



Cal. YM89A

ϕ 27.0 mm
H 5.01 mm

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Date: 24/Dec./'10

S.EPSON Products

MOVEMENT SPECIFICATIONS

CAL. YM89A

Analog Quartz 12^m Big date Center second Chronograph and Timer Movement

1. MOVEMENT DIMENSIONS

- *Outside diameter $\phi 27.60\text{mm (12H-6H)} \times 24.00\text{mm (3H-9H)}$
- *Casing diameter $\phi 27.00\text{mm (12H-6H)}$
- *Total height 5.01mm (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 $-5^{\circ}\text{C to }+50^{\circ}\text{C}$
- *Regulation device Nil (Pre-adjusted)

3. INDICATOR / FUNCTIONS

- *3 Hands Hour / Minute / 1/5second chronograph hand (Center)
- *Small hands Small second hand (9H) / Minute Chronograph hand (6H)
24 Hour hand (3H)
- *Calendar Big size date calendar (12H)
Instant setting device for date calendar
- *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 / Timer setting
Crown pulled out 2nd click : Time setting / Reset
: Chronograph hand reset
- *Stopwatch 2H button: start / stop
4H button: sprit / reset
- *Timer 2H button: start / stop
4H button: Extend timer measurement time / reset

4. FEATURES

- *Jewels 0 Jewel
- *Anti-magnetism Over 1600A/m (Direct current magnetic field)
- *Maximum unbalance of hands Small second hand : $0.03\mu\text{N}\cdot\text{m}$
24 Hour hand : $0.03\mu\text{N}\cdot\text{m}$
Minute chronograph hand : $0.03\mu\text{N}\cdot\text{m}$
1/5 second chronograph hand : $0.09\mu\text{N}\cdot\text{m}$
Minute hand : $0.7\mu\text{N}\cdot\text{m}$
- *Inertia of hand's moment 1/5 second chronograph hand : less than $0.2\mu\text{g}\cdot\text{m}^2$

5. BATTERY

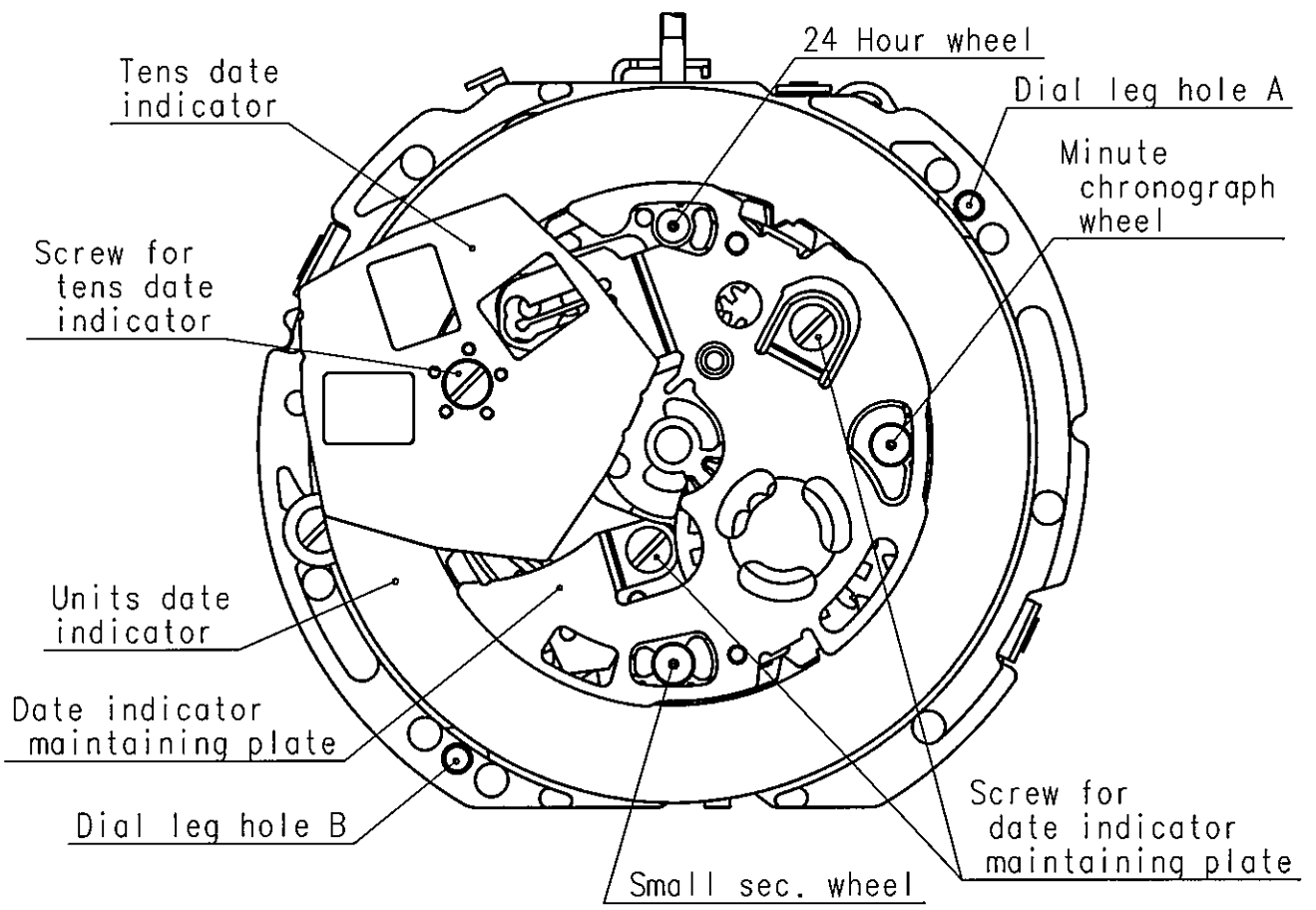
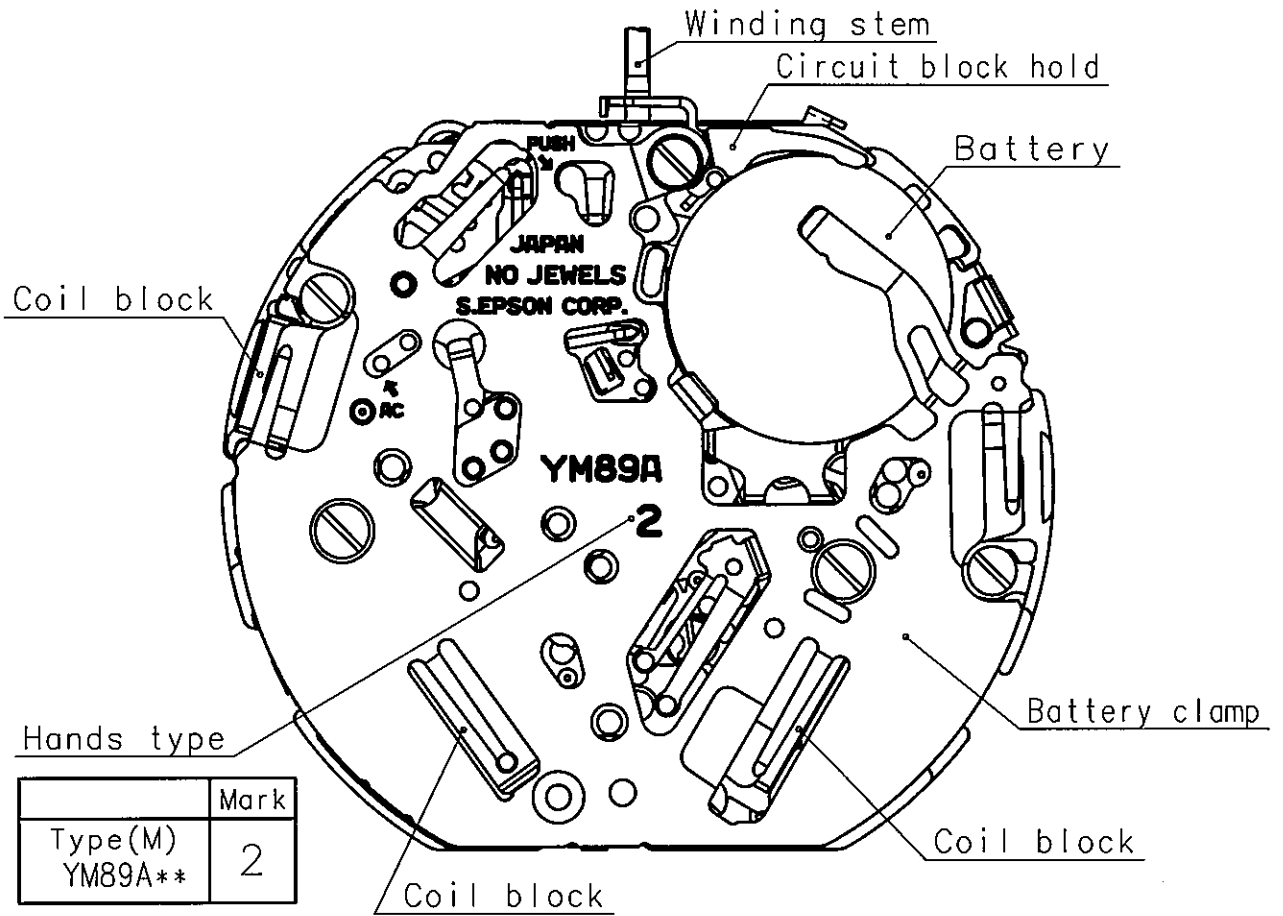
- *Type / Size Silver oxide battery / $\phi 9.5\text{mm} \times t 2.73\text{mm}$
- *Recommended battery SR927W
- *Nominal voltage 1.55 V
- *Battery life Approx. 3 years
- *Driving current consumption Approx. $0.80\mu\text{A}$
- *Operation stopping voltage 0.9 V

