



# AX-311/321 CAX-371

Low Speed Refrigerated Centrifuge/ Hybrid Refrigerated Centrifuge



## Easy Operation



### ■ Easy to see and operate control panel

Easy-to-see LCD monitor display shows various information including remaining run time, error messages, rotor types in use and records of centrifugal operation. The monitor can display in English or Japanese. (CAX-371 · AX-321)

Dual color LED display allows the user to monitor the operation status just by looking the display; red indicates that the rotor is spinning, green indicates that the rotor is stopped.

Popular user-friendly Jog Dial equipped with an <ENTER> button on top enables setting to be changed quickly and more surely.



※Indication displays on the control panel in the photo is different from displays of actual operation.

## Safety & Ecology



### ■ One-push rotor locking knob

With a single knob push, the rotor can be quickly and securely fixed. ※Except some rotors.

### ■ Flap-drive system for safer and more efficient operation

Innovative Flap-drive system employed to maintain safe and efficient centrifugal operation allows a margin of error and eye-balancing of sample tubes. ※Except some rotors.

- The CAX-371 is equipped with a function to automatically reduce the rotation speed and shut the system down if it is being run over the imbalance tolerance limit.
- Non-chlorine, ozone-friendly refrigerant which has zero ozone layer destruction coefficients is adopted.

# All in one unit

from micro tube rotors to multi-place swing rotors.

## A reliable trump card

for centrifuge operations.

**AX-311 & 321**, High Capacity Refrigerated Centrifuges, incorporate functions of microcentrifuge and versatile low speed centrifuge into one compact unit.

**CAX-371**, Hybrid Refrigerated Centrifuge, supports high speed centrifugation of micro samples.

### Flexibility



#### From micro tubes to 250ml bottles

The AX-311 & 321 Series and CAX-371 Centrifuges enable a wide range of applications including micro tubes to 250ml bottles and deep well plates. These new models can accommodate various types of rotors including a sealed angle rotor for use with 15ml or 50ml tubes, and swinging rotor TS-33C as a sealed bucket with an optional bucket cap kit B433. **HS**

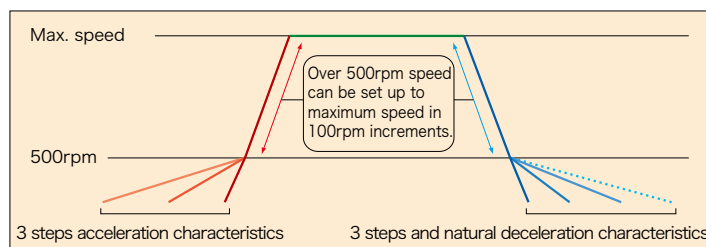
※ **HS** This highly sealed rotor, which has been tested and certified by the Health Protection Agency (HPA, UK) to be compliant with the International Standard (Annex AA of the IEC 61010-2-020), meets requirements for biohazard safety. 'Bucket cap kit B433' is an optional kit.

#### Convenient flashing function

Convenient flashing function allows operation with preset centrifuging conditions.

#### Three-step acceleration and three-step and natural deceleration

Initial values for acceleration and deceleration characteristics are set from 0 to 500rpm, however, they can be varied up to maximum speed in 100rpm increments by function settings.



### Compact Design



#### Compact design for minimum space requirement

More compact in design, compared with existing high capacity refrigerated centrifuge, is one of the many advantages of the AX-311 & 321. With a width of 462mm and depth of 559mm, a smart design has been also achieved in the CAX-371. Both the AX Series and CAX-371 are ideally suited for applications where space is limited.

# ECO mode

ECO mode to realize  
an up to approximately 44%<sup>※1</sup>  
during the waiting time.



