KOOLANCE®

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KOOLANCE®

Superior Liquid Cooling Systems

LIQ TEMP 22.2C
FLOW 0.0LPM

POWER

CTR-KSM100

CTR-KSM100
User's Manual

English v1.0

ISO
9001

Printed in Korea

A newer version of this User Manual may exist.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:** To avoid the risk of electrical shock, do not touch exposed power terminals on this product or its power supply.

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

⚠️ **CAUTION:** Do not power 12V pump using the 24V maximum jumper setting. This can permanently damage the pump and/or the product and is not covered under the warranty.

KOOLANCE CONTACT INFORMATION

Koolance Inc. (USA)
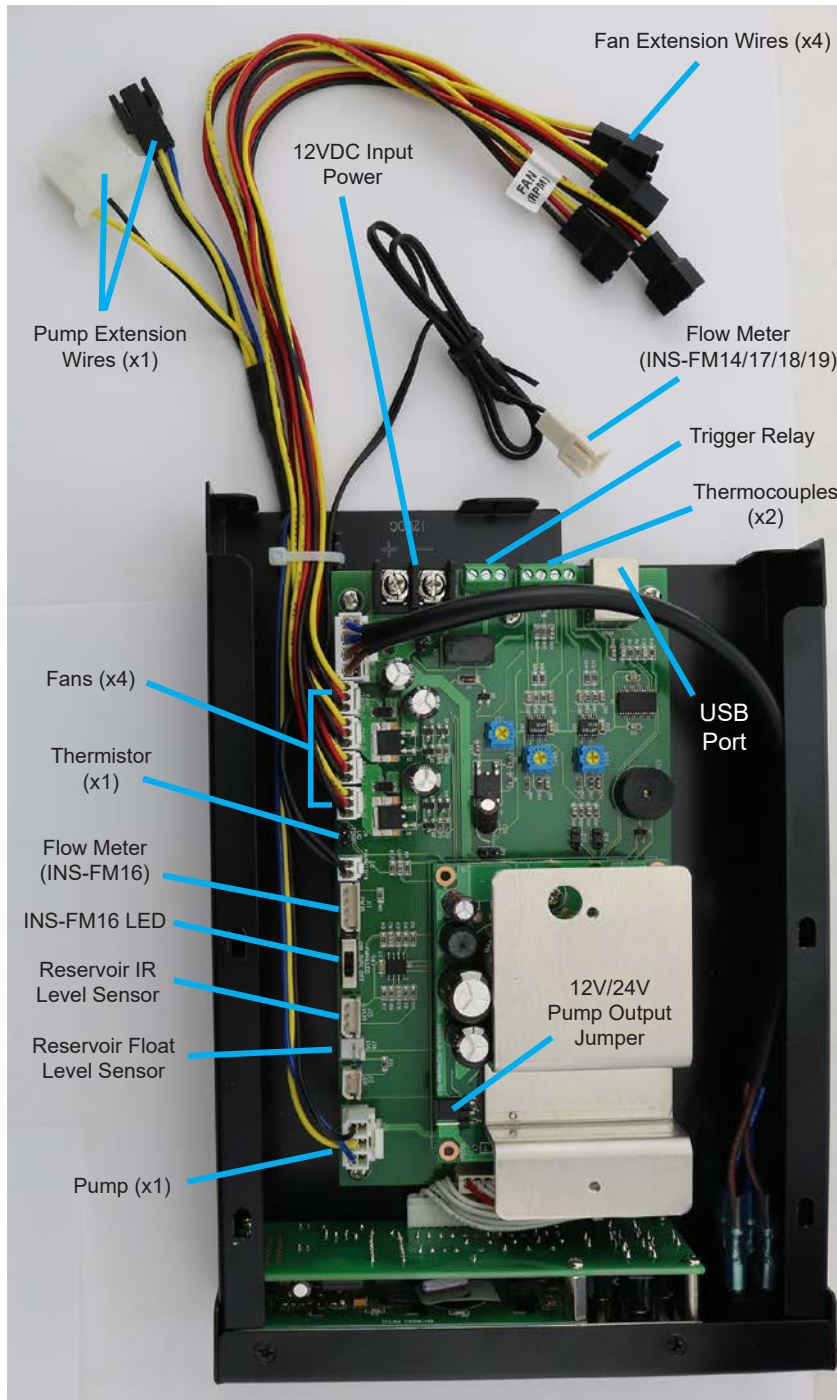Address: 2840 W. Valley Hwy. N., Ste. 101, Auburn, WA 98001, USA
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Connecting Devices