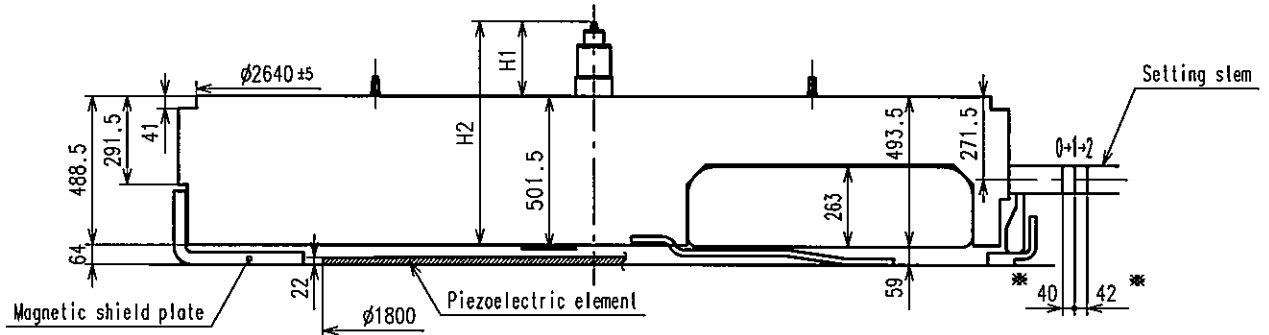
6. SEPARATED PARTS (Parts code)

- *Hand setting stem 0351584 (Standard) or 0351585 (Long)
- *Holding ring for dial 0866854 (Standard)
- *Battery SR927W
- *Magnetic shield plate 4259509
- *Piezoelectric element 4589801
- *A.C. comment seal 0110705

7. TEST OF ACCURACY

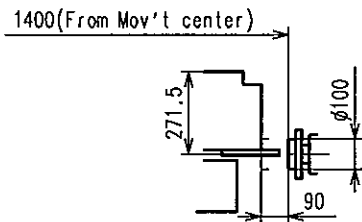
- *Equipment to be used SEIKO quartz tester QT-99, QT2100
Greiner quartz timer-C , Witschi Q-tester 4000
- *Duration of measurement 10 seconds
- *Microphone to be used Electromagnetic detection type



