

**INSTRUCTION MANUAL  
DIGITAL THEODOLITE**

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**DT-300 series**

# HOW TO READ THIS MANUAL

Thank you for selecting the TOPCON instrument.

- Please read this Instruction manual carefully, before using this product.
- The specifications and general appearance of the instrument are subject to change without prior notice and without obligation by TOPCON CORPORATION and may differ from those appearing in this manual.
- The content of this manual is subject to change without notice.
- Some of the diagrams shown in this manual may be simplified for easier understanding.
- Always keep this manual in a convenient location and read it when necessary.
- This manual is protected by copyright and all rights are reserved by TOPCON CORPORATION.
- Except as permitted by Copyright law, this manual may not be copied, and no part of this manual may be reproduced in any form or by any means.
- This manual may not be modified, adapted or otherwise used for the production of derivative works.

## Symbols

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The following conventions are used in this manual.

-  : Indicates precautions and important items which should be read before operations.
-  : Indicates the chapter title to refer to for additional information.
-  : Indicates supplementary explanation.
- {HOLD} etc. : Indicates keys on the operation panel.

## Notes regarding manual style

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- Except where stated, "DT" means DT-302/305/307/305L/307L/309F/309G/309LG in this manual.
- All other company and product names featured in this manual are trademarks or registered trademarks of each respective organization.

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# 1. PRECAUTIONS FOR SAFE OPERATION

For the safe use of the product and prevention of injury to operators and other persons as well as prevention of property damage, items which should be observed are indicated by an exclamation point within a triangle used with WARNING and CAUTION statements in this instruction manual.

The definitions of the indications are listed below. Be sure you understand them before reading the manual's main text.

## Definition of Indication

	<b>WARNING</b>	Ignoring this indication and making an operation error could possibly result in death or serious injury to the operator.
	<b>CAUTION</b>	Ignoring this indication and making an operation error could possibly result in personal injury or property damage.

-  This symbol indicates items for which caution (hazard warnings inclusive) is urged. Specific details are printed in or near the symbol.
-  This symbol indicates items which are prohibited. Specific details are printed in or near the symbol.
-  This symbol indicates items which must always be performed. Specific details are printed in or near the symbol.

## General

-  **Warning**
  -  Do not use the unit in areas exposed to high amounts of dust or ash, in areas where there is inadequate ventilation, or near combustible materials. An explosion could occur.
  -  Do not perform disassembly or rebuilding. Fire, electric shock, burns or hazardous radiation exposure could result.
  -  Never look at the sun through the telescope. Loss of eyesight could result.
  -  Do not look at reflected sunlight from a prism or other reflecting object through the telescope. Loss of eyesight could result.
  -  When securing the instrument in the carrying case make sure to set all the locks. Failure to do so could result in the instrument falling out while being carried, causing injury.
-  **Caution**
  -  Do not use the carrying case as a footstool. The case is slippery and unstable so a person could slip and fall off it.
  -  Do not place the instrument in a damaged case or in a case with a damaged belt. The case or instrument could be dropped and cause injury.
  -  Do not wield or throw the plumb bob. A person could be injured if struck.
  -  Secure handle to main unit. Failure to properly secure the handle could result in the unit falling off while being carried, causing injury.
  -  Tighten the adjustment tribrach clamp securely. Failure to properly secure the clamp could result in the tribrach falling off while being carried, causing injury.

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**Power Supply**

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**Warning**

Do not disassemble or rebuild the battery or the battery charger, nor expose to heavy shocks or vibration. Sparking, fire, electric shock or burns could result.



Do not short circuit. Heat or ignition could result.



Do not place articles such as clothing on the battery charger while charging batteries. Sparks could be induced, leading to fire.



Do not use voltage other than the specified power supply voltage. Fire or electrical shock could result.



Do not use batteries other than those designated. An explosion could occur, or abnormal heat generated, leading to fire.



Do not use damaged power cords, plugs or loose outlets. Fire or electric shock could result.



Do not use power cords other than those designated. Fire could result.



Use only the specified battery charger to recharge batteries. Other chargers may be of different voltage rating or polarity, causing sparking which could lead to fire or burns.



Do not use the battery or charger for any other equipment or purpose. Fire or burns caused by ignition could result.



Do not heat or throw batteries or chargers into fire. An explosion could occur, resulting in injury.



To prevent shorting of the battery in storage, apply insulating tape or equivalent to the terminals. Otherwise shorting could occur, resulting in fire or burns.



Do not use the battery or the battery charger if its terminals are wet. Resultant poor contact or shorting could lead to fire or burns.



Do not connect or disconnect power supply plugs with wet hands. Electric shock could result.

**Caution**

Do not touch liquid leaking from batteries. Harmful chemicals could cause burns or blisters.

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**Tripod**

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**Caution**

When mounting the instrument to the tripod, tighten the centering screw securely. Failure to tighten the screw properly could result in the instrument falling off the tripod, causing injury.



Tighten securely the leg fixing screws of the tripod on which the instrument is mounted. Failure to tighten the screws could result in the tripod collapsing, causing injury.



Do not carry the tripod with the tripod shoes pointed at other persons. A person could be injured if struck by the tripod shoes.



Keep hands and feet away from the tripod shoes when fixing the tripod in the ground. A hand or foot stab wound could result.



Tighten the leg fixing screws securely before carrying the tripod. Failure to tighten the screws could lead to the tripod legs extending, causing injury.

## 2. PRECAUTIONS

### Precautions concerning water and dust resistance

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The instrument conforms to IP66 specifications for waterproofing and dust resistance when battery cover and connector cap are closed.

- Be sure to correctly attach the battery cover to protect the instrument from moisture and dust particles.
- Make sure that moisture or dust particles do not come in contact with the terminal or connectors. Operating the instrument with moisture or dust on the terminal or connectors may cause damage to the instrument.
- Make sure that the inside of the carrying case and the instrument are dry before closing the case. If moisture is trapped inside the case, it may cause the instrument to rust.
- If there is a crack or deformation in the rubber packing for the battery cover, stop using and replace the packing.
- To retain the waterproof property, it is recommended that you replace the rubber packing once every two years. To replace the packing, contact your local dealer.

### Telescope

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- Aiming the telescope at the sun will cause internal damage to the instrument.

### Handle

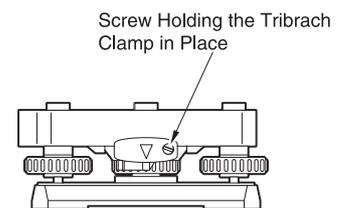
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- The handle of the instrument can be removed. When operating the instrument with the handle attached, always make sure that the handle is securely fixed to the instrument body with the handle locks.

### Tribrach Clamp (Detachable tribrach only)

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- When the instrument is shipped, the tribrach clamp is held firmly in place with a securing screw to prevent the instrument from shifting on the tribrach. Before using the instrument the first time, loosen this screw with a precision screwdriver. And before transporting it, tighten the securing screw to fasten the tribrach clamp in place so that it will not shift on the tribrach.



### Tribrach

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- Always use the tribrach provided.
- If the tribrach is installed incorrectly, the measuring precision could be effected. Occasionally check the adjusting screws on the tribrach. Make sure the tribrach clamp is locked and the securing screws are tightened.

### Other precautions

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- Confirm battery level remaining before operating.
- Consult your local dealer before using the instrument under special conditions such as long periods of continuous use or high levels of humidity. In general, special conditions are treated as being outside the scope of the product warranty.
- When a high degree of precision is required for measurement, provide shade against direct sunlight for the instrument and tripod.
- Remove batteries from the instrument before putting into storage after not using it for long periods. Leaving the batteries attached for extended period of time can result in liquid leaking from batteries, which may lead to malfunctioning.
- Always carry the instrument by its handle.
- When transporting the instrument, provide some protection to minimize risk of shocks. Heavy shocks may cause the measurement to be faulty.
- When mounting the instrument on a tripod, use a wooden tripod when possible. The vibrations that may occur when using a metallic tripod can effect the measuring precision. Tighten securely the leg fixing screws of the tripod on which the instrument is mounted.
- When using high output transceiver etc., make sure it does not come near the instrument.

**Maintenance**

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- Wipe off moisture completely if the instrument gets wet during survey work.
- Always clean the instrument before returning it to the case. The lens requires special care. First, dust it off with the lens brush to remove tiny particles. Then, after providing a little condensation by breathing on the lens, wipe it with the wiping cloth.
- To remove the dust on the case, never use thinner or benzine. Use a clean cloth moistened with neutral detergent.
- When returning the instrument to its case, be sure to match the white positioning marks provided with the case and place the instrument.
- Check the tripod for loose fit and loose screws.

**User**

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- This product is for professional use only!  
The user is required to be a qualified surveyor or have a good knowledge of surveying, in order to understand the user and safety instructions, before operating, inspecting or adjusting.
- Wear the required protectors (safety shoes, helmet, etc.) when operating.

**Exporting this product (Relating EAR)**

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- This product contains software/technology, which are subject to the EAR (Export Administration Regulations). Depending on countries you wish to export or bring the product to, a US export license may be required. In such a case, it is your responsibility to obtain the license. The countries requiring the license as of Mar. 2020 are shown below. Please consult the Export Administration Regulations as they are subject to change.

North Korea

Iran

Syria

Sudan

Cuba

URL for the EAR of the US: <http://www.bis.doc.gov/policiesandregulations/ear/index.htm>

**Exceptions from Responsibility**

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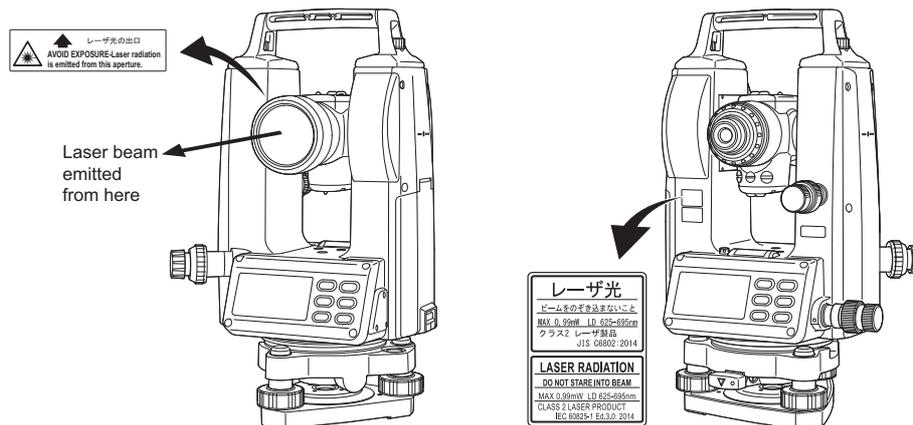
- The manufacturer, or its representatives, assumes no responsibility for any damage, or loss of profits (change of data, loss of data, loss of profits, an interruption of business etc.) caused by use of the product or an unusable product.
- The manufacturer, or its representatives, assumes no responsibility for any damage, or loss of profits caused by usage different to that explained in this manual.
- The manufacturer, or its representatives, assumes no responsibility for consequential damage, or loss of profits due to heavy rain, strong wind, high-temperature and humidity, or storing or use of the product under unusual conditions.
- Product failures caused by rebuilding are out of warranty.
- Cautions and warnings included in this manual do not cover all the possible events.

