

## Yamato Incubators

### Contents

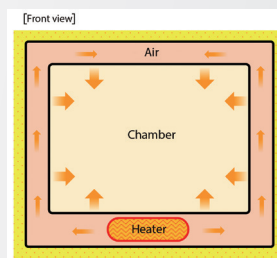
<b>Incubator Overview</b>	-----	Page 2
<b>Natural Convection</b>		
IC Series	-----	Page 3
<b>Forced Air Convection</b>		
IN Series	-----	Page 5
INE Series	-----	Page 7

# INCUBATOR OVERVIEW

**Natural Convection** ensures a homogeneous temperature throughout the chamber



**IC Series: General Purpose Incubator**  
Internal Capacity: 37, 97, 159, 318, 567L

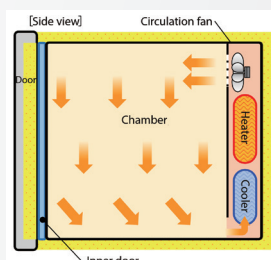


- Non-programmable
- Easy to use digital display setting and timer
- Standard equipped with various functions like self-diagnostic, calibration off-set, overheat prevention and key lock
- Inner glass door for easy and safe sample viewing (except IC-100 models)
- Option to choose from several chamber capacities from small benchtop units to floor standing models
- All models are available with optional Window [W] for improved visibility
- Models 400 to 900 have an option for communication port

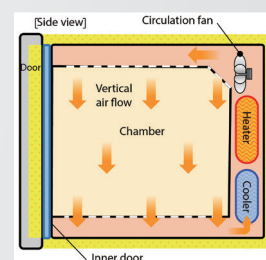
**Forced Air Convection** ensures both optimal heating of materials and a high precision temperature uniformity in the chamber with minimum energy consumption



**IN Series: Programmable Refrigerated Incubator**  
Internal Capacity: 143, 286L



**INE Programmable Refrigerated Eco Incubator**  
Internal Capacity: 286L



- Programmable
- Large Capacity
- Manual and programmed defrosting function
- Easy to use digital display setting and timer
- Standard equipped with various functions like self-diagnostic, calibration off-set, overheat prevention and key lock
- Inner glass door minimizes temperature changes and makes far easy and safe sample viewing
- Cooling system ensures that samples are not dried while cooling
- Option for RS485 interface
- Electrical hook up for shaker inside the chamber (IN series)
- Upgraded inverter control improved refrigeration efficiency and reduced frost significantly (INE series)

# Economical General Purpose Incubator

Natural Convection



## IC Series

Operating temp. range	Room temp. +5°C~80°C	Temp. distribution accuracy	±1.0°C (at 37°C)	Internal capacity	37L (IC103C/113C)	97L (IC403C/413C)	159L (IC603C/613C)	318L (IC803C/813C)	567L (IC903C/913C)
-----------------------	----------------------	-----------------------------	------------------	-------------------	-------------------	-------------------	--------------------	--------------------	--------------------

### Benchtop, compact design incubators (IC103C) General purpose incubators (IC403C/603C/803C/903C)

- Space saving
- All models come with either an observation window (W) for improved visibility or solid door
- Dual door system permits contents to be viewed easily without disrupting atmosphere of the incubator (except IC-100 series)
- Control panel of IC103C/113C located at a higher position for easy access
- Easy to use digital setting display and timer
- Air jacket technology ensures even and efficient heat distribution throughout the chamber
- Standard equipped with various functions such as self-diagnostic, calibration offset, overheat prevention and key lock
- Models 400 to 900 have an option for communication port (R)

