49-8104RK
Standby Battery
Operator's Manual

Part Number: 71-0118RK

Revision: C

Released: 8/4/17

Product Warranty

RKI Instruments, Inc. warrants gas alarm equipment sold by us to be free from defects in materials, workmanship, and performance for a period of one year from date of shipment from RKI Instruments, Inc. Any parts found defective within that period will be repaired or replaced, at our option, free of charge. This warranty does not apply to those items which by their nature are subject to deterioration or consumption in normal service, and which must be cleaned, repaired, or replaced on a routine basis. Examples of such items are:

a) Absorbent cartridges

b) Pump diaphragms and valves

c) Fuses

d) Batteries

e) Filter elements

Warranty is voided by abuse including mechanical damage, alteration, rough handling, or repair procedures not in accordance with the operator's manual. This warranty indicates the full extent of our liability, and we are not responsible for removal or replacement costs, local repair costs, transportation costs, or contingent expenses incurred without our prior approval.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED OR IMPLIED, AND ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF RKI INSTRUMENTS, INC., INCLUDING BUT NOT LIMITED TO, THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL RKI INSTRUMENTS, INC. BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL LOSS OR DAMAGE OF ANY KIND CONNECTED WITH THE USE OF ITS PRODUCTS OR FAILURE OF ITS PRODUCTS TO FUNCTION OR OPERATE PROPERLY.

This warranty covers instruments and parts sold to users by authorized distributors, dealers, and representatives as appointed by RKI Instruments, Inc.

We do not assume indemnification for any accident or damage caused by the operation of this gas monitor, and our warranty is limited to the replacement of parts or our complete goods.

Overview

This manual describes the 49-8104RK standby battery. This manual also describes how to install and maintain the standby battery.

Specifications

Table 1 lists specifications for the standby battery.

Table 1: Specifications

Construction (housing)	Weatherproof ABS plastic
Power Rating	24 VDC, 12 AH (amp hour)
Operating Temperature	32° F to 104° F (0°C to 40°C)
Size	11.28” H x 7.48” W x 5.91” D (287 mm D x 190 mm W x 150 mm D)
Weight	22 lbs (10 kg)

Description

The 49-8104RK Standby Battery is designed for use with a gas monitoring controller capable of running from 24 VDC such as the RKI Instruments, Inc. Beacon 200, Beacon 410A, or Beacon 800 controller. It can provide temporary power to a controller if primary AC power is lost. The standby battery consists of the housing, two batteries (shipped uninstalled), three connection wires (shipped in a small bag), and wire nuts for wiring connections. The figure below shows the batteries and wires installed.

