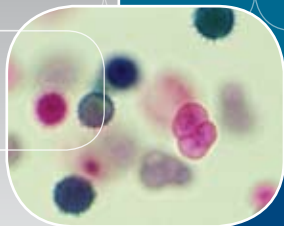
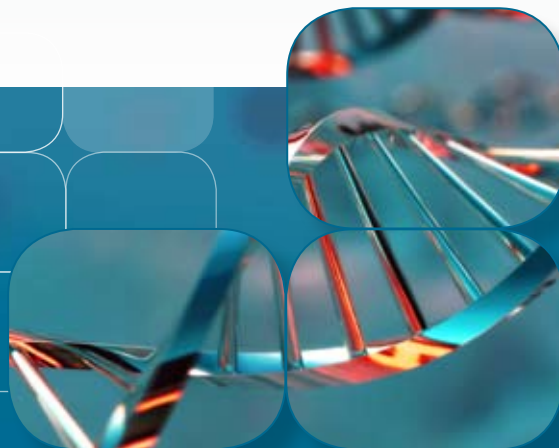


Airstream®



*Esco PCR Cabinet, Model PCR-4A.
Thermal cycler shown in picture not included.*

Polymerase Chain Reaction Cabinets
The Proven Solution for Contaminant-Free PCR



ESCO
WORLD CLASS. WORLDWIDE.



Main Features

- Greater protection against contamination from the ambient environment and cross-contamination within the main chamber.
- High quality polyester pre-filter and main HEPA filter with a typical efficiency of >99.99% at 0.3 microns.
- Built-in UV lamp with timer to facilitate decontamination in between PCR cycles.
- Sentinel™ Microprocessor controller supervises all functions.
- UV lamp is located behind control panel away from line of sight.
- Esco **ISOCIDE™** antimicrobial coating on all painted surfaces.
- Available in 0.9 and 1.2 meter models (3' and 4').



Esco PCR Cabinet, Model PCR-4A.
Thermal cycler shown in picture not included.

Introduction

Polymerase Chain Reaction* (PCR) is a process where millions of copies of DNA are amplified from a single copy, or low copy number template. This reaction is fundamental to almost all applications requiring a high copy number of starting material and is used in all laboratories working with DNA and RNA.

Because of the high copy number generated during PCR, it is essential to prevent possible contamination of the PCR reaction. Precautions must be taken during the sample and reagent

preparation steps to minimize this risk. In addition to good laboratory practice, the ideal PCR laboratory should consist of three areas, each isolated from the other. Reagents should be prepared in the reagent preparation area and transferred to the sample preparation area, through a pass box, or inside closed containers. After preparation of the final reaction mix, the tubes should be transferred to the amplification area, again through a pass box or in a closed container. The PCR amplification and results analysis takes place in this area.

To guarantee contaminant-free samples, it is essential to work in an environment where the air quality is controlled. This should form part of the equipment in the sample preparation area.

* Polymerase chain reaction (PCR) is a patented process owned by Hoffman La Roche

Touchpad data entry buttons permit control settings and access to diagnostics, default settings and hierarchical menus.

Color coded indicator lamps display green for primary function (fan operation); blue for secondary function (fluorescent lights and electrical outlet); and orange for caution (UV lamp ON).

Built-in UV Decontamination with adjustable UV-timer for precise decontamination cycle control.

Programmable automatic UV light timer makes the cabinet the most user friendly PCR cabinet in the market.

A graphical interface indicates cabinet performance.

Digital read-out with alpha-numeric display indicates all input, status and alarm functions.

All functions can be user activated through touch-pad programming access; see Operations Manual.



Sentinel Microprocessor Control System, Programmable

- When programmed ON, the start-up sequence confirms status with Air Safe and local time display.
- When programmed ON, the Personal Identification Number (PIN) access restricts unauthorized adjustments.
- When programmed ON, an airflow alarm warns of deviations from normal velocities.

Designed and Built for Enhanced Usability

Esco PCR cabinets are designed for high performance and comfort to ensure enhanced productivity.

