



# Cal. YM82A

$\phi$  27.0 mm  
H 3.7 mm

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Date: 26/Jul./'13

S.EPSON Products

**CAL. YM82A**Analog Quartz 12<sup>'''</sup> Center second Chronograph Movement**1. MOVEMENT DIMENSIONS**

Outside diameter	$\phi$ 27.60mm(12H-6H) × 24.00mm(3H-9H)
Casing diameter	$\phi$ 27.00mm(12H-6H)
Total height	3.70mm (including battery)

**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 hand / Minute hand / Second chronograph hand (Center)
Small hands	1/100 second chronograph hand / 1/10 second chronograph hand (12H) 40 minute chronograph hand (6H) Small second hand (9H)
Calendar	Instant setting device for date calendar
Reset switch	
System-reset switch	
Power depletion warning function (BLD) (Small second hand moves at 2-second intervals)	
Setting mechanism	Crown at normal position : Free Crown pulled out 1st click : Instant date change Crown pulled out 2nd click : Time setting / Reset : Chronograph hand reset
Stopwatch	2H button: start / stop 4H button: sprit / reset

**4. FEATURES**

Jewels	0 Jewels
Anti-magnetism	Over 1600A/m (Direct current magnetic field)
Maximum unbalance of hands	Small second hand : 0.03 $\mu$ N·m 1/100 second chronograph hand : 0.005 $\mu$ N·m 1/10 second chronograph hand : 0.025 $\mu$ N·m 40 minute chronograph hand : 0.03 $\mu$ N·m second chronograph hand : 0.06 $\mu$ N·m Minute hand : 0.70 $\mu$ N·m second chronograph hand : less than 0.2 $\mu$ g·m <sup>2</sup>
Moment of inertia	

**5. BATTERY**

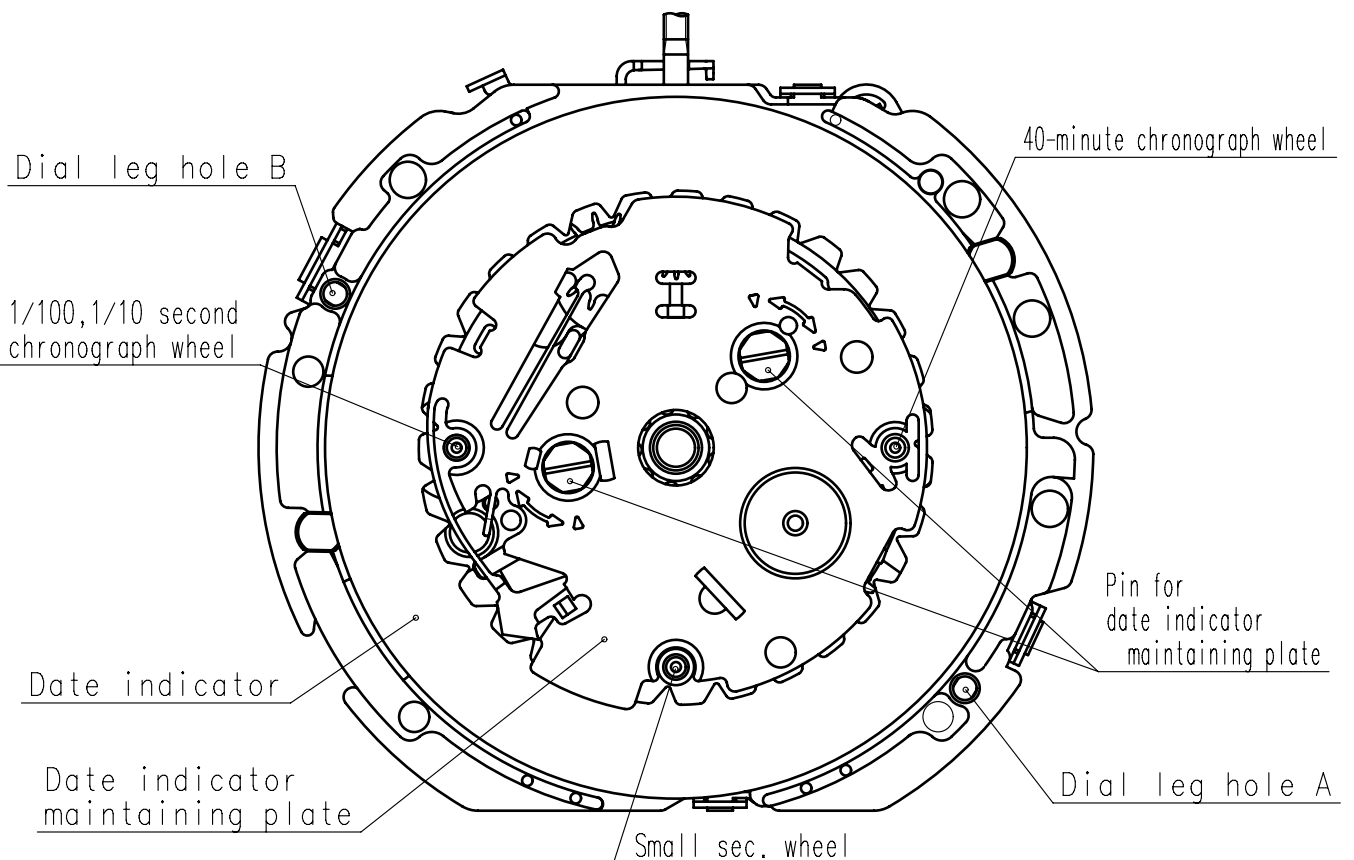
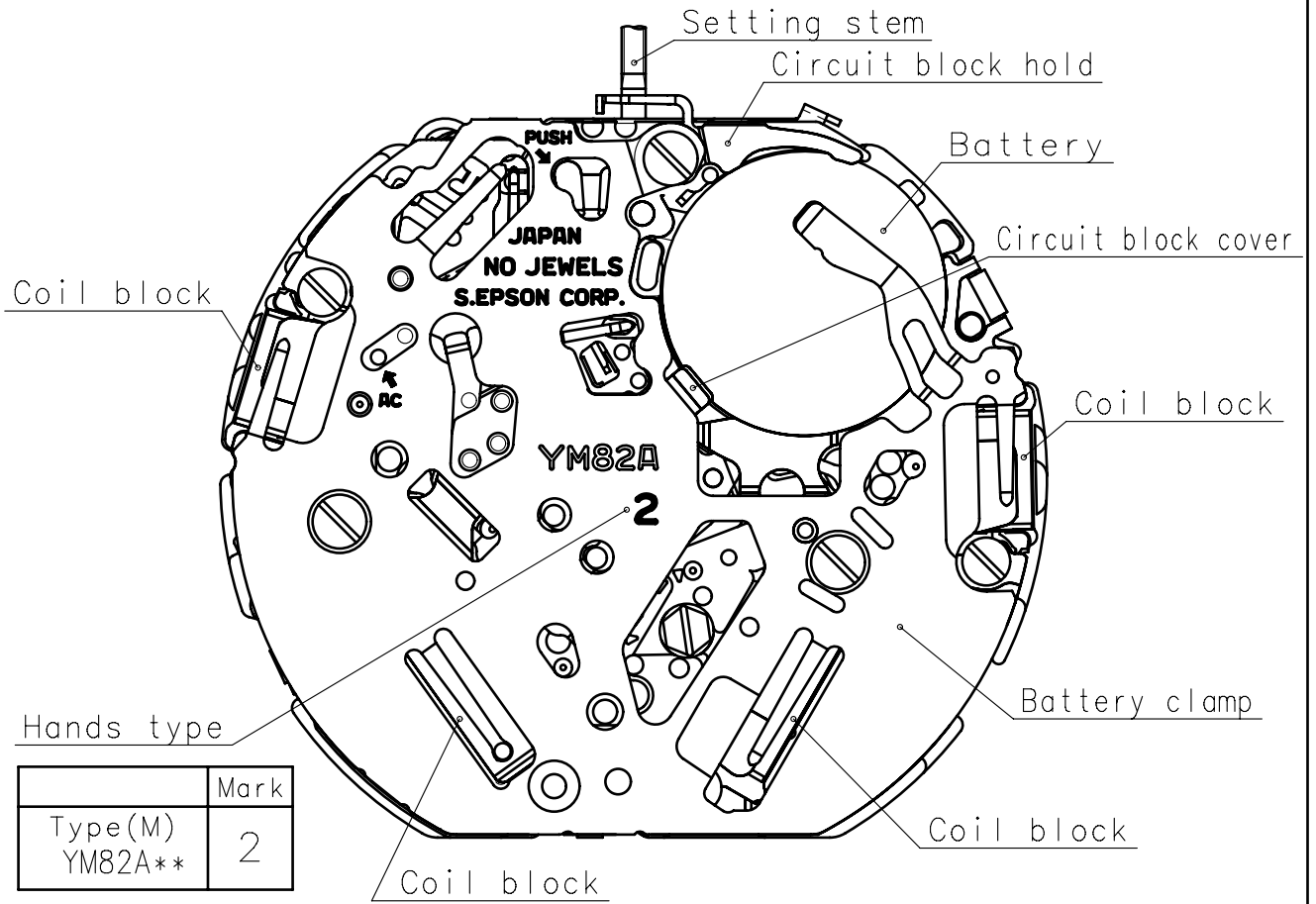
Type / Size	Silver oxide battery / $\phi$ 9.5mm × t 2.73mm
Recommended battery	SR927W
Nominal voltage	1.55 V
Battery life	Approx. 3 years
Driving current consumption	Approx. 0.80 $\mu$ A
Operation stopping voltage	0.9 V

