

Trimble

Trimble 5600 DR Total Station Series

*Direct Reflex servo-driven, highly productive measuring system,
upgradable to Autolock and Robotic surveying*

Key Features and Benefits

- 3 Direct Reflex options available
- Upgradable to Autolock and robotic surveying
- 4-speed servo
- Active search system
- Seamless data flow
- Choice of user interfaces
- Platform for automation

The Trimble 5600 Direct Reflex (DR) Total Station series gives you access to the best and most productive measuring methods available for every measuring situation.

DR capability opens up a new world of measurement applications. Objects that were previously difficult or impossible to be measured can now be measured as easily as those measured with a prism. Visible property boundaries and corners can be measured without gaining land access. Overhead cables, tunnels, bridges, quarry faces, stockpiles, buildings, and elevations can all be measured quickly and easily as well as safely in active or live traffic.

Three DR measurement systems available

DR Standard

The DR Standard option on the 5600 series allows you to measure up to 70 m (230 ft) to a 90% reflective Kodak Gray Card and 50 m (164 ft) to a 18% reflective Kodak Gray Card. The range using a single prism is 5,000 m (16,400 ft) with an accuracy of $\pm(2 \text{ mm} + 2 \text{ ppm})$.

The DR Standard option incorporates a distinct visible coaxial laser spot, for accurate pointing. The laser pointer is eye safe, even when observed through the telescope. The DR Standard EDM is based on the phase shift method: an optical transmitter transmits a modulated light beam to the target. The optical receiver receives the returning light that is reflected from the target. The DR Standard measures the phase difference between the transmitted and received signal and calculates the distance.



The Trimble 5600 DR series provides you with the ultimate surveying system, capable of any type of work in various applications.

The high precision measurements, the distinct laser spot and the narrow beam of the DR Standard make it an ideal tool for all types of interior measurements and short-range precision engineering tasks.

DR 200+

The long-range DR 200+ option for the 5600 series allows you to measure up to 600 m (1,970 ft) to a 90% reflective Kodak Gray Card and 200 m (656 ft) to a 18% reflective Kodak Gray Card. That's 3.3 times further than standard reflectorless total stations. And the range using a single prism is 5,500 m (18,040 ft) with an accuracy of $\pm(3 \text{ mm} + 3 \text{ ppm})$.

DR 300+

The DR 300+* EDM provides superior long-range measurement capability—measuring 300 m (984 ft) to an 18% reflective Kodak Gray Card. The range using a single prism is 5,500 m (18,040 ft) with an accuracy of $\pm(3 \text{ mm} + 3 \text{ ppm})$.

An optional Laser Pointer is available for both the DR 200+ and the DR 300+ options.

The long-range DR options (DR 200+ and DR 300+) use the “time-of-flight” measurement technique that is based on the pulse measurement principle. The 5600 instrument measures the time for a very short transmitted pulse to travel to the target and back.

Furthermore, the DR 200+ and DR 300+ options use a unique patented method of taking the average of many pulses and determining the shape of the pulse before the transmit time is calculated. In this way the influence of noise can be reduced to a large extent and both range and accuracy can be increased considerably.

The range and accuracy specification make the DR 200+ option ideal for every day outdoor surveying tasks, and the DR 300+ ideal for when you need extra range.

* The DR 300+ EDM is only available for the Trimble 5602 Total Station

Increase your productivity with Servo, Autolock, and Robotic options

Servo gives you a 30% productivity increase

The 5600-series is equipped with 4-speed servo operation that gives variable speed, faster, smoother and more accurate aiming. Servo combined with DR provides a platform for measurement automation and for further upgrade to increased productivity.

Upgrade to Autolock and the productivity increase is 50%

Autolock® technology enables semi-robotic operation, with measuring and recording taking place at the total station. The 5600 seeks out the target (Active Remote Measuring Target), locks to it and tracks it during movement between points.

