



Cal. AS32A

ϕ 23.3 mm
H 4.21 mm

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Date: 31/May/'13

S.EPSON Products

CAL. AS32A

Solar Quartz 10 1/2" Movement / Three hands(H/M/S) with Calendar

1. MOVEMENT DIMENSIONS

Outside diameter	ϕ 23.70mm × 22.00mm(3-9H) × 22.60mm(12-6H)
Casing diameter	ϕ 23.00mm
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)	
Working 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·m ²

5. SECONDARY BATTERY (Installed)

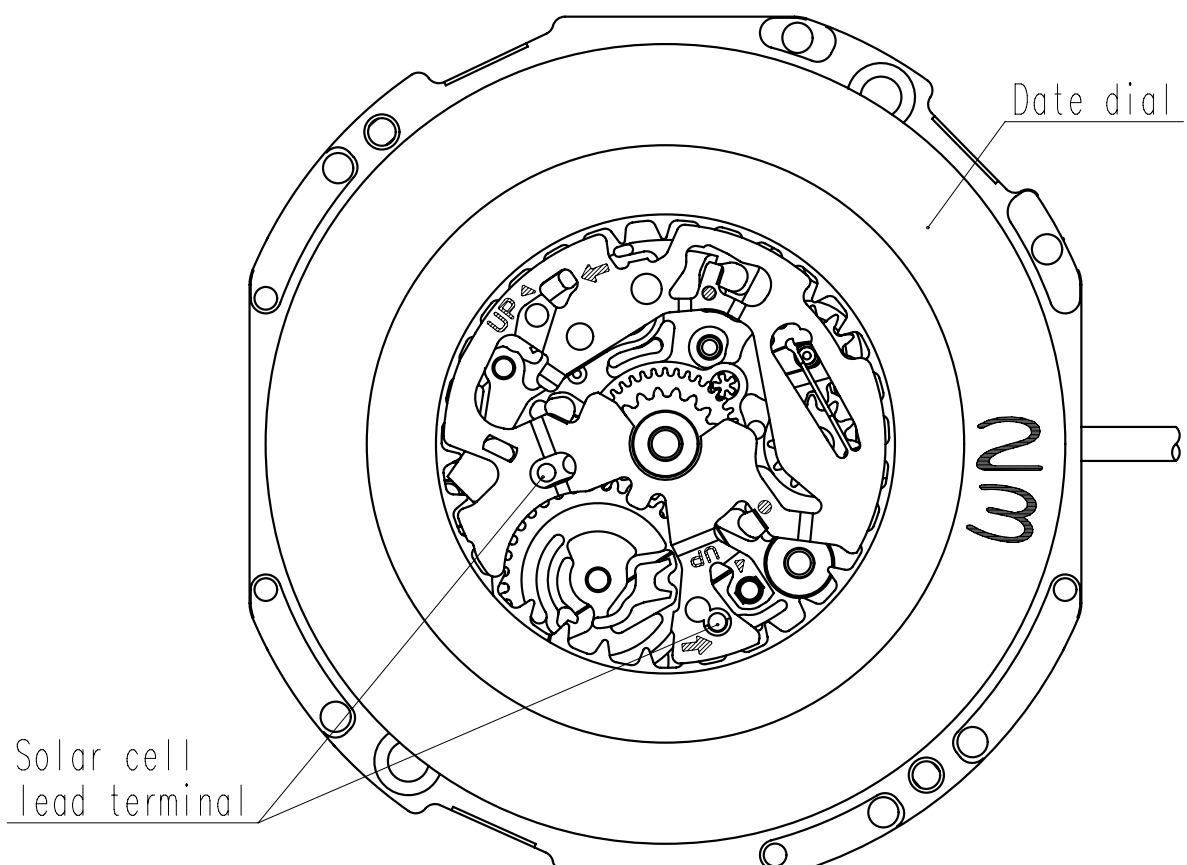
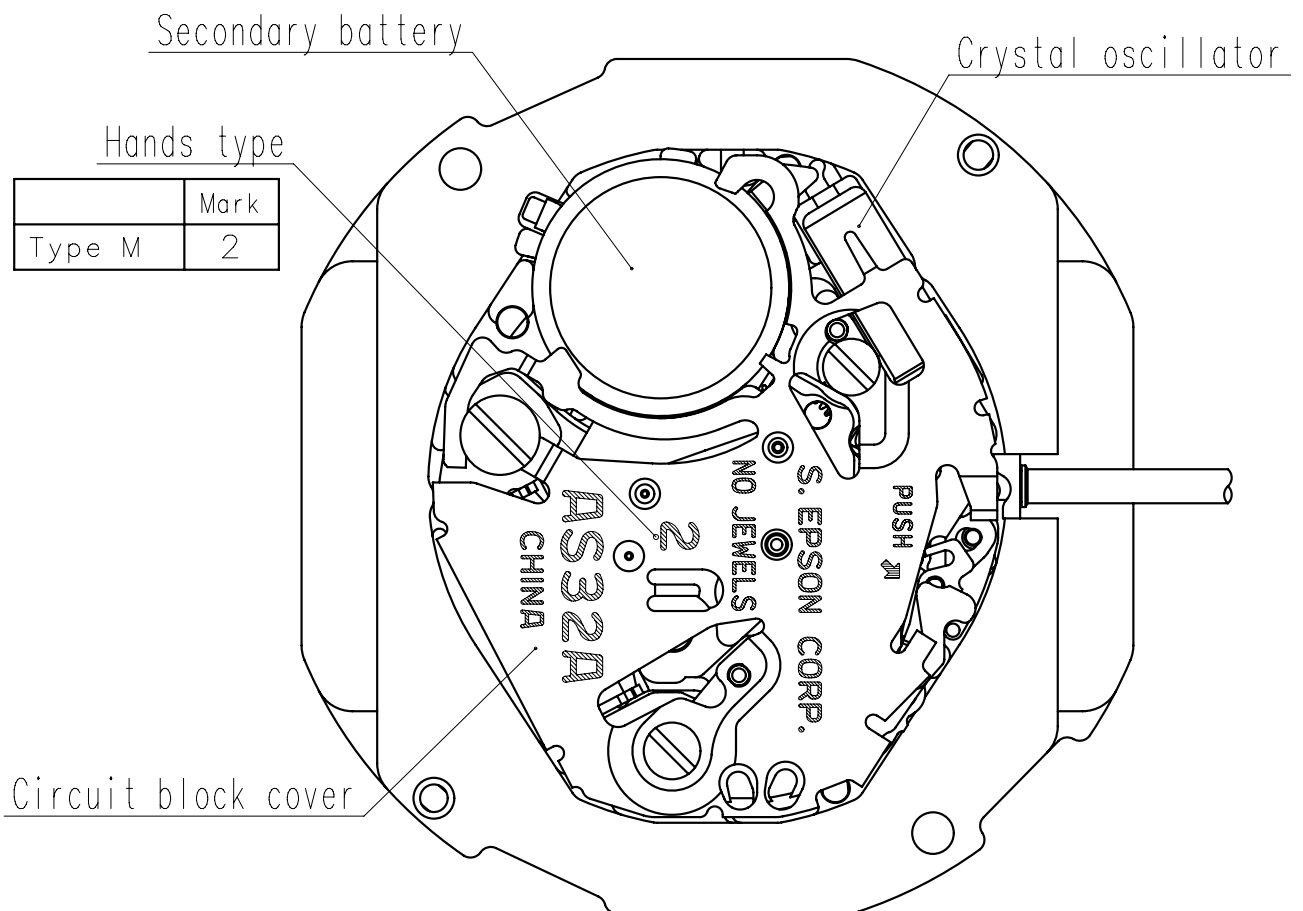
Type	Titanium-lithium-ion second battery
Size	ϕ 6.8mm × t 2.15mm
Nominal voltage	1.5 V
Capacity	2.5 mAh

