

10.041

TOTAL STATION

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Version: 0.02

Purpose

The total station will be used to obtain Reduced Levels and co-ordinates of observation wells, gauge/discharge stations and for general topographic surveying.

Conditions and requirements

- The total station shall be of such a design that it functions reliably and accurately under the prevailing environmental and operational conditions.
- The total station should be able to work efficiently within the temperature range of 0°C to +55°C.
- Can measure Distance without Reflector 300 to 500 meter to a 90% reflective object (in good condition).
- The total station shall be easy to operate and maintain.
- The total station shall have all the latest technology of Absolute Encoders.
- The total station shall be supplied with the accessories as needed for effective deployment.
- All materials of the total station exterior shall be non-corrosive.
- All enclosures, cables and connectors shall be sturdy and water resistant.
- The total station shall be of a rugged design that can cope with the prevailing shock and vibration as experienced in surveying operations and transport by jeep in rough terrain.
- The total station shall have an expected technical lifetime of not less than 10 years.
- Operator's and technical manuals, related to the type and model of the total station and the accessories shall be part of the delivery.
- Power consumption shall be small, to be derived from batteries integrated and/or External batteries.
- The batteries shall be rechargeable and assembled in packages.
- The connectors and electrical cables associated with the total station shall be reliable and sturdy.
- The total station shall have Visible Laser Pointer.
- Date & Time is recorded while modifying or creating a file.
- On Board pre- loaded graphical software Power Topo Lite or equivalent including Area Perimeter, Volume(Cut/fill) and Licensed copy of Auto Plotter Civil Software should invariably be part of the supply. In built road design function.
- The total station shall comprise

- a. Theodolite with integrated laser distance meter, tilt compensation, digital controller with keypad and display, supporting data storage.
- b. Data retrieval and communication unit
- c. Tripod for the total station
- d. Prism poles with associated tripods for prism assemblies
- The laser output power shall be eye safe.
- Operational training shall be part of the delivery.

Specifications:

1. Telescope

- i. **Image - Erect**
- ii. **Magnification $\geq 30 \times$**
- iii. **Field of view $\geq 22 \text{ m @ } 1000 \text{ m}$**
- iv. **Minimum focus distance $\leq 2.0 \text{ m}$**
- v. **Resolving power $\leq 2.5''$**

2. Angle measurement

- i. **Tilt compensation method- dual axis**
- ii. **Tilt compensation range $\geq 3''$**
- iii. **Angle accuracy $\leq 2''$ horizontal and vertical**
- iv. **Displayed resolution (Least count) $\leq 1''$**

3. Distance measurement

- i. **Range (20 km visibility) $\geq 1500 \text{ m}$ with 1 prism & $\geq 3000 \text{ m}$ with assembly of 3 prisms.**
- ii. **Accuracy (in static mode) $\leq (5 \text{ mm} + 3 \text{ ppm of distance})$**
- iii. **Resolution (Least count) $\leq 1 \text{ mm}$**
- iv. **Measurement time $\leq 5 \text{ s}$**
- v. **Prism - Retro reflective type**

4. Optical plummet

- i. **Magnification $\geq 2.0 \times$**
- ii. **Focussing range $\leq 0.5 \text{ to } \geq 2 \text{ m}$**
- iii. **A small Bull's eye Bubble on alidade.**
- iv. **Two Electronic bubbles 30' sensitivity at right angles to each other on display panel.**
- v. **One Circular Bubble on Tribrach.**

- 5. key board and display-** Alpha Numeric keyboard on both sides (identical). Display: 1/4 VGA (320*240 pixels), graphic LCD, colour, illumination, Touch screen
Keyboard: (function keys, alphanumeric keys), Angle display: 360° ' ", 360° decimal. Readable under field light conditions. Marking on keys are clear and non-removable. Graph of entire survey displayed on screen of Total Station with Zoom & Pan facility.
- 6. Pressure & Temperature sensors-**In built Temperature & pressure Sensors for measurement and display of instant atmospheric temperature and pressure in SI system of unit.
- 7. Accessories-**Total station should have following original accessories showing company's mark on it in strong carrying case with Data Transfer Cable. Data Transfer Software . Two rechargeable Batteries, One Charger. One CD containing Instruction Manual . Two Single prism with Target Plate and one wooden stand Range, Two Pole, Two display, Two Detachable Tribrach, lens cover set, cleaning brush, cover of durable plastic, shock absorbing carrying case with shoulder strap etc in complete.
- 8. Data storage (with pc-software for data retrieval, presentation and archiving)**
- Capacity ≥ 10000 points on board memory or more
 - SD Card/CF card slot with 256 MB or more
 - RS232 /USB Interface.

9. Focusing Mode:

Three Focusing Mode viz:

- b) Auto Focus mode
- c) Power Focus mode
- d) Manual Focus mode

10. Physical

- i. weight ≤ 10 kg
- ii. **Temperature range** ≤ 0 to $\geq 55^{\circ}\text{C}$ fully operational
- iii. **Humidity** 0 to $\geq 90\%$ RH
- iv. **Protection** splash waterproof and dustproof.

11. Power

- i. **Batteries Li-ion** rechargeable, no memory effect, during changing of batteries.
- ii. **capacity** ≥ 4 hours of continuous measuring
- iii. **Battery charger , adaptor and cables**
- iv. **Recharge time** ≤ 2 hours
- v. **Power supply** 220 VAC $\pm 25\%$; 47 to 53 Hz
- vi. **Operating temperature** 0 to 55°C
- vii. **Humidity** 0 to $\geq 90\%$ RH

1. Other features

- i. Tri axis Compensator (in addition to dual axis correction in the (X) and (Y) direction, mechanical error in the instrument is corrected).
- ii. Range under Normal Conditions:-
 - Single Prism: 5000 to 7000m or more.
 - Distance Accuracy in Prism Mode:
 - a) Up to 10 meters: + (3mm+2ppmxD)mm
 - b) From 10 meters: +(2mm+2ppmxD)mm
 - Distance Accuracy in Reflectorless Mode:
 - c) Up to 300 meters : + (5mm+2ppmxD)mm