TOPCON

GTS-230N SERIES

ELECTRONIC TOTAL STATION

The All Weather standard for Total Stations

The Topcon GTS-230N Series are the innovative successors to the best selling GTS-210/220 Series Total Stations. The GTS-210 Series with 'Waterproof' design brought revolution to the surveying industry with features and durability. Now the new GTS-230N Series have up-graded their basic functions for distance and angle measurement in addition to maintaining superb durability against the environment.
The GTS-230N Series are also provided with a longer life battery for 10 hours operation, and various application programs making surveying work quick and simple in the field. The features included with the 'All Weather' highly productive GTS-230N Series Total Stations are setting a new standard for surveying!!

Features

Superior Basic Function for measuring distance & angle

The GTS-230N Series are provided with a distance measuring range of 3,000m to a single prism (GTS-239N: 2,000m), while maintaining high accuracy ±(2mm+ 2ppmxD) m.s.e.(GTS-239N: ±(3mm+3ppmxD) m.s.e.). As for distance measuring time, data updates at a high rate speed of 1.2 seconds in the fine measurement mode (0.7 seconds in coarse mode and 0.4 seconds in tracking mode). This quicker distance measurement time will increase efficiency and productivity in the field.

24 Key Keyboard and Graphical Display

The GTS-230N has a 24 numeric key keyboard build in. This 24 key keyboard makes it easier and quicker to key in codes and other alpha or numeric fields.
Besides more flexibility in the key-board the graphical display on the GTS-230N support all European characters.

Increased Internal Memory for Data Storage

The GTS-230N Series has an internal memory to store up to 24,000 points for data collection and layout work.

Dual-Axis Compensator

Dual-axis compensation is available for GTS-233N/235N/236N model. This dual-axis tilt sensor automatically corrects the vertical and horizontal angle compensation for miss-leveling error, ensuring accurate and reliable angle readings.

Compact and Light Weight

The GTS-230N Series are compact and weight only 4.9 kg (instrument body with on-board battery and handle grip). Due to this small size and weight transport is easy to and around the job site. In addition the new style carrying case gives added convenience.

Easy to use

The clear keyboard and display ensure easy operation.
The menu driven software is easy to learn. The use is intuitive, with a complete range of surveying and setting out routines.
The GTS-233N and GTS-235N have 2 side displays; the GTS-236N and the GTS-239N have the display and keyboard on one side.

Waterproof IP66!

The proven robustness and durability of Topcon construction Total Stations is also found in the GTS-230N Series. With International protection standard IP66, the instruments are water and dust proof and ensure reliable performance even in the harshest site conditions. This increases the amount of working hours during a day, even in bad weather and ensures the instrument performing reliably for many years without the need for lengthy service and repairs.

*** Degree of protection against water for Topcon's GTS-230N Series are based on the standard IEC60529, defined as 'Water projected in powerful jets' against enclosure from any direction shall have no harmful effects. And also GTS-230N Series comply with 'Dust-tight' of the IEC60529 standard as to degree of protection against solid foreign objects, defined as 'No ingress of dust'.**

Long Life Battery: 10 hours!

Topcon's new BT-52QA Ni-MH on-board battery allow 10 hours of continuous measuring in the angle/ distance mode, and last 45 hours on the job for angle measurement only. This long life battery will eliminate the need for multiple batteries on the job. One (1) BT-52QA will be sufficient for most full day surveying work.

Software

Full functional surveying and stake out software is included on-board the instrument. All models in the series have the same powerful and easy to use software routines. For example:

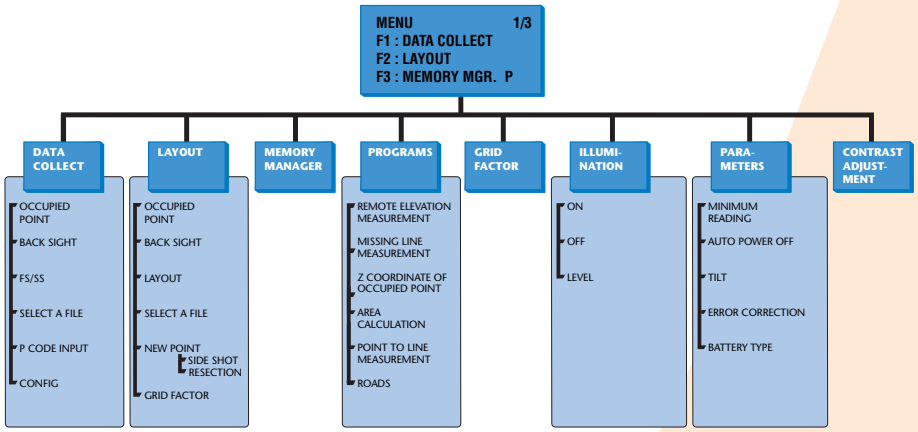
Resection

Instrument coordinates calculated by measuring known points stored in the internal memory. Scale factor used in calculation and standard deviation of measurement can be calculated.

