



# L-K INDUSTRIES

Demand a higher standard.

## Criterion Water Bath

Class I, Division 2 Heating System  
*Operating Manual*



To set the standard for  
**MANUFACTURING QUALITY** and customer  
service in the **PETROLEUM TESTING** industry.

Petroleum Testing Equipment Suppliers Worldwide **Since 1930**



Since 1930 we have taken great pride in building high quality products and providing excellent customer service. Our original "Melton" centrifuge set the standard in 1957 and continues to inspire our product development today.

We look forward to continuing the rich traditions that have made us successful and to manufacturing the next generation of oilfield testing supplies.

Thank you for your business.

Sincerely,

A handwritten signature in black ink, appearing to read "Eric R. Calderon", with a long, sweeping horizontal line extending to the right.

**Eric R. Calderon**  
*President and CEO*  
*L-K Industries*



## Limited Product Warranty

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L-K Industries warrants its manufactured products against defects in materials and workmanship for a period limited to one year from the date of shipment. If purchased from a Distribution Partner, the warranty lasts one year from the in-service date. During the one-year warranty period, L-K Industries shall repair or replace defective equipment free of charge. L-K Industries shall only be liable for repairs or replacements if L-K is contacted immediately following discovery of defect(s).

Defective products (under warranty) shall only be returned after contacting and receiving permission from L-K Industries. The warranty does not extend to L-K Industries products that have been misused, neglected, independently modified (without L-K Industries' approval), improperly installed or accidentally damaged. L-K Industries shall not be liable for damage or loss resulting from use of L-K Industries products—separately or in combination with other equipment.

## Contact Information

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## Getting Started

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### Introduction and Safety Precautions

The Criterion Water Bath Heating System is designed to accurately heat solvents or petroleum samples in Class I, Division 2 testing laboratories or refineries. It can fit comfortably in the fume hood or on a benchtop. The system comes completely assembled, ready for installation.

The modular unit can hold two 1-gallon bottles of solvent, 14 Long Cone (C)/Capillary (E) or 12 Short Cone (D) centrifuge tubes. It is factory programmed to heat to 140±5°F (60±3°C) and maintain that temperature per ASTM/API specifications.

The modular system provides each facility flexibility in configuring its laboratory. It also allows for the addition of extra baths as individual requirements demand.

 **WARNING:** EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE FOLLOWING DEVICES:

1. Selector (ON/OFF) switch and construction materials.

 **AVERTISSEMENT:** L'EXPOSITION À CERTAINS PRODUITS CHIMIQUES PEUVENT DÉGRADER LES PROPRIÉTÉS DE L'ÉTANCHÉITÉ DES MATÉRIAUX UTILISÉS DANS LES APPAREILS SUIVANTS:


1. SÉLECTEUR ET LES MATÉRIAUX UTILISÉS POUR LA CONSTRUCTION DE L'INTERRUPTEUR.

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 **WARNING:** EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR USE IN CLASS I, DIVISION 2 LOCATIONS.


 **AVERTISSEMENT:** RISQUE D'EXPLOSION – LE SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATÉRIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2.

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 **WARNING:** EXPLOSION HAZARD – DO NOT REPLACE FUSE UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

 **AVERTISSEMENT:** RISQUE D'EXPLOSION – COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX AVANT DE REPLACER LE FUSE.

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 **WARNING:** EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

 **AVERTISSEMENT:** RISQUE D'EXPLOSION – AVANT DE DESCONNECTER L'ÉQUIPEMENT COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.



## Getting Started

### Certifications

This apparatus is certified for use in Class I, Division 2 Groups A, B, C, D or unclassified locations (temperature code T3C). It conforms and/or is certified to the requirements of CSA and ETL, as specified by OSHA, CCOHS and Standards Council of Canada. It also conforms to global safety requirements defined by UL.

The ETL Mark on the nameplate is a recognized demonstration of product compliance in the United States and Canada and is proof of verification by a NRTL testing organization. Please see the Specification section for applicable standards.

### Specifications

#### Equipment Rating

Line input	110/220 VAC, 900W, 50/60 Hz, single phase
Operating Temperature Range	-31 to 212°F (-35 to 100°C)
Current Protection (fuse)	250VAC, 10A

#### Environmental Rating

- Indoor use only
- Altitude: 0-2000 meters (0-6562 ft)
- Humidity Range: 80% RH max.
- Pollution Degree: 2

#### Available Part Numbers

Type/Capacity	Model #
2 1-Gallon Bottles (110 VAC)	WB-T2-110
2 1-Gallon Bottles (220 VAC)	WB-T2-220
14 C/E Style Centrifuge Tubes (110 VAC)	WB-T14C-110
14 C/E Style Centrifuge Tubes (220 VAC)	WB-T14C-220
12 D Style Centrifuge Tubes (110 VAC)	WB-T12D-110
12 D Style Centrifuge Tubes (220 VAC)	WB-T12D-220



## Getting Started

### Applicable Safety Standards

- UL 61010-1 Issued: 2012/05/11 Ed: 3 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements
- CAN/CSA-C22.2 No. 61010-1 Issued: 2012/05/11 Ed: 3 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use Part 1: General Requirements
- ISA 12.12.01 Issued: 2015/08/21 Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
- CSA C22.2#213 Issued: 2015/08/21 Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations

### Warnings

The Criterion Water Bath System was designed to optimize operator safety. Realizing the limits of any powered device and carefully following guidelines will assure accident-free use.

- ⚠ Turn off heater switch when equipment is not in use.
- ⚠ Disconnect power supply before removing or replacing electrical or mechanical parts.
- ⚠ DO NOT leave oily or solvent saturated rags in or around the water bath.
- ⚠ DO NOT allow unauthorized visitors to use the water bath system.
- ⚠ BE AWARE of surroundings. DO NOT operate the unit when fatigued or under the influence of medication, alcohol or illegal substances.

