

Hitachi Koki
HITACHI



CR22N

High-Speed Refrigerated Centrifuge

himac



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himac CR22N

High-Speed Refrigerated Centrifuge



Compact body, Larger Capacity

The 6 L rotor was previously available only for large-capacity refrigerated centrifuges or high-end models of high-speed refrigerated centrifuges. With the newly developed drive unit it is now possible to use a 6 L rotor (1.5 L x 4 bottles) with the standard CR22N model high-speed refrigerated centrifuge. In addition, the CR22N has a more compact body than our former model CR-GIII series.

Easy Operation with Color Touch-Sensitive LCD

A high-resolution touch-sensitive LCD with GUI (graphic user interface) icons on a high-contrast black background enables users to easily operate the system. Operation status is continually visible while the centrifuge is in use.



Self-Locking Rotor System

The Himac "self-locking rotor system" is a simple and effective system to place the rotor onto the drive shaft. Once the rotor is placed on the drive shaft it is locked automatically by centrifugal force. 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 market.

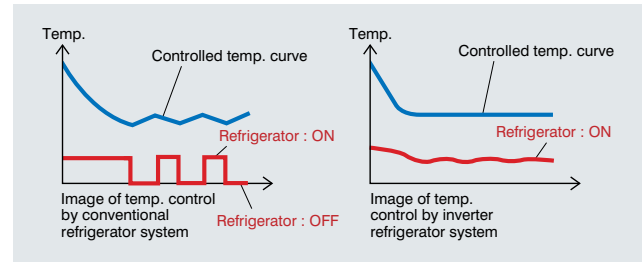


Non-Contact Imbalance Detection System

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.

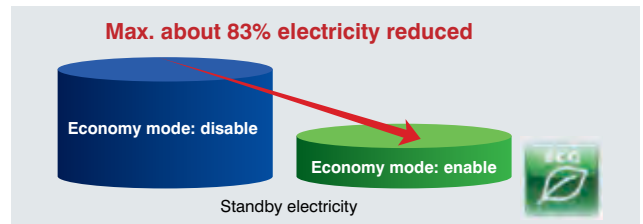
All Standard Rotors maintained at 4° C

The CR22N is the first model in this class* equipped with an inverter refrigerator system. The inverter refrigerator system provides highly efficient temperature control of the rotor while requiring less electricity. Also the refrigeration capacity was improved, so now all standard rotors can be maintained at their maximum speed without a vacuum system. (under room temperature at 25° C) (There are some exceptions about made-to-order rotors.) In addition, an inverter refrigerator system has reduced operating sound, and there is no start-up sound of conventional refrigerator system.



Energy Saving and Environment Friendly Design Economy mode (automatic standby function)

The CR22N has an Economy mode (automatic standby function). If the display is not touched over the set wait time, the system automatically dims the LCD and stops refrigeration (except while running). This system reduces standby electricity by up to 83%**.



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 zero ODP (ozone depletion potential).

* as of October 2012

** comparing with standby electricity without Economy mode under in-house conditions



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 calculates 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



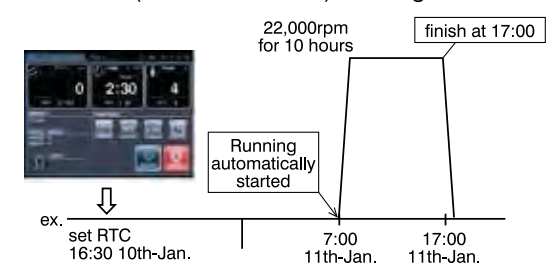
Conventional run timer starts when the rotor starts acceleration. But himac original Actual Run Timer starts when the set speed is attained. It enables users to control actual net run time and obtain higher reproducibility of the separation.

RTC (Real-Time Control) Function



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.

