

# Specifications

Model	CR22N (CE Model)	CR22N (Non-CE Model)
Max. Speed	22,000 rpm	
Max. RCF	55,200 xg (R22A4)	
Max. Capacity	1,500ml x 4 bottles (R9A2)	
Speed Control Range	300 ~ 22,000 rpm	
Temperature Control Range	-20 ~ +40 ℃	
ACL/DCL Mode	ACL: 9 modes, DCL: 9 modes with coasting	
Program Function	30 programs, with RCF(g) / g x sec function	
Drive Unit	Induction Motor (Inverter)	
Refrigerator	Closed Inverter Rotary (Refrigerant : R410A)	
Safety Functions	Interlock Door, Dual Over Speed Detection Non-contact Imbalance Detection, Abnormal Temp. Detection etc.	
Variable Deceleration Slope	Yes (beside DCL mode, moderate deceleration or free coast is selectable.)	
User Lockout Function	Yes	
Data Communication	USB port (Operating history can be output through USB port.)	
Operating Log Management	LAN : Factory Option PC and optional himac LogManager Ver.3.1 network edition is required. Supporting GLP/GMP	
Display	High-resolution 5.7 inch color LCD	
Keypad	Touch-sensitive LCD panel (with GUI icons)	
Noise	64 dB(A) at 1m front (at 22,000rpm)	
ECO Mode	Yes	
Standard	CE marking	N/A
(1) EMC Directive	EN61326-1	
(2) LVD and MD*	EN61010-1, EN61010-2-020	
Dimension (W x D x H : mm)	700 x 810 x 915 (height to chamber : 853)	
Weight	290 kg	
Power	Single Phase, AC 220, 230, 240V+/-10%, 30A (50/60Hz)	
Part No.	903350C1	90335001

Note : 1. Please note that LCD panel may contain a few dead or stuck pixels.  
2. \* LVD : Low Voltage Directive, MD : Machinery Directive

## Appearance



Top view



Front view



Slide view



Display & Operational Panel  
(Enlarged)

**CAUTION:**  
For safe and proper use of your machine, carefully read and follow the instructions in the instruction manual.

- All specifications are subject to change without advanced notice.
- Actual color may vary from the color of the photos on this catalogue, due to printing conditions.
- Due to safety reasons, installation environments, operating environments and conditions may be restricted.
- Unless specially mentioned, products and/or operation panel of the photos are standard specification.
- For further information, please contact your nearest Hitachi Koki's representative.



Hitachi Koki Co., Ltd. is certified international Standard ISO14001 (Environmental Management System) by International Organization for Standard



Scientific Instruments Division of Hitachi Koki Co., Ltd. is certified Quality Management and Quality Assurances Standard (ISO 9001) by International Organization for Standard



UKAS Quality Management

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HLI-8A | 2013.01



**CR22N**  
High-Speed Refrigerated Centrifuge





# himac CR22N

High-Speed Refrigerated Centrifuge

## Compact body, Larger Capacity

6L rotor was available only for large-capacity refrigerated centrifuge or high-end model of the high-speed refrigerated centrifuges in the past. With newly developed drive unit and 1.5L bottle, now you can use 6L rotor (1.5L x 4 bottles) with a new standard model of the high-speed refrigerated centrifuge model CR22N. In addition, the CR22N has a more compact body than the one of our former model CR-GIII series.

## Easy Operation with Color Touch-Sensitive LCD

High resolution color touch-sensitive LCD and GUI (graphic user interface) with high contrast against back screen in black color enable users to easily operate the system or select various menus and function by touching the icon on the display. Of course, operation status is identified at a glance by intelligible screen design.



## Self-Locking Rotor System

himac original "self-locking rotor system" is the most simple system to place the rotor onto the drive shaft. You just simply place the rotor on the drive shaft and that's all. The rotor is locked by centrifugal force automatically. You do not need to fix the rotor by screw or push the button to lock or unlock the rotor like other models available in the markets.

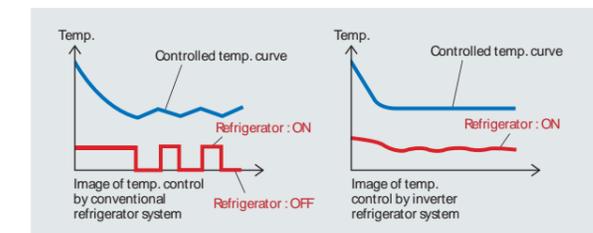


## Non-Contact Imbalance Detection System

The himac original imbalance sensor continuously measures oscillation over the entire rpm range. The system immediately detects abnormal vibrations caused by the imbalance of the rotor and stops the rotation of the rotor automatically.

## All Standard Rotors maintained at 4°C

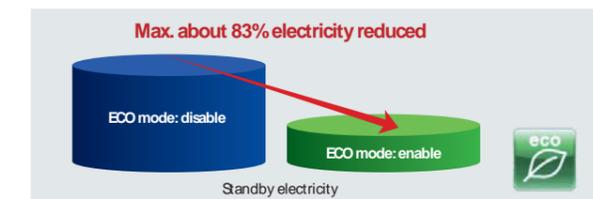
CR22N is the 1st model equips inverter refrigerator system in this class\*. The inverter refrigerator system provides you high efficient temperature control of the rotor and less electricity consumption is anticipated. Also the refrigeration capacity was improved, so now all standard rotors can be maintained at 4°C at their maximum speed without vacuum system (under room temperature at 25°C). (There are some exceptions about made-to-order rotors.) In addition, inverter refrigerator system has reduced operating sound, because there is no start-up sound of conventional refrigerator system.



