Laboratory Exhaust Systems

Vektor® with SĀVVE Technology

Sure-Aire™ Variable Volume Exhaust

- ***Reduced Horsepower***
- ***Reduced Fan Energy***
- ***Reduced Operating Costs***

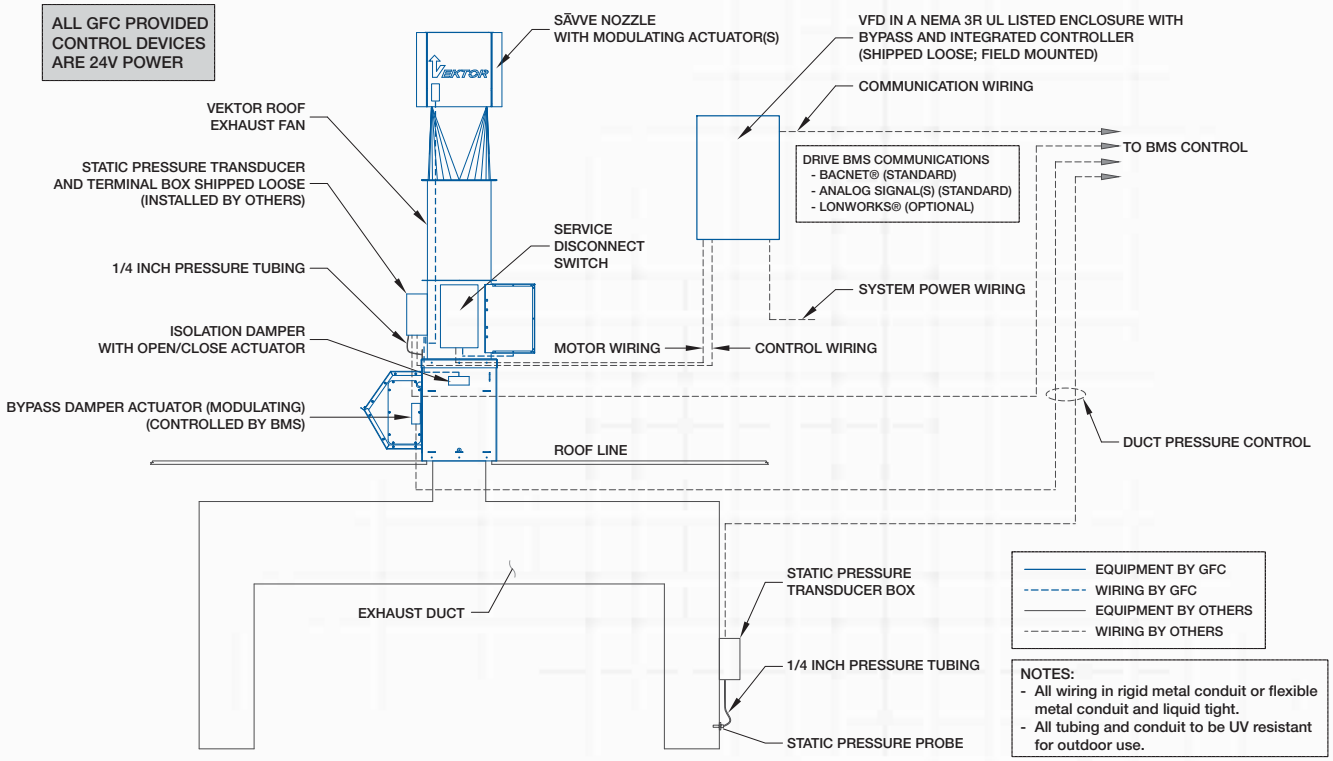
Greenheck GREEN
Supporting Green Building Initiatives Worldwide

System Basics

Historically…in a traditional variable volume laboratory exhaust system, the bypass air damper(s) modulate to maintain duct static pressure. The bypass damper modulation maintains constant airflow volume through the fan to achieve the desired discharge velocity. (No fan energy savings).

