

himac
centrifuges



CP-NX SERIES
Ultracentrifuge



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 condition.
- Due to safety reason, 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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Ultracentrifuge



himac CP-NX SERIES

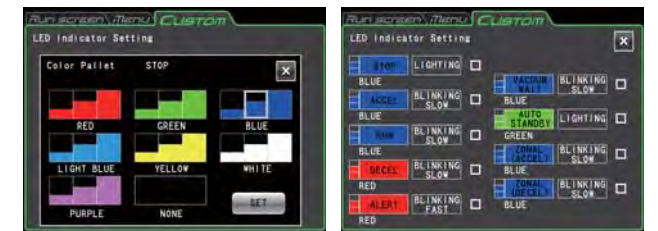
CP100NX / CP90NX / CP80NX

Truly User-friendly Design

LED Indicator – Operation status is at a glance !

LED Indicator of 47cm length is mounted in a front of the table. The LED indicator shows the operating status by different colors, luminous patterns and levels of brightness. You can select a color of LED Indicator from 7 colors and light-off, level of brightness (3 levels) and luminous pattern (lighting, slow blinking, fast blinking, fading : 4 patterns) for each status (stop, acceleration, running at set speed, deceleration, vacuum holding, in economy mode, acceleration in Zonal mode, deceleration in Zonal mode, Alert status). So operating status is at a glance with the LED Indicator now.

* Actual color of LED Indicator may be different from the photos on this information, brochure and website due to printing conditions.



Touch-sensitive LED panel with intelligible screen design

The control panel, 6.5-inch size touch-sensitive color LCD panel, is located in a front part of the machine. You do not need to stretch your arm to operate the centrifuge. The intelligible screen designs, such as a wide indication of basic parameters, many icons for selecting function, folder colors with each symbol for program management, offers user-friendly operation, like operating a smart phone, to all users.



Low table height with smooth sliding door for easy loading / unloading the rotor

The table height of the CP-NX is 863mm. The low table height enables users to load / unload the rotor easier. The rotor is automatically locked by the centrifugal force once the rotation is started by the "self-locking rotor system". So it is not necessary to fix the rotor by screwing the rotor onto the drive shaft or push the button to lock/unlock the rotor any more. In addition, the improved door structure design based on the latest structure analysis technology made the door thickness 5mm thinner than the one of our former model. The lighter door offers the same safety as the before and makes door-sliding movement (back and forth) smoother than before.

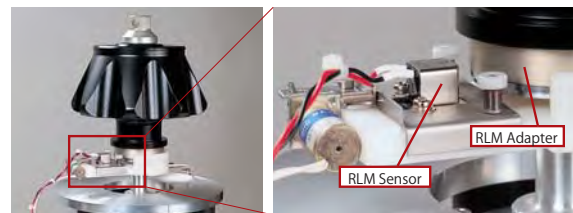




Advanced Technologies, Features & Functions

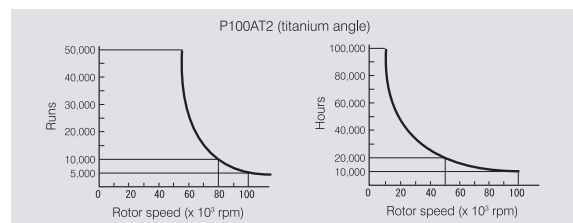
Automatic Rotor Life Management System

Total run times and total accumulated operating hours are managed automatically by the system. The RLM sensor of the ultracentrifuge reads the latest information of total run times and total accumulated operating hours from the RLM adapter during the acceleration and the latest information of total run times and total accumulated operating hours are recorded in the RLM memory assembled on the rotor during the deceleration.



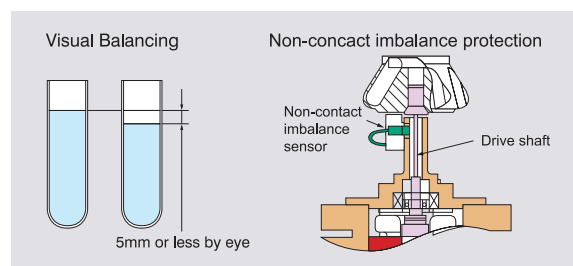
Rotor life is maximized.