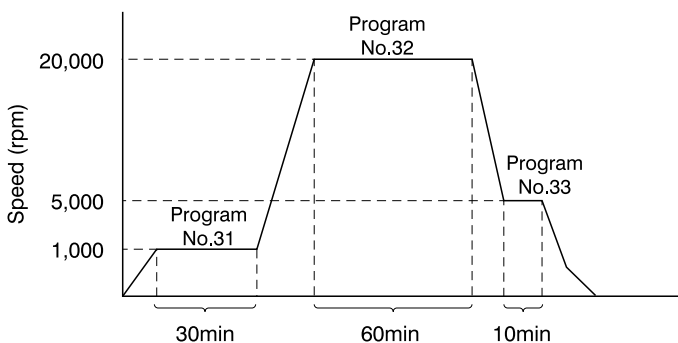
RTC (Real Time Control) Running



Programmed Operation



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 Detecto PAT.

Rotor cover status is detected by an ultrasonic sensor on the door, preventing accidents.

Pre-Cool Function PAT.



This function maintains temperature inside rotor chamber at 15° C, preventing icing, while a rotor is not in place. When a rotor is placed on the drive shaft, the chamber temperature is maintained at the set point.

Zoom Function PAT.



Display of running speed and time is enlarged on the screen in order to see the operating status from a distance. The screen is switched from "Run Screen" to "Zoom Display" automatically 20 seconds after reaching the set speed.

User Administration



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

User Lockout Function



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

Rotor Management



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



Run Screen

Color touch-sensitive LCD enables users to easily operate the system. Menu screen is displayed by just touching the menu tab.



RTC function

You can set a timer to start programmed operation.

Alarm indication

Indicating a cause and corrective action of the alarm by text.



Setting parameters

Pop-up keyboard is displayed by touching the screen.



Menu Screen

Menu Icon



Manager (Admin)

Setting administrative parameters



Rotor Catalog

Referring applicable model and spec. of rotors



Run History

Recording previous running parameters automatically and loading it for new run.



CUSTOM Screen



Zoom

Zooming speed and time indication on run screen



Stop Signal

5 melodies and an electronic beep are selectable.



Pre-Cool

Keeping rotor chamber Temp. at 15° C with preventing from icing.



Backlight

Adjusting brightness of the screen
Setting to deem the backlight

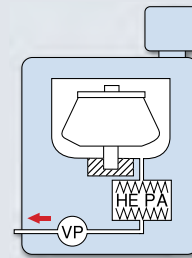


Economy mode (auto standby)

Reducing electricity consumption of the back light, fan, and refrigerator in waiting.

Biosafety Option

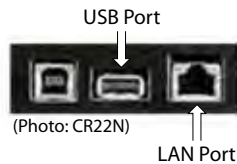
Biosafety is the 1st priority in all laboratories. This is why we design and offer multiple options for biosafety compatibility. These options include biosafety rotors, special sealed type fixed angle rotors, and a Micro Filter which can be assembled in the CR22N system for enhanced level of biosafety. This Micro Filter modification of the CR22N system is available as a 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 a useful and convenient software to manage in real time the operating log of himac CP-WX series, CS150NX, CS150FNX, CR22N and CR-GIII series. A maximum of 16 units of the above mentioned 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 a different location from the installation site of the centrifuges.

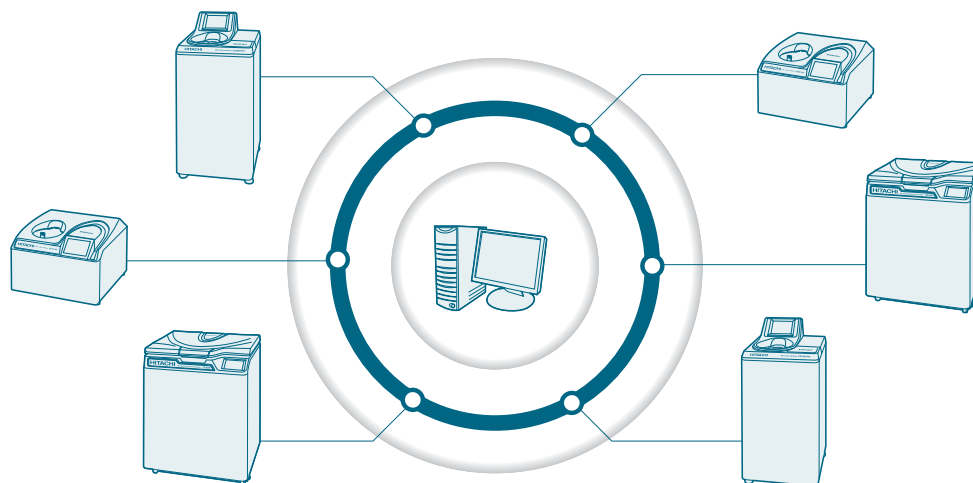
The software is real-time log management software; recording period is selectable from 10 seconds to 5 minutes interval. Of course, the software supports U.S. FDA 21 CFR Part 11, following functions are available;