## Energy Saving and Environment Friendly Design

### ECO mode (automatic standby function)

CR22N has ECO mode (automatic standby function) in it. If the display is not touched over the set wait time, the system automatically deepens backlight of the LCD and stop refrigerator (except at running) so that system reduces maximum 83% of standby electricity\*\*. Just press a button, so you can contribute to the energy saving.



### Re-generating Brake System

The drive unit has a re-generating brake system. It changes the kinetic energy, which was exhausted into the room as a heat in deceleration, to electricity. So it can reduce the temperature increment and return maximum 40% electricity, which is used in whole operation, to power source.

### Environment Friendly Design

CR22N is designed according to Hitachi Group's "Design for Environment Assessment System" standard. Over 80% materials of the product are reusable or recyclable. It has reduced use of harmful substance in materials and components. Also, the refrigerant used in CR22N has ODP (ozone depletion potential) equals to 0.

# Functions



## Automatic Rotor Identification PAT.

This function automatically adjusts optimized running condition based on the rotor automatically identified by compensating for air friction and implement temperature control etc..

## RCF Calculation and Display RCF

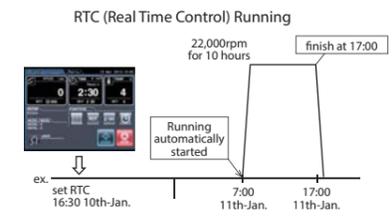
CR22N automatically calculation from rpm value to RCF(xg) value and eliminates many troublesome and time-consuming manual calculations using many parameters, such as speed and R(max.) etc.. You can start operation by entering RCF(xg) value, instead of running speed.

## Actual Run Timer ACT

Conventional run timer starts when the rotor starts acceleration. But himac original Actual Run Timer starts when the set speed is attained. It enables users to control actual net run time and obtain higher reproducibility of the separation.

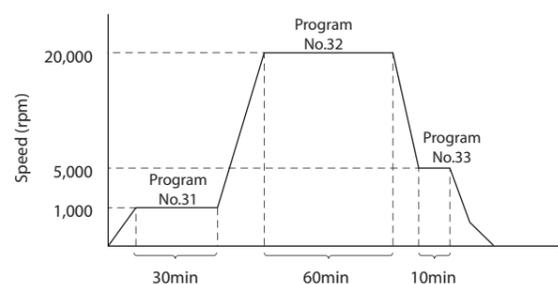
## RTC (Real-Time Control) Function RTC

himac original RTC function makes timer setting easier than conventional delay time setting. You can simply set date and time when you want to start or finish the centrifugation, as calendar and clock are equipped with the system.



## Programmed Operation PROG

You can program 30 operations into the memory. You can set another three programs with three-step-mode operation. (total 33 programs)



## Automatic Rotor Cover Detector PAT.

It detects rotor cover status by ultrasonic sensor on the door. It prevents from unexpected accident caused by without rotor cover in advance.

## Pre-Cool Function PAT.

This function maintains temperature inside rotor chamber at 15°C with preventing from icing, in order to reach target temperature shortly, when the rotor is not set on the drive shaft. When the rotor is set on the drive shaft, refrigerator control the temperature inside the rotor chamber at set temperature.

## Zoom Function PAT.

Display of running speed and time is enlarged on the screen in order to find the operating status from a distance. Screen is switch from "Run Screen" to "Zoom Display" automatically at 20 sec. after reaching the set speed.

## User Administration USER

You can register up to 40 users into the memory. You can set access level and PIN of each user. There are two access level, "Administrator" or "User". "Administrator" can access all function, but "User" cannot access administrator function when the user lockout function is on.

## User Lockout Function LOCK

In case the user lockout function is enabled, only registered user can login the system by entering registered 4 digit PIN. It is useful function to control user access based on the groups or laboratories.