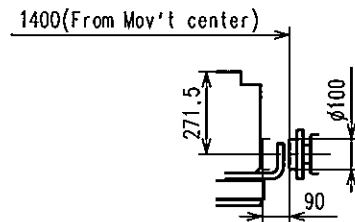


※ Pullout stroke

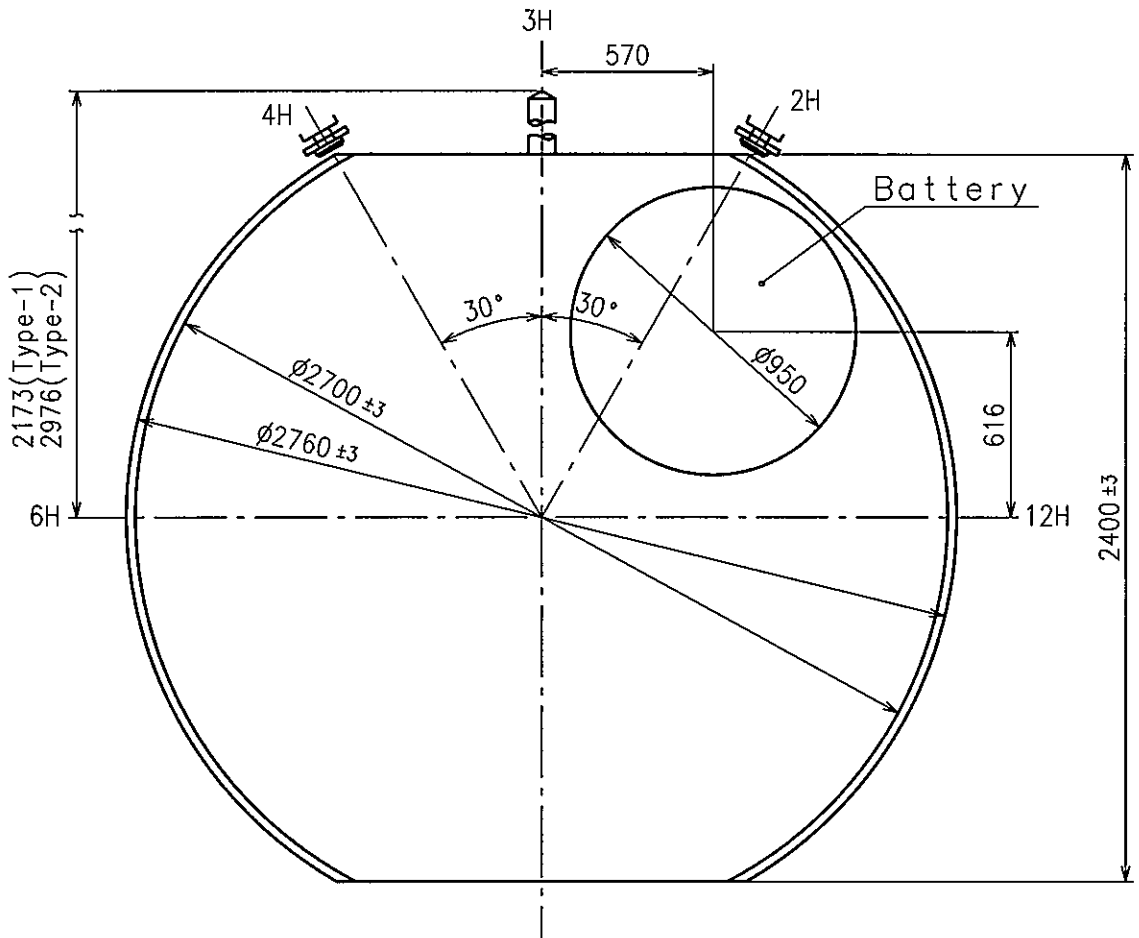
Center post		Type M (2) YM89A**
Maximum height from dial support	H1	246.5
Total height incl. movement	H2	735



