

Watch Movement Specification and Drawing

CHRONOGRAPH

Cal. VR33B

Movement Size

13 1/2'''

Casing Diameter

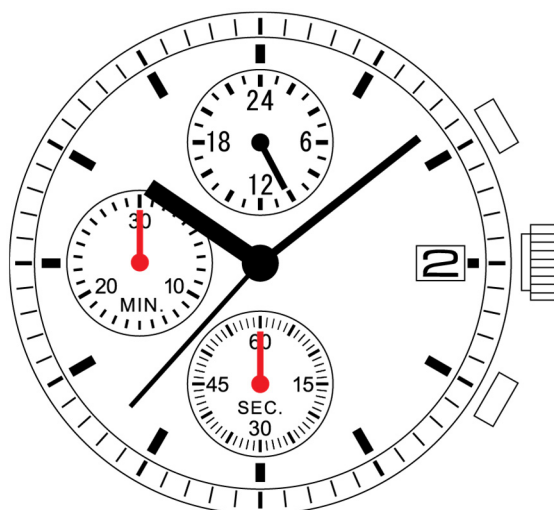
Ø 30.6mm

Height

3.97mm

Battery Life

3 years



Date: 1/Feb./'19

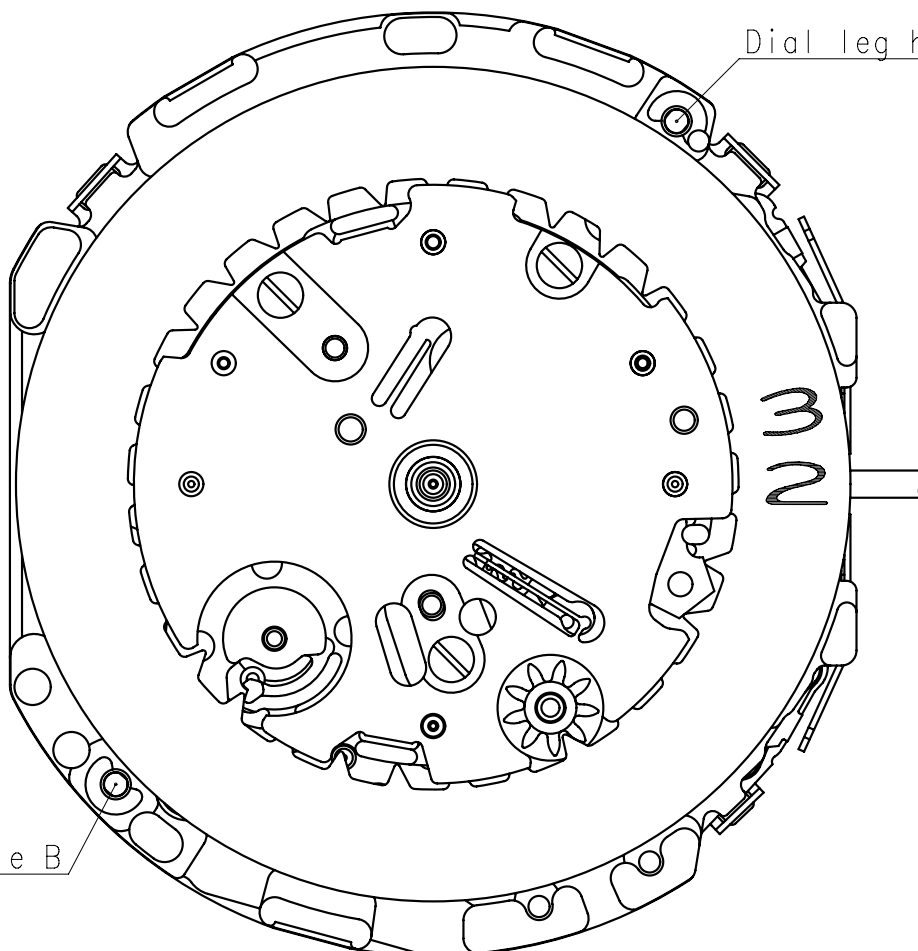
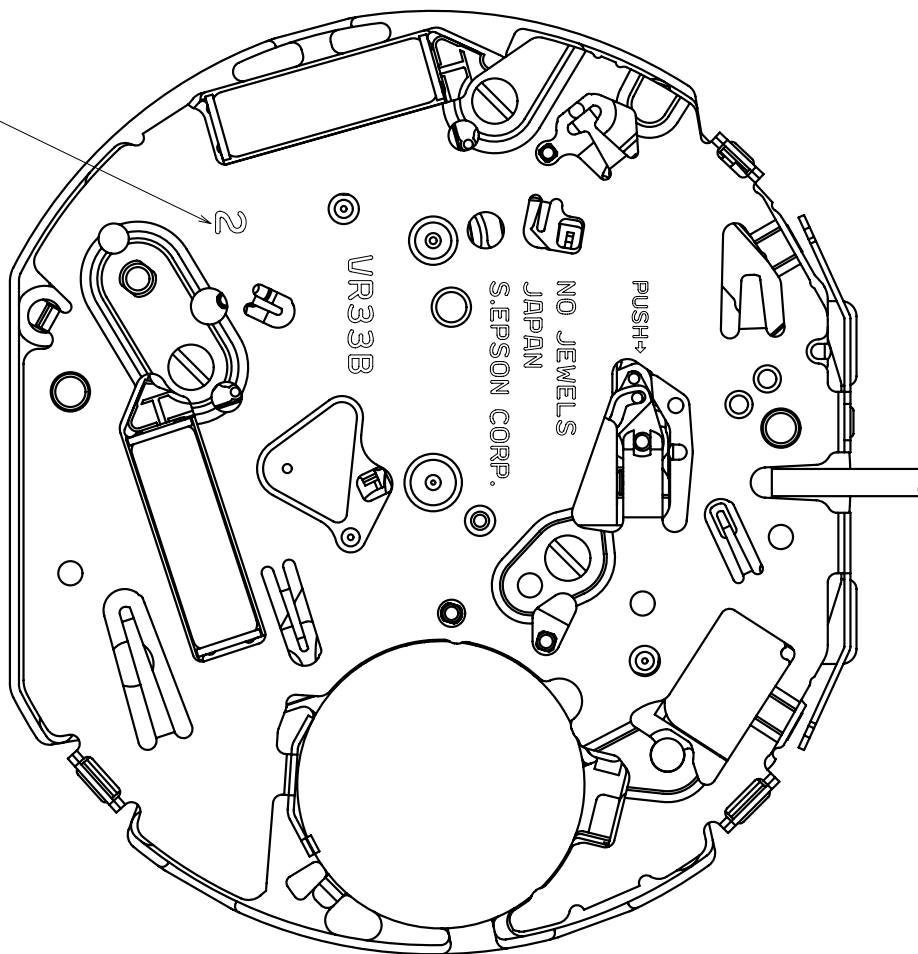
Cal. VR33B

