Model: INA-110-8

Model: IFC-110-8

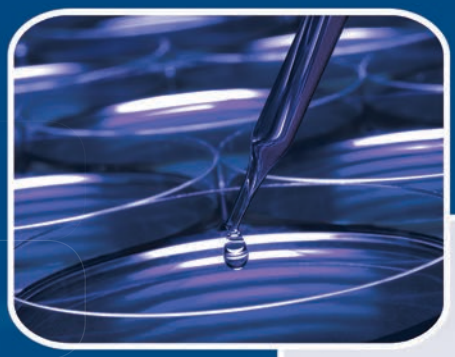
Model: IFA-110-8

Model: OFA-110-8

Isotherm®

Laboratory Thermostatic Products

Reliable Performance for Universal Applications



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ESCO SCIENTIFIC

ISOTHERM® LABORATORY THERMOSTATIC PRODUCTS

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Welcome to Esco

Esco's Vision is to provide enabling technologies for scientific discoveries to make human lives healthier and safer.

The Esco Lifesciences Group is committed to deliver innovative solutions for the clinical, life sciences, research, industrial, laboratory, pharmaceutical, and IVF community. With the most extensive product line in the industry, Esco have passed a number of international standards and certifications. Esco represents innovation and forward-thinking designs, that are of the highest standard quality since 1978.

Availability and Accessibility. Esco has headquarters in Singapore, Indonesia, and Philippines, with manufacturing facilities are located in Asia and Europe. Research and Development (R&D) is conducted worldwide spanning the US, Europe and Asia. Sales, services and marketing subsidiaries are located in 42 major markets including US, UK, Japan, China and India. Esco regional distribution centers are located in Singapore, Malaysia, Thailand, Vietnam, Myanmar, Indonesia, Philippines, Bangladesh, Hong Kong, Taiwan, South Korea, China, Japan, India, UAE, Central and South Africa, Denmark, Germany, Italy, Lithuania, Russia, United Kingdom, and USA. Because of our worldwide presence, you can be sure that Esco is within your reach.

High Quality, Reliable, and Dependable. Esco products are of high quality, reliable, and dependable; assuring customers of research accuracy. Cross functional teams from Esco Production, R&D, Quality Assurance, and Senior Management, are regularly assembled to review and implement areas for improvement.

Esco Cares for Your Safety. Esco focuses on providing safety not just for your samples but also for you and the environment.

Esco Cares for Your Comfort. Building ergonomic designs and reducing noise levels of the units ensures comfort for our users.

Esco Cares for the Environment. One in every four of Esco's employees is involved in R&D and a number of them evaluate new components and/or designs to produce energy efficient equipment. Being GREEN is more than just modifying parts used to produce a new energy efficient technology, it is also embodied in the every aspect of the company.

Customer Service and Support. Our service does not stop once purchase has been done. Esco gives on-time customer service and offers end-user seminars, service training, preventive maintenance, and provides educational materials and informative videos.

As Esco takes the opportunity to respond to the world's needs, we aim not only to contribute in the advancement of scientific discoveries but also in making the world a safer, healthier, and better place to live in.

Products and Application

Laboratory Equipment

Sample Handling and Preparation
- Class I Biological Safety Cabinets
- Class II Biological Safety Cabinets
- Class II Type A2 Biological Safety Cabinets
- Class II Type B1 Biological Safety Cabinets
- Class II Type B2 Biological Safety Cabinets
- Class III Biological Safety Cabinets
- Horizontal Laminar Flow Cabinets
- Vertical Laminar Flow Cabinets
- Laboratory Animal Research Workstations
- Laboratory Centrifuges

Sample Cultivation
- CO_2 Incubators, Direct Heat Air-Jacketed
- CO_2 Incubators with Cooling System
- CO_2 Incubators with High Heat Sterilization
- Laboratory Shakers

Amplification and Detection
- Conventional Thermal Cyclers
- Microplate Shakers
- PCR Cabinets

Sample Storage & Sample Protection Solutions
- Ultra-low Temperature Freezers
- Lab Refrigerators and Freezers
- Sample Database Management Software
- Intelligent Remote Monitoring Application Protocol
- Remote Monitoring, Datalogging, Programming Software
- Wireless Monitoring System

Chemical Research
- Ducted Fume Hoods
- Ductless Fume Hoods
- Filtered Storage Cabinets
- Powder Weighing Balance Enclosure
- Exhaust Blowers
- Fume Hood Airflow Monitor

General Equipment
Laboratory Thermostatic Products
- Forced Convection Laboratory Oven
- Forced Convection Laboratory Incubator
- Natural Convection Laboratory Incubator
- Refrigerated Laboratory Incubator

Medical / IVF Equipment

Controlled Embryo Handling
- Esco Multi-Zone ART Workstation
- Esco Multi-Zone ART Workstation Class II
- AVT Anti-Vibration Table
- Semi-Closed Environment (SCE) IVF

Safe Embryo Culture
- MIRI® Multiroom Incubator
- MIRI® II Multiroom Incubator
- Mini MIRI® Humidified Incubator
- Mini MIRI® Dry Incubator
- CelCulture® CO_2 Incubator

Innovative Time-Lapse Imaging
- MIRI® Time-Lapse Incubator

Accurate Quality Control
- MIRI® GA Gas and Temperature Validation Unit

Unique Consumables
- CultureCoin®

Healthcare

Esco Pharma Products

Airflow Containment
- BioBooth™
- Ceiling Laminar Airflow (CLAF)
- Cytoculture® Cytotoxic Safety Cabinet
- Pharmacon™ Downflow Booth
- Esco Garment Storage Cabinet
- Esco Glassware Hoods
- Laminar Flow Horizontal/Vertical Trolley (LFH/VT)
- Laminar Flow Straddle Units
- Evidence Drying Cabinet

Isolation Containment
- Advanced Processing Platform Isolator (APPI)
- Aseptic Containment Isoaltor (ACTI)
- Blood Cell Labelling Isolator
- Streamline® Closed Restricted Access Barrier System (SLC-RABS)
- Containment Barrier Isolator (CBI)
  - CBI-Unidirectional (CBI-U)
  - CBI-Turbulent (CBI-T)
  - CBI-Class III Biosafety Cabinet (CBI-III)
  - CBI-Convertible Class III/Class I Biosafety Cabinet (CBI-H)
- Isoclean® Healthcare Platform Isolator (HPI)
  - HPI-G3-Without Filter Below Work Zone
  - HPI-G3-With Filter Below Work Zone
  - HPI-Inflatable Seal (HPI-IS)
- General Processing Platform Isolator
  - GPPI-Inflatable Seal (GPPI-IS)
  - GPPI-Static Seal (GPPI-SS)
- Streamline® Compounding Isolator
  - SCI - Isolator Configuration
  - SCI - Class III Biosafety Cabinet (SCI-III)
- Technetium Dispensing Isolator
- Turbulent Flow Aseptic Isolator (TFAI)
- Weighing and Dispensing Containment Isolator (WDCI)

Cross Contamination Facility Integrated Barrier
- BioPass™ Pass Through
- Cleanroom Air Showers
- Dynamic Pass Boxes/ Dynamic Floor Laminar Hatches
- Infinity® Air Shower Pass Box
- Esco Sputum Booth
- Infinity® Pass Boxes
- Infinity® Cleanroom Transfer Hatch
- Soft Capsule® Soft Wall Cleanroom

