ESCO
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# Polymerase Chain Reaction Cabinets

*The Proven Solution for Contaminant-Free PCR*





*Esco PCR Cabinet, Model PCR-4A_. shown with optional support stand*





## 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 between PCR cycles.
- Sentinel™ Silver Microprocessor controller supervises all functions - 0.9 m (3') and 1.2 m (4') models only.
- Esco ISOCIDE™ antimicrobial coating on all painted surfaces.
- Available in 0.6, 0.9 and 1.2 meter models (2', 3' and 4').



## Introduction

### What is PCR

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.

### Why PCR Cabinet

Because of the high copy number generated during PCR, it is essential to prevent possible contamination of the PCR reaction.

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 take place in this area.



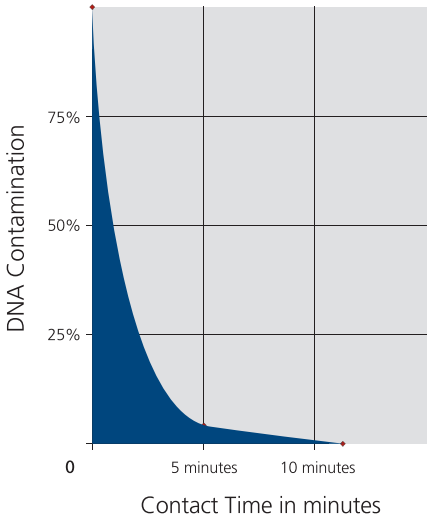

In practice, all these procedures are conducted in the same room. Under these circumstances, PCR Cabinets are used for reagent preparation and sample preparation to minimize contamination. In the case of biohazardous samples, biological safety cabinets must be used for sample preparation

** Polymerase Chain Reaction (PCR) is a patented process owned by Hoffman La Roche*

## How Esco PCR Cabinets Prevent Contamination

### UV Decontamination Technology

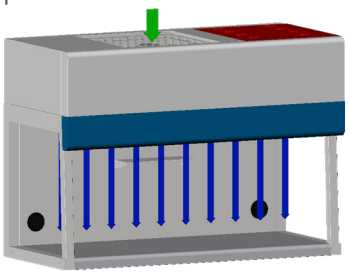
- Powerful, uniformly distributed, UV-C.
- Proven effect on DNA contamination.
- Shelf enables placement of items closer to the UV source, increasing decontamination efficacy.
- UV-C is ozone-free.
- UV hour meter monitors bulb life, simplifies maintenance.
- Adjustable timer.



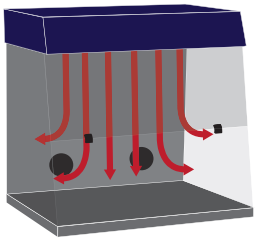

The Effect of UV on DNA Contamination

### HEPA-Filtered Laminar Airflow

- Laminar, not turbulent flow provides superior sample protection.



*Laminar Flow (Esco PCR cabinets)*



*Turbulent Flow*

*Note: many competitors' cabinets have turbulent flow*

- ISO Class 3 air cleanliness.
- Minipleat, separatorless HEPA filters, tested to a typical efficiency of >99.99% for 0.3 micron particles are superior to conventional aluminium separator HEPA filters. Minipleat filters have a greater surface area and a longer service life, which reduce operating costs.

## More Benefits

### Easy-to-Use

- Timer is easy to adjust
- UV hour meter monitors bulb life
- Automatic decontamination for 0.9 m (3') and 1.2 m (4') models
  - Close sash: UV turns on automatically for decontamination
  - Open sash: airflow activates automatically

### Safety

- UV interlock prevents UV exposure
- UL recognized electrical components
- UV filtering sash and side walls

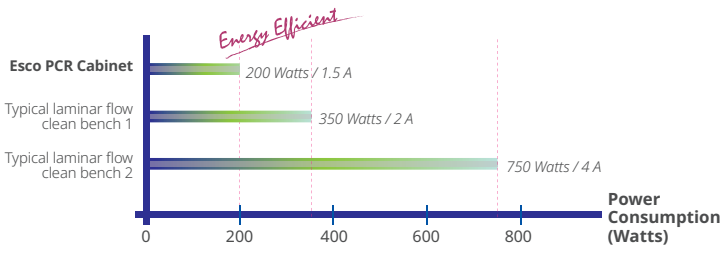
### Two-in-One

Can be used as a regular laminar flow cabinet and UV can also be used for decontaminaton of regular lab items.

