TIME MODULE

Cal. VS22A

ϕ18.1 mm
H 2.63 mm

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Date: 31/Aug./'12

S.EPSON Products

Date : 31/Aug./'12
Rev. : 00

MOVEMENT SPECIFICATIONS

CAL. VS22A

Solar Quartz 7 3/4"' Movement / Three hands(H/M/S) with Calendar

1. MOVEMENT DIMENSIONS

Outside diameter	ϕ18.50mm × 17.50mm(3-9H) ×18.36(12-6H)
Casing diameter	ϕ18.10mm
Total height	2.63mm (Including secondary battery : 2.76mm)

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℃ to +50℃
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 1.10V)	
Working time	Approx. 6 months (After fully charged)
Charging time	Approx. 6 hours (Under 100 KLX sunlight)
	Approx. 60 hours (Under 3000LX fluorescent lamp)
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	2 Jewels
Anti-magnetism	Over 1600A/m (Direct current magnetic field)
Driving current consumption	Approx. 0.56μA (1.35V)
Operation stopping voltage	1.0 V
Solar cell type	Amorphous silicon solar cell
Maximum unbalance of hands	Second hand : 0.03μN･m (3μg･m)
	Minute hand : 0.80μN･m (80μg･m)
	Hour hand : 0.50μN･m (50μg･m)

5. SECONDARY BATTERY (Installed)

Type	Titanium-lithium-ion second battery
Size	ϕ6.8mm × t 2.15mm
Nominal voltage	1.5 V
Capacity	2.5 mAh

6. SEPARATED PARTS (Parts code)

Solar cell	4025562
Dial support ring	0866878
Hand setting stem	0351177
Solar cell lead terminal (3 pcs)	4246529
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.

