SIEMENS

Technical Specification Sheet
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TEC Terminal Box (VAV) Controller

The TEC Terminal Box Controller provides high performance Direct Digital Control (DDC) of pressure-independent, variable-air-volume zone-level routines. The TEC Terminal Box Controller can operate stand-alone or can be networked to perform complex HVAC control, monitoring and energy management functions and is designed to reside on any Siemens Industry control system.

Features

- Advanced PID algorithm for the 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.
- 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.
- No calibration required, thereby reducing maintenance costs.
- Reports airflow in cfm (lps).
- Meets low duct static pressure requirements.
- Separate minimum and maximum air volume setting for heating and cooling modes.

Applications

- Slave Mode (Application 2091)
- VAV Cooling Only (Application 2020)
- VAV Cooling or Heating (Application 2021)
- VAV with Electric Reheat or Baseboard Radiation (Application 2022)
- VAV with Hot Water Reheat (Application 2023)
- VAV Series Fan Powered with Electric Reheat (Application 2024)
- VAV Series Fan Powered with Hot Water Reheat (Application 2025)
- VAV Parallel Fan Powered with Electric Reheat (Application 2026)
- VAV Parallel Fan Powered with Hot Water Reheat (Application 2027)

Control algorithms are pre-programmed. The controller is ready to operate after selecting the application. If desired, the operator may adjust the room temperature setpoints and other parameters. The controller is designed for operation and modification without vendor assistance.

Hardware

Controller Board

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 540-155) protects the controller assembly.

Autozero Modules (optional devices, P/NB 540-200N) are available for mounting with the controller for those applications where uninterrupted airflow is necessary. An optional 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
- Analog input devices (room temperature sensor, room setpoint dial, auxiliary temperature sensor)
- 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 installation and reduces controller start-up time.

Terminal Box Controller Specifications

Power Requirements	
Operating Range	24 Vac +/-20%, 50 or 60 Hz
Power Consumption	3 VA (plus 12 VA per DO)

Dimensions	4-1/8" W × 7-3/4" L × 1-1/2" H
Weight	approx. 3 lbs (1.35 kg)
Controlled Temperature Accuracy, Heating or Cooling	±1.8°F (0.9°C)

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 29 mm)
Weight	1.3 oz. (36.9 g)

Inputs	
Analog	1 room temperature sensor 1 velocity sensor 1 setpoint (optional) 1 auxiliary temperature sensor
Digital	1 aux temp dry contact 1 dry contact only input

Outputs	
Analog	N/A
Digital	6 DO 24 Vac optically isolated solid state switches @ 0.5 amp

Communications	
Remote	4800 bps FLN Trunk
Local	WCIS

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	
UL Listing	UL 916, PAZX
cUL Listed	Canadian Standards C22.2 No. 205-M1983, PAZX7
FCC Compliance	FCC Part 15, Class A

Optional Accessories

Autozero Module

The optional Autozero Module (product number 540-380) should be used 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.

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 (lps) by the controller.

Differential Pressure Sensor Specifications

Temperature Range	32°F to 122°F (0°C to 50°C)
Measurement Range	0 to 5200 fpm (0 to 26 m/s)

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 Terminal Box 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	4 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
TEC Terminal Box Controller	540-100N
TEC Terminal Box Controller with Autozero Module	540-200N
Small enclosure for electronic controller without damper actuator (short board).	540-155

Document Information

Technical Specification Sheets/Technical Instructions	Document Part Number
Room Temperature Sensors – Series 2200	149-820
Room Temperature Sensors – Series 2000	149-321
Duct Temperature Sensor	149-134P25
Analog Sensors – 100 K Ohm Thermistor	149-262
Siemens Valves	**Document Part Number**
599 Series Zone Valves 2-Way, 3-Way Zone Valve Electric	154-034
599 Series Zone Valves and Actuators – Modulating, On/Off Spring Return, 2-Position Control	154-063
Siemens Electronic Actuators	**Document Part Number**
OpenAir Electronic Damper Actuators, GDE/GLB Series Non-spring Return Rotary 24 Vac – Modulating Control 0 to 10 Vdc	155-187P25
OpenAir Electronic Damper Actuators, GDE/GLB Series Non-spring Return, 24 Vac Floating Control, Rotary	155-188P25
OpenAir GEB Series Non-spring Return, 24 Vac, 132 lb-in Rotary Electronic Damper Actuators	155-318P25

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