6. SEPARATED PARTS (Parts code)

Hand setting stem	0351177
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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

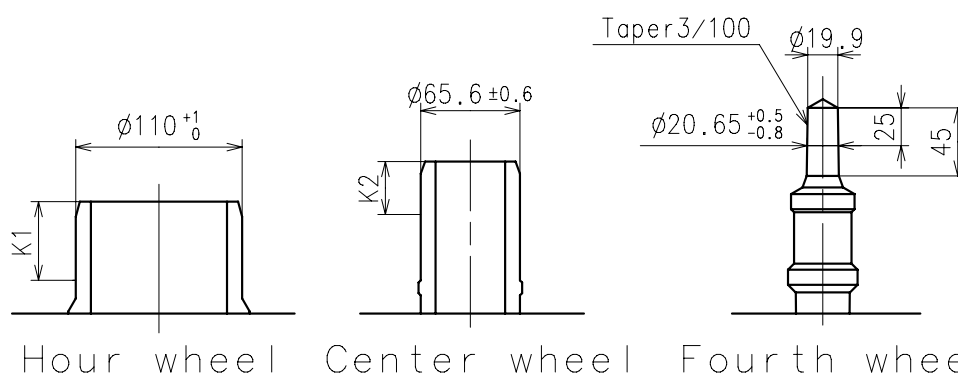




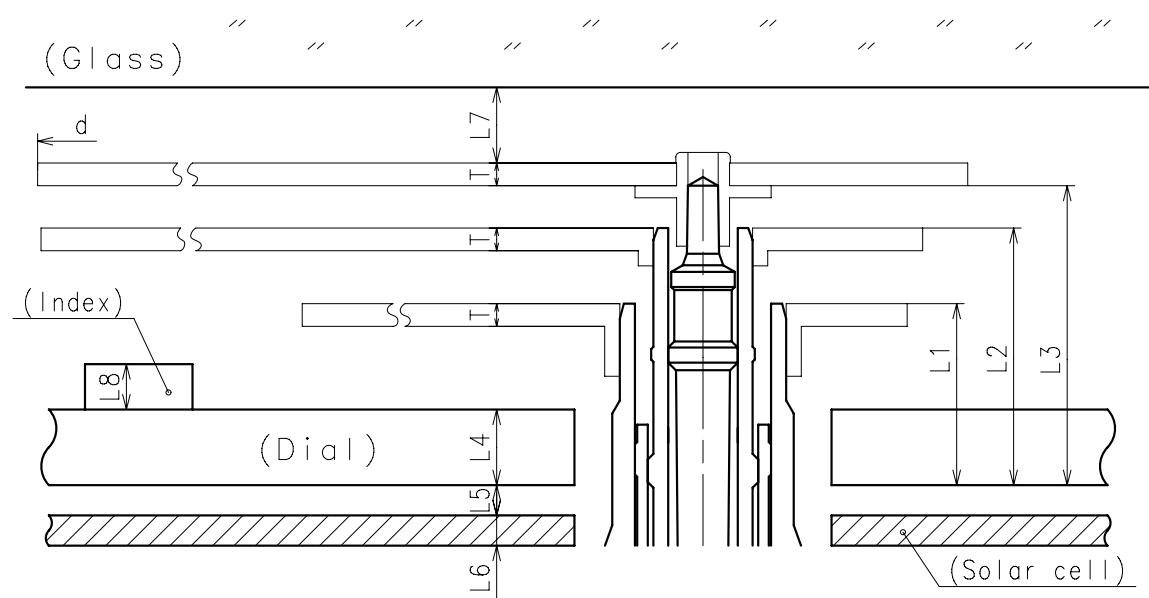
Technical drawing of the top view of a ship's hull, showing dimensions and labels. The drawing includes a central vertical axis and a horizontal axis. Key dimensions and labels are as follows:

