Yamato Scientific America

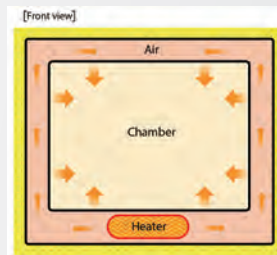Innovating Science for Over 125 Years

Contents

INCUBATOR OVERVIEW

Natural Convection ensures a homogeneous temperature throughout the chamber

[Front view]

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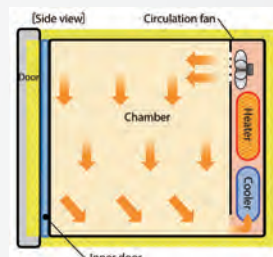**Internal Capacity: 37, 97, 159, 318, 567L**

- 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

Ecological Economical

[Side view]

IN Series: Programmable Refrigerant Incubator
Internal Capacity: 143, 286L

INE Programmable Refrigerant Eco Incubator
Internal Capacity: 286L
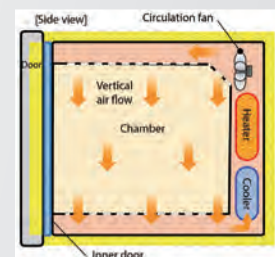
- Programmable
- Large Capacity
- Manual and programmed defrosting function
- Easy to use digital display setting and timer
- Standard equipped with various functions like self-diagnostic, calibration off-set, overheat prevention and key lock
- Inner glass door minimizes temperature changes and makes 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 off-set, overheat prevention and key lock
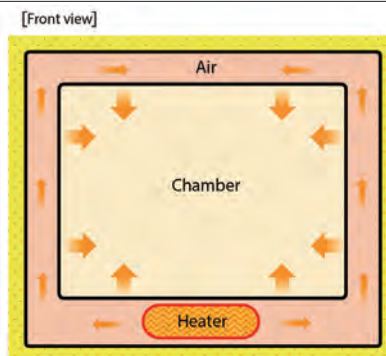- Models 400 to 900 have an option for communication port (R)

37L IC103C

97L IC403C

159L IC603C

■ Specifications

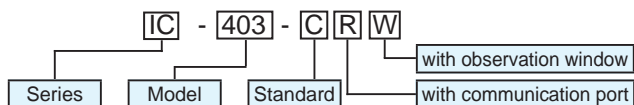| Model	IC103C IC113C	IC403C IC413C	IC603C IC613C	IC803C IC813C	IC903C IC913C
System	Natural convection				
Operating temperature range	Room temp. +5~80°C				
Temp. control accuracy	±0.5°C (at 37°C)				
Temperature distribution accuracy	±1.0°C				
Interior	Stainless steel				
Exterior	Cold rolled steel 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 function	Fixed temperature, Auto start, Auto stop, Quick Auto stop				
Additional function	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 (WxDxHmm)	350 x 300 x 360	450 × 480 × 450	600 × 530 × 500	600 × 530 × 1000	1070 x 530 x 1000
External dimensions (WxDxHmm)	430 x 397 x 606	560 × 606 × 820	710 x 656 x 870	710 × 656 × 1619	1180 x 656 x 1619
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 AC220V 1A	AC115V 4.5A AC220V 2A	AC115V 6A AC220V 2.5A	AC115V 10A AC220V 4.5A	AC115V 13A AC220V 6.5A
Weight	~17 kg	~45 kg	~65 kg	~102 kg	~166kg
Shelf / shelf brackets	Stainless steel				
	2 pcs. / 4pcs.			4 pcs. / 8pcs.	8 pcs. / 16pcs.
Optional items	Stand, Stacking kit, Additional shelf, Cable hole (25/50mm or 30/50mm), External communication terminal (RS485), Temp. output terminal, Time-up output terminal for alarm device				

318L
IC803C

567L
IC903C

■ **Model Guide**

IC - 403 - C R W

Series | Model | Standard
with observation window
with communication port

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**

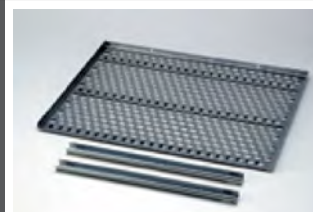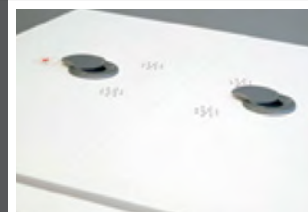| Description	Product code
Stand for up to 600 models (ON61)	211856
Shelf and bracket set for IC100 models	42110501001
Shelf and bracket set for IC400 models	212246
Shelf and bracket set for IC600 and 800 models	212266
Metal stacking kit for IC400 models (OD40)	212822
Metal stacking kit for IC600 models (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

