

## MODEL PAXLIT - PAX LITE 5 AMP AC CURRENT METER



- 5 AMP AC CURRENT INPUT\*
- 3 1/2-DIGIT, 0.56" (14.2 mm) HIGH LED RED DISPLAY
- SELECTABLE DECIMAL POINT LOCATION
- BUILT-IN SCALING PROVISIONS
- OVER-RANGE INDICATION
- NEMA 4X/IP65 SEALED FRONT BEZEL
- OPTIONAL CUSTOM UNITS OVERLAY W/BACKLIGHT

\* Accessory Shunts Available For Higher Current Ranges.

### GENERAL DESCRIPTION

PAXLIT 5 Amp AC Current Meter provides the capability of measuring large AC currents. The internal current shunt in the PAXLIT can measure up to 5 Amps AC current directly. Using an external current transformer, AC currents of up to 1,999 Amps can be measured and displayed.

The PAXLIT can be scaled, using the scaling potentiometer, to display between 200 and 1999 when measuring full scale current. Using the DIP switch selectable decimal points, the display can be customized for direct readout for practically any application.

The 3½-digit bi-polar display (minus sign displayed when current is negative) features a 0.56" high, 7-segment LEDs for easy reading. The meter is also available with custom units label capability. Using the PAX label kit (PAXLBK30), the selected label is installed behind the panel, keeping it safe from washdown or other environmental conditions. A DIP switch is used to control the backlight for the units label.

The meters have a NEMA 4X/IP65 sealed bezel and extensive testing of noise effects to CE requirements, allowing the meter to provide a tough yet reliable application solution.

### SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the literature 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.

### DEFINITION OF TERMS

#### INSTALLATION CATEGORY (overvoltage category) I, (CAT I):

Signal level, special equipment or parts of equipment, telecommunication, electronic, etc. with smaller transient overvoltages than Installation Category (overvoltage category) II. (See IEC 664 & IEC 61010)

#### INSTALLATION CATEGORY (overvoltage category) II, (CAT II):

Local level, appliances, portable equipment, etc. with smaller transient overvoltages than Installation Category (overvoltage category) III. (See IEC 664 & IEC 61010)



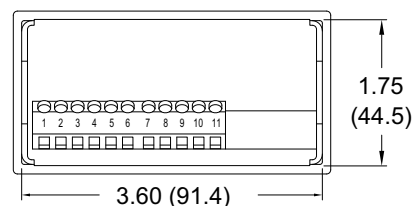
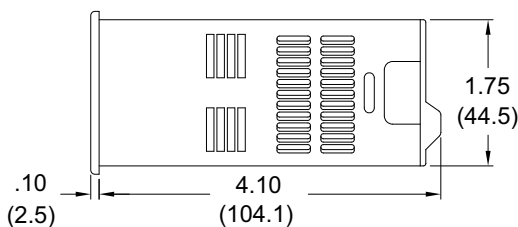
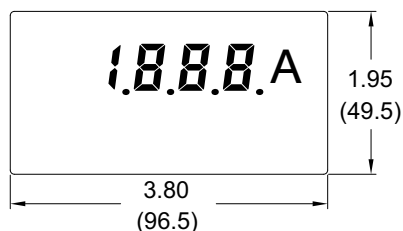
CAUTION: Read complete instructions prior to installation and operation of the unit.



CAUTION: Risk of electric shock.

### DIMENSIONS In inches (mm)

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H x 5.0" (127) W.



