

# ECB-PTU Series

BACnet® B-ASC Powered  
Terminal Unit Programmable  
Controllers



## Overview

The ECB-PTU Series controllers are microprocessor-based programmable controllers designed to control powered terminal units such as powered fan coil units, heat pumps units, and chilled beams.

Each controller uses the BACnet® MS/TP LAN communication protocol and is BTL®-Listed as BACnet Application Specific Controllers (B-ASC) and WSP Certified.

These controllers are optimized for ultra-low power consumption and can be operated as stand-alone units or as part of a networked system to suit any installation requirement



## Features & Benefits

- Flexible inputs and outputs support all industry-standard terminal unitary applications
- Rugged hardware inputs and outputs eliminate the need for external protection equipment
- Factory pre-loaded applications allow for out-of-the-box, energy efficient operation of standard terminal unitary equipment
- End-to-end solution for support of Smart Room Control of HVAC equipment, lighting and sunblinds
- Supports EC-gfxProgram, making Building Automation System programming effortless
- Open-to-Wireless™ ready, supporting a wide variety of wireless sensors and switches and helping to reduce installation costs
- Supports the Allure™ Series Communicating Sensors, providing intelligent sensing and environmental zone control
- eu.bac Certified Control Efficiency guarantees the highest level of performance of the products and systems
- Our controllers are BTL-listed and WSP-certified, which guarantee interoperability with other manufacturers' BTL-listed controllers

# Model Selection

Example: **ECB-PTU-208 (SI)**

Series	Model	Units
ECB-PTU-	<b>107</b> : 12 Points, 3 Powered Relay Outputs, 2 Line-Powered Triac Outputs	<b>(SI)</b> : Preloaded Apps in SI (Metric) units <b>(IMP)</b> : Preloaded Apps in Imperial (US) units
	<b>207</b> : 16 Points, 3 Powered Relay Outputs, 2 Line-Powered Triac Outputs, 4 Analog Outputs	
	<b>208</b> : 14 Points, 3 Powered Relay Outputs, 2x24 VAC Triac Output <sup>1</sup> , 2 Analog Outputs, 24 VAC Power Supply Output	
	<b>307</b> : 17 Points, 3 Powered Relay Outputs, 4 Line-Powered Triac Outputs, 2 Analog Outputs	
	<b>308</b> : 16 Points, 3 Powered Relay Outputs, 4x24 VAC Triac Output <sup>1</sup> , 2 Analog Outputs, 24 VAC Power Supply Output	

1. Can be used to power certain types of valves and air dampers, thereby eliminating the need for a transformer.

## Recommended Applications

Model	ECB-PTU-107	ECB-PTU-207	ECB-PTU-208	ECB-PTU-307	ECB-PTU-308
<b>Fan Coil Unit:</b>					
● 2/4 pipes - 3 speed fan - On/Off / thermal valves	■				
● 2/4 pipes - Variable / 3-speed fan - On/off / thermal valves		■	■		
● 2/4 pipes - Variable / 3-speed fan - Analog actuator		■	■		
● 2 pipes - Variable / 3-speed fan - Floating actuator		■	■		
● 4 pipes - Variable / 3-speed fan - Floating actuator				■	■
● Two Room: 2/4 pipes - Variable speed fan - On/Off / thermal valves				■	■
<b>Heat Pump Unit:</b>					
● 3-speed fan	■				
● Variable speed fan		■	■		
<b>Chilled Beam:</b>					
● On/Off / thermal valves	■		■		
● 2 pipes - Floating actuator	■		■		
● 4 pipes - Floating actuator				■	■
● Two Room: 2/4 pipes - On/Off / thermal / analog valves				■	■
Reversible Ceiling with 6-way valves		■	■		
Unit Ventilator		■	■		

## BACnet Objects

### BACnet Objects

- Calendar Objects 1
- Special events per calendar 25
- Schedule Objects 2
- Special events per schedule 5
- PID Loop Objects 8

