Installation & Parts Manual
LectroCount® Remote Display

18.125
17.25
16.00
.438
1.50
2.57
3.00
6.00
1.715

LectroCount Remote Display

Gallons

LectroCount Remote Display

Gallons

.50

LCD Top
LCD Center
LCD Bottom

20°
40°

Optimum
Viewing
Angle

Side View

Top View

40° 40°

Optimum Viewing Angle

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Publication Updates and Translations

The most current English versions of all Liquid Controls publications are available on our website, **www.lcmeter.com**. It is the responsibility of the Local Distributor to provide the most current version of LC Manuals, Instructions, and Specification Sheets in the required language of the country, or the language of the end user to which the products are shipping . If there are questions about the language of any LC Manuals, Instructions, or Specification Sheets, please contact your Local Distributor.

⚠ WARNING

- Before using this product, read and understand the instructions.
- Save these instructions for future reference.
- All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of equipment and/or systems in accordance with all applicable codes and ordinances.
- Failure to follow the instructions set forth in this publication could result in property damage, personal injury, or death from fire and/or explosion, or other hazards that may be associated with this type of equipment.

Model Numbers

Two LectroCount® Remote Display Models are available for interface to Liquid Controls LectroCount Electronic Registers. Ensure that the model number of the LectroCount Remote Display is compatible with the LectroCount Electronic Register prior to installation. If the device does not match the model number, the system will not work and may be damaged when power is applied.

An identification label appears on the top of the remote display (Figure 1). This label designates the device for which the remote display is designed. It will not work with other devices. The label also contains the Serial Number of the unit. This information will be useful when contacting Liquid Controls for assistance.

E1610 - For use with: LectroCount® LCR-II®
E1611 - For use with: LectroCount® LCR®, LectroCount3

Figure 1. Remote Display Identification Label

The LectroCount Remote Display is a 6-digit, backlit display with 2¼" high digits, viewable to 100 ft, for flow metering applications.

LectroCount Remote Display models are available for LectroCount LCR®, LectroCount LCR-II® and LectroCount³ Electronic Registers.

Model E1610 - For use with LectroCount LCR-II
Model E1611 - For use with LectroCount LCR and LectroCount³

Features include:
- 6-digit, backlit display with 2¼" high display characters.
- 30 ft, 4-wire, shielded cable.
- Class I, Division 2 Group C & D weatherproof NEMA 4X enclosure.
- Weights & Measures Approvals in USA and Canada when used with LectroCount Electronic Registers.
- Viewable up to 100 ft.

Wiring: Connections from the LectroCount register to the LectroCount Remote Display should be made using 22 gage, 4-wire, shielded cable or larger. Thirty feet of cable is provided with the display. The maximum length of cable allowable is 100 ft. The 4-wire cable includes conductors for power, ground, and two signals.

Figure 2. LectroCount Remote Display

SPECIFICATIONS

Environmental

Design for:	Class I, Div. 2, Group C & D
	NEMA 4X
Operating Temp. Range*:	-22º to 158º F
	-30º to 70º C

Approvals

US Weights & Measures:	NTEP COC 86-022
Canada Weights & Measures:	AV-2342

Electrical

Power:	+5 to 15 VDC, 500 mA, Maximum

*At lower temperatures, the liquid crystal display may have a delayed response rate.

Signal Input

Input Signal Levels:	Hi ≥ 2.50 VDC
	Lo ≤ 2.0 VDC

Maximum Frequency Input:

Signal Source:	Frequency
LectroCount LCR	5 kHz
LectroCount LCR-II	N/A
LectroCount LC³	5 kHz

Installation

⚠ CAUTION

The LectroCount Remote Display and accessories (whether supplied by Liquid Controls or other) must be installed and operated in accordance with all applicable federal, state, and local construction, electrical, environmental and safety codes. Failure to do so could result in serious injury or death.

This unit is designed for Class I, Division 2, Group C & D areas.
Do not install in Class I, Division 1 areas.

Installation Requirements

- Read this manual prior to start of installation. If you have any questions, consult with your full service distributor or call the Service Department at Liquid Controls.

- This display should always be securely mounted to a platform or supportive member. Ensure that the display does not experience excessive vibration or shock.

- The LectroCount Remote Display is designed to be compatible with a specific LectroCount Electronic Register as specified by the customer and as indicated on the Serial Number Tag. No attempt should be made to use the display with an input different from the one originally specified.

- The LectroCount Remote Display is supplied with a 30 foot cable, which should be adequate for most installations. If additional cable is required, cable kits are available from Liquid Controls. It is recommended that a 4-wire, shielded cable with 22 gage wire or larger be used. The maximum length of cable allowable is 100 feet.

The LectroCount Remote Display is supplied ready for final cable termination. Should it be necessary to replace the cable between the signal source and the remote display, be sure to secure the cable and tighten the cover so as to maintain the vapor seal.

Remote Display Label

The LectroCount Remote Display is shipped with the units of measure displayed on the label in Gallons. The application in which the display is being utilized may require a different unit of measure.