Automatic Rotor Life Management Systems tracks the rotor usage precisely in the nearest 0.1 time and 0.1 hours means, the rotor life is extended as much as 10 times longer than as conventional calculation. (by manual recording to the rotor log book)



Visual Balancing by non-contact imbalance sensor

Do you still adjust balance between sample tubes using scale or balance before the centrifugation? himac ultracentrifuge model CP-NX series offers visual balancing with max. 5mm sample surface difference between the sample tubes*. (*1 : except P21A2 rotor)
The visual balancing was realized by the non-contact imbalance sensor which monitors oscillation of the drive shaft during the rotation. Imbalance alarm criteria were optimized based on the characteristics of each rotor, so that system offers bigger imbalance tolerance. Of course, the sensor activates the imbalance alarm and stops rotation immediately in case the abnormal oscillation is detected.



Economy mode* for energy saving

The stand-by electricity consumption is reduced max. 50%** compared with our former model, by deeming the backlight of the LCD, stopping cooling fans, stopping cooling system and so on, if the control panel is not touched over the set period (setting range : 1 - 180 mins).

* The mode works while drive unit and vacuum pump are stopped.
** under in-house test condition

Operating History : Max. 5,120 logs

Max. 5,120 operating logs can be recorded in the system automatically. You can export the data according to a user and/or rotor in CSV format through USB port.



Programmed Operation : 1,000 programs

You can register up to 1,000 programs for programmed operation to the system. Folder is used to manage the registered programs. You can select folder's color from 4 colors paired with a character for easy identification of the registered program.

User Lockout (standard function)

Operator can be registered to the system with 3-level access level (Administrator, Supervisor, User). Operational functions can be limited by the access level. You can register up to 50 users. Password should be entered to log-in the system.

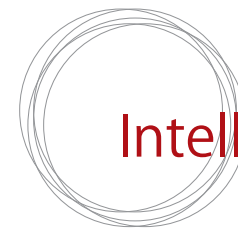
Stress-free operation

Quiet operation
Operating noise level is 51 dB(A) under running at set speed. (as of Jan. 2014, under in-house test condition)

Quick start-up
The system is ready for operation about 6 seconds after the power-on.

Faster vacuum
It takes about 15 minutes to reach the high vacuum status*. The CP-NX series has reduced about 5 minutes to reach the high vacuum status compared with our former model.

(as of Jan. 2014, by our investigation)
(* No condensation in a rotor chamber before starting vacuum)



Intelligible Screen Design

RUN Screen



- Program Button**
To set, select and manage programs for programmed operation
- RCF Button**
To display and set RCF
- ω²T Button**
To set ω²T operation
- RTC Button**
To set timer (RTC : Real-Time Control) operation
- Vacuum Button**
To start and stop vacuum, also shows vacuum level
- Start Button**
To start operation
- Stop Button**
To stop operation

MENU Screen



- Run History**
Automatically record operation log up to 5,120 runs for past runs.
- Rotor Catalog**
To brows available rotors, their specifications and accessories
- Zonal Setting**
To switch between normal and zonal operation
- Defrost Function**
To defrost rotor chamber
- Customize**
To enter Customizing Screen
- Manager (Admin)**
To enter Administration Screen
- ID/Contact**
To key-in instrument's ID and service contact information

CUSTOM Screen



- Zoom**
To enlarge Speed and Time indication on RUN screen during the running
- Stop Signal**
To select sound of stop signal
- Volume**
To adjust sound volume of the stop signal
- Backlight**
To adjust backlight of LCD panel
- Schedule**
To record usage schedule up to 40 schedules
- Date/Time**
To set date and time
- LED Indicator**
To set LED Indicator for each operating status (colors, luminous patterns, brightness)
- Economy Mode**
To set economy mode for energy saving

