

## Watch Movement Specification and Drawing

### SOLAR SERIES

# Cal. AS82A

Movement Size

**6 3/4 × 8'''**

Casing Diameter

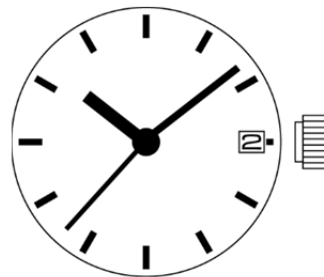
**15.3 × 17.8 mm**

Height

**4.61mm**

Running Time

**Approx. 4 months**



Date: 31/Oct./'16

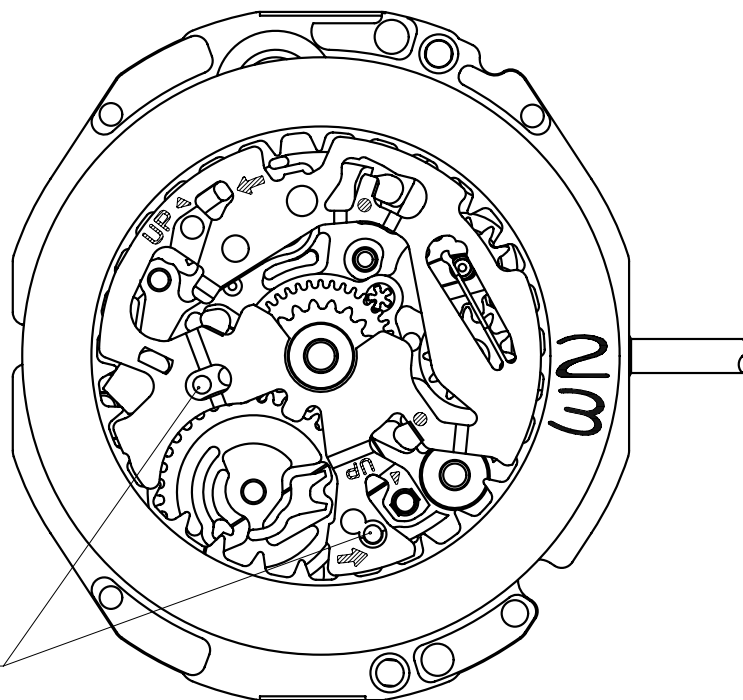
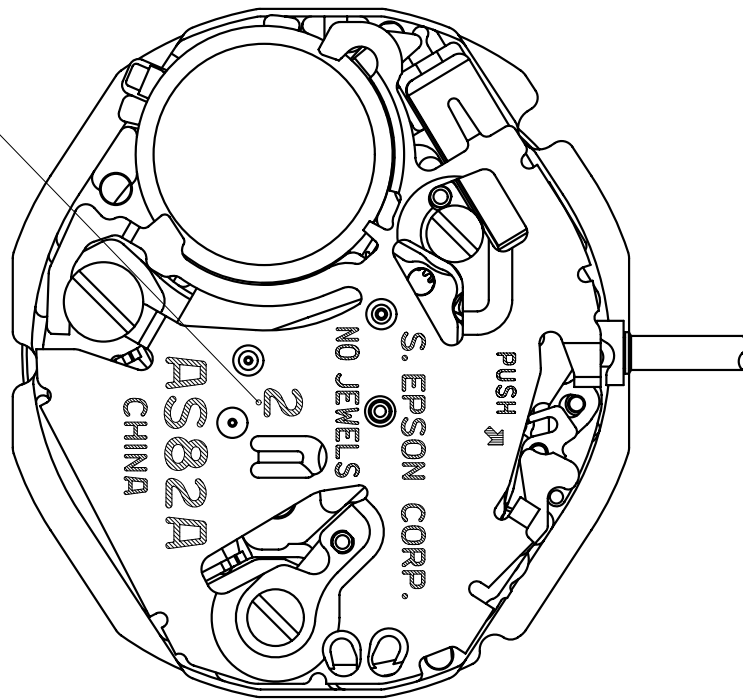
## Cal. AS82A

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Cal. <b>AS82A</b>	<b>Features</b>	Date : 24/Apr.'15 Rev. : 01
<div data-bbox="188 217 525 253" data-label="Section-Header"> <h3>1.Solar-powered watch</h3> </div> <div data-bbox="228 250 1436 320" data-label="Text"> <p>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.</p> </div> <div data-bbox="188 360 863 398" data-label="Section-Header"> <h3>2. Eliminating the need for battery replacement</h3> </div> <div data-bbox="228 394 1447 463" data-label="Text"> <p>Unlike conventional quartz watches, this watch does not use a silver oxide battery, thus eliminating the need for battery replacement.</p> </div> <div data-bbox="188 504 1139 542" data-label="Section-Header"> <h3>3. You can use the dial which light transmittance is more than 30%</h3> </div> <div data-bbox="228 537 1078 573" data-label="Text"> <p>It is possible to assemble the dial which transmits light on the solar cell.</p> </div> <div data-bbox="228 573 1189 609" data-label="Text"> <p>It enabled to cover the solar cell color, and you can design variety colors of dials.</p> </div> <div data-bbox="188 647 422 685" data-label="Section-Header"> <h3>4. Running time</h3> </div> <div data-bbox="228 683 1139 719" data-label="Text"> <p>Expected running time from full charge to stoppage will be around 4 months.</p> </div> <div data-bbox="188 754 711 795" data-label="Section-Header"> <h3>5. Power depletion warning function</h3> </div> <div data-bbox="228 790 1270 826" data-label="Text"> <p>The two-second intervals movement of the second hand is a signal of energy depletion.</p> </div> <div data-bbox="228 824 1377 862" data-label="Text"> <p>The watch continuous running time after two-second intervals movement is approximately 1 day.</p> </div> <div data-bbox="188 898 683 940" data-label="Section-Header"> <h3>6. Structure of the separated parts</h3> </div> <div data-bbox="256 985 1283 1303" data-label="Image"> <p>The diagram illustrates the internal components of the watch. On the left is a circular 'Movement' unit, which is the mechanical core of the watch. To its right is a long, thin 'Hand setting stem' used for adjusting the watch hands. Leader lines connect the text labels to their respective parts in the diagram.</p> </div>		

