



Micro Refrigerated Centrifuge

M300FR F-gas free

new design,
innovation
and
user-oriented



➤ Innovation

Micro Refrigerated Centrifuge
3700/3740
RENEWAL



Micro Refrigerated Centrifuge

M300FR

Refrigerated

IEC61010-2-020

F-gas free

Innovation



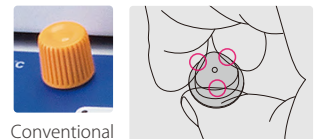
Equipped with self-luminous display (VFD)



- Equipped with technology unique to Japan, VFD (Vacuum fluorescent display)
- Visibility of display generally depends on the contrast ratio of dots in the display. VFD dots are self-luminous and other parts are blacked-out. Therefore, the contrast ratio is large and displays can be identified clearly from a distance.
- With a minimum viewing angle of 126 degrees, the wide viewing angle allows you to see the display even from an angle.

User Interface

- To enable quick and precise setting of centrifugal conditions, we adopted a control knob for adjusting rotation speed (RPM)/relative centrifugal force (RCF) and time. Since this equipment is used on a daily basis, we focused on achieving a design that is easy to grip, turn, and press. This led us to develop our uniquely shaped knob with a rounded triangular form that offers both comfort and operability.
- Three short-cut program keys for direct access.



"easy to grip,"
"easy to turn,"
and "easy to push"

Motorized lid lock

- The centrifuge is equipped with electric door locks. A light press on the door activates the motorized locking mechanism automatically.
- Doors are made of lightweight materials and a free fall stopping mechanism is used so that open doors do not suddenly fall. Doors can also be stopped at the open position.



Check the door lock sensors



Results will be displayed

The functionality for self-checks to support with daily inspections of centrifuges

By simply following the on-screen instructions, users can easily check the operational status of various sensors and the door lock function during daily inspections. This newly developed self-check feature helps ensure safer and more reliable operation of the centrifuge.

The self-check function verifies the following items to support pass/fail judgment: Door lock sensors, Rotor sensors, Imbalance sensors, Temperature sensors, Rotation sensors, Inverter condition, Operational tests, Rotor usage frequency display.

Innovation

Angle rotor

Rotor name	Rotor image	Tube	Nominal capacity	Number of tube	Tube size: Diameter × Length (mm)	Max. speed (rpm)	Max. RCF (×g)	Adaptor Code No.
AF-2024* ¹	 Autoclavable*		1.5/2mL Micro tube	24	9.5~11×36~42	15,300	22,250	—
			0.5mL Micro tube	24	7~7.9×25~34	15,300	19,890	055-7590(Set of 2)
AF-2524	 Autoclavable*		1.5/2mL Micro tube	24	9.5~11×36~42	15,000	21,880	—
			Spin column tube/filtration tube	24	9.5~11×36~60.3	13,000	16,440	—
			0.5mL Micro tube	10	7~7.9×25~34	15,000	17,360	—
			0.2mL 8-well PCR	2	5.9~6.3×20~24	15,000	11,570	Adaptor is equipped with rotor.
0.2mL PCR tube	16	5.9~6.3×20~24	15,000	11,570	Adaptor is equipped with rotor.			
AF-2730	 BS Autoclavable*		1.5/2mL Micro tube	30	9.5~11×36~42	14,000	20,820	—
			0.5mL Micro tube	14	7~7.9×25~34	14,000	17,530	—
			0.2mL PCR tube	14	5.9~6.3×20~24	14,000	16,430	—
AF-2236	 Autoclavable*		1.5/2mL Micro tube	36	9.5~11×36~42	15,000	21,880	—
			0.5mL Micro tube	36	7~7.9×25~34	15,000	19,620	055-7590(Set of 2)
			0.2mL PCR tube	12	5.9~6.3×20~24	15,000	15,340	—
AF-2048A* ¹	 Autoclavable*		1.5/2mL Micro tube	48	9.5~11×36~42	12,000	15,780	—
			0.5mL Micro tube	48	7~7.9×25~34	12,000	14,330	055-7590(Set of 2)
AF-512	 Autoclavable*		5mL Micro tube* ²	12	15×59	15,000	20,880	—

Standard rotor for 24 microtubes. Maximum rotational speed: 15,300 rpm, maximum centrifugal force: 22,250 x g.