- The ergonomically designed sloped front and side glass walls provide a high level of visibility into the work zone.
- A double-flap safety cover, constructed of 5 mm (0.2") UV-absorbing beta radiation resistant polycarbonate, provides superior operator protection while allowing easy access to the work zone.
- The built-in 5000k fluorescent lighting provides superior illumination of the work zone. The zero flicker electronically ballasted lighting system is reliable with instant start.
- The decontamination shelf is placed on the back wall, closer to the UV lamp, for more effective sterilization.

Built-In UV Decontamination

Esco PCR cabinets are specifically designed for use in polymerase chain reaction applications and incorporate a number of unique features.

- Each unit includes a powerful built-in 253.7 nanometer, 20-watt UV lamp.

- The UV lamp is placed out of the operator's direct line of sight, providing maximum operator comfort and safety. A unique placement design eliminates "dead zones" ensuring all exposed interior surfaces are effectively decontaminated.
- The UV decontamination cycle is fully programmable with the Esco Sentinel™ microprocessor-based control system (PCR-3A and PCR-4A models only) allowing precise control of the decontamination cycle.
- A reliable interlock safety system on all models prevents the activation of the UV lamp unless the safety cover is closed. The lamp will be deactivate if the cover is opened.

Enhanced Filtration System

True vertical laminar airflow covering the entire work zone within the cabinet offers greater protection against contamination from the ambient environment and cross-contamination within the main chamber compared to conventional dead-air boxes.

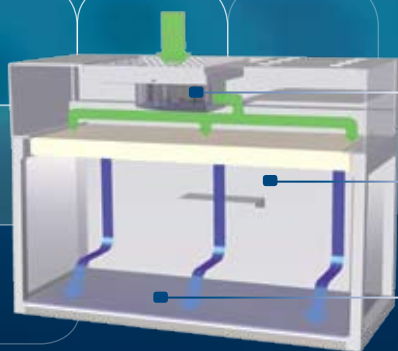
- An improved mini-pleat separation technique maximizes filter surface area, improving efficiency and extending the life of the filter.

- Mini-pleat separatorless HEPA filter technology operates at a typical efficiency of >99.99% at 0.3 microns.
- Esco PCR cabinets provide ISO Class 4 air cleanliness within the work zone (as per ISO 14644.1, equivalent to Class 10 as per US Federal Standard 209E).
- An additional pre-filter traps larger particles, prolonging the life of the main filter.

User-Friendly Control System

The user-friendly Esco Sentinel™ microprocessor-based control system, included in the PCR-3A and PCR-4A models, supervises the operation of all cabinet functions. Controls are configurable to meet user requirements and the unit comes equipped with a number of enhanced features to promote cabinet usability.

- Password-protected administration can be set to restrict access to the main menu.
- Solid state variable speed controllers offer superior control over conventional "step" controllers. The built in RFI and noise filters eliminate interference with adjacent instrumentation.
- Audible and visual alarms ensure product / sample protection by alerting the user in the event of low airflow.



PCR Vertical Laminar Flow Cabinet

- Blower
- Supply HEPA Filter
- Vertical Laminar Flow of Clean Air
- During operation, room air is drawn through the top of the cabinet via a pre-filter, with 85% arrestance, trapping larger particles and increasing the life of the main filter.
- The air is then forced evenly through the main HEPA filter resulting in a unidirectional stream of clean air that is projected vertically over the internal work zone. All airborne contaminants are flushed and diluted, resulting in a particulate-free work environment.

- The purified air then leaves the main work chamber across the open front of the cabinet.
- The average airflow velocity of 0.30 m/s (60 fpm) in PCR-3A and PCR-4A models ensures that cleanliness is maintained in the work zone with 35-38 air changes per minute.

HEPA-filtered air
Room air / Inflow air

- The control unit monitors the performance and usage hours of the UV lamp, pre-filter and main filter, alerting the user when a replacement is required.
- Programmable UV-timer ensures precise decontamination cycle control.

