# ECY-PTU Controller


## Overview

The Eclypse Connected Terminal Unit Controller (ECY-TU/PTU) controls terminal units such as fan coil units, chilled beams, ceilings, and heat pumps. It integrates a control, automation, and connectivity server, power supply, and dedicated I/Os. With wired and wireless IP connectivity, it supports efficient, reliable installation. The embedded web server enables web-based configuration and HTML5 visualization. As part of the DC Space solution, it can also control lighting (DALI, ON/OFF, dimming) and shades/sunblinds (24 VDC or 100–240 VAC) via expansion modules.

The ECY-PTU Controller is powered by Eclypse Facilities and includes two years of Atrius Facilities - Organize.

## Features & Benefits

- Utilizes BACnet/IP and IT standards, delivering empowered IP connectivity and open integration with building management systems
- No external transformer required
- Via its RESTful API, data can be accessed from different applications, such as energy dashboards, analytics tools, and mobile applications
- Supports DC Space for an end-to-end system for the control of HVAC equipment, lighting, and shades/sunblinds
- Embedded alarms, trend log and schedule support allows for fully distributed data and logic providing a more robust system
- Automatic email notifications for system status and alarms to ensure faster system servicing and response time
- Eclypse edge analytics automates the commissioning process, saving up to 30-45 minutes per device
- Readily supports Atrius Facilities that simplifies installation and maintenance of systems and increases the efficiency of building operations.

# Model & Connectivity Selection

**Model Selection**
Example: ECY-***PTU-208-C5 (SI)***

| Series | Supply Voltage Input | Model[1] | Connectivity | Units |
|---|---|---|---|---|
| ECY- | ***PTU*** : 100-240 VAC<br><br>***TU*** :[2] 24 VAC | ***-107*** : Connected Terminal Unit Controller with Eclypse Facilities - 12 Points<br>Inputs: 3 Universal Inputs, 2 Digital Inputs, 1 Sensor Input<br>Outputs: 1 Relay Contact Output (typ. Electric Heater), 3 Line-Powered Relay Outputs (typ. Fan Speeds), 2 Line-Powered Triac Outputs (typ. Valves).<br><br>***-207*** : Connected Terminal Unit Controller with Eclypse Facilities - 16 Points<br>Inputs: 3 Universal Inputs, 2 Digital Inputs, 1 Sensor Input.<br>Outputs: 1 Relay Contact Output (typ. Electric Heater), 3 Line-Powered Relay Outputs (typ. Fan Speeds), 2 Line-Powered Triac Outputs (typ. Valves), 4 Analog Outputs.<br><br>***-208*** : Connected Terminal Unit Controller with Eclypse Facilities - 16 Points<br>Inputs: 3 Universal Inputs, 2 Digital Inputs, 1 Sensor Input.<br>Outputs: 1 Relay Contact Output (typ. Electric Heater), 3 Line-Powered Relay Outputs (typ. Fan Speeds), 2 24VAC-Powered Triac Outputs (typ. Valves), 4 Analog Outputs, 24VAC Power Supply Outputs.<br><br>***-203*** :[3] Connected Terminal Unit Controller with Eclypse Facilities - 16 Points<br>Inputs: 3 Universal Inputs, 2 Digital Inputs, 1 Sensor Input.<br>Outputs: 1 Relay Contact Output (typ. Electric Heater), 3 Unpowered Relay Outputs (typ. Fan Speeds), 2 24VAC-Powered Triac Outputs (typ. Valves), 2 Digital/Analog Outputs, 2 Analog Outputs, 24VAC Power Supply Outputs. | ***-C0***: default model if no connectivity is required<br><br>***-C1 .... C10***: if connectivity is required (see table below) | ***(SI)*** : Preloaded Apps in SI (Metric) units<br><br>***(IMP)*** : Preloaded Apps in Imperial (US) units |

[1]SEP models (single Ethernet port) have secondary Ethernet port factory disabled
[2]Only available with the 203 Model
[3]Only available with the 24 VAC Supply Voltage Input

## Connectivity Packs

Connectivity packs enable remote devices to be added to a connector in Eclypse Facilities. A single pack adds x connections and x * 100 points of connectivity.

