

A **COMPREHENSIVE** GUIDE
TO OUR FUMEHOODS



Disclaimer

In keeping with the Godrej policy of continuous development and improvement, the dimensions and specifications of the Fume Hoods may be changed without prior notice or obligations. The Accessories shown in the manual are not a part of our standard offering. We advise our customers to read this manual carefully before using the product.

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Notes

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1 About Godrej Interio Laboratory Furniture & Engineering Solutions

Godrej Interio is India's largest furniture manufacturer with a vibrant & innovative brand and a diverse product portfolio. Identifying the need for state of art laboratories for research and development in biological life sciences, healthcare, electronics and instrumentation, chemicals and petrochemicals industry, Godrej Interio ventured into Laboratory Furniture and Engineering Solutions. Backed by an excellent manufacturing track record and product offerings conforming to highest standards of performance, it has established itself as a formidable player in this industry.

Godrej Interio Laboratory Solutions take away the hassle of dealing with multiple agencies and provide you a TURNKEY solution for your new build or refurbished laboratory. This includes designing of lab layouts, space planning and installation of furniture and other utility services. Our product and service portfolio includes storage cabinets, fume hoods, anti-vibration tables, exhaust/electrical/safety systems, bio-safety hoods, clean room benches, spot extractors etc.

Commissioning of a fully functional laboratory is done by our competent service team thereby ensuring continuity of work, reduced onsite times and project execution within the set deadlines.



2 Quick Facts

2.1 Introduction: Fume Hood

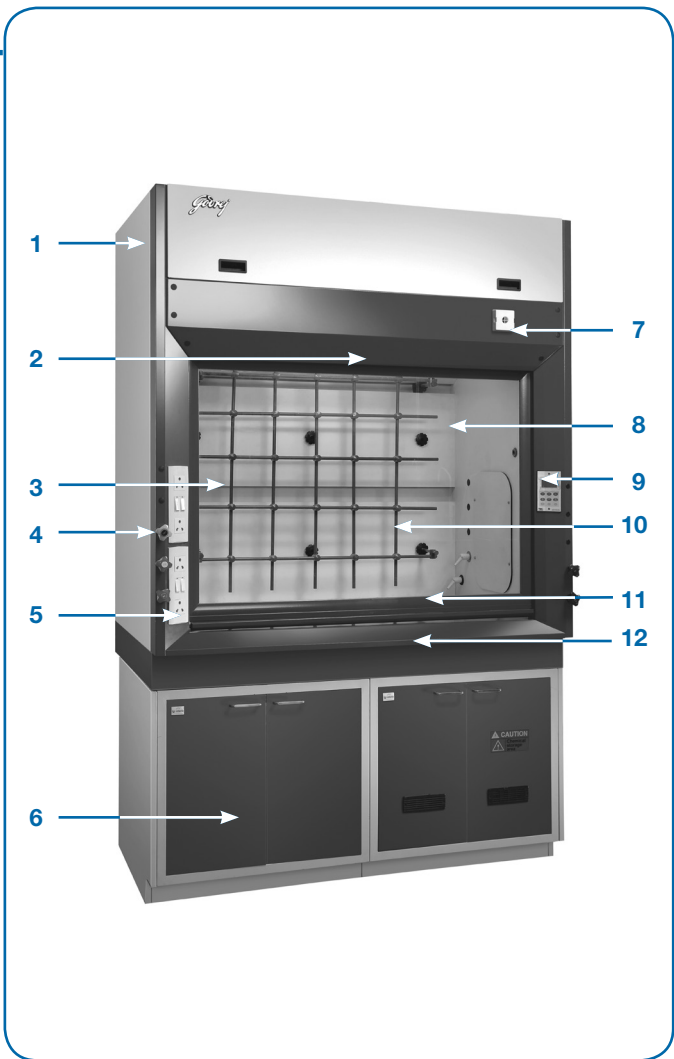
A laboratory Fume Hood (as per SEFA guidelines) is a safety device specifically designed to carry the undesirable effluents (generated within the hood during a laboratory procedure) away from laboratory personnel and out of the building, when connected to a properly designed ventilation system. This protects the lab worker standing in front of the hood and keeps background levels of contaminants in the lab at acceptable concentrations. It is made from flame resistant materials including the top, three fixed sides and a single face opening which is equipped with a sash. The face opening has a profiled entry and usually an airfoil designed to sweep and reduce reverse airflows on the lower surface. It is also equipped with a baffle and a bypass system which are designed to control airflow patterns within the hood and manage even distribution of air at the opening.

2.2 How does a Fume Hood work

The purpose of hood is to capture, contain and remove contaminants, preventing their escape into the laboratory. This is accomplished by drawing contaminants within the hoods work area away from the operator, so that inhalation and contact are minimized. Airflow into the hood is achieved by an exhaust blower which pulls air from the laboratory room into and through the hood and exhaust system. This pull at the opening of the hood is measured as face velocity. A baffle and other aerodynamically designed components control the pattern of air moving into and through the hood. Contaminated air within the hood is then diluted with room air and released through the hoods duct system to the outside where it can be dispersed at an acceptable concentration.

2.3 Parts of a Fume Hood

- 1 Epoxy Powder coated durable, galvanized steel rigid structure
- 2 Open / Restricted bypass to divert air from the face opening when the sash is lowered
- 3 3 Phenol based industrial laminate (6 mm thick)
- 4 3 Colour Coded Valves (with flexible hose and brass fittings)
- 5 4/16 amps, 230 V, 50 Hz Switch sockets
- 6 Under Storage Cabinet: Two storage units with 2 shutters each. Each unit has one shelf. Shutters are Doubleskin with CED coated self-closing hinges
- 7 Air Flow Sensor
- 8 Baffles: 3 point suction system (for light, normal & heavy fumes) to ensure smooth and immediate exhaust of fumes
- 9 Soft Touch Control Panel indicating the face velocity of the airflow, with LED's indicating low / normal flow rates
- 10 Apparatus Holding Grid
- 11 Vertical rising counter-balanced 'Toughened Float Glass' (4 mm thick) fitted in the Powder coated Aluminium extrusion
- 12 Flush powder coated airfoil mounted on the worktop to reduce the air turbulence



2.4 Classification of Fume hoods

2.4a Classification Based on Exhaust Systems

i] Constant Volume Exhaust Systems

ABP (Auto Bypass Unit)

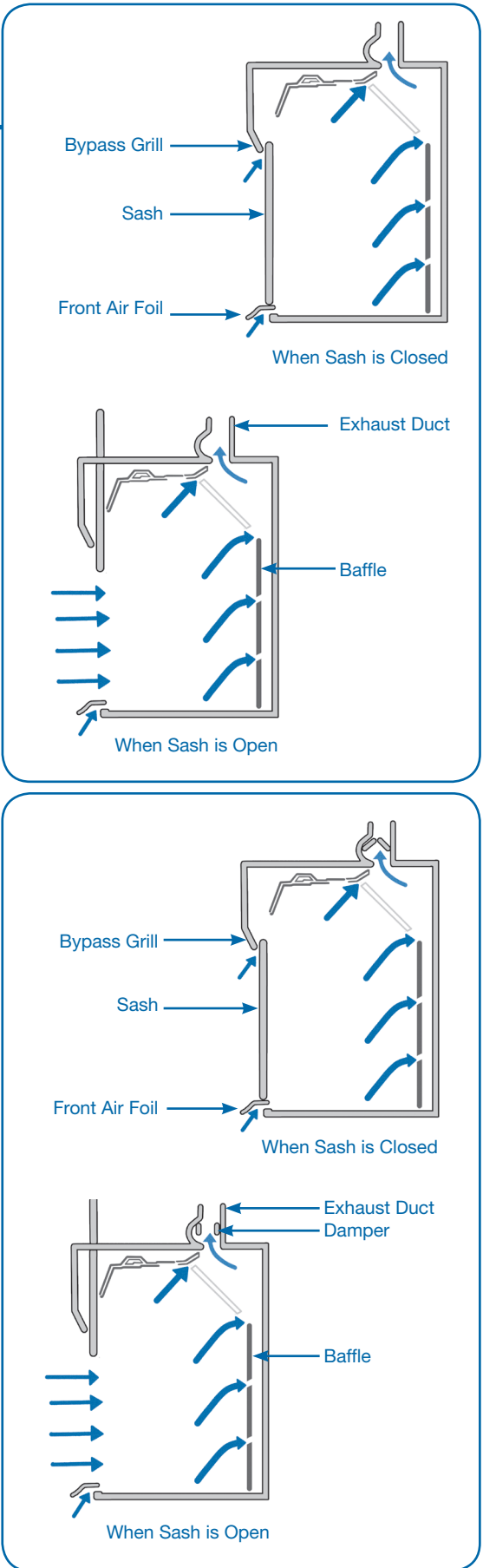
These Fume Hoods are designed to operate at constant exhaust volume, with the sash in closed position. Here air enters through the bypass openings at the top and bottom of the front face of the hood. This helps in preventing the increase in face velocity and thereby prevents turbulent airflow inside the hood. The main advantages of a bypass Fume Hood are its low initial cost, improved safety performance, and better efficiency. There are two types of bypass: Open bypass and restricted bypass. The latter serves the same function but the size is smaller. This is done to reduce the amount of air required by the laboratory fume hood.

LCV (Low Constant Volume)

They are designed to exhaust a constant volume of air from the laboratory Fume Hood regardless of hood use, sash position or operating mode. LCV Fume Hoods obtain reduced energy consumption by restricting the size of the sash opening to 1/3rd. This can be done by limiting the sash opening height or by using multiple horizontal sliding sashes in a common track, so that all the sashes cannot be opened at any given time.

ii] Variable Volume Exhaust System

It is designed to vary the Fume Hoods exhaust rate to maintain a constant average face velocity through the sash travel. VAV systems alter the exhaust volume using the Air Flow Monitor and an ECON damper that opens and closes based on airflow and sash position. VAV control offers significant energy saving opportunities by reducing the air volume released when the sash is lowered.



