

YOM3

JOINT STOCK COMPANY "PRODUCTION ASSOCIATION
«URAL OPTICAL AND MECHANICAL PLANT»
named after E.S. Yalamov»



GEODETIC EQUIPMENT

CATALOGUE



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The Ural Optical and Mechanical Plant named after E.S. Yalamov is one of the largest enterprises of optical branch of Russia and a manufacturer of geodetic instruments, measuring equipment, high-tech medical equipment, energy saving light-diode light equipment.

The geodetic equipment is a traditional direction of the enterprise activity. From the first years of its existence the “Shvabe” company produced several models of levels and range finders. The division for development of geodetic instruments at UOMP is founded in 1956. The Ural Optical and Mechanical Plant gained a large popularity in Russia and abroad owing to its line of classic levels and theodolites and also of modern electronic devices intended for geodetic, land management and cadastral works and also for mapping and monitoring,

Today UOMP keeps its leading positions in Russia in the field of production of theodolites, levels, total stations and also develops a line of high precision satellite geodetic equipment.

JSC “PA “UOMP” is a part of “Shvabe” Holding of “Rostec” State Corporation.

Modern optical instrument engineering



More than **400 employees** in the staff of researchers and developers



Complex of modern high-tech redivisions

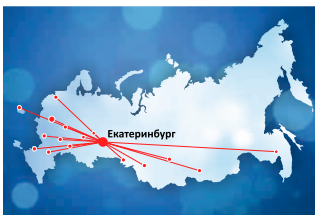


Production of more than **2 000 products** annually



Full cycle of production and assembly of products

Client orientation



Sales, service, information and technical support of clients all over Russia



Export to more than **80 countries** of the world



Representation offices in Germany, Switzerland, China and Belarus



Education of clients. Training courses, seminars, conferences

Guarantee of products quality



Russian and international certificates (CE, SGS, Eurocat)



Quality management system ISO 9001-2001



References of experts

GEODETIK SATELLITE EQUIPMENT



- Modern devices for the whole range of geodetic, land management and cadastral works and also mapping, monitoring and administration of transport
- Presentation of final results in digital format
- Intuitive interface
- High accuracy
- Wide range of maintainable satellite systems
- Ergonomic design
- Lasting operation without recharging



SMR-9

GEODETIC SATELLITE MULTI FREQUENCY EQUIPMENT

The geodetic satellite multi frequency equipment SMR-9 represents a combination of controller and smart-antenna in one compact frame. It is intended for administration of natural and land resources, cadastre, inventory and accounting of production infrastructure objects. It operates as a RTK-rover using GSM-connection.

Advantages

- Wide range of connection modules: Bluetooth, Wi-Fi, GSM
- High accuracy of positioning: up to 6 mm in static mode, up to 20 mm during operation in RTK
- Wide range of maintainable satellite systems: GLONASS, GPS, BEIDOU
- Dust/moisture resistant frame (protection degree IP65), shock proof screen, protection from mechanical damages
- Wide range of operating temperatures: from -20 °C to +60 °C
- Possibility of “hot” replacement of storage battery
- Integrated connector for connection of external antenna
- Ergonomic design, compactness and small weight



MR-8

GEODETIC SATELLITE MULTI FREQUENCY EQUIPMENT

The multi frequency satellite geodetic equipment MR-8 is intended for geodetic surveys, supervision of construction works, high accuracy positioning during creation and development of reference geodetic networks and also for the purposes of cadastre, land management, agriculture, geophysics. It is managed with the help of P-6 controller.

Преимущества

- Wide range of communication modules: GSM, USW, Bluetooth
- High accuracy of positioning: up to 3 mm in static mode, up to 10 mm during operation in RTK
- Wide range of maintainable satellite systems: GLONASS, GPS, BEIDOU, SBAS
- Dust/moisture proof (protection degree IP67), shock resistant frame, protection from mechanical damages
- Wide range of operating temperatures: from -40 °C to +75 °C
- Easy to use: management from controller or mobile device, understandable Russian interface
- Ergonomic design, compactness and small weight



MR-10

GEODETIC SATELLITE MULTI FREQUENCY EQUIPMENT

The multi frequency satellite geodetic equipment MR-10 is intended for geodetic surveys, supervision of construction works, high accuracy positioning during creation and development of reference geodetic networks and also for the purposes of cadastre, land management, agriculture, geophysics. It is equipped with auxiliary inertial system and electronic level that allow to carry out geodetic works at the places with hard conditions.