The LectroCount Remote display is shipped with four (4) additional unit of measure labels. To change the unit of measure, remove the desired label from it's backing and place over the "Gallons" label on the display. The area around Gallons is recessed and the sticker can easily be positioned for placement.
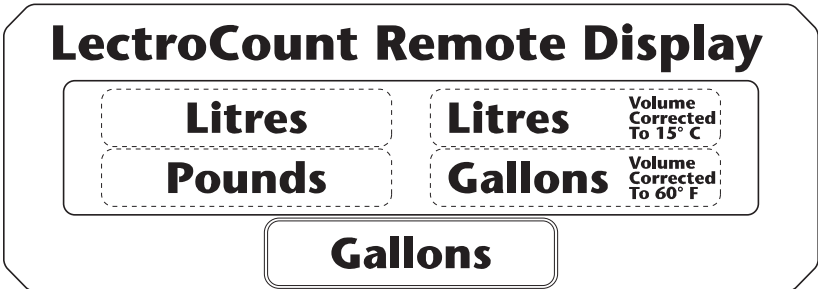

Figure 3. Remote Display Label

Mounting Dimensions

The LectroCount Remote Display should be mounted using the four holes provided in the rear cover. The hole size is designed for use with ¼" screws. It is important to select a mounting location which will position the display as close to the optimal viewing angle as possible (see Page 6).

The diagram below shows the overall dimensions and the locations of the mounting holes on the LectroCount Remote Display.
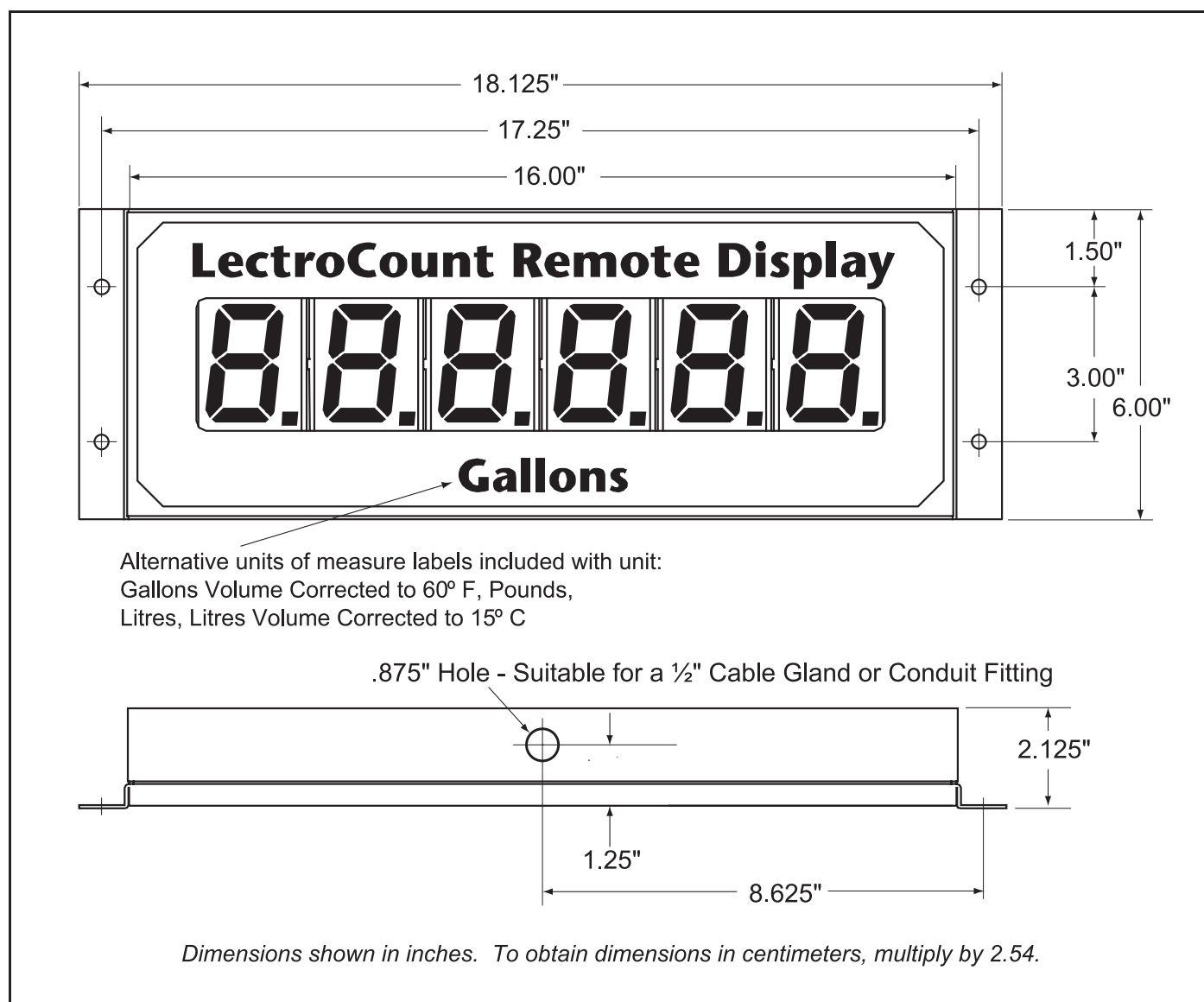
18.125"
17.25"
16.00"

LectroCount Remote Display

1.50"

3.00"

6.00"

Gallons

Alternative units of measure labels included with unit:
Gallons Volume Corrected to 60º F, Pounds,
Litres, Litres Volume Corrected to 15º C

.875" Hole - Suitable for a ½" Cable Gland or Conduit Fitting

2.125"

1.25"

8.625"

Dimensions shown in inches. To obtain dimensions in centimeters, multiply by 2.54.

