

Technical Bulletin for Biological Safety Cabinets and PCR chambers available for procurement through UNICEF Supply Division

Global health security faces an increasing risk of emerging and re-emerging biological threats caused by the evolving pathogenic organisms, and for this reason, biological safety is an important international health issue and infection control is a priority as one of the critical components of laboratory services. It is essential that laboratories conduct adequate risk assessment to identify proper work practices and containment requirements (Biosafety level) for work with biohazardous materials.

Biological safety cabinets (BSCs) are one of the primary means of containment developed to offer personnel, product, and environmental protection if appropriate practices are put in place and followed when working with infectious biological agents. Biosafety cabinets are classified based on the level of containment and are categorized in 3 different classes (I, II, III). Class I BSC offers protection to the personnel and environment but does not offer protection to the product. Class II and III BSCs offers protection to personnel, product, and the environment. Class III BSCs are designed to offer the highest level of protection to personnel and environment when working with highly infectious agents. Class II BSCs are recommended for use in a Biosafety level 2 and 3 laboratories whereas Class III BSCs are to be used in biosafety level 3 and 4 (maximum containment) laboratories.

To respond to emerging and re-emerging biological threats, UNICEF Supply Division has entered in a long-term arrangement with one of the leading global manufacturers, ESCO Micro, for the supply of Class II and III BSCs which can be used in Biosafety level 2- 4 laboratories. PCR chambers are also offered under the same arrangements. It is to be noted, however, that PCR chambers are not biosafety equipment and they do not offer any level of protection to the user or the environment and should not be used for manipulation of infectious samples.

For technical questions concerning the products please contact UNICEF Supply Division: wsebonego@unicef.org
For questions concerning ordering the products please contact UNICEF Supply Division: tptashnik@unicef.org

Key technical and commercial characteristics of the products are summarized in Table 1 below.

Table 1: Biosafety equipment: Biosafety cabinets and PCR chamber

UNICEF Material Number	Product Description	Product Code	Pack Size	Price EUR	FCA Lead Time, indicative	FCA Delivery Port
S0001339	Airstream Class II, Biological Safety Cabinet (S-Series), 4ft/1.2m - Certified as per EN 12469:2000 - Standard warranty: 3 years <u>Supplied with:</u> - UV lamp; UV-30A UV Tube 30W - EO Electrical outlet - Fixed Stand with Caster Wheels, 28" height; SPC-4A0 Gen2 - Pre-filter; PF-42 - Spare filters: Downflow Filter - 1100028 and Exhaust Filter - 1100123	AC2-4S8	EACH	3,928.00	4 weeks	Singapore
S0001798	Airstream Class III, Biological Safety Cabinet, 4ft/1.2m - Certified as per EN 12469:2000 - Standard warranty: 3 years	AC3-4B1	EACH	11,417.00	4 weeks	Singapore

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	<p><u>Supplied with:</u></p> <ul style="list-style-type: none"> - UV lamp - UV-30A UV Tube 30W - EO Electrical outlet - Spare filters: Downflow Filter - 1100002, Exhaust Filter - 1100001 and Secondary Exhaust Filter - 1100014 					
S0001799	<p>Airstream Polymerase Chain Reaction Cabinet, 3ft/0.9m</p> <ul style="list-style-type: none"> - Certified as per EN 12469:2000 - Standard warranty: 3 years <p><u>Supplied with:</u></p> <ul style="list-style-type: none"> - UV lamp; UV-15A UV Tube 15W - SPC-3E0 support stan with castor wheels 28" Height - Prefilter - Spare filters: Downflow Filter - 1100048, Prefilter – 5090023 	PCR-3A1	EACH	2,505.00	4 weeks	Singapore

Product technical specifications

S0001339 Airstream Class II, Biological Safety Cabinet (S-Series), 4ft/1.2m:

Class II, BSC is suitable for use in biosafety level 2 –3 laboratories to offer protection to the user, the product and environment from infectious agents.