Ventilation Containment
- Ventilated Balance Enclosure

Esco VacciXcell Products

Bioreactors and Fermenters
- CelXrocker™
- CelCradle™
- CelShaker™
- CelCradle™ X
- CelCradle Semi-Automated Harvesting System™ (CCX-SAH)
- BioXcell™
- StirCradle™
- StirCradle™ PRO
- TideXcell™
- TideXcell™ Harvesting System (TXLHS)
- VXL™ Hybrid Bioreactor

Cell Culture Monitoring, Media and Consumables
- Super Plus™
- Plus™ Vero
- Plus™ MDCK
- Plus™ MDCK II
- BioNOC™ II macrocarriers
- GlucCell™ Glucose Monitoring System
- CVD Kit

Filling Line Equipment
- Filling Line Isolators
- cRabs (close restricted access barriers)
- oRabs (open restricted access barriers)

Integrated Solutions
- Cell Processing Isolator
- Cell Processing Center

Esco TaPestle Rx Products

Pharmacy Compounding Solutions
- Compounding Pharmacy Isolators (SCI, HPI, CBI, GPPI)
- Safety Cabinets and Enclosures (CYT, Class II BSC, VBE, LFC)
- Aseptic Filling Systems

Radiopharmacy Equipment Solutions
- Radioisotope Fume Hood
- Lead-lined Biosafety Cabinet
- Technetium Dispensing Isolator
- Blood Cell Labeling Isolator
- GMP-compliant Radioisotope Dispensing Isolator

LABORATORY THERMOSTATIC PRODUCTS OVERVIEW

Forced Convection and Natural Convection

Convection is a method of heat energy transfer that involves the movement of a fluid (gas or liquid). Fluid in contact with the source of heat expands and tends to rise within the bulk of the fluid. Cooler fluid sinks to take its place, setting up convection current. However, in a forced convection device, the fluid motion is generated by an external source (like a pump, fan, suction device, etc.).

Forced Convection Laboratory Oven

Laboratory oven is used for high-volume thermal convection applications. This provides uniform temperature throughout the chamber necessary for annealing, dying, sterilizing, and other industrial lab functions. Typical sizes are from one cubic foot (28 liters) to 32 cubic feet (906 liters) with temperatures that can reach 300°C (572°F).

Forced Convection Laboratory Incubator and Natural Convection Laboratory Incubator

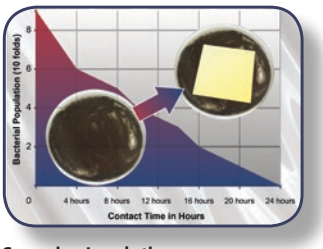
Laboratory incubators are devices that provide temperature-controlled environment to support growth of microbiological cultures. Typical forced and natural convection incubators are insulated boxes with an adjustable heater, going up to 60°C to 65°C (140°F to 149°F), though some can go slightly higher (generally to no more than 100°C).

Refrigerated Incubator

Generally called low temperature incubator designed to maintain temperatures below ambient to as low as about 10°C. Maintaining low temperature is necessary to perform Biochemical Oxygen Demand (BOD) testing which involves incubating samples saturated with oxygen at 20°C usually for five days.

Isotherm®
Forced Convection Laboratory Ovens

Esco Isotherm® laboratory ovens is designed with a forced-convection ventilation system, intuitive interface, microprocessor PID control with programming options, a 4-zone heated air jacket, and ergonomic feature to provide quality and convenience.



Quality Esco Construction

- Electro-galvanized steel exteriors
- Isocide™ coated external surfaces to eliminate 99.9% of surface bacteria within 24 hours of exposure

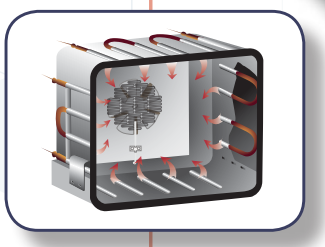
Superior Insulation

- Improves chamber stability while reducing external surface temperatures
- Reduces heat load output to the laboratory and operating power consumption, and lowers operating costs

SmartSense™ Microprocessor PID Control Technology

- Connected to an instrument-grade precision platinum-temperature probe
- Ensures fast ramp time. Prevents overshoot and ensures stable temperature once set point is achieved
- Twin temperature display for easy monitoring ("Actual" and "Set Point" displays)
- Diagnostic LEDs simplify service
- Air flow adjuster via slider for exchange rate of air
- Comes with a timer function (0000 - 9999 minutes) and up to 10 user-configurable program operations

Isotherm® Forced Convection Laboratory Oven Model OFA-110-8

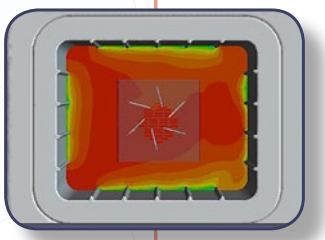


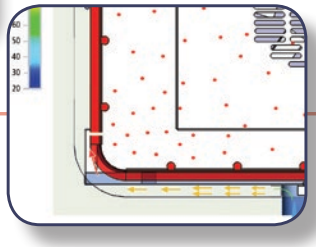
Pre-Heat Chamber Technology

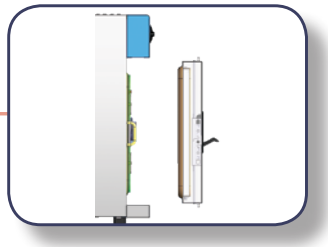
- Guarantees maximum thermal performance
- 4-zone heated air jacket ensures stable heating and maximum temperature uniformity in the chamber
- Standard temperature range of up to 300°C for maximum application stability
- 2-point door seal and eccentric hinge ensures maximum gasket compression for stable chamber temperature

Ventiflow™ Ventilation System

- Forced convection design produces faster temperature response rates, improves uniformity and reduces fluctuation
- Permanently lubricated and maintenance-free fan for uniform air circulation
- Low energy consumption and low noise level
- Adjustable fan speed and air exchange rates
- Fresh air entry from the base of the chamber, combined with the rounded corners of the chamber interior and air exhaust at the rear of the chamber, creates uniform air circulation ensuring maximum temperature uniformity







Guide to Models, Forced Convection Laboratory Ovens

OFA - - -

Volume	Code	Electrical Rating	Code	Main Body	Code
32 L	**32**	220-240 VAC, 50/60 Hz, 1Ø	**8**	EG Steel	
54 L	**54**	110-120 VAC, 50/60 Hz, 1Ø	**9**	Stainless Steel	**SS**
110 L	**110**				
170 L	**170**				
240 L	**240**				

