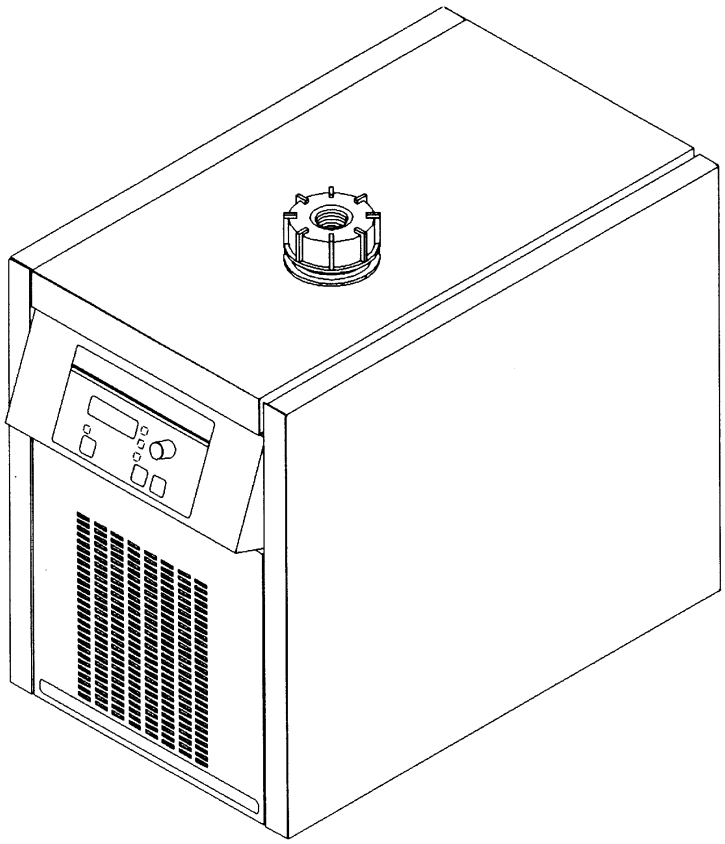
Operators Manual

Refrigerated & Heating Mini - Chiller

Model 5005



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Section 1 - General Information

1.1 Warranty

Thank you for your purchase. We are confident it will serve you for a long time. Our warranty to you is as follows:

The manufacturer agrees to correct for the original user of this product, either by repair, or at the manufacturer's election, by replacement, any defect which develops after delivery of this product within the period as stated on the warranty card. In the event of replacement, the replacement unit will be warranted for ninety (90) days or warranted for the remainder of the original unit's parts or labor warranty period, whichever is longer.

If this product should require service, contact the manufacturer/suppliers' office for instructions. When return of the product is necessary, a return authorization number will be assigned and the product should be shipped, transportation charges pre-paid, to the indicated service center. To insure prompt handling, the return authorization number should be placed on the outside of the package and a detailed explanation of the defect enclosed with the item.

This warranty shall not apply if the defect or malfunction was caused by accident, neglect, unreasonable use, improper service, or other causes not arising out of defects in material or workmanship. There are no warranties, expressed or implied, including, but not limited to, those of merchantability or fitness for a particular purpose which extends beyond the description and period set forth herein. The manufacturer's sole obligation under this warranty is limited to the repair or replacement of a defective product and the manufacturer shall not, in any event, be liable for any incidental or consequential damages of any kind resulting from use or possession of this product.

Some states do not allow: (A) limitations on how long an implied warranty lasts or (B) the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

1.2 Unpacking

Your Mini-Chiller is shipped in a special carton. Retain the carton and all packing materials until the unit is completely assembled and working properly. Set up and run the unit immediately to confirm proper operation. Beyond one week, your unit may be warranty repaired, but not replaced. If the unit is damaged or does not operate properly, contact the transportation company, file a damage claim, then contact the company where your unit was purchased.

1.3. Package Contents

- Recirculating Mini-Chiller
- Operators Manual
- Warranty Card
- $^1/_2$ in. FPT Inlet/Outlet Adapters

1.4 Description

The Mini-Chiller provides cooling down to -5°C and heating up to 50°C for small scale applications. It economically replaces tap water cooling systems. All models have a microprocessor controller, digital set/read and readout in °C or °F. The refrigeration system has modulation capability to provide cooling as needed and thus greater temperature stability and longer compressor life. A magnetic drive centrifugal pump provides flow of coolant to external apparatus. Wettable parts are brass, copper, nylon, polypropylene, PVC and Buna N.

1.5 Specifications

Temperature Range		-5° to 50°C
Temperature Setability		±0.1°C
Temperature Stability		±0.5°C
Readout		LED - Selectable in °C or °F
Cooling Capacity	@20°C 10°C 0°C	450 Watts 350 Watts 150 Watts
Reservoir capacity		1.75 liters
Flow Rate	3 gpm / 11.4 lpm	
Maximum Pressure	@ 0 Flow	5 psi
Inlet / Outlet Size		$^1/_2$ in. internal NPT
Heater		350 Watts
Over Temperature Cutoff		Yes
Low Liquid Alarm		Yes

Section 2 - Set Up

Before proceeding, be sure all power is off.

