

Watch Movement Specification and Drawing

SOLAR SERIES

Cal. AS06A

Movement Size

6 3/4 × 8'''

Casing Diameter

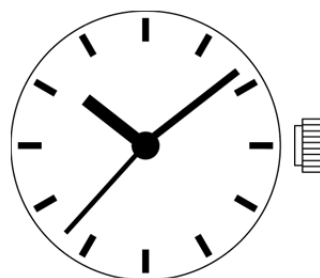
15.3 × 17.8 mm

Height

3.45mm

Running Time

Approx. 2 months



Cal. AS06A

| Items | Rev. | Page |
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| Hand fitting | 02 | 5 |
| Hand setting stem | 02 | 6 |
| Dial-01 | 02 | 7-01 |
| Dial-02 | 02 | 7-02 |
| Dial-03 | 02 | 7-03 |
| Casing ring | 02 | 8 |
| Solar cell unit-01 | 01 | 9-01 |
| Solar cell unit-02 | 01 | 9-02 |
| Solar cell unit-03 | 01 | 9-03 |
| Attention-01 | 01 | 10-01 |
| Attention-02 | 01 | 10-02 |
| Attention-03 | 01 | 10-03 |

| | | |
|------|----------|-------------------|
| Cal. | AS06A | Date : 24/Apr.'15 |
| | Features | Rev. : 01 |
| | | |

1.Solar-powered watch

This watch is a solar-powered watch containing a solar cell underneath the dial to convert any form of light into " electrical energy" and store the power in a secondary battery.

2. Eliminating the need for battery replacement

Unlike conventional quartz watches, this watch does not use a silver oxide battery, thus eliminating the need for battery replacement.

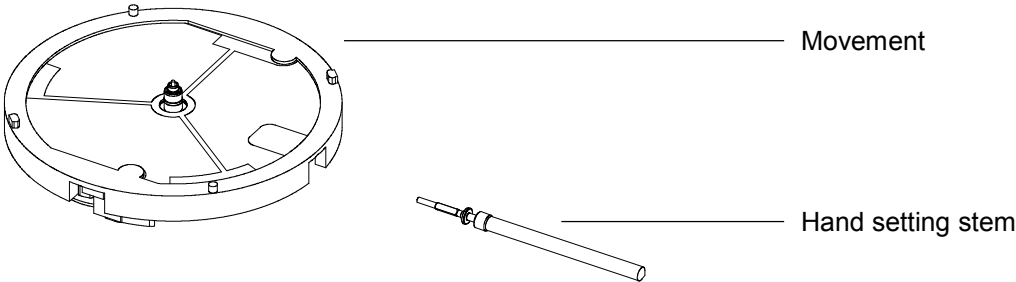
3. You can use the dial which light transmittance is more than 40%

It is possible to assemble the dial which transmits light on the solar cell.
It enabled to cover the solar cell color, and you can design variety colors of dials.

4. Running time

Expected running time from full charge to stoppage will be around 2 months.

5. Structure of the separated parts



| | | | |
|------|-------|----------------|--------------------|
| Cal. | AS06A | Specifications | Date : 24/Apr./'15 |
| | | | Rev. : 01 |

Solar Quartz 6 3/4 × 8''' Movement / Three Hands (H/M/S)

1. MOVEMENT DIMENSIONS

Outside diameter

Casing diameter

Total height

15.30mm(3-9H) × 18.20mm(12-6H)

15.30mm(3-9H) × 17.80mm(12-6H)

3.05mm (Including solar cell : 3.45mm)

2. TIME STANDARD

Type of quartz oscillator

Frequency of quartz oscillator

Accuracy

Operating temperature range

Regulation device

Tuning fork

32,768 Hz

±20 seconds per month (on wrist)

—5°C to +50°C

Nil (Pre-adjusted)

3. INDICATOR / FUNCTIONS

3 Hands

Reset switch

Running time

Setting mechanism

Hour / Minute / Second

Approx. 2 months (After fully charged)

Crown at normal position : Free

Crown pulled out 1st click : Time setting / Reset

4. FEATURES

Jewels

Anti-magnetism

Driving current consumption

Operation stopping voltage

Solar cell type

Maximum unbalance of hands

Moment of inertia

0 Jewels

Over 1600A/m (Direct current magnetic field)

Approx. 1.64 μ A (1.4V)

