Automatic Level
User Manual

iNDEX

Introduction

Thanks for your support. This instrument is designed for ordinary geodetic survey. It’ s suitable for construction project, mines, road, bridge, settings of heavy machinery, etc.

- This instrument is equipped with air compensator. A high precision leveling line will be settled automatically after circular bubble adjusted properly.
- Telescope System is equipped with multilayer coating lens. High
- transmission rate brings out clear and stable image.
  Ip66 standard protect this instrument from dust & water within a good level. Expand its range of working environment.

Please keep User Manual properly and read it carefully for a good use of the instrument.

Notice:

1. For a good state, the instrument should be checked and adjusted by responsible person esp. after long time storage or transportation. For further information, please refer to Page 9
2. Before Measuring, please conform instrument running properly.
3. After working, please clean the instrument and put it into cases.
4. Surface, buttons, screen etc. are suitably cleaned by soft clean clothes, Optical parts is better to use lens paper. Do not touch lens with fingers.
5. During transportation, please keep instrument stay in case. If you are going to move the instrument, put it into case firstly.
6. Storage the instrument in a try room with constant temperature.
7. If the instrument need repair. Make sure it is checked & repaired by technicians with well known of instrument construction or send it back to a professional dealer.

Warning !

1. Never observe the sun through telescope system.
2. Be carefully when working around high voltage facilities.
3. Do not handle Staff in thunderstorms.
4. Pay attention to Spiked feet of tripod during transportation and operation.
5. Survey should be operated in safety area and please obey local safety rules & traffic rules.

1.Important Parts

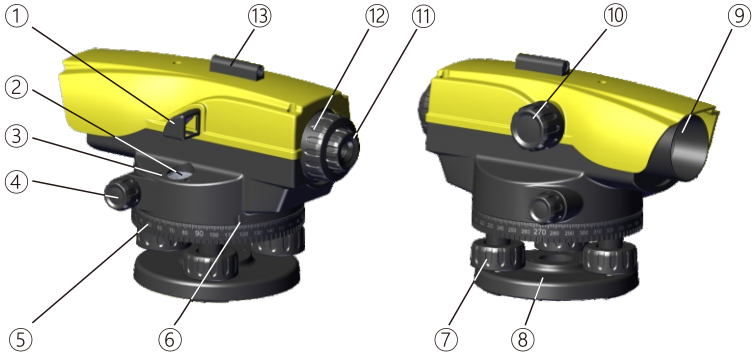

Figure 1

1.Reflecting Mirror
2.Circular Bubble
3.Bubble Adjusting Screw
4.Horizontal Tangent Screw
5.Horizontal Circle
6.Graduation Pointer
7.Footscrews
8.Base
9.Objective Lens
10.Focusing Knob
11.Eyepiece
12.Eyepiece cover
13.peep sight

2. Instrument Operation

2.1 Instrument setting

①Extend the tripod legs until top holder is at eye level.

②Tighten screws and stick tripod legs firmly into the grand.

③Set instrument and tighten the centering screw. (Figure 2)

④Move bubble to the centre of circle by adjusting the footscrews. (Figure 3) Adjust A and B screws to move bubble left and right then adjust C screw to move bubble into the centre circle.

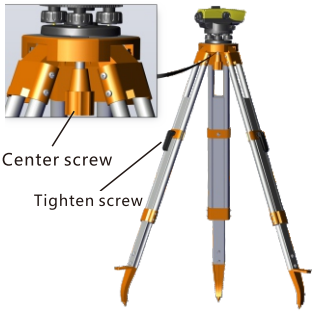

Figure 2

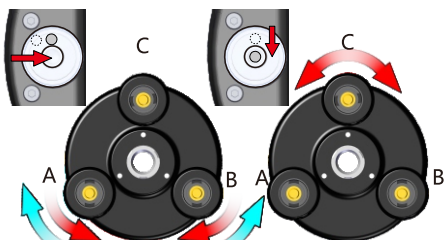

Figure3

2.2 Sight and Focusing

①Rotate eyepiece to make the reticle being clear. (Figure 4)

②Target the staff through peep sight. Rotate focusing knob to make the staff image being clear. Coincide vertical hair with the middle of the staff.(Figure 5)

③Move your eye sight right, left, up and down. If staff image and reticle hair remains still, you can start work.