- Overall Dimensions:**
 - Overall width: 2260
 - Overall height: 2180.5
 - Distance from top edge to centerline: 150
 - Distance from centerline to bottom edge: 710
 - Distance from centerline to right edge: 1800
 - Distance from centerline to left edge: 1780
- Internal Features and Dimensions:**
 - Secondary battery:** Located on the left side, with a width of 875.9 and a height of 690.
 - Central Circular Feature:** A circle with a diameter of $\phi 680$, centered 525 from the left edge and 750 from the bottom edge.
 - Right Circular Feature:** A circle with a diameter of $\phi 1810$, centered 825.1 from the right edge and 750 from the bottom edge.
 - Top Circular Feature:** A circle with a diameter of $\phi 130$, labeled 'A', centered 875.9 from the left edge and 690 from the top edge.
 - Bottom Circular Feature:** A circle with a diameter of $\phi 130$, labeled 'B', centered 825.1 from the right edge and 750 from the bottom edge.
 - Other Dimensions:**
 - Distance from centerline to the top circular feature: 525
 - Distance from centerline to the bottom circular feature: 825.1
 - Distance from centerline to the right circular feature: 825.1
 - Distance from centerline to the left circular feature: 875.9
 - Distance from centerline to the top circular feature: 690
 - Distance from centerline to the bottom circular feature: 750
 - Distance from centerline to the right circular feature: 750
 - Distance from centerline to the left circular feature: 525

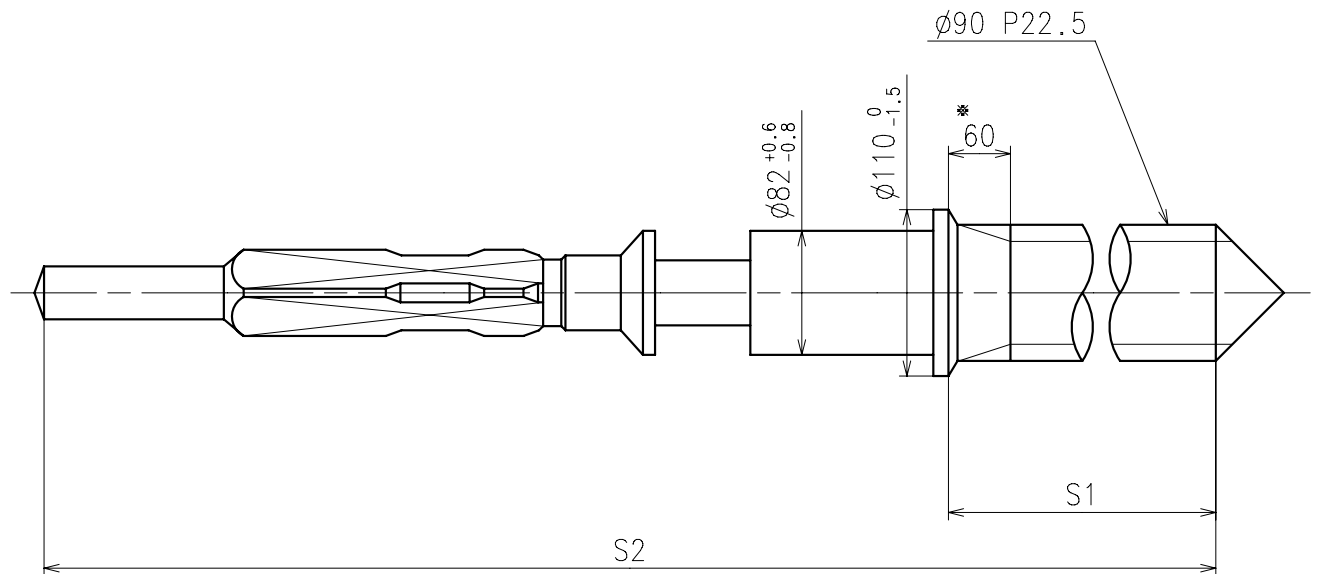
- ※ Hour hand unbalance $\leq 0.5\mu \text{ N} \cdot \text{m}$ $\left(50\mu \text{ g} \cdot \text{m} \right)$
- ※ Minute hand unbalance $\leq 0.6\mu \text{ N} \cdot \text{m}$ $\left(60\mu \text{ g} \cdot \text{m} \right)$
- ※ Second hand unbalance $\leq 0.06\mu \text{ N} \cdot \text{m}$ $\left(6\mu \text{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



	Parts No.			Dimension	
	Hour wheel	Center wheel	Fourth wheel	K1	K2
Type M (2) AS32A**	0271649	0221654	0241584	60	35