Figure 4. Remote Display Dimensions

NOTE: **Dimensions shown are not for construction use.**
Consult factory when certified Engineering Drawings are required.

Installation

Optimum Viewing Angle

LCD displays have an optimum viewing angle. Displays lose contrast and become more difficult to read at some viewing angles and are easier to read at other angles. Because the viewing angle is limited, a bias is designed into the module at the time it is manufactured. The result is a nominal viewing angle which is offset from the perpendicular by a specified amount. The Liquid Controls LectroCount Remote Display is designed with a bias set to accommodate as wide a viewing area as possible. Optimum viewing with the greatest contrast will occur when the display is viewed between 20º above and 40º below horizontal. If the display is viewed outside this range, the display contrast will reduce to a point where it reaches an unacceptable viewing level. The horizontal, side to side viewing angle is 40º left and right from center.

40° | 40°

Optimum Viewing Angle

Top View

LCD Top

LCD Center

LCD Bottom

20°

40°

Optimum
Viewing
Angle

Side View
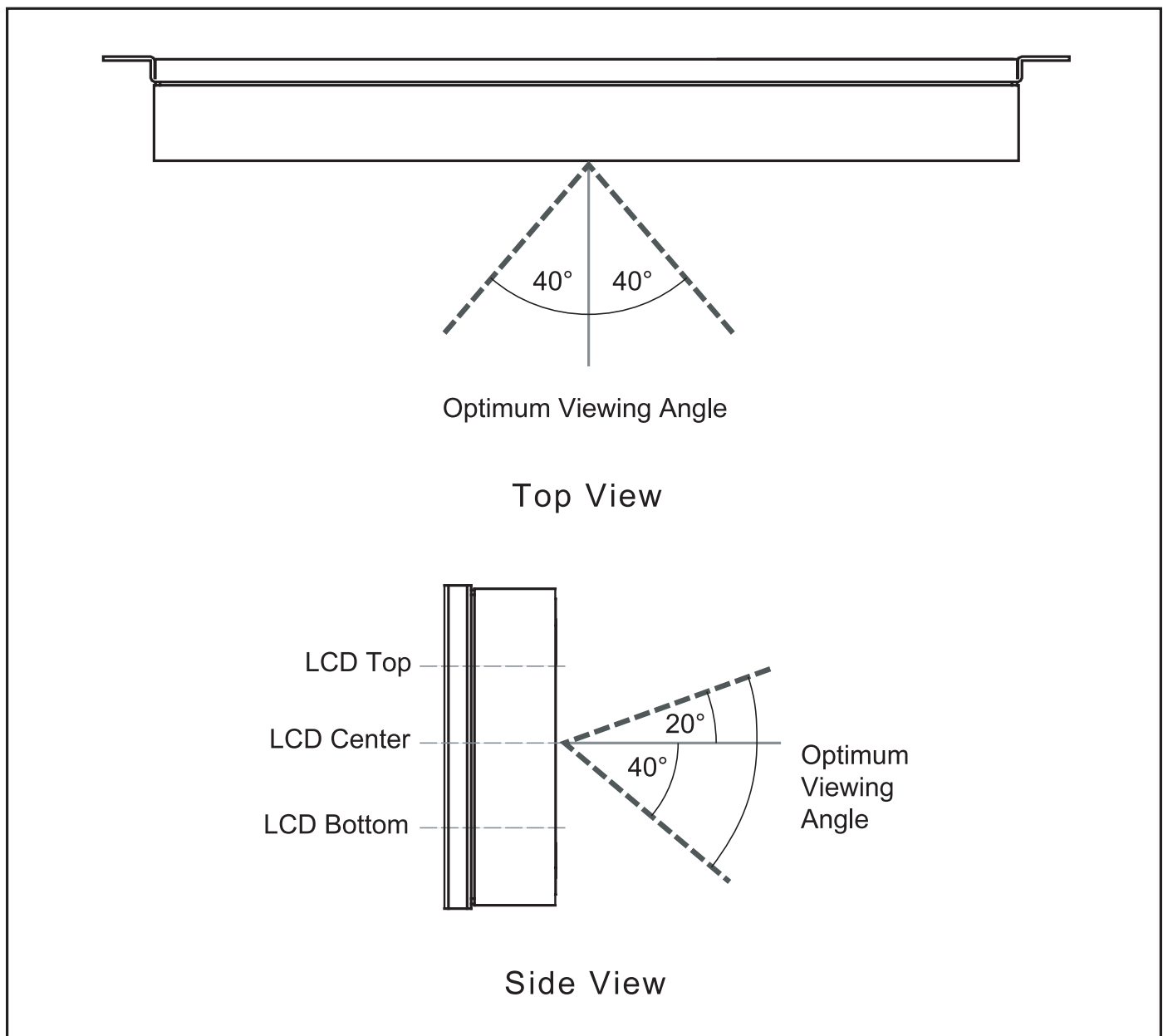
Figure 5. Optimum Viewing Angle

Remote Display Shield Accessory (PN 81879)