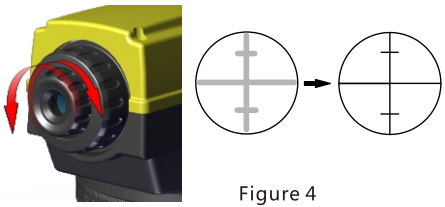

Figure 4

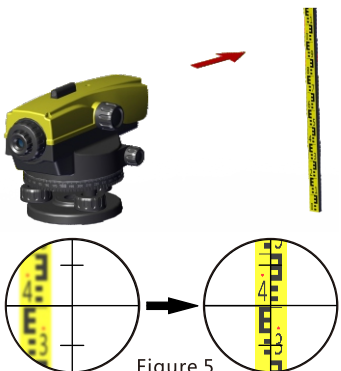

Figure 5

2.3 Measurement

2.3.1 Height measurement.

①Use the ruler side of the staff, and keep vertical.

②Adjust eyepiece and focusing knob to make reticle and staff images both clear.

③Read Data as Figure 6, H=1.403m

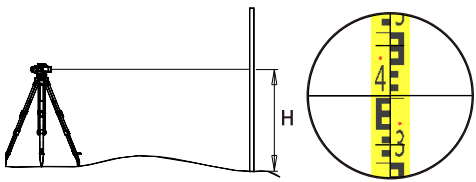

Figure 6

2.3.2 Height Difference

①Set up the instrument at a point approximately halfway between point A and point B.

②Posit the staff vertically at point A, take a reading as “a” (Example a=1.735 m)

③Then read the staff at point B and obtain the reading as "b". (Example b=1.224 m)

④The difference a-b is the AB height difference "h" (Example: h=a-b=1.735-1.224=0.511m)

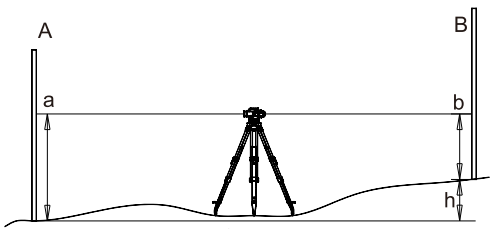

Figure 7

2.3.3 Stadia Measurement

Read the staff and count the Difference L between two stadia lines.(Figure 8)

Up line: 1.480m

Down line: 1.328m

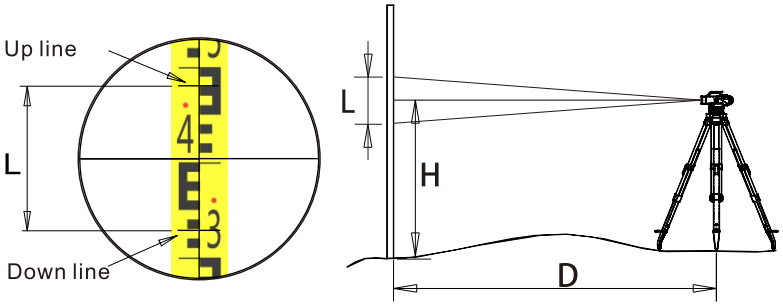

Figure 8

Difference L=1.4801.328=0.152m,
Distance D= 100*L=15.2m

2.3.4Angle Measurement:

①Direct instrument to staff A and turn Horizontal Circle to "0" .(Figure 9)

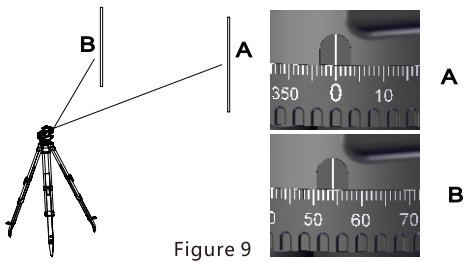

Figure 9

②Point instrument to staff B

③Read off Hz-angle from Horizontal Graduation Circle. Figure 15:

Hz=54°

3.Checking and Adjustment

Pls check instrument before working. Instrument must be checked and adjusted by responsible person regularly.