	L1	L2	L3	L4	L5	L6	L7	L8	T	d
Type M(2) AS32A**	120	170	198	50	20	20	MIN: 50	MAX: 30	15	MAX: Ø2500



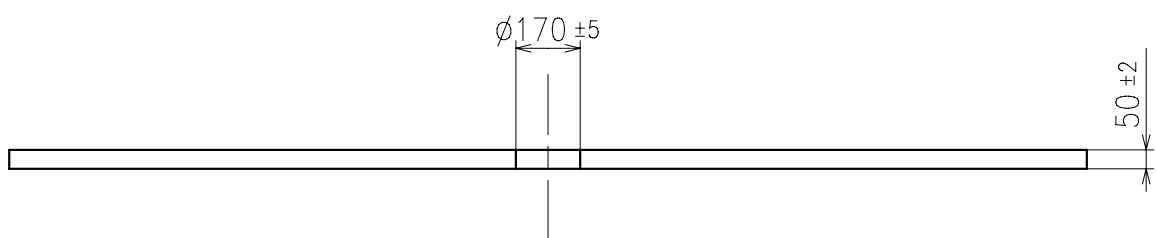
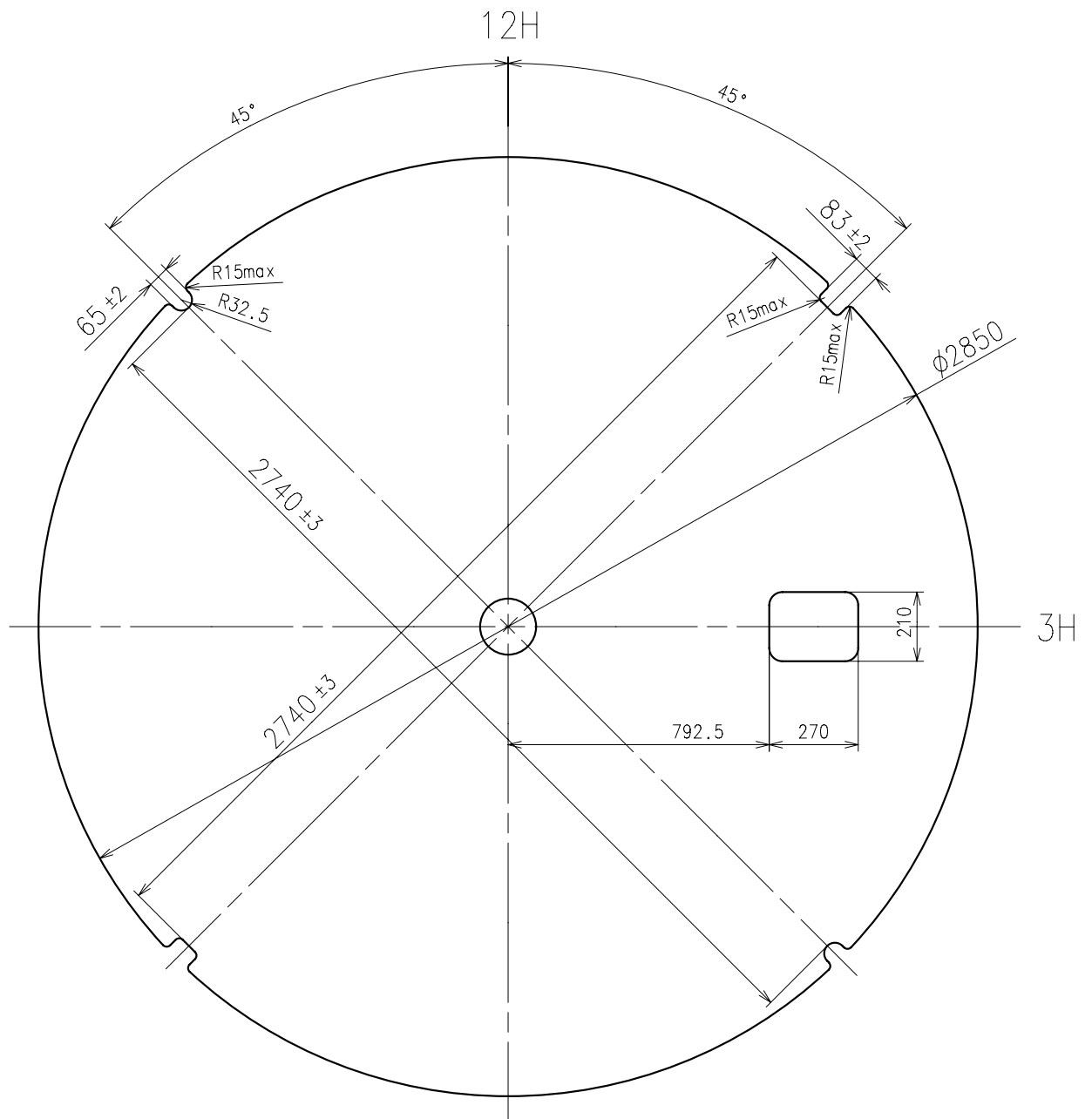
※ Not threaded

