EN

Sportneer

Sportneer Military Compass

User Manual

Contents

1. Applications

This military compass is used to determine azimuths or slope angles, distance, height or to make sure whether it is horizontal, mainly applicable for outdoor hiking, trekking, marching, navigation, exploration, travels and more.

2. Specifications

- Damping Time < 20s
- Dial Interval: 5°, 1°
- Scale Edge Interval: 1mm (metric system) ; 1/16in (imperial system)
- Size: 100 x 65 x 30 mm
- Net Weight: 158g

3. Features

Built with aluminum alloy main body and liquid damped core elements, the Sportneer Military Compass is widely used worldwide. Thanks to the support of both upper and lower parts, the dial rotates rather stably, effectively eliminating the impact of magnetic inclination. The device is compact, lightweight, easy to operate with reliable accuracy and stable performance, and portable to use anywhere.

4. Illustration

Top View (fig. 1)

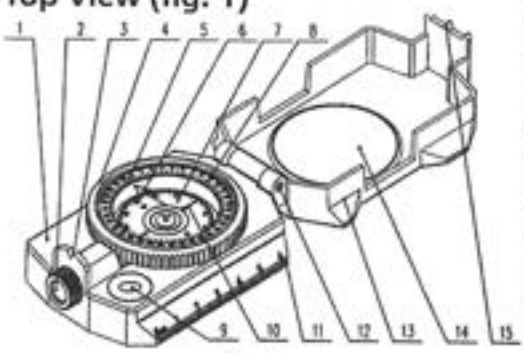


Fig. 1

1 case
2 lens
3 sighting slot
4 bezel ring
5 glass dial
6 magnetic arrow
7 dial
8 index line
9 gradienter
10 orienting arrow
11 scale edge
12 spindle
13 cover
14 protective glass
15 alidade

The case [13], cover [1] and spindle [12] constitute the main body of this military compass. A liquid-damped compass is mounted in the case [1]. The dial [7] is the core part of the compass and its scale value can be seen from the lens [2] that locates in the front of case [1] (see fig. 2). The compass is equipped with a bezel ring [4] and the glass dial [5] is fixed on the bezel ring [4]. You can rotate the bezel ring [4] to make the magnetic arrow [6] on the glass dial [5] point to the set target azimuth angle. In addition, there is a gradienter [9] that can determine whether the compass is placed horizontally, and there are metric and imperial scales [11] on both edges for drawing. The bulge in the middle of alidade [15] is used as an alidade and can also double as a distance estimating scale by using together with the apexes on both sides, while can also work as distance estimater to estimate the distance by combining with sighting slot [3].

Bottom View (fig. 3)

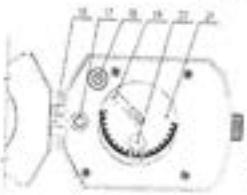


Fig. 3

16 fixed thread
17 locating ring
18 button
19 spring sheet
20 goniometer
21 angle dial

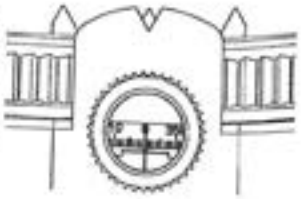


Fig. 2

There is a goniometer [20] on the bottom of device. Press the button [18] to raise the spring sheet [19], then the goniometer [20] can measure angles through vertical gravity. Owing to the same fixed thread [16] with camera, you can mount the military compass to the tripod of camera for increased measuring accuracy.

5. Operating Instruction

5.1 To Measure Azimuth Angle

Open the cover [13] until its rear surface tightly closes to locating ring [17], then both the case and cover are lying flat. The bubble of gradienter [9] stays in the middle.

Place your eye close to the sighting slot [3] to observe the target object through the bulge in the middle of alidade [15] and then look downward to observe the scale indication of dial [7] through lens [2] (see fig. 4). You can rotate the bezel ring [4] of lens [2] to make the scale indication clear based on personal sight distance. The measured data is the azimuth angle of target object.

