SIEMENS

Technical Specification Sheet
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Fume Hood Controller
Constant Volume, 2-state (CV2)

Figure 1. Fume Hood Controller (SMT board), Enclosure and Operator Display Panel

The 2-state Constant Volume Fume Hood Controller is an integral part of the APOGEE® Automation System. The controller is a proven, stand-alone Direct Digital Control (DDC) system for laboratory fume hoods with two discrete air flow rate set points. The controller maintains one of two selectable and adjustable constant volume flow rates. An Operator Display Panel provides the fume hood user with the operating status of the hood, alarm horn, an emergency purge function and even optional air flow rate. The high or low flow setpoint is selected using a dry contact closure and/or by toggling a push-button on the Operator Display Panel. The fume hood controller can use either high-speed or low-speed electronic or pneumatic actuation with either damper or Venturi Air Valve flow control devices.

Features

Controller

- Constant volume fume hood operation
- High and low exhaust flow set-points
- Fully integrates with the APOGEE Automation System controllers and software
- True exhaust flow measurement used to position the flow control device
- Modular components, easy to install and service
- Program and calibration parameters are user defined or modified via the Laptop Terminal
- PID closed loop control for all applications
- Electrically Erasable Programmable Read Only Memory (EEPROM) memory for setpoint and control parameters—no battery needed
- Supports damper and Venturi Air Valve air flow control devices

Operator Display Panel

- Continuous display of hood operating parameters using a large alpha-numeric display
- Colored hood status lights for normal (green), marginal (yellow), and alarm (red) conditions
- Purge push-button for activation of emergency operation mode
- Alarm horn for high and low face velocity indication and emergency purge activation
- Easy to install and connect to the controller via a single cable and telephone type connectors

Applications

Operating independently, or integrated with the APOGEE Automation System, the 2-state Constant Volume Fume Hood Controller may be configured for:

- Display “HI” or “LO” setpoint status
- Display Exhaust Air Flow Rate
- Floating Output for high-speed or low-speed electronic or pneumatic actuation of Dampers or Venturi Air Valves
- Digital Output for HI/LO selection of 2-speed motor, preprogrammed VFD or 2-position Venturi

Description

The VAV Fume Hood Controller consists of the following components, which are required for each fume hood:

- Fume Hood Controller
- Operator Display Panel and Cable
- Air Flow Measurement and Control Options

Controller

The Fume Hood Controller consists of a control circuit board and metal enclosure. The enclosure may be mounted directly on the exterior of the fume hood or remotely on the laboratory wall or ceiling. The controller circuit board is snap mounted inside the enclosure and provides all wiring terminations for input and output points, 24 Vac power, FLN trunk, and the Operator Display Panel. A spare digital input and output are provided for user applications such as auxiliary sensors and alarms.

The control algorithms are pre-programmed. The Fume Hood Controller is ready to begin operation after selecting the proper application number defining the network address, and appropriate set point and control parameters using the laptop terminal. User definable parameters include:

- HI and LO flow setpoints
- Alarm and Warning Limits
- Control PID Gains
- Display Resolution
- Alarm Delay
- Emergency Setpoint

The fume hood controller measures exhaust flow and repositions actuation as necessary up to 10 times per second to ensure maximum speed of response to exhaust flow upsets. Concurrently, the controller continually monitors and updates all fume hood points including:

- High/Low Alarms
- Actual Exhaust Air Flow
- Setpoint Selected

Controller Specifications

Power Requirements	
Operating Range	18-30 Vac, 50/60 Hz
Power Consumption	4.0 VA (nominal) @ 24 Vac plus actuator loads
Inputs	
Analog	1 Velocity Pressure Sensor (4-20 mA)
	1 Spare (0-10Vdc)
Digital	1 dry contact
Outputs	
Analog	1 Exhaust Airflow Signal
(0-10vdc)	1 Spare
Digital	1 Floating Actuator (2 DOs)
(24 VAC optically isolated solid state switches @ 0.5A)	1 Spare
Package	
Dimensions	6.5" H x 10.5" W x 3.0" D (165 mm x 267 mm x 67 mm)
Weight	Approx. 3 lb. (1.35 kg)
Environmental	
Storage Temperature	-40°F to 167°F (-40°F to 75°C)
Operating Temperature	32°F to 122°F (0°C to 50°C)
Operating Humidity	20% to 80% RH non-condensing
Agency Listings	UL 916, PAZX & CSA Certified
	FCC, Class B, Subpart J
	CE, C-tick
Communications	
Local Area Network (FLN trunk)	RS-485 4800 baud
Portable Operator’s Terminal	RS-232 1200 baud
Control Performance	
Speed of Response	<1 second to flow change
Air Flow Measurement	
Range	0 – 2.5" wc
Accuracy*	±3.0%

*Accuracy is shown in percent of Actual Airflow and includes differential pressure transmitter accuracy.

Operator Display Panel

The Fume Hood Controller Operator Display Panel includes a custom designed package for visual and audible indication of fume hood operating conditions and push buttons for emergency mode operation, alarm silence and setpoint selection. The panel is mounted on the fume hood in an easy to access location and will fit over an unused hood electrical box or over pre-drilled holes. RJ-11 type connectors provide termination to the Fume Hood Controller and for the Portable Operator's Terminal. One Operator Display Panel is supported per Fume Hood Controller.

The Operator Display Panel supports the following functions:

- Digital display selected set point (HI/LO or HI/OFF)
- Digital display flow rate
- Green, yellow and red status lights
- Emergency purge push button
- Alarm horn with silence push button
- Push button for setpoint selection
- 1 auxiliary push buttons.

The exhaust airflow rate may be displayed as an option to the indicator (HI/LO or HI/OFF) or the display can be blanked.

Operator Display Panel Specifications

Display Resolution	10 cfm up to9990 cfm
Push Buttons Switch inputs	1 Emergency Purge 1 Horn Silence 1 Momentary Selection 1 Momentary Auxiliary
Alarm Horn	85 dB @ 4" (10 cm)
Dimensions	5.5" H x 3.125" W x 1.5" D (140 mm x 80 mm x 39 mm)
Weight	8 oz. (0.2 kg)

Fume Hood Controller Communication

Compatible with the Modular Building Controller (MBC), stand-alone Control Unit and FLN Controller, up to 32 Fume Hood Controllers can be connected to each one of a field panel's three FLN Trunks for a total of 96 per field panel.

Operators can communicate with the Fume Hood Controller from any field panel on the system network. The APOGEE Automation System network does not require additional hardware to connect controllers. When Fume Hood Controllers are networked to an MBC or FLN Controller, all the APOGEE Automation System features available can utilize the Fume Hood Controller. For example: energy usage reports, alarms, operator override control, modification of the system database, system-wide troubleshooting, and the global commanding of devices.

Portable Operator's Terminal

The laptop computer serving as the Portable Operator's Terminal can communicate with the Fume Hood Controller or other Terminal Equipment Controllers. The terminal connects to the controller via a plug-in jack on the Operator Display Panel. The terminal can be used to remotely adjust setpoints, to troubleshoot and to start up the system. The terminal uses full English language prompting for all functions, eliminating the need to remember coded commands.

Ordering Information

Description	Part Number
Fume Hood Controller-CV2, Replacement Board Only	546-00750A
Fume Hood Controller-CV2, Board & Enclosure	546-00750AE
Fume Hood Controller-CV2, Board, Enclosure & ODP	546-00750BE
Operator Display Panel	537-720
Operator Display Cable 15'	537-772
Operator Display Cable 25'	537-773
Operator Display Cable 50'	537-774
GNP Fast Acting Lab Electronic Actuator	GNP191.1P
LAB AO-P Module (for pneumatic actuation)	546-00090
OpenAir 3-position, fail-in-last-position actuator	GDE131…
OpenAir 3-position, Spring Return actuator	GMA131…
Venturi Air Valve Specification Sheet	149-425P25
Laboratory Exhaust Terminal Specification Sheet	149-320P25

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