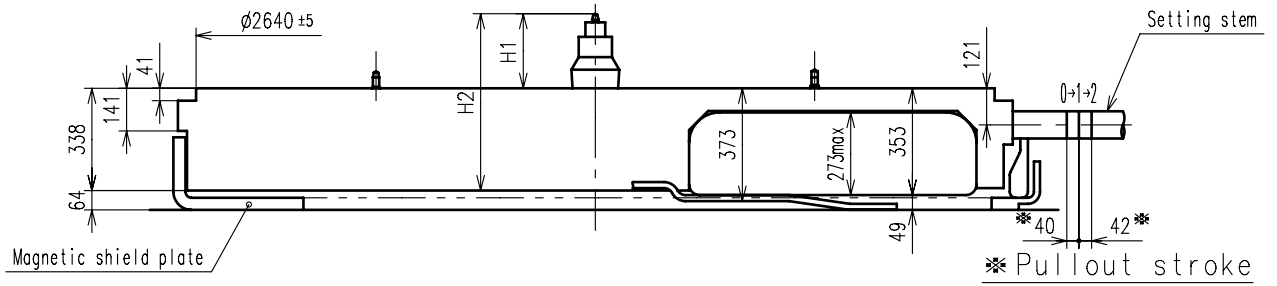
**6. SEPARATED PARTS (Parts code)**

Hand setting stem	0351584 ( $\phi$ 90) , 0351585 ( $\phi$ 90_Long) , 0351583 ( $\phi$ 80)
Magnetic shield plate	4259509
Holding ring for dial	0866650 (standard) 0866789 (special)
Battery	SR927W
A.C. comment seal	0110705

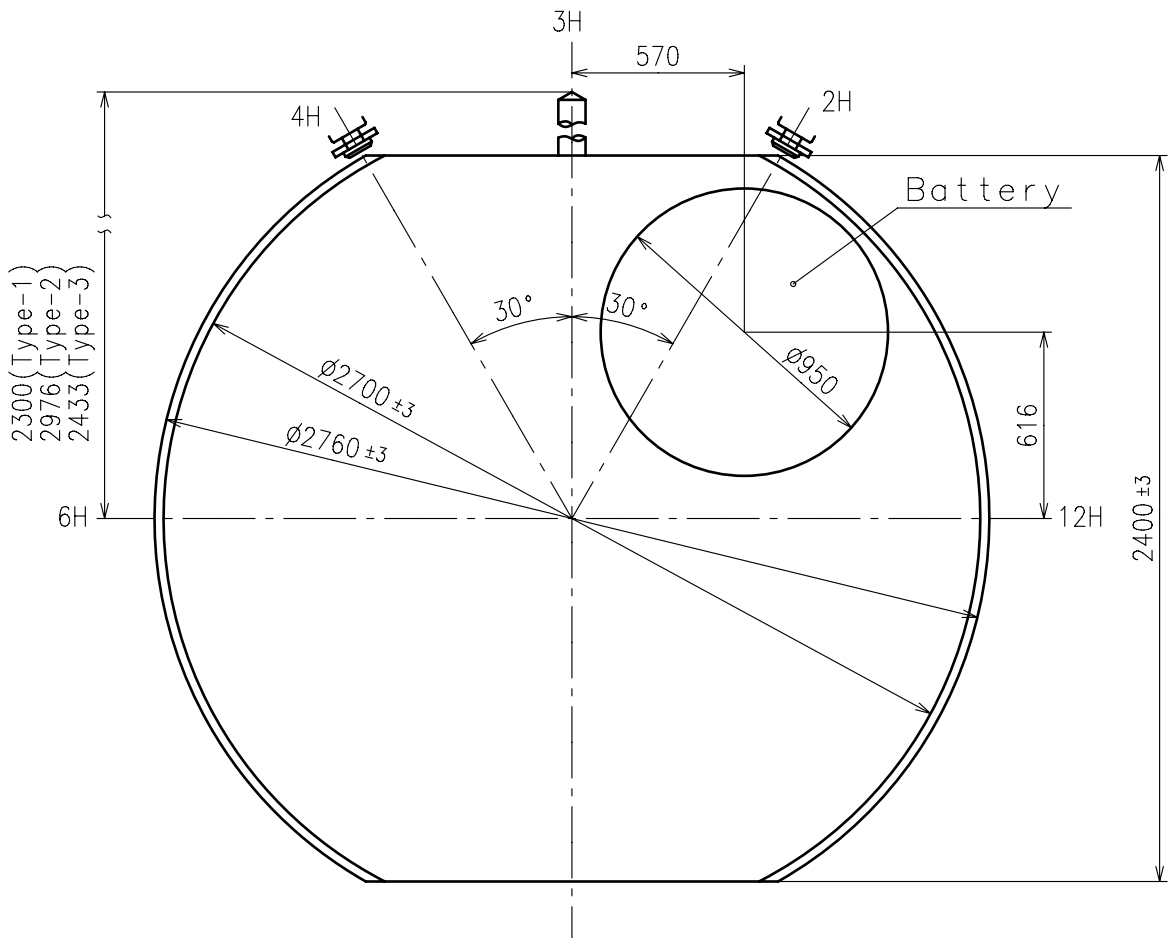
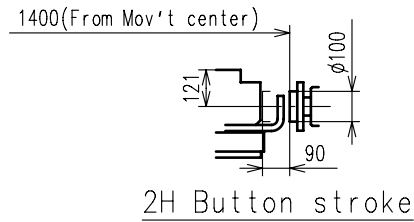
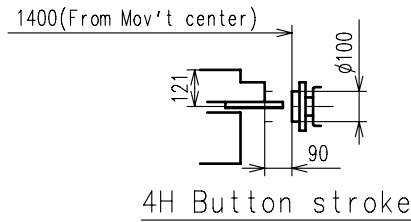
**7. TEST OF ACCURACY**

Equipment to be used	SEIKO quartz tester QT-99, QT2100 Greiner quartz timer-C , Witschi Q-tester 4000
Duration of measurement	10 seconds
Microphone to be used	Electromagnetic detection type





Center post		Type M (2) YM82A**
Maximum height from dial support	H1	246.5
Total height incl. movement	H2	584.5

