EPSON

Watch Movement Specification and Drawing

SOLAR SERIES

Cal. VS43A

Movement Size

11 1/2”’

Casing Diameter

Ø 28.6mm

Height

3.50mm

Running Time

Approx. 12 months

Date: 4/Aug./'23

Cal. VS43A

Items	Rev.	Page
Features	04	1
Specifications	07	2
Appearance	01	3
Casing	02	4
Hand fitting	02	5
Hand setting stem	01	6
Dial-01	04	7-01
Dial-02	01	7-02
Casing ring	01	8
Solar cell unit-01	03	9-01
Solar cell unit-02	00	9-02
Attention-01	06	10-01
Attention-02	02	10-02

Cal. VS43A	Features	Date : 4/Aug./'23
		Rev. : 04

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 20%

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 12 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 1 day.

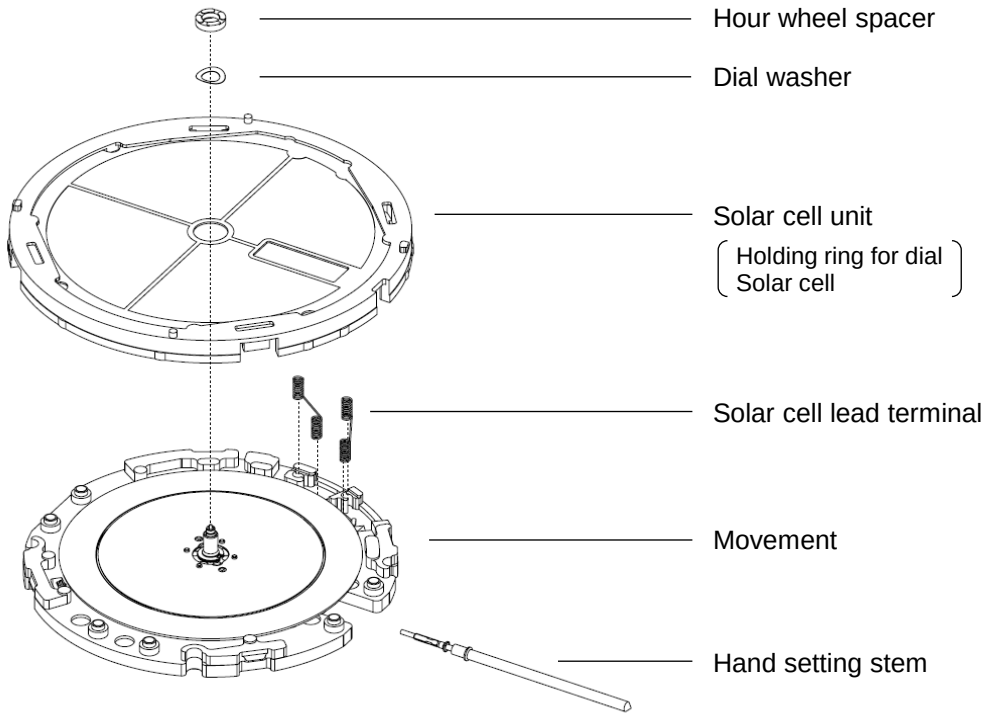
6. Quick start function

This watch has a "Quick start function".
It start running within a few seconds after exposure to a light more than 1000Lx.
(Fluorescent lamp 30W/ 70cm)

7. 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.

8. Structure of the separated parts



Solar Quartz 11 1/2''' Movement / Three hands(H/M/S) with Day/Date

1. MOVEMENT DIMENSIONS

Outside diameter	ϕ28.60mm
Total height	3.09mm (Including secondary battery : 3.50mm)

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	
Day/Date	Instant setting device for date calendar	
Reset switch		
Power depletion warning function		
(Second hand moves at 2-second intervals when voltage is 1.10V)		
Quick start function		
Running time	Approx. 12 months (After fully charged)	
Setting mechanism	Crown at normal position	: Free
	Crown pulled out 1st click	: Instant day / 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. 0.6μA (1.35V)	
Operation stopping voltage	1.0 V	
Solar cell type	Amorphous silicon solar cell	
Maximum unbalance of hands	Second hand	: 0.045μN･m
	Minute hand	: 0.80μN･m
	Hour hand	: 0.50μN･m

5. SECONDARY BATTERY (Installed)

Type	Lithium metal batteries
Size	ϕ9.5mm × t 2.1mm
Nominal voltage	1.5 V
Capacity	5.5 mAh

6. SEPARATED PARTS (Parts code)

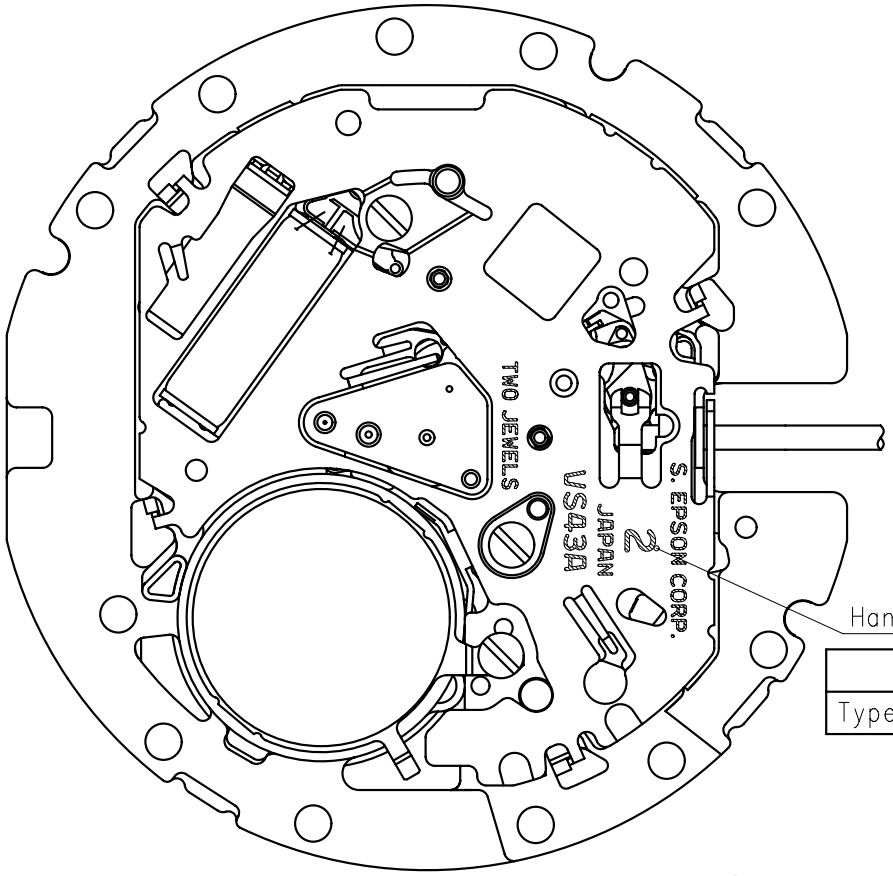
Solar cell unit	4020555 / 4020556
Hand setting stem	0351177
Solar cell lead terminal (2 pcs)	4246524
Hour wheel spacer	0493500
Dial washer	0491735

