

Watch Movement Specification and Drawing

**SOLAR SERIES**

**Cal. VS17A**

Movement Size

**5 1/2'''**

Casing Diameter

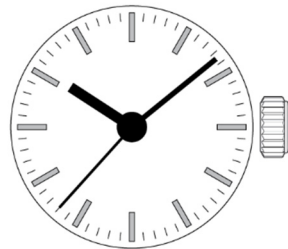
**11.8 × 15.15 mm**

Height

**2.79mm**

Running Time

**Approx. 6 months**



Date: 21/May/'21

# Cal. VS17A

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**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 30%**

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 6 months.

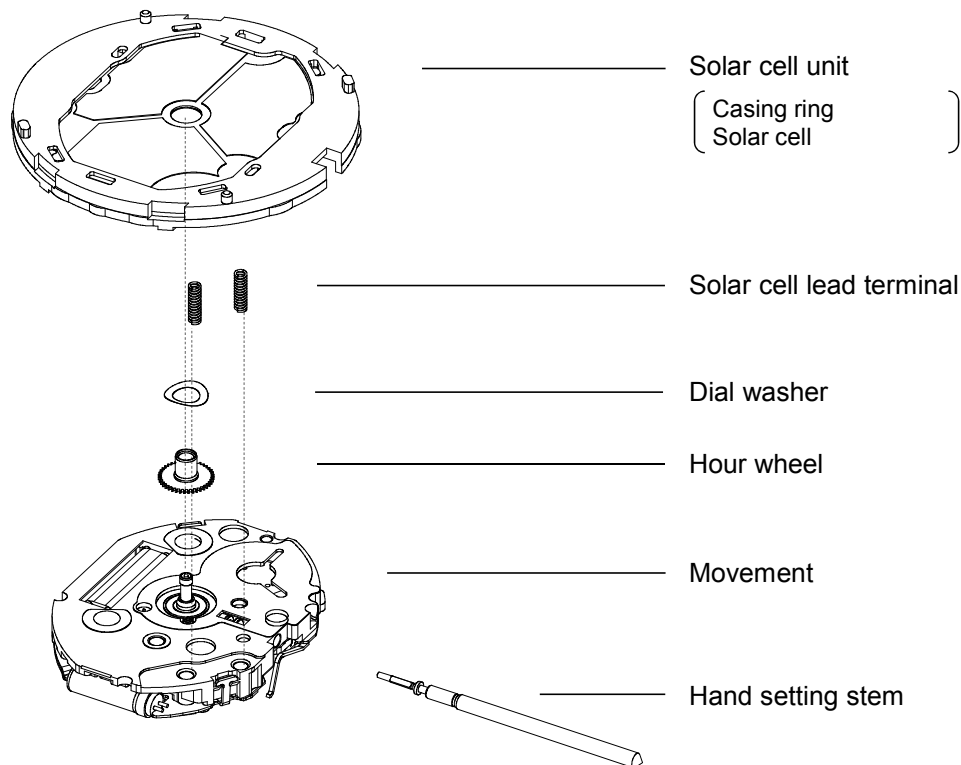
**5. Power depletion warning function**

The two-second intervals movement of the second hand is a signal of energy depletion.

The watch continuous running time after two-second intervals movement is approximately 1 day.

**6. Over charge prevent function is equipped**

If the secondary battery is charged more than predetermined voltage, over charge prevent function is operated to prevent the secondary battery deterioration and breakage.

**7. Structure of the separated parts**

**Solar Quartz 5 1/2" Movement / Three hands(H/M/S)****1. MOVEMENT DIMENSIONS**

Outside diameter	12.05mm(3-9H) × 15.55mm(12-6H)
Casing diameter	11.8mm(3-9H) × 15.15mm(12-6H)
Total height	2.39mm (Including solar cell : 2.79mm)

**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
Reset switch	
Power depletion warning function	
(Second hand moves at 2-second intervals when voltage is 1.10V)	
Running time	Approx. 6 months (After fully charged)
Setting mechanism	Crown at normal position : Free Crown pulled out 1st click : Time setting / Reset

**4. FEATURES**

Jewels	2 Jewels
Anti-magnetism	Over 1600A/m (Direct current magnetic field)
Driving current consumption	Approx. 0.40 μ A (1.35V)
Operation stopping voltage	1.0 V
Solar cell type	Amorphous silicon solar cell
Maximum unbalance of hands	Second hand : 0.03 μ N·m Minute hand : 0.15 μ N·m Hour hand : 0.13 μ N·m
Moment of inertia	Second hand : less than 0.075 μ g·m <sup>2</sup>

**5. SECONDARY BATTERY (Installed)**

Type	Lithium metal batteries
Size	φ5.8mm × t 1.65mm
Nominal voltage	1.5 V
Capacity	1.8 mAh

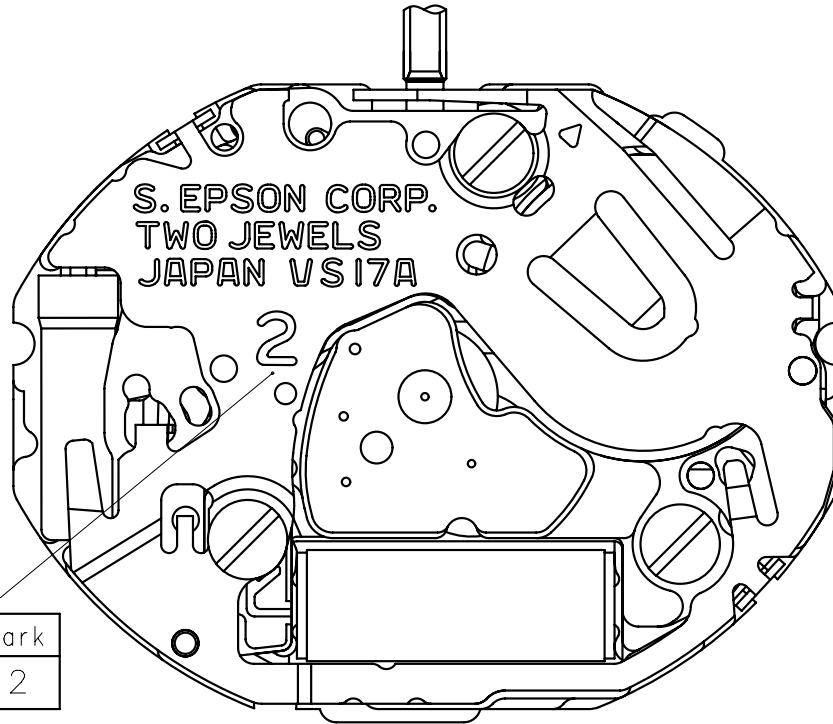
**6. SEPARATED PARTS (Parts code)**

Solar cell unit	4020583(ROUND)	4020536(ROUND-2)
	4020584(SQUARE-1)	4020532(SQUARE-2)
	4020585(TONNEAU)	
Hand setting stem	0351819	
Solar cell lead terminal (2 pcs)	4246644	
Hour wheel	0271945	
Dial washer	0491735	