ADMIN Screen



- User Management**
To register, manage and delete users
- User Lockout**
To limit access of users
- Rotor Management**
To manage total number of run and run time of registered rotors
- Run Time Indication**
To change run time indication between Elapsed Time or Remaining Time
- Actual Run Timer**
To set actual run timer (excluding acceleration time from run time)
- Vacuum Level**
To set vacuum level of acceleration from vacuum stand-by to set speed
- Zonal Speed**
To set zonal speed between 2,000 to 3,000rpm with 100rpm increments
- LAN Communications**
To connect or disconnect LAN communications

Data Communication and Log Management Software

USB (device) x 1, USB (host) x 1 and LAN x 1 are equipped as an interface for the data communication. Operating histories, up to 5,120 logs, can be exported in CSV format through USB (host) port.



himac LogManager ver. 4.0 for windows® (network edition) – optional log management software

himac LogManager ver.4.0 for Windows® (network edition) is a useful and a convenient software to manage real-time operating log of himac CP-NX series, CP-WX series, CS150NX, CS150FNX and CR22N. Maximum 16 units of the above-mentioned centrifuges can be registered to the software and monitored by the software at the same time. The software is installed into the PC and data communication between the centrifuges and the 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 himac CP-WX series, CS150NX, CS150FNX and CR22N.) It means you can manage the operation log at the different location from the installation site of the centrifuges.

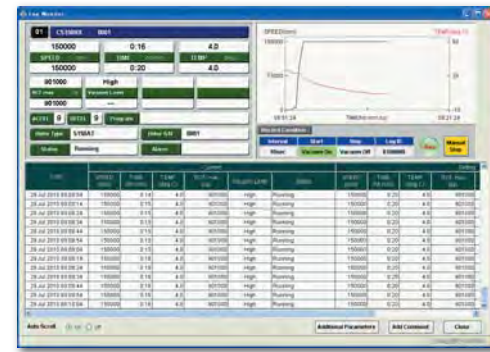


The software is real-time log management software; recording interval period is selectable from 10 seconds to 5 minutes. Of course, the software support U.S. FDA 21 CFR Part 11, following functions are available;

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

Compatible OS :
Windows® 7 Professional and Windows® 8 Professional

Windows®, Windows® 7 and Windows® 8 are registered trademark of Microsoft Corporation in the United States and other countries.



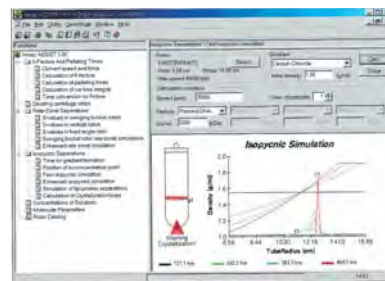
Simulation Software “himac ASSIST” – centrifugation simulation software

himac ASSIST is simulation and calculation software of centrifugal condition and can be installed in your Window®-based PC. CD-ROM of the himac ASSIST is included in the standard accessories. You can simulate whether the centrifugal condition is appropriate before the centrifugation, also can simulate optimal centrifugal condition of a sample, whose centrifugal condition is unknown, based on your CP-NX series ultracentrifuge and rotor.

himac ASSIST has following functions;

- Calculations of K-factor and pelleting time
- Calculation of the allowable rpm with high-density liquid
- Rate zonal centrifugation simulation
- Isopycnic centrifugation simulation
- Solvent concentration conversion
- Mutual conversion of molecular parameters
- Rotor database

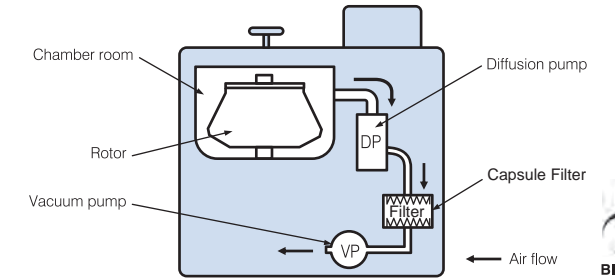
Example : Isopycnic simulation



Plasmid DNA separation with P40ST swinging bucket rotor
CsCl $\rho = 1.55\text{g/ml}$, 35,000rpm
(Note : crystallization warning mark(s) showing that parameters are unsuitable.)

