KOOLANCE

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KOOLANCE®

Superior Liquid Cooling Systems

TLH-300
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A newer version of this User Manual may exist.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.

TRADEMARKS

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COPYRIGHT

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 Safety Data Sheet (SDS) on our website: https://koolance.com

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KOOLANCE CONTACT INFORMATION

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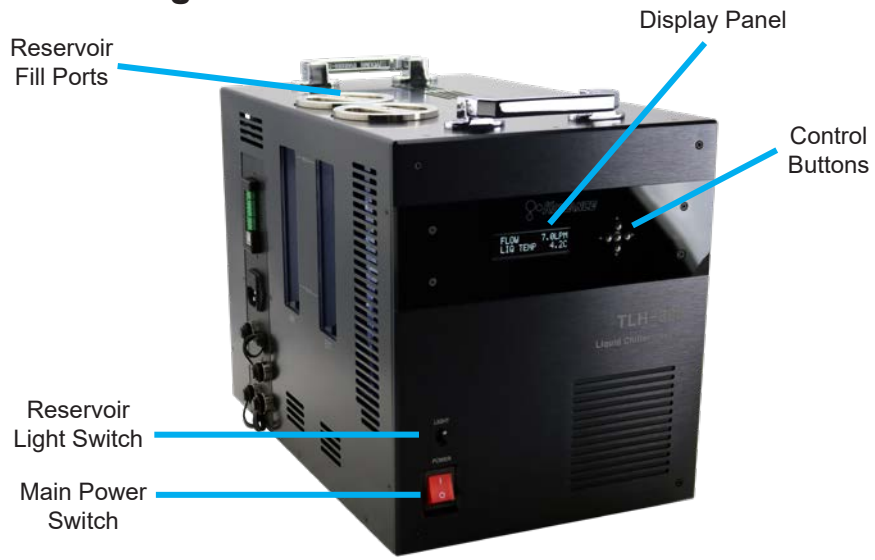
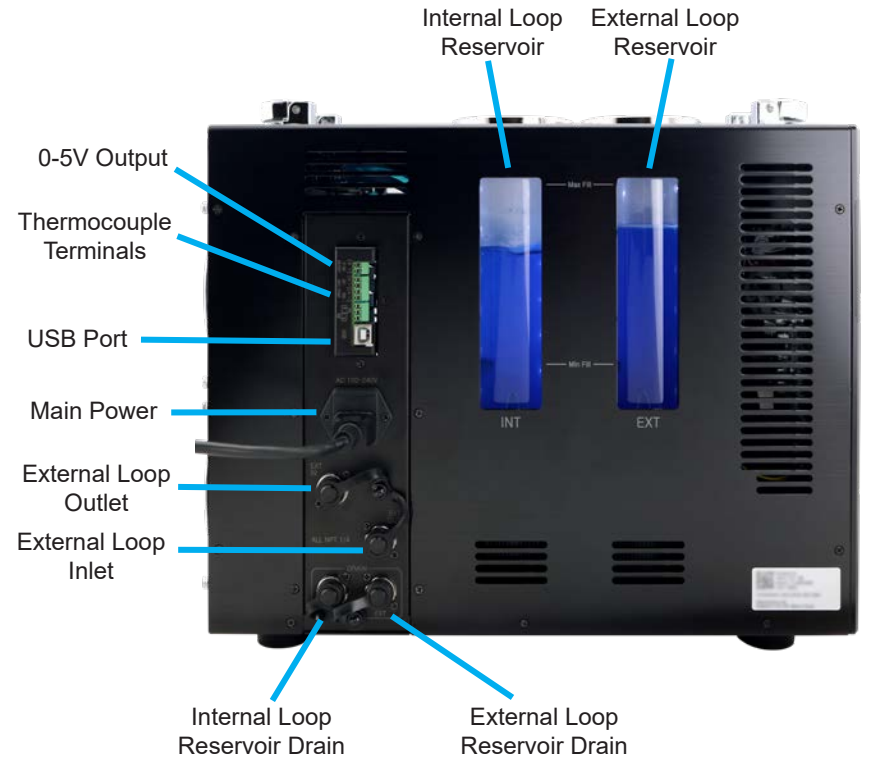
Product Diagram