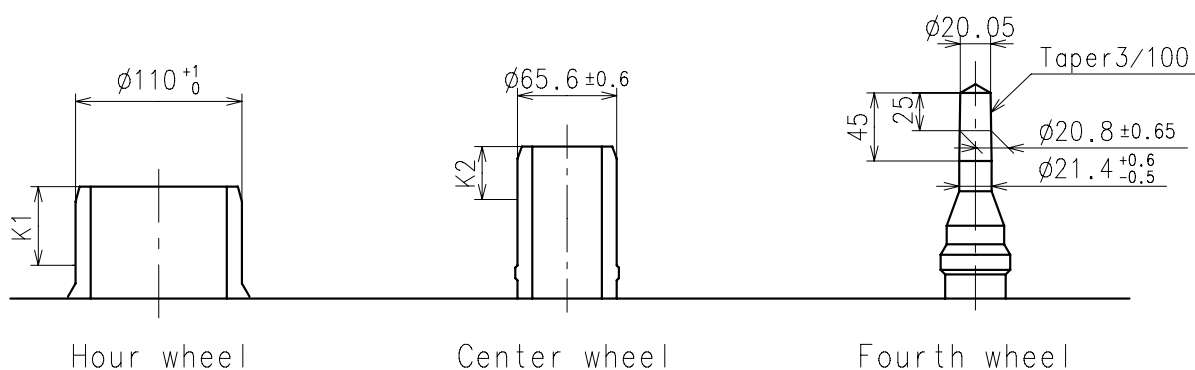
Cal.	AS82A	Specifications	Date : 24/Apr./'15
			Rev. : 01
Solar Quartz 6 3/4 × 8''' Movement / Three Hands (H/M/S) with Calendar			
1. MOVEMENT DIMENSIONS			
Outside diameter	16.30mm(3-9H) × 18.20mm(12-6H)		
Casing diameter	15.30mm(3-9H) × 17.80mm(12-6H)		
Total height	4.21mm (Including solar cell : 4.61mm)		
2. TIME STANDARD			
Type of quartz oscillator	Tuning fork		
Frequency of quartz oscillator	32,768 Hz		
Accuracy	±20 seconds per month (on wrist)		
Operating temperature range	—5°C to +50°C		
Regulation device	Nil (Pre-adjusted)		
3. INDICATOR / FUNCTIONS			
3 Hands	Hour / Minute / Second		
Calendar	Instant setting device for date calendar		
Reset switch			
Power depletion warning function	(Second hand moves at 2-second intervals when voltage is 1.15V)		
Running time	Approx. 4 months (After fully charged)		
Setting mechanism	Crown at normal position : Free		
	Crown pulled out 1st click : Instant date change		
	Crown pulled out 2nd click : Time setting / Reset		
4. FEATURES			
Jewels	0 Jewels		
Anti-magnetism	Over 1600A/m (Direct current magnetic field)		
Driving current consumption	Approx. 0.93 μ A (1.4V)		
Operation stopping voltage	1.0 V		
Solar cell type	Amorphous silicon solar cell		
Maximum unbalance of hands	Second hand : 0.06 μ N•m		
	Minute hand : 0.6 μ N•m		
	Hour hand : 0.5 μ N•m		
Moment of inertia	Second hand : less than 0.11 μ g•m²		
5. SECONDARY BATTERY (Installed)			
Type	Titanium-lithium-ion secondary battery		
Size	φ 6.8mm × t 2.15mm		
Nominal voltage	1.5 V		
Capacity	2.5 mAh		
6. SEPARATED PARTS (Parts code)			
Hand setting stem	0351177		
7. TEST OF ACCURACY			
Equipment to be used	SEIKO quartz tester QT-99, Greiner quartz timer-C , Witschi Q-tester 4000		
Duration of measurement	10 seconds		
Microphone to be used	Electromagnetic detection type		
All specifications are subject to change without notice.			

