

APPROVED
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2026 y.



TECHNICAL TASK
for the purchase of the GPS receiver systems metrological equipment
complex

Tashkent 2026 y.

TASDIQLAYMAN
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TEXNIK TOPSHIRIQ
GPS qabul qiluvchi tizimlar metrologik uskunalar kompleksi xarid qilish uchun

Toshkent 2026 y.

CONTENT:			MUNDARIJA:		
Section / Subsection	Name	Page	Bo‘lim / kichik bo‘lim	Nomlanishi	Sahifa
SECTION 1.	GENERAL INFORMATION	4	BO‘LIM 1.	UMUMIY MA‘LUMOTLAR	4
Subsection 1.1	Name	4	1.1-kichik bo‘lim	Nomi	4
Subsection 1.2	Grounds and Purpose for Purchasing the Equipment Set	4	1.2-kichik bo‘lim	Uskunalar majmuasini sotib olish asoslari va maqsadi	4
Subsection 1.3	Information about novelty of the Equipment Set (year of production/release of Equipment Set)	4	1.3-kichik bo‘lim	Uskunalar majmuasining yangiligi to‘g‘risida ma‘lumot (ishlab chiqarilgan / chiqarilgan yili)	4
Subsection 1.4	Development and Delivery stages	4	1.4-kichik bo‘lim	Ishlab chiqish va yetkazib berish bosqichlari	4
Subsection 1.5	Development/Manufacturing documentation	5	1.5-kichik bo‘lim	Ishlab chiqish / ishlab chiqarish hujjatlari	5
Subsection 1.6	HS Code (TN VED) and Other International Codes (if applicable)	5	1.6-kichik bo‘lim	TIF TN kodi va boshqa xalqaro kodlar (agar qo‘llanilsa)	5
Subsection 1.7	Requirements for the Contractor	5	1.7-kichik bo‘lim	Ijrochiga qo‘yiladigan talablar	5
SECTION 2.	SCOPE OF APPLICATION	5	BO‘LIM 2.	QO‘LLANISH DOIRASI	5
SECTION 3.	TERMS OF USE	6	BO‘LIM 3.	ISHLASH SHARTLARI	6
Subsection 3.1	General operating conditions	6	3.1-kichik bo‘lim	Umumiy foydalanish shartlari	6
Subsection 3.2	Additional/special operating requirements	6	3.2-kichik bo‘lim	Qo‘shimcha/maxsus operatsion talablar	6
SECTION 4.	TECHNICAL REQUIREMENTS	6	BO‘LIM 4.	TEXNIK TALABLAR	6
Subsection 4.1	Main Technical Requirements	6	4.1-kichik bo‘lim	Asosiy texnik talablar	6
Subsection 4.2	Reliability Requirements	21	4.2-kichik bo‘lim	Ishonchlilik talablari	21
Subsection 4.3	Requirements for stability and parameters under the influence of Environmental factors	23	4.3-kichik bo‘lim	Tashqi muhit omillariga ta‘sir qilish sharoitida barqarorlik va parametrlar talablar	23
Subsection 4.4	Marking Requirements	23	4.4-kichik bo‘lim	Markirovka talablari	23
Subsection 4.5	Dimensional and Packaging Requirements	23	4.5-kichik bo‘lim	O‘lcham va qadoqlash talablari	23
SECTION 5.	REQUIREMENTS FOR DELIVERY AND ACCEPTANCE RULES	24	BO‘LIM 5.	YETKAZIB BERISH VA QABUL QILISH QOIDALARIGA QO‘YILADIGAN TALABLAR	24
Subsection 5.1	Delivery and acceptance Procedure	24	5.1-kichik bo‘lim	Topshirish va qabul qilish tartibi	24
Subsection 5.2	Requirements for Transfer of Technical and Other Documentation to the Customer upon Delivery of the Equipment Set	25	5.2-kichik bo‘lim	Uskunalar majmuasini yetkazib berishda buyurtmachiga texnik va boshqa hujjatlarni topshirish talablari	25
SECTION 6.	TRANSPORTATION REQUIREMENTS	26	BO‘LIM 6.	TASHISHGA TAALUQLI TALABLAR	26
SECTION 7.	STORAGE REQUIREMENTS	26	BO‘LIM 7.	SAQLASHGA TAALUQLI TALABLAR	26
SECTION 8.	WARRANTY PERIOD AND CONDITIONS REQUIREMENTS	26	BO‘LIM 8.	KAFOLAT MUDDATIGA VA SHARTLARIGA QO‘YILADIGAN TALABLAR	26

SECTION 9.	MAINTAINABILITY AND TECHNICAL SERVICEABILITY REQUIREMENTS	27	BO'LIM 9.	TA'MIRLASH VA TEXNIK XIZMAT KO'RSATISHGA YAROQLILIK TALABLARI	27
SECTION 10.	SERVICE REQUIREMENTS	27	BO'LIM 10.	XIZMAT KO'RSATISH TALABLARI	27
Subsection 10.1	Maintenance requirements	27	10.1-kichik bo'lim	Texnik xizmat ko'rsatish talablari	27
Subsection 10.2	Service and Support Requirements	27	10.2-kichik bo'lim	Servis va qo'llab quvvatlash talablari	27
SECTION 11.	ENVIRONMENTAL AND SANITARY REQUIREMENTS	27	BO'LIM 11.	EKOLOGIK VA SANITARIYA TALABLARI	27
SECTION 12.	SAFETY REQUIREMENTS	27	BO'LIM 12.	XAVFSIZLIK TALABLARI	27
SECTION 13.	QUALITY AND CLASSIFICATION REQUIREMENTS	28	BO'LIM 13.	SIFAT VA TASNIFGA QO'YILADIGAN TALABLAR	28
SECTION 14.	REQUIREMENTS FOR QUANTITY, CONFIGURATION, PLACE AND DELIVERY TIME (PERIODICITY)	29	BO'LIM 14.	YETKAZIB BERISH MIQDORI, KOMPLEKTATSIYASI, JOYI VA MUDDATI (DAVRIYLI)GA QO'YILADIGAN TALABLAR	29
SECTION 15.	REQUIREMENTS FOR ADDITIONAL SERVICES RELATED TO THE DELIVERY OF THE EQUIPMENT SET	29	BO'LIM 15.	USKUNALAR MAJMUASINI YETKAZIB BERISHDA QO'SHIMCHA XIZMATLARGA QO'YILADIGAN TALABLAR	29
Subsection 15.1	Manufacturing and Inspection Requirements	29	15.1-kichik bo'lim	Ishlab chiqarish va inspeksiya talablari	29
Subsection 15.2	Supervised Installation Requirements	29	15.2-kichik bo'lim	Shef-montaj talablari	29
Subsection 15.3	Commissioning and Adjustment Requirements	30	15.3-kichik bo'lim	Ishga tushirish va sozlashga qo'yiladigan talablar	30
Subsection 15.4	Requirements for Training of the Customer's Personnel	30	15.4-kichik bo'lim	Buyurtmachi xodimlarini o'qitishga qo'yiladigan talablar	30
SECTION 16.	REQUIREMENTS FOR THE FORMAT OF SUBMITTED INFORMATION	31	BO'LIM 16.	TAQDIM ETILADIGAN MA'LUMOT SHAKLIGA QO'YILADIGAN TALABLAR	31
SECTION 17.	LIST OF ACCEPTED ABBREVIATIONS	31	BO'LIM 17.	QABUL QILINGAN QISQARTMALAR RO'YXATI	31

SECTION 1. GENERAL INFORMATION		BO'LIM 1. UMUMIY MA'LUMOTLAR	
Subsection 1.1 Name		1.1-kichik bo'lim. Nomi	
GPS receiver systems metrological equipment complex		GPS qabul qiluvchi tizimlar metrologik uskunalar kompleksi	
Subsection 1.2 Reason and Purpose of Purchasing Equipment Set.		1.2-kichik bo'lim. Uskunalar majmuasini sotib olish asoslari va maqsadi	
In accordance with Clause 13 of Appendix 4 to the Presidential Decree of the Republic of Uzbekistan No. PF-25 dated February 16, 2026, "On Accelerating Reforms in the Field of Technical Regulation Based on Advanced International Practices".		O'zbekiston Respublikasi Prezidentining 2026-yil 16-fevralda qabul qilingan "Texnik jihatdan tartibga solish sohasidagi islohotlarni ilg'or xalqaro amaliyot asosida jadallashtirish to'g'risida"gi PF-25-sonli farmoni 4-ilovasi 13-bandiga muvofiq.	
Subsection 1.3. Information on Novelty or Modernity (Year of Manufacture / Year of Release of the Equipment Set)		1.3-kichik bo'lim. Yangi yoki zamonaviyligi bo'yicha ma'lumotlar (ishlab chiqarilgan yili / Uskunalar majmuasi chiqarilgan yili)	
The Equipment Set to be supplied shall be new and shall not have been manufactured earlier than 2026 (not previously used, not repaired, not assembled from refurbished units or components, with no replacement of constituent parts, no restoration of consumer properties, and free from defects related to manufacturing quality or delivery (transportation)). From the moment of delivery to the Customer, the Equipment Set shall be fit for operation and free from any third-party rights or claims. The delivery of exhibition (demonstration) samples shall not be permitted.		Yetkazib beriladigan Uskunalar majmuasi yangi bo'lishi, ishlab chiqarilgan yili 2026-yildan oldin bo'lmasligi shart (ilgari foydalanilmagan, ta'mirlanmagan, qayta tiklangan uzal va elementlardan yig'ilmagan, tarkibiy qismlari almashtirilmagan, iste'mol xususiyatlari tiklanmagan, shuningdek ishlab chiqarish yoki yetkazib berish (tashish) sifati bilan bog'liq nuqsonlarga ega bo'lmasligi lozim). Uskunalar majmuasi Buyurtmachiga yetkazib berilgan paytdan boshlab foydalanishga yaroqli bo'lishi, uchinchi shaxslarning huquqlaridan xoli bo'lishi kerak. Ko'rgazma (namoyish) namunalarini yetkazib berishga yo'l qo'yilmaydi.	
Subsection 1.4 Development and Delivery Stages		1.4-kichik bo'lim. Ishlab chiqish va yetkazib berish bosqichlari	
Name of stage	Type of supporting document	Bosqich nomi	Tasdiqlovchi hujjat turi
1. A contract for the supply of the Equipment Set shall be concluded.	Contract	1. Uskunalar majmuasini yetkazib berish bo'yicha shartnoma tuziladi.	Shartnoma
2. The Equipment Set shall be delivered to the Customer in accordance with the conditions specified in this Technical Specification.	Shipping documents and Delivery/Acceptance Certificate	2. Uskunalar majmuasi Texnik topshiriqda belgilangan shartlarga muvofiq Buyurtmachiga yetkazib beriladi.	Yuk hujjatlari va qabul qilish dalolatnomasi
3. The Equipment Set shall be installed at the Customer's premises, adjusted, and its main technical parameters shall be verified.	Commissioning Report and Acceptance Certificate	3. Uskunalar majmuasi Buyurtmachi hududida o'rnatiladi, sozlanadi va asosiy texnik ko'rsatkichlari tekshiriladi.	Ishga tushirish va qabul-topshirish dalolatnomasi
4. At least three (3) specialists of the Customer shall be trained in the operation and technical maintenance of the Equipment Set.	Training Completion Certificate	4. Buyurtmachining kamida 3 nafar mutaxassisi qurilmadan foydalanish va texnik xizmat ko'rsatish bo'yicha o'qitiladi.	O'qitish to'g'risidagi dalolatnoma
5. The Equipment Set shall be handed over for operation in full working condition.	Final Acceptance Certificate	5. Uskunalar majmuasi to'liq ishchi holatda ekspluatatsiyaga topshiriladi.	Yakuniy qabul qilish dalolatnomasi