1.2 V

Amorphous silicon solar cell

Second hand : 0.06 μ N•m

Minute hand : 0.6 μ N•m

Hour hand : 0.5 μ N•m

Second hand : less than 0.6 μ g•m²

5. SECONDARY BATTERY (Installed)

Type

Size

Nominal voltage

Capacity

Titanium-lithium-ion secondary battery

φ 6.8mm × t 2.15mm

1.5 V

2.5 mAh

6. SEPARATED PARTS (Parts code)

Hand setting stem

0354788

7. TEST OF ACCURACY

Equipment to be used

Duration of measurement

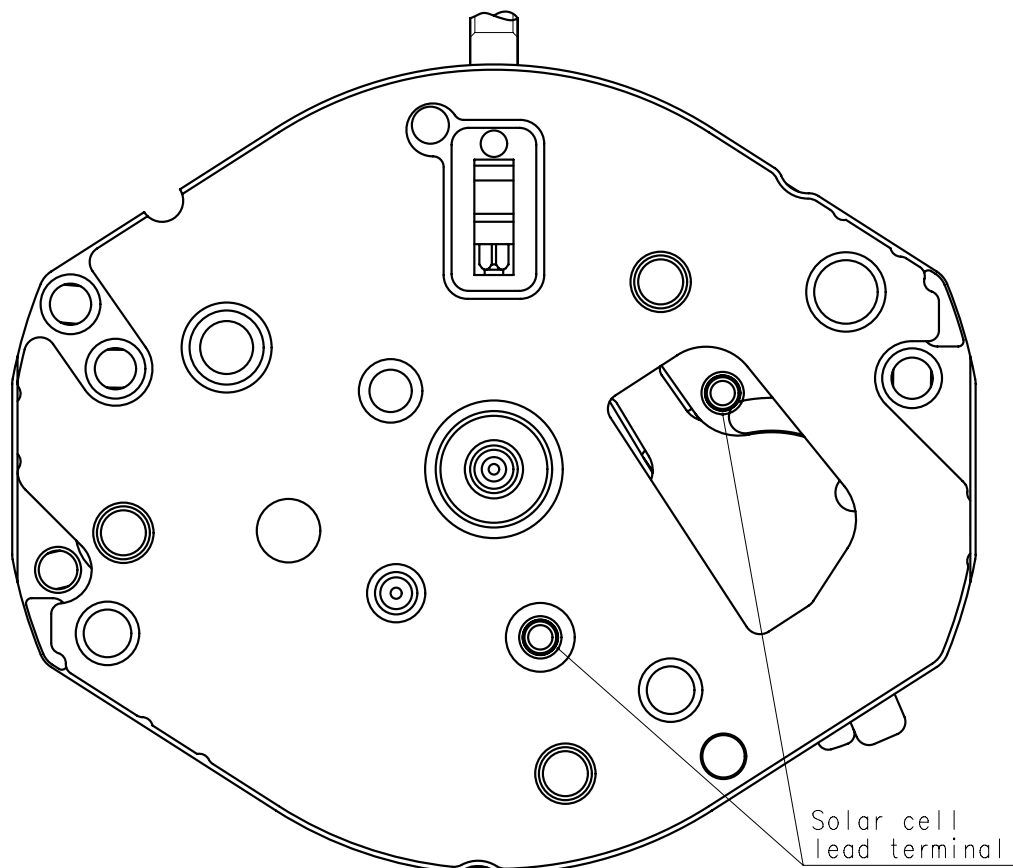
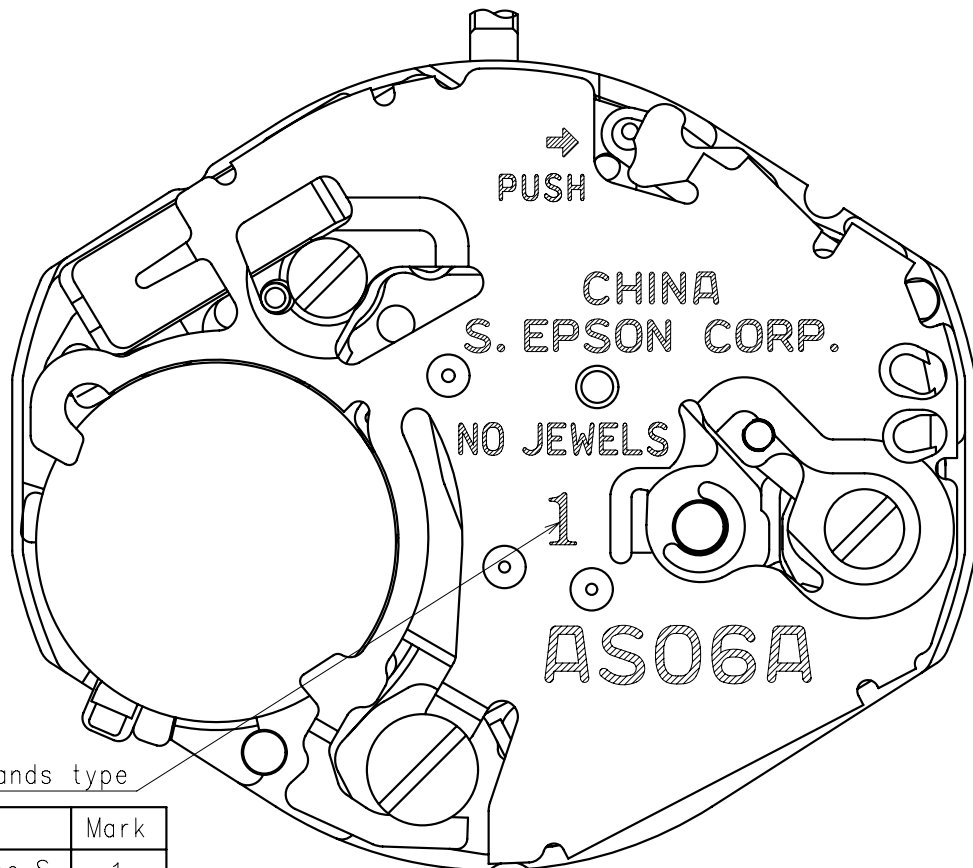
Microphone to be used

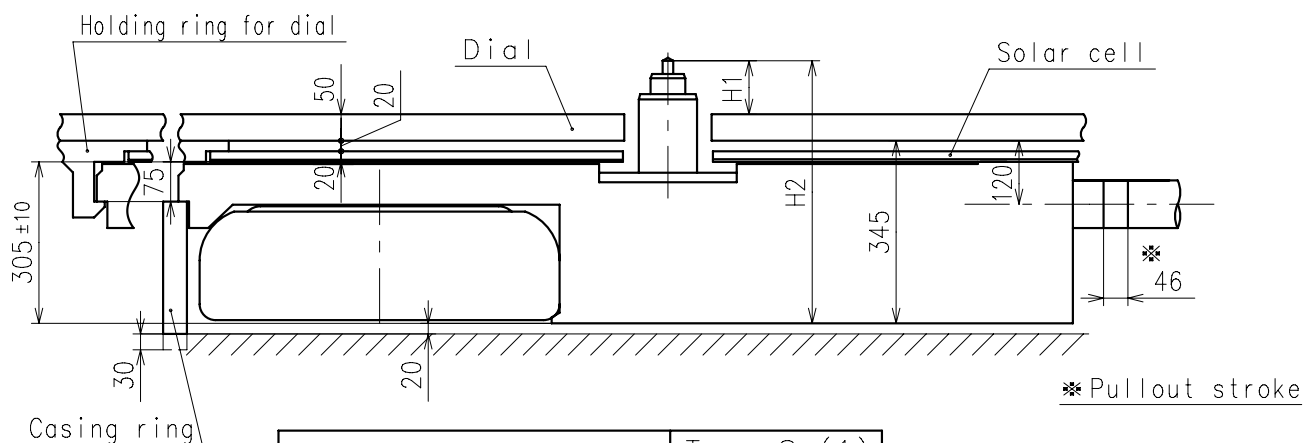
SEIKO quartz tester QT-99,
Greiner quartz timer-C , Witschi Q-tester 4000