2.4b Classification based on Application

i] **Bench top Fume Hood**

It is generally placed on a bench top or above a storage cabinet. They are available in different sizes to accommodate a variety of chemical process. The critical dimensions for a hood include length, breadth and interior height; however, hood size is generally determined by the overall width of the hood. A five feet hood includes the width of the face and the side panels and is not a measure of the opening width. Bench top hoods can have vertical, horizontal or combination sash types and open or restricted bypasses depending on the sash type.

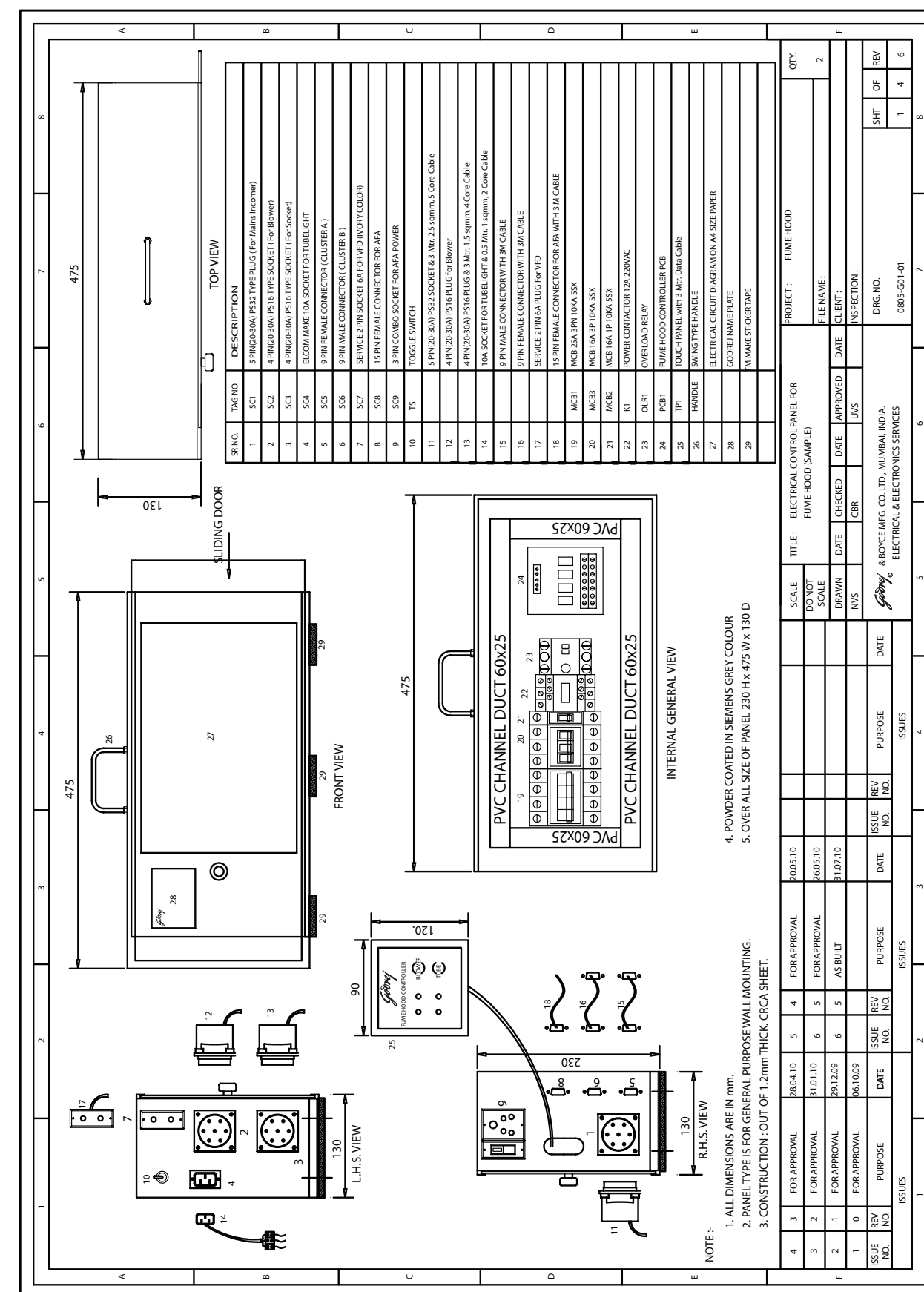
ii] **Low bench / Distillation Fume Hood**

It has the same components as a bench top hood with the exception that the design provides a greater interior height which enables use of large apparatus.

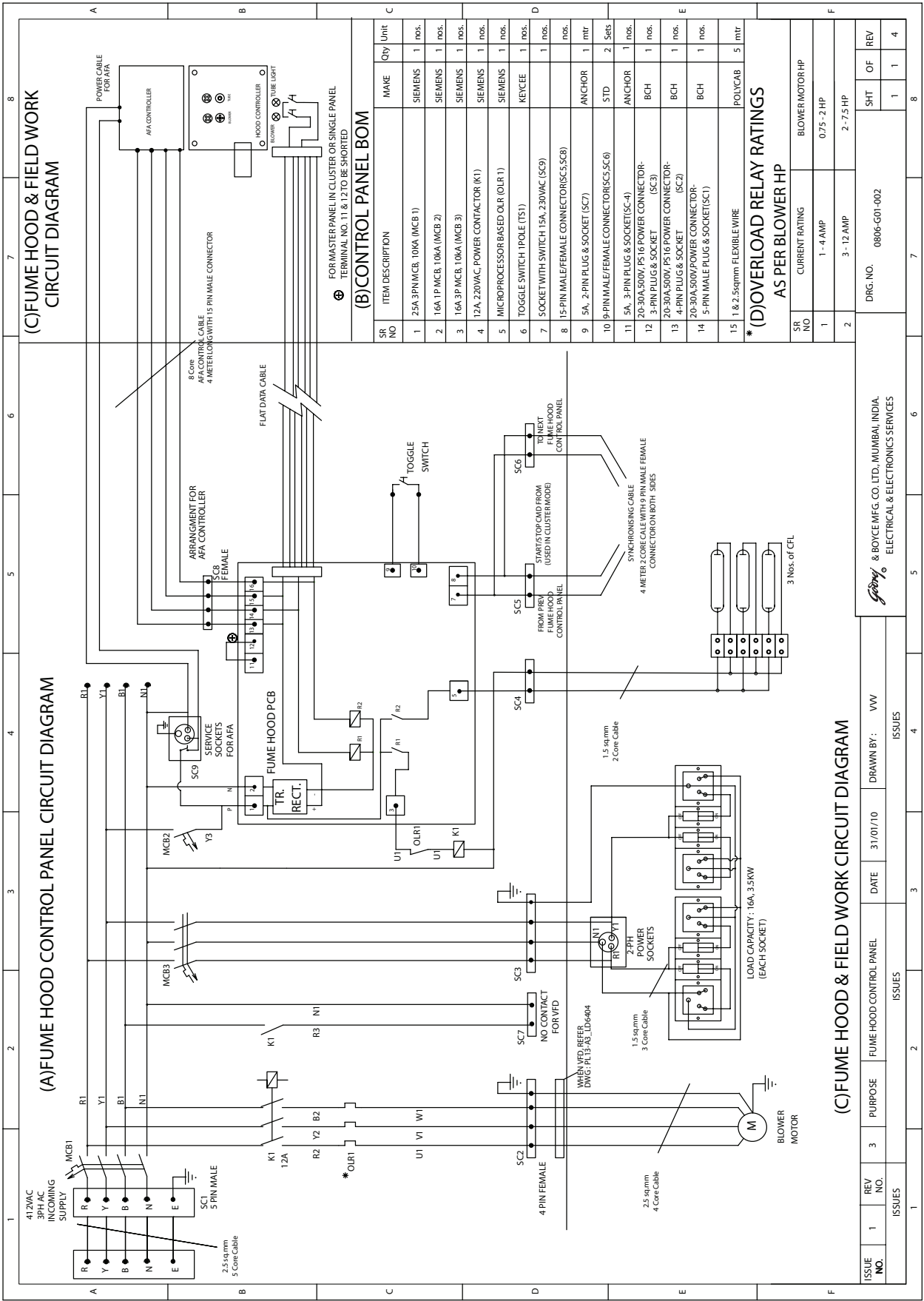
iii] **Walk in Fume Hood**

They are designed to handle large laboratory equipment with roll-in accessibility. However, the hood must never be entered during generation of hazardous materials or while concentrations exist within the enclosure. They are particularly susceptible to variations in face velocity across the opening and room air disturbances due to the large opening area afforded by the hood design. For this reason, it is prudent not to use a floor mounted hood for work with highly toxic materials.

2.5 Circuit Diagram [Electrical Control Panel]



2.6 Field Work Circuit Diagram



Godrej Interio Fume Hoods Range

Prime Air Fume Hoods



Robust Air Fume Hoods



3 About your Fume Hood

3.1 Robust Air Fume Hood

Godrej Interio Robust Air Fume Hood as the name suggests are robustly designed to contain contaminants adequately as per stringent EN 14175 Part 3, besides conforming to ASHRAE 110 Part I –III. They offer unmatched safety to the Fume Hood users and substantial energy savings to the facility owner respectively thereby greatly increasing the overall Green Quotient of the laboratory installation.

As per EN 14175, a Fume Hood is said to pass the Robustness Test if the containment is within norms even while the containment capacity of the operating Fume Hoods is challenged by disturbances due to the normal physical movements of the users present before the Fume Hood at Fume Hood face velocity of 60 FPM.