Subsection 1.5 Development/manufacturing documents The Equipment Set shall be developed and manufactured in accordance with the manufacturer's normative and technical documentation (NTD), design documentation (DD), as well as the applicable national and international standards. These documents shall confirm the Equipment Set's technical parameters, safety requirements, and quality characteristics.	1.5-kichik bo'lim. Ishlab chiqish / ishlab chiqarish hujjatlari Uskunalar majmuasi ishlab chiqaruvchining normativ-texnik hujjatlari (NTH), konstruktorlik hujjatlari (KH) hamda amaldagi xalqaro va milliy standartlar talablariga muvofiq ishlab chiqilgan va ishlab chiqarilgan bo'lishi shart. Mazkur hujjatlar Uskunalar majmuasining texnik parametrlarini, xavfsizlik talablarini va sifat ko'rsatkichlarini tasdiqlashi lozim.
Subsection 1.6 HS code and other international codes, if applicable For each component included in the Equipment Set, the HS (TN VED) code shall be determined separately in accordance with the applicable customs legislation of the Republic of Uzbekistan. The preliminary classification may be defined as follows: GNSS receiver – under the category of relevant radio navigation equipment; Robotic electronic total station – under the category of geodetic measuring instruments; Laser tracker – under the category of high-precision optical measuring equipment. The final HS (TN VED) codes shall be specified by the Contractor prior to shipment, and an official document confirming the customs classification shall be submitted to the Customer. Classification shall be carried out based on the primary functional purpose of the Equipment Set in accordance with the rules of the Harmonized System (HS) for the Description and Coding of Goods.	1.6 – kichik bo'lim. TIF TN kodi va boshqa xalqaro kodlar (agar qo'llanilsa) Uskunalar majmuasi tarkibiga kiruvchi har bir komponent uchun TIF TN (HS) kodi O'zbekiston Respublikasining amaldagi bojxona qonunchiligiga muvofiq alohida belgilanadi. Dastlabki tasnif quyidagicha aniqlanishi mumkin: GNSS qabul qilgichi – tegishli radio-navigatsiya uskunolari toifasi bo'yicha; Robotlashtirilgan elektron total stansiya – geodezik o'lchash asboblari toifasi bo'yicha; Lazer treker – yuqori aniqlikdagi optik-o'lchash uskunolari toifasi bo'yicha. Yakuniy TIF TN (HS) kodlari jo'natishdan oldin Ijrochi tomonidan aniqlashtiriladi hamda bojxona tasnifini tasdiqlovchi rasmiy hujjat Buyurtmachiga taqdim etiladi. Tasniflash Uskunalar majmuasining asosiy funksional vazifasidan kelib chiqib, Tovarlarini tavsiflash va kodlashning uyg'unlashtirilgan tizimi (HS) qoidalariga muvofiq amalga oshiriladi.
Subsection 1.7. Requirements for the Contractor The Contractor shall supply high-quality goods directly from the manufacturer's factory or its authorized representative (distributor).	1.7-kichik bo'lim. Ijrochiga qo'yiladigan talablar Ijrochi ishlab chiqaruvchi zavodidan yoki uning rasmiy vakilidan (distribyutordan) yuqori sifatli tovarlarni yetkazib berishi kerak.
SECTION 2. SCOPE OF APPLICATION The Equipment Set is designed for high-precision determination, transfer, and control of spatial coordinates, as well as for measuring the metrological parameters of measuring equipments. This Equipment Set shall be applied in the following areas: - high-precision geodetic works (within national and local coordinate systems); - spatial metrology applications; - control of geometric parameters of industrial equipment (coaxiality, parallelism, flatness, etc.); - measurement of large-scale components and metal structures; - calibration and verification of measurement systems; - establishment and maintenance of a unified spatial reference system. The Equipment Set is intended for operation in field, industrial, and laboratory environments and shall ensure the accuracy, repeatability, and reliability of	2-BO'LIM. QO'LLANILISH DOIRASI Uskunalar majmuasi fazoviy koordinatalarni yuqori aniqlikda aniqlash, uzatish va nazorat qilish hamda metrologik o'lchash vositalarining metrologik parametrlarini o'lchash uchun mo'ljallangan. Mazkur uskunalar majmuasi quyidagi yo'nalishlarda qo'llaniladi: • yuqori aniqlikdagi geodezik ishlar (milliy va mahalliy koordinata tizimlarida); • fazoviy metrologiya ishlari; • sanoat uskunalarining geometrik parametrlarini nazorat qilish (koaksiallik, parallellik, tekislik va boshqalar); • katta o'lchamli detallar va metall konstruksiyalarni o'lchash; • o'lchash tizimlarini kalibrlash va verifikatsiya qilish; • yagona fazoviy ma'lumotnoma tizimini yaratish va qo'llab-quvvatlash. Uskunalar majmuasi dala, sanoat va laboratoriya sharoitlarida ishlash uchun mo'ljallangan bo'lib, o'lchash natijalarining aniqligi, takrorlanuvchanligi va

measurement results.			ishonchliligini ta'minlashi shart.		
SECTION 3. OPERATING CONDITIONS			3-BO'LIM. ISHLASH SHARTLARI		
Subsection 3.1 General operating conditions			3.1-kichik bo'lim Umumiy ish sharoitlari		
In accordance with the manufacturer's normative and technical documentation (NTD) and design documentation (DD).			Ishlab chiqaruvchining normativ-texnik hujjatlariga (NTH) va konstruktorlik hujjatlariga (KH) muvofiq.		
Subsection 3.2 Additional/special operating requirements			3.2-kichik bo'lim Qo'shimcha/maxsus operatsion talablar		
In accordance with the Manufacturer's normative and technical documentation (NTD) and design documentation (DD).			Ishlab chiqaruvchining normativ-texnik hujjatlariga (NTH) va konstruktorlik hujjatlariga (KH) muvofiq.		
SECTION 4. TECHNICAL REQUIREMENTS			4-BO'LIM. TEXNIK TALABLAR		
Subsection 4.1 Main technical characteristics of GPS receiver systems metrological equipment complex			4.1-bo'lim. GPS qabul qiluvchi tizimlar metrologik uskunalar kompleksining asosiy texnik tavsiflari		
№	Name of Requirements	Content of the Technical Specification	№	Talablar nomi	Texnik topshiriq mazmuni
1	Description of the Equipment Set. (Functional Characteristics and Consumer Properties)	Technical Tasks Equipment Set is intended for high-precision determination and transfer of spatial coordinates, as well as for controlling the geometric parameters of objects in field, industrial, and laboratory environments. The Equipment Set shall provide the capability to integrate GNSS, electronic total station, and laser tracker measurements into a unified coordinate system. Areas of Application The Equipment Set shall be capable of performing the following types of work: positioning and transferring design solutions within local and national coordinate systems; establishment and transfer of reference bases for metrological tasks; control of coaxiality, parallelism, and flatness of industrial equipment; measurement of large-scale components and metal structures; calibration and verification of measurement systems; ensuring metrological traceability of linear and	1	Uskunalar majmuasining tavsifi (funksional xususiyatlari va iste'mol xususiyatlari)	Texnik vazifalar Uskunalar majmuasi dala, sanoat va laboratoriya sharoitlarida fazoviy koordinatalarni yuqori aniqlikda aniqlash va uzatish hamda obyektlarning geometrik parametrlarini nazorat qilish uchun mo'ljallangan. Uskunalar majmuasi GNSS, elektron total stansiya va lazer treker o'lchashlarini yagona koordinata tizimiga integratsiyalash imkoniyatiga ega bo'lishi shart. Qo'llanish sohalari Uskunalar majmuasi quyidagi ish turlarini bajarish imkoniyatiga ega bo'lishi shart: loyihaviy yechimlarni mahalliy va milliy koordinata tizimlarida joylashtirish va ko'chirish; metrologik vazifalar uchun tayanch (referens) bazalarni yaratish va uzatish; sanoat uskunalarining koaksialligi, parallelligi va tekisligini nazorat qilish; katta o'lchamli detallar va metall konstruksiyalarni o'lchash; o'lchash tizimlarini kalibrlash va qiyoslash; chiziqli va burchak o'lchash natijalarining milliy va xalqaro etalonlarga kalibrlashlar zanjiri orqali metrologik kuzatuvchanligini ta'minlash. Funksional imkoniyatlar

		angular measurement results to national and international standards through the calibration chain. Functional Capabilities The Equipment Set shall ensure: high-precision measurements over long distances; stable operation under specified climatic conditions; capability to operate in conditions of limited satellite signal availability; automation of measurement processes; integration with modern CAD/BIM systems; creation and processing of digital models of objects. Use of the Equipment Set shall ensure the accuracy, repeatability, and reliability of measurement results.			Uskunalar majmuasi quyidagilarni ta'minlashi shart: uzoq masofalarda yuqori aniqlikdagi o'lchashlarni amalga oshirish; belgilangan iqlim sharoitlarida barqaror ishlash; sun'iy yo'ldosh signallari cheklangan sharoitlarda ishlash imkoniyati; o'lchash jarayonlarini avtomatlashtirish; zamonaviy CAD/BIM tizimlari bilan integratsiya qilish; obyektlarning raqamli modellarini yaratish va qayta ishlash. Uskunalar majmuasidan foydalanish o'lchash natijalarining aniqligi, takrorlanuvchanligi va ishonchliligini ta'minlashi shart.
2	Purpose of Equipment Set Acquisition	The purpose of the procurement is to establish a technical foundation for spatial metrology, including the high-precision determination of coordinates of measurement systems, length standards, and industrial equipment, and their integration into a unified reference coordinate system. The Equipment Set is intended to ensure the metrological traceability of linear and angular measurements to national standards, as well as to enhance the reliability of calibration and verification results.	2	Uskunalar majmuasini xarid qilish maqsadi	Xarid qilishdan maqsad fazoviy metrologiya uchun texnik bazani yaratish, jumladan o'lchov tizimlari, uzunlik etalonlari hamda sanoat uskunalarining koordinatalarini yuqori aniqlikda aniqlash va ularni yagona referens koordinata tizimiga integratsiyalashdan iborat. Mazkur uskunalar majmuasi chiziqli va burchak o'lchovlarning davlat etalonlariga metrologik izchilligini ta'minlash hamda kalibrash va verifikatsiya natijalarining ishonchliligini oshirishga xizmat qiladi.
3	Required Technical Characteristics of the Equipment Set	Operating Modes The GNSS receiver shall be configurable via the controller to operate in both Base and Rover modes without additional hardware modifications. Metrological characteristics Geodetic instrument: Measuring range: from 0 to 10,000 m	3	Uskunalar majmuasining zarur texnik tavsiflari	Ishlash rejimlari GNSS qabul qilgichi qo'shimcha apparat o'zgarishlarisiz boshqaruv qurilmasi orqali Base va Rover rejimlarida ishlash imkoniyatiga ega bo'lishi shart. Metrologik tavsiflari Geodezik uskunasi: Umumiy o'lchash diapazoni 0 dan 10000 m dan

		minimum.			kam bo'lmagan.
4	Configuration Requirements	Components of the GPS receiver systems metrological equipment complex Multi-frequency GNSS geodetic equipment: Baseline length measurement range: 0 m to 10,000 m Number of channels: minimum 550. Signal Tracking Capabilities The receiver shall support the following satellite navigation systems: GPS: L1, L2, L2C, L5 (standard); GLONASS: L1, L2 (standard); Galileo: E1, E5a, E5b, Alt-BOC, E6. GNSS Measurements Independent code and carrier phase measurements on all frequencies shall be supported. Full carrier phase cycle shall be supported for GPS and GLONASS systems. Capability to receive differential satellite corrections in real time (to ensure planimetric accuracy up to 3 cm). Additional Functions Autonomous signal integrity monitoring with detection and exclusion of faulty satellite signals. Data Communication Protocols The receiver shall support the following formats: RTK formats: CMR, CMR+, RTCM 2.2, 2.3, 3.0, 3.1, 3.2 MSM; NMEA 0183 v4.00 output; Network RTK modes: VRS, FKP, iMAX, MAC (RTCM SC-104). Memory Built-in memory: minimum 4 GB;	4	Komplektatsiyaga qo'yiladigan talablar	GPS qabul qiluvchi tizimlar metrologik uskunalar kompleksi tarkibi Ko'p chastotali GNSS geodezik uskunasi: Bazis uzunligini o'lchash diapazoni 0 dan 10000 m gacha Kanallar soni: kamida 550 ta. Signal qabul qilish imkoniyatlari Quyidagi sun'iy yo'ldosh navigatsiya tizimlarini qo'llab-quvvatlashi shart: GPS: L1, L2, L2C, L5 (standart); GLONASS: L1, L2 (standart); Galileo: E1, E5a, E5b, Alt-BOC, E6; GNSS o'lchashlari Barcha chastotalarda mustaqil kod va tashuvchi faza o'lchashlari amalga oshirilishi shart. Qo'shimcha funksiyalar Ma'lumotlar almashinuvi protokollari Quyidagi formatlarni qo'llab-quvvatlashi shart: RTK formatlari: CMR, CMR+, RTCM 2.2, 2.3, 3.0, 3.1, 3.2 MSM; NMEA 0183 v4.00 chiqishi; Tarmoq RTK rejimlari: VRS, FKP, iMAX, MAC (RTCM SC-104). Xotira Ichki xotira: kamida 4 GB; Olinadigan SD xotira kartasi: kamida 8 GB. Quvvat manbai Almashtiriladigan lityum-ion batareya (2,8 Ah / 11,1 V); Uzluksiz ishlash vaqti: kamida 8 soat. Mexanik va muhitga chidamlilik Himoya darajasi: kamida IP68 (IEC 60529); Qisqa muddatli 1 m chuqurlikkacha suvga botishga chidamli; ISO 9022 va MIL-STD-810F muhit sinovlariga muvofiq bo'lishi shart; Ishlash harorati: -40°C dan +65°C gacha.

