



Cal. YM87A

ϕ 27.0 mm
H 3.7 mm

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Date: 26/Dec./'11

S.EPSON Products

CAL. YM87A

Analog Quartz 12" Yacht Timer Movement

1. MOVEMENT DIMENSIONS

Outside diameter	ϕ 27.60mm(12H-6H) × 24.00mm(3H-9H)
Casing diameter	ϕ 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 / Center hand
Small hands	Mode hand (6H) / Small second hand (9H)
	Small watch hour and minute hands (12H)
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 / Mode change
	Crown pulled out 2nd click : Time setting / Reset
	/ Small watch time setting / Hand position adjustment

4. FEATURES

Jewels	0 Jewel
Anti-magnetism	Over 1600A/m (Direct current magnetic field)
Maximum unbalance of hands	Small second hand : 0.03 μ N·m
	Mode hand and Small watch minute hand : 0.03 μ N·m
	Center hand : 0.09 μ N·m
	Minute hand : 0.70 μ N·m
Inertia of second hand's moment	Center hand : less than 0.2 μ g·m ²

5. BATTERY

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

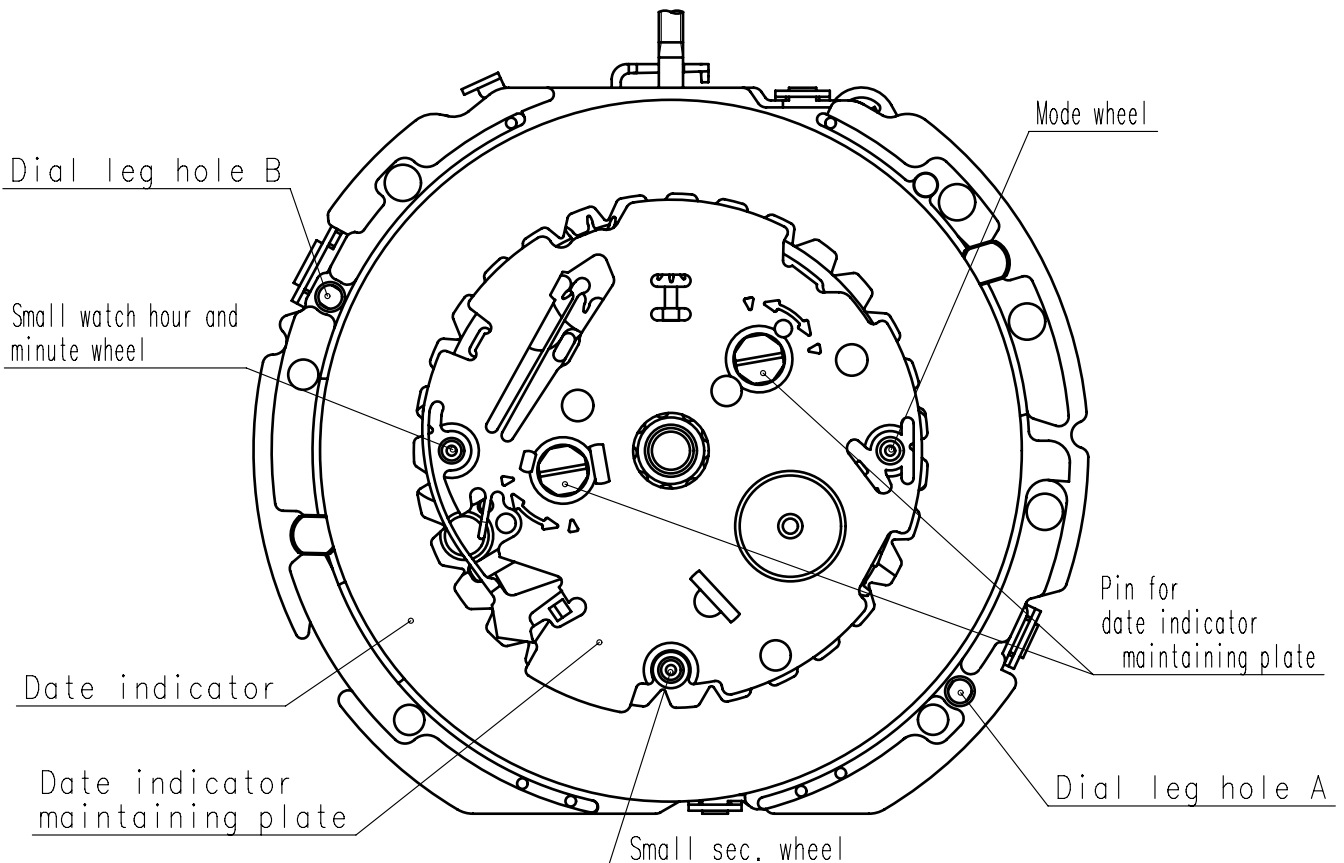
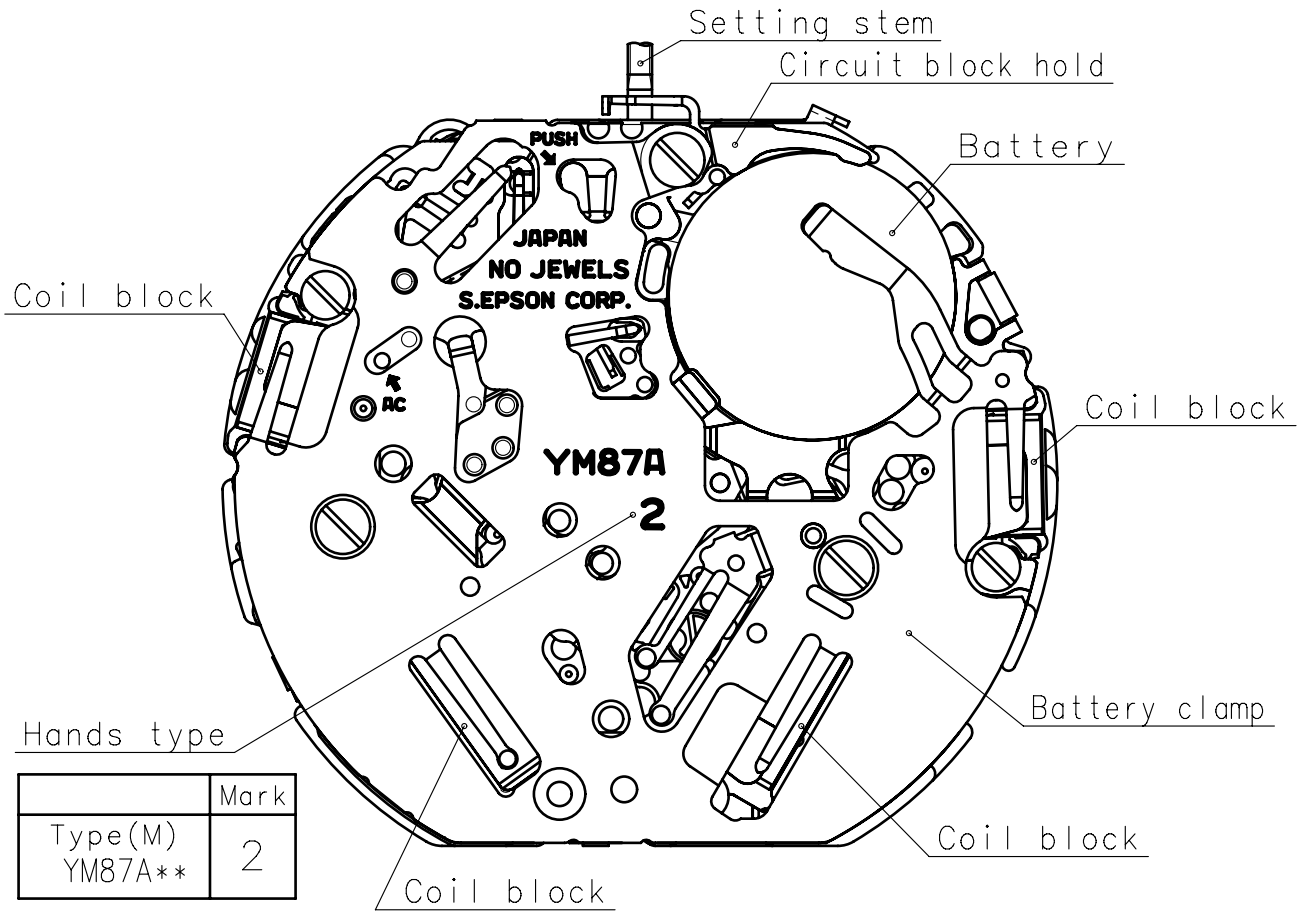
6. SEPARATED PARTS (Parts code)

