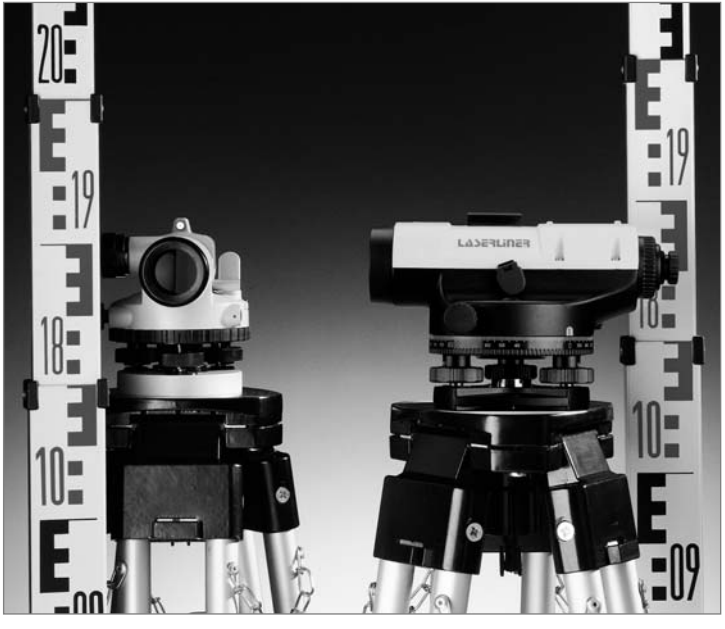
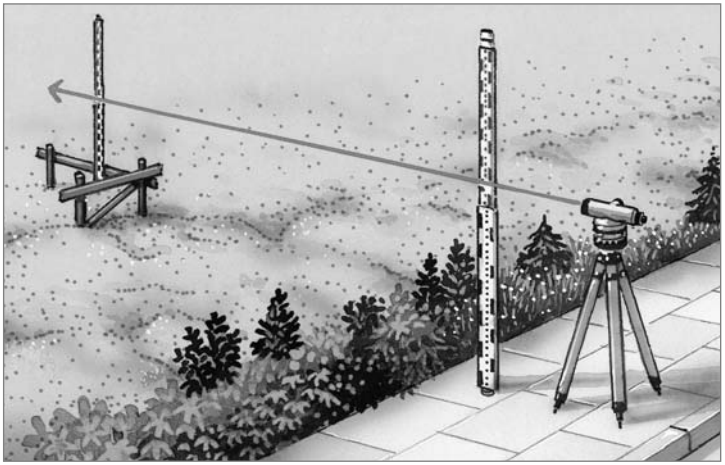
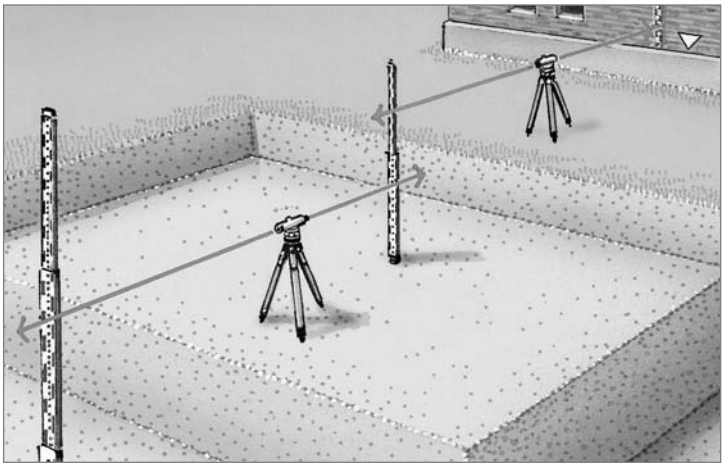
AL 22 / 26 Classic



080.82 / 080.83 / Rev.01.07

LASERLINER®
Innovation in Tools





1 Objektive
2 Telescope
3 Sights
4 Focussing knob
5 Ocular (eyepiece)
6 Lens cap
7 Compensator lock
8 Levelling screw
9 Horizontal dial
10 Calibration screw, levelling bubble
11 Levelling bubble
12 Mirror
13 Lateral fine adjustment

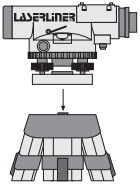
- Sturdy and reliable levelling instruments for the building and construction industry, with a high-performance lens producing a bright image.
- Self-levelling of the horizontal collimation line by a precise compensator with magnetic damping.
- Safe transport of the instrument in its container, with the compensator being locked.
- Distance estimation with the aid of the markings on the crosshairs and easy conversion of the achieved readings from centimetres to metres (multiplier 100).
- Handy adjustable folding mirror for simple adjustment with the aid of the levelling bubble.
- Iron rear- and foresight for rapid pick-up of aim.
- Comfortable operating knobs allow a simple and timesaving operation.
- Dust- and waterproof.