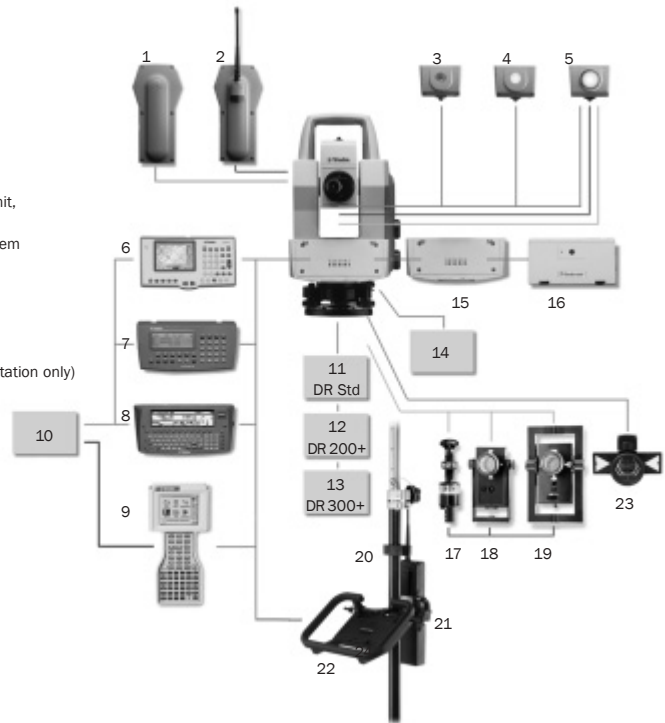
Automatic sets of angle measurements and robotic lite operation—just to mention a few features—are possible with Trimble 5600 upgraded to Autolock. No fine adjustment needed, no focusing, no problems working in the dark (the instrument will locate and track the target in any situation), and no work-related strain injuries or fatigue will be incurred from constant turning and pointing of the total station. In most cases the Autolock feature makes it possible to stake out or gather survey data as fast as the rodman can move. Unique active targets guarantee that the right target is located 100% of the time.

Upgrade to Robotic and the productivity increase is 80%

Robotic operation offers the same advantages as Autolock—in addition, it allows you to move efficiency during stakeout and/or work with one less person. Robotic measuring offers more than increased productivity and reduced personnel costs. It also gives higher quality measurements as all the control initiation and registration takes place at the measuring point, where any errors or discrepancies are quickly identified.

Overview of upgrades and options

1. Standard side cover
2. Radio side cover
3. Internal battery
4. Tracklight®
5. Tracker
6. ACU controller
7. Geodimeter® Control Unit, alphanumeric
8. Zeiss Elta® / Open System Control Unit
9. TSCe™ Controller
10. Field software
11. DR Standard
12. DR 200+
13. DR 300+ (5602 Total Station only)
14. Accuracy 1" 0.3 mgon
Accuracy 2" 0.5 mgon
Accuracy 3" 1.0 mgon
Accuracy 5" 1.5 mgon
15. Panel attachment
16. Card memory
17. RMT Mini
18. RMT Long Range
19. RMT/TS
20. Telescopic range pole
21. External radio
22. Holder for Control unit and external radio
23. Large tiltable reflector



Combine Robotic with Direct Reflex and increase productivity even more

By combining the two methods you have the ultimate one-person operating system. It will also mean increased flexibility to tackle new applications and measure points that were previously difficult or impossible to measure. Imagine that all vertical objects within range are measured from behind the instrument. Then simply move over to Robotic mode and measure the rest of the points. This saves a lot of time and increases crew productivity.

Truly Integrated Surveying

There are situations where measuring with GPS is more productive or practical than using a conventional total station, and vice versa.

Trimble Integrated Surveying™ solutions offer you the best of both worlds. Simply move the ACU or TSCe controller from one system to the other, in a matter of seconds you can continue with your survey. The software environment is identical and the data flow seamless.