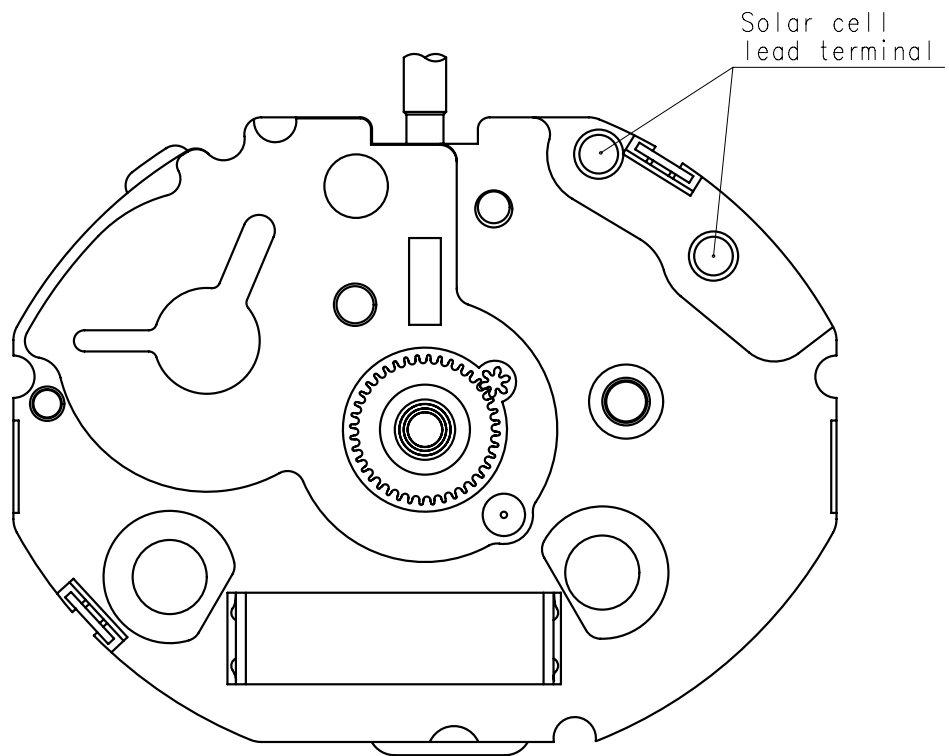
**7. TEST OF ACCURACY**

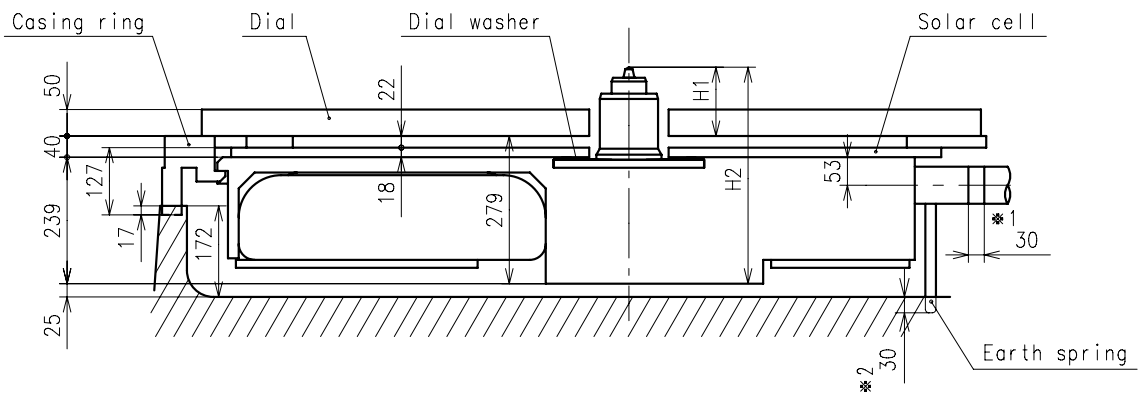
Equipment to be used	SEIKO quartz tester QT-99, Greiner quartz timer-C , Witschi Q-tester 4000
Duration of measurement	10 seconds
Microphone to be used	Electromagnetic detection type

All specifications are subject to change without notice.



	Mark
Type(M)	2

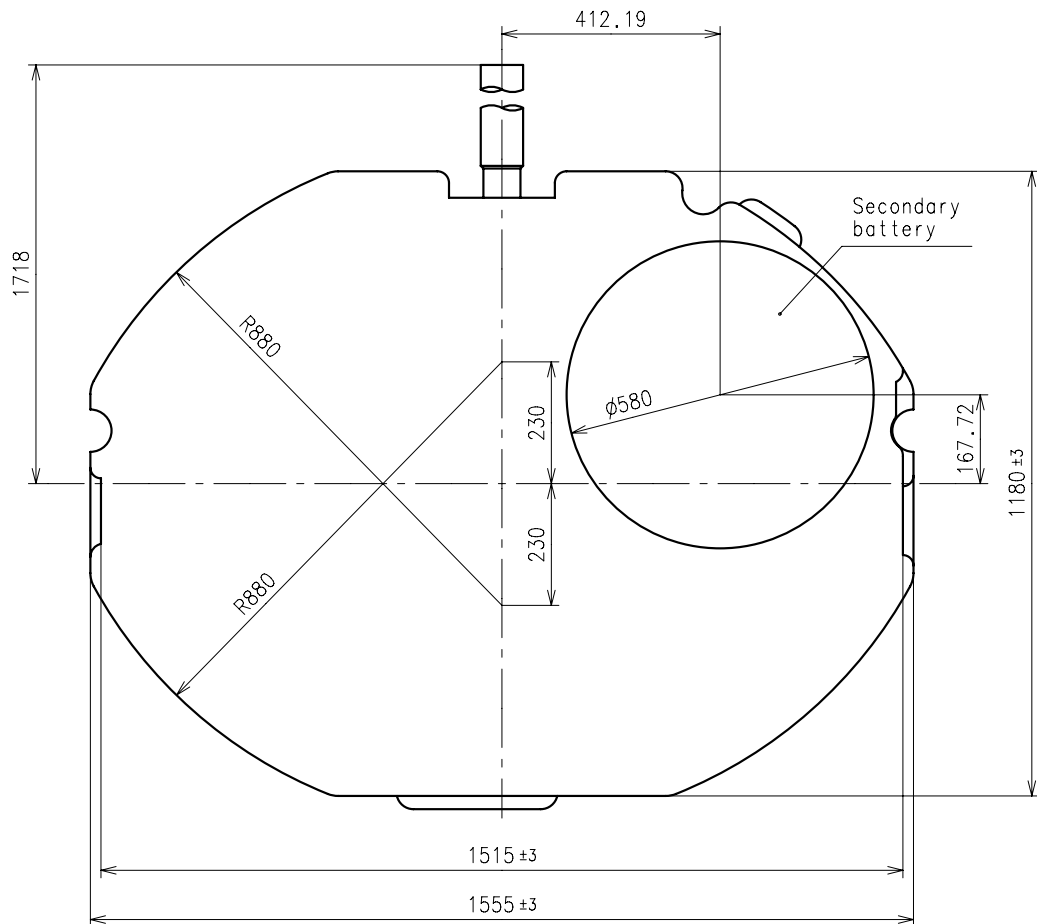




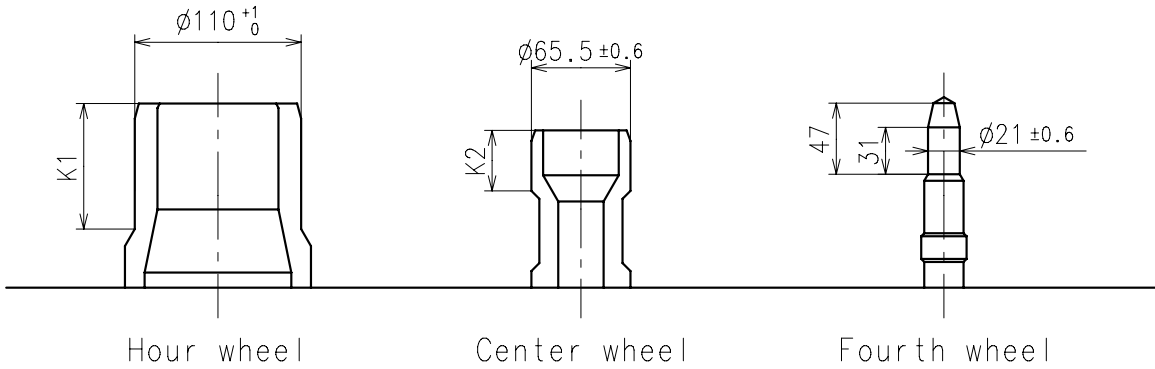
\*1 pullout stroke

\*2: The earth spring is absolutely placed in contact with the case back.

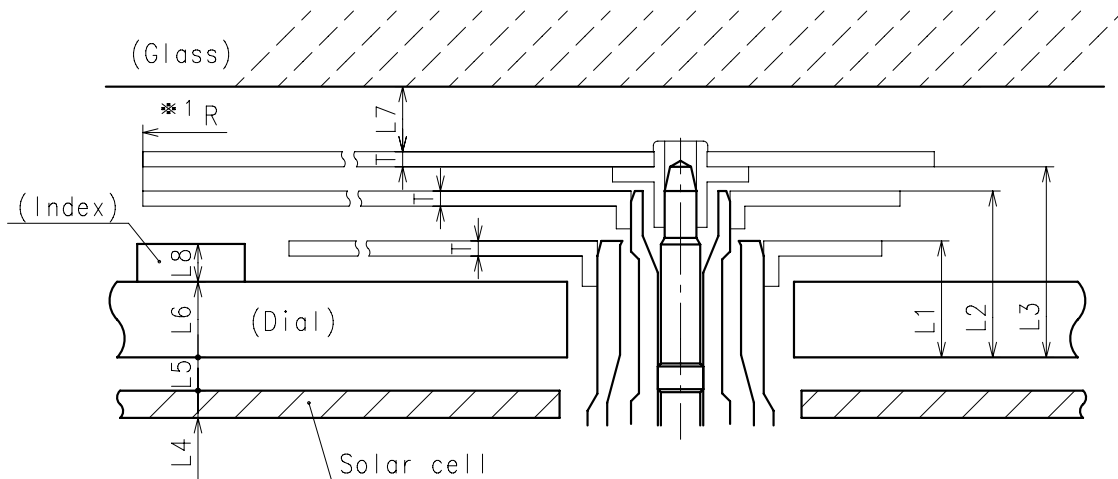
Center post		Type M (2) VS17A**
Maximum height from dial support	H1	157
Total height including movement	H2	436



- ※ Unbalance
  - Hour hand  $\leq 0.13\mu\text{ N}\cdot\text{m}$  ( $13\mu\text{ g}\cdot\text{m}$ )
  - Minute hand  $\leq 0.15\mu\text{ N}\cdot\text{m}$  ( $15\mu\text{ g}\cdot\text{m}$ )
  - Second hand  $\leq 0.03\mu\text{ N}\cdot\text{m}$  ( $3\mu\text{ g}\cdot\text{m}$ )
- ※ Moment of inertia
  - Second hand  $\leq 0.075\mu\text{ g}\cdot\text{m}^2$