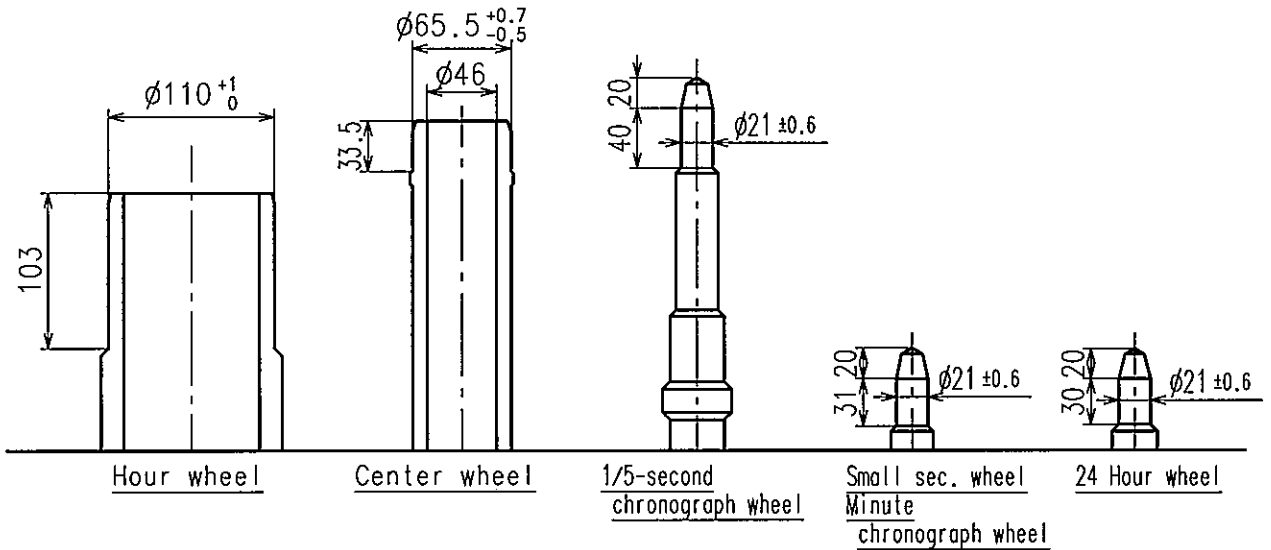
4H Button stroke



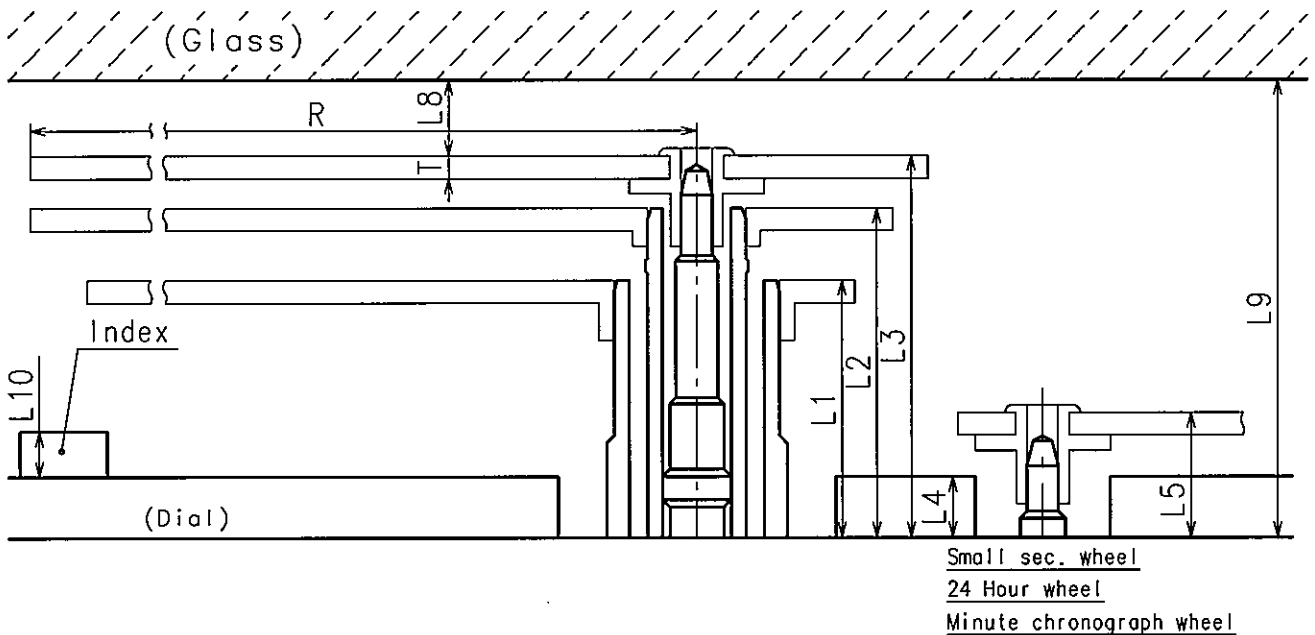
2H Button stroke



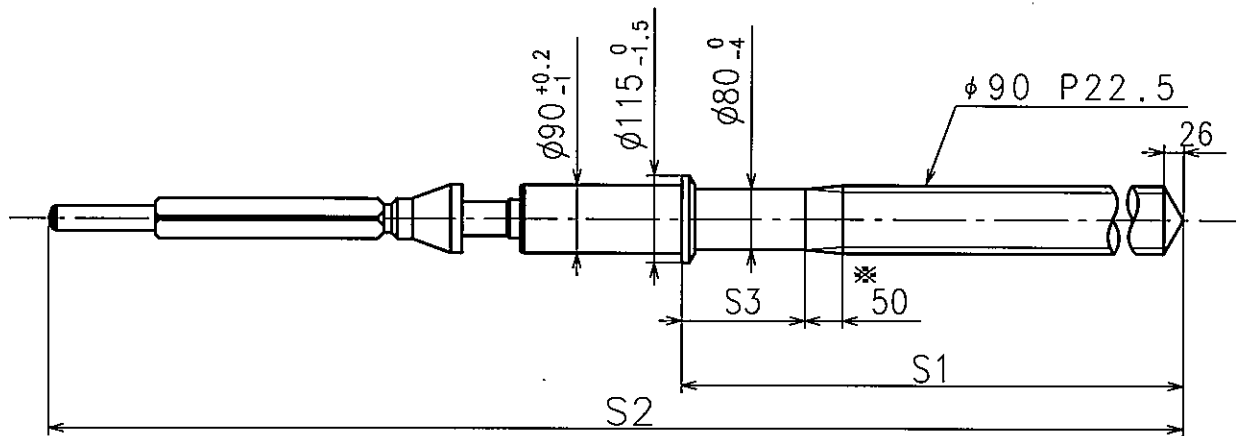
- * Unbalance
 - Small sec. hand $\equiv 3\mu\text{g} \cdot \text{m} (0.03\mu\text{N} \cdot \text{m})$
 - 24 Hour hand $\equiv 3\mu\text{g} \cdot \text{m} (0.03\mu\text{N} \cdot \text{m})$
 - Minute chronograph hand $\equiv 3\mu\text{g} \cdot \text{m} (0.03\mu\text{N} \cdot \text{m})$
 - 1/5-sec. chronograph hand $\equiv 9\mu\text{g} \cdot \text{m} (0.09\mu\text{N} \cdot \text{m})$
 - Minute hand $\equiv 70\mu\text{g} \cdot \text{m} (0.70\mu\text{N} \cdot \text{m})$
- * Moment of inertia
 - 1/5-sec. chronograph hand $\equiv 0.2\mu\text{g} \cdot \text{m}^2$



	Parts No.					
	Hour wheel	Center wheel	1/5-second chronograph wheel	Small sec. wheel	Minute chronograph wheel	24 Hour wheel
Type M (2) YM89A**	0271636	0221604	0888501	0240511	0902500	1002534