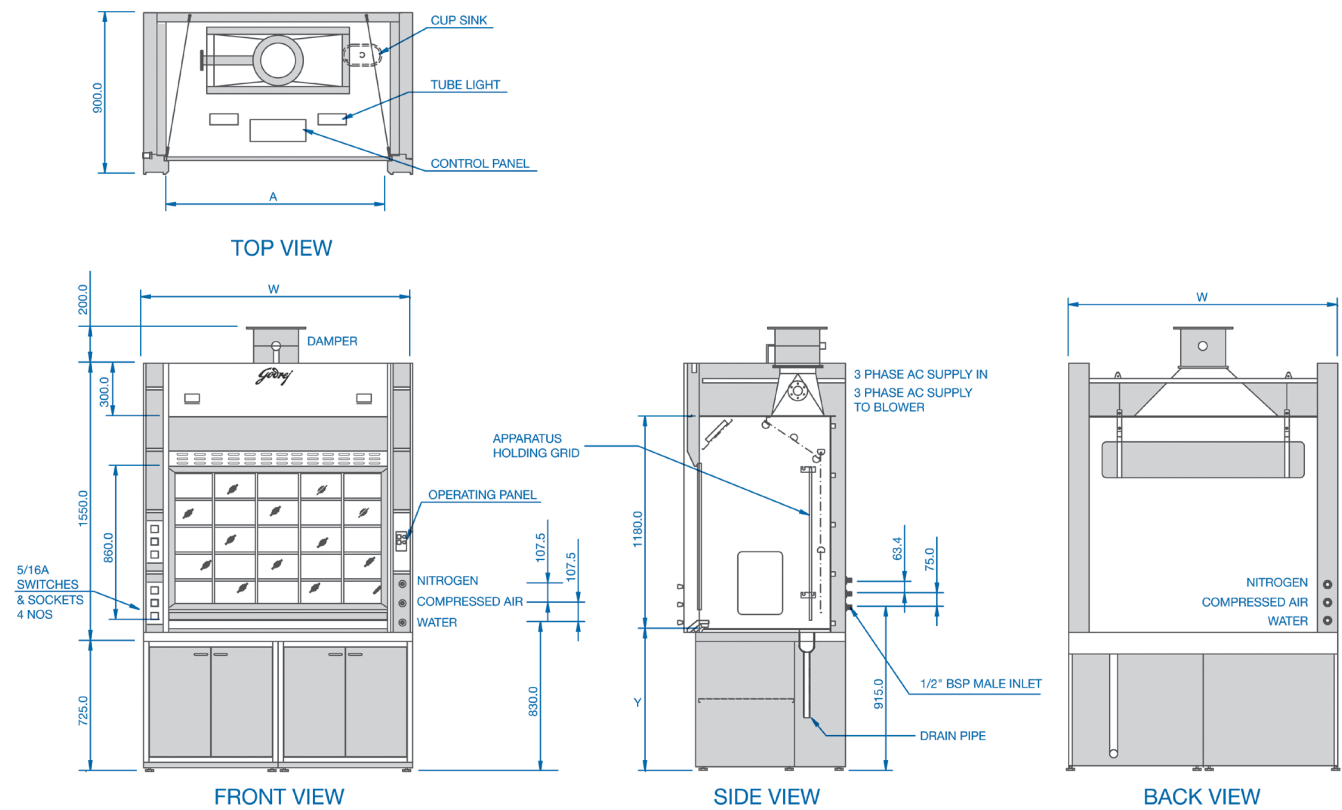
As per empirical fan formulae, the electric energy used by the blower fan varies inversely to the cube of air flow speed. Hence even a marginal drop in airflow speed will lead to substantial drop in energy consumed. While the energy saving in a stand alone Fume hood is clearly visible there is immense potential to save electrical energy in large installations as well.

Researchers have proved that in air-conditioned laboratories the Air Supply Unit Fans and Exhaust Ventilation Fans put together contribute to approximately 50% of electric energy consumed by the entire HVAC system in laboratories.

Considering the fact that a typical laboratory uses approximately eight times more energy than a commercial air-conditioned space of the same area, one can calculate the theoretical energy savings Godrej Interio Robust Air provides in large Fume Hood installations.

Godrej Interio offers Variable Air Volume / Low Air Volume Robust Air Fume Hoods along with Variable Frequency Drive to maximize energy savings there by reducing carbon foot print of the entire facility without compromising the operator safety which is the main objective of a Fume Hood.

3.1a Robust Air Bench Top Fume Hood (LD 6424)



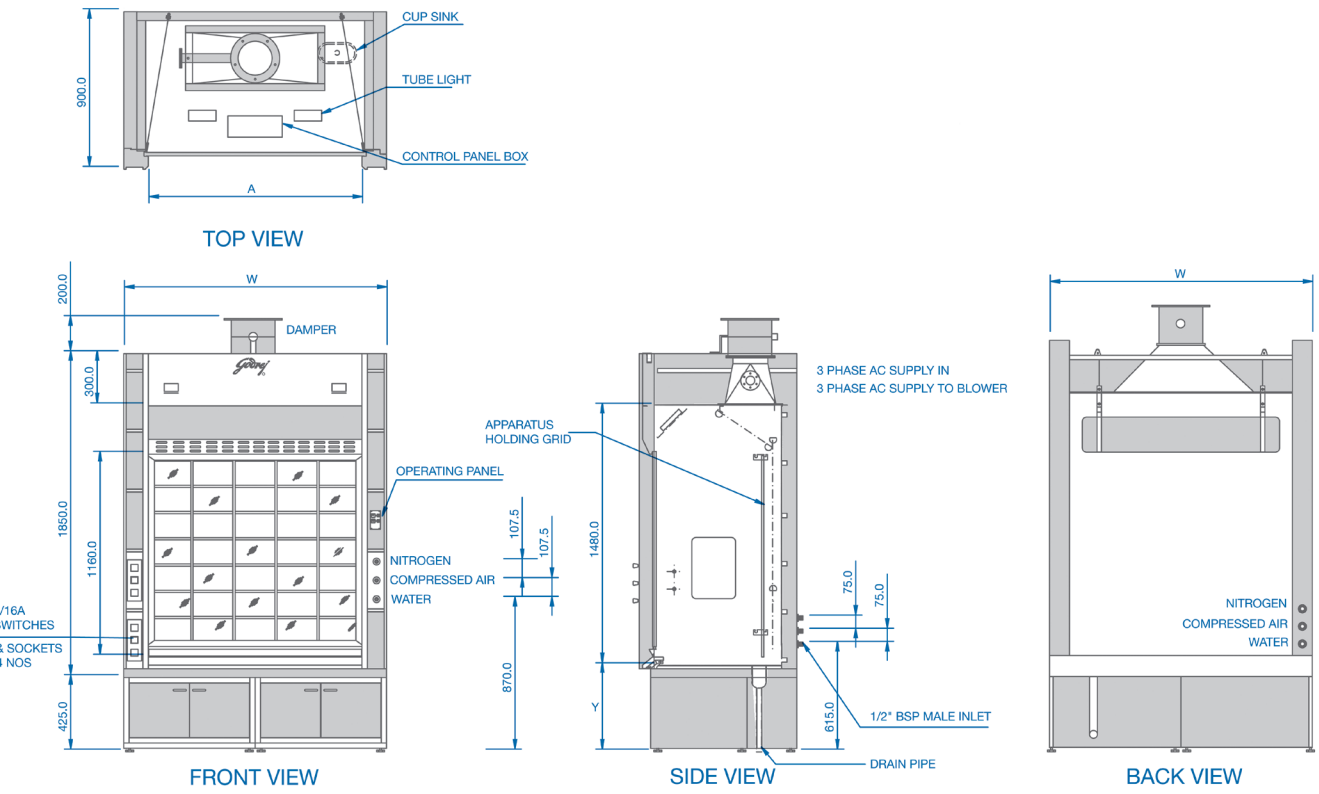
Fume Hood Width	3'	4'	5'	6'	7'	8'
Overall Dimension (W x D x H)	900 x 900 x 2400	1200 x 900 x 2400	1500 x 900 x 2400	1800 x 900 x 2400	2100 x 900 x 2400	2400 x 900 x 2400
Working Volume (A x D x H)	620 x 665 x 1180	920 x 665 x 1180	1220 x 665 x 1180	1520 x 665 x 1180	1820 x 665 x 1180	2120 x 665 x 1180
Bed Size	620 x 665	920 x 665	1220 x 665	1520 x 665	1820 x 665	2120 x 665
Worktop Height from the Ground (Y)	900	900	900	900	900	900

*All Dimentions in mm

* 3 feet Robust Air fume hood has only one storage unit; 4, 5 and 6 feet fume hoods have two srorage units and 7 and 8 feet fume hoods have three storage units in the Under Structure Cabinet.

** 3, 4, 5 and 6 feet Robust Air fume hoods have only one transition at the top whereas 7 and 8 feet fume hoods have two transitions.