2.1. Location

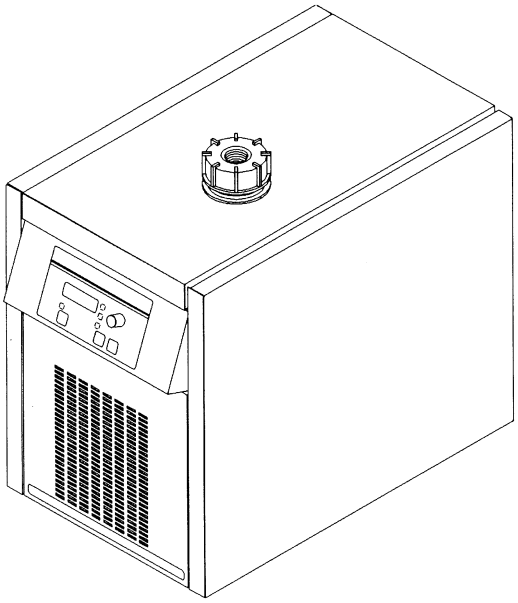
Locate the chiller on a strong, level surface. Insure easy access to the top cover and position the chiller for unobstructed air flow through the front and rear screens. Avoid voltage drops by using properly grounded power outlets wired with 14 gauge or larger diameter wire. If possible, be close to the power distribution panel. Using an extension cord may cause low line voltage problems.

2.2 Reservoir Fluids

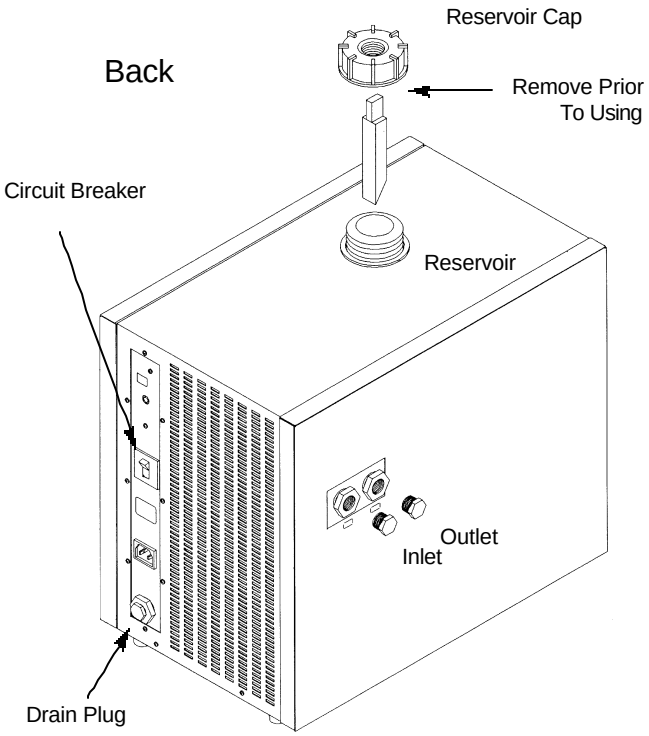
For most applications above +15°C, distilled water is satisfactory. For operation below +15°C, the chiller should be protected with an antifreeze solution. Ethylene glycol (laboratory grade) and water in a 50/50 mixture is satisfactory from +15° to -15°C. Wettable parts are brass, copper, nylon, polypropylene, PVC and Buna N, check for fluid compatibility. Only use fluids that satisfy safety, health and equipment compatibility requirements. Never use caustic, corrosive or flammable fluids.

WARNING
As stated above, operation below +15°C, requires antifreeze in the circulating fluid.
Do not use a flammable fluid as a fire hazard may result.

Front



Back



2.3 Pump, Hoses and Couplings

To maintain a safe workplace and to avoid leaks, special care should be taken when choosing hoses and connectors for the chiller.

1. Pressure ratings - Tubing should be able to withstand the largest pressure that it will encounter. Choose connecting tubing accordingly.
2. Flexible tubing. Avoid tubing that will expand and take up fluid volume when operating at the desired pressure.
3. Hose diameter - The fittings on the chiller Outlet and Inlet lines are internally threaded, $^1/_2$ in. female N.P.T. The two adapters supplied are elbow fittings for $^1/_2$ in. to $^1/_2$ in. and $^1/_2$ in. to $^5/_8$ in. I.D. tubing. Other fittings can be used if a smaller hose diameter is desired. Remember that the operating pressure in the circulating system increases when using a smaller diameter hose.
4. Couplings & Clamps - The use of screw-tightened hose clamps is necessary on all joints to insure good, tight connections. Quick connectors are not recommended because they have the potential for restricting flow rate.

