KODIAK® RECIRCULATING CHILLER

TECHNICAL MANUAL

RC045J03BG0C011

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Revision History

REV	ECN / DATE	REASON FOR CHANGE	ORIGINATOR
A	10/23/03	Initial release	
B	ECN# 12929 / 01/20/05	Update manual to include spare parts and repair procedures.	HB
C	ECN# 14365 / 10/13/06	Add information in regards to motor lubrication.	RJB
D	ECN# 15293 / 10/31/07	Update service document to correct p/n reference for pump coupling.	HB
E	ECN# 16783 / 11/06/09	Customer requested revision history & to remove GE p/n on footer.	MG
F	ECN# 17188 / 06/21/10	Update Parts List	MG
G	ECN# 17303 / 10/11/10	Updated voltages on pages 9 and 10, added color safety symbols, corrected controller feature information, and updated Declaration of Conformity.	GDD

Introduction

Receiving your New Kodiak® Chiller

Inspect your new chiller immediately upon receiving it. If the unit shows shipping damage, contact the transportation company and file freight damage claim. Retain all cartons and packing material until the unit is operated and found to be in good condition. Your chiller has been fully tested at the Lytron factory with clean water. Although the system has been drained, some residual fluid may remain. This will not hinder the performance of the chiller.

About the Warranty

All units returned for warranty claims must have an RMA (Return Material Authorization) number on the outside of the container. Call Lytron Customer Service at +1- 933-7300 for an RMA number. Refer to the end of manual for the chiller warranty. Units should be drained of all fluids and packaged in its original packaging.

Customer Service Support

Lytron is committed to servicing the customer, both during and after the sale. If you have any questions concerning the operation of your unit, contact our Application Engineering Department at +1-781-933-7300. To facilitate your call, please have the **model number** and **serial number** of the unit (located on the rear of the chiller) for the Lytron Applications Engineer.

Service Hotline

Lytron has a 24 hour per day, 7 day per week service hotline to help you with questions on the startup and operation of your Kodiak recirculating chiller. **(We recommend you review the troubleshooting guide on page 34 before calling our service hotline.)** Lytron service can be reached by dialing +1-781 933-7300. To facilitate your call please have the **model number** and **serial number** (located on rear of the chiller) of the unit for the Lytron Service Technician.

® Kodiak is a registered trademark of Lytron, Inc.

Safety Precautions

This system is designed to provide fluid cooling only as specified in this manual. If you use this system in a manner other than as specified, the safety protection of the system may be impaired.

Warnings are posted throughout the manual. Read and follow these important instructions. Failure to observe these instructions or use the chiller other than as specified may impair safety protection, void the warranty, and can result in permanent damage to the unit, significant property damage, personal injury, and/or death.

Make sure you read, understand, and follow all instructions and safety precautions listed in this manual before operating your unit. If you have any questions concerning the operation of your unit or the information in this manual, please contact our Applications Engineering Department at +1-781- 933-7300.

- **If the set point is 10°C (50°F) or below, a freezing point depressant, such as ethylene glycol, is required. This unit is equipped with a low flow switch. This feature will shut the chiller down during a low flow situation to prevent freezing.**
- **DO NOT USE AUTOMOTIVE ANTIFREEZE IN THE CHILLER. The rust inhibitors in the automotive type will cause premature failure of the pump seals. Use of automotive anti-freeze in a Lytron chiller will void the warranty.**
- **Never place the unit in a location where excessive heat, moisture, or corrosive materials are present.**
- **The unit must be plugged into a properly grounded power source.**
- **Do not connect the SUPPLY or RETURN fitting to your building water supply or any pressurized source.**
- **DO NOT USE OR MAINTAIN THE CHILLER OUTDOORS. These units were not designed to withstand outdoor weather conditions.**
- **Performance of installation, operation, or maintenance procedures other than those described in this manual may result in a hazardous situation and may void the Lytron warranty.**
- **Transport the unit with care. Sudden jolts or drops can damage the unit.**
- **Drain the chiller of all water when transporting, shipping, or leaving unused for long periods of time. This will prevent freezing and algae build up while idle.**
- **Observe all warning labels. Never remove warning labels.**
- **Do not operate damaged or leaking equipment.**
- **Do not operate the unit without fluid in the reservoir.**
- **Always turn the unit "OFF" and disconnect the power cord from the power source before performing any service, maintenance procedures or before moving the unit.**
- **Do not operate equipment with damaged power cords.**
- **A qualified technician should perform Service and repairs.**

Labels and Silkscreen Marking

- This label tells maintenance personnel and users to consult the technical manual for more information.