Advantages

- Wide range of communication modules: GSM, USW, Wi-Fi, Bluetooth
- High accuracy of positioning: up to 3 mm in static mode, up to 10 mm during operation in RTK
- Wide range of maintainable satellite systems: GLONASS, GPS, BEIDOU, SBAS
- Dust/moisture proof (protection degree IP67), shock resistant frame, protection from mechanical damages
- Wide range of operating temperatures: from -30 °C to +65 °C
- Easy to use: management from controller or mobile device, understandable Russian interface
- Ergonomic design, compactness and small weight



RS-2

GEODETTIC SATELLITE MULTI FREQUENCY EQUIPMENT

The permanently operating basic station RS-2 is intended for creation and expansion of the network of referential and control-correcting stations, organization of the deformations monitoring system, high accuracy navigation in agriculture and road construction. It provides for transfer of corrections by means of NTRIP-protocol. It has a standard interface of external antenna connection.

Advantages

- Wide range of communication modules: GSM, USW, Bluetooth
- High accuracy of positioning: up to 3 mm in static mode, up to 10 mm during operation in RTK
- Wide range of maintainable satellite systems: GLONASS, GPS, BEIDOU, SBAS
- Dust/moisture proof (protection degree IP67), shock resistant frame, protection from mechanical damages
- Wide range of operating temperatures: from -40 °C to +75 °C
- Easy to use: management from controller or mobile device, understandable Russian interface
- Ergonomic design, compactness and small weight



MT-5

SINGLE FREQUENCY SATELLITE GEODETIC EQUIPMENT

The single frequency satellite geodetic equipment MT-5 is a high accuracy smart-terminal expanding the navigational capabilities of portable equipment. It is intended for management of natural resources (water, forest), survey of electric networks and communications, planning and efficient transport administration, reaction to emergency and crisis situations. It maintains the services of differential corrections receipt.

Advantages

- Wide range of communication modules: GSM, Wi-Fi, Bluetooth
- High accuracy of positioning: up to 3 m in static mode, up to 10 mm during operation in RTK (when using external antenna)
- Wide range of maintainable satellite systems: GLONASS, GPS, BEIDOU, SBAS
- Dust/moisture proof (protection degree IP67), shock resistant frame, protection from mechanical damages
- Wide range of operating temperatures: from -30 °C to +55 °C
- Possibility to connect the external antenna
- Easy to use: management via Wi-Fi, understandable Russian interface
- Ergonomic design, compactness and small weight

OPTICAL-MECHANICAL AND ELECTRONIC GEODETIC INSTRUMENTS



- Modern devices for the whole range of geodetic, land management and cadastre works and also mapping, monitoring
- Presentation of final results in digital format
- Intuitive interface
- High accuracy
- Ergonomic design
- High duration of operation without recharge



7Ta2 / 7Ta5 / 7Ta7

ELECTRONIC TOTAL STATION

7Ta is a series of intellectual total stations operating under control of the mobile operational system based on Linux – engineer total station 7Ta2, technical total station 7Ta5, total station 7Ta7 for construction works.

The total stations of 7Ta series are intended for measurement of inclination distances, horizontal and vertical angles and elevations, for automated solution of a range of application tasks during topographic survey and also in engineering geodesy as to provide for compilation survey of the objects of industrial, hydrotechnical, communication and other kinds of building.

The package of software integrated into the total station gives the possibility to use the most comprehensive set of program means as to solve various tasks of spatial geometry.

