Flowsafe Stable Vortex II

Fume Hood

Product Bulletin

LIT-12013294
April 2022

Overview

The Flowsafe Stable Vortex™ II Fume Hood is a high-performance low-flow chemical fume hood that delivers a superior level of safety for the user while it provides energy savings for a laboratory facility.

The airflow pattern within the patented-design hood controls its efficient and stable operation. The airflow pattern is not controlled by the entry velocity of air through the sash opening.

The Stable Vortex II features top and rear baffles that constantly adjust to environmental changes like user movement, room airflow disturbances, and thermal changes to maintain a vortex stable at two points in the upper chamber. Through maintainence of a vortex that is stable at two points, the fume hood is able to provide measureable and predictable containment that is controlled, monitored, and sustained.

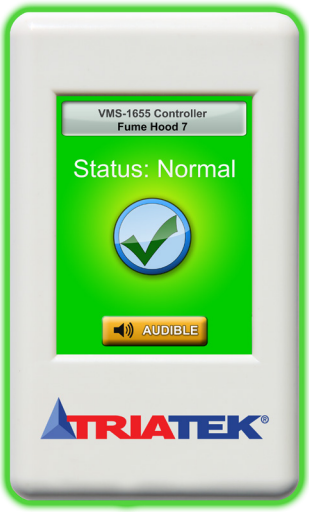
The Stable Vortex II is a constant volume fume hood and the lower airflow capacity allows for substantial energy savings.

The Stable Vortex II works in conjunction with Venturi Valves and the VMS-1655M Fume Hood Monitor.

Features include:

- A unique, patented design that provides dependable safety in a variety of real-world environmental and usage conditions.
- The VMS-1655M measures and controls the stable vortex and alarms when vortex containment cannot be maintained. It features a touchscreen user interface, the patented Safety Halo™ with 360° edge lighting, and is BACnet® MS/TP compatible.
- The Stable Vortex II requires less air to correctly contain, which results in a lower consumption of conditioned air from the lab.
- The dynamic baffle and aerodynamic sash handle keep the vortex correctly suspended when the hood is closed. The top baffle creates a second point of attachment to improve vortex stableness, robustness, and resilience.
- The reduced air flow requirement makes it easier to work with powders.
- Simple to commission and maintain.
- Lower noise makes it possible to conduct research and teach in the same labratory.
- A horizontal and vertical combination sash.
- LED lighting

VMS-1655M Fume Hood Monitor



The VMS-1655M Fume Hood Monitor measures, controls, and adjusts to the vortex pressure and maintains proper fume hood containment. With active vortex stabilization, the VMS-1655M adapts to environmental and usage conditions such as sash movement, fume hood loading, room pressure fluctuations, and cross drafts in real time. Its alarm function notifies you if the fume hood performance is compromised. Some of the features and benefits include:

- Full-color touchscreen display with programmable display options and adjustable back-light
- Safety Halo with 360° edge lighting
- Intuitive user interface that simplifies setup and configuration of unit
- Graphical room status display
- Audible and visual alarms
- Multi-level password protection
- 1 analog input: 0 VDC to 10 VDC
- 2 analog outputs, actuator control, and flow feedback
- BACnet MS/TP network communications

Refer to the *VMS-1655M Fume Hood Monitor Product Bulletin (LIT-12013306)* for more information.

Detailed options

The Flowsafe Stable Vortex II Fume Hood is a high performance, energy efficient, constant volume device and is available as a bench hood (BH), American Disabilities Act (ADA) bench hood, radioisotope, and a walk-in (WI) hood.

Standard fume hood liners are Grade 1125 corrosion-resistant, asbestos-free, and contain fiberglass-reinforced polyester resin. Optional fume hood liners are available as applied 304 and 316 stainless steel liners or as coved-corners 304 and 316 stainless steel liners.

Ordering information

Table 1: Fume hood brand, dimensions, and type

VII-	**72**	**39**	**ADA**
Brand of fume hood	**Width**	**Depth**	**Type**
VII - Triatek ® Flowsafe Stable Vortex II Fume Hood	48 in.	32 in.	ADA - American Disability Act hood
	60 in.	34 in.	BH - Bench hood
	72 in.	39 in.	WI - Walk-in floor mounted fume hood
	96 in.	45 in.	
	120	58 in.	