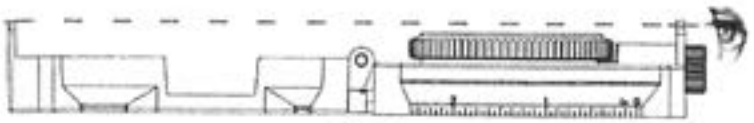


Fig. 4

5.2 To Measure Distance

Lay the compass flat (see fig. 4) and place your eye close to the sighting slot [3]. Observe the apexes on both sides of alidade [15] and target object that you already know the distance between two adjacent points through sighting slot [3]. If you want to measure the height of target object, you can put the compass up.

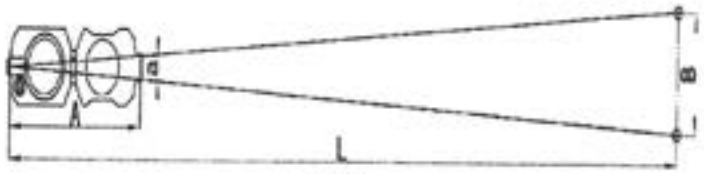


Fig. 5

In fig. 5, the A is the distance from sighting slot to alidade; a is the distance between two apexes on both sides of alidade; L is the distance from observer to the target object; B is the distance between two adjacent points (height) of the target object. A=10a

According to the formula of similar triangles, L = 8x10

E.g. The distance bet ween two adjacent points of target object is 18 meters and the target object is just covered by the 2 apexes on both sides of alidade through observing from sighting slot. Therefore, the distance from target object to standing position is 18x10=180 meters.

If the target object isn't just covered by the 2 apexes on both sides of alidade (more or less than the 2 apexes), you can take the formula as below:

L = B/r x 10 (r is a multiple of B)

E.g. The distance between two target objects is 18 meters, and it was measured by the position of 7/10 of distance between the 2 apexes. Therefore, the distance between the target object and standing position is as below.

L= 18/0.7 x 10 = 257 (m)

Similarly, the distance between two target objects is 18 meters, and it was measured by the position of 1.5 times of distance between the 2 apexes. Therefore, the distance between the target object and standing position is as below.

L= 18/1.5 x 10 = 120 (m)

Note: It is convenient to measure the distance between the target object and standing position in this way, however, it is not in high accuracy.

5.3 To Measure Slope Angle

The slope angle is the angle between the water level and the line that connects the measuring position and the target object. If his compass can touch the slope directly, you can place its measuring surface upwards on the slope and the value that goniometer points to on the angle dial is he measured slope angle (see fig. 6).

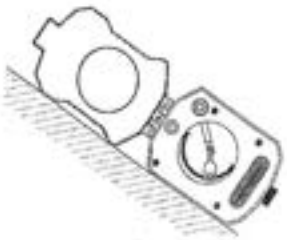


Fig. 6

If there isn't measuring surface, open the cover to a 180 degree state, and place the compass up with goniometer facing downward. Aim the target object through sighting slot and alidade, and keep the spring sheet pressed for 2-3 seconds and then release the sheet. The value that goniometer points to on the angle dial is the measured slope angle (see fig. 7).

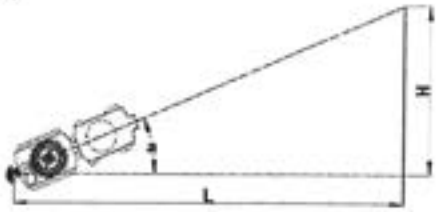


Fig. 7

5.4 To Measure Height

You can measure the height through the horizontal distance from standing position to the target object. First measure the slope angle (see fig. 7) with this compass, and then you can calculate the height by trigonometric function.

E.g. What's the height from the hill bottom to its top? The horizontal distance (L) from your standing position to the hill is 60 meters. The measured slope angle is 23 degrees. Check the SCHEDULE A and you will see tan 23° = 0.42447. Now you can calculate the height H = 60 x 0.42447 = 25.47 (m).

Note: The height should also add in the distance from the ground to your eyes.

Similarly, you can calculate the horizontal distance according to the height.

L = H / tan (a)

E.g. The height of the hill (or an object) is 50 meters. The measured slope angle is 15 degrees. What's the distance from the target object to the measuring position?

You can check the schedule and know tan 15° = 0.26795. Now you can calculate the distance L = 50 / 0.26795 = 186.6 (m).

