

# ILLUMINA SECUNDA



## Mounting the clock

Choose for your clock a place on a stable wall without direct insolation, in order to prevent the clock case from heating up and to come up to the weight of the clock.

To avoid damage of the clockwork and the case during mounting, the following work should only be done by an experienced clockmaker.

Necessary tools:

stone drill 10 mm, drilling machine, socket wrench 13 mm or a ratchet wrench with 13 mm socket, spirit level, hammer

Tools included:

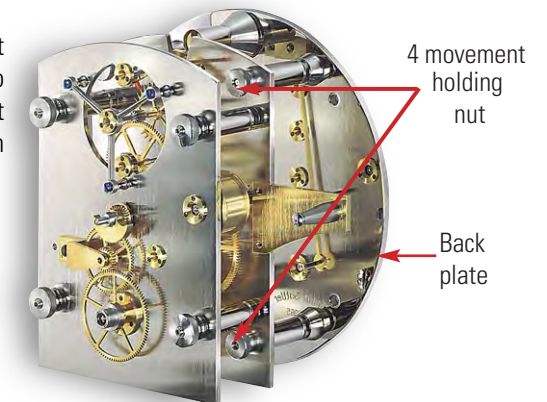
Crosshead screwdriver, Allen key 4 and 5 mm

## Unpacking

Please unpack the clock carefully (keep the packing material for possible transports of the clock).

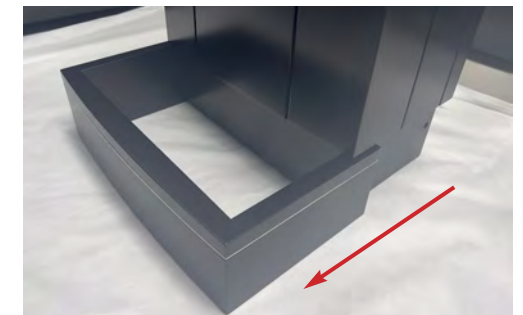
## How to take out the movement

Unscrew the four knurled movement holding nuts, pull the movement up to the front out of the case and put it carefully down on an even and firm underground with the dial downwards.



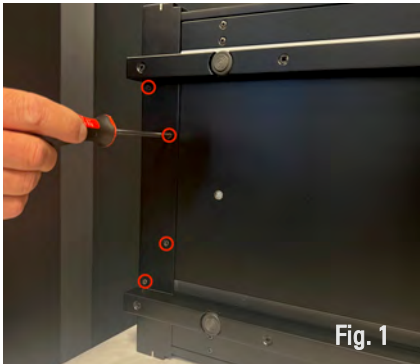
## Setting up the case

1. Place the base on the floor and pull off the magnetic protective panel towards the front.

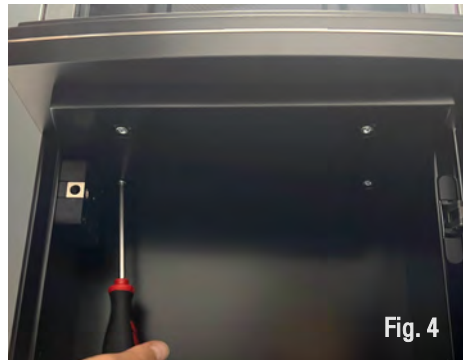


## Setting up the case

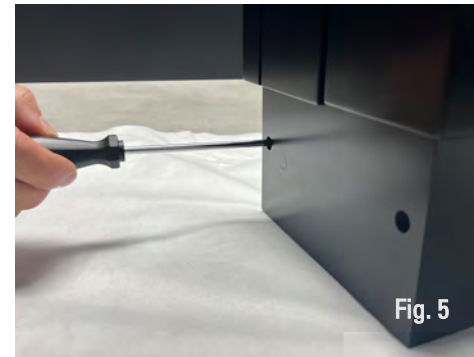
2. Lay the upper part of the clockcase on its side to remove the cover plate on the back. To do this, loosen the 4 crosshead screws. See Fig. 1, red markings.
3. Place the upper part of the enclosure on the base and position it exactly.  
**Caution:** do not clamp any cables!
4. Connect the electrical connections as follows: red to red, black to black, twice white to any slot in the strip. See fig. 2
5. Replace the cover plate.