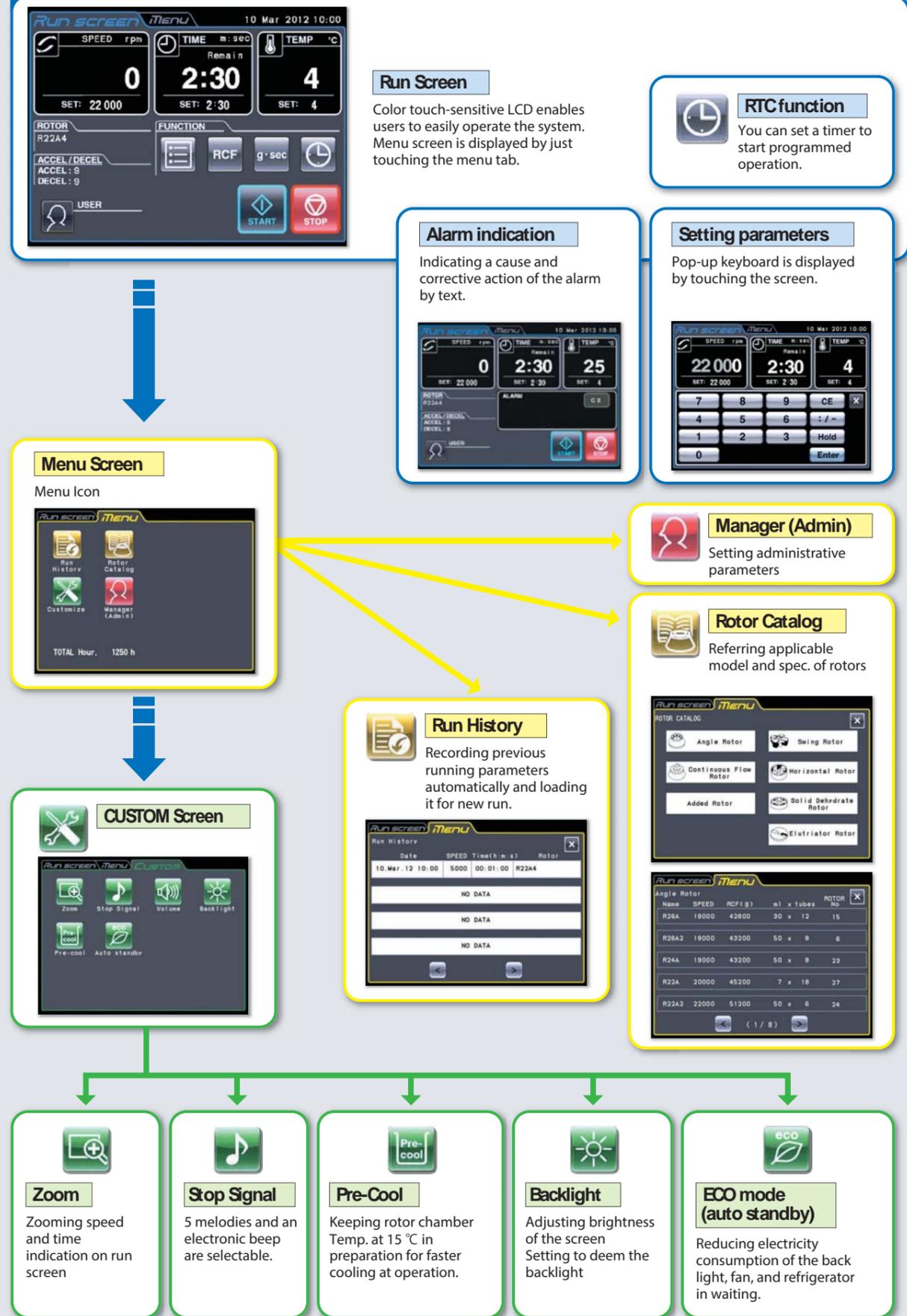
## Rotor Management ROTOR

Your rotors can be registered to the system in order to manage followings;

- \* Serial number of each rotor
- \* Total accumulated operating time (hours)
- \* Total number of operation (runs)

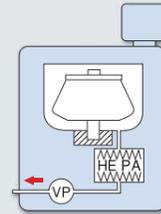
# Operation Flow Diagram

## Color touch-sensitive LCD



## Biosafety Option

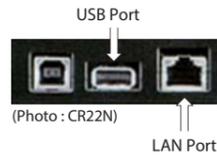
Biosafety is the 1st priority in all laboratories. This is why we design and offer multiple options for biosafety compatibility. Not only biosafety rotors or special-sealed type fixed angle rotor, but also the Micro Filter can be assembled in the CR22N system for enhanced level of biosafety at your option. This Micro Filter modification of the CR22N system is our factory option.



## Data Communication and Operating Log Management

### USB

USB port is equipped as standard specification. The system records up to 100 operating histories in its memory. Operating data can be output in CSV format\* through the USB port.



### LAN

Optional LAN board is also available. You can link CR22N to your PC through ethernet or internet. Optional software "himac LogManager Ver. 3.1 (network edition)" can be installed in your PC and operating history and data of CR22N can be easily managed by your PC.