General Specifications, Forced Convection Laboratory Ovens

Model			OFA-32-8 2110001	OFA-54-8 2110002	OFA-110-8 2110003	OFA-170-8 2110006	OFA-240-8 2110007
	220-240 VAC, 50/60 Hz, 1ø		OFA-32-8-SS 2110012	OFA-54-8-SS 2110013	OFA-110-8-SS 2110014	OFA-170-8-SS 2110015	OFA-240-8-SS 2110016
	110-120 VAC, 50/60 Hz, 1ø		OFA 32-9 2110010	OFA-54-9 2110009	OFA-110-9 2110008	-	-
			OFA-32-9-SS 2110023	OFA-54-9-SS 2110022	OFA-110-9-SS 2110011	-	-
Volume			32 L (1.1 cu. ft)	54 L (1.9 cu. ft)	110 L (3.9 cu. ft)	170 L (6.0 cu. ft)	240 L (8.5 cu. ft)
Temperature Range			Ambient +7.5˚C to 300˚C				
Temperature Variation	70˚C		± 0.7˚C	± 0.6˚C	± 0.6˚C	± 1.3˚C	± 1.3˚C
	150˚C		± 1.5˚C	± 2.2˚C	± 1.6˚C	± 3.5˚C	± 3.6˚C
	250˚C		± 3.3˚C	± 4.0˚C	± 4.1˚C	± 8.5˚C	± 6.4˚C
Temperature Fluctuation	70˚C		± 0.3˚C	± 0.3˚C	± 0.3˚C	± 0.4˚C	± 0.5˚C
Heating Up Time*	70˚C		36 min	40 min	45 min	40 min	41 min
	150˚C		40 min	33 min	31 min	39 min	58 min
	250˚C		32 min	58 min	58 min	48 min	58 min
Recovery Time after 30 sec door open*	70˚C		6 min	5.5 min	7.5 min	3 min	4.5 min
	150˚C		7 min	7 min	9.5 min	4 min	6 min
	250˚C		7 min	8 min	10 min	7.5 min	7 min
Noise Level			51 dBA	49 dBA	49 dBA	51 dBA	52 dBA
Oven Construction	Main Body		Electrogalvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder-coated finish				
	Chamber		Stainless steel, grade 304				
Number of shelves	Standard		2	2	2	2	2
	Maximum		4	5	6	7	9
Maximum Load per Shelf			15 Kg (33 lbs)	15 Kg (33 lbs)	30 Kg (66 lbs)	30 Kg (66 lbs)	30 Kg (66 lbs)
External Dimensions (W x D x H)			550 x 437 x 615 mm (21.7" x 17.2" x 24.2")	550 x 527 x 695 mm (21.7" x 20.7" x 27.4")	710 x 587 x 785 mm (28" x 23.1" x 30.9")	740 x 800 x 910 mm (28.8" x 31.5" x 35.8")	800 x 827 x 1030 mm (31.5" x 32.5" x 40.6")
Internal Dimensions (W x D x H)			400 x 250 x 320 mm (15.7" x 9.8" x 12.6")	400 x 340 x 400 mm (15.7" x 13.4" x 15.7")	560 x 400 x 490 mm (22" x 15.7" x 19.3")	580 x 500 x 580 mm (22.8" x 19.7" x 22.8")	645 x 527 x 700 mm (25.4" x 20.7" x 27.6")
Electrical	220-240 VAC, 50/60 Hz, 1ø	Current Consumption	6.4A	7.3A	9A		
		Power Consumption	1480W	1680W	2080W		
	110-120 VAC, 50/60 Hz, 1ø	Current Consumption	12.8A	15A	18A	N/A	N/A
		Power Consumption	1480W	1680W	2080W	N/A	N/A
Net Weight			43 Kg (95 lbs)	52 Kg (115 lbs)	75 Kg (165 lbs)	114 Kg (251 lbs)	138 Kg (304 lbs)
Shipping Weight			55 Kg (121 lbs)	66 Kg (146 lbs)	94 Kg (207 lbs)	136 Kg (300 lbs)	160 Kg (353 lbs)
Shipping Dimensions (W x D x H)			620 x 530 x 840 mm (24.4"× 20.9"× 33.1")	630 x 620 x 920 mm (24.8" × 24.4" × 36.2")	780 x 680 x 1020 mm (30.7" × 26.8" × 40.2")	900 x 900 x 1100 mm (35.4" × 35.4" × 43.3")	900 x 900 x 1200 mm (35.4" × 35.4" × 47.2")
Shipping Volume			0.37 m³ (13.1 cu. ft)	0.49 m³ (17.3 cu. ft)	0.61 m³ (21.5 cu. ft)	0.89 m³ (31.4 cu. ft)	0.97 m³ (34.3 cu. ft)

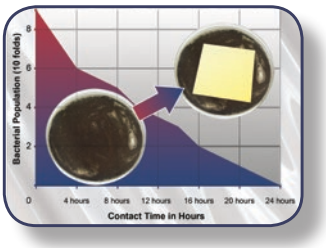
**Up to 98% of the set value. For the set point ≥100°C, if the temperature reading is already 2°C below the set point, it will take longer time to reach set point, due to prevent overshoot.*

Note:

- *All technical specifications are specified for units with standard equipment at an ambient temperature of 25°C and a voltage fluctuation of ±10%.*
- *The temperature data are determined in accordance to DIN 12880 standards as per factory type test condition.*
- *Stainless steel exterior option is available for all sizes.*

Isotherm®
Forced Convection Laboratory Incubators

Esco Isotherm® forced convection laboratory incubator provides a temperature-controlled environment via forced convection design. It is built with reliable performance and standards. Ergonomic, intuitive interfaces, microprocessor PID controls with programming options, 4-zone heated air jacket, precisely tuned and tested ventilation and insulation package, all supported by Esco's solutions-based sales and service representatives worldwide.



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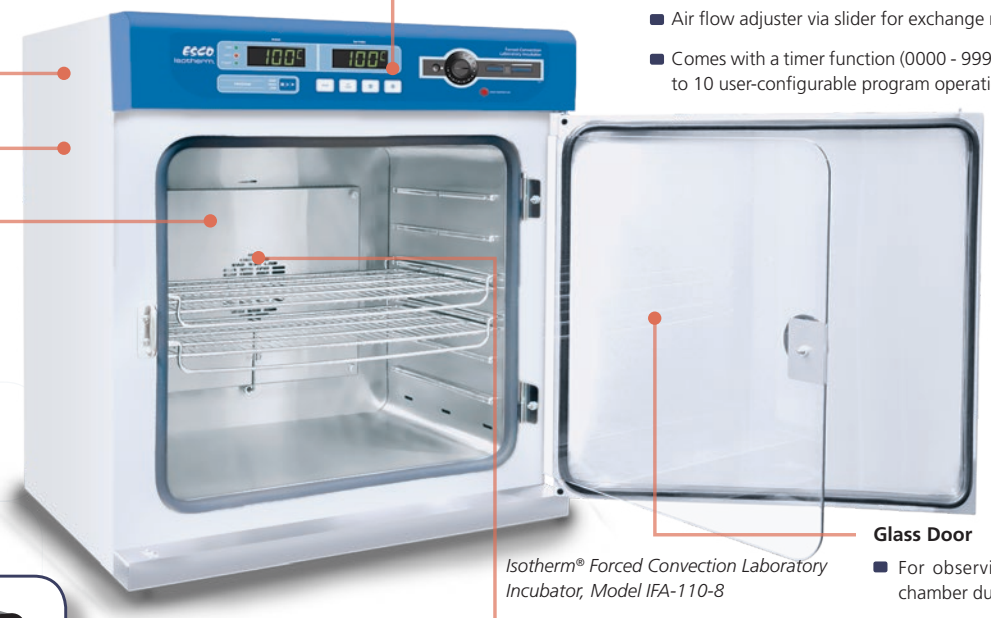
- Ensures fast ramp time. Prevents overshoot and ensures stable temperature once set point is achieved
- Twin temperature display for easy monitoring ("Actual" and "Set Point" displays)
- Diagnostic LEDs simplify service
- Air flow adjuster via slider for exchange rate of air
- Comes with a timer function (0000 - 9999 minutes) and up to 10 user-configurable program operations