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Cal.	VR33B	Specifications		Date : 19/Oct./'18
				Rev. : 00
Analog Quartz 13 1/2" Chronograph Movement				
1. MOVEMENT DIMENSIONS				
Outside diameter		φ 31.2mm × 28.0mm(3-9H)		
Casing diameter		φ 30.6mm		
Total height		3.97mm (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 / Minute / Second		
Small hands		24 hour(12H) / Second chronograph(6H) / Minute chronograph(9H)		
Calendar		Instant setting device for date calendar		
Reset switch				
Power depletion warning function (BLD)				
(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		1/1 second up to 30 minutes with split time measurement		
4. FEATURES				
Jewels		0 Jewels		
Anti-magnetism		Over 1600A/m (Direct current magnetic field)		
Maximum unbalance of hands		Hour hand	:	0.6 μ N·m
		Minute hand	:	0.9 μ N·m
		Second hand	:	0.09 μ N·m
		24 hour hand	:	0.05 μ N·m
		Second chronograph hand	:	0.05 μ N·m
		Minute chronograph hand	:	0.05 μ N·m
Moment of Inertia		Second hand	:	less than 0.35 μ g·m²
		Second chronograph hand	:	less than 0.05 μ g·m²
5. BATTERY				
Type / Size		Silver oxide battery / φ 9.5mm × t 2.0mm		
Recommended battery		SR920SW (Maxell, Sony, Seizaiken)		
Nominal voltage		1.55 V		
Battery life		Approx. 3 years		
Driving current consumption		Approx. 1.2 μ A		
Operation stopping voltage		1.4V (Chronograph function)		
6. SEPARATED PARTS (Parts code)				
Hand setting stem		0351578 or 0351177		
Battery		SR920SW		
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.				

