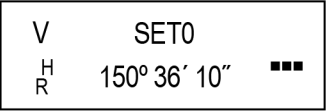


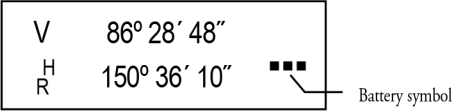
OPERATION

Start Up

- Press and hold [ON/OFF] button. Release [ON/OFF] button when the full character display appears. The LCD displays:



- Move the telescope up and down when the instrument is at the normal position. The beeper beeps and the LCD displays the vertical angle. The instrument enters into measuring mode.
- After the power is switched on and the instrument has entered into measuring mode, the battery level is indicated by the battery symbol in the lower right corner of LCD.
- If all of the three squares are displayed, the battery is fully charged.
- Decreasing squares indicates reduction of charge.
- If the battery symbol blinks, the battery is low and needs recharging or replacing.



Battery symbol

Measurement of Angle

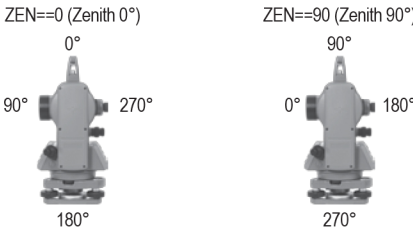
Observing in the “Normal” and “Reverse” Positions of the Telescope

The normal, or direct, position of the telescope refers to observation with the vertical circle being on the left. The reverse position refers to observation with the vertical circle being on the right. The mechanical errors can be offset by averaging the values measured in the normal and reverse positions.



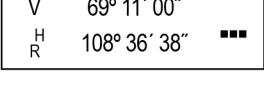
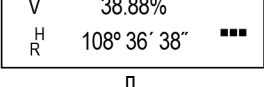
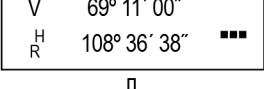
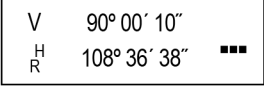
Measurement of Vertical Angle

- 0° angle position can be set as follows in the initial setting:



Compensation of the Tilt Sensor to Vertical Angle.

- If the instrument is inclined within ±3', the tilt sensor can compensate the vertical angle. If the inclination is greater than ±3', the instrument will display [TILT] as shown in the figure.

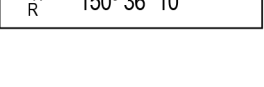
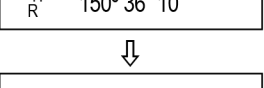
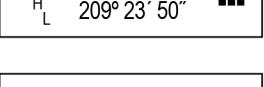
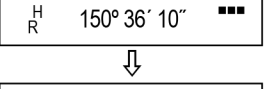
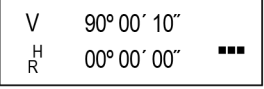
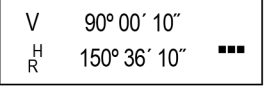


Note: When vertical angle is converted to slope, the precision of the slope reading is two digits after the decimal. The value of slope is displayed only within ± 45° (100%). There will be no slope display exceeding this range.

Measurement of Horizontal Angle

- Reset of Horizontal Angle

Press [0SET] button, the horizontal angle returns to zero



Selecting the Direction of Measurement of Horizontal Angle.

- Press [R/L] button to change the direction of measurement of the horizontal angle.

When “HR” is displayed, the angle increases with clockwise turning.

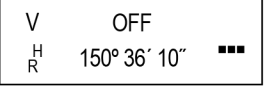
When “HL” is displayed, the angle increases with counterclockwise turning.

Holding Horizontal Angle.

- Press [HOLD] button, the horizontal angle will be held. The reading of the horizontal angle will remain unchanged even if the direction of telescope is changed. Press [HOLD] button again, the hold of horizontal angle is released.

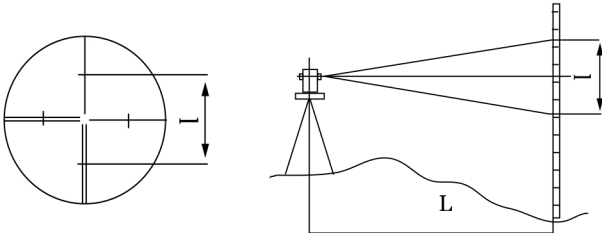
Turning Off.

Press - [ON/OFF] button and hold, “OFF” will be displayed, after a beep; release [ON/OFF] button, the instrument is turned OFF.



Measuring Distance Using the Stadia Method

Read the leveling rod using the stadia hair on the reticle of the telescope. Multiply the reading by 100, to obtain the actual distance L from the target to the measured point. (100 is the multiplication constant error of the instrument, i.e., L = l x 100)



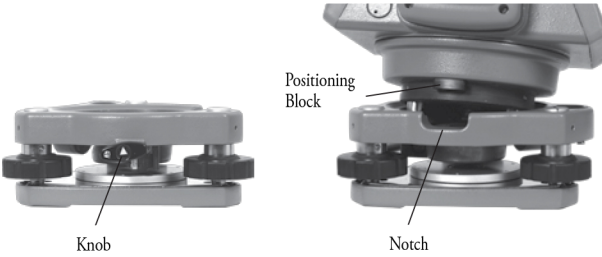
Installation and Removal of the Base

Base Removal

- Turn the screw on the Tribrach Locking Lever outward using a flat screw driver to its stop.
- Turn Tribrach Locking Lever 180° counterclockwise. Holding the base with one hand, take the main body off the base.