Trimble 5600 DR Standard Total Station Series

PERFORMANCE SPECIFICATIONS

ANGLE MEASUREMENT

Accuracy (Standard deviation based on DIN 18732)

| | |
|------|---------------|
| 5601 | 1" (0.3 mgon) |
| 5602 | 2" (0.5 mgon) |
| 5603 | 3" (1.0 mgon) |
| 5605 | 5" (1.5 mgon) |

Angle reading (least count)

| | |
|----------------------------------|---------------|
| Horizontal & vertical | |
| Standard measurement | 1" (0.1 mgon) |
| Fast Standard | 1" (0.1 mgon) |
| Tracking | 2" (0.5 mgon) |

Arithmetic mean value (D-bar)

| | |
|-----------------------------|------------------|
| 5601 | |
| Horizontal angle | 0.1" (0.01 mgon) |
| Vertical angle | 1" (0.1 mgon) |
| 5602-5605 | |
| Horizontal & vertical angle | 1" (0.1 mgon) |

Automatic level compensator Dual-axis compensator $\pm 6'$ (± 100 mgon)

DISTANCE MEASUREMENT

Accuracy (standard deviation)

| | |
|-------------------------------|---|
| Prism | |
| Standard measurement | $\pm(2 \text{ mm} + 2 \text{ ppm}) \pm(0.007 \text{ ft} + 2 \text{ ppm})$ |
| Fast Standard | $\pm(3 \text{ mm} + 2 \text{ ppm}) \pm(0.01 \text{ ft} + 2 \text{ ppm})$ |
| Tracking | $\pm(5 \text{ mm} + 2 \text{ ppm}) \pm(0.016 \text{ ft} + 2 \text{ ppm})$ |
| Arithmetic mean value (D-bar) | $\pm(2 \text{ mm} + 2 \text{ ppm}) \pm(0.007 \text{ ft} + 2 \text{ ppm})$ |

| | |
|-------------------------------|---|
| Reflective foil | |
| Standard measurement | $\pm(3 \text{ mm} + 2 \text{ ppm}) \pm(0.01 \text{ ft} + 2 \text{ ppm})$ |
| Fast Standard | $\pm(3 \text{ mm} + 2 \text{ ppm}) \pm(0.01 \text{ ft} + 2 \text{ ppm})$ |
| Tracking | $\pm(5 \text{ mm} + 2 \text{ ppm}) \pm(0.016 \text{ ft} + 2 \text{ ppm})$ |
| Arithmetic mean value (D-bar) | $\pm(3 \text{ mm} + 2 \text{ ppm}) \pm(0.01 \text{ ft} + 2 \text{ ppm})$ |

| | |
|-------------------------------|--|
| Direct Reflex mode | |
| Standard measurement | $\pm(3 \text{ mm} + 2 \text{ ppm}) \pm(0.01 \text{ ft} + 2 \text{ ppm})$ |
| Fast Standard | $\pm(5 \text{ mm} + 2 \text{ ppm}) \pm(0.016 \text{ ft} + 2 \text{ ppm})$ |
| Tracking | $\pm(10 \text{ mm} + 2 \text{ ppm}) \pm(0.032 \text{ ft} + 2 \text{ ppm})$ |
| Arithmetic mean value (D-bar) | $\pm(3 \text{ mm} + 2 \text{ ppm}) \pm(0.01 \text{ ft} + 2 \text{ ppm})$ |

Shortest possible range

| | |
|-----------------|----------------|
| To prism | 1.5 m (4.9 ft) |
| Direct Reflex | 1.5 m (4.9 ft) |
| Reflective foil | 2.5 m (8.2 ft) |

Measuring time

Prism mode

| | |
|-------------------------------|---|
| Standard measurement | 2 s |
| Fast Standard | 1.8 s |
| Tracking | 0.5 s |
| Arithmetic mean value (D-bar) | 3.5 s per measurement. Repeats until stopped manually (or after 99 measurements). |

