



# GENEVA SCIENTIFIC

LAB EQUIPMENT SOLUTIONS

Purchase Specifications  
Series Class II, Type A2 Biological  
Safety Cabinet

## Sizes

### 5 Foot Biological Safety Cabinet Class II, Type A2

External Dimensions: 67.9" x 32.1" x 60.6"

Internal Dimensions: 61.6" x 24.5" x 26.4"

Work Area: 8.1 sq.ft. (0.75 m<sup>2</sup>)

Working Opening : 10.8" (274 mm)

Average Airflow Velocity:

Inflow: 0.53 m/s (105 fpm)

Downflow: 0.35 m/s (70 fpm)

Airflow Volume

Inflow: 685 m<sup>3</sup> / h (403 cfm)

Downflow 63%: 1147 m<sup>3</sup> / h (675 cfm)

Exhaust, 37%: 685 m<sup>3</sup> / h (403 cfm)

Sound Emission\*

NSF / ANSI 49: <63 dBA

EN 12469: <60 dBA

Fluorescent Lamp Intensity: > 1070 Lux (> 100 foot-candles)

Cabinet Construction:

External: Electrogalvanized steel with Isocide oven-baked epoxy-polyester powder coating

Internal: 1.2 mm (0.05") /18 gauge

## General Performance and Certifications

1. The biological safety cabinet shall comply with one or more of the following international standards, and the manufacturer shall provide a certified copy of containment and performance tests equivalent to or greater than specified in the following independent international standards for biological safety, electrical and other functional characteristics: Class II, Type A2 per NSF / ANSI 49 (USA); Class II per EN 12469, JIS K3800, SFDA YY-0569, SANS12469.
2. The cabinet shall protect (a) the operator and laboratory environment from particulates generated within the work zone; (b) the product and process within the work zone from airborne contamination from ambient air; (c) and the product and process within the work zone from cross contamination.
3. Before shipment each cabinet shall be individually tested by the KI-Discus test (European Standard EN12469:2000) to validate operator/personnel protection. The retention efficiency for the front aperture shall be not less than 99.999%. Microbiological testing for cabinet performance shall be performed on a statistical sampling basis.
4. Each cabinet shall be listed by Underwriters' Laboratories (UL, CUL) or CE for electrical safety.
5. Original documentation specific to each cabinet serial number shall be provided with the cabinet and maintained in the manufacturers' records. Test data verifying all performance criteria shall be available



upon request to include: (a) inflow velocity through direct inflow measurement method; (b) downflow velocity and uniformity; (c) filter leak scan with aerosol challenge for both filters; (d) light, noise, vibration; (e) and electrical safety.

### **Filtration System**

6. The cabinet shall have one supply downflow filter and one exhaust filter. Both filters shall be ULPA type per IEST-RP-CC001.3 and meet EN1822 (H14) requirements.
7. The filters shall be within an aluminum frame with mini-pleat design without aluminum separators; no wood or fiberboard shall be used in the filter assembly.
8. Typical filter efficiency shall be 99.9997% at MPPS and 99.999% for 0.1 to 0.3 microns.
9. An integral filter guard shall be affixed to prevent damage to the filter media.
10. The filters shall be (a) individually scan tested by the manufacturer, (b) individually scan tested after assembly, and (c) easily accessible for scan testing in situ by means of a dedicated upstream sampling port accessible from within the cabinet.
11. The supply filter shall be angled and oriented to the 10° cabinet front angle to maximize downflow uniformity over the work surface.
12. A removable, perforated metal diffuser shall be installed below the supply filter to optimize airflow uniformity and to protect from damage.

### **Blower System**

13. The cabinet shall have a direct drive, permanently lubricated centrifugal blower/motor dynamically balanced in two planes compliant to ISO2710 for low noise, low vibration and long filter life.
14. The blower/motor shall have an external rotor design and include an automatic thermal cut-out to disable the motor in case of overheating.
15. The blower/motor shall have an automatic speed control to compensate for filter loading.
16. The blower/motor system shall be enclosed within a dynamic chamber shaped steel plenum and integrated with the removable supply filter assembly to simplify filter changing.
17. The integral damper shall be externally adjustable.

