



**GTS-220 SERIES**

**ELECTRONIC  
TOTAL STATION**

## The All Weather standard for Total Stations



*The Topcon GTS-220 Series is the innovative successor to the best selling GTS-210 Series Total Stations. The GTS-210 Series with "Waterproof" design brought revolution to the surveying industry with features and durability. Now the new GTS-220 Series has up-graded its basic functions for distance and angle measurement in addition to maintaining superb durability against the environment.*

*The GTS-220 Series is 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-220 Series Total Stations are setting a new standard for surveying!!*



## Features

### Superior Basic Function for measuring distance & angle

The GTS-220 Series is provided with a distance measuring range of 3,000m to a single prism (GTS-229: 2,000m), while maintaining high accuracy  $\pm(2\text{mm}+ 2\text{ppm}\times D)$  m.s.e.(GTS-229:  $\pm(3\text{mm}+3\text{ppm}\times D)$  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 the coarse mode, and 0.4 seconds in the tracking mode). This shorter distance measurement time will allow you to increase your efficiency and productivity in the field.

### Increased Internal Memory for Data Storage

The GTS-220 Series has the internal memory to store up to 8,000 points for data collection, or up to 16,000 points for layout work.

### Dual-Axis Compensator

Dual-axis compensation is available for GTS-223/ 225/226 model. This dual-axis tilt sensor automatically corrects the vertical and horizontal angle compensation for mis-leveling error, ensuring accurate and reliable angle readings.

### Compact and Light Weight

The GTS-220 Series is compact and weighs only 4.9 kg (instrument body with on-board battery and handle grip). Due to this small size and weight you can easily transport to and around the job site. In addition the new style carrying case gives added convenience.

### Easy to use

The clearly layed out keyboard and display ensure easy operation. The menu driven software is easy to learn and use with a complete range of surveying and setting out routines. The GTS-223 and 226 have 2 side displays, the GTS-226 and the GTS-229 have the display and keyboard on one side.

### Waterproof IPX6!!

The GTS-220 Series can stand up to any wet weather condition that can occur in the field, giving the great benefit of not experiencing down time due to bad weather. The waterproofness (IPX6) of the GTS-220 Series assures durable performance in the field under all conditions as an "All Weather" Total Station.

The degree of protection against water for Topcon's GTS-220 Series is based on the standard IEC529, defined as "Water projected in powerful jets" against enclosure from any direction shall have no harmful effects. (IPX6)

### **Long Life Battery: 10 hours!**

Topcon's new BT-52QA Ni-MH on-board battery allows 10 hours of continuous measurement in the angle/distance mode, and can 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.

## **Options**

### **Point Guide System (Factory Option)**

Topcon's field proven Point Guide function is a factory option for the GTS-220 series. Get on line quickly and easily with this feature. Two (2) LED lights, one flashing and one constant, help identify the correct alignment for setting out.

### **Laser Plummet (Factory Option)**

The GTS-220 Series is provided with a conventional plummet as a standard, while a laser plummet located in the alidade is available as an option. With this Laser Plummet, you can set up the instrument fast and easy and have a clearly visible laser spot on the ground.

## **Software**

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

### **Resection**

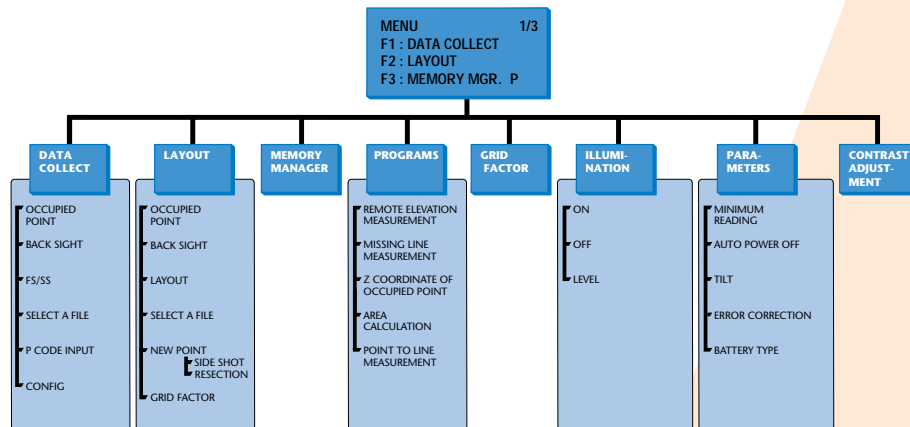
Instrument coordinates can be calculated by measuring known points (Maximum 7 points) stored in the internal memory. Scale factor can be used in the calculation and standard deviation of measurement can be calculated.

