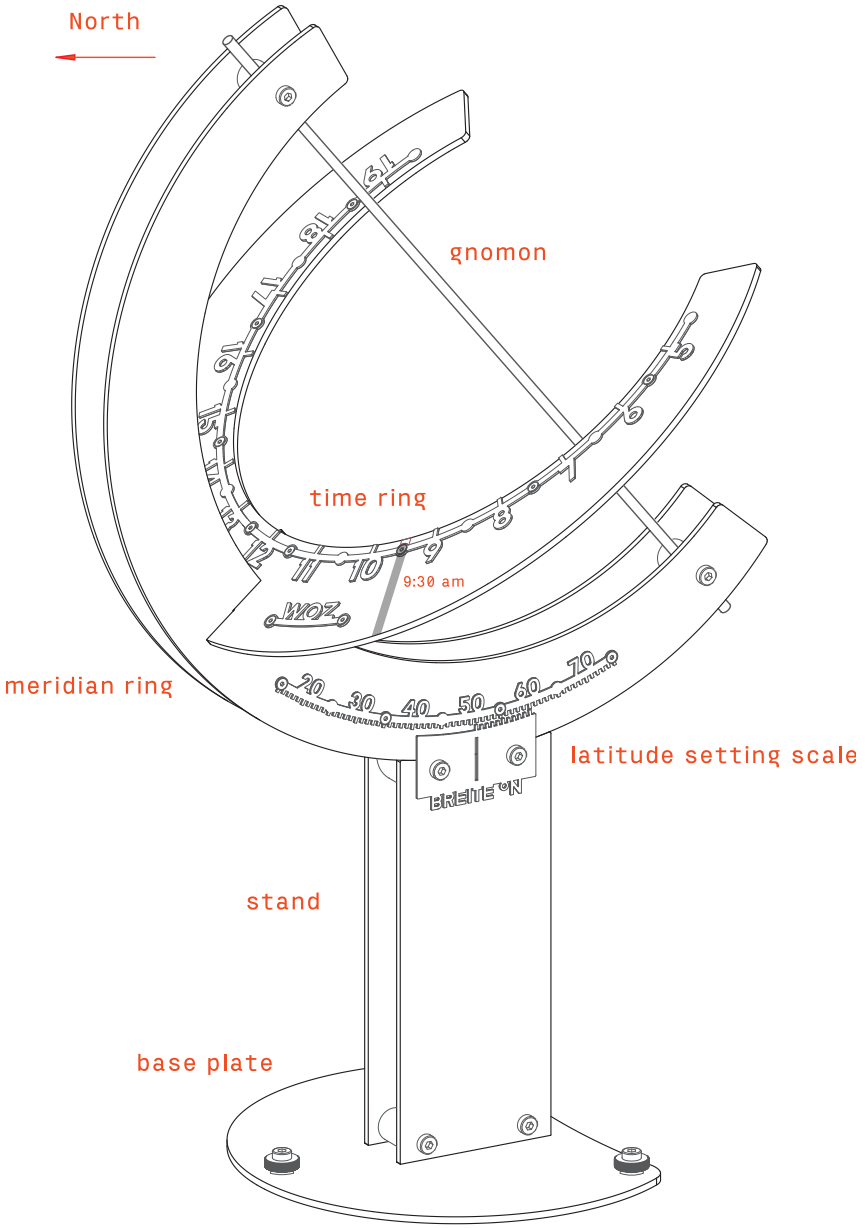

Figure 1: The shadow shows 9:30 am local apparent time on the sundial AEQUINOX.