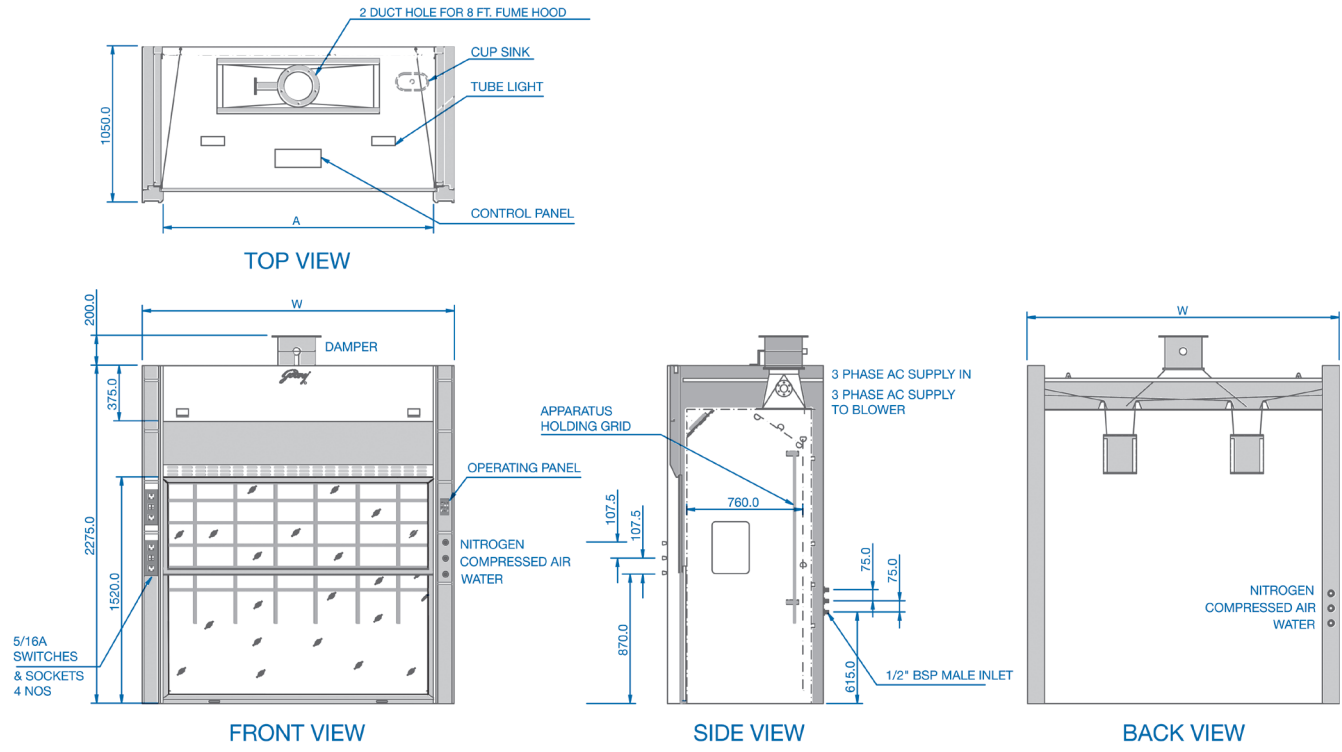
3.1b Robust Air Low Bench Fume Hood (LD 7048)



Fume Hood Width	3'	4'	5'	6'	7'	8'
Overall Dimension (W x D x H)	900 x 900 x 2400	1200 x 900 x 2400	1500 x 900 x 2400	1800 x 900 x 2400	2100 x 900 x 2400	2400 x 900 x 2400
Working Volume (A x D x H)	620 x 665 x 1480	920 x 665 x 1480	1220 x 665 x 1480	1520 x 665 x 1480	1820 x 665 x 1480	2120 x 665 x 1480
Bed Size (W x D)	620 x 665	920 x 665	1220 x 665	1520 x 665	1820 x 665	2120 x 665
Worktop Height from the Ground (Y)	500	500	500	500	500	500

*All Dimentions in mm

3.1c Robust Air Walk In Fume Hood



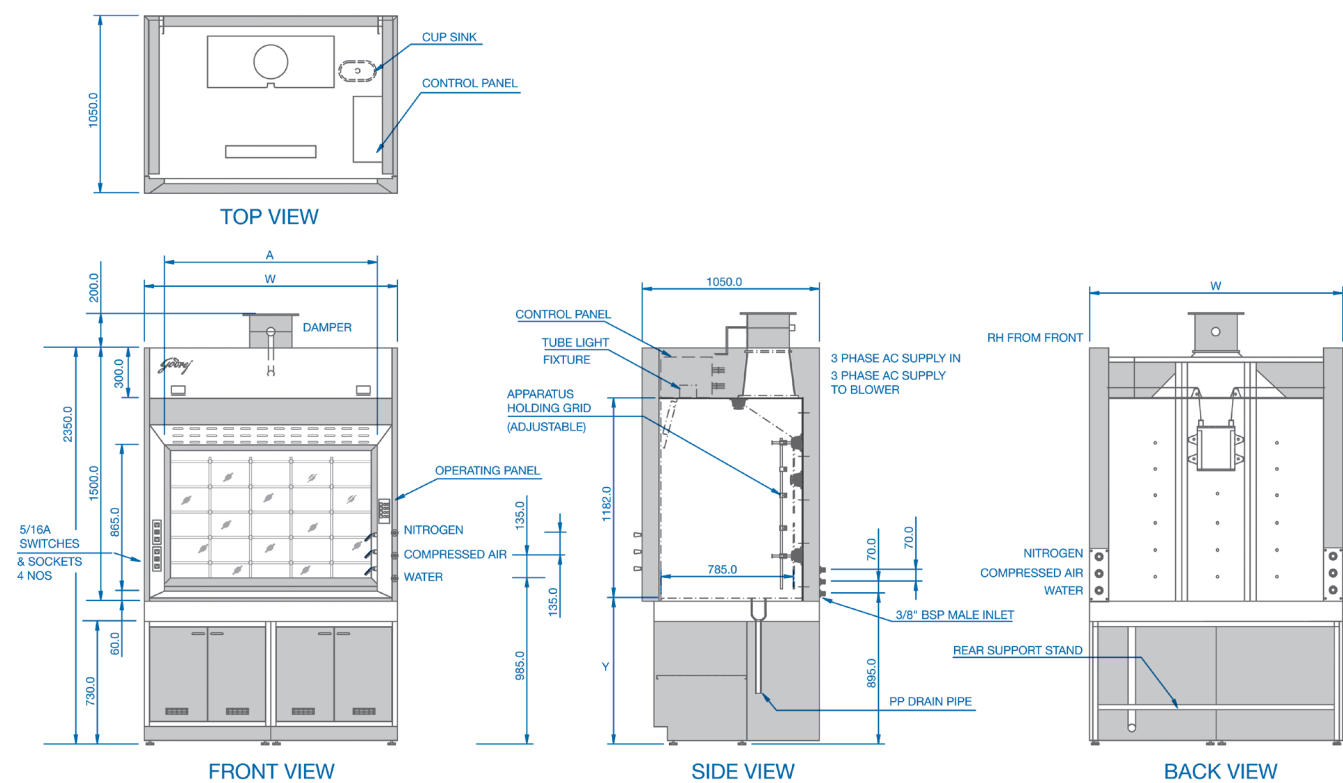
Fume Hood Width	3'	4'	5'	6'	7'	8'
Overall Dimension (W x D x H)	N / A		1500 x 1050 x 2400	1800 x 1050 x 2400	2100 x 1050 x 2400	2400 x 1050 x 2400
Working Volume (A x D x H)			1260 x 760 x 1950	1560 x 760 x 1950	1860 x 760 x 1950	2160 x 760 x 1950
Bed Size			1260 x 760	1560 x 760	1860 x 760	2160 x 760
Worktop Height from the Ground (Y)	No Worktop					

*All Dimentions in mm

3.2 Prime Air Fume Hood

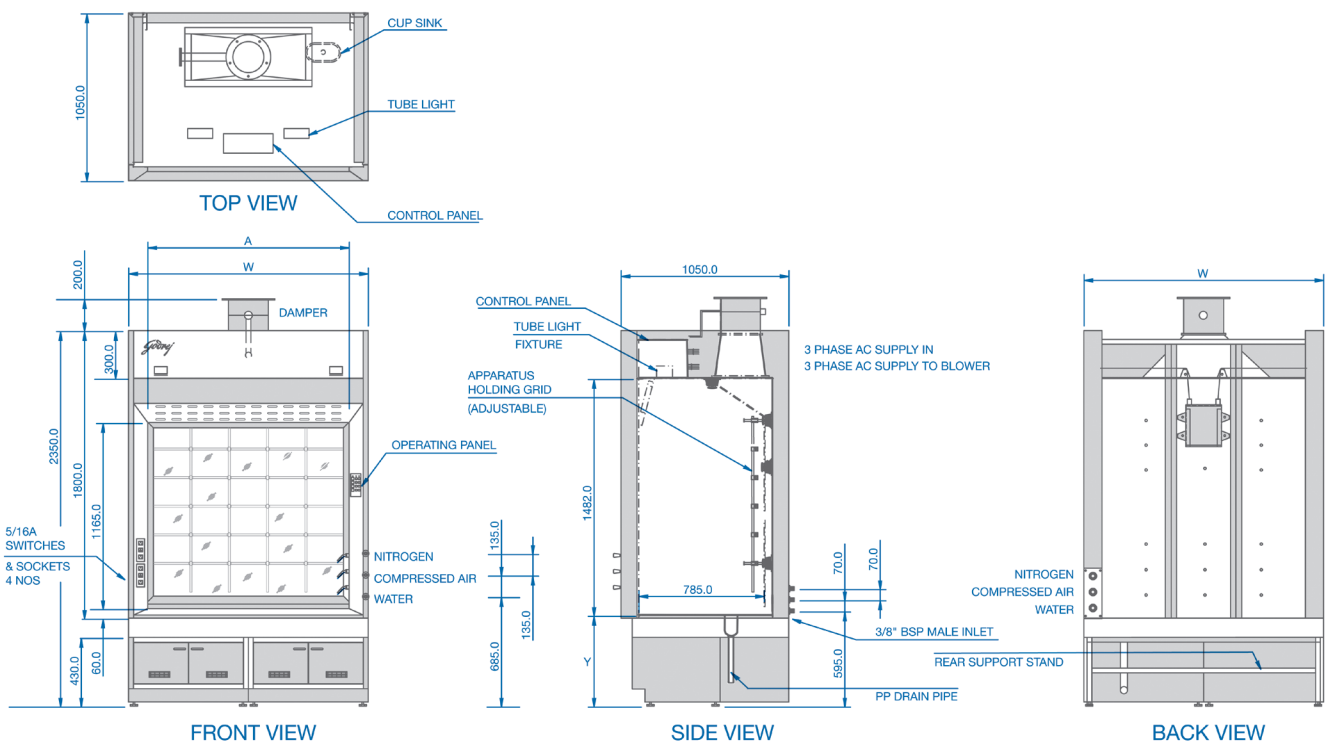
The Prime Air Fume Hoods are constructed from epoxy coated stainless steel CRCA (Cold Roll Close Anneal) sheets for enhanced corrosion resistance. Better corrosion resistance is also brought about by coating all the sheet metal with pure epoxy powder. The cabinets are lined with solid phenol based laminate, thus ensuring excellent chemical and heat resistance. For better illumination and power saving, each cabinet has a CFL tube light (230V, 36 watt). Also, the tube light fixture has user friendly features like easy replacement and a service door at the top of the cabinet. The work top is equipped with a splash guard on all sides for spillage collection. The cup sink and drain pipe are made using Polypropylene. The fastener free and metal free interior ensures the prevention of corrosion in the hood. Plus, the cabinet comes with an enhanced depth of 1050mm for greater working area in the hood. The design is also available in high sight line designs for taller apparatus. These Fume Hoods are complemented with sturdy ceiling enclosures.