7. TEST OF ACCURACY

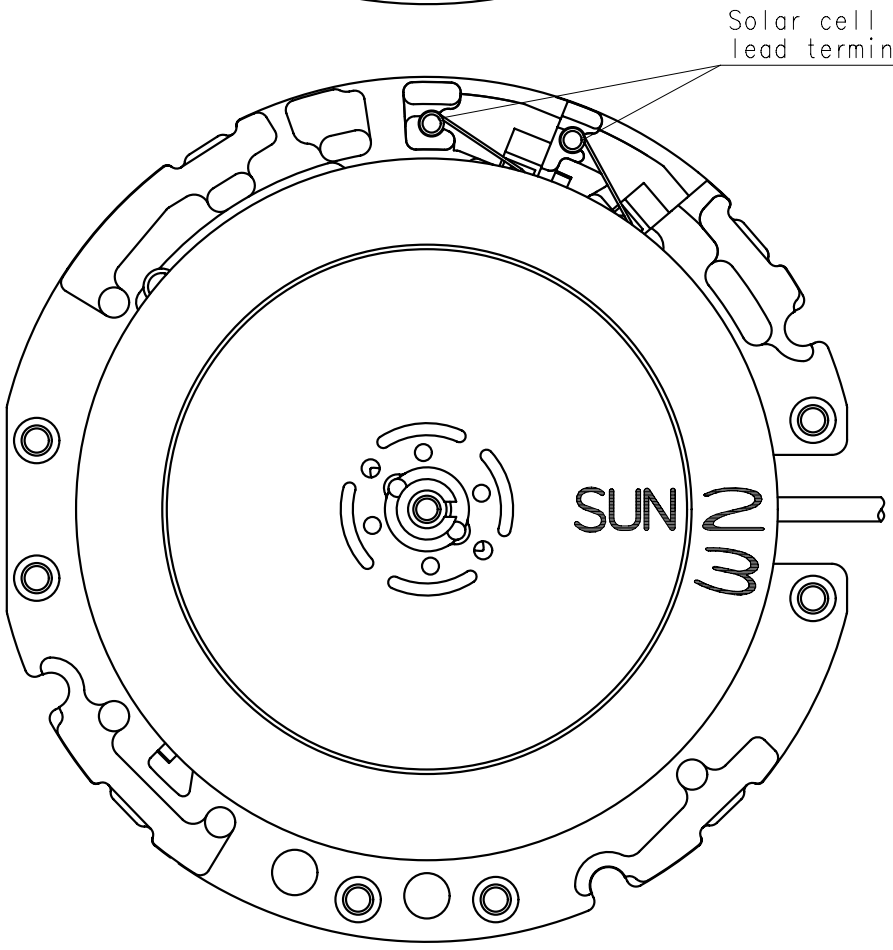
Equipment to be used	SEIKO quartz tester QT-99, Greiner quartz timer-C , Witschi Q-tester 4000
Duration of measurement	10 seconds
Microphone to be used	Electromagnetic detection type

All specifications are subject to change without notice.

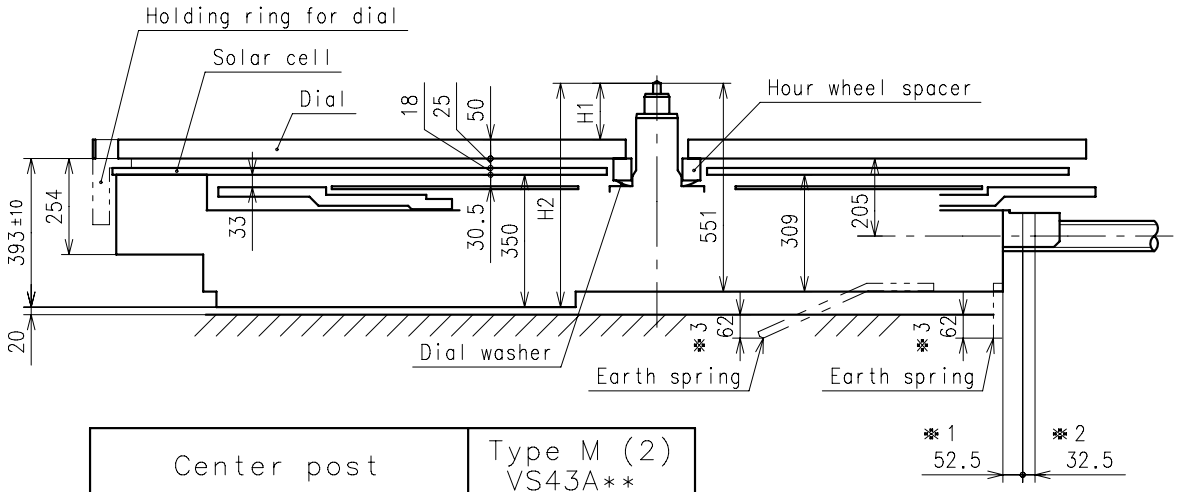
Cal. VS43A	Appearance	Date:24/Apr./'15
		Rev.:01



