini ko'rsatish tartibini, shuningdek uskunani yoki uning komponentlarini ta'mirlash uchun tashish tartibini, xarajatlarning taqsimlanishini va ishga layoqatlilikini tiklash muddatlarini ko'rsatishi lozim.	In the absence of an official service center on the territory of the Republic of Uzbekistan, the Contractor must specify the procedure for providing service support through the manufacturer, an authorized regional service center, or an official representative, as well as the transportation procedure for equipment or its components for repair, distribution of expenses, and recovery times for operability.
Ta'mirlash o'tkazilgandan, komponentlar almashtirilgandan yoki etalonning metrologik tavsiflariga ta'sir ko'rsatishi mumkin bo'lgan boshqa ishlar bajarilgandan so'ng, Ijrochi ishga layoqatlilikni tekshirish, qayta kalibrlash yoki etalonning metrologik tavsiflarini tasdiqlash tartibini ko'rsatishi shart.	After carrying out repairs, replacing components, or performing other work capable of affecting the metrological characteristics of the standard, the Contractor is obliged to specify the procedure for verifying operability, recalibration, or confirmation of the metrological characteristics of the standard.
Taqdim etilgan ma'lumotlar servis qo'llab-quvvatlashining mavjudligini, ishga layoqatlilikini tiklash muddatlarini va etalonni ekspluatatsiya qilish shartlarini baholash uchun ishlatiladi hamda uskunaning muayyan ishlab chiqaruvchisi, modeli yoki konstruksiyasiga qo'yilgan talab sifatida qaralmasligi kerak.	The provided information is used to evaluate the availability of service support, recovery times for operability, and operating conditions of the standard, and shall not be construed as a requirement for a specific manufacturer, model, or equipment design.

BO'LIM 11. EKOLOGIK VA SANITARIYA TALABLARI

SECTION 11. ENVIRONMENTAL AND SANITARY REQUIREMENTS

O'zbekiston Respublikasida amalda bo'lgan qonunlar va normalarga muvofiq.	In accordance with the laws and norms in force in the Republic of Uzbekistan.
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BO'LIM 12. XAVFSIZLIKKA QO'YILADIGAN TALABLAR

SECTION 12. SAFETY REQUIREMENTS

Asosiy texnika xavfsizligi bo'yicha himoya tadbirlari: - himoya yerlashtirishi va potentsiallarni tenglashtirish;	Main technical safety protective measures: - Protective grounding and potential equalization;
O'zbekiston Respublikasi hududida amalda bo'lgan me'yorlar va qoidalar (Iste'molchilarning elektr qurilmalarini ekspluatatsiya qilishda texnika xavfsizligi qoidalari – TXQ, GOST 12.2.007.0) muvofiq.	In accordance with the norms and rules in force in the Republic of Uzbekistan (Safety Rules for the Operation of Consumer Electrical Installations – SRCEI, GOST 12.2.007.0).
Uskuna 1000 V gacha bo'lgan elektr qurilmalari xavfsizligi talablariga muvofiq, elektr toki urishidan himoya qilish bo'yicha	The equipment must comply with safety requirements for electrical installations up to 1000 V and meet at least Class I (or Class II, depending on its functional characteristics) protection against electric shock.

kamida I sinfga (yoki funksional xususiyatidan kelib chiqib II sinfga) muvofiq bo'lishi shart.

Elektr zanjirlari mustahkam izolyatsiyaga ega bo'lishi, tizim o'ta yuklanish va qisqa tutashuvdan ishonchli avtomatik himoya tizimi bilan ta'minlangan bo'lishi lozim.

Favqulodda vaziyatlarda uskunani tarmoqdan zudlik bilan uzib qo'yuvchi avariyaaviy o'chirish tugmasi yoki moslamasi ko'zda tutilgan bo'lishi shart.

Barcha kuch va signal kabellari hamda ulagichlar (konnektorlar) maksimal ishchi kuchlanish va toklarga bardoshli, mexanik va termik ta'sirlardan himoyalangan bo'lishi lozim.

Uskuna elektromagnit moslashuvchanlik bo'yicha xalqaro standart talablariga javob berishi, tashqi xalaqitlardan himoyalangan bo'lishi va o'zidan boshqa metrologik qurilmalarga zararli elektromagnit xalaqitlar bermasligi shart.