- Accelerates to 15,300 rpm in approximately 23 seconds.
- Considering the pipetting to be performed after centrifugation, the centrifuge tube angle was designed to be 45°
- With an (optional) adaptor, 0.5 mL and 0.2 mL PCR tubes can be used.
- With the tube slots being numbered, tubes can be easily set with the point symmetry design.



AF-2024
24×2mL

A newly developed 5-in-1 rotor. This one rotor is sufficient for use with various microtubes.













- Can handle tubes containing volumes ≤2 mL used in the lab, including 2.0mL, 1.5 mL, 0.5 mL, 0.2 mL PCR and 0.2 mL 8-strip PCR tubes.
- If spin columns/filtration tubes are centrifuged, the cap of the microtube can be left open and centrifuged. The AF-2524 rotor is designed to support the tube cap to reduce the risk of tube cap breakage.


(Use at a maximum rotational speed of 13,000 rpm or less in such instances)





AF-2524
24×2mL 2×0.2mL 8-well PCR
10×0.5mL 16×0.2mL PCR


Angle rotor


Rotor name	Rotor image	Tube	Nominal capacity	Number of tube	Tube size:Diameter ×Length(mm)	Max. speed (rpm)	Max. RCF (×g)	Adaptor Code No.
AF-1408A	 Autoclavable*		14mL tube	8	17×75~100	12,000	14,330	—
AF-3806A	 Autoclavable*		38mL tube	6	25~25.6×87~103	15,000	21,880	—
AF-5004RA	 Autoclavable*		50mL tube	4	28.5~29×102~115	15,000	21,880	—
			12mL tube	4	15.8~16.4×103~110	15,000	20,630	055-7410(Set of 2)
			10mL tube	4	16~16.3×79~92	15,000	20,630	055-4280(Set of 2)
AF-5004CH	 Autoclavable*		50mL Conical tube* ³	4	30×117	15,000	22,140	—
			15mL Conical tube	4	17×121	15,000	21,130	055-1250(Set of 4)
AF-5004CS	 BS Autoclavable*		50mL Conical tube* ³	4	30×117	12,000	14,970	—
			15mL Conical tube	4	17×121	12,000	14,490	055-1250(Set of 4) 055-1280(Set of 2)
AF-5004CA	 Autoclavable*		50mL Conical tube* ³	4	30×117	12,000	14,170	—
			15mL Conical tube	4	17×121	12,000	13,520	055-1250(Set of 4) 055-1280(Set of 2)

 ●Adaptor for
0.5mL Micro tube
Code No. 055-7590
(Set of 2)

 ●Adaptor for
12mL tube
Code No. 055-7410
(Set of 2)

 ●Sealing Adaptor for
High speed angle rotor
Code No. 055-4280
(Set of 2)

 ●Adaptor for
15mL conical tube
Code No. 055-1250
(Set of 4)

 ●Adaptor for
15mL conical tube
Code No. 055-1280
(Set of 2)

Rotors have life cycles and service lives. Please contact us for more details.

* The number of cycles allowed for autoclaving and temperature limited. For more details, please contact us.

*1 0.2 mL PCR tubes can be used by using an adaptor (Code No. 055-0500, 2-piece set) for 2 mL tube slots.

*2 Bio-bik 5 mL sampling tubes and Watson 5 mL megatubes can be used.

*3 Cap diameters of up to 36 mm can be used for products manufactured by Iwaki, Greiner, Corning, Sarstedt, Sumilon, Violamo, Falcon, Fisher, Labcon and Nunc.