Side shot

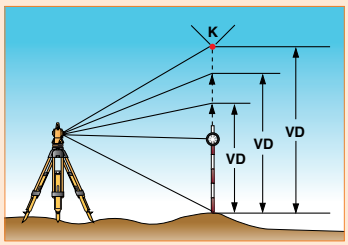
Set the instrument on a known point. After collecting the side shot angle and distance, the side shot point coordinate is calculated and stored in the coordinate data file.

Menu Structure



Application Measurement

Remote elevation measurement (REM)



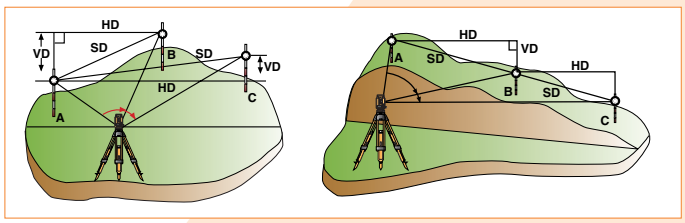
This feature measures the elevation of a point where a prism can not be placed directly. The measurement is extended along the plumb line while the elevation is continuously displayed.

Missing line measurement (MLM)

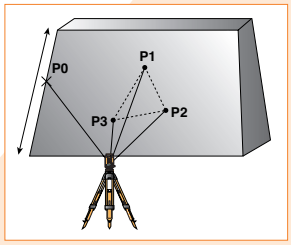
Multiple lines can be drawn between:

- the first point and the last point;
- the last 2 points.

Horizontal distance, difference in height and slope distance is calculated. Coordinate file data and manual input data are available for further use.

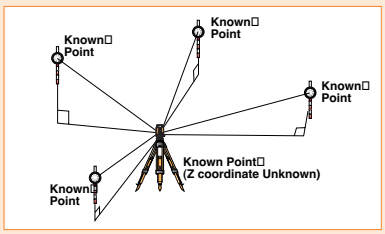


Plane offset measurement



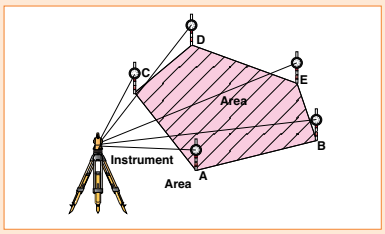
Coordinates are calculated for points where direct measurements to a prism can not be taken, for example point-measurements on a wall or plane. Three random points (P1, P2, P3) on the plane will be measured first to determine the measured plane and their angles and distances are temporarily stored. Then sight the unknown point on the plane and the instrument calculates and displays coordinates and distance values of desired point.

Z coordinate of occupied point (benchmark elevation)



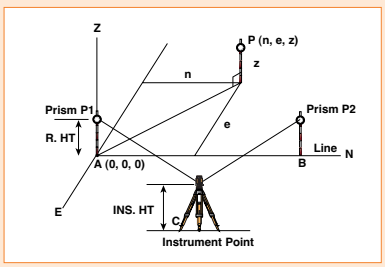
The Z-coordinate and direction angle of the instrument is calculated and reset by measuring Z-coordinates of known points (Max. 10 points).

Area calculation



Area is calculated using measured data or file data (Coordinate data).

Point-to-line measurement



Create a new coordinate by measuring to two points.
The first point becomes the origin and the second point becomes the N axis direction.

Roads

Defining complete roads with the use of lines, curves, spirals and points and stake out roads at each interval with optional offsets to right and left.