# 3. LASER SAFETY INFORMATION

The instrument \*1 is classified as the following class of Laser Product according to IEC Standard Publication 60825-1 Ed.3.0: 2014 and United States Government Code of Federal Regulation FDA CDRH 21CFR Part 1040.10 and 1040.11 (Complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No.56, dated May 8, 2019.)

\*1: DT-305L/307L/309LG

Device	Laser class
Laser-pointer	Class 2



## ⚠Warning

- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- Never intentionally point the laser beam at another person. The laser beam is injurious to the eyes and skin. If an eye injury is caused by exposure to the laser beam, seek immediate medical attention from a licensed ophthalmologist.
- The laser beam is emitted when the power is turned ON. Before turning the power on, make sure that persons are not located in the path of the laser beam.
- Do not look directly into the laser beam. Doing so could cause permanent eye damage.
- Do not stare at the laser beam. Doing so could cause permanent eye damage.
- Aiming the instrument into prism or highly reflective surface can result in serious damage to your eye because the optical axis and laser beam source is in coincidence. Do not aim the instrument directly into prism or highly reflective surface. Do not look at the laser beam directly.

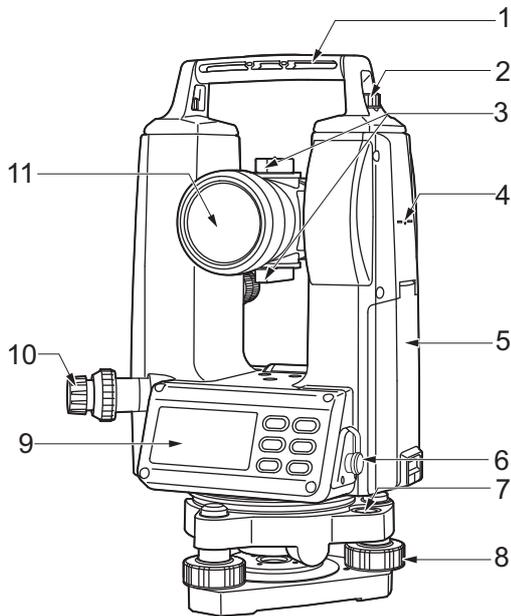
## ⚠Caution

- Perform checks at start of work and periodic checks and adjustments with the laser beam emitted under normal conditions.
- When the instrument is not being used, turn off the power and replace the lens cap.
- When disposing of the instrument, destroy the battery connector so that the laser beam cannot be emitted.
- Avoid setting the instrument at heights at which the path of the laser may strike pedestrians or drivers at head height. Operate the instrument with due caution to avoid injuries that may be caused by the laser beam unintentionally striking a person in the eye.
- Do not emit the laserbeam at eye level.
- Never point the laser beam at mirrors, windows or surfaces that are highly reflective. The reflected laser beam could cause serious injury
- When using the laser-pointer function, be sure to turn OFF the output laser after measurement is completed. Even if the power is turned off, the laser-pointer function is still operating and the laser beam continues to be emitted.

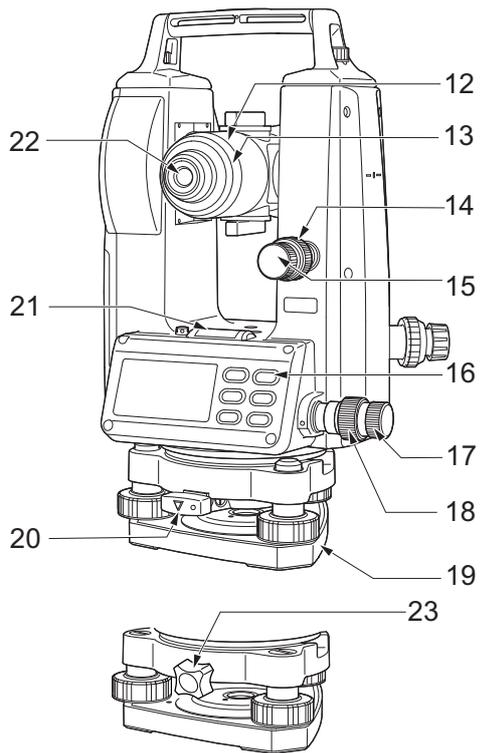
# 4. PRODUCT OUTLINE

## 4.1 Parts of the Instrument

### ■ DT-302/305/307/309F/309G



- 1 Handle
- 2 Handgrip locking screw
- 3 Sighting collimator 
- 4 Instrument height mark 
- 5 Battery cover
- 6 Serial connector (DT-302 only)
- 7 Circular level
- 8 Leveling foot screw
- 9 Display unit\*<sup>1</sup>
- 10 Optical plummet
- 11 Objective lens (Includes "  Laser-pointer function")



- 12 Telescope focusing ring
- 13 Cross-hair adjustment section cover
- 14 Vertical clamp
- 15 Vertical fine motion screw
- 16 Operation keys
- 17 Horizontal fine motion screw
- 18 Horizontal clamp
- 19 Tribrach\*<sup>2</sup>
- 20 Tribrach clamp (DT-302/305/307 only)
- 21 Plate level
- 22 Telescope eyepiece (Diopter ring)
- 23 Centering fixing screw (DT-309F only)

\*1 DT-309F/309G has one side display only.

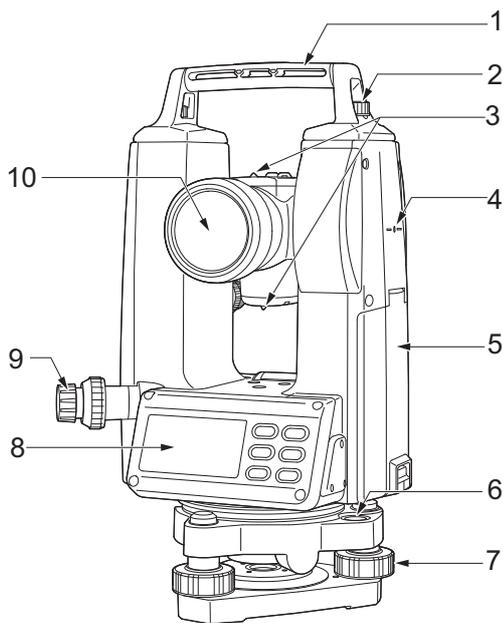
\*2 Tribrach type

DT-302/305/307: Detachable

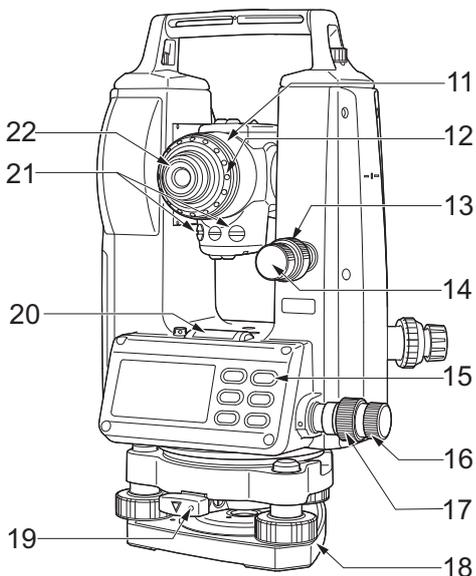
DT-309G: Fixing

DT-309F: Centering

### ■ DT-305L/307L/309LG



- 1 Handle
- 2 Handgrip locking screw
- 3 Sighting collimator 
- 4 Instrument height mark 
- 5 Battery cover
- 6 Circular level
- 7 Leveling foot screw
- 8 Display unit\*<sup>1</sup>
- 9 Optical plummet
- 10 Objective lens (Includes "  Laser-pointer function")



- 11 Telescope focusing ring
- 12 Cross-hair adjustment section cover
- 13 Vertical clamp
- 14 Vertical fine motion screw
- 15 Operation keys
- 16 Horizontal fine motion screw
- 17 Horizontal clamp
- 18 Tribrach\*<sup>2</sup>
- 19 Tribrach clamp (DT-305L/307L only)
- 20 Plate level
- 21 Laser axis adjusting screw (with cap)
- 22 Telescope eyepiece (Diopter ring)

\*1 DT-309LG has one side display only.

\*2 Tribrach type

DT-305L/307L: Detachable

DT-309LG: Fixing



#### Instrument height mark

The height of the instrument is as follows:

- 177mm (from tribrach mounting surface to this mark)
  - 222mm +5/-3mm
- Tribrach type: Detachable (from tribrach TR-103R plate to this mark)  
 Tribrach type: Centering (from tribrach plate to this mark)



#### Laser-pointer function

A target can be sighted with a red laser beam in dark locations without the use of the telescope.



### Sighting collimator

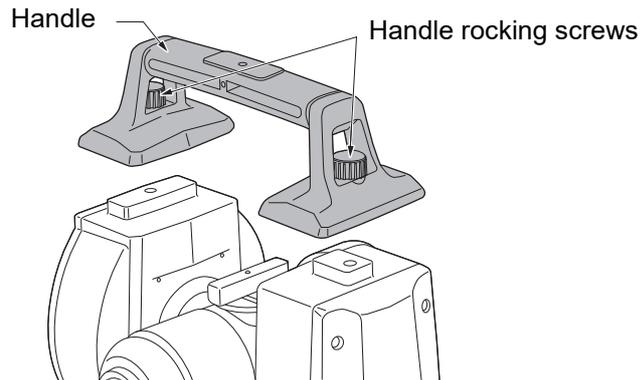
Use sighting collimator to aim the instrument in the direction of the measurement point.

Turn the instrument until the apex of the triangle in the sighting collimator is aligned with the target. A circle surrounds the triangle to make it easier to locate.

### Detaching/attaching the Handle

The carrying handle can be removed from the instrument when the prism is located at the zenith etc.

1. To remove it, loosen the handle rocking screws.
2. To attach the handle, position the handle as shown, tighten the 2 handle rocking screws securely.