Yetkazib beriladigan uskuna jamlanmasida xavfsiz foydalanish bo'yicha batafsil yo'riqnoma va texnik pasport (o'zbek va/yoki rus tillarida) bo'lishi majburiydir.

The electrical circuits must have reinforced insulation, and the system must be equipped with a reliable automatic protection system against overloads and short circuits.

An emergency stop button or device must be provided to immediately disconnect the equipment from the power supply in case of an emergency.

All power and signal cables, as well as connectors, must be capable of withstanding maximum operating voltages and currents and must be protected against mechanical and thermal influences.

The equipment must meet international standards for electromagnetic compatibility, be protected against external interference, and not cause harmful electromagnetic interference to other metrological devices.

It is mandatory for the supplied equipment package to include a detailed safety operation manual and a technical passport (in Uzbek and/or Russian).

BO'LIM 13. SIFAT VA TASNIFLASHGA (KLASSIFIKATSIYAGA) QO'YILADIGAN TALABLAR

SECTION 13. REQUIREMENTS FOR QUALITY AND CLASSIFICATION

Etalonning sifati nafaqat ishlab chiqaruvchi zavodning sifat sertifikatini bilan, balki yetkazib berilayotgan uskunaning texnik topshiriq, shartnoma va ishlab chiqaruvchining me'yoriy-texnik hujjatlari talablariga muvofiqligini tasdiqlovchi hujjatlar to'plami bilan ham tasdiqlanishi kerak.

Ijrochi etalonning sifati, kelib chiqishi, jamlanmaligi, texnik va metrologik tavsiflarini tasdiqlovchi hujjatlarni, shu jumladan ishlab chiqaruvchining sifat sertifikatini, etalon pasporti yoki asosiy komponentlarning pasportlari, kalibrlash sertifikatlari, SI birliklariga metrologik kuzatish to'g'risidagi hujjatlar, qo'llanilishi mumkin bo'lgan hollarda muvofiqlik sertifikatlari, zavod sinovlari yoki ishga layoqatlilikni tekshirish bayonnomalari hamda texnik topshiriq va shartnomada nazarda tutilgan boshqa hujjatlarni taqdim etishi shart.

Ishlab chiqaruvchi zavodning sifat sertifikatini etalonni qabul qilish, ekspluatatsiya qilish va metrologik qo'llash uchun zarur bo'lgan kalibrlash sertifikatlari, metrologik

The quality of the standard must be confirmed not only by the manufacturer's quality certificate, but also by a set of documents confirming the compliance of the supplied equipment with the requirements of the technical terms of reference, the contract, and the manufacturer's regulatory and technical documentation.

The Contractor is obliged to provide documents confirming the quality, origin, completeness, technical, and metrological characteristics of the standard, including the manufacturer's quality certificate, the passport of the standard or passports of the main components, calibration certificates, documents on metrological traceability to SI units, certificates of conformity where applicable, factory test or operability verification protocols, as well as other documents provided for by the technical terms of reference and the contract.

The manufacturer's quality certificate shall not replace calibration certificates, metrological traceability documents, test protocols, software

kuzatish to'g'risidagi hujjatlar, sinov bayonnomalari, dasturiy ta'minot bo'yicha hujjatlar va boshqa hujjatlarning o'rnini bosa olmaydi.	documentation, and other documents required for the acceptance, operation, and metrological application of the standard.
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BO'LIM 14. SONI, BUTLILIGI (KOMPLEKTATSIYASI), JOYI VA YETKAZIB BERISH
 MUDDATI (DAVRIYLIGI) GA QO'YILADIGAN TALABLAR
*SECTION 14. REQUIREMENTS FOR QUANTITY, COMPLETENESS (CONFIGURATION),
 LOCATION, AND DELIVERY TIME (PERIODICITY)*

O'zgaruvchan tok kuchlanishi birligi etaloni tizimi 1 to'plam miqdorida yetkazib berilishi lozim.

Ijrochi etalonni montaj qilish, ishga tushirish-sozlash, ekspluatatsiya qilish va metrologik qo'llash uchun zarur bo'lgan asosiy o'lchash vositalari, etalonlar, manbalar, o'zgartirgichlar, kuchlanish bo'lgichlari, kabel ulanishlari, stoykalar, dasturiy ta'minot, tegishli jihozlar, ehtiyot qismlar, asboblari va anjomlar (ZIP), sarflash materiallari, ekspluatatsiya, texnik va metrologik hujjatlarni o'z ichiga olgan etalonning to'liq to'plami yetkazib berilishini ta'minlashi shart.

