

## Unit Conditioner Controller



**Figure 1. Unit Conditioner Controller.**

The Unit Conditioner Controller (Figure 1) controller provides high performance Direct Digital Control (DDC) of pressure dependent boxes, fan coil units, and induction units. The Unit Conditioner 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 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
- Meets low duct static pressure requirements
- No calibration required, thereby reducing maintenance costs
- Secure Mode (P/N 540-110C) 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/N 540-110C include a user-adjustable offset for the room temperature reading when required for validation purposes
- UL and cUL Listed for Smoke Control

### Applications

- Pressure Dependent Terminal Boxes:
  - Heating or Cooling
  - Hot Water Reheat
- Fan Coil Units:
  - Heat or Cool
  - Heating and Cooling
  - Three-Stage Electric Heat & Chilled Water
  - Three-Stage Electric Heat and Two Stage Cooling
  - Hot Water Heat and Two-Stage Cooling
- Induction Units

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.

## Secure Mode Features

### Secure Mode

The Unit Conditioner Controller is also offered with an optional feature, Secure Mode (P/N 540-110C). 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 Unit Conditioner Controller consists of an electronic controller assembly. This controller provides all wiring terminations for system and local communication, and power. The cable from the room sensor (purchased separately) connects to the RJ-11 jack on the controller. All other connections are removable blocks. The controller assembly is mounted on a plastic track that mounts directly on the fan coil unit, induction unit, or pressure dependent box. An optional enclosure (P/N 550-002) protects the controller assembly.

The controller interfaces with the following external devices:

- Floating control valve and damper actuators
- Temperature sensors (room, pipe, and duct)
- Service and commissioning tools
- Digital input devices (dry contacts from motion sensors, alarm contacts)
- Digital output devices (fan, stages of heat or stages of DX cooling)

### 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.

## Unit Conditioner Controller Specifications

Power Requirements	
Operating Range	19 to 27.6 Vac 50 or 60 Hz
Power Consumption	60 VA maximum @ 24 Vac
Input	
Analog	1 room temperature sensor 1 setpoint (optional) 1 auxiliary temperature sensor
Digital	2 dry contact
Output	
	6 DO 24 Vac optically isolated solid state switch @ 0.5 Amp (0.25 Amp for Smoke Control)
Controlled Temperature Accuracy, Heating, or Cooling	
	± 1.5°F (0.9°C)
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)
Communications	
Remote	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	CE, C-tick
CUL Listed	UL 916 PAZX
CSA Certified	UL 864, UUKL
FCC Compliance	

## 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 Unit Conditioner 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
Unit Conditioner Controller	540-110
Unit Conditioner Controller with Secure Mode	540-110C
Smoke Control Listed Unit Conditioner Controller	540-110K
Smoke Control Listed Unit Conditioner Controller with Secure Mode	540-110CK
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

Specification Sheet/Application Bulletin	Document Part Number
Room Temperature Sensors – Series 1000	149-312P25
Open Air Damper Actuators	155-188P25 (GDE/GLB131.1P)
Siemens Valves and Electronic Actuators: Powermite 599 Series – MT Series Terminal Unit Valve and Actuator Assembly Selection	155-306P25

Information in this document is based on specifications believed correct at the time of publication. The right is reserved to make changes as design improvements are introduced. Product or company names mentioned herein may be the trademarks of their respective owners.  
© 2012 Siemens Industry, Inc.