There are certain applications where sun or bright light may produce glare on the display. Use the optional shield to reduce the effect of glare. This shield fits in place over the LectroCount Remote Display as shown in Figure 6. The holes in the shield are slotted for ease of installation.
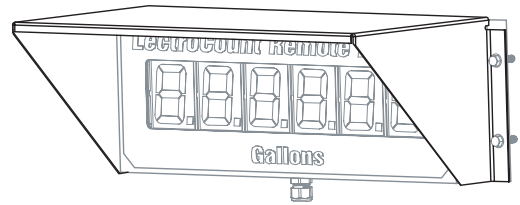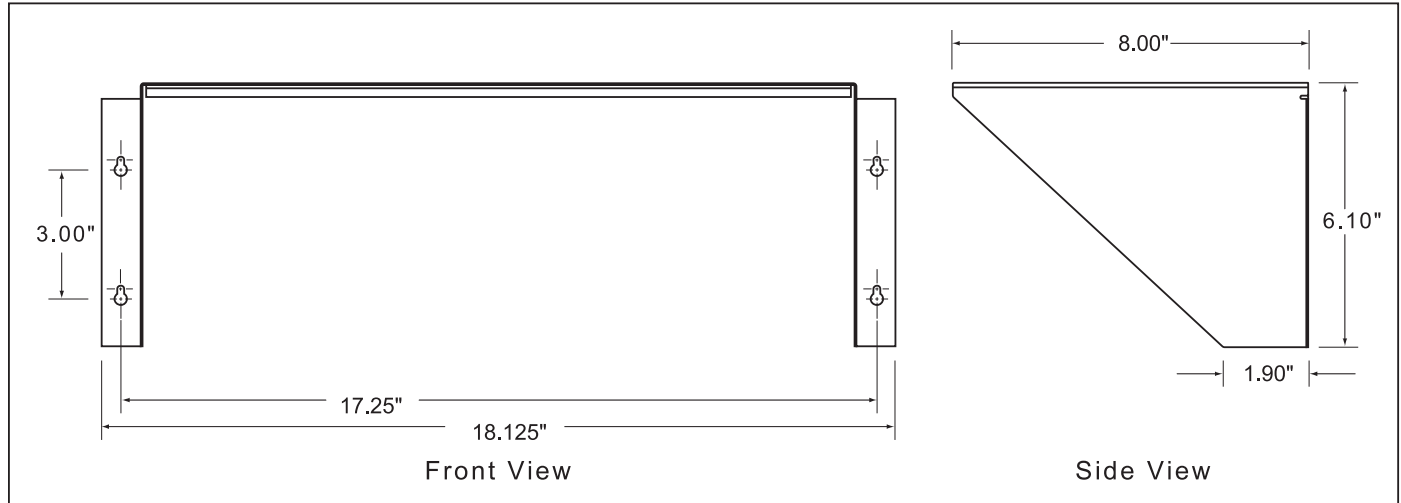
Figure 6. Remote Display Shield

Figure 7. Remote Display Shield Dimensions

NOTE: Dimensions shown in Inches (to obtain centimeters, multiply values shown by 2.54).

Bolt & Torque Specifications

It may be necessary to open the Remote Display for the purpose of changing the decimal point jumper setting (Page 8), or to connect wires to J1 or J2. There are 14 bolts on the rear panel of the Remote Display which need to be removed to gain access to the printed circuit board (PCB). When work on the internal components is complete, the bolts need to be tightened to the proper torque specification and in the proper sequence to ensure that the unit is resealed properly to prevent moisture from entering.

Insert each bolt and tighten by hand, then tighten the bolts according to the sequence show below. The bolts should be tightened to 5-8 In. LBS. (80-128 In. Oz.)
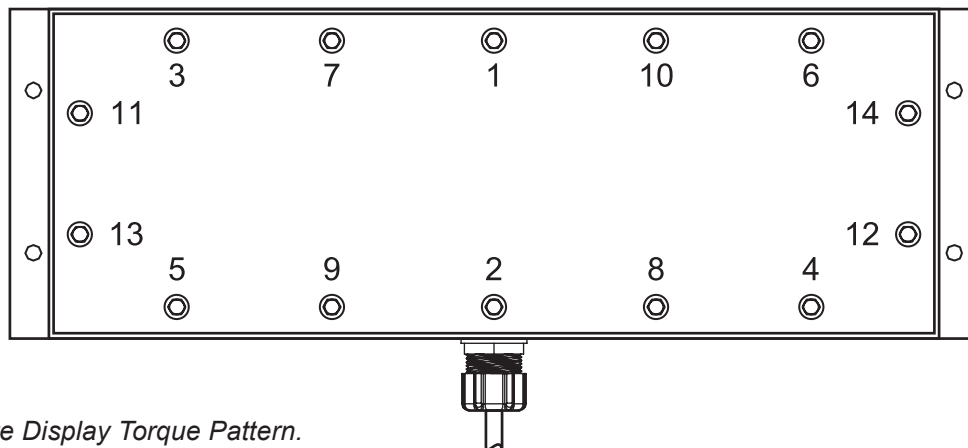
Figure 8. Remote Display Torque Pattern.

Installation

Decimal Point Jumper Setting

NOTE: Model E1610 automatically displays the identical decimal configuration appearing on the **LectroCount LCR-II** display. **There is no need to adjust the jumpers on Model E1610.**

The LectroCount Remote Display may be configured to show the decimal point in one of three positions:
- Whole Units (No Decimal Point)
- Tenth Units
- Hundredth Units

This is accomplished by moving the **J3** and **J4** jumpers on the Remote Display PCB. The PCB is accessed by removing the 14 screws on the back of the enclosure. The jumpers are located on the bottom left side of the PCB, to the left of the **J2** connector (Figure 9).