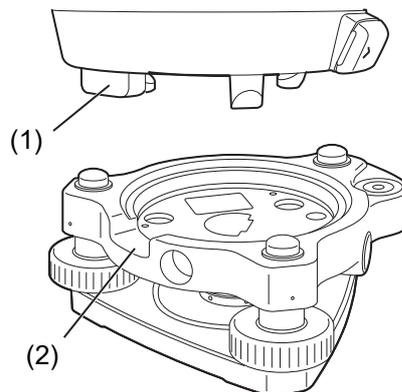


### Detaching the instrument from the tribrach (Detachable tribrach type only)

1. Turn the tribrach clamp counterclockwise to loosen.
2. Lift the instrument to detach.

### Attaching the instrument to the tribrach (Detachable tribrach type only)

1. Align (1) and (2) and lower the instrument onto the tribrach.
2. Turn the tribrach clamp clockwise to tighten.



### Serial Signal RS-232C Connector

(DT-302 only)

Serial signal connector is used for connecting the DT-302 with a computer, which enables the computer to receive measurement data from the DT-302.

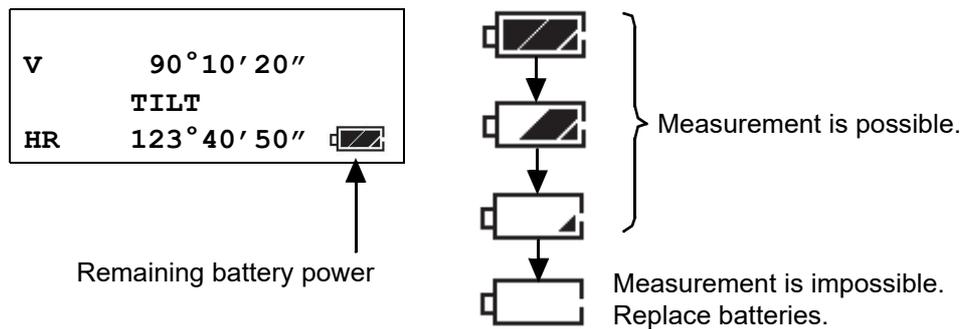


- Contact your local dealer regarding interface cables and output formats used when connecting to a computer.



### ■ Remaining Battery Power

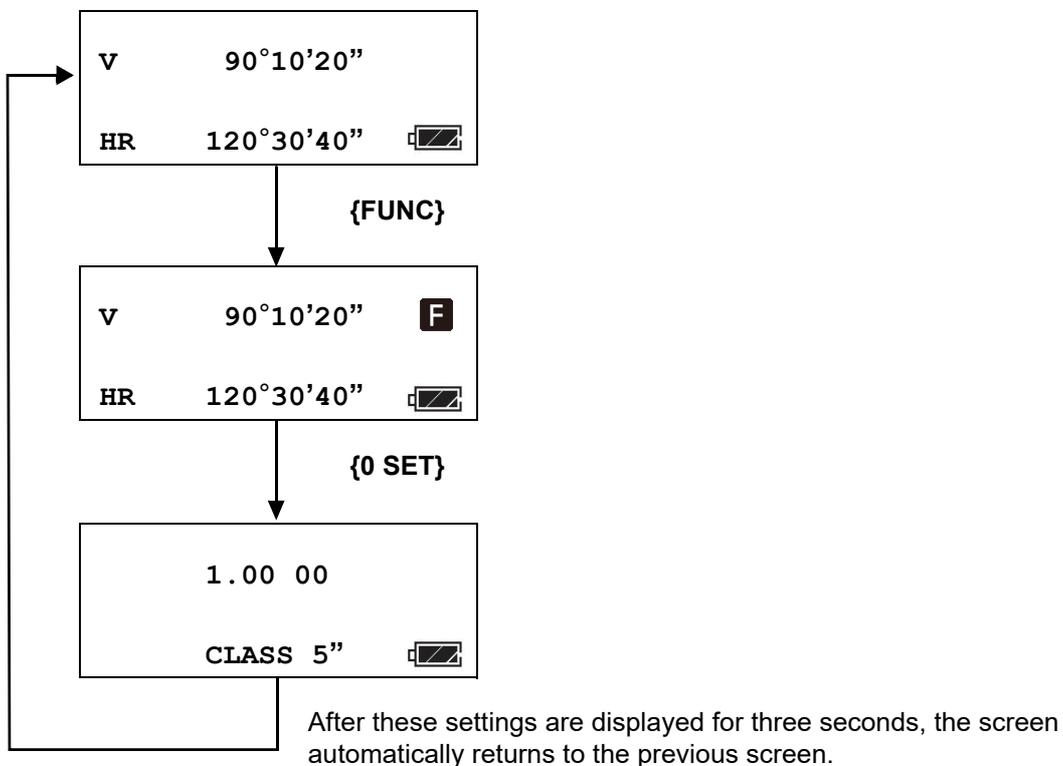
The remaining battery power is displayed in four levels.



- The battery operating time will vary depending on the environmental conditions, such as ambient temperature etc. Prepare spare batteries in advance to minimize disruption to measurement.
- "6. USING THE BATTERY"

### ■ Display of version number and angle measurement accuracy

Press **{FUNC}** to enter Function Mode, and then press **{0 SET}** to display the version number. In Version Display Mode, the software version information on the top line and the angle measurement accuracy information on the second line are displayed.



## 6. USING THE BATTERY

The following batteries can be used with the DT.

- Four AA alkaline batteries (sold separately)
- Battery BDC71 (☞ "14. OPTIONAL ACCESSORIES")

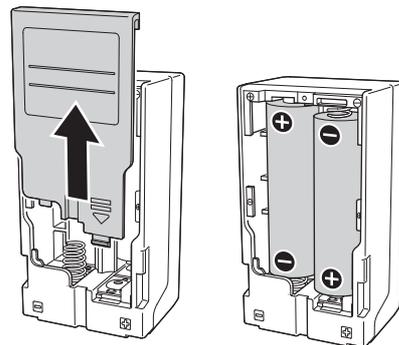
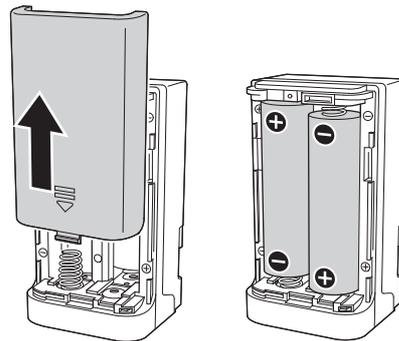
### 6.1 Installing the AA Batteries



- Replace all four batteries with new ones at the same time.
- Do not mix the old batteries to the new ones.

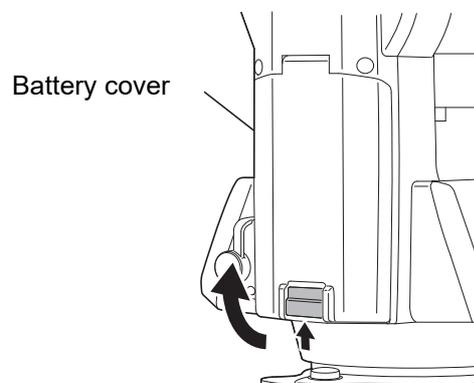
#### PROCEDURE

1. Remove the battery holder (DB-80) cover by sliding it upward.
2. Insert the two AA alkaline batteries according to the +/- indicators on the battery holder.
3. Close the battery holder cover.
4. Similarly, slide the cover on the opposite side and insert the two AA alkaline batteries.
5. Close the battery holder cover.



### 6.2 Installing the Battery (DB-80)

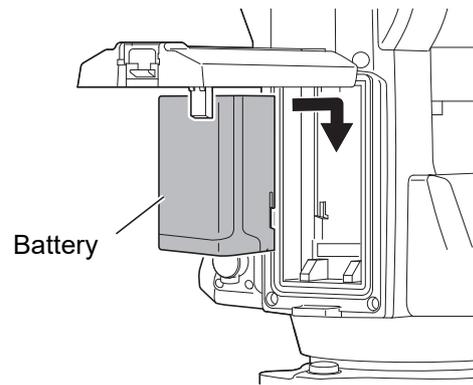
1. Slide the catch on the battery cover to open.



2. Checking the terminal side on the battery, insert the battery as shown.



- Do not insert the battery inclined. Doing so may damage the instrument or battery terminals.



3. Close the battery cover. A click is heard when the cover is secure.

# 7. SETTING UP THE INSTRUMENT

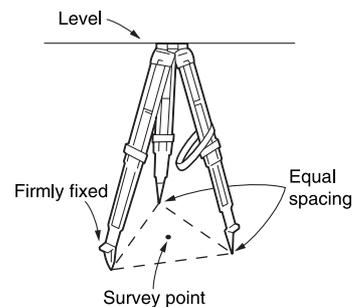


- Mount the battery in the instrument before performing this operation because the instrument will tilt slightly if the battery is mounted after levelling.

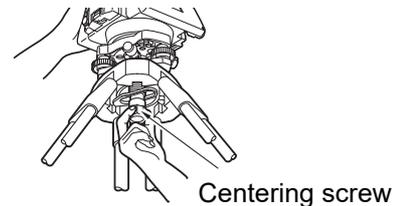
## 7.1 Centering

### PROCEDURE Centering with the optical plummet eyepiece

1. Make sure the legs are spaced at equal intervals and the head is approximately level.  
Set the tripod so that the head is positioned over the survey point.  
Make sure the tripod shoes are firmly fixed in the ground.



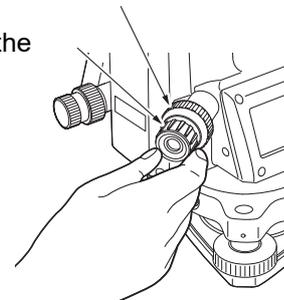
2. Place the instrument on the tripod head.  
Supporting it with one hand, tighten the centering screw on the bottom of the unit to make sure it is secured to the tripod.



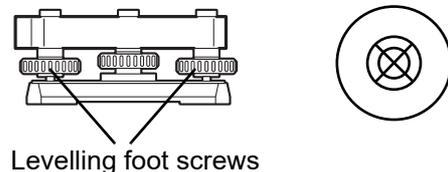
3. Looking through the optical plummet eyepiece, turn the optical plummet eyepiece to focus on the reticle.  
Turn the optical plummet focusing ring to focus on the survey point.