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- ULPA Filter Efficiency: 99.999% at 0.1 to 0.3 micron, ULPA as per IEST-RP-CC001.3 USA or >99.999% at MPPS, H14 as per EN 1822 EU
- Inflow airflow velocity: 0.45m/s
- Downflow airflow velocity: 0.30m/s
- Airflow circulation: Recirculates 70% of air, and exhaust 30% back into the laboratory
- The manufacturer will provide Factory Test Report as per EN 12469 for each BSC individually before shipment.
- Standard warranty: 3 years

S0001798 Airstream Class III, Biological Safety Cabinet, 4ft/1.2m:

Class III BSC is suitable for use in biosafety level 3-4 laboratories to offer protection to the user, the product and the environment from highly infectious agents

- Neoprene™ Synthetic Arm-length Gauntlets: Single piece, leak-tested assembly guarantees maximum protection and flame and abrasion resistant
- Silent operation or Noise pressure levels EN 12469: <51 dBA, NSF 49: <54 dBA
- Pass Box equipped with interlocking doors that permits materials transfer without risk of environmental contamination
- Footswitch for pass box control
- ULPA Downflow, 1st Exhaust, 2nd Exhaust Filters Efficiency: 99.999% at 0.1 to 0.3 µm and MPPS
- Initial Airflow Volume: 355 cfm
- Minimum Required Negative Pressure: -200 Pa
- Nominal Required Negative Pressure: -275 Pa

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- The manufacturer will provide Factory Test Report as per EN 12469 for each BSC individually before shipment
- Standard warranty: 3 years

S0001799 Airstream Polymerase Chain Reaction Cabinet, 3ft/0.9m:

PCR cabinet/chamber is HEPA-filtered enclosures designed to protect contamination-sensitive PCR reagents during amplification and DNA/RNA manipulation. Contaminants coming from the personnel working can also be prevented from compromising the reagents. A PCR cabinet is not a biosafety equipment and should not be used for manipulation of potential infections samples.

- UV-filtering hinged polycarbonate front window and non-removable glass side walls for wide visibility
- It has UV interlock/proximity sensor ensures the frontal shield is lowered before allowing the UV to activate
- UV Decontamination System: Each cabinet includes a powerful, built-in, 253.7nanometer, UV lamp to enable the work zone to be decontaminated between experimental runs, thus preventing cross contamination. UV-C is ozone-free. UV hour meter monitors bulb life simplifies maintenance.
- Laminar Airflow Velocity: 0.30 m/s
- HEPA-Filtered Laminar Airflow: Laminar, not turbulent flow provides superior sample protection. ISO Class 3 air cleanliness. H14 filter with a typical efficiency of >99.99% at 0.3 microns
- Provide ISO Class 3 air cleanliness within the work zone as per ISO 14644.1
- The manufacturer will provide Factory Test Report as per EN 12469 for each PCR Chamber individually before shipment
- Standard warranty: 3 years

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For detailed technical specifications, visit UNICEF Supply Catalogue using the links:

- S0001339 [Biosafety cabinet, class II, stand alone](#)
- S0001798 [Biosafety cabinet, class III, stand alone](#)
- S0001799 [PCR Chamber, stand alone](#)

Installation and training

For biosafety equipment to effectively reduce risks in laboratory, it must be carefully and properly incorporated into the facility design, according to the outline of its safety features. All personnel operating or maintaining a piece of biosafety equipment must be properly trained and be able to demonstrate proficiency.

Installation and training are not included in the price of the equipment and must be purchased separately. Comprehensive training and installation packages are available for all biosafety equipment offered by UNICEF. Overview of the packages is presented in Table 2 below.