	Part No.	S1	S2
Standard	0351177	1366	1964

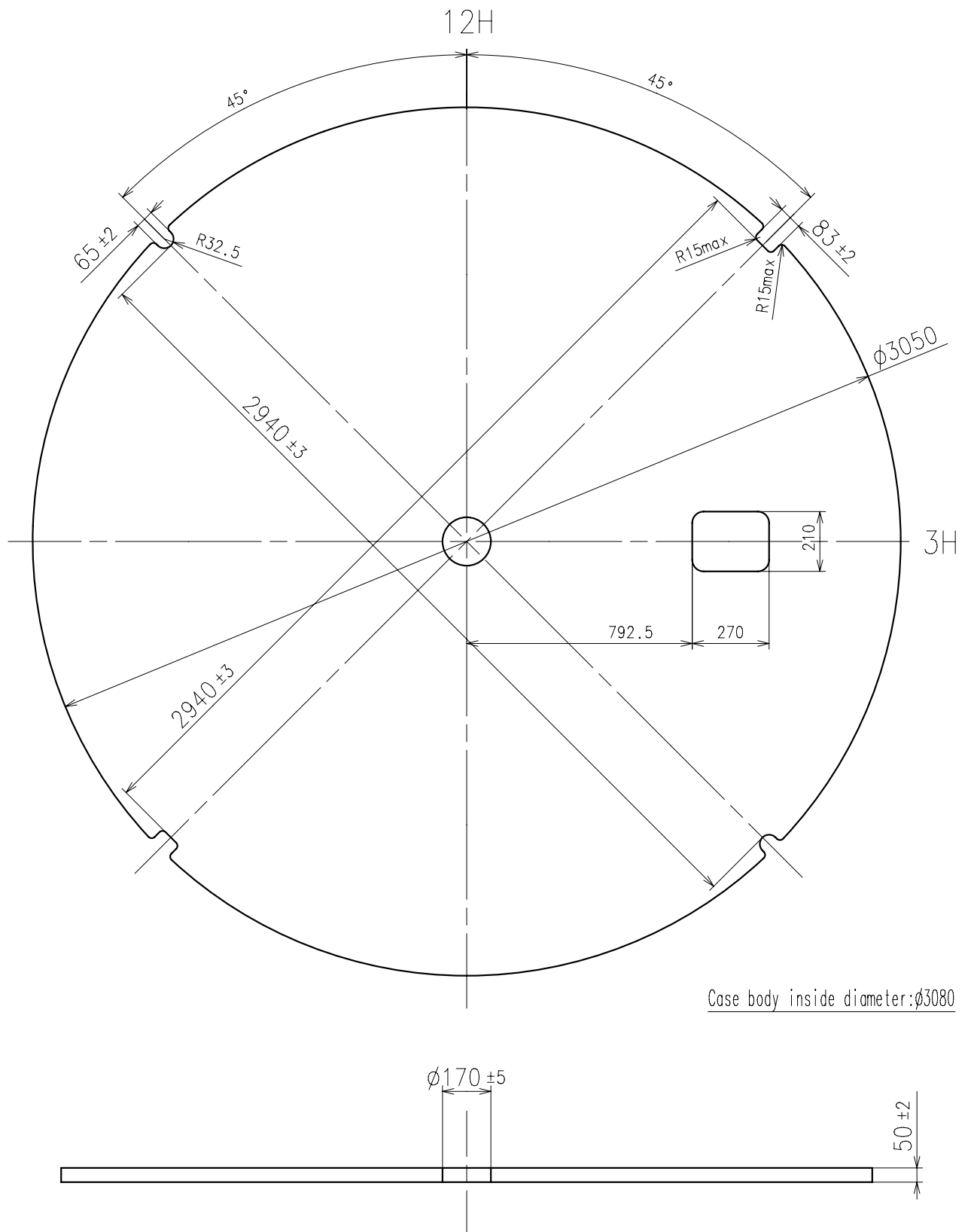
Material : Steel

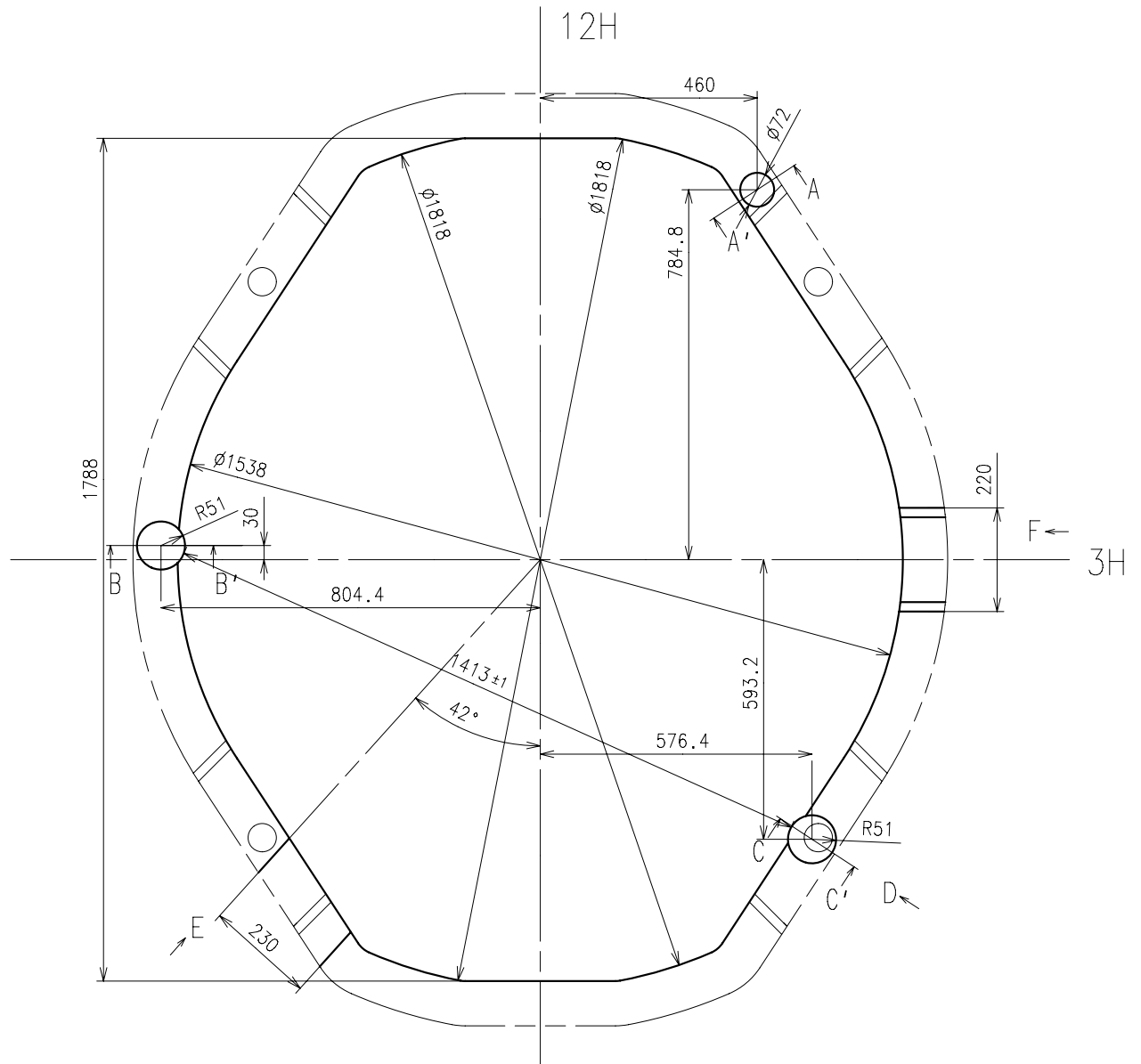
Hardness : Vickers 600 ± 50

transmit light more than 30%

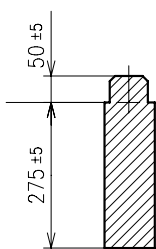


transmit light more than 30%

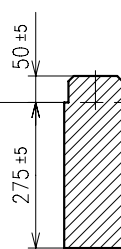




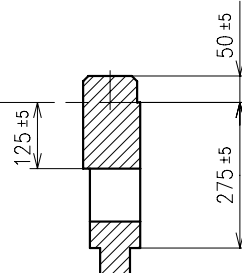
A-A' section



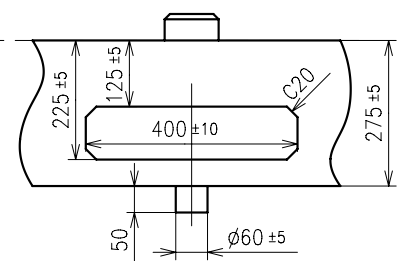
B-B' section



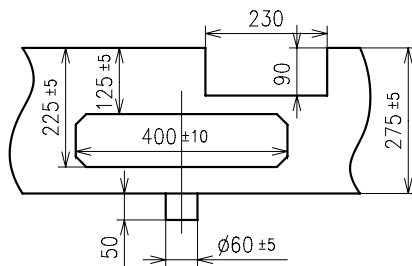
C-C' section



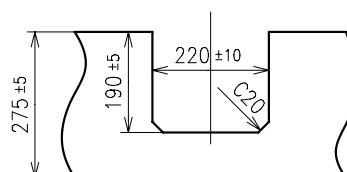
D view

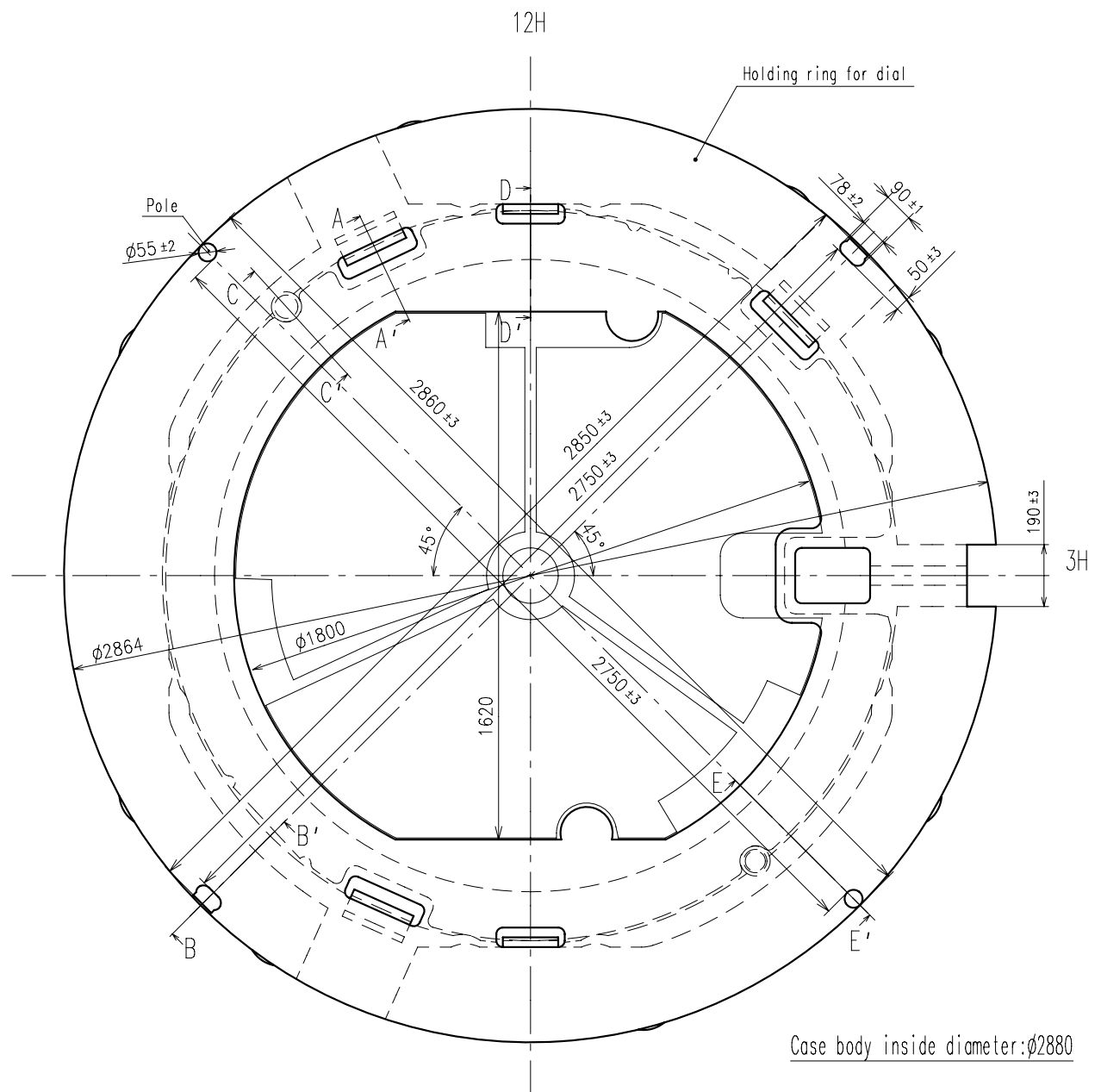


E view

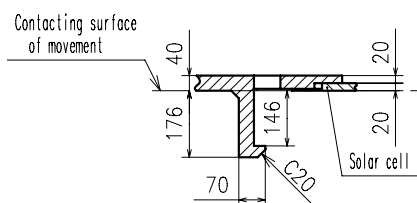


F view

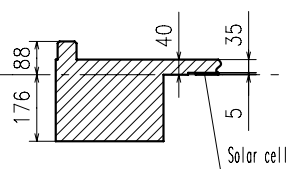




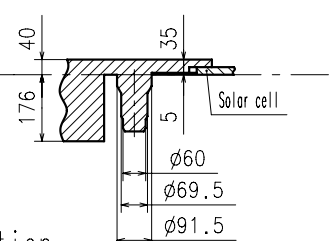
A-A' section



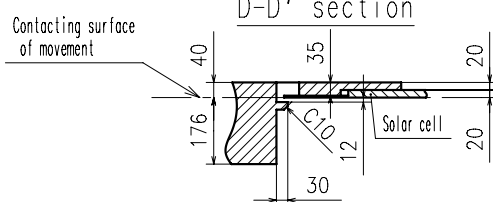
B-B' section