	Removable SD memory card: minimum 8 GB. Power Supply Replaceable lithium-ion battery (2.8 Ah / 11.1 V); Continuous operating time: minimum 8 hours. Mechanical and Environmental Resistance Resistant to drops onto hard surfaces; Shock resistance: 40 g / 15–23 ms, compliant with MIL-STD-810F (Method 516.5); Resistant to overturning from a 2 m pole height; Protection rating: minimum IP68 (IEC 60529); Resistant to short-term immersion up to 1 m depth; Compliant with ISO 9022 and MIL-STD-810F environmental standards; Operating temperature range: –40°C to +65°C. Accuracy Specifications Accuracy shall not be worse than the following parameters: Differential code positioning: Horizontal: 0.25 m + 1 mm/km; Vertical: 0.50 m + 1 mm/km. Static mode: Horizontal: 3 mm + 0.1 mm/km; Vertical: 3.5 mm + 0.4 mm/km. Kinematic mode: Horizontal: 8 mm + 1 mm/km; Vertical: 15 mm + 1 mm/km. In case of base signal loss: Accuracy degradation shall not exceed +10 mm per minute.		Aniqlik ko'rsatkichlari Quyidagi aniqlik parametrlaridan yomon bo'lmasligi shart: Differensial kodli o'lchash: Gorizontal: 0,25 m + 1 mm/km; Vertikal: 0,50 m + 1 mm/km. Statik rejim: Gorizontal: 3 mm + 0,1 mm/km; Vertikal: 3,5 mm + 0,4 mm/km. Kinematik rejim: Gorizontal: 8 mm + 1 mm/km; Vertikal: 15 mm + 1 mm/km. Baza signali uzilganda: Aniqlikning yomonlashuvi +10 mm/daqiqadan oshmasligi shart. Aloqa Ichki radio-modem: 403–470 MHz diapazon; Uzatish quvvati: 1 Vt gacha; Ishlash masofasi: odatda kamida 3–5 km, maksimal 12 km; GSM qo'llab-quvvatlashi; RINEX formatida ma'lumotlarni yuklab olish imkoniyati; O'rnatilgan radio va GSM antennalari. Bazis uzunligini o'lchashdagi ruxsat etilgan mutlaq xatolik chegaralari (0,997 ishonchlilik ehtimoli bilan): Statik va tezkor statik rejimlarda Gorizontal tekislik: $\pm 3 \cdot (2 + 0,5 \cdot 10^{-6} \cdot D)$ mm Balandlik: $\pm 3 \cdot (3 + 0,5 \cdot 10^{-6} \cdot D)$ mm Post-protsessli kinematika va real vaqtli kinematika (RTK) Gorizontal tekislik: $\pm 3 \cdot (4 + 1 \cdot 10^{-6} \cdot D)$ mm Balandlik: $\pm 3 \cdot (8 + 1 \cdot 10^{-6} \cdot D)$ mm Differensial kodli o'lchovlar Gorizontal tekislik: $\pm 3 \cdot (100 + 0,5 \cdot 10^{-6} \cdot D)$ mm Balandlik: $\pm 3 \cdot (200 + 0,5 \cdot 10^{-6} \cdot D)$ mm Izoh: D – o'lchanayotgan masofa (mm) Quvvat manbai kuchlanishi:
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	Communication Integrated radio modem: 403–470 MHz frequency range; Transmission power: up to 1 W; Typical operating range: at least 3–5 km, maximum 12 km; GSM support; Capability to download data in RINEX format; Built-in radio and GSM antennas. Permissible absolute error limits of baseline length measurement (confidence probability 0.997): Static / Rapid static modes Horizontal: $\pm 3 \cdot (2 + 0.5 \cdot 10^{-6} \cdot D)$ mm Vertical: $\pm 3 \cdot (3 + 0.5 \cdot 10^{-6} \cdot D)$ mm Post-processed kinematic / Real-time kinematic (RTK) Horizontal: $\pm 3 \cdot (4 + 1 \cdot 10^{-6} \cdot D)$ mm Vertical: $\pm 3 \cdot (8 + 1 \cdot 10^{-6} \cdot D)$ mm Differential code measurements Horizontal: $\pm 3 \cdot (100 + 0.5 \cdot 10^{-6} \cdot D)$ mm Vertical: $\pm 3 \cdot (200 + 0.5 \cdot 10^{-6} \cdot D)$ mm Note: D – measured distance (mm) Power supply voltage: External power supply: 9–28 V Internal battery: 7.2 ± 0.5 V Operating conditions: Ambient air temperature: –45 °C to +65 °C Package includes: 1 Smart antenna 1 USB cable 1 Power adapter 1 UHF/VHF antenna Components of the GNSS Base Station: 1 unit – GNSS receiver – antenna – GPS / GLONASS (monoblock)		Tashqi ta’minot: 9–28 V Ichki batareya: 7,2 ± 0,5 V Ishlash sharoitlari: Atrof-muhit harorati: –45 dan +65 °C gacha Komplekt: 1 dona Smart antenna 1 dona USB kabel 1 dona Quvvat adapter 1 dona UHF/VHF antenna GNSS bazasining komponentlari: 1 dona – GNSS qabul qilgichi – antenna – GPS / GLONASS (monoblok) 1 dona – Tripodga o’rnatish uchun Tribrach 1 dona – GNSS antennasi uchun tribrach adapteri 1 dona – Asbobning balandligini o’lchash uchun lenta 1 dona – Yog’och shtativ 2 dona – GNSS qabul qilgichi uchun qayta zaryadlanuvchi batareyalar 1 dona – Tashish konteyneri (Base + Rover) 1 dona – 1 GB sanoat darajasidagi SD xotira kartasi 1 dona – Radio-modem uchun tashqi antenna 1 dona – GSM modem uchun tashqi antenna 1 dona – Tarmoqdan va avtomobildan quvvat adapteri bilan lityum-ion batareyalar uchun zaryadlovchi qurilma Rovering GNSS tizimi komponentlari: 1 dona – GNSS qabul qilgichi – antenna – GPS / GLONASS (monoblok) 1 dona – Dala boshqaruvchisi 1 dona – Sanoat darajasidagi 1GB SD xotira kartasi 1 dona – Uglerodli teleskopik ustun 2.00 m 1 dona – Dala boshqaruvchisini o’rnatish uchun ustun o’rnatgich 1 dona – O’rnatish uchun adapter
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	1 unit – Tribrach for tripod mounting 1 unit – Tribrach adapter for GNSS antenna 1 unit – Tape for measuring instrument height 1 unit – Wooden tripod 2 units – Rechargeable batteries for GNSS receiver 1 unit – Transport container (Base + Rover) 1 unit – Industrial-grade 1 GB SD memory card 1 unit – External antenna for radio modem 1 unit – External antenna for GSM modem 1 unit – Charger for lithium-ion batteries with AC mains and vehicle power adapter Components of the Rover GNSS system: 1 unit – GNSS receiver – antenna – GPS / GLONASS (monoblock) 1 unit – Field controller 1 unit – Industrial-grade 1 GB SD memory card 1 unit – Carbon telescopic pole, 2.00 m 1 unit – Pole mount for field controller 1 unit – Mounting adapter 2 units – Lithium-ion batteries for GNSS receiver 2 units – Lithium-ion batteries for field controller 1 unit – Charger for lithium-ion batteries with AC mains and vehicle power adapter 1 unit – External antenna for radio modem 1 unit – External antenna for GSM modem Complete set of high-precision robotic electronic total station: 1 unit – High-precision robotic electronic		2 dona – GNSS qabul qilgichi uchun lityum-ion batareya 2 dona – Dala boshqaruvchisi uchun lityum-ion batareya 1 dona – Elektr tarmog'i va avtomobil uchun quvvat adapteri bilan lityum-ion batareyalar uchun zaryadlovchi qurilma 1 dona – Radio-modem uchun tashqi antenna 1 dona – GSM modem uchun tashqi antenna Yuqori aniqlikdagi robotlashtirilgan elektron total stansiyaning to'liq to'plami: 1 dona – Asbob balandligini lazer yordamida avtomatik ravishda o'lchash, o'lchashlarni ichki xotiraga yozib olish, menyusi ingliz va rus tillarida bo'lishi mumkin bo'lgan yuqori aniqlikdagi robotlashtirilgan elektron total stansiya 1 dona – Yuqori aniqlikdagi elektron total stansiya uchun Tribrach (optik o'lchash chizig'isiz) 2 dona – Ichki almashtiriladigan lityum-ion batareyalar 1 dona – Avtomobil sigaret zanjigalkasidan quvvat olish uchun simi bilan batareya zaryadlovchi qurilmasi 1 dona – Yuqori aniqlikdagi elektron total stansiya uchun yog'och shtativ 1 dona – Yuqori aniqlikdagi robotlashtirilgan elektron total stansiya uchun vertikal konteyner 1 dona – Yuqori aniqlikdagi yumaloq reflektor 1 dona – Reflektor ustuni Joriy vaqt va tezlik qiymatlarini o'lchash kompleksi: UTC(SU) vaqt shkalasiga sinxronlashdagi ruxsat etilgan mutlaq xato: $\pm 0,1$ ms Vaqt ko'rsatkichining ruxsat etilgan mutlaq xato: $\pm 0,1$ ms Transport vositasi tezligini o'lchash diapazoni: 0 – 350 km/h
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	total station with automatic laser measurement of instrument height, internal memory for recording measurements, and menu available in English and Russian 1 unit – Tribrach for high-precision electronic total station (without optical plummet) 2 units – Internal replaceable lithium-ion batteries 1 unit – Battery charger with cable for power supply from a vehicle cigarette lighter 1 unit – Wooden tripod for high-precision electronic total station 1 unit – Vertical transport container for high-precision robotic electronic total station 1 unit – High-precision circular reflector 1 nit – Reflector pole Current time and speed measurement complex: Permissible absolute synchronization error with UTC(SU) time scale: ± 0.1 ms Permissible absolute error of time indication: ± 0.1 ms Vehicle speed measurement and display range: 0 – 350 km/h Permissible error of vehicle speed measurement: ± 0.1 km/h Overall dimensions (L × W × H): 450 × 835 × 225 mm Weight: 6 kg Power supply voltage: 9–30 V Power consumption: 25 W Operating conditions: Ambient air temperature: 10–40 °C Relative humidity at 25 °C: not more than 98%		Tezlikni o'lchashdagi ruxsat etilgan xato: ± 0,1 km/h Umumiy o'lchamlar: 450 × 835 × 225 mm Og'irligi: 6 kg Elektr ta'minoti: 9–30 V Iste'mol quvvati: 25 W Ishlash sharoitlari: Harorat: 10–40 °C Nisbiy namlik: 98 % dan yuqori emas Atmosfera bosimi: 60–406,7 kPa Himoya darajasi: IP66 (ГОСТ 14254) GLONASS/GPS/GALILEO/SBAS NV08C-MCM, NV08C-CSM, NV08C-CSM-DR navigatsion vaqt apparaturasi: Statik rejimda koordinatalarni aniqlash xatolik chegaralari: Avtonom rejim: ±5 m SBAS differensial rejim: ±2 m DGNSS differensial rejim: ±1 m Balandlikni aniqlash aniqligi: Statik rejim: ±6 m Dinamik rejim: ±6 m Tezlikni aniqlash aniqligi: ±0,1 m/s Vaqt sinxronlash RMS og'ishi: 15 ns dan yuqori emas Quvvat manbai: 3,5–5,5 V Iste'mol quvvati: 0,18 W dan yuqori emas Ishlash harorati: –40 dan +85 °C Komplekt: 1 dona NV2410 antenasi 1 dona GPSGL-TMG-SPI-40NCB antenasi 1 dona USB kabel 1 dona RF kabel 1 dona interfeys kabeli 1 dona ma'lumot saqlash qurilmasi 1 dona yorliq 1 dona qadoqlash to'plami
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	Atmospheric pressure: 60–406.7 kPa Degree of protection: IP66 according to FOCT 14254 Navigation-timing equipment for GNSS receivers GLONASS/GPS/GALILEO/SBAS (NV08C-MCM, NV08C-CSM, NV08C-CSM-DR): Static coordinate determination accuracy (HDOP ≤ 4, probability 0.95): Autonomous mode: ± 5.0 m SBAS differential mode: ± 2.0 m DGNSS differential mode: ± 1.0 m Height determination accuracy: Static mode: ± 6 m Dynamic mode: ± 6 m Velocity measurement accuracy: ± 0.1 m/s RMS deviation of synchronization with UTC(SU), UTC(USNO), GLONASS and GPS system time scales: not more than 15 ns Power supply voltage: 3.5–5.5 V Power consumption: not more than 0.18 W Operating temperature range: –40 to +85 °C Package includes: 1 NV2410 antenna 1 GPSGL-TMG-SPI-40NCB antenna 1 USB 2.0 multimedia cable (length 1.8 m) 1 UFL-SMA RF cable (100 mm) 1 interface cable 1 data storage device 1 label 1 packaging set		Imitator: Ishchi chastota diapazoni: 24,050–24,250 GHz Tezlik imitatsiya diapazoni: 1–400 km/soat Tezlik imitatsiya xatosi: $\pm 0,03$ km/soat Masofa imitatsiya diapazoni: 2–150 m Quvvat manbai: 10–16 V Iste'mol quvvati: 7 W dan yuqori emas Ishlash sharoitlari: Harorat: –30 dan +50 °C Namlik: 98 % gacha Og'irligi: 3 kg dan yuqori emas O'lchamlari: Uzunlik 200 mm Kenglik 200 mm Balandlik 150 mm dan yuqori emas Komplekt: 1 dona Noutbuk (Protessor: Intel Core Ultra 7 255H (2 GHz – 5.1 GHz) (16 yadro; 16 oqim), Videokarta: NVIDIA® GeForce RTX™ 5070 8GB GDDR7, Ekran diagonali: 16 dyuym IPS 165 Hz, Ekran o'lchamlari: WUXGA (1920 × 1200), Tarmoq: Intel® Wi-Fi 6E AX211 (2×2) va Bluetooth® 5.3, Matritsa turi: IPS, Operativ xotira (RAM): 24 GB DDR5, Saqlash qurilmasi: 1 TB PCIe® NVMe™ M.2 SSD, Klaviatura: Yorug'lik bilan ENG/RU, Veb-kamera: HD 720p) 1 dona uch oyoqli stend 1 dona kabellar komplekti 1 dona kalibr lash kabeli 1 dona “Сапсан-3” dasturi disk 1 dona qo'shimcha jihozlar komplekti Aniq vaqtning birlamchi manbai: 50 Ω yukdagi 1 Hz chastotali chiqish impuls signalining amplitudasi 3,5 dan 5 V gacha 1 Hz (1PPS) chiqish signalining vaqt shkalasini UTC(SU) vaqt shkalasiga nisbatan sinxronlashtirishdagi ruxsat etilgan mutlaq xatolik chegaralari, GNSS GLONASS/GPS signalini
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	Simulator: Operating frequency range: 24.050–24.250 GHz Simulated vehicle speed range: 1–400 km/h Permissible simulation error: ±0.03 km/h Simulated distance to moving vehicle: 2–150 m Control signal amplitude range: 0.0025–2.5 V Power supply voltage: 10–16 V Power consumption: not more than 7 W Operating conditions: Ambient air temperature: –30 to +50 °C Relative humidity: up to 98% Atmospheric pressure: 630–800 mmHg Weight: not more than 3 kg Dimensions: Length 200 mm Width 200 mm Height not more than 150 mm Package includes: Laptop with the following specifications: Processor: Intel Core Ultra 7 255H (2 GHz – 5.1 GHz), 16 cores, 16 threads Graphics card: NVIDIA GeForce RTX 5070, 8 GB GDDR7 Display size: 16 inches IPS, 165 Hz Display resolution: WUXGA (1920 × 1200) Network: Intel Wi-Fi 6E AX211 (2×2) and Bluetooth 5.3 Panel type: IPS RAM: 24 GB DDR5 Storage: 1 TB PCIe NVMe M.2 SSD Keyboard: backlit ENG/RU Web camera: HD 720p 1 tripod stand with rotating mechanism 1 cable set		sinxronlashtirish rejimida ± 1 mks 1 Hz (1PPS) chiqish signalining vaqt shkalasini UTC(SU) vaqt shkalasiga nisbatan 24 soat davomida mustaqil ishlash rejimida sinxronlashtirishdagi ruxsat etilgan mutlaq xatolik chegaralari ± 100 ms Ethernet interfeysi orqali NTP protokoli bo'yicha vaqt shkalasini UTC(SU) vaqt shkalasiga nisbatan sinxronlashtirishdagi ruxsat etilgan mutlaq xatolik chegaralari ± 100 mks Quvvat manbai: AC tarmog'idan Chastotasi 47,5 dan 52,5 Hz gacha, Kuchlanishi 198 dan 242 V gacha DC manbaidan: Kuchlanishi 18 dan 72 V gacha Iste'mol qilinadigan quvvat 6 V·A dan yuqori emas Gabarit o'lchamlari (U × K × B): Plastik korpusli variant 160 × 95 × 60 mm, Metall korpusli variant 105 × 150 × 30 mm dan yuqori emas Og'irligi 0,6 kg dan yuqori emas Ishlash sharoitlari: Atrof-muhit havo harorati 5 dan 40 °C gacha, 25°C haroratdagi nisbiy namlik 80 % dan yuqori emas Komplekt: 1 dona Noutbuk (Protessor: Intel Core Ultra 7 255H (2 GHz – 5.1 GHz) (16 yadro; 16 oqim), Videokarta: NVIDIA® GeForce RTX™ 5070 8GB GDDR7, Ekran diagonal: 16 dyuym IPS 165 Hz, Ekran o'lchamlari: WUXGA (1920 × 1200), Tarmoq: Intel® Wi-Fi 6E AX211 (2×2) va Bluetooth® 5.3, Matritsa turi: IPS, Operativ xotira (RAM): 24 GB DDR5, Saqlash qurilmasi: 1 TB PCIe® NVMe™ M.2 SSD, Klaviatura: Yorug'lik bilan ENG/RU, Veb-kamera: HD 720p) 1 dona Antena kabeli 1 dona GPS/GLONASS antena bloki 1 dona Quvvat kabeli (AC tarmog'idan ta'minlanadigan variantlar uchun)
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	1 calibration cable with power adapter 1 CD with “Сапсан-3” software 1 additional equipment set Primary time source: Amplitude of the output pulse signal at a frequency of 1 Hz with a 50 Ω load: from 3.5 to 5 V. Permissible limits of absolute error in synchronization of the 1 Hz (1PPS) output signal time scale relative to the UTC(SU) time scale in GNSS GLONASS/GPS signal synchronization mode: ±1 μs. Permissible limits of absolute error in synchronization of the 1 Hz (1PPS) output signal time scale relative to the UTC(SU) time scale during 24 hours of autonomous operation mode: ±100 ms. Permissible limits of absolute error in synchronization of the time scale relative to the UTC(SU) time scale via the Ethernet interface using the NTP protocol: ±100 μs. Power Supply From AC mains: Frequency: 47.5 to 52.5 Hz Voltage: 198 to 242 V From DC source: Voltage: 18 to 72 V Power consumption: not more than 6 VA. Overall Dimensions (L × W × H) Plastic enclosure version: 160 × 95 × 60 mm Metal enclosure version: not more than 105 × 150 × 30 mm Weight Not more than 0.6 kg Operating Conditions		Taxeometr: Burchak o'lchovlari GU va VU o'lchash usuli – Absolyut, uzluksiz, tort martalik O'lchash aniqligi – 0,5 soniya O'lchash masofasi • Kamida 0.9 m dan 3500 m gacha – prizma (qaytargich) orqali • Kamida 0.9 m dan 1000 m gacha – prizmasiz (har qanday sirt bo'yicha) Chiziqli o'lchovlar O'lchash aniqligi / o'lchash vaqti • Bir martalik rejim (prizma) – 0.6 mm + 1 ppm / odatda 2.4 s • Bir martalik rejim (har qanday sirt) – 2 mm + 2 ppm / odatda 2 s Lazer nuqtasi o'lchami • 50 m masofada – 8 mm × 20 mm O'lchov tizimi • Koaksial tizim • Korinadigan diapazondagi qizil lazer Keng burchakli va koaksial kameralar • Ruxsat qobiliyati – 5 Mp, KMOP matritsa • Korish maydoni burchagi ○ keng burchakli kamera – 19.4° ○ koaksial kamera – 1.5° • Kadrlar almashish chastotasi – soniyasiga 20 kadrgacha Motorlash tizimi • To'g'ridan-tog'ri piezo yuritma Aylanish tezligi • Aylanish tezligi – soniyasiga 180° • Doira almashtirish vaqti – odatda 2.9 s Qaytargichga avtomatik yonaltirish (ATRplus) • Avtomatik yonaltirish masofasi – 1500 m • Nishonni ushlab masofasi – 1000 m • Aniqlik / o'lchash vaqti – 0.5 soniya /
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	Ambient air temperature: from 5 to 40 °C Relative humidity at 25 °C: not more than 80% комплект (Package Includes) Laptop with the following specifications: Processor: Intel Core Ultra 7 255H (2 GHz – 5.1 GHz), 16 cores, 16 threads Graphics card: NVIDIA GeForce RTX 5070, 8 GB GDDR7 Display size: 16 inches IPS, 165 Hz Display resolution: WUXGA (1920 × 1200) Network: Intel Wi-Fi 6E AX211 (2×2) and Bluetooth 5.3 Panel type: IPS RAM: 24 GB DDR5 Storage: 1 TB PCIe NVMe M.2 SSD Keyboard: backlit ENG/RU Web camera: HD 720p Included Accessories 1 antenna cable 1 GPS/GLONASS antenna unit 1 power cable (for versions powered from AC mains) Tacheometer: Angle Measurements Angle measurement method – Absolute, continuous, fourfold Measurement accuracy – 0.5" (arc-second) Measurement Distance • From 0.9 m to 3500 m – using a prism (reflector) • From 0.9 m to 1000 m – reflectorless (any surface) Distance Measurements Measurement accuracy / measurement time		odatda 3–4 s Qaytargichni tez qidirish • Qidirish masofasi – 300 m • Qidirish vaqti – odatda 5 s Lazerli stvor korsatkichi (EGL) • Ishlash diapazoni – 5–150 m • Aniqligi – 100 m masofada odatda 5 sm Operatsion tizim • Windows EC7 Protsessor • Kamida quyidagi darajada: • TI OMAP4430 1 GHz ikki yadroli ARM Cortex A9 Avtomatik fokusli korish trubasi • Kattalashtirish – 30 marta • Fokuslash diapazoni – 1.7 m dan cheksizlikkacha Taxeometr balandligini avtomatik o'lchash moduli • Chiziqli aniqlik – 1.0 mm • O'lchash diapazoni – 0.7 m dan 2.7 m gacha Displey • 5 dyuym • WVGA rangli sensor ekran • ikki tomondan boshqariladigan Klaviatura • 37 ta tugma • yoritilgan Boshqaruv elementlari • 3 ta cheksiz yonaltiruvchi vint • 1 ta servo fokuslash vinti • 2 ta avtomatik fokus tugmasi • dasturlashtiriladigan SmartKey tugmasi Quvvat manbai • Almashtiriladigan litiy-ion batareya • kamida 9 soat ishlash muddati Malumotlarni saqlash • Kamida 2 Gb ichki xotira
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	• Single measurement mode (prism) – 0.6 mm + 1 ppm / typically 2.4 s • Single measurement mode (any surface) – 2 mm + 2 ppm / typically 2 s Laser Spot Size • At 50 m distance – 8 mm × 20 mm Measurement System • Coaxial system • Visible spectrum red laser Wide-Angle and Coaxial Cameras • Resolution – 5 MP CMOS sensor • Field of view Wide-angle camera – 19.4° Coaxial camera – 1.5° • Frame rate – up to 20 frames per second Motorization System • Direct piezo drive Rotation Speed • Rotation speed – 180° per second • Circle switching time – typically 2.9 s Automatic Prism Targeting (ATRplus) • Automatic targeting range – 1500 m • Target lock range – 1000 m • Accuracy / measurement time – 0.5" / typically 3–4 s Fast Prism Search • Search range – 300 m • Search time – typically 5 s Laser Guide (EGL) • Operating range – 5–150 m • Accuracy – typically 5 cm at 100 m Operating System • Windows EC7 Processor At least equivalent to: TI OMAP4430 1 GHz dual-core ARM Cortex-A9 Telescope with Autofocus • Magnification – 30×		• Kamida 1 Gb almashtiriladigan SD karta Interfeyslar • RS232 • USB • Bluetooth • WLAN Ogirligi • Ichki batareya bilan 7.7 kg dan oshmasligi kerak Ichki dasturiy taminot va amaliy dasturlar • Ish jarayonini, malumotlarni va koordinata tizimini boshqarish • Malumotlarni import va eksport qilish • Foydalanuvchi ASCII, DXF, LandXML fayllari • Nuqtalar buluti bilan ishlash • Malumotlar boshqaruvida va ilovalarda toliq xaritani korish • DXF fayllarni fon tasviri va loyiha malumoti sifatida korish • GNSS tizimlari bilan birgalikda ishlash • Natijalarni real vaqt rejimida grafik korsatish • Xarita orqali nuqtalarni tanlash • Elektron abris yuritish imkoniyati • Fotosuratlarida chizish, bloknotta chizish, skrinshot olish • Ichki kodlar va yangi kodlar yaratish imkoniyati • Kodlangan malumotlarni qatlamlar boyicha saralash • Kodlarni oynani almashtirmasdan almashtirish • Bir vaqtning ozida bir nechta kod bilan ishlash • Lazer skanerlar va skanerlovchi elektron taxometrlardan olingan nuqtalar bulutini qollab quvvatlash • Taxometr kamerasidan video oqimini
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	• Focusing range – from 1.7 m to infinity Automatic Instrument Height Measurement Module • Linear accuracy – 1.0 mm • Measurement range – 0.7 m to 2.7 m Display • 5 inches • WVGA color touchscreen • Operable from both sides Keyboard • 37 keys • Backlit Control Elements • 3 endless drive screws • 1 servo focusing screw • 2 autofocus buttons • Programmable SmartKey button Power Supply • Replaceable lithium-ion battery • Minimum 9 hours operating time Data Storage • At least 2 GB internal memory • At least 1 GB removable SD card Interfaces • RS232 • USB • Bluetooth • WLAN Weight • Not more than 7.7 kg with internal battery Internal Software and Applications • Workflow, data and coordinate system management • Data import and export • Support for ASCII, DXF, LandXML user files • Working with point clouds • Full map view within data management		olish • Nuqtaga boglangan fotosuratlar olish imkoniyati • DXF fayllarni 3D korinishda yuklash • 3D rejimda ishlash: nuqtalar buluti, o'lchangan malumotlar, DXF fayllar va 3D modellar bilan ishlash Interfeys tillari • Rus • Ingliz • boshqa tillar Joyiga chiqarish funksiyalari • Nuqtalar boyicha joyiga chiqarish • Raqamli relyef modeli boyicha joyiga chiqarish • Turli usullar yordamida nuqtaga otish • Sifat nazorati • Yuzalar va hajmlarni o'lchash hamda hisoblash Ishlash harorat diapazoni • -20 °C dan +50 °C gacha Chang va namlikdan himoya • IP65 Qiya yomgirga chidamlilik: MIL-STD-810G standartiga mos Namlik 95% gacha, kondensatsiya hosil bolmasdan
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		and applications • Viewing DXF files as background images and project data • Integration with GNSS systems • Real-time graphical display of results • Selecting points via the map • Electronic sketch (field sketch) capability • Drawing on photos, drawing in notebook, screenshot capture • Built-in codes and creation of new codes • Sorting coded data by layers • Changing codes without switching windows • Working with multiple codes simultaneously • Support for point clouds from laser scanners and scanning total stations • Video streaming from the total station camera • Ability to capture photos linked to points • Loading DXF files in 3D view • Working in 3D mode with point clouds, measured data, DXF files and 3D models Interface Languages • Russian • English • Other languages Stake-Out Functions • Stake-out by points • Stake-out using Digital Terrain Model (DTM) • Multiple stake-out methods for points • Quality control • Surface and volume measurement and calculation Operating Temperature Range • From –20 °C to +50 °C Dust and Water Protection		
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		• IP65 protection rating • Resistant to slanting rain according to MIL-STD-810G Humidity • Up to 95%, without condensation			
5	Requirements for Supervised Installation and Commissioning Works	After delivery of the Equipment Set, the Contractor's technical specialist, whose qualification is confirmed by an official certificate issued by the manufacturer, shall visit the Customer's site and perform the following works: - installation of the Equipment Set; - commissioning and adjustment; - verification of the main technical and metrological parameters of the equipment; - configuration and commissioning of the software; - provision of practical instruction to the Customer's personnel. During commissioning, the technical and accuracy parameters specified in Clause 4.1 shall be practically demonstrated and confirmed. Upon completion of supervised installation and commissioning works, an Acceptance Certificate shall be executed with the participation of authorized representatives of both the Customer and the Contractor. The Equipment Set shall be deemed commissioned and accepted for operation after successful completion of all tests and signing of the relevant Acceptance Certificate.	5	Shef-montaj va ishga tushirish-sozlash ishlariga qo'yiladigan talablar	Uskunalar majmuasi yetkazib berilgandan so'ng, malakasi ishlab chiqaruvchining rasmiy sertifikati bilan tasdiqlangan Ijrochining texnik mutaxassisi Buyurtmachi hududiga chiqib, quyidagi ishlarni bajarishi shart: - uskunalar majmuasini o'rnatish; - ishga tushirish va sozlash ishlarini amalga oshirish; - uskunaning asosiy texnik va metrologik ko'rsatkichlarini tekshirish; - dasturiy ta'minotni sozlash va ish holatiga keltirish; - Buyurtmachi xodimlariga amaliy ko'rsatma berish. Ishga tushirish jarayonida 4.1-bandda ko'rsatilgan texnik va aniqlik ko'rsatkichlari amalda namoyish etilishi va tasdiqlanishi shart. Shef-montaj va ishga tushirish ishlari yakunlari bo'yicha Buyurtmachi va Ijrochi vakillari ishtirokida qabul-topshirish dalolatnomasi rasmiylashtiriladi. Uskunalar majmuasi barcha sinovlar muvaffaqiyatli yakunlangandan va tegishli dalolatnoma imzolangandan so'ng foydalanishga topshirilgan hisoblanadi.
6	Requirements for Personnel Training	The Contractor shall organize practical training at a foreign metrology institute for at least three (3) specialists of the Customer in the operation, technical	6	Xodimlarni o'qitishga qo'yiladigan talablar	Ijrochi Buyurtmachining kamida 3 (uch) mutaxassisini uskunalar majmuasidan foydalanish, texnik xizmat ko'rsatish, metrologik tekshiruv va kalibrlash ishlarini amalga oshirish bo'yicha