3.2a Prime Air Bench Top Fume Hood (LD3415)



Fume Hood Width	3'	4'	5'	6'	7'	8'
Overall Dimension (W x D x H)	900 x 1050 x 2400	1200 x 1050 x 2400	1500 x 1050 x 2400	1800 x 1050 x 2400	2100 x 1050 x 2400	2400 x 1050 x 2400
Working Volume (A x D x H)	660 x 785 x 1182	960 x 785 x 1182	1260 x 785 x 1182	1560 x 785 x 1182	1860 x 785 x 1182	2160 x 785 x 1182
Bed Size (W x D)	660 x 785	960 x 785	1260 x 785	1560 x 785	1860 x 785	2160 x 785
Worktop Height from the Ground (Y)	900	900	900	900	900	900

3.2b Prime Air Low Bench Fume Hood (LD 4062)

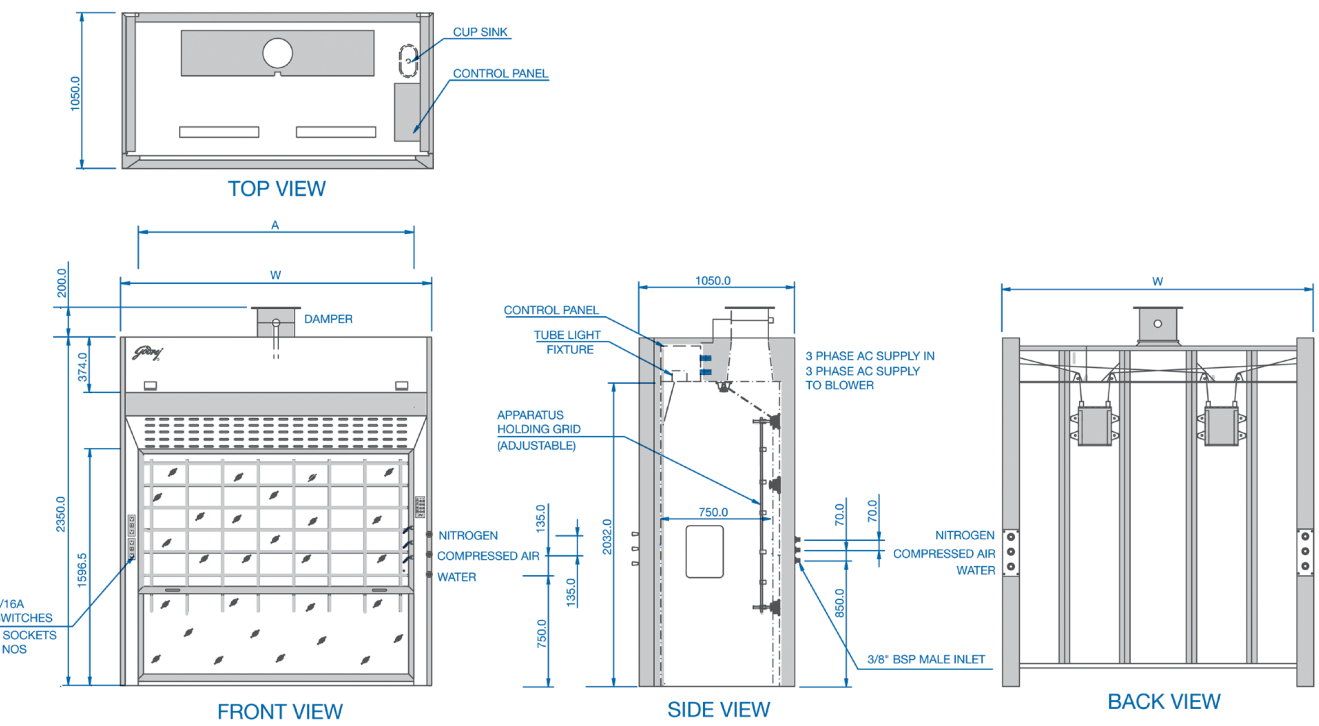


Fume Hood Width	3'	4'	5'	6'	7'	8'
Overall Dimension (W x D x H)	900 x 1050 x 2400	1200 x 1050 x 2400	1500 x 1050 x 2400	1800 x 1050 x 2400	2100 x 1050 x 2400	2400 x 1050 x 2400
Working Volume (A x D x H)	660 x 785 x 1482	960 x 785 x 1482	1260 x 785 x 1482	1560 x 785 x 1482	1860 x 785 x 1482	2160 x 785 x 1482
Bed Size (W x D)	660 x 785	960 x 785	1260 x 785	1560 x 785	1860 x 785	2160 x 785
Worktop Height from the Ground (Y)	500	500	500	500	500	500

*All Dimentions in mm

* 3 feet Prime Air fume hood has only one storage unit; 4, 5 and 6 feet fume hoods have two sorage units and 7 and 8 feet fume hoods have three storage units in the Under Structure Cabinet.
** 3, 4, 5 and 6 feet Prime Air fume hoods have only one transition at the top whereas 7 and 8 feet fume hoods have two transitions.

3.2c Prime Air Walk In Fume Hood



Fume Hood Width	3'	4'	5'	6'	7'	8'
Overall Dimension (W x D x H)	N / A	1200 x 1050 x 2400	1500 x 1050 x 2400	1800 x 1050 x 2400	2100 x 1050 x 2400	2400 x 1000 x 2400
Working Volume (A x D x H)		960 x 750 x 2100	1260 x 750 x 2100	1560 x 750 x 2100	1860 x 750 x 2100	2160 x 750 x 2100
Bed Size (W x D)		960 x 750	1260 x 750	1560 x 750	1860 x 750	2160 x 750
Worktop Height from the Ground (Y)	No Worktop					

*All Dimentions in mm

3.3 Working Parts - - - - -

3.3a Centrifugal Blower

It is a silent, highly efficient remote blower consisting of continuous rating motor and chemical resistant impeller. The blower is designed to give a face velocity of 60 to 120 fpm as per ANSI/ AIHA Z9.5 at the safe working height. It satisfies all international safe velocity norms and is mounted on an Anti Vibration pad for shock absorption.



3.3b Ducting

Rigid Ducting of PP+FRP, Flexible Ducting, with Flanges, Bends, Dampers Transitions, Clamps up to Blower. Flexible joints are provided in the ducting in order to avoid transmittion of Blower Vibrations to the hood. A weather proof rain cowl is also provided at the outlet of blower.

3.3c Testing

All Fume Hoods are 'Factory Tested' as per international face velocity norms. Also, 'Onsite Validation' is carried out to ensure that the Fume Hood works as per international norms.

4 The Godrej Advantage

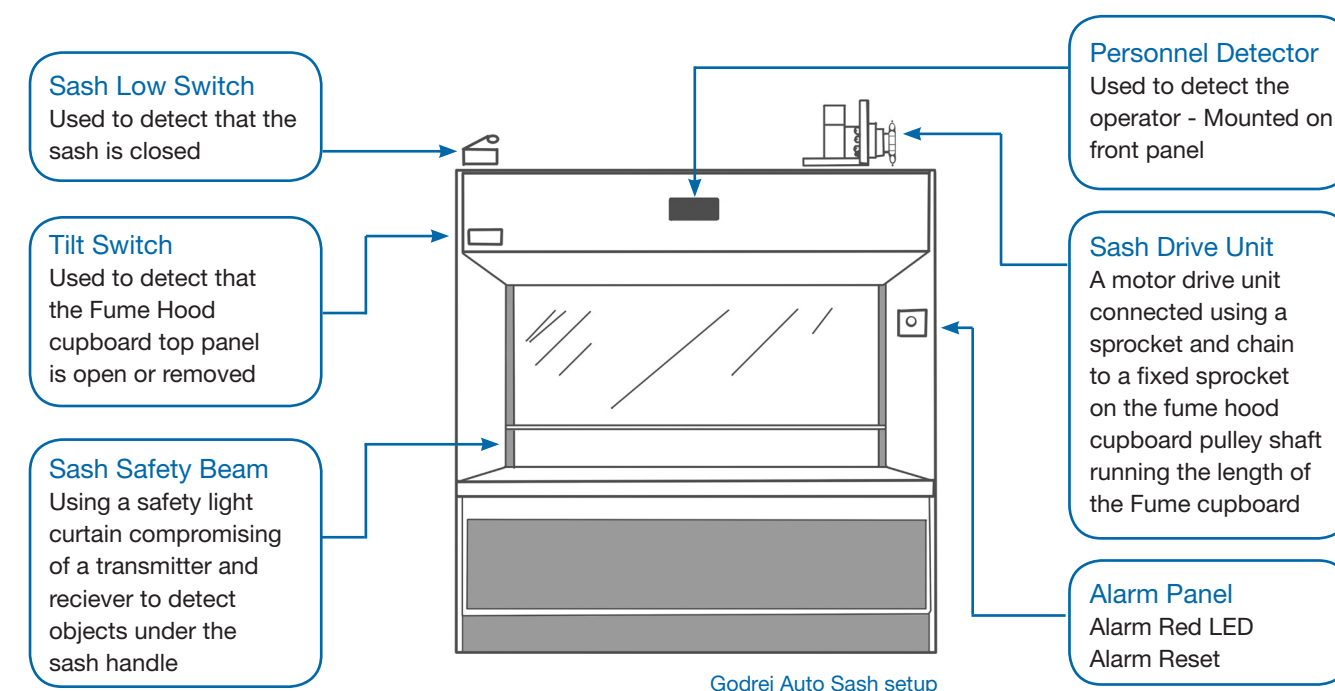
Salient Features of Godrej Interio Fume Hoods