Method

[Front view]

Air

Chamber

Heater

Control Panel

MEASURED TEMP

Observation Window

IC103CW

Interior (IC613C)

Shelf & Bracket Set

Exhaust Ports

Dimensions (mm)

430 | 606
397

IC103C/113C

820
560 | 606

IC403C/413C

870
710 | 656

IC603C/613C

380 | 275
1619
710 | 656

IC803C/813C

380 | 275
1619
1180 | 656
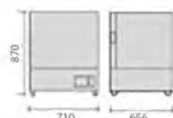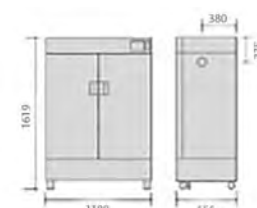
IC903C/913C

Programmable Refrigerant Incubator

Forced Air Convection

IN Series

Operating temp. range	-10°C~+50°C	Temp. distribution accuracy	±1.0°C(at 37°C)	Internal capacity	143L (IN602C/612C)	286L (IN802C/812C)

Standard low temperature incubator

- Large capacity
- Forced circulation with a fan enables high accuracy temperature control and even temperature distribution
- All models come with either an observation window (W) for improved visibility or solid door
- Inner glass door keeps temperature stable during sample observation
- Employment of a large dual-glass door and inner door, forms a triplex glass doors for better heat insulation result (for models with observation window)
- Equipped with various functions such as self-diagnostic (temperature sensor error, heater disconnection, SSR short-circuit, automatic overheat prevention), calibration off-set, clock, timer, overheat prevention device and key lock
- Manual and program defrost operation are both available
- After power failure, unit automatically restarts operation at setting before power failure

143L
IN602C

286L
IN802C

(Stand optional)

■ Specifications

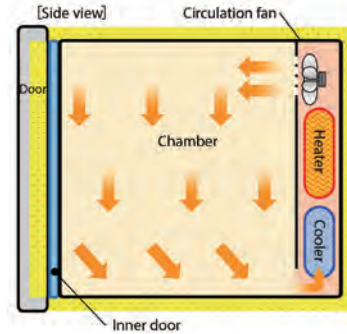| Model	IN602C	IN612C	IN802C	IN812C
System	Forced air convection			
Operating temperature range	-10°C~+50°C			
Temperature adjustment accuracy	±0.3°C (when refrigerator in continuous operation)			
	±1.0°C (when refrigerator in cycle operation)			
Temperature distribution accuracy	±1.0°C(when refrigerator in continuous operation at 37°C)			
Maximum temperature reaching time	20~50°C ~20min		20~50°C ~30min	
Minimum temperature reaching time	20~-10°C ~ 45min (20~-10°C ~55 min for IN602CW / 612CW)		20~-10°C ~65min	
Interior	Stainless steel			
Exterior	Chrome free electronic galvanized plated steel plate chemical proof baking finish			
Heat insulation material	Styrene foam			
Refrigerator	Air-cooled fully closed compressor 275W		Air-cooled fully closed compressor 375W	
Refrigerator medium	R134A			
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	I.D.: 32 mm (right side)			
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	0min.~999hrs. 59min. / 1min.			
Operation function	Fixed temperature, auto stop, auto start, program (up to 32 steps, repeat operation)			
Additional function	Timer function (accumulated time to 49,999 hrs), calibration off-set function, clock display			
Safety device	Refrigerator overload relay, independent overheat prevention device, over current leakage breaker, self diagnostic functions (temperature sensor error, heater disconnection, SSR short-circuit, automatic overheat prevention), abnormal buzzer alarm			
Internal dimensions (W x D x Hmm)	600 x 477 x 500		600 x 477 x 1,000	
External dimensions (W x D x Hmm)	710 x 645 x 915		710 x 645 x 1,630	
Internal capacity	143L		286L	
Shelf plate load	15kg / pc.			
Shelf rest step number / pitch	13 steps / 30mm		23 steps / 30mm	
Power supply (50/60Hz)	AC115 9A	AC220V 5A	AC115 10A	AC220V 6A
Weight	~89kg		~ 115kg	
Shelf / Shelf brackets	3 pcs. / 6 pcs.		5 pcs. / 10 pcs.	
Optional items	Stand, additional shelf, cable port (ø30/50mm), recorder, warning light combination (stand-by / operation / error), observation window, external communication function (RS485), temperature output terminal (4-20mA), external alarm output terminal, time up output terminal			

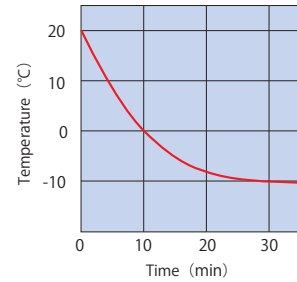Observation window dimension: W516 x H416mm