SPECIFICATIONS

MODEL NAME	GTS-233N	GTS-235N	GTS-236N	GTS-239N
TELESCOPE				
Length	150 mm			
Objective Lens	45 mm (EDM:50 mm)			
Diameter				
Magnification (x)	30x			
Image	Erect			
Field of View	1°30			
Recolving Power	2.5"			
Minimum focusing Distance	1.3 m			
DISTANCE MEASUREMENT				
Condition 1				
1 Prism		3,000 m		2,000 m
3 Prisms		4,000 m		2,700 m
9 Prisms		5,000 m		3,400 m
Condition 2				
1 Prism		3,500 m		2,300 m
3 Prisms		4,700 m		3,100 m
9 Prisms		5,800 m		4,000 m
Condition 1: Slight haze with visibility about 20 km moderate sunlight with light heat shimmer. Condition 2: No haze with visibility over 40 km, overcast with no heat shimmer.				
Accuracy	± (2 mm + 2ppm XD*) m.s.e.			± (3mm + 3ppmXD*) m.s.e.
Least count in measurements				
Fine mode	1 mm/0.2 mm			
Coarse mode	10 mm/1 mm			
Tracking mode	10 mm			
Measurment display	11 digitis: max. display 9999999.9999			
Measuring time	1 mm: 1.2 sec (Initial 4 sec.)			
Fine mode	0.2 mm: 2,8 sec (Initial 5 sec.)			
Coarse mode	0.7 sec (Initial 3 sec.)			
Tracking mode	0.4 sec (Initial 3 sec.)			
	(The initial time will be different by a condition and setting EDM off time)			
Atmospheric correction range	-999.9 to +999.9 ppm (by 0.1ppm)			
Prism constant correction range	99.9 to +99.9 mm (by 0.1mm)			
ANGLE MEASUREMENT				
Method	Absolute reading			
Detecting system	H:2 sides V:1 side			H:1 side V:1 side
Minimum reading	5"/1"			10"/5"
	1 mgon/0.2 mgon			2 mgon/1 mgon
Accuracy **	3" 1 mgon	5" 1.5 mgon	6" 1.8 mgon	9" 2.7 mgon
Measuring time	Less than 0.3 sec.			
Diameter of circle	71 mm			
TILT CORRECTION (AUTOMATIC INDEX)				
Tilt sensor	Dual Axis			Single Axis
Method	Liquid type			
Compensating range	± 3'			
Correction unit	1" (0.1 mgon)			
LEVEL SENSITIVITY				
Circular level	10'/2mm			
Plate level	20"/2mm			40"/2mm
OPTICAL PLUMMET TELESCOPE				
Magnification (x)	3x			
Focussing range	0.5 m to infinity			
Image	Erect			
Field of View	5°			
DURABILITY				
Water protection	IP66 (with BT-52QA)			
Ambient temperature range	-20°C to +50°C			
OTHERS				
Dimensions	343 (H) x 184 (W) x 150 (D) mm			
Instrument height	176 mm			
Weight instrument (with battery)	4.9 kg			
BATTERY BT-52QA				
Output voltage	7.2 V			
Capacity	2.7 AH (Ni-MH)			
Maximum operating time at +20°C (including distance measurement)	10 hours (12,000 points)			
Angle measurement only	45 hours			
Weight	0.3 kg			
BATTERY CHARGER BC-27				
Input voltage	100 ~ 240V			
Frequency	50/60 Hz			
Recharging time at +20°C	1.8 hours			
Operating temperature	+10°C to +40°C			
Weight	0.5 kg			

* D: measuring distance (mm)
** Standard deviation bases on DIN18723.
Designs and specifications here in are subject to change without notice.

Standard set composition

GTS-230N series	1 each
Battery BT-52QA	1 each
Battery charger BC-27	1 each
Tool kit with case	1 set
Plastic carrying case	1 each
Silicon cloth	1 each
Plastic rain cover	1 each
Plumb bob set	1 each
Lens cap	1 each
Sun shade	1 each
Instruction manual	1 vol.

Optional accessories

TROUGH COMPASS-6

DIAGONAL EYEPIECE-10

SOLAR FILTER-6

SOLAR RETICULE-6

More than 70 years of experience

For 70 years, Topcon has been a leading manufacturer in industrial, medical and positioning enhancement tools. This broad experience has created a basis for Topcon's wide product line for basically every positioning need, whether it's for construction or surveying applications. For the construction industry, Topcon offers a complete range of innovative laser and sonic solutions, including industry-leading products for interior, utility, general construction and machine control applications.
For surveying applications, Topcon manufacturers and supplies a complete range of optical measuring products, from digital and optical levels to theodolites and robotic total stations, and a full line of GPS+ satellite positioning solutions.

Product & Service support

To assure that your Topcon product maintains peak performance, your local Topcon dealer offers factory trained certified service technicians. And just in case service assistance isn't available in your area, our Europe wide network of Topcon offices, offer repair and return service policies second to none.

Innovation, not imitation

During the last decades, Topcon has brought many innovative solutions to the industry, which offers the contractor significant productivity increase and greater ease of use. That's the key to leadership, and the reason Topcon is the world's leading supplier of laser and surveying instruments. Some examples of unique Topcon technologies:

- Waterproof auto level
- The integrated total station, 'The Guppy'
- The compact coaxial total station (GTS-1)
- World's First laser with beam scanning technology
- The first waterproof total station
- GreenBeam® visible construction lasers
- Automatic excavator control system
- World's First 3-D machine control (3D- MC™ LPS)
- 5" Grade laser with automatic alignment & remote control
- Horizontal self leveling laser with liquid compensator
- First robotic total station with instant beam lock system (GTS-800A and RC-2)
- First satellite-directed automatic 3D machine control system (3D-MC™ GPS)
- GPS+: GPS and GLONASS
- mmGPS: GPS flexibility with total station accuracy

TOPCON

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