

# PXU - Temperature/Process Controller Installation Guide



See the Red Lion website at [www.redlion.net](http://www.redlion.net) for a complete user manual.



**CAUTION: Risk of electric shock.**

When the power is on, DO NOT touch the AC terminals, an electric shock may occur. Make sure the power is disconnected when you check the input power supply.

1. Prevent dust or metallic debris from falling into the controller and causing malfunctions. DO NOT modify the controller.
2. The PXU is an open-type device. Make sure it is installed in an enclosure free of dust and humidity in case of an electric shock.
3. Wait for one minute after the power is switched off to allow the unit to discharge. DO NOT touch the internal wiring within this period of time.

## SPECIFICATIONS

### POWER:

**Line Voltage Models:**

100 to 240 VAC -20/+8 %, 50/60 Hz, 5 VA

**Low Voltage Models:**

DC Power: 24 VDC, ±10%, 4 W

AC Power: 24 VAC, ±10%, 50/60 Hz, 5.5 VA

### INPUT CAPABILITIES:

**Thermocouple Inputs:**

Types: T, E, J, K, R, S, B, N, L, U, and TXK

**RTD Inputs:**

Type: 2 or 3 wire, 2 wire can be compensated for lead wire resistance

Excitation: 180 µA typical

Input Type:

100 Ω Pt alpha = .00385

100 Ω Pt alpha = .00392

120 Ω Nickel alpha = .00672

50 Ω Copper alpha = .00428

**Process Input Ranges:**

0-5 VDC      0-20 mA      0-50 mV

0-10 VDC      4-20 mA

**CT Rating:**

**Current Ratio:** 40 A/30.7 mA AC

**Turn Ratio:** 1:1300

**PXU CT Input Rating:**

**Input:** 0 to 25 mA AC

**Input Impedance:** 10 Ω @ 50/60 Hz

**Frequency:** 50/60 Hz

**Maximum Continuous Overload:** 31 mA AC

**Remote Input:**

**Input:** Program selectable 0-5 V, 1-5 V, 0-10 V, 0-20 mA, 4-20 mA

### USER INPUT (Optional):

**Contact/NPN Open Collector Input:**

ON Resistance 1 KΩ max.

OFF Resistance 100 KΩ min.

**Response Time:** 1 sec max

**Functions:** Programmable

### OUTPUT:

**CONTROL RELAY OUTPUTS (OUT1/OUT2):**

**Type:** Form A

**Contact Rating:** 5 A @ 250 VAC

**Contact Isolation to all I/O:** 2300 VAC for 1 min.

**CONTROL SSR DRIVE OUTPUT (OUT1):**

**Rating:** 12 VDC ± 10% @ 40 mA max.

**CONTROL OUTPUT (OUT1) Analog Models:**

**Analog Types:** 4 to 20 mA or 0 to 10 VDC

**Isolation To Sensor & Communication Common:** 500 VDC for 1 min.

**Compliance:** 10 VDC: 1 KΩ load min., 20 mA: 500 Ω load max.

**ALARMS: 2 relay alarm outputs.**

**Type:** Form A or Form C, model and alarm dependent

**Contact Rating:** 3 A @ 250 VAC

**Analog Output (Retrans):**

**Output Type:** 4 to 20 mA

**Isolation To Sensor & Communication Common:** 500 VDC for 1 min.

**Compliance:** 500 Ω load max.

### ENVIRONMENTAL CONDITIONS:

**Operating Temperature Range:** 0 to 50 °C

**Storage Temperature Range:** -20 to 65 °C

**Vibration Resistance:** Operational 10 to 55 Hz, 1 g

**Shock Resistance:** Operational 30 g

**Operating and Storage Humidity:** 80% max relative humidity (non-condensing) from 0°C to 50°C

**Altitude:** Up to 2000 meters

### CERTIFICATIONS AND COMPLIANCES:

**CE Approved**

EN 61326-1 Immunity to Industrial Locations

Emission CISPR 11 Class A

EN 61010-1

RoHS Compliant

UL Listed: File #E179259

IP65 Enclosure rating (Face only)

**CONNECTIONS:** Wire-clamping screw terminals

**CONSTRUCTION:** Black plastic alloy case and panel latch. Black plastic textured bezel with transparent display window. Controller meets IP65 requirements for indoor use when properly installed. Installation Category II, Pollution Degree 2.