#### Focusing on the survey point

Focusing on the reticle



4. Adjust the levelling foot screws to center the survey point in the optical plummet reticle.



5. Continue to the levelling procedure.  
➡ "7.2 Levelling"

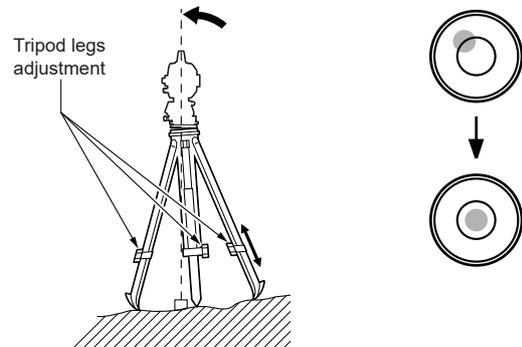
## 7.2 Levelling

### PROCEDURE

1. Perform the centering procedure.

 "7.1 Centering"

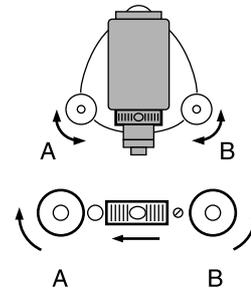
2. Roughly center the bubble in the circular level by either shortening the tripod leg closest to the offcenter direction of the bubble or by lengthening the tripod leg farthest from the offcenter direction of the bubble. Adjust one more tripod leg to center the bubble.



3. Turn the upper part of the instrument until the plate level is parallel to a line between levelling foot screws A and B.

Center the air bubble using levelling foot screws A and B simultaneously.

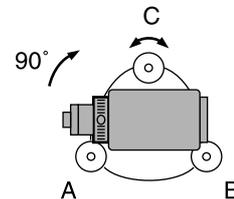
The bubble moves towards a clockwise rotated levelling foot screw.



4. Turn the upper part of the instrument though  $90^\circ$ .

The plate level is now perpendicular to a line between levelling foot screws A and B.

Center the air bubble using levelling foot screw C.



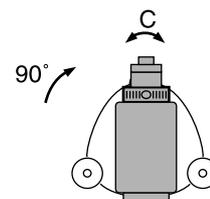
5. Turn another  $90^\circ$  and check bubble position.

Turn the upper part of the instrument a further  $90^\circ$  and check to see if the bubble is still in the center of the plate level. If the bubble is offcenter, perform the following:

- a. Turn levelling foot screws A and B equally in opposite directions to remove half of the bubble displacement.
- b. Turn the upper part a further  $90^\circ$ , and use levelling foot screw C to remove half of the displacement in this direction.

Or adjust the plate level.

 "13.1 Plate Level"



6. Turn the instrument and check to see if the air bubble is in the center position in all directions. If it is not, repeat the levelling procedure.

7. Adjust the leveling screw again to align the survey point with the center of the optical vertical reticle.

(Tribrach type: Detachable)

Loosen the centering screw slightly.

Looking through the optical plummet eyepiece, slide the instrument over the tripod head until the survey point is exactly centered in the reticle.

Retighten the centering screw securely.

(Tribrach type: Centering)

Loosen the centering fixing screw slightly.

Looking through the optical plummet eyepiece, slide the instrument over the tripod head until the survey point is exactly centered in the reticle.

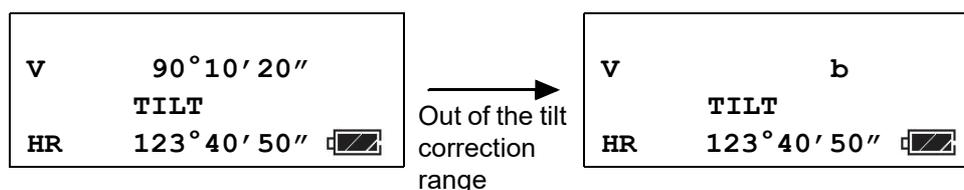
(The instrument is moved horizontally within a range of  $\pm 8\text{mm}$ .)

8. Check again to make sure the bubble in the plate level is centered.  
If not, repeat the procedure starting from step 3.

### 7.3 Vertical Angle Tilt Correction

(DT-302/305/305L/307/307L only)

When the tilt sensor is activated, automatic correction of vertical angle for mislevelment is displayed. To ensure a precise angle measurement, tilt sensors must be turned on. If the "b" display appears the instrument is out of automatic compensation range and must be leveled manually.



In case the instrument is used in an unstable situation, constant indexing of vertical angle may be impossible. In this case, the function of tilt correction can be stopped.

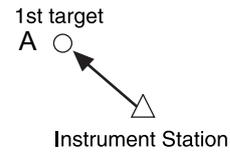
 To stop the function of tilt correction, refer to "12. SELECTING MODE".



# 9. ANGLE MEASUREMENT

## 9.1 Measuring the Horizontal Angle Right and Vertical Angle

1. Sight the first target "A".



V	90° 10' 20"
HR	120° 30' 40"

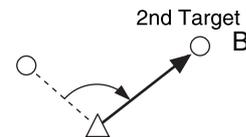
2. Press **{0 SET}** twice to set the horizontal angle of target "A" to "0°00'00".



- Horizontal angle can be set to 0 with one press of **{0 SET}**.  
 "12. SELECTING MODE"

V	90° 10' 20"
HR	0° 00' 00"

3. Sight the second target "B".



The required H/V angle to target B will be displayed.

V	92° 10' 20"
HR	160° 40' 20"

## 9.2 Switching Horizontal Angle Right/Left

1. Sight the first target "A".

V	90° 10' 20"
HR	120° 30' 40"

2. Press **{R/L}**.

The mode switches from Horizontal angle right (HR) to Horizontal angle left (HL).  
 HR/HL mode switches every time **{R/L}** is pressed.

V	90° 10' 20"
HL	239° 29' 20"

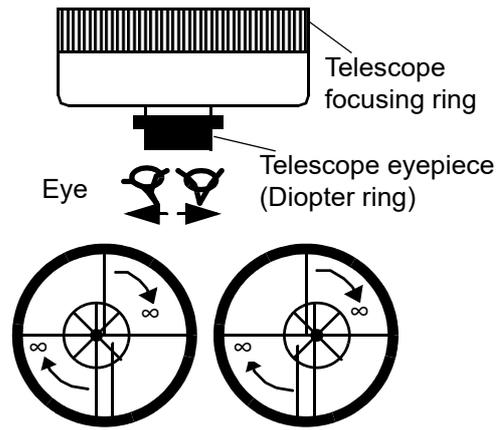
3. Measure as HR mode.

### Note Sighting

1. Point the telescope toward the light. Turn the diopter ring and adjust the diopter so that the cross hairs are clearly observed. (Turn the diopter ring toward you first and then backward to focus.)
2. Aim the peak of the triangle mark of the sighting collimator at the target. Allow a certain space between the sighting collimator and yourself for sighting.

3. Focus on the target with the telescope focusing ring.
- \* If parallax is created between the cross hairs and the target when viewing vertically or horizontally through the telescope, focusing is incorrect or diopter adjustment is insufficient.

This adversely affects precision in measurement or survey. Eliminate the parallax by focusing carefully and using diopter adjustment.



### 9.3 Measuring from the Required Horizontal Angle

1. Display the required horizontal angle using the horizontal fine motion screw and horizontal clamp.

V	90° 10' 20"
HR	130° 40' 20"

2. Press **{HOLD}**.  
Horizontal angle display blinks and the horizontal angle will be held.

**Note**

- To return to the angle status before the data is held, press any key except **{HOLD}**.

V	90° 10' 20"
HR	130° 40' 20"

blinks

3. Sight the target to set.
4. Press **{HOLD}**.  
Angle measurement will start from the held angle.

V	90° 10' 20"
HR	130° 40' 20"

### 9.4 Vertical Angle % Display

You can switch the vertical angle display to the percentage (%) display.

1. Press **{V/%}**.

**Note**

- The mode switches every time **{V/%}** is pressed.  
[-----] is displayed when a point is sighted at 45° or more from the horizontal.

V	66° 23' 10"
HR	120° 30' 40"

V	43.719%
HR	120° 30' 40"

## 9.5 Repetition Angle Measurement

1. Press **{FUNC}** to go function mode screen.

V	90°10'20"	F
HR	120°30'40"	

2. Press **{REP}** to go repetition angle measurement mode.

Ht	0°00'00"
0	
H	

3. Sight the target "A", and press **{OSET}** twice to become 0°.

Ht	0°00'00"
0	
H	

4. Sight the target "B", and press **{HOLD}**.

Ht	45°10'00"
1AVG	
H	45°10'00"

5. Sight the target "A" again and press **{R/L}**.

6. Sight the target "B" again, and press **{HOLD}** to finish 2 measurements.

		Total angle
		↑
Ht	90°20'00"	
2AVG		
H	45°10'00"	
		2 measurements

The number of measurements

Average angle

7. Repeat procedures 5 and 6 for the desired number of repetitions.

Ht	180°40'00"
4AVG	
H	45°10'00"

Example: 4 measurements

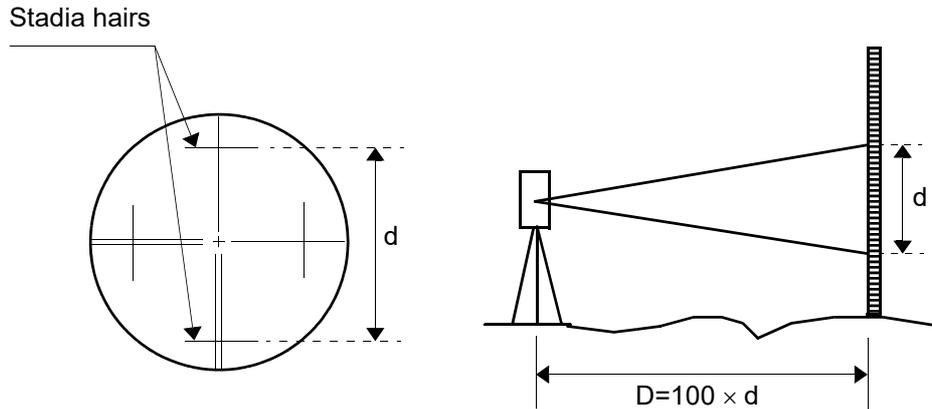
8. To finish repetition measurement, press **{FUNC}** then press **{HOLD}**.



- Only horizontal angle right measurement can be carried out in the repetition angle mode.
- Horizontal angle can be accumulated up to 2000°00'00" – minimum reading (horizontal angle right). In case of 5" reading, horizontal angle can be accumulated up to +1999°59'55".
- When the discrepancy value of each measurement is more than ±30", error code "E04" is displayed. Press **{OSET}**, and start measurement again.
- Up to 19 measurements can be made.  
The first digit "1" will be omitted from the measurement number for the 10th measurement onwards.