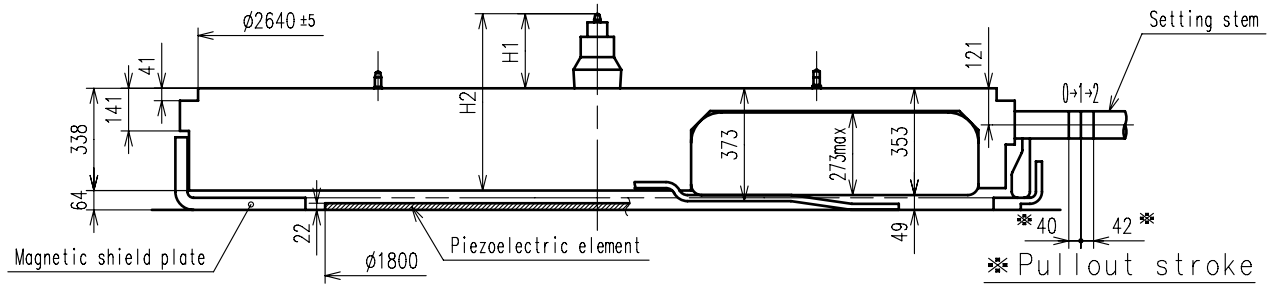
Hand setting stem	0351584 (Standard) or 0351585 (Long)
Magnetic shield plate	4259509
Holding ring for dial	0866650 (Standard) 0866789 (Special)
Battery	SR927W
Piezoelectric element	4589801
A.C. comment seal	0110705

7. TEST OF ACCURACY

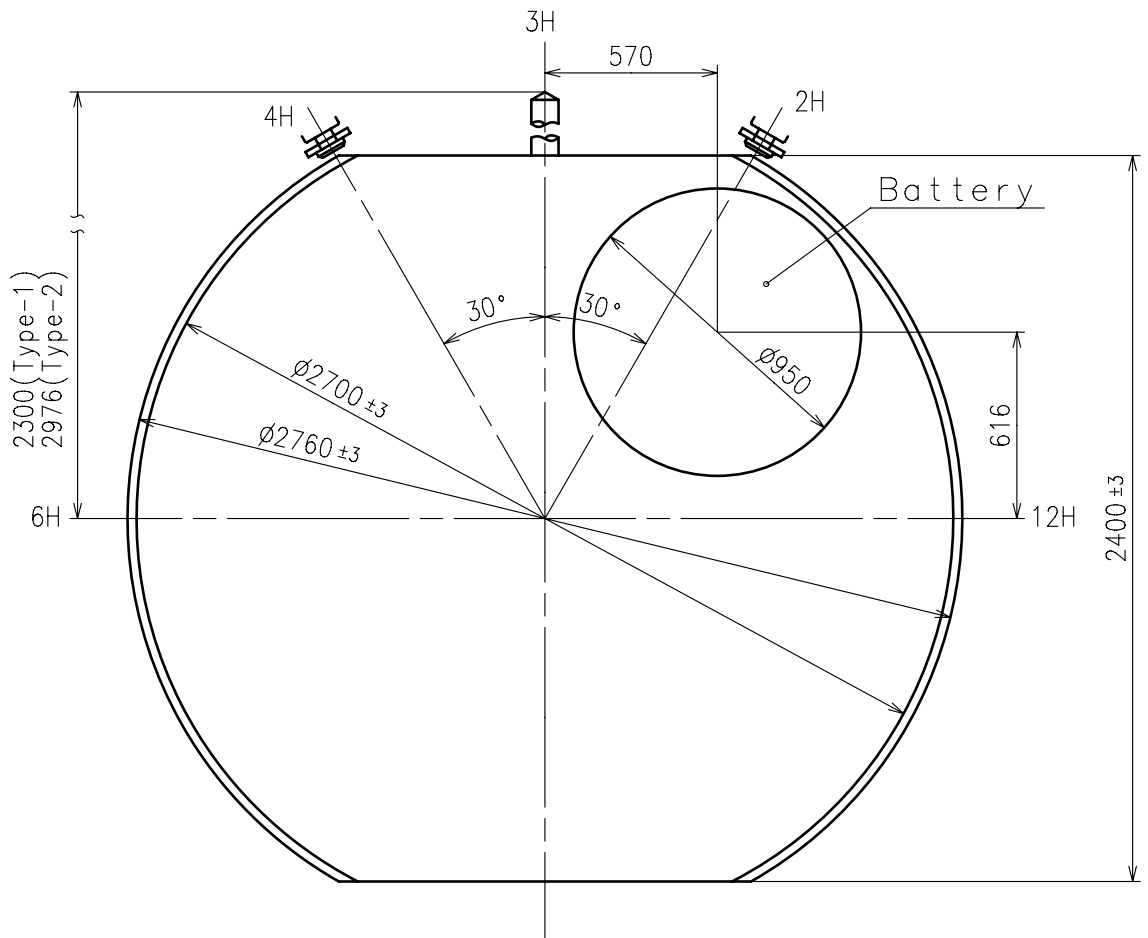
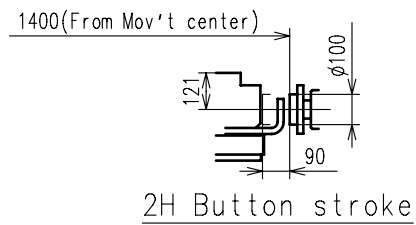
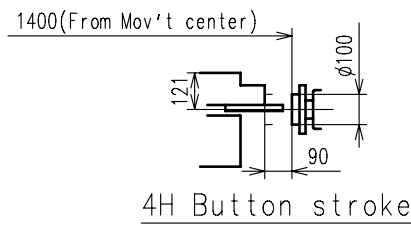
Equipment to be used	SEIKO quartz tester QT-99, QT2100 Greiner quartz timer-C , Witschi Q-tester 4000
Duration of measurement	10 seconds
Microphone to be used	Electromagnetic detection type

All specifications are subject to change without notice.





Center post		Type M (2) YM87A**
Maximum height from dial support	H1	246.5
Total height incl. movement	H2	584.5