Hands type	
Type M	Mark
	2

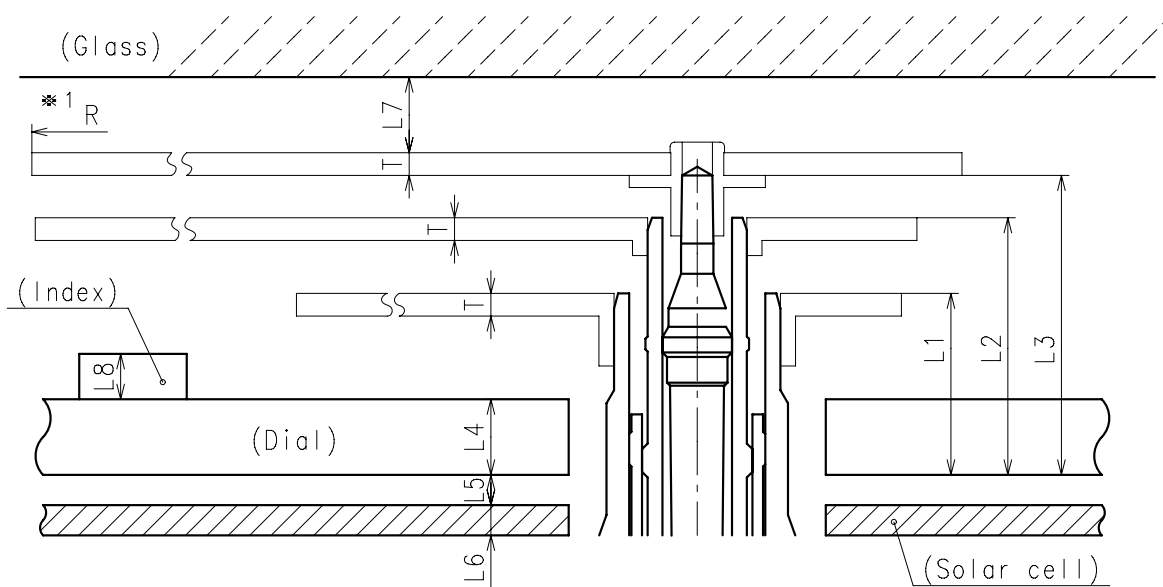




- ※ Unbalance
- Hour hand  $\leq 0.5\mu \text{ N} \cdot \text{m}$  ( $50\mu \text{ g} \cdot \text{m}$ )
  - Minute hand  $\leq 0.6\mu \text{ N} \cdot \text{m}$  ( $60\mu \text{ g} \cdot \text{m}$ )
  - Second hand  $\leq 0.06\mu \text{ N} \cdot \text{m}$  ( $6\mu \text{ g} \cdot \text{m}$ )
- ※ Moment of inertia
- Second hand  $\leq 0.11\mu \text{ g} \cdot \text{m}^2$

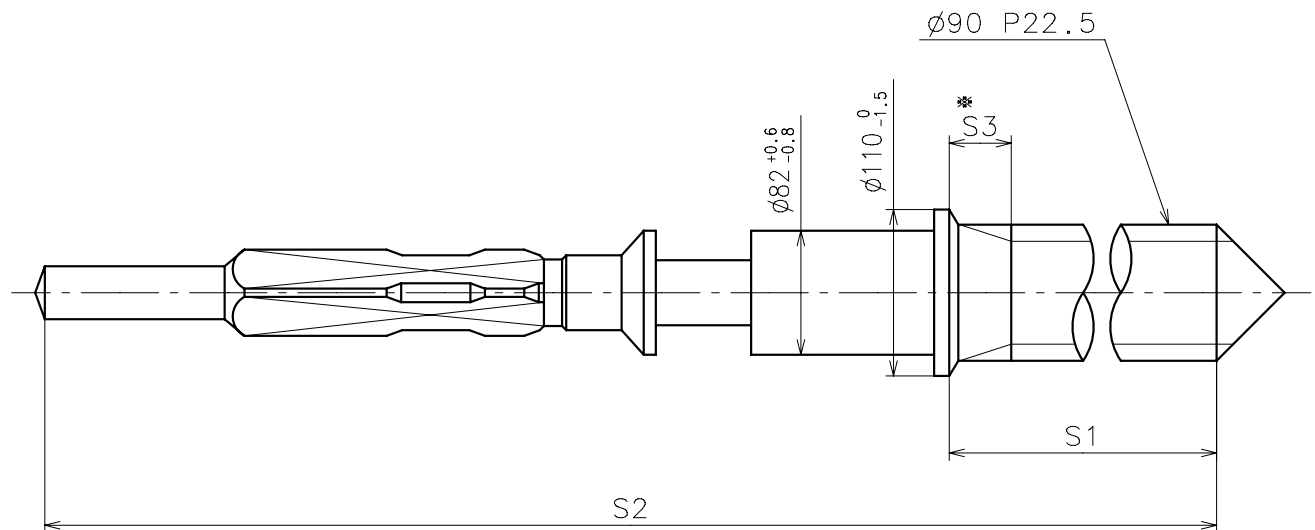


	Parts No.			Dimension	
	Hour wheel	Center wheel	Fourth wheel	K1	K2
Type M (2) AS82A**	0271649	0221654	0241584	60	35



	L1	L2	L3	L4	L5	L6	L7	L8	T	*1 R
Type M(2) AS82A**	120	170	198	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.