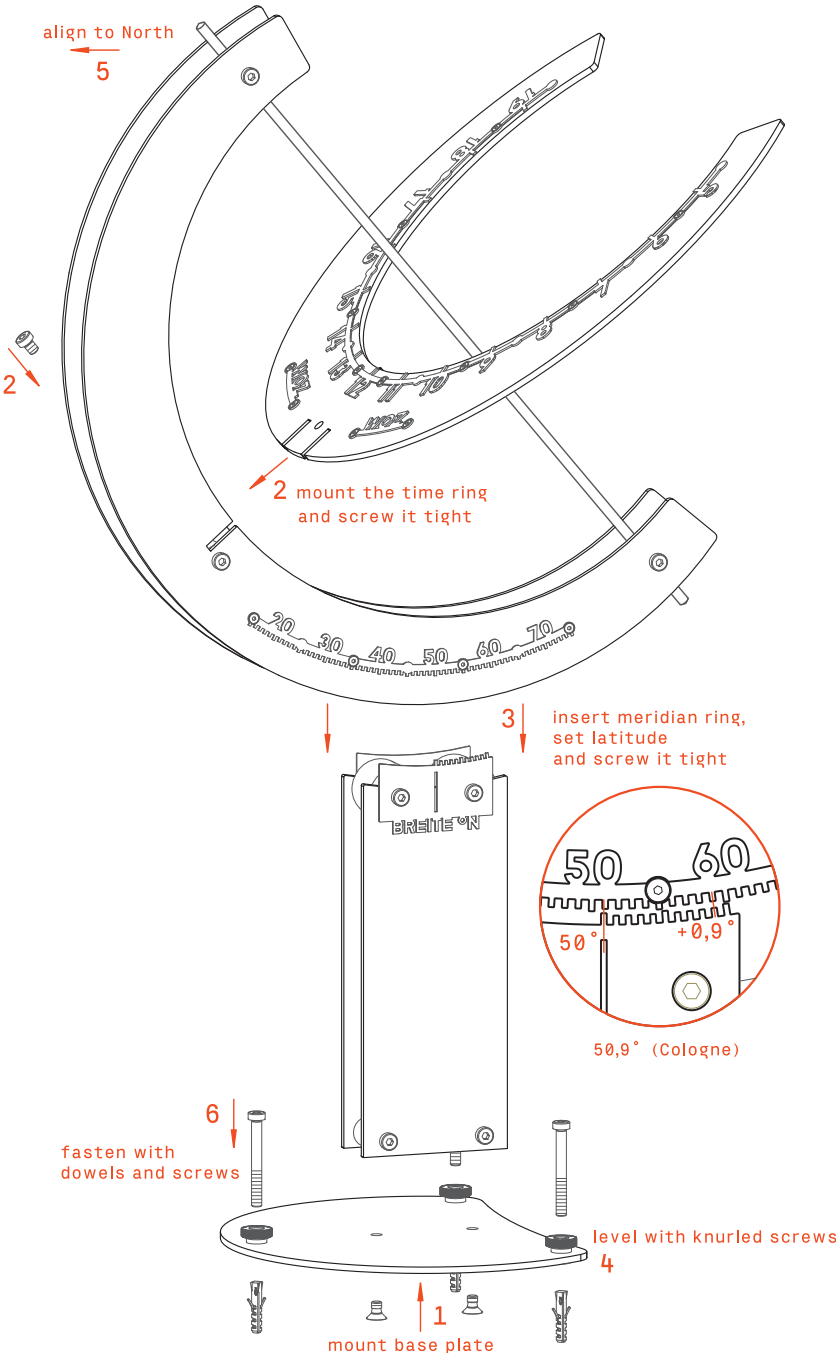

Figure 2: Assembly of the AEQUINOX in six steps.

Assembly

The sundial can be assembled, set up and aligned in a few simple steps (see fig. 2).

1 Screw the foot plate to the stand from below using the two countersunk screws M6x12.

2 Then push the time ring into the slots of the meridian ring until it stops. With the screw M6x6 the time ring is fixed to the meridian ring.

3 Now insert the meridian ring into the guides of the stand. Set the northern latitude of your location on the latitude scale. Using the vernier scale you can set the latitude within 0.1° accuracy. An example is shown in fig 2. The reading mark is between 50° and 51° North latitude. The more accurate value 50° + 0.9° is obtained because the 9th mark of the vernier is aligned exactly opposite a mark on the latitude scale. The sundial is then set for 50.9°N (Cologne, Germany).

Finally, all four screws on the stand for clamping the meridian ring are tightened.

Alignment and reading

4 The base plate is levelled with a spirit level and the three knurled levelling screws.

5 Use a compass to find the North point. Rotate the sundial so that the gnomon at its top points to it. The sundial is then North aligned. Do not drill any anchor holes in your support until final adjustment in step 6.

The time you read in the middle of the shadow is true solar time, officially called local apparent time (LAT). For example, in figure 1 the sundial shows true solar time from Cologne, Germany at 9:30 am.

Please note that in autumn and winter the sun moves „below“ the equator and the shadow is only visible at the inner edge of the time ring.

Three values are added to the local apparent time (LAT) to determine the time of our wristwatch, the standard time of your location, e. g. the Central European Time (CET):

A **Local time difference:** constant time difference to the time zone meridian of CET, which lies 15° east of Greenwich. The local time difference depends on the longitude of the sundial location. The value is taken from table 2 for larger cities. Example: The local time difference of Cologne, Germany is 32 minutes.

B **Date-dependent time difference:** The mean local time of wristwatches is sometimes before and sometimes after the local apparent time that you read from the sundial during the year (Table 1). Example: On April 25th, the date-dependent time difference is -2 min.

C **Summer time difference:** From the end of March to the end of October, summer (daylight saving) time is valid. Another hour is added. In the example, this also applies on 25 April. The dates may vary in your time zone.

