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.

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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.

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

CAUTION: Risk of electric shock.

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.

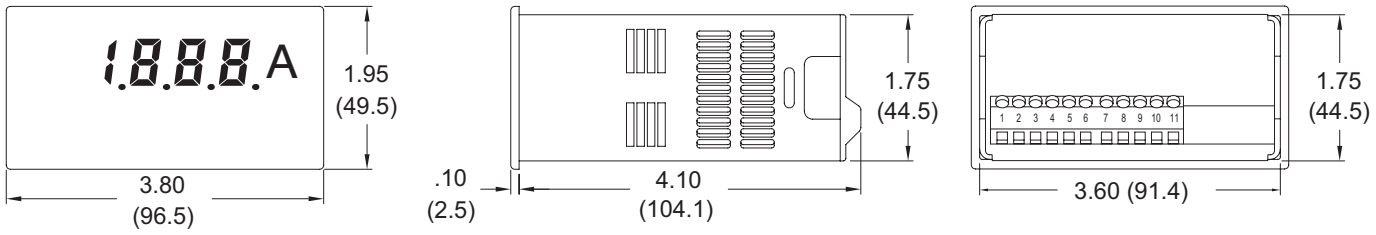
DEFINITION OF TERMS

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)

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

PAXL	IT	0	0

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 ±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**: ±(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 to IEC 68-2-6: Operational 5 to 150 Hz, 2 g.
   Shock to IEC 68-2-27: Operational 30 g
   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**:
    CE Approved
    EN 61326-1 Immunity to Industrial Locations
    Emission CISPR 11 Class B
    Safety requirements for electrical equipment for measurement, control, and laboratory use:
    EN 61010-1: General Requirements
    EN 61010-2-030: Particular Requirements for Testing and Measuring Circuits
    RoHS Compliant
    UL Listed: File #E137808
    Type 4X Outdoor Enclosure rating (Face only)
    IP65 Enclosure rating (Face only)
    IP20 Enclosure rating (Rear of unit)
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 Type 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

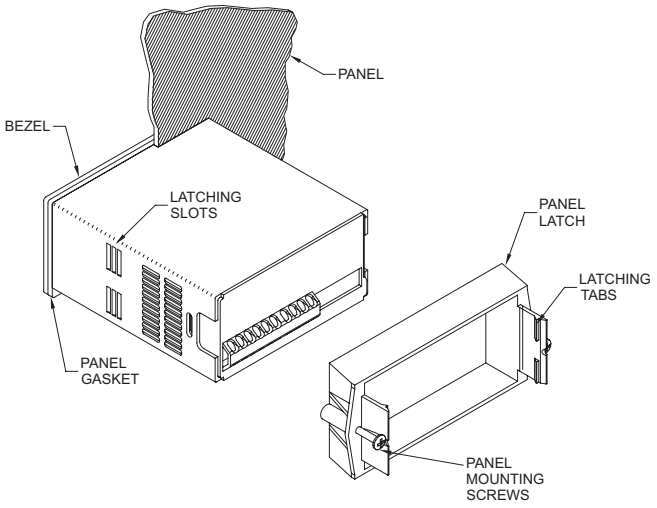
UNITS LABEL KIT (PAXLBK)

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.



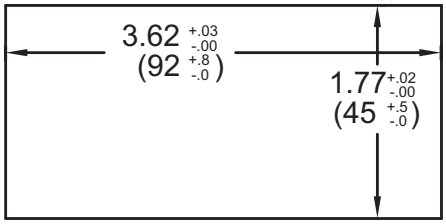
While holding the unit in place, push the panel latch over the rear of the unit so that the tabs of the panel latch engage in the slots on the case. The panel latch should be engaged in the farthest forward slot possible. To achieve a proper seal, tighten the latch screws evenly until the unit is snug 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.

PANEL CUT-OUT



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

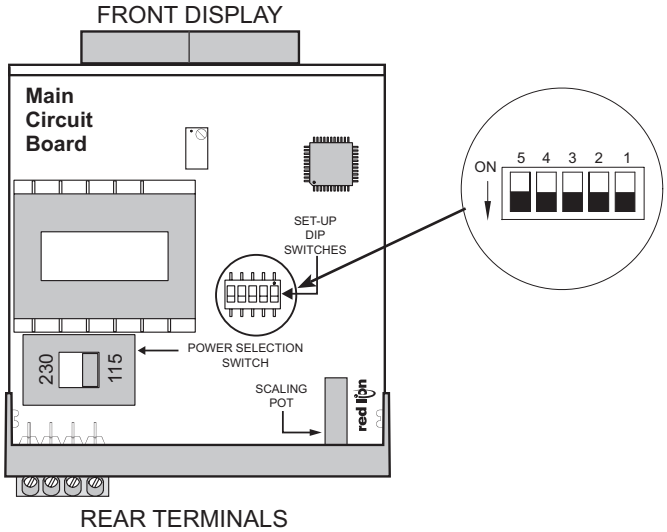
Caution: Insure the AC power selection switch is set for the proper voltage before powering the meter. The meter is shipped from the factory in the 230 VAC position.