	Mark
Type M (2)	2



Cal. VS43A	Casing	Date:24/Apr./'15
		Rev.:02

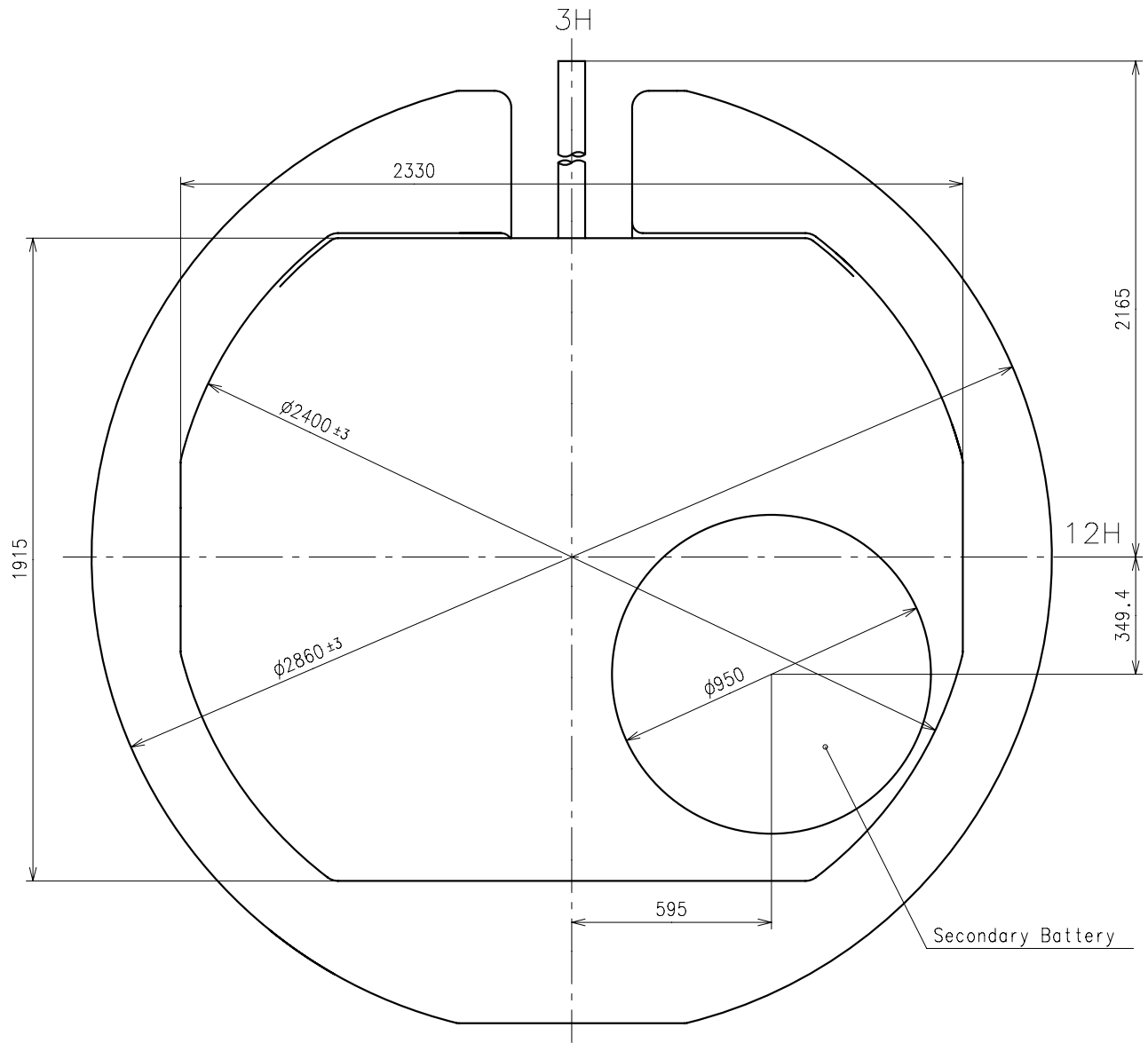


Center post		Type M (2) VS43A**
Maximum height from dial	H1	149
Total height including movement	H2	592

※1:First pullout stroke

※2:Second pullout stroke

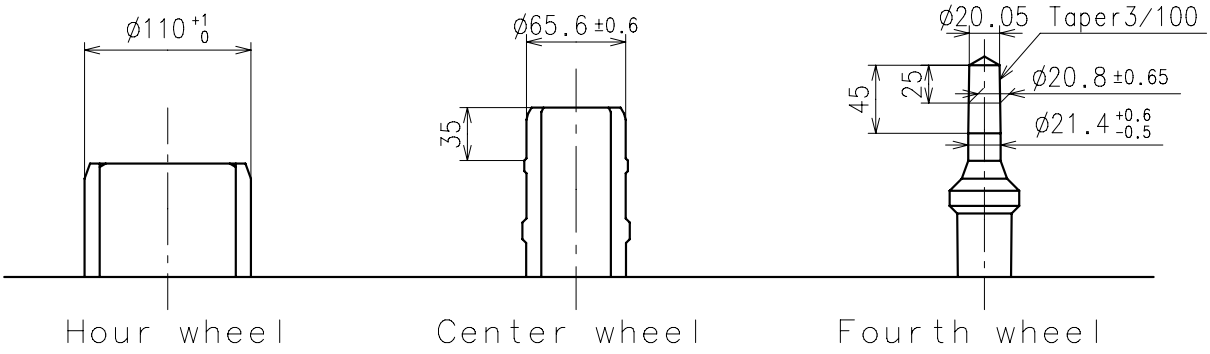
※3:The earth spring is absolutely placed in contact with the case back



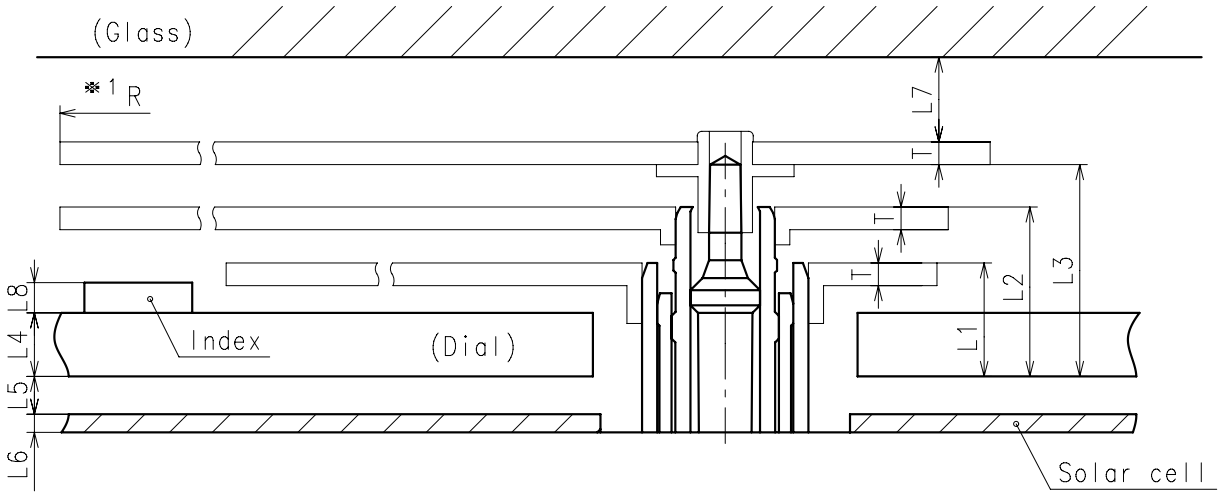
Unit : 1=1/100mm

Cal. VS43A	Hand fitting	Date:11/Jan./'19
		Rev.:02

※ Hour hand unbalance ≦ 0.5μ N・m (50μ g・m)
※ Minute hand unbalance ≦ 0.8μ N・m (80μ g・m)
※ Second hand unbalabce ≦ 0.045μ N・m (4.5μ g・m)



