

SINCE 1889



Yamato Scientific
America

Yamato Water Circulators & Cold Trap

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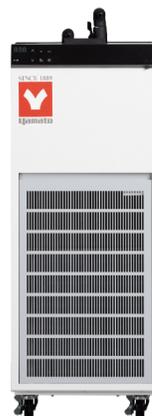
CB100



CFA302



CF303Y
CF313Y



CF802A



CA301

Water Circulator (Chiller)

Water Circulator (Chiller)

Purpose

Supplies a source of temperature controlled fluid, typically water, which removes heat from a process

Benefits

Keeps water in the condenser at a stable low temperature thereby creating ideal conditions for collecting the maximum amount of solvent

Cold Trap

Purpose

Efficiently collects moisture and harmful vapors by trapping them in the container and keeping them from reaching the vacuum pump

Benefits

Protects vacuum pumps

For oil-sealed pumps, collection of vapors is critical to prevent them from getting into the vacuum pump where they would condense and contaminate the pump's oil which will eventually cause loss of efficiency or irreparably damage pump

Protects the environment

For dry pumps, collection of vapors makes the evaporation system a closed system, preventing vapors from passing through the vacuum pump and into the environment

Increases evaporation rate

Vapors are collected as a frozen solid and are therefore not condensed inside the vacuum tubing, which would slow evaporation

Cold Trap

Specifications

Type	Series	Temperature range	Dehumidifying capacity	Capacity (L)	Features	Application	Recommended in combination with
Water Circulator (Chiller)	CB100	-10°C to 80°C	N/A	3.4L	<ul style="list-style-type: none"> ● Closed circulation system ● Environment friendly coolant used for refrigeration ● Less energy use and less cooling capacity loss by fixing the heat resistant lead ● Can connect four (4) Rotary Evaporators when using CF802A 	<ul style="list-style-type: none"> ● Used for many cooling applications 	Viscometer Spectrofluorometer
	CFA302	-10°C to 60°C	N/A	13L			TE100 Thermal Analyzer
	CF303Y CF313Y	-20°C to 30°C <i>no heating function</i>	N/A	3.9L			Rotary evaporator
	CF802A		N/A	15.5L			
Cold Trap	CA301	<i>Max lowest temperature -45°C</i>	Max 0.9 kg (water type liquid)	4L	<ul style="list-style-type: none"> ● A worry-free system which can be operated without adding dry ice or liquid nitrogen ● Uses environment friendly and CFC-free refrigerant ● Standard equipped with stainless steel condenser / option for glass trap for corrosives ● Space saving and highly mobile on wheels, equipped with stoppers in the front caster wheels 	<ul style="list-style-type: none"> ● Large amount of outgassing or contaminants that may be present ● Large amount of liquid that must be removed from the vacuum environment (e.g. freeze drying) 	Vacuum oven Freeze dryer

Benchtop Water Circulator (Chiller)

Precision low temperature, compact water circulator



CB-100

Operating temp. range -10°C ~ 80°C

Capacity ~3.4L (Liquid volume 2.3L)



Operation and functions

Wide temperature range of -10 ~ 80°C

Can be used for various applications such as as maintaining temperature for cell samples in a spectrofluorometer and a viscometer

High head and flow rate

Lift is ~3.3/4.7m (50/60 Hz), which is very high in this class, so even piping with pressure loss can be circulated sufficiently. In addition, the maximum flow rate is as large as ~6.8/8.0L/min (50/60 Hz). The lift and flow rates allow stable circulation even when installed under a desk.

Easy to clean cooling air intake filter

Filter mounting plate located on the front of the unit can be easily removed when cleaning

Standard equipped with drain

Maintenance work such as replacement of liquid can be easily performed. After use, it can be stored in the space inside the main unit.

Nozzle can be used in any orientation

Since the nozzle is freely rotatable, it can be installed in any direction

Compact

With a width of 180mm and a depth of 360mm, it is ideal for limited spaces

Low GWP value that is friendly to the global environment

Since the alternative CFC refrigerant R-134a is used, the global warming potential is as low as 1430, good for the global environment.