2.4 Setting Up a Closed System or Cooling Coil to the Chiller

The Mini-Chiller has a pressure pump designed only for circulating fluid in a closed system. It is not applicable for open systems where pressure is required to circulate fluid to an open tank and suction is needed to return fluid to the chiller.

1. Connect your closed cooling system to the chiller with either hoses or pipes. The direction of the flow through the system can be controlled by the way the hoses or pipes are connected to the chiller. The “Inlet” draws liquid into the chiller; the “Outlet” pumps liquid out.
2. Turn the reservoir cap on the top of the chiller counterclockwise and lift it up to remove it. Use a funnel to fill the reservoir with fluid. When full, remove the funnel, but do not replace the cap at this time. Check all hoses and fittings for tightness and be sure there are no bends or crimps in the connecting hoses.
3. Plug the chiller into the proper AC outlet per section 3.1. Press the POWER button ON. The chiller begins pumping liquid through your system. Check again for leaks. Set the temperature as per section 3.2., Controller Temperature Setting and Adjustment.
4. With the pump running, the fluid level in the reservoir decreases as the closed system begins to fill. Add a little fluid at a time until the level in the reservoir stops going down. This means that your system is filled and the air has been purged from it. Replace the reservoir cap and turn it clockwise to lock it. Recheck the cap for tightness.

Section 3 - Operation

3.1 Power

After connecting the chiller plumbing, plug the unit into a properly wired, grounded outlet with the same voltage and frequency indicated on the identification label (back of the unit). With the power OFF and chiller plugged in, the display indicates standby mode (....). If there is no response, check the circuit breaker (back of the unit) is in the ON position. Extension cords are not recommended, but if necessary, use one that is properly grounded and handles the total wattage of the unit. The extension cord should not cause a voltage drop to the chiller.

3.2 Controller Temperature Setting and Adjustments

Front Controller Panel Diagram

After setting up and filling the chiller, set the desired temperature:

1. Press the POWER button ON. The pump starts to operate. The LED display indicates power-up self test mode (8888). Upon self test completion, the actual fluid temperature is displayed. The operating temperature can now be set.
2. Press the SET/ENTER button. The degree light flashes indicating the temperature can be changed.
3. Turn the INCREASE/DECREASE knob to the desired setting. This setting is accepted after pressing the SET/ENTER button or is automatically accepted after a few seconds.
4. When the degree light stops flashing, actual temperature is again displayed. Check the set temperature at any time by pressing and releasing the SET/ENTER button.
5. Allow sufficient time for the chiller to stabilize at the desired temperature.

3.3 Selection of Celsius or Fahrenheit Readout

To change the readout to °C or °F:

1. Press and hold the SET/ENTER button until the display reads “UNITS”.
2. Press SET/ENTER again then turn the INCREASE/DECREASE knob and select °C or °F.
3. Press SET/ENTER or the setting will be accepted after a few seconds.

3.4 Setting The Controller High Limit

In case of malfunction, this feature limits the upper operating temperature to the preselected limit you desire. This electronic over temperature feature shuts off the chiller in case of runaway temperature. To set the high limit:

1. Press and hold the SET/ENTER button until the display reads “UNITS”.
2. Turn the INCREASE/DECREASE knob until the display reads “HI-L”.
3. Press the SET/ENTER button and enter the desired value using the INCREASE/DECREASE knob.
4. Press SET/ENTER and the display again reads HI-L. The INCREASE/DECREASE knob can be turned to access another menu option or you can wait until the entered value has been accepted. When the value is accepted, the degree light stops flashing and the actual temperature is displayed.

Warning! When refrigeration is switched off, it should not be restarted for approximately 10 minutes in order to allow the internal pressures to equalize. System damage could result if you do NOT observe this waiting period.

3.5 Over-Temperature Protection

This over-temperature protective device is independent of the high limit setting and protects the Mini-Chiller. The protection automatically activates if the reservoir/system temperature exceeds approximately 60°C. The temperature limit is pre-set at the factory and cannot be changed. The chiller completely shuts down and the display indicates error message E-OT.

3.6 Controller Display Messages

	Display	Message
Normal Screens:		
	....	Standby mode. Unit plugged in. Power switch OFF, rear circuit breaker on.
	8888	Power up self test displayed when power is button is pressed ON.
Menu Screen:		
	Unit	Change to °F or °C
	Unit/Hi-L	Limits operating temperature
Error Screens:		
	E-tF	Triac (alternistor) failure
	DEF	Displayed when chiller is reset to factory default settings
	E-OT	Over-temperature protection activated.

3.7 Draining the Unit

Press the POWER OFF button and unplug the chiller. Remove both of the hoses from the back of the chiller.

3.8 Controller Default Settings

Should the need arise, the following steps return all settings to the factory default values.

1. While unit is powered up, use the circuit breaker (at rear of unit) to turn unit off. (see diagram in section 2)
2. Hold the SET/MENU button, while turning the unit back on at the circuit breaker.
3. The controller displays “DEF” and goes to the standby mode.
4. The set temperature and other settings will have to be reset.