



Viconics VT7300 Series PIR Ready Fan-coil Controllers Engineering Guide Specification

General – The VT7300 series are PIR Ready low-voltage microprocessor-based fan-coil controllers. Models are available controlling single speed and multi-speed (up to three (3) speeds) fan-coil units as well as ON/OFF, 0-10Vdc analog, staged, three-point floating heating/cooling applications. Non-communicating “Network-Ready” models as well as communicating BACnet™ MS-TP, Echelon™ Lontalk™ and Zigbee™ wireless models are available depending on the application. Models with integrated relative humidity sensor available for increased occupant comfort through dehumidification. Special hotel/lodging models available with temperature scale button instead of Mode button to prevent room override.

Quality Assurance - The controller shall be manufactured within a systems certified **ISO-9001** and **ISO-14001** facility and must have the following specifications and industry approvals:

Terminal Equipment Controller power requirements:	19-30 VAC 50 or 60 Hz; 2 VA Class 2
Operating conditions:	0 °C to 50 °C (32 °F to 122 °F) 0% to 95% R.H. non-condensing
Storage conditions:	-30 °C to 50 °C (-22 °F to 122 °F) 0% to 95% R.H. non-condensing
Temperature sensor:	Local 10 K NTC thermistor
Temperature sensor resolution:	± 0.1 °C (± 0.2 °F)
Temperature control accuracy:	± 0.5 °C (± 0.9 °F) @ 21 °C (70 °F) typical calibrated
Humidity sensor and calibration :	Single point calibrated bulk polymer type sensor Reading range from 10-90% R.H. non-condensing
Humidity sensor precision:	10 to 20% precision is 10% 20 to 80% precision is 5% 80 to 90% precision is 10% Less than 1.0% yearly (typical drift)
Humidity sensor stability:	
Dehumidification set point range	30 to 95% R.H.
Contact output rating	Triac output: 30 VAC, 1 Amp. Maximum, 3 Amp. In-rush. Analog: 0 to 10 VDC into 2KΩ resistance min.
Occ, Stand-By and Unocc cooling set point range:	12.0 to 37.5 °C (54 to 100 °F)
Occ, Stand-By and Unocc heating set point range:	4.5 °C to 32 °C (40 °F to 90 °F)
Room and outdoor air temperature display range:	-40 °C to 50 °C (-40 °F to 122 °F)
Proportional band for room temperature control:	Cooling & Heating: Default: 1.8°C (3.2°F)
Binary inputs:	Dry contact across terminal BI1, BI2 & UI3 to Scm
Wire gauge:	18 gauge maximum, 22 gauge
Approximate shipping weight:	0.75 lb (0.34 kg)
Agency Approvals all models:	UL: UL 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN XAPX (US) and XAPX7 (Canada) Industry Canada: ICES-003 (Canada) FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US) CE : EMC Directive 89/336/EEC (Europe Union) C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand) Supplier Code Number N10696 FCC: Compliant to: Part 15, Subpart C
Agency Approvals Wireless models:	



VT7300 Series

General – The low-voltage fan coil controller shall be capable of **(ON/OFF, three point floating, 0-10Vdc analog)** control of a VAV damper actuator, two-pipe heating and/or cooling application, or four-pipe heating and cooling applications as well as auxiliary re-heat (if necessary).

The controller shall be **(a non-communicating “Network-Ready” model, BACnet™ MS-TP communicating model, Echelon™ Lontalk™ communicating model or Zigbee™ wireless communicating model).**