### himac LogManager Ver. 3.1 for Windows® (Network Edition)

-Optional log management software

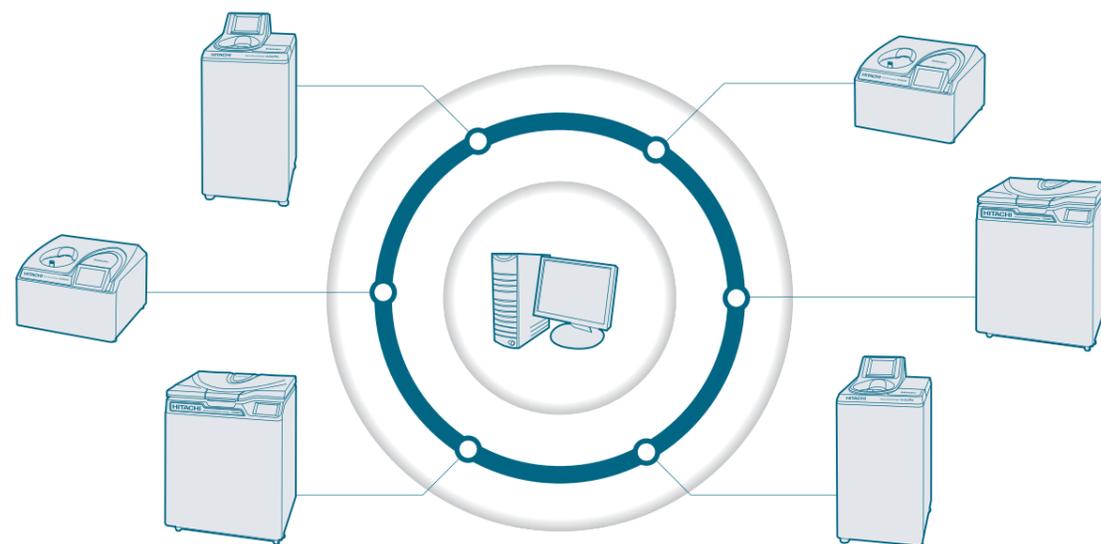
himac LogManager Ver. 3.1 for Windows® (Network Edition) is useful and convenient software to manage real time operating log of himac CP-WX series, CS150NX, CS150FNX, CR22N and CR-GIII series. Maximum 16 units of the abovementioned centrifuges can be registered to the software. As data communication between the centrifuge and PC is done via LAN or Ethernet, so there is no distance limitation to establish a network. You can easily establish the network configuration and relocation with commercially available LAN devices. (Optional LAN board is required for the centrifuges.) It means you can manage the operating log at the different location from the installation site of the centrifuges.

The software is real-time log management software; recording period is selectable from 10 seconds to 5 minutes interval. Of course, the software supports U.S. FDA 21 CFR Part 11, following functions are available;

- Digital Signature
- Audit Trail
- Encrypted Data Files etc.

Compatible OS;  
Windows® XP, Windows Vista®, Windows® 7

Windows®, Windows® XP, Windows Vista® and Windows® 7 are registered trademark of Microsoft Corporation in the United States and other countries.



## Unique 6L Rotor model R9A2 & 1500PP Bottle (WM)



We proudly introduce the newly developed 1500PP Bottle (WM). Hitachi Koki is the 1st manufacturer developed unique 1.5L triangular bottle for high-speed refrigerated centrifuge use. The unique 1.5L triangular bottle has a wide mouth so that it is easy to collect separated sample (pellet) and clean the bottle. We could minimize the size and weight of our new 6L capacity fixed angle rotor with 1.5L triangular bottle. Comparing with R7A fixed angle rotor (1L x 6 bottles) for large-capacity refrigerated centrifuge, R9A2 rotor is lighter than R7A rotor and R9A2 rotor can offer higher g force.

R9A2 : 17.1kg / 15,100 xg (8,500rpm)  
R7A : 18.7kg / 11,100 xg (7,000rpm)

R9A2 rotor and 1500PP Bottle (WM) including its cap can be sterilized by autoclave (at 121°C for 20min.)  
4sets 1500PP Bottle (WM) including cap, cap support, inner cap and O-ring are supplied as standard accessories with R9A2 rotor.

### Configuration of 1500PP Bottle (WM)

Part No.	Description
S310087A	1500PP Bottle (WM) (4pcs/set : bottle only)
S310071B	1500AL Cap (2pcs/set : cap only)
S412932A	Cap Support (4pcs/set : cap support only)
S412933A	1000 Inner Cap (WM) 2 (4pcs/set : inner cap only)
S412935A	O-ring (10pcs/set : O-ring only)

### Specification

Max. Speed	8,500 rpm
Max. RCF	15,100 xg
Nominal Capacity	1,500ml x 4 bottles
Tube Cavity Angle	22°
K-factor	4,313
Weight (kg)	17.1
Product No.	904374D0



PAT. P

NEW



# Standard Fixed Angle Rotor

## New Rotors

R21A2

Auto  
clave



The R21A2 rotor is designed for 30ml x 6 tubes and has 40° tube cavity angle. It is suitable for pelleting. 40SS tube and 40Ti tube (for ultracentrifuge) can be used.

Specification	
Max. Speed	21,000 rpm
Max. RCF	50,000 xg
Nominal Capacity	30ml x 6 bottles
Tube Cavity Angle	40°
K-factor	487
Weight (kg)	5.4
Product No.	904373D0

R22A6

Auto  
clave

Bio  
safety



The R22A6 rotor is designed for 10ml x 12 tubes and has 45° tube cavity angle. It is suitable for pelleting. 12SS tube and 12 Ti tube (for ultracentrifuge) can be used.

Specification	
Max. Speed	22,000 rpm
Max. RCF	55,100 xg
Nominal Capacity	10ml x 12 bottles
Tube Cavity Angle	45°
K-factor	319
Weight (kg)	4.8
Product No.	904375D0

## High-capacity Light Weight Rotor

### Innovative aluminum alloy made light weight rotor

This series' rotors are half the weight of conventional rotors in the same capacity. They greatly reduce acceleration/deceleration time. They can be rotated at Max. speed with bottles filled with any volume, as long as balanced.