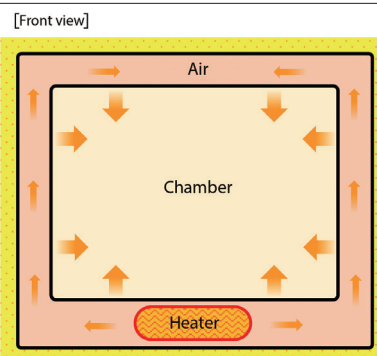


### Specifications

Model	IC103C IC113C	IC403C IC413C	IC603C IC613C	IC803C IC813C	IC903C IC913C
System	Natural convection				
Operating temperature range	Room temp. +5~80°C				
Temp. control accuracy	±0.5°C (at 37°C)				
Temperature distribution accuracy	±1.0°C				
Interior material	Stainless steel				
Exterior material	Cold rolled steel plate with melamine resin baking finish				
Heat insulator	Glass fiber				
Heater	Stainless steel heating pipe	Iron-chrome wire heater			
	0.2kW	0.3kW	0.4kW	0.7kW	2.2kW
Temperature controller	PID control by microprocessor				
Temperature setting system	Operation menu key and digital setting by ▲/▼ keys, digital display				
Temperature display	Measurement temperature: Digital display by 4 digit green LED Setting temperature: Digital display by 4 digit red LED				
Timer	1 min. ~ 99 hrs 59 mins. and 100~999 hrs 50 mins (including timer waiting function)				
Operation functions	Fixed temperature, Auto start, Auto stop, Quick Auto stop				
Additional functions	Calibration off-set, Key-lock, Power outage compensation				
Safety device	Self diagnostic functions, temp. sensor error, display error, measurement temp. error, auto overheat prevention				
Heater control circuit	SSR drive system				
Sensor	K-thermocouple				
Internal dimensions (WxDxH)	350 x 300 x 360 mm	450 × 480 × 450 mm	600 x 530 x 500 mm	600 × 530 × 1000 mm	1070 x 530 x 1000 mm
External dimensions (WxDxH)	430 x 397 x 606 mm	560 × 606 × 820 mm	710 x 656 x 870 mm	710 × 656 × 1619 mm	1180 x 656 x 1619 mm
Internal capacity	37L	97L	159L	318L	567L
Inner door	None	Reinforced glass door x 1		Reinforced glass door x 2	
Shelf load capacity	~15 kg/pc.				
Shelf rest step number	8 steps	9 steps	12 steps	29 steps	29 steps x 2
Power supply (50/60 Hz)	AC115V 1.8A with plug AC220V 1A no plug, round terminal	AC115V 4.5A with plug AC220V 2A no plug, round terminal	AC115V 6A with plug AC220V 2.5A no plug, round terminal	AC115V 10A with plug AC220V 4.5A no plug, round terminal	AC115V 13A with plug AC220V 6.5A no plug, round terminal
Weight	~17 kg	~45 kg	~65 kg	~102 kg	~166kg
Included accessories: Shelf / shelf brackets	Stainless steel				
	2 pcs. / 4pcs.			4 pcs. / 8 pcs.	8 pcs. / 16 pcs.
Optional accessories	Stand, Stacking kit, Additional shelf, Cable hole (25/50mm or 30/50mm), Temp. output terminal, Time-up output terminal for alarm device				



## Method



## Control Panel



## Observation Window



## Interior (IC613C)



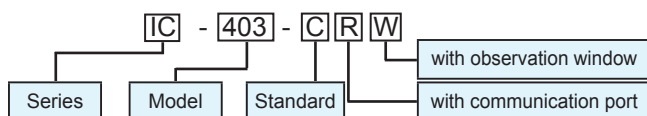
## Shelf & Bracket Set



## Exhaust Ports



## Model Guide



## Examples:

- IC-103C: Standard model
- IC-403CR: Standard model with communication port
- IC-603CW: Standard model with observation window
- IC-803CRW: Standard model with communication port and observation window

## Optional items

Description	Product code
Stand for up to 600 models (ON61)	211856
Shelf and bracket set for IC100 models	42110501001
Shelf and bracket set for IC400 models	212246
Shelf and bracket set for IC600 and 800 models	212266
Metal stacking kit for IC400 models (OD40)	212822
Metal stacking kit for IC600 models (OD60)	212823
Cable port ø25mm	281121
Cable port ø50mm	281122
Temperature output terminal (4~20mA) for ODK12	281123
Time-up output terminal for ODK14	281124
Wi-Fi network bridge	WV4A