### **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.

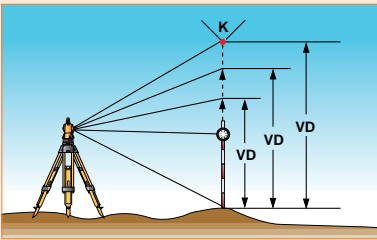


## Menu structure



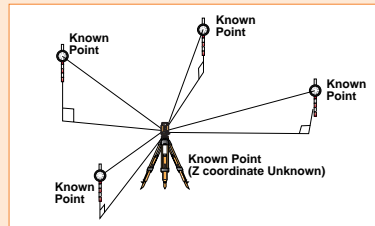
## Application measurement

### Remote elevation measurement (REM)



This feature measures the height where a prism can not be placed directly. Measurement can be extended along the plumb line as the height is continuously displayed.

### Z coordinate of occupied point (benchmark elevation)



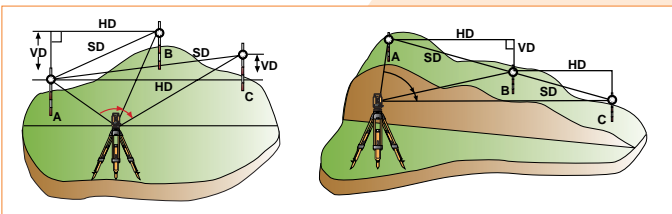
Z coordinate and direction angle of the instrument can be calculated and reset by measuring Z coordinate of known points (Max. 10 points)

### Missing line measurement (MLM)

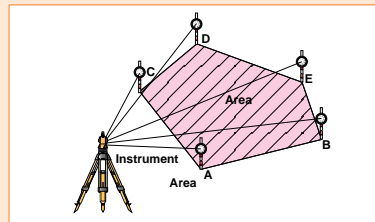
Multiple lines can be drawn between;

1. the first point and the last point.
2. the last 2 points.

Horizontal distance, difference in height and slope distance are calculated. Coordinate file data and manual input data are available to be used.

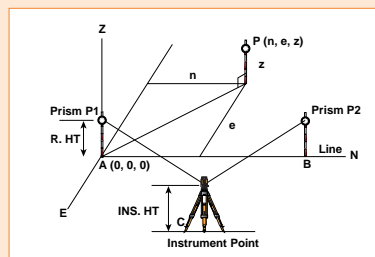


### Area calculation



Area can be calculated using measured data or file data (Coordinate data)

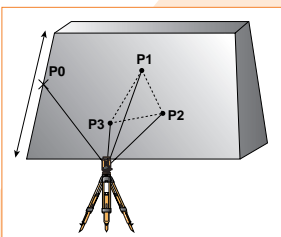
### Point-to-line measurement



Create a new coordinate by measuring to two points.

The 1st point becomes the origin and the 2nd point becomes the N axis direction.

### Plane offset measurement



Coordinates can be calculated for points where direct measurements to a prism can not be taken, for example measurements to points 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 temporarily stored. Then sight the unknown point on the plane and the instrument calculates and displays coordinates and distance values of desired point.