		maintenance, metrological verification, and calibration of the Equipment Set. The training shall meet the following requirements: - The duration of the training shall be at least one (1) month; - The training shall be conducted at the manufacturer's facilities or at an internationally recognized metrology institute; - The training program shall include both theoretical and practical sessions; - The program shall cover metrological traceability, calibration methodology, and measurement uncertainty evaluation; - Upon completion of the training, an official Certificate of Completion shall be issued. The Contractor shall bear all expenses related to the training, including: - tuition fees; - travel expenses; - accommodation costs; - insurance costs. A copy of the issued certificate shall be submitted to the Customer upon completion of the training.			xorijiy metrologiya institutida amaliy o'qitishni tashkil etishi shart. O'qitish quyidagi talablarga javob berishi shart: - O'qitish muddati — kamida 1 (bir) oy; - O'qitish uskunalar majmuasini ishlab chiqaruvchi korxona yoki xalqaro darajada tan olingan metrologiya instituti bazasida o'tkazilishi; - O'quv dasturi nazariy va amaliy mashg'ulotlarni o'z ichiga olishi; - Metrologik kuzatuvchanlik, kalibrlash metodikasi va o'lchash noaniqligini baholash masalalarini qamrab olishi; - O'qitish yakunida rasmiy sertifikat (Certificate of Completion) berilishi. Ijrochi o'qitish bilan bog'liq barcha xarajatlarni, jumladan: - o'quv to'lovlari; - yo'l xarajatlari; - yashash xarajatlari; - sug'urta xarajatlari to'liq qoplash majburiyatini oladi. O'qitish yakunlangandan so'ng berilgan sertifikat nusxasi Buyurtmachiga taqdim etilishi shart.
7	Documentation Supplied with the Equipment Set and the Required Quantity of Consumables	For the Equipment Set and the auxiliary equipment supplied therewith, the following shall be provided: a copy of the certificate of origin, a copy of the quality certificate, a certificate of conformity, operation manuals in Russian (or English), as well as other consumables necessary for the normal operation of the device.	7	Uskunalar majmuasi bilan birga topshiriladigan hujjatlar va zarur miqdordagi sarf materiallari	Uskunalar majmuasi va unga birga yetkazib beriladigan yordamchi jihozlar uchun kelib chiqish sertifikati nusxasi, sifat sertifikati (quality certificate) nusxasi, muvofiqlik sertifikati, rus (yoki ingliz) tilidagi foydalanish qo'llanmalari hamda qurilmaning normal ishlashi uchun zarur bo'lgan boshqa sarf materiallari taqdim etilishi lozim.
8	Service Life	Not less than 10 years	8	Xizmat muddati	Kamida 10 yil
Subsection 4.2 Reliability requirements			4.2-kichik bo'lim. Ishonchlilik talablari		
The Equipment Set shall ensure stable and uninterrupted operation throughout			Uskunalar majmuasi ishlab chiqaruvchining texnik hujjatlarida ko'rsatilgan		