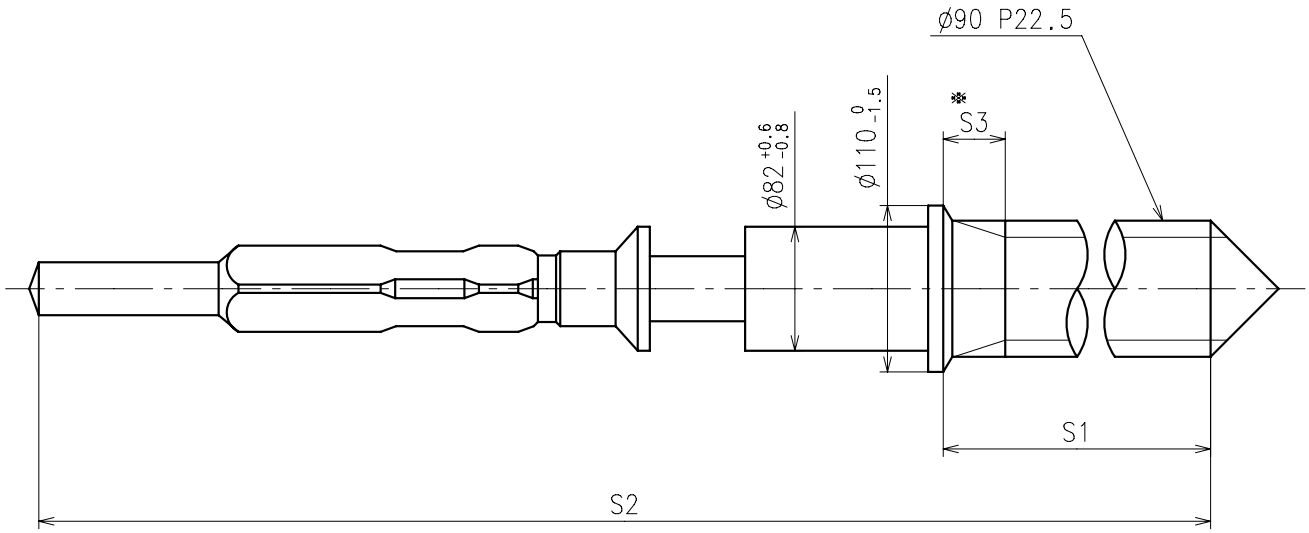
	Parts No.		
	Hour wheel	Center wheel	Fourth wheel
Type M (2) VS43A**	0271639	0221602	0241559



	L1	L2	L3	L4	L5	L6	L7	L8	T	※1 R
Type M (2) VS43A**	118	171	199	50	25	18	MIN: 50	MAX: 60	15	MAX: 1450

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

Cal. VS43A	Hand setting stem	Date:24/Apr./'15 Rev.:01



※ Not threaded

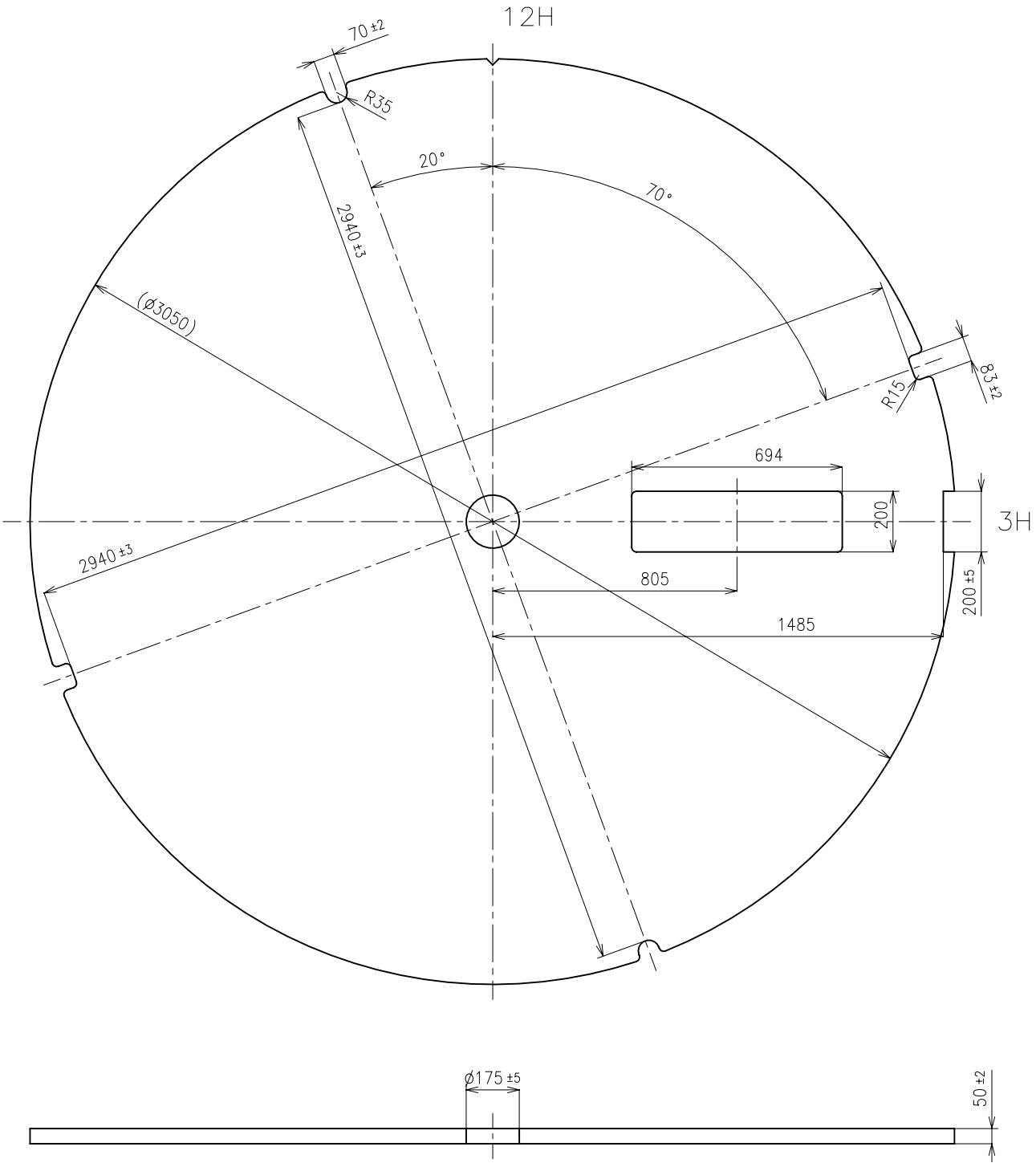
	Part No.	S1	S2	※ S3
Standard	0351177	1366	1964	60