Removing the Rotor

- (1) Pull the tube out of the rotor.
 - (2) Press the head of the drive shaft in the center of the rotor with both thumbs.
Then, pull the rotor straight upward, and you can remove the rotor.
- ※ If you pull up aslant, the rotor will hit against other parts and cannot be removed smoothly.





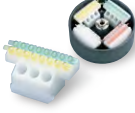




**Tool for Removing
the AF-5004CH**
Code No. 028-0627



When removing the AF-5004CH, if it is difficult to push the head of the drive shaft in the center of the rotor, it may be helpful to use a special tool.





Multi rotor

Rotor name	Bucket Code No.	Tube	Nominal capacity	Number of tube	Tube size: Diameter × Length (mm)	Max. speed (rpm)	Max. RCF (×g)	Adaptor Code No.
MF-2236A	053-5860 		1.5/2mL Micro tube	24	9.5~11×36~42	15,000	18,360	—
			0.5mL Micro tube	24	7~7.9×25~34	15,000	15,090	055-7590(Set of 2)
			0.2mL PCR tube	24	5.9~6.3×20~24	15,000	11,820	055-0500(Set of 2)
	053-2000 		1.5/2mL Micro tube	24	9.5~11×36~42	15,000	18,870	—
			0.5mL Micro tube	24	7~7.9×25~34	15,000	16,100	055-7590(Set of 2)
			0.2mL PCR tube	24	5.9~6.3×20~24	15,000	13,330	055-0500(Set of 2)
	053-0060 	 	1.5/2mL Micro tube	12	9.5~11×36~42	15,000	15,600	—
			0.5mL Micro tube	12	7~7.9×25~34	15,000	13,330	055-7590(Set of 2)
			0.2mL PCR tube	12	5.9~6.3×20~24	15,000	11,320	055-0500(Set of 2)
0.2mL 8-well PCR			8	5.9~6.3×20~24	15,000	17,860	—	

● Adaptor for 0.2mL PCR tube
Code No. 055-0500
(Set of 2)

● Adaptor for 0.5mL Micro tube
Code No. 055-7590
(Set of 2)

Swinging bucket rotor

Rotor name	Rotor image	Plate	Plate *8	Number of plate	Plate size (mm)	Max. speed (rpm)	Max. RCF (×g)	Adaptor Code No.
PF-206	 Autoclavable*	  	PCR Plate	2	86 (W) × 128 (D) × 52 (H)	4,000	1,790	—
			Micro plate	6				
			Deep-well plate	2				

Rotor durability

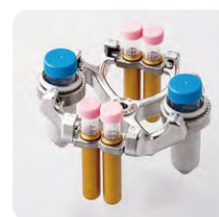
- The rotating parts of the centrifuge, its rotors and buckets, are made of metal, such as stainless steel and aluminum.
- If a metal plate is bent and straightened over and over, it will eventually break due to metal fatigue.
- Rotors and buckets undergo repeated “bending and straightening” during spin-up and spin-down. After a specified period of use or number of operations is reached, these parts may break due to metal fatigue.
- To use KUBOTA's products safely, we ask that you replace any rotor that has reached the end of its life time. We appreciate your understanding and cooperation.

Mixed Loading **MIX**

KUBOTA achieved Mixed Loading where two different types of buckets or tube racks can be centrifuged at the same time.



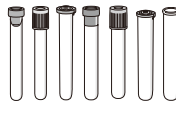


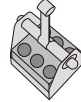

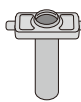
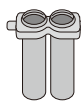
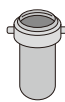

Moreover, frequently used combinations of buckets are offered as a set as standard so that the accessories become more affordable.