Direct Reflex mode

| | |
|-------------------------------|---|
| Standard measurement | 3 s up to 30 m (98.4 ft) +1 s/10 m (32.8 ft) |
| Fast Standard | 2 s up to 30 m (98.4 ft) +1 s/10 m (32.8 ft) |
| Tracking | 0.8 s up to 30 m (98.4 ft) +1 s/10 m (32.8 ft) |
| Arithmetic mean value (D-bar) | 3.5 s per measurement. Repeats until stopped manually (or after 99 measurements). |

Range (under standard clear conditions*)

Range using prism

| | |
|---|---------------------|
| 1 prism | 3,000 m (9,840 ft) |
| 1 prism Long Range mode (for measurements >1000 m only) | 5,000 m (16,400 ft) |
| 3 prisms | 5,000 m (16,400 ft) |
| 3 prisms Long Range mode (for measurements >1000 m only) | 7,500 m (24,600 ft) |

Range using reflective foil

| | |
|--|------------------|
| Reflective foil 20 mm | 100 m (328 ft) |
| Reflective foil 20 mm Long Range mode | 200 m (656 ft) |
| Reflective foil 60 mm | 250 m (820 ft) |
| Reflective foil 60 mm Long Range mode | 800 m (2,625 ft) |

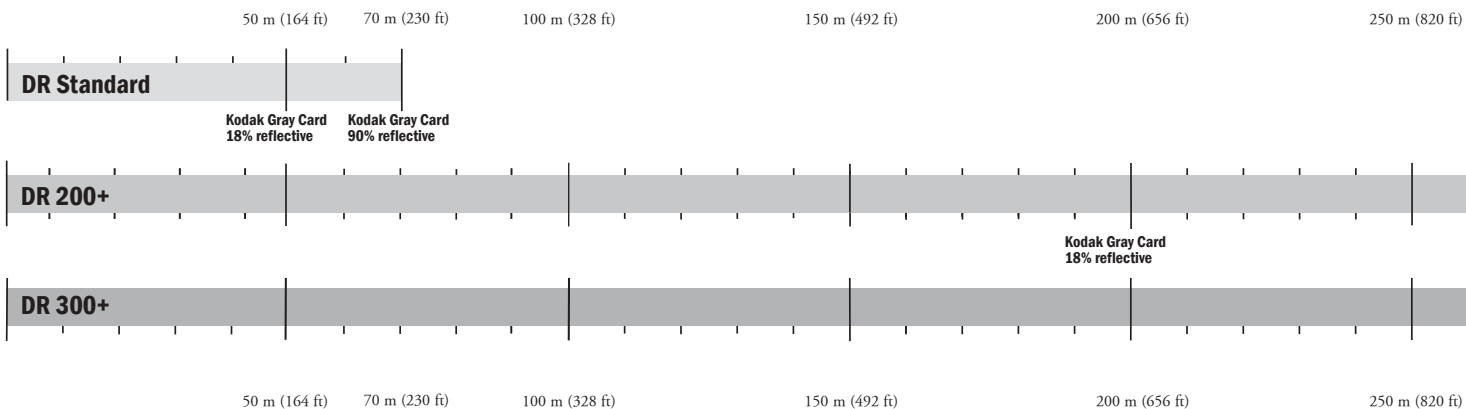
Range Direct Reflex measurement (typically)

| | |
|---------------------------------------|----------------------|
| Kodak Gray Card (18% reflective)** | 50 m (164 ft) |
| Kodak Gray Card (90% reflective)** | 70 m (230 ft) |
| Concrete | 40–50 m (131–164 ft) |
| Wood construction | 40–60 m (131–197 ft) |
| Metal construction | 40–60 m (131–197 ft) |
| Light rock | 40–50 m (131–164 ft) |
| Dark rock | 30–40 m (98–131 ft) |

* Standard clear: No haze, overcast or moderate sunlight with very light heat shimmer. Range and accuracy are dependent on atmospheric conditions and background radiation