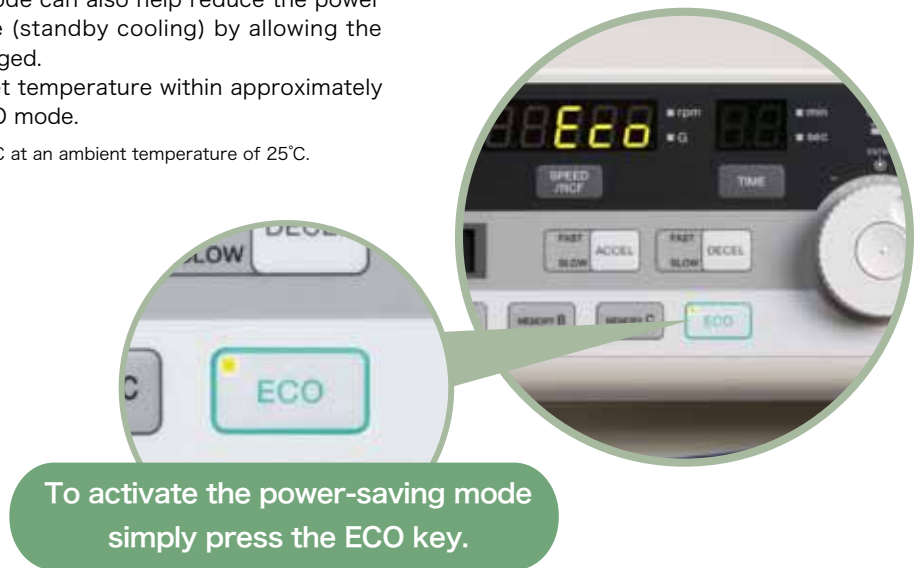
※1 In case of AX-321 The reduction rates of power consumption vary from model to model and may vary from one product to another.

## [ECO] mode Electric power saving

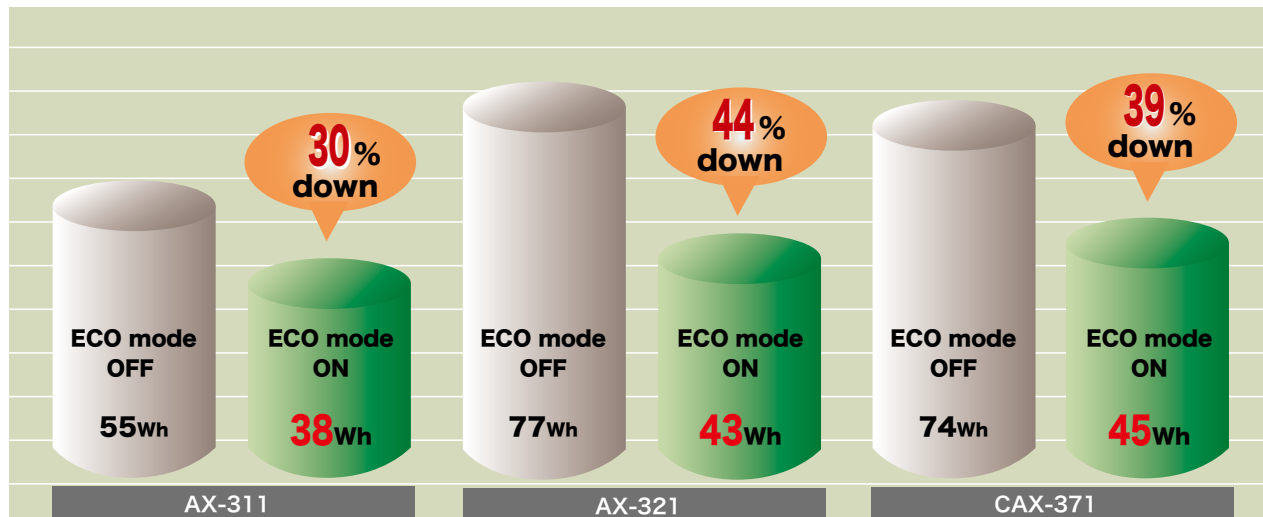
Patent pending

Activating the power-saving [ECO] mode can also help reduce the power consumption during the waiting time (standby cooling) by allowing the temperature control bands to be changed. The chamber can cool down to the set temperature within approximately 3 minutes (※2) after release from ECO mode.

※2 Under the conditions: set temperature of 4°C at an ambient temperature of 25°C.



### ■ Power consumption at ECO mode



■ Measurement conditions: Set to 4°C at an ambient temperature of 25°C while centrifugation is stopped.  
(Rotors in use: AX-311: TS-38C+3850-04P, AX-321: TS-37C+3750-TC06P, CAX-371: TS-7C+7215-06)  
■ The values shown above are average values obtained by measuring the units.

# LINE UP

We offer three high capacity general-purpose centrifuges, allowing for you to choose the best model for your application.