- Disconnect power warning.

RETURN

- This silk-screen marking identifies the connection where heated fluid is returned from the user's machine.

SUPPLY

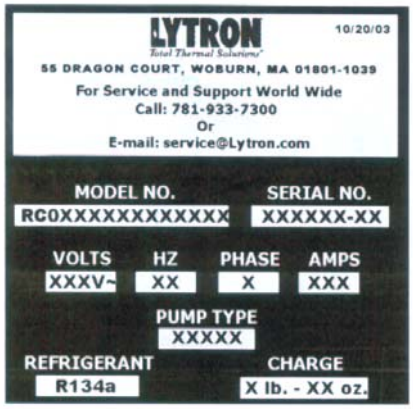
- This silk-screen marking identifies the connection where chilled fluid is supplied to the user's machine.

- Positive earth (ground) terminal.

- Agency compliance and approval product conforms to standards

-Agency compliance and approvals.

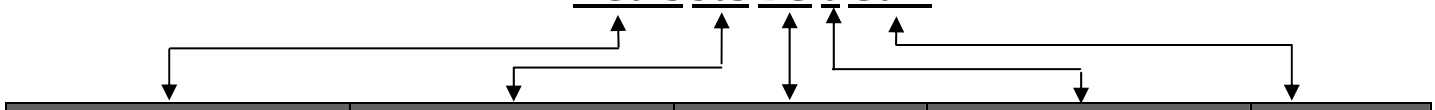
- The crossed out wheeled bin label requires that the product be disposed of or recycled with the requirements of local law.



- The product ID Label identifies the model#, serial#, electrical information, pump, refrigerant, and charge.

Part Number Description

RC045 J03 BG 0 C011



Basic Model No.	Electrical Configurations	Pump Options	Controller Configuration	Custom Modification
RC045 = 5,950 Watts **NOTE:** **Cooling capacity and pump flows are rated at 60Hz. For 50Hz power capacity is reduced by 17%.**	**J03** = 208V~/1 Ph/50/60Hz	**BG** = 4.3 gpm Positive Displacement Pump	**0** = Temperature control, calibration offset, auto restart, high temperature indication, and chiller fault shut down (toggle “on” and “off”).	