** Kodak Gray Card, Catalog number E1527795

Direct Reflex Range



Trimble 5600 DR 300+ Total Station Series

PERFORMANCE SPECIFICATIONS

ANGLE MEASUREMENT

| | |
|---|--|
| Accuracy (Standard deviation based on DIN 18732) | |
| 5602 | 2" (0.5 mgon) |
| Angle reading (least count) | |
| Horizontal & vertical | |
| Standard measurement | 1" (0.1 mgon) |
| Fast Standard | 1" (0.1 mgon) |
| Tracking | 2" (0.5 mgon) |
| Arithmetic mean value (D-bar) | |
| Horizontal & vertical angle | |
| | 1" (0.1 mgon) |
| Automatic level compensator | |
| | Dual-axis compensator $\pm 6'$ (± 100 mgon) |

DISTANCE MEASUREMENT

| | |
|--------------------------------------|--|
| Accuracy (standard deviation) | |
| Prism | |
| Standard measurement | $\pm(3 \text{ mm} + 3 \text{ ppm}) \pm(0.01 \text{ ft} + 3 \text{ ppm})$ |
| Fast Standard | $\pm(8 \text{ mm} + 3 \text{ ppm}) \pm(0.025 \text{ ft} + 3 \text{ ppm})$ |
| Tracking | $\pm(10 \text{ mm} + 3 \text{ ppm}) \pm(0.032 \text{ ft} + 3 \text{ ppm})$ |
| Arithmetic mean value (D-bar) | $\pm(3 \text{ mm} + 3 \text{ ppm}) \pm(0.01 \text{ ft} + 3 \text{ ppm})$ |
| Reflective foil | |
| Standard measurement | $\pm(3 \text{ mm} + 3 \text{ ppm}) \pm(0.01 \text{ ft} + 3 \text{ ppm})$ |
| Fast Standard | $\pm(8 \text{ mm} + 3 \text{ ppm}) \pm(0.025 \text{ ft} + 3 \text{ ppm})$ |
| Tracking | $\pm(10 \text{ mm} + 3 \text{ ppm}) \pm(0.032 \text{ ft} + 3 \text{ ppm})$ |
| Arithmetic mean value (D-bar) | $\pm(3 \text{ mm} + 3 \text{ ppm}) \pm(0.01 \text{ ft} + 3 \text{ ppm})$ |
| Direct Reflex mode | |
| 5-300 m (16.4 ft-984 ft) | |
| Standard measurement | $\pm(3 \text{ mm} + 3 \text{ ppm}) \pm(0.01 \text{ ft} + 3 \text{ ppm})$ |
| Fast Standard | $\pm(8 \text{ mm} + 3 \text{ ppm}) \pm(0.025 \text{ ft} + 3 \text{ ppm})$ |
| Tracking | $\pm(10 \text{ mm} + 3 \text{ ppm}) \pm(0.032 \text{ ft} + 3 \text{ ppm})$ |
| Arithmetic mean value (D-bar) | $\pm(3 \text{ mm} + 3 \text{ ppm}) \pm(0.01 \text{ ft} + 3 \text{ ppm})$ |
| > 300 m (984 ft) | |
| | $\pm(5 \text{ mm} + 3 \text{ ppm}) \pm(0.016 \text{ ft} + 3 \text{ ppm})$ |
| Shortest possible range | |
| To prism | 2 m (6.56 ft) |
| Direct Reflex | 2 m (6.56 ft) |
| Reflective foil | 2 m (6.56 ft) |

Measuring time

| | |
|-------------------------------|---|
| Prism mode | |
| Standard measurement | 3 s |
| Fast Standard | 3 s |
| Tracking | 0.4 s |
| Arithmetic mean value (D-bar) | 3.5 s per measurement. Repeats until stopped manually (or after 99 measurements). |
| Direct Reflex mode | |
| Standard measurement | 3-7 s |
| Fast Standard | 3-7 s |
| Tracking | 0.4 s |
| Arithmetic mean value (D-bar) | 3.5 s per measurement. Repeats until stopped manually (or after 99 measurements). |