its entire specified service life, provided that the operating conditions specified in the manufacturer's technical documentation are observed.

4.2.1. Reliability Indicators

- The average service life of the Equipment Set shall be not less than 10 years.
- The Mean Time Between Failures (MTBF) shall be confirmed by the manufacturer's technical documentation.
- The Equipment Set shall be capable of operating continuously for at least 8 hours in nominal operating mode.
- The main measurement and metrological parameters shall not exceed the accuracy limits specified by the manufacturer during the warranty period.
- The Equipment Set shall be serviceable by design and allow modular repair.

4.2.2. Service and Technical Support

The Contractor shall ensure the following:

- Availability of an official service center within the territory of the Republic of Uzbekistan or a certified service engineer authorized by the manufacturer.
- From the date of receipt of a fault notification:
 - o remote technical response time shall not exceed 72 hours;
 - o on-site diagnostic visit shall not exceed 5 working days.
- Delivery time for spare parts and components shall not exceed 30 calendar days.
- In the event of discontinuation of production, availability of spare parts shall be guaranteed for at least 10 years.

4.2.3. Warranty Obligations

- The warranty period shall be not less than 12 months from the date of commissioning.
- Defects identified during the warranty period shall be eliminated within no more than 45 calendar days.
- If the repair period exceeds 45 days, the Contractor shall provide a temporary replacement Equipment Set for the duration of repair or, upon agreement with the Customer, replace the unit entirely.
- During the warranty period, all spare parts, service works, and transportation costs shall be borne by the Contractor.

4.2.4. Technical Maintenance

The Contractor shall:

- Provide free technical maintenance during the warranty period;
- Provide a preventive maintenance schedule;

ekspluatatsiya sharoitlariga rioya qilingan holda butun normativ xizmat muddati davomida barqaror va uzluksiz ishlashni ta'minlashi shart.

4.2.1. Ishonchlilik ko'rsatkichlari

- Uskunalar majmuasining o'rtacha xizmat muddati — kamida 10 yil.
- O'rtacha nosozliklar orasidagi vaqt (MTBF — Mean Time Between Failures) — MTBF ishlab chiqaruvchining texnik hujjatlari bilan tasdiqlangan bo'lishi shart.
- Uskunalar majmuasi uzluksiz kamida 8 soat davomida nominal ish rejimida ishlash imkoniyatiga ega bo'lishi shart.
- Asosiy o'lchash va metrologik parametrlar kafolat muddati davomida ishlab chiqaruvchi tomonidan belgilangan aniqlik chegaralaridan chiqmasligi shart.
- Uskunalar majmuasi konstruktiv jihatdan servisga yaroqli va modul tamoyilida ta'mirlash imkoniyatiga ega bo'lishi shart.

4.2.2. Servis va texnik qo'llab-quvvatlash

Ijrochi quyidagilarni ta'minlashi shart:

- O'zbekiston Respublikasi hududida rasmiy servis markazi yoki ishlab chiqaruvchi tomonidan vakolat berilgan sertifikatlangan servis muhandisining mavjudligi.
- Nosozlik yuzasidan murojaat qabul qilingan kundan boshlab:
 - o masofaviy texnik javob berish muddati — 72 soatdan oshmasligi;
 - o joyiga chiqib diagnostika qilish muddati — 5 ish kunidan oshmasligi.
- Ehtiyot qismlar va butlovchi qismlarni yetkazib berish muddati — 30 kalendar kundan oshmasligi.
- Qurilma ishlab chiqarilishi to'xtatilgan taqdirda ham ehtiyot qismlar bilan ta'minlash muddati — kamida 10 yil kafolatlanishi shart.

4.2.3. Kafolat majburiyatlari

- Kafolat muddati — foydalanishga topshirilgan kundan boshlab kamida 12 oy.
- Kafolat davrida aniqlangan nosozliklar 45 kalendar kundan kechiktirmay bartaraf etilishi shart.
- Agar ta'mirlash muddati 45 kundan oshsa, Ijrochi ta'mirlash muddati davomida muqobil uskunalar majmuasini vaqtinchalik foydalanish uchun taqdim etishi shart yoki Buyurtmachi bilan kelishilgan holda qurilmani to'liq almashtirishi shart.
- Kafolat davrida barcha ehtiyot qismlar, servis ishlari va transport xarajatlari Ijrochi tomonidan qoplanadi.