Mini-pleat Separatorless Filter (left) vs. Conventional Aluminium Separator Filter (right)



Esco cabinets use Swedish Camfil Farr® mini-pleat filters without aluminum separators to increase filter efficiency, minimize the chance of leakage, and to prolong filter life. Filters include a lightweight aluminum frame for structural stability and elimination of swelling common to conventional wood frames.

- All cabinet components are cleanroom compatible.
- The exterior surfaces are coated with Esco Isocide™ antimicrobial coating to protect against contamination and inhibit bacterial growth. Isocide eliminates

99.9% of surface bacteria within 24 hours of exposure.

- Tempered UV-resistant glass sides provide additional operator protection.

Blower Efficiency

- Esco PCR cabinets incorporate permanently lubricated direct drive centrifugal blowers.
- An energy efficient external rotor motor design reduces operating costs and has extremely low noise and vibration levels.

Designed and Built to Exceed Safety Criteria

All components used in Esco products meet or exceed all applicable safety requirements.

- Each cabinet is individually factory tested for safety and performance in accordance with the latest clean air standards and is shipped with a detailed factory commissioning report.
- All electrical components are UL listed or UL recognized, ensuring superior electrical safety for the operator.
- Esco PCR cabinets meet general safety requirements set by independent testing laboratories (see Technical Specifications for details).

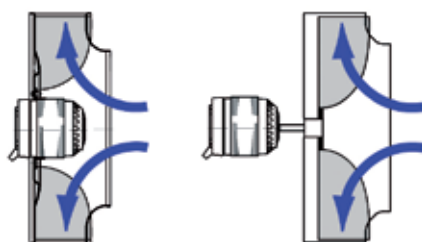
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The Highest Quality Cabinet Construction

All Esco products are manufactured using the finest materials for the most demanding laboratory applications.

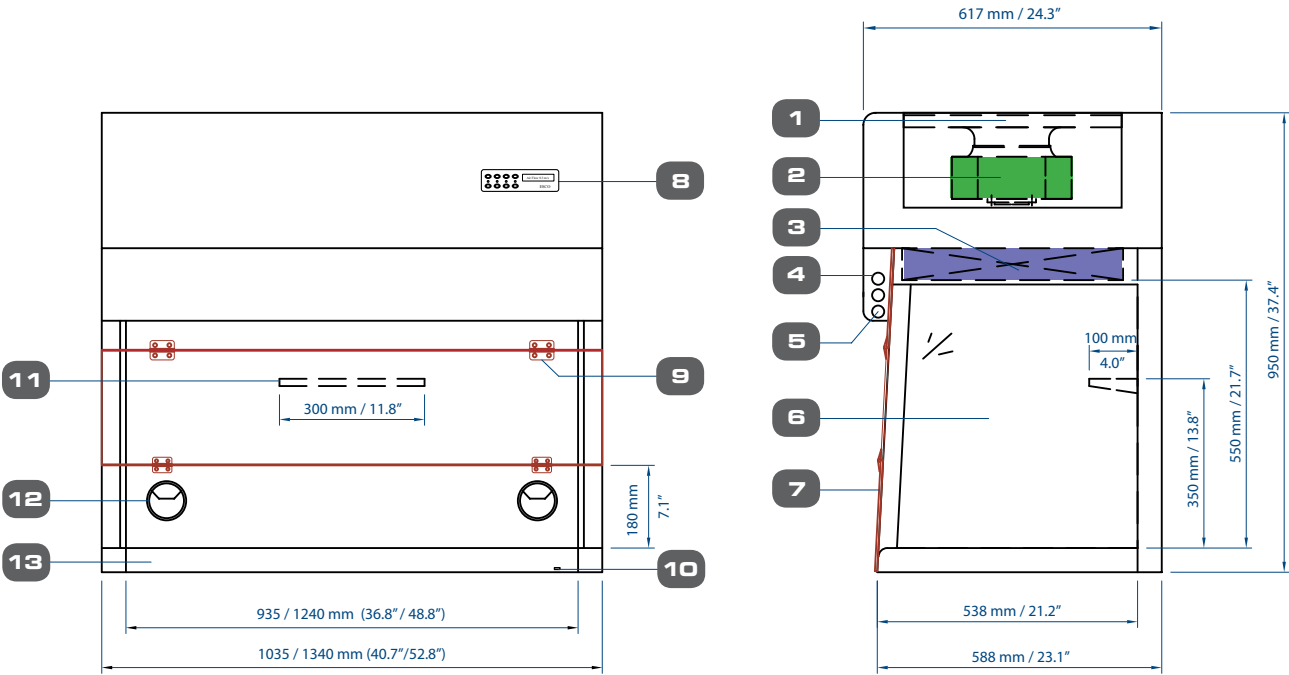
- All components are designed for maximum chemical resistance, durability and long service life.
- The cabinet main body is constructed of industrial-grade electrogalvanised steel and is superior to the less durable plastic constructed cabinets offered by the competition.