10 seconds

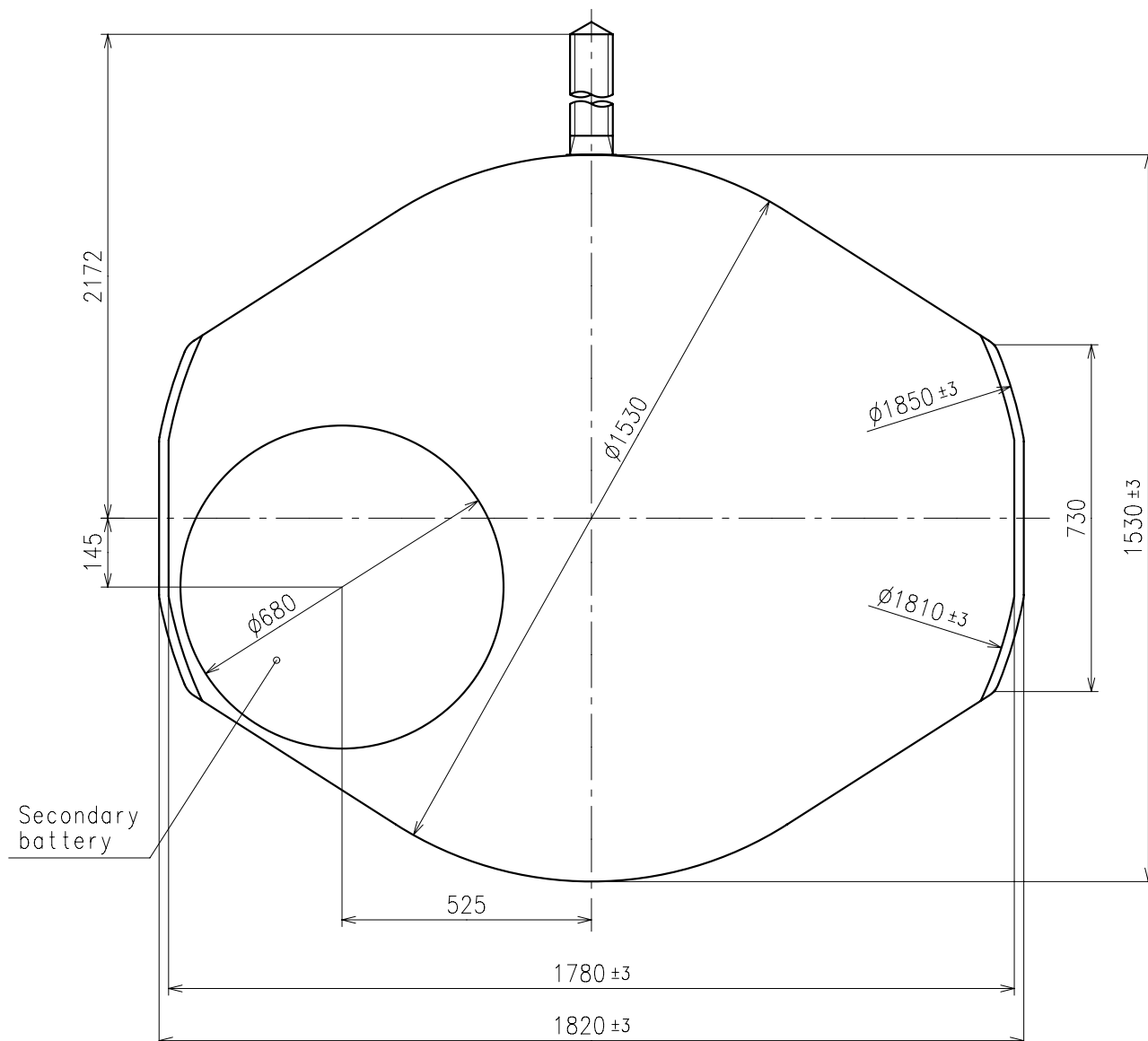
Electromagnetic detection type

All specifications are subject to change without notice.

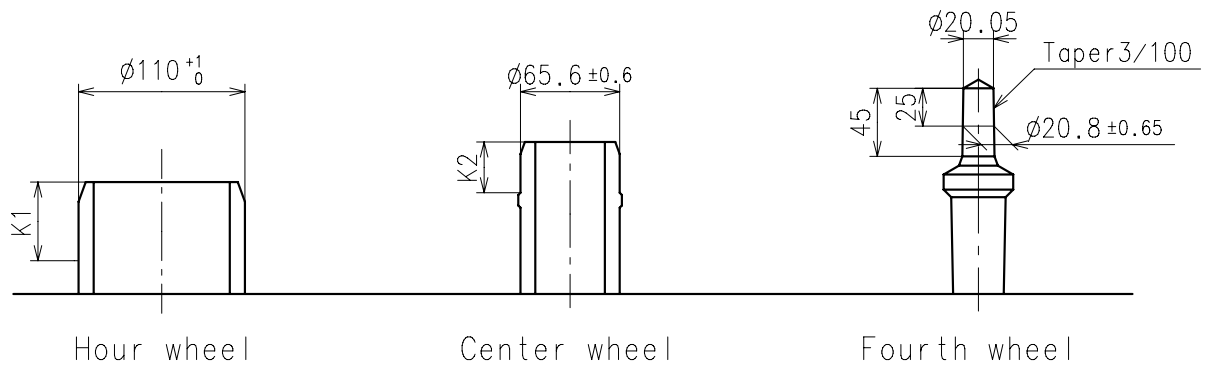




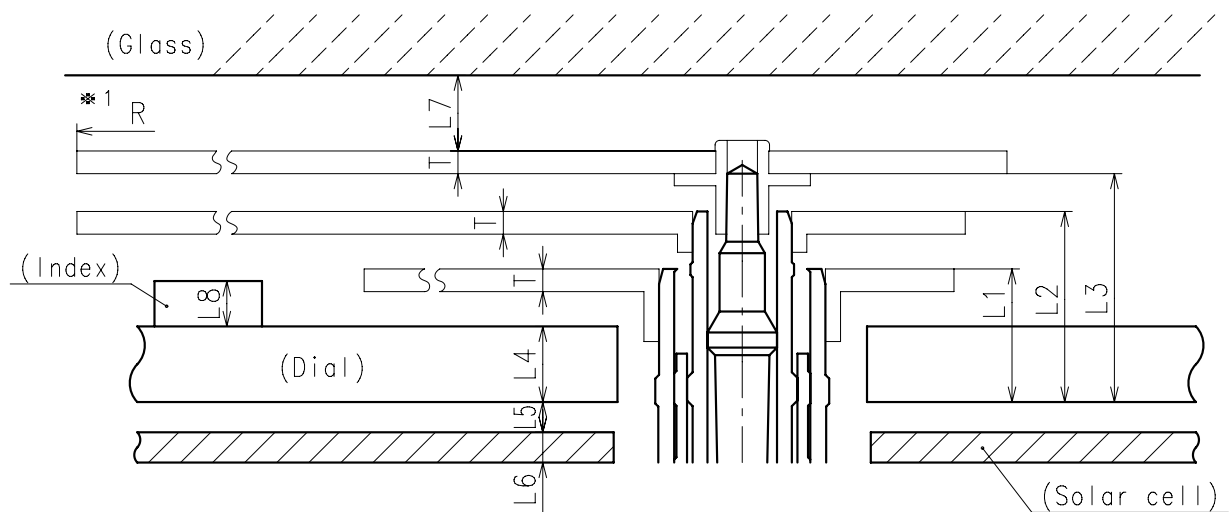
| Center post | | Type S (1) AS06A** |
|---------------------------------|----|-----------------------|
| Maximum height from dial | H1 | 101 |
| Total height including movement | H2 | 496 |