Application programs

- Staking-out
- Resection
- Inaccessible altitude
- Reference line
- Inaccessible distance
- Projection of a point to the line
- Area (plane and surface)
- 3D volume
- Measurements with displacement
- Free station
- Transit traverse equalization
- Calculation of intersections
- 2D road
- Survey of cross-sections
- Construction
- Indirect measurements
- Reference plane

Advantages

- Video channel
- Alignment indicator
- Touch TFT-display
- Temperature sensor
- Class of dust and moisture protection IP65
- Communication ports COM, USB, Bluetooth, card reader
- Reflectionless range finder with measurement distance up to 1500 m

TOTAL STATIONS



6Ta2 / 6Ta3 ELECTRONIC TOTAL STATION

The total station is intended for realization of large-scale topographic surveys for creation of compilation survey networks, for realization of executive surveys of territories built-up and being built for automatized solution in field conditions of various geodetic and engineering tasks with the help of application programs.

Advantages

- Position angle sensor
- Reflectorless distance meter 1000 m (6Ta2) / 500 m (6Ta3)
- High resolution telescope with objective aperture 50 mm
- Two speed guiding screws
- Range indicator
- Target laser indicator
- Laser centering device
- Keyboard illumination
- Memory card MMC/SD having capacity up to 2 Gb
- Communication ports COM, USB, Bluetooth, smart card reader
- Lithium-ionic accumulator of large capacity
- Class of dust and moisture protection IP65 (6Ta2) / IP54 (6Ta3)

THEODOLITES



2T5EN1

ELECTRONIC THEODOLITE

Designed to measure horizontal and vertical angles (zenith distances). It is used during the breakdown of compilation survey networks, geodetic networks of thickening, carrying out of engineering survey and geodetic works, applied geodesy.

Advantages

- Availability of electronic level and laser centering device allows the operator to reduce the time to install theodolite
- Step-by-step prompts on the display will help you quickly grow familiar with the work of the operator of any qualification
- LED display illumination and telescope reticles during night time operation

THEODOLITES



3T2KP/3T2KA/3T5KP OPTICAL AND MECHANICAL THEODOLITES

Designed to measure angles in theodolite traverses during the breakdown of compilation survey networks, geodetic networks of thickening, angle measurement during engineering survey and construction works, as well as magnetic azimuths along the surveying compass and inclined distances along the stadia transit (3T2KP, 3T5KP).

The theodolites of the 3T series are equipped with compensator at vertical circle, which automatically takes into account the inclination of the vertical axis in the plane of sight, have a high-quality pipe of direct image, mechanism for the transmission of horizontal circle and precise installation, additional circle is a finder. The 3T2KA theodolite is autocollimating.

Advantages

- Convenient and reliable in operation
- Availability of the compensator at a vertical circle allows to carry out measurement quickly and precisely
- Unlike foreign analogs, they allow carry out measurements at low temperatures



4T15P/4T30P

OPTICAL AND MECHANICAL THEODOLITES

Designed to measure angles in theodolite traverses during the breakdown of compilation survey networks, to measure distances using the stadia transit of telescope, and also for leveling with horizontal beam using the level at the tube and determining the magnetic azimuths along the surveying compass. The readings are taken with scale microscope.

The theodolites can be additionally equipped with surveying compass, lantern with microscope scale illumination; 4T30P – with vertical collimator built into the stand.

Advantages

- Small size and weight make them indispensable in expeditionary conditions, in agriculture and construction
- The theodolite 4T15P has built-in micrometer, which allows to increase the accuracy of angle measurement

LEVELS



4N-2KL

AUTOMATIC CONSTRUCTION LEVEL

Precise level with automatic compensator of the sight axis inclination with magnetic damper.

Designed for geometric leveling - determining the difference of the points height on the terrain with the help of the sighting beam in the topography, during engineering and technical surveys, in construction, land management, etc.

Advantages

- Easy to use
- Wide temperature range of operation from -40 °C to +50 °C
- The attention-calling color and casing ensure safety when working on construction sites, in places of heavy traffic, in wooded area



4N-3KL

AUTOMATIC LEVEL FOR CONSTRUCTION WORKS

The level of technical accuracy, availability of automatic compensator of sighting axis inclination allow to carry out measurements with greater accuracy and efficiency.