6. The enclosed chip can be used to unlock and then open the base door. The sensor is located at the top on the left side of the base, see Fig. 3.
7. To connect the top part to the base, the 4 Allen screws with the washers are screwed into the threads of the top part from the inside of the base. See fig. 4



8. Now place the case at the desired position on the wall.
9. Adjust the 4 adjustable feet in the base with the Allen key so that the clockcase stands vertically and fits flat against the wall. If necessary, adjust the 6 adjustable feet (black knurled screws) on the back of the enclosure. See fig. 5
10. Open the glass door and mark the drilling position through the central hole in the movement holding plate.
11. Remove the case again and drill a 10mm hole, then insert the plug.
12. Connect the plug to the grid. Carefully push the case back onto the wall using the protruding hanger bolt and position it (the adjustable feet may need to be readjusted).
13. For final assembly, the case must be screwed to the wall through the central hole in the movement holding plate (hanger bolt with 2 washers and cap nut enclosed) in order to achieve a good accuracy.
14. Position the shelf in the base at the desired height. See fig. 6
15. Finally, slide the magnetic protective panel back onto the base.



### Caution!

With the clock, there is a protecting cover that has to be laid inside the bottom of the case for the following steps! The cover has to be used, to avoid damages of the case! Please remove the cover only after the installation is complete!

## How to hang in the pendulum

### Caution!

Do always hold or carry the pendulum at the free pendulum rod, never at the adjusting-table or the plate of the barometer-instrument.

Since the movement is already removed, the nickel plated protection tube can be pulled off from the suspension spring block (located between the two upper movement holding pillars).

Remove the suspension spring and keep in reach. Now unscrew the protection cap from the tip of the pendulum. To avoid damage of the delicate suspension spring we recommend to insert it into the slot of the pendulum rod first, hold it in place and then hang the pendulum together with the suspension spring into the suspension spring block.

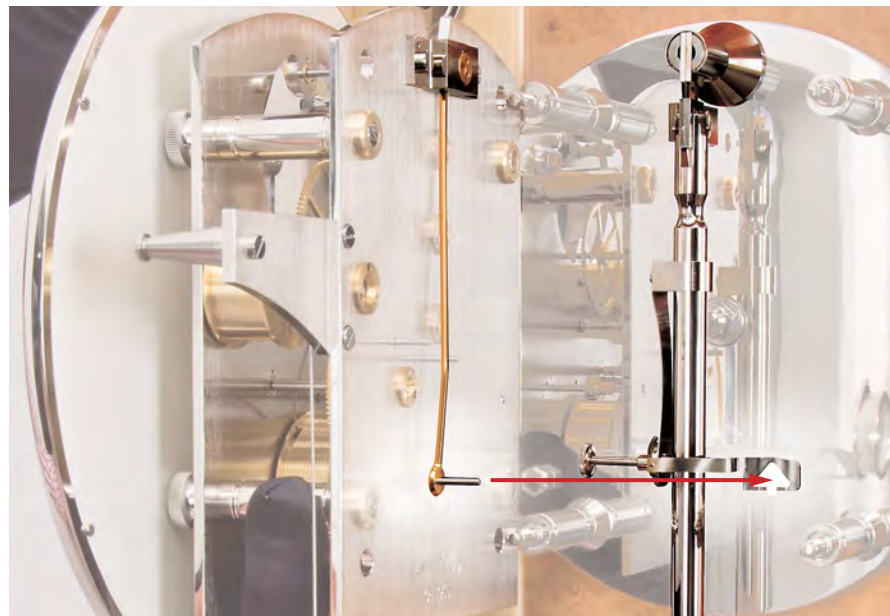


Push back the protection tube on the suspension spring block. Because of the lateral mounted air pressure compensation, the pendulum is pushed slightly from the centre position to the side. By turning the nuts at the sides of the pendulum scale you can adjust the pendulum scale in a position that the tip of the pendulum points exactly to »0«.

## How to fit in the movement

Remove the safety rubber band from the pallet. Push the movement on the 4 pillars and screw it down with the four knurled nuts. Remove the transport protection of the escapement lever.