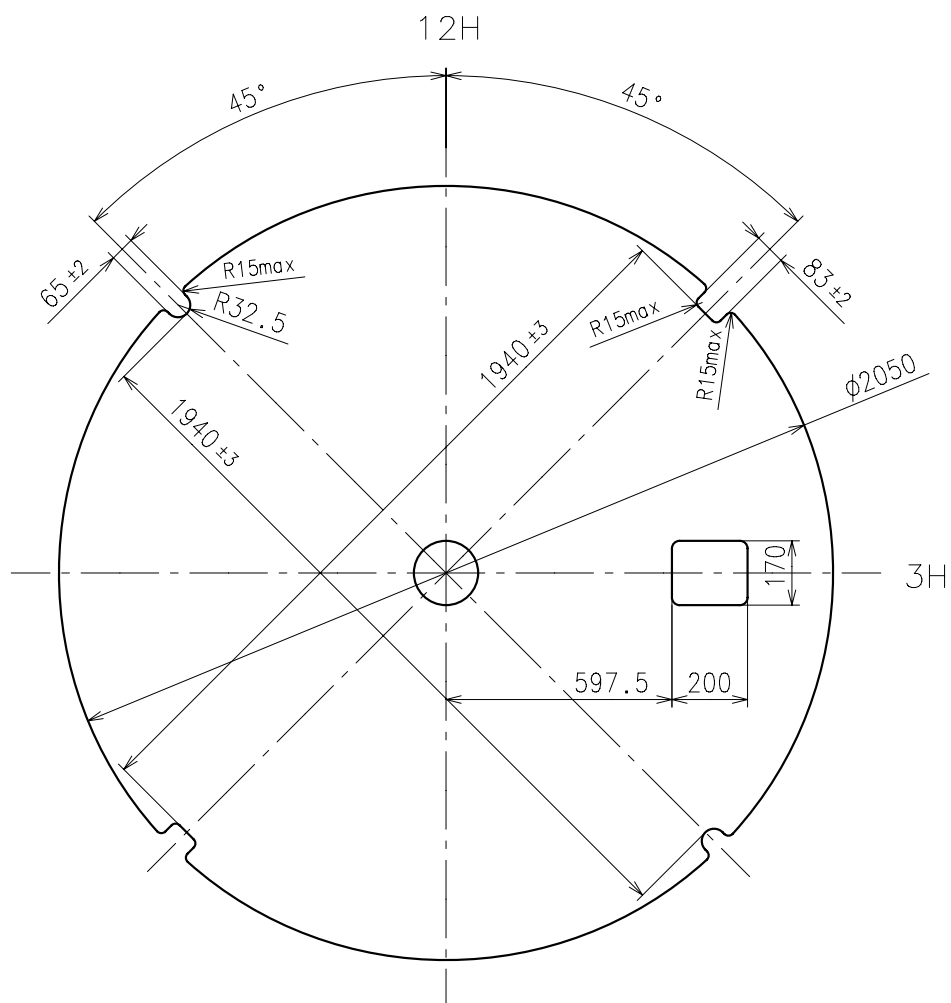


※ Not threaded

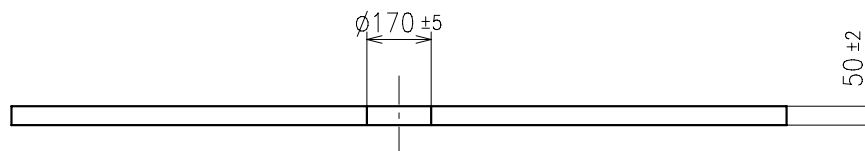
	Part No.	S1	S2	※ S3
Standard	0351177	1366	1964	60

Material : Steel

Hardness : Vickers 600±50



Case body inside diameter:  $\phi 2080$



[Attention]

Each elements of solar cell must be kept the transparency rate of the dial more than 30%.  
Refer to the Fig.[1] or [Solar cell unit-01] page instruction as to the shape of solar cell.