1. Enhanced corrosion resistance owing to GP chromate zero sprangle CRCA sheets.
2. Better corrosion resistance as all sheet metals used are pure epoxy powder coated.
3. Since solid phenol resin based laminates are used as a liner, it offers excellent chemical & heat resistance properties.
4. Control panel for critical controls with built-in blower motor starter & overload controller. (Customers do not have to purchase motor starter separately).
5. Accessibility & Serviceability: Storage cabinets from the under structure table can be easily detached to get access to the rear side of the Fume Hood. Service panels provided on the sideliner provide easy access to remote control valves (working pressure of 150 psi for water and gas valves).
6. Sash: 4 mm thick toughened glass is fitted in the powder coated Aluminium extrusions. The sash is counter balanced with SS wire rope and has a smooth operation as the wire rope is guided over nylon bearings.
7. Rectangular to circular transition at the outlet of Fume Hood ensures silent operation.
8. Modular electrical switches & sockets for easy replacement (without opening any panel) & good aesthetics.
9. CFL tube light (230 V, 36 watt) is used for better illumination & power saving. Tube light fixture is designed for easy replacement. Service door is provided at the top for easy access to the tube light.
10. The worktop is equipped with a splashguard on all sides for spillage collection. Cup sink & drainpipe are of PP for long life.
11. Corrosion inside the hood is avoided with a fastener free interior.
12. There is an option of Apparatus Storage Cabinet or Chemical Storage cabinet with the fume hood. In the latter option, cabinets are coated with a 2mm Chemical resistant polypropylene layer and provided with a ducting mechanism for longer life & ventilation of fumes.
13. Storage cabinets are provided with the self-closing CED coated hinges. CED coating provides a protection against corrosion. Cabinets are also offered with SS handles.
14. Hood is designed for easy accommodation of apparatus holding grid at any point of time without making any changes in the existing hood. Apparatus grid is made from aluminium or stainless steel tubes which are in turn EPOXY powder coated to avoid any corrosion.
15. Godrej Prime Air and Robust Air fume hoods conform to highest standards of performance and offer unmatched safety because they have been tested and certified as per ASHRAE-110 and EN-14175.

5 Accessories

5.1 Auto Sash Control

Fume Hoods consume a large amount of energy and its poor management leads to high energy consumption. Moreover, most operators leave the hoods fully open all the time. This can lead to poor containment due to reduced air flow velocity. But Godrej Interio 'Auto Sash Closure' helps you in proper control of the sash position, automatically through a smart system comprising of personnel & sash sensors, alarm panel, sash low and tilt switch and sash drive unit.



An electronic sensor located at a convenient height (not more than 2800 mm) on the front face of the Fume Hoods scans the area.

- If the area in front of the Fume Hood is clear, the sash control will close the sash after a delay of 30 seconds.
- If the user returns to the Fume Hood during the 30 second period, the control timer will stop and reset once the user has left the Hood again.
- If the user returns to the Hood once the sash is closing the drive will stop as soon as it sees the user.
- If there is an obstruction detected under the sash the sash control will not operate the sash and will give a visual alarm to indicate a fault condition.
- If there is an obstruction detected whilst the sash is closing the sash drive will stop and give a visual indication to indicate a fault condition. The fault alarm can be reset by pressing the reset button.
- Once the sash is closing a timer is initiated, if the sash does not close within the specified time the sash drive will stop and will give a visual alarm to indicate a fault condition. At any time if the user is in front of the Hood the sash can be operated by hand. Such a mechanism ensures adequate safety by providing optimal containment and still maintaining a constant face velocity.
- Additional energy savings, if required, are possible through reduction in fan speed (with the help of a Variable frequency drive) in relation to the sash position without violating the ACH requirements or the Laboratory Design considerations from the occupants' safety point of view.
- As an added advantage Godrej Interio Auto Sash Closure can be retrofitted to an already in-use Godrej Interio Fume Hood.

5.2 Cabinets - - - - -

Fume Hoods are designed to rest on a bench – high base stand or a cabinet which is a complete rigid steel structure. It is epoxy powder coated to prevent corrosion and rusting. Base cabinets have two storage units with two shutters each and each unit has one shelf. Shutters are Double Skin with CED coated self closing hinges.

Overall Dimensions of the Storage Cabinet:

Width Of Fume Hood (feet)	Width (W) mm.	Depth (D) mm.	Height (H) mm.
4	545	570	643
5	695	570	643
6	845	570	643
8	765	570	643

Chemical Storage Base Cabinets:

The above mentioned Apparatus Storage Base Cabinet when provided with internal lining (including shelf) of 1mm Polypropylene/FRP and a ducting mechanism, becomes a chemical storage base cabinet which can be used for storing toxic chemicals.



5.3 Worktop Options

The Work Surface should be chosen according to the type of chemicals to be handled in the Fume Hood. Proper selection of work material is very critical for optimum Fume Hood performance. Sink and the trap material can also be chosen according to the work surface. Chemical resistant splash and spillage proof ‘Jet Black Granite’ worktop is our standard offering.

Granite: These are only damaged by hydrofluoric acid. Advantage is that it has best chemical resistance. The disadvantages are variation in thickness as it is a natural material and less ability to take thermodynamic stress there by making it difficult to transport. It can be used in areas where there is high chemical usage and it is easily available in India.

Vitrified Tiles: This material is resistant to almost all the acids except hydrofluoric acid. In spite of having high resistance to chemicals, it forms gaps on the tops which requires filling and is difficult to clean. However, it can be used in all kinds of laboratory benches that are subject to chemical usage.

Polypropylene: These tops react with hydrocarbons, citric acids, oxalic acid, carbon tetrachloride, diesel, petrol, ozone, concentrated nitric acid, chloroform and benzol. The advantages of this work surface are flat surface, light weight, less glass breakage. The major disadvantages are that the material is soft and sensitive to scratches and heat. It can be used in areas which involve working with hydrofluoric acid and radioisotopes.

Epoxy Resin: They easily react with various solvents and diluted acids and are damaged by hydrofluoric acid, concentrated warm mineral acids. The advantages are even thickness, flat and solid panels and high mechanical loading possibility. However, they are sensitive to concentrated acids and scratches.

Stainless Steel: It reacts with cadmium, lactic acid, oxalic acid and gets easily damaged by compounds containing formic acid and sulphuric acid. They are also sensitive to halogens and their compounds. They have high temperature resistance and are used in biological, microbiological, pharmacy, pathology labs and radioisotope areas which require maximum decontamination, moisture and solvent resistance.

5.4 Air Flow Monitor - - - - -

Air Flow Monitors alert the operator immediately if face velocity falls below a pre programmed operating level. This device is an accessory for a Fume Hood and indicates the approximate face velocity of airflow with the primary purpose of warning when a low flow condition occurs. Red and green LEDs correspond to low and normal flow rates (respectively). When flow decreases from Normal to Low, an audible alarm will also activate requiring manual acknowledgement for silence.

Operating Features:

- a) Safe LED (non flashing) will be displayed if the airflow is greater than low air alarm point.
- b) Alarm LED (flashing) will be displayed if the airflow is less than low air alarm point.
- c) Sash High (flashing) will be displayed if the sash is raised above the safe working height.
- d) ENTER also can be used to mute audible alarms.

It is recommended that none of the settings of the air flow monitor are changed without consulting with Godrej technical support personnel.

5.5 Apparatus Holding Grid - - - - -

It is made up of Aluminum (with epoxy powder coating) pipe, to hold the apparatus. It will cover the entire length of the fume hood and is placed at fume hood backside.



- Display range – 0-999 fpm (0-5.0 m/s)
- Alarm range – 0-999 fpm (0-5.0 m/s)
- Field set-up – 2-point velocity calibration (with on-screen instructions)
- Accuracy Sensor / Display resolution - 1 fpm
- Face velocity accuracy is +/-10%
- Power Requirement Input – 120VAC, 60Hz
- Output – 15VDC, 500ma
- Alarm indication – Red LED & audible alarm
- Auxiliary pushbuttons – 3 (used for fan start/stop, light on/off, scrubber pump on/off etc)
- Operating temperature – 13-30 C



5.6 Liner Options

The material used for a Fume Hood interior is called a liner.
The options available are:

Industrial Laminate: It is light in weight and has fairly good resistance to chemicals.

Stainless Steel: It has excellent chemical/heat and stain resistance. It also offers superior moisture and impact resistance and has excellent cleanability.



6 Best Practices

6.1 Safety Checklist

Please follow safety instructions at all times.

Failure to follow these instructions could result in physical injury or illness.

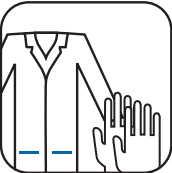
Do's



1 Confirm that the fume hood exhaust system and controls are operating properly and providing the necessary airflow. It is recommended that the hood be equipped with an air flow monitoring device.



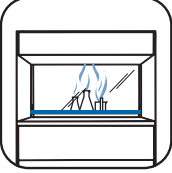
2 Fume hood should be tested at the time of installation and annually thereafter by a qualified Godrej Interio service personnel.