Specifications

Model	CB-100	
System/circulating water	Closed circulation / tap water, anti-freeze solution (for 10°C or lower)	
Temperature control system	Refrigerator control + heater PID control -10 to 50°C: Refrigerator ON, control by heater PID 50.1 to 80°C: Refrigerator OFF, control by heater PID only	
Operating ambient temperature range	5 to 30°C	
Performance	Temperature setting range	-10°C to 80°C
	Temperature setting range for refrigerator continuous use	-10°C to 50°C
	Max. flow rate ^{*1}	8 L/min.
	Max. head ^{*1}	4.7m
Function / Configuration	Temperature control accuracy ^{*2}	±0.1°C
	Cooling capacity (liquid temp) ^{*3}	~230W (liquid temp. at 10°C)
	Controller	7-segment 3-digit white LED digital display, key input, resolution: 0.1°C
	Control heater	115V 650W stainless steel
	Refrigerator / Refrigerant	Air cooling / 100W / R134a
	Temperature sensor	Pt100Ω
	Circulation pump motor	Induction motor 40W
	Cooling pipe	Stainless steel 304
	External input	External temperature sensor input connector
	User function	Calibration offset, auto-resume mode select
Safety devices	Circulation system	Control unit front side, one system / One touch connector (swivel type, L type) / Flow rate valve
		Overcurrent ELCB, temp. sensor failure, temp. rise/fall alarm (operation continues), temp. upper/lower limit error (operation stops), float switch for dry heating prevention, refrigeration overload relay, refrigeratoor high pressure cut-off switch, fan motor protection, circulation pump thermal protector, delay timer for refrigerator protection, overheat prevention device
Standard	Water bath material	Stainless steel
	Water bath capacity	~3.4L (Liquid volume 2.3L)
	Power source	Single phase AC115V 13A, with plug
	External dimension (WxDxH) (including protrusions)	180 x 360 (440) x 553 (600) mm (including protrusions)
	Weight	~22kg
Included accessories	Hose nozzle 10mm O.D. connection (for flexible hose connection (2), knurled screw (2)	

^{*1} Pump performance based on tap water at 20°C

^{*2} Circulating water -10 to 10°C: Nybrine/10.1 to 80°C water. Performance based on 115V 60Hz supplied power, being short circuited, no load applied.

^{*3} Performance based on 115V 60Hz supplied power and 23°C ambient temperature.

Control Panel



Filter Mounting Plate



Compact



Water Circulator (Chiller)

Externally-sealed precision circulation system



CFA-302

Operating temp. range -10°C ~ +60°C

Capacity ~ 13L



■ Operation and functions

- Provides highly accurate circulating water with an operating temperature range of -10 to 60°C and a temperature control accuracy of $\pm 0.1^\circ\text{C}$
- Demonstrates powerful cooling ability of 370W as a cooling device. (at liquid temperature 10°C, room temperature at 20°C)
- Air-cooled, which generates less heat from the device
- Standard equipped with a variety of support functions such as auto-stop operation, auto-start operation, temperature output terminal, and calibration offset function

■ Specifications

Model	CFA-302
PERFORMANCE¹	
Circulation method	External closed system circulation
Temperature control range	-10~+60°C
Setting temperature range	-15 ~ +65°C
Temperature control accuracy	$\pm 0.1^\circ\text{C}$ at 20°C JTM
Temperature fluctuation	$\pm 0.3^\circ\text{C}$ at 20°C JIS
Temperature display unit	0.1°C
Cooling capacity	~ 370W (318Kcal/h) at liquid temperature 10°C
Ambient temp. range	5 ~ 35°C
Circulation capacity (50/60Hz)	8.9/10.3L/min
Maximum flow rate (pump capacity)	(15.0/17.0L/min)
Circulation capacity (50/60Hz)	6.6/9.0m
Maximum head (pump capacity)	(8.0/11.0m)
CONFIGURATION	
Bath	Stainless steel SUS304
Temperature control system	PID control
Temperature sensor	Double sensor: Pt100Ω (for temperature control) K-thermocouple (for overheating prevention)
Temperature setting / display method	Digital setting
Refrigeration system/rated performance	Air cooling / 300W
Refrigerant	R404A 300g
Circulation pump	Magnet pump 45W
Heater	850W (SUS316)
Cooling coil	Copper nickel plating treatment
External circulation nozzle	Rc3/8 with discharge port and return ports outer diameter $\Phi 14$ mm hose nipple
Safety device	Earth leakage breaker, overheating prevention device, refrigerator overload relay protecting circuit, delay timer for refrigerator protection, refrigerator pressure detection, float switch, bypass for circulating pump protection, self-diagnostic functions (sensor failure, heater disconnection, SSR short circuit, main relay contact short circuit, automatic overheating prevention)
Other functions	Operation monitor, drain cock, key lock, calibration offset, temperature output terminal, refrigerator pressure indicator, condenser filter
STANDARD	
Tank dimension (WxDxH)	245 x 315 x 180 mm
External dimension (WxDxH) *2	380 x 565 x 725 mm
Water tank capacity	~13L
Power source	AC100V single phase 13.8A
Weight	~60kg
Included accessories	Drain hose 0.5m 1 piece overflow hose 0.5m 1 piece