4.2.4. Texnik xizmat ko'rsatish

Ijrochi:

- Kafolat davrida bepul texnik xizmat ko'rsatishi shart;
- Profilaktik texnik xizmat ko'rsatish jadvalini taqdim etishi shart;
- Metrologik xizmat ko'rsatish va qayta kalibrlash davriyligi bo'yicha yozma tavsiyalar berishi shart;

- Provide written recommendations regarding the periodicity of metrological maintenance and recalibration; Specify the recommended interval for calibration and verification activities.	Kalibrlash va verifikatsiya ishlari uchun tavsiya etilgan intervalni ko'rsatishi shart.
Subsection 4.3 Requirements for stability and parameters under the influence of environmental factors	4.3-kichik bo'lim. Tashqi muhit omillariga ta'sir qilish sharoitida barqarorlik va parametrlar talablar
In accordance with the manufacturer's design documentation as agreed with the Customer.	Buyurtmachi bilan kelishilgan ishlab chiqaruvchining loyiha hujjatlariga muvofiq.
Subsection 4.4 Marking Requirements	4.4-kichik bo'lim. Markirovka talablari
The Equipment Set and all its components shall be marked in compliance with the applicable technical regulations of the Republic of Uzbekistan, as well as relevant national and international standards. The marking shall be clear, durable, indelible, and resistant to mechanical and climatic influences throughout the entire service life of the equipment. Each main measuring unit (GNSS receiver, robotic electronic total station, and laser tracker) shall bear a permanent marking plate or equivalent identification containing at least the following information: - Full name and model of the device; - Name and legal address of the manufacturer; - Factory (serial) number; - Date of manufacture (month and year); - Country of origin; - Electrical supply parameters (where applicable); - Conformity marking (where required by legislation); - Ingress protection rating (IP rating), where applicable. The marking information shall fully correspond to the identification data specified in the equipment passport, technical documentation, and calibration certificates supplied with the Equipment Set. Where licensed software is included in the Equipment Set, the identification details of the software (version, license type, activation key or serial number) shall be specified in the relevant documentation. Transport packaging shall contain appropriate handling symbols and markings (e.g., "This Side Up", "Fragile", "Keep Dry", etc.) in accordance with applicable transport regulations. All marking and identification elements shall remain legible and intact for the entire specified service life of the Equipment Set.	Uskunalar majmuasi va uning tarkibiy qismlariga qo'yiladigan markirovka amaldagi O'zbekiston Respublikasi texnik jihatdan tartibga solish to'g'risidagi qonunchiligi hamda tegishli milliy va xalqaro standartlar talablariga muvofiq bo'lishi shart. Markirovka aniq, o'chmaydigan, mexanik va iqlimiy ta'sirlarga chidamli usulda bajarilgan bo'lishi lozim. Har bir asosiy o'lchash qurilmasida (GNSS qabul qilgichi, robotlashtirilgan elektron total stansiya, lazerli treker) quyidagi ma'lumotlar ko'rsatilgan bo'lishi shart: - qurilmaning to'liq nomi va modeli; - ishlab chiqaruvchining nomi va yuridik manzili; - zavod (seriya) raqami; - ishlab chiqarilgan sanasi (oy va yil); - ishlab chiqarilgan mamlakat; - elektr ta'minoti parametrlari (zarur hollarda); - muvofiqlik belgisi (agar qonunchilikda talab etilsa); - IP himoya darajasi (mavjud bo'lsa). Markirovka ma'lumotlari yetkazib berilgan qurilmaning texnik hujjatlari, pasporti va kalibrlash sertifikatlarida ko'rsatilgan identifikatsion ma'lumotlarga to'liq mos bo'lishi shart. Agar uskunalar majmuasi tarkibida dasturiy ta'minot litsenziyalari mavjud bo'lsa, ularning identifikatsion ma'lumotlari (versiya, litsenziya turi, aktivatsiya kodi yoki seriya raqami) tegishli hujjatlarda aks ettirilgan bo'lishi lozim. Transport qadoqlarida yuklash-tushirish belgilarining (yuqoriga yo'naltirish belgisi, namlikdan saqlash belgisi, ehtiyotkorlik bilan tashish belgisi va boshqalar) mavjudligi ta'minlanishi shart. Markirovka va identifikatsiya elementlari qurilmaning butun xizmat muddati davomida saqlanib qoladigan darajada mustahkam bo'lishi lozim.
Subsection 4.5 Dimensional and Packaging Requirements	4.5-kichik bo'lim. O'lcham va qadoqlash talablari
The Equipment Set shall be delivered in packaging that ensures its integrity and safety during transportation, loading, unloading, and handling operations. The type and method of packaging shall be determined by the Contractor;	Uskunalar majmuasi tashish, yuklash-tushirish hamda ko'chirish jarayonida uning butligi va saqlanishini ta'minlaydigan qadoqda yetkazib berilishi shart. Qadoqlash turi va usuli Ijrochi tomonidan mustaqil ravishda belgilanadi, biroq

however, the delivered Equipment Set shall be complete, undamaged, and fully operational. The Contractor shall bear full responsibility for any damage or defects occurring prior to the signing of the Acceptance Certificate.	yetkazib berilgan Uskunalar majmuasi to'liq, shikastlanmagan va ishga yaroqli holatda bo'lishi shart. Uskunalar majmuasi qabul-topshirish dalolatnomasi imzolangan qadar yuzaga kelgan har qanday shikastlanish yoki nuqsonlar uchun javobgarlik Ijrochi zimmasida bo'ladi.
SECTION 5. REQUIREMENTS FOR THE DELIVERY AND ACCEPTANCE RULES	5-BO'LIM. YETKAZIB BERISH VA QABUL QILISH QOIDALARIGA QO'YILADIGAN TALABLAR
Subsection 5.1 Delivery and acceptance procedure	5.1-kichik bo'lim. Qabul qilish va topshirish tartibi
Acceptance of the Equipment Set shall be carried out in terms of quantity, completeness, technical specifications, and functional capabilities. 5.1.1. Initial Acceptance (Upon Delivery) The Customer shall verify the following: - integrity of the packaging; - compliance of the configuration with Section 4; - factory marking and serial number; - completeness of documentation; - absence of external mechanical damage. Based on the results, an Acceptance Certificate shall be executed. 5.1.2. Post-Installation Acceptance After completion of installation and commissioning works, the following checks shall be performed: - Testing the accuracy of the GNSS receiver in static and RTK modes; - Verification of angular and distance measurement accuracy of the robotic total station; - Verification of the volumetric accuracy parameters of the laser tracker as specified by the manufacturer; - Testing of all communication interfaces (radio, GSM, Bluetooth, WLAN); - Verification of software functionality (import/export, 3D visualization, calculation modules); - Verification of calibration certificates and metrological traceability documentation; - Continuous operation test for at least 8 hours in test mode. Test results shall be documented in the Acceptance Certificate. 5.1.3. Acceptance Tests Acceptance tests shall include: - performing measurements on reference samples; - comparing measurement results with the accuracy limits specified by the manufacturer; - verifying the stability of results during repeated measurements; - verifying continuous operation for at least 8 hours in test mode.	Uskunalar majmuasini qabul qilish miqdori, komplektatsiyasi, texnik tavsiflari va funksional imkoniyatlari bo'yicha amalga oshiriladi. 5.1.1. Birlamchi qabul qilish (yetkazib berilganda) - Buyurtmachi quyidagilarni tekshiradi: - qadoq butligi; - komplektatsiyaning 4-bo'limga muvofiqligi; - zavod markirovkasi va seriya raqami; - hujjatlar to'liqligi; - tashqi mexanik shikastlanishlarning mavjud emasligi. - Natija bo'yicha qabul qilish dalolatnomasi rasmiylashtiriladi. 5.1.2. Montajdan keyingi qabul qilish Montaj va ishga tushirish-sozlash ishlari yakunlangandan so'ng quyidagi tekshiruvlar amalga oshirilishi shart: GNSS qabul qilgichining statik va RTK rejimdagi aniqlik ko'rsatkichlarini sinovdan o'tkazish; Robotlashtirilgan total stansiyaning burchak va masofa o'lchash aniqligini tekshirish; Laser trekerning ishlab chiqaruvchi tomonidan belgilangan volumetrik aniqlik ko'rsatkichlarini tekshirish; Barcha aloqa interfeyslarining (radio, GSM, Bluetooth, WLAN) ishlashini sinovdan o'tkazish; Dasturiy ta'minot funksionalligini tekshirish (import/eksport, 3D vizualizatsiya, hisoblash modullari); Kalibrlash sertifikatlari va metrologik kuzatuvchanlik hujjatlarini tekshirish; Uzluksiz kamida 8 soatlik test rejimida ishlashini sinovdan o'tkazish. Sinov natijalari qabul-topshirish dalolatnomasi bilan rasmiylashtiriladi. 5.1.3. Qabul-topshirish sinovlari - Qabul-topshirish sinovlari quyidagilarni o'z ichiga oladi: - Nazorat namunalari o'lchash o'tkazish; - O'lchash natijalarini ishlab chiqaruvchi ko'rsatgan aniqlik chegaralari bilan solishtirish; - Takroriy o'lchashlarda natijalarning barqarorligini tekshirish; - Kamida 8 soatlik uzluksiz sinov rejimida ishlashini tekshirish.

- Test results shall be formalized in an official report. 5.1.4. Rejection Criteria The Equipment Set shall not be accepted in the following cases: - if the technical specifications do not comply with the requirements of Section 4; - if metrological characteristics exceed the specified accuracy limits; - if the configuration is incomplete; - if persistent operational malfunctions are detected. 5.1.5. Final Acceptance The Equipment Set shall be deemed accepted after the following conditions are fulfilled: - installation and adjustment works are completed; - acceptance tests are successfully passed; - the Customer's personnel have been trained; the completion certificate has been signed.	- Sinov natijalari dalolatnoma bilan rasmiylashtiriladi. 5.1.4. Rad etish mezonlari - Quyidagi holatlarda Uskunalar majmuasi qabul qilinmaydi: - Texnik tavsiflar 4-bo'lim talablariga mos kelmasa; - Metrologik ko'rsatkichlar belgilangan aniqlikdan chiqsa; - Komplektatsiya to'liq bo'lmasa; - Ishlashda barqaror nosozliklar aniqlansa. 5.1.5. Yakuniy qabul qilish - Uskunalar majmuasi quyidagi shartlar bajarilgandan so'ng qabul qilingan hisoblanadi: - Montaj va sozlash ishlari yakunlangan; - Qabul-topshirish sinovlari muvaffaqiyatli o'tkazilgan; - Buyurtmachi xodimlari o'qitilgan; - Bajarilgan ishlar dalolatnomasi imzolangan.
Subsection 5.2. Requirements for the Transfer of Technical and Other Documentation to the Customer upon Equipment Set Delivery	5.2-kichik bo'lim. Uskunalar majmuasini yetkazib berishda buyurtmachiga texnik va boshqa hujjatlarni topshirish talablari
5.2.1. Operational documentation related to the Equipment Set shall be provided to the Customer in two languages — English and Russian — and shall include the following: - Equipment Set passport; - Certificate of origin of the Equipment Set; - Quality certificate; - Installation and adjustment instructions for the Equipment Set; - Operation, maintenance, and repair manual; - Recommendations on the list of minimum spare parts, special tools, and components required for maintenance and repair; - Schedule, scope, and periodicity of maintenance and repair; - Calibration methodology of the Equipment Set; - The calibration certificate shall indicate the serial number of the Equipment Set, calibration date, measurement results, uncertainty values, and the traceability chain; - The Contractor shall provide the Customer with all necessary technical information and requirements for preparing the laboratory premises for installation of the delivered Equipment Set, including: installation layout, utility connection diagrams, recommended placement plan of the Equipment Set, foundation load diagram, foundation requirements, and any other technical data necessary for installation.	5.2.1 Buyurtmachiga Uskunalar majmuasiga oid ekspluatatsion hujjatlar ikki tilda — ingliz va rus tillarida quyidagi tarkibda taqdim etiladi: - Uskunalar majmuasining pasporti; - Uskunalar majmuasining kelib chiqish sertifikat; - Sifat sertifikat; - Uskunalar majmuasini montaj qilish va sozlash bo'yicha yo'riqnoma; - Uskunalar majmuasidan foydalanish, texnik xizmat ko'rsatish va ta'mirlash bo'yicha qo'llanma; - Texnik xizmat ko'rsatish va ta'mirlash uchun zarur minimal ehtiyot qismlar, maxsus asboblardan va butlovchi qismlar ro'yxati bo'yicha tavsiyalar; - Ta'mirlash va texnik xizmat ko'rsatishning davriyligi, hajmi va jadvali; - Uskunalar majmuasining kalibrlash metodikasi; - Kalibrlash sertifikatida Uskunalar majmuasining seriya raqami, kalibrlash sanasi, o'lchash natijalari, noaniqlik ko'rsatkichlari hamda metralogik kuzatuvchanlik (traceability) zanjiri ko'rsatilgan bo'lishi shart. - Ijrochi Buyurtmachiga yetkazib berilayotgan Uskunalar majmuasini o'rnatish uchun laboratoriya xonasini tayyorlashga oid barcha zarur texnik ma'lumotlar va talablarni taqdim etishi shart, jumladan: montaj sxemasi, kommunikatsiyalar sxemasi, Uskunalar majmuasini joylashtirishning tavsiya etilgan rejasi, poydevorga tushadigan yuklamalar sxemasi, poydevorga qo'yiladigan talablar hamda yetkazib berilayotgan Uskunalar majmuasini o'rnatish uchun zarur bo'lgan boshqa texnik ma'lumotlar.