Superior Insulation

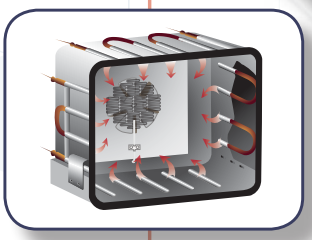
- Improves chamber stability while reducing external surface temperatures
- Reduces heat load output to the laboratory and operating power consumption, and lowers operating costs



Isotherm® Forced Convection Laboratory Incubator, Model IFA-110-8

Glass Door

- For observing samples inside the chamber during operation

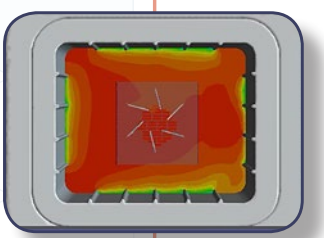


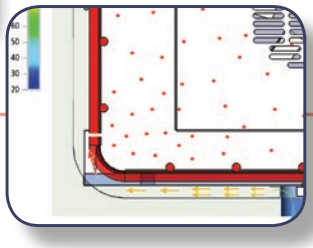
Pre-Heat Chamber Technology

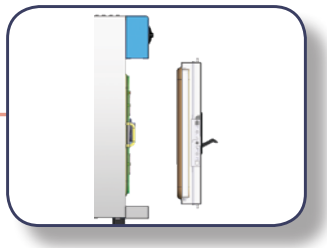
- Guarantees maximum thermal performance
- 4-zone heated air jacket ensures stable heating and maximum temperature uniformity in the chamber
- Standard temperature range of up to 100°C for maximum application stability
- 2-point door seal and eccentric hinge ensures maximum gasket compression for stable chamber temperature

Ventiflow™ Ventilation System

- Forced convection design produces faster temperature response rates, improves uniformity and reduces fluctuation
- Permanently lubricated and maintenance-free fan for uniform air circulation
- Low energy consumption and low noise level
- Adjustable fan speed and air exchange rates
- Fresh air entry from the base of the chamber, combined with the rounded corners of the chamber interior and air exhaust at the rear of the chamber, creates uniform air circulation ensuring maximum temperature uniformity







Guide to Models, Forced Convection Laboratory Incubators

IFA - __ - __ - __

Volume	Code	Electrical Rating	Code	Main Body	Code
32 L	**32**	220-240 VAC, 50/60 Hz, 1Ø	**8**	EG Steel	
54 L	**54**	110-120 VAC, 50/60 Hz, 1Ø	**9**	Stainless Steel	**SS**
110 L	**110**				
170 L	**170**				
240 L	**240**				

General Specifications, Forced Convection Laboratory Incubators

Model			IFA-32-8 2100001	IFA-54-8 2100002	IFA-110-8 2100003	IFA-170-8 2100014	IFA-240-8 2100015
	220-240 VAC, 50/60 Hz, 1ø		IFA-32-8-SS 2100021	IFA-54-8-SS 2100022	IFA-110-8-SS 2100016	IFA-170-8-SS 2100024	IFA-240-8-SS 2100025
	110-120 VAC, 50/60 Hz, 1ø		IFA 32-9 2100017	IFA-54-9 2100018	IFA-110-9 2100020	-	-
			IFA-32-9-SS 2100052	IFA-54-9-SS 2100051	IFA-110-9-SS 2100053	-	-
Volume			32 L (1.1 cu. ft)	54 L (1.9 cu. ft)	110 L (3.9 cu. ft)	170 L (6.0 cu. ft)	240 L (8.5 cu. ft)
Temperature Range			Ambient +7.5˚C to 100˚C				
Temperature Variation	37˚C		± 0.3˚C	± 0.3˚C	± 0.3˚C	± 0.4˚C	± 0.4˚C
	50˚C		± 0.3˚C	± 0.3˚C	± 0.5˚C	± 0.7˚C	± 0.6˚C
Temperature Fluctuation	37˚C		± 0.3˚C	± 0.3˚C	± 0.3˚C	± 0.5˚C	± 0.3˚C
	50˚C		± 0.3˚C	± 0.3˚C	± 0.3˚C	± 0.5˚C	± 0.3˚C
Heating Up Time*	37˚C		28 min	23 min	30 min	38 min	35 min
	50˚C		35 min	35 min	52 min	46 min	55 min
Recovery Time after 30 sec door open*	37˚C		1.5 min	1.5 min	3 min	1 min	1.5 min
	50˚C		4 min	3 min	5.5 min	3 min	3 min
Noise Level			49 dBA	48 dBA	49 dBA	51 dBA	51 dBA
Incubator Construction	Main Body		Electrogalvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder-coated finish				
	Chamber		Stainless steel, grade 304				
Number of shelves	Standard		2	2	2	2	2
	Maximum		4	5	6	7	9
Maximum Load per Shelf			15 Kg (33 lbs)	15 Kg (33 lbs)	30 Kg (66 lbs)	30 Kg (66 lbs)	30 Kg (66 lbs)
External Dimensions (W x D x H)			550 x 437 x 615 mm (21.7" x 17.2" x 24.2")	550 x 527 x 695 mm (21.7" x 20.7" x 27.4")	710 x 587 x 785 mm 28" x 23.1" x 30.9"	740 x 800 x 910 mm (28.8" x 31.5" x 35.8")	800 x 827 x 1030 mm (31.5" x 32.5" x 40.6")
Internal Dimensions (W x D x H)			400 x 250 x 320 mm (15.7" x 9.8" x 12.6")	400 x 340 x 400 mm (15.7" x 13.4" x 15.7")	560 x 400 x 490 mm 22" x 15.7" x 19.3"	580 x 500 x 580 mm (22.8" x 19.7" x 22.8")	645 x 527 x 700 mm (25.4" x 20.7" x 27.6")
Electrical	220-240 VAC, 50/60 Hz, 1ø	Current Consumption	3.5A	4A	4.8A	5A	
		Power Consumption	760W	880W	1080W	1180W	
	110-120 VAC, 50/60 Hz, 1ø	Current Consumption	7A	8A	9.6A	N/A	N/A
		Power Consumption	760W	880W	1080W	N/A	N/A
Net Weight			45 Kg (99 lbs)	55 Kg (121 lbs)	79 Kg (174 lbs)	118 Kg (260 lbs)	144 Kg (318 lbs)
Shipping Weight			57 Kg (126 lbs)	69 Kg (152 lbs)	98 Kg (216 lbs)	140 Kg (309 lbs)	166 Kg (366 lbs)
Shipping Dimensions (W x D x H)			620 x 530 x 840 mm (24.4"x 20.9"x 33.1")	630 x 620 x 920 mm (24.8" x 24.4" x 36.2")	780 x 680 x 1020 mm (30.7" x 26.8" x 40.2")	900 x 900 x 1100 mm (35.4" x 35.4" x 43.3")	900 x 900 x 1200 mm (35.4" x 35.4" x 47.2")
Shipping Volume			0.37 m³ (13.1 cu. ft)	0.49 m³ (17.3 cu. ft)	0.61 m³ (21.5 cu. ft)	0.89 m³ (31.4 cu. ft)	0.97 m³ (34.3 cu. ft)