BACnet Network Values in EC-*gfx*Program are available without connectivity packs.

| Connectivity | | Device Ratios | | | |
|---|---|---|---|---|---|
| | | **1:1** | **2:1** | **8:1** | **100:1** |
| Connectivity Pack | Connections (device loads) | BACnet Devices (IP or MS/TP) | Modbus devices (TCP/IP or RTU) | M-Bus devices[1] | Global point count |
| C1[2] | 1 | 1 | 2 | 3 | 100 |
| C3 | 3 | 3 | 6 | 3 | 300 |
| C5 | 5 | 5 | 10 | 3 | 500 |
| C10 | 10 | 10 | 20 | 3 | 1000 |

[1]The maximum number of physical M-Bus meters is 3 when the ECY-MBUS module is connected to the controller's USB port.
[2]Minimum Connectivity Pack required to enable BACnet routing, MS/TP "Client", integration, use of RS485 port

Depending on the connector, a device can consume a whole connection or a fraction of a connection.

The device ratios are the following using a C5 connectivity pack (refer to table above):

- BACnet (1:1) = 5 BACnet with C5
- Modbus (2:1) = 10 Modbus with C5
- M-Bus[1] (8:1) = 40 M-Bus with C5

[1]Some physical M-Bus meters can include more than 1 virtual M-Bus device. Since each virtual M-Bus device has its own M-Bus address on the M-Bus network, the Connectivity Pack will count the number of virtual devices, rather than the number of physical M-Bus meters. It is therefore recommended to check whether the M-Bus meters that will be connected to the controller include virtual M-Bus devices, and, if so, how many, before choosing a Connectivity Pack license.

### How to calculate connectivity

Connectivity packs are cumulative but only one pack can be ordered with a controller. More packs can be added afterwards in the field. The following shows how to calculate the connectivity needed:

6 BACnet + (3 Modbus ÷ 2) + (6 M-bus ÷ 8) = 8.25

Select C10 (10 connections, 1000 points)

To assist in calculating the required connectivity, contact your RSM for more details or refer to the price list if available.

### Accessories

| | |
|---|---|
| Terminal covers | Terminal cover designed to conceal the wire terminals of the ECY-PTU/TU Series controllers. Required to meet local safety regulations in certain jurisdictions |

# Product Specifications

### Power Supply Input (ECY-PTU-107, ECY-PTU-207, and ECY-PTU-208)

| | |
|---|---|
| Voltage Range | 100-240 VAC; ±10% |
| Frequency Range | 50 to 60Hz |
| Overcurrent Protection | 4.0 A external circuit breaker type C |
| Device Insulation Type | Double Insulation |
| Overvoltage Category | II - 2.5 kV |
| Power Consumption | 5 W plus all external loads |
| Maximum Consumption | 4 A |

### Power Supply Input (ECY-TU-203)

| | |
|---|---|
| Voltage Range | 24 VAC; ±15%; Class 2 |
| Frequency Range | 50 to 60Hz |
| Overcurrent Protection | 2.0 A fast acting, 5x20mm (GMA-2A) internal fuse |
| Device Insulation Type | Double Insulation |
| Overvoltage Category | II - 2.5 kV |
| Power Consumption | 5 W plus all external loads |
| Maximum Consumption | 2 A |

### Communications

| | |
|---|---|
| Ethernet Connection Speed | 10/100 Mbps |
| Cable Type | Cat 5e, 8 conductor twisted pair (unshielded) |
| Addressing | IPv4 or Hostname |
| BACnet Profile | BACnet Building Controller (B-BC) |
| BACnet Listing | BTL (B-BC) |
| BACnet Interconnectivity | BBMD forwarding capabilities<br>BACnet/SC routing |
| BACnet Transport Layer | IP, BACnet/SC (Node) |
| Web Server Protocol | HTML5 |
| Web Server Application Interface | REST API |
| Network Security | 802.1X<br>• EAP-TTLS / MSCHAPv2<br>• PEAP-MSCHAPv2<br>• EAP-TLS |
| Wireless Adapter | Optional, USB Port Connection<br>Refer to the Eclypse Wi-Fi Adapter Spec Sheet |