- ※ Unbalance
- Hour hand $\leq 0.5\mu \text{ N} \cdot \text{m}$ ($50\mu \text{ g} \cdot \text{m}$)
 - Minute hand $\leq 0.6\mu \text{ N} \cdot \text{m}$ ($60\mu \text{ g} \cdot \text{m}$)
 - Second hand $\leq 0.06\mu \text{ N} \cdot \text{m}$ ($6\mu \text{ g} \cdot \text{m}$)
- ※ Moment of inertia
- Second hand $\leq 0.6\mu \text{ g} \cdot \text{m}^2$

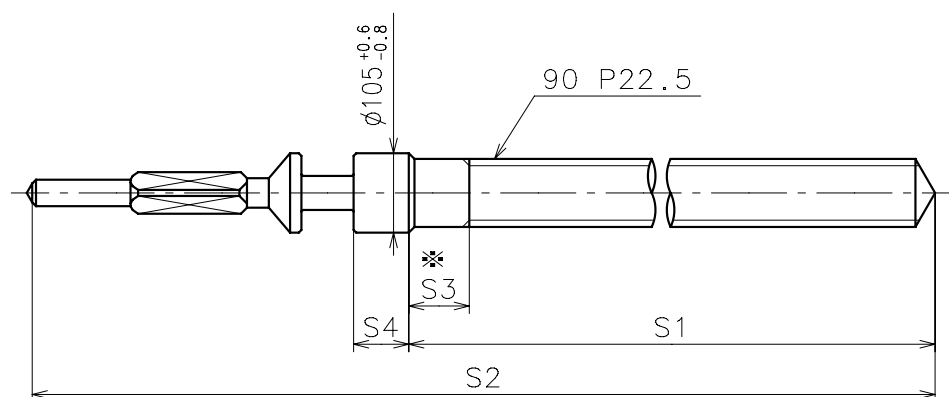


| | Parts No. | | | Dimension | |
|----------------------|------------|--------------|--------------|-----------|------|
| | Hour wheel | Center wheel | Fourth wheel | K1 | K2 |
| Type S(1) AS06A** | 0271764 | 0221764 | 0241764 | 60 | 33.5 |



| | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | T | *1 R |
|----------------------|----|-----|-----|----|----|----|------------|------------|----|--------------|
| Type S(1) AS06A** | 88 | 126 | 151 | 50 | 20 | 20 | MIN: 50 | MAX: 30 | 15 | MAX: 1250 |

※ 1: It is the size taken into consideration for hands attachment.
Please observe some standard value specified in unbalance and moment of inertia when using long hands.

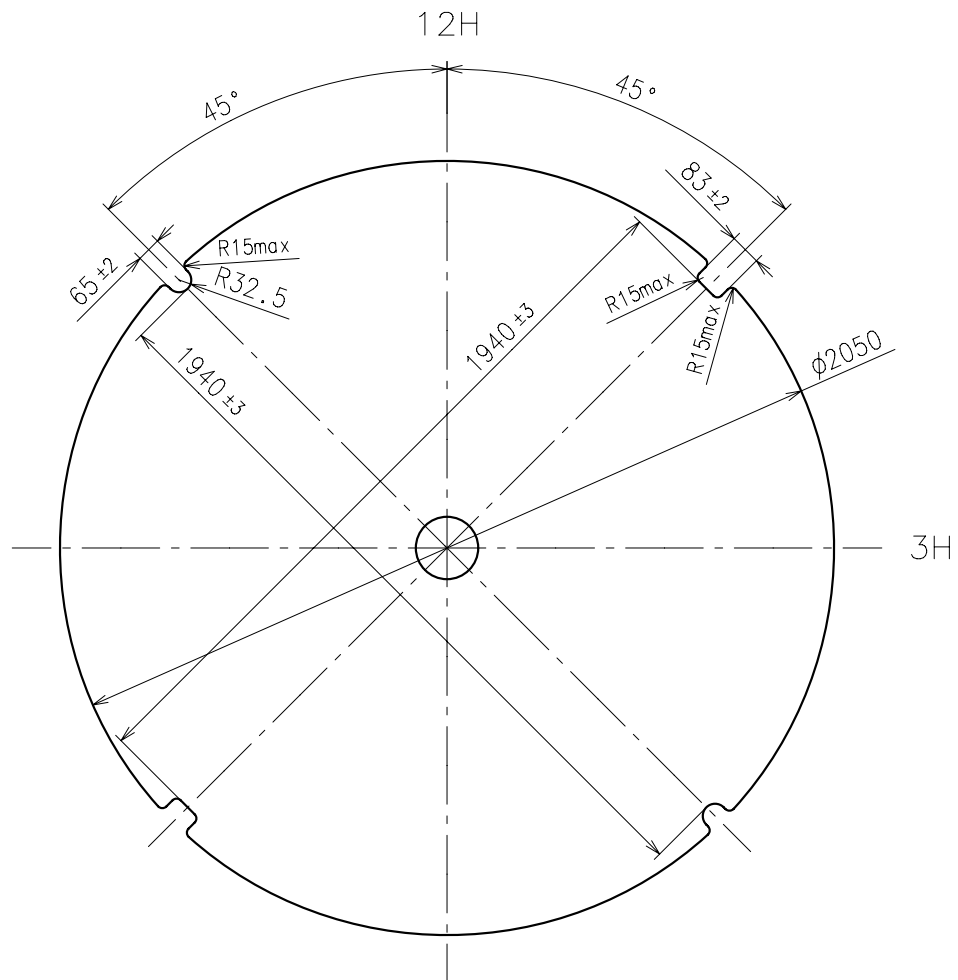


* Not threaded

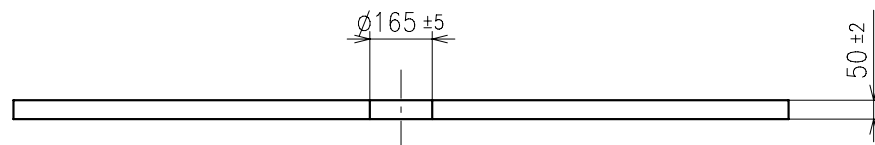
| | Part No. | S1 | S2 | * S3 | S4 |
|----------|----------|------|------|------|----|
| Standard | 0354788 | 1473 | 1971 | 80 | 73 |

Material : Steel

Hardness : Vickers 530 ± 50



Case body inside diameter: $\phi 2080$



[Attention]

Each elements of solar cell must be kept the transparency rate of the dial more than 40%. Refer to the Fig.[1] or [Solar cell unit-01] page instruction as to the shape of solar cell.

