

# 5,000 CFM - 50,000 CFM

Deep Bed – Vertical Tube System (VTS)



## MODEL NUMBER NOMENCLATURE

VTS	Model "VTS" Vertical Tube System		
5200	AIRFLOW (CFM)		
124112	Media Beds	124	One 24" deep bed
		112	One 12" deep bed
SS	Construction	SS	Stainless
BT	Fan	BT	Blow Thru
		DT	Draw Thru
		NF	No Fan
XXX	Options (See List Below)		

## OPTIONS

- + IL (Intake Louver); IH (Intake Hood); ID (Inlet Isolation Damper);
- + PF (Pre-Filter); MG (Mist and Grease Eliminator); FF (Final-Filter);
- + PH(EorG) (Preheater Electric or Glycol); SWPH (Summer/Winter Preheater);
- + AC (Packaged Air Conditioning or Dehumidification);
- + INS (Insulated); DW (Double Wall Construction);
- + MB (Multiple Media Beds);
- + PW (Prewired); RW (Remote Wired);
- + EF (Enclosed Fan);
- + RF (Redundant Fans);
- + SIL (Discharge Silencer)

The model described above is a Vertical Tube System: 5,200 CFM, one 24", one 12" deep bed, with 14 GWG welded stainless steel construction, and Draw-thru horizontal flow configuration.

## SYSTEM DESCRIPTION

The Unisorb Canada VTS System is a complete self-contained, horizontal airflow package. This vertical tube system provides continuous high efficiency air purification for contaminated air streams ranging in volume to 52,000 CFM.

Unisorb Canada VTS System comes in either Blow-thru or Draw-thru configurations. Blow-thru configurations are generally used for corrosion control applications. Draw-thru configurations are generally used for odor control or environmental emission applications.

The standard VTS air purification system includes the following:

### CONSTRUCTION

Standard casing construction is 14-gauge stainless steel. An optional insulated and double walled casing is available when required for heat loss or condensation.

### PRE-FILTER SECTION

This section provides a pre-filter to protect the downstream system components. The 2" deep - 35% MERV 8 pre-filter is used for the retention of larger particulates, protecting the chemical media bed section from being blinded by particulates. Optional 95% MERV 14 after filters are available for protection against blinding of the media bed by smaller particulates.

For odor control applications, a three stage 99.99%, 2-micron, ultra-high efficiency, quick release, side access, mist and grease eliminator section. This pre-filter section has a 0"-4" magnehelic gauge that visually indicates the pressure differential, so that operating and service personal can determine when to change filters. A pressure switch is included to provide filter clog signal to the control panel for Filter Clog Alarm. When the magnehelic gauge indicates approximately 1.5" W.C. then the filter needs to be replaced. A spare pad can be provided to enable continuous operation during pad cleaning periods. This section includes a 1½" drain connection, which requires field trapping by others. The side access door has ¼ turn adjustable latch handles.

A magnehelic differential pressure gauge is used to monitor the pressure drop across the particulate filter sections to determine when the changeout or cleaning of filters is necessary. An optional photohelic differential pressure gauge/switch is used when a set of contacts is required to provide local monitoring and to send an alarm signal to a remote location to indicate when the filters need to be checked or changed. Side access doors with quick release, snap acting type, positive pressure latches are used for quick, easy access to the filters.

### CHEMICAL MEDIA SECTION

This section houses the Unisorb Canada chemical media(s) as selected to suit the specific contaminant control application. VTS units are designed for bulk loading of chemical media. Hatch access is on the top of the unit through quick release, snap acting type, positive pressure latches for immediate access. Removal of spent media is vacuumed out from the top hatches as well.

Media sample ports are provided on each system to assist in retrieving media samples for analysis.

Multiple chambers are provided when more than one type of chemical media is required to facilitate removal of all the different types of contaminants, which are present in any particular air space.

Optional media bed monitors are installed in this section when required to assist in monitoring and tracking the rate of progression of H<sub>2</sub>S contaminants through the chemical media bed. This option is useful for the prediction of H<sub>2</sub>S contaminant breakthrough for such systems.

### FINAL-FILTER SECTION

This section provides high efficiency particulate filtration to remove any fine dust, which may be released from the system during media changeout, or initial startup of the system. The high efficiency 6" deep - 95% MERV 14 final-filter is used for the retention of fine particulates to protect the downstream air space.

A magnehelic differential pressure gauge is used to locally monitor the pressure drop across the filter section to determine when the changeout of filters are necessary. An optional photohelic differential pressure gauge/switch is used when a set of contacts is required to provide local monitoring and to send an alarm signal to a remote location to indicate when the filters need to be checked or changed. Side access doors with quick release, snap acting type, positive pressure latches are used for quick, easy access to the filters.