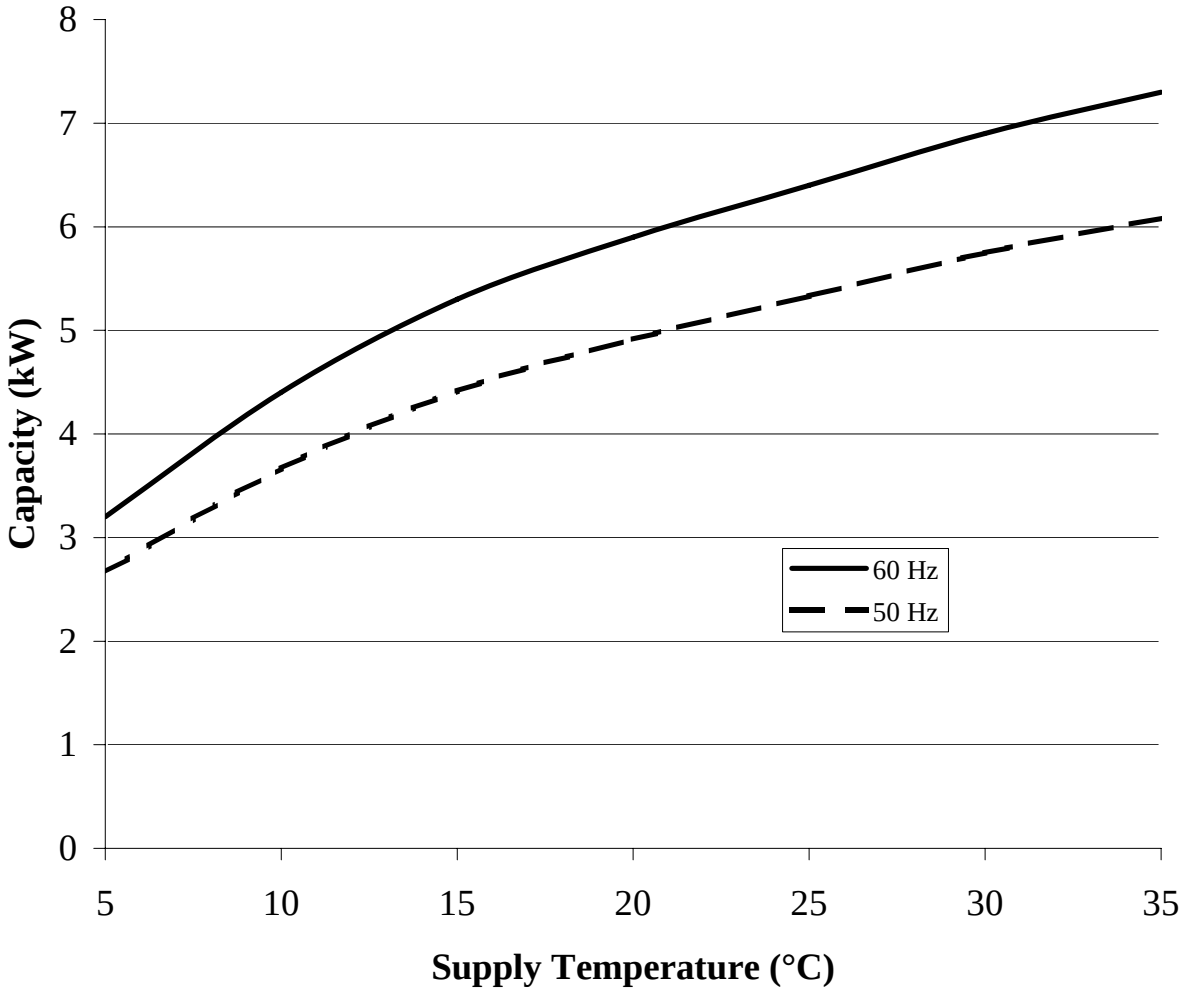
Specifications[1]

	RC045	
Thermal Capacity [2]	60 Hz	50 Hz
Watts	5,950	4,950
BTU/hr	20,230	16,830
208V~ 50/60 Hz 1 ph	J03	
Full Load Amps[4]	19.6 A	
Compressor Size	1 ½ Hp	
Refrigerant Type	R134A	
Temperature Stability	+/- 0.2°F (0.1°C)	
Operating Environment	50°F to 95°F (10°C to 35°C)	
Coolant Temperature Range	42°F to 95°F (5°C to 35°C)	
Reservoir Capacity	6 gal (22.6 l)	
Dimensions		
Width	21.4" (543)	
Depth	27.8" (705)	
Height	31.0" (787)	
Connection	½" FNPT	
Weight (dry)	250 lbs (110 kg)	
Weight (wet)	295 lbs (135 kg)	
Process Coolant Delivery Pressure	Factory preset to 85 psig.	

[1]Specifications are subject to change.

[2]Capacity is for 20°C delivery water at 20°C ambient air temperature.

Performance Curve



General Information

Chiller System Description

Your chiller consists of a refrigeration system, a coolant loop, associated controls, and plumbing. The pump draws coolant from the internal reservoir and pumps it out to cool your equipment, and then the coolant flows back to the chiller. It flows through the evaporator, where the heat is removed, and then flows back into to the reservoir.

Coolant Loop

Kodiak chillers are designed to operate with continuous coolant flow through a closed loop. This loop contains the system pump, temperature sensor, reservoir, internal and external plumbing lines and fittings, and the external heat load. The external plumbing and the heat loads are provided by the end user and are generally unique to the user's process or location.