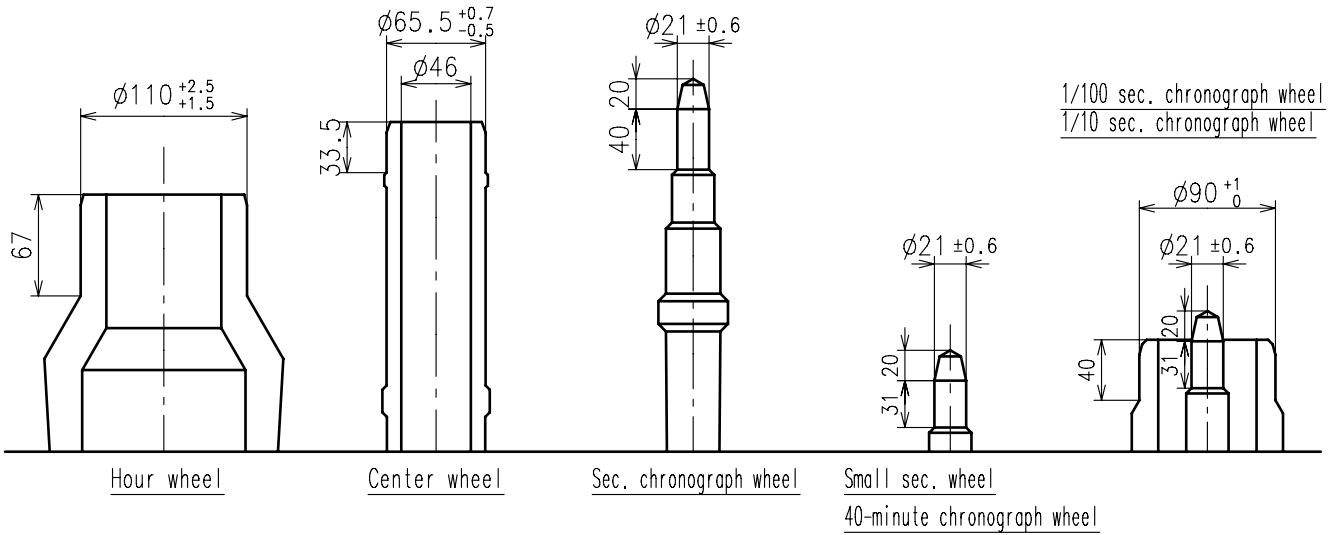


※ Unbalance

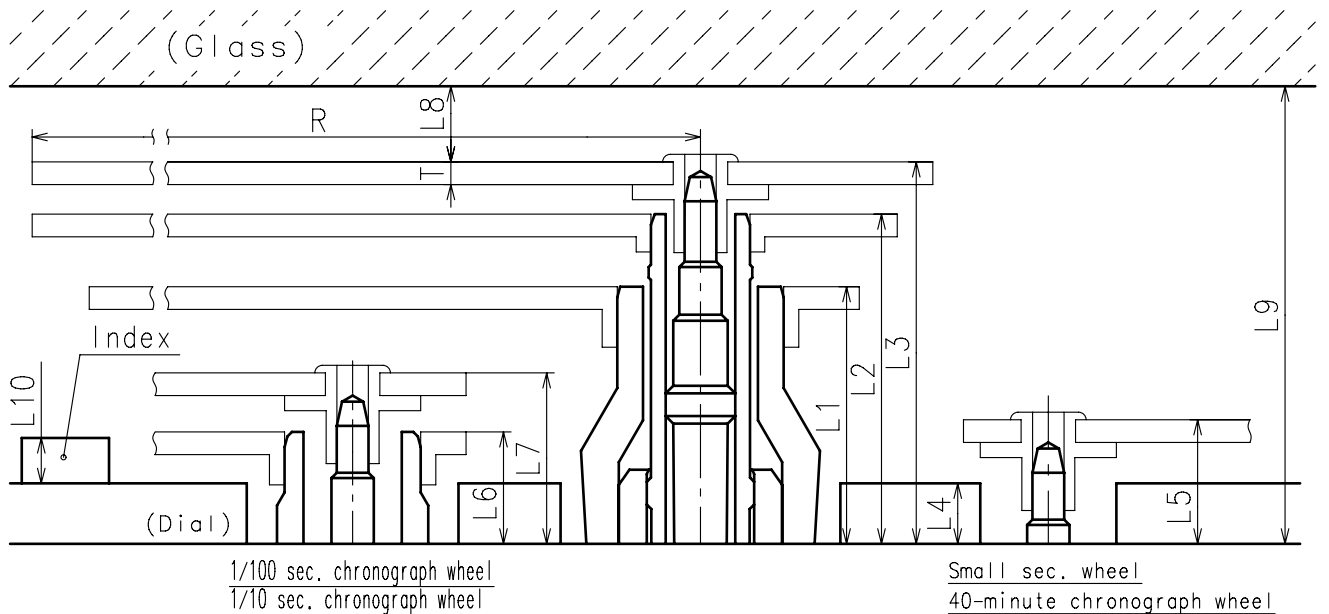
- Small sec. hand  $\leq 0.03\mu\text{N}\cdot\text{m}$  (  $3\mu\text{g}\cdot\text{m}$  )
- 1/100 sec. chronograph hand  $\leq 0.005\mu\text{N}\cdot\text{m}$  (  $0.5\mu\text{g}\cdot\text{m}$  )
- 1/10 sec. chronograph hand  $\leq 0.025\mu\text{N}\cdot\text{m}$  (  $2.5\mu\text{g}\cdot\text{m}$  )
- 40-minute chronograph hand  $\leq 0.03\mu\text{N}\cdot\text{m}$  (  $3\mu\text{g}\cdot\text{m}$  )
- Sec. chronograph hand  $\leq 0.06\mu\text{N}\cdot\text{m}$  (  $6\mu\text{g}\cdot\text{m}$  )
- Minute hand  $\leq 0.70\mu\text{N}\cdot\text{m}$  (  $70\mu\text{g}\cdot\text{m}$  )

※ Moment of inertia

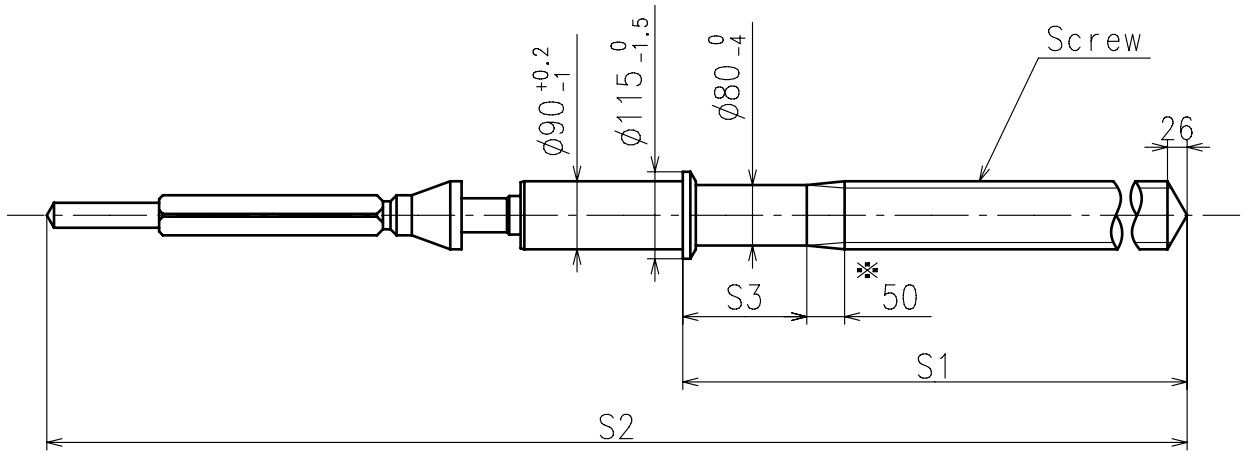
- Sec. chronograph hand  $\leq 0.2\mu\text{g}\cdot\text{m}^2$



	Parts No.						
	Hour wheel	Center wheel	Sec. chronograph wheel	Small sec. wheel	40-minute chronograph wheel	1/100 sec. chronograph wheel	1/10 sec. chronograph wheel
Type M (2) YM82A**	0271588	0221583	0888582	0240580	0270582	0888593	0271583



	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	T	R
Type M (2) YM82A**	170	218	252.5	40	77	74	113	MIN: 50	MIN: 302.5	MAX: 50	15	MAX: 1250