### Commandable Objects

- BV Objects 10
- MSV Objects 10
- AV Objects 25

### Non-Commandable Objects

- BV Objects 40
- MSV Objects 40
- AV Objects 75

# Product Specifications

## Power Supply

Voltage Range	100-240 VAC; -15%/+10%;
Frequency Range	50/60Hz
Overcurrent Protection	4.0A external circuit breaker type C or 4.0A fast acting high breaking external fuse (250 VAC min)
Device Insulation Type	Type Double Insulation
Overvoltage Category	II - 2.5 kV
Power Consumption (ECB-PTU-107 / 207 / 307)	0.9 W plus all external loads <sup>1</sup>
Power Consumption (ECB-PTU-208 / 308)	<2.7 W plus all external loads <sup>1</sup>
Maximum Consumption (ECB-PTU-107 / 207 / 307)	4.0 A
Maximum Consumption (ECB-PTU-208 / 308)	3.5 A

- External loads must include the power consumption of any connected modules such as an Allure Series Communicating Sensor. Refer to the respective module's datasheet for related power consumption information.

## Communications

Communication Bus	BACnet MS/TP
BACnet Profile	B-ASC <sup>1</sup>
EOL Resistor	Built-in, dip switch selectable
Baud Rates	9600, 19 200, 38 400, or 76 800 bps
Addressing	Dip switch

- Refer to Distech Controls' Protocol Implementation Conformity Statement for BACnet.

## Subnetwork

Communication	RS-485
Cable	Cat 5e, 8 conductor twisted pair
Connector	RJ-45
Connection Topology	Daisy-chain
Maximum number of room devices supported per controller combined	4
Allure EC-Smart-View Series <sup>1</sup>	4
Allure EC-Smart-Comfort Series	4
Allure EC-Smart-Air Series <sup>1</sup>	4
EC-Multi Sensor	4
ECx-Light-4 / ECx-Light-4D / ECx-Light-DALI	4
ECx-Blind-4 / ECx-Blind-4LV	4

- A controller can support a maximum of 2 Allure sensor models equipped with a CO<sub>2</sub> sensor. Any remaining connected sensors must be without a CO<sub>2</sub> sensor.

## Hardware

Processor	STM32 (ARM Cortex™ M3) MCU, 32 bit
CPU Speed	68 MHz
Memory	384 kB Non-volatile Flash (applications) 1 MB Non-volatile Flash (storage) 64 kB RAM
Green LEDs	Controller and Power Status,
Orange LEDs	LAN Tx & Rx

## Wireless Receiver

Communication Protocol	EnOcean wireless standard <sup>1</sup>
Number of Wireless Inputs <sup>2</sup>	24
Supported Wireless Receivers	Refer to the Open-to-Wireless Application Guide
Cable	Telephone cord
Connector	4P4C modular jack
Length (maximum)	2m (6.5ft)



- Available when an optional external Wireless Receiver module is connected to the controller. Refer to the Open-to-Wireless Application Guide for a list of supported EnOcean wireless modules.
- Some wireless modules may use more than one wireless input from the controller.

## Mechanical

Dimensions (H × W × D)	132 × 132 × 44 mm (5.2 × 5.2 × 44")
Dimensions with Terminal Covers (H × W × D)	182 × 132 × 44 mm (7.2 × 5.2 × 44")
Shipping Weight (ECB-PTU-107 / 207)	0.82lbs (0.37 kg)
Shipping Weight (ECB-PTU-307)	0.86lbs (0.39 kg)
Shipping Weight (ECB-PTU-208 / 308)	0.93lbs (0.42 kg)
Enclosure Material <sup>1</sup>	ABS
Enclosure Rating	Plastic housing, UL94-5VB flammability rating
Mounting	Din-rail or wall-mounting

- All materials and manufacturing processes comply with the RoHS directive and are marked according to the Waste Electrical and Electronic Equipment (WEEE) directive

## Environmental

Operating Temperature	+5°C to +40°C (+41°F to +104°F)
Storage Temperature	-20°C to +70°C (-4°F to +158°F)
Relative Humidity	0 to 90% Non-condensing
Ingress Protection Rating	IP30 (with terminal block cover and strain relief)
Altitude	< 6561ft (2000m)
Pollution Degree	2