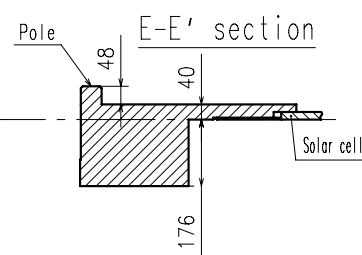
C-C' section

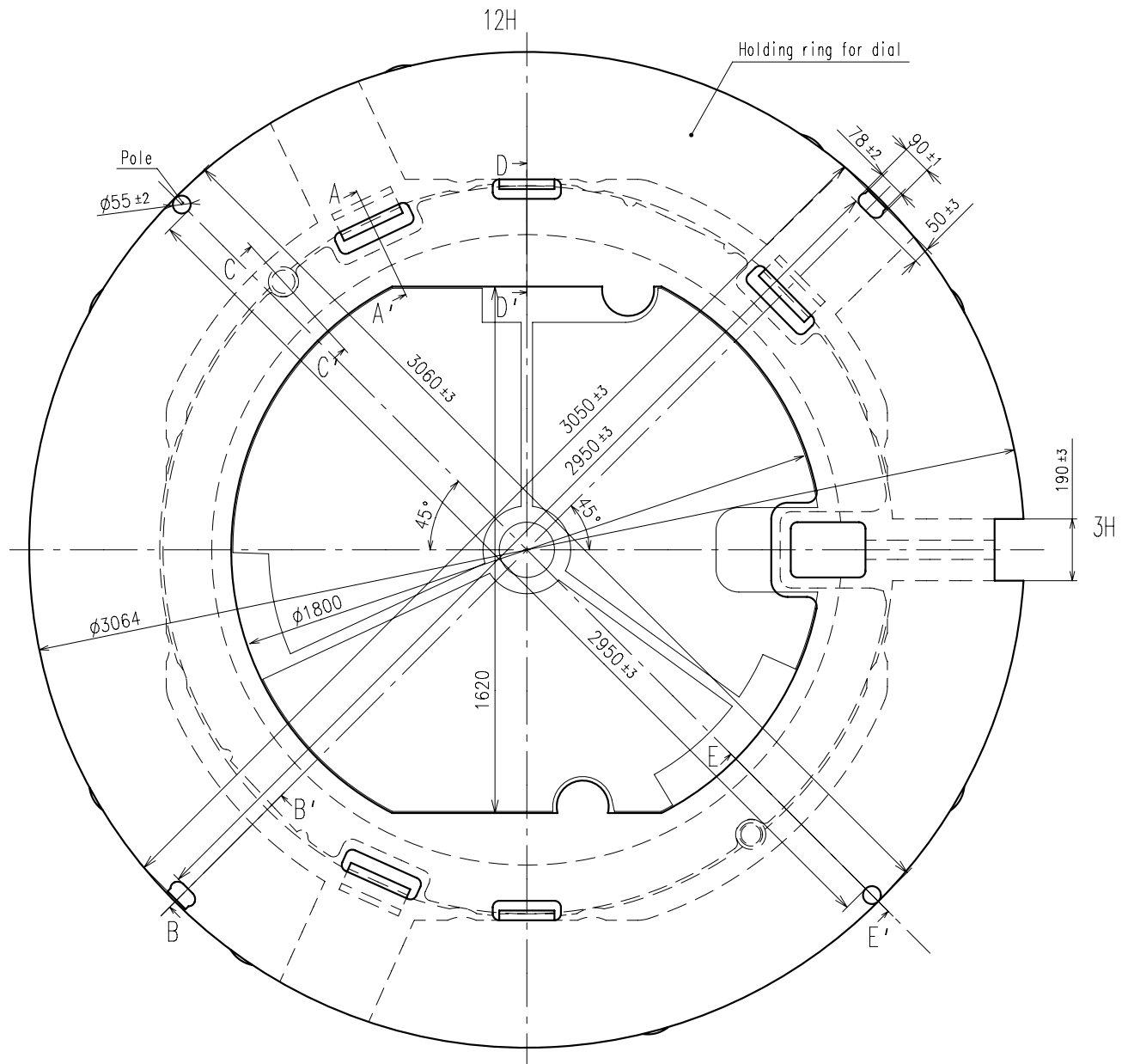


D-D' section

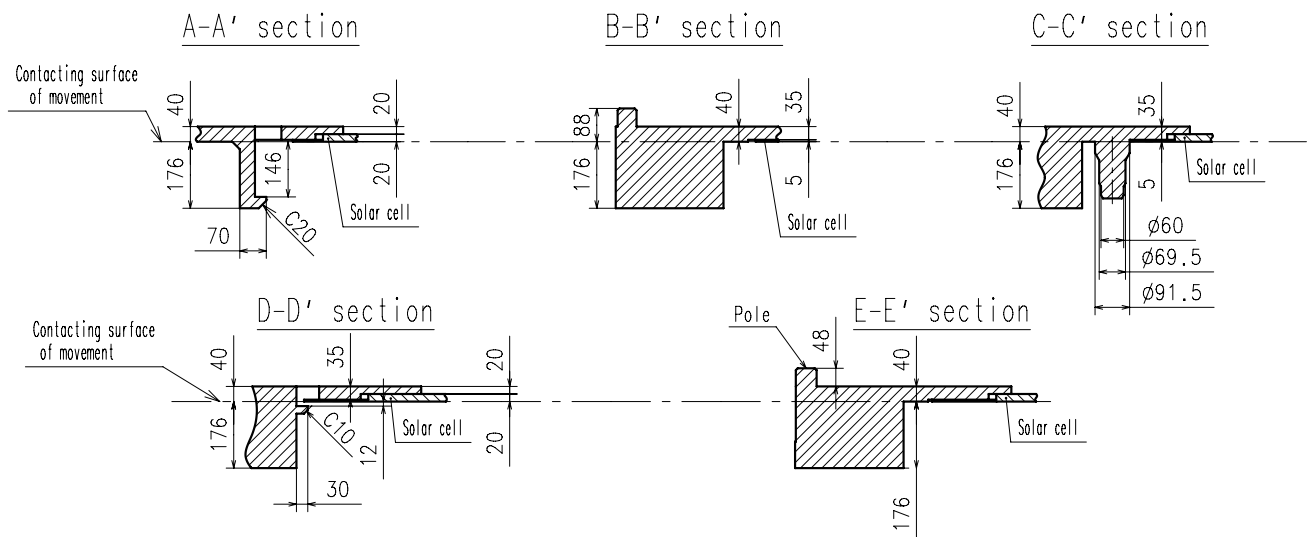


E-E' section





Case body inside diameter: $\phi 3080$



AS32A Characteristics

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. Working time

Expected life per charge from full charge to stoppage will be around 4 months.

4. Power depletion warning function

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

The watch continuous working time after two-second interval movement is approximately 1 days.

When the second hand starts moving at two-second intervals, please charge the watch by exposing it to light.

5. Eco-friendly

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

AS32A Attention-1

Date : 31/Jan./'13

