AirFixture®

Specification Sheet

FlexFloor3 (Underfloor Controller Terminal)

Description

FlexFloor3 (Underfloor Controller Terminal) manages the air pressure and monitors the temperature of the underfloor plenum used in underfloor air distribution systems. Preassembled into an MIT sized box with prewired sensors and a Carel pCO controller, the FlexFloor3 drops into the raised floor in place of a diffuser. The FlexFloor3 includes a diffuser grille that is customized to match the type/size/color of other cooling diffusers installed on the project (please specify on order – see Figure 1 for examples).

The FlexFloor3 controller manages plenum air pressure by controlling the VFD fan speed or the damper between the supply air duct and the underfloor plenum. It can operate as a standalone device or as part of a Building Automation System (BAS) using BACnet.

The FlexFloor3 includes four sensors, which monitor: underfloor air pressure, underfloor air temperature, slab temperature, and underfloor relative humidity. With the information provided by these sensors, the FlexFloor3 controller modulates air flow to maintain underfloor pressure and monitors underfloor conditions.

The FlexFloor3 is factory preset with a default pressure setpoint of 0.05 in. w.c. (12.5 Pa), so no programming is required. If desired, the setpoints can be easily modified using the built-in display and keypad, accessible by removing one or both grille inserts. The display provides information on the operating and communication status of the controller. The display defaults to a blank screen, remaining hidden and unobtrusive when not in use.

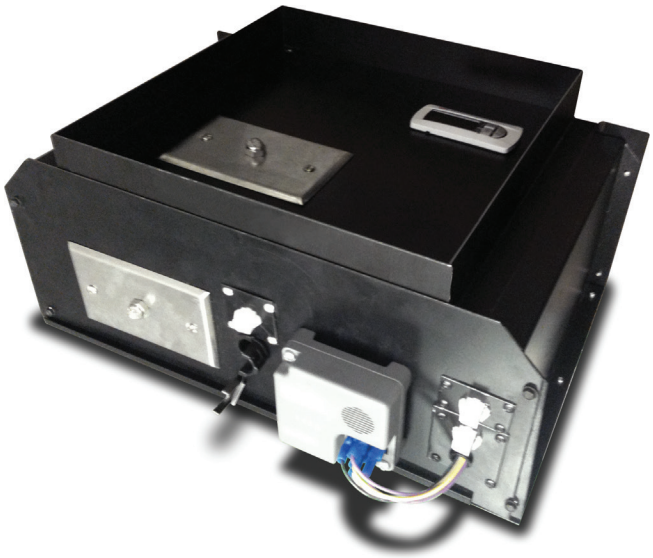

Figure 1

Features

- Preprogrammed application simplifies commissioning process
- Outputs from the FlexFloor3 controller can provide input to the AHU
- Communicates to other network devices using BACnet MS/TP or BACnet IP
- Riveted pre-painted galvanized steel terminal construction

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Sensors and Inputs

The FlexFloor3 uses four sensors to monitor the air condition in the underfloor plenum. The internal underfloor air temperature, relative humidity, and pressure sensors are factory installed. The external slab temperature sensor is furnished loose for field installation; it attaches to the terminal using a molex connector to simplify installation.

Outputs

The output device (underfloor plenum damper or AHU fan) connects to the FlexFloor3 using modular Plug & Play cables with molex connectors.

Communication

The FlexFloor3 can pass information (calculated or input by its sensors) to the BAS via the bacnet network using BACnet IP or BACnet MSTP (specify on order).

Sequence of Operation

The pressure in the underfloor plenum is maintained at a setpoint, typically 0.05 in. w.c. (12.5 Pa) by modulating either a damper or variable speed fan between the supply duct and underfloor plenum. This ensures consistent flow into the plenum when the cooling diffusers are open. The FlexFloor3 controller uses a PID loop to control the damper position or fan speed based on setpoint and pressure sensor input. Care should be taken to locate and orient the high reference pressure sensor on the FlexFloor3 away from velocity pressure.

Application Configuration

The FlexFloor3 is factory furnished with the application loaded and in a Plug & Play condition, ready to be installed with only the slab temperature sensor, power, and network requiring connection. For specific applications the controller can be easily configured using the builtin display and keypad or through network parameters.

Specifications

Application:	Underfloor Controller Assembly | Raised Access Floors 8" (203mm) +
Terminal Dimensions: **LxWxH (Nominal)**	14.5" x 10.5" x 7" (368mm x 267mm x 178mm)
Grille Dimensions: **Diameter (Nominal)**	Diffuser Opening: 8"Ø (203mm) | Full Face: 9.5"Ø (241mm) Installation Cut-Out: 8.3125"Ø [+.125/-.00] (211mm [+3.175/-.00])
Grille Rating:	Cast Aluminum | Conforms to NFPA 90a | 1250 lbs. (567 Kg) Load Strength
Electrical:	Power Source: 24VAC | Max Power: 20VA
Interface:	BACnet IP | BACnet MS/TP; RS485 | Built-In Display + Keypad
Sensors:	Plenum Pressure: ±1% Full Scale Plenum Temperature: ±0.36°F (0.20°C) Plenum Relative Humidity: ±3% Slab Temperature: ±0.36°F (0.20°C)
Outputs:	Damper / VSD Control: 0–10VDC Analog Signal