Hands type

	Mark
Type M	2
Type LL	4

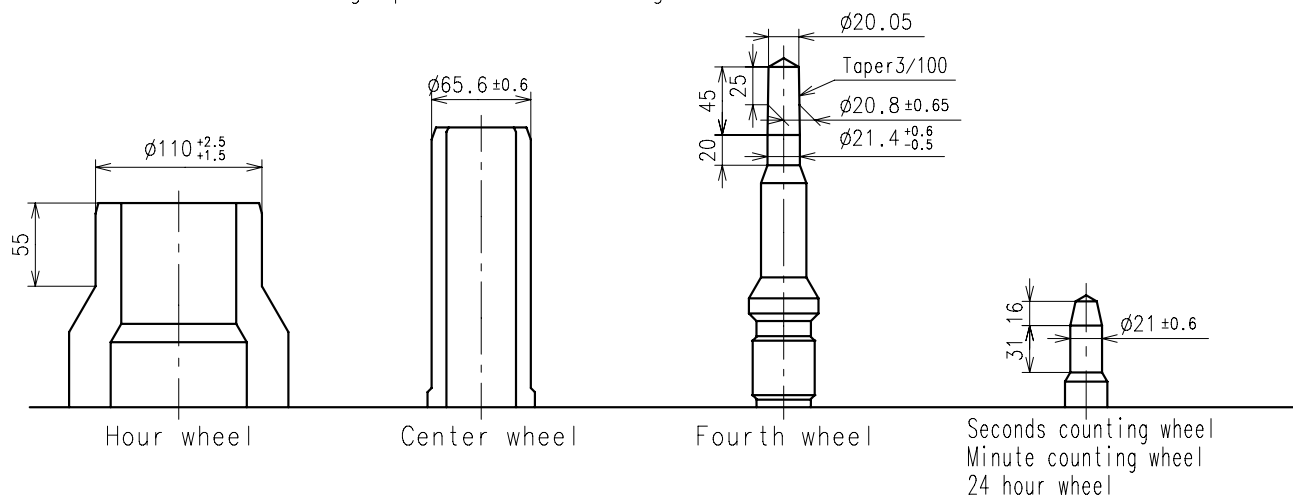


※ Unbalance

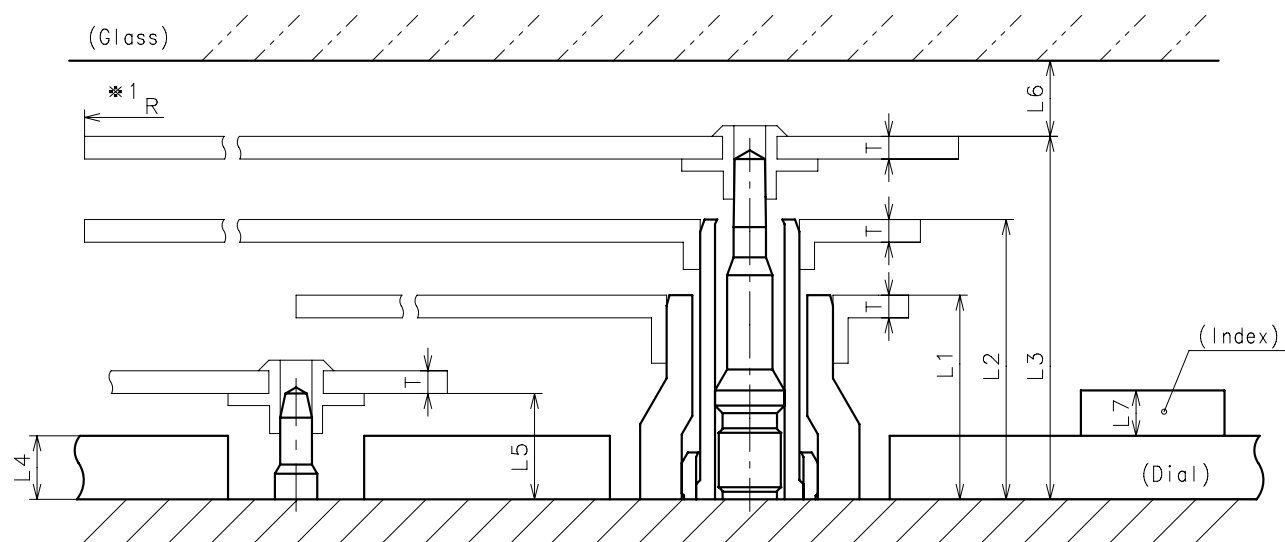
· Hour hand	$\leq 0.6\mu\text{N}\cdot\text{m}$ ($60\mu\text{g}\cdot\text{m}$)
· Minute hand	$\leq 0.9\mu\text{N}\cdot\text{m}$ ($90\mu\text{g}\cdot\text{m}$)
· Second hand	$\leq 0.09\mu\text{N}\cdot\text{m}$ ($9\mu\text{g}\cdot\text{m}$)
· Second chronograph hand	$\leq 0.05\mu\text{N}\cdot\text{m}$ ($5\mu\text{g}\cdot\text{m}$)
· Minute chronograph hand	$\leq 0.05\mu\text{N}\cdot\text{m}$ ($5\mu\text{g}\cdot\text{m}$)
· 24 hour hand	$\leq 0.05\mu\text{N}\cdot\text{m}$ ($5\mu\text{g}\cdot\text{m}$)

※ Moment of inertia

· Second hand	$\leq 0.35\mu\text{g}\cdot\text{m}^2$
· Second chronograph hand	$\leq 0.05\mu\text{g}\cdot\text{m}^2$



	Parts No.					
	Hour wheel	Center wheel	Fourth wheel	Seconds counting wheel	Minute counting wheel	24 hour wheel
Type M (2) VR33B**	0271661	0221662	0241604	0888510	0888520	1002561



	L1	L2	L3	L4	L5	L6	L7	T	*1 R
Type M (2) VR33B**	135	185	240	40	70	MIN: 50	MAX: 50	15	MAX: 1500

※ 1: It is the size taken into consideration for hands attachment.

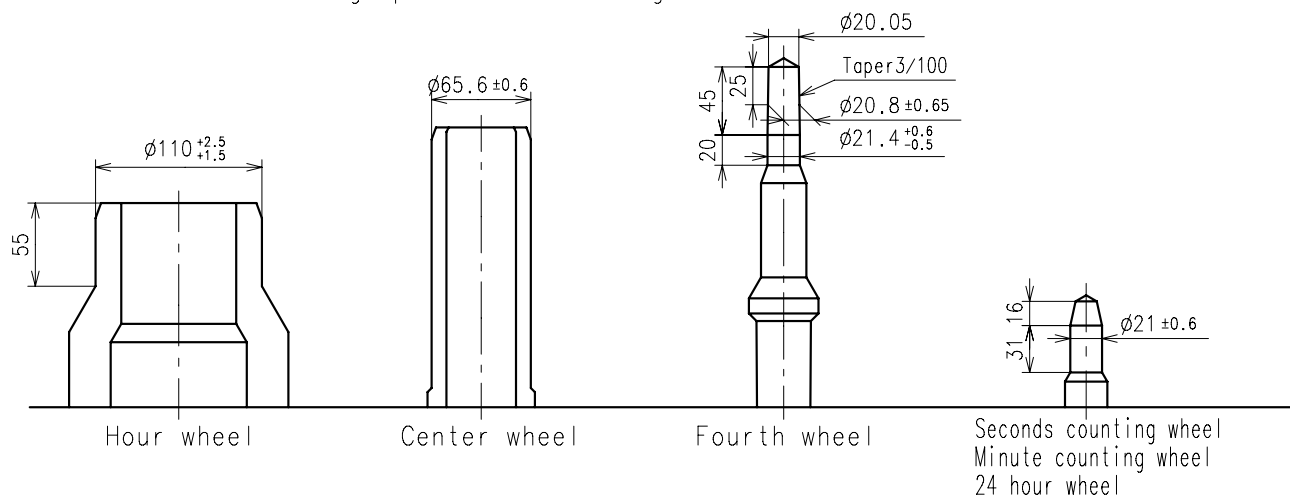
Please observe some standard value specified in unbalance and moment of inertia when using long hands.

