SIEMENS

Technical Specification Sheet
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Constant Volume Controller

Figure 1. Constant Volume Controller.

The Constant Volume Controller (Figure 1) provides high performance Direct Digital Control (DDC) technology for room pressure and temperature control of constant volume systems. The Constant Volume Controller can operate stand-alone or can be networked to perform complex HVAC control, monitoring and energy management functions. This controller is designed to reside on the Siemens control system.

Features

- Advanced PID algorithm for temperature control loops is employed to provide stability and to reduce unnecessary changes in the Flow setpoint when the room temperature is at or near the room temperature setpoint
- Unique control algorithms for specific applications;
- Reports airflow in cfm (l/s)
- Separate air velocity setpoints for occupied and unoccupied modes
- Plenum rated controller
- Setpoints and control parameters assigned and changed locally or remotely
- Setpoint and control parameters stored in Electrically Erasable Programmable Read Only Memory (EEPROM)—no battery backup required
- Returns from power failure without operator intervention
- Meets low duct static pressure requirements
- Secure Mode (P/Ns 540-103C and 540-104C) prevents unauthorized users from making changes to the controller through the HMI port or room sensor (supports FDA 21 CFR Part 11 compliance -guidelines for protection of electronic records)
- Applications in P/Ns 540-103C and 540-104C include a user-adjustable offset for the room temperature reading when required for validation purposes
- UL and cUL Listed for Smoke Control

Applications

- CV Cooling Only
- CV with Hot Water Reheat (proportional)
- CV with Electric Reheat (one-, two- or three-stage)

Control algorithms are preprogrammed. The controller is ready to operate after selecting the application and assigning the controller's address. If desired, the operator may adjust the airflow setpoints in cfm (l/s), room temperature setpoints and other parameters. The controller is designed for operation and modification without vendor assistance.

Secure Mode Features

Secure Mode

The Constant Volume Controller is also offered with an optional feature, Secure Mode (P/Ns 540-103C and

540-104C). Secure Mode prevents unauthorized users from making any changes to the controller through the HMI port or room sensor. This functionality allows the controller to support FDA 21 CFR Part 11 compliance - guidelines for protection of electronic records.

Hardware

Controller Board

The Constant Volume Controller consists of an electronic controller assembly and a differential pressure transducer. This controller provides all wiring terminations for system and local communication and power. The cable from the room sensor (purchased separately) connects to an RJ-11 jack on the controller. All other connections are removable terminal blocks. The controller assembly is mounted on a plastic track that mounts directly on the terminal box. An optional enclosure (P/N 550-002) protects the controller assembly.

An Autozero Module is available for those applications where uninterrupted airflow at a constant volume is necessary. A Pneumatic Transducer provides control of pneumatic damper and valve actuators.

The controller interfaces with the following external devices:

- Averaging air velocity sensors provided by terminal box manufacturers
- Floating control valve and damper actuators
- Temperature sensors (room, duct, immersion, and outside air)
- Service and commissioning tools
- Digital input devices (dry contacts from motion sensors, alarm contacts, etc.)
- Digital output devices (fan, stages of electric heat)

Room Sensor

The room sensor connection to the controller board consists of a quick-connect RJ-11 jack. This streamlines the installation and reduces controller start-up time.

Constant Volume Controller Specifications

Power Requirements	
Operating Range	19.2 to 27.6 Vac 50 or 60 Hz
Power Consumption	60 VA maximum @ 24 Vac
Inputs	
Analog	1 room temperature sensor 1 velocity sensor 1 set point (optional) 1 auxiliary temperature sensor
Digital	2 dry contacts
Outputs	6 DO 24 Vac optically isolated solid state switches @ 0.5 Amp (0.25 Amp for Smoke Control)
Dimensions	4-1/8" W x 7-3/4" L x 1-1/2" H (105 mm x 197 mm x 38 mm)
Weight	approx. 3 lbs. (1.35 kg)
Controlled Temperature Accuracy, Heating or Cooling	±1.5°F (0.9°C)
Ambient Conditions	
Shipping & Storage Temperature	-13°F to 158°F (-25°C to 70°C)
Operating Temperature	32°F to 122°F (0°C to 50°C)
Humidity Range	5 to 95% rh (non-condensing)
Agency Listings	CE, C-tick
UL Listing	UL 916, PAZX
cUL Listed	UL 864, UUKL
CSA Certified	
FCC Compliance	
Communications	
Remote	FLN Trunk
Local	WCIS

Differential Pressure Sensor

The differential pressure sensor is easily connected to the box's air-velocity sensing elements to provide measurement of the differential pressure. The measured value is converted to actual airflow in cfm (l/s) by the controller.