## Dimensions (mm)



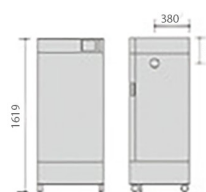
IC103C/113C



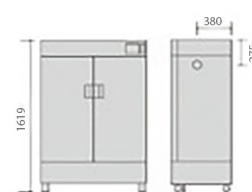
IC403C/413C



IC603C/613C



IC803C/813C



IC903C/913C

# Programmable Refrigerated Incubator

Forced Air Convection



**IN604-115V IN604-220V / IN604W-115V IN604W-220V**  
**IN804-115V IN804-220V / IN804W-115V IN804W-220V**

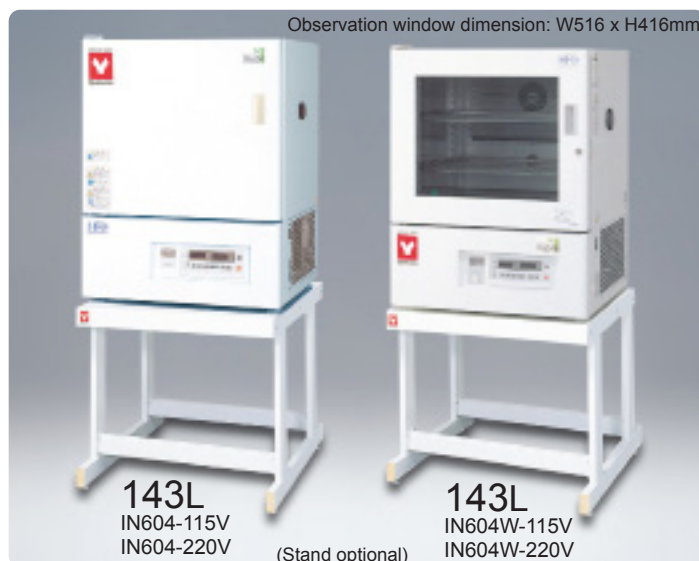
Operating temp. range -10°C~+50°C

Temp. distribution accuracy ±1.0°C (at 37°C)

Internal capacity 143L (IN604/604W) 286L (IN804/804W)

## Applicable for low temperature tests and environmental tests

- High accuracy temperature control and temperature distribution
- Inner glass door keeps temperature stable during sample observation
- Designed with a large dual glass door and inner door that forms a triplex glass door for improved heat retention (IN604W/804W)
- Interior light for better sample visibility (IN604W/804W)
- Optional slide shaker table available to put in and take out sample easily (IN600 models)