### Subnetwork

| | |
|---|---|
| Communication | RS-485 |
| Cable Type | Cat 5e, 8 conductor twisted pair |
| Connector | RJ-45 |
| Connection Topology | Daisy-chain |
| Maximum number of standard room devices supported per controller combined[1] | 4 |
| Allure EC-Smart-Vue Series[2] | 4 |
| Allure EC-Smart-Comfort Series | 4 |
| Allure EC-Smart-Air Series[2] | 4 |
| EC-Multi Sensor | 4 |
| ECx-Light-4 / ECx-Light-4D / ECx-Light-4DALI / ECx-Light-DALI-A[1] | 2 |
| ECx-Blind-4 / ECx-Blind-4LV / ECx-Blind-OO4smi / ECx-Blind-4SMI-LoVo [1] | 2 |
| Maximum number of Bluetooth low energy room devices per controller combined [3] | 4 |
| Allure UNITOUCH™ | 2 |
| EC-Multi-Sensor-BLE | 4 |

[1]For more details about supported quantities, see the Product Selection Tool available in Builder: https://builder.distech-controls.com.

[2]A controller can support a maximum of 2 Allure sensor models equipped with a $CO_2$ sensor. Any remaining connected sensors must be without a $CO_2$ sensor.

[3]A mixed architecture with standard room devices and Bluetooth low energy enabled devices is not recommended.

### Hardware

| | |
|---|---|
| Processor | Sitara ARM processor |
| CPU Speed | 600MHz |
| Memory | 4GB Non-volatile Flash (applications & storage)<br>512MB RAM |
| Real Time Clock (RTC) | Real Time Clock with rechargeable battery<br>Supports SNTP network time synchronization |

| | |
|---|---|
| RTC Battery | 20 hours charge time, 20 days discharge time<br>Up to 500 charge / discharge cycles |
| Cryptographic Module | FIPS 140-2 Level 1 Compliant |
| Ethernet | 2 × switched RJ-45 Ethernet ports with integrated fail-safe for daisy-chaining |
| USB Connections | 2 × USB 2.0 Ports<br>1 × Micro-USB 2.0 Ports |
| Subnet | RJ-45 |
| Green LED | Power status and Ethernet Traffic |
| Orange LED | Controller status and Ethernet Speed |

### Open-to-Wireless Adapter

| | |
|---|---|
| Communication Protocol | EnOcean wireless standard[1] |
| Connector Type | USB |
| Number of Wireless Inputs | Unlimited[2] |

[1]Available when an optional external Eclypse Open-to-Wireless Adapter is connected to the controller. Refer to the Open-to-Wireless Application Guide for a list of supported EnOcean wireless modules.

[2]Wireless inputs will only be limited by physical distance between the EnOcean devices and the Eclypse Open-to-Wireless Adapter.

### Mechanical

| | |
|---|---|
| Dimensions (H × W × D) | 142 × 145 × 57 mm<br>(5.60 × 5.71 × 2.24") |
| Dimensions with Terminal Covers (H × W × D) | 195 × 145 × 57 mm<br>(7.67 × 5.71 × 2.24") |
| Shipping Weight | 0.6 kg [1.32 lbs] |
| Enclosure Material[1] | FR/ABS |
| Enclosure Rating | Plastic housing, UL94-5VB flammability rating |
| Mounting | Din-rail or wall-mounting |