### Ergonomics

- Low noise
- Angled front
- Glass sides
- Curved work surface front edge
- Powder-coated rear wall eliminates reflections
- Vertical airflow minimizes direct airflow towards operator, causing dry eyes

## Energy Efficiency




- *Even more energy efficient than regular laminar flow clean benches*
- *UV timer shuts off UV after pre-set duration*
- *The backward curved wheel with external rotor motor delivers class-leading energy efficiency for lower operating costs*

# Esco PCR Cabinets

***Provide Product Protection***

**Pre-Filters**

An additional disposable pre-filter traps large particles in the inflow air prior to reaching the main filter, protecting against damage and prolonging filter life.

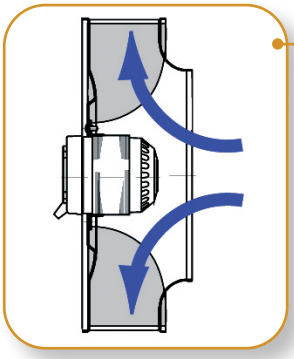


**High Performance Fan System**

German made ebm-papst® permanently lubricated, centrifugal motor/blowers with external rotor designs.

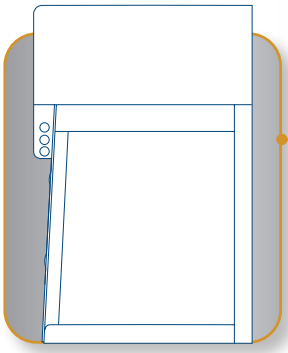
Motors selected for energy efficiency, compact design, and flat profile. Completely integrated assembly optimizes motor cooling.

All rotating parts balanced for smooth, quiet, vibration-free operation.



**User Interface**

An angled front, rounded work surface front edge, and glass sides promote ergonomics. The powder- coated work zone rear wall eliminates harsh reflections which may be associated with conventional stainless steel interiors. The vertical airflow design minimizes direct airflow which may lead to dry eyes and fatigue.





*Esco PCR Cabinet,*
*Model PCR-4A_with optional support stand*



**UV Decontamination System**

Each cabinet includes a powerful, built-in, 253.7 nanometer, UV lamp to enable the work zone to be decontaminated between experimental runs, thus preventing cross contamination.

The decontamination cycle time may be set with the UV timer, thus extending UV bulb life.

UV-filtering polycarbonate front and glass sides shield the user from accidental UV exposure. A proximity sensor ensures the frontal shield is lowered before allowing the UV to activate.

## Control System



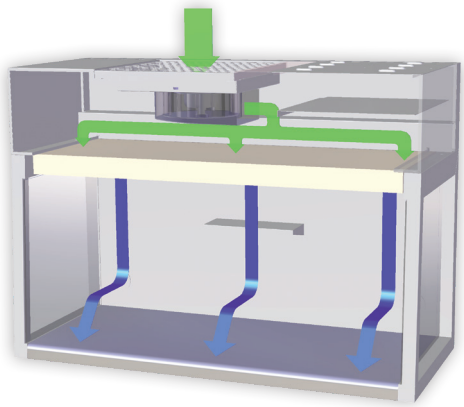

0.6 m (2') models are equipped with rocker switches for blower, light and UV or




0.9 m (3') and 1.2 m (4') models are equipped with a microprocessor control system and soft touch controls for blower, light and UV.

Both models have a UV timer function; however, the microprocessor has additional program functions including automatic activation of UV when front shield is lowered, UV countdown on LCD display, total UV run hours, and more.





### Proven Product Protection

Vertical laminar airflow with HEPA-filtration, >99.99% at 0.3 microns, provides a sterile work space for PCR sample preparation.

**Air Cleanliness Standards**
(ISO 14644-1, Air Cleanliness Particle Limits)
(No. of Particles / $m^3$)

| Particle Size (µm) | Cleanliness Class | | | | | |
|---|---|---|---|---|---|---|
| | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 |
| 0.1 | 10 | 100 | 1000 | 10000 | 100000 | 1000000 |
| 0.2 | 2 | 24 | 237 | 2370 | 23700 | 237000 |
| 0.3 | - | 10 | 102 | 1020 | 10200 | 102000 |
| 0.5 | - | 4 | 35 | 352 | 35200 | 35200 |
| 1.0 | - | - | 8 | 83 | 835 | 8320 |
| 5.0 | - | - | - | - | 29 | 293 |

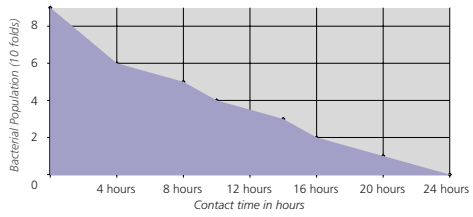
### Superior Air Cleanliness

Esco PCR cabinets provide ISO Class 3 air cleanliness within the work zone as per ISO 14644.1, significantly cleaner than the usual Class 5 classification on clean benches offered by the competition.