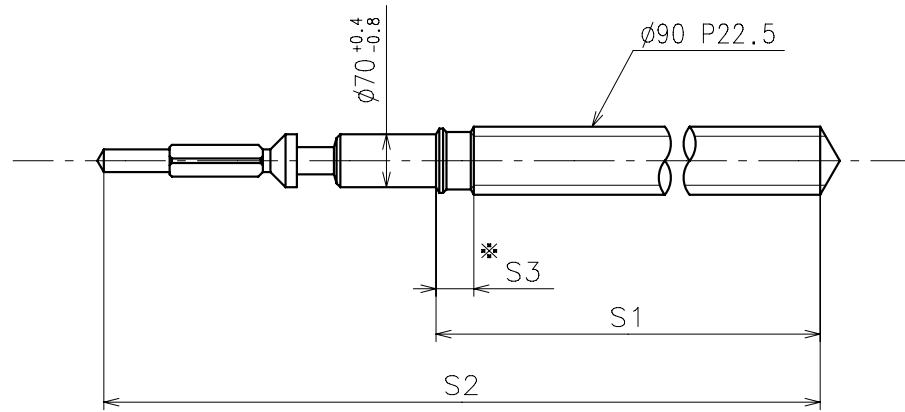


	Parts No.			Dimension	
	Hour wheel	Center wheel	Fourth wheel	K1	K2
Type M (2) VS17A**	0271945	0221968	0241967	94	40



	L1	L2	L3	L4	L5	L6	L7	L8	T	*1 R
Type M (2) VS17A**	90	137	157	18	22	50	MIN: 40	MAX: 34	10	MAX: 750

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



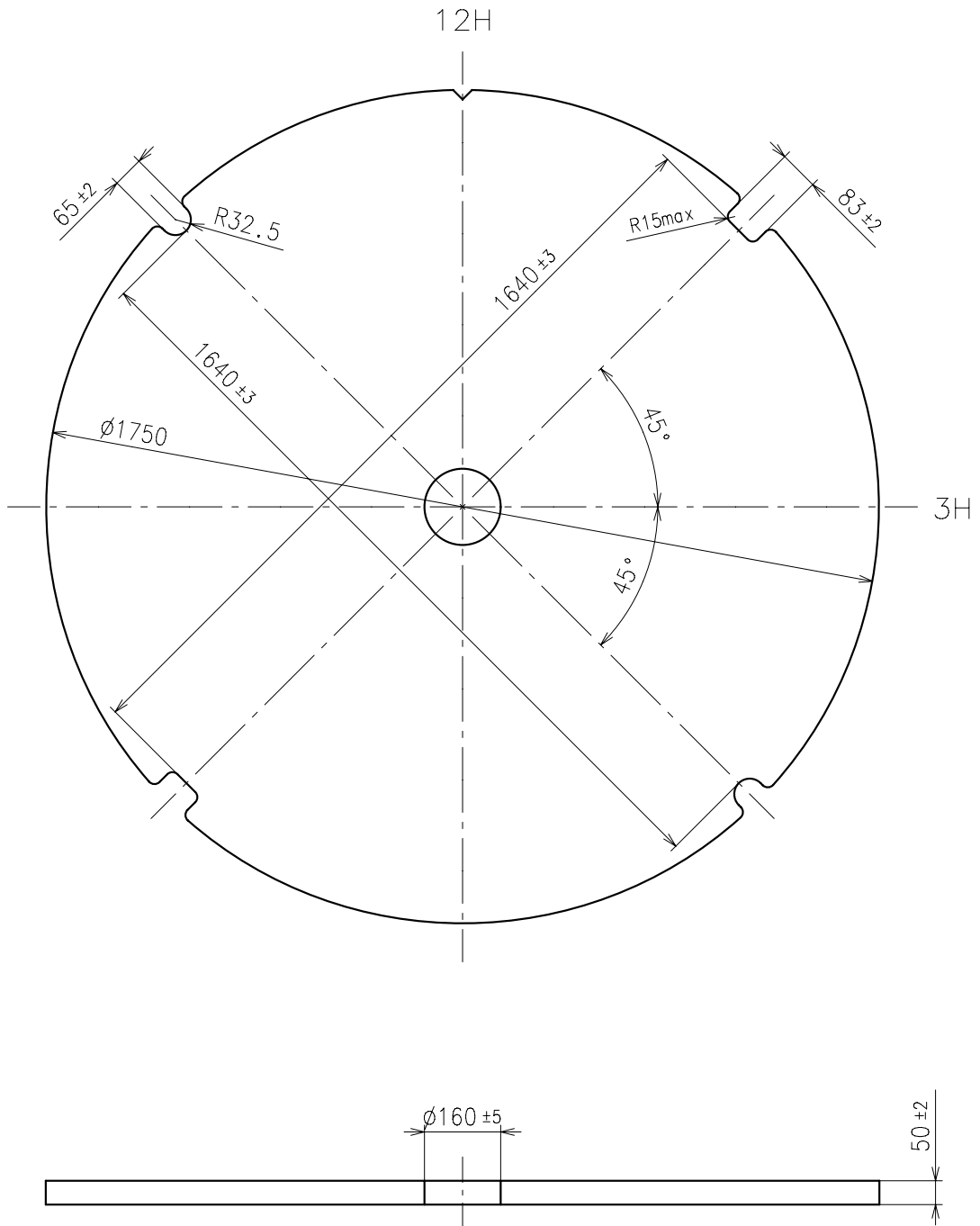
\* Not threaded

	Part No.	S1	S2	S3
Standard	0351819	1148	1577	50

Material : Steel

Hardness : Vickers 600±50





[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.

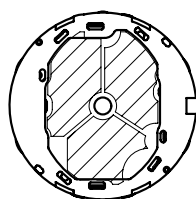
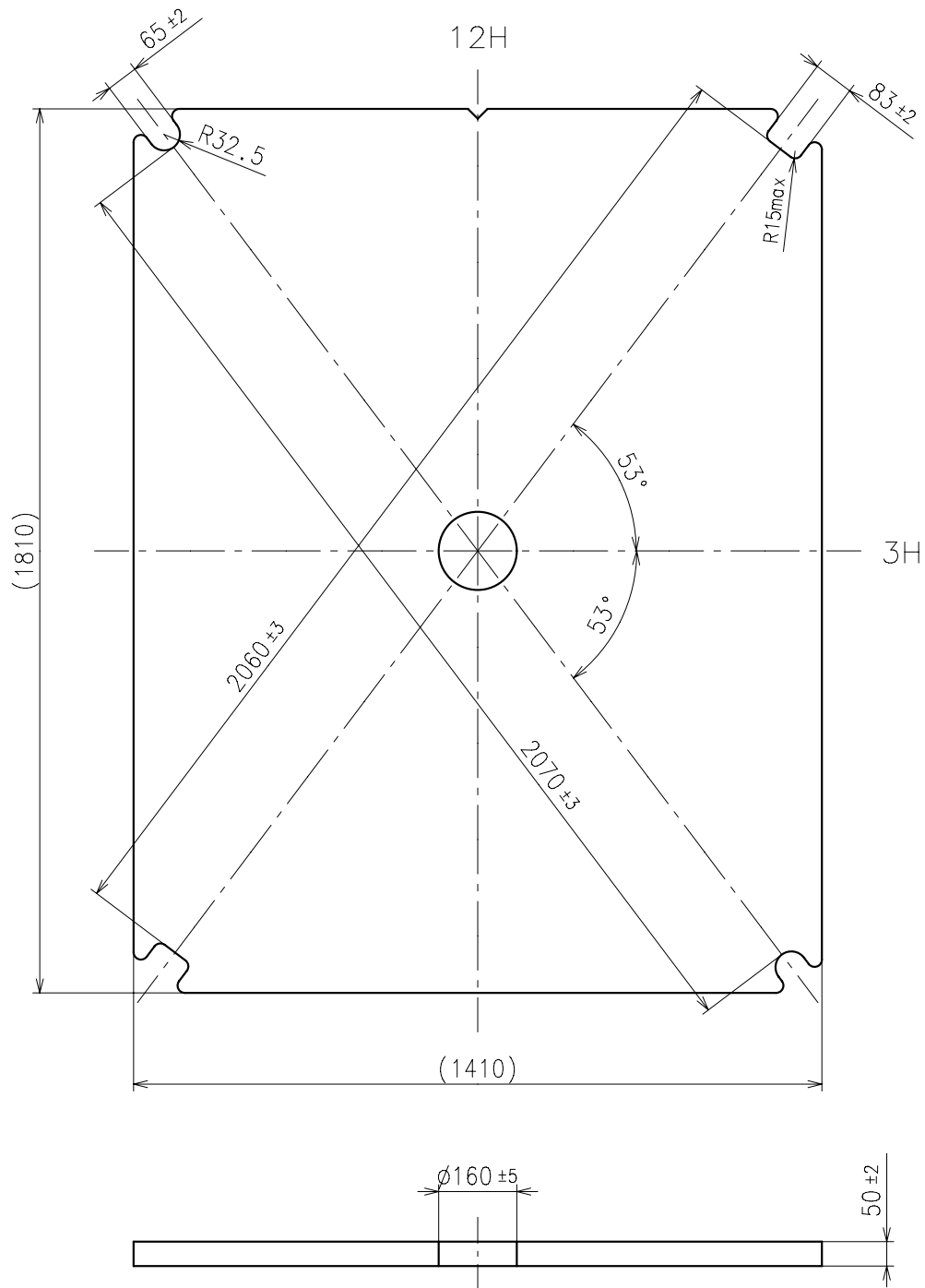


Fig.[1]  elements of solar cell



[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-02] page instruction as to the shape of solar cell.