.5 To Calibrate a Map

nfold the compass, and rotate the bezel ring to align the magnetic rrow on the glass dial with the orienting arrow (pay attention to the iodification of magnetic declination, see SCHEDULE B). Lay the compass at on the map, and point the alidade towards the north pole of map to iake the scale edge tangent with the magnetic meridian of map. Rotate ie map to allow the orienting arrow on the dial to coincide with the ienting arrow on the glass dial, then this map is already calibrated. nfold the compass on the map to allow the scale edge passing through our standing point and marching destination, then the direction of agnetic arrow pointing to is the marching direction. Rotate the bezel ng to make the orienting arrow of glass dial consistent with the S and N rections of map, then mark the azimuth angle that the orienting arrow oints to. Face the orienting arrow, hold the compass and turn your body allow the orienting arrow on the dial to coincide with the magnetic row on the glass dial. At this time, aim the sighting slot and alidade ith the marching direction. Any tree or house in the marching direction in work as auxiliary target and you can continue to march based on ese auxiliary targets. Fold the compass and store it in the carrying bag o not rotate the bezel ring in the process). You can find another xiliary target to continue marching until you arrive the destination. You ould always check the direction readings along the way.

.6 To Orient Directions

orient directions is also called to mark the intersection point, that is, e direction and position of the target. Open the cover to make the otective glass face toward your arms (in this way to measure targets on gh position. If you want to measure targets on low position, let the otective glass face the direction opposite to your arms), and hold the mpass tightly with right hand (try your best to avoid body shaking). en adjust the protective glass and rotate your body to allow the target ming into your sight and the target being evenly separated by the ass lines.

Please allow the bulge in the middle of alidade to coincide with the glass line intersection and keep the bubble stayed in the middle. At this time, the direction the magnetic arrow points to is the direction of target (you should calculate the magnetic declination).

Change another standing point to measure the direction of target in the same way, then the intersection point of the two direction lines is the position of the target.

6. Notifications

1. Do not place the instrument close to magnetic substances, high voltage lines, and electromagnetic elements to avoid measuring errors and reduce its sensitivity.
2. Place it in a dry and ventilated place to avoid mold when not in use.
3. Do not vibrate it heavily to prevent possible impact on the azimuth measuring accuracy.
4. Try your best to avoid colliding with hard objects or scratches.
5. When the organic glass or lens is stained, please wipe it clean with white fleece or degrease cotton. If necessary, you can polish it with toothpaste. Never wipe it with bare hand, common cotton, tissue or organic solvent since these matters would scratch its surface or lower its light transmittance. Actually, you can use the white fleece to wipe clean any surface.

7. Package Contents

1 x Military Compass

1 x User Manual

1 x Oxford Fabric Bag

1 x Strap

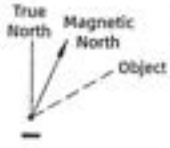
1 x Plastic Bag

3. Schedule A

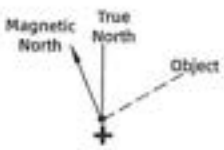
Tangent Function Table		
1° = 0.01746	16° = 0.28675	31° = 0.60086
2° = 0.03492	17° = 0.30573	32° = 0.62487
3° = 0.05241	18° = 0.32492	33° = 0.64941
4° = 0.06993	19° = 0.34433	34° = 0.67451
5° = 0.08749	20° = 0.36397	35° = 0.70021
6° = 0.1051	21° = 0.38386	36° = 0.72654
7° = 0.12278	22° = 0.40403	37° = 0.75355
8° = 0.14054	23° = 0.42447	38° = 0.78129
9° = 0.15838	24° = 0.44523	39° = 0.80978
10° = 0.17633	25° = 0.46631	40° = 0.8391
11° = 0.19438	26° = 0.48773	41° = 0.86929
12° = 0.21256	27° = 0.50953	42° = 0.9004
13° = 0.23087	28° = 0.53171	43° = 0.93252
14° = 0.24933	29° = 0.55431	44° = 0.96569
15° = 0.26795	30° = 0.57735	45° = 1

ichedule B

xamples of magnetic declination degrees in the United States



If the arrow on the compass is to the right of true north,or to the east, subtract the declination.



If the arrow on the compass is to the left of true north,or to the west, add the declination.

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Sportneer Militärkompass

Benutzerhandbuch