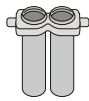

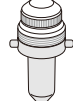

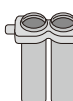



Available swing rotors: **SF-242**



SF-242 Mix
2×50mL conical tube
4×15mL conical tube

Swing rotor

			 *1 Flow cytometry	 *2			
	Nominal capacity	1.5/2mL×24	5-10mL blood collection tube/15mL glass tube×16	7-10mL blood collection tube/15mL glass tube×4	7-10mL blood collection tube/15mL glass tube×8	7-10mL blood collection tube/15mL glass tube×4	50mL glass tube×4
	Tube size: Diameter x length(mm)	9.5~11×36~42	12~17×65~107	12~17.2×86~110		12~17.8×87~110	27~37×95~110
Swing rotor	Max. speed(rpm)	4,000	4,000	4,000	4,000	4,000	4,000
	Max. RCF(x g)	2,410	2,410	2,540	2,520	2,500	2,540
SF-242	Bucket Code No.	053-4800	053-4930 *3	053-6010 *3	053-6020 *3	053-4990	053-4990
							
	Adaptor Code No.	—	—	—	—	055-7400 *4	—
		—	—	—	—	 (Set of 4)	—

				 Sealing type for biohazard countermeasures	 *7 MiX			
	Nominal capacity	15mL conical tube×8	15mL conical tube×4	50mL conical tube×4	15mL conical tube×4	50mL conical tube×4	15mL conical tube×4	50mL conical tube×2
	Tube size: Diameter x length(mm)	17×121	17×121	30×117	17×121	30×117	17×121	30×117
Swing rotor	Max. speed(rpm)	4,000	4,000	4,000	4,000	4,000	4,000	4,000
	Max. RCF(x g)	2,580	2,590	2,610	2,590	2,610	2,580	2,610
SF-242	Bucket Code No.	053-1580	053-5010		053-0040 *5		053-0130 *6	
						 SHIELD bucket		
	Adaptor Code No.	—	055-1280	—	055-1280	—	—	—
		—	 (Set of 2)	—	 (Set of 2)	—	—	—

Rotors have life cycles and service lives. Please contact us for more details.

* The number of cycles allowed for autoclaving and temperature limited. For more details, please contact us.

- *1 Blood collection tubes with a cap diameter of 18 mm or less and a cap bottom length of 61 mm or more can be used. Thin and thick/long and short 5 to 10 mL blood collection tubes, such as Sekisui Insepack II, Terumo Venoject II, Nipro Neotubes, and Becton Dickinson Vacutainer tubes, can be used. Flowsight tubes can also be used.
- *2 Blood collection tubes with a cap diameter of 18 mm or less and a cap bottom length of 85 mm or more can be used. Thin and thick/long 7 to 10 mL blood collection tubes, such as Sekisui Insepack II, Terumo Venoject II, Nipro Neotubes, and Becton Dickinson Vacutainer tubes, can be used.
- *3 Shipped with bottom rubber (Code No. 024-0159) attached.
- *4 Bottom rubber (Code No. 024-0159, 10-piece set) is required.
- *5 Bucket with sealing cap. Sealing cap and O-ring (made of silicon) are included. Autoclavable (121°C).
- *6 This bucket (Code No. 053-0130) is sold as a set of two Code No. 053-1580 items and two Code No. 053-5010 items.
- *7 MiX sets can be used with the M300FR instrument. Cannot be used with Model 3740.
- *8 Test the strength of plates before centrifugation. Plates on lower levels may collapse.