※ Unbalance

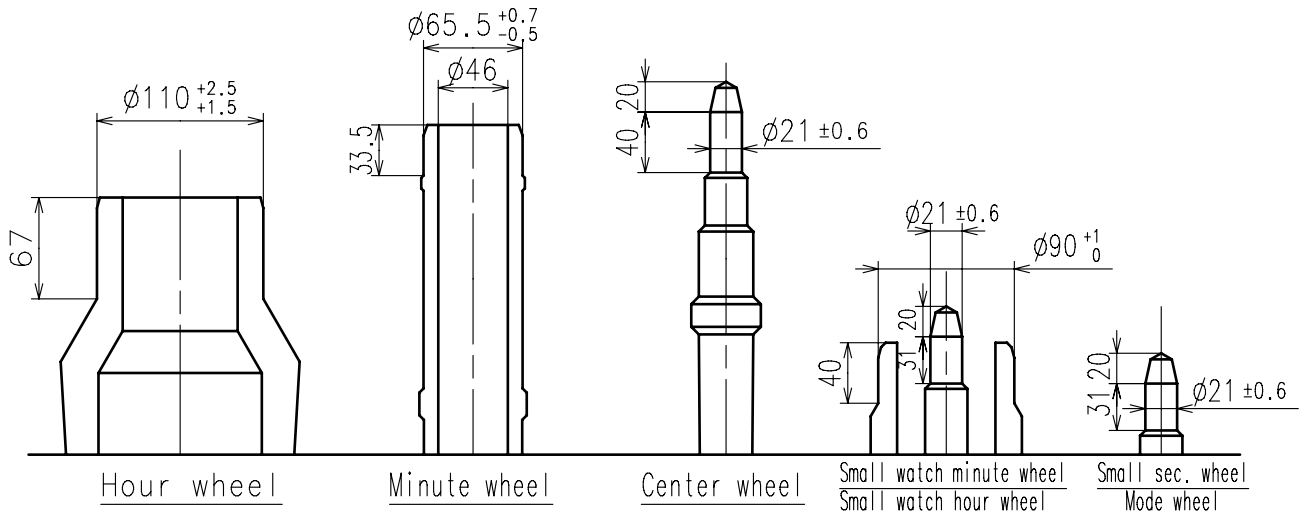
- Small sec. hand
- Small watch minute hand
- Mode hand
- Center hand
- Minute hand

- ≦ 0.03μ N·m (3μ g·m)
- ≦ 0.03μ N·m (3μ g·m)
- ≦ 0.03μ N·m (3μ g·m)
- ≦ 0.09μ N·m (9μ g·m)
- ≦ 0.70μ N·m (70μ g·m)

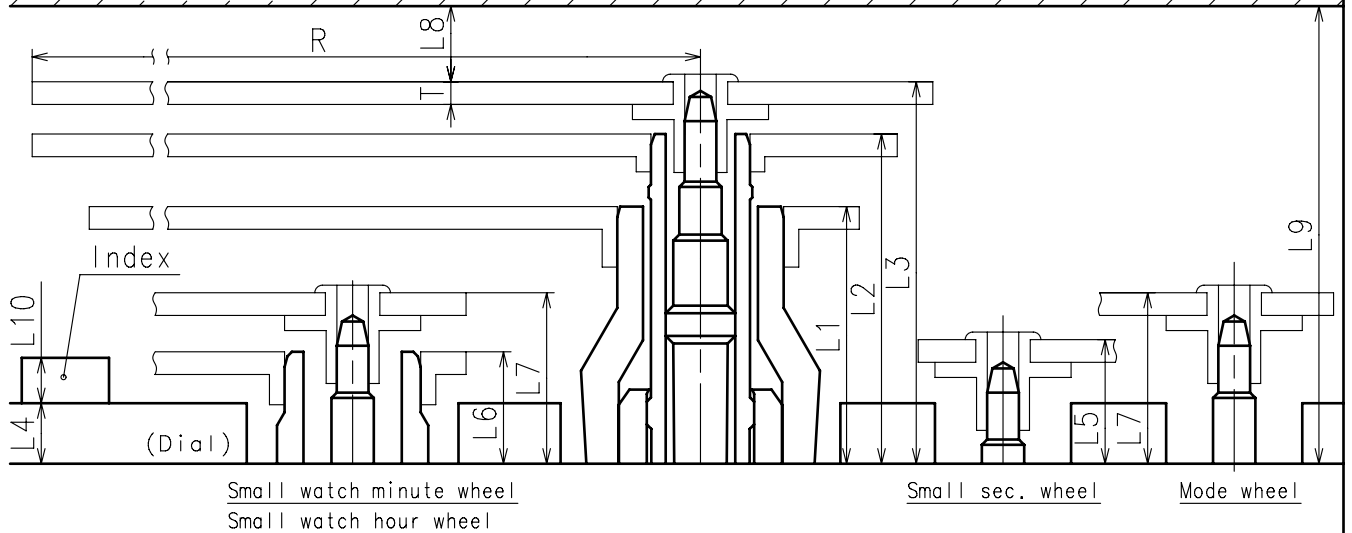
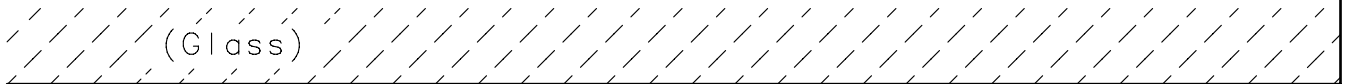
※ Moment of inertia

- Center hand

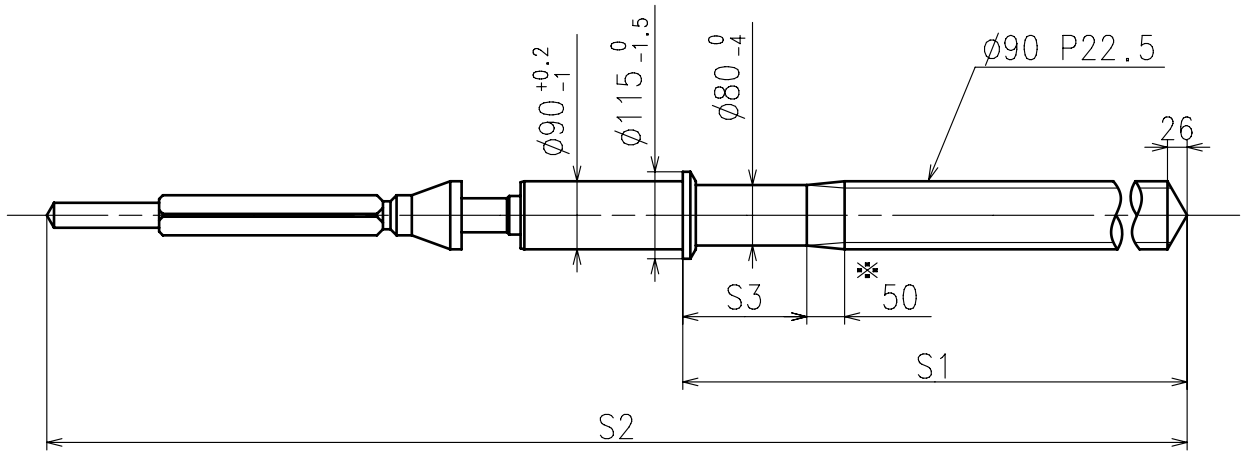
- ≦ 0.2μ g·m²



	Parts No.						
	Hour wheel	Minute wheel	Center wheel	Small watch minute wheel	Small watch hour wheel	Mode wheel	Small sec. wheel
Type M (2) YM87A**	0271588	0221583	0888582	0270582	0271583	0270582	0240580



	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	T	R
Type M (2) YM87A**	170	218	252.5	40	77	74	113	MIN: 50	MIN: 302.5	MAX: 50	15	MAX: 1250