Once the enclosure is opened, the jumpers may be moved to configure the display according to the LectroCount Electronic Register for which it is designed. See the table below for jumper settings.

NOTE: The jumpers need to be in position. Do not remove and discard them. If Whole Units is desired, then J3 and J4 must **BOTH** have jumpers in the **OFF** position.

NOTE: If J3 and J4 are **BOTH** in the **ON** position, then 2 decimal points will appear on the display. This is not a valid jumper configuration.
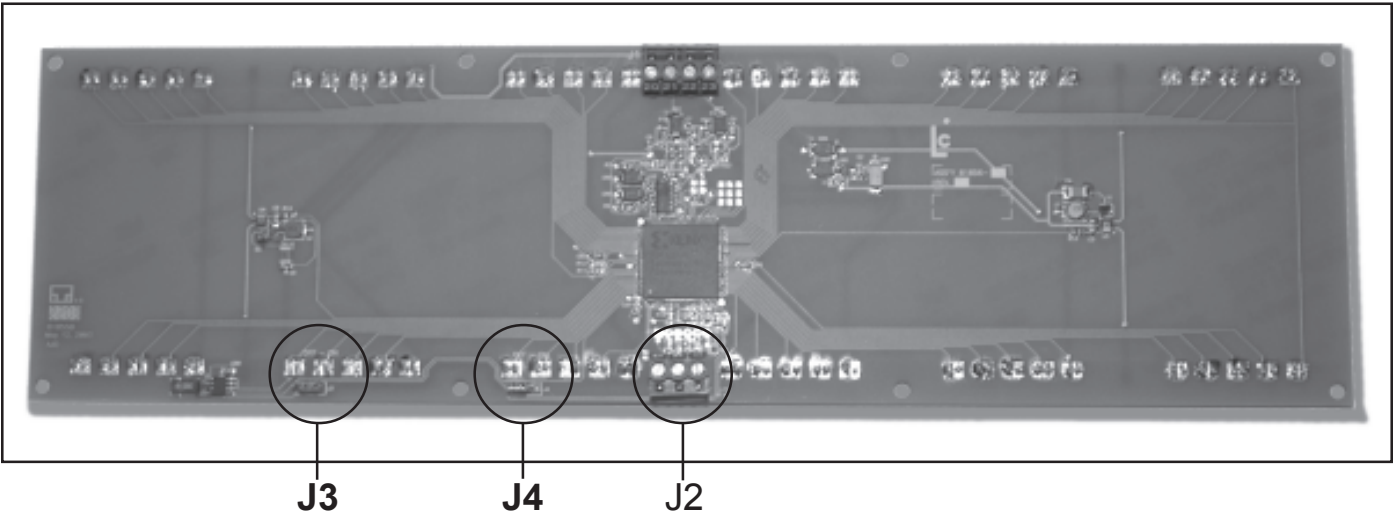

J3   J4   J2

Figure 9. Jumper Locations

DEVICE	MODEL No.	Whole Units		Tenth Units		Hundreth Units	
		J3	J4	J3	J4	J3	J4
LectroCount LCR-II	E1610	*OFF*	*OFF*	*OFF*	*OFF*	*OFF*	*OFF*
LectroCount LCR, LectroCount³	E1611	OFF	OFF	ON	OFF	OFF	ON

Table 1. Decimal Point Jumper Setting.

## Model No. E1610
For use with LectroCount LCR-II

Once the display is mounted, the factory installed cable should be routed to the LectroCount LCR-II. Choose an unused port on the LCR-II and connect the cord grip provided. Route the cable through the cord grip and connect the cable to the J12 Connector on the LCR-II PCB as shown in Figure 10.

J12	J1
Pin 39	Pin 21 (WHITE)
Pin 40	Pin 22 (GREEN)
Pin 41	Pin 23 (BLACK)
Pin 45*	Pin 20 (RED)
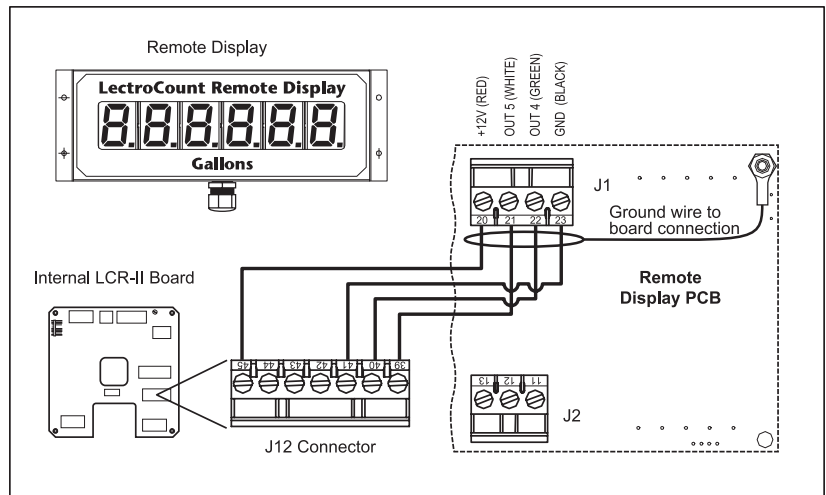
*If the power supplied to the LCR-II ever exceeds +24VDC, then the remote display should be powered from Pin 32 on J8, +5VDC.