## Certified Performances

eu.bac license number	213324
<b>Cooling Control Accuracy</b>	
Chilled Ceiling Systems	0.36°F (0.2°C)
Fan Coil Systems (2 pipes + electric heater)	0.18°F (0.1°C)
Fan Coil Systems (4 pipes)	0.18°F (0.1°C)
<b>Heating Control Accuracy</b>	
Fan Coil Systems (2 pipes + electric heater)	0.18°F (0.1°C)
Fan Coil Systems (4 pipes)	0.18°F (0.1°C)

## Standards and Regulation

CE Emission	EN61000-6-3: 2006; A1:2010
CE Immunity	EN61000-6-1: 2005
FCC	Compliance with FCC rules part 15, subpart B, class B
UL Listed (CDN & US)	UL 61010-1 Energy management equipment CSA C22.2 NO. 61010-1 File number: E352591
PEP ecopassport®	Compliant environmental declaration



## Universal Inputs (UI)

### General

Input Type	Universal; software configurable
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### Contact

Type	Dry contact (0 – 3.3VDC)
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### Counter

Type	Dry contact (0 – 3.3VDC)
Maximum Frequency	1Hz maximum
Minimum Duty Cycle	500milliseconds On / 500milliseconds Off

### 0 to 10VDC

Range	0 to 10VDC
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### Resistance/Thermistor

Thermistor	10KΩ Type 2, 3 (10KΩ @ 77°F; 25°C)
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## Sensor Inputs (SI)

### General

Input Type	Sensor; software configurable
Accuracy	± 0.1°C, 32.18°F @ 25°C; 77°F (controller only)

### Contact

Type	Dry contact (0 – 3.3VDC)
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### Counter

Type	Dry contact (0 – 3.3VDC)
Maximum Frequency	1Hz maximum
Minimum Duty Cycle	500ms On / 500ms Off

### Resistance

Thermistor	10KΩ Type 2, 3 (10KΩ @ 77°F; 25°C)
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## Digital Inputs (DI)

### General

Input Type	Digital; software configurable
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### Contact

Type	Dry contact (0 – 3.3VDC)
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## Counter

Type	Dry contact (0 – 3.3VDC)
Maximum Frequency	1Hz maximum
Minimum Duty Cycle	20 milliseconds On / 20 milliseconds Off

## Power Supply (Vref)

Output (Vref)	5 VDC for polarization (I < 1 mA)
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## Triac Outputs

### General (ECB-PTU-107 / 207 / 307)

Output Type	Triac
Voltage Range	100-240 VAC (same as device power supply)
Maximum Current per Output	0.5 A continuous 1 A @ 15% duty cycle for a 10-minute period
Inrush Current	3.0 A maximum (<20 milliseconds)
Common Terminal	1 per pair of outputs

### General (ECB-PTU-208 / 308)

Output Type	Triac
Power Source	Internal on-board 24 VAC power supply
Voltage Range	See on-board 24 VAC power supply
Current	See on-board 24 VAC power supply
Common Terminal	1 per pair of outputs

### Digital (On/Off)

Voltage Range (ECB-PTU-107 / 207 / 307)	0 or 100-240 VAC (same as device power supply)
Voltage Range (ECB-PTU-208 / 308)	0 or 24 VAC

### PWM

Application	Typically Thermal Valve Control
Range	Adjustable period from 2 to 65 seconds

### Floating

Minimum Outputs	2 consecutive outputs
Minimum Pulse On/Off Time	500 milliseconds
Drive Time Period	Adjustable from 10 to 600 seconds

## Powered Relay Outputs

### General

Output Type	Digital
Application	Typically Fan Speeds
Current	3.0 A max. (inductive or resistive load) for the total sum of the 3 outputs
Resting State	Normally Open
Common Terminal	Shared

### Digital (On/Off)

Voltage Range	0 or 100-240 VAC (Same as device power supply)
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## Digital Relay Contact Outputs

### General

Output Type	Digital
Application	Typically Electric Heater
Protection	Must be protected with an external circuit breaker or fast acting, high breaking fuse in accordance with the controlled load (10 A max. / min voltage according to the controlled load)