Material : Steel

Hardness : Vickers 600±50

Unit : 1=1/100mm

Cal. VS43A	Dial-01	Date: 4/Aug./'23
		Rev.:04



[Attention]
Each elements of solar cell must be kept the transparency rate of the dial more than 20%.
Refer to the Fig.[1] or [Solar cell unit] page instruction as to the shape of solar cell.

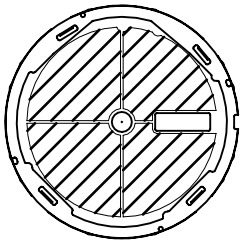
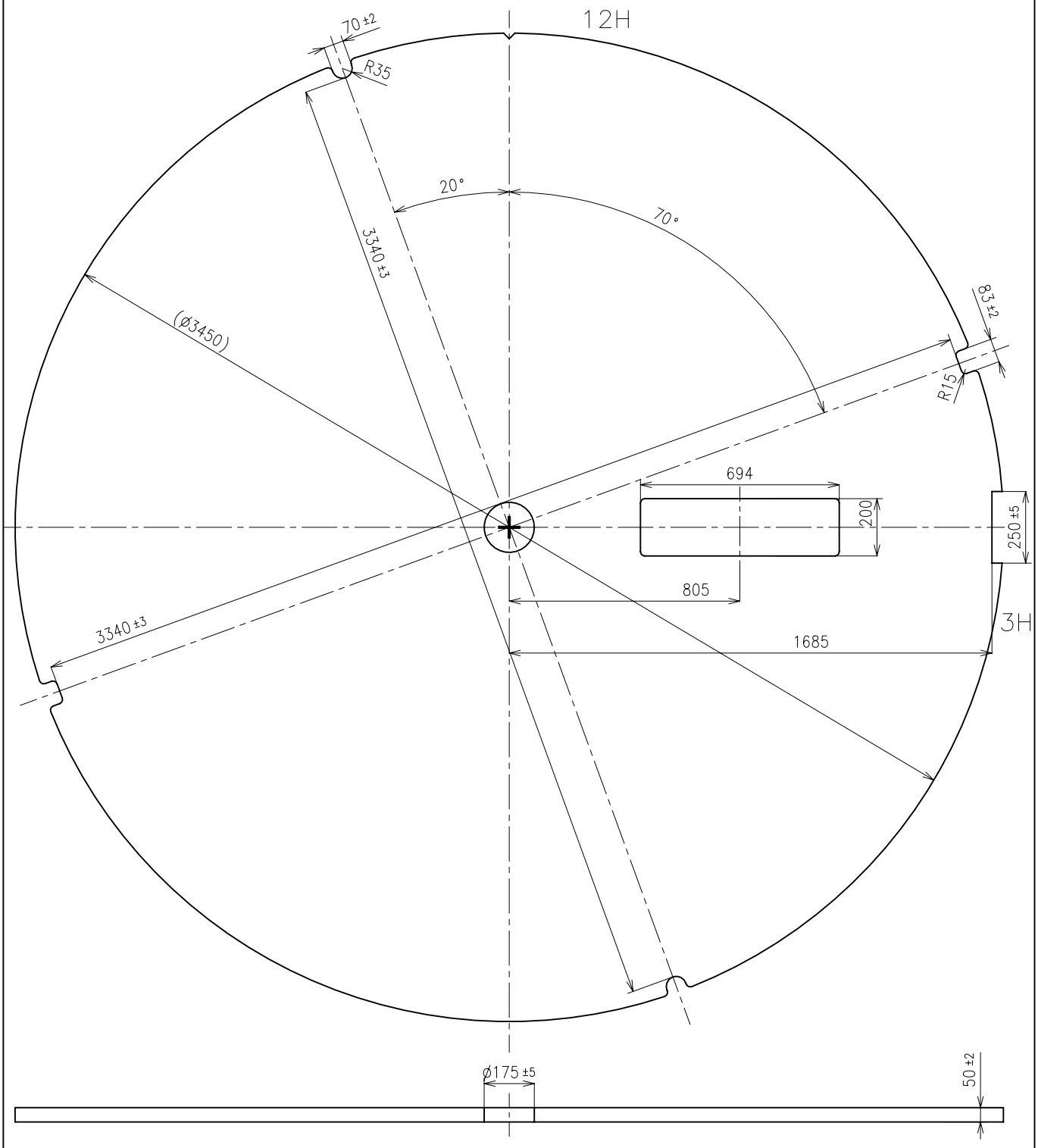


Fig.[1] elements of solar cell

Unit : 1=1/100mm

Cal. VS43A	Dial-02	Date: 4/Aug./'23
		Rev.:01



[Attention]
Each elements of solar cell must be kept the transparency rate of the dial more than 20%.
Refer to the Fig.[1] or [Solar cell unit] page instruction as to the shape of solar cell.