Cal. VS22A	Appearance	Date:31/Aug./'12
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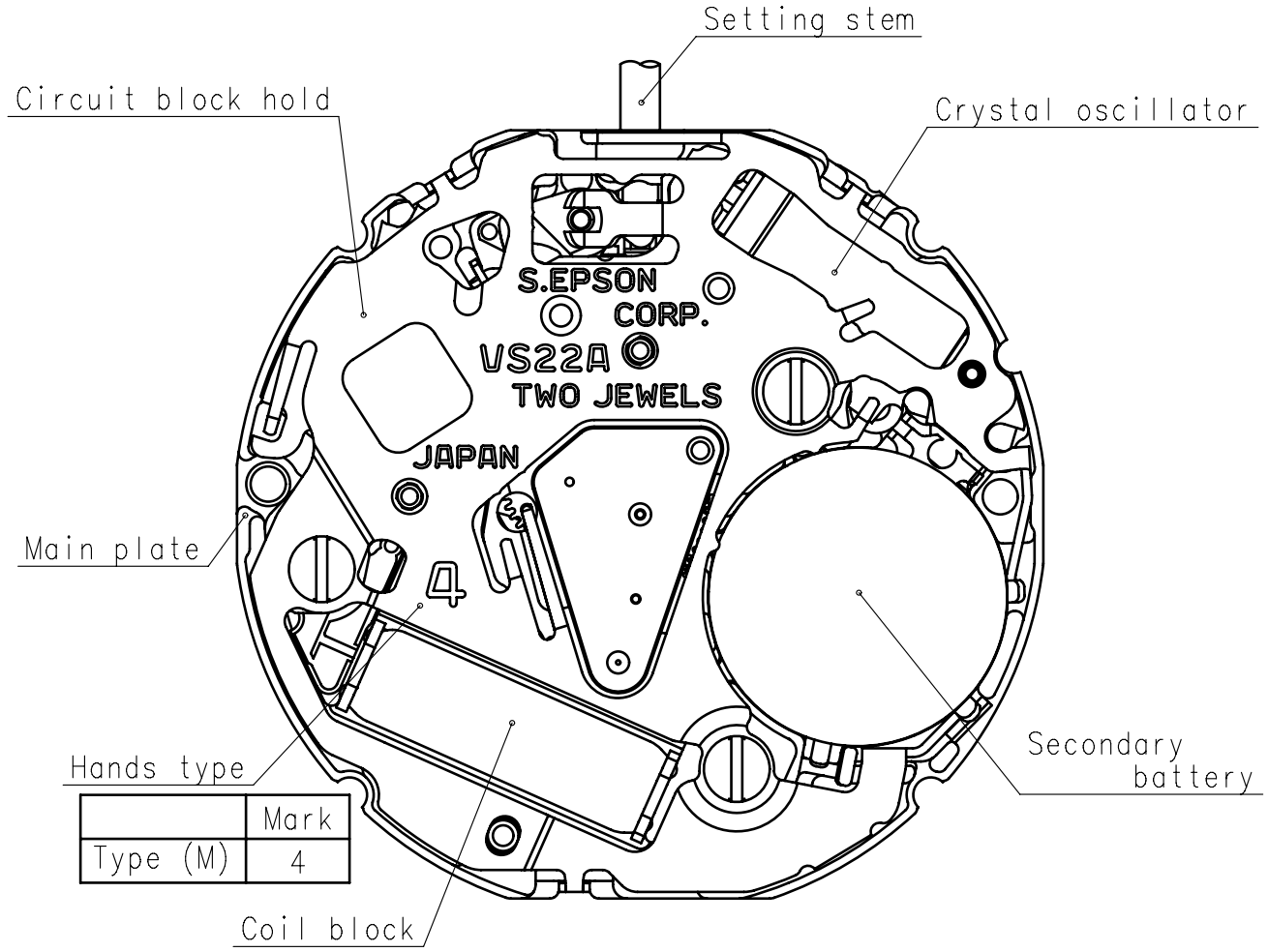
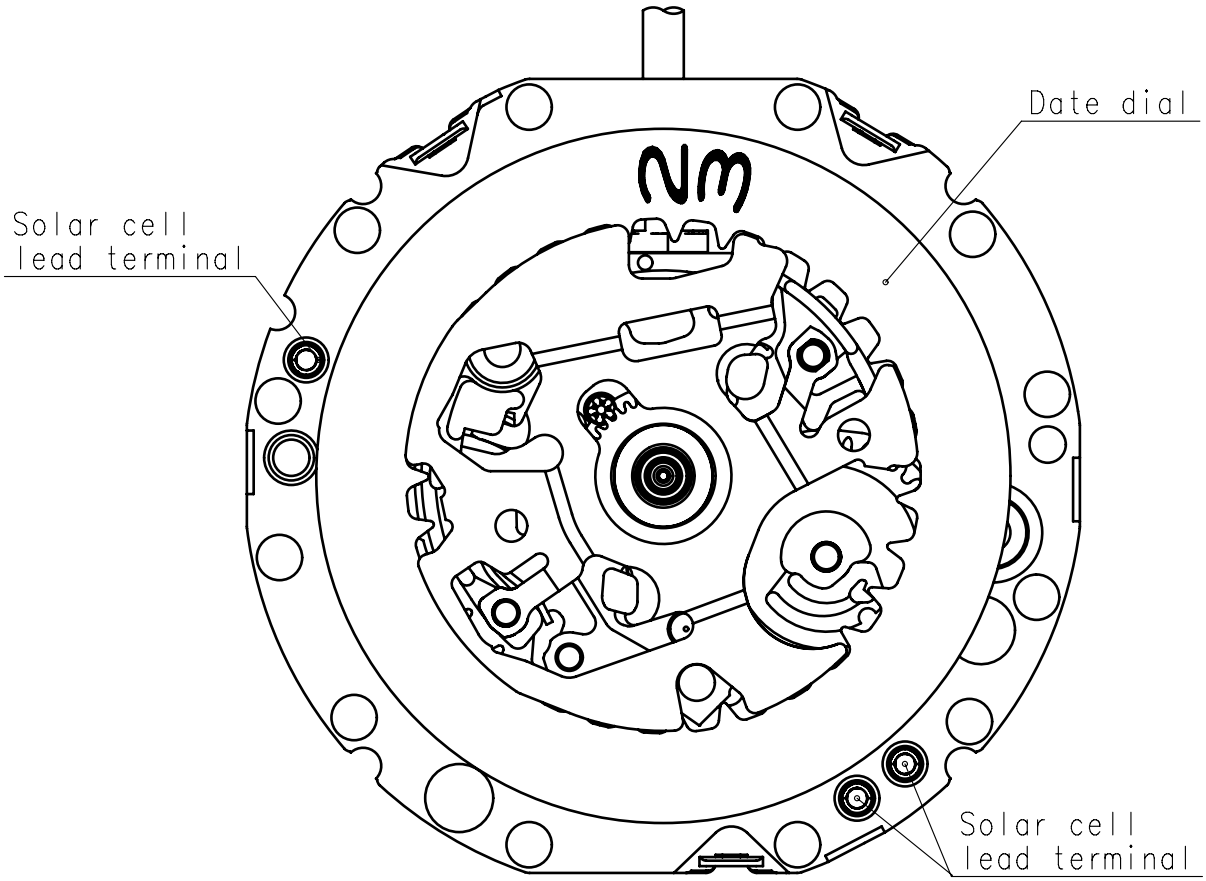
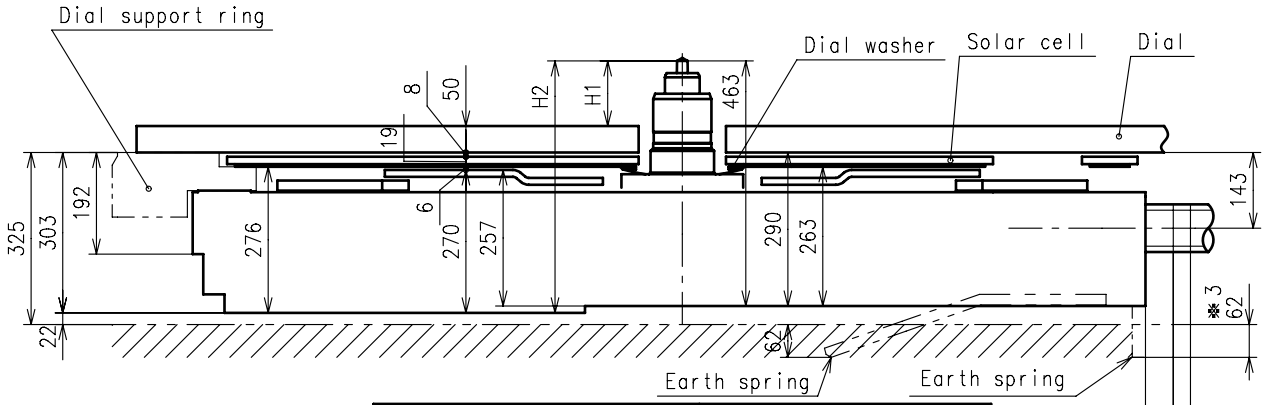