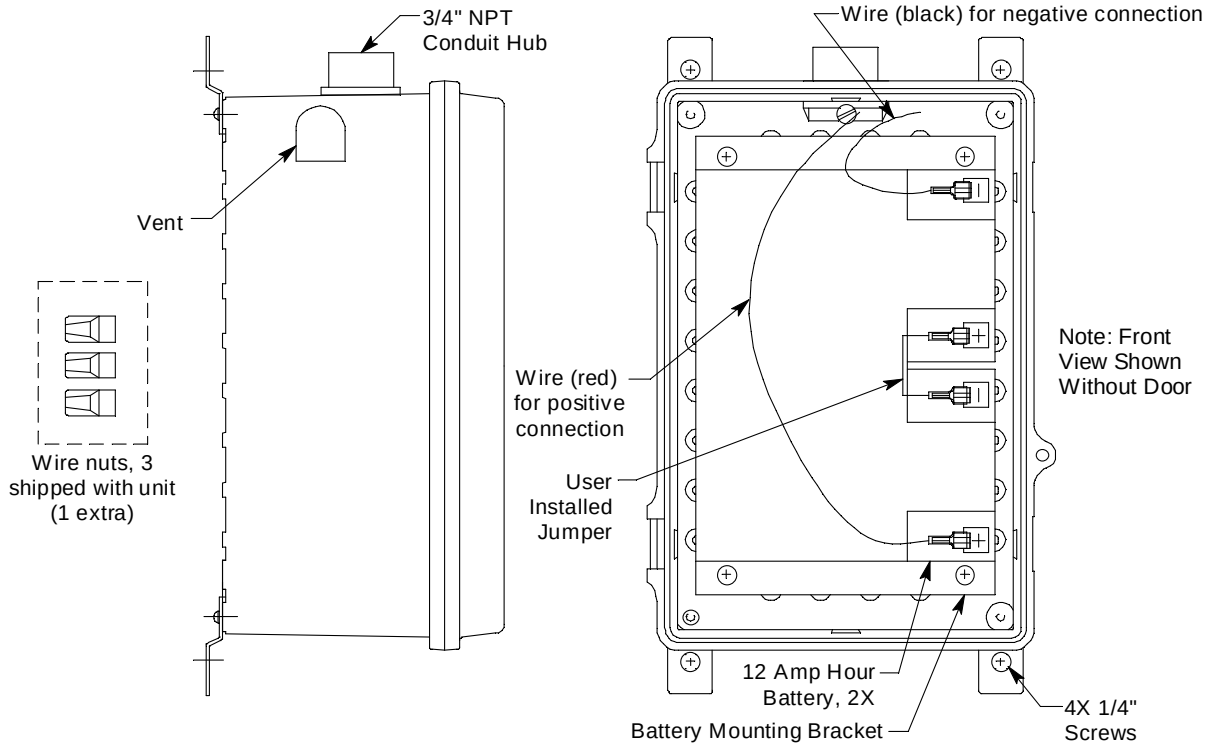

Figure 1: Standby Battery Component Location

Housing

The standby battery's fiberglass housing is weather- and corrosion-resistant. It is suitable for installation where general purpose equipment is in use. The housing door is hinged on the left side and is secured by two latches on the right side. Four mounting feet are attached to the back of the housing (one at each corner). The mounting feet allow you to install the housing to a vertical surface. A conduit hub on the top of the housing is for external wiring connections. A weather-resistant vent on the upper left side prevents buildup of hydrogen in the housing if it is vented by the batteries.

Batteries

Two lead acid 12 VDC, 12 AH batteries are shipped with the housing but are not installed. The batteries must be installed into the housing and connected with a wire jumper so that they produce 24 VDC. Two wires must be connected to the batteries to allow connection to the positive and negative of the standby battery. The ends of these wires are covered with insulating shrink tubing to prevent shorting during shipment. These pieces of shrink tubing will have to be removed during installation of the standby battery (see "Wiring the Standby Battery to a Controller" on page 7).

Wire Nuts

Three wire nuts are provided with the standby battery for wiring connections. The wire nuts are shipped in the standby battery packaged in a small plastic bag. Only two wiring connections will have to be made to the standby battery (see "Wiring the Standby Battery to a Controller" on page 7), so one of the wire nuts is provided as an extra in case one is lost or damaged.

Installation

This section describes procedures to mount the standby battery and wire it to a controller.

Installing the Batteries

The batteries are shipped separately in order to prevent damage to the housing. Three wires are provided in a bag in order to make connections to the batteries. The figure below shows how the standby battery is shipped.