Rev. : 00

1. How to pull out the setting stem

When you pull out the setting stem, please put the 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.

2. Attention for solar cell unit

Please pay attention not to scratch the surface of solar cell unit.

3. Attention for dial transparency rate

Please use the dial with transparency rate more than 30%.

(Effective aperture is ϕ 1.9mm)

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

* For reference: 1,000Lx is 70cm under from 30W fluorescent lamp

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. Secondary battery unit replacement

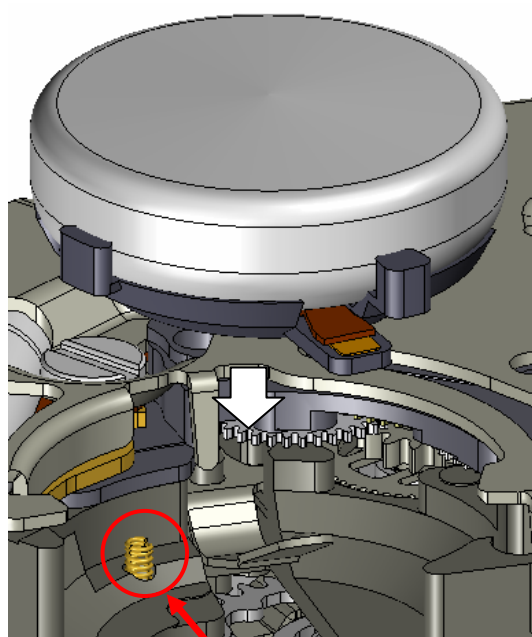
Please set the exclusive secondary battery unit.

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

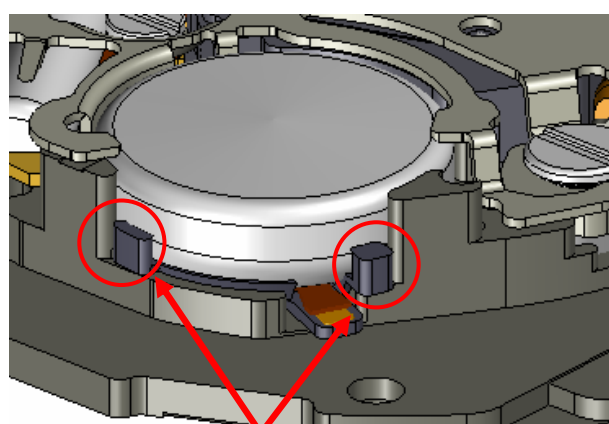