[1]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<br>(+41°F to +104°F) |
| Storage Temperature | -20°C to +70°C<br>(-4°F to +158°F) |
| Relative Humidity | 0 to 90% non-condensing |
| Ingress Protection Rating | IP30 (with terminal block covers and strain relief) |
| Nema Rating | 1 |
| Altitude | < 2000 m (6560 ft) |
| Pollution Degree | 2 |

### Standards and Regulations

| | |
|---|---|
| CE Emission | EN61000-6-3: 2007+A1:2011 |
| CE Immunity | EN61000-6-1: 2007 |
| CE Electrical Safety | EN 60730-1 : 2011 |
| FCC | Compliance with FCC rules part 15, subpart B, class B |
| UL Listed (CDN & US) | UL 61010-1 |
| PEP ecopassport® | Compliant environmental declaration |

### Universal Inputs (UI)

#### General

| | |
|---|---|
| Input Type | Universal; software configurable |

#### Contact

| | |
|---|---|
| Type | Dry contact (0 – 3.3VDC) |

#### 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 (40kΩ input impedance) |

#### Resistance/Thermistor

| | |
|---|---|
| Thermistor | 10KΩ Type 2, 3 (10KΩ @ 77ºF; 25ºC) |

### Sensor Inputs (SI)

#### General

| | |
|---|---|
| Input Type | Sensor; software configurable |

#### Contact

| | |
|---|---|
| Type | Dry contact (0 – 3.3VDC) |

#### Counter

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

#### Resistance/Thermistor

| | |
|---|---|
| Thermistor | 10KΩ Type 2, 3 (10KΩ @ 77ºF; 25ºC) |
| Accuracy | ±0.1°C @ 25°C (±0.18°F @ 77°F) |

### Digital Inputs (DI)

#### General

| | |
|---|---|
| Input Type | Digital; software configurable |

#### Contact

| | |
|---|---|
| Type | Dry contact (0 – 3.3VDC) |

#### Counter

| | |
|---|---|
| Type | Dry contact (0 – 3.3VDC) |
| Maximum Frequency | 100Hz maximum |
| Minimum Duty Cycle | 5 milliseconds On / 5 milliseconds Off |

### Power Supply (Vref)

| | |
|---|---|
| Output (Vref) | 5 VDC for polarization (I < 1 mA) |

### Triac Outputs

#### General (ECY-PTU-107 and ECY-PTU-207)

| | |
|---|---|
| Output Type | Triac |
| Voltage Range | 0 or 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 (ECY-PTU-208 and ECY-TU-203)

| | |
|---|---|
| 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) (ECY-PTU-107 and ECY-PTU-207)

| | |
|---|---|
| Voltage Range | 0 or 100-240 VAC (same as device power supply) |

#### Digital (On/Off) (ECY-PTU-208 and ECY-TU-203)

| | |
|---|---|
| Voltage Range | 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 |

### Powered Relay Outputs

#### General (ECY-PTU-107, ECY-PTU-207, and ECY-PTU-208)

| | |
|---|---|
| Output Type | Digital |
| Application | Typically Fan Speeds |
| Supplied Voltage | Same as device power supply |
| Current | 3.0 A max. (inductive or resistive load) for the total sum of the 3 outputs |
| Resting State | Normally Open |
| Common Terminal | Shared |

### Unpowered Relay Outputs

#### General
#### (ECY-TU-203)

| | |
|---|---|
| Output Type | Digital |
| Application | Typically Fan Speeds |
| Supplied Voltage | None |
| Supported Voltage | 100-277 VAC |
| Current | 3.0 A max. (inductive or resistive load) for the total sum of the 3 outputs |
| Protection | Must be protected with an external circuit breaker or fast acting, high breaking fuse in accordance with the controlled load (3 A max. / min voltage according to the controlled load) |
| Resting State | Normally Open |
| Common Terminal | Shared |

### 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 (ECY-PTU-107 / ECY-PTU-207 / ECY-PTU-208) | 100-240 VAC |
| Voltage Range (ECY-TU-203) | 100-277 VAC |
| Current | 9.0 A max. on a resistive load (2 kW @ 230 VAC) |
| Resting State | Normally Open |
| Common Terminal | Dedicated digital |