※ Unbalance

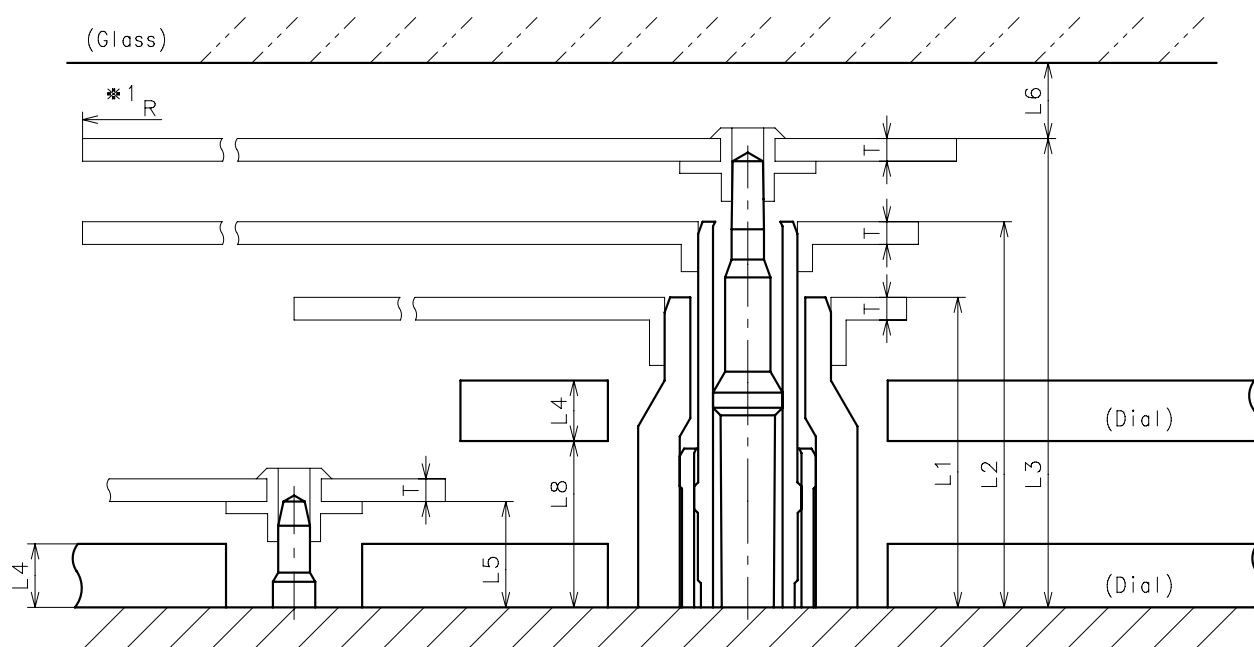
· Hour hand	$\mathbb{W}$	$0.6\mu\text{ N}\cdot\text{m}$	$(60\mu\text{ g}\cdot\text{m})$
· Minute hand	$\mathbb{W}$	$0.9\mu\text{ N}\cdot\text{m}$	$(90\mu\text{ g}\cdot\text{m})$
· Second hand	$\mathbb{W}$	$0.09\mu\text{ N}\cdot\text{m}$	$(9\mu\text{ g}\cdot\text{m})$
· Second chronograph hand	$\mathbb{W}$	$0.05\mu\text{ N}\cdot\text{m}$	$(5\mu\text{ g}\cdot\text{m})$
· Minute chronograph hand	$\mathbb{W}$	$0.05\mu\text{ N}\cdot\text{m}$	$(5\mu\text{ g}\cdot\text{m})$
· 24 hour hand	$\mathbb{W}$	$0.05\mu\text{ N}\cdot\text{m}$	$(5\mu\text{ g}\cdot\text{m})$

※ Moment of inertia

· Second hand	$\mathbb{W}$	$0.35\mu\text{ g}\cdot\text{m}^2$
· Second chronograph hand	$\mathbb{W}$	$0.05\mu\text{ g}\cdot\text{m}^2$