Refrigeration System and Hot Gas Bypass

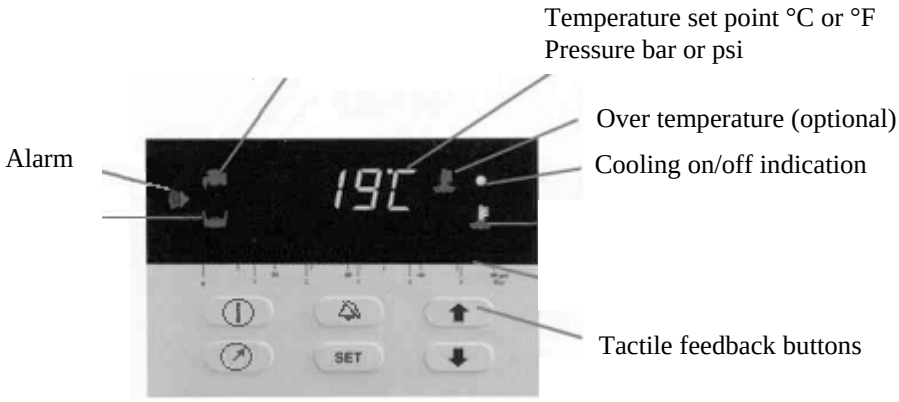
The chiller uses a standard refrigeration system to keep the coolant at the process temperature set point. The compressor compresses the refrigerant vapor. The vapor then passes through the condenser where it is cooled and turns to a liquid. The refrigerant in then passes through the evaporator. The coolant also flows into the evaporator, through passages separated by thin layers of metal from the refrigerant. The refrigerant evaporates, drawing heat from the coolant. The refrigerant vapor returns to the compressor and continues the cycle.

Many refrigeration systems, such as those used in household refrigerators, control the temperature by turning the compressor on and off. This is a simple, inexpensive method of controlling the cooling, but its temperature control is not precise and the frequent on-off cycles causes wear on the compressor motor.

Lytron's recirculating chillers use a better method for controlling the cooling rate: a hot-gas bypass system. This employs a liquid line solenoid valve and a hot-gas bypass valve to meter the refrigerant flow through the evaporator when cooling is needed. When the coolant reaches its set point temperature, the liquid line solenoid valve closes, causing the hot-gas bypass valve to open. The hot-gas valve lets hot gas from the compressor discharge into the evaporator, adjusting the temperature in the evaporator to maintain the correct coolant temperature. When refrigeration is needed the liquid line solenoid valve opens, the hot-gas valve closes, and the cycle starts again.

This hot gas bypass control method provides precise temperature control. It also minimizes wear on the compressor motor, since the compressor runs continuously and does not experience the stress of repeated cycling.