Biosafety Option

The biosafety is always priority in the laboratories. In order to prevent from exhausting bio-hazardous sample into a room, a Capsule filter can be assembled in a vacuum line at option. For details, please contact your nearest sales representative of Hitachi Koki Co., Ltd.



Specifications

Model	CP100NX	CP90NX	CP80NX
Max. Speed (rpm)	100,000	90,000	80,000
Max. RCF (xg)	803,000 (P100AT2)	700,000 (P90AT)	615,000 (P80AT)
Speed Control Accuracy	+/- 10rpm (1,000rpm – max. speed)		
ACCEL/DECEL Mode	ACCEL : 10 / DECEL : 11 (10 and coasting)		
Set Speed Range	from 1,000rpm to max. speed with 100rpm increments		
Timer	from 1 min to 999 hours 59 min (with 1 min increments) with HOLD function		
Vacuum System	Oil rotary vacuum pump and oil diffusion pump		
Operating Sound	51dB(A) (running at set speed, under in-house test condition)		
Heat Radiation Into a Room	1kW or below		
Cooling System	Thermo-module cooling system (CFC/HCFC/HFC-free)		
Control Panel	Touch-sensitive color LCD panel (6.5 inch)		
Data Communication	USB : Host x 1, Devis x 1 / LAN x 1		
Rotor Life Management	Automatic Rotor Life Management for rotors with RLM adapter Registered by serial number to the system for rotors with optical overspeed disk		
Size (mm)	790 (W) x 690(D) x 880(H) (with door cover : 890(D)) Max. height to the end of the door handle : 925(H) / Height to the table : 863(H)		
Floor area (m ²)	0.81 (900 x 900 mm)		
Weight (kg)	390		
Power	Single phase, AC200V, 208V and 220V +/-10%, Max. 20A (normally 8A) Single phase, AC230V and 240V +/-10%, Max. 16A (normally 7A)		
Installation Environment	Ambient temperature for operation : 2°C to 40°C Ambient temperature for performance guarantee : 10°C to 30°C		
Standard	CE marking qualified Product Safety : EN61010-1 and EN 61010-2-020 Electromagnetic Compatibility : EN 61326-1		
Warranty of Drive Unit	10 years after the shipment (Full warranty)*1		
Part No. (Asia/Middle East)	901067C1	901068C1	901069C1
Part No. (EU market)	901067C2	901068C2	901069C2

Remarks :
*1) Limited to appropriate operation after the installation by our authorized engineer. (please refer to the operation manual for detailed conditions.)
2) CP-NX series is not registered as medical device in Japan.
3) Due to safety reasons, installation environments, operation environments and conditions may be restricted.

New Rotor

Fixed Angle Rotor model P21A2

The new fixed angle rotor model P21A2 is a successor model of P19A. The P21A2 offers faster max. speed. (max. speed : 21,000rpm / max. RCF : 71,000 xg) and lighter weight (11.4kg) than P19A (18.7kg) with offering the same nominal capacity of P19A. The nominal capacity of P21A2 rotor is 230ml x 6 bottles* for larger volume centrifugation. Due to greater RCF of P21A2, P21A2 can reduce centrifugation time over 25% comparing the one of P19A.
(* actual volume is 210ml x 6 bottles)



Specifications

Model	P21A2	P19A *1
Max. Speed (rpm)	21,000	19,000
Max. RCF (xg)	71,000	55,100
K-factor (at max. speed)	486	754
Max. Nominal Capacity	230ml x 6 bottles	230ml x 6 bottles
Max. Actual Capacity	210ml x 6 bottles	225ml x 6 bottles
Tube Cavity Angle	26°	26°
Rotor Weight (kg)	11.4	18.7
Part No.	9023171M	902221M
Applicable Ultracentrifuges	CP-NX / CP-WX / CP-MX series *2	CP-NX / CP-WX / CP-MX / CP-α series