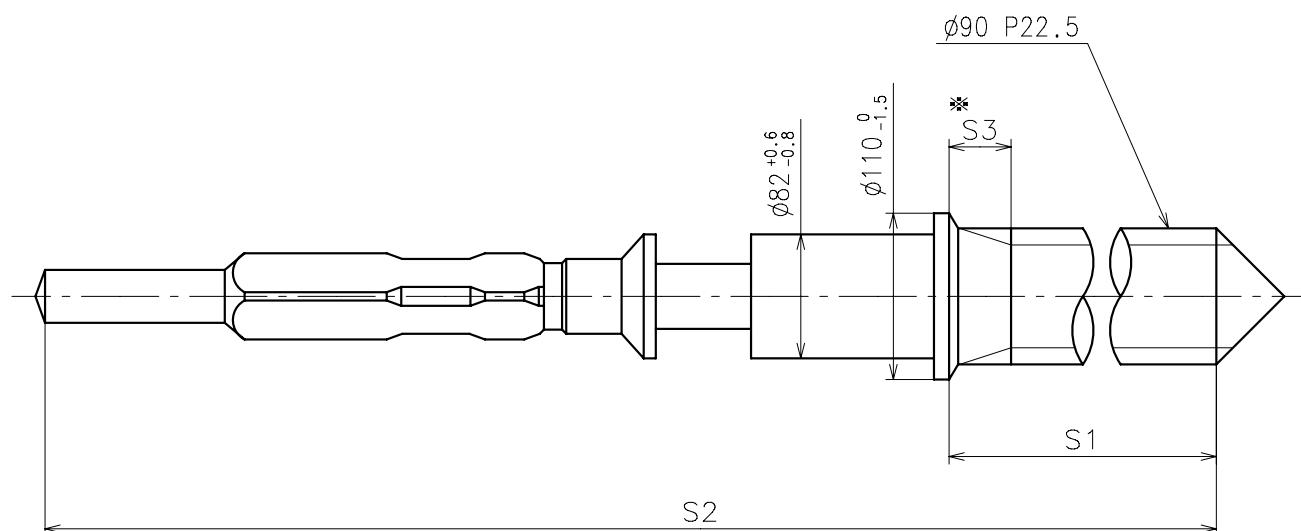
	Parts No.					
	Hour wheel	Center wheel	Fourth wheel	Seconds counting wheel	Minute counting wheel	24 hour wheel
Type LL(4) VR33B**	0271662	0221663	0241605	0888510	0888520	1002561



	L1	L2	L3	L4	L5	L6	L8	T	*1 R
Type LL(4) VR33B**	205	255	310	40	70	MIN: 50	110	15	MAX: 1500

※ 1: It is the size taken into consideration for hands attachment.

Please observe some standard value specified in unbalance and moment of inertia when using long hands.

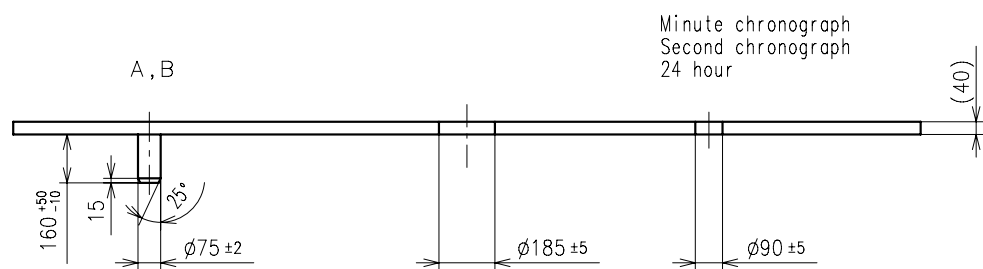
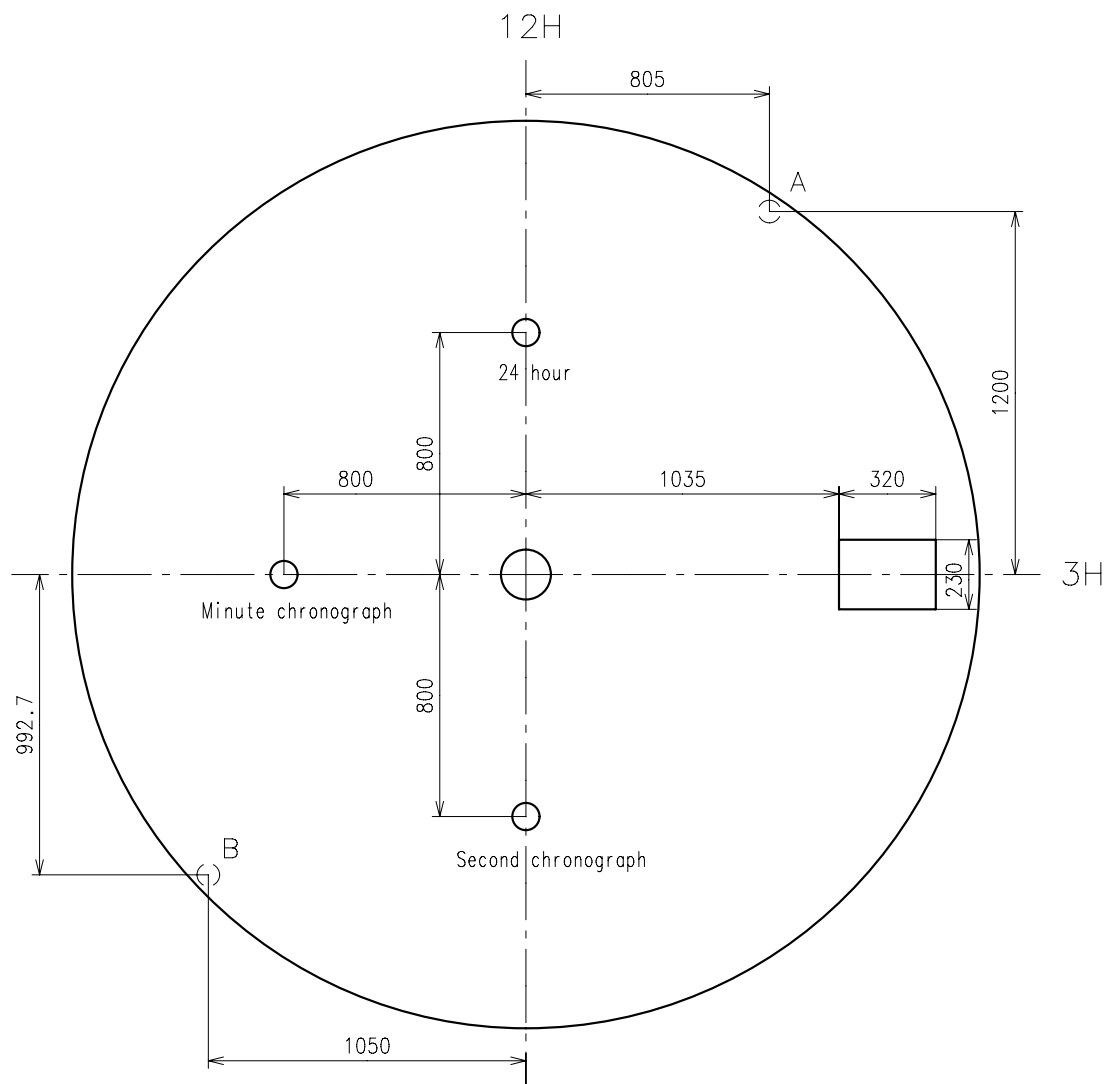