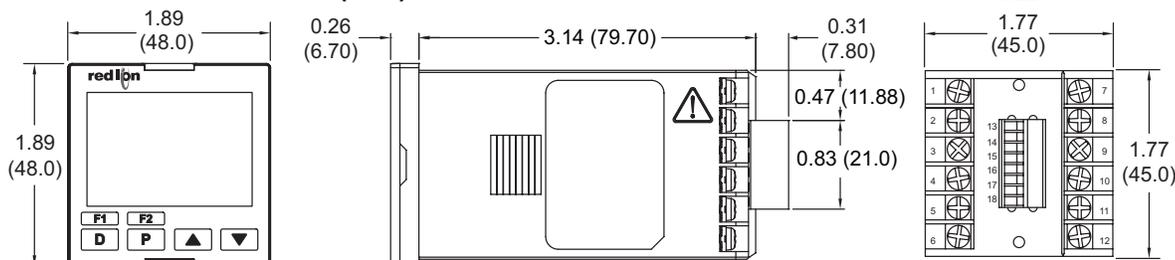
**WEIGHT:**

1/4 DIN: 11.0 oz (312 g)

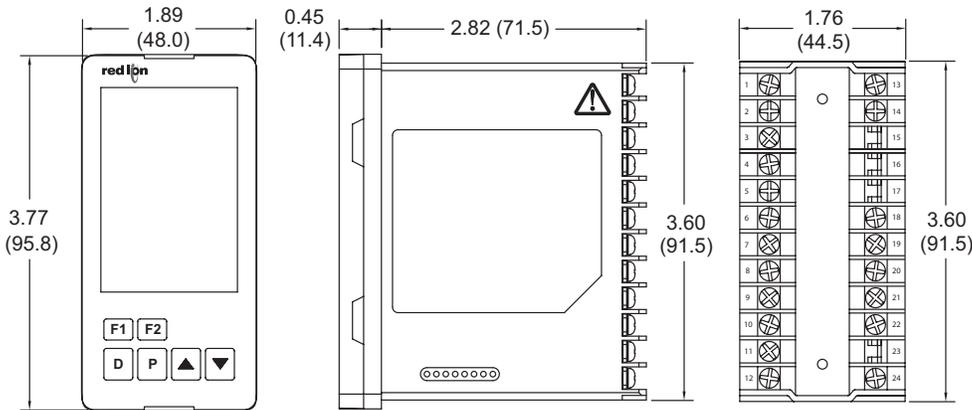
1/8 DIN: 7.8 oz (221 g)

1/16 DIN: 5.3 oz (150 g)

## DIMENSIONS In inches (mm) - 1/16 DIN



**DIMENSIONS In inches (mm) - 1/8 DIN**

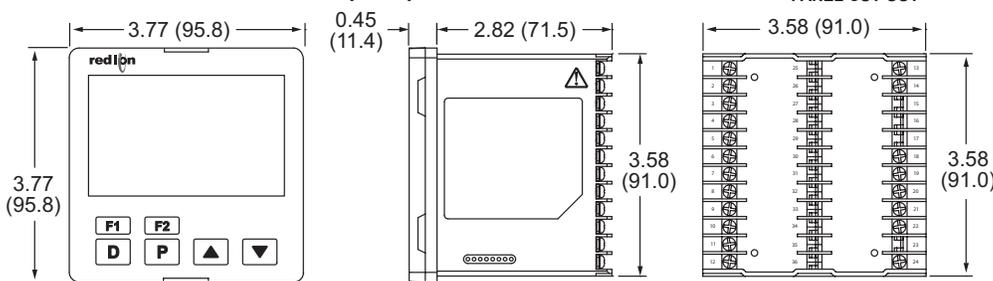


**SAFETY SUMMARY**

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller. If redundant safeguards are not in place, an independent and redundant temperature limit indicator with alarm outputs is strongly recommended.

**DIMENSIONS In inches (mm) - 1/4 DIN**



**CAUTION: Risk of Danger.**  
Read complete instructions prior to installation and operation of the unit.

**SETTING THE JUMPERS**

The PXU controller has input type jumpers that must be checked and/or changed prior to applying power. The following Jumper Figures show an enlargement of the jumpers.

