

 **KOOLANCE**[®]
Superior Liquid Cooling Systems



LLX-7000 User's Manual

English v1.0

A newer version of this User Manual may exist. Please be sure to check our support page for the latest version of this guide: www.koolance.com

GENERAL PRECAUTION

Please read this manual carefully before beginning the installation of your Koolance system.

ABOUT SIGNS

Throughout this document, critical information is highlighted in gray-colored boxes. The following symbols are intended to help prevent any situation which may cause personal injury and/or damage to equipment:



WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in personal injury or be life-threatening.



CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in damage to equipment or property.



PROHIBITED: Indicates a prohibited action.

PROHIBITED USE

This product is designed, developed and manufactured as contemplated for general use, including without limitation: general office use, personal use and household use, but is not designed, developed and manufactured as contemplated for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could lead directly to death, personal injury, severe physical damage or other loss, including without limitation: nuclear power core control, airplane control, air traffic control, mass transport operation control, life support, or weapon launching control. If these products are used in such hazardous environments, Koolance Incorporated does not warrant them.

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WARNING: The Koolance liquid coolant contains chemicals which may be harmful or fatal if swallowed. **KEEP THIS AND ALL DANGEROUS CHEMICALS OUT OF THE REACH OF CHILDREN.** Please refer to the coolant MSDS available on our website: www.koolance.com



CAUTION: Supply only the proper input voltage and polarity to the cooling system, as labeled below the terminals on the unit. Improper power can damage the unit and is not covered under the warranty.

KOOLANCE CONTACT INFORMATION

Koolance Inc. (USA)

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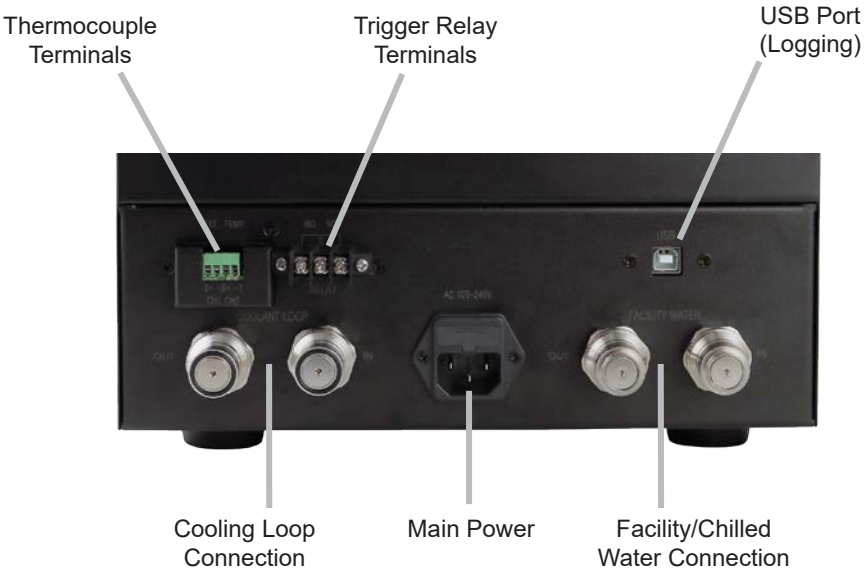
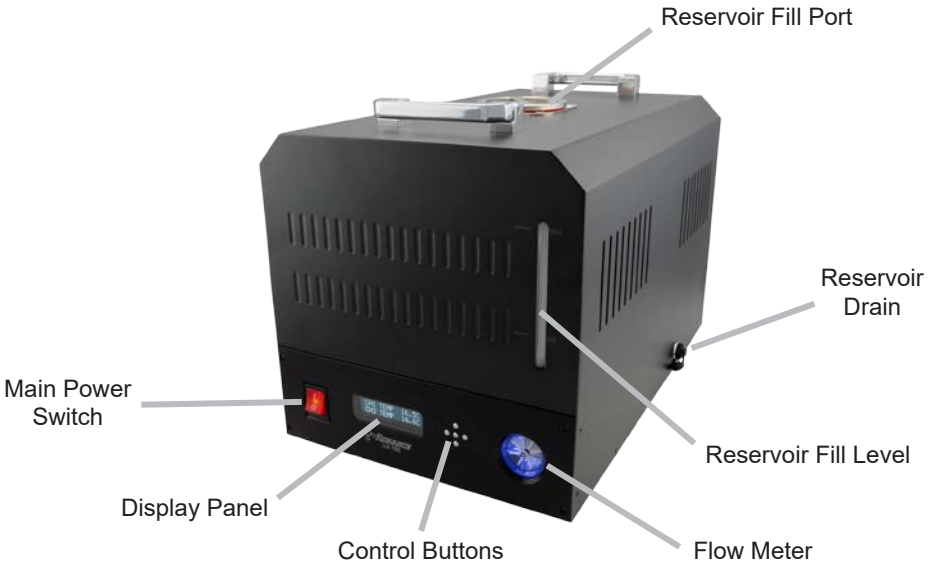
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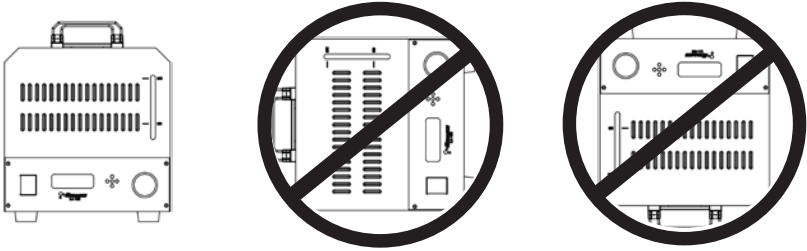
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Product Diagram