Auto  
clave



R9A2

Net weight: 17.1kg  
8,500 rpm / 15,100 xg  
1500ml x 4 bottles

Auto  
clave



R9A

Net weight: 13.7kg  
9,000 rpm / 15,300 xg  
1000ml x 4 bottles

Auto  
clave



R12A6

Net weight: 14.8kg  
12,000 rpm / 22,500 xg  
500ml x 4 bottles

Auto  
clave

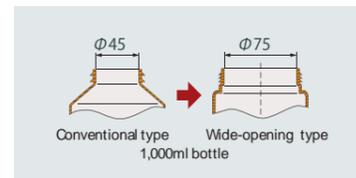


R13A

Net weight: 11.0kg  
13,000 rpm / 26,400 xg  
250ml x 6 bottles

### Wide Mouth Bottle

It is easy to collect separated sample and clean the bottle.



## Fixed Angle Rotor for 50ml TC (Conical-Bottom) Tube

Auto  
clave



R18A

18,000 rpm / 42,200 xg  
50ml x 8 tubes

Auto  
clave



R15A

15,000 rpm / 32,240 xg  
15/50ml x 10 tubes each

### "himaC 50TC tube" applicable to high xg is available!

(Part No. S307904A : 300 pcs/set)

Max. RCF : 42,200 xg\*

Max. Speed : 18,000 rpm\*

Sterilized by electron beam for immediate use to culture and process fungus  
Scale indication and writing spare are ethanol/methanol proof.

\*with R18A fixed angle rotor



## Fixed Angle Rotor (Standard model)

Auto  
clave



R22A4

22,000 rpm / 55,200 xg  
1.5/2ml x 30 tubes



R20A2

20,000 rpm / 48,000 xg  
50ml x 8 tubes



R14A

14,000 rpm / 30,240 xg  
250ml x 4 tubes



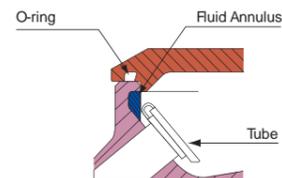
R12A3

12,000 rpm / 23,800 xg  
250ml x 6 tubes

## Fixed Angle Rotor with Fluid Annulus

Even if a sample is overflowed from a tube inside the rotor during centrifugation, overflowed sample is dwelled in the fluid annulus.

Model : R13A, R22A4, R12A6



# Standard Swinging Bucket Rotors

## General-purpose Swinging Bucket Rotor

R4SS



5ml ~ 10ml x 40 tubes  
50ml TC (conical bottom) x 8 tubes  
15ml TC (conical bottom) x 24 tubes



4ml/5ml x 8 tubes/bucket  
5x8S adaptor



7ml/10ml x 8 tubes/bucket  
10x8S adaptor



10ml/15ml x 8 tubes/bucket  
15x8S adaptor



15ml TC x 6 tubes/bucket  
15TCx6S adaptor



50ml TC x 2 tubes/bucket  
50TCx2S adaptor



4~10ml x 10 tubes/bucket  
10x10SB adaptor



15ml x 10 tubes/bucket  
15x10S adaptor

## Versatile Swinging Bucket Rotor

R3S



50ml TC (conical bottom) x 28 tubes  
15ml TC x 40 tubes



10ml x 24 tubes/bucket  
Tube Rack GR



3~5ml x 30 tubes/bucket  
Tube Rack BL



15ml x 18 tubes/bucket  
Tube Rack YE



10ml x 4 tubes/bucket  
50ml x 4 tubes/bucket  
Tube Rack OR



225ml x 1 tube/bucket  
175ml x 1 tube/bucket  
Tube Rack 61x1



250ml (Nargen) x 1 tube/bucket  
Tube Rack 62x1



10ml x 18 tubes/bucket  
Tube Rack 15.5x18



7ml x 18 tubes/bucket  
Tube Rack 13.2x18



15ml TC x 10 tubes/bucket  
Tube Rack 17x10



50ml x 7 tubes/bucket  
50T7S adaptor



500ml x 1 tube/bucket  
500PA tube



96-hole microplate x 1 pc/bucket  
M bucket

## High-speed Swinging Bucket Rotor for TC (conical bottom) Tube

R8S

Auto  
clave  
Bio  
safety

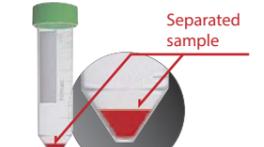


Max. Speed : 8,000 rpm  
Max. RCF : 11,500 xg  
No wind-sealed shell design offers easy operation to users.  
Nominal Capacity : 50ml TC tube (conical-type) x 4 tubes



Bucket sealing cap  
for biosafety (option)  
(Part No. S302194A : 4pcs/set)

Suitable for pelleting  
samples with conical-type tube



\*Buckets are autoclavable. (121°C, for 20minutes)  
\*Optional bucket sealing cap is available for your biosafety.  
\*Optional bucket sealing cap is also autoclavable. (121°C, for 20minutes)

## Swinging Bucket Rotor for Micro Plate

Auto  
clave

Bio  
safety



R5S4

DWP x 4 pcs  
MP x 12 pcs

## Balancer



S302859A : Scale Balancer (for 1,000ml bottle)  
349981A : 500g Balancer (up to O.D. 73mm)  
349981B : 250g Balancer (up to O.D. 38mm)

The rotor marked with this icon can be sterilized by autoclave at 121°C for 20 minutes.