## Specifications

Model	IN604-115V IN604-220V	IN604W-115V IN604W-220V	IN804-115V IN804-220V	IN804W-115V IN804W-220V
System	Forced air convection			
Operating temperature range	-10°C~+50°C			
Temperature adjustment accuracy	±0.3°C (refrigerator in continuous operation) ±1.0°C (refrigerator in cycle operation)			
Temperature distribution accuracy	±1.0°C (refrigerator in continuous operation at 37°C)			
Maximum temperature reaching time	20~50°C ~20min		20~50°C ~30min	Data not available
Minimum temperature reaching time	20~-10°C ~45min	20~-10°C ~55min	20~-10°C ~65min	Data not available
Interior material	Stainless steel			
Exterior material	Chrome free electronic galvanized plated steel plate chemical proof baking finish			
Observation window	--	W516 x H416mm (with key)	--	Data not available
Heat insulation material	Styrene foam			
Refrigerator	Air-cooled fully closed compressor 250W		Air-cooled fully closed compressor 300W	
Refrigerator medium	R134A		R404A	
Defrosting mechanism	Manual ON / Auto OFF, Timer operation, Cycle operation			
Blower fan	Axial fan			
Heater	Iron-chrome wire heater: 550W		Iron-chrome wire heater: 750W	
Sensor	Platinum resistance temperature detector: Pt100Ω (temperature controller), K-thermocouple (overheat prevention device)			
Cable port (right side of main unit)	I.D. 32 mm	I.D. 50 mm	I.D. 32 mm	I.D. 32 mm
Room light / service outlet	--	Fluorescent lamp: 10W/5A with grounding terminal	--	Flourescent lamp: 10W/5A with grounding terminal
Temperature control	PID control			
Temperature setting	Digital setting with ▲/▼ keys			
Temperature display	Measured temperature: 4-digit orange LED digital display + VFD fluorescent display			
Timer / timer resolution	0 min.~999 hrs. 59 min. / 1min.			
Operation function	Fixed temperature, auto stop, auto start, program (up to 32 steps, repeat operation)			
Additional functions	Timer function (accumulated time to 49,999 hrs), calibration off-set function, clock display			
Safety device	Self diagnostic function (Temp. sensor error, Heater disconnection, SSR short-circuit, Main relay error, Automatic overheat prevention function), Key lock, Over current ELB, Overheat prevention device			
Internal dimensions (WxDxH mm)	600 x 477 x 500		600 x 477 x 1000	
External dimensions (WxDxH mm)	710 x 645 x 913		710 x 645 x 1630	
Internal capacity	143L		286L	
Shelf plate load	15 kg / pc.			
Shelf rest step number / pitch	13 steps / 30mm		23 steps / 30mm	
Power supply (50/60Hz)	AC115V 9A with plug AC220V 5.5A no plug, round terminal	AC115V 10.5A with plug AC220V 7.5A no plug, round terminal	AC115V 10.5A with plug AC220V 6A no plug, round terminal	AC115V with plug AC220V no plug, round terminal
Weight	~89 kg		~120 kg	
Included accessories: Shelf / shelf brackets	3 pcs. / 6 pcs. (stainless steel punched metal)		5 pcs. / 10 pcs. (stainless steel punched metal)	
Door keys	--	2 keys	--	2 keys
Optional items	Stand, additional shelf, cable port (ø30/50mm), recorder, warning light combination (stand-by/operation/error), observation window, temperature output terminal (4-20mA), external alarm output terminal, time up output terminal			

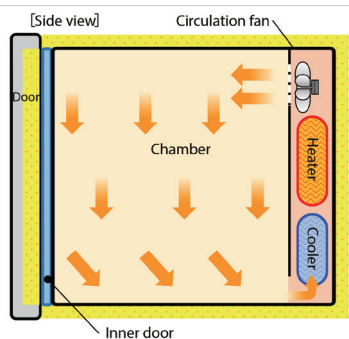




## Control Panel



## Method

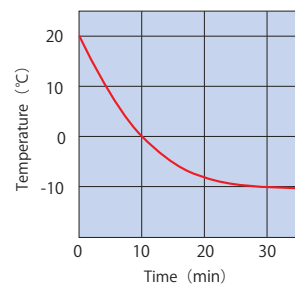


## Optional items

Description	Product code	Model	Applicable units
Stand	211856	ON61	IN604/604W
Metal stacking kit with cooling fan for 600 models	212823	OD60	IN604/604W
Stainless steel punched metal shelf up to 15kg	211221	--	All
Stainless steel wire shelf up to 20kg	213464	--	All
Temperature output terminal*	281168	--	All
External alarm terminal*	281169	--	All
Time up output terminal*	281170	--	All
Seismic mat for 600 models	296902	--	IN604/604W
Shaker setting stage with slide rail	211318	--	IN604W

\* Please specify when ordering main unit.