¹ Performance at the environmental temperature of -20°C ± 5

² Outer dimensions excludes protrusions.

Water Circulator (Chiller)

Powerful closed circulation system with excellent cooling capacity



CF-303Y CF-313Y / CF802A

Operating temp. range -20°C~30°C no heating function

Capacity ~3.9L (Liquid vol. 3.5L) (CF303Y/CF313Y) ~15.5L (Liquid vol.14L) (CF802A)



CF-303Y
CF-313Y

CF802A

Operation and functions

- User-friendly controller
Controller with high visibility and improved operability. Possible to switch between measured temperature and set temperature.
- Convenient circulation pathway connection
Connection is completed by inserting a hard tube with 10 mm OD or flexible hose with 9mm ID. Connector can be freely moved and be set in the desired direction
- Easy drainage of condensate water
A condensation drain port is designed near the connector on the upper rear of the unit
- Easy to clean intake filter
Filter mounting plate located on the front of the unit can be easily removed when cleaning
- Compact size for easy installation (for CF303Y/313Y)
Requires minimal installation space. Can be installed on or below a laboratory table
- Space-saving solvent recovery device stored in the main body as secondary trap (option for CF802A)
Used to recover solvent gases remaining in the concentration recovery process

Specifications

Model	CF-303Y CF-313Y	CF-802A
PERFORMANCE		
System/circulating water	Closed circulation / tap water, anti-freeze solution (below 10°C)	Closed circulation / tap water, anti-freeze solution (over 10°C)
Operating ambient temperature range	5 to 35°C	
Temperature setting range ^{*1}	-20°C ~ 30°C (no heating function)	
Temperature control accuracy ^{*2}	±1.0 °C (≥ 0°C) ±1.5 °C (< 0°C)	±1.0°C
Temperature fluctuation ^{*2}	2.0 °C (≥ 0°C) 3.0 °C (< 0°C)	3.0°C
Cooling capacity (liquid temp) ^{*2}	~450W at 10°C ~330W at -10°C	~1320W at 10°C ~700W at -10°C
Max. flow rate ^{*3}	~ 10L/min.	~ 14L/min.
Max. head ^{*3}	~ 5.7m	~ 14.3m
CONFIGURATION		
Temperature control system	Refrigeration ON-OFF	
Temperature sensor	Pt100Ω	
Controller	White LED digital display, key entry, minimum digit of 1°C	
Refrigeration system/rated performance	Air cooling / 450W	Air cooling / 700W
Refrigerant	R452A	R410A
Cooling coil	Stainless steel	304 Stainless steel
External circulation connection port	Rear top panel, single line One touch connector (swivel type, L type) Flow rate valve (optional)	Rear top panel, single line One touch connector (swivel type, L type) Flow rate valve
Safety device	Overcurrent ELCB, temp. sensor failure, temp. upper/lower limit alert, temp. upper/lower limit error, refrigerator high pressure cut off switch fan motor protection, circulation pump protection, delay timer for refrigerator protection, overcurrent protection fuse (service outlet) for CF802, refrigerator overload relay (CF802)	
Other functions	Drain hose, condensate drain hose, Intake dust filter, cooling operation key, circulating pump key, calibration offset, auto resume function, service outlet (2A) for CF802A	
STANDARD		
Water bath material	Stainless steel	
Water bath capacity	~3.9L (Liquid volume 3.5L)	~15.5L (Liquid volume 14L)
Power source	Single phase AC115V 6.8A with plug Single phase AC220V 4A no plug	AC115V 15A with plug
External dimension (WxDxH) mm (including protrusions)	205 x 396 x 535 (225 x 434 x 564)	340 x 370 x 838 (340 x 408 x 920)
Weight	~30kg	~44kg
Included accessories	Condensation drain hose(1m)(1), Hose clamp (2), Hose nozzle (for flexible hose connection)(2), spare fuse for service outlet 2A (1) for CF802A	