So that motion can be transmitted from the movement to the pendulum, the driving pin of the pallet lever must be inserted in the triangular cut-out in the safety flap on the beat adjuster. To do so, reach behind the movement from the side, carefully press the lever with the cut-out backwards and upwards until the driving pin slots into the triangular cut-out.



## How to set the barometer hand

The scale of the barometer does not correspond to the display of changes of pressure measured in hectopascal, as is nowadays the case with barometers. The scale does rather display the changes of pressure, as it was formerly done, in millimetre mercury column. When the pressure at the destination of the clock is »normal« adjust the display by setting the hand of the barometer to zero by turning the knurled-head screw above the aneroid boxes.

You can now read the reactions of the barometer to changes of pressure as follows: High pressure is displayed in the upper half of the scale, in the »positive« range, low pressure is displayed in the lower half of the scale, in the »negative« range. If the pressure increases the period of oscillation of the pendulum lengthens, thus the clock is slow. By the compression of the aneroid boxes however, the weight located on them sinks towards the centre of the pendulum, resulting in the acceleration of the pendulum. The change in speed caused by the change of pressure is thus compensated.



## How to start the clock

Before hanging the weight into the pulley, make sure the cable runs in the front groove of the guide pulley.

Wind the clock with the crank one turn counter clock wise. Deflect the pendulum until a »tick«, caused by the drop of the escapement wheel tooth on the pallet, is audible. Watch the pendulum scale and note the angular minutes, indicated by the tip of the pendulum, exactly in the moment where the »tick« occurs. Now deflect the pendulum to the other side and again note the angular minutes when the »tick« is audible. It is ideal, when the angular minutes are equal on both sides.

If the pendulum has to be deflected more to the right side than to the left to hear the "tick", you can correct this by turning the adjustment screw on the pendulum rod behind the movement to the right side.

Stop winding the clock, when the top end of the pulley is about 1 cm below the dialring.

## How to set the time

When setting the time, the minute hand may be turned forwards as well as backwards. The second hand shall not be turned. In order to synchronise the second hand to that of another clock (e.g. a radio clock) stop the pendulum when the second hand has reached the mark of the sixtieth second. Let the pendulum go when the second hand of the clock of comparison reaches the sixtieth second.

## How to adjust the accuracy

Your clock has been exactly adjusted in our workshop. The transport, the sea level and the geographic latitude of the place where the clock is hung up may however lead to a variation in the period of oscillation of the pendulum. You will therefore most probably have to adjust your clock once again.

Adjust your clock as follows:

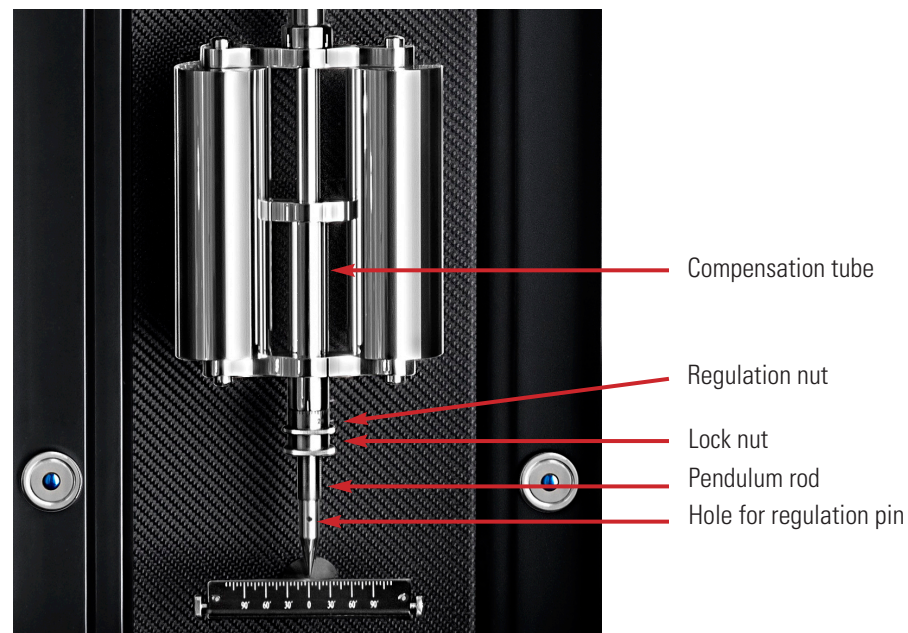
### a) Coarse adjustment:

Should the accuracy deviate by more than one second per day it is necessary to adjust the clock by the adjusting nut.