### Analog Outputs

#### General
#### (ECY-PTU-207, ECY-PTU-208 and ECY-TU-203)

| | |
|---|---|
| Output Type | Analog |
| Voltage Range | 0-10 VDC linear |
| Current | 5 mA max |
| Current sourcing | Maximum 5 mA at 10 VDC (minimum resistance 2 kΩ) |
| Current sinking | Maximum 2 mA at 1 VDC (minimum resistance 5 kΩ) |

### 24 VAC Outputs

#### (ECY-PTU-208 and ECY-TU-203)

| | |
|---|---|
| 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

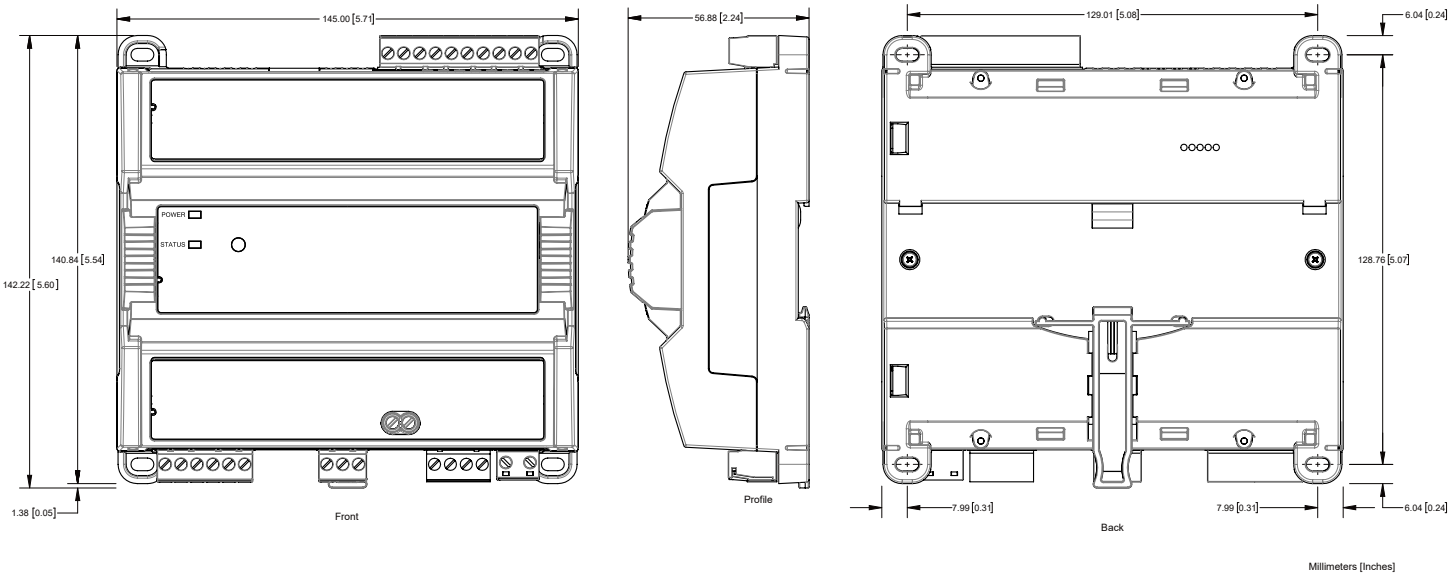
#### General
#### (ECY-PTU-208 and ECY-TU-203)

| | |
|---|---|
| Power Source | Internal on-board 24 VAC power supply |
| Voltage Range | 24 VAC; ± 15% |
| Frequency | 50 Hz |
| Current | 600 mA max. on a resistive load (14 VA; ± 15%) |
| Peak current | 850 mA |
| Short-circuit protection (ECY-PTU-208) | Integrated Fail Safe |
| Short-circuit protection (ECY-TU-203) | Fuse |
| Overload protected | Yes |