It is intended for geometric leveling – determination of the difference of the points heights on the terrain with the help of sighting ray in topography, during engineering and technical surveys, in construction, land management etc.

Advantages

- Compact, reliable and user friendly instrument
- Sighting axis of the instrument remains stable with wind and vibrations
- Simple adjustment (using the tool that is supplied in the delivery set)
- Wide temperature range of operation from -40 °C to +50 °C
- Attention-calling color and case ensure safety during operation at construction sites, in places of intensive transport circulation, in woodland



3N-5L

SMALL-SIZED LEVEL FOR CONSTRUCTION WORKS

The level of technical accuracy, blind; it has simple design making it easy to maintain and repair that is required during construction works.

It is intended for geometric leveling – determination of the difference of the points heights on the terrain with the help of sighting ray in topography, during engineering and technical surveys, in construction, land management etc.

Advantages

- Optimal design
- Comfortable location of levels and handles
- Reliable and easy to use
- Wide temperature range of operation from -40 °C to +50 °C
- Attention-calling color and case ensure safety during operation at construction sites, in places of intensive transport circulation, in woodland.

ACCESSORIES

The enterprise produces the whole range of accessories required for realization of topographic-geodetic works: stakes, tripods, tribraches, optical centering devices (vertical collimators), reference surveying compasses, prism reflectors, cases.



REFERENCE SURVEYING COMPASSES

The reference surveying compass is used for theodolites of 3T series (except 3T2KA) and 4T, it is to be fixed on the theodolite cover. Error of the theodolite orientation relative to magnetic meridian is 30'.



VERTICAL COLLIMATORS

Mean-square error of sighting axis installation into plumb position is 30", magnification is 2.5x, division value of levels is 30".



ASTRONOMIC AND AUTOCOLLIMATION NOZZLES

The nozzles allow to carry out sighting with minimum value of zenith distance and to perform autocollimation with the help of total station.



STANDS

The tribrach of the stand has connection thread 5/8" to be installed onto tripod. The stands are manufactured of two types: for theodolites of 3T and 4T series.



SIGHTING TARGETS

The reflectors (one prism, three prisms), mini reflectors and mark with film reflector have apertures with connection thread 5/8" and will be installed: onto stakes – directly, and onto stands – via vertical collimators, adapting bushes and adapters.



STAKES

The scale on the retractable part of the stake indicates the reflector height over the terrain point. The stake is equipped with a circular level. The hood is provided for storage and transportation of the stake.



TRIPODS

The tripods are completed with stadia plumb and spanner, connection thread of tripod clamp is 5/8"



RODS

The telescopic aluminum rods for survey and construction works



ANTENNAS

The external antennas for geodetic satellite equipment provide for stability and regularity of signals at all operating frequencies.



CABLE FOR DATA TRANSMISSION

The cable is used for data transmission from total stations to PC



CASES

The case frame is made from impact-resistant plastic material, it consists of two halves filled with soft locating blocks. The cases are manufactured of various standard sizes



SOFTWARE

The compact disk with software to process the data of statistic measurements and conversion into standard format "Rinex" to be installed into PC. With the help of the mentioned PC the following is provided: interaction of modules of smart-antenna, adjustment and control of operation process, storage and transmission of measurement results and also post processing of measured data.