Yetkazib berish joyi: O'zbekiston Respublikasi, Toshkent shahri, Farobiy ko'chasi, 333A, Buyurtmachining ombori/laboratoriyasi.

Import yetkazib berishda yetkazib berish shartlari yetkazib berish joyigacha yetkazib berish, bojxona rasmiylashtiruv, tegishli bojxona to'lovlari, soliqlar, yig'implarni to'lash, tovar Buyurtmachiga topshirilgungacha bo'lgan transportda tashish, sug'urtalash, yukni tushirish va tovarni Buyurtmachiga topshirishni o'z ichiga olgan holda Incoterms 2020 ga ko'ra DDP Toshkent sh., Buyurtmachining ombori/laboratoriyasiga muvofiq bo'lishi kerak (agar shartnomada boshqacha nazarda tutilmagan bo'lsa).

Etalonni yetkazib berish muddati shartnomada belgilangan sanadan e'tiboran 300 kalendar kundan oshmasligi kerak. Shartnomada ko'rsatilgan muddat faqat uskunani yetkazib berishni o'z ichiga oladimi yoki montaj, ishga tushirish-sozlash ishlari, xodimlarni o'qitish, tajriba-sinov ekspluatatsiyasi va yakuniy topshirish-qabul qilish dalolatnomasini imzolashni ham qamrab oladimi - alohida belgilanishi zarur.

One complete set of the AC voltage unit standard system shall be supplied.

The Contractor is obliged to ensure the delivery of a complete set of the standard, including main measuring instruments, standards, sources, converters, voltage dividers, cable connections, racks, software, accessories, spare parts, tools, consumables, operational, technical, and metrological documentation required for installation, commissioning, operation, and metrological application of the standard.

Place of delivery: Republic of Uzbekistan, Tashkent, Farobiy str., 333A, Customer's warehouse/laboratory.

In the case of import delivery, the delivery terms must comply with DDP Tashkent, Customer's warehouse/laboratory, Incoterms 2020, including delivery to the place of delivery, customs clearance, payment of applicable customs duties, taxes, fees, transportation, insurance until the moment of handover of the goods to the Customer, unloading, and handover of the goods to the Customer, unless otherwise provided for by the contract.

The delivery timeframe for the standard must not exceed 300 calendar days from the date established by the contract. It is necessary to separately define in the contract whether the specified period includes only equipment delivery or also installation, commissioning operations, personnel training, trial operation, and signing of the final acceptance certificate.

BO'LIM 15. ETALONNI YETKAZIB BERISHDA QO'SHMA XIZMATLARGA QO'YILADIGAN TALABLAR

SECTION 15. REQUIREMENTS FOR RELATED SERVICES UPON DELIVERY OF THE STANDARD

Kichik bo'lim 15.1 Shef-montajga qo'yiladigan talablar	<i>Subsection 15.1 Supervision of installation (Shef-montaj) requirements</i>
Shef-montaj ishlari Ijrochi, ishlab chiqaruvchi, ishlab chiqaruvchining vakolatli vakili yoki o'xshash etalon yoki yuqori aniqlikdagi metrologik uskunalar bilan ishlash tajribasiga ega bo'lgan boshqa vakolatli tashkilotning malakali mutaxassislari tomonidan bajarilishi kerak. Shef-montaj ishlari tarkibiga laboratoriya xonasining tayyorligini tekshirish, uskunani joylashtirish sharoitlarini tekshirish, etalon komponentlarini o'rnatish va ulashning to'g'riligini nazorat qilish, kabel ulanishlari, aloqa interfeyslari, yerga ulash (zazemleniye), elektr ta'minoti, ekspluatatsiya sharoitlarini tekshirish, shuningdek uskunani ishga tushirish-sozlash ishlariga tayyorlash kirishi lozim. Ijrochi shef-montaj dasturini, xonani tayyorlashga qo'yiladigan talablarni, bajariladigan ishlar ro'yxatini, mutaxassislarning malakasi to'g'risidagi ma'lumotlarni, shuningdek shef-montaj ishlari bajarilganligi haqidagi dalolatnoma yoki bayonnomani taqdim etishi shart.	Supervision of installation (chief assembly) work must be performed by qualified specialists of the Contractor, manufacturer, authorized representative of the manufacturer, or another competent organization with experience in working with similar reference or high-precision metrological equipment. Supervision of installation work shall include checking the readiness of the laboratory room, checking the equipment placement conditions, monitoring the correctness of installation and connection of the standard components, verifying cable connections, communication interfaces, grounding, power supply, operating conditions, as well as preparing the equipment for commissioning operations. The Contractor is obliged to provide an installation supervision program, requirements for room preparation, a list of tasks to be performed, information on the qualifications of specialists, as well as a certificate or protocol of completed installation supervision work.
Kichik bo'lim 15.2 Ishga tushirish-sozlashga qo'yiladigan talablar	<i>Subsection 15.2 Commissioning requirements</i>