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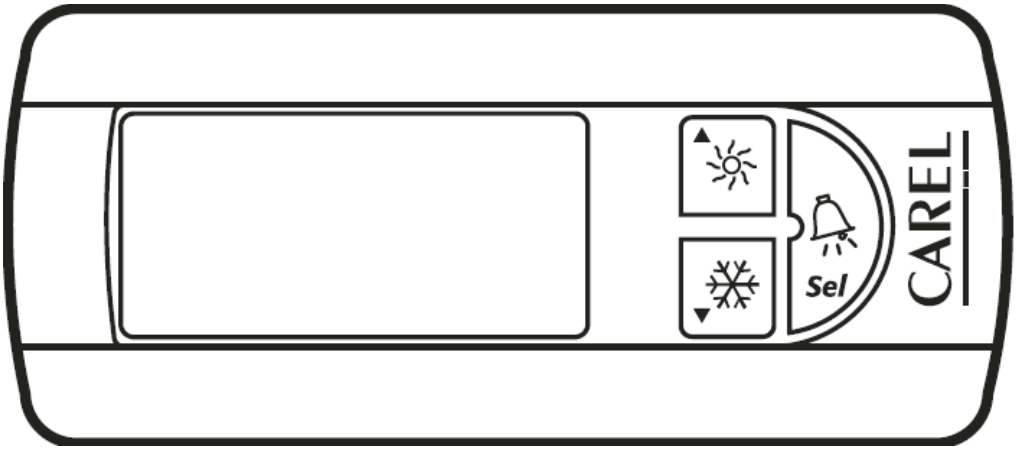
User Menu

Panel Display Normal:

- Blank
- Current Pressure Reading
- “SP” - Setpoint (default 50 = 0.05 iwg)
- “Out” - Control Output
- “Pt” - Plenum Temperature
- “St” - Slab Temperature
- “rH” - Relative Humidity
- “dP” - Dew Point
- “Alr” - Dew Point Alarm

Panel Setup Mode *(Push and hold both up and down for 5 seconds)*:

- “C-F” - Temperature units C/F (default F)
- “d-r” - Direct or Reverse Acting (default Direct)
- “StP” - Start Point - Low Voltage Cutoff (default 1.5V)
- “Lo” - Minimum V out (default 0.0V)
- “Hi” - Maximum V out (default 10.0V)
- “Pb” - Ctrl Loop Proportional Value (default 80 = 800)
- “It” - Ctrl Loop Integration Value (default 5)
- “Dt” - Ctrl Loop Derivative Value (default 0)
- “Db” - Deadband (default 2 = .002 iwg)
- “Of1” - Calibration Offset for Pressure Sensor
- “Of2” - Calibration Offset for Humidity Sensor
- “Of3” - Calibration Offset for Plenum Temperature Sensor
- “Of4” - Calibration Offset for Slab Temperature Sensor
- “Sr” - Software Revision



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Network Parameters

Param	Description	Default	Min	Max		Addr	Type
Pressure Setpoint	Pressure Setpoint (iwg) x 1000; e.g. 50 = 0.05iwg	50	0	250	r/w	41	Integer
Direct/Reverse Acting	Set Output as 0-to-10 or 10-to-0	1 (Direct)	0	1	r/w	1	Boolean
Output Start Voltage	Initial turn-on Voltage	1.5	0	10	r/w	6	Analog
Output Min Voltage	Minimum Output Voltage	0	0	10	r/w	7	Analog
Output Max Voltage	Maximum Output Voltage	10	0	10	r/w	8	Analog

Table 1: Job Specific Settings

Param	Description	Default	Min	Max		Addr	Type
Output Level	Output 0 to 100%	-	0%	100%	r	10	Analog
Pressure Reading	Pressure (iwg) x 1000; e.g. 50.0 = 0.05iwg	-	0	250	r	11	Analog
Plenum Temperature	Plenum Temperature (degree F)	-	50	90	r	12	Analog
Slab Temperature	Slab Temperature (degree F)	-	50	90	r	13	Analog
Relative Humidity	Relative Humidity (%)	-	0%	100%	r	14	Analog
Plenum Dew Point	Plenum Dew Point (degree F)	-			r	15	Analog
Dew Point Alarm	Condensation Warning	-			r	16	Boolean
SW Revision	SW Revision	2.1			r	201	Analog

Table 2: Status Outputs

Param	Description	Default	Min	Max		Addr	Type
Plenum Temp Cal	Temperature Offset (degree F)	0	-10	10	r/w	21	Analog
Slab Temp Cal	Temperature Offset (degree F)	0	-10	10	r/w	22	Analog
Pressure Cal	Pressure Offset (1 = .001iwg)	0	-25	25	r/w	23	Analog
Humidity Cal	Humidity Offset	0	-10	10	r/w	24	Analog
PID Loop Proportional	PID Proportional Setting /10; e.g. 80 = 800	80	0	999	r/w	42	Integer
PID Loop Integration	PID Integration Setting	5	0	999	r/w	43	Integer
PID Loop Derivative	PID Derivative Setting	0	0	999	r/w	44	Integer
PID Lood Deadband	Deadband (iwg) x 1000; e.g. 2 = 0.002iwg	2	0	999	r/w	45	Integer

Table 3: Tuning Parameters