Biosafety of the rotor marked with this icon was verified by in-house test according to the procedure modified IEC61010-2-020 Annex AA, using Bacillus subtilis containing  $\geq 1 \times 10^6$  spores/ml.  
\* Sample may be leaked from the rotor if o-ring is deteriorated or operation is not appropriate.

# Standard Rotor : Rotors and Accessories List

Type	Model	Part No.	Maximum speed (rpm)	Maximum RCF (xg)	Weight (kg)	For tubes		Standard accessories	
			CR22N			Nominal capacity (ml) x number of tubes	Tube dimensions (dia. x mm)	Tube/bottle	
Fixed angle rotor	R22A6	904375D0	22,000	55,100	4.2	10 x 12	16 x 82	10PA bottle (with cap) x 12	
	R22A4	904363D0	22,000	55,200	3.3	2 x 30	11 x 42	-	
	R21A2	904373D0	21,000	50,000	5.4	30 x 6	26 x 97	30PA bottle (with cap) x 6	
	R20A2	904295D0	20,000	48,000	6.8	50 x 8	29 x 103	50PA tube x 8	
	R18A	904359D0	18,000	42,200	8.2	50 x 8	30 x 115	himac 50TC tube x 300	
			12,000	18,760		50 x 8	30 x 115	50 ml culture tube	
	R15A	904360D0	15,000	32,300	10.5	50 x 10	30 x 115	himac 50TC tube x 300	
			12,000	20,670		50 x 10	30 x 115	50 ml culture tube	
			11,000	17,380		15 x 10	17 x 120	15 ml culture tube	
	R14A	904306D0	14,000	30,240	16.8	250 x 4	62 x 124	250PP bottle x 4	
	50TA300 adapter	S408203A	12,000	18,800	-	50 x 4	30 x 115	50 ml culture tube	
	R13A	904366D0	13,000	26,400	11.0	250 x 6 11 x 6	62 x 124 16 x 82	250PP bottle x 6	
	R12A6	904357D0	12,000	22,500	14.8	500 x 4	73 x 163	500PA bottle x 4	
	R12A3	904325D0	12,000	23,800	16.0	250 x 6	62 x 124	250PP bottle x 6	
	R10A5	904365D0	10,000	18,900	15.5	500 x 6	69.5 x 169	500 ml bottle (Nalgene®)	
	R10A3	904345D0	10,000	18,800	16.9	500 x 6	73 x 163	500PA bottle x 6	
	R9A2	904374D0	8,500	15,100	17.1	1,500 x 4	W126 x H175	1500PP bottle (WM) x 4	
	R9A***	904364D0	9,000	15,300	13.7	1,000 x 4	98 x 168	1000PP bottle (WM) x 4	
	Swinging bucket rotor	R8S	904371D0	8,000	11,500	7.2	50 x 4	30 x 115	50 ml culture tube
		R5S4	904369D0	4,700	3,100	5.2	96DWx4/96MPx12	W128xD86xH90	-
R4S5		904370D0	4,000	2,900	4.9	-	-	-	
15 x 10S adapter		S308546A	4,000	2,860	-	15 x 40	16.5 x 110	-	
15 x 8S adapter		S307334A	4,000	2,860	-	15 x 32	16.5 x 110	-	
10 x 10SB adapter		S308695A	4,000	2,800	-	10 x 40	15.4 x 100	-	
10 x 8S adapter		S307333A	4,000	2,860	-	10 x 32	13.2 x 100	-	
5 x 8S adapter		S307332A	4,000	2,380	-	5 x 32	13.2 x 78	-	
50 x 2S adapter		S308844A	3,500	2,120	-	50 x 8	35 x 100	-	
15TC x 6S adapter		S307335A	4,000	2,900	-	15 x 24	17 x 120	-	
50TC x 2S adapter		S307336A	4,000	2,860	-	50 x 8	30 x 115	-	
R3S		904315D0	3,000	1,940	6.0	-	-	-	
500PA tube		S303830A	3,000	1,940	-	500 x 4	98 x 100	-	
Tube rack BL		336821A	3,000	1,870	-	10 x 120	12 x 120	-	
Tube rack GR		336822A	3,000	1,870	-	7 x 96	13-14 x 120	-	
Tube rack YE		336823A	3,000	1,870	-	15 x 72	16.5 x 120	-	
Tube rack OR		336824A	3,000	1,870	-	50 x 16	36.5 x 120	-	
Tube rack BL (B)		S307165A	3,000	1,870	-	10 x 16	12 x 120	-	
Tube rack GR (B)		S307167A	3,000	1,870	-	10 x 120	12 x 120	-	
Tube rack YE (B)		S307164A	3,000	1,870	-	7 x 96	13-14 x 120	-	
Tube rack OR (B)	S307166A	3,000	1,870	-	15 x 72	16.5 x 120	-		
Tube rack 61 x 1	S303580A	3,000	1,800	-	50 x 16	36.5 x 120	-		
Tube rack 17 x 10	S304528A	3,000	1,940	-	10 x 16	12 x 120	-		
Tube rack 13.2 x 18	S304666A	3,000	1,800	-	175 x 4	Falcon® culture tube**	225/175 ml culture tube		
Tube rack 15.5 x 18	S304667A	3,000	1,800	-	15 x 40	17 x 120	15 ml culture tube		
50T7S adapter	S305213A	3,000	1,870	-	7 x 72	φ13 vacuum blood collecting tube	-		
Tube rack 29.5 x 5 (B)	S307253A	3,000	1,830	-	10 x 72	φ15 vacuum blood collecting tube	-		
M bucket	346977A	2,000	700	-	50 x 28	30 x 115	50 ml culture tube		
MP bucket	S305521A	3,000	1,650	-	50 x 20	30 x 115	50 ml culture tube		
								96-hole microplate	