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



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

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

The R9A2 rotor and 1500PP Bottle (WM) including its cap can be sterilized by autoclave (at 121° C for 20 min.) Four 1500PP Bottles (WM) including caps, cap supports, inner caps, and O-rings, are supplied as standard accessories with the R9A2 rotor.

PAT. P

NEW



Configuration of 1500PP Bottle (WM)

Part No.	Description
S310087A	1500PP Bottle (WM) (4pcs/set: bottle only)
S310071B	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	1,500 ml x 4 bottles
Tube Cavity Angle	22°
K-factor	4,313
Weight (kg)	17.1
Product No.	904374D0



Standard Fixed Angle Rotor

New Rotors

R21A2



The R21A2 rotor is designed for 30 ml 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	30 ml x 6 bottles
Tube Cavity Angle	40°
K-factor	487
Weight (kg)	5.4
Product No.	904373D0

R22A6



The R22A6 rotor is designed for 10 ml x 12 tubes and has 45° tube cavity angle. It is suitable for pelleting. m12SS tube and 12 Ti tube (for ultracentrifuge) can be used.

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

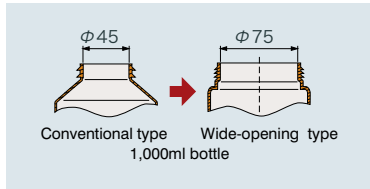
High-capacity Light Weight Rotor

Innovative aluminum alloy made light weight rotor

This series' rotors are half the weight of conventional rotors of 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

Wide Mouth Bottle

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



R9A2
Net weight: 17.1 kg
8,500 rpm / 15,100 xg
1500 ml x 4 bottles



R9A
Net weight: 13.7 kg
9,000 rpm / 15,300 xg
1000 ml x 4 bottles



R10A5
Net weight: 15.5 kg
10,000 rpm / 18,900 xg
500 ml x 6 bottle



R12A6
Net weight: 14.8kg
12,000 rpm / 22,500 xg
500 ml x 4 Bottles



R10A3
Net weight: 16.9 kg
10,000 rpm / 18,800 xg
500 ml x 6 bottles



R13A
Net weight: 11.0 kg
13,000 rpm / 26,400 xg
250 ml x 6 bottles

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



R18A
18,000 rpm / 42,200 xg
50 ml x 8 tubes



R15A
15,000 rpm / 32,240 xg
15/50 ml 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 Mode)



R22A4
22,000 rpm / 55,200 xg
1.5/2 ml x 30 tubes



R20A2
20,000 rpm / 48,000 xg
50 ml x 8 tubes



R14A
14,000 rpm / 30,240 xg
250 ml x 4 tubes

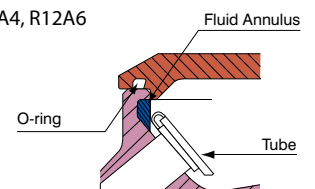


R12A3
12,000 rpm / 23,800 xg
250 ml x 6 tubes

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 Rotor

General-purpose Swinging Bucket Rotor

R4SS



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



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



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



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



15 ml TC x 6 tubes/bucket
15TCx6S adaptor



50 ml TC x 2 tubes/bucket
50TCx2S adaptor



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



15 ml x 10 tubes/bucket
15x10S adaptor

Versatile Swinging Bucket Rotor

R3S



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



10 ml x 24 tubes/bucket
Tube Rack GR



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



15 ml x 18 tubes/bucket
Tube Rack YE



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



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



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



10 ml x 18 tubes/bucket
Tube Rack 15.5x18



7 ml x 18 tubes/bucket
Tube Rack 13.2x18



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



50 ml x 7 tubes/bucket
50T7S adaptor



500 ml 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



Max. Speed : 8,000 rpm
Max. RCF : 11,500 xg

No wind-sealed shell design offers easy operation to users.
Nominal Capacity : 50 ml TC tube (conical-type) x 4 tubes