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## ORDERING INFORMATION

### Meter Part Numbers



IT - 5 Amp Current Meter

### Accessories Part Numbers

TYPE	MODEL NO.	DESCRIPTION	PART NUMBERS
Accessories	PAXLBK	Units Label Kit Accessory	PAXLBK30
	CT	50:5 Amp Current Transformer	CT005050
		200:5 Amp Current Transformer	CT020050

# GENERAL METER SPECIFICATIONS

1. **DISPLAY:** 3 1/2-digit, 0.56" (14.2 mm) high, 7-segment red LED. Decimal points inserted before 1st, 2nd, or 3rd least significant digits by DIP switch selection.
2. **POWER:** 115/230 VAC, switch selectable. Allowable power line variation  $\pm 10\%$ , 50/60 Hz, 6 VA.  
**Isolation:** 2300 Vrms for 1 min. between input and supply  
**Working Voltage:** 300 V max., CAT II
3. **SIGNAL INPUT:**  
**Range:** 0 to 5 Amps AC @ 45 to 400 Hz  
**Resolution:** 2.5 mA  
**Working Voltage:** 300 V max., CAT II
4. **ACCURACY:**  $\pm(0.5\%$  of reading + 5 digits).
5. **OVER-RANGE INDICATION:** is indicated by blanking 3 least significant digits.
6. **MAX SHUNT CURRENT:** 50 Amps for 1 sec.; 8 Amps continuous.  
*Caution: In circuits where fault currents can exceed the maximum shunt current, a fast-blow fuse should be installed in series with the input signal. Otherwise, a slow blow 8 Amp fuse is recommended that will allow for start-up over current situations, while still protecting the instrument.*
7. **ENVIRONMENTAL CONDITIONS:**  
**Operating Temperature:** 0° to 60 °C  
**Storage Temperature:** -40° to 80 °C  
**Operating and Storage Humidity:** 85% max. relative humidity (non-condensing)  
**Vibration According to IEC 68-2-6:** Operational 5 to 150 Hz, in X, Y, Z direction for 1.5 hours, 2g's.  
**Shock According to IEC 68-2-27:** Operational 30g's, 11 msec in 3 directions.  
**Altitude:** Up to 2000 meters
8. **RESPONSE TIME TO STEP CHANGE INPUT:** 1 sec. nominal
9. **READING RATE:** 2.5 readings/sec., nominal
10. **CERTIFICATIONS AND COMPLIANCES:**

## SAFETY

UL Recognized Component, File # E179259, UL61010A-1, CSA C22.2 No. 61010-1  
Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.  
UL Listed, File # E137808, UL508, CSA C22.2 No. 14-M95  
LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards  
Type 4X Enclosure rating (Face only), UL50  
IECEE CB Scheme Test Report # 04ME11209-20041018  
Issued by Underwriters Laboratories, Inc.  
IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.  
IP65 Enclosure rating (Face only), IEC 529

## ELECTROMAGNETIC COMPATIBILITY

Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

### Immunity to Industrial Locations:

Electrostatic discharge	EN 61000-4-2	Criterion A 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion B 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion B 2 kV power 2 kV signal
Surge	EN 61000-4-5	Criterion A 1 kV L-L, 2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion A 3 V/rms
Voltage dip/interruptions	EN 61000-4-11	Criterion A 0.5 cycle; 40 % variation

### Emissions:

Emissions	EN 55011	Class B
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### Notes:

1. *Criterion A: Normal operation within specified limits.*
  2. *Criterion B: Temporary loss of performance from which the unit self-recovers.*
11. **CONNECTIONS:** High compression cage-clamp terminal block  
Wire Strip Length: 0.3" (7.5 mm)  
Wire Gage: 30-14 AWG copper wire  
Torque: 4.5 inch-lbs (0.51 N-m) max.
  12. **CONSTRUCTION:** This unit is rated for NEMA 4X/IP65 outdoor use. Installation Category II, Pollution Degree 2. One piece bezel/case. Flame resistant. Panel gasket and mounting clip included.
  13. **WEIGHT:** 0.65 lbs. (0.24 Kg)