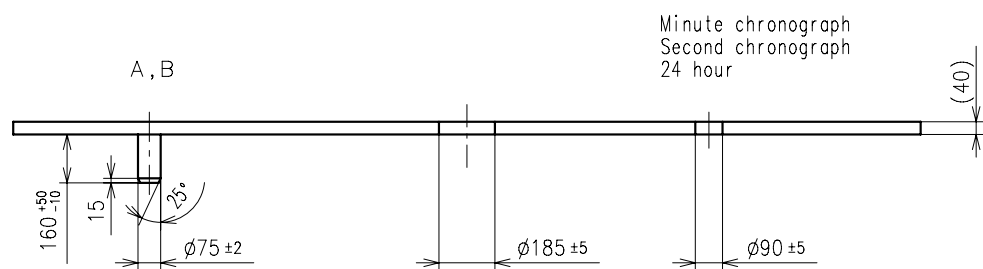
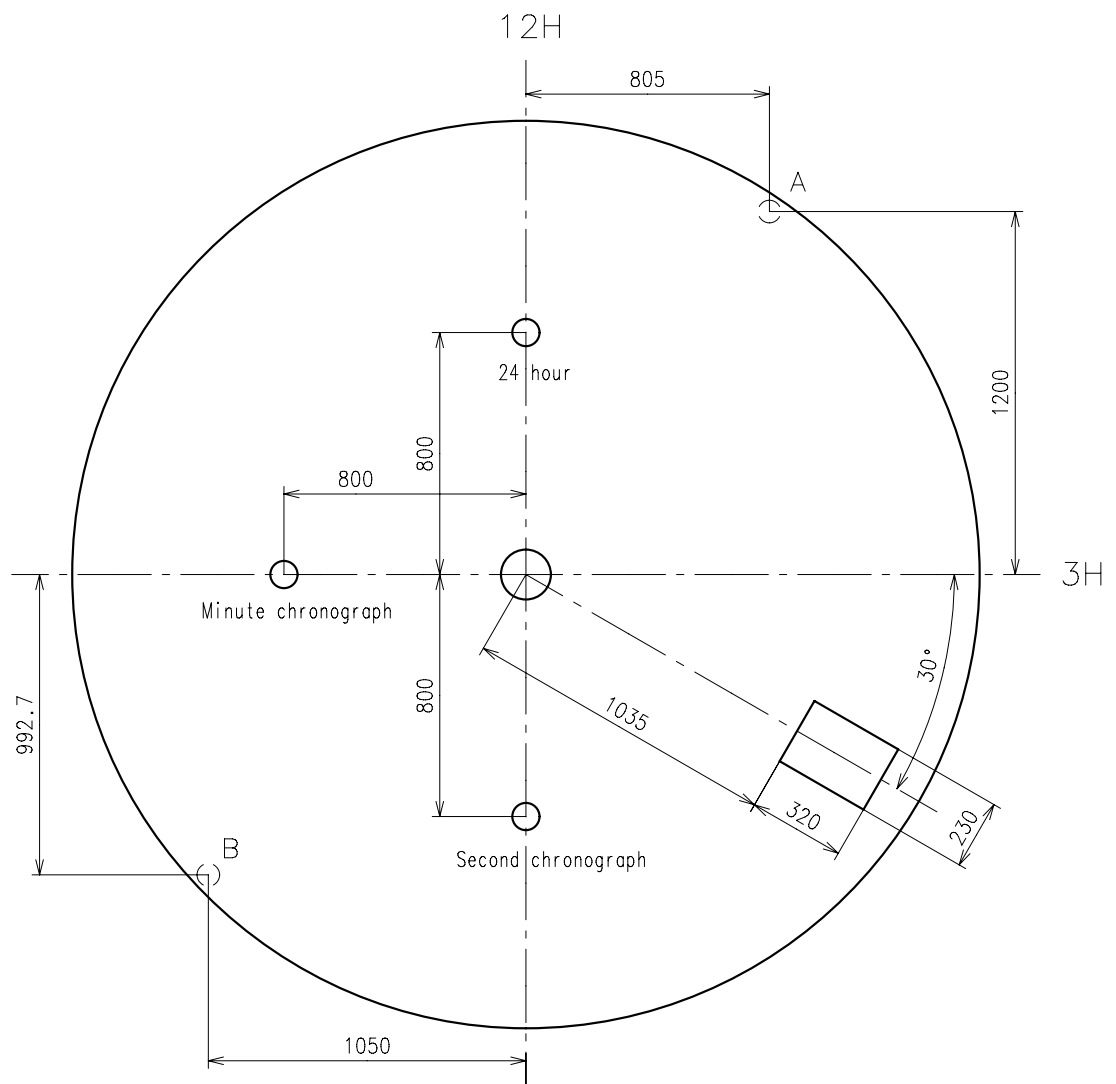
※ Not threaded