GEODETTIC SATELLITE EQUIPMENT



SMR-9

MR-8

MR-10

Accuracy of static measurement	(project) 6 mm + 1 mm/km (height) 8 mm + 2 mm/km	(project) 3 mm + 1 mm/km (height) 5 mm + 1 mm/km	(project) 3 mm + 1 mm/km (height) 5 mm + 1 mm/km
Accuracy of kinematic measurement	(project) 20 mm + 1 mm/km (height) 30 mm + 2 mm/km	(project) 10 mm + 1 mm/km (height) 20 mm + 1 mm/km	(project) 10 mm + 1 mm/km (height) 20 mm + 1 mm/km
Frequency range	372 channels	372 channels	372 channels
Recording frequency	1 Hz, 2 Hz, 5 Hz	1 Hz (10 Hz, 20 Hz by option)	1 Hz (10 Hz, 20 Hz by option)
Received satellite signals	– GPS: L1, L2 – GLONASS: L1, L2 – BEIDOU: B1, B2 – SBAS	– GPS: L1, L2 – GLONASS: L1, L2 – BEIDOU: B1, B2 – SBAS	– GPS: L1, L2 – GLONASS: L1, L2 – BEIDOU: B1, B2 – SBAS
Power supply source	Accumulator battery 11,1 V	Accumulator battery 7,4 V External source from 9 V to 18 V	Accumulator battery 11,1 V External source from 9 V to 18 V
Operating temperatures range	from -20 °C to +60 °C	from -40 °C to +75 °C	from -30 °C to +65 °C
Relative humidity	up to 98%	up to 98%	up to 98%
Protection degree	IP65	IP67	IP67
Overall dimensions	234 mm x 99 mm x 56 mm	186 mm x 96 mm	140 mm x 144 mm
Weight	0,9 kg	1,2 kg	1,37 kg
Software	«Converter RINEX, after-treatment, field measurements RTK»	«Converter RINEX, after-treatment, field measurements RTK»	«Converter RINEX, after-treatment, field measurements RTK»
Connection and data storage	– Built-in GSM-modem – Wi-Fi: 802.11 b/g – Bluetooth – USB-connector – Built-in memory 4 Hz + SD expansion slot (up to 32 Gb) – SMB-connector for external antenna	– Built-in GSM-modem – USW-radio modem with frequency: 433-450 MHZ – Bluetooth – 7-pins Lemo and 5-pins Lemo connectors – Built-in memory: 256 Mb + SD slot (up to 8 Gb)	– Built-in GSM-modem – USW-radio modem with frequency: 433-450 MHZ – Bluetooth – Wi-Fi: 802.11 b/g/n – Built-in memory: 4Gb + SD expansion slot (up to 32 Gb)
Delivery set	– Receiver – Adapter for the accumulator battery charging – Accumulator battery – USB-cable – OTG-cable (for quick connection) – Wrist band – Stylus – Bag – Screen protective film – Package (transport box) – Certificate – Compact disk	– Smart-antenna – Accumulator battery (2 pcs.) – Charging device – Adapter for charging device – USW-antenna – GSM-antenna – Tape measure – Screwdriver – Cable (for data receive and transmission) – Rack (for smart-antenna fixing) – Box (transport) – Certificate – Compact disk – Field controller P-6: – Accumulator battery – Adapter for charging device – Charging device – USB-cable – Cable for quick connection – Certificate – Compact disk – Package	– Smart-antenna – Accumulator battery (2 pcs.) – Charging device – Adapter for charging device – USW-antenna – GSM-antenna – Tape measure – Plate (for height measurement) – Cable (for data receive and transmission) – Box (transport) – Rack (for smart-antenna fixing) – Adapter (rotating) – Adapter (quick-removable) – Certificate – Compact disk