Please stop the pendulum first. Now put the regulation pin enclosed in the case into the hole below the counter nut in the pendulum rod to avoid a twisting of the suspension spring during adjustment.

Loosen the lower nut, the lock nut, and then screw the adjusting nut one line to the left per second gained per day, i.e. one line to the right per second lost per day. Afterwards screw the lock nut slightly up again.

After having watched the accuracy a couple of days you may readjust the clock as described above.



### b) Precision adjustment:

For precision adjustment of the clock, i.e. for the correction of small deviations of accuracy, you don't need to stop the pendulum.

Precision adjustment is done by means of the timing weights in the case. Place them on the adjusting-table situated at the middle of the pendulum rod.

The heavier the timing weight, the greater the acceleration of the pendulum, i.e. the faster runs the clock.

By taking away a timing weight, the period of oscillation of the pendulum is lengthened, i.e. the clock goes slower.

### c) How to correct deviations of 1 - 2 seconds from standard time:

You can correct deviations of 1 - 2 seconds from standard time with the aid of the two stainless steel regulation weights also enclosed in the case. You neither need to stop the pendulum, nor the second hand. One of the weights should thus always be located on the adjusting table.

In case the second hand deviates approx. minus 1 second from standard time, place the second weight onto the adjusting table as well. As soon as the deviation is recovered, take the weight off again.

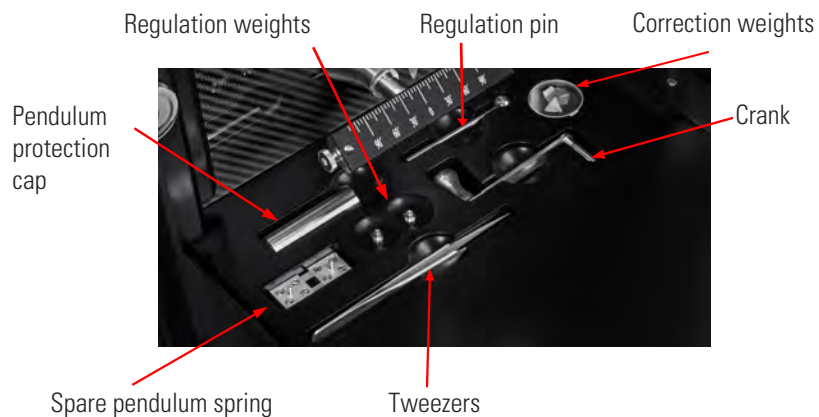
A deviation of approx. plus 1 second shall be corrected by occasionally taking away the weight permanently located on the adjusting table.

Due to the fact that every place on earth has a different gravitation, a clock that runs +/- 0 sec in Munich/Germany will gain or lose time if it is located somewhere else. As an example see the list below:

Place	Gravitation g in $\text{cms}^{-2}$	Fast in sec./day	Slow in sec./day
Bangkok	978,321		106,2
Berlin	981,288	24,4	
Budapest	980,852	5,2	
Bukarest	980,554		7,9
Göttingen	981,176	19,5	
Hamburg	981,375	28,2	
Madrid	979,981		33,1
München	980,733	0	0
Nürnberg	980,942	9,2	
Rom	980,347		17,0
St. Petersburg	981,925	52,5	
Stockholm	981,843	48,8	
Stuttgart	980,901	7,4	
Tokio	979,805		40,9

### The accessory box

With the door fully open, pull the case lid forward by the stainless steel inlay until it stops. In the bottom of the case, the accessories are in place as shown. The pendulum protection cap can also be placed here.