CTR-KSM100 can power and/or monitor multiple cooling system devices. These are not included with the CTR-KSM100 controller:

- **Fans**: 4 extension wires are provided for 3-pin fans. Each connector supports 12VDC up to 2A. Multiple fans can be connected to one plug, provided they are cumulatively below the amperage limit. It is not recommended to splice multiple fans to the "RPM" plug, which reports fan speed to CTR-KSM100.
- **Pump**: Three different connectors (two on extensions, one on the main board) are provided for powering one 12V (max 36W) or 24V (max 50W) DC pump. Powering multiple pumps is not supported.
- **Temperature Sensors**: One Koolance 10K-ohm thermistor, and up to two K-type thermocouples are supported.
- **Flow Meter**: One Koolance flow meter can be connected to the unit. Models INS-FM14, INS-FM16, INS-FM17/N, INS-FM18, INS-FM19, and SEN-FM18T10 are supported.
- **Coolant Level Sensor**: One Koolance reservoir level sensor can be connected to the unit. Models SEN-LVL70 and SEN-LVLIR01 are supported. (Models SEN2-LVL70 and SEN2-LVL100 can be connected, but only one level point is monitored.)

CTR-KSM100 must be opened temporarily to connect power terminals and certain devices. Remove the screws circled on the right. Then slide back the cover, and lift up to remove it. Device cables should exit together at the rear grommeted opening.
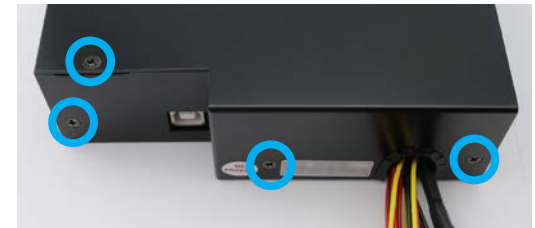
Power Terminals

CTR-KSM100 requires 12VDC input power from a power supply with enough amperage to power all connected devices. For applications up to 8-Amps, Koolance model PSU-ALX12V power supply can be used.

Attach the included power terminals from the DC power supply to the -/+ labeled terminals. DO NOT REVERSE THE POLARITY, or damage to the CTR-KSM100 could result.
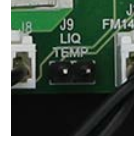

Negative (-)   Positive (+)

External Sensors

Up to two K-type thermocouples and one Koolance 10K Ohm thermistor (sensors not included) can be used for temperature monitoring, alarm, and relay options. For thermocouples, follow the polarity marked on the board.
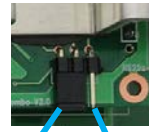
Thermocouples (x2)　　Thermistor (x1)

12V/24V Pump Jumper

Select between a maximum pump output voltage of 12VDC or 24VDC by moving the indicated jumper. ONLY USE A VOLTAGE SUPPORTED BY THE CONNECTED PUMP, or damage can occur.

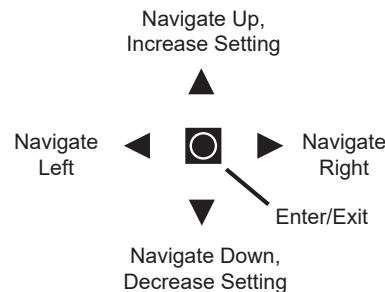12V Max　　24V Max

Software Control

This unit supports Koolance's "System Monitor" application for device control, viewing, 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 details on usage. Software features requires the USB port be connected to a computer running Windows 10.

Display Panel

To power on the unit, flip the front power switch.