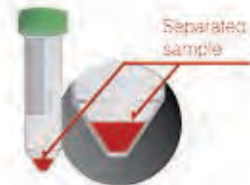


Bucket sealing cap
for biosafety (option)
(Part No. S302194A : 4pcs/set)

*Buckets are autoclavable. (121° C, for 20 minutes)

*Optional bucket sealing cap is available for your biosafety.

*Optional bucket sealing cap is also autoclavable. (121° C, for 20 minutes)



Suitable for pelleting samples with
conical-type tube

Swinging Bucket Rotor for Micro Plate



R5S4
DWP x 4 pcs
MP x 12 pcs



Balancer



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



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		50 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	5408203A	12,000	18,800	-	50 x 4	30 x 115	50 ml culture tube
	R13A	904366D0	13,000	26,400	11.0	250 x 4 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 ¹)
	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	126 x H175	126 x H175	1500PP bottle (WM) x 4
	R9A***	904364D0	9,000	15,300	13.7	98 x 168	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	-	-	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	-	-	30 x 115	-
	R3S	904315D0	3,000	1,940	6.0	-	-	-
	500PA tube	S303830A	3,000	1,940	-	-	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	-
						10 x 16	12 x 120	-
	Tube rack BL (B)	S307165A	3,000	1,870	-	10 x 120	12 x 120	-
	Tube rack GR (B)	S307167A	3,000	1,870	-	7 x 96	13-14 x 120	-
	Tube rack YE (B)	S307164A	3,000	1,870	-	15 x 72	16.5 x 120	-
	Tube rack OR (B)	S307166A	3,000	1,870	-	50 x 16	36.5 x 120	-
						10 x 16	12 x 120	-
	Tube rack 61 x 1	S303580A	3,000	1,800	-	-	Falcon ⁵ culture tube**	225/175 ml culture tube
	Tube rack 17 x 10	S304528A	3,000	1,940	-	15 x 40	17 x 120	15 ml culture tube
	Tube rack 13.2 x 18	S304666A	3,000	1,800	-	7 x 72	φ13 vacuum blood collecting tube	-
Tube rack 15.5 x 18	S304667A	3,000	1,800	-	10 x 72	φ13 vacuum blood collecting tube	-	
50T7S adapter	S305213A	3,000	1,870	-	50 x 28	30 x 115	50 ml culture tube	
Tube rack 29.5 x 5 (B)	S307253A	3,000	1,830	-	50 x 20	30 x 115	50 ml culture tube ††	
M bucket	S305521A	2,000	700	-	Microplate x 4pcs	W128 x D86 x H10-30	-	
MP bucket	-	3,000	-	-	Microplate x 4pcs	W128 x D86 x H10-55	96-hole microplate	

Notes: 1. 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-GIII 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-GIII, 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. Nalgen[®] is a registered trademark of Nalgen Nunc International Corporation.

Made-to-Order Rotors

Fixed Angle Rotors

							
R22A2 22,000 rpm / 51,200 xg 50 ml x 6 tubes	R22A 22,000 rpm / 45,170 xg 7 ml x 18 tubes	R21A 21,000 rpm / 43,600 xg 11 ml x 16 tubes	R20A 18,000 rpm / 33,200 xg 16 ml x 32 tubes	R19A 19,000 rpm / 40,940 xg 80 ml x 6 tubes	R17A 17,000 rpm / 27,700 xg 50 ml x 14 tubes	R14A3 14,000 rpm / 29,100 xg 100 ml x 10 tubes	R12A4 12,000 rpm / 23,800 xg 2 ml x 72 tubes