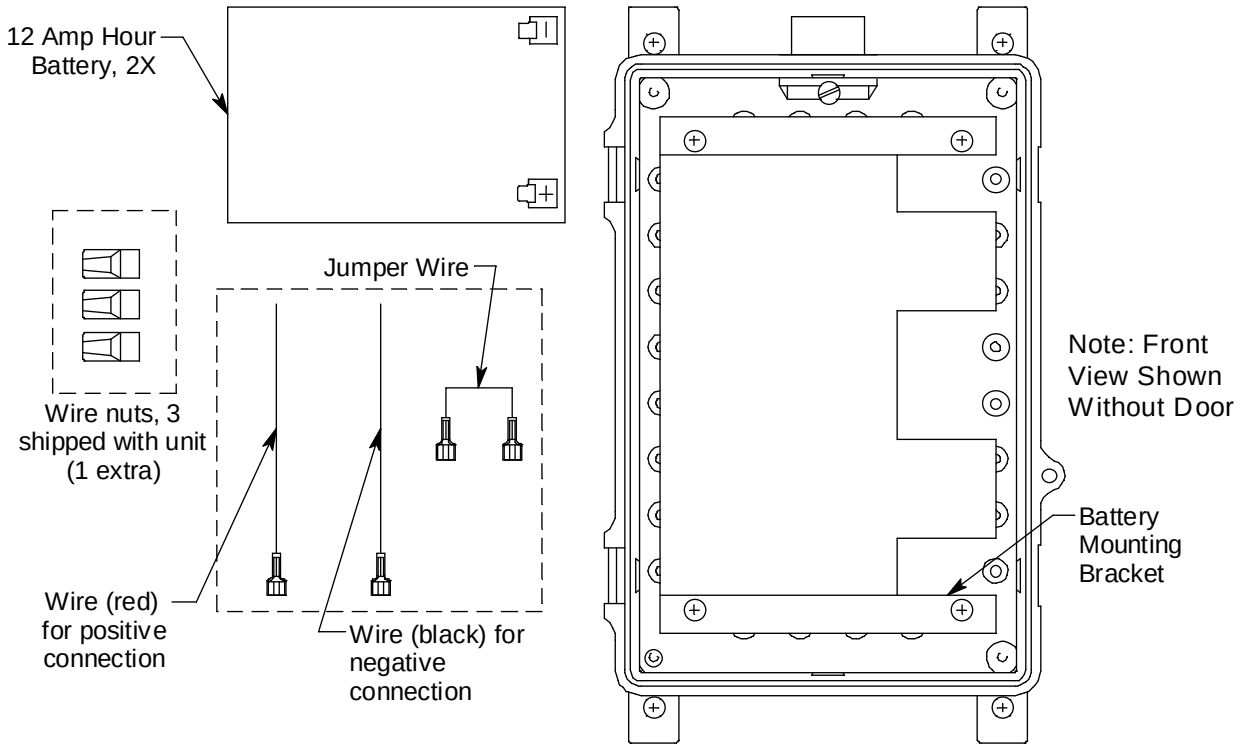

Figure 2: Standby Battery Components as Shipped

1. Place the enclosure on a table or bench top and open the door.
2. Unscrew the four screws retaining the battery mounting bracket to the case.
3. Carefully remove the battery mounting bracket from the case.
4. Place the batteries in the enclosure and arrange them so that all battery terminals are on the right as shown in Figure 1.
5. Place the battery bracket over the batteries and line up the mounting holes in the bracket with the mounting holes in the case.
6. Install the four screws that retain the battery bracket and tighten firmly.
7. Install the positive (red) wire to the "+" connection on the bottom battery (see Figure 1). This wire is one of three wires in a small bag included with the shipping contents.
8. Install the negative (black) wire to the "-" connection of the top battery (see Figure 1). This wire is one of three wires in a small bag included with the shipping contents.

CAUTION: *Before continuing, confirm that the positive wire (red) and the negative wire (black) are not shorting to each other. Each wire has shrink tubing on the end to prevent shorting. Leave the shrink tubing on.*

9. Install the wire jumper between the "+" connection of the top battery and the "-" connection of the bottom battery (see Figure 1). This wire is one of three wires in a small bag included with the shipping contents.

Mounting the Standby Battery

1. Select a mounting site close to the controller that requires standby power. Consider the following when you select the mounting site.
   - Select a site where the standby battery is not likely to be bumped or disturbed. Make sure there is sufficient room to perform maintenance procedures.
   - The conduit hub on the top of the standby battery housing makes wiring to a controller convenient if the standby battery is mounted below a controller.
2. Open the standby battery door and remove any packing materials from the housing. Be careful not to lose the three wire nuts that are provided for wiring connections.
3. Close and latch the standby battery housing door.
4. The standby battery is shipped with the mounting feet positioned behind the housing. Loosen the screws that secure the feet to the housing, rotate the feet to their mounting position as shown in Figure 3, then tighten the screws.