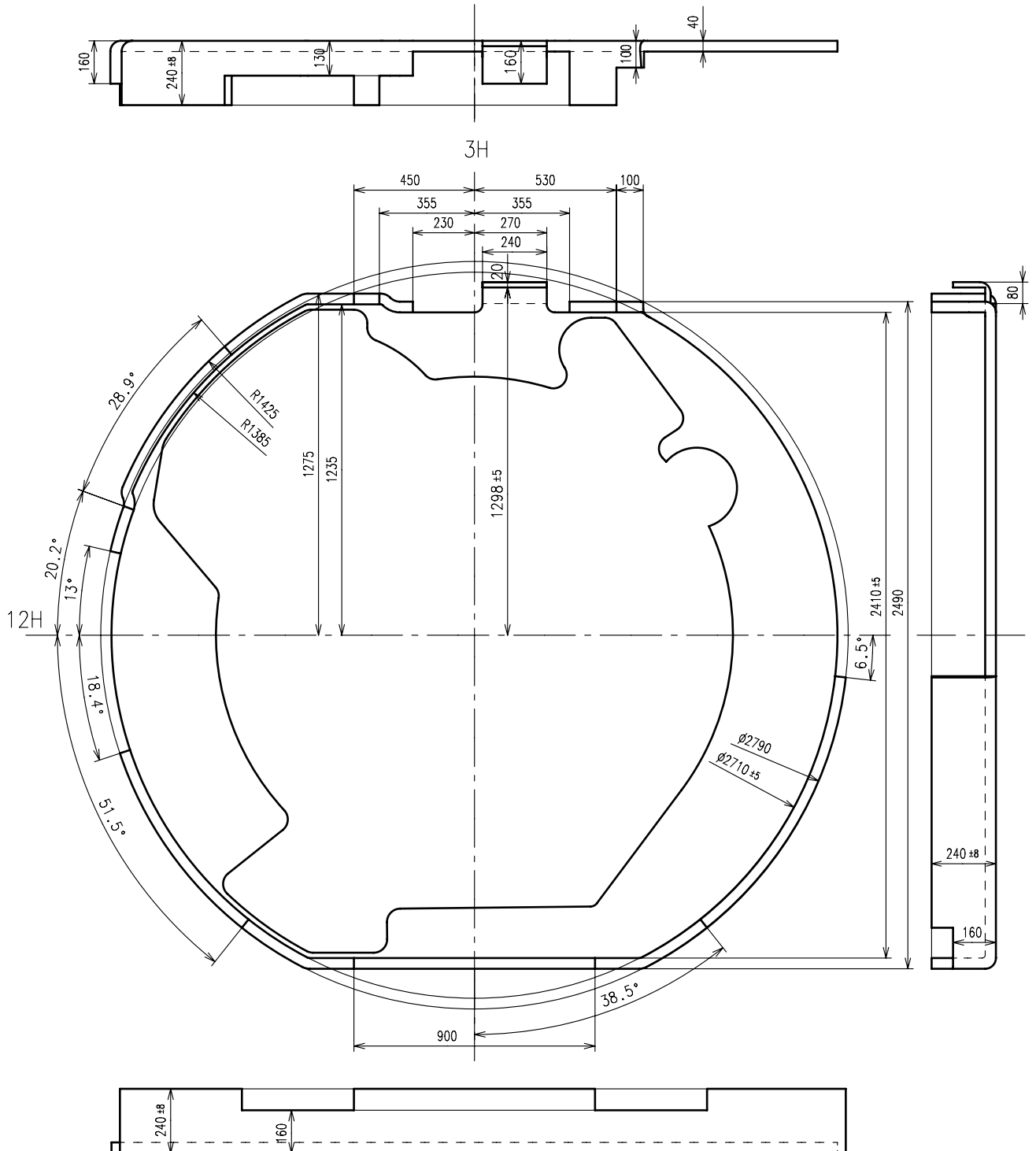
\* Not threaded

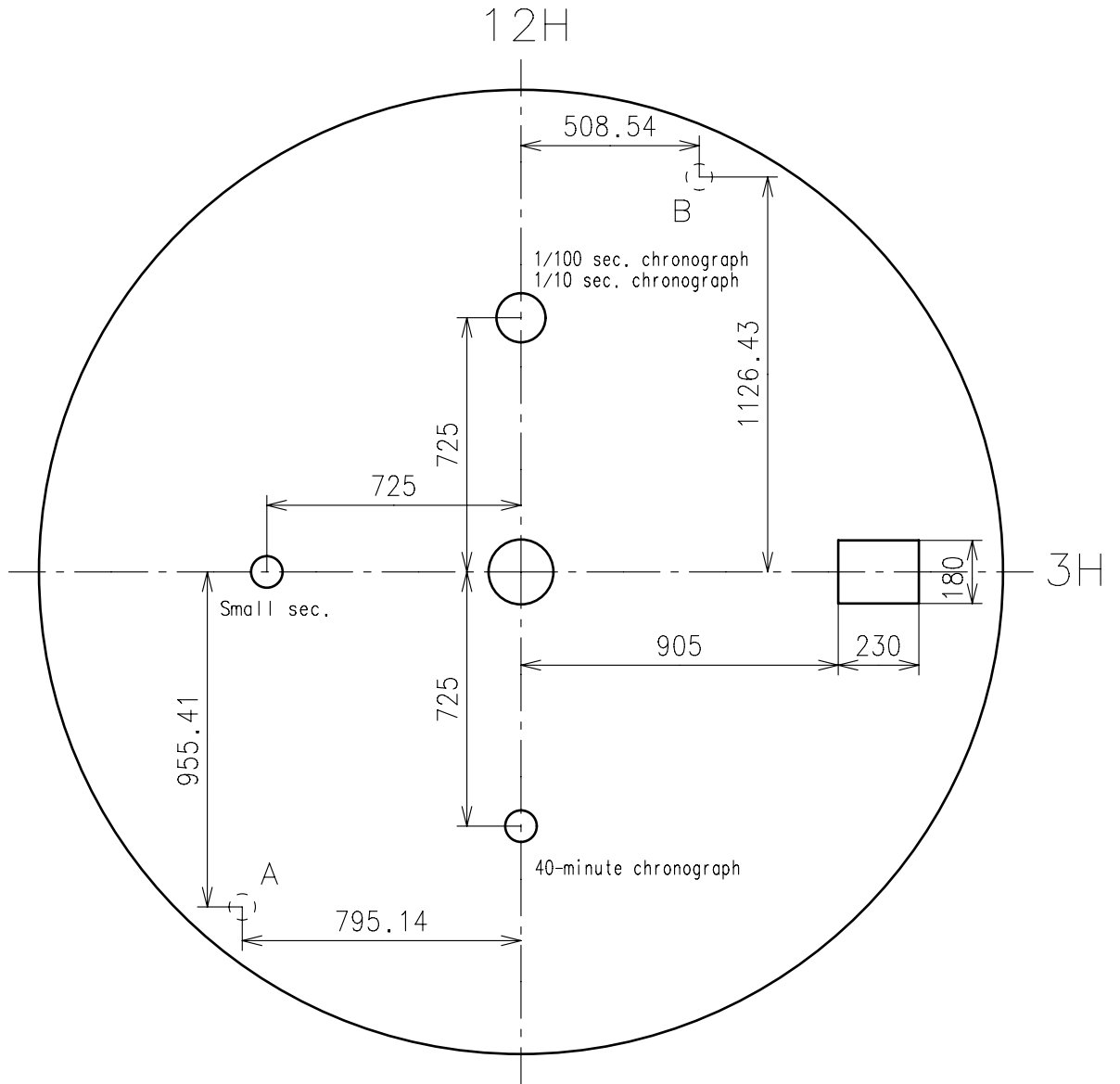
	Part No.	Screw	S1	S2	S3
Type-1 (Standard)	0351584	$\phi 90-22.5$	1164	2005.5	164
Type-2 (Long)	0351585	$\phi 90-22.5$	1840	2681.5	750
Type-3 (Standard)	0351583	$\phi 80-20$	1297	2138.5	164