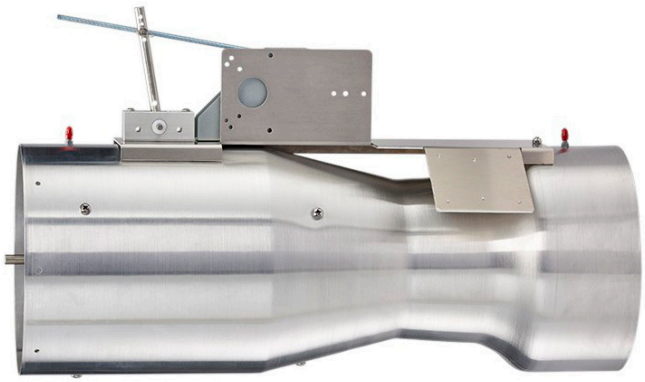
Table 2: Flowsafe fume hood models

Item	Triatek fume hood model number SKUs
1	VII-4834BH
2	VII-4839BH
3	VII-6034BH
4	VII-6039BH
5	VII-7234BH
6	VII-7239BH
7	VII-9639BH
8	VII-9645BH
9	VII-4839ADA
10	VII-6039ADA
11	VII-7239ADA
12	VII-9639ADA
13	VII-9645ADA
14	VII-4858WI
15	VII-6058WI
16	VII-7258WI
17	VII-9658WI
18	VII-12058WI

Flowsafe Stable Vortex II Fume Hoods and Venturi Valves

The Flowsafe Stable Vortex II Fume Hood is a constant volume device and requires pressure-independent exhaust flow to function. Venturi Valves are available in a variety of materials, sizes, and constant volumes. Refer to the *Venturi Valve Product Bulletin (LIT-12013220)* for more information.

Medium and low pressure constant volume Venturi Valves



Medium pressure constant volume Venturi Valves are pressure-independent and designed to maintain a constant flow rate regardless of the changing duct static pressure. These valves maintain a constant volume at a specific shaft position over a range of 0.6 in. W.C. to 3 in. W.C. As static pressure increases or decreases, the internal cone adjusts to maintain a constant volume of air. Kynar® and Heresite® coatings are available to prevent corrosion.

The low pressure constant volume Venturi Valve arrives on-site calibrated and ready for installation. For installations that invlove harsh chemicals in the air stream, Kynar and Heresite coatings are available to prevent corrosion. Vertical low pressure Venturi Valves range from 0.4 in. W.C. to 3 in. W.C.

Design charts

Table 3: General hood dimensions

Hood width	4ft	5ft	6ft	8ft
Exhaust outlet collar diameter	8 in.	10 in.	10 in.	8 x 2 in.
Net free area of work surface	8.38 ft²	11.02 ft²	13.67 ft²	22.55 ft²
Internal volume, 34 in. deep hood	27.44 ft³	36.11 ft³	44.78 ft³	62.11 ft³
Internal volume, 39 in. deep hood	32.72 ft³	43.05 ft³	53.39 ft³	74.05 ft³
Internal volume, 45 in. deep hood	n/a	n/a	n/a	88.39 ft³
Horizontal sash maximum open width	18.5 in.	24.5 in.	30.5 in.	42.5 in.
Horizontal sash maximum opening area	3.53 ft²	4.68 ft²	5.82 ft²	8.12 ft²
Vertical sash width	39 in.	51 in.	63 in.	87 in.
Vertical sash,18 in. opening area	4.8 ft²	6.3 ft²	7.8 ft²	10.8 ft²
Vertical sash, 72.5 in. opening area	7.45 ft²	9.74 ft²	12.03 ft²	16.61 ft²

Figure 1: Fume hood vertical sash opening A, 27.5 in.

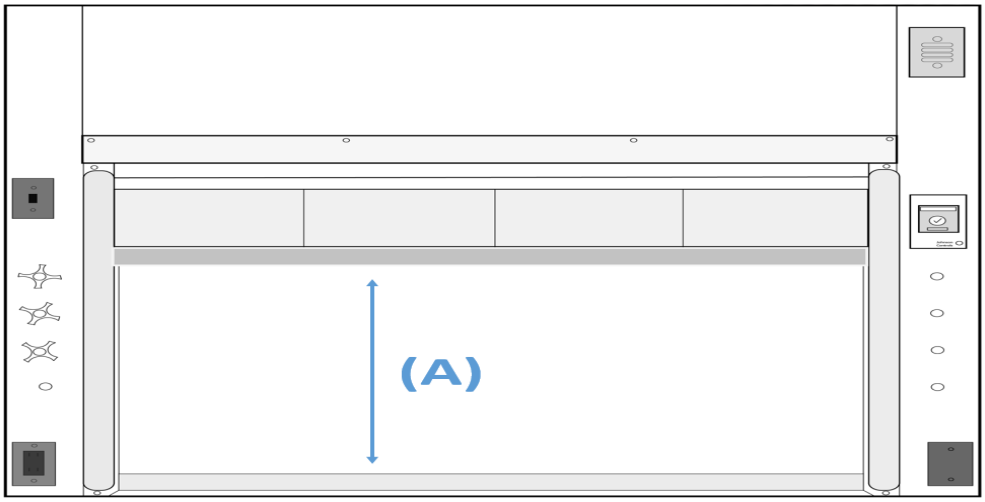


Table 4: Total exhaust air flow requirements, cfm, and static pressure at 27.5 in. vertical sash opening A

