



KOOLANCE[®]
Superior Liquid Cooling Systems



ALX Series Products 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A newer version of this User Manual may exist.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.

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Product Diagram

ALX systems are composed of two modules physically connected together: the front “RPM” and rear “HXM”. Diagrams below are general representations, as individual module specifications and sizes can vary.

RPM Reservoir and Pump Module

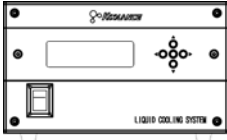


HXM Heat Exchanger Module



Positioning the System

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



Combining Modules

If you have purchased both RPM and HXM modules, they are combined together using hardware included with those products.



Fittings on Rear of RPM

Install the shorter fittings included with the RPM module onto its rear inlet and outlet. These should be finger-tightened. (This is a parallel thread, do not use plumber's tape.)



Fittings on Front of HXM

Install the longer fittings included with the HXM module onto its *front* inlet and outlet. These should be finger-tightened. (This is a parallel thread, do not use plumber's tape.)

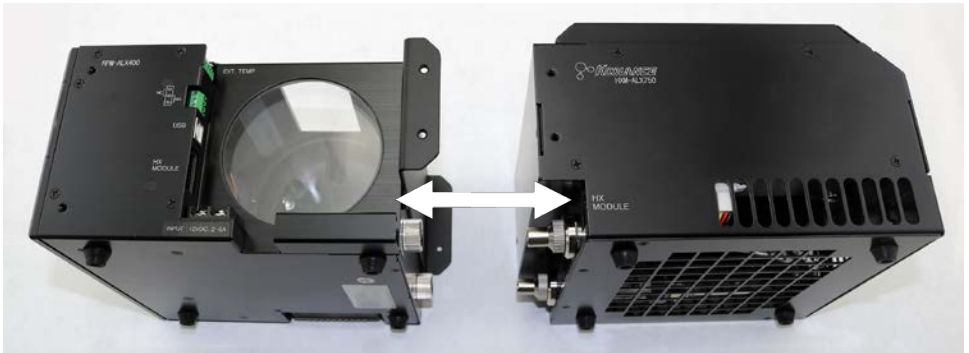


Fasten the included mounting bracket to the rear of the RPM module using four bracket screws.

The bracket must match the orientation shown to the right.



Push the RPM and HXM modules together. Their fittings will mate and seal.



Finish combining modules by securing the bracket with its remaining four screws.

Two screws are installed into corresponding holes on each side of the HXM module.

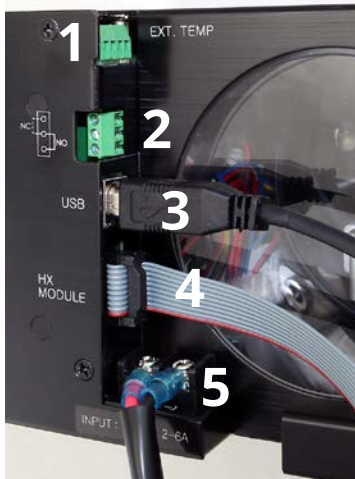


Wiring

The ALX cooling system requires a 12VDC power supply (not included). Amperage for RPM and HXM modules are printed separately on their labels. These can be added together for the total power requirement and range between 2-8A.



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.



There are several available wire terminals near the reservoir window of the RPM module:

1. Two K-Type Thermocouples (not included)
2. Relay Output NO/NC (normally open or closed)
3. USB for Data Logging (Type B Plug)
4. HXM Module, Fan & Flow Meter ribbon cable



5. Connect power leads to the red positive “+” and black negative “-” power terminals, as labeled on the side of the unit.

Connect the included ribbon cable between RPM and HXM “HX Module” plugs. For the data logging feature, attach the included USB cable.

There is a cable guide beneath the reservoir to hide some of the wiring.



For a cleaner appearance, the power and USB cables can be routed beneath the HXM module towards the back.

Zip ties are included to secure them to the radiator grill (use needle-nose pliers).

Tube Fittings



Tube fittings are purchased separately.

Unlike the fittings used to combine RPM and HXM modules, 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.



Cut tubing into two segments. You will need to connect each to the rear fittings.

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.



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 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. Remove the large slot-headed screw with a screwdriver or large coin.



Coolant will be filled to about 1/2-inch (13mm) from the top of the reservoir. **Never completely fill or “top-off” the reservoir.** An air gap must always remain to accommodate thermal expansion of the liquid.



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.).

 Replace the fill port on the reservoir. **Do not overtighten the fill port.**

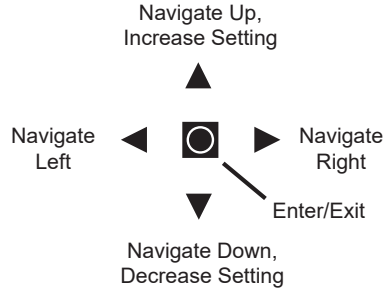






Power on the cooling unit, and increase the pump speed to move coolant if needed. When most of the air has been pushed out of the tubing, the liquid noise will decrease. This process can take several minutes, depending on the filling technique and components attached to the cooling system.

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.

-  TEMP/FAN 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 .

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 and set point options.



TEMP/FAN SET

Under “TEMP/FAN SET”, you can select the active set-point temperature the system will attempt to follow, or else operate the fans at a fixed power level. There are four options to select from. Press ▼ and ▲ to scroll among them:

↑ LIQ TEMP: Liquid Temperature (Range: -30 to 90°C)
CH1 TEMP: Thermocouple #1, if attached (Range: -20 to 120°C)
CH2 TEMP: Thermocouple #2, if attached (Range: -20 to 120°C)
↓ FAN PWR: Static fan power setting (Range: 0 to 100%)


The sensor currently displayed in this menu is what the system will follow. Only one can be active. Press  to adjust the target value using ▼ and ▲. Below are some examples:

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


CH1 TEMP= 50C Maintain the first thermocouple at 50°C, if attached

CH2 TEMP= -5C Maintain the second thermocouple at -5°C, if attached.
(This is not a sub-ambient system. Without external assistance, this temperature may not be reached.)

FAN PWR= 45% Keep fans at 45% power, regardless of temperature.

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

ALARM SET

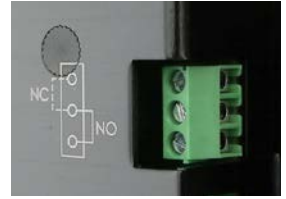
This menu affects when the built-in audio alarm will sound. There are five options which are simultaneously active. Upon entering the alarm menu, the last edited value will flash. Press ▼ or ▲ to adjust this value. Press  to accept and return to the previous menu. To disable an alarm, increase or decrease 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 accept and 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”).

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:

FAN SET 50% : 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:

↑ FAN SET : (Field varies) Shows current active set-point or fan power
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:

↑ *FAN SET : (Field varies) Shows current active set-point or fan power
*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 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.

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 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.

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

Check that all fittings are properly installed and tightened. This product uses both parallel and tapered threaded fittings. Be sure only to use plumber’s tape on the tapered fittings (see “Combining Modules” and “Tube Fittings”).

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 (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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Printed in Korea