Material : Steel

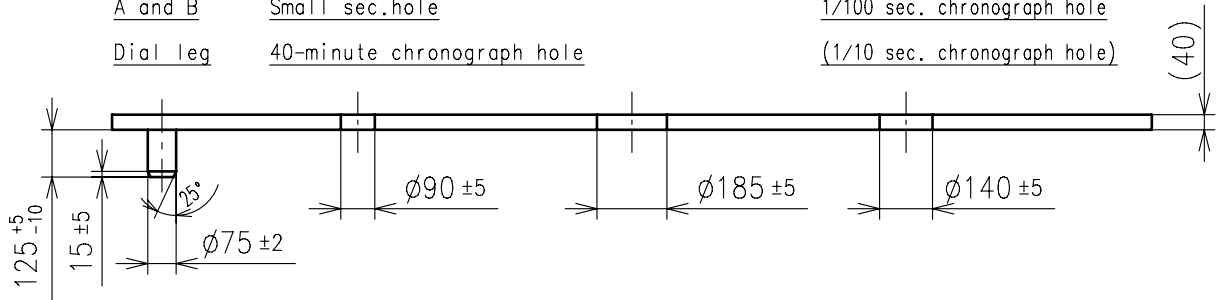
Hardness : Vickers  $600 \pm 50$

Part No. : 4259509

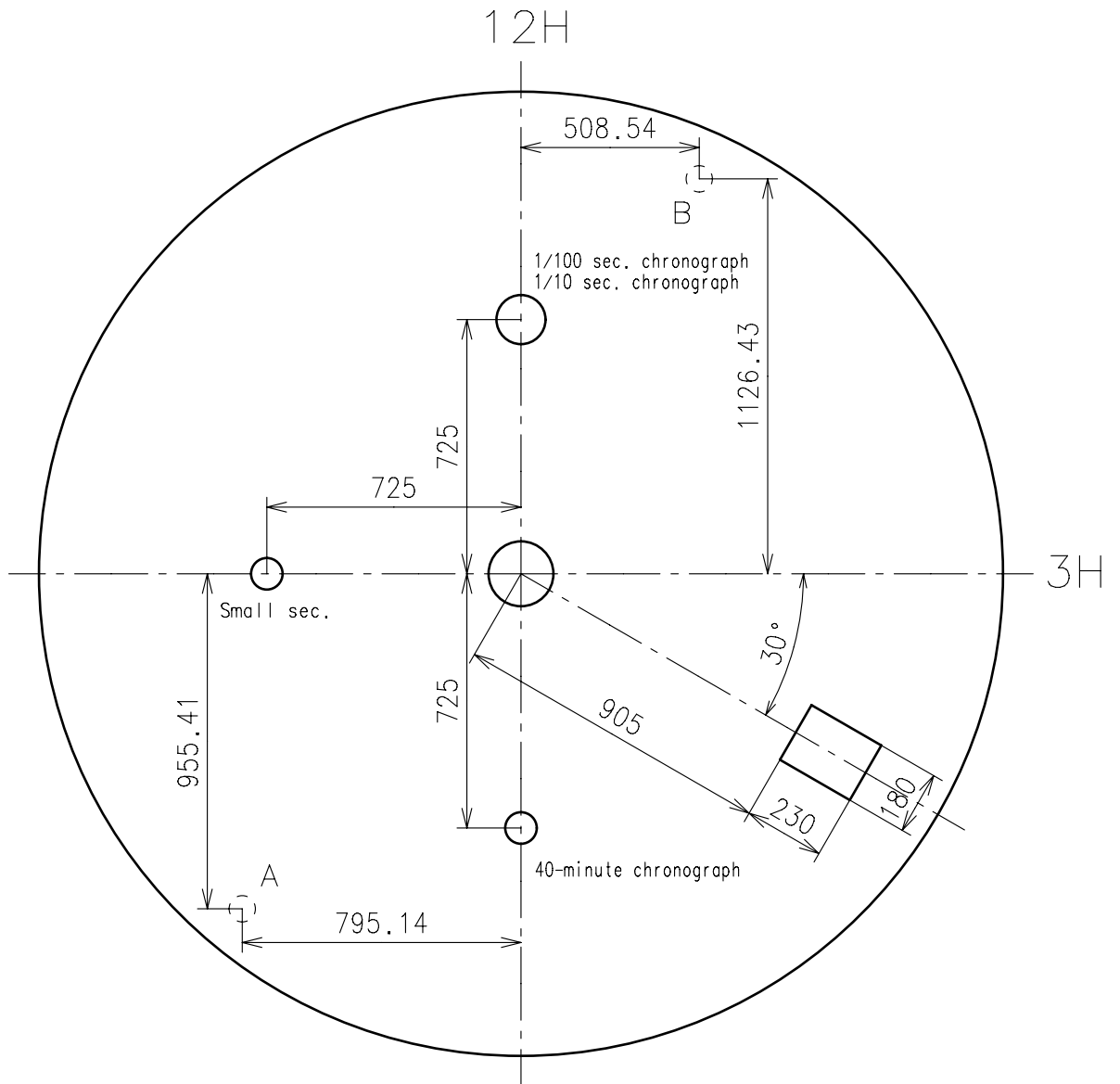




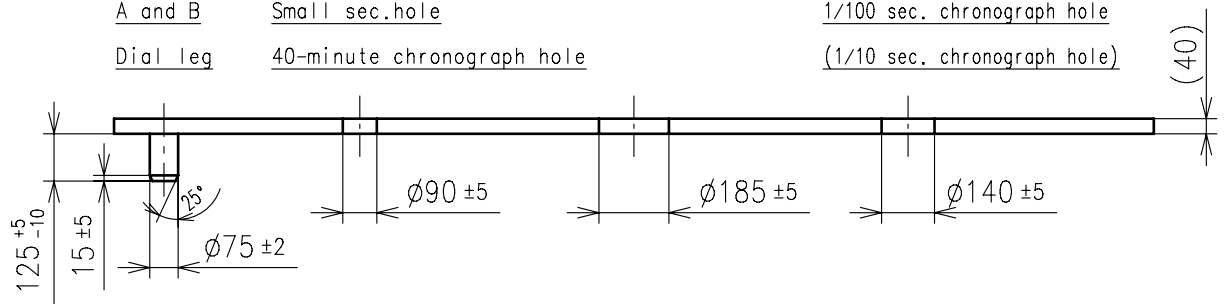
<u>A and B</u>	<u>Small sec.hole</u>	<u>1/100 sec. chronograph hole</u>
<u>Dial leg</u>	<u>40-minute chronograph hole</u>	<u>(1/10 sec. chronograph hole)</u>



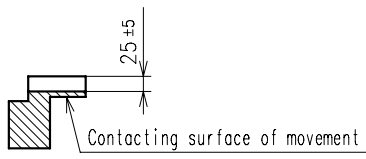
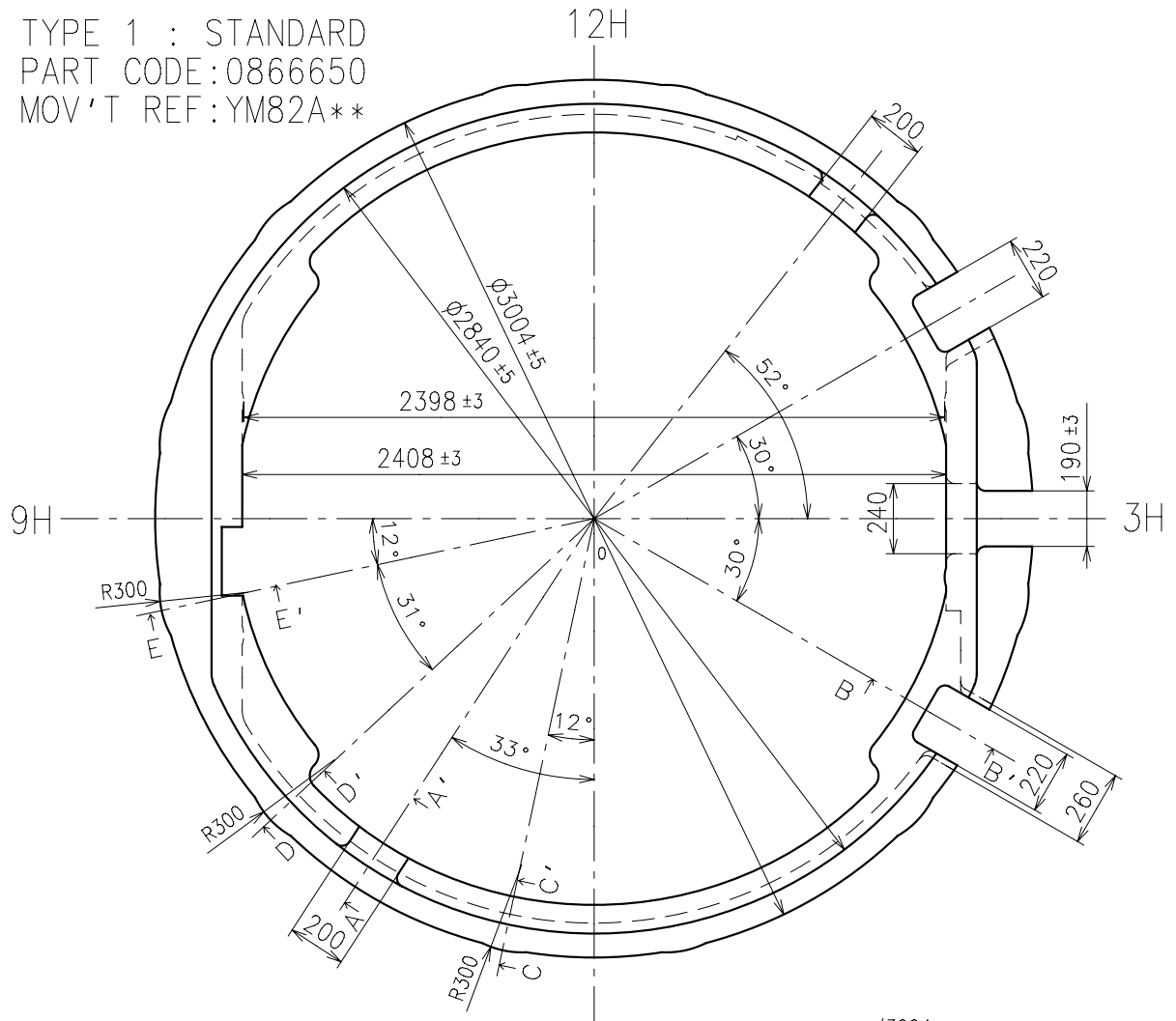