- Controller shall be equipped with large, 2 line, 16 character LCD dual intensity backlit display with three status LEDs showing FAN, HEAT, COOL.
- Controller shall achieve accurate temperature control using a PI proportional-integral algorithm. Traditional differential-based controllers are not acceptable.
- Controller shall have an embedded local “real text” configuration utility for simplified sequence selection, start-up and configuration using an integrated five-button keypad. Controllers requiring external configuration tools or network interface for start-up and configuration are not acceptable.
- Controller shall be supplied (without networking interface, BACnet™ MS-TP network interface, Echelon™ Lontalk™ network interface, Zigbee™ wireless network interface). BACnet™ MS-TP versions shall be provided with Protocol Implementation Conformance Statement or Lonmark approval disclosing all object/SNVT properties and instance numbers to facilitate the integration process. Echelon™ Lontalk™ communicating versions shall be provided with appropriate application files and LNS plug-in as required free of charge from the manufacturer. “Network Ready” non-communicating model can be field upgraded by adding one of the following communication adapters:
 1. VCM7300V5000B: Terminal Equipment Controller BACnet™ MS-TP communication adapter
 2. VCM7300V5000E: Terminal Equipment Controller Echelon™ Lontalk™ communication adapter
 3. VCM7000V5000W: Terminal Equipment Controller wireless communication adapter
- Controller shall utilize EEPROM memory to back up local configuration parameters in the event of power failure. Controllers requiring batteries, or have no provisions for retention during loss of power shall not be acceptable.
- Controller shall have password protection to prevent unauthorized access to the configuration menu parameters.
- Controller shall have integrated changeover function, which will allow seamless switching between cooling and heating mode based upon temperature or network value input.
- Controller shall be provided with two (2) floating or two (2) analog proportional-integral control outputs and one configurable auxiliary output to be used for heating, or local digital output.
- Controller shall be compatible with the Viconics VI-PIR “Passive Infrared” cover for advanced active occupancy logic. An additional occupancy level “Stand-by” shall be added between “occupied” and “unoccupied” modes for additional energy savings strategies. The controller can be retrofitted with the VI-PIR cover on the site.
- Controller shall be capable of local or remote override during unoccupied mode. The controller shall resume occupied set points and will revert back to unoccupied set points after a certain amount of time (adjustable from 0 – 24hours in one hour increments).



- Controller shall have an adjustable “Auto Fan” parameter (depending on selected Fan sequence):
 1. **AS (Default)** = Auto Speed during occupied periods. Fan is always on during occupied periods. Low, medium and high speeds operate on temperature offset from set point.
 2. **AS AD** = Auto Speed / Auto Demand during occupied periods. In this mode, medium and high speeds operate on temperature offset from set point. Low speed operates on demand and will shut down when no demand is present.
- Controller shall have configurable temporary or permanent local override set points. When the “temporary set points” mode is enabled, once the temporary occupancy timer expires, the set points will revert back to their default values.
- Controller shall have adjustable local unoccupied heating and cooling set point limits as well as maximum heating and minimum cooling limits.
- Controller shall have an adjustable deadband (from 2°F to 5°F, 1°C to 2.5°C).
- Controller shall have an adjustable proportional band (from 3°F to 10°F, 1.2°C to 5.6°C).

Controller shall have six (6) adjustable keypad lockout levels limiting access to as follows:

Level	Occupied temperature set points	System mode setting	Fan mode setting	Unoccupied Override
0	Yes access	Yes access	Yes access	Yes access
1	Yes access	Yes access	Yes access	No access
2	Yes access	No access	No access	Yes access
3	Yes access	No access	No access	No access
4	No access	No access	No access	Yes access
5	No access	No access	No access	No access