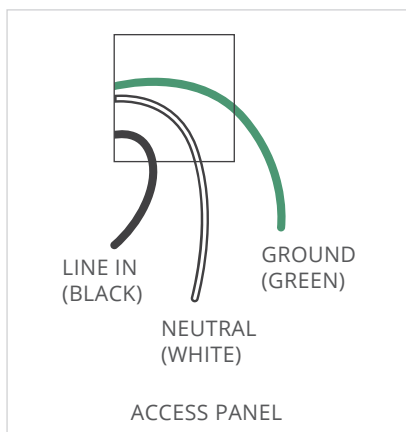
### Installation

For best results, the water bath should be housed in a fixed location with a controlled environment. The units have been designed to fit under the standard fume hood in a laboratory.

The unit should be hard-wired using 14 AWG copper wire. The unit should be connected using an external switch and circuit breaker for disconnection and overcurrent protection of the equipment. The external switch should be near the unit for safety considerations.

To connect each unit, remove the access panel on the control module and expose the wire. Feed the supply voltage wire through the conduit hub and attach per local electrical codes conforming to Class I, Division 2 Areas. Replace the access panel.

Figure 1: 110VAC/220VAC Model Wiring Diagrams





## Getting Started

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### Bath Preparation

The WB-T2 models can hold two 1-gallon bottles. Place the solvent bottles inside and fill the basin with water to within 1" of the top of the bath. Maintain water level at 1-1.5" from the top of the bath.

The WB-T14 models will hold 14 Long Cone (C) centrifuge tubes, while the WB-T12 will hold 12 Short Cone (D) tubes. With all tubes in place, fill the basin to within 1" of top and maintain water level 1-1.5" from the top.

Evaporation is minimal, but it is recommended that the water levels be monitored daily and replenished as necessary. Adjust the water level if the unit will be operated with less than the full capacity of tubes or solvent bottles.

**Warning:** DO NOT OPERATE THESE UNITS DRY!





## Operation

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### Loading and Powering On

Insure the water level is optimal and turn the power switch to the "ON" position. The LCD display on the temperature controller should illuminate. If the unit is being started cold, the indication on the controller should reflect ambient temperature in RED numbers. Upon reaching the temperature set point, the LCD display will switch from red to green.

### Changing Temperature Set Point

If a set point other than the 140°F/60°C is required, the temperature controller must be reprogrammed.

1. Press and hold "SEL" button, and then briefly press "SEL" again.
2. Press "RST" to enter security code (055).
3. Press and hold "SEL".
4. Press "RST" to until the 4-SPT input is reached.
5. The first input is SPSEL, press "RST" to change the input to SP-1.
6. Press "SEL" until the SPT-1 input is reached.
7. In the SPT-1 input, press "RST" (temperature set point will display with a flashing digit).
8. Continue to press "RST" until desired number is reached.
9. Press "SEL" to toggle between digits.
10. Press and hold "SEL" to set and press "SEL" until the end of the program is reached.

**NOTE:** The updated temperature will not be set until the "HEAT ON/OFF" switch is cycled off and back on.

Call the L-K Industries Tech Helpline if any assistance is required.



## Maintenance

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Other than cleaning, little maintenance is required. The power (ON/OFF) switch should be periodically inspected for any degradation and replaced if necessary.

 **WARNING:** EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE FOLLOWING DEVICES:

1. Selector switch, and the materials used for switch construction

 **AVERTISSEMENT:** L'EXPOSITION À CERTAINS PRODUITS CHIMIQUES PEUVENT DÉGRADER LES PROPRIÉTÉS DE L'ÉTANCHÉITÉ DES MATÉRIAUX UTILISÉS DANS LES APPAREILS SUIVANTS :

1. Sélecteur et les matériaux utilisés pour la construction de l'interrupteur

### Replacement Parts and Repair Services

Replacement parts for all water baths can be purchased through the L-K Industries Warehouse, on the L-K Industries website or from a Distribution Partner (see back cover). L-K Industries also repairs and rebuilds all water bath models in-house. For repairs, first obtain a RMA (Return Merchandise Authorization) number from L-K Industries. Then ship the unit to L-K Industries with a completed RMA form describing any problems.

### Housekeeping

Keep the unit clean. Oil residue can build up and cause difficulty operating the unit. The water bath is coated with ceramic epoxy for safety, prevention of corrosion and easy cleaning.

### Replacement of Fuses

The fuse is located on the control module. This fuse is used for over-current protection due to voltage spikes or other accidents. If replacement becomes necessary, disconnect power to the unit. Remove the fuse with an appropriate tool. Replace the fuse with a 250V, time-delay fuse that is CSA or UL certified.

 **WARNING:** EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR USE IN CLASS I, DIVISION 2.

 **AVERTISSEMENT:** – RISQUE D'EXPLOSION – LE SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2.

### Troubleshooting

If the controller does not illuminate and the unit does not heat when powered on:

- Check to ensure power connectivity at the breaker and/or the remote switch.
- Make sure the power source is supplying proper voltage to the unit.
- Check the fuse.

For issues that cannot be identified and resolved by the user, more technical troubleshooting details can be found on the L-K Industries website. Alternatively, contact the L-K Industries Tech Helpline for assistance.



## Appendices

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### Appendix A: Wiring & Assembly Diagrams

The following schematics may be found at  
<http://www.lk-ind.com/downloads>:

- Outer Front Panel Schematic
- Inner Front Panel Schematic

### Appendix B: Programming Overview

The following programming diagram may be found at  
<http://www.lk-ind.com/downloads>:

- Red Lion RTD Programming

# **L-K INDUSTRIES**

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