	Mark
Type (M)	4

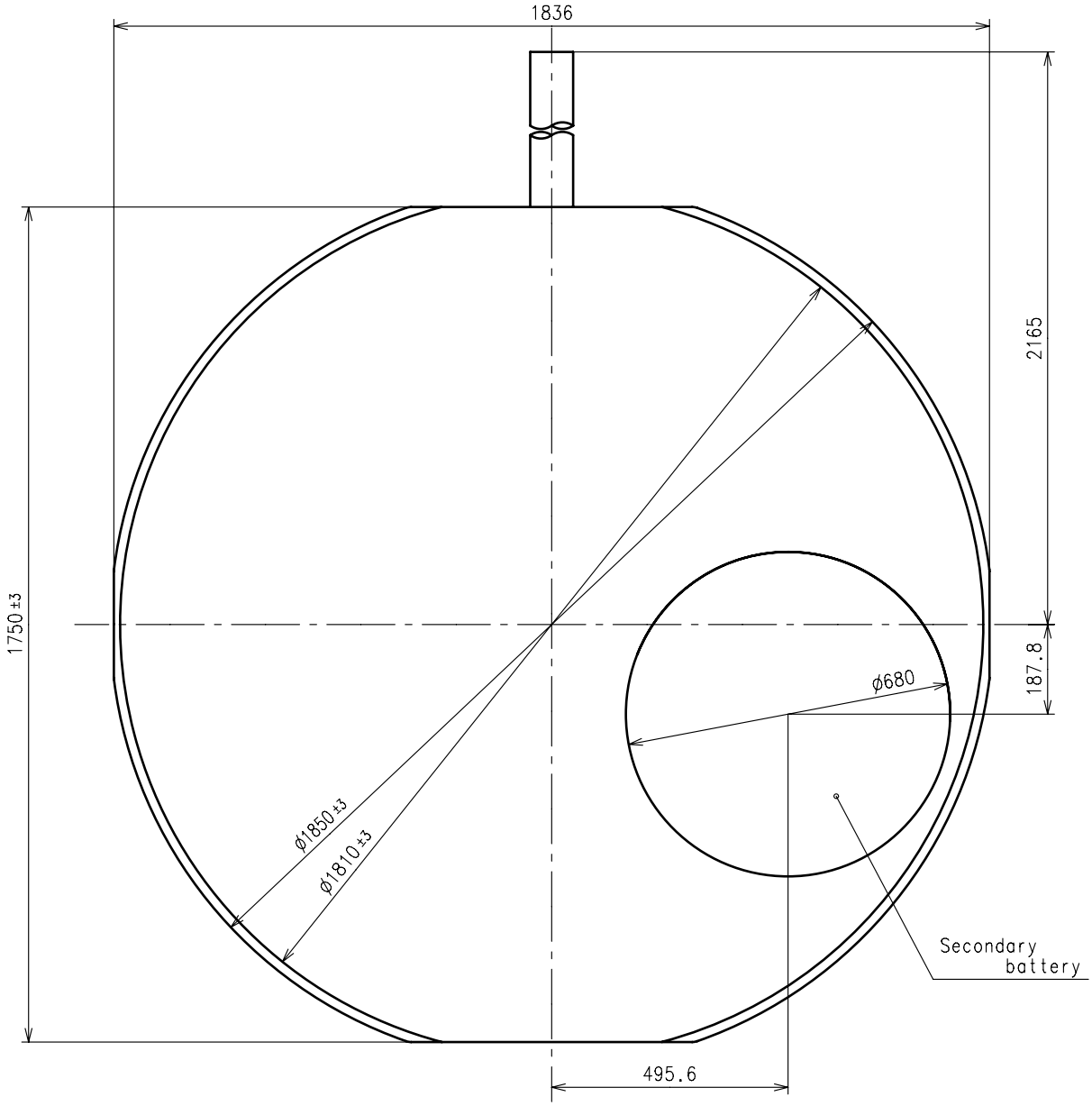


Cal. VS22A	Casing	Date:31/Aug./'12
		Rev.:00



Center post		Type M(4) VS22A**
Maximum height from dial	H1	123
Total height incl.movement	H2	476

※1:First pullout stroke
※2:Second pullout stroke
※3:The earth spring is absolutely placed in contact with the case back