## Temperature Drop Curve (IN604)



## Interior

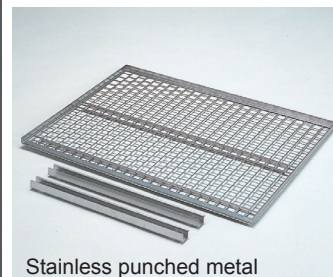


IN604W with MK161 shaker



IN604

## Shelf & Bracket Set

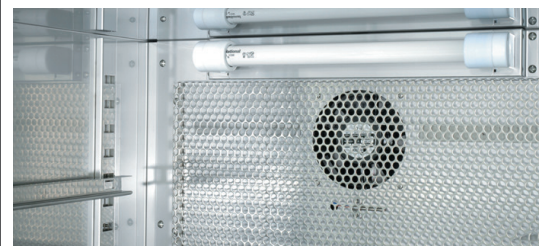


Stainless punched metal



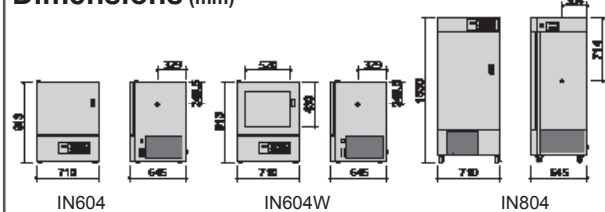
Stainless wire

## Interior Light



IN604W/804W

## Dimensions (mm)



# Programmable Refrigerated Eco Incubator

Forced Air Convection

INE800-115V / INE800-220V



Temperature range 0~+60°C

Temp. distribution accuracy ±0.5°C (at 37°C during continuous operation)

Internal capacity 286L

Inverter control Energy savings

**Upgraded inverter control improved refrigeration efficiency, reduced frost significantly and minimized wasted power during refrigeration.**

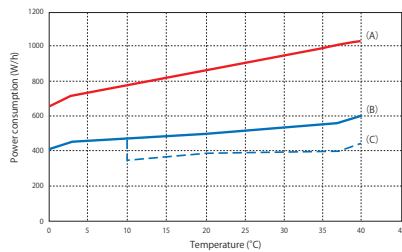
- 44% power savings compared to previous models
- Controller upgraded for easier viewing and operability
- Temperature distribution accuracy improved for better incubation
- Standard equipped with program operation, auto-stop, auto-start, self-diagnostic, timer, calibration off-set, memory, and electricity & CO<sub>2</sub> emission monitor



## Specifications

Model	INE800-115V	INE800-220V
System	Forced air convection	
Operating temperature range	0~+60°C	
Setting temperature range	-5~+65°C	
Temperature adjustment accuracy	±0.2°C (at 37°C during continuous operation), ±0.5°C (at 37°C cycle operation)	
Temperature fluctuation	±0.3°C (at 37°C during continuous operation), ±1.0°C (at 37°C cycle operation)	
Temperature distribution accuracy	±0.5°C (at 37°C during continuous operation)	
Temperature gradient	2.0°C (at 37°C during continuous operation)	
Max. temperature reaching time	20~60°C 35min.	
Min. temperature reaching time	20~0°C 50min.	
Cooling Mechanism	Continuous operation, Cycle operation, Cooling-stop operation	
Interior	Stainless steel	
Exterior	Chromate-free electrogalvanized steel plate Baked chemical resistant finish	
Heat insulator	Styrene foam (non-freon)	
Freezer	200W Rotary Unit	
Cooling Medium	R134a 350g	
Operation range of freezer	Below 40°C	
Defrosting mechanism	Hot Gas Bypass Method, Manual (random) Defrost / Auto (time) Defrost	
Blower fan	DC Axial flow fan 4-Step, Equipped with Error Signal when stopped	
Heater	Iron-chrome wire heater : 750W	
Sensor	Double sensor: Platinum resistance temperature detector: Pt100Ω (temperature controller), K-thermocouple (overheat prevention device)	
Cable port	I.D.: 50 mm (right side of main unit)	
Temperature controller	PID control by microprocessor	
Temperature Display	Setting Temp. Display : 5-digit orange LED digital display, Actual Temp. Display : 4-digit green LED digital display	
Timer / timer resolution	0~99hr. 59min. / 1min.	
Operation function	Fixed temperature, Auto start, Auto stop, Quick auto stop, Program (99 steps, 99 patterns)	
Additional function	Timer, Calibration off-set, Electricity & CO <sub>2</sub> Emission Monitor, Voltage Recovery Optional, User Setting saving/readout, Calendar timer (24 hours)	
Safety device	Self diagnostic function (temp. sensor error, heater disconnection, SSR short-circuit, main relay error, automatic overheat prevention), Key lock, Overcurrent electric leakage breaker, Overheat prevention device, Fan malfunction detector, Cooling high-pressure detector, Inverter malfunction detector	
External dimensions	W710 x D645 x H1730mm	
Internal dimensions	W600 x D477 x H1000 (effective 800) mm	
Internal capacity	286L	
Shelf load capacity	15 kg/pc.	
Shelf rest step number / pitch	23 steps / 30mm	
Power supply (50/60 Hz)	AC115V 8.7A (with plug)	AC220V 4.5A (no plug, round terminal)
Weight	~135kg	
Included accessories	Stainless steel punched metal 5 pcs. shelf / 10pcs. brackets, 2 keys, silicon stopper for cable hole 1 pc	