## 9.6 Stadia Surveying

This instrument can be used for stadia surveying. Measurement by stadia is a convenient method for measuring distances ( $D$ ) with the stadia hairs of the instrument, in combination with a graduated rod, such as a leveling rod or stadia rod, which is preferable for long distances. The distance from the center of the instrument to the rod is found by sighting through the instrument on the rod and multiplying the stadia interval ( $d$ ) by 100. The stadia interval is the distance between the top stadia hair reading and the bottom stadia hair reading.



1. Set the rod on the point to be surveyed.
2. Sight through the telescope of the leveled instrument and determine the distance or interval, "d", between the top stadia hair reading and bottom stadia hair reading of the rod.

The horizontal distance "D" from the center of the instrument to the rod is equal to 100 times the stadia interval, "d".

$$D=100 \times d$$

# 10. HOW TO OPERATE THE LASER POINTER

(DT-305L/307L/309LG only)

## CAUTION

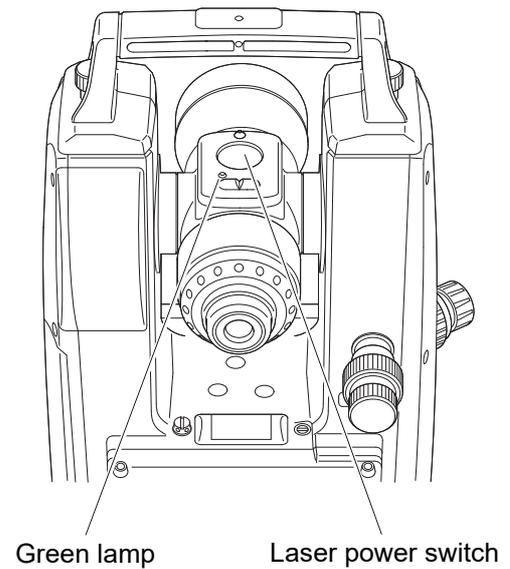
- When using the laser-pointer function, be sure to turn OFF the output laser after measurement is completed. Even if the power is turned off, the laser-pointer function is still operating and the laser beam continues to be emitted.

### 10.1 Using the Laser-pointer Function

1. Sight a target.
2. Press the laser power switch.  
The laser beam will emit and the green lamp will illuminate.

#### Note

- DT-305L/307L/309LG are so designed as to provide the telescope and laser beam with simultaneous focusing to give the minimum spot.



# 11. OTHER FUNCTIONS

## 11.1 Buzzer for Horizontal Angle 90° Increments

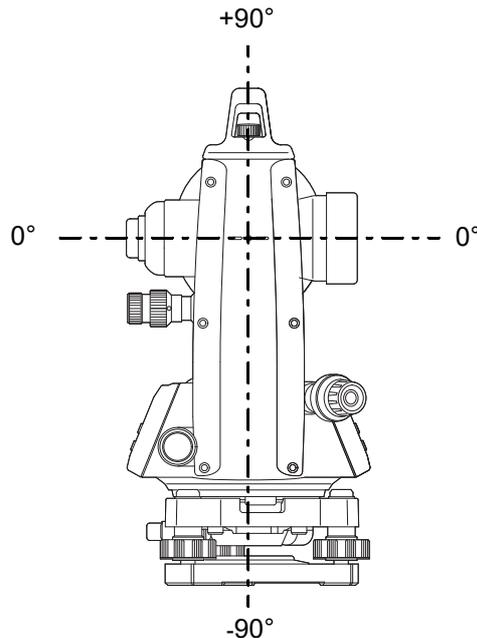
When the horizontal angle falls below  $\pm 1^\circ$  of  $0^\circ$ ,  $90^\circ$ ,  $180^\circ$  or  $270^\circ$ , the buzzer sounds. Buzzer stops only when the horizontal angle is adjusted to  $0^\circ 00' 00''$ ,  $90^\circ 00' 00''$ ,  $180^\circ 00' 00''$  or  $270^\circ 00' 00''$ .

Settings:  "12. SELECTING MODE".

## 11.2 Compasses (vertical angle)

Vertical angle scale is displayed as shown below.

Settings:  "12. SELECTING MODE".



## 11.3 Power-saving Automatic Cut-off

If no key operation is given for more than 10 or 30 minutes, the power turns off automatically.

Settings:  "12. SELECTING MODE".

## 11.4 Setting Minimum Display

Select minimum display unit for angle measurement from the options shown below.

Settings:  "12. SELECTING MODE".

DT-302	1"/5" (0.5 mgon/1 mgon)
DT-305/305L	1"/5" (0.5 mgon/1 mgon)
DT-307/307L	5"/10" (1 mgon/2 mgon)
DT-309F/309G/309LG	10"/20" (2 mgon/5 mgon)

# 12. SELECTING MODE

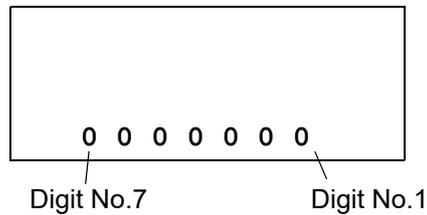
The following modes are available.

## 12.1 Selecting Mode Options

### ■ Selecting mode 1

To set the instrument to selecting mode 1, turn the power ON while pressing {R/L}.

Selecting mode 1  
{R/L} + Power on

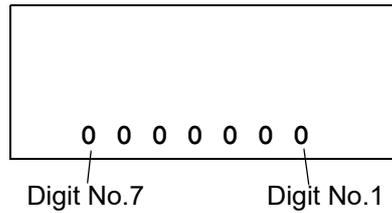


Selecting mode 1				
Digit No.	Items	Contents	Setting value = 0	Setting value = 1
1	Minimum angle unit	Select the minimum angle unit.	5" (DT-302)  5" (DT-305/305L)  10" (DT-307/307L)  20" (DT-309F/309G/ 309LG)	1"  1"  5"  10"
2	V angle Z0/H0	Select the vertical angle reading from zenith or from horizontal.	Horizontal 0	Zenith 0
3	Power-saving automatic cut-off ON/OFF	Set whether or not to power off when no key operation performed for 10 or 30 minutes.	ON	OFF
4	Auto cut off time 10 min./30 min.	Set the interval time of power off automatically.	10 min.	30 min.
5	Angle unit DEG/GON	Select degree (DEG) or gon (GON).	DEG	GON
6	90° buzzer ON/OFF	Specify whether the buzzer sounds or not for every horizontal 90°.	ON	OFF
7	Angle unit MIL	Select angle unit MIL.	DEG /GON	MIL

## ■ Selecting mode 2

To set the instrument to selecting mode 2, turn the power ON while pressing **{V/%}**.

Selecting mode 2  
**{V/%}** + Power on



Selecting mode 2				
Digit No.	Items	Contents	Setting value = 0	Setting value = 1
1	Press <b>{0 SET}</b> once/twice	Select number of times <b>{0 SET}</b> is pressed to set horizontal angle to 0.	Twice	Once
2	Compass ON/OFF	Set the compass to ON or OFF (Vertical angle scale).	OFF	ON
3	RS-232 Output *1)	Set data output function to ON or OFF.	OFF	ON
4	H Angle Memory	Horizontal angle set can be retained after the power is turned off.	OFF	ON
5	Tilt correction ON/OFF *2)	Set tilt correction to ON or OFF.	OFF	ON
6 7	Unused	---	---	---

\*1) DT-302 only

\*2) DT-302/305/305L/307/307L only



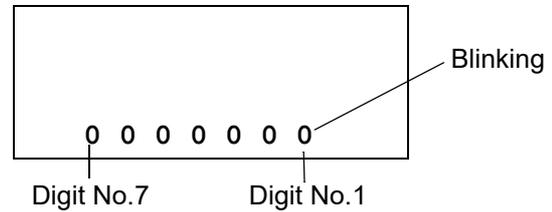
- Do not change the setting value (0) of unused items.

## 12.2 How to Set the Selecting Modes

### ■ Selecting Mode 1

Sample setting: Auto cut off: OFF, 90° buzzer: OFF

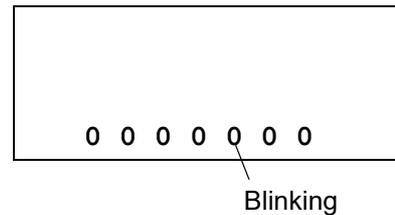
- Turn the power ON while pressing {R/L}.  
The instrument will be in selecting mode 1, and the digit No.1 will blink.



- Press {◀} until digit No.3 blinks.

Note

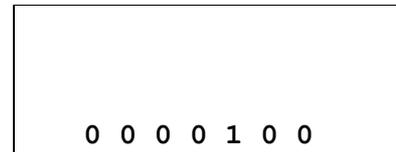
- Pressing {▶} moves the blinking digit to the right.



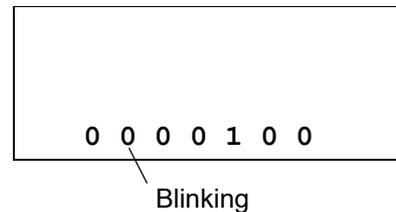
- Press {▲} to set this digit to "1".

Note

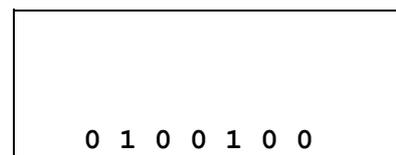
- Pressing {▲} switches the blinking digit value between "0" and "1".



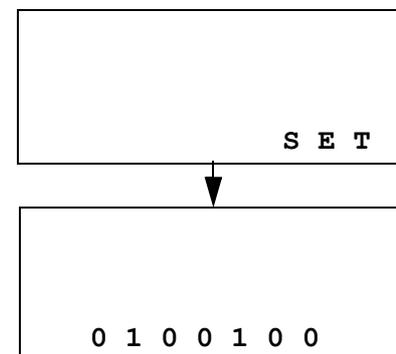
- Press {◀} until digit No.6 (90° buzzer) blinks.



- Press {▲} to set this digit to "1".



- Press {0 SET} to set.



- Turn the power off.

Note

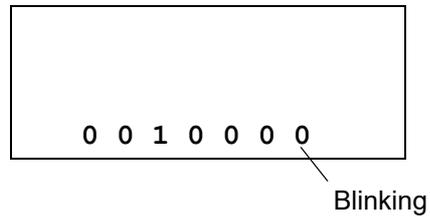
- Pressing {▶} moves the blinking digit to the right.  
If you press {▶} while the rightmost digit (digit number 1) is blinking, the leftmost digit (digit number 7) will start to blink. In the same way, if you press {◀} while the leftmost digit (digit number 7) is blinking, the rightmost digit (digit number 1) will start to blink.