Please note

Prior to its use, the instrument should be given time to adopt the prevailing temperature of the area.

Positioning the level

1. Adjust height of the instrument to a comfortable position (telescope should be eye-level). When working on soft ground, tread legs of tripod firmly into the ground.

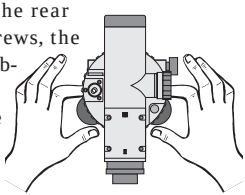


2. Place the instrument onto the tripod and fix it by turning the fixing screw into the tripod socket.

3. Levelling bubble to be centred by operating the levelling screws.

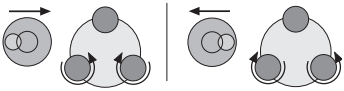
Advice for positioning

Turn horizontal dial onto position 0, before doing so, levelling screws are to be slightly loosened. Now, by using only the rear levelling screws, the levelling bubble is to be centred (see drawing).

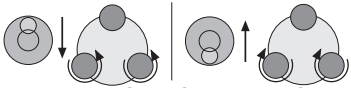


Adjust folding mirror in a way that the levelling bubble is well visible.

a) Turn both levelling screws in opposite senses:



b) Turn both levelling screws into the same direction:



4. Focus crosshairs by turning the focusing ring on the lens - background should be bright.

Alignment

1. Initial alignment of the telescope towards the graduated staff is done by hand, using the iron sights.

2. Focus the image of the staff, by operating the focusing knob, turn crosshairs onto the staff centre.

3. Make sure focusing is free of parallax. The focusing is alright when crosshairs and graduation of the staff don't change their positions even when looked at from different angles (keep changing position of the eye in front of the eyepiece).

Please note:

Prior to its use, the instrument should be given time to adopt the prevailing temperature of the area.

Alignment

1. Initial alignment of the telescope towards the graduated staff is done by hand, using the iron sights.

2. Focus the image of the staff, by operating the focusing knob, turn crosshairs onto the staff centre.

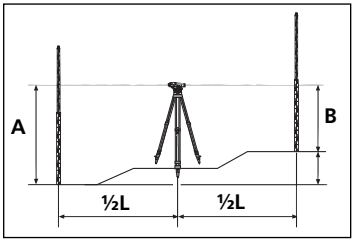
3. Make sure focusing is free of parallax. The focusing is alright when crosshairs and graduation of the staff don't change their positions even when looked at from different angles (keep changing position of the eye in front of the eyepiece).

Important:

Remaining inclinations of the crosshairs which are left after the levelling bubble has been centred will be eliminated by the compensator. The compensator, however, will not eliminate any inclinations caused by faulty calibration of the levelling bubble or the crosshairs. Therefore, the positions of both gadgets should be checked before measuring (see calibration).

Determination of a height difference

1. Place instrument halfway between the positions of staves A and B. Aim instrument at staff A and read the value of the graduation of the staff at your crosshairs (A = 140 cm). Turn instrument towards rod B and get the reading from the graduation (B = 90 cm).

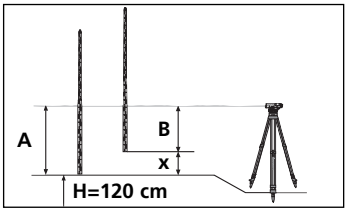


2. The difference (A-B) results in a height difference H = +50 cm between B and A. The point B is 50 cm higher than point A. The difference H turns negative when point B is lower than point A.

Important:

A slight deviation of the crosshairs does not cause any misreadings provided the instrument has been placed approx. midway between the positions of the two staves A and B.

Staving out a height



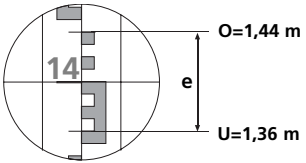
1. Place the staff on a point with a known height. Read value (A) from the graduation (A = 90 cm) Add the read value to the height of the known point. Now deduct the height of the point to be staved out from this value (height on the crosshairs). **H+A-x=B**

2. Keep moving the levelling staff vertically until the calculated difference B can be read on the graduation. Afterwards, mark the height of the toe of staff.