5.2.2. A factory calibration certificate and/or a calibration certificate bearing the CIPM MRA logo (issued by national metrology institutes) shall be provided. The calibration certificate shall be issued by a laboratory accredited in accordance with ISO/IEC 17025. 5.2.3. The Contractor shall provide the Customer with complete operational documentation for all supplied components, along with copies of the relevant certificates. The calibration date shall not exceed six (6) months prior to the delivery date of the Equipment Set. Certificates and documentation related to the components shall specify their brand, model, and identification details. All submitted documents shall correspond to the factory serial number of the delivered Equipment Set. 5.2.4. All the above-mentioned documents shall be provided by the Contractor in one (1) hard copy and one (1) electronic copy. Electronic versions shall be in PDF format. If the above-mentioned documents are not provided in full, the Equipment Set shall not be accepted.	5.2.2 Ishlab chiqaruvchi kalibrlash sertifikatini va/yoki CIPM MRA logotipiga ega kalibrlash sertifikatini (milliy metrologiya institutlari tomonidan berilgan kalibrlash sertifikatini). Kalibrlash sertifikatini ISO/IEC 17025 standarti talablariga muvofiq akkreditatsiyadan o'tgan laboratoriya tomonidan berilgan bo'lishi shart. 5.2.3 Ijrochi tomonidan Buyurtmachiga barcha butlovchi qismlar bo'yicha to'liq ekspluatatsion hujjatlar (Kalibrlash sanasi Uskunalar majmuasini yetkazib berish sanasidan oldingi 6 oydan oshmasligi shart) va sertifikatlar nusxalari topshiriladi. Butlovchi qismlarga taalluqli sertifikatlar va hujjatlarda ularning markasi, modeli va identifikatsiya ma'lumotlari ko'rsatilgan bo'lishi shart. Taqdim etilgan barcha hujjatlar yetkazib berilayotgan Uskunalar majmuasining zavod seriya raqamiga mos bo'lishi shart. 5.2.4 Yuqorida ko'rsatilgan barcha hujjatlar Ijrochi tomonidan qog'oz va elektron shaklda 1 ta nusxadan taqdim etiladi. Elektron versiyalar PDF formatida bo'lishi shart. Yuqorida ko'rsatilgan hujjatlar to'liq taqdim etilmagan taqdirda Uskunalar majmuasi qabul qilinmaydi.
SECTION 6. TRANSPORTATION REQUIREMENTS	6-BO'LIM. TASHISHGA TAALUQLI TALABLAR
Transportation shall be carried out by any type of transport in accordance with the applicable regulatory documents governing that mode of transport. During transportation and loading/unloading operations, protection against mechanical and climatic damage shall be ensured, and safety requirements as well as guarantees of cargo integrity and preservation shall be observed. The Equipment Set shall be delivered to the Customer's address, and full responsibility for its integrity and safekeeping shall remain with the Contractor until the Acceptance Certificate is signed.	Tashish har qanday transport turi orqali ushbu transport turiga nisbatan amal qiluvchi normativ hujjatlarga muvofiq amalga oshirilishi lozim, bunda tashish hamda yuklash-tushirish jarayonida mexanik va iqlimiy shikastlanishlardan himoya qilish, xavfsizlik talablari hamda yukning butligi va saqlanishini ta'minlash kafolatlari hisobga olinishi shart. Uskunalar majmuasi Buyurtmachining manziliga yetkazilib, qabul qilish dalolatnomasi imzolangan qadar uning butligi va saqlanishi uchun to'liq javobgarlik Ijrochi zimmasida bo'ladi.
SECTION 7. STORAGE REQUIREMENTS	7-BO'LIM. SAQLASHGA TAALUQLI TALABLAR
In accordance with the manufacturer's specifications.	Ishlab chiqaruvchining texnik hujjatlariga muvofiq.
SECTION 8. REQUIREMENTS FOR THE SCOPE AND/OR DURATION OF GUARANTEES	8-BO'LIM. KAFOLAT MUDDATI VA SHARTLARIGA QO'YILADIGAN TALABLAR
The warranty period shall be not less than 12 months from the date of signing the Acceptance Certificate for the Equipment Set. The warranty period shall be calculated from the date of signing the Acceptance Certificate. The warranty shall cover all major assemblies of the Equipment Set, including the optical system, electronic units, and software. During the warranty period, the costs of repair, spare parts, components, and necessary transportation shall be borne by the Contractor.	Kafolat muddati Uskunalar majmuasi qabul-topshirish dalolatnomasi imzolangan kundan boshlab kamida 12 oy bo'lishi shart. Kafolat muddati Uskunalar majmuasi qabul-topshirish dalolatnomasi imzolangan kundan boshlab hisoblanadi. Kafolat Uskunalar majmuasining barcha asosiy uzellari, optik tizimi, elektron bloklari va dasturiy ta'minotini qamrab olishi shart. Kafolat muddati davomida ta'mirlash, ehtiyot qismlar, butlovchi qismlar va zarur transport xarajatlari Ijrochi zimmasida bo'ladi.

If the same defect occurs three times during the warranty period, the Equipment Set shall be replaced with a new one. The response time to a defect notification shall not exceed five (5) working days. During the warranty period, in the event of defects not caused by the user, the Contractor shall repair or replace the defective Equipment Set within no more than 45 days from the date of receipt of the Customer's notification.	Agar kafolat muddati davomida bir xil nosozlik uch marta takrorlansa, Uskunalar majmuasi yangisiga almashtirilishi lozim. Nosozlik to'g'risidagi xabarnomaga javob berish muddati 5 ish kunidan oshmasligi shart. Kafolat muddati davomida, foydalanuvchi aybi bilan bog'liq bo'lmagan nosozliklar yuzaga kelgan taqdirda, Ijrochi Buyurtmachining xabarnomasini olgan kundan boshlab 45 kundan kechiktirmay nosoz Uskunalar majmuasini ta'mirlashi yoki almashtirishi shart.
SECTION 9. MAINTAINABILITY REQUIREMENTS	9-BO'LIM. TA'MIRLASH VA TEXNIK XIZMAT KO'RSATISHGA, YAROQLILIKKA QO'YILADIGAN TALABLAR
The Equipment Set and its components shall be maintainable under operating conditions.	Uskunalar majmuasi va uning tarkibiy qismlari ekspluatatsiya sharoitida ta'mirlashga yaroqli bo'lishi shart.
SECTION 10. SERVICE REQUIREMENTS	10-BO'LIM. XIZMAT KO'RSATISH TALABLARI
Subsection 10.1. Maintenance Requirements	10.1-kichik bo'lim. Texnik xizmat ko'rsatish talablari
Technical maintenance of the Equipment Set shall be carried out in accordance with the manufacturer's technical documentation.	Uskunalar majmuasiga texnik xizmat ko'rsatish ishlab chiqaruvchining texnik hujjatlariga muvofiq amalga oshirilishi shart.
Subsection 10.2. Services and Support Requirements	10.2-bo'lim. Servis va qo'llab quvvatlash talablari
During the warranty period, in the event of defects not caused by the user, the Contractor shall provide service free of charge. Remote technical consultation and diagnostic support for the Equipment Set shall be ensured. During the warranty period, software updates (if available) shall be provided free of charge. Warranty and service support shall be performed free of charge within the territory of the Republic of Uzbekistan by an official service center or an authorized representative of the manufacturer/supplier.	Kafolat muddati davomida Uskunalar majmuasida foydalanuvchi aybi bilan bog'liq bo'lmagan nosozliklar yuzaga kelgan taqdirda, Ijrochi servis xizmatini bepul asosda amalga oshirishi shart. Uskunalar majmuasi bo'yicha masofaviy texnik maslahat va diagnostika imkoniyati ta'minlanishi lozim. Kafolat muddati davomida dasturiy ta'minot yangilanishlari bepul taqdim etilishi shart (agar mavjud bo'lsa). Kafolat va servis xizmati O'zbekiston Respublikasi hududida joylashgan rasmiy servis markazi yoki ishlab chiqaruvchi/yetkazib beruvchining vakili tomonidan bepul asosda bajarilishi lozim.
SECTION 11. ENVIRONMENTAL AND SANITARY REQUIREMENTS	11-BO'LIM. EKOLOGIK VA SANITARIYA TALABLAR
The Equipment Set shall comply with the applicable environmental and sanitary regulations in force in the Republic of Uzbekistan.	Uskunalar majmuasi O'zbekiston Respublikasida amalda bo'lgan ekologik va sanitariya me'yorlariga muvofiq bo'lishi shart.
SECTION 12. SAFETY REQUIREMENTS	12-BO'LIM. XAVFSIZLIK TALABLARI
The Equipment Set shall ensure the safety of personnel's life and health, the environment, and buildings and structures during operation. 12.1. Electrical and Mechanical Safety 1. The Equipment Set shall comply with applicable national and international electrical safety requirements. 2. The device shall be protected against overvoltage, short circuit, and electric shock.	Uskunalar majmuasi ekspluatatsiya jarayonida xodimlarning hayoti va sog'lig'i, atrof-muhit hamda bino-inshootlar xavfsizligini ta'minlashi shart. 12.1. Elektr va mexanik xavfsizlik 1. Uskunalar majmuasi amaldagi milliy va xalqaro elektr xavfsizligi talablariga muvofiq bo'lishi shart. 2. Qurilma ortiqcha kuchlanish, qisqa tutashuv va elektr zarbasidan himoyalangan bo'lishi shart.

3. The design shall be stable and safe, minimizing the risk of mechanical injury during operation. 12.2. Laser Safety 1. Laser measurement modules shall comply with applicable laser safety standards. 2. The laser safety class shall be specified in the manufacturer's documentation. 3. Laser safety instructions shall be included in the operational documentation. 12.3. Electromagnetic Compatibility 1. The device shall comply with electromagnetic compatibility (EMC) requirements. 2. Radio communication modules shall not cause harmful interference to other equipment. 12.4. Fire Safety 1. The battery and charging system shall comply with fire safety requirements. The materials of the device shall possess properties that minimize fire risk.	3. Konstruksiya barqaror va xavfsiz bo'lib, ekspluatatsiya vaqtida mexanik shikastlanish xavfini minimallashtirishi shart. 12.2. Lazer xavfsizligi 1. Lazerli o'lchash modullari amaldagi lazer xavfsizligi standartlariga muvofiq bo'lishi shart. 2. Lazer xavfsizlik klassi ishlab chiqaruvchi hujjatlarida ko'rsatilgan bo'lishi shart. 3. Lazer bilan ishlash bo'yicha xavfsizlik yo'riqnomasi ekspluatatsion hujjatlarda mavjud bo'lishi shart. 12.3. Elektromagnit moslik 1. Qurilma elektromagnit moslik talablariga muvofiq bo'lishi shart. 2. Radioaloqa modullari boshqa qurilmalar ishiga zararli ta'sir ko'rsatmasligi shart. 12.4. Yong'in xavfsizligi 1. Batareya va zaryadlash tizimi yong'in xavfsizligi talablariga javob berishi shart. Qurilma materiallari yong'in xavfini minimallashtiruvchi xususiyatga ega bo'lishi shart.
SECTION 13. QUALITY AND CLASSIFICATION REQUIREMENTS The Equipment Set shall be newly manufactured, unused, not refurbished, and produced in accordance with the manufacturer's approved technical documentation. The manufacturer of the Equipment Set shall operate a quality management system certified in compliance with the current version of ISO 9001, and a valid certificate issued by an accredited certification body shall be provided upon request. The Equipment Set, as measuring equipment, shall have a defined accuracy class and/or technical classification established by the manufacturer. The declared metrological and technical characteristics shall be confirmed by official technical documentation and calibration certificates. Calibration of the Equipment Set shall be performed by a laboratory accredited in accordance with ISO/IEC 17025, and the calibration certificate shall confirm measurement results, associated uncertainty values, and traceability to national or international measurement standards. The quality and classification of the Equipment Set shall be confirmed by the following documents: - Equipment passport (or equivalent manufacturer's document); - Certificate of conformity (where applicable); - Calibration certificate;	13-BO'LIM. SIFAT VA TASNIFGA QO'YILADIGAN TALABLAR Uskunalar majmuasi ishlab chiqaruvchining tasdiqlangan texnik hujjatlariga muvofiq ishlab chiqarilgan, yangi, foydalanilmagan va qayta tiklanmagan bo'lishi shart. Uskunalar majmuasini ishlab chiqaruvchi korxonada sifat menejmenti tizimi joriy etilgan bo'lishi hamda u amaldagi ISO 9001 standarti talablariga muvofiqligi bilan tasdiqlangan bo'lishi lozim. Uskunalar majmuasi o'lchash vositasi sifatida ishlab chiqaruvchi tomonidan belgilangan aniqlik sinfi yoki texnik toifaga ega bo'lishi hamda ushbu ko'rsatkichlar rasmiy texnik hujjatlar va kalibrlash sertifikatlari bilan tasdiqlanishi shart. Kalibrlash ishlari ISO/IEC 17025 standarti talablariga muvofiq akkreditatsiyadan o'tgan laboratoriya tomonidan amalga oshirilgan bo'lishi lozim. Uskunalar majmuasining sifati va tasnifi quyidagi hujjatlar bilan tasdiqlanadi: - uskunaning pasporti; - muvofiqlik sertifikati (mavjud bo'lsa); - kalibrlash sertifikati; ishlab chiqaruvchining texnik tavsif hujjatlari.