Etalonni ishga tushirish-sozlash ishlari Ijrochi tomonidan o'z kuch va vositalari bilan hamda o'z hisobidan bajariladi va etalonni o'rnatish, ulash, sozlash, ishga tushirish, ishga layoqatliligini tekshirish va ekspluatatsiyaga tayyorlashni o'z ichiga olishi kerak. Ishga tushirish-sozlash ishlari tarkibiga uskunaning jamlanmaligi va holatini tekshirish, etalonning barcha komponentlarini ulash, dasturiy ta'minotni sozlash, aloqa interfeyslarini tekshirish, manbalar, o'zgartirgichlar, kuchlanish bo'lgichlari, o'lchash asboblari va boshqa komponentlarning o'zaro ta'sirini tekshirish, sinov o'lchashlarini bajarish, bayonnoma hamda hisobotlarning shakllantirilishini tekshirish, shuningdek etalonning texnik topshiriq talablariga muvofiqligini tasdiqlash kirishi lozim. Ijrochi ishga tushirish-sozlash ishlarini bajarish uchun zarur bo'lgan barcha materiallar, asbob-uskunalar, sarflash materiallari, yordamchi qurilmalar, dasturiy vositalar va boshqa resurslarni, hattoki ular texnik topshiriqda to'g'ridan-to'g'ri ko'rsatib o'tilmagan bo'lsa ham, lekin etalonning normal ishlashi uchun zarur bo'lsa, ta'minlashi shart. Ishga tushirish-sozlash ishlari natijalari bo'yicha Ijrochi Buyurtmachiga ITS bayonnomalari, ishga layoqatlilikni tekshirish bayonnomalari, bajarilgan sozlamalar to'g'risidagi ma'lumotlar, dasturiy ta'minot sozlamalarining zaxira nusxasi va etalonning tajriba-sinov ekspluatatsiyasiga yoki qabul qilish sinovlariga tayyorligi to'g'risidagi dalolatnomani taqdim etishi shart.	Commissioning of the standard shall be carried out by the Contractor using its own resources and at its own expense, and must include installation, connection, configuration, startup, operability verification, and preparation of the standard for operation. Commissioning operations shall include checking the completeness and condition of the equipment, connecting all components of the standard, configuring the software, checking communication interfaces, verifying the interaction between sources, converters, voltage dividers, measuring instruments, and other components, performing test measurements, verifying the generation of protocols and reports, as well as confirming the compliance of the standard with the requirements of the technical terms of reference. The Contractor is obliged to provide all necessary materials, tools, consumables, auxiliary devices, software tools, and other resources required to carry out commissioning operations, even if they are not explicitly listed in the technical terms of reference, but are necessary for the normal operation of the standard. Based on the results of the commissioning operations, the Contractor is obliged to provide the Customer with commissioning protocols, operability verification protocols, details of the performed configurations, a backup copy of software settings, and a certificate of readiness of the standard for trial operation or acceptance testing.
Kichik bo'lim 15.3 Buyurtmachi xodimlarini o'qitishga qo'yiladigan talablar Ijrochi Buyurtmachining kamida 4 nafar xodimini Ijrochi tomonidan ishlab chiqilgan va Buyurtmachi bilan kelishilgan dastur bo'yicha o'qitishni o'tkazishi shart. O'qitish etalonning tarkibi, konstruksiyasi va ishlash printsipi, ekspluatatsiya qilish qoidalari, xavfsizlik talablari, texnik xizmat ko'rsatish, etalonni metrologik qo'llash, qo'lda va avtomatlashtirilgan rejimlar, dasturiy ta'minot bilan ishlash, bayonnomalarni yaratish va chop etish, Buyurtmachining shablonlari bo'yicha kalibrlash hamda qiyoslash sertifikatlarini shakllantirish, ma'lumotlarni arxivlash, sozlamalarning zaxira nusxasini yaratish va	<i>Subsection 15.3 Training requirements for the Customer's personnel</i> The Contractor is obliged to train at least 4 employees of the Customer in accordance with a program developed by the Contractor and agreed upon with the Customer. The training must include theoretical and practical sessions on the composition, design, and operating principle of the standard, operating rules, safety requirements, maintenance, metrological application of the standard, manual and automated modes, working with software, creating and printing protocols, generating calibration and verification certificates according to the Customer's templates, data archiving, backing