143L
IN602CW

(Stand optional)

Model Guide

IN - 602 - C S W

Series | Model | Standard | with shaker hook-up | with observation window

Examples:
IN-602C: Standard model
IN-602CW: Standard model with observation window
IN-602CSW: Standard model with shaker hook-up and observation window

Optional items

Description		Product code
Stand for 600 models (ON61)		211856
Metal stacking kit with cooling fan for 600 models (OD60)		212823
Stainless steel punched metal shelf up to 15kg		211221
Stainless steel wire shelf up to 20kg		213464
External communication function (RS422)*		281166
External communication adapter (RS232C)*		281167
Temperature output terminal*		281168
External alarm terminal*		281169
Time up output terminal*		281170
Seismic mat for 600 models		296902
Anti-vibration material	with support EPM-08	851352
	without support EPM-05	851351
Shaker table with slide rail for 600 models		211318

* Please specify when ordering main unit.

Dimensions (mm)

329
249.5
710 | 645
IN602C/612C

520
430
913
329
249.5
710 | 645
IN602CW/612CW

304
714
1630
710 | 645
IN802C/812C

Method

[Side view] Circulation fan
Door
Chamber
Heater
Cooler
Inner door

Control Panel

Temperature Drop Curve (IN612C)

(graph: Temperature (°C) vs Time (min), values 20, 10, 0, -10; time 0, 10, 20, 30)

Interior

IN602CSW with MK161 shaker installed

IN612C

Interior Light
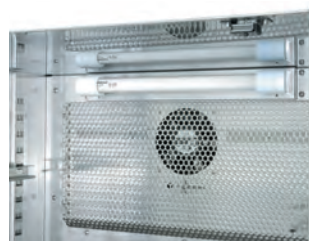
For models with observation window

Shelf & Bracket Set

Programmable Refrigerant Eco Incubator

ECO Ecological Economical

Forced Air Convection

INE800

| 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_2 emission monitor
- Designed with Analog Output (4-20mA) and External Communication Port (RS485)

■ Specifications

| Model	INE800
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 prevaation device)
Cable port	I.D.: 50 mm (right side of main unit)
Temperature controller	PID control by microprocesser
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_2 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 prevaation 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)	AC100V~240V
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
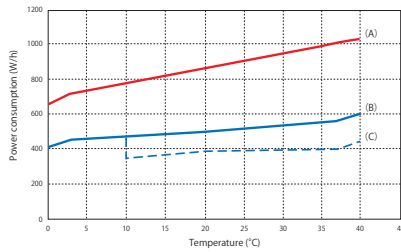
	0°C	3°C	20°C	37°C
IN804	648	712	864	1007
INE800	409	446	498	560
Reduction Rate	37%	37%	42%	44%

Unit: Wh

Comparison with IN804
1. Condition : AC115V/50Hz, Room Temp 23°C, 5 shelves, no load
2. Data was taken when each setting was stable

CO$_2$ emissions reduced by approx 1,269 kg
(Calculated for 1 year operation with 37°C setting)

Falling / Rising Temp. Curve
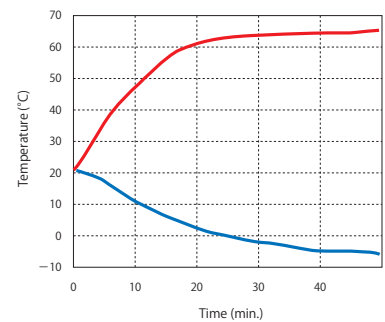

9 Point Temperature Distribution

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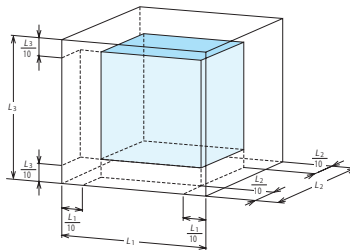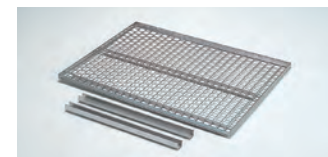

Method
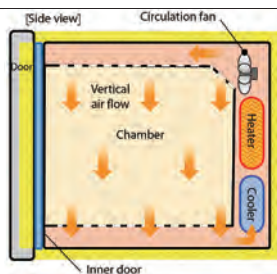
Control Panel

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 communication adapter	211880
(4) External alarm terminal	211881
(5) Time-up output terminal	211882
(6) Earthquake resistant fixture	211883

* (4) and (5) please specify when ordering main unit
External Communication Adapter is equipped with RS485-USB interchange adapter, 1m USB cable, 3m RS485 connection cable and utility software CD (accepts Windows XP, Vista, 7)

Dimensions (mm)

INE800