- Each time you press {▲}, the blinking digit value alternately displays 0 and 1.

### ■ Selecting mode 2

Sample setting: {0 SET} operation: Once, Tilt correction: OFF

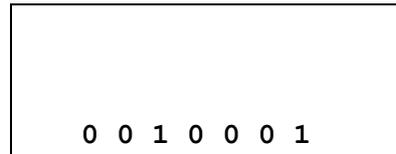
1. Turn the power ON while pressing {V/%}.  
The instrument will be in selecting mode 2, and the digit No.1 (0set operation) will blink.



2. Press {▲} to set this digit to "1".

Note

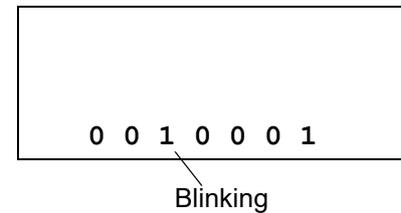
- Pressing {▲} switches the blinking digit value between "0" and "1".



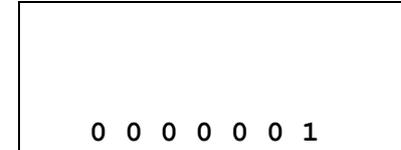
3. Press {◀} until digit No.5 (Tilt correction) blinks.

Note

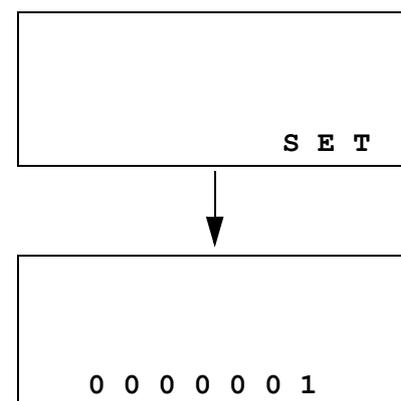
- Pressing {▶} moves the blinking digit to the right.



4. Press {▲} to set this digit to "0".



5. Press {0 SET} to set.



6. Turn the power off.

Note

- Pressing {▶} moves the blinking digit to the right.
- Each time you press {▲}, the blinking digit value alternately displays 0 and 1.



# 13. CHECKS AND ADJUSTMENTS

ADT is a precision instrument that requires fine adjustments. It must be inspected and adjusted before use so that it always performs accurate measurements.

- Always perform checking and adjustment in the proper sequence beginning from "13.1 Plate Level" to "13.7 Laser Beam".
- In addition, the instrument should be inspected with special care after it has been stored a long time, transported, or when it may have been damaged by a strong shock.
- Make sure the instrument is securely set up and stable before performing checks and adjustments.

## 13.1 Plate Level

The bubble tube is made of glass, so it is sensitive to temperature changes or to shock. Check and adjust it as outlined below.

### PROCEDURE Checking and adjusting

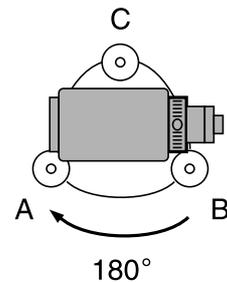
1. Level the instrument and check the position of the bubble of the plate level.

☞ "7.2 Levelling", steps 3 to 5

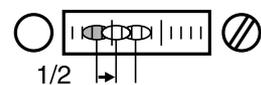
2. Turn the upper part of the instrument through  $180^\circ$  and check the bubble position.

If the bubble is still centered, no adjustment is necessary.

If the bubble is off-center, adjust as follows.

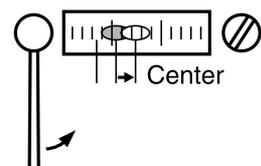


3. Correct half of the bubble displacement using levelling foot screw C.



4. Correct the remaining half of the displacement by using the adjustment pin to rotate the plate level adjustment screw.

When the plate level adjustment screw is turned in the counterclockwise direction, the bubble moves in the same direction.



5. Rotate the top of the instrument and continue adjustments until the bubble remains centered for any position of the upper part.

If the bubble does not move to the center even when the adjustment has been repeated, ask your local dealer to adjust it.

## 13.2 Circular Level

Check and adjust it as outlined below.



- Be careful that the tightening tension is identical for all the adjusting screws. Also, do not over-tighten the adjusting screws as this may damage the circular level.

### PROCEDURE Checking and adjusting

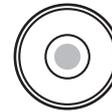
1. Level the instrument and adjust the position of the bubble of the plate level.

☞ "13.1 Plate Level"

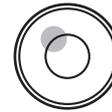
2. Check the position of the bubble of the circular level.

☞ "7.2 Levelling", steps 1 to 2

If the bubble is not off-center, no adjustment is necessary.

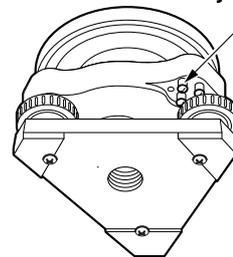


If the bubble is off-center, perform the following adjustment.



3. First confirm the off-center direction. Use the adjusting pin to loosen the circular level adjustment screw on the side opposite in the direction the bubble is displaced to move the bubble to the center.

Circular level  
adjusting screws



4. Adjust the adjusting screws until the tightening tension of the three screws is the same to align the bubble in the middle of the circle.

### 13.3 Vertical Cross-hair

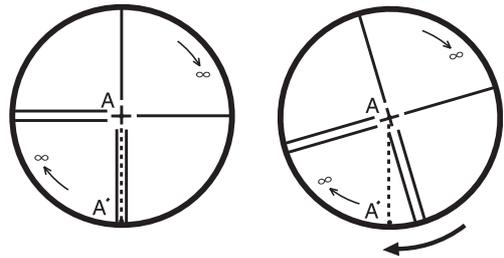
Adjustment is required if the vertical cross-hair is not perpendicular to the horizontal axis of the telescope (since it must be possible to use any point on the hair for measuring horizontal angles or running lines).

#### PROCEDURE Checking

1. Carefully level the instrument with the plate level.
2. Sight the cross-hairs on a well defined Point A and clamp horizontal motion.
3. Using the vertical clamp, move the point A to the point A' at the bottom of the telescope view.

If the point appears to move continuously on the hair, the vertical cross-hair lies in a plane perpendicular to the horizontal axis (and adjustment is not required).

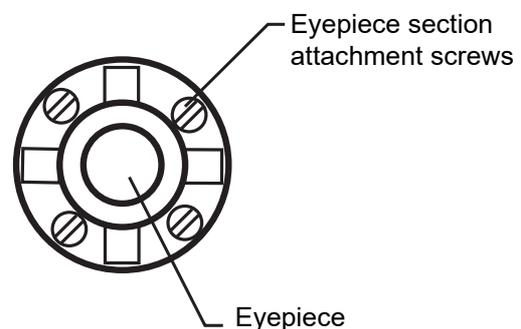
However, if the point appears to be displaced from the vertical cross-hair, as the telescope is swung vertically, then proceed with the following adjustment.



#### PROCEDURE Adjusting

1. Unscrew the cross-hair adjustment section cover by turning it in the counterclockwise direction, and remove. This will expose four eyepiece section attachment screws.
2. Loosen all four eyepiece section attachment screws slightly with the screwdriver provided (while taking note of the number of revolutions). Then turn the eyepiece so that the vertical cross-hair is aligned with Point A'.
3. Finally, re-tighten the four eyepiece section attachment screws by the amount that they were loosened.

Check again that the point A is aligned with the point A'. Then, the adjustment has been completed. If the point A still appears to be displaced from the point A', repeat the above procedure again.



- Perform "13.4 Collimation", "13.6 Vertical Angle 0 Datum" after completing the above adjustment.

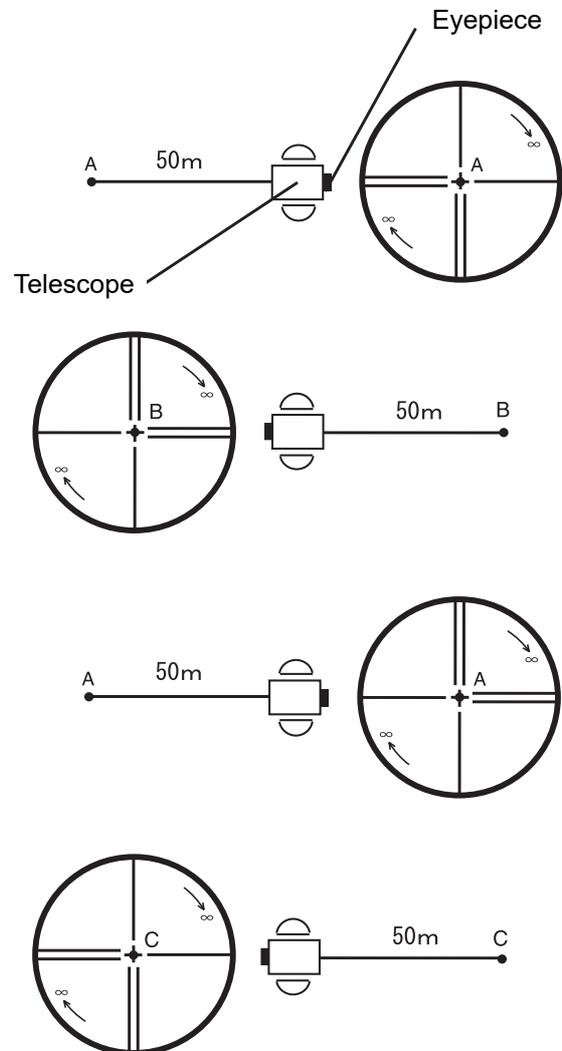
### 13.4 Collimation

Collimation is required to make the line of sight of the telescope perpendicular to the horizontal axis of the instrument. Otherwise, it will not be possible to extend a straight line by direct means.

#### PROCEDURE Checking

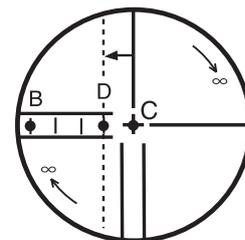
1. Set the instrument up with clear sights of about 50 to 60 meters (160 to 200 ft.) on both sides of the instrument.
2. Carefully level the instrument with the plate level.
3. Sight Point A at approximately 50 meters (160 ft.) distance.
4. Loosen the vertical clamp only, and rotate the telescope 180° or 200gon around the horizontal axis, so that the telescope is pointed in the opposite direction.
5. Sight Point B, at equal distance as Point A and tighten the vertical clamp.
6. Release the horizontal clamp and rotate the instrument 180° or 200 gon around the vertical axis. Fix a sight on Point A once more and tighten the horizontal clamp.
7. Release the vertical clamp only and rotate the telescope 180° or 200 gon around the horizontal axis once more and fix a sight on Point C, which should coincide with previous Point B.