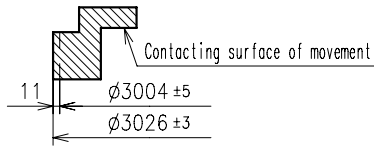
A and B      Small sec. hole      1/100 sec. chronograph hole  
 Dial leg      40-minute chronograph hole      (1/10 sec. chronograph hole)



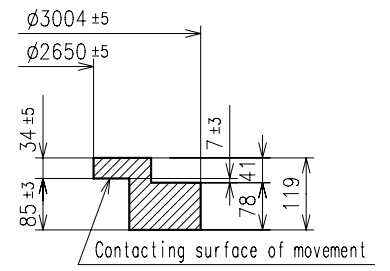
TYPE 1 : STANDARD  
PART CODE: 0866650  
MOV'T REF: YM82A\*\*



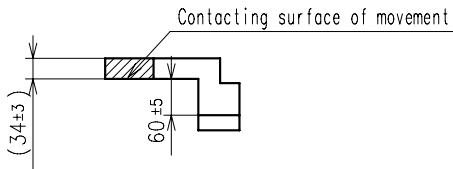
A-A' section



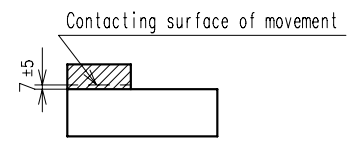
D-D' section  
E-E' section



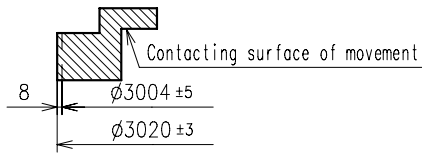
0-12H section



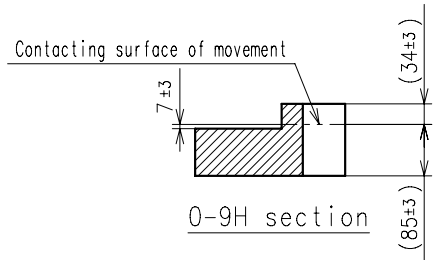
B-B' section



0-3H section

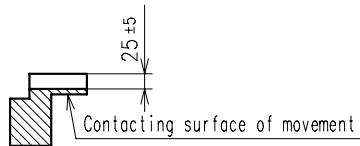
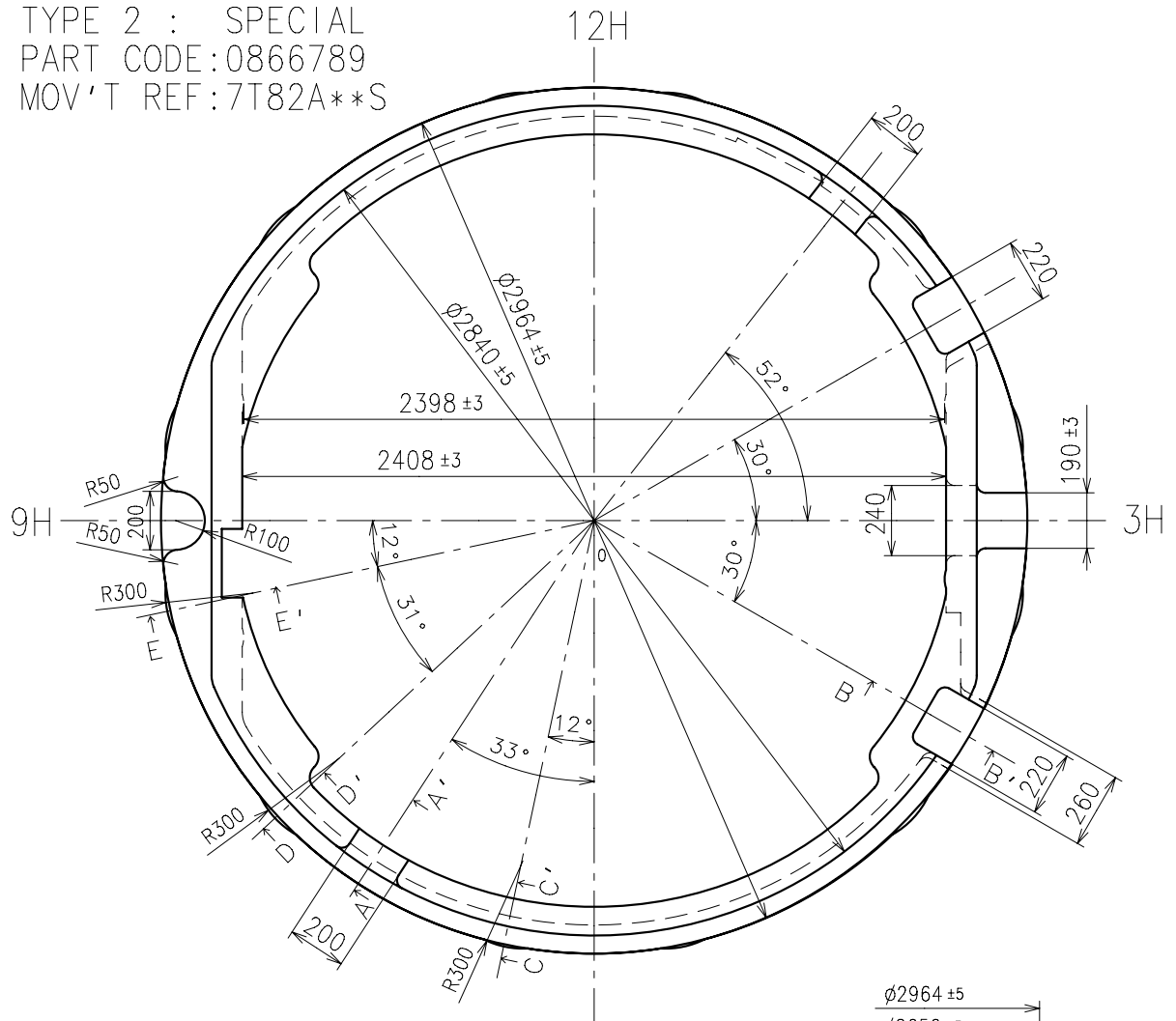


C-C' section

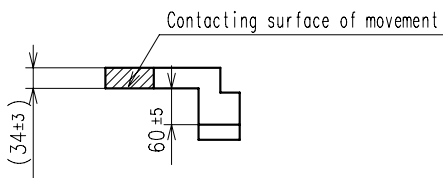


0-9H section

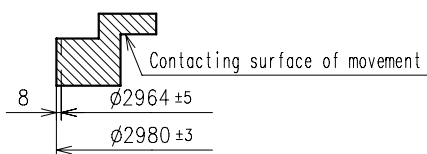
TYPE 2 : SPECIAL  
PART CODE: 0866789  
MOV'T REF: 7T82A\*\*S