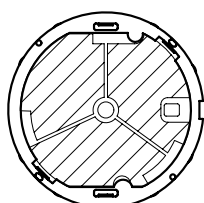
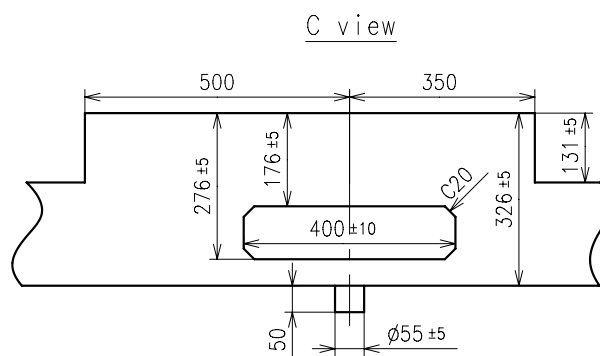
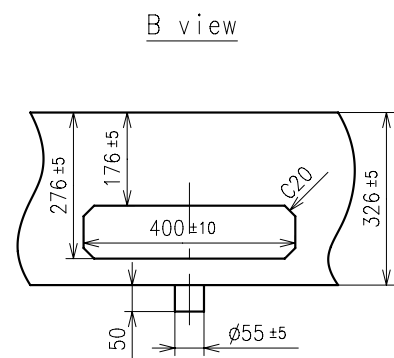