	L1	L2	L3	L4	L5	—	—	L8	L9	L10	T	R
Type M (2) YM89A**	170	218	252.5	40	82	—	—	MIN: 50	MIN: 302.5	MAX: 50	15	MAX: 1250



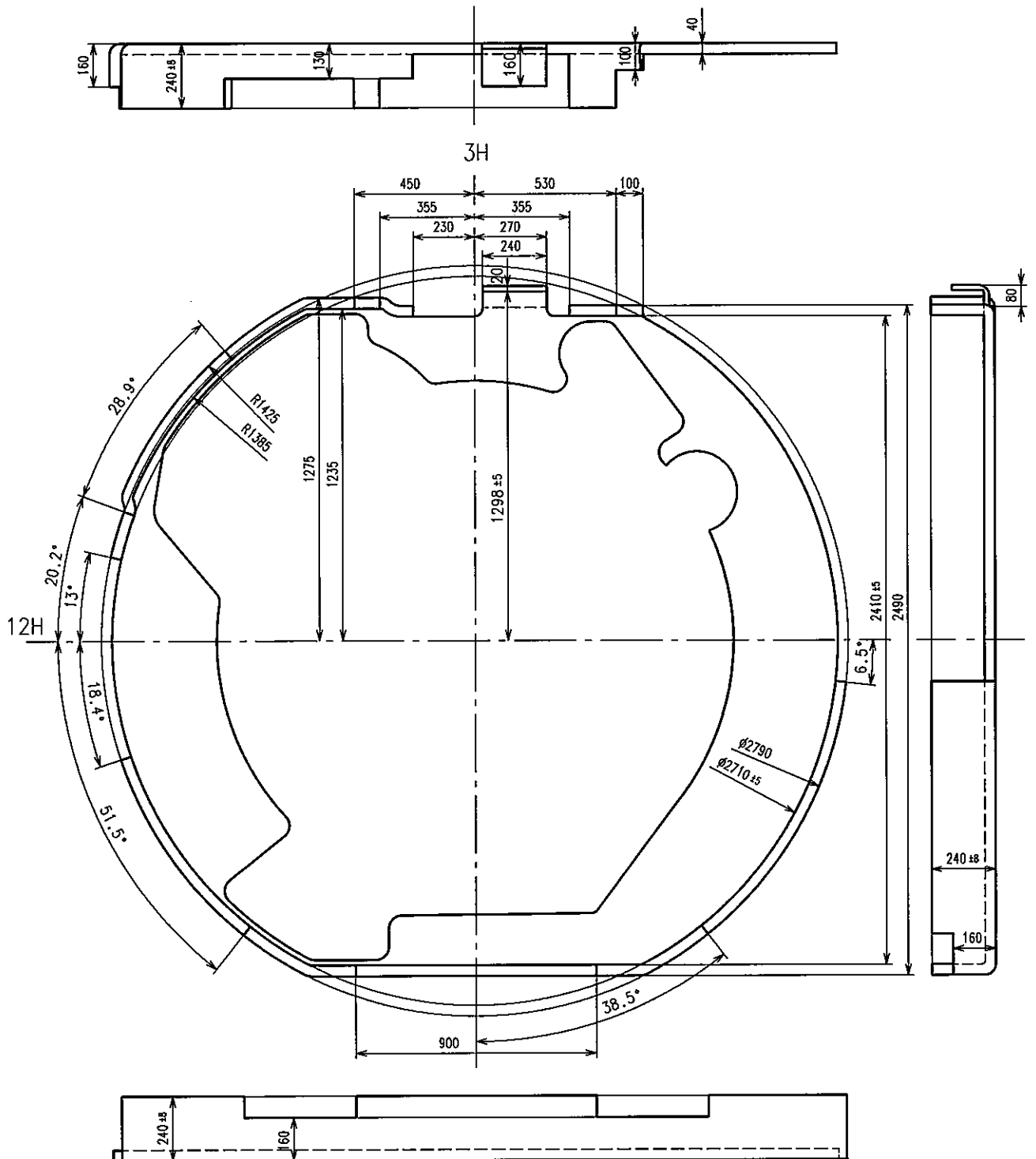
* Not threaded

	Part No.	S1	S2	S3
Type-1 (Standard)	0351584	1037	1878.5	164
Type-2 (Long)	0351585	1840	2681.5	750