Control Panel Functions

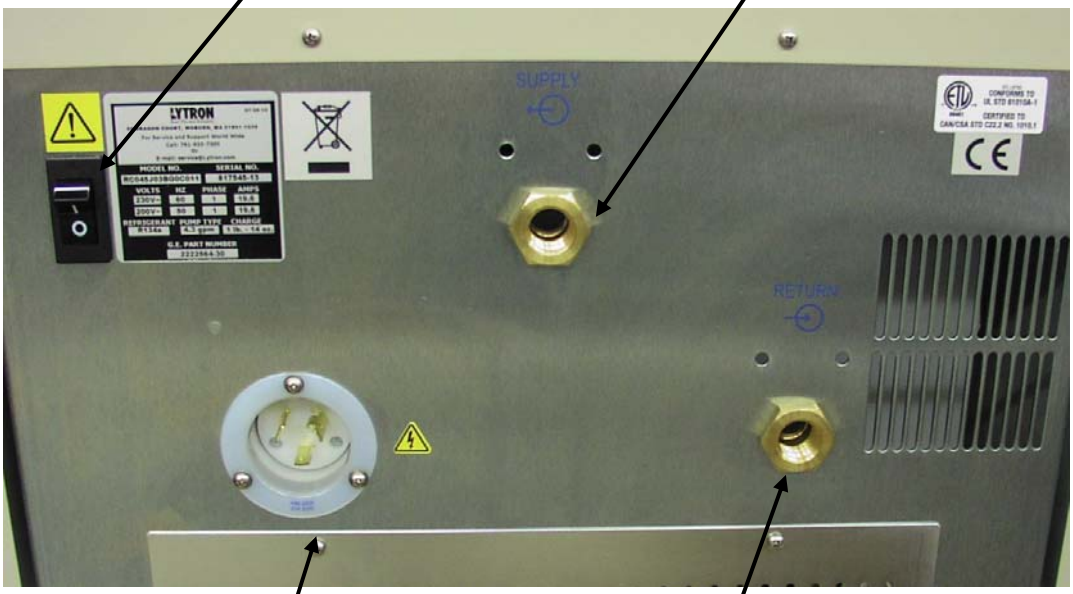


Kodiak Control Panel

Key	Operation
⏻	Turn on/off chiller
⬆ "UP" + "DOWN" + ⬇	Enter menu (press simultaneously and hold for 3 seconds and release)
"SET"	Push to display or change set point
"UP" arrow ⬆	Increase set point temperature
"DOWN" arrow ⬇	Decrease set point temperature
Bell symbol	Alarm Sound disabled or Muted (alarm will stay muted until error is corrected, then resets)

Description of Indicators	
Temperature Set Point	Displays coolant temperature or set point in °C or °F.
Cooling Indicator	Solenoid valve is open and chiller is cooling the process fluid when this light is illuminated.
Alarm Indicator	Illuminates to indicate an alarm fault condition.
Over Temperature Indicator	Illuminates to indicate water temperature is above high temperature alarm set point.
Low Temperature Indicator	Set Point.

Rear Panel Components



System Features

Fault Chiller Shutoff

Allows chiller to be programmed to shut down on fault (on) or continue to run during fault conditions (off).

Control Package 0

- Temperature control, +/-0.1°C.
- Temperature display in °C or °F.
- Offset temperature calibration -4°C to 4°C, -7°F to 7°F.
- Auto Restart
- High temperature alarm
- Fault chiller shutoff (toggle on/off)

Installation Requirements

Coolant Requirements

- GE Part Number 2138791 shall be used as a coolant. This is an Ethylene Glycol – deoinized water mixture with corrosion inhibitors
- **NOTICE** If the set point is 10°C/50°F or below, a freezing point depressant, such as ethylene glycol, is required.
- **NOTICE** Do not use automotive Antifreeze in the Chiller. The rust inhibitors in the automotive type will cause premature failure of the pump seals. Use of automotive anti-freeze in a Lytron chiller will void the warranty.

Electrical Requirements

Refer to the Specification section and to the product ID label on the rear of the chiller for the specific electrical requirements of your unit. The chiller power module is configured with a standard international IEC320/C20 inlet. To safely operate the chiller, use an SJT cord set with an IEC 320/C19 receptacle and an inlet plug that is compatible to the local power grid and the power requirements of the chiller. All Kodiak chillers should use SJT 3 conductor 12 AWG minimum power cord.

Selecting Chiller Location

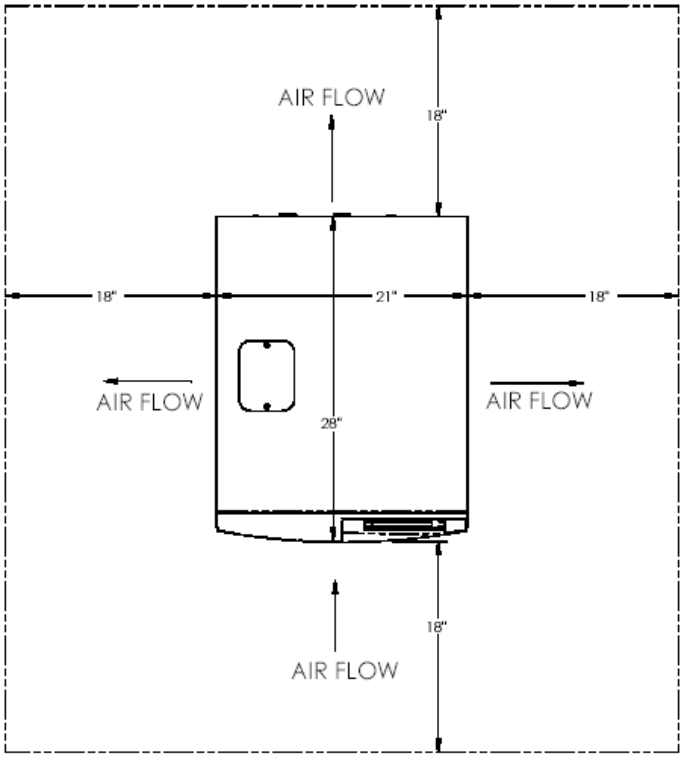
NOTICE Do not operate or store Kodiak chillers outside. These systems are not intended for outdoor use.