If Points B and C do not coincide, adjust in the following manner.



#### PROCEDURE Adjusting

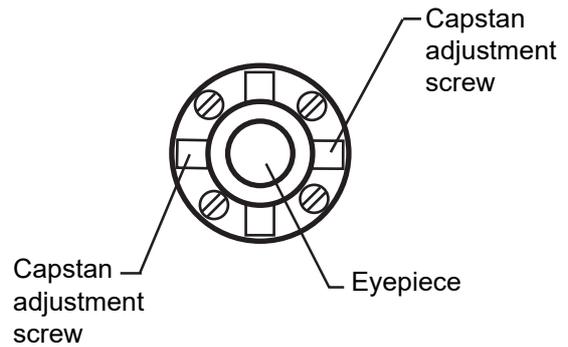
1. Unscrew the cross-hair adjustment section cover.
2. Find point D at a point between points C and B, which should be equal to 1/4th the distance between points B and C and measured from point C. This is because the apparent error between points B and C is four times the actual error since the telescope has been reversed twice during the checking operation.



- Shift the vertical cross-hair line and align it with point D, by revolving the left and right capstan adjustment screws with the hexagonal wrench\* (or adjusting pin). Upon completing the adjustment, repeat the checking operation once more.

If points B and C coincide, further adjustment is not required. Otherwise, repeat the adjustment.

\* DT-302/305/307/309F/309G: Hexagonal wrench  
DT-305L/307L/309LG: Adjusting pin



- First, loosen the capstan adjustment screw on the side to which the vertical cross-hair line must be moved. Then tighten the adjustment screw on the opposite side by an equal amount which will leave the tension of the adjustment screws unchanged. Revolve in the counterclockwise direction to loosen and in the clockwise direction to tighten, but revolve as little as possible.
-  Perform "13.6 Vertical Angle 0 Datum" after completing above adjustment.

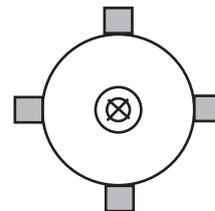
### 13.5 Optical Plummet



- Be careful that the tightening tension is identical for all the adjusting screws.

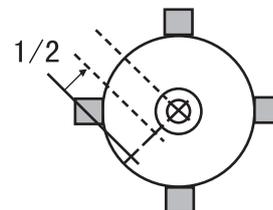
#### PROCEDURE Checking

- Carefully level the instrument and center a survey point precisely in the reticle of the optical plummet.
- Turn the upper part through 180° and check the position of the survey point in the reticle.  
If the surveying point is still centered, no adjustment is necessary.  
If the survey point is no longer centered in the optical plummet, perform the following adjustment.



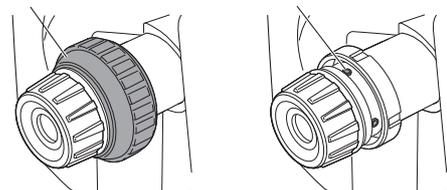
#### PROCEDURE Adjusting

- Correct half the deviation with the levelling foot screw.
- Remove the optical plummet reticle cover.



Cover

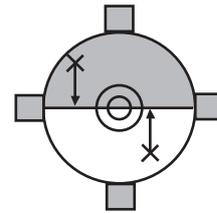
Adjusting screw



3. Turn the 4 adjusting screws of the optical plummet to adjust the remaining half of the deviation using hexagonal wrench (1.3 mm) as shown below.

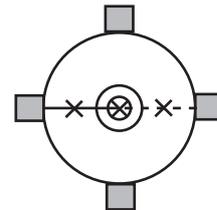
When the survey point is on the lower (upper) part of the illustration:

Loosen the upper (lower) adjusting screw slightly, and tighten the upper (lower) adjusting screw the same amount to move the survey point to a point directly under the center of the optical plummet. (It will move to the line in the figure on the right.)



If the survey point is on the solid line (dotted line):

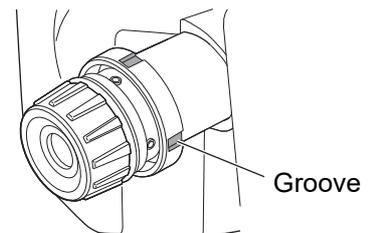
Loosen the right (left) adjusting screw slightly and, tighten the left (right) adjusting screw by the same amount to move the survey point to a point in the center of the optical plummet.



4. Check to make sure that the survey point remains centered on the reticle even if the upper part of the instrument is rotated.

If necessary, perform the adjustment again.

5. Replace the optical plummet reticle cover by matching the grooves on the cover with the grooves on the optical plummet.

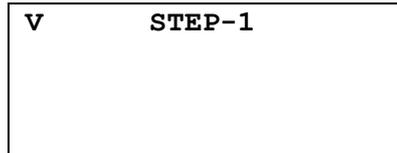


### 13.6 Vertical Angle 0 Datum

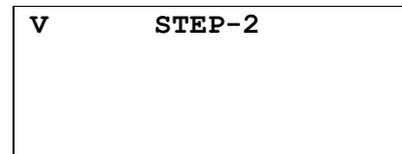
If when measuring the vertical angle of target A in both faces, the total of combined face left and face right measurements is other than  $360^\circ$  (ZENITH-0), half of the difference from  $360^\circ$  is the error amount from corrected 0 setting. Carry out adjustment. As adjustment for vertical angle 0 determines instrument coordinate origin, use special care for adjustment.

#### PROCEDURE Adjusting

1. Level the instrument properly with the plate level.
2. While pressing **{0SET}**, turn power switch ON.
3. Sight target A from the telescope properly in face left.



4. Press **{0SET}**.



5. Sight target A in face right.

6. Press **{0SET}**.  
Correction values are calculated and stored at the same time as tilt offset values.



7. Turn the power switch off.

#### Note

- Any misoperating and error code display appears. Repeat the above procedure from the start.
- Check that the total amount of face left and face right angular travel is  $360^\circ$  when sighting the target A.

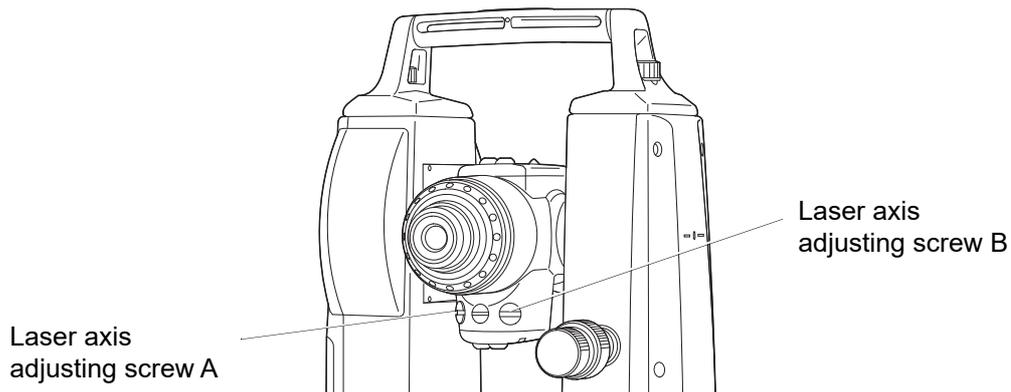
## 13.7 Laser Beam

This adjustment must be done after completing the checks and adjustments of "13.3 Vertical Cross-hair" and "13.4 Collimation".

If intersection of the cross-hair does not coincide with the laser spot, turn the laser axis adjusting screws to move the laser spot to coincide with intersection of the cross-hair.

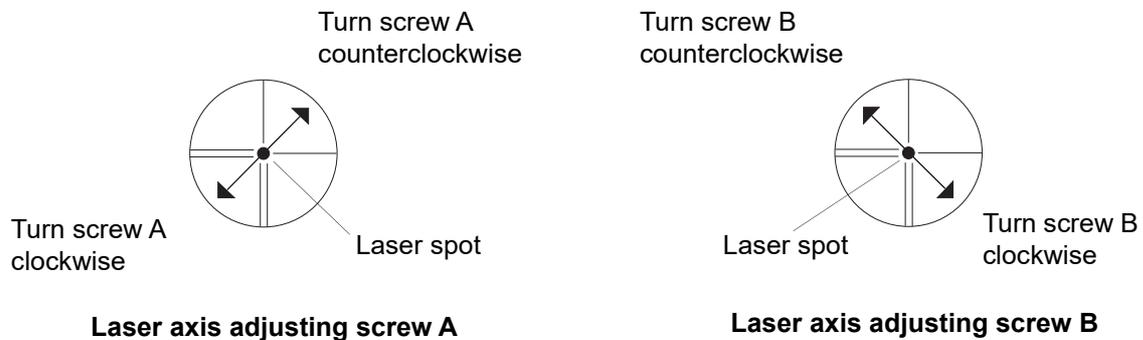
### PROCEDURE Adjusting

1. Remove the caps of the laser axis adjusting screws A and B with a coin.



2. Turn the laser axis adjusting screw A or B with a screwdriver.

The following shows the moving direction of the laser spot when the laser adjusting screws are turned.



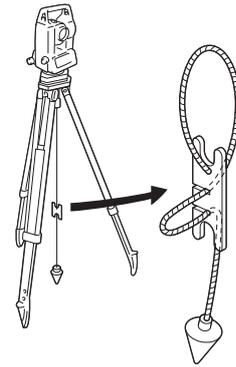
3. Attach the caps of the laser axis adjusting screws.

# 14. OPTIONAL ACCESSORIES

The following are outlines and how to use optional accessories.

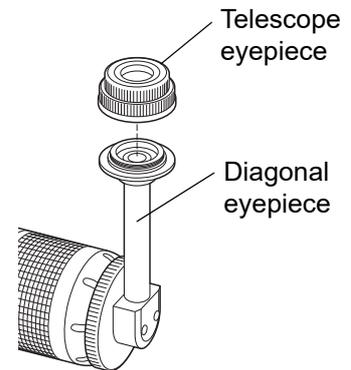
- **Plumb bob**

The plumb bob can be used to set up and center the instrument on days when there is little wind. To use the plumb bob, unwind its cord, pass it through the cord grip piece as shown in the figure to adjust its length, then suspend it from the hook attached to the centering screw.



