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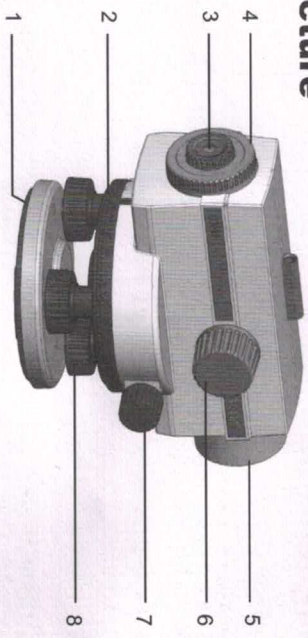
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Technical Data

Technical Data	DS24	DS28	DS32
Telescope	erect	erect	erect
Magnification	24X	28X	32X
Clear objective aperture	40mm	40mm	40mm
Field of view	1° 20'	1° 20'	1° 20'
Shortest focusing distance	0.65m	0.65m	0.65m
Multiplication factor	100	100	100
Additive factor	0	0	0
Waterproof	yes	yes	yes

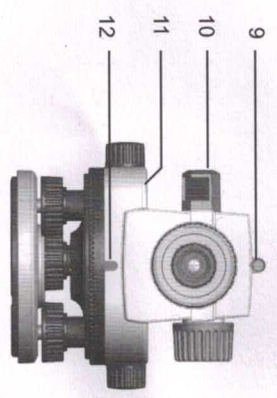
Compensator	DS24	DS28	DS32
Working range	± 15'	± 15'	± 15'
Setting accuracy	± 0.5"	± 0.4"	± 0.3"
Sensitivity of bubble	8' / 2mm	8' / 2mm	8' / 2mm
Circle graduation	1° or 1gon	1° or 1gon	1° or 1gon
Standard deviation for 1km double - run leveling	2.0mm	1.5mm	1.0mm
Instrument N.W.	1.3kg	1.3kg	1.3kg
Centre size of tripod	M16 or 5/8"	M16 or 5/8"	M16 or 5/8"

Outside Structure



- 1. Spheric base plate
- 2. Circle
- 3. Eyepiece
- 4. Eyepiece cover
- 5. Objective lens
- 6. Focusing knob
- 7. Horizontal tangent screw
- 8. Leveling screw

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- 9. Optical Peep sight
- 10. Mirror for reading circular level
- 11. Circular bubble
- 12. Horizontal circle scale reading Index

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).

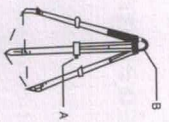


Fig. 1

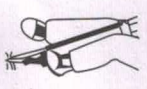


Fig. 2

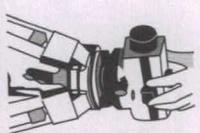


Fig. 3

2. Pointing and focusing

- (1) Through the Peep sight, point it to the staff.
- (2) Turn the focusing ring to set the cross hair clear.
- (3) Turn the focusing knob until the staff is clear.
- (4) Adjust the Horizontal tangent screw to make the staff at the centre.

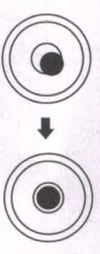


Fig. 4

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Measuring method

1. Height measurement

- (1) Set up the instrument between A and B.
- (2) Set up the staff vertically at A, the height reading is a.
- (3) Set up the staff vertically at B, the height reading is b.
- (4) The reading of height distance between A and B is a-b

$$h = a - b$$

$$= 1.735 - 1.224$$

$$= 0.511 \text{ m}$$

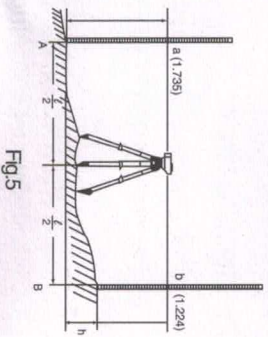


Fig.5

2. Distance measurement

- (1) Point the staff, get the reading between upper & lower stadia hair, unit is "cm"
- (2) Then the distance from the instrument to the staff equals to l , unit is "m".

(Fig.6&7) length of l is 32cm, that is the distance from instrument to staff is 32m.



Fig.6

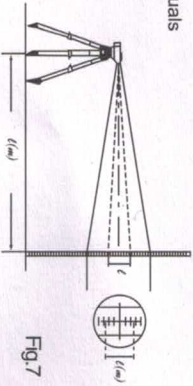


Fig.7

3. Angle measurement

- (1) Sight A with vertical hair, read circle, get angle α .
- (2) Turn instrument to sight B, get angle β .
- (3) $\angle AOB = \alpha - \beta$ (Fig.8)

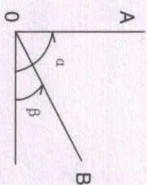


Fig.8

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.

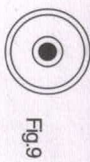


Fig.9

- (1) Turn the footscrews, making the bubble halfway to centre (Fig.10).
- (2) Using wrench adjust bubble screws to move the bubble to centre (Fig.11).

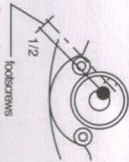


Fig.10

- (3) Repeat (1) & (2) until the bubble stays at the centre when the instrument is turned to any directions.

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 a_1 , b_1 (Fig.12).

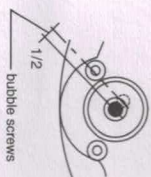


Fig.11

- (2) Move the instrument $2m$ away from A, the readings are a_2 , b_2 (Fig. 13).
- (3) Calculate $b_2 = a_2 - (a_1 - b_1)$. If $b_2 = b_2$, it shows that line of sight is no need to correct.
- (4) If $b_2 \neq b_2$, it shows that correction shall be needed.
- (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 b_2' .
- (6) repeat the above until $|b_2 - b_2'| < 3mm$.

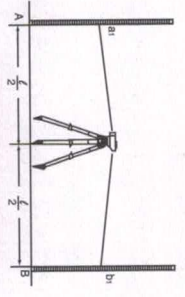


Fig. 12

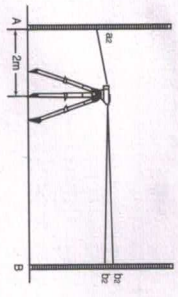
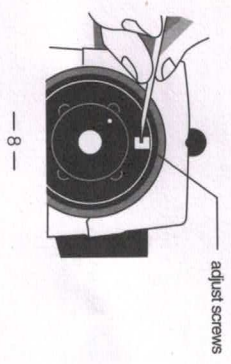


Fig. 13



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 efficiency, bake it or change new one.
5. The instrument should be stored at a dry, clean and good air condition place.