Unit : 1=1/100mm

Cal. VS22A	Hand fitting	Date:31/Aug./'12
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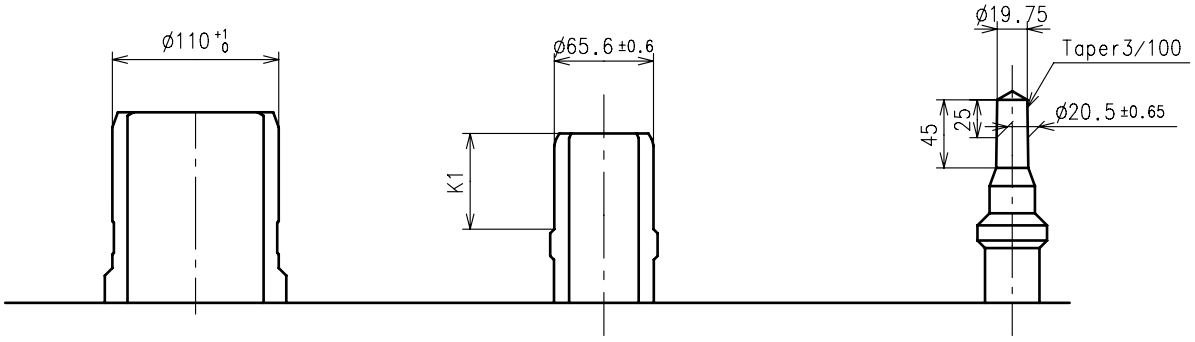
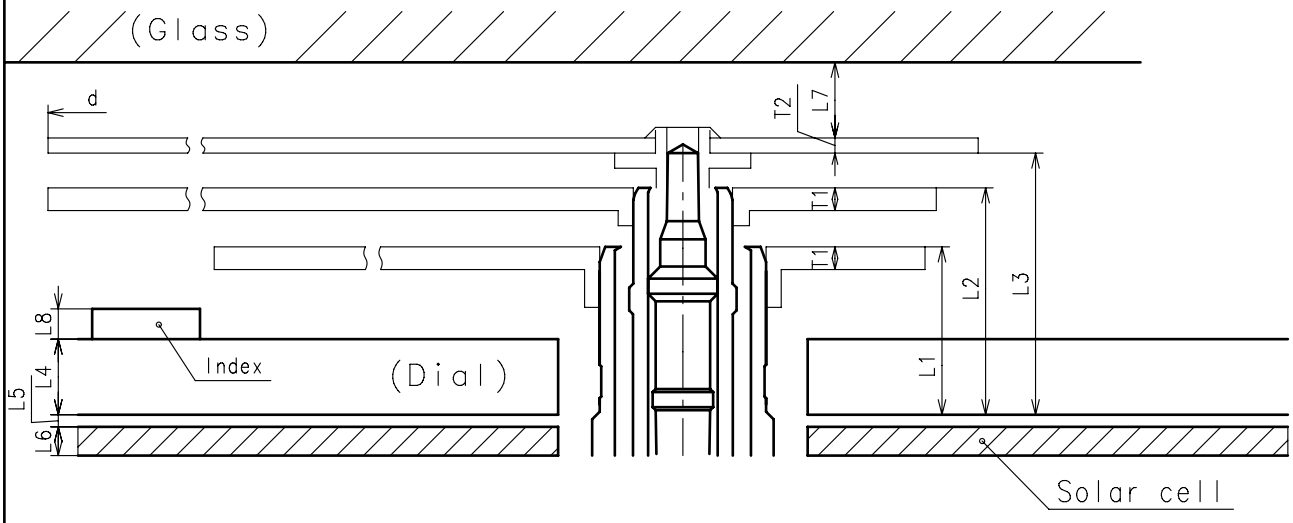
※Hour hand unbalance ≦ 0.5μ N・m (50μ g・m)
※Minute hand unbalance ≦ 0.8μ N・m (80μ g・m)
※Second hand unbalabce ≦ 0.03μ N・m (3μ g・m)



Hour wheel　　Center wheel　　Fourth wheel

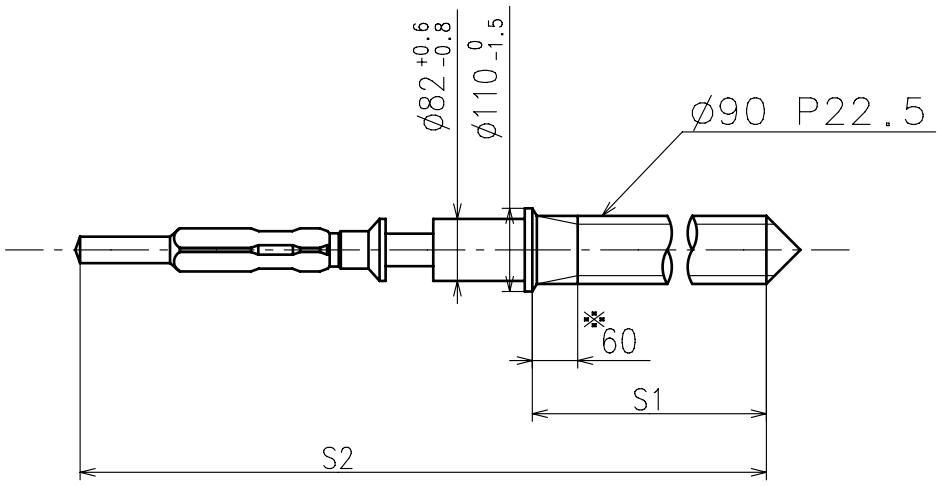
	Parts No.			Dimension
	Hour wheel	Center wheel	Fourth wheel	K1
Type M (4) VS22A**	0271647	0221607	0241173	63