To access the jumper, locate the two latches located on top and bottom of the front of the unit. Starting with the top latch, insert a small flat-blade screwdriver between the case latch and bezel while using your thumb to push out on the bezel until the latch is disengaged. Repeat this process with the bottom latch. After the latches are disengaged, using the flat-blade screwdriver, gently pry out on the bezel in several areas until the unit releases from the case.

**Current Input**

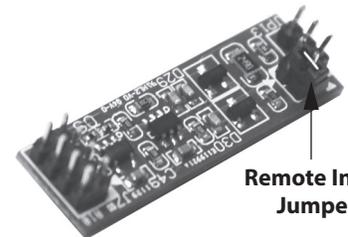
When Input Type is selected as one of the two current input types (0-20 or 4-20), the current input jumper must be installed.

After removing the unit from the case as described, look for the Current Input Jumper located close to the pc board area that connects to the input terminals. For a current input type, position the jumper across both pins. If input type is anything other than a current input, position the jumper on only one pin. The current input jumper is factory set for Temperature and Voltage input types.

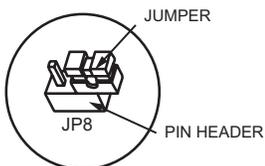
**Remote Input**

When Remote Input Type (RmtP) is selected as one of the voltage input types (0-5, 1-5, or 0-10), the current input jumper must be removed.

After removing the unit from the case as described, look for the Remote Input option card. This card has REMOTE silk screened on it. It may be necessary to remove a sticker to positively identify. Remove the Remote Input option card and locate the 2 pin jumper on the bottom side of the card. For a voltage input type, position the jumper on only 1 of the 2 pins. If Remote Input type is a current input type, position the jumper on both pins. The Remote Input Type input jumper is factory set for current input (0-20, 4-20).

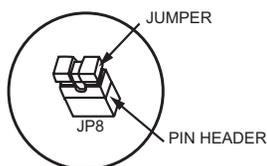


**Thermocouple, RTD or Voltage Input**

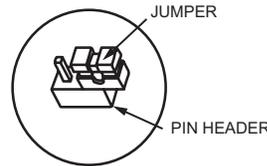


**FACTORY SETTING**

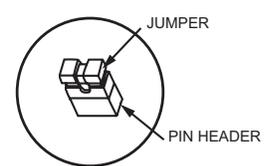
**Current Input (4-20 mA or 0-20 mA)**



**Voltage Input (0-5, 1-5, or 0-10 VDC)**



**Current Input (4-20 mA or 0-20 mA)**



**FACTORY SETTING**

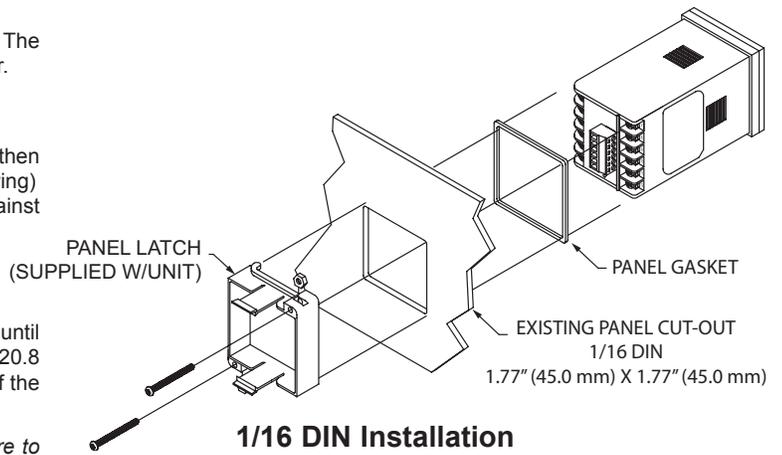
### INSTALLING THE CONTROLLER

The controller is designed to be mounted into an enclosed panel. The unit must be inserted in the case during installation of the controller.