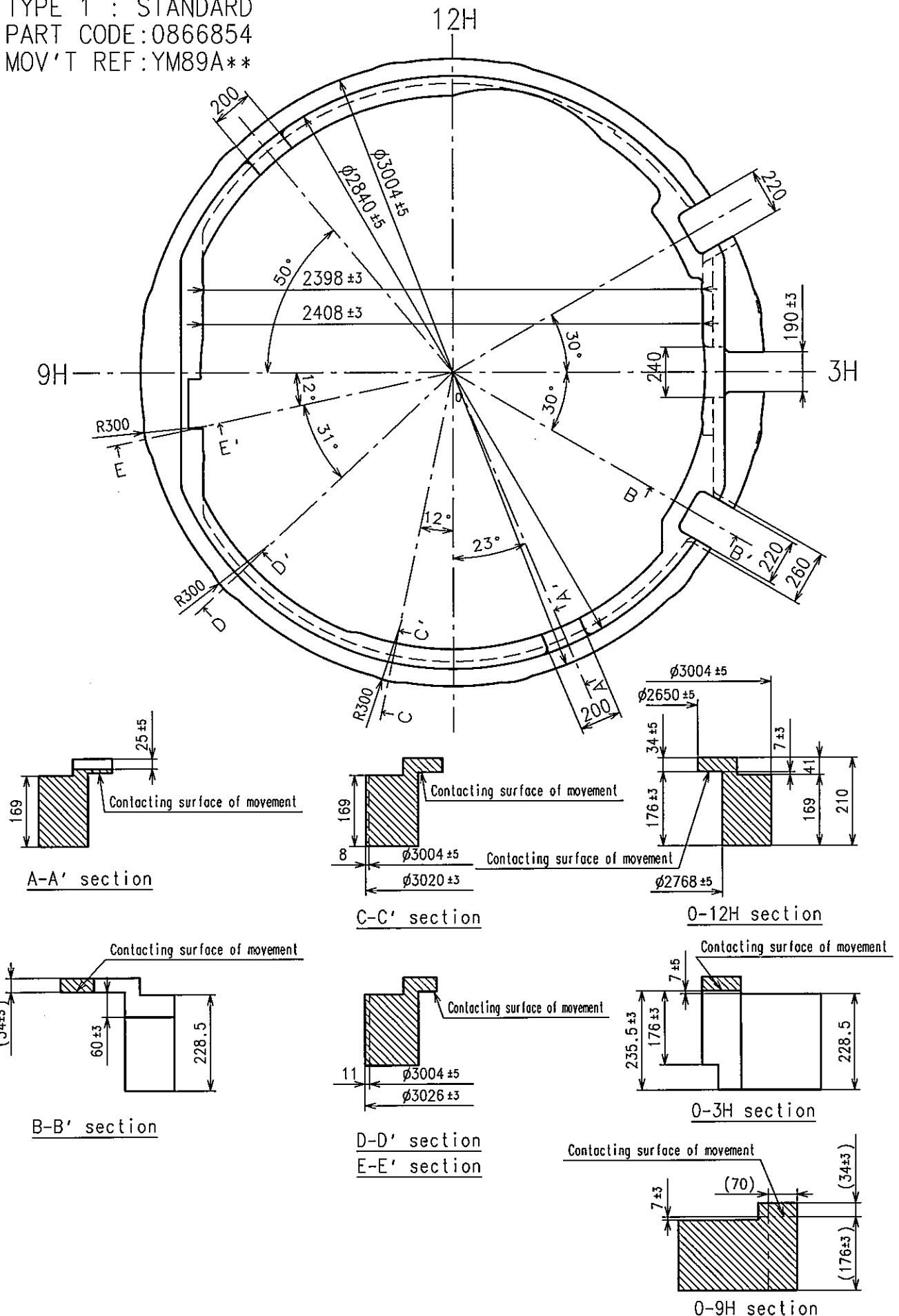
Material : Steel

Hardness : Vickers 600±50

Part No. : 4259509

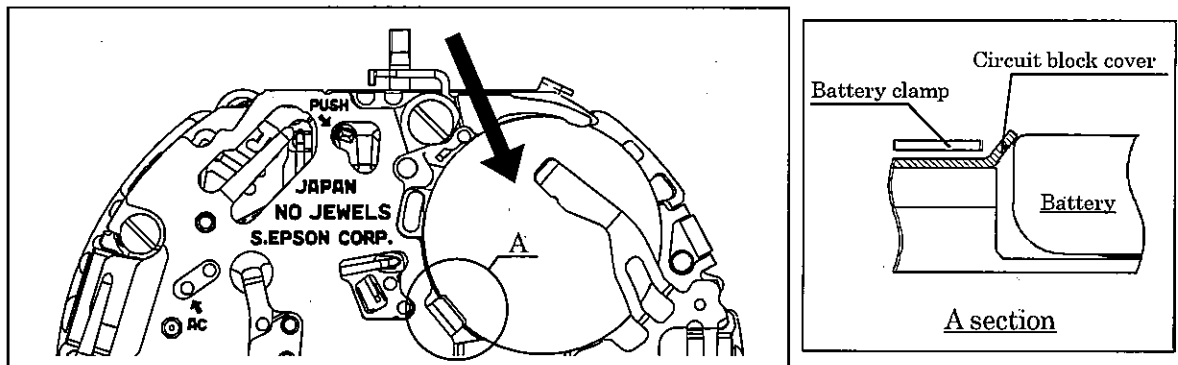


TYPE 1 : STANDARD
PART CODE: 0866854
MOV'T REF: YM89A**



1) How to change the battery

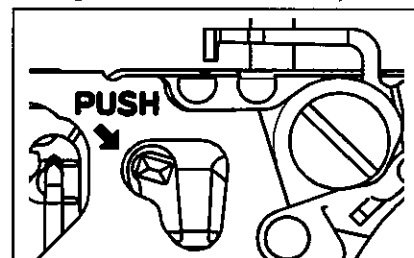
- Please use the exclusive battery to keep the stable performance for a long time.
- Please set the battery with the minus part toward the inside of the watch.
- When you assemble or change the battery, it is recommended to pull out three battery clamp screws first, and then take out the battery clamp 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.
- After the battery is changed, please set the current time first, and then set the 1/5 second CG hand and minute CG hand at 12H 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 adjust the date

- Don't touch the calendar disks.
- To adjust the date, we recommend using fingers to turn the crown.

4) 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.
- Please assemble the hands on the date between 02-08.

5) **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.

6) **How to test the accuracy**

- Measure the timing with Quartz Tester in 10 second's gate.

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YM89 Attention of casing part structure

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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) Magnetic shield plate

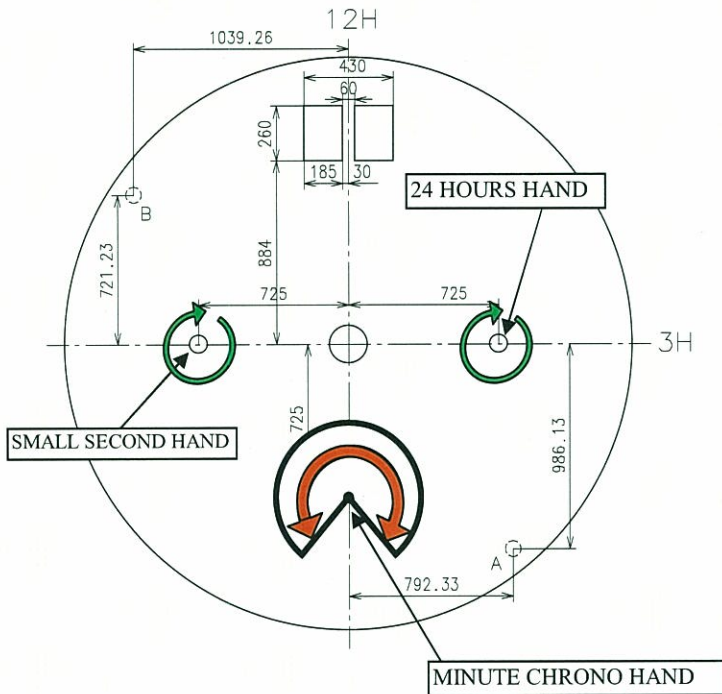
- Please set the Anti-magnetic plate B above the movement (battery clamp) before assembling the Case back. So as to don't mistake assembling direction, please refer to the [Magnetic shield plate] page instruction.