Figure 10. LCR-II Wiring Diagram

LectroCount LCR-II - Select Switch Kit Accessory (PN 82593)

This kit is not required for operation of the LectroCount Remote Display with the LectroCount LCR-II. It is an optional accessory which allows the user to select the various displays available from a remote location. The switch kit accessory does not connect to the LectroCount Remote Display, **it is wired directly into the LectroCount LCR-II.**

The Select Switch Kit includes the following:
• Push Button (& cord grip)
• Cord Grip (2)
• 4-port Conduit Box
• 30 Foot, 2-wire, Shielded Cable

The 4-port Conduit Box can be configured as desired. Each port is the same size (½") so the plugs and cord grip and switch may be reconfigured to suit the application.

When a location has been determined for the switch kit, mount the conduit box. Route the 30 foot cable provided to the LectroCount LCR-II and connect the cord grip to an available port on the back of the LCR-II. Route the free end of the 30 foot cable through the cord grip on the back of the LCR-II. Connect the two wires for the Select switch to terminal J8 on the LCR-II PCB as shown in Figure 11.
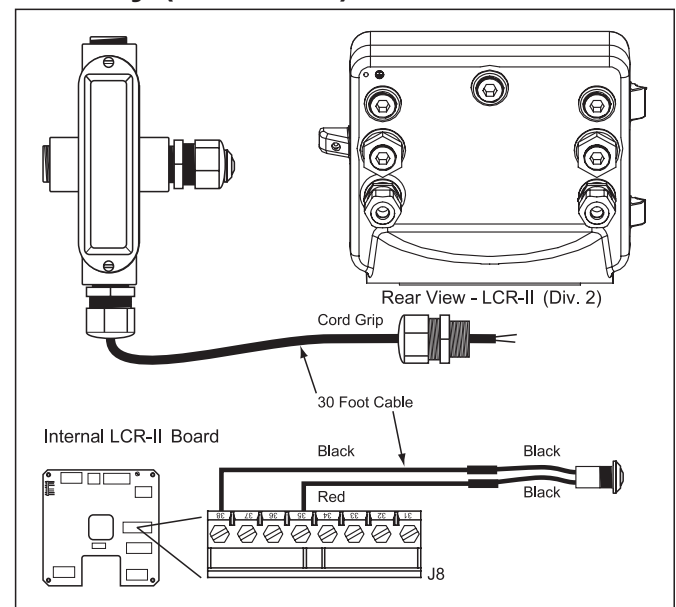
RED to Pin 35
BLACK to Pin 38.

Figure 11. Select Switch Wiring Diagram

When a delivery is active, pressing the Select Switch will cause the display to show the current flow rate. After 5 seconds, the display returns to current flow total.

Wiring Diagrams

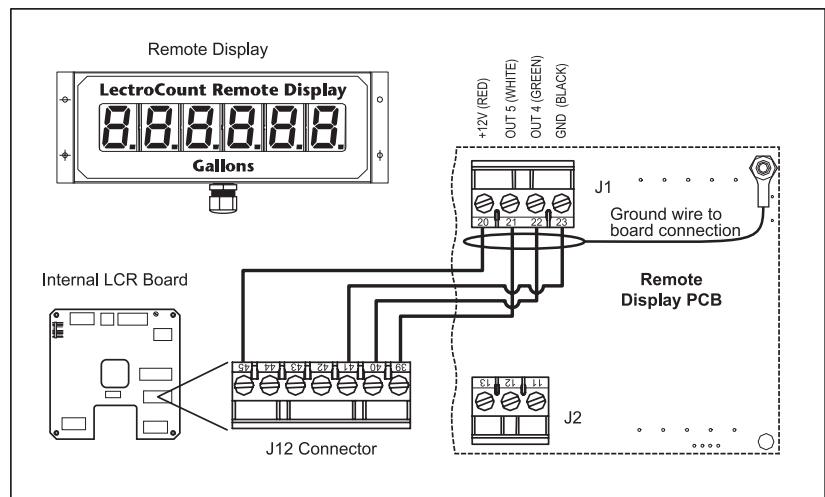## Model No. E1611
For use with LectroCount LCR

Once the display is mounted, the cable should be routed to the LCR. Choose an unused port on the LCR and connect the cord grip provided. Route the cable through the cord grip and connect the cable to the J12 Connector on the LCR PCB as shown in Figure 12.

J12	J1
Pin 39	Pin 21 (WHITE)
Pin 40	Pin 22 (GREEN)
Pin 41	Pin 23 (BLACK)
Pin 45*	Pin 20 (RED)

Figure 12. LCR Wiring Diagram

When functional, the remote display will match the LCR display. No external reset switch is required for operation.

*If the power supplied to the LCR ever exceeds +24VDC, then the remote display should be powered from Pin 32 on J8, +5VDC.

Model No. E1611
For use with LectroCount³

Once the display is mounted, the cable should be routed to the LectroCount³. Choose an unused port on the LC³ and connect the cord grip provided. Route the cable through the cord grip and connect the cable to the J1 Connector on the LectroCount³ PCB as shown in Figure 13.