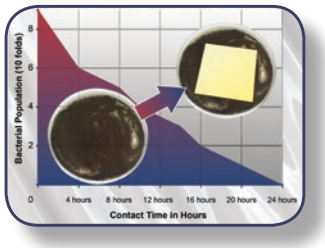
**Up to 98% of the set value. For the set point ≥100°C, if the temperature reading is already 2°C below the set point, it will take longer time to reach set point, due to prevent overshoot.*

Note:

- *All technical specifications are specified for units with standard equipment at an ambient temperature of 25°C and a voltage fluctuation of ±10%.*
- *The temperature data are determined in accordance to DIN 12880 standards as per factory type test condition.*
- *Stainless steel exterior option is available for all sizes.*

Isotherm®
Natural Convection Laboratory Incubators

Esco Isotherm® natural convection laboratory incubator provides a temperature-controlled environment via natural convection design. It is built with reliable performance and standards. Ergonomic, intuitive interfaces, microprocessor PID controls with programming options, 4-zone heated air jacket, precisely tuned and tested ventilation and insulation package, all supported by Esco's solutions-based sales and service representatives worldwide.



Quality Esco Construction

- Electro-galvanized steel exteriors
- Isocide™ coated external surfaces to eliminate 99.9% of surface bacteria within 24 hours of exposure

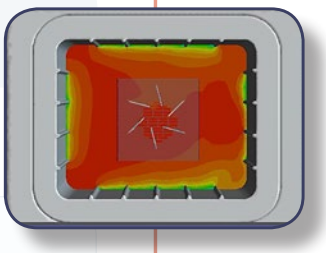
SmartSense™ Microprocessor PID Control Technology

- Connected to an instrument-grade precision platinum-temperature probe
- Ensures fast ramp time. Prevents overshoot and ensures stable temperature once set point is achieved
- Twin temperature display for easy monitoring ("Actual" and "Set Point" displays)
- Diagnostic LEDs simplify service
- Air flow adjuster via slider for exchange rate of air
- Comes with a timer function (0000 - 9999 minutes) and up to 10 user-configurable program operations

Superior Insulation

- Improves chamber stability while reducing external surface temperatures
- Reduces heat load output to the laboratory and operating power consumption, and lowers operating costs

Isotherm® Forced Convection Laboratory Incubator, Model INA-110-8

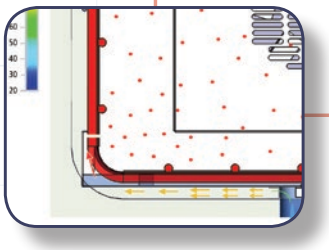


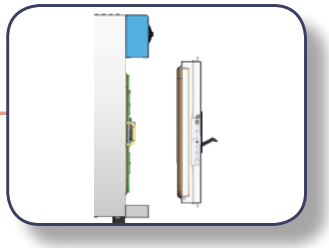
Pre-Heat Chamber Technology

- Guarantees maximum thermal performance
- 4-zone heated air jacket ensures stable heating and maximum temperature uniformity in the chamber
- Standard temperature range of up to 80°C for maximum application stability
- 2-point door seal and eccentric hinge ensures maximum gasket compression for stable chamber temperature

Glass Door

- For observing samples inside the chamber during operation





Guide to Models, Natural Convection Laboratory Incubators

INA - -

Volume	Code	Electrical Rating	Code
32 L	**32**	220-240 VAC, 50/60 Hz, 1Ø	**8**
54 L	**54**		
110 L	**110**		
170 L	**170**		
240 L	**240**		

General Specifications, Natural Convection Laboratory Incubators

Model	220-240 VAC, 50/60 Hz, 1ø		INA-32-8 2100045	INA-54-8 2100046	INA-110-8 2100044	INA-170-8 2100047	INA-240-8 2100048
Volume			32 L (1.1 cu. ft)	54 L (1.9 cu. ft)	110 L (3.9 cu. ft)	170 L (6.0 cu. ft)	240 L (8.5 cu. ft)
Temperature Range			Ambient +7.5˚C to 80˚C				
Temperature Variation	37˚C		± 0.6˚C	± 0.5˚C	± 0.5˚C	± 0.8˚C	± 0.7˚C
Temperature Fluctuation	37˚C		± 0.3˚C	± 0.4˚C	± 0.3˚C	± 0.3˚C	± 0.3˚C
Heating Up Time*	37˚C		30 min	39 min	36 min	42 mins	46 min
Recovery Time after 30 sec door open*	37˚C		3 min	3.5 min	3 mins	3.5 min	3.5 min
Incubator Construction	Main Body		Electrogalvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder-coated finish				
	Chamber		Stainless steel, grade 304				
Number of shelves	Standard		2	2	2	2	2
	Maximum		4	5	6	7	9
Maximum Load per Shelf			15 Kg (33 lbs)	15 Kg (33 lbs)	30 Kg (66 lbs)	30 Kg (66 lbs)	30 Kg (66 lbs)
External Dimensions (W x D x H)			630 x 437 x 652 mm (24.8" x 17.2" x 25.7")	630 x 531 x 733 mm (24.8" x 20.9" x 28.9")	790 x 592 x 819 mm (31.1" x 23.3" x 32.2")	810 x 693 x 889 mm (31.9" x 27.3" x 35.0")	875 x 693 x 1005 mm (34.4" x 27.3" x 39.6")
Internal Dimensions (W x D x H)			400 x 250 x 320 mm (15.7" x 9.8" x 12.6")	400 x 340 x 400 mm (15.7" x 13.4" x 15.7")	560 x 400 x 490 mm (22" x 15.7" x 19.3")	580 x 500 x 580 mm (22.8" x 19.7" x 22.8")	645 x 520 x 700 mm (25.4" x 20.5" x 27.6")
Electrical	220-240 VAC, 50/60 Hz, 1ø	Current Consumption	3.5A	4A	4.8A	5A	
		Power Consumption	760W	880W	1080W	1180W	
Net Weight			45 Kg (99 lbs)	55 Kg (121 lbs)	79 Kg (174 lbs)	92.5Kg (204 lbs)	112Kg (246 lbs)
Shipping Weight			54.5 Kg (120 lbs)	65 (143 lbs)	92 Kg (203 lbs)	111 Kg (245 lbs)	131Kg (289 lbs)
Shipping Dimensions (W x D x H)			720 x 650 x 865 mm (28.3" x 25.6" x 34.1")	720 x 650 x 945 mm (28.3" x 25.6" x 37.2")	895 x 720 x 1030 mm (35.2" x 28.3" x 40.6")	1115 x 895 x 1100 mm (43.9" x 35.2" x 43.3")	1115 x 895 x 1215 mm (43.9" x 35.2" x 47.8")
Shipping Volume			0.40m³ (14.1 cu. ft)	0.44 m³ (15.5 cu. ft)	0.66 m³ (23.3 cu. ft)	1.09 m³ (38.5 cu. ft)	1.21 m³ (42.7 cu. ft)

**Up to 98% of the set value. For the set point ≥50°C, if the temperature reading is already 2°C below the set point, it will take longer time to reach set point, due to prevent overshoot.*

Note:

- *All technical specifications are specified for units with standard equipment at an ambient temperature of 25°C and a voltage fluctuation of ±10%.*
- *The temperature data are determined in accordance to DIN 12880 standards as per factory type test condition.*
- *Stainless steel exterior option is available for all sizes.*

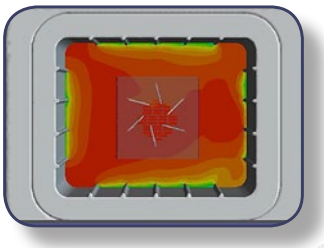
Isotherm®
Refrigerated Incubators

Green Product

Esco Isotherm® refrigerated incubator is designed to maintain temperatures below ambient to as low as about 10°C. It is built with reliable performance and standards. Ergonomic, intuitive interfaces, microprocessor PID controls with programming options, 4-zone heated air jacket, precisely tuned and tested ventilation and insulation package, all supported by Esco's solutions-based sales and service representatives worldwide.