5) A.C. comment seal

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

1) The index design of chronograph hands

- When the chronograph function is activated, the minute chronograph hands of YM89 on 6H have a 270 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.



When the chronograph function is activated, the small hands on 6H move 270 degree from the point of start.



When the chronograph hand adjustment is activated, the small hands on 6H turn full round.



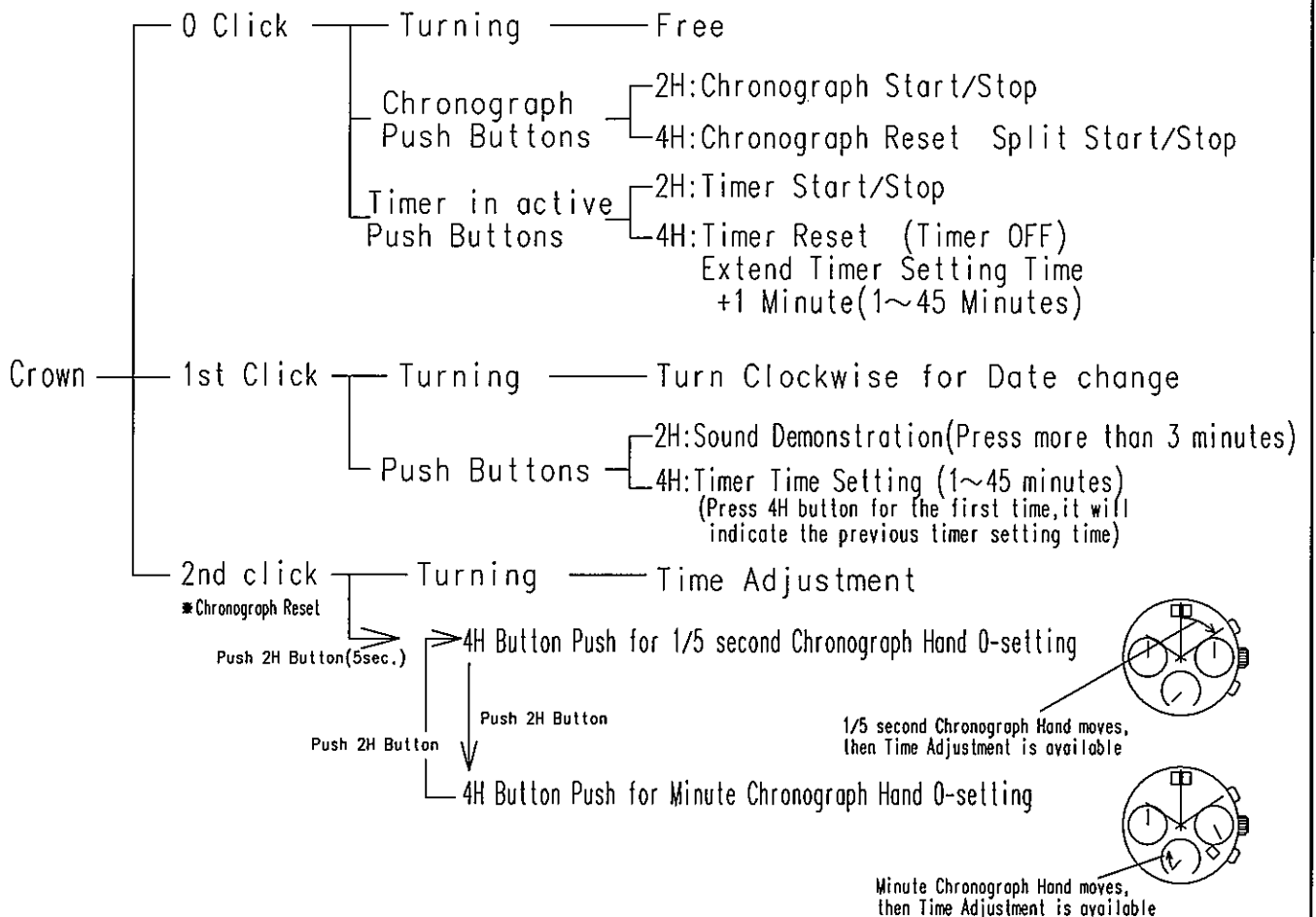
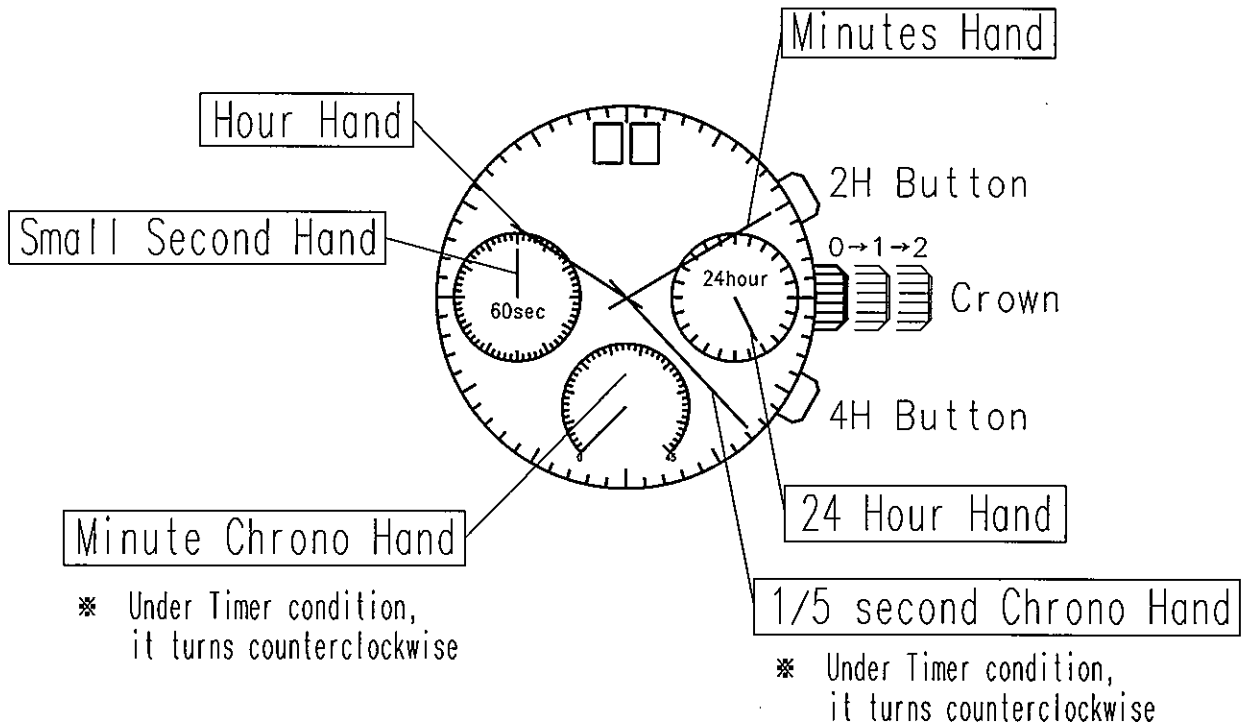
The Dial index must be designed as the chronograph hands turn full round without any blocks.