RS-2

MT-5

Accuracy of static measurement	(project) 3 mm + 1 mm/km (height) 5 mm + 1 mm/km	(project) 3 mm + 1 mm/km * (height) 5 mm + 1 mm/km *
Accuracy of kinematic measurement	(project) 10 mm + 1 mm/km (height) 20 mm + 1 mm/km	(project) 10 mm + 1 mm/km (height) 20 mm + 1 mm/km
Frequency range	372 channels	372 channels
Recording frequency	1 Hz, 2 Hz, 5 Hz, 10 Hz, 20 Hz, 50 Hz	1 Hz (10 Hz, 20 Hz by option)
Received satellite signals	<ul style="list-style-type: none"> – GPS: L1, L2 – GLONASS: L1, L2 – BEIDOU: B1, B2, B3 – SBAS 	<ul style="list-style-type: none"> – GPS: L1 – GLONASS: L1 – BEIDOU: B1 – SBAS
Power supply source	External source from 9 V to 16 V	Accumulator battery 3,7 V
Operating temperatures range	from -30 °C to +65 °C	from -30 °C to +55 °C
Relative humidity	up to 98%	up to 98%
Protection degree	IP65	IP65
Overall dimensions	222 mm x 164 mm x 79 mm	86 mm x 32 mm x 120 mm
Weight	2,0 kg	0,35 kg
Software	«Converter RINEX, after-treatment, field measurements RTK»	«Converter RINEX, after-treatment, field measurements RTK»
Connection and data storage	<ul style="list-style-type: none"> – Built-in GSM-modem – Wi-Fi: 802.11 b/g/n – Bluetooth – Ethernet – Two serial ports RS 232 (DB9 and LEMO7pin) – Built-in memory: 4 Gb 	<ul style="list-style-type: none"> – Built-in GSM-modem – Wi-Fi: 802.11 b/g/n – Bluetooth – Micro-USB interface – Built-in memory 4Gb – SMB connector for external antenna
Delivery set	<ul style="list-style-type: none"> – Station – Network adapter with set of connectors – Cable USB/RS-232 – Cable DB9-RS232 – Serial cable – Antenna cable (3 m) – Antenna of Choke-Ring type – Package (transport box) – Certificate – Compact disk 	<ul style="list-style-type: none"> – Smart-terminal – Network adapter – Set of connectors for adapter – USB-cable – Bag (belt) – Box (transport box) – Certificate – Compact disk

*In case of external antenna use

TOTAL STATIONS


7Ta2

7Ta5

7Ta7

Mean-square error of measurement: – vertical and horizontal angle – inclination distance against prism reflector – inclination distance against film reflector – without reflector (over diffusely reflecting surface)	2" $2+2 \cdot 10^{-6} \cdot D$ mm $3+2 \cdot 10^{-6} \cdot D$ mm $3+2 \cdot 10^{-6} \cdot D$ mm <small>D – is the measured distance, mm</small>	5" $3+2 \cdot 10^{-6} \cdot D$ mm $3+2 \cdot 10^{-6} \cdot D$ mm $3+2 \cdot 10^{-6} \cdot D$ mm <small>D – is the measured distance, mm</small>	7" $3+2 \cdot 10^{-6} \cdot D$ mm $5+3 \cdot 10^{-6} \cdot D$ mm $5+3 \cdot 10^{-6} \cdot D$ mm <small>D – is the measured distance, mm</small>
Range of distance measurement: – using prism reflector – using film reflector – over diffusely reflecting surface	from 1,5 to 7000 m from 1,5 to 1500 m from 1,5 to 1500 m	from 1,5 to 5000 m from 1,5 to 1000 m from 1,5 to 1000 m	from 1,5 to 3000 m from 1,5 to 500 m from 1,5 to 500 m
Time of measurement of angles and inclination distance	1 s	1 s	1 s
Inclination sensor: – operation range – systematic error	±4' 1"	±5' 3"	±5' 3"
Telescope: – magnification – minimum distance of sighting	30 ^x 1,7 m	30 ^x 1,7 m	30 ^x 1,7 m
Volume of internal memory	4 Gb	4 Gb	4 Gb
Memory card SD/MMC	4 Gb	4 Gb	–
Operating temperature	from -20 °C to +50 °C	from -20 °C to +50 °C	from -20 °C to +50 °C
Time of operation from one accumulator	20 h	20 h	20 h
Delivery set	<ul style="list-style-type: none"> – Electronic total station 7Ta2 – Stylus (2 pcs.) – Geodetic tribrach – Accumulator (2 pcs.) – Charging device GM-5W, RECOM – Interface cable – Memory card – Compact disk – Tools and accessories set – Casing – Certificate – Operation manual 	<ul style="list-style-type: none"> – Electronic total station 7Ta5 – Stylus (2 pcs.) – Geodetic tribrach – Accumulator (2 pcs.) – Charging device GM-5W, RECOM – Interface cable – Memory card – Compact disk – Tools and accessories set – Casing – Certificate – Operation manual 	<ul style="list-style-type: none"> – Electronic total station 7Ta7 – Stylus – Geodetic tribrach – Accumulator (2 pcs.) – Charging device GM-5W, RECOM – Interface cable – Compact disk – Tools and accessories set – Casing – Certificate – Operation manual