- **Diagonal eyepiece (Model 13)**

The diagonal eyepiece is convenient for observations near the nadir and in narrow spaces.



- **Battery BDC71**

- **Charger CDC77**

A dedicated power cable for the country or the area where the instrument is purchased is attached.

# 15. ERROR DISPLAY

Display	Contents	Countermeasure
AnGLE Error	Displayed when the instrument or the telescope rotated quickly.	In this case, it is not failure. However, repair is required when "AnGLE Error" is displayed frequently.
E04	Displayed when the discrepancy value of each measuring is more than $\pm 30''$ while repetition angle measurement is operated.	Press <b>{0SET}</b> , measure again from the beginning.
E70	When "Adjustment of Vertical Angle 0 datum" is adjusted in wrong procedure. or When "Adjustment of Vertical Angle 0 datum" is carried out to the range out of $\pm 45^\circ$ from the horizontal.	Switch off the power, then on again. Confirm the procedure and adjust again.
E99	Abnormality in internal memory system while "Adjustment of Vertical Angle 0 Datum" is operated, or horizontal angle is set zero or hold.	Switch off the power, then on again. Confirm the procedure and adjust again.



- If errors still persist after attempting to clear them, contact your local dealer.

# 16. SPECIFICATIONS

## Telescope

Length	
DT-302/305/307/309F/309G:	149mm
DT-305L/307L/309LG:	152mm
Aperture	45 mm
Magnification	30X
Image	Erect
Resolving power	2.5"
Field of view	1°30' (26 m/1,000 m)
Minimum focus	
DT-302/305/307/309F/309G:	0.9 m
DT-305L/307L/309LG:	1.0 m
Reticle illumination	Yes
Stadia ratio	100
Stadia constant	0

## Angle measurement

Horizontal and Vertical circles type	Rotary absolute encoder
Angle units	Degree/Gon/Mil (selectable)
Minimum display	
DT-302:	1" (0.0002 gon/0.01 mil)/5" (0.001 gon/0.1 mil) (selectable)
DT-305/305L:	1" (0.0002 gon/0.01 mil)/5" (0.001 gon/0.1 mil) (selectable)
DT-307/307L:	5" (0.001 gon/0.01 mil)/10" (0.002 gon/0.1 mil) (selectable)
DT-309F/309G/309LG:	10" (0.002 gon/0.05 mil)/20" (0.005 gon/0.1 mil) (selectable)
Accuracy (ISO 17123-3: 2001)	
DT-302:	2" (0.0006 gon/0.010 mil)
DT-305/305L:	5" (0.0015 gon/0.025 mil)
DT-307/307L:	7" (0.0022 gon/0.035 mil)
DT-309F/309G/309LG:	9" (0.0031 gon/0.049 mil)
Measuring mode	
Horizontal angle:	Right/Left (selectable)
Vertical angle:	Zenith/Horizontal/Horizontal $\pm 90^\circ/\%$ (selectable)

## Tilt angle compensation (DT-302/305/305L/307/307L only)

Type:	Automatic vertical compensator
Range of compensation:	$\pm 3'$ ( $\pm 0.0555$ gon)
Compensation constant:	Can be changed (compensation is done at the same time with vertical angle 0 point)

## Laser-pointer

Signal source:	Red laser diode (633nm) Class 2 (IEC60825-1 Ed.3.0:2014/FDA CDRH 21CFR Part 1040.10 and 1040.11 (Complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No.56, dated May 8, 2019.))
Maximum output:	0.6mW
Beam accuracy:	$\pm 1$ mm or less (Less than 20 m) $\pm 10''$ (20 m or more)
Laser beam range:	50m (in daylight)

Laser beam diameter (When focused)\*1

Telescope Magnification	Distance (m)	5	10	20	30	50
30x	Beam diameter (m) (width x height)	0.1x0.2	0.2x0.4	0.5x0.7	0.7x1.1	1.2x1.9

\*1 The laser beam diameters are theoretical values. The visible laser beam diameter will vary with ambient brightness.

**Power Supply**

Power source 4 AA alkaline batteries

Working duration at 20 °C

	Model	Dry batteries	BDC71 (Optional accessory)
<b>Theodolite only</b>	DT-302	about 180 hours	about 250 hours
	DT-305/305L	about 230 hours	about 300 hours
	DT-307/307L	about 230 hours	about 300 hours
	DT-309F/309G/309LG	about 250 hours	about 350 hours
<b>Laser only</b>	DT-305L	about 80 hours	about 100 hours
	DT-307L	about 80 hours	about 100 hours
	DT-309LG	about 80 hours	about 100 hours
<b>Theodolite and laser</b>	DT-305L	about 55 hours	about 70 hours
	DT-307L	about 55 hours	about 70 hours
	DT-309LG	about 55 hours	about 70 hours

Battery state indicator 4 levels  
 Auto power-off 3 levels (10/30 min/Not set) (selectable)

**General**

Display unit Reflective type TN LCD graphic display  
 Backlight: On/Off (selectable)  
 Keyboard 6 keys  
 Serial signal RS-232C connector Yes (DT-302 only)  
 Sensitivity of levels  
     Circular level: 10"/2 mm  
     Plate level: 30"/2 mm  
 Optical plummet  
     Image: Erect  
     Magnification: 3X  
     Minimum focus: 0.5 m  
 Operating temperature range -20 to 50°C (-4 to 122°F) \*2  
 Storage temperature range -30 to 60°C (-22 to 140°F) (no condensation)  
 Dust and water resistance IP66 (IEC 60529: 2001)  
 Instrument height 177 mm from tribrach mounting surface  
 Size (with handle)  
     Display on both sides: 173 (W) X 181 (D) X 318 (H) mm  
     Display on one side: 173 (W) X 174 (D) X 318 (H) mm

Weight

Detachable:	4.1 kg (9.04 lb) (with batteries and battery holder)
Centering:	4.1 kg (9.04 lb) (with batteries and battery holder)
Fixing	4.0 kg (8.82 lb) (with batteries and battery holder)

\*2 No direct sunlight for using high temperatures of 50°C (-22 °F).

# 17. REGULATIONS

Region/ Country	Directives/ Regulations	Description
U.S.A.	FCC-Class A	<p><b>FCC Compliance</b></p> <p><b>WARNING:</b> Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.</p> <p><b>NOTE:</b> This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful inter-ference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.</p>
California, U.S.A	Proposition 65	<div style="border: 2px solid black; padding: 10px;"> <p><b>⚠ WARNING:</b> This product can expose you to chemicals including Lead, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>.</p> </div>
Canada	ICES-Class A	<p>This Class A digital apparatus meets all requirements of Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la Class A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.</p> <p>This class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme a la norme NMB-003 du Canada.</p>
EU	EMC-Class B	<p><b>EMC NOTICE</b> In industrial locations or in proximity to industrial power installations, this instrument might be affected by electromagnetic noise. Under such conditions, please test the instrument performance before use.</p> <p><b>Manufacturer</b> Name : TOPCON CORPORATION Address : 75-1, Hasunuma-cho, Itabashi-ku, Tokyo, 174-8580 JAPAN</p> <p><b>Europe Representative and Importer</b> Name : Topcon Europe Positioning B.V. Address : Essebaan 11, 2908 LJ Capelle a/d IJssel, The Netherlands</p>
EU	WEEE Directive	<div style="border: 1px solid black; padding: 10px;"> <p> <b>WEEE Directive</b> This symbol is applicable to EU members states only.</p> <p>Following information is only for EU-member states: The use of the symbol indicates that this product may not be treated as household waste. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about the take-back and recycling of this product, please contact your supplier where you purchased the product or consult.</p> </div>

Region/ Country	Directives/ Regulations	Description																																									
EU	EU Battery Directive	<div style="border: 1px solid black; padding: 5px;">  <p><b>EU Battery Directive</b> This symbol is applicable to EU members states only.</p> <p>Battery users must not dispose of batteries as unsorted general waste, but treat properly.</p> <p>If a chemical symbol is printed beneath the symbol shown above, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration. This will be indicated as follows: Hg: mercury(0.0005%), Cd: cadmium(0.002%), Pb: lead(0.004%)</p> <p>These ingredients may be seriously hazardous to human and the global environment.</p> </div>																																									
China	Chinese Environmental Directive	<p style="text-align: center;">&lt;产品中有毒物质的名称及含量&gt;</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">部件名称</th> <th colspan="6">有 害 物 质</th> </tr> <tr> <th>铅 (Pb)</th> <th>汞 (Hg)</th> <th>镉 (Cd)</th> <th>六价铬 (Cr(VI))</th> <th>多溴联苯 (PBB)</th> <th>多溴二苯醚 (PBDE)</th> </tr> </thead> <tbody> <tr> <td>望远镜部位</td> <td>×</td> <td>×</td> <td>×</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>主机部位</td> <td>×</td> <td>○</td> <td>×</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>附件</td> <td>×</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>盒子</td> <td>×</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> </tr> </tbody> </table> <p>○：表示该有毒有害物质在该部件所有均质材料中的含量均在电子信息产品中有毒有害物质的限量要求标准规定的限量要求（GB/T 26572）以下  ×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出电子信息产品中有毒有害物质的限量要求标准规定的限量要求（GB/T 26572）</p> <p>This information is applicable for People's Republic of China only.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <p>环保使用期限标识是根据《电器电子产品有害物质限制使用管理办法》以及《电器电子产品有害物质限制使用标识要求》（SJ/T11364）制定的，适用于中国境内销售的电子信息产品的标识。</p> <p>只要按照安全及使用说明内容在正常使用电子信息产品情况下，从生产日期算起，在此期限内产品中含有的有毒有害物质不致发生外泄或突变，不致对环境造成严重污染或对其人身、财产造成严重损害。产品正常使用后，要废弃在环保使用年限内或者刚到年限的产品，请根据国家标准采取适当的方法进行处置。另外，此期限不同于质量/功能的保证期限。</p> <p>The Mark and Information are applicable for People's Republic of China only.</p> </div>	部件名称	有 害 物 质						铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)	望远镜部位	×	×	×	○	○	○	主机部位	×	○	×	○	○	○	附件	×	○	○	○	○	○	盒子	×	○	○	○	○	○
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附件	×	○	○	○	○	○																																					
盒子	×	○	○	○	○	○																																					

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**TOPCON CORPORATION** (Manufacturer)

75-1 Hasunuma-cho, Itabashi-ku, Tokyo 174-8580, Japan <https://www.topcon.co.jp>

Please see the following website for contact addresses.

**GLOBAL GATEWAY** <https://global.topcon.com>

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