3.1 Circular Bubble:

①Center the bubble of the Circular Level precisely by using the Leveling Foot Screws.

②Turn the telescope around 180°(Figure 10). The bubble needs adjusting if it is uncentered.

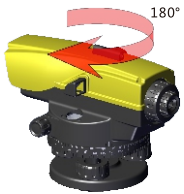

Figure 10

③The bubble needs adjustment if it is uncentered.

④Adjust Leveling Footscrews to move the bubble to the

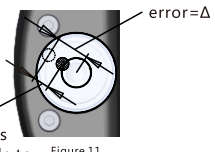

Figure 11

middle place of the error.(Figure 11)
⑤Adjust the rest half of error by using Allen key.(Figure 12)
⑥Repeat the above steps until the bubble remains centered when telescope point to any direction.

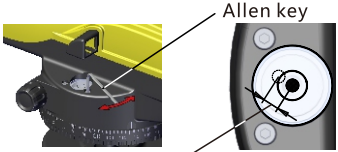

Figure 12

3.2 Line of sight
①Set the instrument at a point halfway between point A and B spaced about 30-40m apart. Take readings of staff A and staff B as "a1" and "b1".(Figure 13)
Calculate the real height difference : ΔH=a1-b1

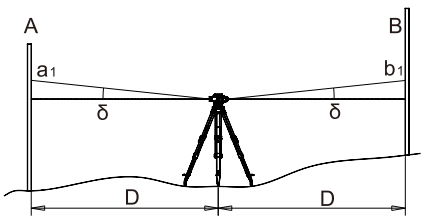

Figure 13

②Set up the instrument about 1 m away from point A and read staff A and staff B as "a2" and "b2". (Figure 14)

③. Then you can get logical value b2′ =a2-ΔH

----b2′ is the height b2 should be

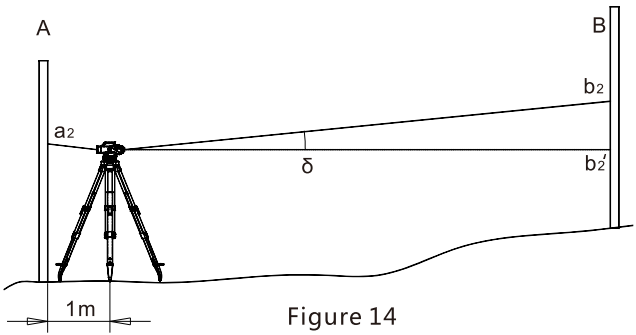

Figure 14

④When the difference between b2 and b2′ is more than 3mm, the line of sight must be adjusted.

⑤Rotate the adjusting screw until horizontal hair move to reading b2’ .

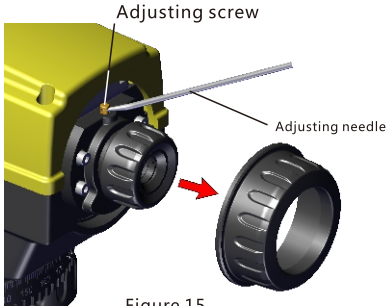

Figure 15

4. Packing list

Instrument: 1 pc
Manual : 1 pc
Allen key: 1pc
Adjusting needle: 1pc
Plumb: 1pc

Technical data

Modle	AL18-20	AL18-24	AL18-28	AL18-32
Image	Erect			
Magnification	20×	24×	28×	32×
Valid Objective Aperture	36mm			
View Angle	1°20′			
Min Focusing Distance	1m			
Stadia Ratio	100			
Additive constant	0			
Setting Accuracy	±0.5″			
Compensating Range	≥15′			
Circular Level Sensitivity	8′/2mm			
Horizontal Circle Graduating	1° or 1gon			
Standard Deviation 1.0mm	1.5mm	1.5mm	1.2mm	1.0mm
Working Temperate	-20~+50℃			
StorageTemperate	-40~+70℃			
IP Standard	Ip66			
InstrumentSize(L×W×H)（mm）	210x135x140			
Weight（kg）	1.4			

Geo Navigation Instrument Network

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