	L1	L2	L3	L4	L5	L6	L7	L8	T1	T2	d
Type M (4) VS22A**	111	150	173	50	8	19	MIN: 40	MAX: 60	15	10	MAX: ø2400

Unit : 1=1/100mm

Cal. VS22A	Hand setting stem	Date:31/Aug./'12 Rev.:00



※ Not threaded

	Part No.	S1	S2
Standard	0351177	1366	1964

Material : Steel

Hardness : Vickers 600±50

Unit : 1=1/100mm

Cal. VS22A	Dial	Date:31/Aug./'12
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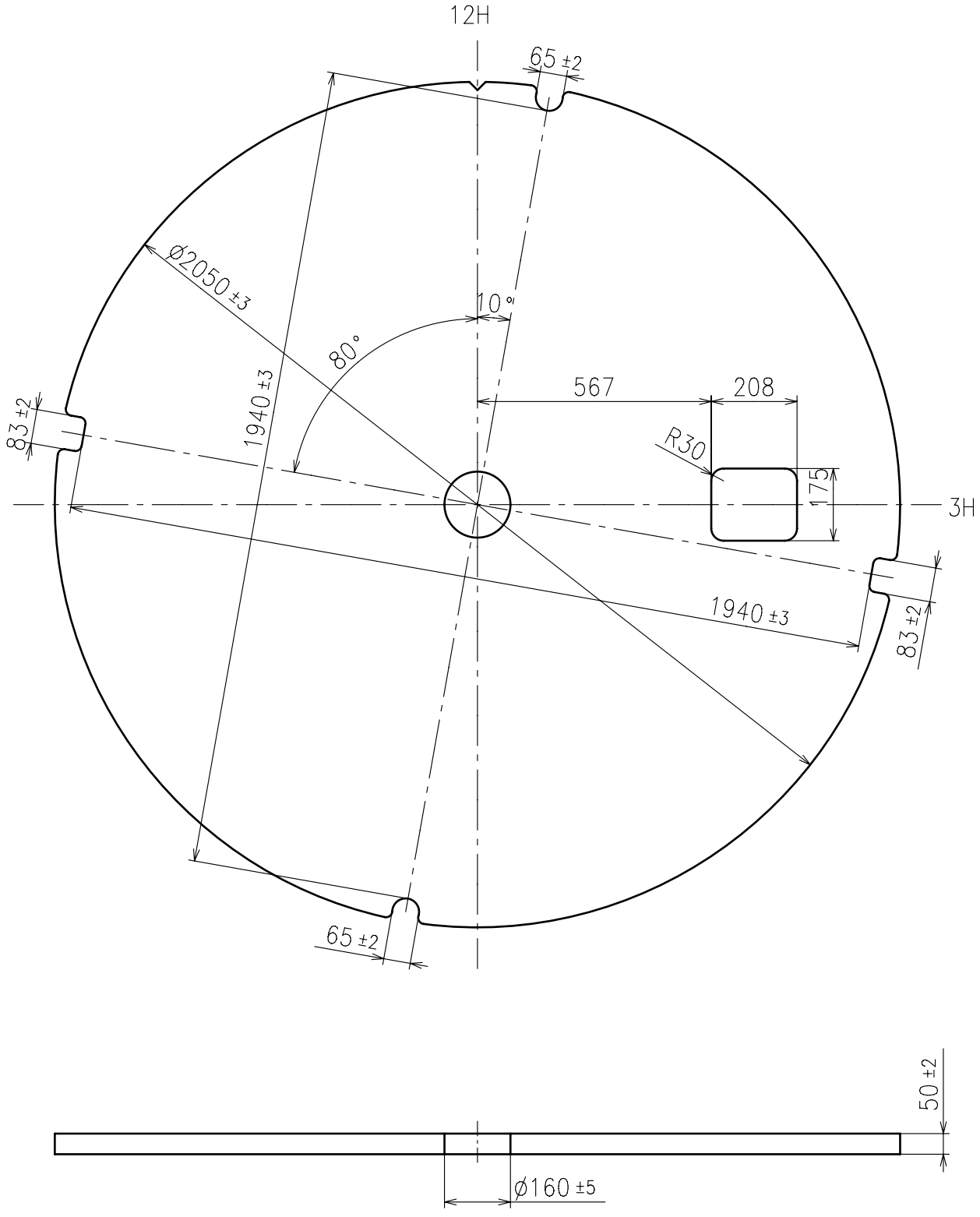
Transmit light more than 30%