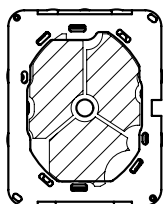
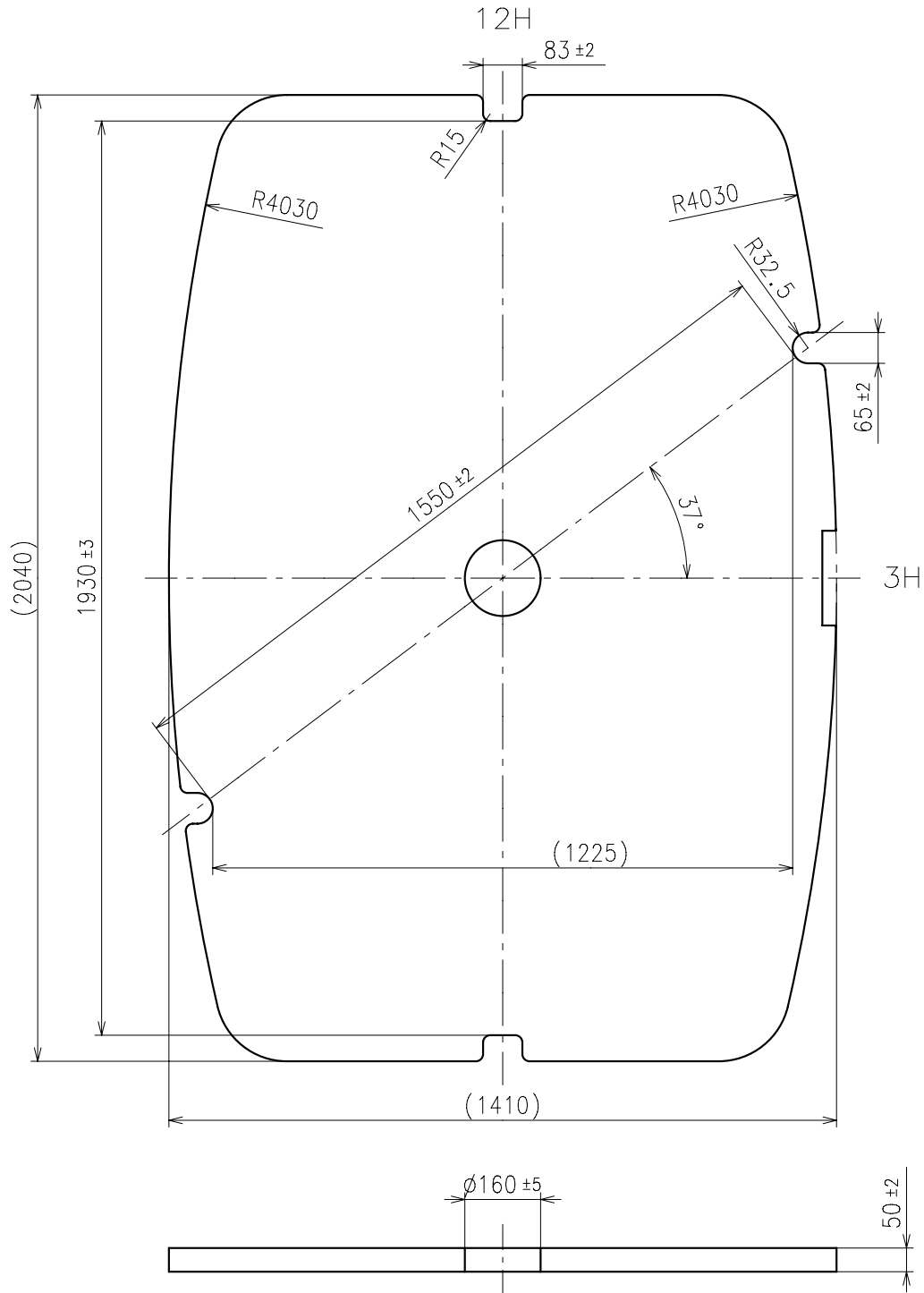


Fig.[1]  elements of solar cell



[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-03] page instruction as to the shape of solar cell.

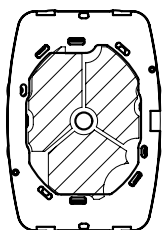
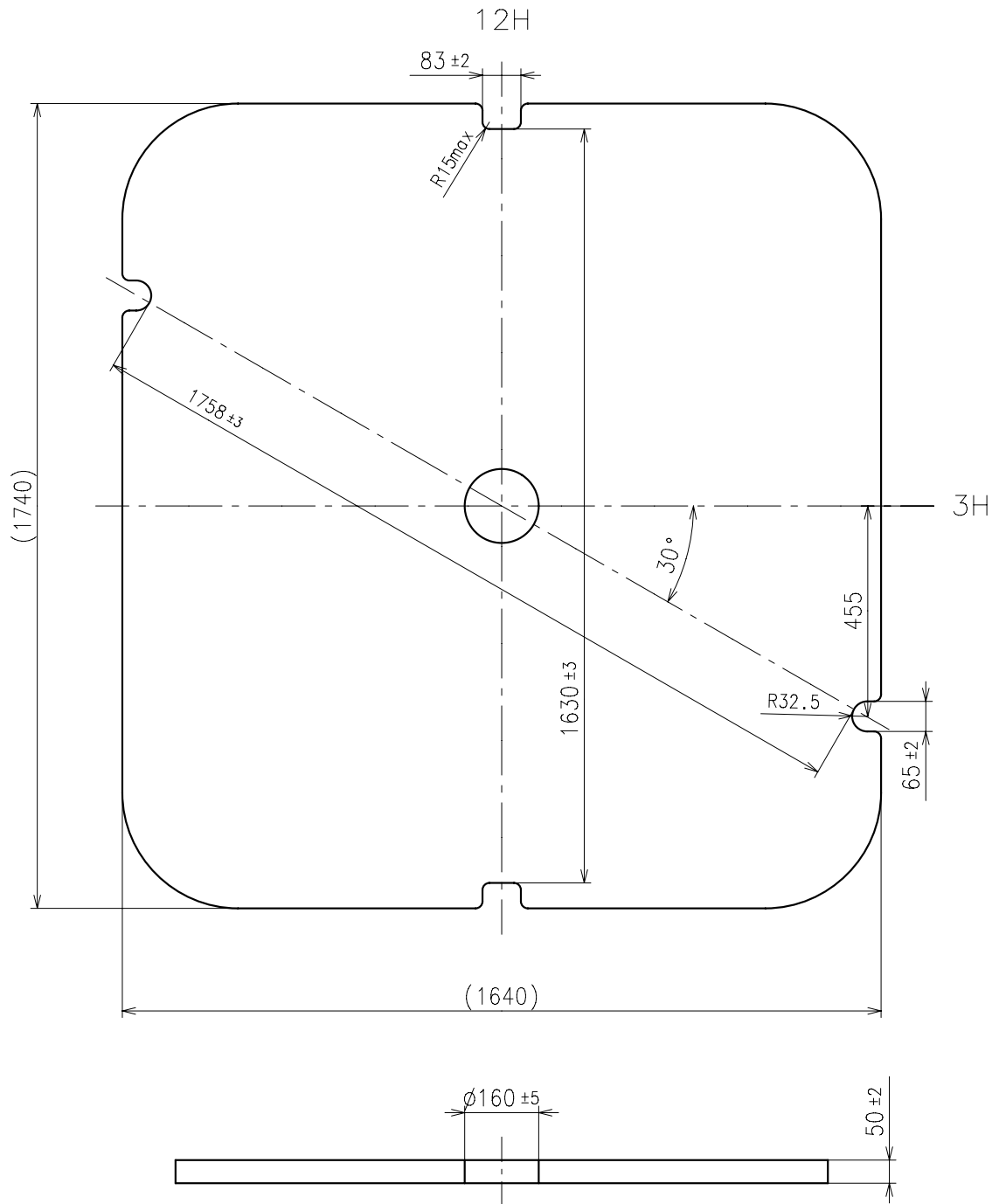


Fig.[1]  elements of solar cell



[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-04] page instruction as to the shape of solar cell.