3 Protective clothing like gloves, lab coat, approved eye protection, long pants, safety shoes, etc is a must.



4 Clean spills immediately.



5 If fumes or odours are present, stop operating the hood & close the sash.



6 The hood user should know the Standard Operating Procedure (SOP) of the hood and should design experiments in consultation with the laboratory in charge whenever there are hazards associated with dangerous fumes leaking out.



7 Limit chemical storage in fume hoods. Keep the smallest amount of chemicals in the hood needed to conduct the procedure at hand.

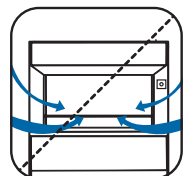
Dont's



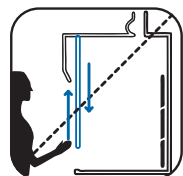
- 1 Do not use hood for Perchloric acid procedures



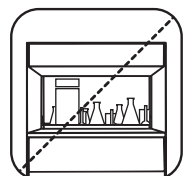
- 2 Do not place your head inside the hood. Extend only hands and arms into the hood.



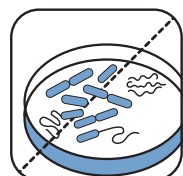
- 3 Do not open the hood if there are cross-drafts or turbulence in front of the hood.



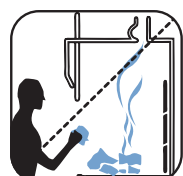
- 4 Do not open the sash rapidly. Avoid rapid body movements.



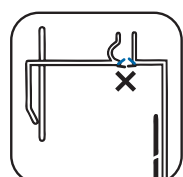
- 5 Do not use a fume hood as a storage device. Keep only necessary materials inside the hood.



- 6 Work involving harmful micro organisms should be done in a Biosafety Cabinet, rather than a chemical hood.

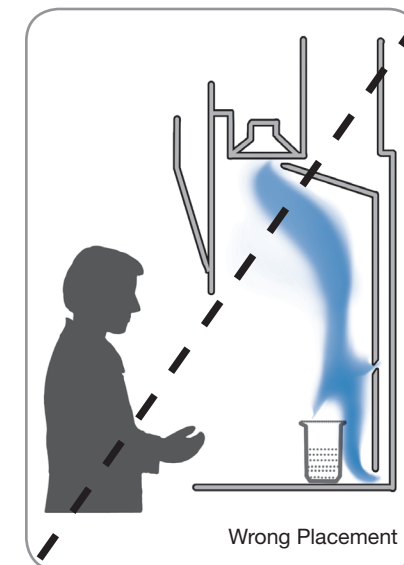
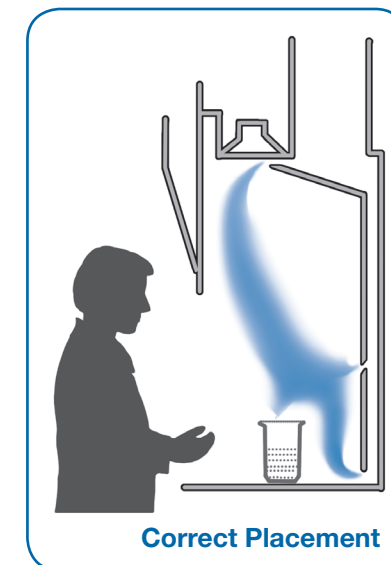
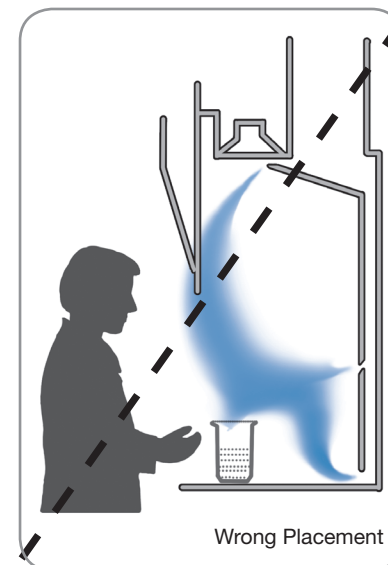


- 7 A fume hood should not be used for waste disposal. It is a violation of environmental regulations to intentionally send waste up the hood stack.



- 8 Godrej VAV Fume hood is equipped with adjustable dampers. Please do not adjust them without consultation with qualified Godrej Interio service personnel.

6.2 Placement of Material inside Fume Hood



6.3 Designing a Laboratory

- The laboratory should be completely separated from outside areas. It must be bound by four walls because having enclosed laboratories will help contain spills, keep unauthorized personnel from entering areas where hazardous operations are performed.
- All chemical / biological / pathological laboratories should have a sink for hand washing because exposure to hazardous materials / pathogenic organisms can occur by hand to mouth transmission. Therefore, it is extremely important that hands are washed prior to leaving the laboratory.
- Chemical storage shelves should not be placed above laboratory sinks.
- The laboratory shall have a minimum aisle clearance of at least 24". Main aisle used for emergency egress must have a clearance width of at least 36". Clear aisles and exits are necessary to facilitate departure in the event of an emergency.
- Laboratory shelving should not be installed at heights and distances which require workers to reach 30cms above shoulder height and extend arms greater than 30cms while holding objects of weight 16kg or less when standing on the floor or on a 12" step stool. Installation of high shelving, above laboratory benches in particular, can create several potential hazards like ergonomic issues, spill and exposure to chemicals, radiological and biological agents.
- Laboratory areas should be provided with adequate natural or artificial illumination to ensure sufficient visibility for operational safety.
- The space between adjacent workstations and laboratory benches should be 5' or greater to provide ease of access. In a teaching laboratory, the desired spacing is 6'. Clear aisles and exits are necessary to facilitate departure in the event of an emergency.
- Materials which in combination with other substances may cause a fire or explosion, or may liberate a flammable or poisonous gas, must be kept separate.

- It is recommended that solvents should not be stored under the laboratory Fume Hoods, as this is a location where fires are most likely to occur.
- Flammable liquid storage cabinets should not be located near exit doorways, stairways, or in locations that would impede leaving the area. Nor it should be wall mounted, or located near an ignition source. Vent materials for flammable liquid storage cabinets shall be resistant to high temperatures. Stainless Steel, hard soldered copper, and carbon steel are all appropriate vent materials for flammable storage cabinets. Clear aisles and exits are necessary to facilitate departure in the event of an emergency.
- Sufficient space or facilities (eg storage cabinets with partitions) shall be provided so that incompatible chemicals/ gases (waste and non waste) can be physically separated and stored. Materials which in combination with other substances may cause a fire or explosion, or may liberate a flammable or poisonous gas, must be kept separate.

6.4 Selecting a Fume Hood

Factors to be considered while selecting a Fume Hood

Room Size: Length x Width x Height

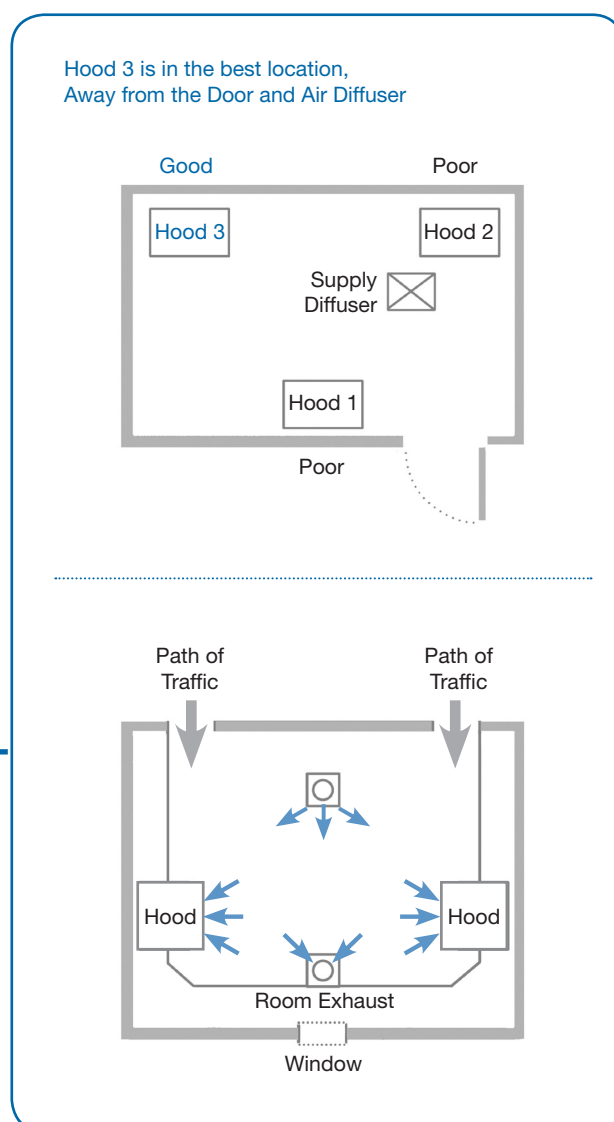
- 3' & 4' width hoods are intended for 1 person, with relatively small apparatus.
- 5' hoods are for 1 or 2 people or with large apparatus.
- 6' hoods are generally for 2 or more people in teaching labs or with very large apparatus.
- 6' hoods are not recommended as large capacity blower is reqd to exhaust effectively.

Fume Hood Application

- A normal Auto – Bypass Fume Hood can be used for general purpose applications like in teaching & non – AC research laboratories involving use of acids & organic solvents.
- For handling Per Chloric acid, highly toxic & other unstable explosive materials, a stainless steel interior should be used in a Fume Hood.
- Godrej LCV and VAV Fume Hoods should be used for AC labs

6.5 Location instructions – – –

- Fume Hoods should be located away from activities or facilities, which produce air currents or turbulence. It should also be located away from high traffic areas, air supply diffusers, doors, and operable windows.
- Fume Hoods should not be located adjacent to a single means of exit. It is recommended that hoods be located more than 10 feet from any door or doorway.