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### BLOWER SECTION

This section contains the blower, motor, and belt drive components to move the appropriate quantity of air through the system. The blower system is designed to overcome the static pressure losses involved with the air purification system and the external system losses. The components are selected to provide reliability for continuous 24 hour, 365 days per year operation in a contaminated environment.

Corrosion resistant pressure blowers are used for most applications. Radial or backward inclined bladed centrifugal blowers are selected for each unique application to ensure an operating point, which will allow flexibility for field adjustments should the operating parameters change. Scroll drains, belt guards, and shaft guards are standard on all systems. The blower is typically isolated from the remainder of the system for vibration, and acoustic purposes.

Where spark proof or special corrosion resistant construction is required, they will be provided.

Standard motors are TEFC. Special explosion proof construction features are available as required to suit field requirements.

The standard unit comes ready for field wiring connections to the electrical box on the motor. Starters, disconnects, controls, and panel lights are all available as required.

### STANDARD CONSTRUCTION

- + 14-Gauge Welded Stainless Steel
- + Pre-Filter Section
- + Stainless Steel Extrusion Filter Tracks
- + Structural Steel Base (Epoxy Coated)
- + Doors Sealed With - Closed Cell Neoprene Gasketing
- + ¼ Turn and Snap Acting Positive Pressure Latches
- + Blower - TEFC Motor
- + Single Media Bed
- + Magnehelic Gauges for Pre & Final-Filter Sections

### OPTIONS

- Draw-thru Design
- Blow-thru Design
- 16-Gauge SS
- Insulated Casing
- Double Wall Construction
- Final-Filter Section
- Intake Louver with Birdscreen
- Intake Hood with Birdscreen
- Mist and Grease Elimination Pre-Filter
- Preheat Coil
- Cooling or Dehumidification
- Media Bed Monitor(s)
- Photohelic Differential Pressure Gauges
- NEMA Rated Control Panel, Starter, and Disconnect
- Explosion Proof Motor (TEXP)
- Structural Steel Base (Epoxy Coated)
- Spark Proof Blower Construction
- Redundant Fans
- Enclosed Fan
- Final-Filter Section
- Other \_\_\_\_\_

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## VTS SELECTION GUIDE

VTS Model No.	Air Flow Range (CFM)	Motor Range (HP)	Standard Split “V” Configuration			High Cube Container Single Chamber Configuration		
			Media Volume (FT3) *	Shipping Weight Empty (LBS)	Operating Weight (LBS) *	Media Volume (FT3) *	Shipping Weight Empty (LBS)	Operating Weight (LBS) *
VTS-8000-136	4800-8000	20-25	257	4980	17830	263	4980	18130
VTS-10000-136	6000-10000	25-30	322	6000	22100	328	6000	22400
VTS-15000-136	9000-15000	30-40	490	8000	32500	492	8000	32600
VTS-20000-136	12000-20000	50-60	646	10500	42800	655	10500	43250
VTS-25000-136	15000-25000	60-75	827	13000	54350	818	13000	53900
VTS-30000-136	18000-30000	75-100	981	15000	64050			
VTS-40000-136	24000-40000	100-110	1292	20000	84600			

\*Media Volume and Operating Weights based on typical 3 ft. deep media bed

## SPECIFICATIONS

### 1.0 PURPOSE

A Unisorb Canada VTS air purification system is to be provided for this application. The system shall be a complete package designed for the removal of all organic and inorganic vapors or gases. The system shall ensure no bypass of contaminants and shall provide a minimum 99.9% removal efficiency of constituent contaminants.

### 2.0 DESIGN

- 2.1 The manufacturer shall have a minimum of 5 years of history in design, fabrication, and testing of similar air purification systems. The system shall provide a minimum airflow capacity as outlined in the specification parameters.
- 2.2 The air purification system shall have pre-filters, chemical media bed(s), final-filters, and a blower section to suit the specific requirements.
- 2.3 The system shall be configured in a draw-thru configuration.
- 2.4 The manufacturer shall guarantee a minimum life expectancy for the system according to the inlet and outlet contaminant levels for this application. Discharge contaminant levels shall not exceed defined parameters at any time before media expiry.
- 2.5 The manufacturer shall have the capability of providing in house laboratory analysis for testing media and air samples to assist in determining media bed consumption rates.
- 2.6 Where corrosion control is involved, the equipment manufacturer shall provide corrosion monitoring assistance for the controlled space. In house support and analysis of corrosion coupons shall be provided by the equipment manufacturer.
- 2.7 The chemical media shall have the capability of being unloaded by gravity flow through a hinged unloading door or a vacuum unloader at the bottom side of each media section. Loading shall be accomplished through the removable hatch on top of the unit.
- 2.8 All media beds shall be designed to have a means of obtaining a media sample.