# ACCESSORIES

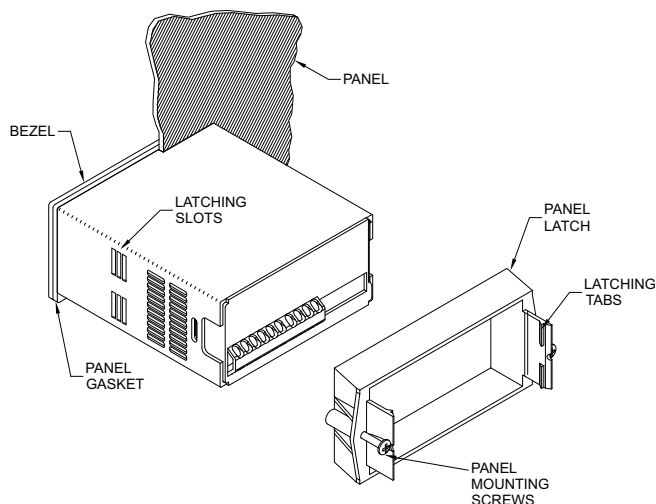
## UNITS LABEL KIT (PAXLBK)

Each meter has a units indicator with backlighting that can be customized using the Units Label Kit. The backlight is controlled by a DIP switch.

# 1.0 INSTALLING THE METER

## Installation

The PAX meets NEMA 4X/IP65 requirements when properly installed. The unit is intended to be mounted into an enclosed panel. Prepare the panel cutout to the dimensions shown. Remove the panel latch from the unit. Slide the panel gasket over the rear of the unit to the back of the bezel. The unit should be installed fully assembled. Insert the unit into the panel cutout.

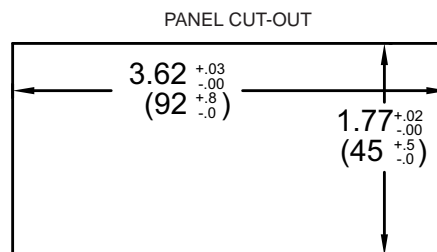


While holding the unit in place, push the panel latch over the rear of the unit so that the tabs of the panel latch engage in the slots on the case. The panel latch should be engaged in the farthest forward slot possible. To achieve a proper seal, tighten the latch screws evenly until the unit is snug in the panel (Torque to approximately 7 in-lbs [79N-cm]). Do not over-tighten the screws.

## Installation Environment

The unit should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation. Placing the unit near devices that generate excessive heat should be avoided.

The bezel should be cleaned only with a soft cloth and neutral soap product. Do NOT use solvents. Continuous exposure to direct sunlight may accelerate the aging process of the bezel.



# 2.0 SETTING THE SWITCHES

The meter has switches, which must be checked and/or changed prior to applying power. To access the switch, remove the meter base from the case by firmly squeezing and pulling back on the side rear finger tabs. This should lower the latch below the case slot (which is located just in front of the finger tabs). It is recommended to release the latch on one side, then start the other side latch.

## Power Selection Switch

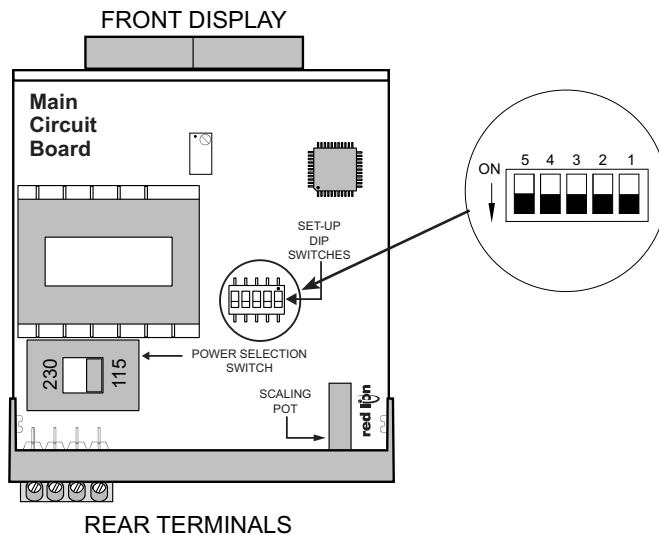


Caution: Insure the AC power selection switch is set for the proper voltage before powering the meter. The meter is shipped from the factory in the 230 VAC position.