Pre-Heat Chamber Technology

- Ensures stable heating and maximum temperature uniformity in the chamber
- Standard temperature range of 0°C up to 100°C for maximum application flexibility
- 2-point door seal and eccentric hinge ensures maximum gasket compression for stable chamber temperature



SmartSense™ Microprocessor PID Control Technology

- Connected to an instrument-grade precision platinum-temperature probe
- Ensures fast ramp time. Prevents overshoot and ensures stable temperature once set point is achieved
- Twin temperature display for easy monitoring ("Actual" and "Set Point" displays)
- Diagnostic LEDs simplify service
- Air flow adjuster via slider for exchange rate of air
- Comes with a timer function (0000 - 9999 minutes) and up to 10 user-configurable program operations

UV Disinfection

- Can be manually or automatically operated

Ventiflow™ Ventilation System

- Forced convection design produces faster temperature response rates, improves uniformity and reduces fluctuation
- Ventilated stainless steel shelves contribute to uniform air circulation
- Low energy consumption and low noise level

Isotherm® Refrigerated Incubator, Model IFC-110-8

Auto-Defrost System

- Auto-heating activates and continues for a predetermined time during operation
- Auto-defrosting during operation and activates regularly
- Influence on temperature fluctuation and uniformity is minimal

Glass Door

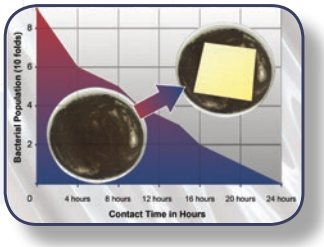
- For observing samples inside the chamber during operation

Water Reservoir

- For water collection during defrosting

Side Access Port

- For temperature validation and mapping



Quality Esco Construction

- Electro-galvanized steel exteriors
- Isocide™ coated external surfaces to eliminate 99.9% of surface bacteria within 24 hours of exposure

Maintenance-free Fan

- Permanently lubricated and maintenance-free for uniform air circulation

Guide to Models, Refrigerated Incubators

IFC - __ - __ - __

Volume	Code	Electrical Rating	Code	Main Body	Code
110 L	**110**	220-240 VAC, 50/60 Hz, 1Ø	**8**	EG Steel	
170 L	**170**			Stainless Steel	**SS**
240 L	**240**				

General Specifications, Refrigerated Incubators

Model	220-240 VAC, 50/60 Hz, 1ø		IFC-110-8 2100010 IFC-110-8-SS 2100026	IFC-170-8 2100035 IFC-170-8-SS 2100056	IFC-240-8 2100011 IFC-240-8-SS 2100027
Volume			110 L (3.9 cu. ft)	170 L (6.0 cu. ft)	240 L (8.5 cu. ft)
Temperature Range			0°C ~ 100°C		
Temperature Variation per DIN 12880 Spatial Uniformity	15°C		± 0.3°C	± 0.3°C	± 0.3°C
	25°C		± 0.3°C	± 0.3°C	± 0.3°C
	37°C		± 0.3°C	± 0.3°C	± 0.3°C
Temperature Fluctuation per DIN 12880 Control Fluctuation	15°C		± 0.3°C	± 0.3°C	± 0.3°C
	25°C		± 0.3°C	± 0.3°C	± 0.3°C
	37°C		± 0.3°C	± 0.3°C	± 0.3°C
Heating Up Time*	37°C		31 min	27 min	37 min
Recovery Time after 30 sec door open*	5°C		3 min	4 min	5 min
	37°C		2 min	3 min	3 min
	50°C		2 min	3 min	3 min
Incubator Construction	Main Body		Electrogalvanized steel with white oven-baked epoxy-polyester Isocide™ antimicrobial powder-coated finish		
	Chamber		Stainless steel, grade 304		
Number of Shelves	Standard		2	2	2
	Maximum		4	7	8
Maximum Load per Shelf			30 Kg (66 lbs)		
External Dimensions (W x D x H)			820 x 730 x 1185 mm (32.3" x 28.7" x 45.6")	815 x 840 x 1311 mm (30.1" x 33.11" x 51.5")	841 x 871 x 1462 mm (33.11" x 34.3" x 53.3")
Internal Dimensions (W x D x H)			600 x 399 x 480 mm (23.6" x 15.7" x 18.9")	620 x 500 x 550 mm (24.4" x 19.7" x 21.6")	645 x 530 x 700 mm (25.4" x 20.9" x 27.6")
Electrical	220-240 VAC, 50/60 Hz, 1ø	Current Consumption	6A		
		Power Consumption	481W	563W	
Net Weight			134 Kg (295 lbs)	155 Kg (342 lbs)	164 Kg (362 lbs)
Shipping Weight			166 Kg (366 lbs)	180 Kg (397 lbs)	195 Kg (430 lbs)
Shipping Dimensions, (W x D x H)			878 x 787 x 1425 mm (34.5" x 30.9" x 56.1")	930 x 900 x 1700 mm (36.6" x 36.6" x 66.9")	891 x 933 x 1628 mm (35.0" x 36.7" x 64.1")
Shipping Volume			0.98 m^3 (34.6 cu. ft)	1.47 m^3 (51.9 cu. ft)	1.35 m^3 (47.7 cu. ft)

**Up to 98% of the set value. For the set point ≥50°C, if the temperature reading is already 2°C below the set point, it will take longer time to reach set point, due to prevent overshoot.*

Note:

- *All technical specifications are specified for units with standard equipment at an ambient temperature of 25°C and a voltage fluctuation of ±10%.*
- *The temperature data are determined in accordance to DIN 12880 standards as per factory type test condition.*
- *Stainless steel exterior option is available for all sizes.*

OTHER SUPERB FEATURES OF ISOTHERM® LABORATORY THERMOSTATIC PRODUCTS

Safe, Superior Protection for Sample, User and the Environment

- Multiple redundant over-temperature protection systems guarantee maximum sample and user protection
- Over-all temperature protection meets DIN 12880 Class 3.1 standards

Ergonomic Design

- Access port for temperature validation and mapping

RS485 Communication Port

- Provides serial communication port for PC that can be daisy chained from product to product and connected to a PC

Ergonomic Door Handle with Keylock

- For gravity assisted operation and prevents unauthorized access to sensitive samples

Easy to Clean

- "Cleanroom" design, single-piece stainless steel chamber with rounded corners and dismountable glass door

Easy to Service

- Diagnostics functions include historical read-out of temperatures, sensor inputs and controller settings
- Service can be carried out from the front and electrical components are isolated form the work chamber and easily accessible for replacement
- Low service costs