Official technical specifications issued by the manufacturer.	
SECTION 14. Requirements for Quantity, Completeness, Place and Delivery Time (Periodicity)	14-BO'LIM. Yetkazib berish miqdori, komplektatsiyasi, joyi va muddati (davriyligi)ga qo'yiladigan talablar
Quantity — 1 (one) complete set. Delivery terms: DDP, Tashkent. Delivery time: within 90 calendar days from the date of advance payment or opening of a letter of credit. The Equipment Set to be supplied shall comply with the complete configuration specified in Section 4 of this Technical Specification. Delivery of the Equipment Set shall be carried out to the following address: SE "UzNIM", Republic of Uzbekistan, 100174, Tashkent city, Almazar district, Farobiy Street 333 B. Phone: +998 78 150 26 03 Fax: +998 78 150 26 06 E-mail: info@nim.uz Website: www.nim.uz	Miqdori — 1 (bir) komplekt. Yetkazib berish shartlari: DDP, Toshkent shahri. Yetkazib berish muddati: oldindan to'lov amalga oshirilgan yoki akkreditiv ochilgan kundan boshlab 90 kalendar kuni ichida. Yetkazib berilishi lozim bo'lgan Uskunalar majmuasi mazkur Texnik topshiriqning 4-bo'limida keltirilgan to'liq komplektatsiyaga muvofiq bo'lishi shart. Uskunalar majmuasini yetkazib berish quyidagi manzil bo'yicha amalga oshiriladi: «O'zNIM» DM, O'zbekiston Respublikasi, 100174, Toshkent shahri, Olmazor tumani, Farobiy ko'chasi, 333 B. Telefon: +998 78 150 26 03 Faks: +998 78 150 26 06 E-mail: info@nim.uz Veb-sayt: www.nim.uz
SECTION 15. Requirements for Additional Services Related to the Delivery of the Equipment Set.	15-BO'LIM. Uskunalar majmuasini yetkazib berishda qo'shimcha xizmatlarga qo'yiladigan talablar
Subsection 15.1 Manufacturing and Inspection Requirements	Kichik bo'lim 15.1 Ishlab chiqarish va inspeksiya talablari
The manufacturer shall conduct factory acceptance tests (FAT), and the relevant documentation confirming the results shall be provided. The Equipment Set shall be manufactured under factory conditions in accordance with the manufacturer's normative and technical documentation (NTD) and design documentation (DD).	Ishlab chiqaruvchi tomonidan zavod sinovlari o'tkazilgan bo'lishi va bu haqda tegishli hujjat taqdim etilishi lozim. Uskunalar majmuasini ishlab chiqarish zavod sharoitida, ishlab chiqaruvchi zavodning normativ-texnik hujjatlari (NTH) va konstruktorlik hujjatlariga (KH) muvofiq amalga oshirilishi shart.
Subsection 15.2 Supervision of Installation Requirements	Kichik bo'lim 15.2 Shef-montaj talablari
The Contractor shall carry out the installation, commissioning, and adjustment of the equipment complex at the Customer's site with the participation of a qualified specialist authorized by the manufacturer. Supervised Installation (Supervisory Commissioning) shall include: • installation and configuration of the equipment; • configuration of the software; • on-site verification of the main technical and metrological parameters; • testing of communication channels and interfaces; • provision of practical instructions for operation and use. Upon completion of the supervised installation, an acceptance report (completion certificate) shall be prepared and signed by both parties. All expenses related to the supervised installation works shall be borne by the Contractor.	Ijrochi uskunalar majmuasini Buyurtmachi hududida o'rnatish, ishga tushirish va sozlash ishlarini ishlab chiqaruvchi tomonidan vakolat berilgan malakali mutaxassis ishtirokida amalga oshirishi shart. Shef-montaj ishlari quyidagilarni o'z ichiga olishi shart: • uskunani o'rnatish va konfiguratsiya qilish; • dasturiy ta'minotni sozlash; • asosiy texnik va metrologik ko'rsatkichlarni joyida tekshirish; • aloqa va interfeyslarning ishlashini sinovdan o'tkazish; • foydalanish bo'yicha amaliy ko'rsatma berish. Shef-montaj ishlari yakunlari bo'yicha tomonlar tomonidan dalolatnoma rasmiylashtiriladi. Shef-montaj bilan bog'liq barcha xarajatlar Ijrochi zimmasida bo'ladi.

Subsection 15.3 Commissioning Requirements The Contractor shall, upon completion of installation of the Equipment Set, carry out commissioning and adjustment works in full scope. Commissioning and adjustment works shall include the following: 1. Bringing all components of the Equipment Set (GNSS receiver, robotic total station, laser tracker, and control software) into operational condition; 2. Configuration of system parameters in accordance with the manufacturer's recommendations; 3. On-site testing of the main technical and metrological characteristics; 4. Verification of measurement accuracy in accordance with the requirements specified in Clause 4.1; 5. Verification of the full functional performance of the software; 6. Testing of communication channels and interfaces (radio, GSM, Bluetooth, WLAN); 7. Verification of the availability of calibration certificates and documents confirming metrological traceability. Commissioning works shall include verification of continuous operation in test mode for not less than eight (8) hours. Upon completion of commissioning and adjustment works, an Acceptance Certificate shall be executed. All expenses related to commissioning shall be borne by the Contractor.	15.3-bo'lim. Ishga tushirish va sozlashga qo'yiladigan talablar Ijrochi uskunarlar majmuasini o'rnatish yakunlangandan so'ng ishga tushirish va sozlash ishlarini to'liq hajmda amalga oshirishi shart. Ishga tushirish va sozlash ishlari quyidagilarni o'z ichiga olishi shart: 1. Qurilmaning barcha komponentlarini (GNSS qabul qilgichi, robotlashtirilgan total stansiya, lazer treker va boshqaruv dasturi) ishchi holatga keltirish; 2. Tizim parametrlarini ishlab chiqaruvchi tavsiyalariga muvofiq konfiguratsiya qilish; 3. Asosiy texnik va metrologik ko'rsatkichlarni joyida sinovdan o'tkazish; 4. O'lchash aniqligini 4.1-bandda belgilangan talablar asosida tekshirish; 5. Dasturiy ta'minotning to'liq funksional ishlashini tekshirish; 6. Aloqa kanallari va interfeyslarning (radio, GSM, Bluetooth, WLAN) ishlashini sinovdan o'tkazish; 7. Kalibrlash va metrologik kuzatuvchanlik hujjatlarining mavjudligini tekshirish. Ishga tushirish ishlari kamida 8 soatlik sinov rejimida uzluksiz ishlashni tekshirishni o'z ichiga olishi shart. Ishga tushirish va sozlash ishlari yakunlari bo'yicha qabul-topshirish dalolatnomasi rasmiylashtiriladi. Ishga tushirish bilan bog'liq barcha xarajatlar Ijrochi tomonidan qoplanadi.
Subsection 15.4 Requirements for Training of the Customer's Personnel Training of three (3) employees of the Customer shall be provided at leading foreign metrology institutes for a minimum duration of 30 (thirty) calendar days. Hardware Training Scope The hardware training program shall include the following topics: • System description and operating principles • Technical maintenance procedures • Metrological servicing procedures Training Program Requirements The training program shall comprehensively cover: • Operation of the equipment set • Fundamentals of calibration • Technical maintenance procedures • Safety requirements Upon completion of the training, the Customer's personnel shall be issued an official confirming document (certificate or formal statement of completion).	15.4-bo'lim. Buyurtmachi xodimlarini o'qitishga qo'yiladigan talablar Ijrochi Buyurtmachining kamida 3 nafar mutaxassisini uskunarlar majmuasidan foydalanish, texnik xizmat ko'rsatish, metrologik tekshiruv va kalibrlash ishlarini amalga oshirish bo'yicha xorijiy metrologiya institutida amaliy o'qitishni tashkil etishi shart. O'qitish quyidagi talablarga javob berishi shart: • o'qitish muddati — kamida 1 (bir) oy; • o'qitish uskunarlar majmuasini ishlab chiqaruvchi korxona yoki xalqaro darajada tan olingan metrologiya institutida o'tkazilishi; • o'quv dasturi nazariy va amaliy mashg'ulotlarni o'z ichiga olishi; • metrologik kuzatuvchanlik, kalibrlash metodikasi va o'lchash noaniqligini baholash masalalarini qamrab olishi; • o'qitish yakunida rasmiy sertifikat berilishi. Ijrochi o'qitish bilan bog'liq barcha xarajatlarni, jumladan o'quv to'lovlari, yo'l xarajatlari, yashash va sug'urta xarajatlarini to'liq qoplashi shart. O'qitish yakunlangandan so'ng berilgan sertifikat nusxalari Buyurtmachiga taqdim etiladi va qabul-topshirish hujjatlarining ajralmas qismi hisoblanadi.

SECTION 16. REQUIREMENTS FOR THE FORMAT OF SUBMITTED INFORMATION			16-BO'LIM. TAQDIM ETILADIGAN MA'LUMOT SHAKLIGA QO'YILADIGAN TALABLAR		
Textual documentation shall be provided in Russian and/or English in two (2) hard copies and in electronic format.			Matnli ma'lumotlar rus va/yoki ingliz tillarida qog'oz va elektron shaklda (2 nusxada) taqdim etilishi lozim.		
SECTION 17. LIST OF ACCEPTED ABBREVIATIONS			17-BO'LIM. QABUL QILINGAN QISQARTMALAR RO'YXATI		
1	NTD	Normative technical documentation	1	NTH	Normativ-texnik Hujjatlari
2	TK	Terms of reference	2	TT	Texnik Topshiriq
3	CIPM MRA	International Committee for Weights and Measures Mutual Recognition Arrangement	3	CIPM MRA	Og'irliklar va O'lchashlar Xalqaro Qo'mitasi O'zaro Tan olish Shartnomasi
4	BIPM	The International Bureau of Weights and Measures	4	BIPM	Og'irliklar va O'lchashlar Xalqaro Byurosi
5	EAA	Spare parts, tools and accessories	5	EAA	Ehtiyot qismlar, asboblari va aksessuarlar
6	CIP	Carriage and Insurance Paid	6	HT	Hujjatlar To'plami
7	ILAC MRA	International Laboratory Accreditation Organization Mutual Recognition Agreement	7	ILAC MRA	Xalqaro Laboratoriya Akkreditatsiyasi Tashkiloti O'zaro Tan olish Shartnomasi

Developed by:

Specialist of the Department of Measurement of Geometrical and Mechanical Quantities

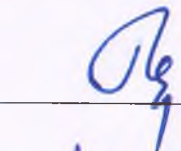
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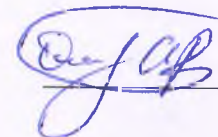
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Ishlab chiquvchi:

Geometrik va mexanik kattaliklarni o'lchash bo'limi mutaxassisi

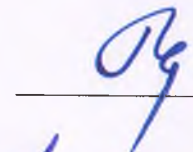
 T. Qazaqov

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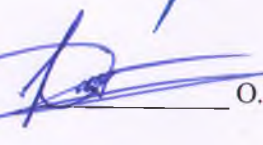
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