## Set-Up DIP Switches

A DIP switch is located inside the meter. It is used for the selection of decimal points, backlight annunciator, and scaling. Selecting the "ON" position enables the function.

SWITCH	FUNCTION
1	Decimal Point 1 (000.0)
2	Decimal Point 2 (00.00)
3	Decimal Point 3 (0.000)
4	Backlight Annunciator for Units Label
5	Enables the Scaling Pot



# 3.0 WIRING THE METER

## WIRING OVERVIEW

Electrical connections are made via screw-clamp terminals located on the back of the meter. All conductors should conform to the meter's voltage and current ratings. All cabling should conform to appropriate standards of good installation, local codes and regulations. It is recommended that power supplied to the meter (AC) be protected by a fuse or circuit breaker.

When wiring the meter, compare the numbers embossed on the back of the meter case against those shown in wiring drawings for proper wire position. Strip the wire, leaving approximately 0.3" (7.5 mm) bare lead exposed (stranded wires should be tinned with solder.) Insert the lead under the correct screw-clamp terminal and tighten until the wire is secure. (Pull wire to verify tightness.)

## EMC INSTALLATION GUIDELINES

Although this meter is designed with a high degree of immunity to Electro-Magnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, its source or the method of coupling into the unit may be different for various installations. Listed below are some EMC guidelines for successful installation in an industrial environment.

1. The meter should be mounted in a metal enclosure, which is properly connected to protective earth.
2. Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors feeding motors, solenoids, SCR controls, and heaters, etc. The cables should be run in metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter.
3. Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.

4. In extremely high EMI environments, the use of external EMI suppression devices, such as ferrite suppression cores, is effective. Install them on Signal and Control cables as close to the unit as possible. Loop the cable through the core several times or use multiple cores on each cable for additional protection. Install line filters on the power input cable to the unit to suppress power line interference. Install them near the power entry point of the enclosure. The following EMI suppression devices (or equivalent) are recommended:

Ferrite Suppression Cores for signal and control cables:

Fair-Rite # 0443167251 (RLC #FCOR0000)

TDK # ZCAT3035-1330A

Steward #28B2029-0A0

Line Filters for input power cables:

Schaffner # FN610-1/07 (RLC #LFIL0000)

Schaffner # FN670-1.8/07

Corcom #1VR3

*Note: Reference manufacturer's instructions when installing a line filter.*

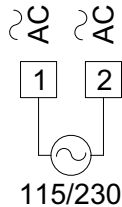
5. Long cable runs are more susceptible to EMI pickup than short cable runs. Therefore, keep cable runs as short as possible.
6. Switching of inductive loads produces high EMI. Use of snubbers across inductive loads suppresses EMI.  
Snubber: RLC#SNUB0000.

## 3.1 POWER WIRING

### AC Power

Terminal 1: VAC

Terminal 2: VAC

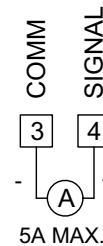


## 3.2 INPUT SIGNAL WIRING

### Current Signal (self powered)

Terminal 4: + Amps AC

Terminal 3: - Amps AC



# 4.0 SCALING THE METER

## FACTORY SCALING

The meter is calibrated from the factory for 5 Amps AC current input to show 1999. This scaling will be used when the Scale Switch is in the "OFF" position.

## SCALING READOUT

Place the Scale Switch in the "ON" position. This enables the Scale Potentiometer which is accessible from the back of the meter. (Enabling the Scale Potentiometer does NOT affect the calibration of the meter.) Place the Decimal Point Switches to the proper location. Apply the meter power and the current signal. Adjust the Scale Potentiometer to the desired value.

This scaling only effects the span. There is no offset scaling. This means that only zero current can display a value of zero.