POWER

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.
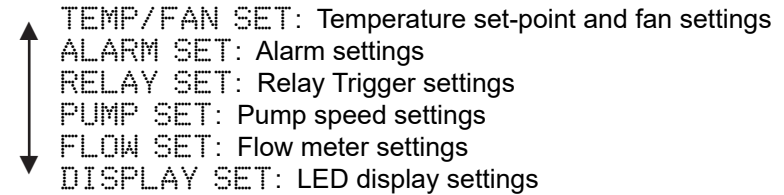
Navigate Up, Increase Setting ▲

Navigate Left ◄　◉　► Navigate Right

Enter/Exit

▼ Navigate Down, Decrease Setting

- 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.
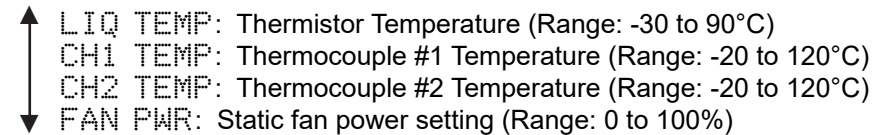- To reset **ALL** settings to default, hold ▼ + ▲ for 3 seconds.

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 and fan settings
ALARM SET: Alarm settings
RELAY SET: Relay Trigger settings
PUMP SET: Pump speed settings
FLOW SET: Flow meter settings
DISPLAY SET: LED display settings
```

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

TEMP/FAN SET

Under "TEMP/FAN SET", you can select an active set-point temperature the controller will attempt to follow by way of automatically adjusting fan speed. It is also possible to keep the fans at a fixed power level. There are four options to select from. Press ▼ and ▲ to scroll among them:

```
LIQ TEMP: Thermistor Temperature (Range: -30 to 90°C)
CH1 TEMP: Thermocouple #1 Temperature (Range: -20 to 120°C)
CH2 TEMP: Thermocouple #2 Temperature (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 unit will follow. Only one can be active. Press ◉ to adjust the target value using ▼ and ▲. Below are some examples:

```
LIQ TEMP= 32C   Maintain thermistor sensor at 32°C

CH1 TEMP= 50C   Maintain the first thermocouple at 50°C

CH2 TEMP= -5C   Maintain the second thermocouple at -5°C.

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 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`: Thermistor Temperature (Range: 0 to 99°C)
`CH1 TEMP`: Thermocouple #1 Temperature (Range: 0 to 99°C)
`CH2 TEMP`: Thermocouple #2 Temperature (Range: 0 to 99°C)
`FAN`: Fan Tachometer (Range: 100 to 10,000RPM)
`PUMP`: Pump Tachometer (Range: 100 to 10,000LPM)
`FLOW`: Coolant Flow Rate (Range: 0.1 to 10.0LPM)
▼
`LEVEL`: Low Coolant Level in Reservoir (ON, or OFF to disable)

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. Either option will use one wire on common (COM).

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`: Thermistor Temperature (Range: 0 to 99°C)
`CH1 TEMP`: Thermocouple #1 Temperature (Range: 0 to 99°C)
`CH2 TEMP`: Thermocouple #2 Temperature (Range: 0 to 99°C)
`FAN`: Fan Tachometer (Range: 100 to 10,000RPM)
`PUMP`: Pump Tachometer (Range: 100 to 10,000LPM)
`FLOW`: Coolant Flow Rate (Range: 0.1 to 10.0LPM)
▼
`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.

FLOW SET

Configures the unit for an attached Koolance flow meter model:

`FM-(14/16/17/18/19)` : flow meter model number
`ID: 6/10/13mm`: Internal tubing diameter attached to the flow meter

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 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 thermistor temperature sensor
`CH1 TEMP` : Shows first thermocouple temperature sensor
`CH2 TEMP` : Shows second thermocouple temperature sensor
`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.

Troubleshooting

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

1. The fan says "0RPM"

   This product can only read the motor speed for one fan connected to the cable marked "FAN (RPM)". The tachometer must be an open collector type. Do not connect more than one tachometer to this plug, or the value can be incorrect.

2. The pump says "0RPM"

   This product can only read the motor speed for one pump using an open collector tachometer. Do not connect more than one pump.

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

   The offending device and value will flash in the front display whenever an alarm sounds. Check that your alarm is configured as desired (see "ALARM SET"). If the unit is otherwise working properly, try resetting all controller settings by holding ▼ + ▲ for a few seconds until 3 beeps are heard.

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

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

5. LIQ TEMP says "OPEN".

   A Koolance 10K Ohm thermocouple is not connected, defective, or is not the expected type of thermocouple. Try reconnecting or replacing the sensor.

6. CH1 or CH2 says "----".

   A K-type thermocouple is not connected or might be defective. Try reconnecting the wires to the terminals, or replace the sensor.

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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