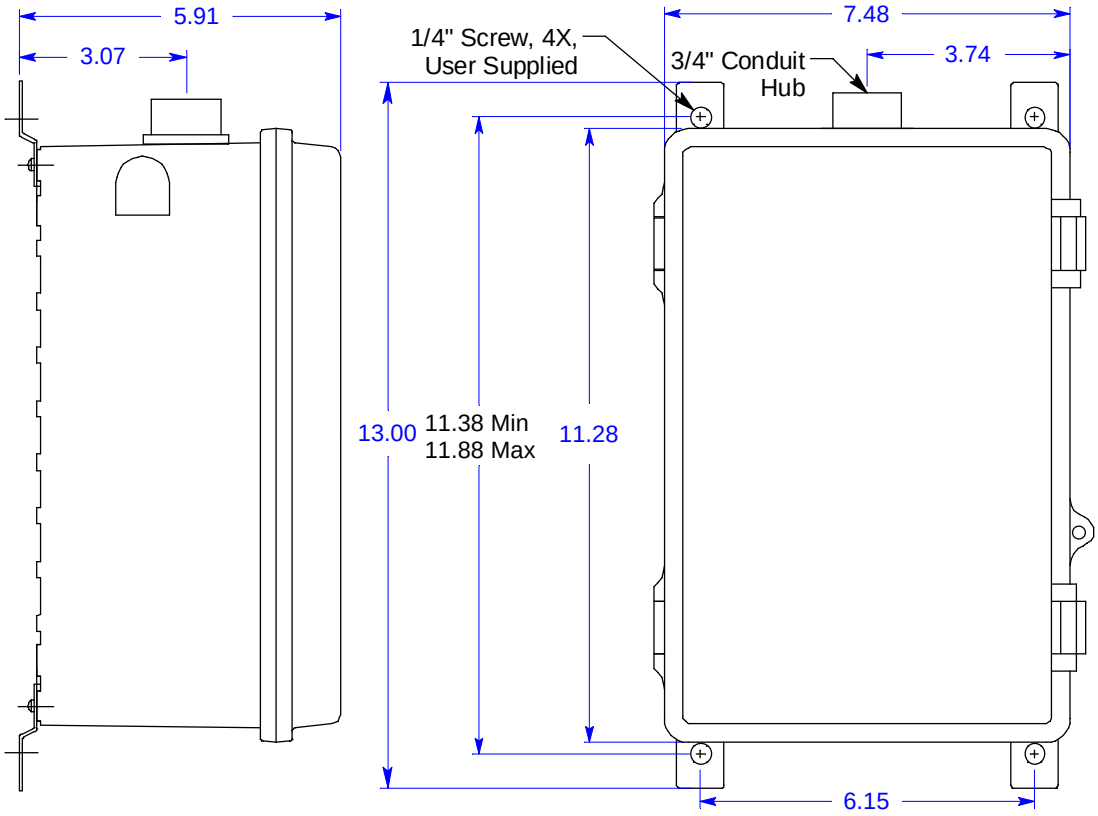

Figure 3: Outline & Mounting Dimensions

5. Insert 1/4 inch screws through the slots in the mounting feet at each corner of the housing to secure the housing to the mounting surface.

Wiring the Standby Battery to a Controller

WARNING: ***Always verify that all power to the controller is OFF before you make wiring connections.***

1. Turn off the controller.
2. Turn off or unplug power to the controller.
3. Install an appropriately rated cable bushing or conduit to the conduit hub on the controller that will be used for wires from the standby battery.
4. Open the standby battery housing door.
5. Install an appropriately rated cable bushing or conduit to the conduit hub on the standby battery housing.
6. Route two wires in conduit or a two wire cable with wires from the controller conduit hub to the standby battery conduit hub. 16 AWG wire is recommended, but the wire nuts will accommodate wire up to 14 AWG wire.
7. Connect the two wires to the 24 VDC power input terminals at the controller. Note which wire is positive and which wire is negative.
8. A short, user-installed jumper wire terminated with push-on lugs connects the two batteries in the standby battery. Remove this wire from one of the battery terminals and make sure it is not contacting the terminal.
9. When the standby battery is shipped from the factory, the ends of the two wires provided for external wiring connections are covered with shrink tubing to prevent shorting of the batteries during shipment. Remove the shrink tubing and strip the end of each wire. Take care not to short the wires to the mounting bracket or to each other.