To minimize the heat gain and pressure drop through the connecting hoses, the chiller unit should be located as close as possible to the heat load (user equipment). This is more important for units with centrifugal pumps. Coolant lines are best run at or near the same level as the cooling system. Once the chiller is in position lock the casters.

Airflow is critical to optimize performance of the chiller. All sides of the chiller must have a minimum of 18" clearance. The top clearance must be at least 6". Ensure that the hot air exiting the chiller does not recirculate into the inlet openings. The front of the unit must have a free supply of ambient-temperature air.

The fill port for the tank on the chiller is located on the top of the system. It should be installed in a location where it is accessible in order to maintain the water level in the tank. If the chiller is located underneath a table or in a similar location the chiller will need to be moved forward to add fluid. If the system cannot be moved 2 feet of clearance above is recommended for service.

Before moving the chiller cap all ports to prevent any coolant leakage. Unlock the casters and move to new location. Once in the new location lock the casters. To prevent freezing during storage drain water if the chiller is located in an area below 10°C (50°F).



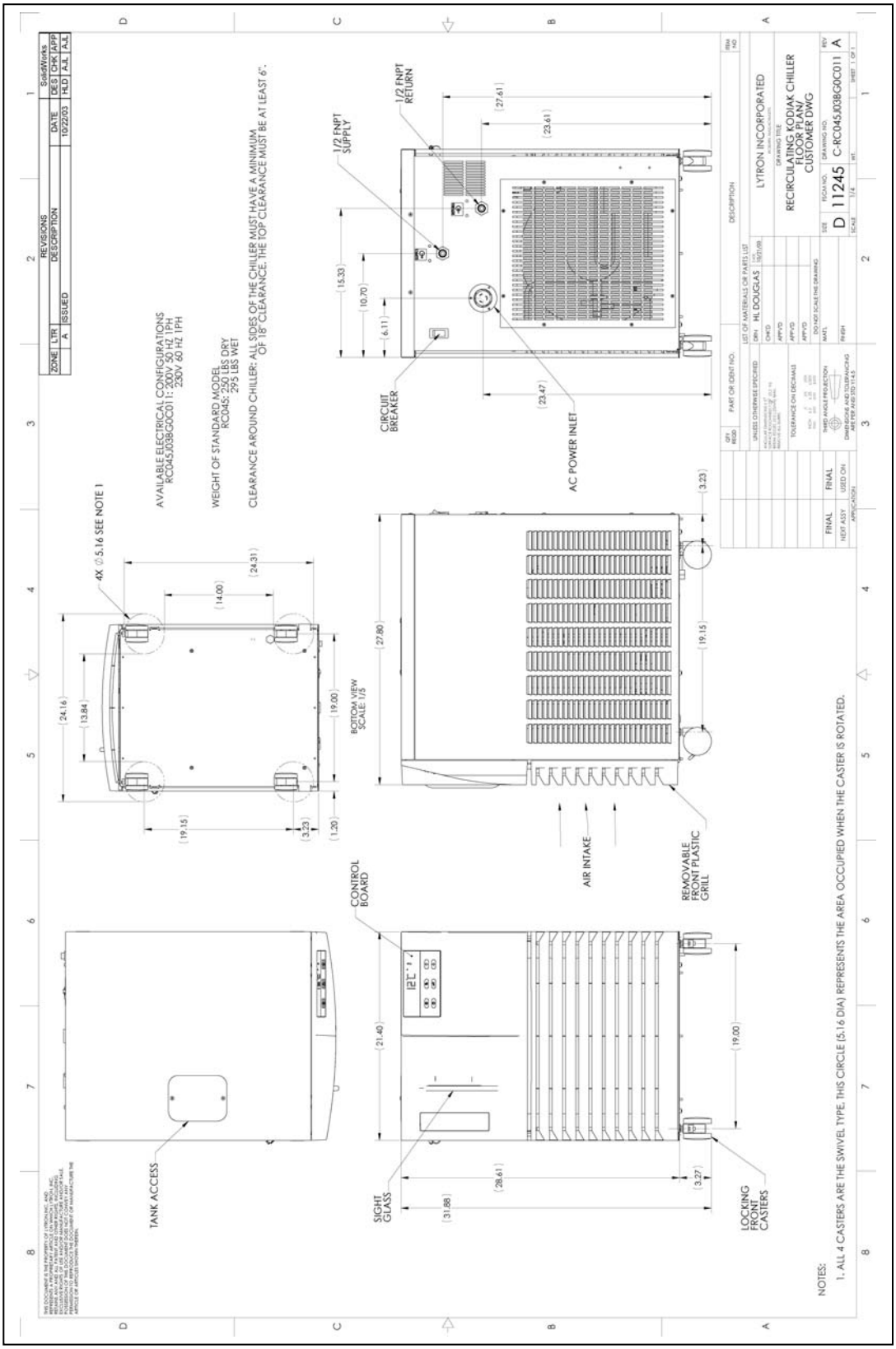
Before moving the chiller cap all ports to prevent any coolant leakage. Unlock the casters and move to new location. Once in the new location lock the casters. To prevent freezing during storage drain water if the chiller is located in an area below 10°C (50°F).