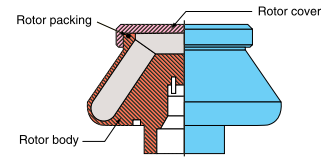
Swinging Bucket Rotors

	R15S3 15,000 rpm / 28,700 xg 11 ml x 4 tubes		R10S 10,000 rpm / 16,470 xg 50 ml x 4 tubes		R7S 7,000 rpm / 9,420 xg 250 ml x 4 tubes		R6S 5,700 rpm / 5,010 xg 96-hole microplate x 1pc/bucket
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Special Seated-type Fixed Angle Rotor

The himac Special Sealed-type Rotor prevents sample leakage utilizing a rotor body threaded directly into the rotor cover. It is recommended for use when you need to separate a sample with a high level of sealing.

R18AY 18,000 rpm / 38,800 xg 50 ml x 8 tubes	R16AY 16,000 rpm / 32,300 xg 80 ml x 6 tubes
R12AY 12,000 rpm / 22,200 xg 250 ml x 4 tubes	R8AY 8,000 rpm / 12,000 xg 500 ml x 6 tubes




Horizontal Rotor

	R10H 10,000 rpm / 13,000 xg 96-hole microplate x 4pcs
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Soil Dehydration Rotor

	R11D2 11,000 rpm / 15,800 xg
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Continuous Flow Rotor

	R18C 18,000 rpm / 34,960 xg 1,000 ml (500 ml*1)	R10C 10,000 rpm / 14,590 xg 3,200 ml (2,300 ml*1)
R13C 13,000 rpm / 21,260 xg 2,200 ml (1,600 ml*1)	Non-CE	

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
						Nominal capacity (ml) x number of tubes	Tube dimensions (dia. x mm)	
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 (sales discontinued)	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	Non-CE 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 tube (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	S408787A	5,700	5,010	-	2 x 96	11 x 4	Microtube
	0.2 x 96MP adapter	S408786A	5,700	5,010	-	96-hole microplate for PCR	-	-
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	90131900	11,000	15,800 (PF2.6-4.2)	12.0	100 x 4	50 x 51	Dehydration tool x 4
Continuous flow rotor	R18C*	Non-CE 90131900	18,000	34,960	7.5	1,000	-	-
	R18C seal unit (E) for CR22N (Part No. S203036A), 18 batch unit for CR22N (Part No. 217247A)							
	R13C*	Non-CE 90432000	13,000	21,260	9.2	2,200 (1,600*1)	-	-
	R13C seal unit (E) for CR22N (Part No. S203037A), 13 batch unit for CR22N (Part No. 217248A)							
R10C*	Non-CE 90432100	10,000	14,590	11.8	3,200 (2,300*1)	-	-	
R10C seal unit (E) for CR22N (Part No. S203038A), 10 batch unit for CR22N (Part No. 217250A)								

Notes: 1.  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° C. At the maximum speed, the rotor temperature can be cooled below 15° C (when room temperature is 25° C).

3. Automatic identification type rotors can be used with previously delivered centrifuges (CR-GIII 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-GIII 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.

Specifications

Model	CR22N (CE Model)	CR22N (Non-CE Model)
Max. Speed (rpm)	22,000 rpm	
Max. RCF	55,200 xg (R22A4)	
Max. Capacity	1,500 ml x 4 bottles (R9A2)	
Speed Control Range	300 ~ 22,000 rpm	
Temperature Control Range	-20 ~ +40° C	
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 22,000 rpm)	
Economy Mode	Yes	
Standard	CE marking	N/A
(1) EMC Directive	EN61326-1	
(2) LVD and MD*	EN61010-1, EN61010-2-020	
Dimensions (w x d x h)	27½ x 32 x 36 in (700 x 810 x 915 mm); Height to Chamber: 33½ in (853 mm)	
Weight	290 kg	
Power Requirements	Single Phase, AC 200, 208, 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



Side view



Display & Operational Panel (Enlarged)

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CAUTION:

For sale 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.



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