Table 2: Training and installation packages for biosafety equipment

Package	U484003 Training and installation – BSC, class II	U484005 Training and installation – BSC, class III	U484007 Training and installation – PCR Chamber
For procurement with	S0001339 Biosafety cabinet, class II, stand alone	S0001798 Biosafety cabinet, class III, stand alone	S0001799 PCR chamber, stand alone
Description	<p>The supplier or its nominated service provider shall provide installation, commissioning and initial on-site testing (aerosol leak test, recirculating air filter, exhaust air filter, airflow measurements inside the BSC and inward/exhaust airflow) of the equipment, as well as initial on-site training at the time of installation with no additional cost to the end user. All costs related to labor, travel and accommodation shall be assumed by the supplier.</p> <ul style="list-style-type: none"> ▪ Prior to installation of the equipment, the supplier shall provide advice on environmental and infrastructure prerequisites (e.g., need for air conditioning, uninterrupted power supply, extended batteries, voltage stabilizer, waste management requirements, cables, etc.) ▪ The supplier shall perform an on-site inspection to confirm site readiness per prerequisites and advise the end user in advance of any additional equipment not 	<p>The supplier or its nominated service provider shall provide installation, commissioning and initial on-site testing (aerosol leak test, recirculating air filter, exhaust air filter, airflow measurements inside the BSC and inward/exhaust airflow) of the equipment, as well as initial on-site training at the time of installation with no additional cost to the end user. All costs related to labor, travel and accommodation shall be assumed by the supplier.</p> <ul style="list-style-type: none"> ▪ Prior to installation of the equipment, the supplier shall provide advice on environmental and infrastructure prerequisites (e.g., need for air conditioning, uninterrupted power supply, extended batteries, voltage stabilizer, waste management requirements, cables, etc.) ▪ The supplier shall perform an on-site inspection to confirm site readiness per prerequisites and advise the end user in advance of any additional equipment not 	<p>The supplier or its nominated service provider shall provide installation, commissioning and initial on-site testing (aerosol leak test, recirculating air filter, exhaust air filter, airflow measurements inside the PCR Chamber and inward/exhaust airflow) of the equipment, as well as initial on-site training at the time of installation with no additional cost to the end user. All costs related to labor, travel and accommodation shall be assumed by the bidder.</p> <ul style="list-style-type: none"> ▪ Prior to installation of the equipment, the supplier shall provide advice on environmental and infrastructure prerequisites (e.g., need for air conditioning, uninterrupted power supply, extended batteries, voltage stabilizer, waste management requirements, cables, etc.) ▪ The supplier shall perform an on-site inspection to confirm site readiness per prerequisites and advise the end user in advance of any additional equipment not

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	<p>provided but required for successful installation/operation of the equipment.</p> <ul style="list-style-type: none"> ▪ The site inspection is to be performed before the scheduled arrival of the equipment on site. ▪ The supplier shall undertake equipment verification before installation to ensure the equipment is in good order. ▪ The supplier shall train up to 6 users, of them at least 1 power user on site, providing initial training on equipment use and basic maintenance. ▪ Initial end user training shall be undertaken within 2 days of installation of the equipment or as early as the facility are available. ▪ The supplier shall provide a certification/installation certificates signed by end user and the supplier as evidence of successful installation and initial training. All measurement results to be printed out for documentation in the maintenance record. ▪ The supplier shall provide a comprehensive service & maintenance plan, in which standard service guaranteed over the period of warranty will be clearly defined. 	<p>provided by bidder but required for successful installation/operation of the equipment.</p> <ul style="list-style-type: none"> ▪ The site inspection is to be performed before the scheduled arrival of the equipment on site. ▪ The supplier shall undertake equipment verification before installation to ensure the equipment is in good order. ▪ The supplier shall train up to 6 users, of them at least 1 power user on site, providing initial training on equipment use and basic maintenance. ▪ Initial end user training shall be undertaken within 2 days of installation of the equipment or as early as the facility are available. ▪ The supplier shall provide a certification/installation certificates signed by end user and the supplier as evidence of successful installation and initial training. All measurement results to be printed out for documentation in the maintenance record. ▪ The supplier shall provide a comprehensive service & maintenance plan, in which standard service guaranteed over the period of warranty will be clearly defined. 	<p>provided by supplier but required for successful installation/operation of the equipment.</p> <ul style="list-style-type: none"> ▪ The site inspection is to be performed before the scheduled arrival of the equipment on site. ▪ The supplier shall undertake equipment verification before installation to ensure the equipment is in good order. ▪ The supplier shall train up to 6 users, of them at least 1 power user on site, providing initial training on equipment use and basic maintenance. ▪ Initial end user training shall be undertaken within 2 days of installation of the equipment or as early as the facility are available. ▪ The supplier shall provide a certification/installation certificates signed by end user and the bidder as evidence of successful installation and initial training. All measurement results to be printed out for documentation in the maintenance record. ▪ The supplier shall provide a comprehensive service & maintenance plan, in which standard service guaranteed over the period of warranty will be clearly defined.
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Price	Upon request (factoring number and location of installation sites, number of trainees, need for additional tools and instrumentation, etc.)	Upon request (factoring number and location of installation sites, number of trainees, need for additional tools and instrumentation, etc.)	Upon request (factoring number and location of installation sites, number of trainees, need for additional tools and instrumentation, etc.)
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Service and maintenance