Positioning the System

This product must be operated in an upright orientation (shown below). Alternative orientations can prevent the coolant pump from operating properly.

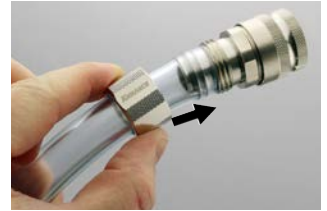


Tube Fittings

The rear of the cooling system uses two different types of Koolance quick disconnect auto-shutoff fittings. QD4 series is used for the cooling loop. The facility water connections use QD4H for a higher pressure rating (up to 8kgf/cm², 114psi). **QD4 and QD4H are not physically compatible with one another.**

The QD4 and QD4H fittings included with LLX-7000 are for 13mm x 19mm (1/2in x 3/4in) tubing. Alternative fittings are available from Koolance.

Each tubing connection will use a threaded compression ring or tube clamp to keep it secure. Be sure to thread the compression ring or tube clamp onto the tubing before attaching it.



Tighten the connection by sliding the compression nut down over the fitting and screwing securely. For barbed fittings, use pliers to move the clamp into the proper position before releasing.



Cooling Loop

Facility Water

Connect the QD4 fittings and tubing to the cooling loop assembly.

Connect the QD4H fittings and tubing to the external facility water source.

Coolant Filling and Power-On



WARNING: Most coolants are electrically conductive. Use caution when filling the system, and keep all liquids away from electronics and power cables. Keep the primary AC supply unplugged whenever filling or draining coolant.

Once all devices (cold plates, fittings, etc.) have been connected with tubing, the system can be filled with coolant. The fill port is located above the reservoir. Unscrew the large metal fill port.

Slowly fill the system with coolant. **To maintain the product warranty, use only Koolance approved coolant.** Many alternative liquids and additives can cause permanent damage to the cooling unit (through chemical reaction, corrosion, biological growth, high thermal expansion, viscosity, etc.).



Maximum and minimum fill markings are provided on the front side of the unit to help maintain the coolant level.

Replace the fill port on the reservoir. Plug in the AC power cable.

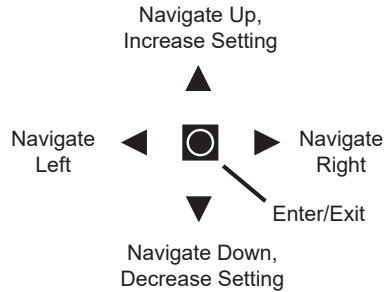
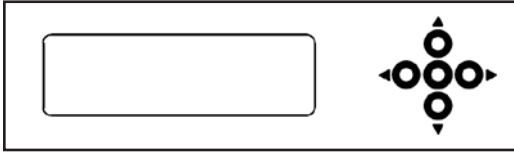






Power on the cooling unit, and increase the pump speed to move coolant if needed. When most of the air has been pushed out of the tubing, the liquid noise will decrease. This process can take several minutes, depending on the filling technique and components attached to the cooling system.

During this process, liquid components (or the cooling system itself) may need to be tilted gently to assist with air evacuation. The reservoir level will decrease during this procedure. Remove the fill port cap and add more liquid as needed.