Distance determination

1. Read values of the upper graduation mark (O = 1,44 m) and the lower graduation mark (U = 1,36 m).

2. Multiply the difference by the factor 100 (E = 100 x e), the result is the distance E = 8 m.



Advice: In order to get reliable results, the following rules should be obeyed:

– make sure the distances to the aims are equal

– see to an exact vertical positioning of the staff

– avoid tripod and staff from sinking into the ground

– avoid reading errors

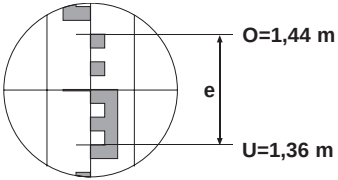
Angle measurement

1. Attach the string of the plumb bob to the hook and then place the tripod over the point in a way that the plum bob is already close to the point. The top of the tripod should be as horizontal as possible. Tread legs of tripod firmly into the ground.

2. Attach instrument to tripod and fix it. Now centre the plumb bob exactly over the point by adjusting the lenghts of the tripod legs or by changing the position of the instrument on the tripod.

3. With the aid of your iron sights, aim telescope at the first aim, align by using the lateral fine adjustment. First aim = known point. Now turn knurled ring until the index and the zero position of the horizontal dial are congruent (turn dial onto zero).

4. Aim telescope at the second aim and read the angle function under the index marking.



Distance determination

1. Read values of the upper graduation mark (O = 1,44 m) and the lower graduation mark (U = 1,36 m).

2. Multiply the difference by the factor 100 (E = 100 x e), the result is the distance E = 8 m.

Advice for 3.1 - 3.3:

In order to get reliable results, the following rules should be obeyed:

- make sure the distances to the aims are equal
- see to an exact vertical positioning of the staff
- avoid tripod and staff from sinking into the ground
- avoid reading errors

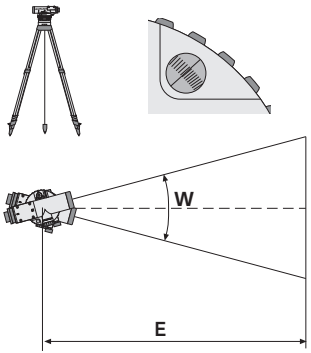
Angle measurement

1. Attach the string of the plumb bob to the hook and then place the tripod over the point in a way that the plumb bob is already close to the point. The top of the tripod should be as horizontal as possible. Tread legs of tripod firmly into the ground.

2. Attach instrument to tripod and fix it. Now centre the plumb bob exactly over the point by adjusting the lenghts of the tripod legs or by changing the position of the instrument on the tripod.

3. With the aid of your iron sights, aim telescope at the first aim, align by using the lateral fine adjustment. First aim = known point. Now turn knurled ring until the index and the zero position of the horizontal dial are congruent (turn dial onto zero).

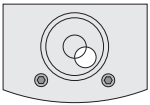
4. Aim telescope at the second aim and read the angle function under the index marking.



Calibration

Levelling bubble

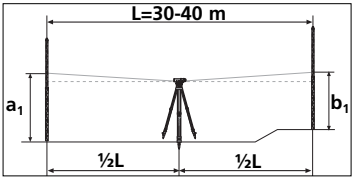
1. Control:
Set horizontal dial onto 0°. Place bubble right into the centre of the circle on the levelling bubble by turning the levelling screws.
Turn telescope through 180°/200 gon.



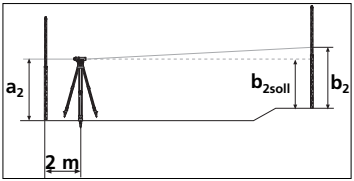
2. Adjustment:
In case the bubble is now out of the centre marking, set half of the deviation "a" which is (fi a) by operating the three calibration screws on the levelling bubble. After that, adjust levelling bubble by using the levelling screws, then check calibration by turning the whole instrument through 180°/200 gon. 3. Repeat control and calibration until the bubble of the levelling bubble remains in the inner circle after each turn of the instrument.

Crosshairs

1. Control:
Place instrument midway between two fixed staves A and B which are some 30 to 40 metres apart. At the point A on the staff, read the value a_1 and at the point B on the other staff, secure the value b_1. Calculate the height difference (a_1 - b_1). The result you get is right, even with the crosshairs dejusted, because the distances between both staves are equal.



Now place instrument in a distance of approx. 2 m away from staff A and read the value a_2. Next, turn the instrument and aim the level at point B on the staff. Read the value b_2 and calculate the height difference, which is (a_2 - b_2).

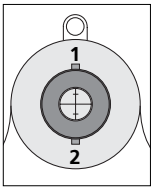


The adjustment of the level is correct when you get the reading (a_1 - b_1) = (a_2 - b_2). This means that the values of the height differences achieved with the first and the second measurement are equal, and the instrument operates error-free.