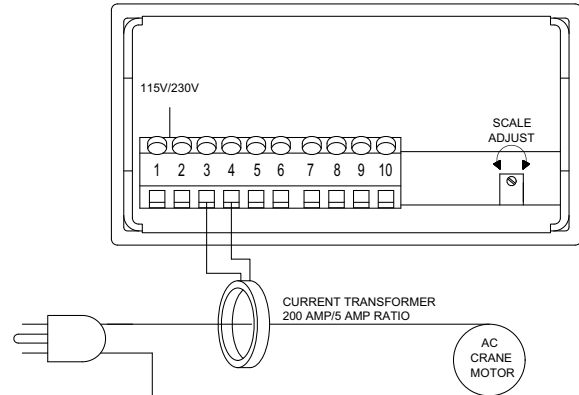
At 5 Amps AC current input, the display can be scaled from 1999 down to 200 by using the scaling potentiometer. For display values below 200, turn on the appropriate Decimal Point Switch and then adjust the potentiometer to achieve the desired display value. Example: A customer wants to display 50 Amps because he is using a 50:5 CT. In this case, he must turn DIP switch 1 on for a decimal point and DIP switch 5 on for scaling. Then apply the 5 Amp signal and turn the scaling pot until 50.0 is shown on the display.

# 5.0 APPLICATION

## MOTOR CURRENT MEASUREMENT USING A CURRENT TRANSFORMER

The PAXLIT 5 Amp AC Current Meter is configured by simply connecting the "COMM." (Terminal 3) and the "5AMP" (Terminal 4) to the external current transformer. The current carrying wire to be sensed is passed through the center of the current transformer. The resolution of the display, in this case, is 0.1 Amp, therefore, "Switch #1" is selected.

The meter is now ready to be scaled. The installer has access to a calibrated portable digital current meter capable of measuring the motor current. Scaling will be accomplished by adjusting the scaling pot on the PAXLIT meter to agree with the portable digital current meter. The operator turns on the AC motor and lifts a large weight to load the motor. The installer then simply adjusts the scaling adjustment, located at the rear of the unit, until the display is equal to the value indicated on the portable current meter. The meter will now indicate the load current of the motor precisely.



**CAUTION:** It is recommended that the current transformer be internally protected or that a voltage clamping circuit be provided, preventing dangerous high voltage across the CT secondary windings in case of accidental opening of the secondary output leads when the primary is energized.

In order to prevent risk of electric shock ensure CT is installed according to local NEC regulations for installation of current instrument transformers.

# 6.0 TROUBLESHOOTING

PROBLEM	REMEDIES
NO DISPLAY	<b>CHECK:</b> Power switch and line voltage
INCORRECT DISPLAY	<b>CHECK:</b> Scaling adjustment pot <b>ADJUST:</b> Scaling pot <b>VERIFY:</b> Input Signal
OVER-RANGE INDICATION	<b>VERIFY:</b> Input signal

For further assistance, contact technical support at the appropriate company numbers listed.

# 7.0 CALIBRATION

The meter has been fully calibrated at the factory. Scaling to convert the input signal to a desired display value is performed by enabling the scale pot DIP switch. If the meter appears to be indicating incorrectly or inaccurately, refer to Troubleshooting before attempting to calibrate the meter.

When recalibration is required (generally every two years), it should only be performed by qualified technicians using appropriate equipment.

## Input Calibration



**WARNING:** Calibration of this meter requires a signal source with an accuracy of 0.05% or better and an external meter with an accuracy of 0.005% or better.

Before starting, verify that the precision signal source is connected and ready. Allow a 30 minute warm-up period before calibrating the meter.

Then perform the following procedure:

1. Set the DIP switch off to disable the scaling pot.
2. Apply half scale input signal.
3. Adjust calibration potentiometer as necessary for the display to read 1000 (ignore decimal point)
4. Apply zero signal and ensure display reads zero.
5. Apply full scale signal and ensure display reads 1999.

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### **LIMITED WARRANTY**

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

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