Unit : 1=1/100mm

Cal. VS22A	Dial support ring	Date:31/Aug./'12
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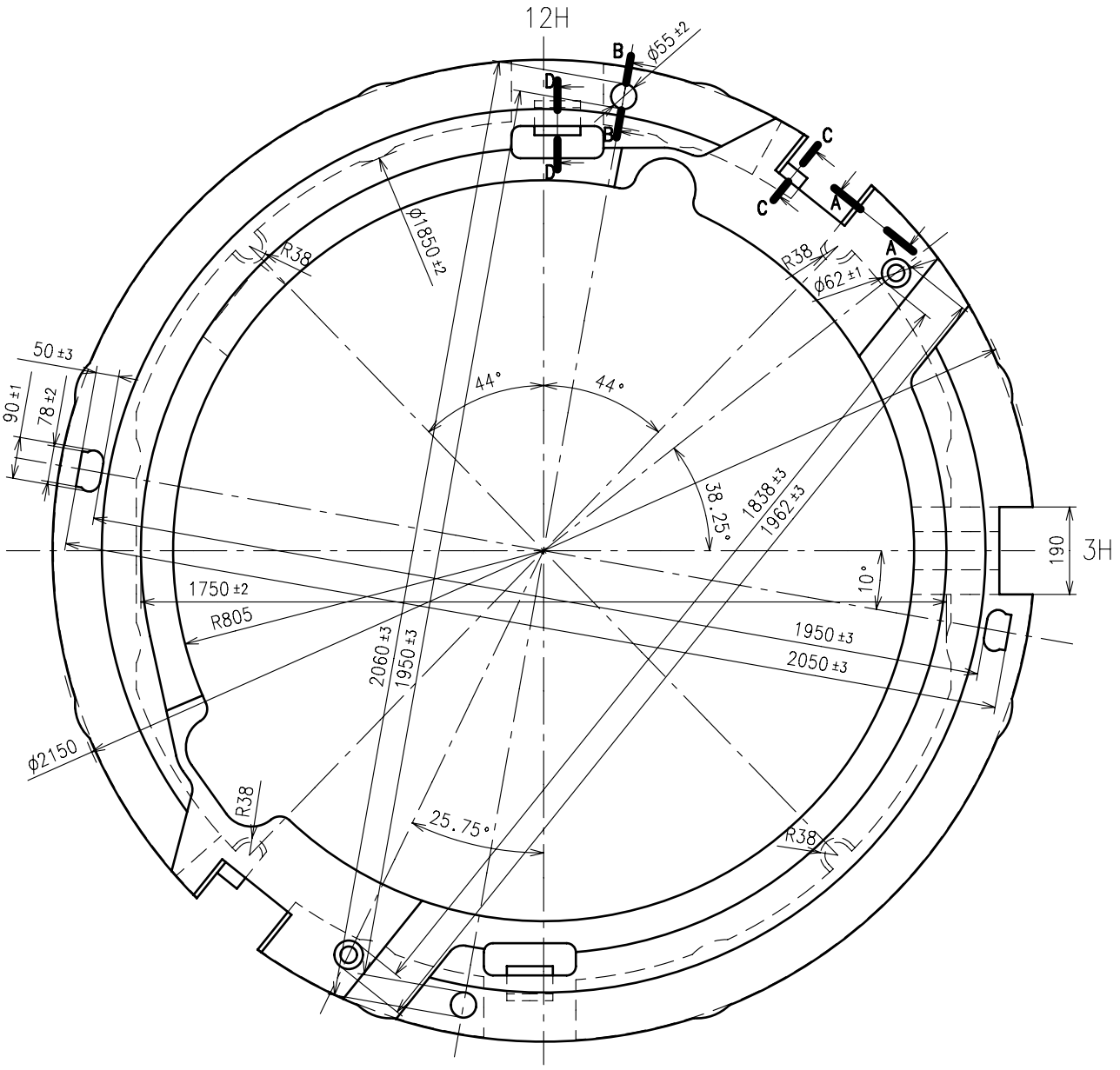
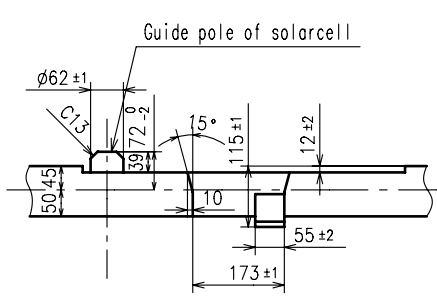
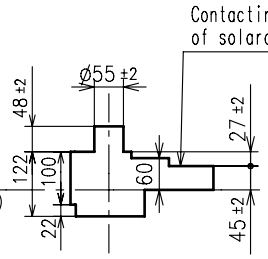