10. Use the wire nuts provided with the standby battery to connect the positive and negative wires in the standby battery to the positive and negative wires coming from the controller as shown in Figure 4, Figure 5, and Figure 6.

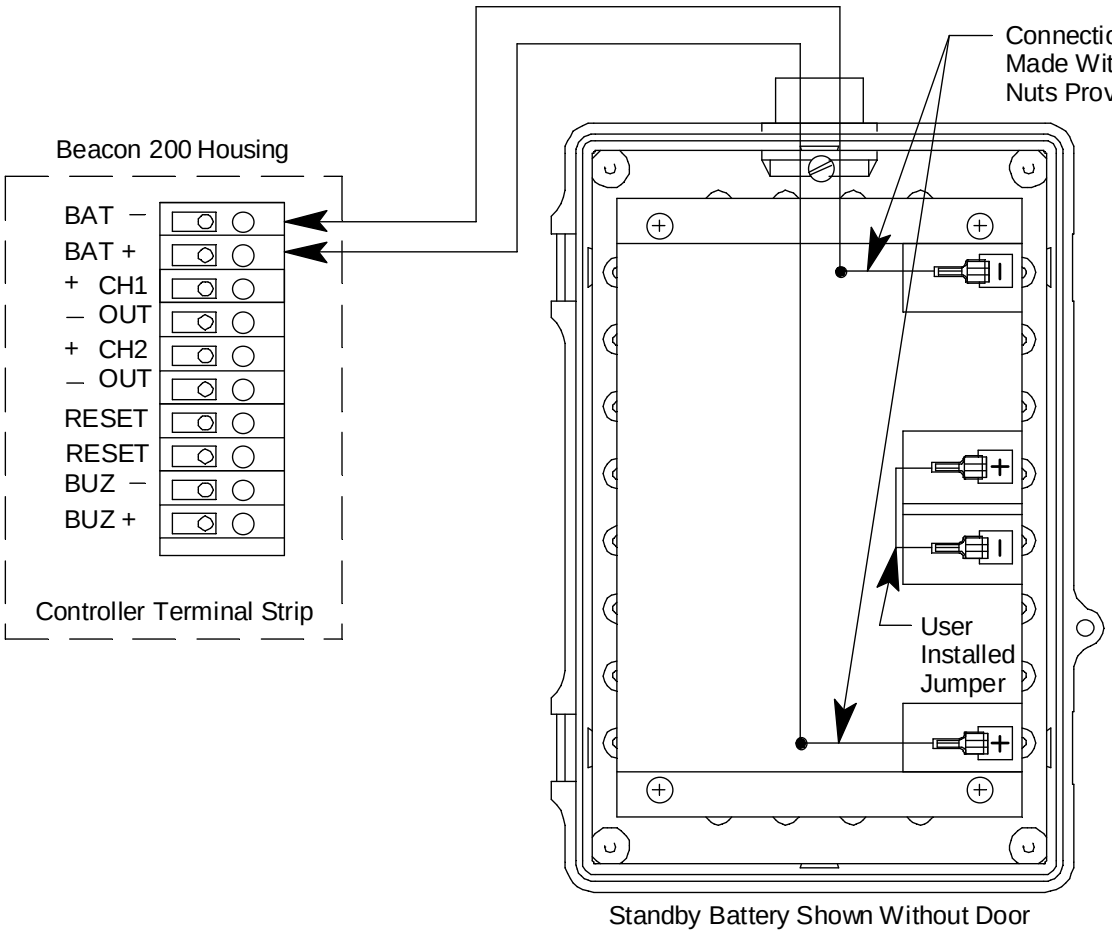

Figure 4: Wiring the Standby Battery to a Beacon 200

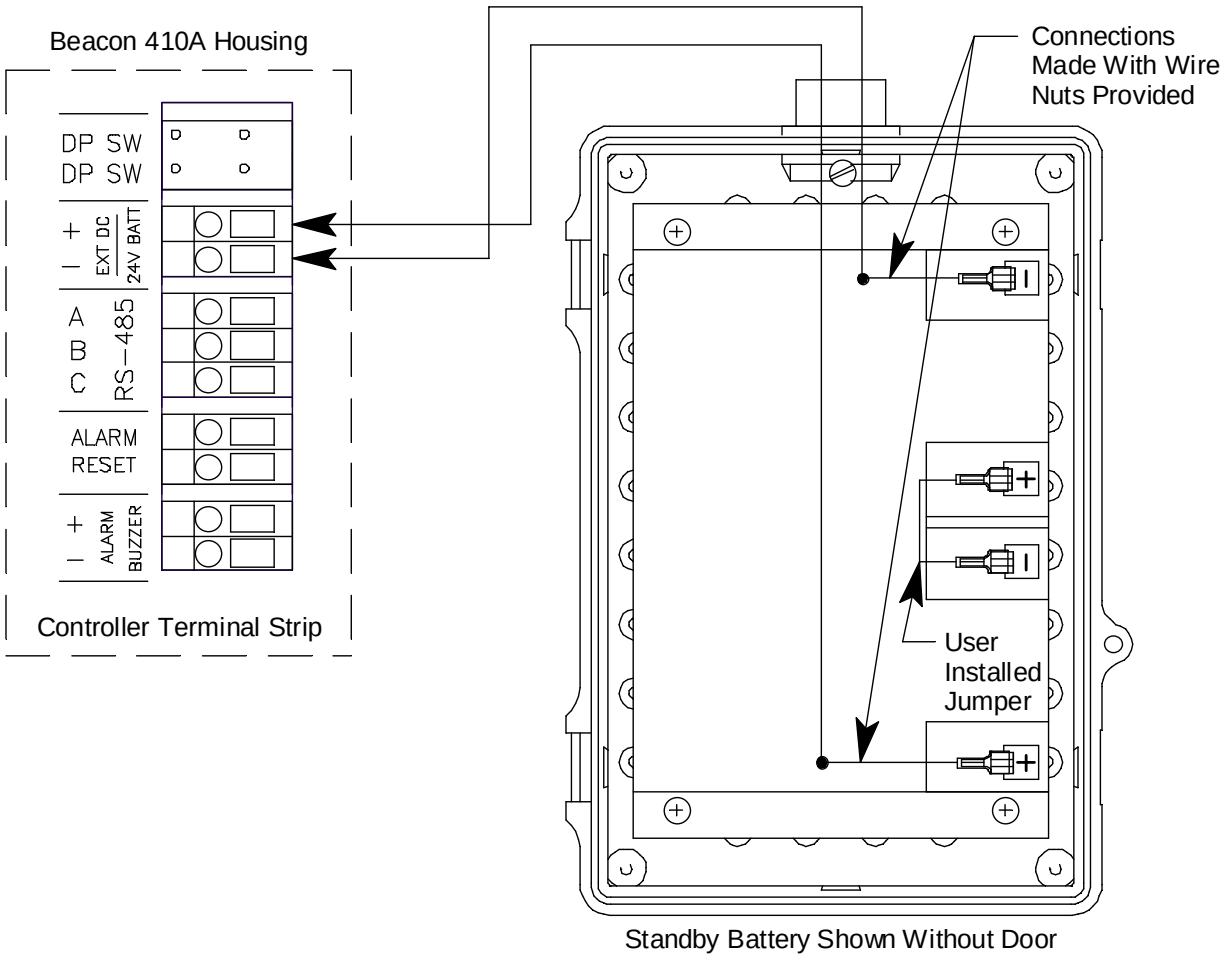

Figure 5: Wiring the Standby Battery to a Beacon 410A

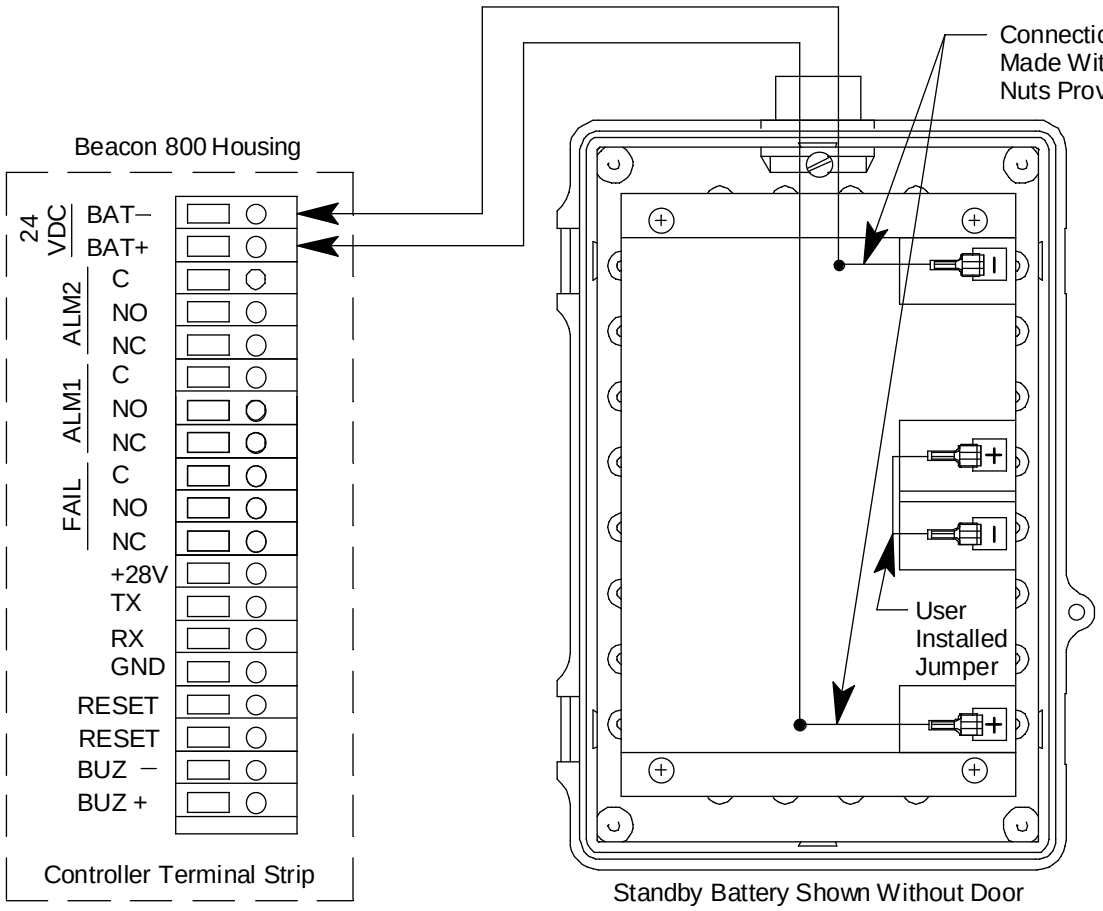

Figure 6: Wiring the Standby Battery to a Beacon 800

11. Turn on power to the controller.
12. Turn on the controller.
13. When the controller has completed its startup sequence, re-connect the end of the jumper wire to the battery terminal from which it was removed.
14. Close the standby battery housing door.
15. The on / off switch in the Beacon 200, Beacon 410A, and Beacon 800 controls AC power to the instruments. Verify that the standby battery is installed properly by flipping the on / off switch to the off position and observing that the controller continues to operate powered by the standby battery.
16. Flip the controller power switch to the on position.

Operation

When the standby battery is connected to an RKI Instruments, Inc. controller such as the Beacon 200, Beacon 410A, or the Beacon 800, the controller maintains a trickle charge on the battery to keep it fully charged. If primary AC power to the controller goes down, the standby battery will power the controller for a limited amount of time until primary power returns. When primary AC power returns, the controller will begin charging the standby battery. Recharge time will vary depending on the controller and the level of discharge, but a typical recharge time if the battery is completely discharged is about 4 days.

Runtime will vary depending on the controller and configuration of the controller. The table below shows typical controller runtimes for common configurations.

