SIEMENS

Technical Specification Sheet
Document No. 149-257P25
August, 2012

Dual Duct Controller - Two Air Velocity Sensors

Figure 1. Dual Duct Controller – Two Air Velocity Sensors.

The Dual Duct Controller (Figure 1) provides high performance Direct Digital Control (DDC) technology for room temperature control in Dual Duct Variable Air Volume (VAV) systems or air volume setpoints and room temperature control in Constant Volume (CV) systems. The DDC and related components provide a totally electronic control system. The DDC can operate independently, stand-alone or 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 the temperature control loops is employed to provide stability and to reduce unnecessary changes to the Flow setpoint when the room temperature is at or new the room temperature setpoint
- Unique control algorithms for specific applications
- Reports airflow in cfm (l/s)
- Plenum rated controller
- Setpoints and control parameters assigned and changed locally or remotely
- Setpoints 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
- No calibration required, thereby reducing maintenance costs
- Separate minimum and maximum air volume setting for heating and cooling modes
- Separate air volume setpoints for occupied and unoccupied modes (CV Applications only)

Applications

- Constant Volume – Hot Duct and Cold Duct Air Velocity Sensors with optional auxiliary heat.
- Constant Volume – Cold Duct and Outlet Air Velocity Sensors with optional auxiliary heat.
- Variable Air Volume – Hot Duct and Cold Duct Air Velocity Sensors with optional auxiliary heat.
- Variable Air Volume – Cold Duct and Outlet Air Velocity Sensors with optional auxiliary heat.
- Variable Air Volume – Hot Duct and Cold Duct Air Velocity Sensors with changeover.

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

Hardware

Controller Board

The Dual Duct Controller – Two Air Velocity Sensors consists of a differential pressure transducer and an electronic controller assembly. This controller provides all wiring terminations: input/ output, 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 mounting on the controller for those applications where uninterrupted airflow 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 VAV terminal unit 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)
- 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.

Dual Duct Controller Specifications

Power Requirements	
Operating Range	19.2 to 27.6 Vac 50 or 60 Hz
Power Consumption	4 VA (Nominal) to 5.3 VA (Peak) @ 24 Vac (plus loads)
Inputs	
Analog	1 room temperature sensor 2 velocity sensor 1 setpoint (optional) 1 auxiliary temperature sensor
Digital	3 dry contacts
Outputs	8 DO 24 Vac optically isolated solid state switches @ 0.5 amp
Dimensions	4-1/8" W x 11-1/4" L x 2" H (105 mm x 286 mm x 51 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 70°C)
Operating Temperature	32°F to 104°F (0°C to 40°C)
Humidity Range	5 to 95% rh (non-condensing)
Agency Listings	
UL Listing	UL 916, PAZX
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)
Measurement Resolution	±4 fpm (±0.02 m/s)
Measurement Accuracy*	
300 to 4000 fpm (1.5 to 20 m/s)	±5% of actual reading
200 to 300 fpm (1 to 1.5 m/s)	+12% to -15% of actual reading
Repeatability	± 8 fpm (0.04 m/s)

*All specifications assume an unadjusted flow coefficient of 1.

Autozero Module

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)

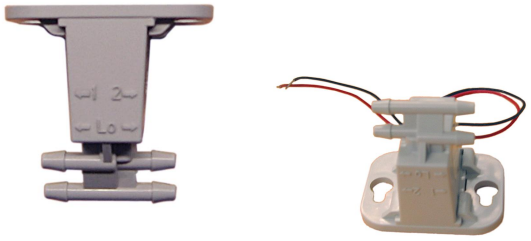

Figure 2. Autozero Module.

Pneumatic Transducer

The PTS Pneumatic Transducer (Figure 3) 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)

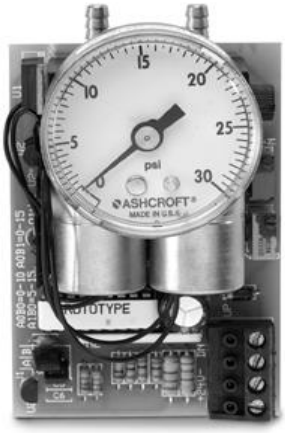

Figure 3. PTS Pneumatic Transducer.

Product Ordering Information

Description	Product Part Number
Dual Duct Controller – Two Air Velocity Sensor	540-506
Dual Duct Controller – Two Air Velocity Sensor with Autozero Module	540-507
CE Compliant Dual Duct Controller – Two Air Velocity Sensor	550-506
CE Compliant Dual Duct Controller – Two Air Velocity Sensor with Autozero Module	550-507
Pneumatic Transducer	PTS4

Document Information

Specification Sheet/Application Bulletin Part Name	Document Part Number
Room Temperature Sensors – Series	149-312P25
Analog Sensors – 100 K Ohm Thermistor	149-262P25
Electronic Damper Actuator	155-114 (SQR 81.1) or 155-123 (EA 349
Powers Electronic Valve Actuators:	
VE 339 2-Way Valve	155-120
VE 339 3-Way Valve	155-121
VE VMP	155-116
Electronic Retrofit Actuator	155-122

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