Base Installation

- Turn the Tribrach Locking Knob counterclockwise until it reaches the position limit. Align the positioning block on the main body of the instrument to the notch on the base. Install the main body onto the base .
- Turn the Tribrach Locking Lever clockwise until it reaches the position limit so that the ‘v’ mark points downward. Turn the locking screw inward until it hits its stop.



INSPECTION

Tubular vial

- Attach the instrument to a tripod and rough level. Position the tubular vial parallel to a line connecting any two of the three leveling screws on the base. Adjust the two leveling screws so that the tubular bubble is centered.
- Turn the instrument 180° and check if the bubble remains at the center.



- If the bubble remains at the center, no adjustment is required. Otherwise, perform adjustments as follows:
- Using the bubble adjustment screws, move the bubble towards the tube center for half of the error
- Turn the leveling screw to correct the other half of the error so that the bubble is centered.
- Rotate the instrument 180 degrees and check if the bubble remains centered. If the bubble is centered, the adjustment is complete. If not, repeat the steps until the bubble is centered when the instrument is at any position.

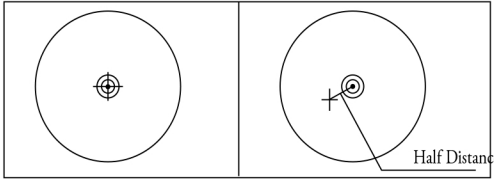
Circle vial

After making sure that the tubular vial is correctly adjusted, check the circular level. If the bubble is centered, no adjustment is required. Otherwise, adjust the three adjustment screws with a needle to center the bubble.



Optical Plummet

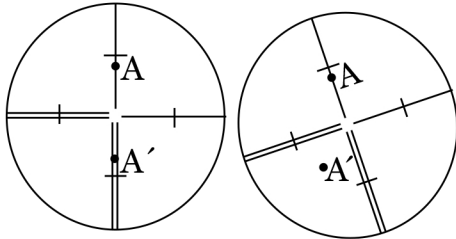
- Attach the theodolite to a tripod (no leveling is required).
- Place a target under the instrument.
- Focus the image of the target then adjust the leveling screws so that the target is centered in the reticule.
- Turn the instrument 180°.
- If the target remains at the center of the reticule, no adjustment is required. Otherwise, adjust as follows.



Perpendicularity of Vertical Crosshair of Reticule of Telescope

- Attach the instrument on a tripod and precisely level
- Place a target point, A, 50M away from instrument.
- Aim the telescope at point A. Move the telescope using the vertical fine movement. If point A moves along the vertical hair of the reticule, no adjustment is required. Perform the following adjustment if the point A strays from the vertical crosshair:
- Remove the protective cover of the reticule and slightly loosen the four adjusting screws. Turn the assembly so that point A coincides with the vertical hair, retighten the four adjusting screws.

Repeat the above steps until there is no error.



Collimation Error

- Attach the instrument on a tripod and precisely level.
- Aim at point A in the distance with the normal, direct position of telescope. Record the reading of the horizontal angle - HR-DIRECT. Next using the reverse position of the telescope, take the reading of the horizontal angle - HR-REVERSE, then:

Collimation Error C = (HR-Direct — HR-Reverse ± 180°)/2

If C <10", no adjustment is required. If C >10", the following adjustment is required:

Adjust the horizontal fine motion in the reverse position of the telescope so that the reverse reading HR-Rev = HR-Rev + C.

Remove the protective cover of the reticule of the telescope and adjust both the left and right adjusting screws so that the vertical hair of the reticule coincides with object A.

Repeat the steps until acceptable condition is reached.

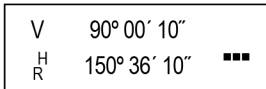
Index Error of Vertical Circle

- Attach the instrument on a tripod and precisely level.
- Aim at any object, point P, in the normal position and take the reading of vertical angle - V-Direct.
- Turn the telescope to the reverse position and aim it at point P again. Take the reading of other vertical angle - V-Rev.
- If (V-Direct + V-Rev) - 360°= ≤15", no adjustment is required. Otherwise, perform adjustment as follows:

Press and hold [R/L] + [HOLD] buttons while pressing [ON/OFF] button. Release [ON/OFF] button when full character display appears and then release [R/L] + [HOLD] buttons when four beeps are heard.

Swing the telescope near horizontal with the instrument in the normal position. Allow the vertical angle to reset after it crosses zero. Aim the telescope in the normal position at object P and press [0SET] to confirm.

Aim the telescope in the reverse position at object P and press [0SET] to confirm. With this, the compensation of index error is completed.



ACCESSORIES

- 1 plumb bob
- 1 tool kit (containing a screw driver and 2 needles)
- 2 bags of desiccant
- 1 rain cover
- 1 user guide
- 1 charger
- 1 battery pack alkaline
- 1 battery pack rechargeable

ERROR CODES

Display	Meaning and remedy
E01	Count error, if displayed repeatedly, repair is needed
TOO FAST	The telescope or collimation unit rotated too fast, press any key except [on/off] and [], the instrument returns to normal state
E04	Horizontal sensor I error, repair is needed.
E05	Horizontal sensor II error, repair is needed.
E06	Vertical sensor error, repair is needed.
TILT	The tilt sensor is out of range. Level the instrument again. If this does not clear the error code, repair is needed. Note: For a temporary solution, the tilt sensor can be turned off.

Due to our policy of continuous improvement, we reserve the right to alter product design and specification without prior notification.

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