Differential Pressure Sensor Specifications

Temperature Range	32°F to 122°F (0°C to 50°C)
Measurement Range	0 to 4000 fpm (0 to 20 m/s)

Autozero Modules

The optional Autozero Module (Figure 2) is required when continuous operation at occupied flow is required for an area. The Autozero Module is connected to the air velocity inlet ports of the controller and provides periodic recalibration of the air velocity transducer without changing air volume being delivered to a room. This recalibration ensures long-term precise airflow delivery.

Autozero Module Specifications

Power Consumption	.75 VA @ 24 Vac max.
Dimensions	2" W x 1.51" H x 1.89"D (58 mm x 78 mm x 29mm)
Weight	1.3 oz. (36.9 g)

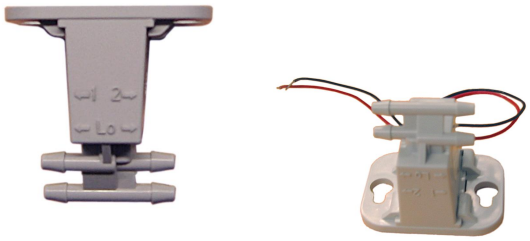

Figure 2. Autozero Module.

Pneumatic Transducer

The PTS Pneumatic Transducer contains the transducers that provide the signal conversion from electronic to pneumatic. The module is piped to the pneumatic actuator and wired to the controller. This transducer provides for accurate control of pneumatic actuators for precise temperature and air volume control.

Pneumatic Transducer Specifications

Maximum Input Pressure	30 psi (207 kPa)
Air Consumption	0 SCIM
Power Consumption	3.6 VA @ 24 Vac max.
Dimensions	3-1/2" L x 2-1/4" W x 1-1/2" H (87 mm x 57 mm x 38 mm)
Weight	9 oz (0.3 kg)

Product Ordering Information

Description	Product Part Number
Constant Volume Controller	540-103
Constant Volume Controller with Secure Mode	540-103C
Constant Volume Controller with Autozero Module	540-104
Constant Volume Controller with Autozero Module with Secure Mode	540-104C
Smoke Control Listed Constant Volume Controller	540-103K
Smoke Control Listed Constant Volume Controller with Secure Mode	540-103CK
Smoke Control Listed Constant Volume Controller with Autozero Module	540-104K
Smoke Control Listed Constant Volume Controller with Autozero Module with Secure Mode	540-104CK
Smoke Control Listed Large Equipment Controller Enclosure	550-002K
Smoke Control Listed Small Equipment Controller Enclosure	540-155K
UL Listed Class 2 transformer with 120/240/277/480 Vac 50/60 HZ 0.4A primary w/ hub and 24Vac 50VA secondary w/ hub and circuit breaker for use with Smoke Control Listed Equipment Controllers	5041MWCB (SBT P/N MUC0240502TFCB)
UL Listed Class 2 transformer with 120/240/277/480 Vac 50/60 HZ 0.5A primary w/ hub and 24Vac 96VA secondary w/ hub and circuit breaker for use with Smoke Control Listed Equipment Controllers	10041MWCB (SBT P/N MUC0241002TFCB)
Pneumatic Transducer	PTS4

Document Information

Specifications Sheet/Application Bulletin	Document Part Number
Room Temperature Sensor s– Series 1000	149-312P25
Duct Temperature Sensor	149-134P25
Electronic Damper Actuator	155-188P25 (GDE 131.1P)
Siemens Valves and Electronic Actuators:	
Flowrite 599 Series – Valve and Actuator Assembly Selection	155-304P25
Powermite 599 Series – MT Series Terminal Unit Valve and Actuator Assembly Selection	155-306P25
Powermite 599 Series – MZ Series Zone Control Valve and Actuator Assembly Selection	155-307P25