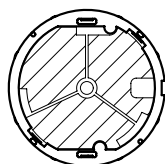
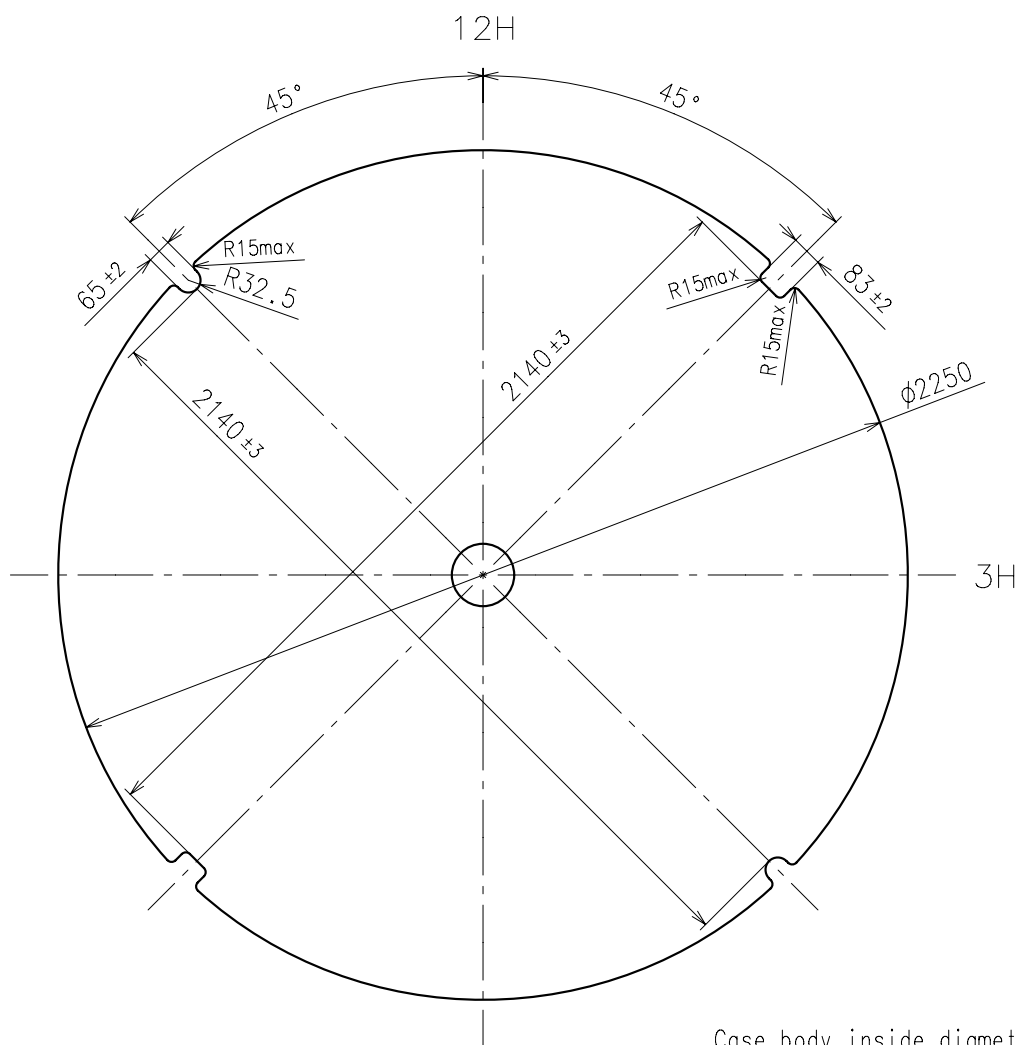
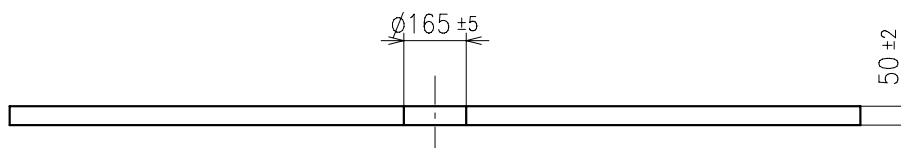


Fig.[1]  elements of solar cell



Case body inside diameter: $\phi 2280$



[Attention]

Each elements of solar cell must be kept the transparency rate of the dial more than 40%.
Refer to the Fig.[1] or [Solar cell unit-03] page instruction as to the shape of solar cell.

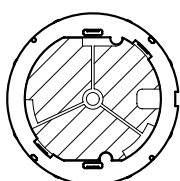
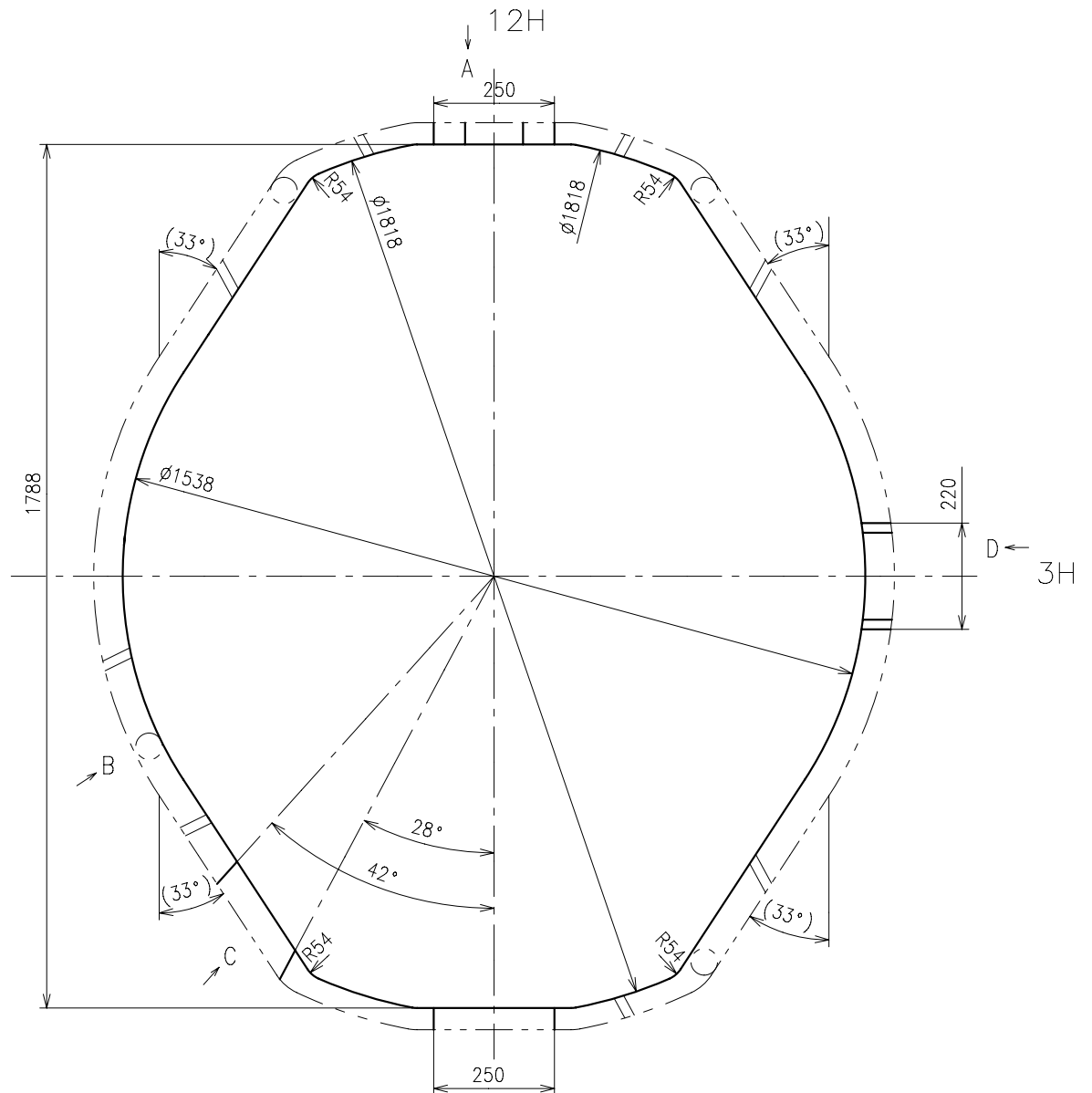
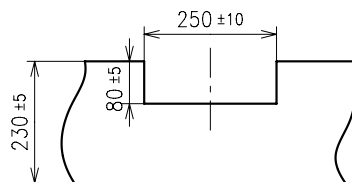