For biosafety equipment to effectively reduce risks in laboratory, it must be regularly maintained, validation/calibration procedures undertaken, and their results documented.

Routine service and maintenance are not included in the price of the equipment and must be purchased separately. Comprehensive service and maintenance packages are available for all biosafety equipment offered by UNICEF. Overview of the packages is presented in Table 3 below.

Table 3: Service and maintenance packages for biosafety equipment

Package	U484004 Service and maintenance – BSC, class II	U484006 Service and maintenance – BSC, class III	U484008 Service and maintenance – PCR Chamber
For procurement with	S0001339 Biosafety cabinet, class II, stand alone	S0001798 Biosafety cabinet, class III, stand alone	S0001799 PCR chamber, stand alone
Description	<p>The supplier shall perform preventive maintenance visits at scheduled intervals according to the service & maintenance plan agreed with the end user.</p> <ul style="list-style-type: none"> ▪ The supplier shall perform annually calibration and certification of the BSC as per EN 12469/NSF 49 standard. ▪ The supplier shall provide a 	<p>The supplier shall perform preventive maintenance visits at scheduled intervals according to the service & maintenance plan agreed with the end user.</p> <ul style="list-style-type: none"> ▪ The supplier shall perform annually calibration and certification of the BSC as per EN 12469/NSF 49 standard. ▪ The supplier shall provide a 	<p>The supplier shall perform preventive maintenance visits at scheduled intervals according to the service plan agreed with the end user, including physical inspection of the chamber, verification of air flow, integrity of air filters and general performance of the PCR chamber.</p> <ul style="list-style-type: none"> ▪ The supplier shall perform annually calibration and certification of the

