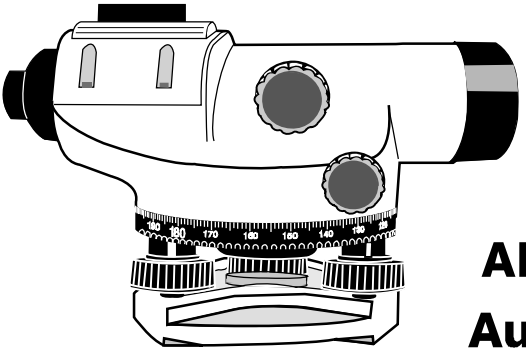
User Manual



AL Series
Automatic Levels

Contents

Technical Data	AL20	AL24	AL28	AL32
Telescope	erect	erect	erect	erect
Magnification	20X	24X	28X	32X
Clear objective aperture	30mm	30mm	40mm	40mm
Field of view	1°30'	1°30'	1°30'	1°30'
Shortest focusing distance	0.5m	0.5m	0.5m	0.5m
Multiplication factor	100	100	100	100
Additive factor	0	0	0	0
Waterproof	yes	yes	yes	yes

Compensator	AL20	AL24	AL28	AL32
Working Range	±15'	±15'	±15'	±15'
Setting accuracy	±0.5″	±0.5″	±0.4″	±0.3″
Sensitivity of bubble	8' /2mm	8' /2mm	8' /2mm	8' /2mm
Circle graduation	1°or1gon	1°or1gon	1°or1gon	1°or1gon
Standard deviation for 1Km double-run levelling	2.5mm	2.0mm	1.5mm	1.0 mm
Instrument N/W	1.3kg	1.3kg	1.3kg	1.3kg
Centre size of tripod	M16or5/8″	M16or5/8″	M16or5/8″	M16or5/8″

Using Method

1. Setting up

(1) Adjust the tripod to horizontal level, tighten screw A.(Fig.1)

(2) Adjust the tripod roughly horizontal, fix it to ground.(Fig. 2)

(3) Set the instrument on the tripod head B, and tighten it.(Fig. 3)

(4) Turn footscrews and centre the bubble.(Fig. 4)

2. Pointing and focusing

(1) Through the optical sight, point it to the staff.

(2) Turn the focusing knob to set cross hair clear.

(3) Turn the knob until the staff is clear.

(4) Adjust the horizontal drive to make the staff at the centre.

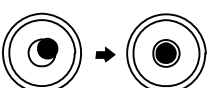


Fig. 4

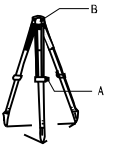


Fig. 1

Fig. 2

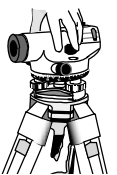


Fig. 3

Measuring method

1. Height measurement

(1) Set up the instrument between A and B.

(2) Vertically set up the staff at A, the height reading is a.

(3) Vertically set up the staff at B, the height reading is b.

(4) The reading of height distance between A and B is a-b

(Fig.5) h=a−b
=1.735−1.224
=0.511m

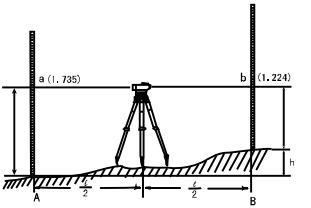


Fig 5

2. Distance measurement

(1) Point the staff, get the reading between upper & lower staddia hair, unit is "cm"

(2) Then the distance from the instrument to the staff equals to ℓ unit is "m".

(Fig6. 7) lenght of ℓ is 32cm, that is the distance from instrument to staff is 32m.

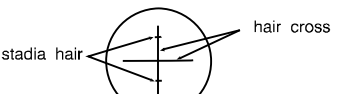


Fig 6

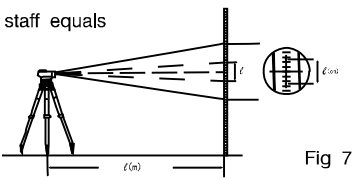


Fig 7

3. Angle measurement

(1) Sight A with vertical hair, read circle, get angle α .

(2) Turn instrument to sight B, get angle β.

(3) <AOB= $\alpha-\beta$ (Fig 8)

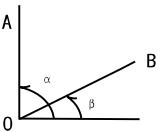


Fig 8

Checking and adjusting

1. Circular bubble checking

(1) Turn footscrews to centre the bubble.

(2) Turn the instrument 180°, the bubble shall be at centre. (Fig. 9)otherwise it shall be adjusted. The method is as following.

(Ⅰ) Turn footscrews, making the bubble halfway to centre. (Fig. 10)

(Ⅱ) Using wrench adjust bubble screws to move the bubble to centre.(Fig. 11)

(3) Repeat (Ⅰ)(Ⅱ) until the bubble stays at the centre when the instrument is turned to any directions.


Fig 9

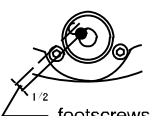


Fig 10

2. Horizontality of the line of sight

(1) Set the instrument halfway between A and B. staff A and B shall be 30~40M away, the readings are a1、b1(Fig. 12)

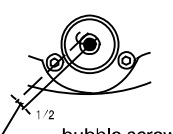


Fig 11

(2) Move the instrument 2m away from A, the readings are a2、b2(Fig. 13)

(3) Calculate b2'=a2-(a1-b1). If b2'=b2, it shows that line of sight is no need to correct.

(4) If b2'≠b2, it shows that correction shall be needed.

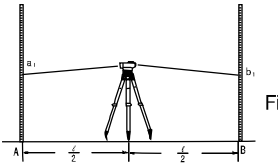


Fig. 12

(5) Point the optical sight to staff B, screw off the eyepiece cover, adjust the screw of cross-hair to make middle hair give the required reading b2'.

(6) Repeat the above until |b2'-b2| <3mm.

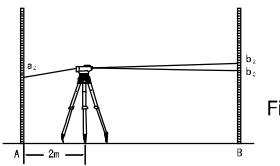
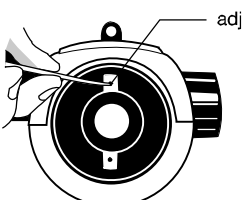


Fig. 13



Maintenance of instrument

In order to protect all parts and not lose its accuracy,care must be taken.

1. After the surveying operation, the instrument should be cleaned and kept in the container.

2. Use soft brush, lens paper to wipe lenses. Do not use finger to touch lenses.

3. If the instrument has something wrong or damaged, it must be checked and repaired by technician or skillful person, or have it repaired by the manufacturer.

4. There is a bag of drier in the container. If it has lost efficency, bake it or change new one.

5. The instrument should be stored at a dry, clean and good air conditio place.

Note: 400gon circle、5/8" tripod are for export.

Detail

Carrying Case 1
Auto-level 1
Adjusting pin 1
Allen wrench 1
User guide 1
Plumb (additional) 1
Drier 1

Auto level Warranty Card

Please complete and return within 14 days of purchase to validate your warranty.

Model Number: _____

Serial Number: _____

Date Purchased: _____

County/State/Province Purchased: _____

Your Company Name: _____

Contact: _____

Office Address: _____

City: _____ Phone/Fax: _____

Zip: _____ State/Province: _____