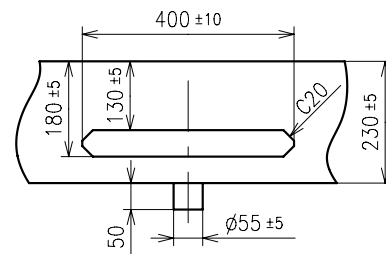
Fig.[1]  elements of solar cell



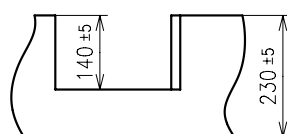
A view



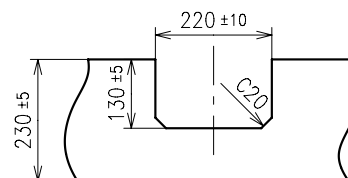
B view

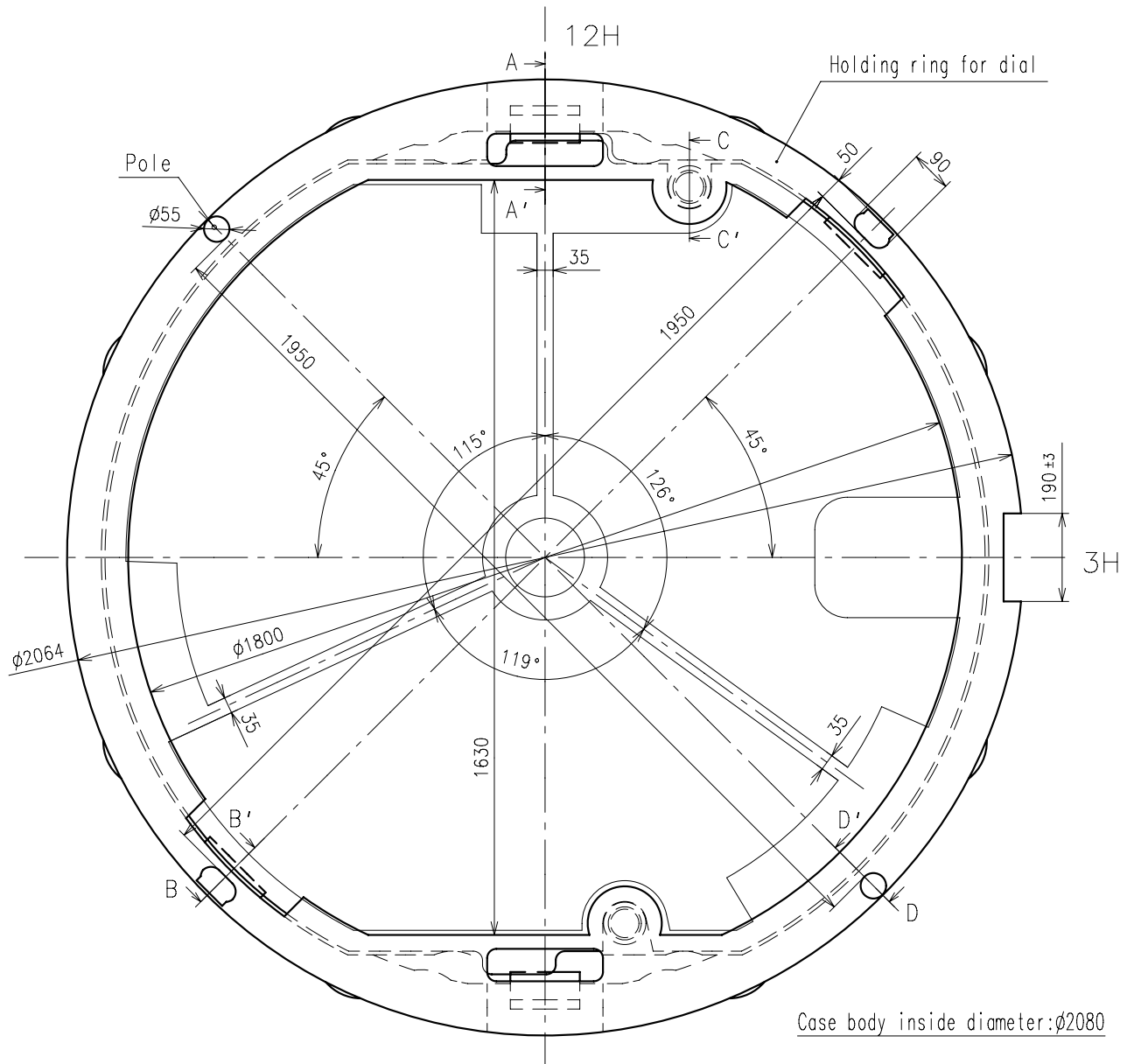


C view

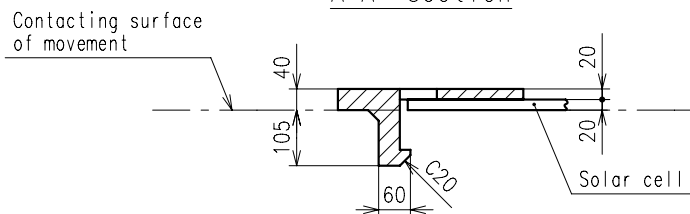


D view

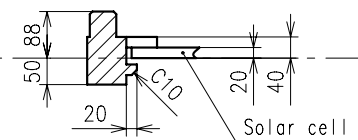




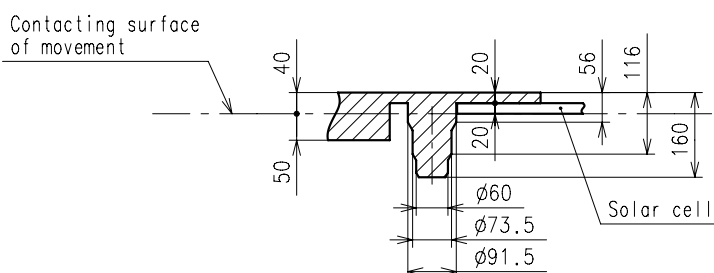
A-A' section



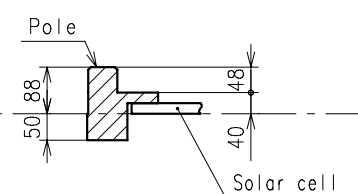
B-B' section

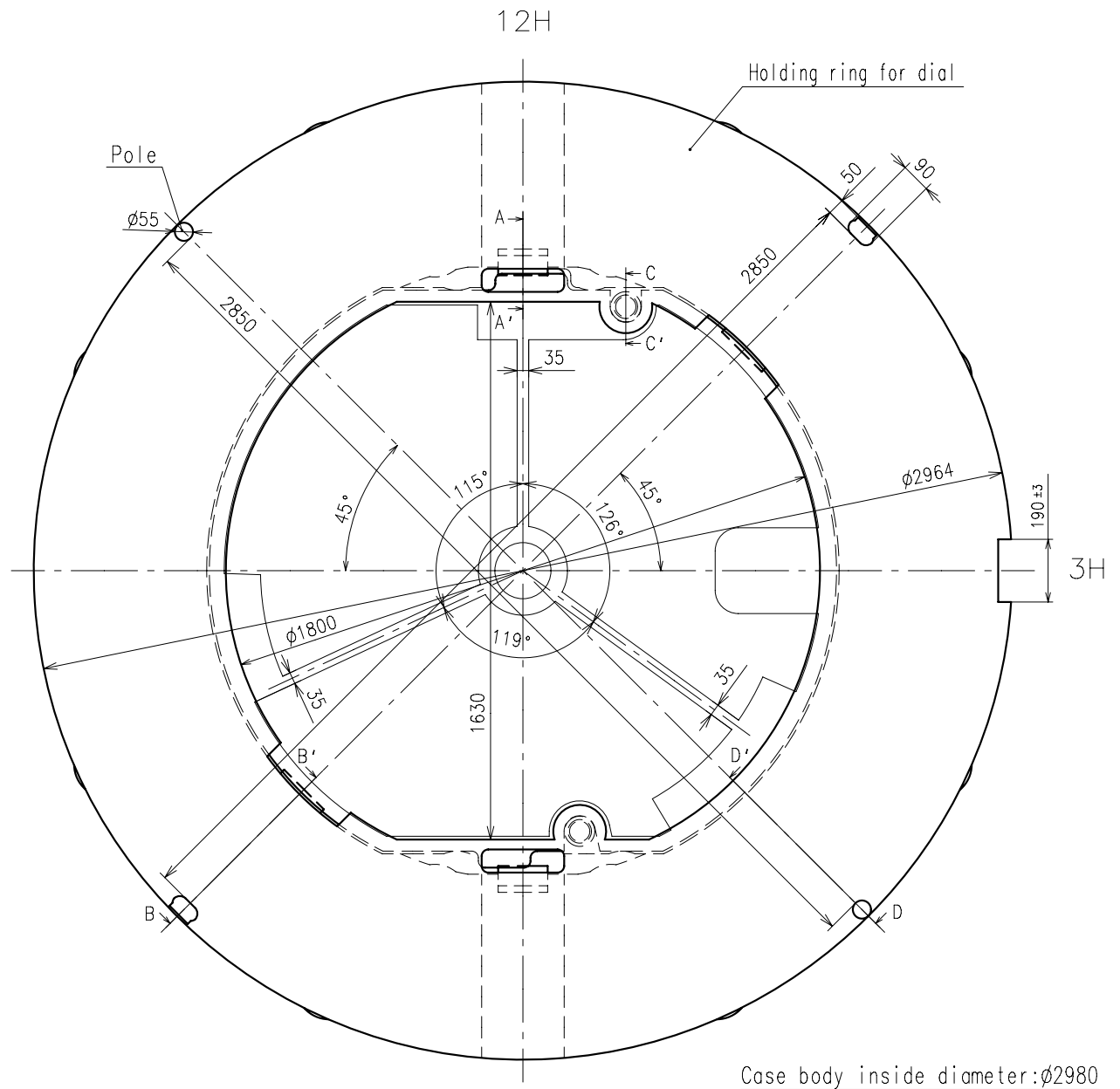


C-C' section



D-D' section





1. How to remove the setting stem

When removing the setting stem, put the setting stem at normal position and push the "setting lever" by tweezers. (Refer to the Fig.[0].)

The "setting lever" can not be push if the setting stem is not at normal position.

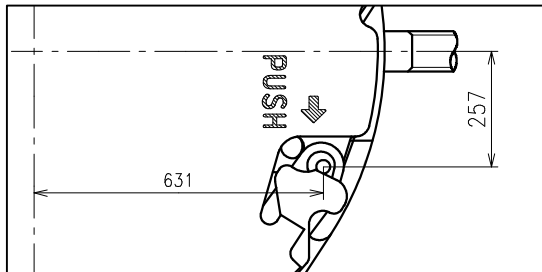


Fig.[0]

2. Attention for solar cell unit

Pay attention not to touch and scratch the surface of the solar cell.

3. Dial transparency rate

Keep the transparency rate of the dial more than 40%.

(Effective aperture is ϕ 19mm)

Each elements of solar cell must be kept the transparency rate.