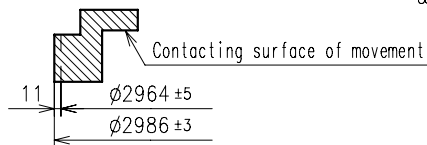
A-A' section



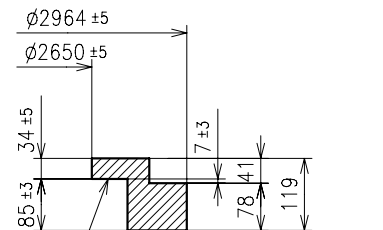
B-B' section



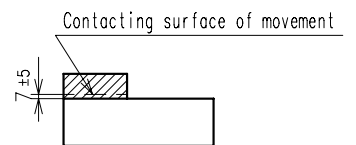
C-C' section



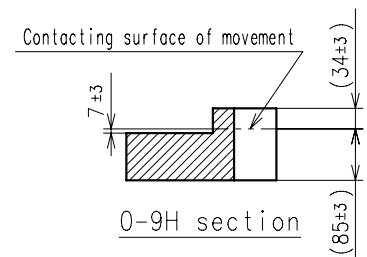
D-D' section  
E-E' section



0-12H section



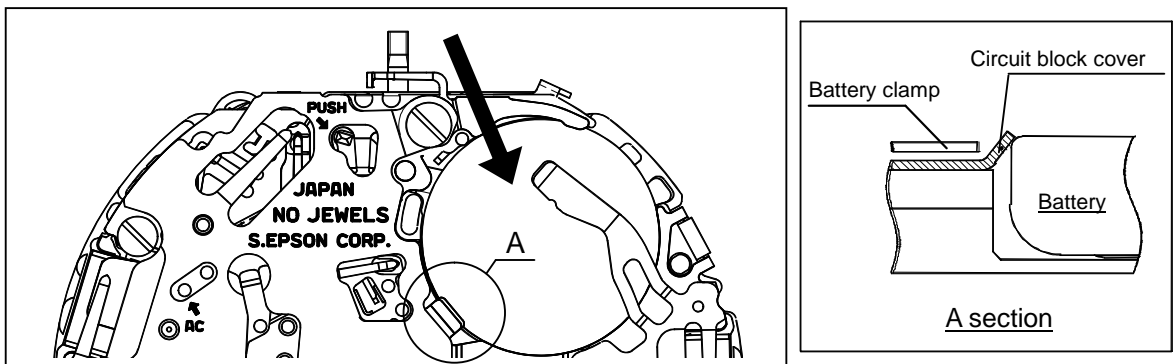
0-3H section



0-9H section

## 1.How to change the battery

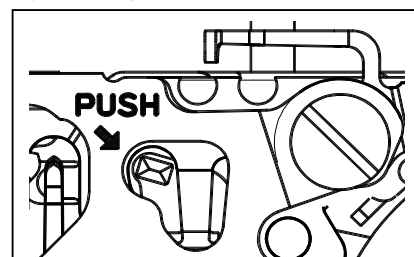
- Please use the exclusive battery to keep the stable performance for a long time.
- Please set the battery with the minus part toward the inside of the watch.
- When you assemble or change the battery, it is recommended to pull out three battery clamp screws first, and then take out the battery clamp in order not to add the damage to the movement part.
- When you assemble the battery without taking out the battery clamp, please refer to the picture in below and set the battery from the [→] direction.
- Regarding the [A] part of the following chart, it is recommended that the battery must be under the circuit holder.
- It is necessary to do system-reset. After assembling the battery, please short the circuit pattern “AC” and the battery clamp for more than 2 seconds.
- Please set the 1/10-second CG hand,1/100-second CG hand,40-minute CG hand at “0” position.



## 2.How to pull out the stem

- Please pull out the crown at 1<sup>st</sup> click and then pull out the stem while you are pressing the hollow part of the setting lever by tweezers. If the stem is not at 1<sup>st</sup> position, it is impossible to be pulled out.

(Crown pulled out at 1<sup>st</sup> click)



## 3.Attention to set each hand

- Hand moves at one-second interval. Please set the each hand at correct position according to the scale of the dial in order not to make a mistake.
- Please do not turn the hour hand forcibly.

## 4.How to take off the hand

- When you take off the hand, please use the fork-shaped exclusive tools.
- Please do not take off the dial when any hands are assembled.

## 5.How to test the accuracy

- Measure the timing with Quartz Tester in 10 seconds gate.

# YM82A Attention of casing part structure

Date: 31/Aug./'12

Rev.: 00

## 1. Minute hand

- In order not to push the minute hand too much, the second wheel have a safety stopper structure. However, please pay attention for the friction between hour hand and minute hand.

## 2. Casing ring

- Please use the exclusive casing ring to fix the movement tightly inside of the case, and to stabilize the button switching stroke. As to the shape and tolerance, please refer to the [Casing ring] page instruction.

## 3. Case

- Please use the metal case to prevent movement from being mal-functioned by static electricity.

## 4. Hour wheel

- The hour wheel is made by plastic. If you re-assemble the hour hand repeatedly, it may reduce the hand fixing torque. To keep the enough fixing torque, please do not change the hour hand more than 5 times.

## 5. Magnetic shield plate

- Please set the Anti-magnetic plate B above the movement (battery clamp) before assembling the Case back. So as to don't mistake assembling direction, please refer to the [Magnetic shield plate] page instruction.

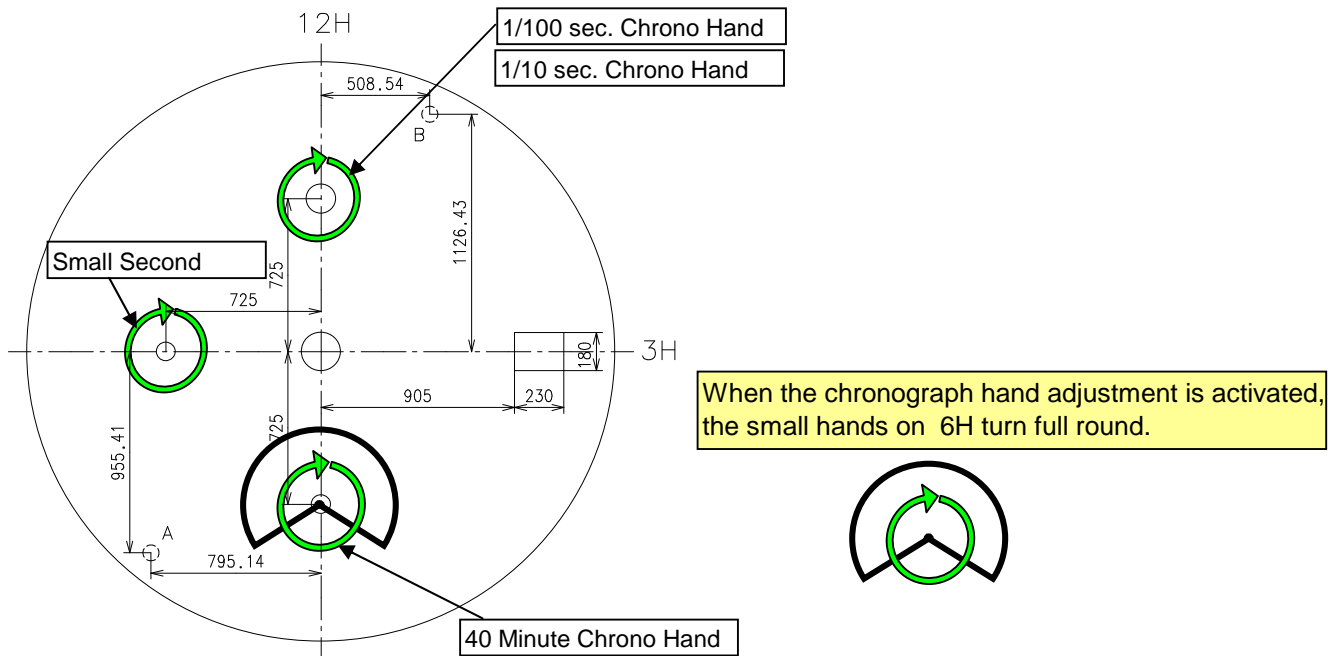
## 6.A.C. comment seal

- Please attach the A.C. comment seal to the center of the Case back.

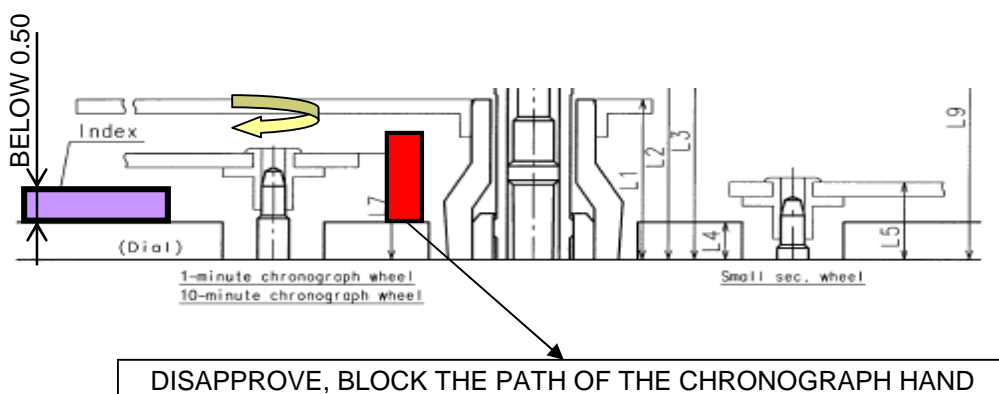
# YM82A Attention of dial design

## 1.The index design of chronograph hands

- When the chronograph function is activated, the chronograph hands of YM82 on 6H have a 240 degree of movement.
  - When the chronograph hand position adjustment is activated, the chronograph hands on 6H turn full round.
- Therefore, the index must be designed on the assumption that the chronograph hands turn full round.