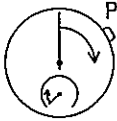
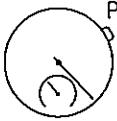
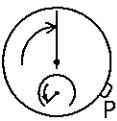
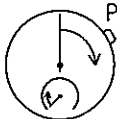
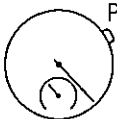
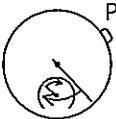
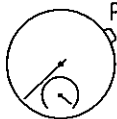
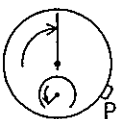
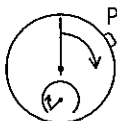
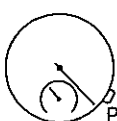
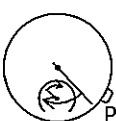
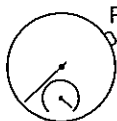
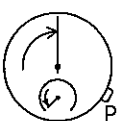
DISAPPROVE, BLOCK THE PATH OF THE CHRONOGRAPH

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, the chronograph hands will move 270 degree from the point of start.



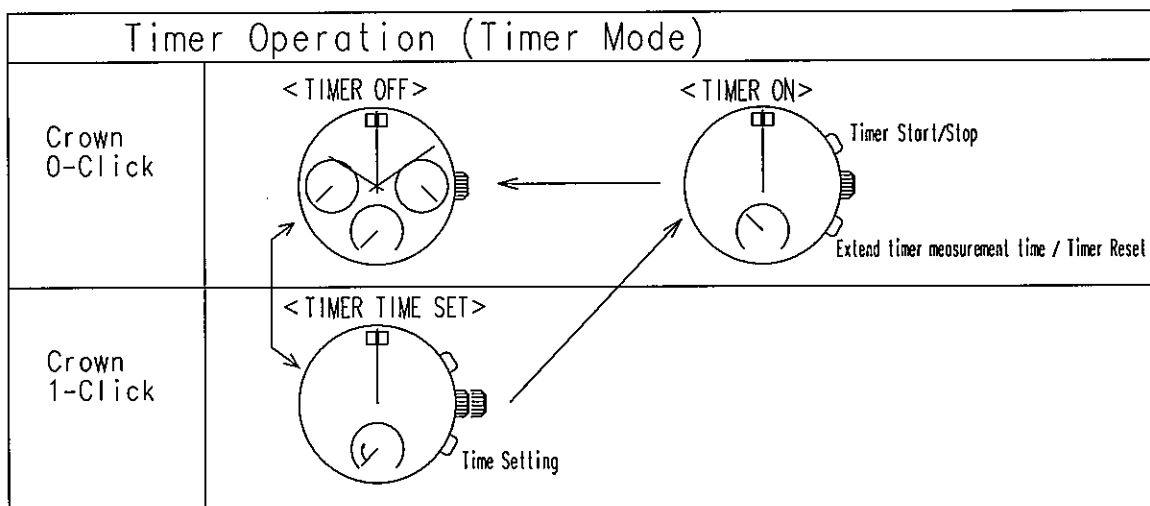
At 2nd click position, system-reset is possible by pushing the 2H button and 4H button for more than 2 seconds simultaneously.

Chronograph Operation					
Total Time	START	STOP			RESET
					
Accumulated Time	START	STOP	RESTART	STOP	RESET
					
Split Time	START	SPLIT	RESPLIT	STOP	RESET
					

Chronograph will be stopped automatically after 45 minutes counting.
At that time, the 1/5 second chronograph hand stops at 0 position and the minute chronograph hand stops at 45 minute position.

If the time elapse 45 minutes while measuring split time, the split function will be released.
The 1/5 second chronograph hand will stop at 0 position and minute chronograph hand will stop at 45 minute position.

After stop counting automatically, press 4H button for 0 position reset.



After measuring timer, timer setting will be reset and it will be ready for chronograph.

Under the Timer Time Set condition, press 4H button for the first time, it will indicate the previous time setting time.