APPLICATIONS

Forced Convection Laboratory Ovens

Application	Material/Sample
Drying	Glassware
	Powder
	Paper & Textile
	Soil and Sand
	Electronics
	Pharmaceutical Preparations
	Tape
Material Testing	Cables
	Plastics
Curing	Adhesives
	Plastics
	Metals
Heated Storage	Drugs and Pills
Vulcanization	Rubber

Forced and Natural Convection Laboratory Incubators

Application	Material/Sample
Microbiological Culture	Bacteria, Yeasts and Molds
Coliform Determination	Bacteria
Egg Incubation	Eggs
Heated Storage	Media & Samples
Gene Cloning	Bacteria, Yeasts and Molds
Pharmaceutical Stability Testing	Pathogenic Bacteria
Food and Beverage Testing	Bacteria, Yeast and Molds
Paraffin Embedding	Paraffin

Refrigerated Incubators

Application	Material/Sample
BOD Determination of Wastewater and Sewage	Bacteria
Plant Cell Growth	Plant Cell
Fish and Insect Cell Growth	Fish and Insect Cells
Fermentation Studies	Bacteria and Yeasts
Microbiological Culture	Bacteria, Yeast and Molds
Pharmaceutical Stability Testing	Pathogenic Bacteria

OPTIONS AND ACCESSORIES

Wall bracket (only for 32 L and 54 L chambers)

- Accommodates desired operating heights

Reversed Door Swing (Factory-installed)

- For OFA, IFA, INA models only

Voyager® Software Kit

- Esco Voyager® is a PC-based software package developed for remote monitoring, datalogging and programming/device configuration of Esco controlled environment laboratory equipment

Support stands fixed height at 715 mm (28")

Additional Shelf

- Two shelves are included for 32 L, 54 L, 110 L, 170 L and 240 L models as standard. Additional shelves may be ordered.

Optional Stainless Steel Exterior

- Robust construction and corrosion-resistant surface that meets pharmaceutical and clinical laboratory requirements

ORDERING INFORMATION

Unit Ordering

Model	Item Code	Description
OFA-32-8	2110001	Isotherm® Forced Convection Oven, 32 L, 220-240 VAC, 50/60 Hz
OFA-32-9	2110010	Isotherm® Forced Convection Oven, 32 L, 110-120 VAC, 50/60 Hz
OFA-32-8-SS	2110012	Isotherm® Forced Convection Oven, Stainless Steel Exterior Cabinet, 32 L, 220-240 VAC, 50/60 Hz
OFA-32-9-SS	2110023	Isotherm® Forced Convection Oven, Stainless Steel Exterior Cabinet, 32 L, 110-120 VAC, 50/60 Hz
OFA-54-8	2110002	Isotherm® Forced Convection Oven, 54 L, 220-240 VAC, 50/60 Hz
OFA-54-9	2110009	Isotherm® Forced Convection Oven, 54 L, 110-120 VAC, 50/60 Hz
OFA-54-8-SS	2110013	Isotherm® Forced Convection Oven, Stainless Steel Exterior Cabinet, 54 L, 220-240 VAC, 50/60 Hz
OFA-54-9-SS	2110022	Isotherm® Forced Convection Oven, Stainless Steel Exterior Cabinet, 54 L, 110-120 VAC, 50/60 Hz
OFA-110-8	2110003	Isotherm® Forced Convection Oven, 110 L, 220-240 VAC, 50/60 Hz
OFA-110-9	2110008	Isotherm® Forced Convection Oven, 110 L, 110-120 VAC, 50/60 Hz
OFA-110-8-SS	2110014	Isotherm® Forced Convection Oven, Stainless Steel Exterior Cabinet, 110 L, 220-240 VAC, 50/60 Hz
OFA-110-9-SS	2110011	Isotherm® Forced Convection Oven, Stainless Steel Exterior Cabinet, 110 L, 110-120 VAC, 50/60 Hz
OFA-170-8	2110006	Isotherm® Forced Convection Oven, 170 L, 220-240 VAC, 50/60 Hz
OFA-170-8-SS	2110015	Isotherm® Forced Convection Oven, Stainless Steel Exterior Cabinet, 170 L, 220-240 VAC, 50/60 Hz
OFA-240-8	2110007	Isotherm® Forced Convection Oven, 240 L, 220-240 VAC, 50/60 Hz
OFA-240-8-SS	2110016	Isotherm® Forced Convection Oven, Stainless Steel Exterior Cabinet, 240 L, 220-240 VAC, 50/60 Hz

Model	Item Code	Description
IFC-110-8	2100010	Isotherm® Refrigerated Incubator, 110 L, 220-240 VAC, 50/60 Hz
IFC-110-8-SS	2100026	Isotherm® Refrigerated Incubator, Stainless Steel Exterior Cabinet, 110 L, 220-240 VAC, 50/60 Hz
IFC-170-8	2100035	Isotherm® Refrigerated Incubator, 170 L, 220-240 VAC, 50/60 Hz
IFC-170-8-SS	2100056	Isotherm® Refrigerated Incubator, Stainless Steel Exterior Cabinet, 170 L, 220-240 VAC, 50/60 Hz
IFC-240-8	2100011	Isotherm® Refrigerated Incubator, 240 L, 220-240 VAC, 50/60 Hz
IFC-240-8-SS	2100027	Isotherm® Refrigerated Incubator, Stainless Steel Exterior Cabinet, 240 L, 220-240 VAC, 50/60 Hz

Model	Item Code	Description
IFA-32-8	2100001	Isotherm® Forced Convection Incubator, 32 L, 220-240 VAC, 50/60 Hz
IFA-32-9	2100017	Isotherm® Forced Convection Incubator, 32 L, 110-120 VAC, 50/60 Hz
IFA-32-8-SS	2100021	Isotherm® Forced Convection Incubator, Stainless Steel Exterior Cabinet, 32 L, 220-240 VAC, 50/60 Hz
IFA-32-9-SS	2100052	Isotherm® Forced Convection Incubator, Stainless Steel Exterior Cabinet, 32 L, 110-120 VAC, 50/60 Hz
IFA-54-8	2100002	Isotherm® Forced Convection Incubator, 54 L, 220-240 VAC, 50/60 Hz
IFA-54-9	2100018	Isotherm® Forced Convection Incubator, 54 L, 110-120 VAC, 50/60 Hz
IFA-54-8-SS	2100022	Isotherm® Forced Convection Incubator, Stainless Steel Exterior Cabinet, 54 L, 220-240 VAC, 50/60 Hz
IFA-54-9-SS	2100051	Isotherm® Forced Convection Incubator, Stainless Steel Exterior Cabinet, 54 L, 110-120 VAC, 50/60 Hz
IFA-110-8	2100003	Isotherm® Forced Convection Incubator, 110 L, 220-240 VAC, 50/60 Hz
IFA-110-9	2100016	Isotherm® Forced Convection Incubator, 110 L, 110-120 VAC, 50/60 Hz
IFA-110-8-SS	2100020	Isotherm® Forced Convection Incubator, Stainless Steel Exterior Cabinet, 110 L, 220-240 VAC, 50/60 Hz
IFA-110-9-SS	2100053	Isotherm® Forced Convection Incubator, Stainless Steel Exterior Cabinet, 110 L, 110-120 VAC, 50/60 Hz
IFA-170-8	2100014	Isotherm® Forced Convection Incubator, 170 L, 220-240 VAC, 50/60 Hz
IFA-170-8-SS	2100024	Isotherm® Forced Convection Incubator, Stainless Steel Exterior Cabinet, 170 L, 220-240 VAC, 50/60 Hz
IFA-240-8	2100015	Isotherm® Forced Convection Incubator, 240 L, 220-240 VAC, 50/60 Hz
IFA-240-8-SS	2100025	Isotherm® Forced Convection Incubator, Stainless Steel Exterior Cabinet, 240 L, 220-240 VAC, 50/60 Hz