Notes: 1. [shaded] indicates tubes available on the market. Purchase directly from your local supplier.  
 2. Automatic identification type rotors can be used with previously delivered centrifuges (CR-Gill or earlier series). Depending on the centrifuge unit, however, there may be cases in which a ROM exchange or upgrade (for a nominal fee) is required.  
 3. It is possible to use rotors you currently own in CR22N by inputting the rotor data. With regard to any rotor within the warranty period, upgrades to the automatic identification type (for a nominal fee) will be accepted. (R12A2, R15S, R15S2, R6S, R20V, R11D, R18C, R13C and R10C rotors cannot be remodeled.)  
 4. For information on product compatibility, please contact your nearest Hitachi Koki's representative if one of these rotors is used in a previously delivered (old-type) centrifuge or if a previously delivered (old-type) rotor is used in a new centrifuge.

5. \*\* Falcon is a registered trademark of Becton Dickinson and Company. For prevention of deformation, a cushion produced by Falcon (Falcon part No. 2090) is also required.  
 6. \*\*\* 1,000PP/PC bottle (2), the conventional product, cannot be used.  
 7. \* Both 50ml free standing culture tubes and 50ml V-bottom culture tubes can be used.  
 8. R9A2 rotor is an exclusive model for CR22N. It cannot be used with our former models, such as CR-GII, CR-GII, CR-G and CR-F series.  
 9. When the above rotors are used with our former model, their max. speed may be restricted. For more detailed information, please contact your nearest Hitachi Koki's representative.  
 10. The rotor warranty period is 7 years.  
 11. Eppendorf® is a registered trademark of Eppendorf AG.  
 12. Nalgene® is a registered trademark of Nalgene Nunc International Corporation.

# Made-to-Order Rotors

## Fixed Angle Rotors

**R22A2**  
22,000 rpm / 51,200 xg  
50ml x 6 tubes

**R22A**  
22,000 rpm / 45,170 xg  
7ml x 18 tubes

**R21A**  
21,000 rpm / 43,600 xg  
11ml x 16 tubes

**R20A**  
18,000 rpm / 33,200 xg  
16ml x 32 tubes

**R19A**  
19,000 rpm / 40,940 xg  
80ml x 6 tubes

**R17A Non-CE**  
17,000 rpm / 27,700 xg  
50ml x 14 tubes

**R14A3**  
14,000 rpm / 29,100 xg  
100ml x 10 tubes

**R12A4**  
12,000 rpm / 23,800 xg  
2ml x 72 tubes

## Swinging Bucket Rotors

**R15S3**  
15,000 rpm / 28,700 xg  
11ml x 4 tubes

**R10S**  
10,000 rpm / 16,470 xg  
50ml x 4 tubes

**R7S**  
7,000 rpm / 9,420 xg  
250ml x 4 tubes

**R6S**  
5,700 rpm / 5,010 xg  
96-hole microplate x 1pc/bucket

## Special Sealed-type Fixed Angle Rotor

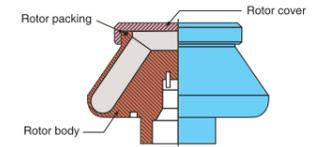
himac Special Sealed-type Rotor prevents leakage of sample, by design that rotor body screwed into the rotor cover in order to increasing sealing level. It is recommended to use, when you need to separate the sample for high level sealing.

**R18AY**  
18,000 rpm / 38,800 xg  
50ml x 8 tubes

**R16AY**  
16,000 rpm / 32,300 xg  
80ml x 6 tubes

**R12AY**  
12,000 rpm / 22,200 xg  
250ml x 4 tubes

**R8AY**  
8,000 rpm / 12,000 xg  
500ml x 6 tubes



## Horizontal Rotor

**R10H**  
10,000 rpm / 13,000 xg  
96-hole microplate x 4pcs

## Soil Dehydration Rotor

**R11D2**  
11,000 rpm / 15,800 xg

## Continuous Flow Rotor

**R18C**  
18,000 rpm / 34,960 xg  
1,000ml (500ml\*)

**R13C**  
13,000 rpm / 21,260 xg  
2,200ml (1,600ml\*)

**R10C**  
10,000 rpm / 14,590 xg  
3,200ml (2,300ml\*)

## Continuous flow rotors: R18C/R13C/R10C

**Continuous flow rotors**  
The sample is introduced into the rotor through the inlet pipe. The supernatant liquid after separation is taken up by the impeller (like a vane wheel of a centrifugal pump) and discharged from the rotor.

**Batch rotors**  
Batch rotors centrifugally separate samples introduced directly into the rotor. There is no need to establish balance. Four blades protect the sample from disturbance.