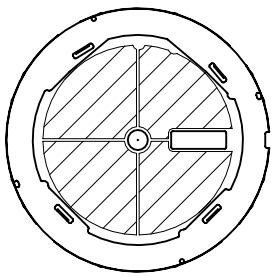
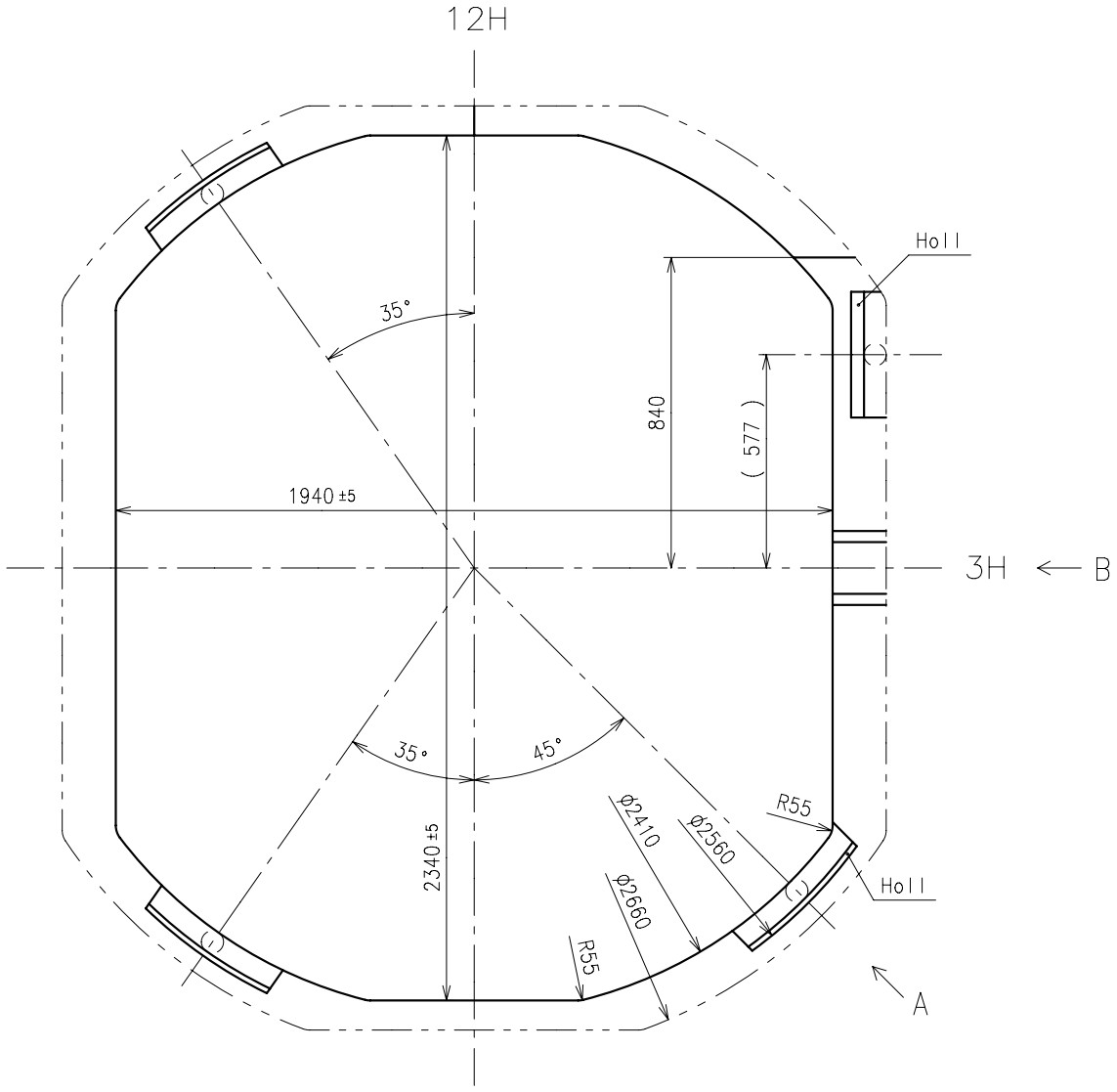


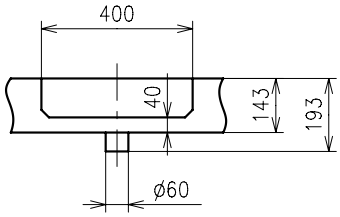
Fig.[1] elements of solar cell

Unit : 1=1/100mm

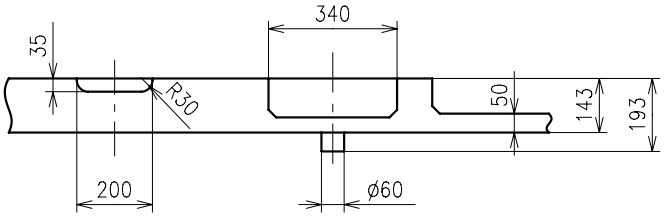
Cal. VS43A	Casing ring	Date:24/Apr./'15
		Rev.:01