Model	Item Code	Description
INA-32-8	2100045	Isotherm® Natural Convection Incubator, 32 L, 220-240 VAC, 50/60 Hz
INA-54-8	2100046	Isotherm® Natural Convection Incubator, 54 L, 220-240 VAC, 50/60 Hz
INA-110-8	2100044	Isotherm® Natural Convection Incubator, 110 L, 220-240 VAC, 50/60 Hz
INA-170-8	2100047	Isotherm® Natural Convection Incubator, 170 L, 220-240 VAC, 50/60 Hz
INA-240-8	2100048	Isotherm® Natural Convection Incubator, 240 L, 220-240 VAC, 50/60 Hz

ACCESSORIES ORDERING

Model Code	Item Code	Description	Available for
TOA-1005	5070326	Wall bracket for 32 L	OFA, IFA, INA
TOA-1006	5070327	Wall bracket for 54 L	OFA, IFA, INA
TOA-1007	5130106	Support stand, 715mm (28") for 32 L	OFA, IFA, INA
TOA-1008	5130107	Support stand, 715mm (28") for 54 L	OFA, IFA, INA
TOA-1009	5130108	Support stand, 715mm (28") for 110 L	OFA, IFA, INA
TOA-1010	5130141	Support stand, 715mm (28") for 170 L	OFA, IFA, INA
TOA-1017	5130110	Support stand, 715mm (28") for 240 L	OFA, IFA, INA
TOA-1012	5070328	Additional shelves for 32 L	OFA, IFA, INA
TOA-1013	5070329	Additional shelves for 54 L	OFA, IFA, INA
TOA-1014	5070330	Additional shelves for 110 L	OFA, IFA, INA
TOA-1018	5070331	Additional shelves for 170 L	OFA, IFA, INA
TOA-1019	5070332	Additional shelves for 240 L	OFA, IFA, INA
TOA-1021	5070610	Additional shelves for IFC-110 L	IFC
TOA-1023	5170622	Additional shelves for IFC-170 L	IFC
TOA-1024	5072066	Additional shelves for IFC-240 L	IFC
5250001-U	5250001	Voyager® Software Kit with iRMAP (Intelligent Remote Monitoring Application Protocol)	OFA, IFA, INA, IFC
TOA-1015	5070333	RS-485 Communication Port	OFA, IFA, INA, IFC
TOA-1020	5070609	IQ/OQ Document	OFA
TOA-1023	5070612	IQ/OQ Document	IFA / INA
TOA-1022	5070611	IQ/OQ Document	IFC

TESTING AND CERTIFICATION


biomedis
Kalibrierservice GmbH & Co.KG

Test-report No.: 160312


Kalibrier-Zertifikat Calibration certificate 706216

Esco Isotherm® Laboratory Thermostatic Products were tested, validated and have passed the calibration conducted by Biomedis, an ISO/IEC 17025 accredited testing laboratory. The measuring installation used for calibration are regularly calibrated and traceable to the national standards of the German Federal Physical Technical Institute (PTB).

Standard Compliances	Temperature Safety	Electrical Safety
	DIN 12880 Class 3.1	CAN/CSA-22.2, No. 61010-1; EN 61010-1, Europe; IEC 61010-1, Worldwide

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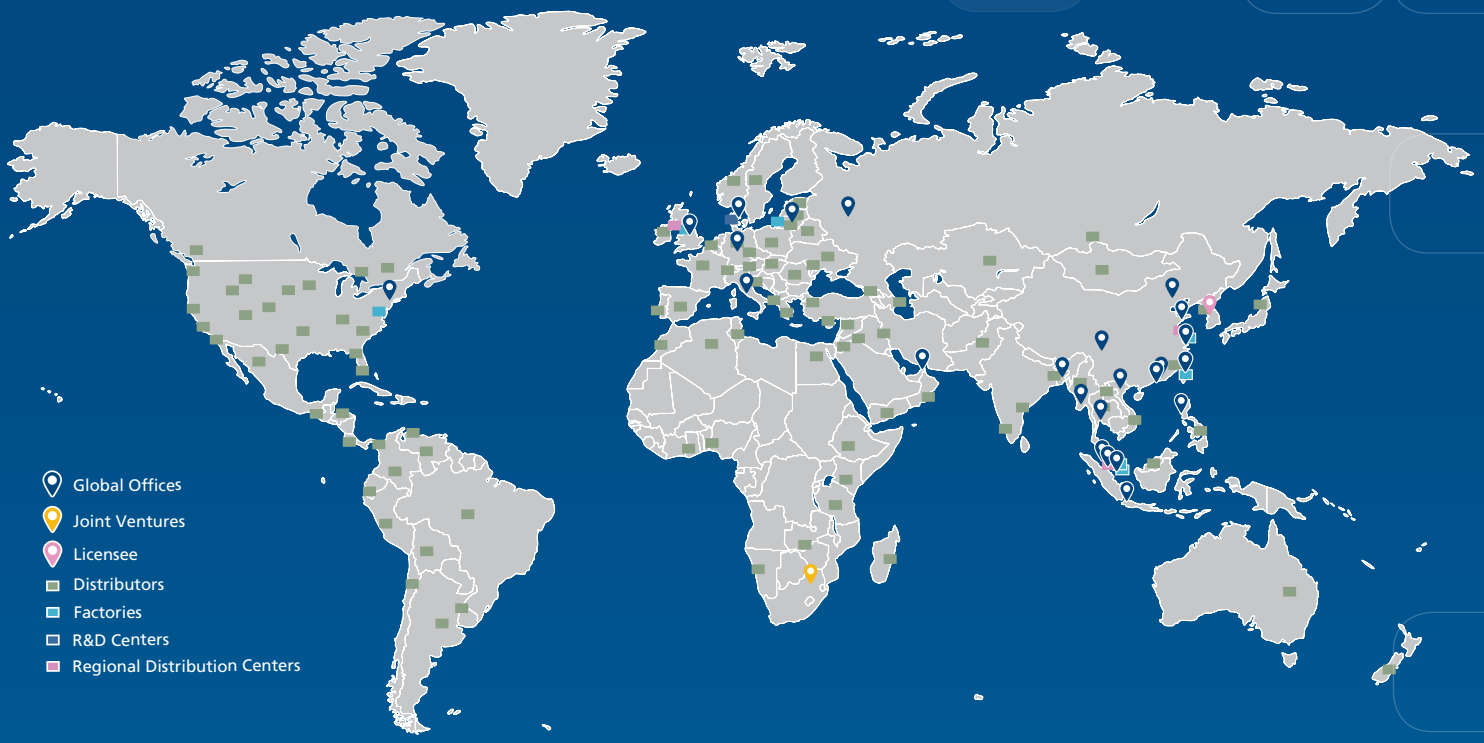
42 LOCATIONS IN 21 COUNTRIES ALL OVER THE WORLD



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