In case the height differences are not equal, the instrument has to be adjusted according to the following procedure:

2. Adjustment:

Calculate the value $b_{2soll} = a_2 - a_1 + b_1$



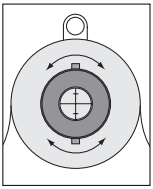
and adjust the crosshairs, with the aid of the calibration screws, which are visible behind the eyepiece once the protective cap has been removed, to the calculated setting b_{2soll} $b_{2soll} = a_2 - a_1 + b_1$

b_{2soll}. **$b_{2soll} = a_2 - a_1 + b_1$**

a) In case b_2 is smaller than b_{2soll}, loosen screw 1 and move crosshairs by turning screw 2 until $b_2 = b_{2soll}$. After that, carefully tighten calibration screws against each other.

b) In case b_2 is larger than b_{2soll}, loosen screw 2 and adjust crosshairs by operating screw 1 until $B_2 = b_{2soll}$. After that, carefully tighten calibration screws against each other. Repeat control of the adjustment until you get the result $(a_1 - b_1) = (a_2 - b_2)$.

3. Vertical adjustment:



The crosshairs can be rotated to achieve vertical adjustment (loosen calibration screws). Afterwards, the instrument must be adjusted horizontally again.

Then screw on the protective cap again.

Formula:

$(a_1 - b_1) = (a_2 - b_2)$

$b_{2soll} = a_2 - a_1 + b_1$ is the result of:

$b_{2soll} = a_2 - (a_1 - b_1)$

Care and storage

1. Use a soft cloth to clean instrument from dust and dirt.

2. Carefully clean lens and ocular with a soft and clean cloth, cotton or a soft brush, use no liquids other than pure alcohol. Do not touch any surfaces of the lenses.

3. After use under wet weather conditions, container and instrument are to be field-cleaned and then, at home, left to dry thoroughly with the container open.

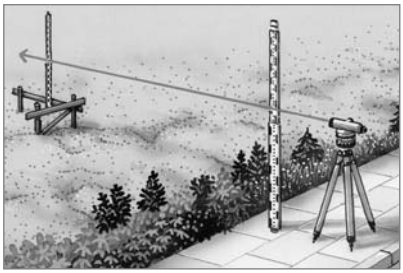
4. For carrying the instrument over long distances, it is best to place it in its container. Attention: Levelling screws to be turned all the way in.

Technical data

Standard deviation	2,5 mm / km (AL 22)
Standard deviation	1,5 mm / km (AL 26)
Telescope:	
Magnification	22 fach (AL 22)
	26 fach (AL 26)
mm / cm- estimation	to 85 m / to 170 m (AL 22)
	to 100 m / to 200 m (AL 26)
Minimum range	0,5 m
Objective diameter	30 mm (AL 22)
	34 mm (AL 26)
Field of view	1° 30'
Iron sights	fine
Compensator:	
Damping	magnetic
Range of operation	± 15'
Accuray	0,5"
Compensation time	< 2 s
Horizontal dial 360°/400 gon:	
Graduation 360° - horizontal circle	1°
Graduation 400 gon - horizontal circle	1 gon
Levelling bubble:	
Accuracy	8' / 2 mm
General:	
Operating temperature	- 10 ... + 40°C
Storage temperature	- 20 ... + 70°C
Tripod adapter	5/8" thread
Weight	1,4 kg
Dimensions	200 x 130 x 130 mm

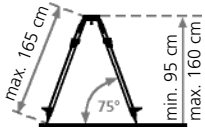
(Subject to technical alterations)

- (D) **Zubehör (optional)**
- (GB) **Accessories (optional)**
- (NL) **Accessoires (optioneel)**
- (DK) **Tilbehør (ekstra-udstyr)**
- (F) **Accessoires (en option)**
- (E) **Accesorios (opcional)**
- (I) **Accessori (optional)**
- (PL) **Akcesoria (opcja)**
- (FIN) **Lisämahdollisuuksia valinnaisvarusteilla**
- (RUS) **Полезные принадлежности**



Art.-Nr: 080.06

4 m: Art.-Nr: 080.40
5 m: Art.-Nr: 080.41



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AL 22 / 26 Classic

CE

(D) Service- und Versand-Anschrift

(GB) Service- and Shipping Address

(NL) Service- en verzendadres

(DK) Service- og Postadresse

(F) Livraison et expédition

(E) Dirección de servicio y de envío

(I) Indirizzo di assistenza e di spedizione

(PL) Serwis i sprzedaż

(FIN) Service- og Postadresse

(RUS) Адрес службы сервиса и для отправки

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