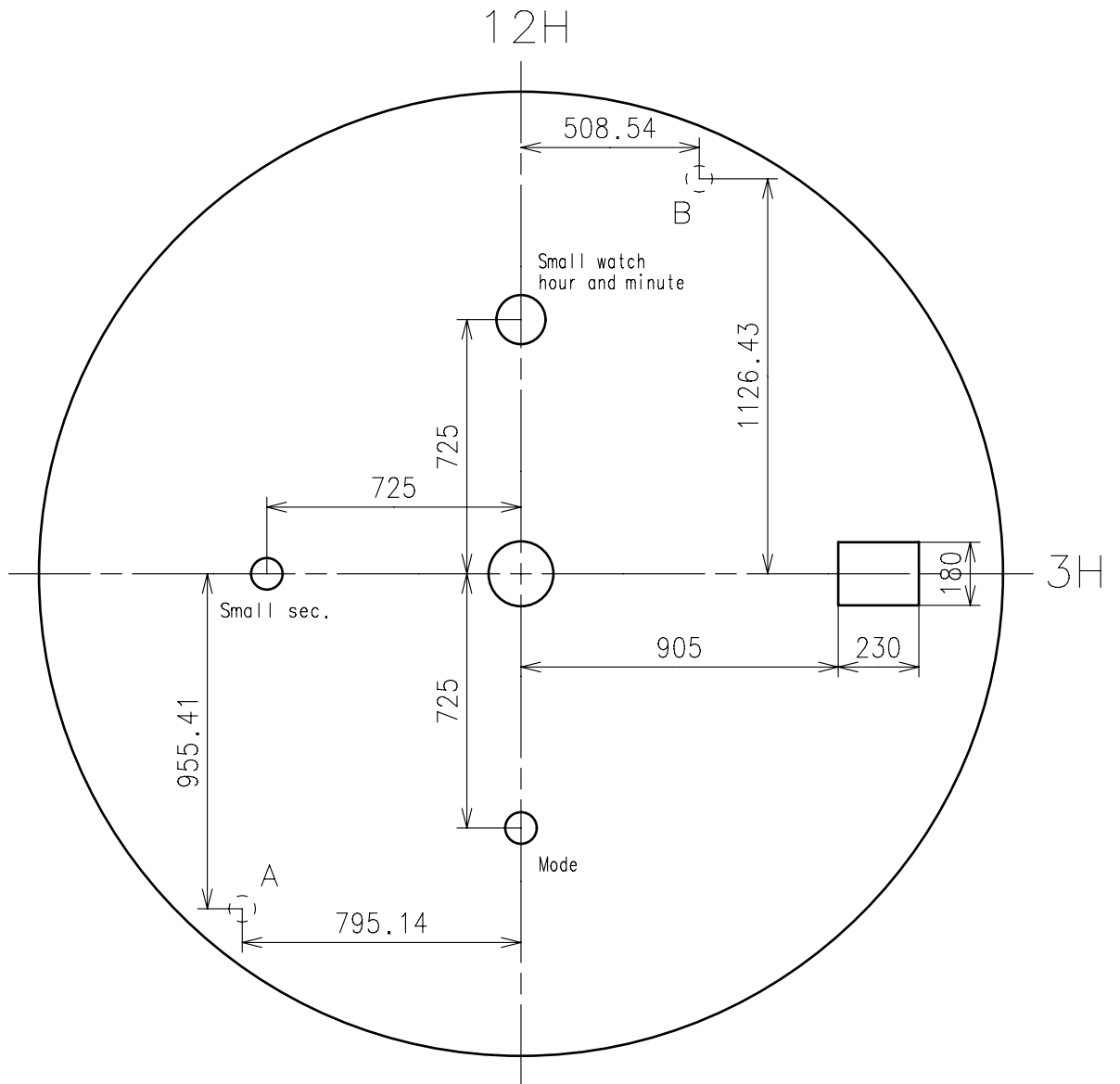


※ Not threaded

	Part No.	S1	S2	S3
Type-1 (Standard)	0351584	1164	2005.5	164
Type-2 (Long)	0351585	1840	2681.5	750