Two Cooling Loops

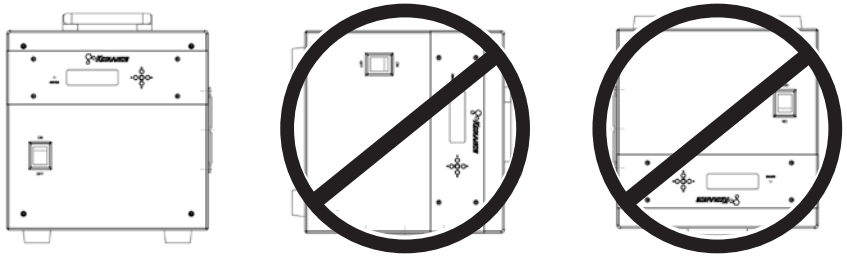
There are two reservoirs in the unit which supply coolant to separate cooling loops. Coolant must be added into both reservoirs to operate the cooling system. **To maintain the product warranty, use only Koolance approved coolant.**

The reservoir marked "EXT" is for the coolant which is externally circulated (via the inlet and outlet ports) to provide cooling and heating for the application.

The reservoir marked "INT" is for the coolant which is only circulated internally to regulate the chiller's thermoelectric components.

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

Tube fittings are purchased separately.

Threading for the tube fittings is tapered 1/4-inch NPT. Plumber's tape (PTFE) is required to seal them properly.

After wrapping with tape, the inlet and outlet fittings should be inserted by hand, then finished with a wrench for the last 1-2 rotations.

Squeeze the tube while pushing it firmly over the fitting. Tubing should completely cover the fitting or barb. This step can be eased by first dipping the end of the tubing in water.

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.

Coolant Filling

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 power cable unplugged whenever filling or draining coolant.

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.

Once all devices (cold plates, fittings, etc.) have been connected with tubing, the system can be filled with coolant.

The fill ports are located above the reservoirs. Remove the large reservoir caps to fill both reservoirs.

Slowly fill each reservoir 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, thermal expansion, viscosity, etc.).

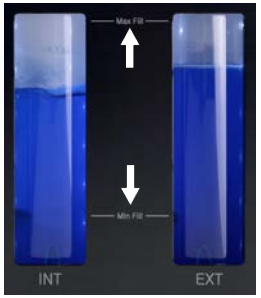
Replace the fill ports on the reservoirs by hand. **Do not overtighten the fill ports.**

Powering-On

Insert the main power cable into the cooling unit and connect the other end to an AC wall outlet.

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.



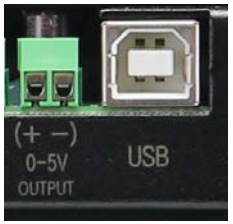
Maximum and minimum fill markings are provided on the side of the unit to help maintain the coolant level.

Draining

There are two drain ports on the side of the unit for emptying or replacing the coolant for each reservoir. Before opening the drain plug, remove the corresponding top fill port cap (internal or external) to allow air into the reservoir.

0-5V Output and USB

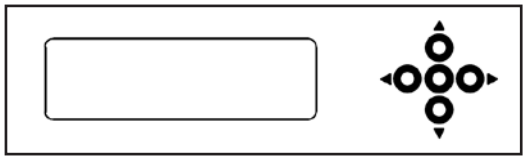
A 0-5V differential voltage output is provided for industrial process monitoring. The output will be 0V when the user's set point and actual liquid temperature are identical, or if the unit is heating. The output will increase to 5V if the difference between the actual liquid temperature and user's set point is at least +0.1ºC.