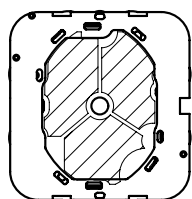
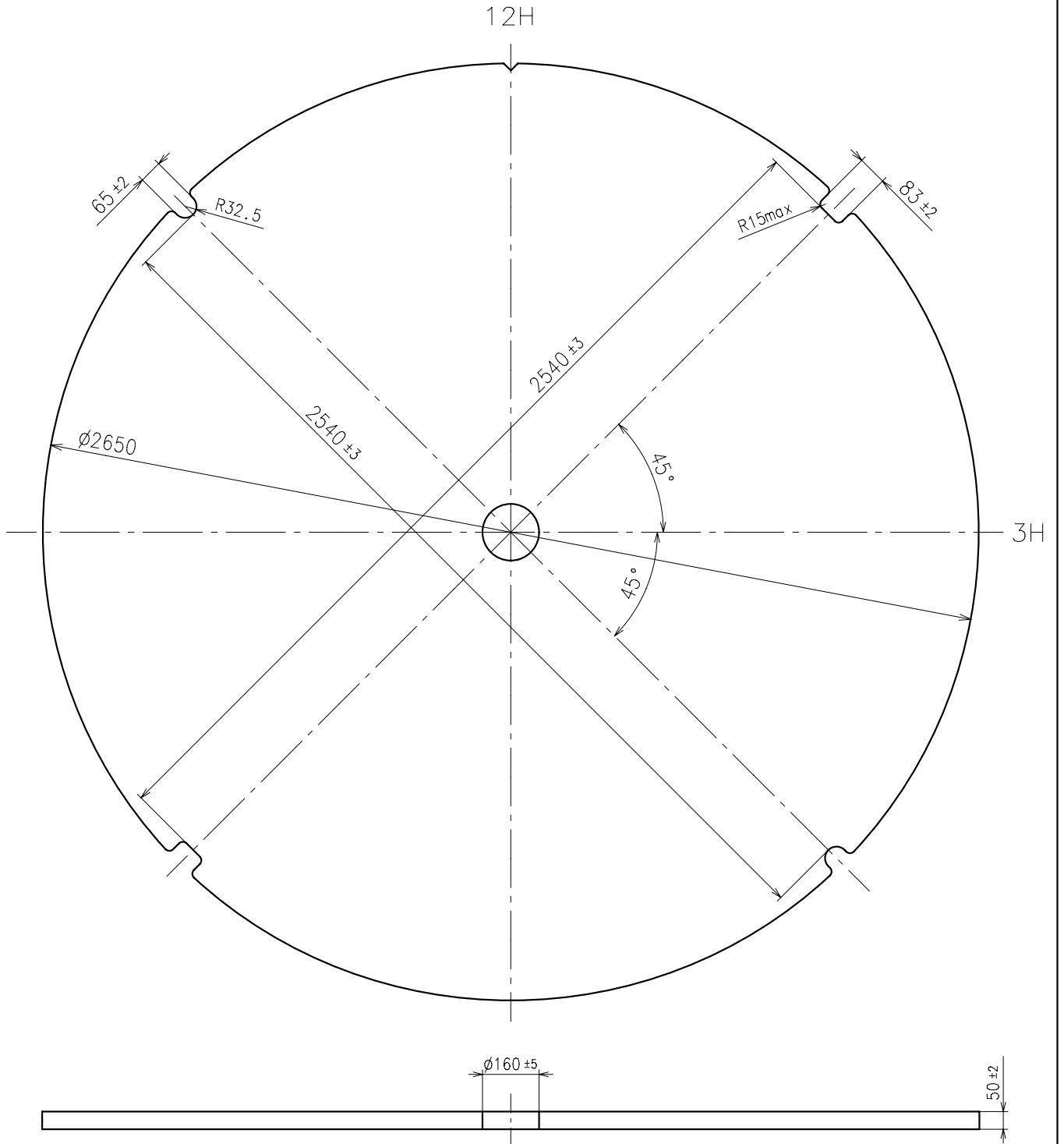


Fig.[1]  elements of solar cell



[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-05] page instruction as to the shape of solar cell.