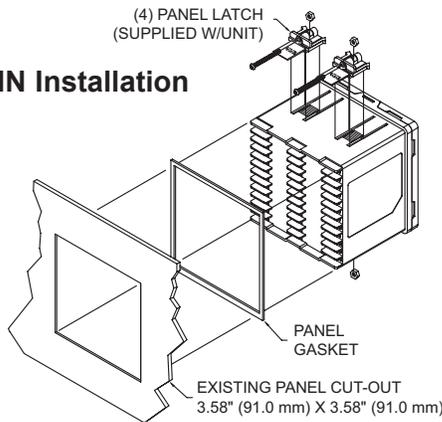
#### Instructions:

1. Prepare the panel cutout to the proper dimensions.
2. Assemble the mounting clip by inserting the nut into the slot and then insert the screw and thread through the nut as shown (See drawing)
3. Slide the panel gasket over the rear of the controller, seating it against the lip at the front of the case.
4. Insert the controller into the panel cutout. While holding the controller in place, install the panel latch(es) and then slide it to the farthest forward slot possible.
5. To achieve a proper seal, tighten the panel latch screws evenly until the controller is snug in the panel, torquing the screws to 13.9 to 20.8 oz-in (9.8 to 14.7 N-cm). Overtightening can result in distortion of the controller, and reduce the effectiveness of the seal.

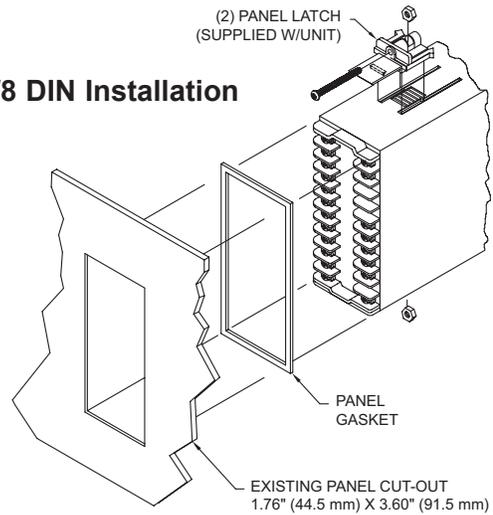
*Note: The installation location of the controller is important. Be sure to keep it away from heat sources (ovens, furnaces, etc.) and away from direct contact with caustic vapors, oils, steam, or any other process by-products in which exposure may affect proper operation.*



#### 1/4 DIN Installation

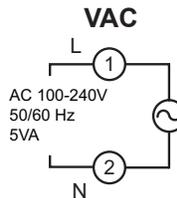


#### 1/8 DIN Installation

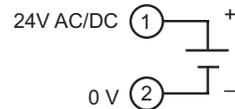


### CONTROLLER POWER CONNECTIONS

For best results, the power should be relatively "clean" and within the specified limits. Drawing power from heavily loaded circuits or from circuits that also power loads that cycle on and off should be avoided. It is recommended that power supplied to the controller be protected by a fuse or circuit breaker.



#### VAC/VDC

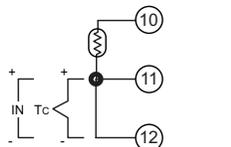


### INPUT CONNECTIONS

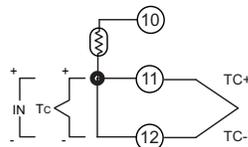
For two wire RTDs, install a copper sense lead of the same gauge and length as the RTD leads. Attach one end of the wire at the probe and the other end to input common terminal. This is the preferred method as it

provides complete lead wire compensation. If a sense wire is not used, then use a jumper. A temperature offset error will exist. The error may be compensated by programming a temperature offset.

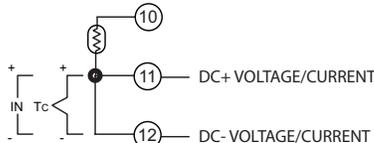
#### RTD and Resistance



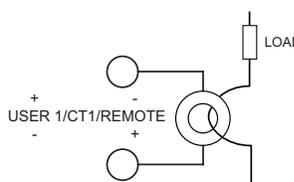
#### Thermocouple and Millivolt



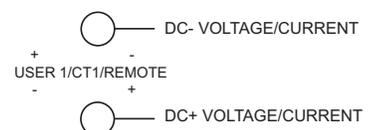
#### Voltage and Current



#### CT Input

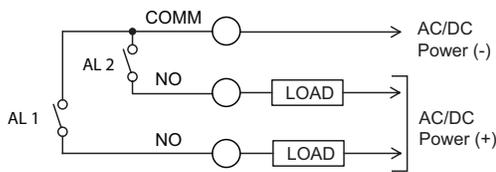


#### Remote Input

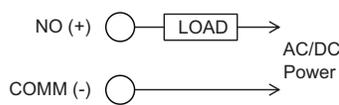


### CONTROL AND ALARM OUTPUT CONNECTIONS

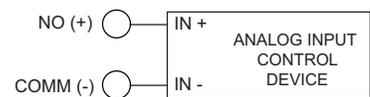
#### Alarm 1 and 2 \* (1/16 DIN Shown)