## AX-311

### Low Speed Refrigerated Centrifuge

Accepts a variety of tubes from general-purpose tubes to micro plates in swing-out rotors and 50ml culture tubes in angle rotors.



## AX-321

### Low Speed Refrigerated Centrifuge


Accepts a variety of tubes including micro and culture tubes, or 250ml bottles and deep-well plate x 8 in a swing-out rotor TS-37C.



## CAX-371

### Hybrid Refrigerated Centrifuge

Spins a variety of tubes including 2ml tubes at 15,000rpm with an angle rotor, or vessels from micro plates to 250ml bottles with swing-out rotors.

Rotor Type	Bucket Type	Tube Rack Type	Max. Speed (rpm)		Max. RCF (G)		Rotor Capacity (mlxnumber tubes)	Comments	
			AX-311/321	CAX-371	AX-311/321	CAX-371			
Swing-out rotors	TS-4C	S4096-02	1,800		510		Microplatex4	Load dimensions (LxDxH) up to 128.5x86x32mm	
	TS-7C	7015-06	3,600		2,320		15x24 *1	G, culture tube	
		7215-06	3,600		2,430		15x24		
		7015-08	3,500		2,190		15x32 *1		
		7115-08	3,500	—	2,380	—	15x32		
		7050-01	4,000		2,810		50x4 *2 *3		
		7150-01	5,000		4,670		50x4 *2 *3		
		7050-02	3,500		2,150		50x8 *2 *3		
		B407	0705-10P	2,600		1,170			5x40
			0705-FA10P	3,100		1,670			
		BH50-01 <b>HS</b> *4	—	4,000		2,950			50x4
	BH10-04 <b>HS</b> *4	—	3,500		2,140		10x16		
	SC-2	—	1,600		420		8x4	Floating cell collection bucket	
	TS-33C	B433 *5	3305-07P	2,700		1,200		5x28	Veno-Ject II tube 5ml
			3307-07P	2,600		1,200		7x28	Veno-Ject II tube 7ml
			3314-04P	4,000		2,990		14x16	BDF
			3315-G07P	4,700		3,980		15x28	G, PAX gene blood collection tube
			3315-TC04P	4,700		4,130		15x16	Culture tube
			3350-TC01P	4,700		4,130		50x4	
			3350-G01P	4,700		3,980		50x4	G
—			4,700		4,170		250x4	NAL, BDF (225/175ml)	
Bucket cap kit B433  <b>HS</b>	—		—		—		Sealed cap for Bucket B433 CAP433-1 with gasket		
TS-41C	Bucket, Adapter and Bucket Cover are included.	4,400	4,500	3,010	3,150	Deep-well plate x4 *6	Load dimensions (LxDxH) Up to 128.5x86x80mm		
CS-1	M0415-04	—	9,000	15,000	6,610	18,370	2x16	Micro tube	
	M0406-05	—	9,000	15,000	5,800	16,100	0.5x20		
	M0404-09	—	9,000	15,000	7,160 or 5,980	19,880 or 16,610	0.4x36 or 0.25x36		
Fixed-angle rotors	CA-1	—	9,000	15,000	6,430	17,860	2x18	NAL or BDF	
	CA-4 <b>HS</b> *7	—	9,000	15,000	6,880 or 6,250	19,120 or 17,360	50x4 or 14x4		
	CA-5	—	9,000	15,000	7,610	21,130	2x24	Micro tube	
	CA-6	—	9,000	15,000	7,610	21,130	2x18 (Outer line)		
					6,700	18,620	2x18 (Inner line)		
	CA-8 *7	—	9,000	14,000	7,610	18,410	50x4 or 15x4	Culture tube	
					7,340	17,750			
	CA-9 *7	—	9,000	13,000	9,600	20,030	50x6 or 15x6		
	CA-10	—	9,000	13,500	7,880	17,730	2x24	Micro tube	
	CA-12	—	9,000	15,000	7,430	20,630	5x12	TOM *8	
	CA-14 <b>HS</b> *7	—	9,000	15,000	7,610	21,130	50x4 or 5x4	Culture tube or BDF *9	
					6,070	16,860			
CA-15	—	9,000	15,000	6,880	19,120	2x18 (Outer line)	Micro tube		
				5,340	14,840	0.5x12 (Inner line)			
				4,710	13,080	0.2x12 (Middle line)			