Range (under standard clear conditions*)

| | |
|--|----------------------------------|
| Range using prism | |
| 1 prism | 2,500 m (8,200 ft) |
| 1 prism Long Range mode | 5,500 m (18,040 ft) (max. range) |
| 3 prisms | 3,500 m (11,480 ft) |
| 3 prisms Long Range mode | 5,500 m (18,040 ft) (max. range) |
| Range using reflective foil | |
| Reflective foil 20 mm | 180 m (590 ft) |
| Reflective foil 20 mm Long Range mode | 1,200 m (3,937 ft) |
| Reflective foil 60 mm | 360 m (1,181 ft) |
| Reflective foil 60 mm Long Range mode | 2,400 m (7,874 ft) |

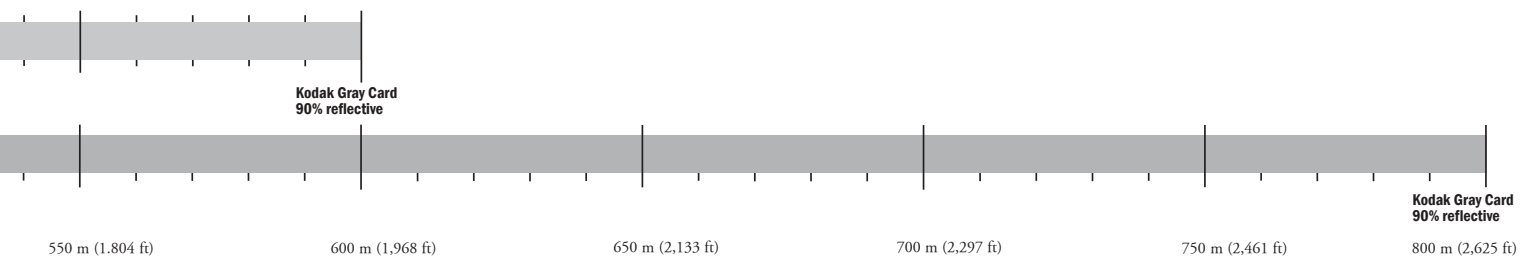
Range Direct Reflex measurement (typically)

| | |
|------------------------|--------------------------|
| Kodak Gray Card | |
| (18% reflective)** | >300 m (984 ft) |
| Kodak Gray Card | |
| (90% reflective)** | >800 m (2,625 ft) |
| Concrete | 300-400 m (984-1,312 ft) |
| Wood construction | 200-400 m (656-1,312 ft) |
| Metal construction | 200-250 m (656-820 ft) |
| Light rock | 200-300 m (656-984 ft) |
| Dark rock | 150-200 m (492-656 ft) |

* Standard clear: No haze, overcast or moderate sunlight with very light heat shimmer. Range and accuracy are dependent on atmospheric conditions and background radiation

** Kodak Gray Card, Catalog number E1527795

550 m (1,804 ft) 600 m (1,968 ft) 650 m (2,133 ft) 700 m (2,297 ft) 750 m (2,461 ft) 800 m (2,625 ft)



SPECIFICATION FOR ROBOTIC SURVEYING

| | |
|--|---|
| Range | |
| Robotic* | Up to 1,200 m (3,937 ft) depending on type of RMT |
| Autolock* | Up to 2,200 m (7,218 ft) depending on type of RMT |
| Shortest search distance | 2 m (6.5 ft) |
| Tracker pointing precision at 200 m (656 ft) (standard deviation) | <2 mm (0.007 ft) |
| Angle reading (least count) | |
| Standard measurement | 1" (0.1 mgon) |
| Fast Standard | 1" (0.1 mgon) |
| Tracking | 2" (0.5 mgon) |
| Arithmetic mean value (D-bar) | 1" (0.1 mgon) |

| | |
|---|---|
| Measuring time DR Standard, DR 200+, and DR 300+ | |
| Standard measurement | 5–8 s |
| Fast Standard | 5–8 s |
| Tracking | 0.4 s |
| Arithmetic mean value (D-bar) | 3.5 s per measurement. Repeats until stopped manually (or after 99 measurements). |
| Search time (typical)** | 2–10 s |
| Search area | 360 degrees (400 gon) or defined horizontal & vertical search window |