By utilizing Greenheck's SĀVVE technology, a constant duct static pressure is maintained by adjusting the fan speed with a variable frequency drive. As airflow through the fan varies, the nozzle discharge area automatically adjusts to maintain a constant and safe discharge velocity. (Min. 3,000 ft/min per ANSI Z9.5).

Typical Wiring Schematic



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SAVVE Component Details

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Variable Frequency Drive
- NEMA-3R enclosure (UL Listed)
- Sized to fan voltage and horsepower
- Integral controller
- Integral VFD Bypass Mode
- Removable user interface
- Three parameter display at interface (hertz, amps, cfm)
- Internal wiring kit to control external devices
- Labeled terminal strip for easy hookup of external devices
- Factory installed system parameters
- Drive shipped loose; field mounted
- Compatible with Building Management System:
  - BACnet® (Standard)
  - Analog Signal(s) (Standard)
  - LonWorks® (Optional)

Variable Nozzle
- Factory assembled
- LabCoat™ corrosion-resistant coated steel construction
- Sealed bearings at pivot points
- Adjustable discharge blades
- Adjustable blade seals
- Actuator(s) with weatherproof cover

Nozzle Actuator
- 24V actuator power
- Mounted in a weatherproof enclosure
- Modulating VDC position scaled from Sure-Aire™ calculation
- Actuator position feedback

Sure-Aire™ Monitoring
- NEMA-3R enclosure
- Adjustable differential pressure transducer
- VDC signal scaled to pressure range
- Non-invasive flow monitoring at inlet venturi

Isolation Damper Actuator
- 24V actuator power
- Mounted in a weatherproof enclosure
- Two position spring return

Bypass Damper
- Heavy duty control damper up to 15 in. wg

Typical Specifications

For complete fan specification, refer to the Vektor® specification found on www.greenheck.com

2.25 VARIABLE NOZZLE
A. Factory assembled fan discharge nozzle with variable discharge area capable of maintaining constant discharge velocity at variable fan volumes.
B. Nozzle housing and adjustable blades to be heavy-gauge steel construction. Variable nozzle coating shall meet specification section 2.15 for corrosion-resistant coating in the Laboratory Exhaust Fan specification.
C. Moveable discharge blades to include adjustable blade seals between the blade body and nozzle housing.
D. The pivot point for the adjustable discharge blades shall utilize sealed bearings located outside the airstream.
E. The nozzle assembly to include a factory-supplied and mounted modulating electrical actuator(s) to adjust nozzle discharge area. Actuator(s) to be enclosed within a weatherproof cover.
F. Modulating electric actuator(s) are 24V.



Patent Pending

2.26 FAN HOUSING AND BYPASS PLENUM
A. Exhaust fan inlet venturi to include factory supplied, non-invasive flow monitoring system with differential pressure transducer.
B. Exhaust fan and bypass plenum assembly to include isolation damper with airfoil blades. Isolation damper to use a 24V, two-position actuator.
C. Bypass plenum to include a bypass damper with modulating actuator controlled by building management system.

2.27 ELECTRICAL CONTROLS
A. Fan manufacturer to include a variable frequency drive with bypass mode and integral nozzle controls.
B. Variable frequency drive to be matched with fan motor voltage and horsepower rating.
C. Fan speed, amps, and CFM to be viewable at the variable frequency drive user screen.
D. Variable frequency drive to be mounted within NEMA-3R UL Listed enclosure and be suitable for indoor or outdoor installation with a maximum operating temperature of 40°C. (Enclosures with only a NEMA rating are not acceptable).
E. Fan motor to include shaft grounding protection device to eliminate induced bearing currents.
F. Serial communication with building management systems and/or bypass damper controller to be: BACnet® MS/TP EIA 485 (standard communication), analog VDC signal(s) (standard communication), or LonWorks® (optional communication).
G. Variable frequency drive controls to be controlled through the building management system. Sequence of operation for the variable nozzle system to be coordinated with the fan manufacturer and system controls provider.
H. Installation shall be the responsibility of the contractor and should be installed in accordance of recommendations by the Fan and VFD manufacturer(s).

U.S. GREEN BUILDING COUNCIL MEMBER

Prepared to Support Green Building Efforts

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Building Value in Air.

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