## Other Features

- All Esco products are manufactured for the most demanding laboratory applications. All components are designed for maximum chemical resistance and enhanced durability for a long service life. The main body of the cabinet is constructed of industrial-grade electrogalvanized steel.
- One-piece formed stainless steel work surface with a rounded front edge is designed for maximum operator comfort.
- Built-in warm white, electronic ballasted, 5000k lighting provides excellent illumination of the work zone and reduces operator fatigue. The reliable lighting system is zero-flicker and instant start.
- Each PCR cabinet is individually factory tested for safety and performance in accordance with international standards.

**Caution:** *PCR cabinets do not provide operator protection. They should not be used with applications involving unknown or hazardous agents.*




### Built-In Protection

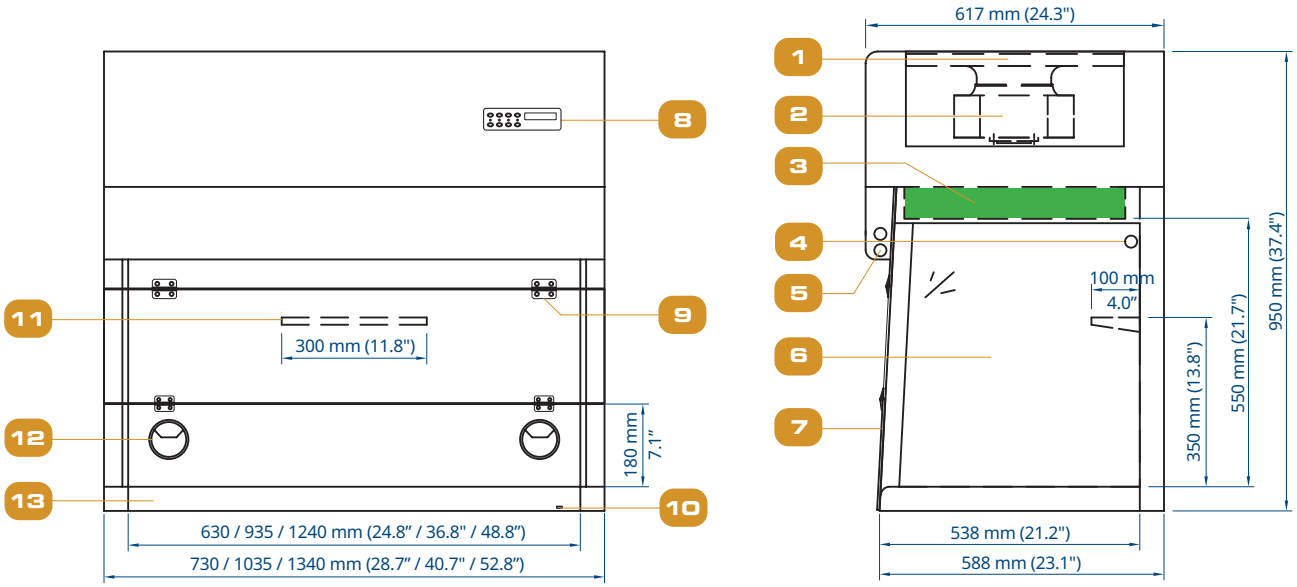
External surfaces are powder coated with Esco ISOCIDE™ to eliminate 99.9% of surface bacteria within 24 hours of exposure.