Product name	Micro Refrigerated Centrifuge
Swing rotor	
Max. capacity	50mL×4 (SF-242)
Max. speed	15,000rpm (MF-2236A)
Max. RCF	18,360×g (MF-2236A)
Angle rotor	
Max. capacity	38mL×6 (AF-3806A)
Max. speed	15,300rpm (AF-2024)
Max. RCF	22,250×g (AF-2024)
Size	39 (W) × 54 (D) × 79 (H) cm Height with opened lid: 122 cm
Weight	110V 86Kg, 220V/230V 85Kg
Power consumption and Heat out put	630W, 2.3MJ/h About 11W(power consumption in power saving mode)
Power requirements	Single phase 110 ± 10 % V 60Hz, 15A Single phase 220 ± 10 % V 50/60Hz, 10A Single phase 230 ± 10 % V 50/60Hz, 10A
Rated voltage and Rated current	110 V , 60 Hz : 7.3A 220 V , 50 / 60 Hz : 3.5A 230 V , 50 / 60 Hz : 3.5A
Operation environment	For indoor use only Altitude: 2000m or less Temperature: 10°C to 35°C Relative humidity: Maximum relative humidity 80% at 10°C to 31°C , decreasing linearly to 50% relative humidity at 40°C at above 31°C . Overvoltage category: II Pollution degree: 2
Test standard	IEC61010-2-020
Control system	Inverter Microprocessor control, Rotation speed, RCF, Time, acceleration / deceleration, Number of memories: 99 channels at the maximum (3 for direct invocation using the panel button)
Error and user message display	Lid open , Imbalance , Over speed , Motor , Speed sensor , temperature sensor , Lid rock , inverter , Abnormal temperature , Imbalance sensor.
Speed setting	Digital, 10 or 100 rpm step, 200 rpm-15300 rpm
RCF setting	Digital Indication : From 0 seconds to 99 hours 59 minutes seconds 1 second step indication minutes 1 minute step indication hour 1 hour step indication Hold
Timer setting	Digital display, with Hold From 1 sec. to 99 hour 59 min 59 sec, in 1sec. increment setting
Temperature force setting	Digital 1 °C step · indication Setting range : From -10 °C to 40 °C in 1 °C increments Indication : From -11 °C to 43 °C in 1 °C increments
Refrigerant	R1234yf(HFO) Quantity: 0.21 kg GWP : <1 Contains fluorinated greenhouse gases in a hermetically sealed system.
Acceleration /Deceleration	3 ways of switching


アイコン	説明
	IEC61010-2-020 Model that complies with the international safety standard for centrifuges, IEC61010-2-020.
	F-gas Free Models Model that uses R1234yf (F-gas free).
	One-Touch Rotor No tools are required when removing and installing the rotor. To remove the rotor, press down on the head of the drive shaft while lifting the rotor.
	Power-saving mode When no key operation is performed for a certain period of time, it reduces power consumption by shutting down the display and the refrigeration units.
	Self-Check Functionality By operating the centrifuge according to the centrifuge panel display, it is possible to check whether the various sensors and door lock functions are working properly.
	Pre-Cooling A function that cools the inside of the centrifuge chamber and rotor in advance.
	Tachometer Port Compatible with rotational speed measurements using a photoelectric tachometer.
	Key Lock Function Changes to centrifugation conditions and operations during centrifugation are controlled with passwords.

Kubota is certified to ISO 9001 and ISO 13485 standards.

Precautions for use

Products in this catalogue are designed for use only by people who have the requisite technical knowledge, and must always be used with considerable care and only for their intended purpose. People who do not have adequate technical knowledge or training should only use the products under appropriate supervision by someone with expert knowledge, or else accidents are likely to occur.

 Prohibited	<p>Please immediately stop using the products in any of the cases listed on the right.</p> <ul style="list-style-type: none"> ● The rotor or buckets appear to be damaged or corroded. ● When the replacement period (years of operation, operating lifetime) of a rotor has passed. ● The equipment emits a burning smell or becomes abnormally hot. ● You receive a weak electric shock when you touch the equipment with your bare hands. ● When any other abnormality or indication of failure is noticed. 	<p>IMPORTANT</p> <p>If any of the cases listed at the left occurs, immediately turn off the power, disconnect the power cable plug or connecting terminals from the main power outlet, place a "Do not use" sign on the unit, and contact your nearest dealer</p>
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 Safety Precautions	<p>To use the equipment safely, be sure to read the instruction manual carefully before you start operations.</p>	<p>Do not misplace the instruction manual. Keep the instruction manual nearby so that you can refer to it whenever necessary.</p>
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- The term of supplying spare parts for repair is 7 years after discontinuation of production (except spare parts which we are unable to procure).
- This catalogue is not for distribution in the USA, Canada and Mexico as products shown are not for sale in these countries.

KUBOTA CORPORATION

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