4. The guideline of charging time is as in below

(Dial transparency rate = 40%)

| Illumination (Lx) | Source of light | Environment | A (Approx. Hours) | B (Approx. Hours) | C (Approx. Minutes) |
|-------------------|--------------------|-------------------|-------------------|-------------------|---------------------|
| 700 | A fluorescent lamp | Inside the office | — | 45 | 132 |
| 3,000 | | 30W 20cm | 60 | 4 | 33 |
| 10,000 | Sun light | Cloudy | 20 | 1.5 | 11 |
| 100,000 | | Fine weather | 5 | 15 minutes | 2.5 |

Condition A : Time required for full charge

Condition B : Time required for steady operation

Condition C : Time to charge 1 day of power

5. Caution

When charging the watch, do not place it too close to fluorescent lamp or other light sources as the watch temperature will become extremely high, causing damage to the parts inside the watch.

6. Attention for the secondary battery unit

Please set the exclusive secondary battery unit.

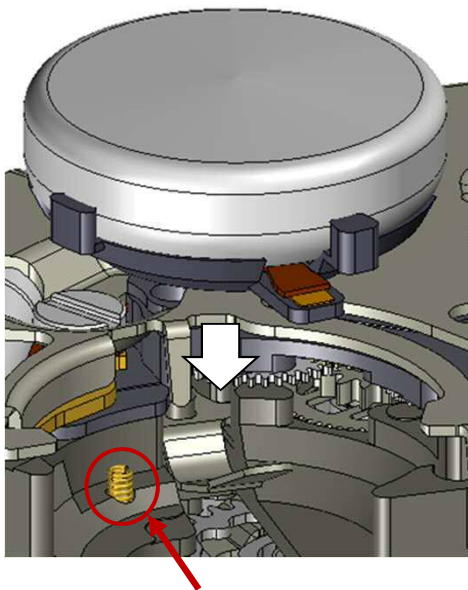
(The secondary battery is Titanium-lithium-ion battery without any environmentally harmful substances.)

If the silver oxide battery is accidentally set and charged, there is a possibility of battery explosion.

To prevent from the battery explosion, it is adopted safety structure not to charge the silver oxide battery even if it is accidentally set.

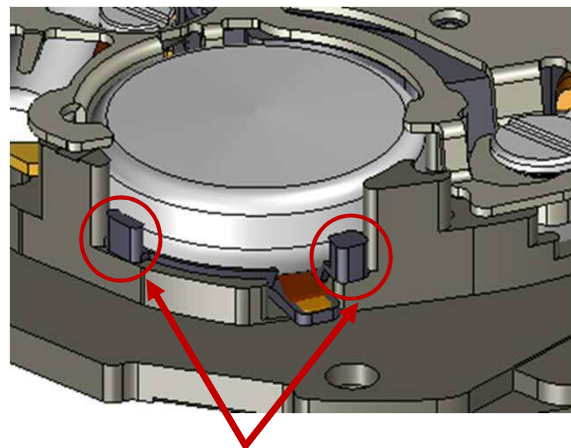
When the secondary battery is assembled, please match the phase in accordance with illustration and push the battery vertical direction. (Refer to the Fig.[1], [2] in below.)

Please pay attention not to bend the solar cell lead terminal.



Solar cell lead terminal

Fig.[1]



Setting position

Fig.[2]

When the secondary battery is disassembled, please broaden the spring of circuit block cover toward the (⇒) direction and remove the battery in accordance with illustration. (Refer to the Fig.[3] in below.)

Please refrain from touching the diode element on the back side of the secondary battery.

(Refer to the Fig.[4] in below.)

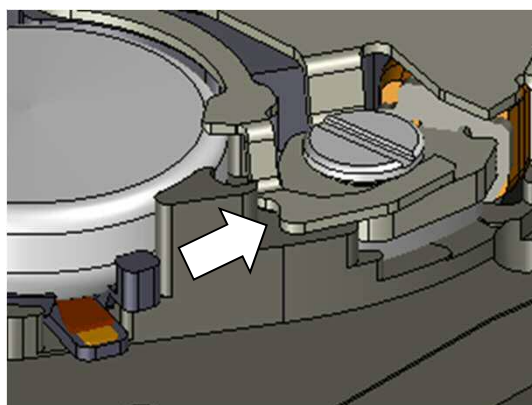


Fig.[3]

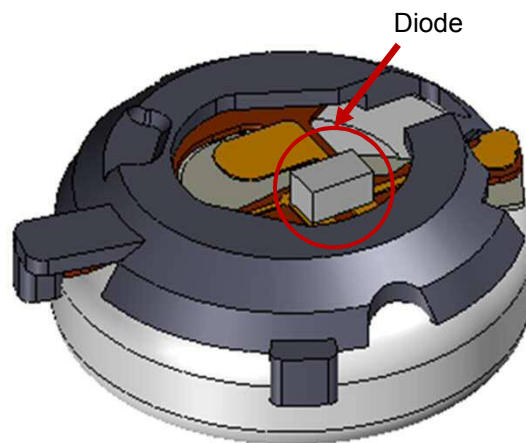
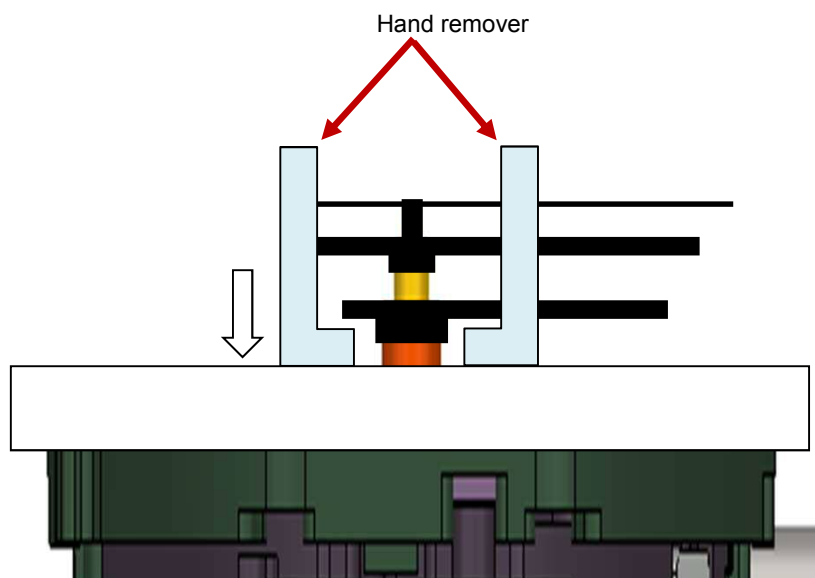


Fig.[4]

7.Attention for hands disassemble

When the hand is disassembled, please be sure to hold the dial.

If the hand is disassembled without holding the dial, it may have a possibility to break the movement.

**8. How to set the dial**

The dial is held by the four guide poles on the solar cell unit.