Esco Centrifugal Fan with External Rotor Motor (left) vs. Conventional Fan with Standard Motor (right)



- Esco cabinets use German made **ebm-papst®** permanently lubricated, centrifugal motor/blowers with external rotor designs.
- Integrated blades narrow the profile and eliminate need for a motor shaft.
- Motors are selected for energy efficiency, compact design, and flat profile. The completely integrated assembly optimizes motor cooling.
- All rotating parts are unitized and balanced for smooth, quiet, vibration-free operation.

Model PCR Vertical Laminar Flow Cabinet Technical Specifications



1. Pre-filter
2. Blower
3. HEPA filter
4. UV lamp
5. Fluorescent lamps
6. Tempered glass side panel
7. Hinged window, polycarbonate
8. Esco Sentinel microprocessor control system
9. Spring-loaded hinge
10. UV interlocking magnetic switch
11. Perforated powder-coated shelf
12. Pass-through port (1 for 3ft, 2 for 4ft model)
13. Stainless steel worktop with curved front edge

	Cabinet Performance	Air Quality	Filtration	Electrical Safety
Standards Compliance	IEST-RP-CC002.2, Worldwide	ISO 14644.1, Class 4, Worldwide IEST-G-CC1001, Worldwide IEST-G-CC1002, Worldwide and other equivalent air cleanliness requirement	IEST-RP-CC034.1, Worldwide IEST-RP-CC007.1, Worldwide IEST-RP-CC001.3, Worldwide EN1822 (H 13), Europe	IEC 61010-1, Worldwide EN 61010-1, Europe UL-61010-1, USA CAN/ CSA 22.2 No. 61010-1

Warranty

Esco PCR cabinets are covered by a 3 year warranty, excluding consumable parts and accessories. Contact your local Sales Representative for specific warranty details.

Accessories and Options

Esco offers a variety of options and accessories to meet local applications. Contact Esco or your local Sales Representative for ordering information.

Support Stands

- Fixed height, available 710mm (28") or 860mm (34")
 - With leveling feet
 - With casters

Cabinet Accessories

- Ergonomic foot rest

General Specifications, PCR Vertical Laminar Flow Cabinets

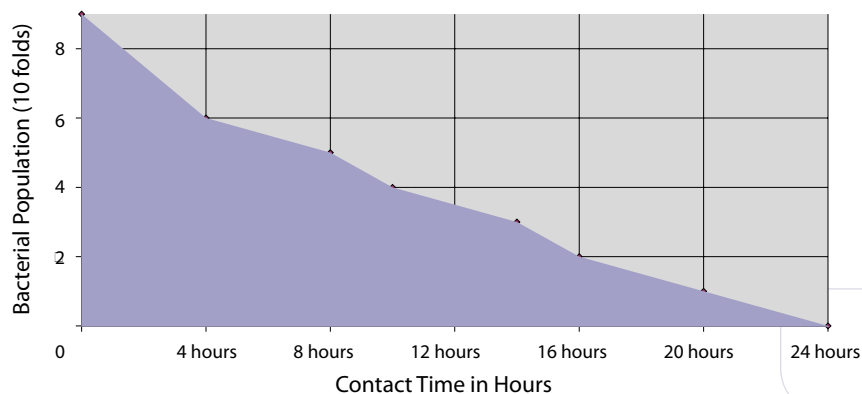
Note to customer: Choose from the following options and specify option number when ordering.