Remarks :

- *1) Sales discontinued
- *2) To use P21A2 with CP-WX or CP-MX series, ROM in CP-WX or CP-MX series may be exchanged based on its MFG number. Please inform model name and MFG No. of the ultracentrifuge to HKK to check if the ROM should be exchanged or not before placing the rotor. If necessary, please order the ROM (P/N : 98002999) with P21A2

Note : Visual balancing with 5mm sample surface difference between the tubes is not applicable to the P21A2 rotor. Max. allowable imbalance tolerance is 7g between the tubes, so it is equivalent to 2mm sample surface difference between the tubes. Due to characteristics of the sample, the number of sample surface difference between the tubes may be lower than 2mm. Intentional high-imbalance operation may cause damages to the ultracentrifuge and/or the rotor.

Applicable Bottle & Cap

Part No.	Description	Remarks
336621A	230PA Bottle Assy (10pcs/set)	
S413248B	AL Cap (2) Assy (2pcs/set)	Exclusive for P21A2
S401809A	O-ring (10pcs/set)	As a spare of AL Cap (2) Assy

Remarks : 6 sets of 230PA Bottle, AL Cap (2) and O-ring are included in standard accessories of P21A2 rotor.



Rotor List

Type	Model	Part No. (w/RLM Adapter)	Max. Speed (rpm)	Max. RCF (xg)	Nominal Capacity (ml x tubes)	K-factor	Main Purpose
Fixed Angle Rotor	P100AT2*	9023113M	100,000	803,000	6.5 x 8	18	Separation of microscopic particles and lipoprotein
	P90AT*†	9023053M	90,000	700,000	12 x 8	25	Separation of cell organelles, Plasmid DNA and RNA Rapid separation of intermediate volume sample
	P80AT*	9023093M	80,000	615,000	12 x 8	27	
	P70AT2*	9022753M	70,000	452,000	12 x 12	36	Rapid separation of intermediate-to-large volume sample
	P70AT*	9022623M	70,000	505,000	40 x 8	44	
	P65A*†	9022313M	65,000	370,000	12 x 10	48	Separation of cell organelles, Plasmid DNA and RNA
	P50AT4 †	9024111M	50,000	316,000*1	6.5 x 44	32*1	Separation of lipoprotein
	P50AT2*	9022633M	50,000	303,000	40 x 12	70	Rapid separation of intermediate-to-large volume sample
	P50A3	9023140M	50,000	252,000	1.5 x 24	33	Rapid pelleting micro volume samples
	P45AT*	9022643M	45,000	235,000	94 x 6	130	Rapid separation of large volume samples
	P42AT †	9022651M	42,000	223,000	0.23 x 72	12	Rapid separation of lipoprotein for examination
	P32AT*†	9023150M	32,000	111,000	12 x 32	186	Simultaneous processing of many specimens
	P27A †	9023121M	27,000	106,000	160 x 6	352	Separation of large volume samples
P21A2 †	9023171M	21,000	71,000	230 x 6	486		
Neo Angle Rotor	P90NT*†	9023073M	90,000	646,000	5 x 8	10	Rapid separation of Plasmid DNA and RNA
	P65NT*†	9024153M	65,000	402,000	12 x 10	23	
	P65NT2*†	9023103M	65,000	431,000	5 x 18	15	Processing of many tubes of Plasmid DNA
Vertical Rotor	P100VT*†	9023063M	100,000	700,000	5 x 8	6	Rapid separation of Plasmid DNA
	P65VT2*†	9023023M	65,000	416,000	5 x 16	10	Separation of plasmid DNA etc. by the sedimentation equilibrium centrifugation
	P65VT3*†	9023033M	65,000	402,000	12 x 10	13	
	P50VT2*†	9023083M	50,000	243,000	40 x 8	36	Density gradient centrifugation of large volume samples
Swinging Bucket Rotor	P65ST †	9022391M	65,000	419,000	5 x 3	48	Density gradient centrifugation of Protein, DNA and RNA etc.
	P56ST †	9022551M	56,000	409,000	4 x 6	54	Density gradient centrifugation of micro volume samples
	P55ST2 †	9022771M	55,000	366,000	5 x 6	50	
	P40ST	9022371M	40,000	284,000	13 x 6	139	Density gradient centrifugation of intermediate volume samples
P28S *2	9022881M	28,000	141,000	40 x 6	252		
Zonal Rotor	P32ZT †	9023160M	32,000	102,000	1,690ml	363	Large-scale purification of protein and virus particles by density gradient centrifugation
Continuous Flow Rotor	P32CT †	Coming Soon *3	32,000	102,000	430ml	42	Continuous concentration of large virus particles