^{*1} Unit does not feature heating function. Depending on ambient temperature or connection conditions, temperature may not reach -20°C.

^{*2} Performance based on 115V/220V supplied power and 20°C ambient temp. Temp. control accuracy and temp fluctuation are standards calculated accdg. to JTM K05 and JIS respectively.

^{*3} Pump performance based on tap water at 20°C

Features

■ Control Panel



■ Discharge and Return Ports



■ Filter mounting plate



■ Circulation Hose Connection



■ Easy installation



CF303Y / 313Y installed under the table



CF303Y / 313Y installed on the table

■ Optional items

Product name	Product code	Applicable models
Circulation Connection (fittings)	Check manual for fitting components	All models
Circulation Connection (hoses)	Check manual for fitting components	All models
Strainer set	281482	All models
External interlock input terminal	281588 281589 281485	CF303Y CF313Y CF802A
Flow rate valve	281477	All models
Glass container (secondary trap)	281487	CF802A
Seal lid for external open connection	281479	CF802A

Cold Trap



CA301-115V CA301-220V

Maximum low temperature -45°C

Dehumidifying capacity 0.9 kg (Water type liquid)



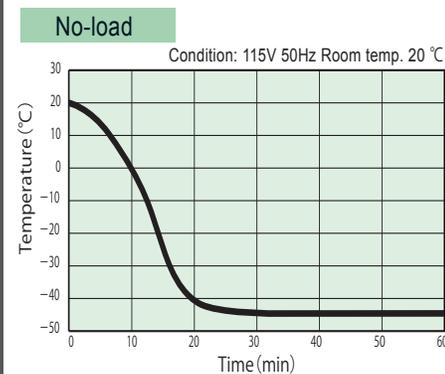
Efficiently traps water vapor and toxic substances discharged from rotary evaporator and vacuum oven to protect the vacuum pump

- Excellent choice to extract acid and organic solvents with the optional glass condenser
- Efficiently reduces vapor inhalation amount to the vacuum pump
- Can be used as a low temperature tank as well as pre-cooling tank
- Utilizes R404A
- Space saving and highly mobile on wheels

Specifications

Model	CA301-115V / CA301-220V
Method	Direct trap or Glass trap (optional)
Dehumidifying capacity	Max. 0.9kg (aqueous system)
Max. low temperature	-45°C
Time to achieve the maximum lowest temperature	20 minutes or less
Refrigerator	Air cooling, 400W
Refrigerant	R404A
Cooling coil	ID ø90mm SUS304
Lid	OD ø17.6mm with nozzle, SUS304
Bath shape / material	Cylindrical / SUS304
Ambient temp. range	5~35°C
Temperature display	7 segment LED
Temperature sensor	Platinum resistance temperature detector Pt100Ω
Safety devices	Electric leakage breaker with over current protection, refrigeration overload relay
Defrosting mechanism	None
Tank dimensions	I.D. ø153 x H 235 mm
Internal capacity	~4L (Liquid 3L)
Power source 50/60 Hz	AC115V 5.1A / AC220V 2.3A
External dimension WxDxH	345 x 475 x 726 mm
Weight	~50kg

Cooling Curve



Optional items

Product description	Product code	Function / Feature
Glass condenser set OCA10	221487	To trap acidic and organic solvents
Reducer for rubber tube brass ø30×ø18	242185	Used when connection size is different
brass ø30×ø12	242186	
SUS ø30×ø18	221496	
SUS ø30×ø12	241497	
SUS lid	281296	Lid of trap tank



Glass condenser set



Glass condenser



Stainless cover