nosozliklar yuzaga kelganda harakat qilish bo'yicha nazariy va amaliy mashg'ulotlarni o'z ichiga olishi kerak.

O'qitish dasturi, shuningdek, metrologik tavsiflarni tasdiqlash, o'lchash noaniqligini hisoblash va qo'llash, metrologik hujjatlar uchun ma'lumotlarni tayyorlash, etalonni metrologik kuzatish zanjirida ishlatish va etalonning aniqligi hamda barqarorligiga ta'sir etuvchi ekspluatatsiya sharoitlariga rioya qilish masalalarini qamrab olishi lozim.

O'qitish yetkazib berilgan va montaj qilingan etalonda amaliy mashg'ulotlarni, shu jumladan ishga tushirish-sozlash ishlari va/yoki tajribas-inov ekspluatatsiyasi davridagi mashg'ulotlarni o'z ichiga olishi kerak.

O'qitish yakunlangach, Ijrochi o'qitilgan xodimlarning bilimlari va amaliy ko'nikmalarini tekshirishi, shuningdek Buyurtmachiga o'qishdan o'tganlikni hamda etalonni mustaqil ekspluatatsiya qilish va unga texnik xizmat ko'rsatish imkoniyatini tasdiqlovchi sertifikatlar, bayonnomalar yoki boshqa hujjatlarni taqdim etishi shart.

up settings, and actions to be taken in case of malfunctions.

The training program must also cover issues regarding the confirmation of metrological characteristics, calculation and application of measurement uncertainty, preparation of data for metrological documents, use of the standard in the metrological traceability chain, and compliance with operating conditions affecting the accuracy and stability of the standard.

The training must include practical sessions on the delivered and installed standard, including sessions during the period of commissioning operations and/or trial operation.

Upon completion of the training, the Contractor is obliged to test the knowledge and practical skills of the trained employees, as well as provide the Customer with certificates, protocols, or other documents confirming completion of the training and the capability for independent operation and maintenance of the standard.

BO'LIM 16. TAQDIM ETILADIGAN AXBOROTNING SHAKLIGA QO'YILADIGAN TALAB SECTION 16. REQUIREMENTS FOR THE FORM OF PROVIDED INFORMATION

Buyurtmachiga topshiriladigan barcha texnik, ekspluatatsiya, metrologik, tovar-kuzatuv va boshqa hujjatlar qog'oz va elektron shaklda taqdim etilishi kerak.

Hujjatlar o'zbek va/yoki rus tilida taqdim etilishi lozim. Ishlab chiqaruvchining ingliz tilida pacrasmiylashtirilgan hujjatlariga, agar bunday tarjima etalonni qabul qilish, ekspluatatsiya qilish, texnik xizmat ko'rsatish va metrologik qo'llash uchun zarur bo'lsa, rus yoki o'zbek tiliga qilingan tarjimasi taqdim etilishi sharti bilan ruxsat beriladi.

Qog'ozdagi hujjatlar, agar shartnomada boshqacha nazarda tutilmagan bo'lsa, kamida 2 nusxada taqdim etilishi kerak.