## Power Consumption Comparison



Unit: Wh

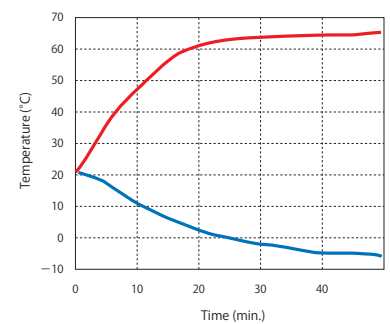
	0°C	3°C	20°C	37°C
IN804	648	712	864	1007
INE800	409	446	498	560
Reduction Rate	37%	37%	42%	44%

Comparison with IN804

- Condition : AC115V/50Hz, Room Temp 23°C, 5 shelves, no load
- Data was taken when each setting was stable

**CO<sub>2</sub> emissions reduced by approx 1,269 kg**  
(Calculated for 1 year operation with 37°C setting)

## Falling / Rising Temp. Curve

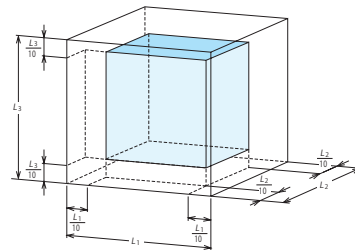


## 9 Point Temperature Distribution

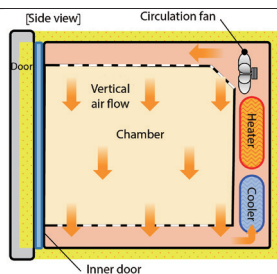
	Upper Front Left	Upper Back Left	Upper Front Right	Upper Back Right	Lower Front Left	Lower Back Left	Lower Front Right	Lower Back Right	Center Side	(°C)
No load	37.1	36.2	37.2	36.9	36.8	36.8	37.1	36.9	37.0	
Loaded	37.1	36.3	37.0	36.9	36.5	35.9	36.7	36.1	37.0	

Condition

- Above 9 measurement points were taken from the effective internal capacity down-scale by 10% (as the image on the right)
- Room Temp. 23°C, AC115V, 50Hz, Average temperature during stable setting temp. set at 37°C
- No Load condition: 5 shelves
- Loaded condition: each of the 12 shelves were loaded with 20 Petri Dishes (Total : 240 Petri Dishes )



## Method



## Control Panel



## Overheat Prevention Device



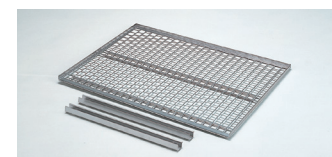
## External Output Terminal (Top: optional Bottom: standard)



## Cable Port (I.D.Φ50mm standard)



## Shelf & Bracket Set



## Optional items

Description	Product code
(1) Stainless steel punched metal shelf up to 15kg	211221
(2) Stainless steel wire shelf up to 20kg	212918
(3) External alarm terminal*	211881
(4) Time-up output terminal*	211882
(5) Earthquake resistant fixture	211883

\* (3) and (4) please specify when ordering main unit

## Dimensions (mm)