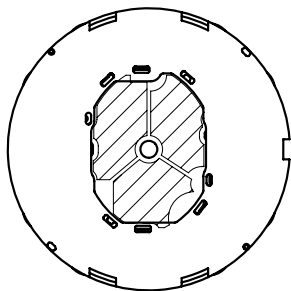
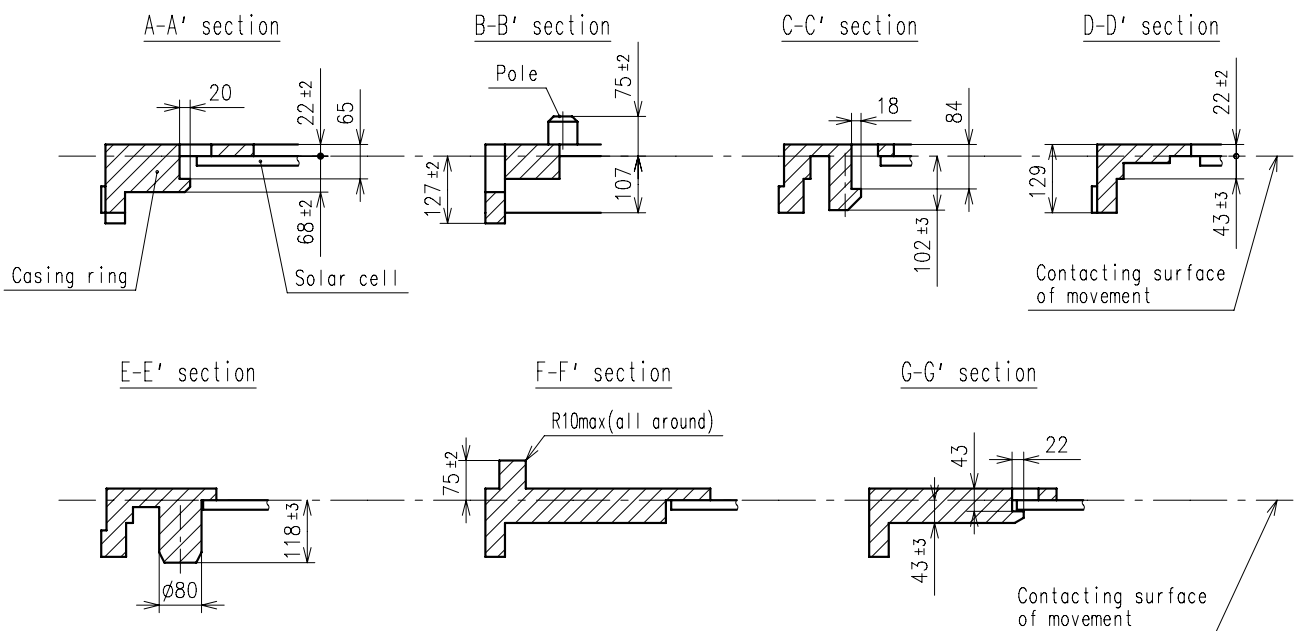
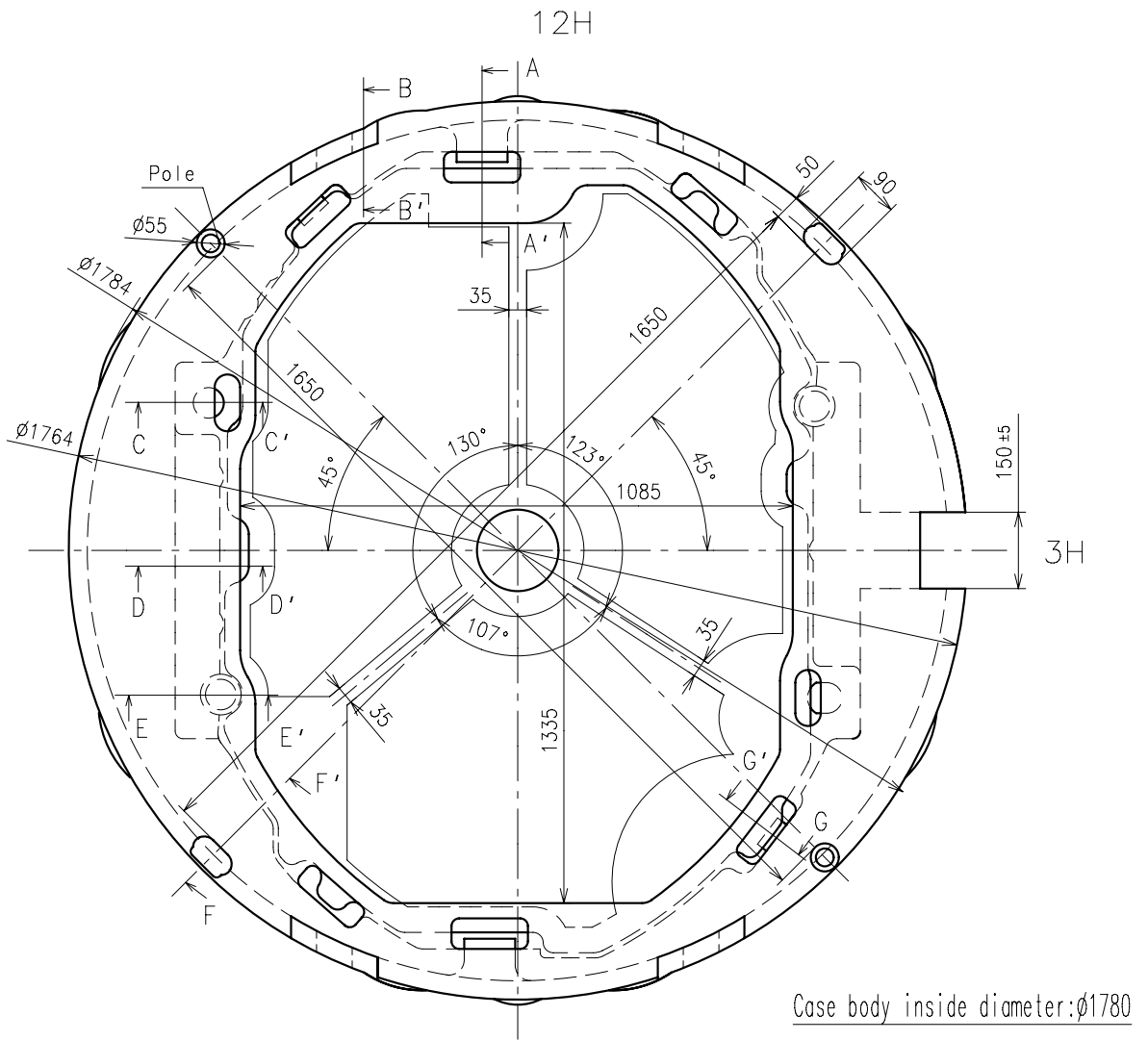
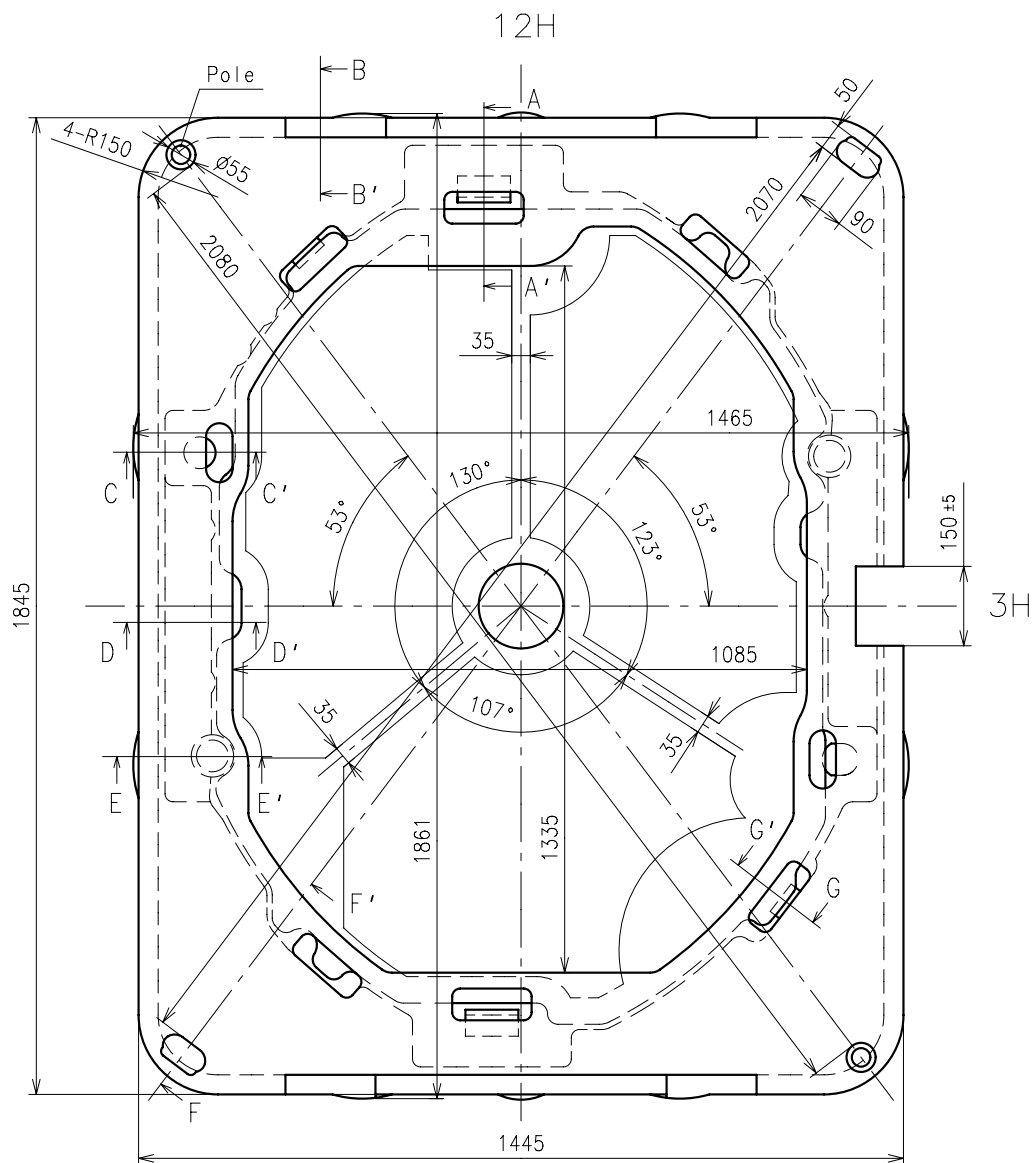
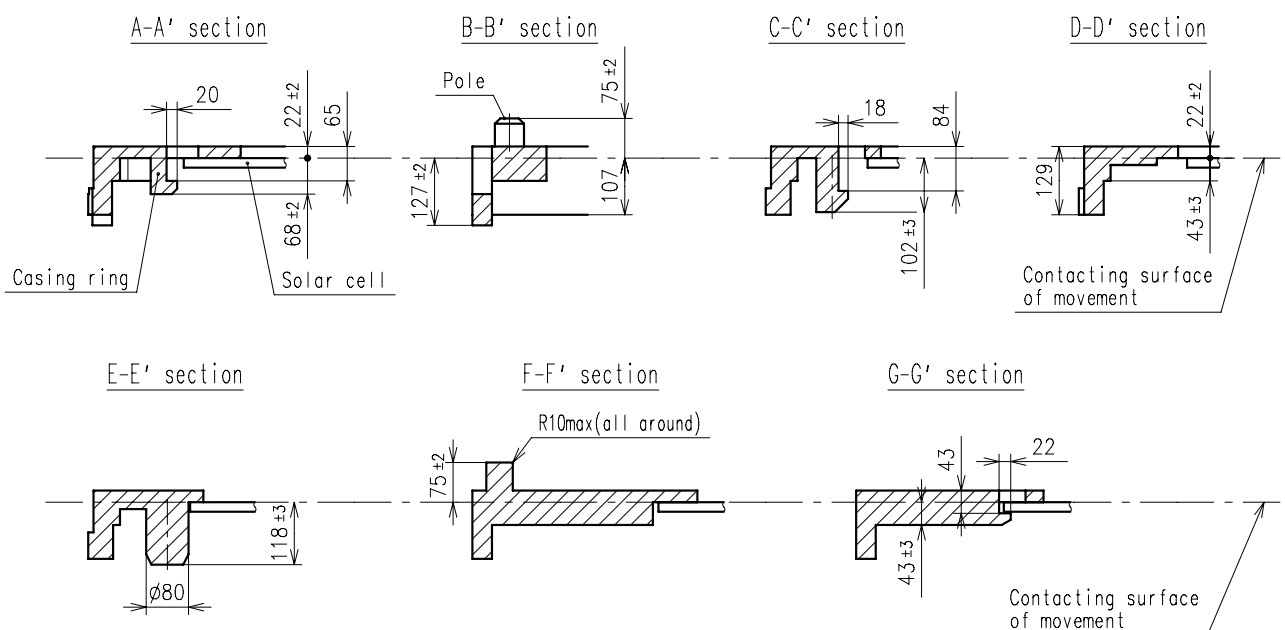