Remarks

- 1) * Tubes, caps and adapters are not included in the standard accessories. Please order them separately.
- 2) † The rotor is made-to-order item.
- 3) *1 : Indicated value is for outside tube cavity. Inside tube cavity has different values.
- 4) *2 : Optional bucket (P/N 34607A : 16Ti Bucket Assy) is available for 16ml x 6 tubes nominal capacity.
- 5) Carbon fiber rotors cannot be used with CP-NX series.
- 6) *3 : Due to different design of accessories, the exclusive model of P32CT will be introduced for CP-NX series. (New part number is assigned. Official announcement will be published in the near future.) Current model of P32CT (P/N9022660M) cannot be used with CP-NX series
- 7) Rotors with model name including the letter T are made of titanium alloy. Rotors with model name not including the letter T are made of aluminum alloy. All buckets for swinging bucket rotors are made of titanium alloy.
- 8) To use zonal rotor model P32ZT, seal attachment assy model RPZ-S (P/N 90130600) is required. (order separately)
- 9) When using a seal tube in the above rotors, tube sealer and respective tube rack are required. (order separately)
- 10) Capacity in the above table shows nominal capacity of tubes. Actual capacity in actual usage may be smaller than the nominal capacity depending on rotor structure, tube shape etc.

Rotor Accessories



Tube Sealer model STF3

The STF3 is heat-welding tube sealer to use the seal tubes with fixed angle rotors, vertical rotors and neo angle rotors.

Features

- ◇ Easy & Simple Usage
 1. Set seal tubes in the appropriate tube rack then set the tube rack on the rack guide of the STF3.
 2. Adjust position of the tube rack in order the tube inlet comes under a heater of the STF3.
 3. Pull the handle down to contact the heater the tube inlet and hold the handle for 1 to 2 seconds. Then pull the handle down to the end and wait until the HEAT Lamp goes off. (It takes about 40 seconds.)
- ◇ CE Marking is qualified.
- ◇ HEAT Lamp indicates the status of the heater.
- ◇ Tube racks are compatible with our former model STF2.

Specifications

Model	STF3
Seal Method	Direct welding by the molding heater
Standard	CE marking qualified (cCSAus : 100-120V model only)
	1. EMC : EN61326-1
	2. Product Safety : EN61010-1
Dimension (mm)	132 (W) x 225 (D) x 260 (H)
	<when raising the handle : 320 (H)>
Weight (kg)	8.0
Power	110-120V equipment : 99 ~ 132 VAC, 2A, 50/60Hz
	200-240V equipment : 180 ~ 264 VAC, 2A, 50/60Hz
Part Number	110-120V equipment : 90132501
	200-240V equipment : 90132502

Tube Rack (sold separately)