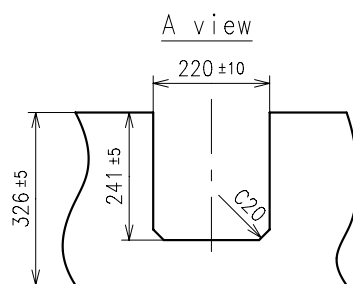
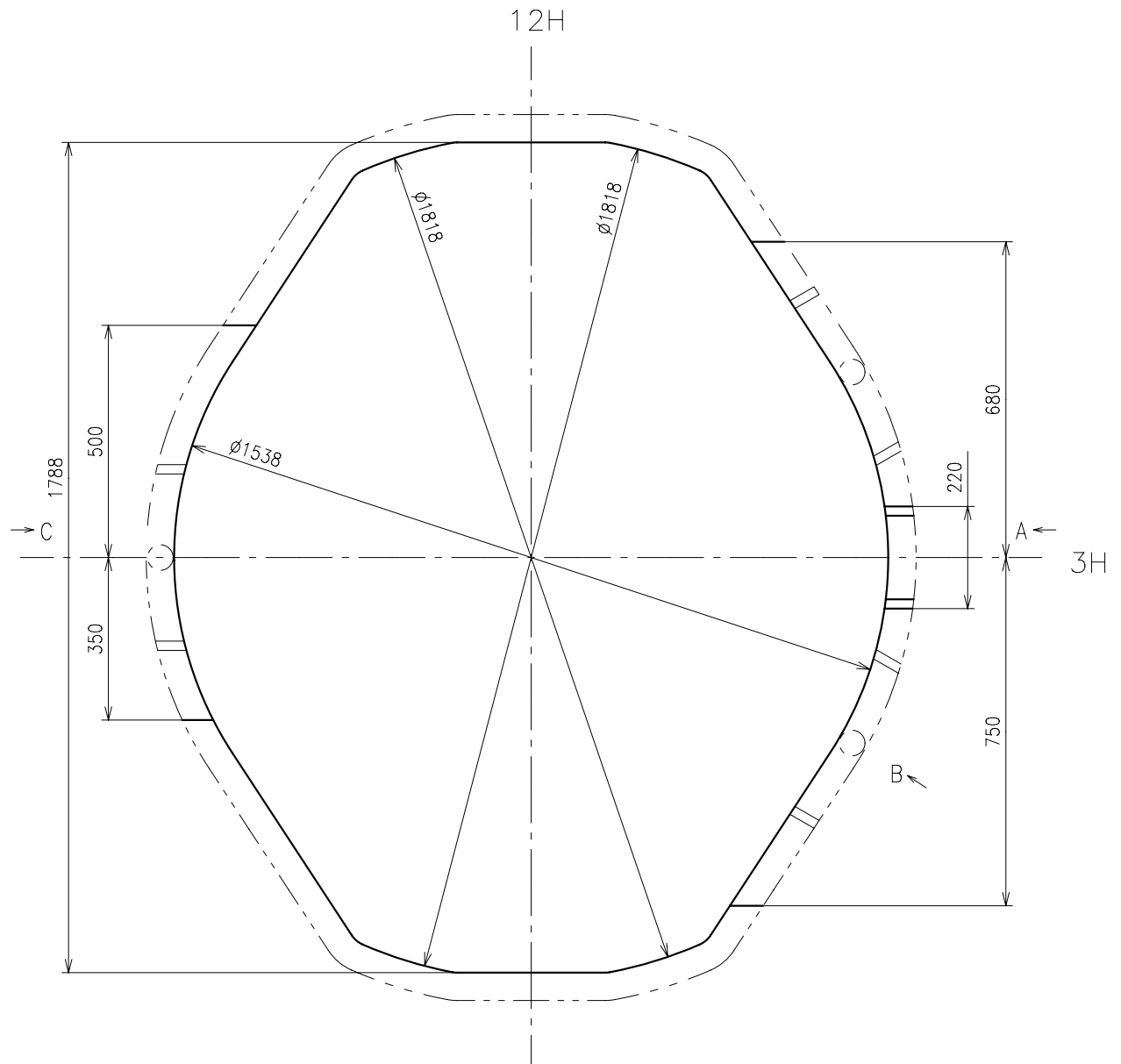
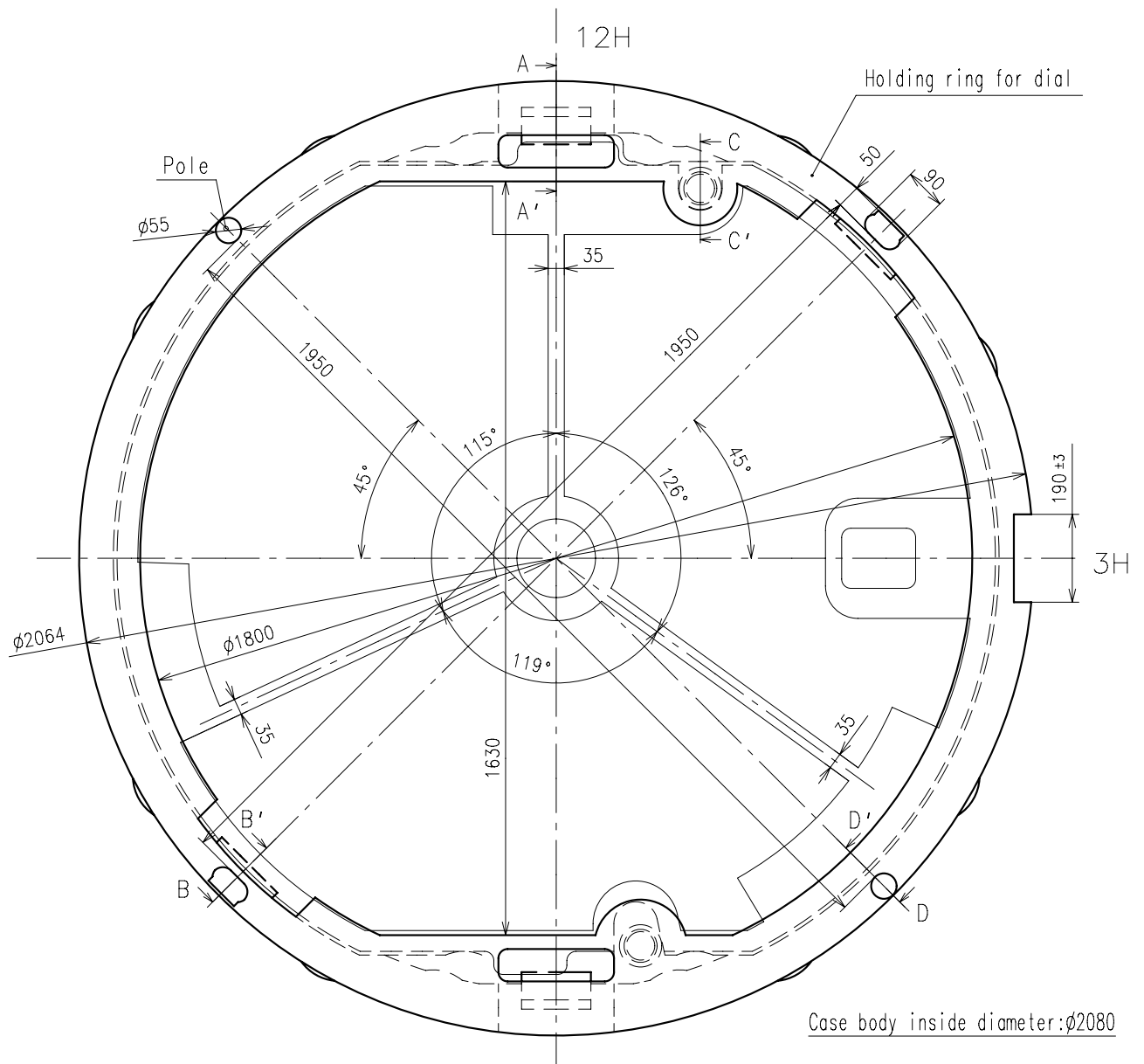