Typical fume hood size by width[1]	4ft	5ft	6ft	8ft
100 fpm	745 cfm	974 cfm	1203 cfm	1661 cfm
80 fpm	596 cfm	779 cfm	962 cfm	1329 cfm
60 fpm	447 cfm	584 cfm	722 cfm	997 cfm
Static pressure loss	0.35 in. W.G.	0.35 in. W.G.	0.35 in. W.G.	0.35 in. W.G.
Vertical sash, 72.5 in. opening area	7.45 ft²	9.74 ft²	12.03 ft²	16.61 ft²
Vertical sash width A	39 in.	51 in.	63 in.	87 in.

Note:

A sash height of 27.5 in. is only for loading purposes.

[1] Air flow requirement at 100 fpm face velocity

Figure 2: Fume hood vertical sash opening B, 18 in.

Table 5: Total exhaust air flow requirments, cfm, and static pressure at 18 in. vertical sash opening B

Typical fume hood size by width[1]	**4ft**	**5ft**	**6ft**	**8ft**
100 fpm	480 cfm	630 cfm	780 cfm	1080 cfm
80 fpm	384 cfm	504 cfm	624 cfm	864 cfm
60 fpm	285 cfm	375 cfm	465 cfm	645 cfm
Static pressure loss	0.35 in. W.G.	0.35 in. W.G.	0.35 in. W.G.	0.35 in. W.G.
Vertical sash 18 in. opening area	4.8 ft²	6.3 ft²	7.8 ft²	10.8 ft²
Vertical sash width B	39 in.	51 in.	63 in.	87 in.

[1] Air flow requirement at 100 fpm face velocity

Figure 3: Fume hood vertical sash opening C, max opening

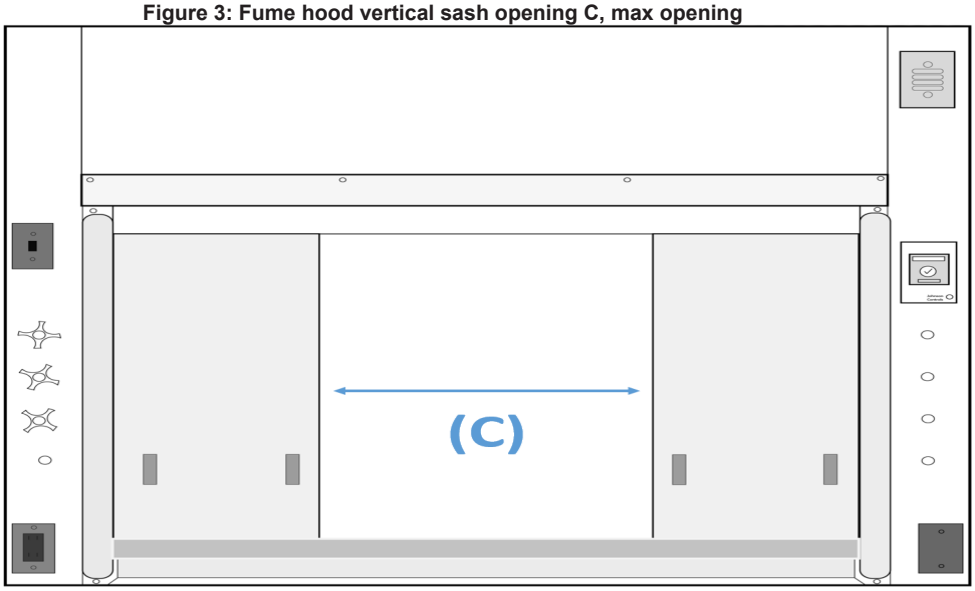


Table 6: Total exhaust air flow requirements, cfm, and static pressure at maximum horizontal sash opening C

Typical fume hood size by width[1]	**4ft**	**5ft**	**6ft**	**8ft**
100 fpm	353 cfm	468 cfm	582 cfm	812 cfm
80 fpm	285 cfm	375 cfm	465 cfm	645 cfm
60 fpm	212 cfm	281 cfm	349 cfm	487 cfm
Hood static pressure loss	0.35 in. W.G.	0.35 in. W.G.	0.35 in. W.G.	0.35 in. W.G.
Sash working horizontal open area	3.53 ft²	4.68 ft²	5.82 ft²	8.12 ft²
Horizontal sash maximum opening C	18.5 in.	24.5 in.	30.5 in.	42.5 in.