Display Panel

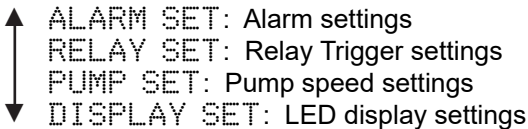
The Koolance display panel allows control and monitoring of various aspects of the cooling unit. 5 buttons are used, with directional arrows to navigate or change settings, and a center button to select/exit.




- On the main screen, hold  for 3 seconds to change display units between °C/°F and LPM/GPM.
- You can exit any menu and return to the main screen by holding  for 2 seconds.
- To reset **ALL** settings to default, hold  +  for 3 seconds.

Main Menu

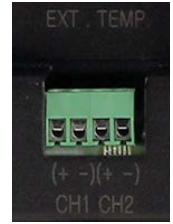
To enter the main menu, briefly press . The selected option will begin flashing. Use  and  to navigate this menu.




When in the top menu, press  to enter one of the above categories. To exit from here and most subcategories, press .

External Sensors

This unit has an integrated liquid temperature sensor in the reservoir. It also provides terminals for connecting up to two K-type thermocouples (not included) for external temperature monitoring, alarm, and relay options. NOTE: “CH1” and “CH2” (thermocouples) values will not be valid unless thermocouples are connected.



ALARM SET

This menu affects when the built-in audio alarm will sound. There are five options which are simultaneously active. Upon entering the alarm menu, the last edited line will flash. Press ▼ or ▲ to change it. Press  to edit the value, and again to return to the previous menu. To disable an alarm, increase or decrease its setting to “-----”.


- ↑ LIQ TEMP: Liquid Temperature (Range: 0 to 99°C)
- CH1 TEMP: Thermocouple #1, if attached (Range: 0 to 99°C)
- CH2 TEMP: Thermocouple #2, if attached (Range: 0 to 99°C)
- ↓ FLOW: Coolant Flow Rate (Range: 0.1 to 10.0LPM)
- LEVEL: Low Coolant Level in Reservoir (ON, or OFF to disable)

The regular audio alarm is a repeating beep. If a steady alarm tone is heard, this indicates the relay has been triggered (see “RELAY SET”).

RELAY SET

Terminals are provided for a configurable relay. Wires can be connected as normally-open (NO), or normally-closed (NC), labeled near the terminals.



There are five options which are simultaneously active. Upon entering the relay menu, the last edited value will flash. Press ▼ or ▲ to adjust this value. Press  to edit the value, and again to return to the previous menu. To disable the relay, increase or decrease its setting to “-----”.

- ↑ LIQ TEMP: Liquid Temperature (Range: 0 to 99°C)
- CH1 TEMP: Thermocouple #1, if attached (Range: 0 to 99°C)
- CH2 TEMP: Thermocouple #2, if attached (Range: 0 to 99°C)
- ↓ FLOW: Coolant Flow Rate (Range: 0.1 to 10.0LPM)
- LEVEL: Low Coolant Level in Reservoir (ON, or OFF to disable)

The relay is accompanied by a steady audio alarm tone. If a repeating beep is heard, this indicates the regular alarm has been triggered (see “ALARM SET”).



CAUTION: The cooling system's pump can not be run dry for any period of time. Do not power-on the unit without sufficient liquid in the reservoir. Dry-running (and thereby damaging the pump) is not covered under the Koolance product warranty.

PUMP SET

The pump speed can be manually set from 1 (lowest) to 10 (highest):


PUMP (1-10) 7LV : Pump Speed Level

The pump speed level will flash. Press ▼ or ▲ to adjust. Press  to return to the previous menu.

DISPLAY SET

The display settings configure which values you wish to appear on the front display and how they are shown:

DISPLAY
FIXED CYCLIC : Show 2 fixed values or cycle multiple values

The first option, "FIXED", will flash. Press ◀ or ▶ to change between these options. Press  to configure one of the selections, or press ▲ to exit. If "FIXED" is selected, two lines will be shown:


LIQ TEMP 14.5C : First line display option
CH1 TEMP 17.6C : Second line display option

The first line will flash. Press ▼ or ▲ to change what this line will display:

↑ LIQ TEMP : Shows reservoir liquid temperature
CH1 TEMP : Shows first external sensor temperature (if connected)
CH2 TEMP : Shows second external sensor temperature (if connected)
PUMP : Shows pump impeller RPM
↓ FLOW : Shows liquid flow rate through the unit

Press  to move to line 2, and similarly use ▼ or ▲ to choose what will be displayed on the second line. Press  again to exit.