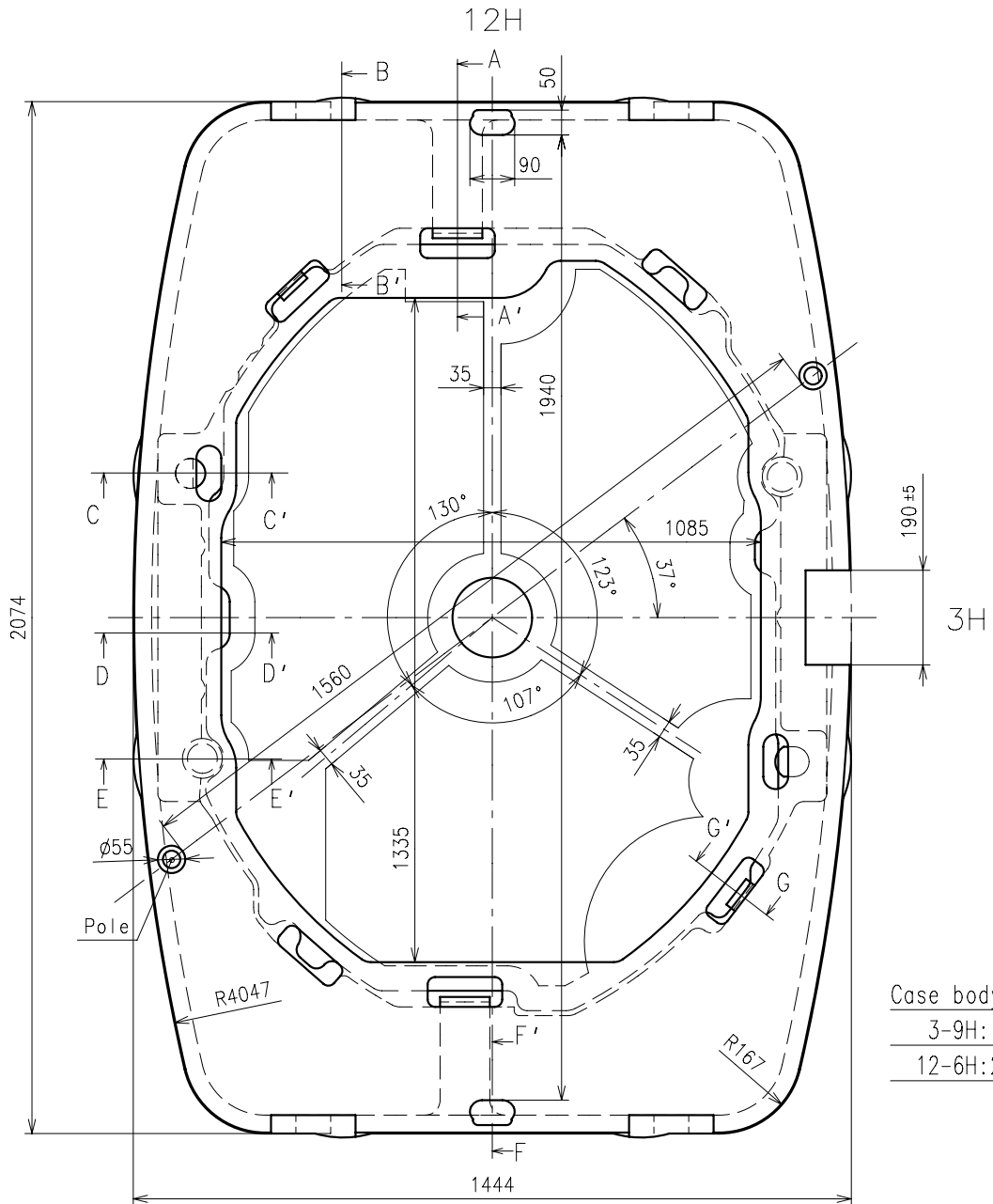
Fig.[1]  elements of solar cell





Case body inside dimension:1461×1861





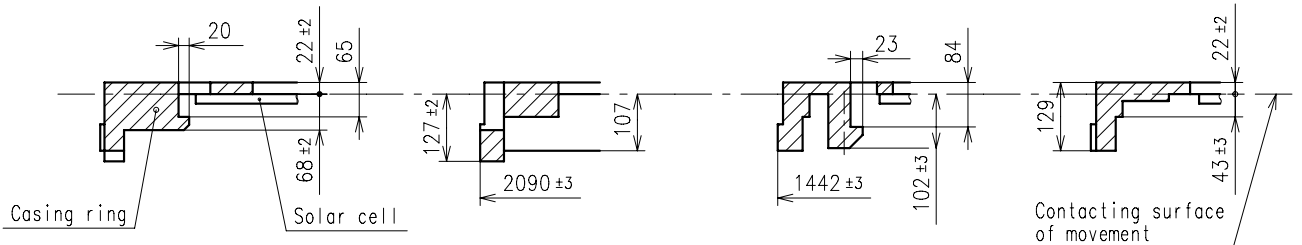
Case body inside
3-9H:1460
12-6H:2090

A-A' section

B-B' section

C-C' section

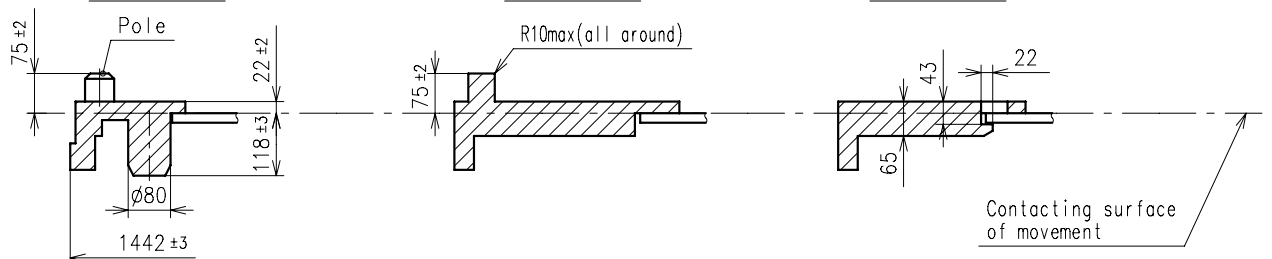
D-D' section



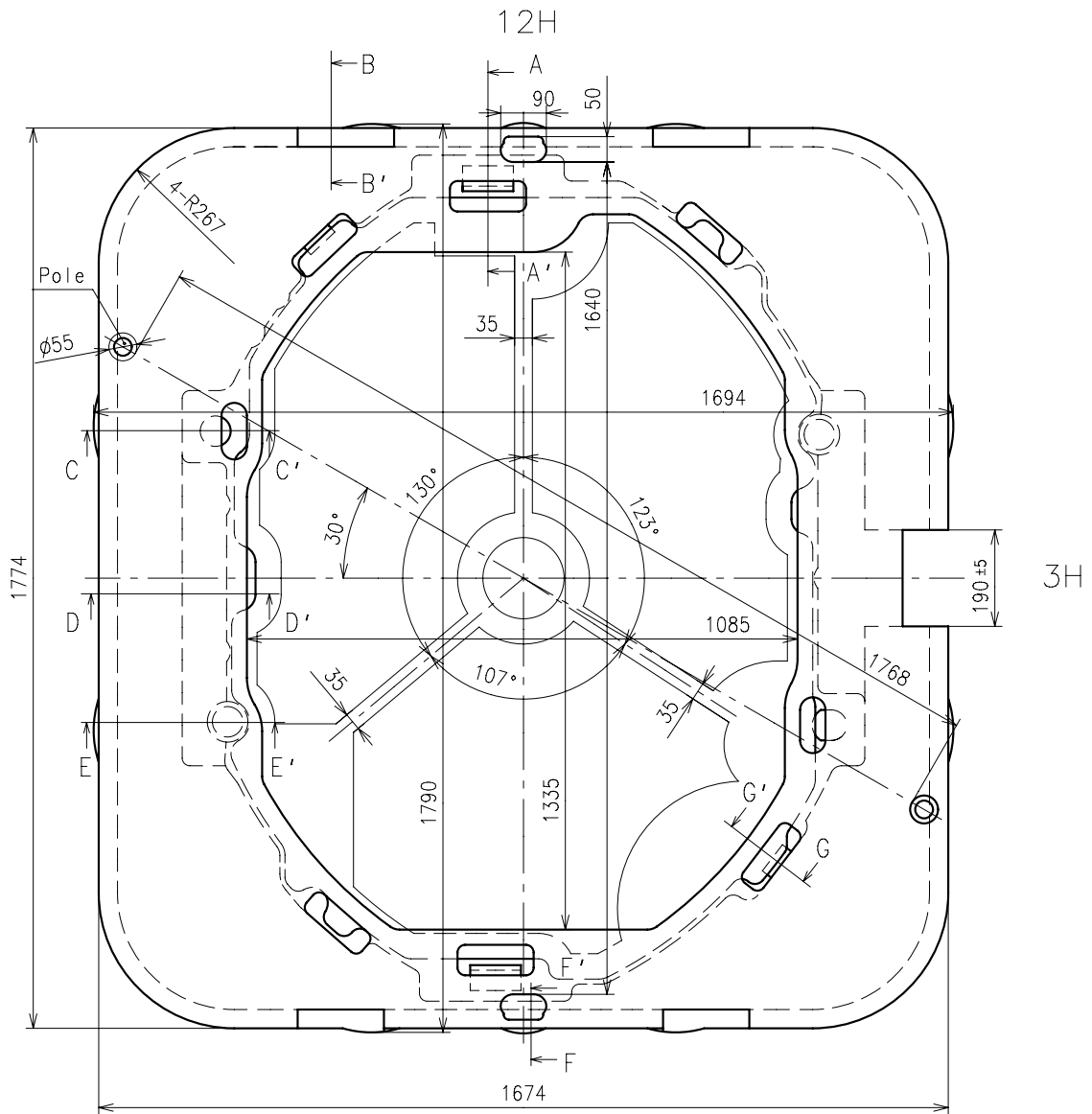
E-E' section

F-F' section

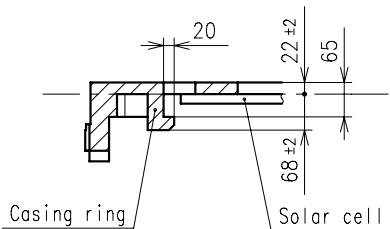
G-G' section



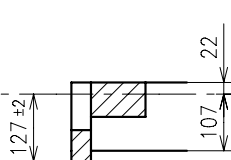




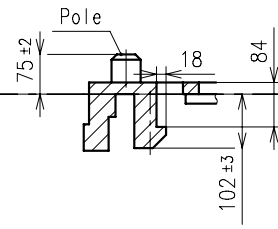
A-A' section



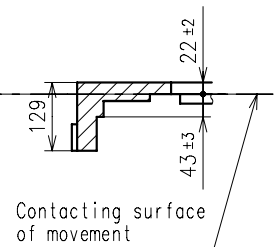
B-B' section



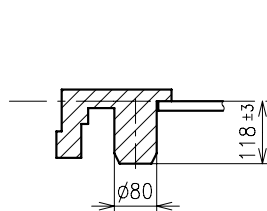
C-C' section



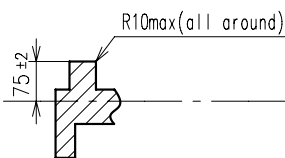
D-D' section



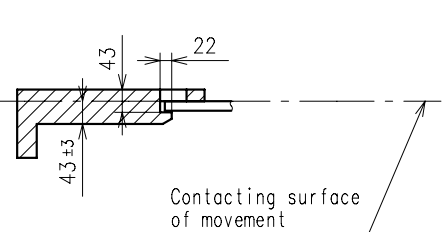
E-E' section

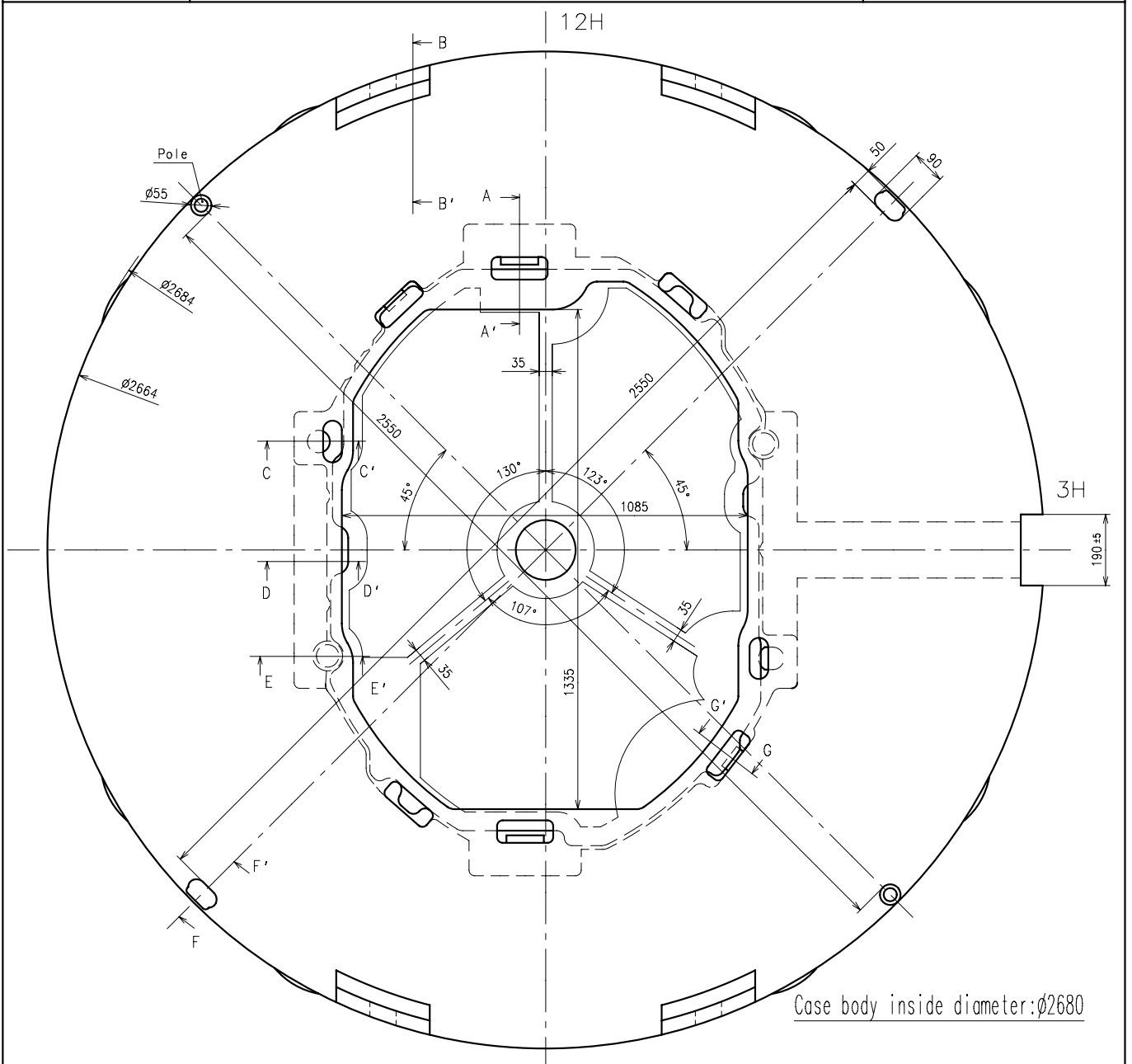


F-F' section

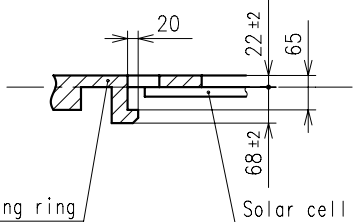


G-G' section

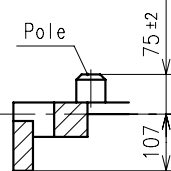




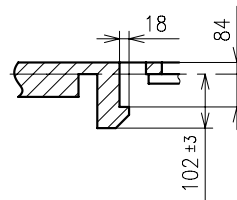
A-A' section



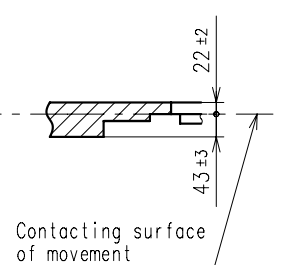
B-B' section



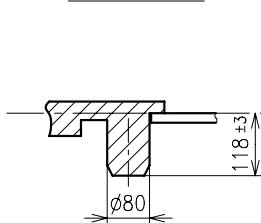
C-C' section



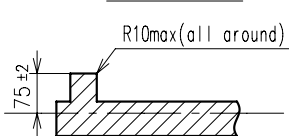
D-D' section



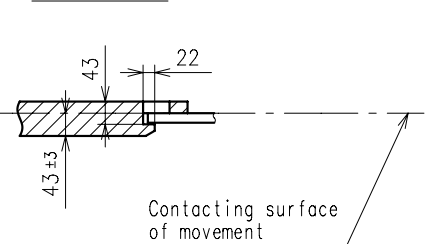
E-E' section



F-F' section



G-G' section



**1. How to remove the setting stem**

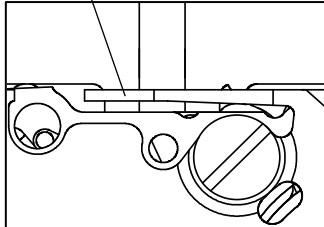