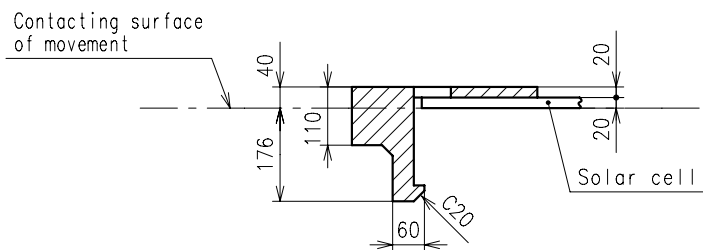
Fig.[1]  elements of solar cell



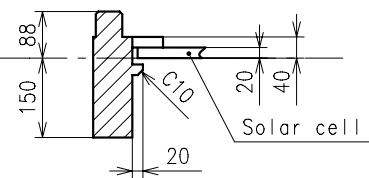




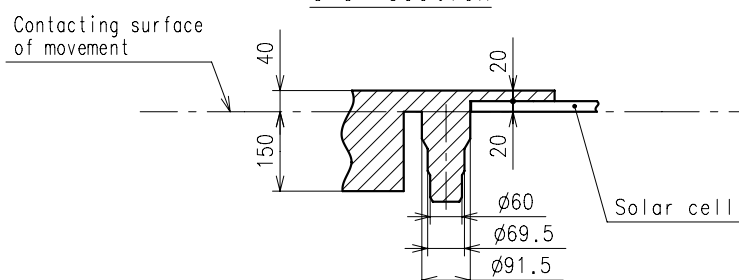
A-A' section



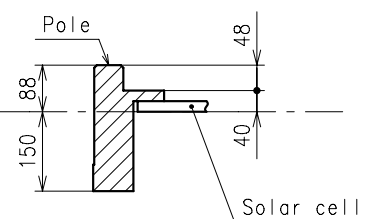
B-B' section

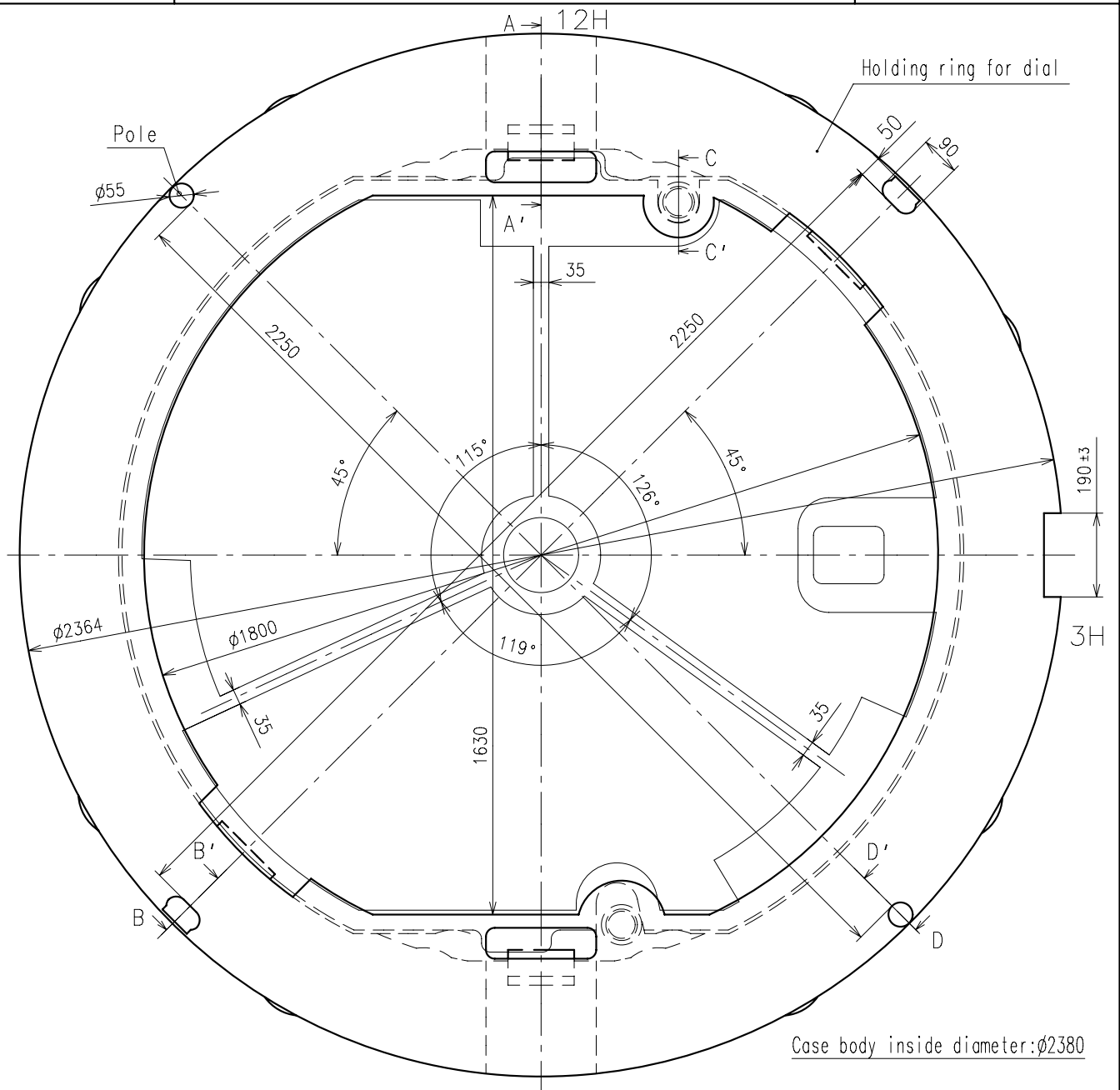


C-C' section

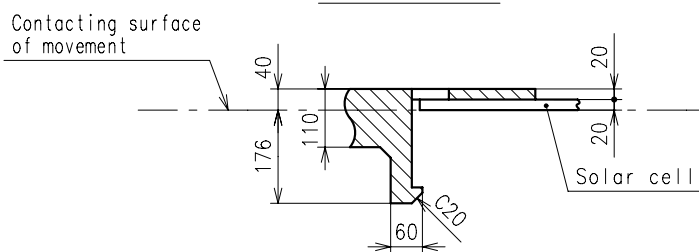


D-D' section

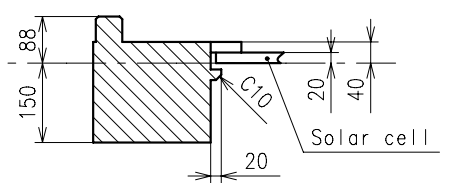




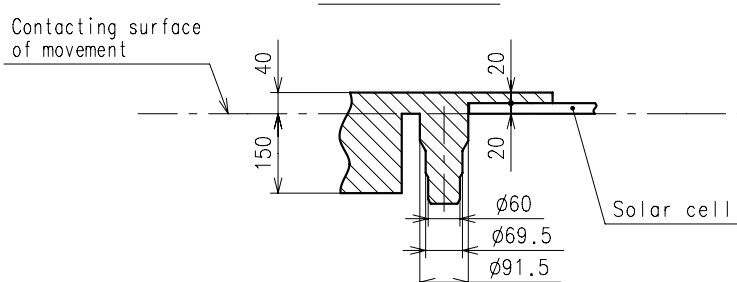
A-A' section



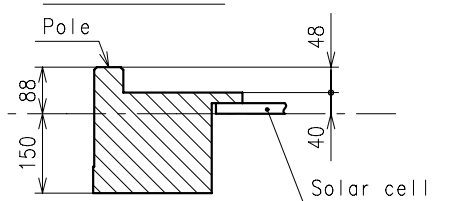
B-B' section



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.

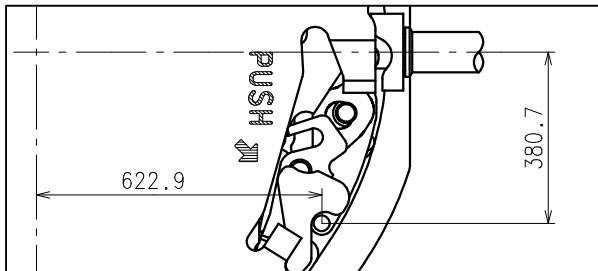


Fig.[0]

**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 30%.

(Effective aperture is  $\phi$  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 = 30%)

Illumination (Lx)	Source of light	Environment	A (Approx. Hours)	B (Approx. Hours)	C (Approx. Minutes)
700	A fluorescent lamp	Inside the office	—	35	100
3,000		30W 20cm	60	4	25
10,000	Sun light	Cloudy	20	1.5	8
100,000		Fine weather	5	15 minutes	2

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.