If “CYCLIC” is chosen from the DISPLAY SET menu, multiple values can be rotated through the front display.

The first line will flash. Use ▼ and ▲ to navigate to other lines. Press  to enable or disable each value. This will remove the asterisk (*), thereby hiding that line from being shown on the main screen:

- ▲ *LIQ TEMP : Shows reservoir liquid temperature
- CH1 TEMP : Shows first external sensor temperature (if connected)
- CH2 TEMP : Shows second external sensor temperature (if connected)
- *PUMP : Shows pump impeller RPM
- ▼ *FLOW : Shows liquid flow rate through the unit

Press ◀ to return to the previous menu, or press ▶ to exit DISPLAY SET.

Software Feature

This unit supports Koolance’s “System Monitor” application for viewing cooling values and logging data to a computer file. Visit www.koolance.com/software to download the latest version of the program. Consult the application’s readme.txt for further details.

Draining

There is a drain on the side of the unit for emptying or replacing the coolant. Before opening the drain plug, remove the top coolant fill port to allow air into the reservoir.



Troubleshooting

We hope your Koolance system will provide you with years of reliable cooling performance. To help avoid unnecessary RMA issues, we have prepared this list of possible operational problems, and their most common solutions.

1. After filling the reservoir with coolant and turning on the system, there are no visible signs of liquid movement...

Check the flow meter value (see “DISPLAY SET”). If there is no detected flow immediately after filling the reservoir, or the flow rate is very low or periodic, this usually indicates the pump has not finished priming. Open the fill port on top of the reservoir and temporarily set the pump speed to 10 (see “PUMP SET”) to help push out the air.

If possible while the pump is running, gently tilt your cold plates or other components connected to the system in various directions to assist with bleeding air from the cooling loop. If it becomes necessary to significantly tilt the unit to assist with priming, close the fill port and power-off the unit before doing so.

3. The alarm sounds and I'm not sure why...

The offending sensor and value will flash in the front display whenever an alarm sounds. Check that your alarm is configured as desired (see “ALARM SET”). If you are certain the cooling system is working properly otherwise, try resetting all system settings by holding ▼ + ▲ for 3 seconds.

A steady alarm tone indicates the relay trigger has been activated. In that case, check that the values are configured as desired (see “RELAY SET”).

4. My system appears to be leaking fluid or water...

Check that all fittings and tubing are properly installed, that compression nuts are tightened, and that tube clamps are located properly on their barbs. A leak on the tubing connection may indicate the tubing diameter is not correct for the fittings being used.

5. The front display is locked up or not responding.

Reset all system settings by holding ▼ + ▲ for 3 seconds. After a reset, all configuration settings (alarm, pump, relay, etc.) must be updated again.

Limited Warranty

Koolance Incorporated (“Koolance”) warrants each new Koolance liquid-cooled system (“the system”), against defects in materials or workmanship for a period of one year from the date of purchase, and agrees to repair or replace any defective Koolance system without charge. Shipping costs are non-refundable.

This warranty is non-transferable. All warranty claims must be accompanied by the original proof of purchase.

THIS WARRANTY DOES NOT COVER DAMAGE RESULTING FROM ACCIDENT, MISUSE OR ABUSE, LACK OF REASONABLE CARE, SHIPPING DAMAGE, MODIFICATIONS, THE AFFIXING OF ANY ATTACHMENT NOT PROVIDED WITH THE PRODUCT, LOSS OF PARTS, OR OPERATING COMPONENTS AT SPEEDS OR FUNCTIONS OTHER THAN THOSE SPECIFIED BY THEIR MANUFACTURERS.

Use of unauthorized replacement parts or liquids will void this warranty. Koolance Incorporated will not pay for warranty service performed by a non-authorized repair or diagnostic service and will not reimburse the consumer for damage resulting from warranty service performed by a non-authorized repair service. No responsibility is assumed for any special incidental or consequential damages due to a defective Koolance product.

In order to obtain warranty service, contact our RMA department for information. The product must be shipped postage prepaid to an authorized Koolance service location. It is suggested that, for your protection, you return shipments of product by insured mail, insurance prepaid. Damage occurring during shipment is not covered by this warranty. Shipping costs are non-refundable. No other warranty, written or oral, is authorized by Koolance Incorporated.

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