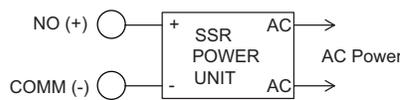
#### OP1/OP2 Output Control Relay \*



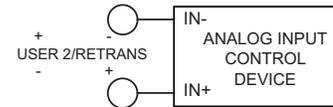
#### OP1 Output Control Analog \*



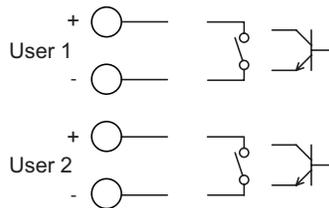
#### OP1 Output Control Logic/SSR \*



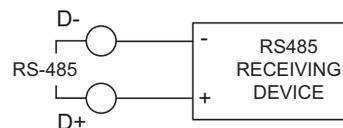
#### Analog Output (Retrans)\*



#### USER INPUT CONNECTIONS \*

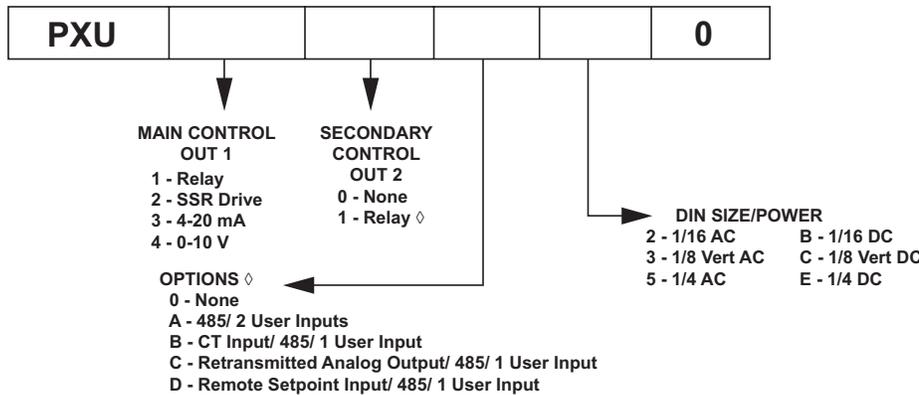


#### RS 485 CONNECTIONS \*



\* See unit label for terminal identification.

### ORDERING INFORMATION



◊ Options selections A, B, C, & D require Secondary Control (OUT2) selection to be 1.  
 - The unit must have 485 option to program the unit using Crimson.  
 Not all option configurations are available. Available part numbers can be viewed at [www.redlion.net/PXU](http://www.redlion.net/PXU).

#### LIMITED WARRANTY

(a) Red Lion Controls Inc. (the "Company") warrants that all Products shall be free from defects in material and workmanship under normal use for the period of time provided in "Statement of Warranty Periods" (available at [www.redlion.net](http://www.redlion.net)) current at the time of shipment of the Products (the "Warranty Period"). **EXCEPT FOR THE ABOVE-STATED WARRANTY, COMPANY MAKES NO WARRANTY WHATSOEVER WITH RESPECT TO THE PRODUCTS, INCLUDING ANY (A) WARRANTY OF MERCHANTABILITY; (B) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; OR (C) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.** Customer shall be responsible for determining that a Product is suitable for Customer's use and that such use complies with any applicable local, state or federal law.

(b) The Company shall not be liable for a breach of the warranty set forth in paragraph (a) if (i) the defect is a result of Customer's failure to store, install, commission or maintain the Product according to specifications; (ii) Customer alters or repairs such Product without the prior written consent of Company.

(c) Subject to paragraph (b), with respect to any such Product during the Warranty Period, Company shall, in its sole discretion, either (i) repair or replace the Product; or (ii) credit or refund the price of Product provided that, if Company so requests, Customer shall, at Company's expense, return such Product to Company.

(d) **THE REMEDIES SET FORTH IN PARAGRAPH (c) SHALL BE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDY AND COMPANY'S ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH IN PARAGRAPH (a).**