J1 (LC³)	J1 (Remote Display)
Pin 1	Pin 20 (RED)
Pin 2	Pin 23 (BLACK)
Pin 5	Pin 21 (WHITE)
Pin 6	Pin 22 (GREEN)

Figure 13. LC³ Wiring Diagram
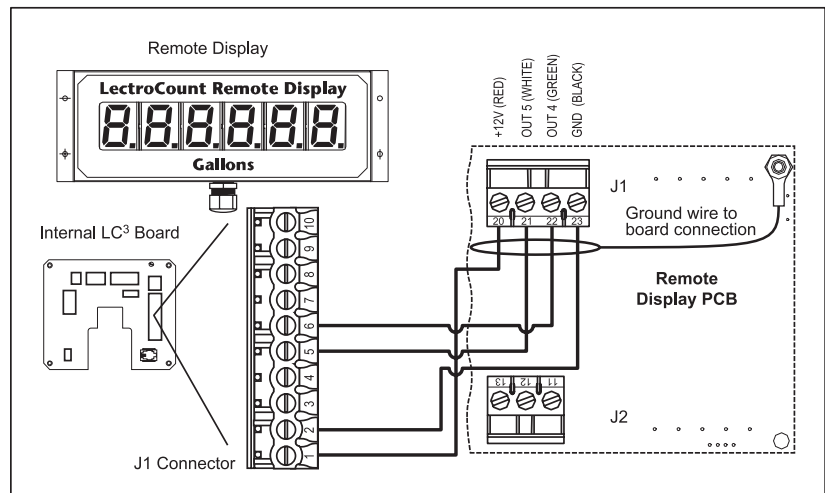
When functional, the remote display will match the LC³ display. No external reset switch is required for operation.

Dual Display Kit (PN 82594)
(For use with Models E1610 & E1611)

The Dual Display Kit is designed for use with two (2) LectroCount Remote Displays and a single LectroCount Electronic Register. This kit contains:
- 4-Port Junction Box
- Cord Grip (2)
- Nipple & Seal Washer

The LectroCount Remote Displays are equipped with a 30 ft, 4-wire, shielded cable.

To install the Dual Display Kit:
1. Open one of the units by removing the 14 bolts on the back panel.

2. Disconnect the cable from J1.

3. Remove the cord grip and cable from the unit.

4. Install the 4-Port Junction Box in the space where the cord grip was just removed.

5. Route the cable from the unopened Remote Display through a cord grip attached to the junction box.

6. Route the removed cable through a second cord grip in the junction box.

7. Connect both cables to J1 on the PCB.

> **J1**
> Pin 20 - Red Wire
> Pin 21 - White Wire
> Pin 22 - Green Wire
> Pin 23 - Black Wire