To prevent the battery explosion, it is adopted safety structure not to charge the silver oxide battery even if it is accidentally be set.

When the secondary battery is assembled, please match the phase in accordance with this illustration and push the battery vertical direction.

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



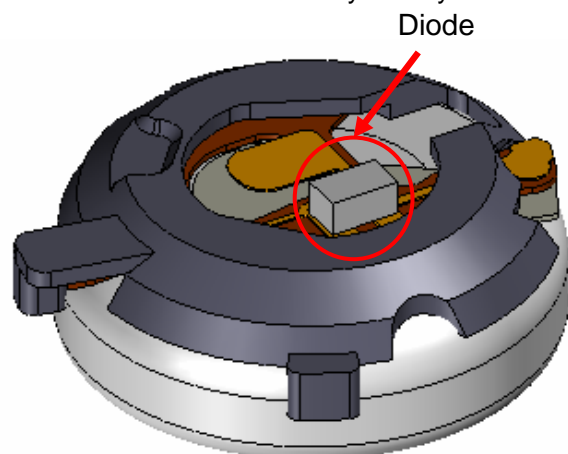
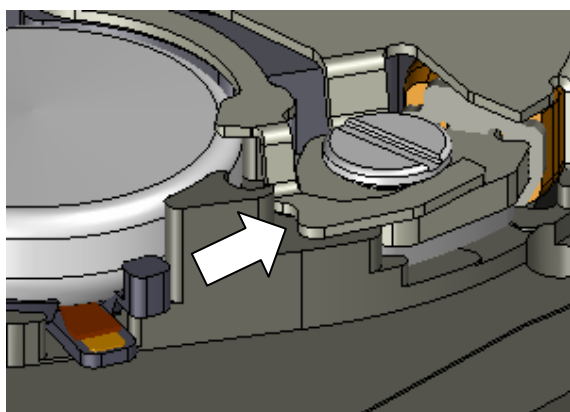
Solar cell lead



Setting position

When the secondary battery is disassembled, please broaden the spring of circuit block cover toward the (⇒) direction and remove the battery in accordance with this illustration.

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



AS32A Attention-3

Date: 31/Jan./'13

Rev.: 00

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.