Model		PCR-3A_	PCR-4A_
Nominal Size		0.9 meters (3')	1.2 meters (4')
External Dimensions (L x W x H)		1035 x 617 x 950 mm 40.7" x 24.3" x 37.4"	1340 x 617 x 950 mm 52.8" x 24.3" x 37.4"
Internal Dimensions (L x W x H)		935 x 538 x 550 mm 36.8" x 21.2" x 21.7"	1240 x 538 x 550 mm 48.8" x 21.2" x 21.7"
Laminar Airflow Velocity		Average of 0.30 m/s (60 fpm)	
Pre-Filter		Washable polyurethane fibers with 85% arrestance	
Sound Emission		<53 dBA	<62 dBA
Fluorescent Lamps Intensity		>975 Lux (>91 foot candles)	>1230 Lux (>114 foot candles)
UV Lamp		253.7 nanometer 15-watt UV lamp	253.7 nanometer 30-watt UV lamp
Construction	Main Body	Electrogalvanised steel with white oven-baked epoxy powder-coated finish. Coated with Esco Isocide antimicrobial coating	
	Work Zone	1.2mm (0.05") 18 gauge stainless steel grade 304	
Shipping Dimensions, Maximum (L x W x H)**		1130 x 730 x 1150 mm 44.5" x 28.9" x 45.3"	1420 x 730 x 1150 mm 55.9" x 28.7" x 45.3"
Shipping Volume, Maximum**		0.95 m ³ (34 ft ³)	1.18 m ³ (42 ft ³)
Shipping Weight, Maximum**		123 kg (271 Lbs)	140 kg (309 Lbs)
Electrical*	220-240V, AC, 50Hz, 1Ø	PCR-3A1	PCR-4A1
	110-130V, AC, 60Hz, 1Ø	PCR-3A2	PCR-4A2
	220-240V, AC, 60Hz, 1Ø	PCR-3A3	PCR-4A3

* Additional voltages may be available; contact Esco for ordering information.

** Cabinet only; excludes optional stand.

ISOCIDE™ Antimicrobial Powder-Coating



All exterior painted surfaces are powder-coated with Esco Isocide, an antimicrobial inhibitor to diminish contamination. Isocide is integrated into the coating substrate and cannot wash out or diminish by repeated cleaning. Performance results are available upon request. Contact Esco or your Esco Sales Representative for details.



Esco Containment, Clean Air and Laboratory Equipment Products

Biological Safety Cabinets, Class II, III
Fume Hoods, Conventional, High Performance, Ductless Carbon Filtered
Laminar Flow Cabinets, Horizontal, Vertical, PCR
Animal Containment Workstations
Hospital Pharmacy Isolators, Cytotoxic Safety Cabinets
Specialty Workstations: *In-Vitro* Fertilization, Powder Weighing
PCR Thermal Cyclers, Conventional, Real-Time
Cleanroom Fan Filter Units, Modular Rooms, Air Showers, Pass Thrus

Since 1978, Esco has emerged as a leader in the development of controlled environment, laboratory and cleanroom equipment solutions. Products sold in more than 95 countries include biological safety cabinets, fume hoods, ductless fume hoods, laminar flow clean benches, animal containment workstations, cytotoxic cabinets, hospital pharmacy isolators, and PCR cabinets and instrumentation. With the most extensive product line in the industry, Esco has passed more tests, in more languages, for more certifications, throughout more countries than any biosafety cabinet manufacturer in the world. Esco remains dedicated to delivering innovative solutions for the clinical, life science, research and industrial laboratory community. www.escoglobal.com.

NSF / ANSI 49 Biological Safety Cabinets • Animal Containment Workstations • Fume Hoods • Clean Benches

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