Case body inside diameter:Ø2150

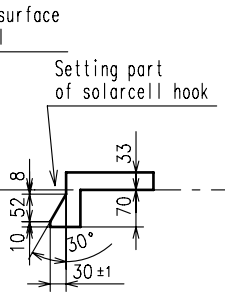
A-A section



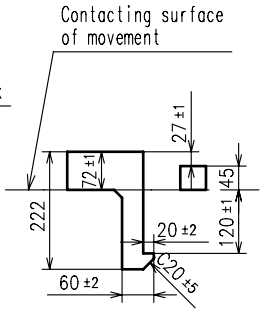
B-B section



C-C section



D-D section



Unit : 1=1/100mm

Cal. VS22A	Casing ring	Date:31/Aug./'12
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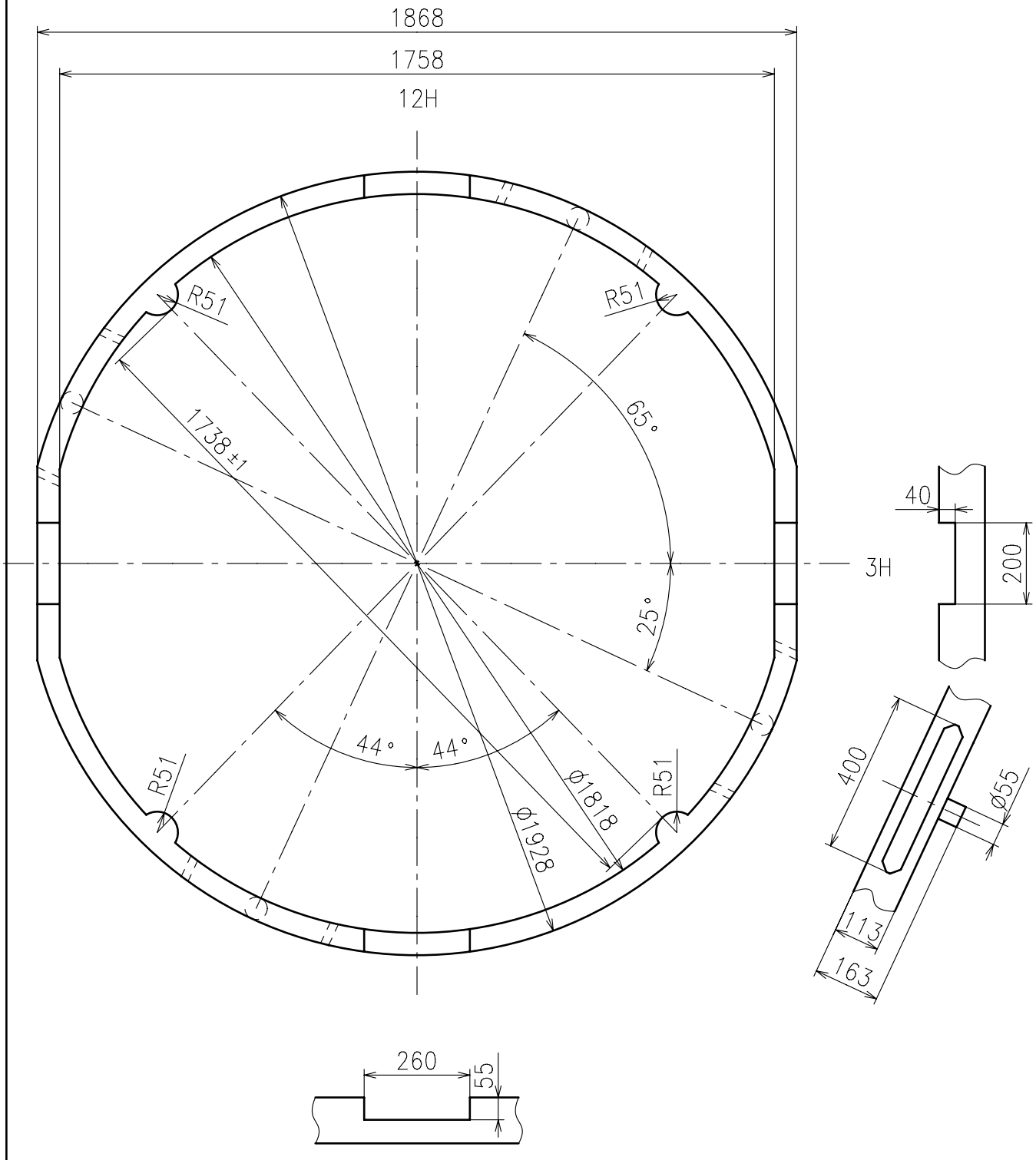

Unit : 1=1/100mm

Date : 31/Aug./'12
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VS22A Features

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 sliver oxide battery, thus eliminating the need for battery replacement.

3. Working time

Expected life per charge from full charge to stoppage will be around 6months.

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.

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.

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VS22A Attention-1

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.

3. Attention for dial transparency rate

Please use the dial with transparency rate more than 30%.
(Effective aperture is ϕ1750)

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	—	25	70
3,000		30W 20cm	60	8	20
10,000	Sun light	Cloudy	20	2	6
100,000		Fine weather	6	24 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.