- Fume Hood openings should not be located opposite workstations where personnel will spend much of their working day, such as desks or microscope benches.
- A Fume Hood should be placed away from the face of another hood positioned directly across an aisle.
- If clustering of Fume Hood is done, then the hoods should be arranged in such a way to give minimum amount of ducting.

6.6 Maintenance of a Fume Hood

Your 'GODREJ' Fume Hood is virtually maintenance free and requires minimum maintenance.

- The exterior surface of the Fume Hood and the sash should be cleaned regularly with an appropriate cleaner. (Note: be sure this cleaner is not reactive with other chemicals in the laboratory).
- Stainless steel surfaces should be cleaned with a stainless steel cleaner and wipe only in the direction of the grain to ensure scratches do not form.
- Air Foil area should be kept dirt free to prevent any accumulation of chemicals and other foreign material.
- Check all internal pulleys and cables for any deterioration on a monthly basis.
- If the Fume Hood environment is very corrosive, checks should be performed more often.

7 FAQ

- 1 Which airflow option should I choose: By-pass, LCV or VAV?**
For non air conditioned labs, you should go for Automatic By-pass model. For A.C. labs, one has a choice between Auxiliary or LCV / VAV models. The selection will depend upon your Fume Hood usage and other HVAC parameters. Please feel free to contact us to select the right model for your applications.
- 2 Do I need to go for a special application Perchloric Acid Hood, even though I use Perchloric acid very rarely in my chemical processes?**
For day to day applications where perchloric acid usage is low, you need not go for a special hood. Only for extensive usage of perchloric acid, dedicated Fume Hoods are to be used. A dedicated hood is required because explosions may occur when perchloric acid reacts with organic materials. The special hoods for perchloric acid contain a wash-down system and special duct arrangements.
- 3 Do Fume Hoods require explosion proof electrical fixtures?**
No. The electrical & light fixtures are totally isolated from Fume Hood inner work area. They do not come in direct contact with fumes. Where there is a probability for hazard, the user may wish to use explosion-proof electrical fixtures for added safety.
- 4 What is the safe face air velocity for my Fume Hood?**
Various organizations state different face velocity ranges as acceptable but 100 FPM (feet/ minute) has been the accepted norm worldwide. All Godrej Interio Fume Hoods satisfy these norms.
- 5 At what sash height should I measure the hood face velocity?**
Normally the hood face velocity is measured with the sash fully open. However, if the hood has a sash stop or a sash label to indicate the safe sash height, the face velocity should be measured with the sash at the stop or label.
- 6 What standards exist for testing Fume Hoods?**
SEFA 1.1 Laboratory Fume Hoods Recommended Practices has sections on visualization of flow patterns and measuring face velocity. ASHRAE 110 also recommends standards for testing performance of Laboratory Fume Hoods.
- 7 When do we need to cluster the Fume Hoods?**
Clustering can be done when a large battery of Fume Hoods are placed in a particular place and are to be used simultaneously. Please note that in clustering there is only one blower for all the Fume Hood and hence all the Fume Hoods will be working simultaneously.
- 8 Do I need to work on all the Fume Hoods simultaneously if they are clustered to one blower?**
All the Fume Hoods need not be used simultaneously but since they are connected to a single blower there will be suction through all the clustered Fume Hoods.

|||||

8 Glossary

Air Foil – It is designed to assist the smooth movement of air into the Fume Hood.

Baffle – The baffle is a panel located at the rear of the hood interior. Its function is to help in distributing the flow of air moving into and through the hood.

Bypass – A bypass is an airflow compensating opening. The bypass maintains a relatively constant volume exhaust through a Fume Hood regardless of the sash position, thereby limiting the maximum face velocity as the sash is lowered.

Centrifugal Blower – The blower is a vital element in the performance of a Fume Hood. They are made from special materials to resist corrosion from chemical fumes. Its suction capacity is determined on the basis of recommended face velocity. The blowers are designed in such a way to provide maximum efficiency with minimal power consumption.

Cubic Feet per Minute (CFM) - It is a unit of air volume measurement.

Combination Sash – It consists of horizontal panels in a vertical rising frame.

Damper – It controls airflow volume and is installed in the duct.

Electrical Points – These points are located on the hood's exterior which provides ease of access to the operator and prevents them from the corrosive effects of the fumes inside the hood structure. Provisions are made so that all electrical wiring is isolated and physically separated from the vapours handled within the hood.

Face Opening – This is the hood opening or the plane of the inside surface of the sash. This area is used to calculate the square footage of the hood opening and face velocity is measured in this plane.

Face Velocity – Typically expressed in feet per minute (fpm), face velocity is the rate of flow or velocity of air moving into the laboratory hood entrance or face.

Hood Interior – The area sheltered by the side, back and top enclosure panels, the work surface, the face opening, the sash, and the exhaust plenum including the baffle system for airflow distribution.

Lighting – Vapour proof and fluorescent, these light fixtures are installed outside the hood liner and cosseted from the hood interior by a transparent, impact resistant shield. Replacing or cleaning is done from the exterior whenever possible.

Make up Air – This refers to the air needed to replace the air taken from the room by laboratory hood and other air exhausting devices.

Safe Working Height – The sash must not be raised beyond this limit in usual working conditions. The safe working height helps to achieve optimum Fume Hood performance. It may be raised further only in case of keeping or removing an instrument.

Sash – A movable, transparent panel set in the hood entrance to form a protective shield and to control the face velocity. Its movement is controlled by counter balancing mechanism i.e. the sash weight is balanced by equal amount of weight by means of ropes and pulley arrangement.

Service Fixtures – These include connections for gases, air, water or vacuum. All service supply lines are accessible for maintenance. Inner hose connectors are corrosion resistant.

Superstructure – This refers to the upper portion of a Fume Hood resting on base cabinets.

Under Structure – This refers to the lower portion of a Fume Hood consisting of base cabinets (apparatus or chemical storage cabinets).

Work Surface – This is the top material area in a Fume Hood where the apparatus rests and where work is performed.

Face Velocity Test

Calibrated anemometer reading at the top, bottom, middle & both sides of the hood should be taken while Fume Hood is operational.
It should be in the specified range of 0.4-0.6 m/s or 80-110fpm as per ANSI standards.

Record reading at each spot and take the average.

		Position	Working Height	Reading in m/s	Average(Sum Of Readings)
1	Top	Left			m/s
		Middle			
		Right			
2	Middle	Left			
		Middle			
		Right			
3	Bottom	Left			
		Middle			
		Right			

Final Average Reading: _____ m/s

Test carried out successfully: YES ☐ NO ☐

Date:

Authorized Signatory
For Godrej & Boyce Mfg.Co.Ltd.



10 Warranty

GODREJ Interio Fume Hood system is warranted for twelve months from the date of dispatch, only against manufacturing defect. We undertake to repair / replace any part thereof, which subject to our satisfaction was originally defective and the fact that the system was not mishandled or repaired by any unauthorized person.

Warranty does not cover the consequential damages / defects of any nature resulting from improper selection and use of the system or claims arising out of fire, accident and any other force majeure conditions. We provide certain accessories like switches, motors, electric and plastic fittings, etc. to complement our system which will be covered by the warranty conditions as specified by the manufactures of the respective items.

This Warranty excludes every condition or warrantee, whether statutory or otherwise, whatsoever not herein expressly stated.

Seal

Commissioned On:

Warranty valid upto:

Authorized Signatory,
Godrej and Boyce Mfg. Co. Ltd

Client:_____

Fume Hood no:_____

Lab Name:_____



11 Pre-Dispatch Inspection Report

FUME HOOD PRE-DISPATCH INSPECTION REPORT

Customer Name					
Sr. No.		Project No.		SO. No.	
Model	BT / LB / WI	Air Type	ABP / VAV / LCV	Length	4 / 5 / 6 / 8
CP No.		OP AFA No.		No. of Service	
Fume Hood Clustering : No / Yes					
ELECTRICAL FITTINGS :					
Sr. No.	Parameter	Instrument used	Acceptance Criteria		Remarks (Ok/Not Ok)
A	Aesthetic / Visual				
1	Color Combination	Visual			
2	Gap between Knob & Body	Visual	Even		
3	No. of Counter Weight	Visual			
4	Liner Color and Material	Visual	Ivory colour Laminate 6.00 mm thick		
5	Internal Liner finish	Visual	Free from Dust & clean		
6	Sticker on Sash	Visual	Proper placed		
7	Work Top Finish	Visual	Free from Dust & clean		
8	Work Top Color and Mat	Visual	Granite Jet Black		
9	No. of Water Lines	Visual			
10	No. of Gas Lines	Visual			
11	TL Wiring with Panel	Visual	2 core 1.5 mm Sq.		
12	Socket Wiring with Panel	Visual	4 core 2.5 mm Sq. 2 Phase connection		
13	Main Incoming Wire	Visual	5 core 2.5 mm Sq.		
14	Blower Connection	Visual	4 core 2.5 mm Sq.		
15	Coating Surface Finish	Visual	Free from coating defect		
B	Dimentional / Physical				
1	Outer L X W X H	M.T.			
2	Inner L X W X H	M.T.			
3	Glass L X W X H	M.T.			
C	Functional Test				
1	Sash Operate 10 Times	Manual			
2	Operate 10 Times Service	Manual			
3	Service Lines Leakage	Manual			
4	TL Function with OP	Manual			
5	Socket Function with OP	Manual			
6	Motor Function with OP	Manual			

D	Packing Instruction / Condition				
a	Wooden Crate	Defined as per Drawing			
1	Fume Hood	Visual	All available with plastic wrapping		
2	Damper, Cup sink & Drain	Visual	Tag at LH side top		
3	Counter weight	Visual	Tag with vertical chanel		
4	Fume Hood Manual	Visual	With PDI (In side plastic folder)		
5	LCV F / H Glass packing	Visual	As per Defined by Design		
E	Outside Identification				
1	As per Instruction by Design	M.T.			
Prepared By :					
Approved By :					



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