### Door lock in the base

The door in the base is equipped with an electronic RFID (radio-frequency identification) lock. The lock is opened electronically without contact using the chip ( quantity of delivery: 2 pieces).



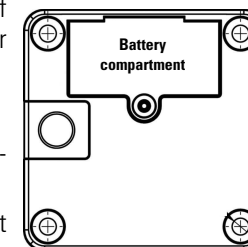
The locking mechanism automatically returns to the locked position after opening, so that the door is locked again after closing.

When the end of the battery life is reached, a continuous tone of 15 seconds sounds when the lock is opened and the lock no longer locks from that moment on.

Change the battery:

To do this, loosen the crosshead screw on the battery compartment and lift off the cover.

Please make sure that the batteries are inserted with the correct polarity!



### Remote control of the indirect lighting

The lighting in the clock and the indirect lighting behind the clock can be switched and dimmed separately with the remote control. Only the two upper rows of buttons and the master button are required for this.

Master button (silver-coloured button):

On / Off, when switched on, the previous brightness is restored.

+ / - buttons:

Press briefly: dim up or down in 11 steps.

Press and hold: stepless dimming up or down



## Technical specifications Caliber 1965

- Plates of 4mm thick, rolled brass
- Nuts of stainless steel
- Main wheel and guide pulley running in ball-bearings – altogether 5 precision ball bearings
- Gears and anchor mounted in 9 jewel bearings, in gold plated, screwed chatons
- Pinions with high number of teeth (12 and 20) of hardened steel, polished
- Gears finely crossed out, milled, precision-ground, bevelled and gold-plated
- Graham escapement with improved transmission system
- Gold-plated escapement lever
- Agate pallets
- Suspension spring of rolled spring stainless steel
- Pendulum rod of heat treated super invar
- Pendulum weight turned of solid brass, nickel-plated
- Temperature compensation
- Barometric-error compensation with 5 aneroid boxes
- Adjusting-table
- Top plate of 6mm thick brass, nickel-plated
- Rope pulley polished and nickel-plated, mounted in a ball bearing
- Weight in nickel-plated brass tube, 3100g
- Anodised, three-part dial with recessed scales, cutaway in seconds dial, numbered consecutively
- Natural anodised dial version: Blue steel hands domed by hand
- Black anodised dial version: Polished steel hands domed by hand
- Bezel turned of solid brass, nickel-plated or gold-plated
- Winding period of 30 days
- Achievable accuracy: under optimal conditions- deviation of less than 1-2 sec. / month possible
- clock case of solid fine wood
- Beat rate 3600 per hour

## Technical data case

- Height: 206 cm, width: 35 cm, depth: 23 cm  
Glass window in the top of the case  
Door with magnetic closure, Anti-reflective mineral glass, U-shaped glass  
Power supply: 110 -230 V
- Door with electronic RFID (radio-frequency identification) lock in the case base,  
Battery: CR123A 3V
- Compartment dimensions: height 46 cm, width 30 cm, depth 16 cm  
Lighting in the clock and indirect lighting behind the clock, separately switchable and dimmable with remote control,  
Lithium battery: CR2032 3V

## Care and Maintenance:

The following maintenance tips will ensure that you enjoy your Illumina Secunda for many years.

We therefore advise you never to keep the clock case open over a long period of time, in order to prevent dust from depositing on the clockwork. Please do not use caustic or abrasive cleaners on the housing. Clean with a damp soft cloth that may be moistened with a mixture of water and pH neutral soap.

After 10 years the latest you should entrust your pendulum clock to a competent clockmaker's work-shop in order to have the clockwork cleaned and oiled anew. In the case of a pendulum clock, which keeps precious time over many years, 24 hours a day, exactly to the second, this should be self-evident. It will then untiringly do good service over decades and will be passed on with pride from generation to generation as a precious chronometer.

**ERWIN SATTLER GmbH & Co. KG**

Großuhrenmanufaktur

Lohenstr. 6 · D-82166 Gräfelfing / Germany

Phone +49(0)89 / 8955806-0 · Fax +49(0)89 / 8955806-28

e-mail: [info@erwinsattler.de](mailto:info@erwinsattler.de)

[www.erwinsattler.de](http://www.erwinsattler.de)