The difference is added up:

32 min - 2 min + 1 h = 1 h 30 min. In Cologne, Germany it is on 25 April at 9:30 am LAT already 11:00 am CEST.

If the calculated time does not match the wristwatch, the sundial is not yet correctly aligned. Turn the sundial until the calculated time matches. This method is more accurate than aligning the sundial with the compass.

6 Finally, you can drill the anchor holes and fix the sundial to your support using the plugs and screws provided. If you have any questions about the sundial, please contact us.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3	14	12	4	-3	-2	4	6	0	-10	-16	-11
5	5	14	12	3	-3	-2	5	6	-1	-12	-16	-9
10	7	14	10	1	-4	-1	5	5	-3	-13	-16	-7
15	9	14	9	0	-4	0	6	5	-5	-14	-15	-5
20	11	14	8	-1	-4	1	6	3	-6	-15	-14	-3
25	12	13	6	-2	-3	3	7	2	-8	-16	-13	0
30	13		5	-3	-3	4	6	1	-10	-16	-11	2

Table 1: Date-dependent time difference in minutes. The table value corresponds to the negative value of the equation of time (= local apparent time - local mean time).

City	Lat. °N	Long. °E	Ti. dif. min	City	Lat. °N	Long. °E	Ti. dif. min
Aachen	50,8	6,1	36	Jena	50,9	11,6	14
Augsburg	48,4	10,9	16	Kaiserslautern	49,4	7,8	29
Aurich	53,5	7,5	30	Karlsruhe	49,0	8,4	26
Baden-Baden	48,8	8,2	27	Kassel	51,3	9,5	22
Bamberg	49,9	10,9	16	Kiel	54,3	10,1	20
Basel	47,5	7,6	30	Köln	50,9	7,0	32
Bautzen	51,2	14,4	2	Konstanz	47,7	9,2	23
Bayreuth	50,0	11,6	14	Klagenfurt	46,6	14,3	3
Berlin	52,5	13,4	6	Leipzig	51,3	12,4	10
Bern	47,0	7,4	30	Linz	48,3	14,3	3
Bielefeld	52,0	8,5	26	Lübeck	53,9	10,7	17
Bonn	50,7	7,1	32	Magdeburg	52,1	11,6	14
Braunschweig	52,3	10,5	18	Mainz	50,0	8,3	27
Bremen	53,1	8,8	25	Mannheim	49,5	8,5	26
Celle	52,6	10,1	20	München	48,1	11,6	14
Chemnitz	50,8	12,9	8	Münster i. W.	52,0	7,6	30
Coburg	50,3	11,0	16	Neubrandenburg	53,6	13,3	7
Cottbus	51,8	14,3	3	Nordhausen	51,5	10,8	17
Darmstadt	49,9	8,7	25	Nürnberg	49,5	11,1	16
Dessau	51,8	12,2	11	Osnabrück	52,3	8,0	28
Dortmund	51,5	7,5	30	Passau	48,6	13,5	6
Dresden	51,1	13,7	5	Plauen	50,5	12,1	12
Düsseldorf	51,2	6,8	33	Potsdam	52,4	13,1	8
Emden	53,4	7,2	31	Regensburg	49,0	12,1	12
Erfurt	51,0	11,0	16	Rostock	54,1	12,1	12
Essen	51,5	7,0	32	Saarbrücken	49,2	7,0	32
Flensburg	54,8	9,4	22	Salzburg	47,8	13,1	8
Frankfurt/M	50,1	8,7	25	Schwerin	53,6	11,4	14
Frankfurt/O	52,3	14,6	2	Speyer	49,3	8,4	26
Freiberg i. Sa.	50,9	13,3	7	Stralsund	54,3	13,1	8
Freiburg i. Br.	48,0	7,9	28	Stuttgart	48,8	9,2	23
Gera	50,9	12,1	12	Suhl	50,6	10,7	17
Gießen	50,6	8,7	25	Trier	49,8	6,6	34
Görlitz	51,2	15,0	0	Ulm	48,4	10,0	20
Göttingen	51,5	9,9	20	Weimar	51,0	11,3	15
Graz	47,1	15,5	-2	Wien	48,2	16,3	-5
Greifswald	54,1	13,4	6	Wiesbaden	50,1	8,2	27
Güstrow	53,8	12,2	11	Wismar	53,9	11,5	14
Halle/Saale	51,5	12,0	12	Würzburg	49,8	9,9	20
Hamburg	53,6	10,0	20	Zittau	50,9	14,8	1
Hannover	52,4	9,7	21	Zürich	47,4	8,6	26
Innsbruck	47,3	11,3	15	Zwickau	50,7	12,5	10

Table 1: Geographic coordinates and local time difference of different cities.
Formula: Local time difference (ti. dif.) = (15° E - °E longitude) x 4 min / °