**SPECIFICATIONS**

MODEL NAME	GTS-223	GTS-225	GTS-226	GTS-229
<b>TELESCOPE</b>				
Length	150mm			
Objective Lens	diameter 45mm (EDM:50mm)			
Magnification(x)	30x			
Image	Erect			
Field of View	1°30'			
Resolving Power	2.5"			
Minimum focusing distance	1.3m			
<b>DISTANCE MEASUREMENT</b>				
Condition 1				
1 Prism	3,000m			2,000m
3 Prisms	4,000m			2,700m
9 Prisms	5,000m			3,400m
Condition 2				
1 Prism	3,500m			2,300m
3 Prisms	4,700m			3,100m
9 Prisms	5,800m			4,000m
Condition 1: Slight haze with visibility about 20km (12.5 miles) moderate sunlight with light heat shimmer				
Condition 2: No haze with visibility about 40km (25 miles), overcast with no heat shimmer.				
Accuracy	±(2mm+2ppmxD*) m.s.e.			±(3mm+3ppmxD*)m.s.e.
Least count in measurements				
Fine mode	1mm/0.2mm			
Coarse mode	10mm/1mm			
Tracking mode	10mm			
Measurement display	11 digits: max.display 9999999.9999			
Measuring time				
Fine mode	1mm: 1.2sec.(Initial 4 sec.)			
	0.2mm: 2.8sec.(Initial 5 sec.)			
Coarse mode	0.7sec.(Initial 3 sec.)			
Tracking mode	0.4sec.(Initial 3 sec.)			
(The initial time will be different by a condition and setting EDM off time.)				
Atmospheric correction range	-999.9 to +999.9ppm (By 0.1ppm)			
Prism constant correction range	-99.9 to +99.9mm (By 0.1mm)			
<b>ANGLE MEASUREMENT</b>				
Method	Absolute reading			
Detecting system	H:2 sides V:1 side			H:1 side V:1 side
Minimum reading	5"/1"			10"/5"
	(1mgon/0.2mgon)			
Accuracy **	3" (1mgon)	5" (1.5mgon)	6" (1.8mgon)	9" (2.7mgon)
Measuring time	Less than 0.3sec.			
Diameter of circle	71mm			
<b>TILT CORRECTION (AUTOMATIC INDEX)</b>				
Tilt Sensor	Dual Axis			Single Axis
Method	Liquid type			
Compensating range	±3'			
Correction unit	1"(0.1mgon)			
<b>LEVEL SENSITIVITY</b>				
Circular level	10'/2mm			
Plate level	30"/2mm			40"/2mm
<b>OPTICAL PLUMMET TELESCOPE</b>				
Magnification	3x			
Focusing Range	0.5m to infinity			
Image	Erect			
Field of view	5°			
<b>DURABILITY</b>				
Water protection	IPX6(with BT-52QA)			
Ambient temperature range	-20°C to +50°C			
<b>OTHERS</b>				
Dimensions	343(H)x184(W)x150(D)mm			
Instrument height	176mm			
Weight				
Instrument (with battery)	4.9kg			
Plastic carrying case	3.2kg			
<b>BATTERY BT-52QA (Ni-MH)</b>				
Output voltage	7.2V			
Capacity	2.7AH			
Maximum operating time at +20°C including distance measurement	10 hours (12,000 points)			
Angle measurement only	45 hours			
Weight	0.3kg			
<b>BATTERY CHARGER BC-27CR</b>				
Input voltage	AC230V			
Frequency	50/60Hz			
Recharging time (at +20°C)	1.8hours			
Operating temperature	+10°C to +40°C			
Weight	0.5kg			

\* D: measuring distance(mm)

\*\* Standard deviation base on DIN18723.

Designs and specifications here in are subject to change without notice.

## Standard set composition

GTS-220 series	1 pc.
Battery BT-52QA	1 pc.
Battery charger BC-27CR (230V)	1 pc.
Tool kit with case	1 set
Plastic carrying case	1 pc.
Silicon cloth	1 pc.
Plastic rain cover	1 pc.
Plumb bob set	1 pc.
Lens cap	1 pc.
Sun shade	1 pc.
Instruction manual	1 vol.



## Optional accessories



TROUGH COMPASS-6



DIAGONAL EYEPIECE-10



SOLAR FILTER-6



SOLAR RETICULE-6



DK-7

## 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 manufactures 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, that offer 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)



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