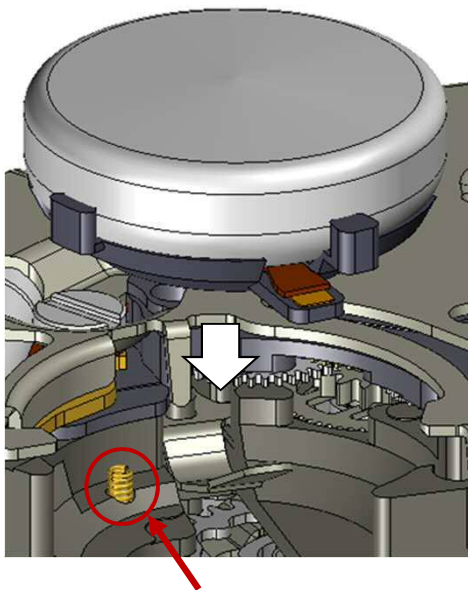
(The secondary battery is Titanium-lithium-ion battery without any environmentally harmful substances.)

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.

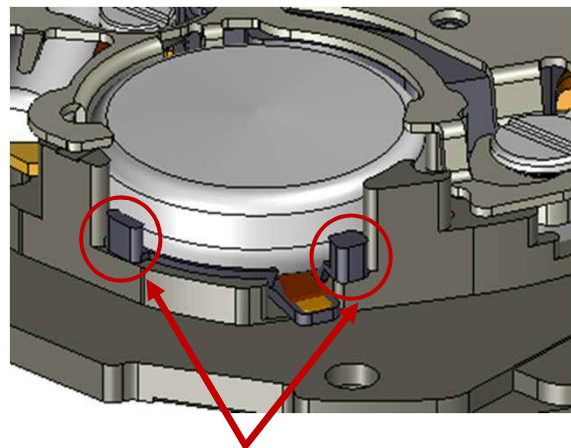
When the secondary battery is assembled, please match the phase in accordance with illustration and push the battery vertical direction. (Refer to the Fig.[1], [2] in below.)

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.)

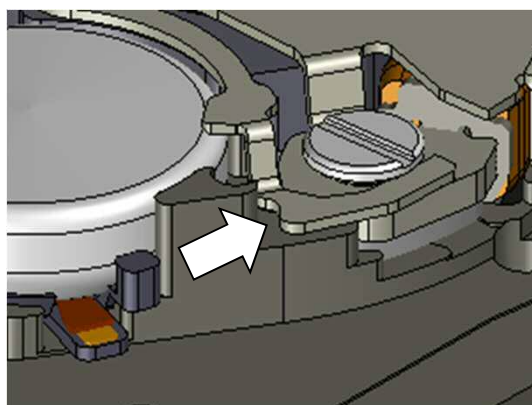


Fig.[3]

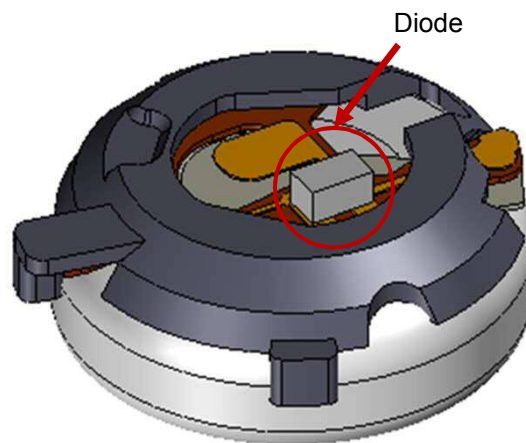
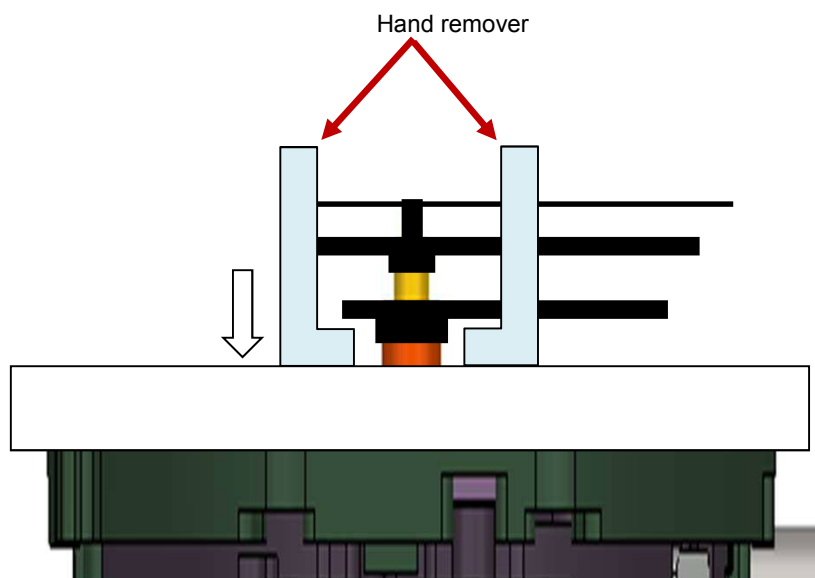


Fig.[4]

**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.