6Ta2



6Ta3

Mean-square error of measurement: – vertical and horizontal angle – inclination distance against prism and film reflector – without reflector (over diffusely reflecting surface)	2" ($2+2\cdot 10^{-6}\cdot D$) mm ($3+2\cdot 10^{-6}\cdot D$) mm <small>D – is the measured distance, mm</small>	3" ($3+2\cdot 10^{-6}\cdot D$) mm ($5+2\cdot 10^{-6}\cdot D$) mm <small>D – is the measured distance, mm</small>
Range of distance measurement: – using prism reflector – using film reflector – over diffusely reflecting surface	from 1,5 to 5000 m from 1,5 to 2000 m from 1,5 to 1000 m	from 1,5 to 5000 m from 1,5 to 1000 m from 1,5 to 500 m
Time of measurement of angles and slope distance	1 s	1 s
Inclination sensor: – operation range – systematic error	±4' 1"	±5' 2"
Telescope – magnification – minimum distance of sighting	30 ^x 1,7 m	30 ^x 1,7 m
Volume of internal memory	1 Mb	1 Mb
Memory card SD/MMC	up to 2 Gb	up to 2 Gb
Operating temperature	from -20 °C to +50 °C	from -20 °C to +50 °C
Time of operation from one accumulator	20 h	20 h
Delivery set	<ul style="list-style-type: none"> – Electronic total station – Geodetic tribrach – Accumulator – Charging device – Interface cable – Adapter USB/RS-232 TU-S9 – CD disk – Memory card of MMC type – Tools and accessories set: <ul style="list-style-type: none"> - Small screwdriver - Big screwdriver - Small pin - Big pin - Oiler with oil - Bag – Casing – Certificate – Operation manual 	<ul style="list-style-type: none"> – Electronic total station – Geodetic tribrach – Accumulator – Charging device – Interface cable – Adapter USB/RS-232 TU-S9 – CD disk – Memory card of MMC type – Tools and accessories set: <ul style="list-style-type: none"> - Small screwdriver - Big screwdriver - Small pin - Big pin - Oiler with oil - Bag – Casing – Certificate – Operation manual

THEODOLITES



2TSENI

Mean-square error of measurement by one method: – horizontal angle – vertical angle	not more than 5" not more than 5"
Measurement range: – horizontal angle – vertical angle – zenith distance	from 0° to 360° from +45° to -45° from 45° to 135°
Mean power, consumed by the theodolite	not more than 1,5 Br
Time of result measurement receipt	not more than 0,5 c
Inclination sensor operation range	from - 5' to + 5'
Telescope: – magnification – field angle	31 ^x 1° 30'
Sighting distance	from 1 m
Image	erect
Least division of levels: – cylindrical – round (on the tribrach)	30" 10'
Theodolite weight with tribrach and power supply source	not more than 4,2 kg
Operation time from power supply source	not less than 10 ч.
Delivery set	<ul style="list-style-type: none"> – Theodolite with tribrach – Casing – Spare parts kit: <ul style="list-style-type: none"> - Small screwdriver - Big screwdriver - Small pin - Big pin - Oiler with oil - Bag – Certificate

Interchangeable sets of power supply source

1. Tape for power supply elements:
 - Power supply element 2000 AA, Camelion*
 - Charging device, Camelion*
2. Charging device HR05NS04**
 - Mains plug-adapter**
 - Accumulator