Swing-out rotors

<p><b>TS-4C</b> Microplatex4 1,800rpm : 510G</p> 	<p><b>TS-7C</b> 15mlx32 5,000rpm : 4,670G</p> 	<p><b>TS-33C</b> 250mlx4 4,700rpm : 4,170G</p> 	<p><b>TS-37C</b> Deep well plate x8 3,200rpm : 2,100G</p> 	<p><b>TS-41C</b> Deep well Platex 4 4,500rpm : 3,150G</p> 
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Rotor Type	Bucket Type	Tube Rack Type	Max. Speed (rpm)	Max. RCF (G)	Rotor Capacity (ml × number tubes)	Comments	
Swing-out rotors	TS-37C Can be used for AX-321	B437	3625C-01P	3,200	2,070	250×4 *10	NAL, BDF (225/175ml)
			3610C-G02P	3,200	2,050	100×8	G
			3650-G05P	3,200	2,030	50×20	G
			3650-TC05P *11	3,200	2,100	50×20	Culture tube
						15×8	
			3615-G16P	3,200	2,080	15×64	G
			3615-TC14P	3,200	2,100	15×56	Culture tube
			3614C-18P	3,200	2,020	14×72	BDF
			3606C-35P	3,200	2,100	6×140	EIK
			3605C-48P	3,200	2,100	5×192	BDF
			3602C-36P	3,200	1,920	2×144	Micro tube
			AS36C-96D	3,200	2,080	Deep-well plate x8	Load dimensions (LxDxH) Up to 128.5×86×90mm
						Microplate x16	Load dimensions (LxDxH) Up to 128.5×86×58mm
			3750-G06P	3,200	2,030	50×24	G
	3750-TC06P *7	3,200	2,100	50×24	Culture tube		
				15×8			
	3715-G24P	3,200	2,080	15×96	G		
	3715-TC16P	3,200	2,100	15×64	Culture tube		
	TS-38C Can be used for AX-311 and AX-321	B438	3850-04P	3,500	2,380	50×16	
			3850-N04P	3,500	2,380	50×16	NAL
			3850-02P	3,500	2,380	50×8	G
			3815-10P	3,500	2,380	15×40	Culture tube
			3815-16P	3,500	2,370	15×64	G
			3806-EK20P	3,500	2,330	6×80	EIK
			3810-N20P	3,500	2,270	10×80	NAL
			3805-FA16P	3,500	2,080	5×64	BDF
			3802-EP24P	3,500	1,780	2×96	Micro tube
			B438-29	—	4,200	3,650	250×4 *10
B438-96	—	4,200	3,100	Microplate x4	Load dimensions (LxDxH) Up to 128.5×86×33mm		
B438-1507BH <sup>HS</sup> *4	—	4,000	3,310	15×28	Culture tube		
B438-5002BH <sup>HS</sup> *7 *4	—	4,000	3,310	50×8			
				15×8			

Tubes other than stated above are also available. As for details, please contact your local dealer.

■ Tube Material G: Glass

■ Manufacturer Abbreviation

TOM: TOMY SEIKO CO., LTD. BDF: Falcon/Becton, Dickinson and Company. COR: CORNING INTERNATIONAL CORP. EIK: EIKEN CHEMICAL CO., LTD. NAL: NALGENE/Thermo Fisher Scientific K.K.

\*1: Use only four holes in the center of the bucket (15ml x 4) for use with culture tubes. \*2: For 15ml tubes, a metal adapter A1500-04 is necessary. \*3: For culture tubes, an adapter IW9330-050 is necessary. \*4: Sealed buckets \*5: An optional bucket cap kit B433 is available for use as a sealed bucket. \*6: When centrifuging with a bucket cover, up to deep-well plate x 1. \*7: Do not load different type of tubes at the same time. \*8: 5ml conical tubes. \*9: FACS tubes by Falcon \*10: An optional culture Tube Adapter (BD Falcon Tube Cushion, Cat. No.352090) is required. \*11: Can be spun 50mlx4 and 15mlx2. \*12: Values indicate those of the rotor being mounted in the CAX-371.