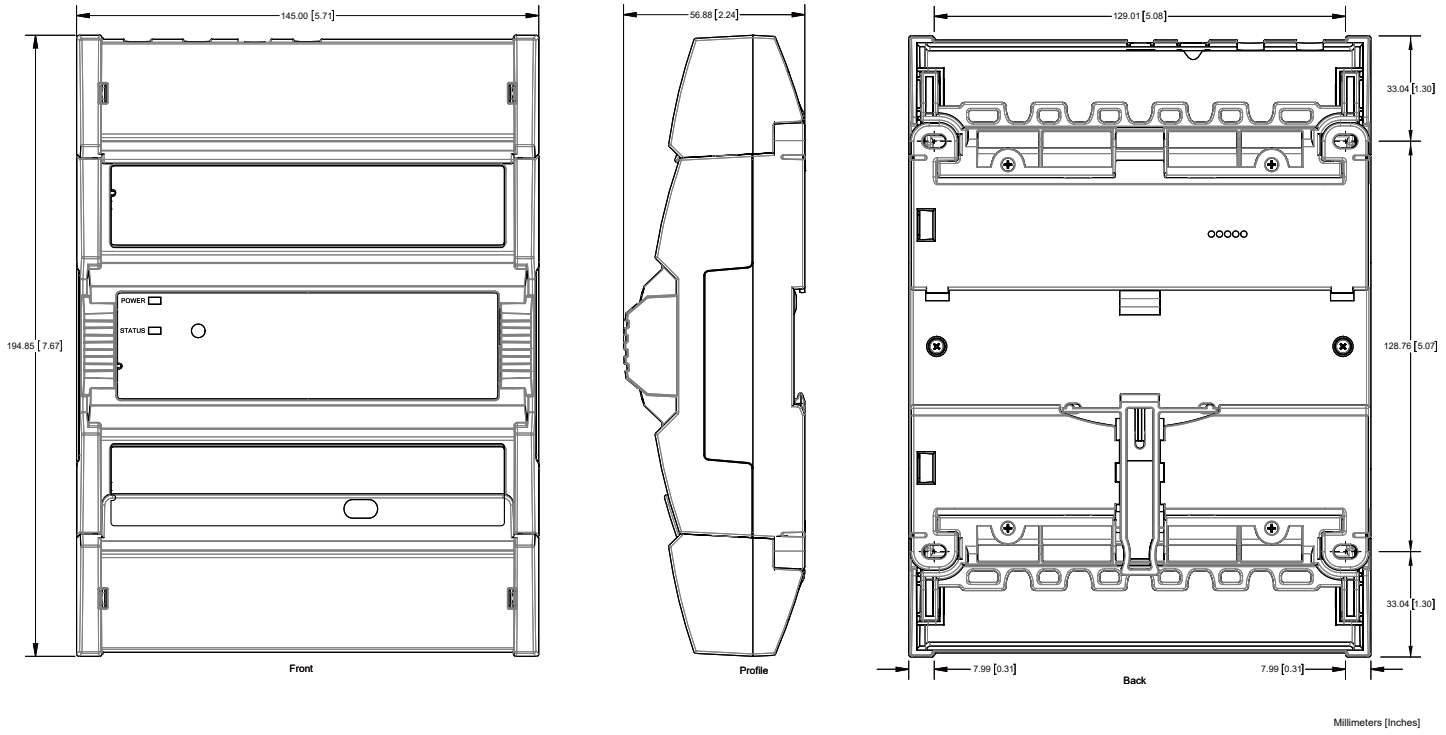
### Digital-Analog Outputs
#### General
#### (ECY-TU-203)

| | |
|---|---|
| Output Type | Digital Triac or Analog; software configurable |
| Triac Output Mode | See Triac Output specifications |
| Analog Output Mode | See Analog Output specifications |

# Dimensions




*ECY-PTU without terminal block covers*




*ECY-PTU with terminal covers*