### Contact

Type	Dry contact
Voltage Range	100-255 VAC
Current (ECB-PTU-107 / 207 / 208 / 308)	9.0 A max. on a resistive load (2 kW @ 230 VAC)
Current (ECB-PTU-307)	6.0 A max. on a resistive load (1.4 kW @ 230 VAC)
Resting State	Normally Open
Common Terminal	Dedicated digital

## 24 VAC Outputs

### (ECB-PTU-208 / 308)

Power Source	Internal on-board 24 VAC power supply
Voltage Range	See on-board 24 VAC power supply
Current	See on-board 24 VAC power supply

## On-board 24 VAC Power Supply

### (ECB-PTU-208 / 308)

Power Source	Internal on-board 24 VAC power supply
Voltage Range	24 VAC; $\pm 10\%$
Frequency	50 Hz
Current	500 mA max. on a resistive load (12 VA @ 24 VAC)
Peak current	800 mA
Short-circuit protection	Fuse
Overload protected	Yes

## Analog Outputs

### (ECB-PTU-207 / 208 / 307 / 308)

Output Type	Analog
Voltage Range	0-10 VDC linear
Current	5 mA max

## Dimensions

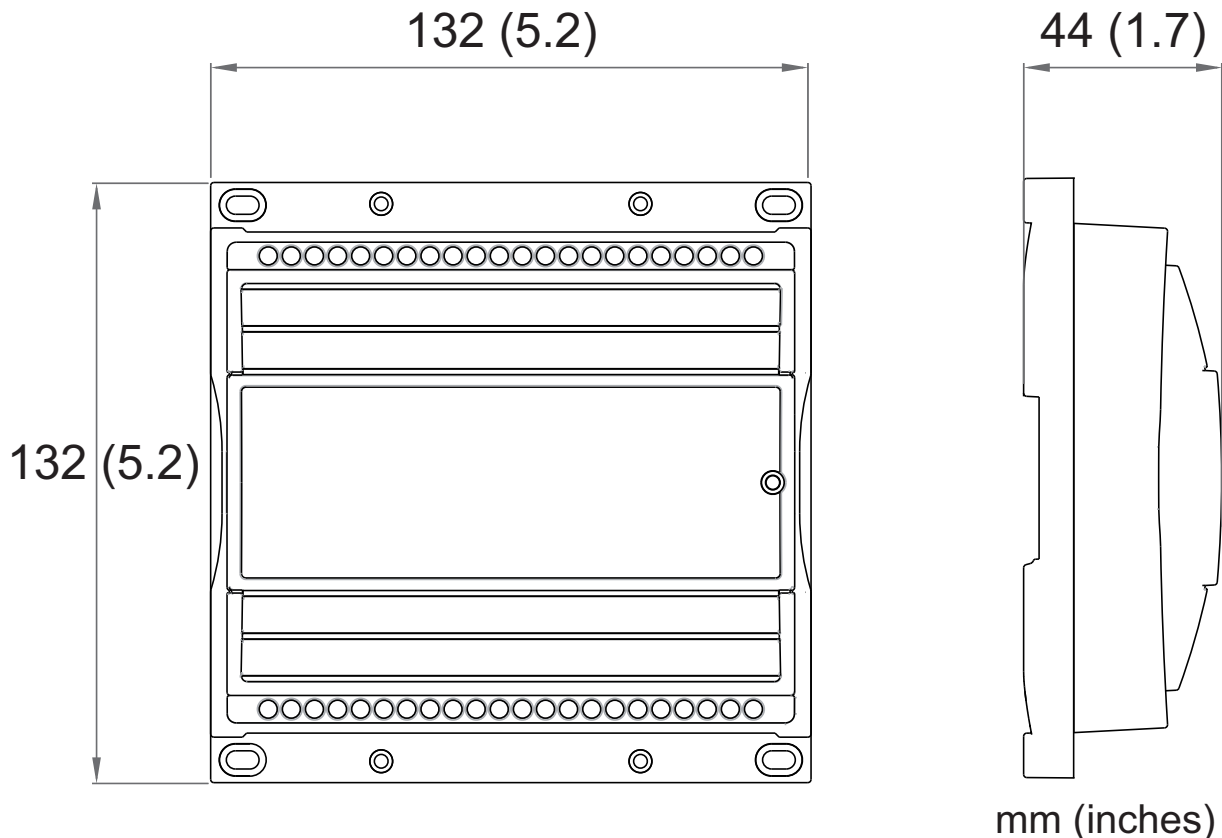


Figure 1: PTU Enclosure - Without strain relief

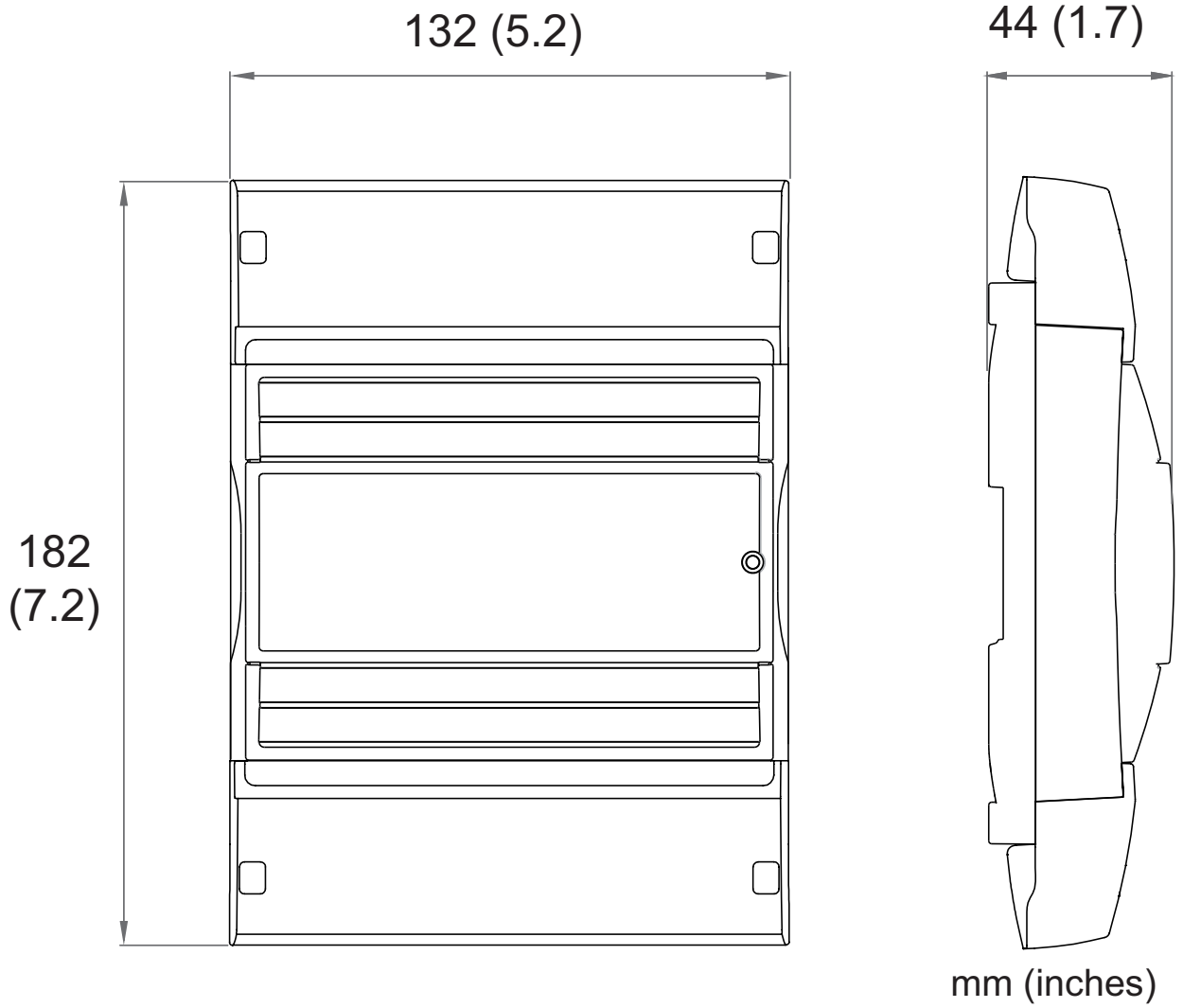


Figure 2: PTU Enclosure - With strain relief

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