[1] Air flow requirement at 100 fpm face velocity

Table 7: ANSI Z9.5 minimum required cfm for the air changes per hour (ACH)

Hood width	4ft	5ft	6ft	8ft
CFM for 150 ACH interior to hood				
34 in. deep	69 cfm	90 cfm	112 cfm	155 cfm
39 in. deep	82 cfm	108 cfm	133 cfm	185 cfm
45 in. deep	n/a			221 cfm
CFM for 375 ACH interior to hood				
34 in. deep	172 cfm	226 cfm	280 cfm	388 cfm
39 in. deep	205 cfm	269 cfm	334 cfm	463 cfm
45 in. deep	n/a			552 cfm

Standard colors

Table 8: Stable Vortex II standard colors

Color	Color name	Color code
	Appliance white	E-9132
	Light almond	E-7688
	Ivory	E-8389
	Beige	E-5809
	Off white	E-6328
	Platinum	E-2731
	Matte grey	E-2702
	Dark taupe	E-2439
	Green	E-5091
	Black	E-3037
	Light blue	E-10289
	Sea blue	E-5610
	Deep blue	E-6320
	Burgundy	E-7065

Notes:

- These colors are a close representation of the actual paint. All drawer bodies are painted off-white.
- Base cabinet with doors: shelf color is off-white regardless of door type with the exception of GH or GSF models. Shelves are painted to match the base cabinet.
- Base cabinet without doors or open: shelf color matches the base cabinet.

Electrical fixtures

Flush-mount electrical service fixtures come complete with a device box and stainless steel face plate. To request the factory to set the electrical fixtures, specify part number F-340 in addition to the electrical fixture number. To request the factory to set the wires of electrical fixtures, specify part number F320 in addition to the electrical fixture number. The factory wiring of explosion-proof fixtures is by application only.

Figure 4: F-200 electrical fixture

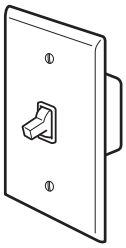


Figure 5: F-221 electrical fixtures

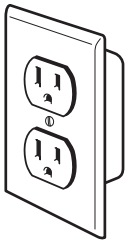


Figure 6: F-225 electrical fixtures

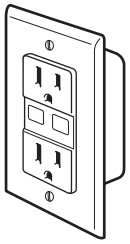


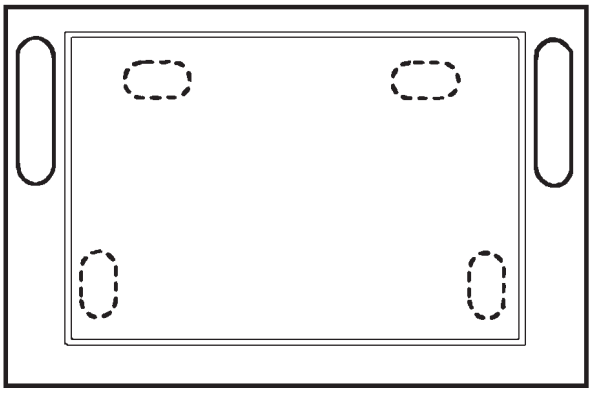
Table 9: Electrical fixture models

Electrical fixture model	Description
F-200	Single pole light switch, 115 V, 15 A
F-221	Duplex receptacle, 115 V, 20 A
F-225	Ground fault interrupter (GFI) duplex receptacle, 115 V, 20 A

Countertops

Fume hood work surfaces are molded from a modified epoxy resin that is especially compounded and cured to provide the optimum physical and chemical resistance required for a heavy duty laboratory working surface. Countertops are 1 in. thick with a 3/8 in. deep dishing to contain spills and have a non-glare black finish. If you require sinks or cupsinks, specify the location.

Figure 7: Overhead view of the countertop



Remote control fume hood fixtures

Remote control valves feature forged brass valve bodies for strength and durability. Valves for gas, air, vacuum, and special gases are of needle type design with a stainless steel float cone and stainless steel replaceable seat. Valves for steam service have a flat Teflon valve disc and stainless steel replaceable seat. Valves for water service have a renewable unit that includes a stainless steel seat and volume control. All outlet assemblies have color-coded nylon interior outlets. For acid and solvent resistant coatings, add the following suffix to the part numbers:

Table 10: Remote control fume hood fixture coatings

Acid and solvent resistant coating	Suffix for part number
Clear epoxy	01
White epoxy	02
Black epoxy	03

To request the factory to set a service fixture, specify part number F-330 in addition to the service fixture number. To request the factory to set the piping of service fixtures, specify part number F-300 in addition to the service fixture number.