When removing the setting stem, put the setting stem at normal position and push the "setting lever" by tweezers.

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

When removing the setting stem, pay attention not to break or not to cut off the circuit block.

Please do not transform the earth spring.

Earth spring

**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%.

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	—	45	115
3,000		30W 20cm	85	10	28
10,000	Sun light	Cloudy	25	3	8
100,000		Fine weather	4	25 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. Attention for the secondary battery unit**

Please set the exclusive secondary battery unit.

(The secondary battery is Lithium metal batteries 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.

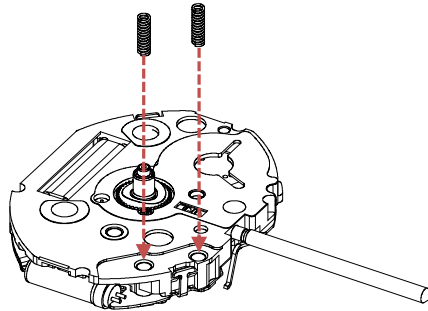
**6. Caution**

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.

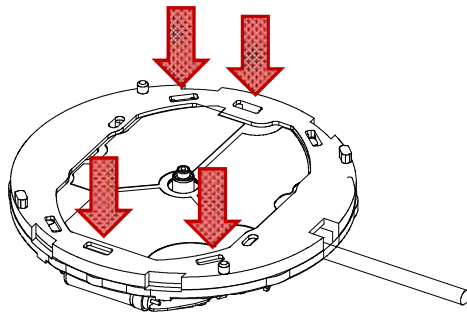
**7. How to set the solar cell lead terminal**

Please set 2pcs of solar cell lead terminals in accordance with this illustration.

As to the solar cell lead terminal shape, there is no distinction between upper and lower.

**8. How to set the solar cell unit**

Push above part of each hook on the solar cell unit into main plate certainly.

**9. How to set the dial**

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