Note: If a continuous flow rotor is used in models compatible with conventional type equipment, please contact your nearest Hitachi Koki's representative.

Type	Model	Part No.	Maximum speed (rpm)	Maximum RCF (xg)	Weight (kg)	For tubes		Standard accessories
			CR22N			Nominal capacity (ml) x number of tubes	Tube dimensions (dia. x mm)	Tube/bottle
Fixed angle rotor	R22A	904299D0	22,000 (21,000)	45,170 (49,800)	7.0	7 x 18	16 x 60	7PA tube x 18
	R22A2	904300D0	22,000	51,200	5.4	50 x 6	29 x 103	50PA tube x 6
	R21A	904301D0	21,000 (20,000)	43,600 (48,300)	8.5	11 x 16	16 x 82	11PA tube x 16
	R20A	904302D0	18,000 (17,000)	33,200 (37,510)	10.0	16 x 32	18 x 99	16PP tube x 40
	R19A	904303D0	19,000 (18,000)	40,940 (40,900)	10.4	80 x 6	38 x 104	80PA bottle x 6
	R17A	904305D0	17,000 (16,000)	27,700 (32,600)	11.0	50 x 14	29 x 103	50PA tube x 14
	R14A3	904322D0	14,000	29,100	12.9	100 x 10	38 x 104	80PA bottle x 10
	R12A4	904327D0	12,000	23,800	7.7	2 x 72	11 x 41	Eppendorf® (marketed product)
Swinging bucket rotor	R15S3	904339D0	15,000	28,700	5.8	11 x 4	16 x 82	11PA tube x 4
	R10S	904312D0	10,000	16,470	6.0	50 x 4	29 x 103	50PA tube x 4
	R7S	904313D0	7,000	9,420	9.0	250 x 4	62 x 124	250PP bottle x 4
	R6S	904334D0	5,700	5,010	10.7	Microplate x 2 pcs	W128 x D86 x H10-55	96-hole microplate
	2 x 48S adapter 0.2 x 96MP adapter	S408787A S408786A	5,700 5,700	5,010 5,010	-	2 x 96 96-hole microplate for PCR	11 x 41	Microtube
Special sealed-type fixed angle rotor *	R18AY	904328D0	18,000	38,800	6.9	50 x 8	29 x 103	50PA bottle x 8
	R16AY	904329D0	16,000	32,300	8.7	80 x 6	38 x 104	80PA bottle x 6
	R12AY	904330D0	12,000	22,200	14.3	250 x 4	62 x 124	250PP bottle x 4
	R8AY	904331D0	8,000	12,000	24.1	500 x 6	73 x 163	500PA bottle x 6
Horizontal rotor	R10H	904348D0	10,000	13,000	10.6	Microplate x 4 pcs	W128 x D86 x H15-45	96-hole microplate
Soil dehydration rotor	R11D2	904353D0	11,000	15,800 (PF2.6-4.2)	12.0	100 x 4	50 x 51	Dehydration tool x 4
Continuous flow rotor	R18C*	90131900	18,000	34,960	7.5	1,000 (500ml*)	-	-
	R13C*	90432000	13,000	21,260	9.2	2,200 (1,600ml*)	-	-
	R10C*	90432100	10,000	14,590	11.8	3,200 (2,300ml*)	-	-
								R18C seal unit (E) for CR22N (Part No. S203036A), 18 batch unit for CR22N (Part No. 217247A) R13C seal unit (E) for CR22N (Part No. S203037A), 13 batch unit for CR22N (Part No. 217248A) R10C seal unit (E) for CR22N (Part No. S203038A), 10 batch unit for CR22N (Part No. 217250A)

Notes: 1. [shaded] indicates tubes available on the market. Purchase directly from your local supplier.  
 2. Values in parentheses in the maximum speed and maximum RCF columns are those at which the rotor temperature can be cooled at 4℉. At the maximum speed, the rotor temperature can be cooled below 15℉ (when room temperature is 25℉).  
 3. Automatic identification type rotors can be used with previously delivered centrifuges (CR-Gill or earlier series). Depending on the centrifuge unit, however, there may be cases in which a ROM exchange or upgrade (for a nominal fee) is required.  
 4. It is possible to use rotors you currently own in CR22N by inputting the rotor data. With regard to any rotor within the warranty period, upgrades to the automatic identification type (for a nominal fee) will be accepted. (R12A2, R15S, R15S2, R6S, R20V, R11D, R18C, R13C and R10C rotors cannot be remodeled.)

5. For information on product compatibility, please contact your nearest Hitachi Koki's representative if one of these rotors is used in a previously delivered (old-type) centrifuge or if a previously delivered (old-type) rotor is used in a new centrifuge.  
 6. \* Collector units for R18C/R13C/R10C cannot be used on CR22N and CR-Gill series.  
 7. \* 1 : Maximum pellet capacity (ml).  
 8. When the above rotors are used with our former model, their max. speed may be restricted. For more detailed information, please contact your nearest Hitachi Koki's representative.  
 9. Non-CE rotors cannot be used with CR22N (CE model), due to higher kinetic energy and rotor ID identification. Therefore Non-CE rotors are not sold in EU countries.  
 10. The rotor warranty period is 7 years.