<sup>HS</sup> This bucket, which has been tested and certified by the Health Protection Agency (HPA, UK) to be compliant with the International Standard (Annex AA of the IEC 61010-2-020), meets requirements for biohazard safety. <sup>HS</sup> It adopted a hermetically sealed structure equivalent to <sup>HS</sup> bucket or rotor designed and tested in accordance with the International Standard (Annex AA of the IEC 61010-2-020) to offer excellent sealing performance.

Fixed-angle rotors	<b>CA-4HS</b> <sup>HS</sup> 50ml×4/14ml×4 15,000rpm : 19,120/17,360G *12 	<b>CA-9</b> 50ml×6/15ml×6 13,000rpm : 20,030G *12 	<b>CA-12</b> 5ml×12 15,000rpm : 20,630G *12 	<b>CA-14HS</b> <sup>HS</sup> 50ml×4/5ml×4 15,000rpm : 21,130/16,860G *12 	<b>CA-15</b> 2ml×18/ 0.5ml×12 / 0.2ml×12 15,000rpm : 19,120/14,840 /13,080G *12 
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## Specifications

Model	AX-311	AX-321	CAX-371
Maximum Speed	9,000rpm		15,000rpm
Maximum RCF	9,600G		21,130G
Maximum Capacity	1,000ml (250ml×4)	Deep-well plate×8 (1,536ml)	1,000ml (250ml×4)
Control System	Microprocessor control (feedback system)		
Drive Motor	Induction motor		
Drive System	Flex-Spin drive system (Direct drive with an automatic alignment function)		
Data Entry	Jog Dial		
Temperature Setting Range	From -9°C to 35°C (1°C increments)		
Speed Setting Range	100 to 9,000rpm (100rpm increments)		100 to 15,000rpm (100rpm increments)
RCF Setting Range	10 to 9,600G (10G increments for the range less than 300G, 100G increments for the range over 300G)		10 to 21,130G (10G increments for the range less than 300G, 100G increments for the range over 300G)
Time Setting Range	From 10 sec to 50 sec, in 10 sec increments, from 1 min to 99 min, in 1 min increments or <F--> for free		
Safety Devices	<ul style="list-style-type: none"> <li>●Imbalance detector ●Lid interlock ●Lid open/close detector ●Abnormal speed detector</li> <li>●Over-current circuit breaker ●Rotor identification system ●Motor over-current detector</li> <li>●Abnormally high or low chamber temperature detector.</li> </ul>		
Additional Functions	<ul style="list-style-type: none"> <li>●Three-step acceleration characteristics selection ●Three-step deceleration characteristics selection</li> <li>●Three memory function ●FLASH (momentary spin) function ●BART Code selection ●Power saving (ECO) mode.</li> </ul>		
Refrigerant	HFC134a (260g)	HFC134a (310g)	HFC134a (280g)
Rated Voltage	AC120V, AC220/230/240V		
Rated Current	120V : 12A, 220/230/240V : 6A		
Power Requirements	Single phase 50/60Hz, AC120V 15A, AC220/230/240V 8A		
Power Consumption (Heat output)	930W (800kcal/h)	1,030W (890kcal/h)	1,040W (900kcal/h)
Breaker	Rated breaking current 120V : 15A, 220/230/240V : 7.5A		
Protection Against Electric Shock	Class I		
Dimensions (except protruding portion)	510W×589D×939H mm (table height:776H mm)	540W×619D×939H mm (table height:776H mm)	462W×559D×939H mm (table height:776H mm)
Net Weight	125kg(120V) 130kg(220/230/240V)	134kg(120V)139kg(220/230/240V)	118kg(120V)123kg(220/230/240V)
Environmental Requirements	Ambient temperature range:10 to 35°C, Relative humidity:30 to 85%, Atmospheric pressure:700 to 1,060hPa		
Accessories Included	<ul style="list-style-type: none"> <li>●Operator's manual × 1 copy ●Warranty card × 1 copy ●BART Code table × 1 pcs</li> <li>●Clear storage case for operator's manual × 1 pcs ●Attaching screw for clear storage case × 1 pcs</li> <li>●Spanner × 1 pcs ●Leveler × 1 pcs ●Rotor locking knob × 1 pcs ●Drain plug × 1 pcs</li> </ul>		

Sales Office

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Manufacturer

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### TOMY SEIKO CO.,LTD.

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