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	<p>report/certification certificate to the end user for all tests conducted during the calibration and recertification visit and at the minimum the following must be documented in the report:</p> <ul style="list-style-type: none"> - Standard Air flow velocity measurement (e.g. Down and in-flow) - Standard Airflow patterns - Air Filter integrity leak testing as per the requirements of ISO 14644-3 or equivalent - Lighting - Vibration - Sound - Smoke test carried out and to determine leakage in or out of the cabinet. (Air flow visualization test) - Airborne particle counts as per the requirement of ISO 14644-1 or equivalent - Cabinet integrity testing - Replacements of spare parts such as filters, UV lights, LED lights as applicable ▪ A certification sticker should be affixed to the cabinet indicating the validity of the certification and when the next visit will be. ▪ All services to have job cards detailing work done and recommendations on suitability for continued use. ▪ The supplier shall conduct scheduled annual refresher trainings on use and maintenance based on manufacturer's 	<p>report/certification certificate to the end user for all tests conducted during the calibration and recertification visit and at the minimum the following must be documented in the report:</p> <ul style="list-style-type: none"> - Standard Air flow velocity measurement (e.g. Down and in-flow) - Standard Airflow patterns - Air Filter integrity leak testing as per the requirements of ISO 14644-3 or equivalent - Lighting - Vibration - Sound - Smoke test carried out and to determine leakage in or out of the cabinet. (Air flow visualization test) - Airborne particle counts as per the requirement of ISO 14644-1 or equivalent - Cabinet integrity testing - Replacements of spare parts such as filters, UV lights, LED lights as applicable ▪ A certification sticker should be affixed to the cabinet indicating the validity of the certification and when the next visit will be. ▪ All services to have job cards detailing work done and recommendations on suitability for continued use. ▪ The supplier shall conduct scheduled annual refresher trainings on use and maintenance based on manufacturer's 	<p>chamber as per manufacturers standard depending on the model.</p> <ul style="list-style-type: none"> ▪ The supplier shall provide report/certification certificate to the end user for all tests conducted during the calibration and recertification visit and at the minimum the following must be documented in the report: <ul style="list-style-type: none"> - Standard Air flow velocity measurement (e.g. Down flow) - Standard Airflow pattern - Filters - Lighting - Vibration - Sound ▪ Replacements of spare parts such as filters, UV lights, LED lights as applicable ▪ A certification sticker should be affixed to the chamber indicating the validity of the certification and when the next visit will be. ▪ All services to have job cards detailing work done and recommendations on suitability for continued use ▪ The supplier shall conduct scheduled annual refresher trainings on use and maintenance based on manufacturer's recommendations according to the service plan agreed with the end user. ▪ The supplier shall respond to the end user's support request within 48 hours after a call for intervention. The response to be provided either through remote support or, if assessed required, through
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	<p>recommendations according to the service & maintenance plan agreed with the end user.</p> <ul style="list-style-type: none"> ▪ The supplier shall respond to the end user's support request within 48 hours after a call for intervention. The response to be provided either through remote support or, if assessed required, through onsite service. ▪ In case of a breakdown, time to fully repair is no longer than 10 working days, including delivery of necessary spare parts. ▪ The supplier shall state any after sales support provided to the end user at the expiration of the warranty terms, including replacement of spare parts. 	<p>recommendations according to the service and maintenance plan agreed with the end user.</p> <ul style="list-style-type: none"> ▪ The supplier shall respond to the end user's support request within 48 hours after a call for intervention. The response to be provided either through remote support or, if assessed required, through onsite service. ▪ In case of a breakdown, time to fully repair is no longer than 10 working days, including delivery of necessary spare parts. ▪ The supplier shall state any after sales support provided to the end user at the expiration of the warranty terms, including replacement of spare parts. 	<p>onsite service.</p> <ul style="list-style-type: none"> ▪ In case of a breakdown, time to fully repair is no longer than 10 working days, including delivery of necessary spare parts. ▪ The supplier shall state any after sales support provided to the end user at the expiration of the warranty terms, including replacement of spare parts.
Price	<p>Upon request (factoring number and location of installation sites, number of trainees, need for additional tools and instrumentation, etc.)</p>	<p>Upon request (factoring number and location of installation sites, number of trainees, need for additional tools and instrumentation, etc.)</p>	<p>Upon request (factoring number and location of installation sites, number of trainees, need for additional tools and instrumentation, etc.)</p>

Further references

- Please refer to WHO laboratory biosafety link below for further information on Laboratory Biological Safety. WHO [Laboratory biosafety manual, 4th edition: Biological safety cabinets and other primary containment devices](#) dated 21 December 2020.
- The supplier also provides free seminars for end-users on awareness of hazards, risk of diseases and laboratory incidents. For more detail, please follow the link: <https://www.escolifesciences.com/services/training-services-and-end-user-seminars>