- Controller shall provide the following local monitoring capabilities:
 - DI-1
 1. **None:** No function will be associated with the input (free input to be used for alarming or monitoring of a remote digital contact to be shared over a communications network).
 2. **Remote Night Setback:** Remote night setback timer clock input. Scheduling shall be set as per the binary input providing low cost setback operation via a dry contact.
 3. **Motion NO and Motion NC:** Advanced PIR occupancy functions using Normally Open (NO) or Normally Closed (NC) remote PIR motion sensor. Occupancy mode shall be set as per applied PIR function and configuration.
 4. **EMS:** Door/window strategy. Shall display an alarm if door/window is open and thus heating/cooling has stopped.
 - DI-2
 1. **None:** No function will be associated with the input (free input to be used for alarming or monitoring of a remote digital contact to be shared over a communications network)
 2. **(Door Dry) Door contact & Motion detector:** This configuration is only functional if binary input #1 is set to Motion NO or Motion NC or a PIR accessory cover is used. When sequence is enabled, the occupancy shall be dictated through 2 inputs. Any motion detected shall set the zone to occupied status. The zone shall remain permanently in occupied mode until the door contact switch opens momentarily. The controller shall then go in stand-by mode. If more movements are detected, the occupied mode shall resume. While the door is opened, any movements detected by the remote PIR sensor or the PIR accessory cover shall be ignored.
 3. **Remote Override:** Temporary occupancy remote override contact. Local keypad override shall be disabled. Override function shall be controlled only by a manual remote toggle signal.
 4. **Filter:** A backlit flashing Filter alarm shall be displayed on the local controller LCD screen when input (from a differential pressure switch) is energized.
 5. **Service:** A backlit flashing Service alarm shall be displayed on the local controller LCD screen when input is energized.
 - UI-3
 1. **None:** No function will be associated with the input (free input to be used for monitoring of a remote 10k type II thermistor (discharge air, outside air, return air etc.) to be shared over a communications network)
 2. **COC/NH:** Change over dry contact - Normally Heat: For two-pipe systems
 3. **COC/NC:** Change over dry contact - Normally Cool: For two-pipe systems
 4. **(COS):** Change over analog sensor: For two-pipe systems
 5. **(SS) Supply air sensor monitoring:** Used for supply air temperature monitoring.



- Controller shall be provided with six unique sequences to meet the needs of most zone temperature control applications.

Sequence selected	Mode Menu
0 = Cooling only	Off - Cool
1 = Heating only	Off - Heat
2 = Cooling With Reheat	Off – <u>Auto</u> * – Heat – Cool
3 = Heating With Reheat	Off - Heat
4 = Cooling / Heating 4 pipes	Off – <u>Auto</u> * – Heat – Cool
5 = Cooling / Heating 4 pipes with Reheat	Off – <u>Auto</u> * – Heat – Cool

* Auto. The Auto mode can be disabled from the menu

- Controller shall be pre-programmed, containing all required I/O to accomplish local HVAC temperature control.
- Controllers shall be provided with intelligent HMI, to which will display services only as are available as switched through local digital input or network layer such as:
 - Outdoor air temperature display only enabled when outdoor air temperature network variable is received.
 - “Stand-by time” and “Stand-by set point” parameters only when VI-PIR cover is connected.
 - COM Address and various other parameters when a communication module is integrated inside the unit.
- **For hotel/lodging applications only:** Controller shall be provided with a temperature scale keypad button instead of a Mode button to prevent occupant from overriding the schedule. Occupant may change between °C and °F.



VI-PIR Viconics Passive Infrared Cover

- Controller shall be supplied with (or capable of being retrofitted on site) with the VI-PIR cover. Passive infrared sensor shall be integrated into the cover of the controller. Controls with remote motion detectors are not acceptable.
- VI-PIR shall add a third level of occupancy, “Stand-by” in between “Occupied” and “Unoccupied”. Controller shall have an adjustable “Stand-by timer” integrated to change the occupancy mode from “Occupied” to “Stand-by” if no motion is detected. Additionally, the controller shall drop from “Stand-by” mode to “Unoccupied” if no motion is detected for a certain amount of time during “Stand-by” mode. Both timers are adjustable. “Stand-by” mode shall have adjustable heating and cooling set points. Stand-by set points are intended to be set a few degrees less or more than “Occupied” set points to ensure a quick recovery to “Occupied” set points when motion is detected. Controls with motion detectors that only switch from “Unoccupied” mode to “Occupied” mode without a stand-by mode are not acceptable.

Model Specific Features:

VT73xx5x00W

- Controller shall be equipped with the wireless communication model enabling compatibility with the Viconics Wireless Door Switch (VWA5000D5000W) and Viconics Wireless Window Switch (VWA5000W5000W).
- Controller and VWA5000x5000W wireless switches shall be easily paired by simply configuring the controller for Window and/or Door contact and then enabling pairing mode in the wireless switch.

Controllers shall be Viconics, model VT730xx5x00x