Hujjatlarning elektron versiyalari elektron tashuvchida yoki ko'rish, saqlash, chop etish hamda Buyurtmachi tomonidan kelgusida foydalanish uchun qulay bo'lgan formatlarda, shu jumladan PDF, DOC/DOCX, XLS/XLSX yoki boshqa tegishli formatlarda kelishilgan boshqa usulda taqdim etilishi lozim.

Ijrochi hujjatlarning qog'ozdagi va elektron nusxalari o'zaro muvofiqligini

All technical, operational, metrological, shipping, and other documentation handed over to the Customer must be provided in hard copy and electronic format.

Documents must be presented in Russian and/or Uzbek. Documents from the manufacturer issued in English are permissible provided that a translation into Russian or Uzbek is supplied, if such translation is necessary for the acceptance, operation, maintenance, and metrological application of the standard.

Hard copy documents must be provided in at least 2 copies, unless otherwise provided for by the contract.

Electronic versions of the documents must be provided on electronic media or by another agreed method in formats suitable for viewing, storage, printing, and further use by the Customer, including PDF, DOC/DOCX, XLS/XLSX, or other applicable formats.

The Contractor is obliged to ensure the consistency between hard copy and electronic copies of the documentation. In the event of a discrepancy between the hard copy and

ta'minlashi shart. Qog'ozdagi va elektron versiyalar o'rtasida tafovut yuzaga kelganda, ustuvorlik shartnoma shartlari bilan belgilanadi.	electronic versions, priority shall be determined by the terms of the contract.
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BO'LIM 17. QABUL QILINGAN QISQARTMALARNING RO'YXATI
SECTION 17. LIST OF ACCEPTED ABBREVIATIONS

T/r No.	Qisqartma Abbreviation	Qisqartmaning kengaytmasi	Definition of Abbreviation
1	CIPM	Xalqaro o'lchov va tarozilar qo'mitasi (XO'TQ)	International Committee for Weights and Measures
2	ILAC	Laboratoriyalarni akkreditatsiya qilish bo'yicha Xalqaro tashkilot (International Laboratory Accreditation Cooperation)	International Laboratory Accreditation Cooperation
3	MRA	O'zaro tan olish to'g'risidagi kelishuv (Mutual Recognition Arrangement)	Mutual Recognition Arrangement
4	CIPM-MRA	Milliy etalonlarni hamda Milliy metrologiya institutlari tomonidan beriladigan kalibrlash va o'lchovlar to'g'risidagi guvohnomalarni o'zaro tan olish to'g'risidagi kelishuv (bu milliy metrologiya institutlari o'rtasidagi kelishuvdir)	Mutual Recognition Arrangement for national measurement standards and for calibration and measurement certificates issued by National Metrology Institutes (an agreement between national metrology institutes)
5	CMC	CMC (Calibration and Measurement Capabilities) – Kalibrlash va o'lchov imkoniyatlari bo'lib, mijoz uchun normal sharoitlarda quyidagi shaklda mavjud bo'ladi: - CIPM MRA ning Asosiy taqqoslashlar ma'lumotlar bazasida (KCDB) e'lon qilinganidek; yoki - ILAC Kelishuvi imzolovchisi tomonidan taqdim etilgan laboratoriyaning akkreditatsiya doirasida tavsiflanganidek	CMC (Calibration and Measurement Capabilities) – Calibration and measurement capabilities available to a customer under normal conditions in the following forms: - As published in the CIPM MRA Key Comparison Database (KCDB); or - As described in the laboratory's scope of accreditation provided by a signatory to the ILAC Arrangement
6	MTH RTD	Me'yoriy-texnik hujjatlar	Regulatory and Technical Documentation
7	TT TS	Texnik topshiriq	Technical Specification
8	O'V MI	O'lchash vositalari	Measuring Instruments
9	ZIP SPTA	Zaxira qismlar, asboblari va anjomlar (Akkessuarlar)	Spare parts, tools, and accessories

BO'LIM 18. ILOVALARNING RO'YXATI
SECTION 18. LIST OF APPENDICES

T/r No.	Ilovaning nomi / Name of the appendix	Sahifa raqami / Page number
-		

Ishlab chiqildi:

Developed by:

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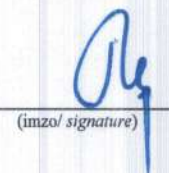
Kelishildi:

Agreed:

"O'zMMI" DM direktori o'rinbosari

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