



HELIOS WATCH

| | 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 |

HELIOS Sundials

Phone: +49 - 611-185 11 06

E-Mail: email@helios-sundials.com

True Solar time

Use the **HELIOS WATCH** to tell the time easily using the sun.



Proceed as follows:

1. Flip open the gnomon by turning the watch crown.
2. Hold the sundial watch horizontally and adjust it so that the red north arrow of the built-in compass is in line with the North marker (N).
3. Now read the true solar time from the shadow (8:30 true solar time in the example).

Solar time reflects the natural solar path. It is 12:00 noon true solar time when the Sun has reached its daily high point (culmination) and passes through the local meridian.

This is true noon, since it literally divides the day into two equal halves. True solar time relates to the longitude on which you are located. It is also called local apparent time (LAT).

Central European Time

As late as the nineteenth century, towns had their own local time until most countries introduced an averaged zone time which related to a particular longitude.

In most Mid-European countries this is Central European Time (CET). In order to determine this from the solar time you read from the watch, the following three values are required:

1. **Local time difference:** You can calculate this from the longitudinal differential to the CET time zone meridian which is located 15° east of Greenwich. For locations west of 15° East, we add 4 minutes per degree of longitude. For example, the local time difference from Cologne (7°E) is 32 min. Calculation: $(15^\circ - 7^\circ) \times 4^\circ/\text{min} = 32 \text{ min}$.
2. **Date-dependent time difference:** The solar time that we read from a sundial will be fast or slow during the year (see table). Example: on 25 April the date-dependent time is -2 min.
3. **Summer time difference:** From March to the end of October summer time (CEST) is valid. An extra hour is added.

All values added give the following result for Cologne: 32 min - 2 min + 1 h = 1 h 30 min. So on 25 April at 8:30 solar time it is already 10:00 CEST in Cologne.

Owners of the **HELIOS WATCH** City can simply add the date-dependent time difference in order to determine summertime (CEST). Outside the summer time period, they just need to subtract one hour.