Table 2: Typical Controller Runtimes on Standby Battery

Controller	Controller Detector Configuration	Runtime
Beacon 200	2 Channels LEL	40 hours
Beacon 200	2 Channels Toxic or Oxygen	90 hours
Beacon 200	2 Channels 35-3000RK Sample Draw	18 hours
Beacon 200	2 Channels GD-K7D2 Sample Draw	22 hours
Beacon 410A	4 Channels LEL	40 hours
Beacon 410A	4 Channels Toxic or Oxygen	96 hours
Beacon 410A	4 Channels 35-3000RK Sample Draw	14 hours
Beacon 410A	4 Channels GD-K7D2 Sample Draw	17 hours
Beacon 800	8 Channels LEL	18 hours
Beacon 800	8 Channels Toxic or Oxygen	60 hours
Beacon 800	8 Channels 35-3000RK Sample Draw	4 hours
Beacon 800	8 Channels GD-K7D2 Sample Draw	5 hours

Maintenance

This section describes preventive maintenance and troubleshooting procedures. It also includes component replacement procedures and a parts list.

Preventive Maintenance

Check the standby battery voltage with a volt meter on a quarterly basis and verify that it is fully charged. A fully charged standby battery connected to a controller that trickle charges it will typically measure between 28 volts and 29 volts.

Troubleshooting

The troubleshooting guide describes symptoms, probable causes, and recommended action for problems you may encounter with the standby battery.

Condition	Symptom(s)	Probable Causes	Recommended Action
Low Battery Voltage	• The standby battery voltage measures below 28VDC at the quarterly voltage check.	• The wiring to the controller is disconnected or misconnected. • The wire nut connections in the standby battery are not properly made. • The wiring to the battery terminals in the standby battery is disconnected. • The controller is not fully charging the standby battery.	1. Verify that the wiring at the controller is correct and secure. 2. Verify that the wire nut connections in the standby battery are properly made. 3. Verify that the lugs that fit over the battery terminals are securely and correctly installed. 4. Check the DC fuse at the controller. 5. If the low voltage condition continues, contact RKI for further instruction.

Replacing a Battery

If one of the 12 VDC batteries in the standby battery needs replacement, RKI Instruments, Inc. recommends that both batteries be replaced. The part number for a replacement battery is listed in the parts list at the end of this section. Follow the instructions below to replace the batteries.

1. Turn off the controller.
2. Turn off power to the controller.
3. Open the standby battery housing door.
4. Remove the jumper wire that connects the two batteries. It connects to both batteries with a push-on lug.
5. Remove the remaining two connections to the batteries, the positive and negative connections, by removing the push-on lugs from each battery.
6. Fix the positive and negative wires out of the way.
7. Unscrew the top two screws retaining the battery bracket to the case. Hold the battery bracket in place so that the batteries do not fall out of the case.
8. While holding the battery bracket in place, unscrew the bottom two screws retaining the battery bracket in place. Be careful when the screws are removed as the batteries are heavy and may fall out of the housing if the battery bracket is not held firmly when the screws are removed.

9. Carefully remove the battery bracket and batteries from the case.
10. Replace the batteries in the bracket with the new batteries.

NOTE: Dispose of the old batteries properly.

11. Place the battery bracket with the batteries in the case and line up the mounting holes in the bracket with the mounting holes in the case. Hold the bracket with the batteries in place firmly.
12. Install the bottom screws that retain the battery bracket and tighten firmly.
13. Install the top screws that retain the battery bracket and tighten firmly.
14. Install the positive and negative connections to the appropriate battery terminals (see Figure 4, Figure 5, and Figure 6).
15. Turn on power to the controller.
16. Turn on the controller.
17. When the controller has completed its warm-up sequence, install the jumper wire between the two batteries (see Figure 4, Figure 5, and Figure 6).
18. Close the standby battery housing door.
19. The on / off switch in the Beacon 200, Beacon 410A, and Beacon 800 controls AC power to the instruments. Verify that the standby battery is installed properly by flipping the on / off switch to the off position and observing that the controller continues to operate powered by the standby battery.
20. Flip the on / off switch to the on position.

Parts List

Table 3 below lists spare parts for the standby battery.

Table 3: Standby Battery Spare Parts

Part Number	Description
18-0107RK	3 / 4" NPT conduit hub
18-0112RK	Vent
45-0600RK	Wire nut, for 22 - 14 AWG wire
49-1552RK	Battery, lead acid, 12 V, 12 amp hour