Table 11: Fume hood service valves

Remote service valve model	Description
F-100	Remote service valve with angled hose cock outlet. Use with gas, air, vacuum, steam, or other special gases. Specify type of service.
F-110	Remote service valve with gooseneck. Use with water and specify hot or cold water.
F-120	Remote service valve with gooseneck and vacuum breaker. Use with water specify hot or cold water.
F-125	Dual remote service valve with gooseneck. Use with hot and cold water.
F-130	Dual remote service valve with gooseneck and vacuum breaker. Use with hot and cold water.

Figure 8: F-100 Remote service valve

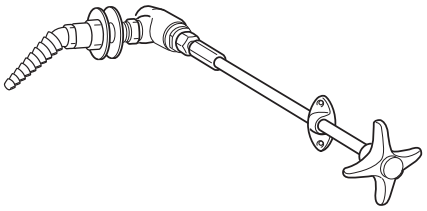


Figure 9: F-110 Remote service valve

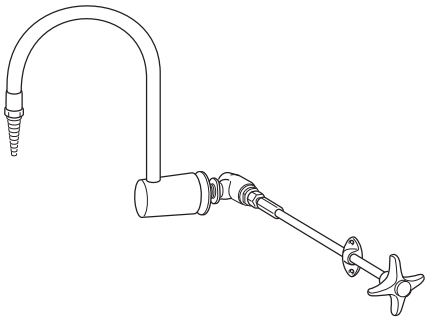


Figure 10: F-120 Remote service valve

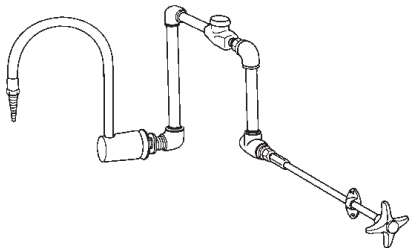


Figure 11: F-125 Remote service valve

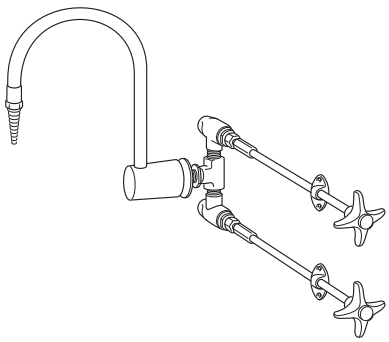
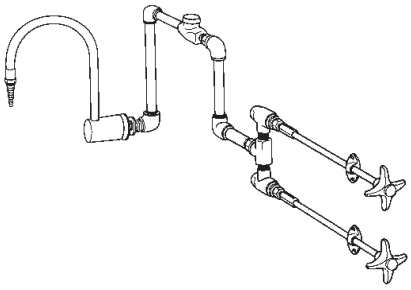


Figure 12: F-130 Remote service valve



Sinks

Sinks are available in a variety of sizes and configurations for installation in fume hoods.

Table 12: Fume hood cup sinks

Sink model	Description
HTCS	Oval epoxy resin cupsink, 3 in. x 6in., 1 1/2 in. NPT outlet connection.
F-401	Oval polypropylene panel mount cupsink, 3 in. x 6 in., with retainer nut, 1 1/2 in. NPT outlet connection.
F-402	Rectangular epoxy resin cupsink, 13 3/4 in. x 4 1/2 in. x 5 1/2 in. with stainless steel straining screen, 1 1/2 in. NPT outlet.
F-410	Drop-in epoxy resin sink, 16 in. x 12 in. x 8 in. depth
F-411	Drop-in epoxy resin sink, 18 in. x 15 in. x 8 in. depth
F-412	Drop-in epoxy resin sink, 24 in. x 16 in. x 8 in. depth