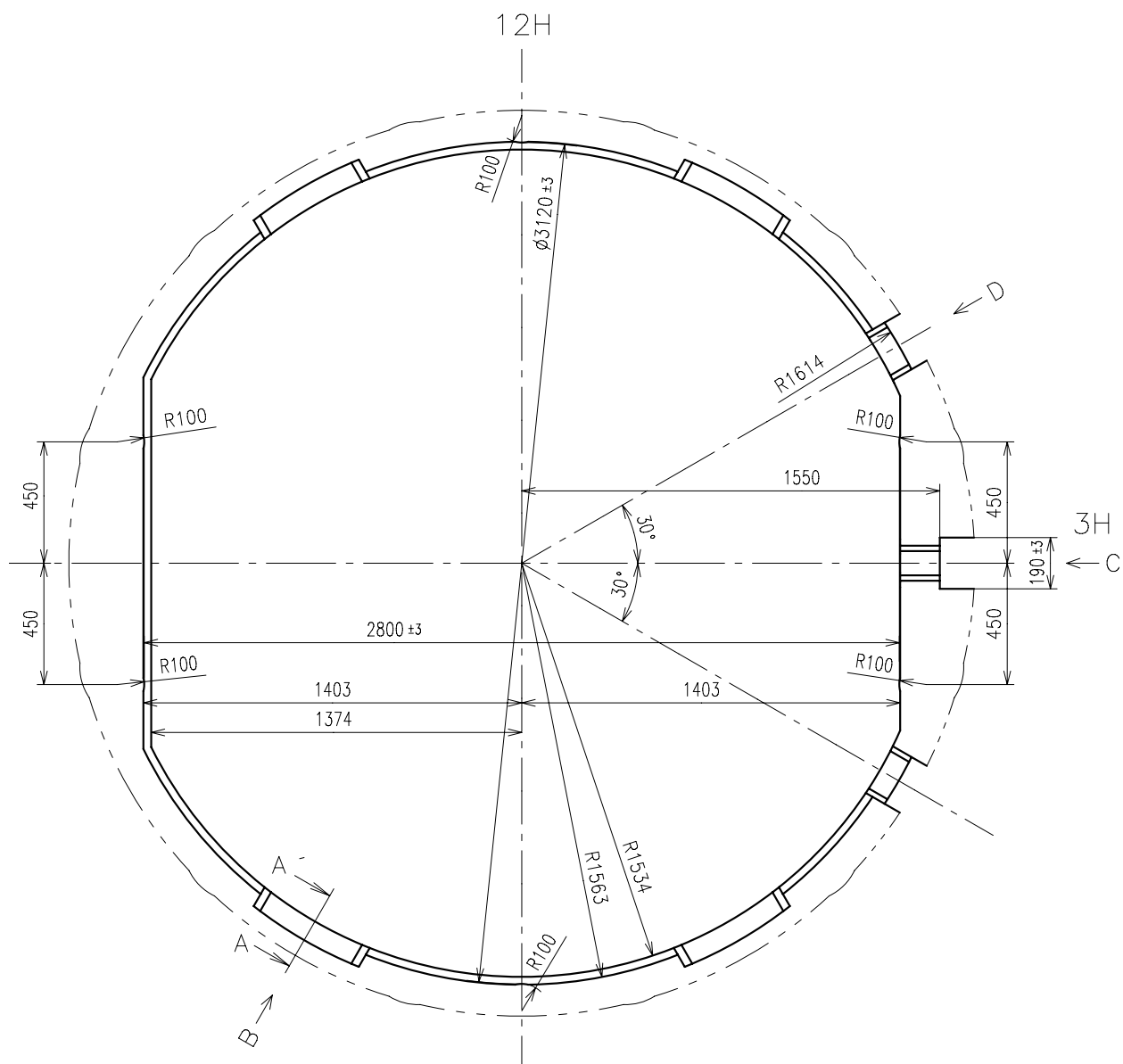
	Part No.	S1	S2	※ S3
Type-1	0351177	1366	1964	60
Type-2 (Standard)	0351578	2507	3105	650