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 *

** Turn scaling pot fully clockwise (25 turns max.) when scaling is disabled. Factory setting is the fully clockwise position.*



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

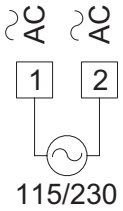
Although Red Lion Controls Products are designed with a high degree of immunity to Electromagnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, source or coupling method into a unit may be different for various installations. Cable length, routing, and shield termination are very important and can mean the difference between a successful or troublesome installation. Listed are some EMI guidelines for a successful installation in an industrial environment.

1. A unit should be mounted in a metal enclosure, which is properly connected to protective earth.
2. Use shielded cables for all Signal and Control inputs. The shield connection should be made as short as possible. The connection point for the shield depends somewhat upon the application. Listed below are the recommended methods of connecting the shield, in order of their effectiveness.
   a. Connect the shield to earth ground (protective earth) at one end where the unit is mounted.
   b. Connect the shield to earth ground at both ends of the cable, usually when the noise source frequency is over 1 MHz.
3. 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 through 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. Also, 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. Long cable runs are more susceptible to EMI pickup than short cable runs.
5. In extremely high EMI environments, the use of external EMI suppression devices such as Ferrite Suppression Cores for signal and control cables is effective. The following EMI suppression devices (or equivalent) are recommended:
   Fair-Rite part number 0443167251 (RLC part number FCOR0000)
   Line Filters for input power cables:
   Schaffner # FN2010-1/07 (Red Lion Controls # LFIL0000)
6. To protect relay contacts that control inductive loads and to minimize radiated and conducted noise (EMI), some type of contact protection network is normally installed across the load, the contacts or both. The most effective location is across the load.
   a. Using a snubber, which is a resistor-capacitor (RC) network or metal oxide varistor (MOV) across an AC inductive load is very effective at reducing EMI and increasing relay contact life.
   b. If a DC inductive load (such as a DC relay coil) is controlled by a transistor switch, care must be taken not to exceed the breakdown voltage of the transistor when the load is switched. One of the most effective ways is to place a diode across the inductive load. Most RLC products with solid state outputs have internal zener diode protection. However external diode protection at the load is always a good design practice to limit EMI. Although the use of a snubber or varistor could be used.
   RLC part numbers: Snubber: SNUB0000
   Varistor: ILS11500 or ILS23000
7. Care should be taken when connecting input and output devices to the instrument. When a separate input and output common is provided, they should not be mixed. Therefore a sensor common should NOT be connected to an output common. This would cause EMI on the sensitive input common, which could affect the instrument's operation.

Visit RLC's web site at http://www.redlion.net/emi for more information on EMI guidelines, Safety and CE issues as they relate to Red Lion Controls products.

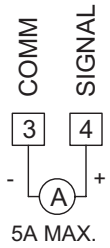
3.1 POWER WIRING

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.

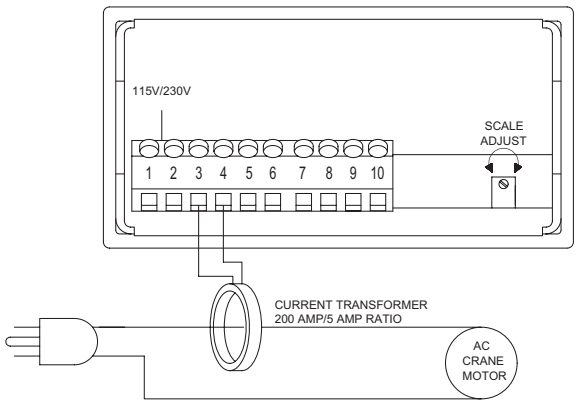
At 5 Amps AC current input, the display can be scaled from 1999 down to 200 by using the scaling potentiometer. For display values below 200, turn on the appropriate Decimal Point Switch and then adjust the potentiometer to achieve the desired display value. Example: A customer wants to display 50 Amps 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	**CHECK**: Power switch and line voltage
INCORRECT DISPLAY	**CHECK**: Scaling adjustment pot DIP switch position **ADJUST**: Scaling pot **VERIFY**: Input Signal
OVER-RANGE INDICATION	**VERIFY**: 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, verfiy 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 (2.5 A @ 60 Hz).
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 (5 A @ 60 Hz) and ensure display reads 1999.