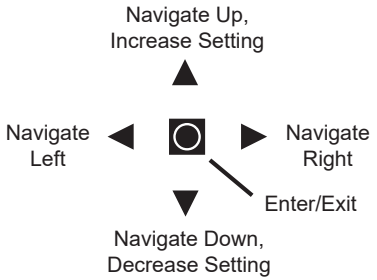


This product supports Koolance's "System Monitor" software application for control and logging via the USB port. Please download the software from Koolance's website for these features.

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.

- TEMP SET: Temperature set-point adjustment
- ALARM SET: Alarm settings
- RELAY SET: Relay Trigger settings
- PUMP SET: Pump speed settings
- DISPLAY SET: LED display settings

When in the top menu, press ◯ to enter one of the above categories. To exit from here, press ◄.

TEMP SET

Under "TEMP SET", you can adjust the set-point temperature the system will try to follow.

LIQ TEMP: Liquid Temperature (Range: -30 to 60°C)

Press ◯ to adjust the target value using ▼ and ▲. Below is an example:

LIQ TEMP= 32C: Maintain coolant coming from the system at 32°C

Press ◯ again to exit configuration of the sensor. Press ◄ to return to the previous menu.

If necessary, this cooling system will automatically apply heat to the liquid when following the user set-point. This can become necessary if the set-point is above ambient temperature and attached heat sources are too weak to adequately warm the coolant.

CAUTION: To avoid permanent damage to the pump and other cooling system components, do not allow the liquid temperature to exceed 60°C (140°F) by set-point or other methods. This is the maximum temperature supported by the cooling system.

ALARM SET

This menu affects when the built-in audio alarm will sound. There are seven 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: Difference from Set Point Temperature (±1 to 49°C)
- CH1 TEMP: Thermocouple #1, if attached (Range: 0 to 119°C)
- CH2 TEMP: Thermocouple #2, if attached (Range: 0 to 119°C)
- FAN: Fan Speed (Range: 100-10,000RPM)
- PUMP: Pump Speed (Range: 100-10,000RPM)
- FLOW: Coolant Flow Rate (Range: 0.1 to 20.0LPM)
- LEVEL: Low Coolant Level in Reservoir (ON, or OFF to disable)

The regular audio alarm is a repeating beep.

RELAY SET

Terminals are provided for a configurable relay, which is rated to a maximum of 1A, 24VDC. Wires can be connected as normally-open (NO), or normally-closed (NC), labeled near the terminals.

There are seven 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: Difference from Set Point Temperature (±1 to 49°C)
- CH1 TEMP: Thermocouple #1, if attached (Range: 0 to 119°C)
- CH2 TEMP: Thermocouple #2, if attached (Range: 0 to 119°C)
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- LEVEL: Low Coolant Level in Reservoir (ON, or OFF to disable)

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 SET 30C : First line display option
LIQ TEMP 30.5C : Second line display option

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

- LIQ SET : Shows current user set-point
- LIQ TEMP : Shows reservoir liquid temperature
- CH1 TEMP : Shows first external sensor temperature (if connected)
- CH2 TEMP : Shows second external sensor temperature (if connected)
- FAN : Shows radiator fan RPM
- 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 SET : Shows current user set-point
- *LIQ TEMP : Shows reservoir liquid temperature
- CH1 TEMP : Shows first external sensor temperature (if connected)
- CH2 TEMP : Shows second external sensor temperature (if connected)
- FAN : Shows radiator fan RPM
- *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 adjusting and viewing cooling values and logging data to a computer file. To download the latest version of the program, visit https://koolance.com/software. Consult the readme.txt within the application for further details.

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.

2. The temperature alarm sounds and I'm not sure why...

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

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

    Check that all fittings are properly installed and tightened. This product uses tapered threaded fittings. Be sure to use plumber's tape on the tapered fittings (see "Tube Fittings").

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

    Reset all system settings by holding ▼ + ▲ for 3 seconds. After a reset, all configuration settings (temperature, alarm, fans, 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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