Material : Steel

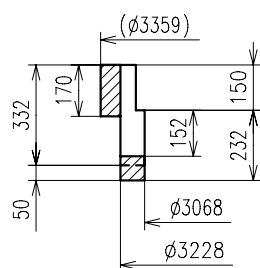
Hardness : Vickers 600 ± 50



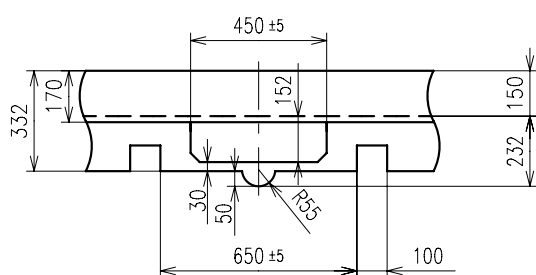




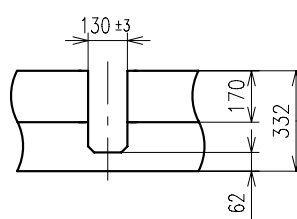
A-A' section



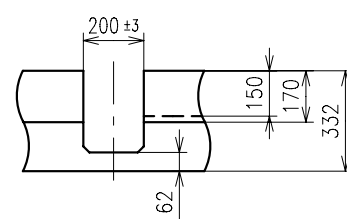
B view

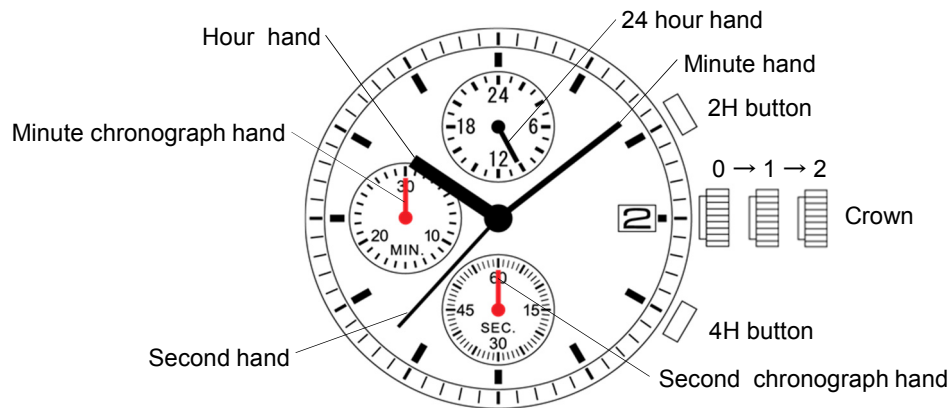


C view



D view





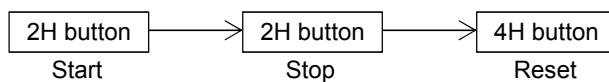
	Crown position		
	0 click	1st click	2nd click
Crown	Free	Turn counterclockwise for date change	Time setting
2H button	Chronograph Start/Stop Restart	Chronograph Start/Stop Restart	Chronograph hands 0-setting (clockwise)
4H button	Chronograph Reset Split Split release	Chronograph Reset Split Split release	Chronograph hands 0-setting (counterclockwise)

Chronograph function

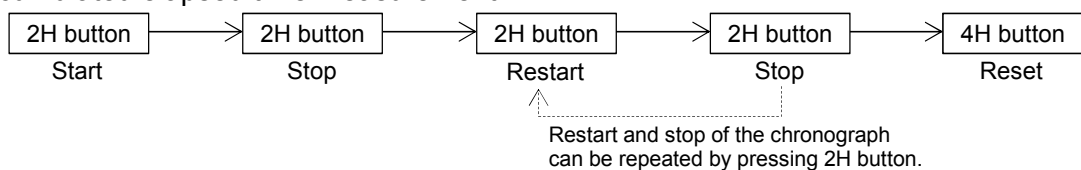
Second chronograph hand is capable of timing 30 minutes. (60 seconds x 30 times)

Minute chronograph hand is capable of timing 30 minutes.

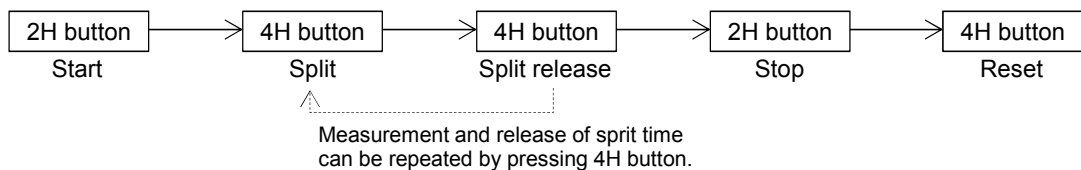
■ Standard measurement



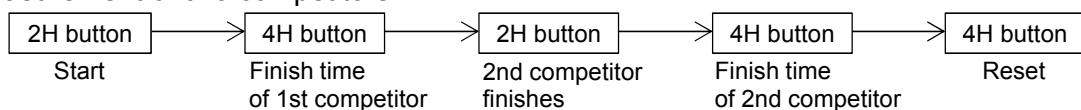
■ Accumulated elapsed time measurement



■ Split time measurement



■ Measurement of two competitors



1. Case

Please use the metal case back to prevent from the movement mal-function by static electricity.

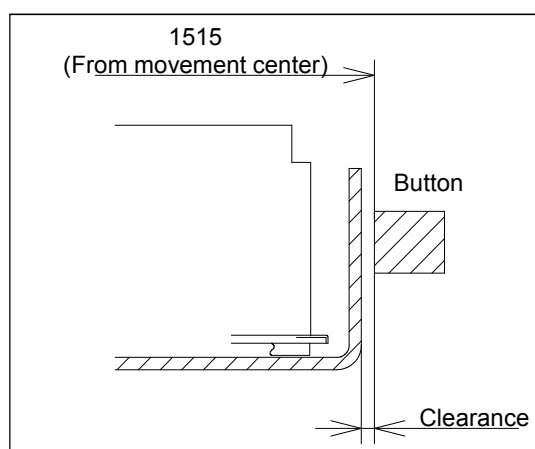
2.Hour Wheel

When set and remove the hour hand repeatedly, it may reduce the hand fixing torque because the hour wheel is made by plastic.

To ensure the enough fixing torque, it isn't recommended to re-assemble the hour hand more than five times.

3. Button position

Please keep the clearance between the movement and the tip of button to prevent the interference in assembling and enable to be cased smoothly.



To keep the clearance, it is recommended to use button spring.