* *Standard clear: No haze, overcast or moderate sunlight with very light heat shimmer. Range and accuracy are dependent on atmospheric conditions and background radiation.*

** *Dependent on selected search window.*

GENERAL SPECIFICATIONS

| | |
|---|---|
| TRIMBLE 5600 DR 200+ AND DR 300+ | |
| Light source | Pulsed laser diode 870 nm Laser class 1 |
| Laser pointer eccentric* | Laser class 2 |
| Beam divergence | |
| Horizontal | 0.4 mrad (4 cm/100 m) (0.13 ft/328 ft) |
| Vertical | 0.8 mrad (8 cm/100 m) (0.26 ft/328 ft) |
| TRIMBLE 5600 DR STANDARD | |
| Light source | Laser diode 660 nm Laser class 1 in Prism mode Laser class 2 Direct Reflex Laser class 2 |
| Laser pointer coaxial (Standard) | |
| Beam divergence DR-mode | |
| Horizontal | 0.4 mrad (2 cm/50 m) (0.066 ft/164 ft) |
| Vertical | 0.8 mrad (4 cm/50 m) (0.13 ft/164 ft) |
| Beam divergence Prism mode: | |
| Horizontal | 1.4 mrad (14 cm/100 m) (0.46 ft/328 ft) |
| Vertical | 2 mrad (20 cm/100 m) (0.65 ft/328 ft) |
| GENERAL | |
| Atmospheric correction | –60 to 195 ppm continuously |
| Leveling | |
| Circular level in tribrach | 8/2 mm (8'/0.007 ft) |
| Electronic 2-axis level in the LC-display with a resolution of | 6" (2 mgon) |
| Clamps and slow motions | Servo-drive. Endless fine adjustment |
| Centering | |
| Centering system | Trimble 3-pin. |
| Optical plummet | Optical plummet in tribrach |
| Magnification | 2.4x |
| Shortest focusing distance | 0.5 m (1.6 ft) to infinity |

| | |
|---|--|
| Telescope | |
| Magnification | 26x (30x Optional) |
| Aperture | 40 mm (1.57 in.) |
| Field of view at 100 m (328 ft) | 2.6 m (8.5 ft) |
| Shortest focusing distance | 1.7 m (5.58 ft) to infinity |
| Illuminated crosshair | Variable (15 steps) |
| Tracklight | Optional (Servo only) Standard (Autolock and Robotic) |
| Operating temperature | –20°C to +50°C (–5°F to +122°F) |
| Power Supply | |
| Internal battery | Rechargeable NiMH battery 12 V, 1.8 Ah Operating time approx. 3 h (Servo only) |
| External battery | External rechargeable NiMH batteries 12 V, 3.8–11.4 Ah. Operating time approx. 11 h Autolock, 9 h Robotic (11.4 Ah) |
| Weight | |
| Instrument with ACU controller | 6.7 kg (14.7 lbs) |
| Instrument with Geodimeter Control Unit | 6.4 kg (14.1 lbs.) |
| Tribrach | 0.7 kg (1.5 lbs.) |
| Internal battery | 0.4 kg (0.9 lbs.) |
| Instrument for Robotic surveying (incl. Tracker, and built in radio) | 7.5 kg (16.5 lbs.) |
| Trunnion axis height | 205 mm (8.1 in.) |

* *Provided as standard on the 5602 Total Station with DR 300+.*
Optional on all other instruments.

ORDERING INFORMATION

For further information please contact your nearest Trimble Authorized Distributor or Trimble Office.

You may also visit our website at <http://www.trimble.com>



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