Figure 13: HTCS

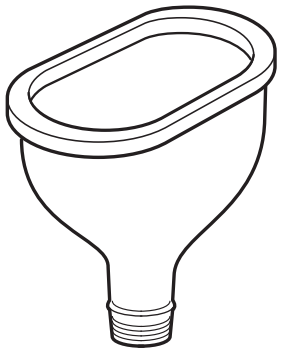


Figure 14: F-401

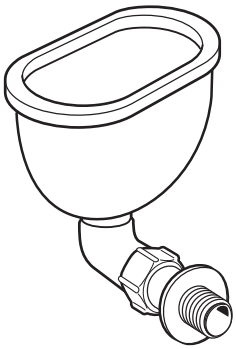


Figure 15: F-402 sink

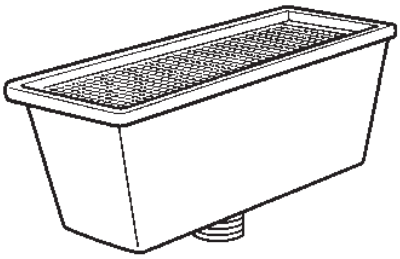
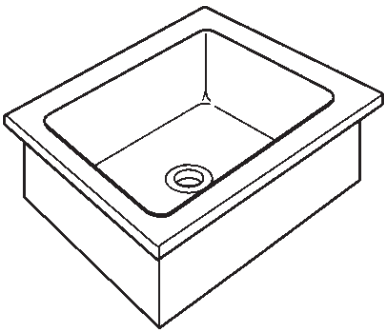


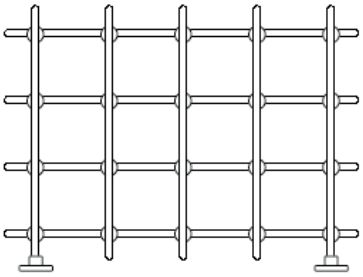
Figure 16: F-410, F-411, F-412 sinks



Aluminum lattice assembly

The aluminum lattice assembly is sized to fit the fume hood with a maximum center size of 12 in.

Figure 17: Aluminum lattice assembly



Base cabinets

Figure 18: Base cabinet at standing or counter height

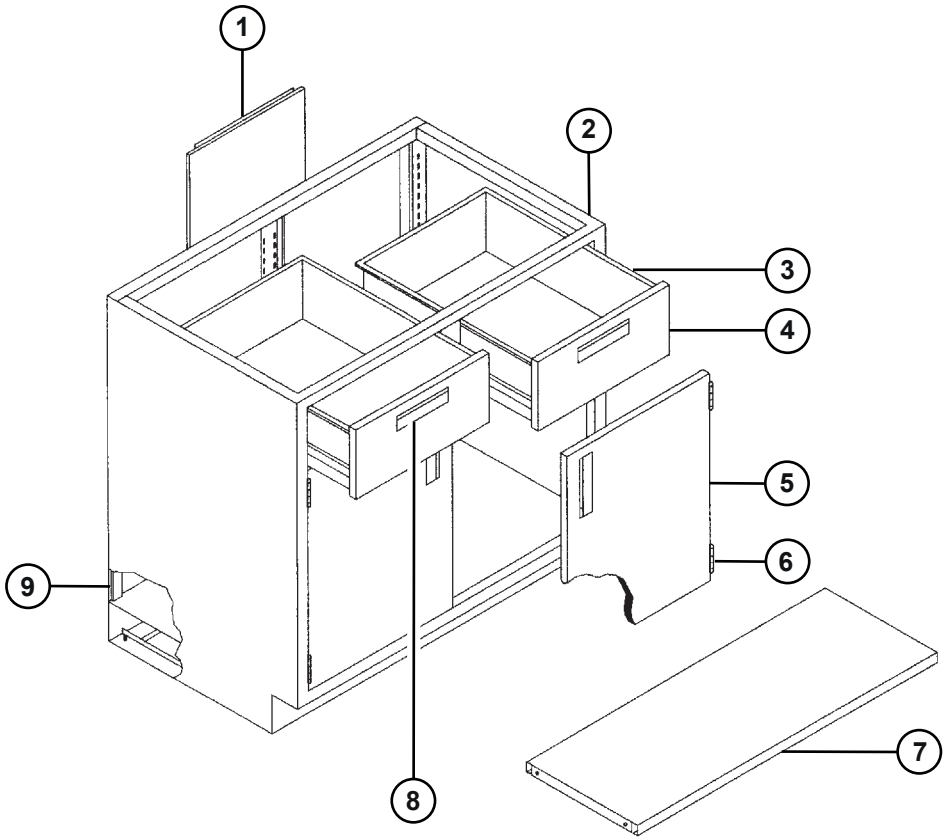


Table 13: Base cabinet components

Number	Description
1	Removable backs
2	Flush front construction
3	Full extension, ball bearing, plated drawer slides
4	Doors and drawer heads are double pan construction and sound deadened
5	Adjustable doors with full access opening
6	Stainless steel, 5-knuckle institutional type hinge: 13 ga.
7	Full-depth adjustable shelf, adjustable on 1 in. centers
8	Standard pulls are flush, extruded aluminum with capability to be a label holder, or aluminum bar style pull.
9	Removable bottom panned up to contain spills

Table 14: Component acid and solvent resistant coating thicknesses

Component	Gauge
Aprons	18
Back panels	20
Bottom panels	18
Drawer or door outer panel	20
Door inner panel	20
Drawer bodies	20
Square tube legs, 2 in.	18

Component	Gauge
Shelves	18
Side panels	18
Table frames	18
Knape & Vogt® shelf clip	-

Notes:
- The paint is a chemical resistant baked-on epoxy powder. Specific test data is available upon request.
- For complete specifications, request our full line of product specifications. Subject to change.