8. Replace the cover on the back of the display following the specifications on Page 7.

9. Connect the loose end of the cable to the LectroCount Electronic Register as shown on Pages 9-10.
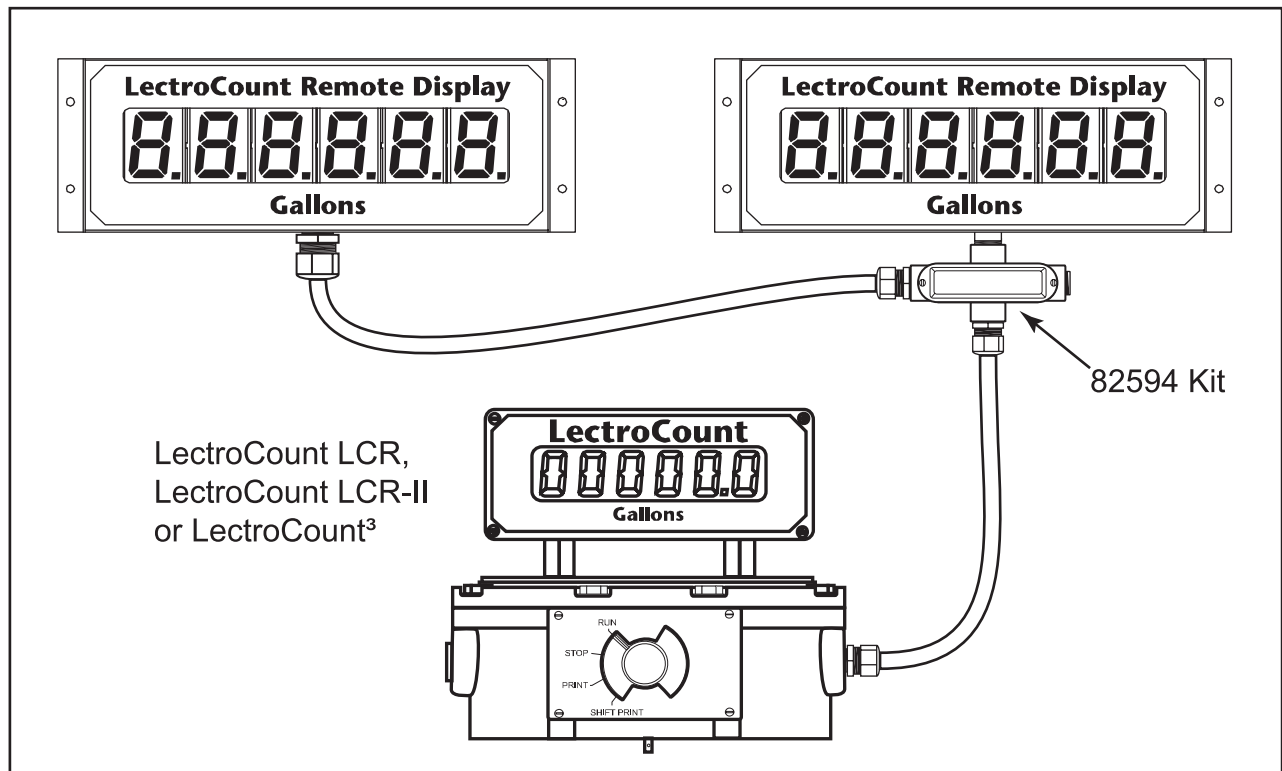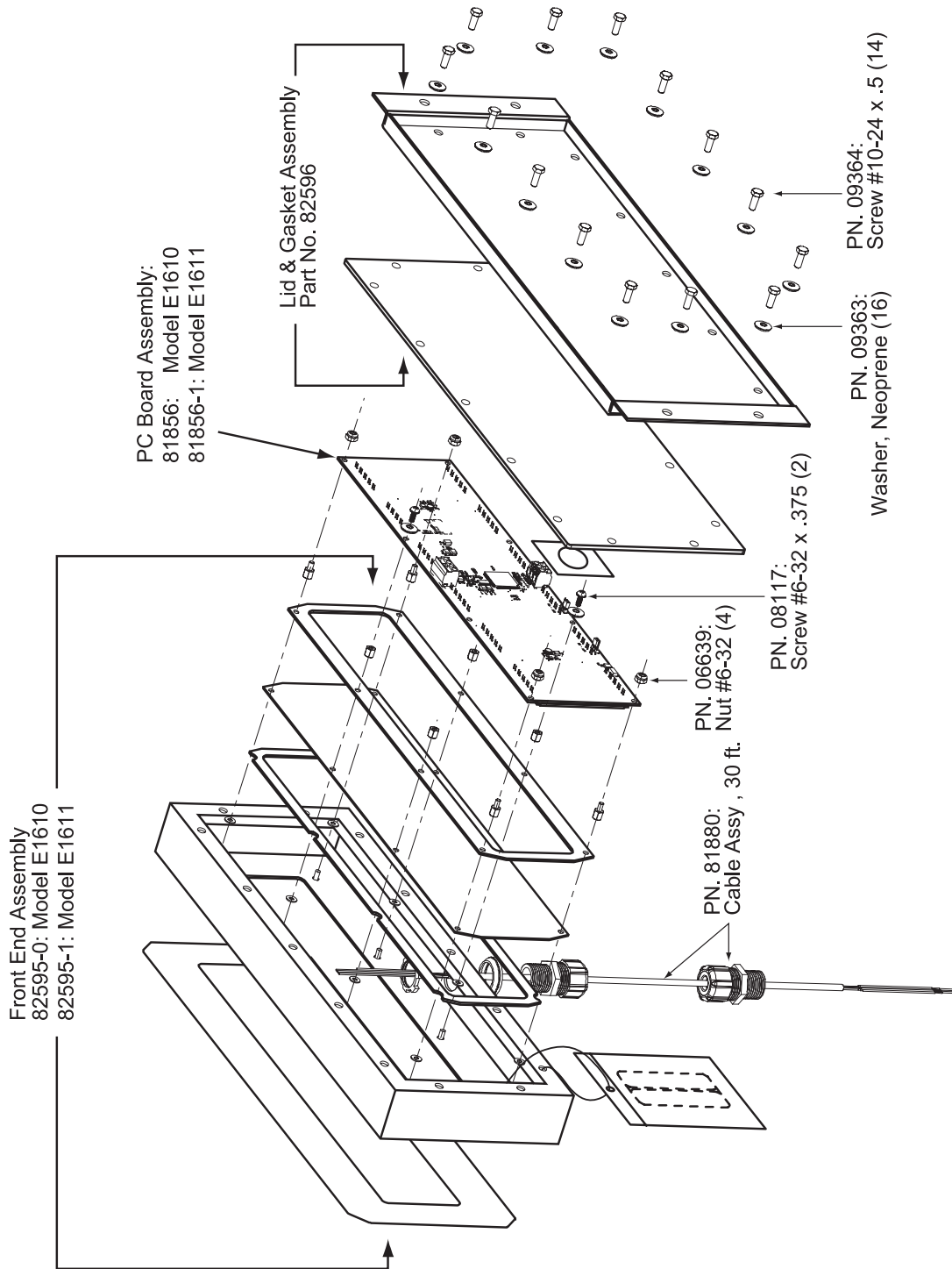

Figure 14. Dual Display Kit - 2 Remote Displays with 1 LectroCount Electronic Register

PC Board Assembly:
81856:   Model E1610
81856-1: Model E1611

Lid & Gasket Assembly
Part No. 82596

PN. 09364:
Screw #10-24 x .5 (14)

PN. 09363:
Washer, Neoprene (16)

PN. 08117:
Screw #6-32 x .375 (2)

PN. 06639:
Nut #6-32 (4)

Front End Assembly
82595-0: Model E1610
82595-1: Model E1611

PN. 81880:
Cable Assy , 30 ft.

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ISO 9001
ISO 14001

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CERTIFIED FIRM
Certificate No. 08732

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