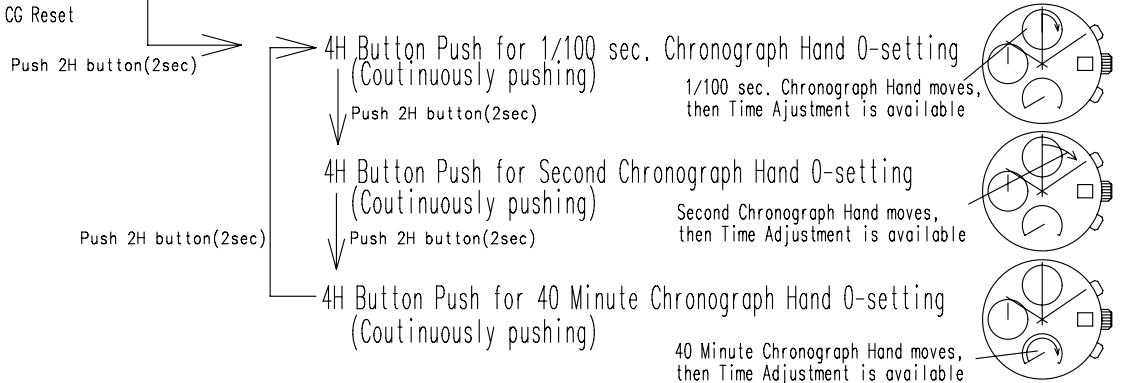
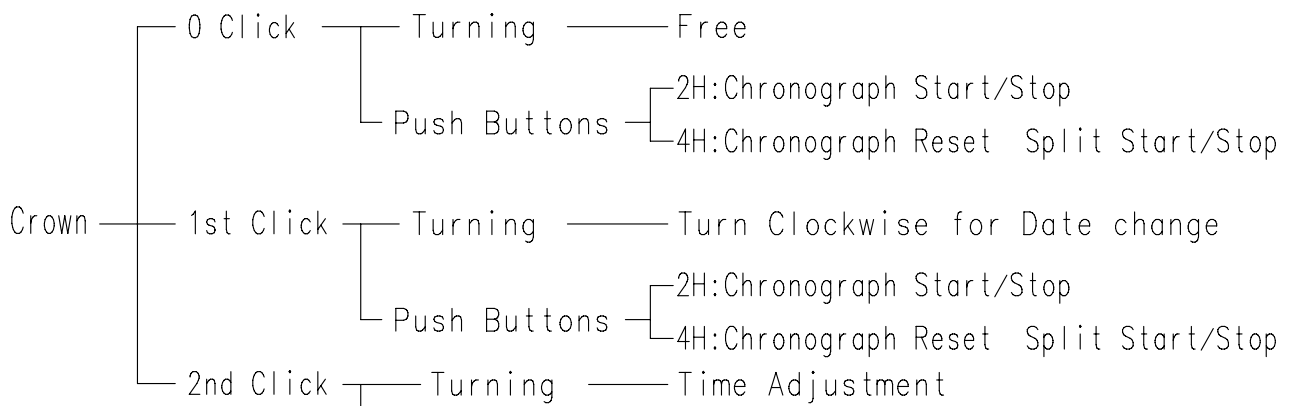
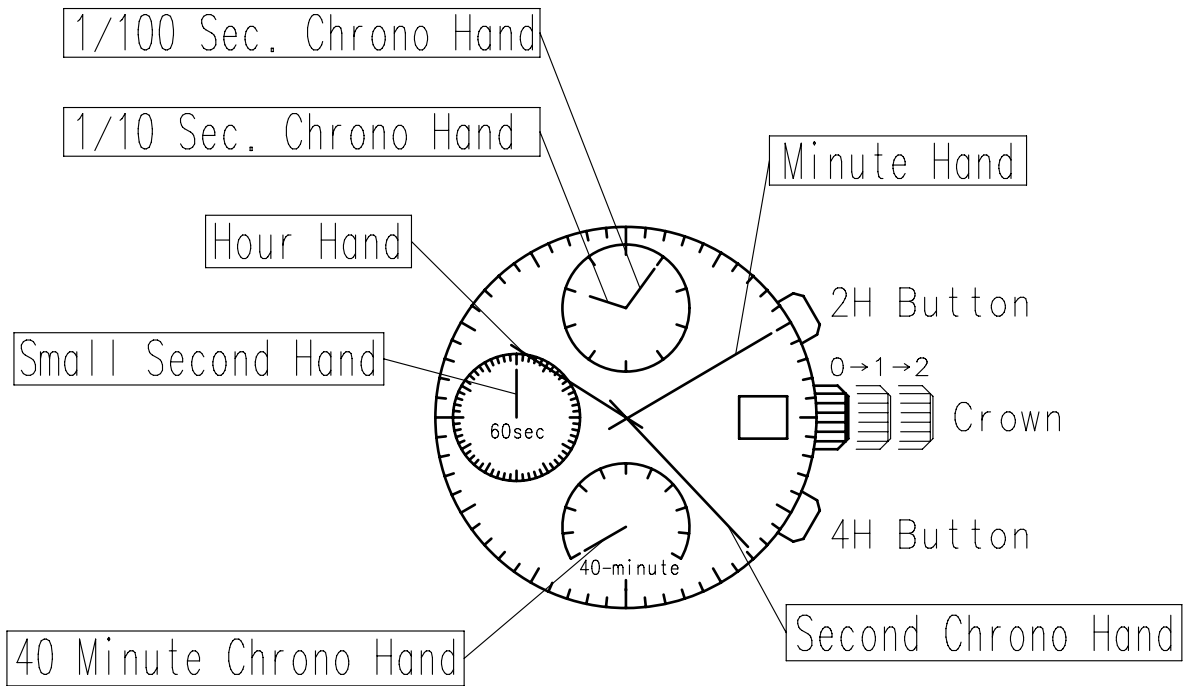


**The Dial index must be designed as the chronograph hands turn full round without any blocks.**



## 2.The start point of chronograph hands

- The start position of the chronograph hand can set on any position in the range of 360 degree.
- When the chronograph function is activated, 40 minute chronograph hand will move 240 degree from the point of start.

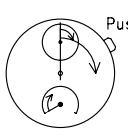
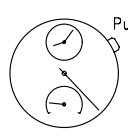
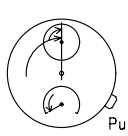
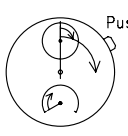
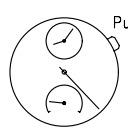
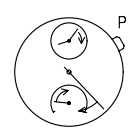
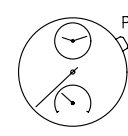
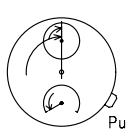
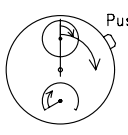
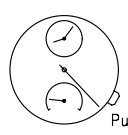
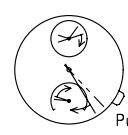
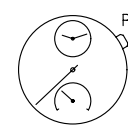
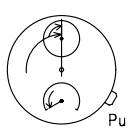


At 2nd click position, system-reset is possible by pushing the 2H button and 4H button for more than 2 seconds simultaneously.

Hands behavior demonstration

If crown is at normal position, press 4H button more than 3 seconds.

1/100CG, 1/10CG, 40 minuteCG and second CG hand show 3 seconds quick demo.

Chronograph Operation (Crown 0-Click)					
Total Time	START	STOP			RESET
					
Accumulated Time	START	STOP	RESTART	STOP	RESET
					
Split Time	START	SPLIT	SPLIT RELEASE	STOP	RESET
					

1) 1/100sec, 1/10sec chrono hands stop running after 3 minutes.  
(inside mechanism continues calculating)

2) If the 40 minutes chronograph count up and reaches 41 minute,  
the CG hand returns to 1 minute position.

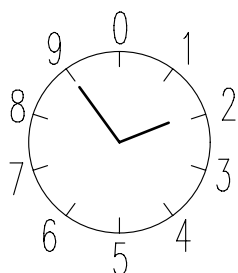
3) Chronograph hand stop running after 120 minutes. when the  
chronograph count up 120 minute, each hand stops at following  
position.

1/100, 1/10sec. CG hand : Stop at 0 position

Second CG hand : Stop at 0 position

40 minutes CG hand : Stop at 40 minutes position

4) How to read 1/100 CG measuring result.



The left side picture shows 19/100 sec.