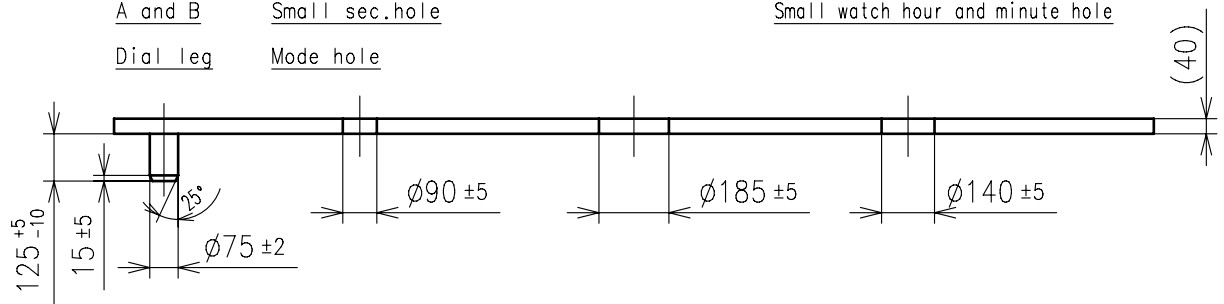
Material : Steel

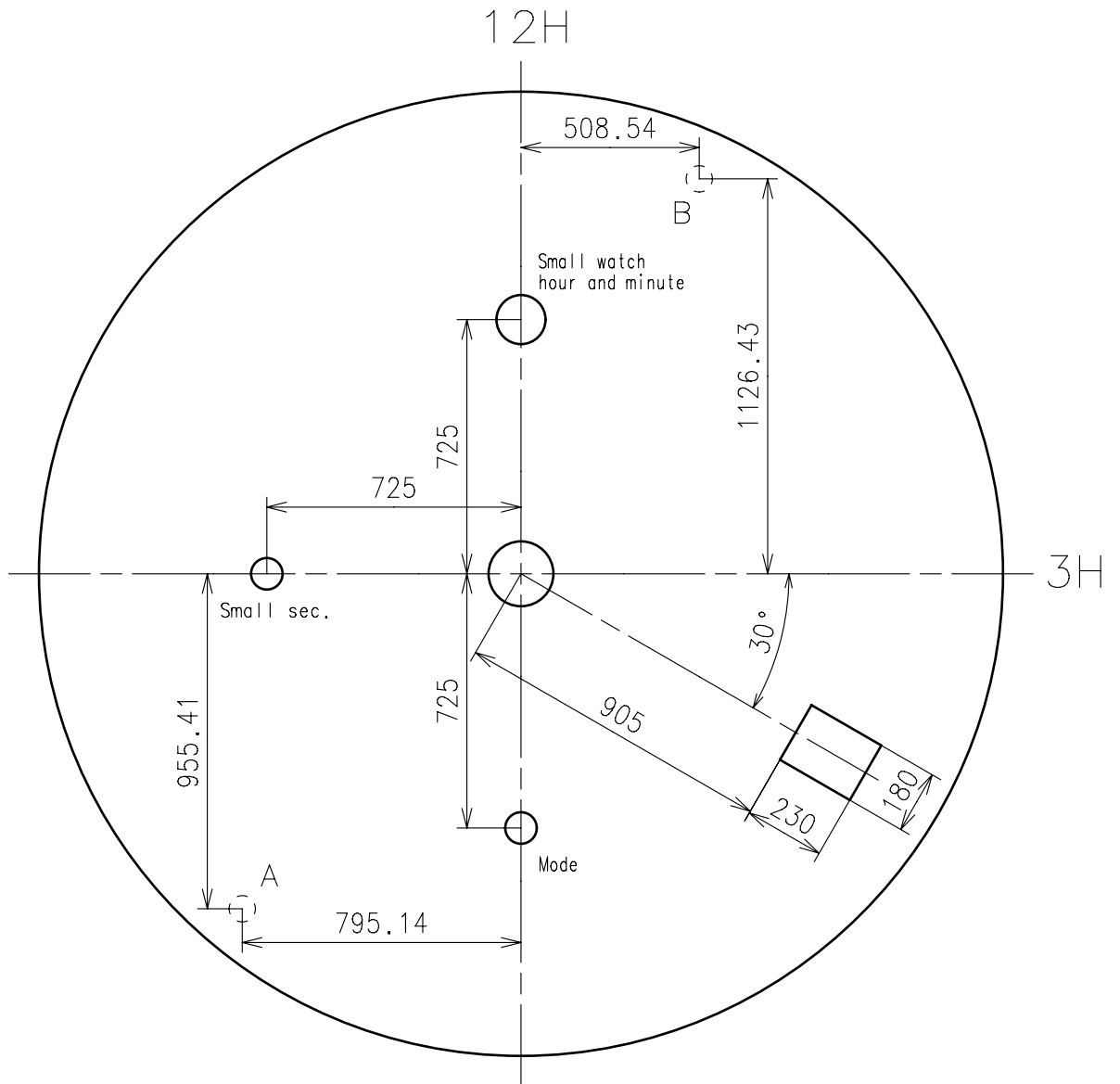
Hardness : Vickers 600 ± 50



A and B Small sec.hole
Dial leg Mode hole

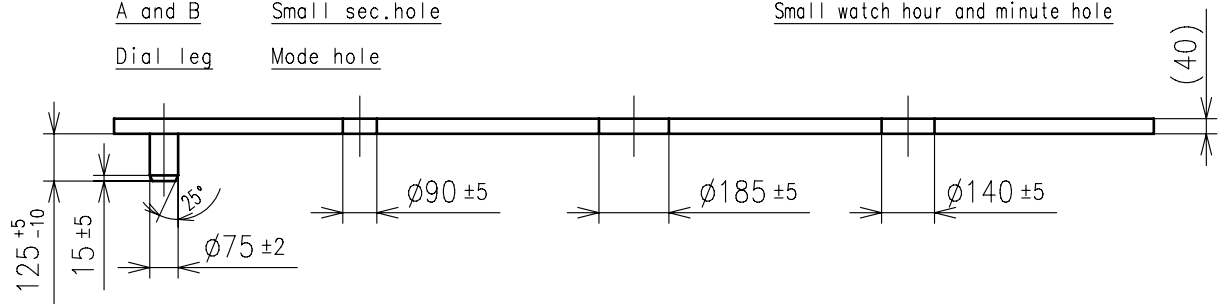
Small watch hour and minute hole



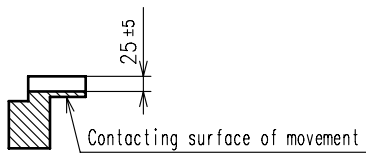
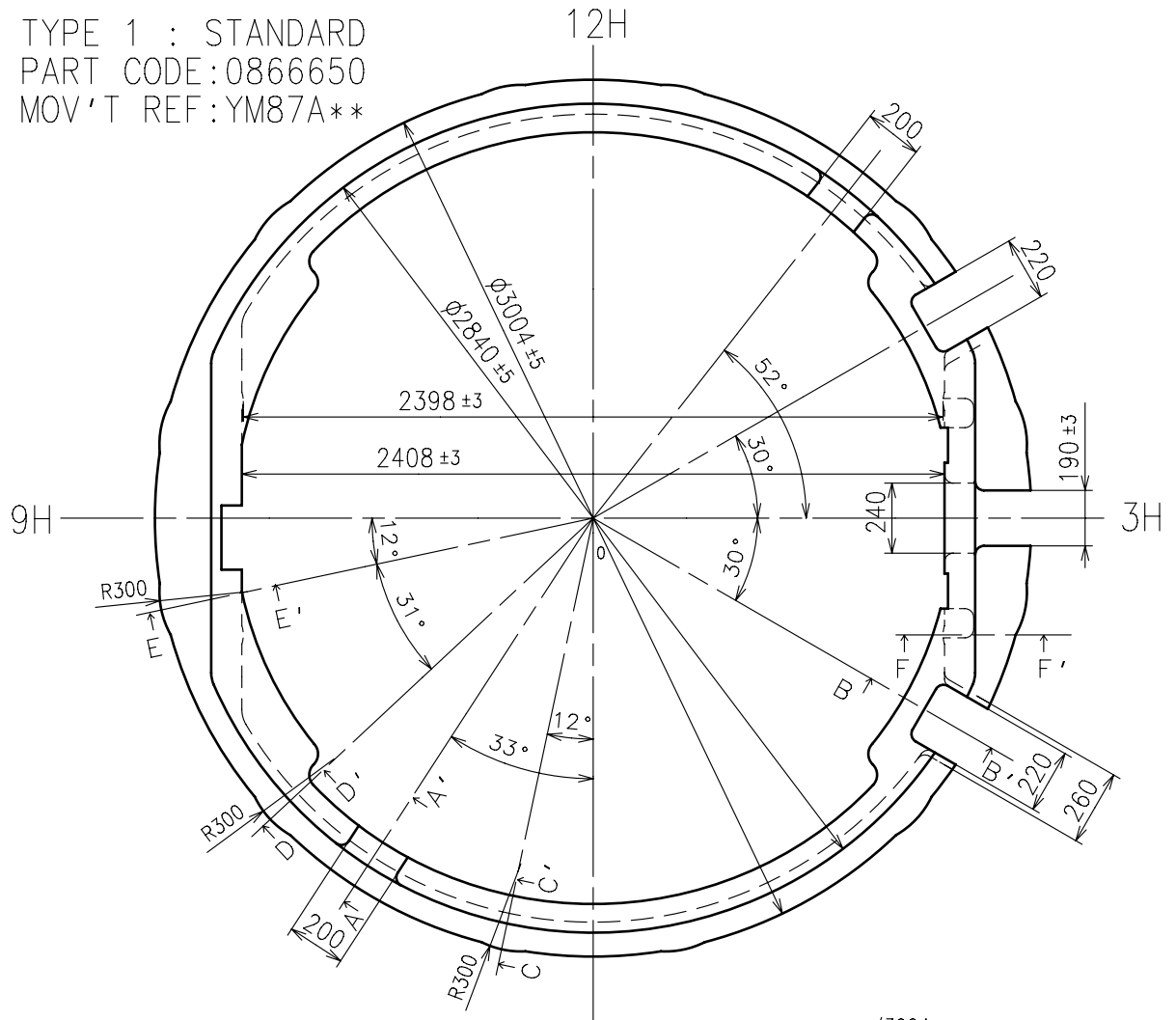


A and B Small sec.hole
Dial leg Mode hole

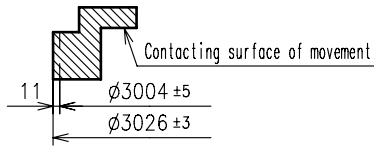
Small watch hour and minute hole



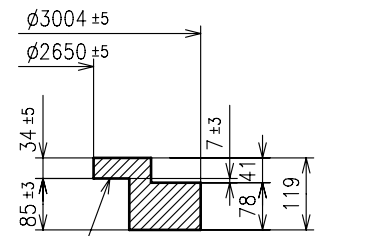
TYPE 1 : STANDARD
PART CODE: 0866650
MOV'T REF: YM87A**