Part Number	Description	Tube Size
S201778G	Tube Rack (G2)	1.5PA seal tube
S201778F	Tube Rack (G)	2PA seal tube
S201778E	Tube Rack (B2)	3.5PA seal tube
S201778H	Tube Rack (B3)	4PA seal tube
S201778A	Tube Rack (B)	5PA seal tube
S201778J	Tube Rack (B4)	6.5PA seal tube
S201778L	Tube Rack (C2)	8PA seal tube
S201778B	Tube Rack (C)	12PA seal tube
S201778C	Tube Rack (E)	40PA seal tube
S201778M	Tube Rack (F2)	94PA seal tube
S201778K	Multi Rack*	

* for 2, 4, 5, 6.5, 12 and 40PA seal tube

S-Cap Series

himac original S-cap series offer simple and easy operation of the tube cap for open-top (thin-walled) tubes. The unique system requires just three components and three steps to assemble the cap to the tube.

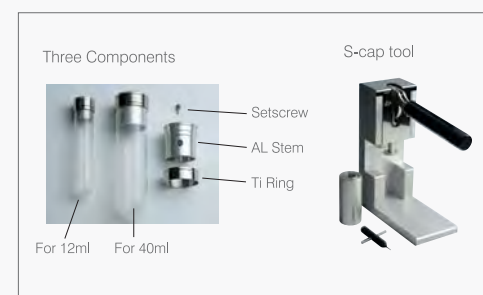
- * No consumables, such as O-ring
- * Easy cleaning and no maintenance of the components

Three assembling steps

1. Fill sample into the tube up to 80% volume and insert AL Stem into the tube by the tool.
2. Assemble Ti Ring on the tube and tighten AL Stem and Ti Ring by the tool.
3. Fill up the sample into the tube by an injector and close Setscrew.

Disassemble procedure after the centrifugation is also simple and easy.

1. Remove Setscrew and withdraw 20% supernatant from the center hole of AL Stem by the injector.
2. Remove Ti Ring to downwards by hand.
3. Connect tube setter into the center hole of AL Stem and remove the AL Stem by moving the tube setter left and right slowly and gradually pulling up AL Stem.



Part Number	Description	Remarks
S410542A	S-12AL Cap Assy (1pc/set)	12PA/12PE tube
S410532A	S-40AL Cap Assy (1pc/set)	40PA/40PE tube
S308625A	S-Cap Tool Set	
S308626A	S-12AL Cap Tool Set (8caps/set)	12PA/12PE tube
S308626B	S-12AL Cap Tool Set (12caps/set)	12PA/12PE tube
S308627A	S-40AL Cap Tool Set (8caps/set)	40PA/40PE tube
S308627B	S-40AL Cap Tool Set (12caps/set)	40PA/40PE tube

* S-12AL/S-40AL Cap Tool Set includes required number of the cap and S-cap tool set.

Rotors for Density Gradient Centrifugation

The density gradient centrifugation is very useful to separate multiple nano-sized particles simultaneously in the density gradient solution. We offer exclusive rotors, zonal rotor model P32ZT and continuous flow rotor model P32CT, for larger volume process.

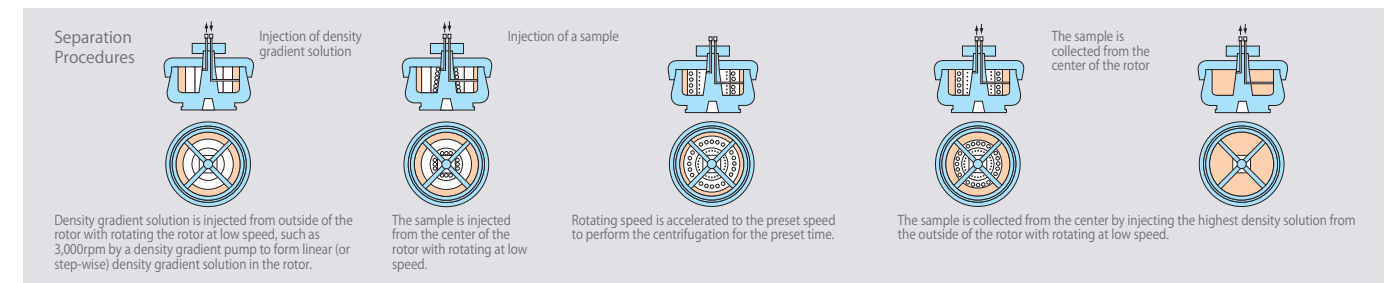
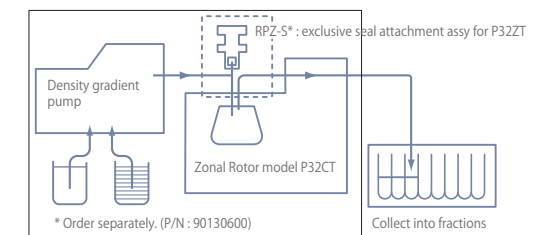
P32ZT : Zonal centrifugation system