### **Cabinet Design, Construction, Cleaning**

18. The cabinet shall be of triple wall design whereby all positive pressure plenums capable of handling contaminated air shall be surrounded by negative pressure. No positive pressure areas shall be accessible external to the cabinet. The third wall shall conceal utilities.
19. The cabinet shall maintain containment performance even when removable work area components are removed for cleaning.



20. The work tray shall be one-piece, removable, stainless steel with radius corners without crevice or joints.
21. The cabinet shall have a stainless steel, onepiece fabricated drain trough with open angles to channel spills to a common drain.
22. The closed sidewall shall be sealed without perforations, return air slots or concealed areas which can contain contaminants.
23. The cabinet shall be free of sharp edges, nonfunctional protrusions, bolts, screws or hardware, and all metal edges shall be deburred.
24. The cabinet exterior top shall be slanted to discourage placement of foreign objects and to maintain proper exhaust airflow.

#### **Ergonomics and Convenience**

25. The front sash shall be frameless to maximize visibility, and accessible for cleaning front and back. Sash glass shall be safety glass.
26. The sash counterbalance shall be suspended on two high-strength cables, and the sash shall lock into position in the event one cable becomes detached.
27. Magnetic, not mechanical, proximity sensors shall work in conjunction with the control system to indicate proper sash position for containment.
28. Fluorescent lamps shall be mounted behind the control panel module out of the work zone. Electronic ballasts shall be used to eliminate flicker, extend lamp life and reduce heat output.
29. The UV lamp, if installed, shall be mounted behind the control panel and away from the user's line of site for protection. (Note: Does not apply to 1.8 meter/ 6 ft. model.)
30. The UV lamp shall operate via an automatic timer with automatic shut-off managed by the microprocessor controller and shall be interlocked with the blower/motor and fluorescent lights for safety.
31. The cabinet shall be designed with a 10° angled front to optimize user comfort, reduce glare and maximize reach into the work area.
32. The front grille shall be raised to prevent airflow blockage and improve comfort.
33. Penetrations for petcocks and service fittings shall be provided; penetrations shall be offset to improve user access.
34. The cabinet shall accommodate an optional mounting stand for fixed-height or adjustable height configurations.

#### **Control and Alarm System**



35. All cabinet functions shall be managed by a programmable microprocessor control system capable of software updates via Internet downloads.
36. The microprocessor controller shall be mounted on the main control panel facing down toward the user.
37. The controller shall include soft-touch keypad controls and backlit LCD displays to permit operation of the blower/motor, light, UV lamp, electrical outlet(s) and menu.
38. The controller shall be user programmable in situ to enable or disable functions such as PIN (personal identification number) access restriction, cabinet start-up protocol, airflow alarm and other microprocessor controlled operations outlined in the user manual.
39. When programmed ON, the start-up protocol shall perform an automatic pre-purge and postpurge cycle to ensure proper cabinet operation.
40. The controller shall include a blower/motor hours meter to display aggregate motor running time to assist in predictive maintenance.
41. Audible and visual alarms shall be provided for unsafe conditions such as improper airflow or sash position.
42. Airflow shall be monitored by a temperature compensating, thermistor-based, true air velocity sensor mounted in the cabinet.
43. The airflow display and alarm system shall be individually calibrated before shipment.
44. The main control panel shall exhibit continuous display of air velocity and a 24-hour clock display.

#### **Certification, Service and Decontamination**

45. The cabinet shall be approved for both hydrogen peroxide vapor (HPV) and formaldehyde decontamination protocol.
46. All panels leading to potentially contaminated and/or hazardous areas shall be color coded red.
47. All components with the exception of blower/motor and ULPA filters shall be located outside of contaminated air spaces to facilitate servicing without the need to decontaminate the cabinet.
48. All exterior surfaces shall be painted with a permanent antimicrobial inhibitor coating to minimize contamination.