Fume hood base cabinets

Figure 19: Hood base

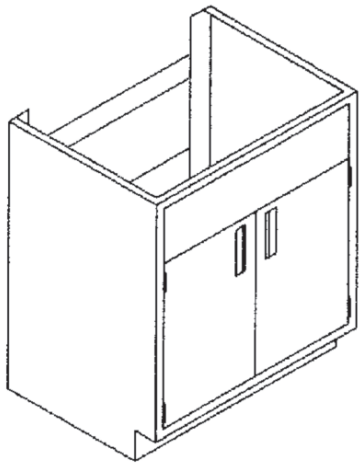


Table 15: Fume hood base cabinet ordering information [1]

Product code number	Description
B3318-10P	Fume hood base cabinet, 33 in. H x 18 in. W, 1 door
B3324-10P	Fume hood base cabinet, 33 in. H x 24 in. W, 1 door
B3330-20P	Fume hood base cabinet, 33 in. H x 30 in. W, 2 doors
B3342-20P	Fume hood base cabinet, 33 in. H x 42 in. W, 2 doors
B3348-20P	Fume hood base cabinet, 33 in. H x 48 in. W, 2 doors

Table 16: ADA fume hood base cabinet ordering information

Product code number	Description
B3518-10P	Fume hood base cabinet, 35 in. H x 18 in. W, 1 door
B3524-10P	Fume hood base cabinet, 35 in. H x 24 in. W, 1 door
B3530-20P	Fume hood base cabinet, 35 in. H x 30 in. W, 2 doors
B3536-20P	Fume hood base cabinet, 35 in. H x 36 in. W, 2 doors
B3542-20P	Fume hood base cabinet, 35 in. H x 42 in. W, 2 doors
B3548-20P	Fume hood base cabinet, 35 in. H x 48 in. W, 2 doors

[1] **Specify left or right hinge on 18 in. and 24 in. units.**

Acid storage cabinets

Acid storage cabinets are reinforced steel with a hi-tech performance polymer alloy coating. This reduces the possibility of corrosion. All acid cabinets are 18 in. deep. Add the suffix VK to the product code number if a vent kit is required.

Figure 20: Acid storage cabinets

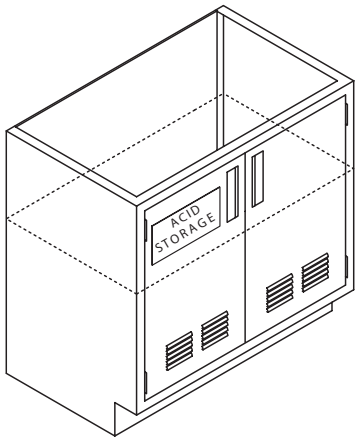


Table 17: Fume hood acid storage cabinet ordering information [1]

Product code number	Description
ASB3315-100 (R)	Acid storage base, 33 in. H x 15 in. W, 1 door, right hinge facing
ASB3315-100 (L)	Acid storage base, 33 in. H x 15 in. W, 1 door, left hinge facing
ASB3318-100	Acid storage base, 33 in. H x 18 in. W, 1 door
ASB3324-100	Acid storage base, 33 in. H x 24 in. W, 1 door
ASB3330-200	Acid storage base, 33 in. H x 30 in. W, 2 doors
ASB3336-200	Acid storage base, 33 in. H x 36 in. W, 2 doors
ASB3342-200	Acid storage base, 33 in. H x 42 in. W, 2 doors
ASB3348-200	Acid storage base, 33 in. H x 48 in. W, 2 doors

Table 18: ADA fume hood acid storage cabinet ordering information

Product code number	Description
ASB3518-100	Acid storage base, 35 in. H x 18 in. W, 1 door
ASB3524-100	Acid storage base, 35 in. H x 24 in. W, 1 door
ASB3530-200	Acid storage base, 35 in. H x 20 in. W, 2 doors
ASB3536-200	Acid storage base, 35 in. H x 36 in. W, 2 doors
ASB3542-200	Acid storage base, 35 in. H x 42 in. W, 2 doors
ASB3548-200	Acid storage base, 35 in. H x 48 in. W, 2 doors

[1] **Specify left or right hinge on 18 in. and 24 in. units.**

Flammable storage cabinets

All flammable storage cabinets are 18 in. deep.