A view

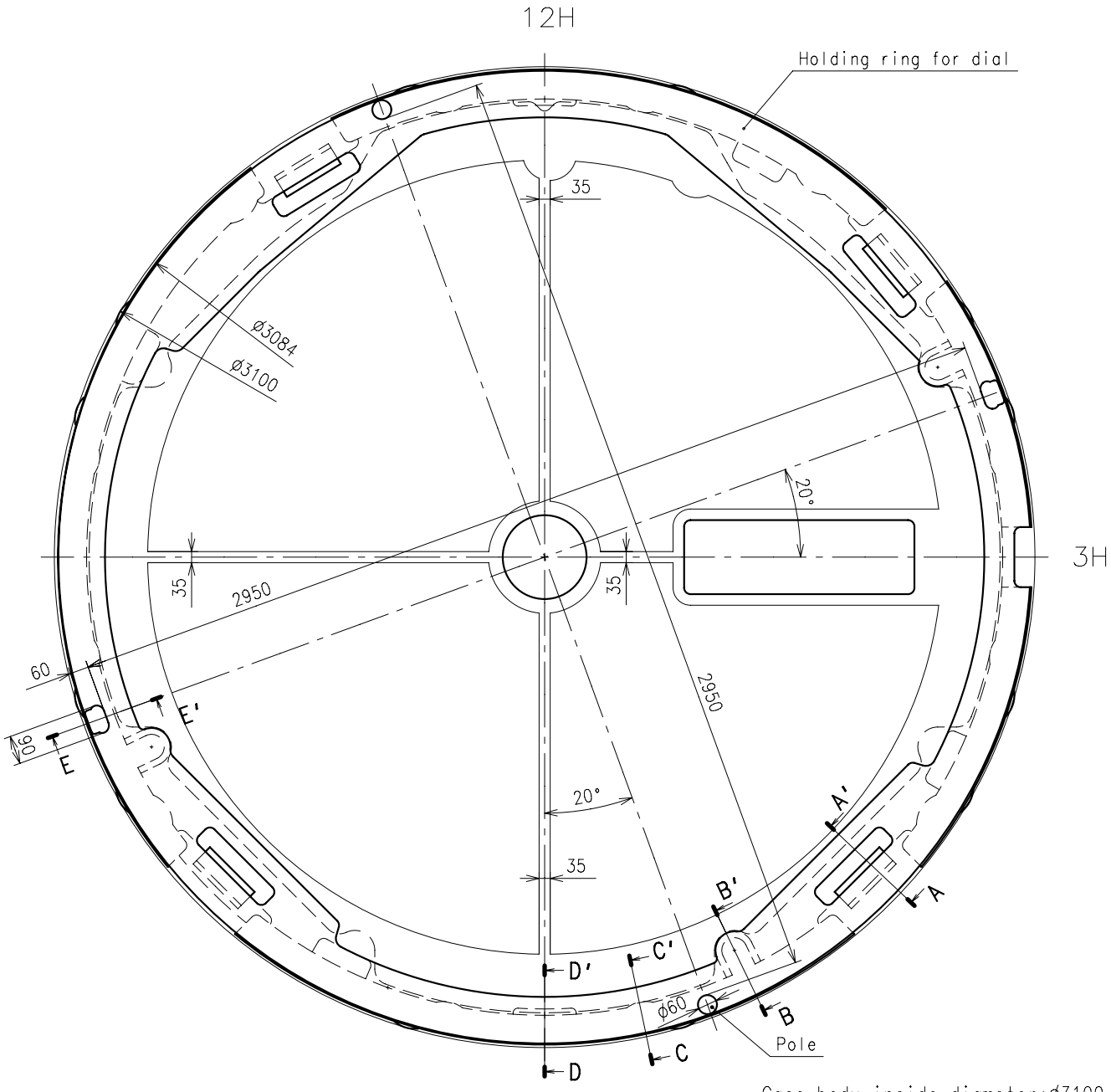


B view



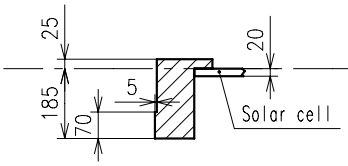
Unit : 1=1/100mm

Cal. VS43A	Solar cell unit-01	Date:28/Aug./'20
		Rev.:03

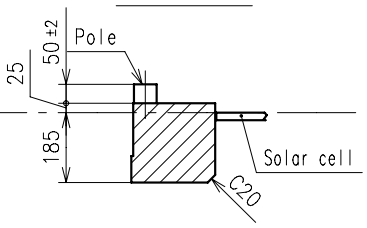


Case body inside diameter:ϕ3100

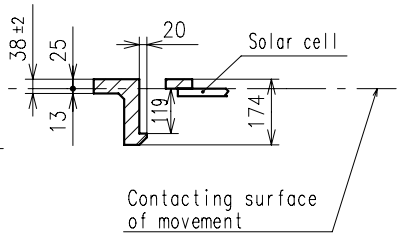
C-C' section



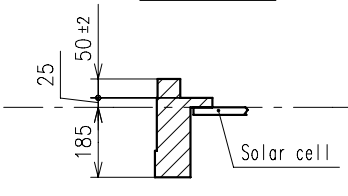
B-B' section



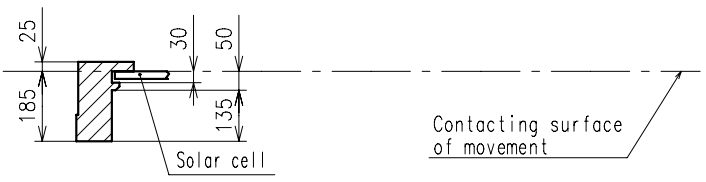
A-A' section



E-E' section

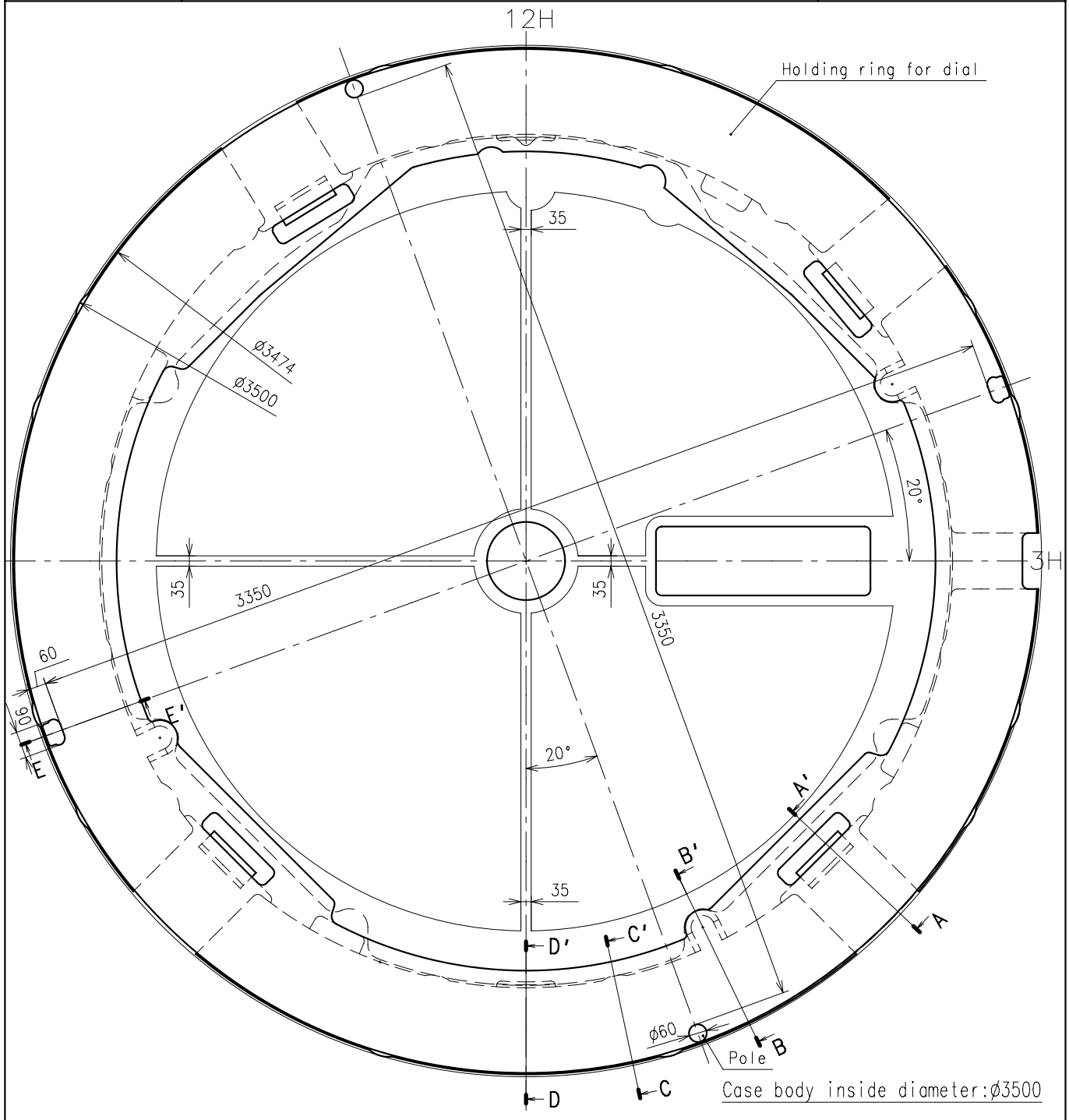


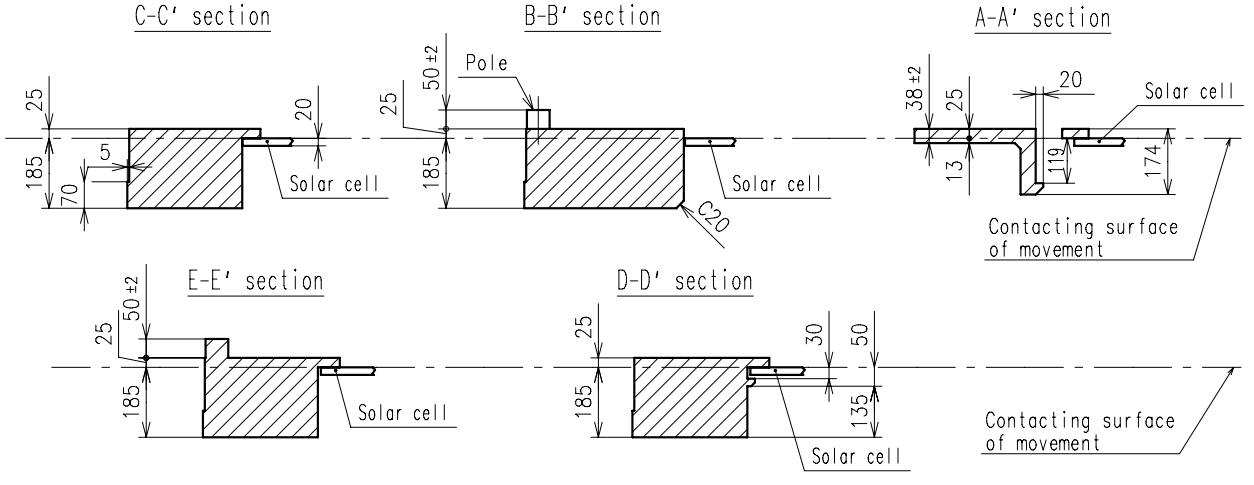
D-D' section



Unit : 1=1/100mm

Cal. VS43A	Solar cell unit-02	Date:28/Aug./'20
		Rev.:00





Unit : 1=1/100mm

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.

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 20%.

(Effective aperture is ϕ25mm)

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

4. The guideline of charging time is as in below

			Dial transparency rate = 20%			Dial transparency rate = 30%		