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| General Specifications, Polymerase Chain Reaction Cabinets | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Model** | | **SCR-2A_** | | | **PCR-3A_** | | | **PCR-4A_** | | |
| Nominal Size | | 0.6 meter (2') | | | 0.9 meter (3') | | | 1.2 meter (4') | | |
| External Dimensions (W x D x H) | | 730 x 617 x 950 mm (28.7" x 24.3" x 37.4") | | | 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" 37.4") | | |
| Internal Dimensions (W x D x H) | | 630 x 538 x 550 mm (24.8" x 21.2" x 21.7") | | | 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 | | 0.30 m/s (60 fpm) | | | | | | | | |
| Pre-Filter | | Polyurethane fibers with 85% arrestance | | | | | | | | |
| Sound Emission* | | <63 dBA | | | <56 dBA | | | <58 dBA | | |
| LED Lamp Intensity | | >800 Lux (>75 foot candles) | | | >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 | | |
| Controller | | Rocker Switches | | | Esco Sentinel™ Microprocessor Control | | | | | |
| Construction | Main Body | Electrogalvanized steel with white oven-baked epoxy-polyester powder-coated finish. Coated with Esco Isocide™ antimicrobial coating | | | | | | | | |
| | Work Zone | 1.2 mm (0.05") 18 gauge stainless steel grade 304 | | | | | | | | |
| Electrical** | Model | SCR-2A1 (2150009) 220-230 VAC, 50 Hz | SCR-2A2 (21500010) 110-120 VAC, 50/60 Hz | SCR-2A3 (21500011) 220-230 VAC, 60 Hz | PCR-3A1 (2150001) 220-230 VAC, 50 Hz | PCR-3A2 (2150003) 110-120 VAC, 50/60 Hz | PCR-3A3 (2150004) 220-230 VAC, 60 Hz | PCR-4A1 (2150005) 220-230 VAC, 50 Hz | PCR-4A2 (2150007) 110-120 VAC, 50/60 Hz | PCR-4A3 (2150008) 220-230 VAC, 60 Hz |
| | Cabinet Full Load Amps (FLA) | 1 A | 1.5 A | 1 A | 0.75 A | 1.1 A | 0.75 A | 1.8 A | 3.8 A | 1.8 A |
| | Cabinet Nominal Power | 136 W | 165 W | 117 W | 135 W | 146 W | 144 W | 184 W | 260 W | 180 W |
| | Cabinet BTU | 464 | 563 | 400 | 461 | 498 | 491 | 628 | 887 | 614 |
| Net Weight | | 76.5 Kg (169 lbs) | | | 99 Kg (218 lbs) | | | 115.4 Kg (254 lbs) | | |
| Shipping Weight*** | | 100.5 Kg (222 lbs) | | | 123.3 Kg (272 lbs) | | | 139.8 Kg (308 lbs) | | |
| Shipping Dimensions, Maximum (L x W x H)*** | | 850 x 730 x 1150 mm (33.5" x 28.7" x 45.3") | | | 1130 x 730 x 1150 mm (44.5" x 28.7" x 45.3") | | | 1420 x 730 x 1150 mm (55.9" x 28.7" x 45.3") | | |
| Shipping Volume, Maximum*** | | 0.71 $m^3$ (25 cu.ft.) | | | 0.95 $m^3$ (34 cu.ft.) | | | 1.19 $m^3$ (42 cu.ft.) | | |
| Support Stands | Support Stand with Caster Wheels (SPC) 28" Height | SPC-2E0 5131359 | | | SPC-3E0 5131345 | | | SPC-4E0 5131346 | | |
| | Support Stand with Caster Wheels (SPC) 34" Height | SPC-2F0 5131360 | | | SPC-3F0 5131354 | | | SPC-4F0 5131355 | | |
| | Support Stand with Leveling Feet (SAL) 28" Height | SAL-2E0 5131357 | | | SAL-3E0 5131348 | | | SAL-4E0 5131349 | | |
| | Support Stand with Leveling Feet (SAL) 34" Height | SAL-2F0 5131358 | | | SAL-3F0 5131351 | | | SAL-4F0 5131352 | | |
| Misc | Foot Rest | FT-REST 5170492 | | | | | | | | |
| | Laboratory Chair | ME-LD-AR360 1150006 | | | | | | | | |
| | IQOQ Protocol | 9010179 | | | | | | | | |

**Noise reading in open field condition / anechoic chamber*
*** Additional voltages may be available; contact Esco for ordering information.*
****Cabinet only; excludes optional stand.*

## PCR Cabinet Engineering Drawing




1. *Pre-filter*
2. *Blower*
3. *HEPA filter*
4. *UV lamp*
5. *LED lamps*
6. *Tempered glass side panel*
7. *Hinged window, polycarbonate*
8. *Control system (microprocessor version shown)*
9. *Spring-loaded hinge*
10. *UV interlocking magnetic switch*
11. *Perforated powder-coated shelf*
12. *Pass-through port (1 for 2ft and 3ft, 2 for 4ft model)*
13. *Stainless steel work surface with rounded front*

| | Cabinet Performance | Air Quality | Filtration | Electrical Safety |
|---|---|---|---|---|
| **Standards Compliance** | IEST-RP-CC002.2, Worldwide | ISO 14644.1 Class 3, Worldwide<br>AS 1386 Class 1.5, Australia<br>JIS B9920 Class 3, Japan | IEST-RP-CC034.1, Worldwide<br>IEST-RP-CC007.1, Worldwide<br>IEST-RP-CC001.3, Worldwide<br>EN1822 (H 13), Europe | IEC 61010-1, Worldwide<br>EN 61010-1, Europe<br>UL-61010-1, USA<br>CAN/ CSA 22.2 No. 61010-1 |