* Replacement is acceptable

** Delivered in sets, replacement is acceptable


3T2KP

3T2KA

3T5KP

Mean-square error of measurement by one method: – horizontal angle – vertical angle or zenith distance	2" 2,4"	2" 2,4"	5" 5"
Magnification	30 ^x	30 ^x	30 ^x
The least sighting distance	1,5 m	1,5 m	1,5 m
Compensator operation range at vertical circle	±3'	±3'	±4'
Least division of gradienter	1"	1"	1"
Image	Erect	Erect	Erect
Delivery set	<ul style="list-style-type: none"> – Theodolite with tribrach – Casing – Small screwdriver – Big screwdriver – Small pin – Big pin – Oiler with oil – Adjusting key – Certificate 	<ul style="list-style-type: none"> – Theodolite with tribrach – Casing – Bag – Lens eye-piece on the objective lens – Mirror – Lens hood – Stake – Eye-piece adapters: <ul style="list-style-type: none"> - on telescope (with neutral light filter) - on microscope – Lamp for electric lightning – Cord with plugs – Lightning emitting diode – Accumulator in casing – Bag for accumulator – Small screwdriver – Big screwdriver – Small pin – Big pin – Oiler with oil – Adjusting key – Certificate 	<ul style="list-style-type: none"> – Theodolite with tribrach – Casing – Small screwdriver – Big screwdriver – Small pin – Big pin – Oiler with oil – Adjusting key – Certificate

THEODOLITES


4T30P

4T15P

Mean-square error of measurement by one method: – horizontal angle – zenith distance	20" 30"	15" 30"
Orientation error by surveying compass: – systematic component – mean-square deviation of random component	30' 10'	30' 10'
Vertical angles measurement range	from +60° to -55°	from 30° to 145°
Telescope : – magnification – angular field	20 ^x 2°	20 ^x 2°
The least sighting distance	1,2 m	1,2 m
Image	erect	erect
Stadia transient coefficient	100±0,5	100±0,5
Constant intercept of stadia transit	0	0
External diameter of objective lens mount	38 mm	38 mm
Weight	2,3 kg	2,4 kg
Weight of theodolite in casing with accessories	3,8 kg	3,9 kg
Delivery set	<ul style="list-style-type: none"> – Theodolite – Tribrach – Level for telescope 20" – Casing – Set of eye-piece adapters for telescope and microscope – Small screwdriver – Big screwdriver – Small pin – Big pin – Oiler with oil – Bag – Certificate 	<ul style="list-style-type: none"> – Theodolite – Ttribrach – Level for telescope – Casing – Eye-piece adapters for telescope and microscope – Small screwdriver – Big screwdriver – Small pin – Big pin – Oiler with oil – Certificate

LEVELS


4N-2KL
4N-3KL
3N-5L

	4N-2KL	4N-3KL	3N-5L
Mean-square error of increase measurement on 1 km of double traverse procedure	not more than 2 mm	not more than 2,5 mm	5 mm
Admissible mean-square error of horizontal angle measurement	not more than 0,1°	not more than 0,5°	not more than 0,15°
Telescope: – magnification – angular field of view	30 ^x 1° 30'	23 ^x 2°	20 ^x 2°
The least sighting distance: – without lens eye-piece – with lens eye-piece	1,5 m 0,8 m	1,2 m –	1,2 m 0,5 m
Diameter: – entrance pupil – objective lens mount	40 mm 50 mm	35 mm –	30 mm 38 mm
Stadia coefficient	100±1	100±1	100±1
Limb diameter	107 mm	107 mm	107 mm
Least division of limb	1°	1°	1°
Installation level least division	5'	5'	10'
Compensator: – compensator operation range – systematic error of compensator operation on 1' of level axis inclination	not less than ±15' не более 0,3"	not less than ±15' не более 0,5"	– –
Damping	magnetic	magnetic	–
Weight	2 kg	1,5 kg	1,4 kg
Weight with bag	3,3 kg	2,8 kg	3,0 kg
Delivery set possibility:	– optical micrometer – prismatic eye-piece – lens eye-piece	–	– lens eye-piece
Delivery set	– Level – Casing – Lens hood – Cover – Screwdriver (2 pcs.) – Pin (2 pcs.) – Oiler with oil – Certificate	– Level – Casing – Screwdriver (2 pcs.) – Pin (2 pcs.) – Oiler with oil – Certificate	– Level – Casing – Small screwdriver – Big screwdriver – Small pin – Big pin – Oiler with oil – Certificate