### 3.0 CONSTRUCTION AND FABRICATION

- 3.1 The base frame shall be structural steel epoxy coated channel.
- 3.2 The unit casing shall be welded with similar metals. Any dissimilar metals shall be fastened together by mechanical fasteners.
- 3.3 To produce high quality low distortion welds, the GTAW (TIG) welding process shall be used.
- 3.4 All access doors and hatches shall use closed cell neoprene gasketing to prevent any air leakage.
- 3.5 All gasket material shall be ¼" thick by ¾" wide-open cell neoprene foam.
- 3.6 Service doors and all unit access shall be oriented to suit field conditions or requirements.
- 3.7 Hinges shall be of continuous piano type pin, and constructed of 300 series stainless steel. Doors shall be held closed with quick release, snap acting type, positive pressure latches.

### 4.0 INTAKE & PRE-FILTER SECTION

- 4.1 The intake section shall take into consideration any intake hoods, louvers, birdscreens, flanges, and pre-filters to prevent the passage of rain, snow, or particulates into the downstream sections of the air purification system.
- 4.2 Any preheating, cooling, or humidification necessary to temper the incoming air stream shall be provided by the equipment manufacturer.
- 4.3 The two stage pre-filter section shall include a 35% MERV 8 roughing pre-filter, based on ASHRAE Standard 52.1, and shall carry Class 2 certification in accordance with UL Standard 900. Optional 95% MERV 14 after filter is available.
- 4.4 Filter face velocities and filter resistances shall not exceed the allowances for the project.
- 4.5 Any mist elimination and grease pre-filter systems shall be provided when required.
- 4.6 Access doors to the filters shall be with quick release, snap acting type, positive pressure latches.
- 4.7 The pre-filter section shall be monitored by a magnehelic differential pressure gauge or a photohelic pressure switch/gauge.

### 5.0 CHEMICAL MEDIA

- 5.1 The chemical media(s) shall be as selected for this application with minimum performance and physical characteristics as defined for the application. Media data sheets, current SDS information and original samples are to be provided by the manufacturer.
- 5.2 The chemical media(s) shall be as selected for this application with minimum performance and physical characteristics as defined for this application. Media data sheets, current SDS information and original samples are to be provided by the manufacturer.
- 5.3 Media bed face velocities shall not exceed the specified rate for this application.
- 5.4 Media pressure losses shall not exceed the design limitations.
- 5.5 The chemical media shall have the capability of being unloaded by gravity flow through a hinged unloading door or a vacuum unloader at the bottom side of each media section. Loading shall be accomplished through the removable hatch on top of the unit.
- 5.6 All media beds shall be designed to have a means of obtaining a media and air sample.

### 6.0 FINAL-FILTERS

- 6.1 The particulate final-filter section shall include a 95% MERV 14 high efficiency after filter based on ASHRAE Standard 52.1, and shall carry Class 2 certification in accordance with UL Standard 900.
- 6.2 Filter face velocities and filter resistances shall not exceed the allowances for the project.
- 6.3 Access doors to the filters shall use quick release; snap acting type, positive pressure latches.
- 6.4 The final-filter section shall monitor the pressure drop by a magnehelic differential pressure gauge or a photohelic pressure switch/gauge.

### 7.0 BLOWER SECTION

- 7.1 Standard blower arrangement shall be configured for a draw-thru or blow-thru application. The blower shall be an industrial centrifugal type of suitable corrosion resistance construction. Bearings shall be based on L10 minimum life of 40,000 hours of average life of 200,000 hours. Adjustable motor base shall have a two-point leveling and tension adjustment.
- 7.2 The blower assembly shall be installed utilizing isolation mounts for vibration purposes.
- 7.3 Sheaves shall be sized for a minimum of 150% of motor horsepower, fully machined, cast iron, keyed and securely attached to the shaft. The blower shall be driven using a heavy industrial adjustable V belt assembly, which is oil and heat resistant and non-static conducting.
- 7.4 The blower section shall have accessibility for maintenance purposes, including balancing, grease nipples, tachometer (RPM) opening, and scroll drain.
- 7.5 Shaft and belt guards shall be provided for safety.
- 7.6 Optional spark proof blower construction shall be provided for such rated environments.
- 7.7 The motor shall be totally enclosed fan cooled (T.E.F.C.) type rated for the intended duty cycle.
- 7.8 Optional explosion proof motor construction shall be provided for such rated environments.
- 7.9 Optional disconnect, starter, and controls shall be provided as required to suit the application

### 8.0 PACKAGING & HANDLING

- 8.1 The air purification system shall be capable of preventing any deflection during rigging, handling, transportation, operation, or servicing.
- 8.2 Lifting lugs and/or anchor bolt locations shall be provided for safe handling and operation of the system.