P32ZT
P/N : 9023160M

In zonal centrifugation, a density gradient is developed within the zonal rotor running at low speed. Next, the samples to be separated are loaded through the center of the zonal rotor. Then increase the speed to the preset high speed to separate the samples into the respective band in the density gradient in the rotor. After separation, separated sample with the density gradient solution are collected through the center by injecting the highest density gradient solution from the outside wall of the zonal rotor while the rotor is running at low speed. Collected samples with the density gradient solution are separated into the fractions. Optical density of each fraction is checked by the spectrophotometer to find the fractions containing the separated samples.

System flow diagram



P32CT : Continuous flow centrifugation system



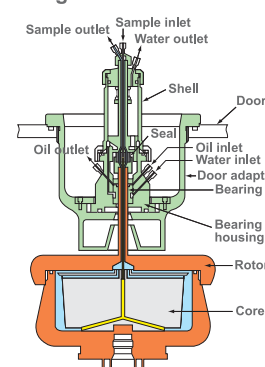
P32CT
P/N : Coming Soon *1

The continuous flow rotor model P32CT, designed for use with Hitachi ultracentrifuges, enables you to perform highly efficient continuous flow separation and purification of large volume samples under high centrifugal force using differential pelleting or the density gradient centrifugation technique.

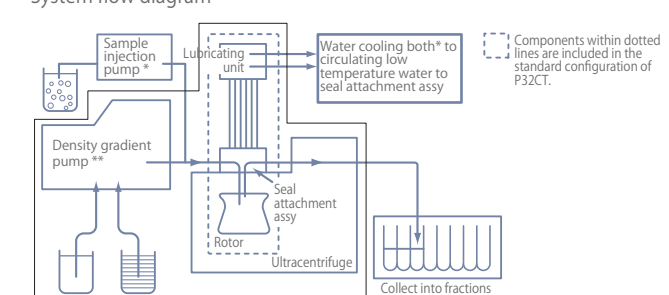
Optional 940ml Core Assy (P/N 34833A)

For separating samples containing much sediment or performing separation after increasing the density gradient, the optional 940ml Core Assy increases the rotor capacity from 430ml to 940ml. The flow volume performance is about 35% less than that of standard core (for 430ml capacity).

Configuration of P32CT

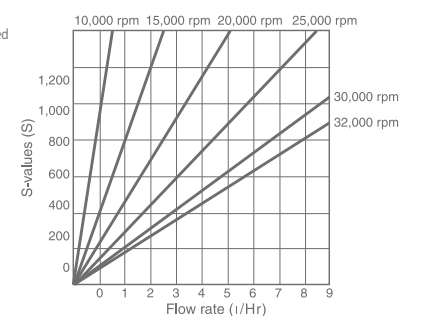


System flow diagram



* Required to use P32CT. Please purchase the pump and the water cooling bath separately from your local supplier before installation of P32CT. Please contact us for their detailed required specification.

** Required to use P32CT for density gradient centrifugation.



*1 : Due to different design of accessories, the exclusive model of P32CT will be introduced for CP-NX series. (New part number is assigned. Official announcement will be published in the near future.) Current model of P32CT (P/N9022660M) cannot be used with CP-NX series