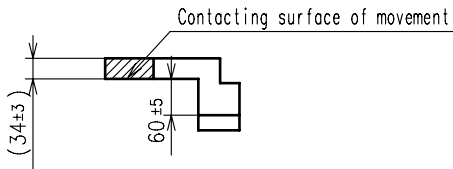
A-A' section



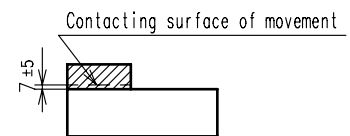
D-D' section
E-E' section



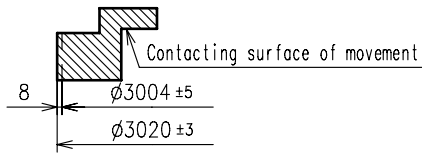
0-12H section



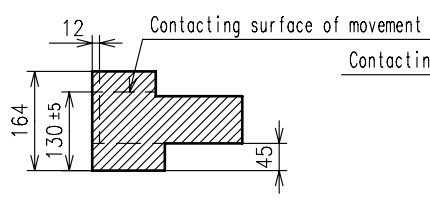
B-B' section



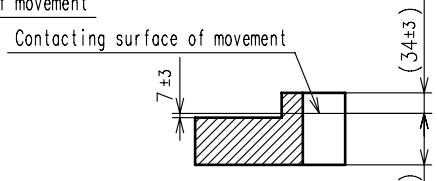
0-3H section



C-C' section

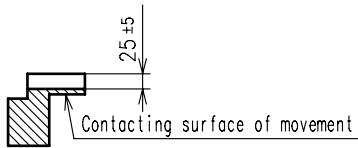
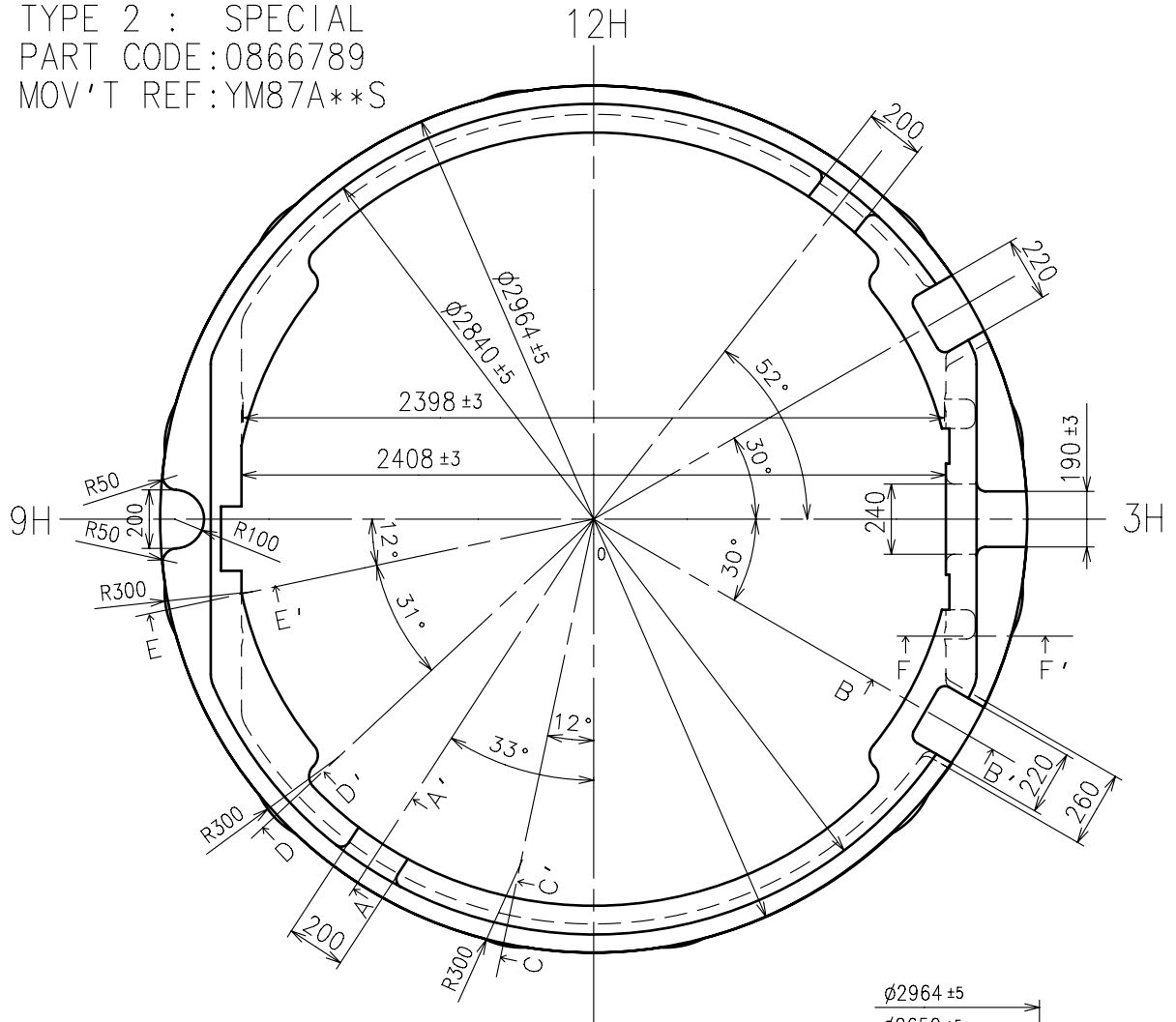


F-F' section

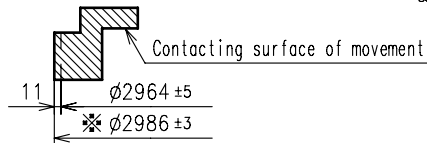


0-9H section

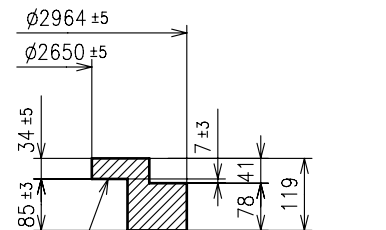
TYPE 2 : SPECIAL
PART CODE: 0866789
MOV'T REF: YM87A**S



A-A' section

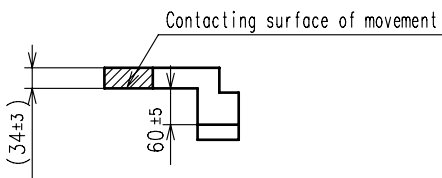


D-D' section
E-E' section

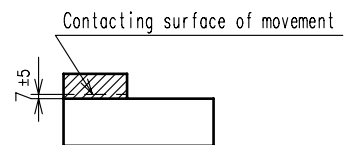


Contacting surface of movement

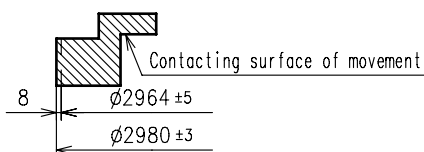
0-12H section



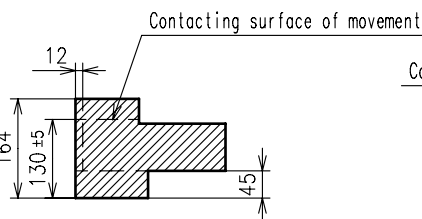
B-B' section



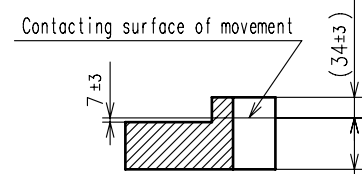
0-3H section



C-C' section



F-F' section

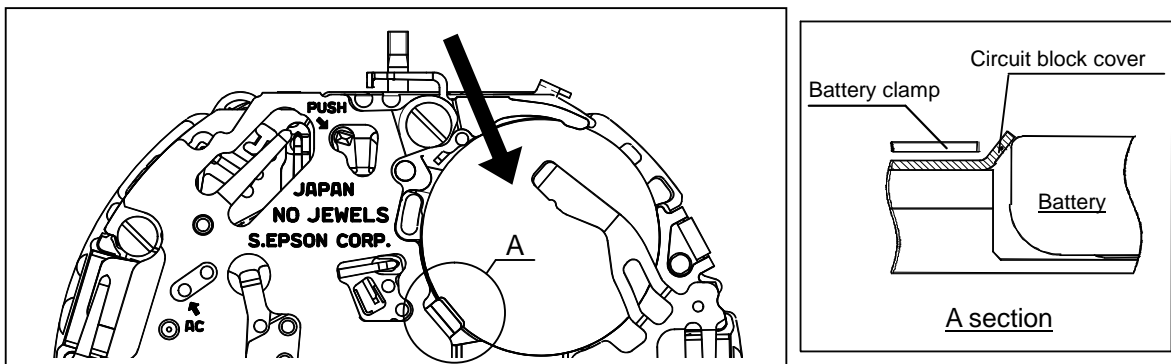


0-9H section

* "DIAMETER OF INSIDE CASE IS SAME AS YM5 SERIES"

1.How to change the battery

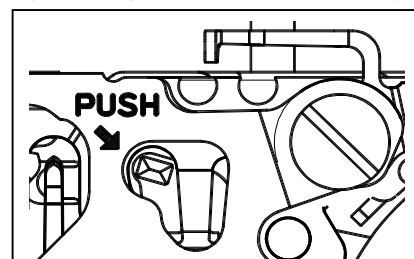
- Please use the exclusive battery to keep the stable performance for a long time.
- Please set the battery with the minus part toward the inside of the watch.
- When you assemble or change the battery, it is recommended to pull out three battery clamp screws first, and then take out the battery clamp 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 Small watch hour and minute hand, Center hand and Mode hand at "0" position.