Illumination (Lx)	Source of light	Environment	A (Approx. Hours)	B (Approx. Hours)	C (Approx. Minutes)	A (Approx. Hours)	B (Approx. Hours)	C (Approx. Minutes)
700	A fluorescent lamp	Inside the office	–	50	89	–	37	54
3,000		30W 20cm	120	12	25	80	8	12
10,000	Sun light	Cloudy	35	3.0	8	25	3	4
100,000		Fine weather	9	1.1	2	6	0.6	1

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

(1) Please set one side of the solar cell lead terminal into the 318# or 319# hole first.

(2) Then, please set the other side of the solar cell lead terminal under the main plate according to the following procedure.

(3) Tilt the spring slightly and slide the bottom part of the spring under the main plate.
Push the top part of the spring and place it under the main plate.
(Refer to the Fig.[1] in below.)

Pay attention not to damage the date disk.

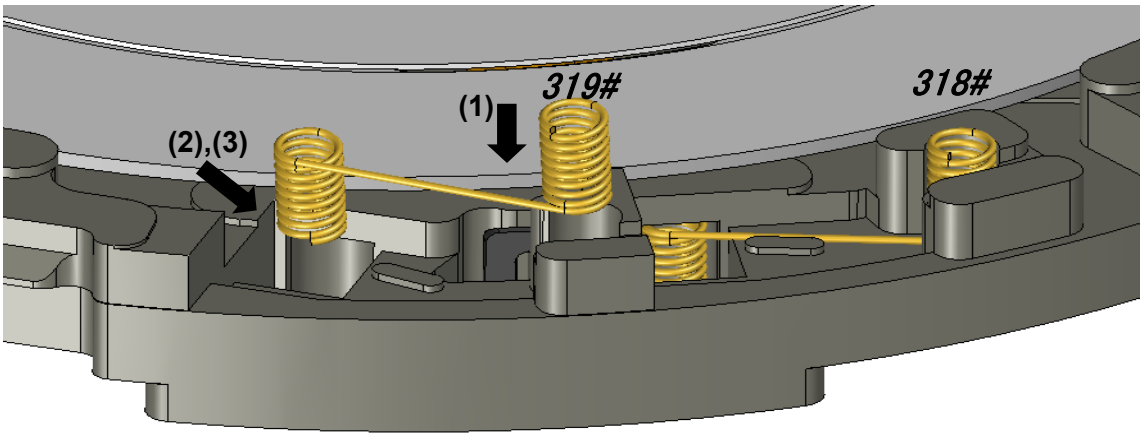
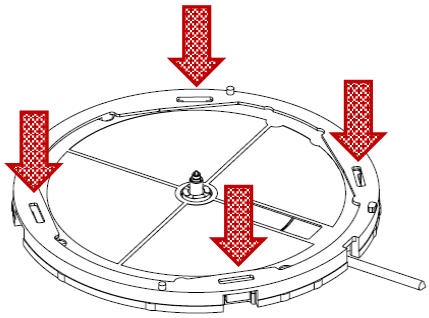


Fig.[1]

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.