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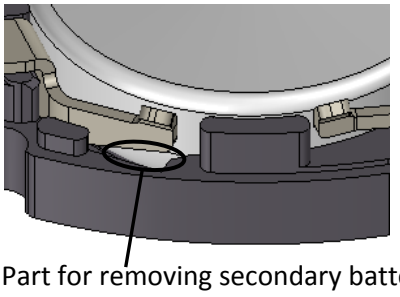
VS22A Attention-2

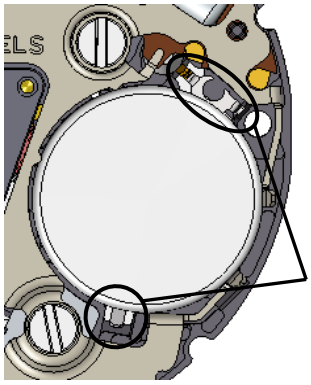
6. Secondary battery replacement

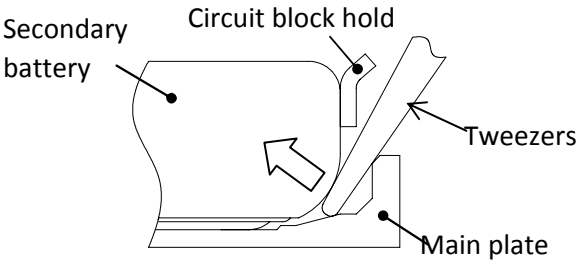
Please set the exclusive secondary battery.
If the silver oxide battery is accidentally be set and charged, there is a possibility of batery explosion.
To prevent the battery explosion, it is adopted safety structure
not to charge the silver oxide battery even if it is accidentally be set.

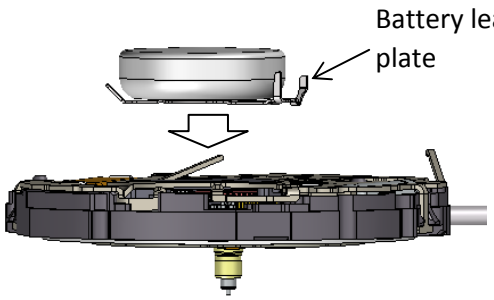
When the secondary battery is disassembled,please use tweezers or screwdriver
and remove the battery in accordance with this illustration.
When the secondary battery is assembled, please match the phase in accordance with this illustration
and push the battery vertical direction.

Please pay attention not to deform the battery lead plate.



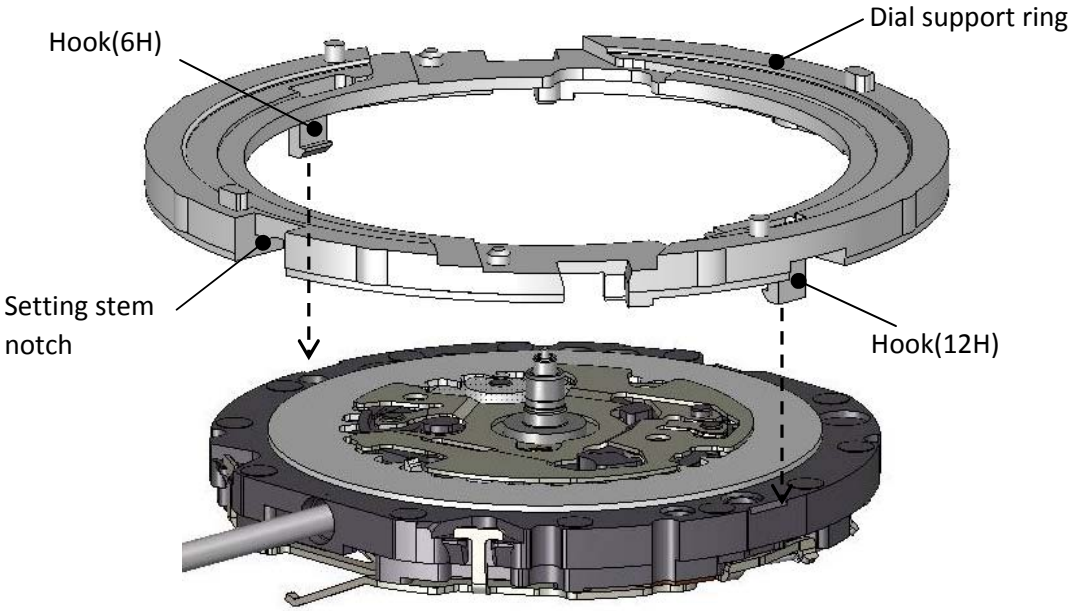






7. How to set the dial support ring

Please match the dial support ring on the movement with setting stem notch toward 3H position.
There are 2pcs of dial support ring hook at 6H and 12H position.
Please gently slide the dial support ring and set hooks to the movement until it click into place.



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VS22A Attention-3

8. How to set the solar cell lead terminals and solar cell

Please set 3pcs 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.

There are 2pcs of guide pole on the dial support ring,
please set the solar cell toward these guide poles.
There are 2pcs of solar cell hook at 2H and 8H position,
please gently slide the solar cell hooks toward the dial support ring and set it until it click into place.

《 Attention 》
When the solar cell hook is set to the dial support ring,
please lightly push the " pushing part " of the following illustration.
Please pay attention not to touch to the surface of solar cell except the pushing part.
When the solar cell is disassembled from the dial support ring,
please pay attention not to broaden hooks too much.
Because there is a possibility that the hook is deformed.
Before re-assemble the solar cell to the dial support ring,
please check whether the solar cell hook is not deformed during the disassemble process.