2.How to pull out the stem

- Please pull out the crown at 1st 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 1st position, it is impossible to be pulled out.

(Crown pulled out at 1st 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 second's gate.

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.

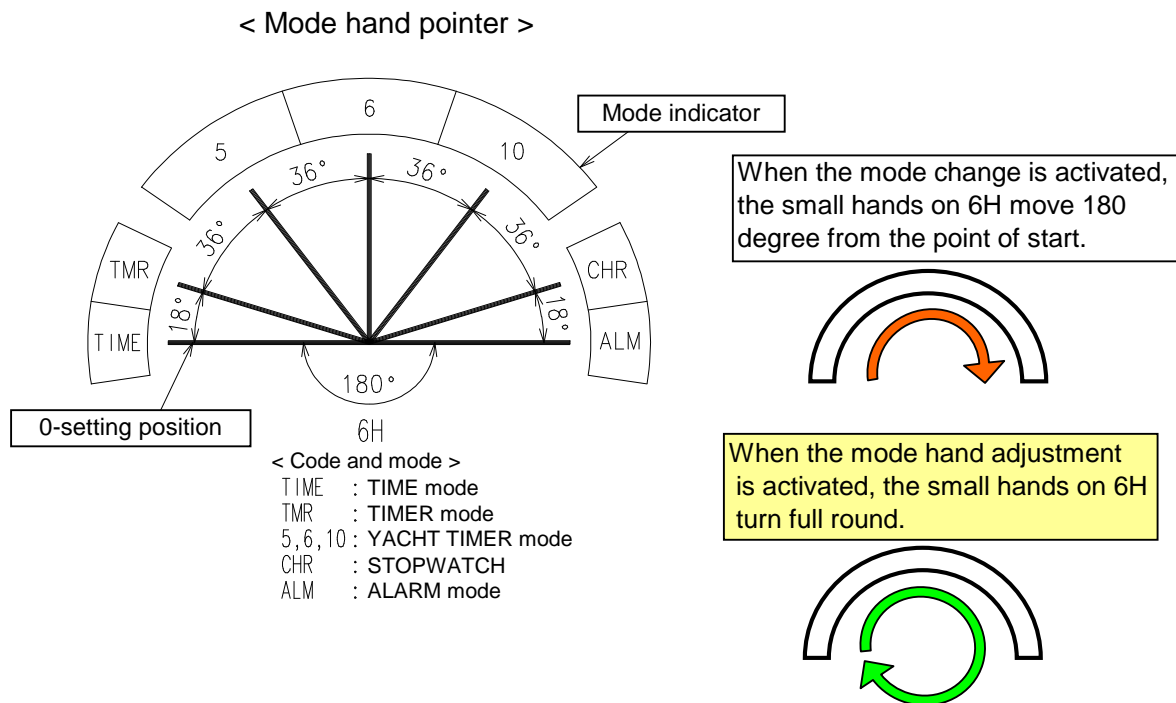
6.A.C. comment seal

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

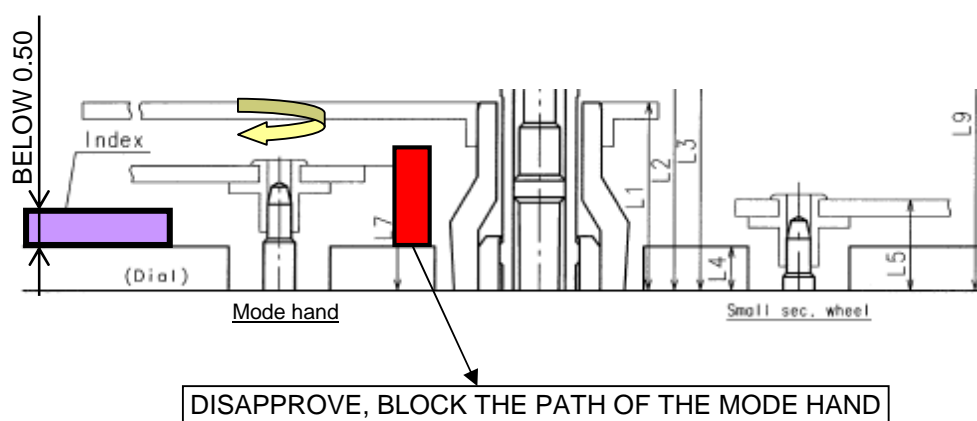
YM87 Attention of dial design

1.The index design of mode hand

- The mode hand of YM87 on 6H have a 180 degree of movement.
- When the mode hand position adjustment is activated, the mode hands on 6H turn full round. Therefore, the index must be designed on the assumption that the mode hands turn full round.

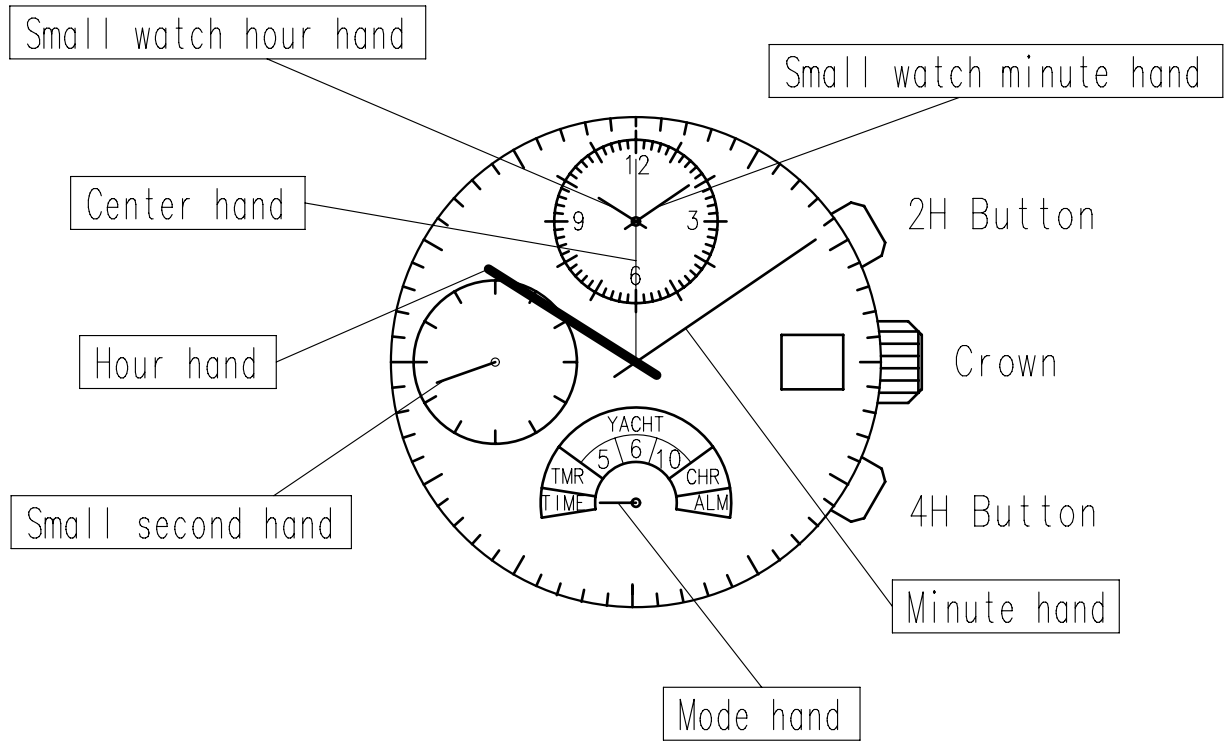


The Dial index must be designed as the mode hands turn full round without any blocks.