## Accessories:



**Support Stand with Caster Wheels (SPC)**

- For 0.6 m (2'), 0.9 m (3') and 1.2 m (4') models
- Available in two standard heights: 711mm (28.0") or 860mm (34.0")
- Durable polyurethane caster wheels with 360 degree horizontal rotation
- Total brake system on front wheels
- Maximum weight supported: 600 Kg (1323 lbs)

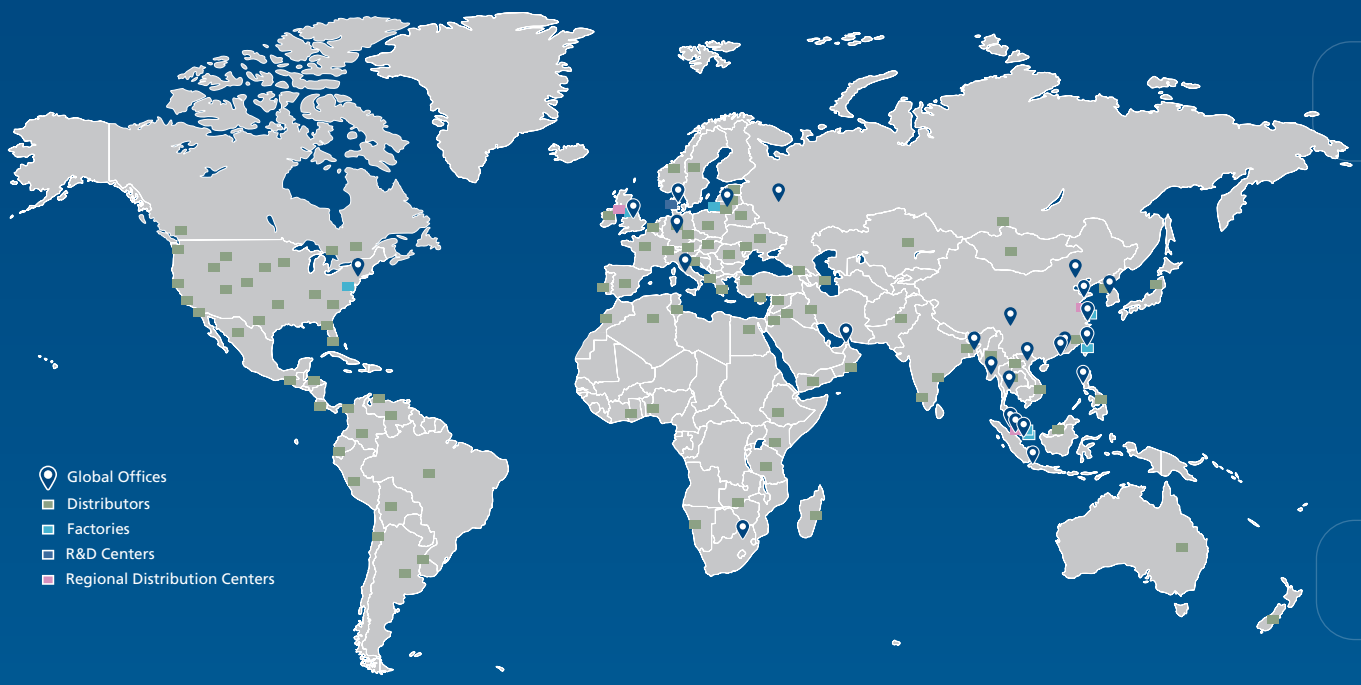


**Support Stand with Leveling Feet (SAL)**

- For 0.6 m (2'), 0.9 m (3') and 1.2 m (4') models
- Available in two standard sizes: 711 mm (28.0") or 864 mm (34.0")
- Maximum weight supported: 500 Kg (1,100 lbs)

# ESCO LIFESCIENCES GROUP

*42 LOCATIONS IN 24 COUNTRIES ALL OVER THE WORLD*




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