Figure 21: Flammable storage cabinet

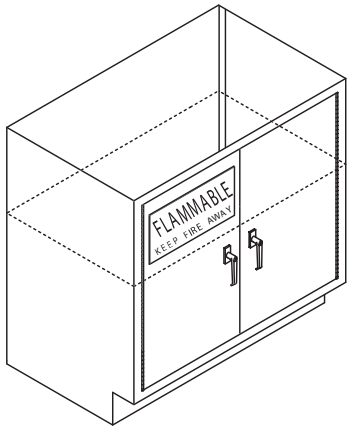


Table 19: Fume hood flammable storage cabinet ordering information [1]

Product code number	Description
FSB3324-100	Flammable storage cabinet, 33 in. H x 24 in. W, 1 door
FSB3330-200	Flammable storage cabinet, 33 in. H x 30 in. W, 2 doors
FSB3336-200	Flammable storage cabinet, 33 in. H x 36 in. W, 2 doors
FSB3342-200	Flammable storage cabinet, 33 in. H x 42 in. W, 2 doors
FSB3348-200	Flammable storage cabinet, 33 in. H x 48 in. W, 2 doors

Table 20: ADA fume hood flammable storage cabinet ordering information

Product code number	Description
FSB3524-100	Flammable storage cabinet, 35 in. H x 24 in. W, 1 door
FSB3530-200	Flammable storage cabinet, 35 in. H x 30 in. W, 2 doors
FSB3536-200	Flammable storage cabinet, 35 in. H x 36 in. W, 2 doors
FSB3542-200	Flammable storage cabinet, 35 in. H x 42 in. W, 2 doors
FSB3548-200	Flammable storage cabinet, 35 in. H x 48 in. W, 2 doors

[1] Specify left or right hinge on 18 in. and 24 in. units.

Flowsafe Stable Vortex II Fume Hood technical specifications

Construction material	**Structure**	18 gauge epoxy powder coated cold-rolled steel
	Liner and baffles	Fiberglass reinforced polyester, 304 stainless steel (SS304), or 316 stainless steel (SS316)
	Sash	1/4 in. thick laminated safety glass
	Work surfaces	1 in. thick epoxy with 3/8 in. dished design
Sash type		Horizontal and vertical combination sash
Light type		LED 4,000 Kelvin color temperature and a minimum color rendering index of 80
Alarm/Monitor/Vortex controller		VMS-1655M visual and audible alarm with patented Safety Halo, BACnet MS/TP network, touchscreen and user interface
Industry standards compliance		ASHRAE 110-2016
		ANSI Z9.5-2012
		NFPA 45-2019
		ASTM E84
		UL 1805
		SEFA 1
Chemical resistance		Meets or exceeds UL 1805 and/or SEFA 8.1

VMS-1655M Fume Hood Monitor technical specifications

Electrical	**Face velocity range**	0 fpm to 325 fpm
	Accuracy of measurement	± 2 fpm. Accuracy is ± 5 fpm when velocity drops below 60 fpm or exceeds 140 fpm.
	2 analog outputs	0 VDC to 10 VDC, 4 mA to 20 mA
	1 analog inputs	0 VDC to 10 VDC
	Power supply	Class 2, 24 VAC ± 10%, 30 VA universal 120/240 VAC to 24 VAC, 60/50 Hz, step-down isolation transformer provided
	Recommended cable type	Belden 1325A
Communications	**BACnet MS/TP network**	Two-wire twisted pair, RS-485 signaling
	Recommended cable type	Belden 3107A
Touch screen user interface	**LCD size**	3.2 in. diagonal
	LCD type	Transmissive
	Resolution	240 pixels x 320 pixels portrait
	Viewing area	50.6 mm x 66.8 mm
	Color depth	18-bit or 262K colors
	Back light color	White
	Luminous intensity	Min 2500 cd/m2
Mechanical	**VMS-1655M surface-mount enclosure (height x width x depth)**	5 in. x 3 in. x 1.13 in.
	External remote sensor housing (height x width x depth)	4 in. x 2.5 in. x 2 in.
	Stainless steel cover plate for flow tube (height x width x depth)	4.5 in. x 2.7 in. x 0.2 in.
	VMS-1655M with flow tube cover plate	Approx. 3.5 lb
	VMS-1655M with sidewall sensor	Approx. 4.0 lb
	Flow tube cover plate mounting	Flush
Environmental	**Operating temperature**	32°F to 125°F
	Operating humidity	10% to 95%

Contact information

For pricing, ordering and product assistance contact:

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Patents

Patents: https://jcipat.com

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