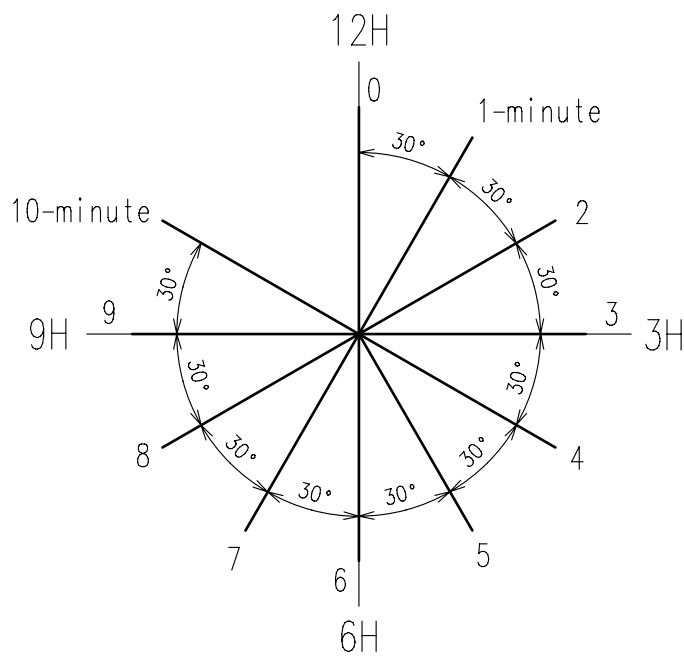


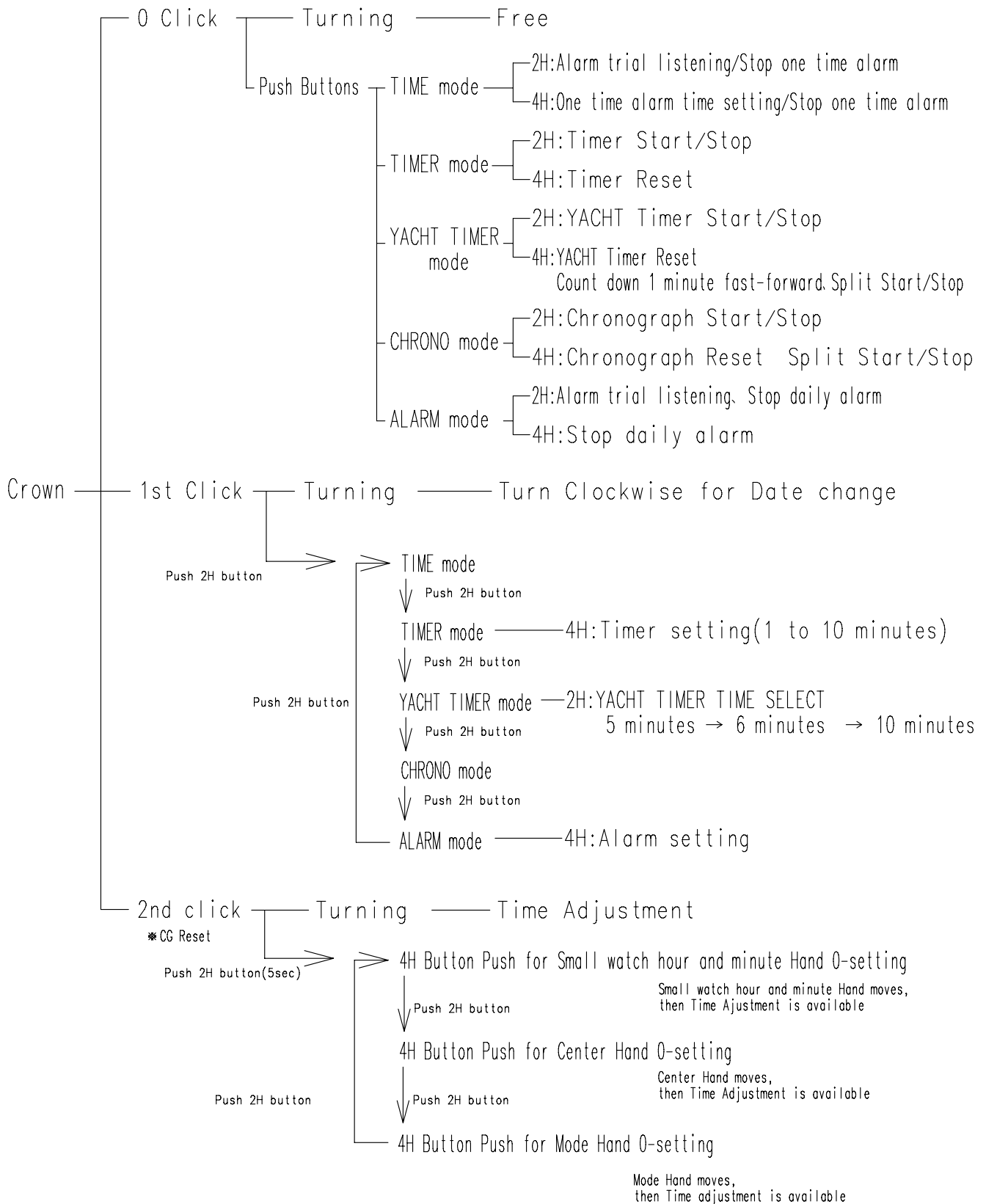
2.The start point of mode hands

- The start position of the mode hand can set on any position in the range of 360 degree.
- When the mode change is activated, the mode hand will move 180 degree from the point of start.

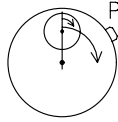
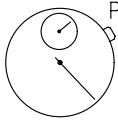
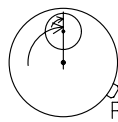
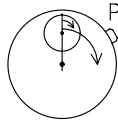
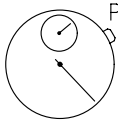
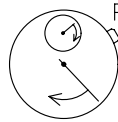
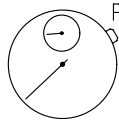
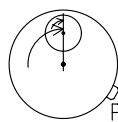
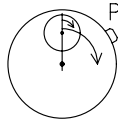
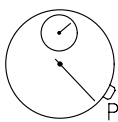
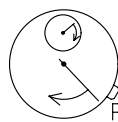
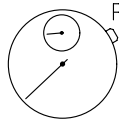
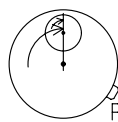


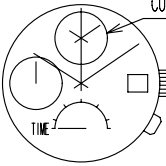
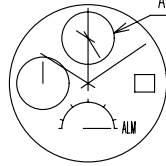
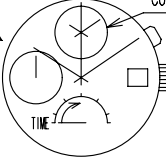
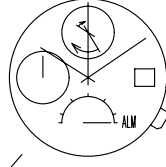
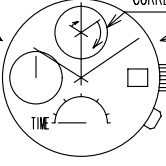
The numbers on the outer circle of the dial indicated by the center hand shows the timer time.
The small watch minute hand also indicates the timer time.

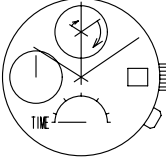




At 2nd click position, system-reset is possible by pushing the 2H button and 4H button for more than 2 seconds simultaneously.

Chronograph Operation (Chrono Mode)					
Total Time	START	STOP			RESET
					
Accumulated Time	START	STOP	RESTART	STOP	RESET
					
Split Time	START	SPLIT	RESPLIT	STOP	RESET
					

Daily Alarm Operation (Alarm Mode)	
Crown 0-Click	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>< DAILY ALARM OFF ></p>  <p>CURRENT TIME</p> <p>One Tutch Alarm Time Setting</p> </div> <div style="text-align: center;"> <p>< DAILY ALARM ON ></p>  <p>ALARM SETTING TIME</p> </div> </div>
Crown 1-Click	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>< MODE CHANGE ></p>  <p>CURRENT TIME</p> <p>Mode Switching</p> </div> <div style="text-align: center;"> <p>< DAILY ALARM SET ></p>  <p>Continue pushing</p> </div> </div>
Crown 2-Click	<p>< Time Adjustment ></p>  <p>CURRENT TIME</p> <p>Continue pushing</p>

One Tutch Alarm Operation (Time Mode)	
Crown 0-Click	 <p>One Tutch Alarm Time Setting</p>