Center of Gravity

NOTICE Do not operate or store Kodiak chillers outside. These systems are not intended for outdoor use.

The center of gravity for the entire system when filled with water is located 9.5” from the left side, 12.0” from the rear and 13.5” off of the floor. Care should be taken when transporting, handling, and installing the chiller to keep the system stable. Tilting the chiller beyond 30° to either side could result in the unit tipping over. Always install chiller on a flat, level surface to prevent unexpected movement or tipping.

Chiller Dimensions



Installation Procedure

Selecting and Locating Hoses

- The coolant ports are located on the rear of the system and are labeled as previously shown.
- To minimize the pressure loss in the coolant lines, use the largest practical diameter tubing. If substantial lengths of cooling lines are required, they should be pre-filled with coolant before connecting them to the chiller.
- To minimize heat gain, all lines should be as short as possible. Keep them away from heat sources such as radiators and hot water pipes. Lines that cannot be routed away from heat sources should be protected with thermal insulation, preferably at least 1/2" (12.7mm).
- Flexible tubing should be of heavy wall or reinforced construction. All tubing should be rated to withstand 125 psig at 186°F (30°C). Make sure all tubing connections are secured and leak-tight. Also, whenever possible use opaque lines to prevent algae growth during prolonged non-operating periods.

Connecting Plumbing

To connect the fluid lines to the chiller and user equipment follow these steps:

1. Remove the plastic caps covering the supply and return ports on the rear panel of the unit.
2. Attach coolant lines to the supply and return ports on the rear panel. Fittings should either be brass, stainless steel or nylon. **NOTICE** Never use steel or cast iron fittings, as the corrosion will damage the chiller. The supply port provides chilled coolant to the user's equipment. The return port connects to the outlet of the user's equipment.
3. Check that fittings are tight to prevent leaks.
4. Remove water filler cover on top of the unit to access the reservoir.
5. Fill the reservoir. Use the reservoir sight tube on the front of the unit to see the coolant level in the tank as you are filling. Be sure to allow for the volume of coolant needed to fill the cooling lines between the chiller and the equipment, if they were not filled with coolant before installation.

Connecting Power

⚠WARNING In order to avoid an electrical potential at the chiller frame due to insulation failure, a proper ground connection to the system must be provided. Failure to do so could result in damage to the equipment, personal injury, and/or death.

Connect a 3-conductor SJT type power cord with a NEMA L6-20 plug to the power entry module on the rear of the unit and to an appropriate AC power source. All chillers should use a 12-gauge power cord. This power cord is supplied by GEHC.

Startup Procedure

1. Turn "ON" the circuit breaker on the rear of the unit. The controller will go through a diagnostic test. Turn on the chiller unit using the top left key located on the Keypad Display panel. The controller displays "OFF" for 8 seconds. The delay prevents rapid cycling of the compressor using the "ON" and "OFF" switch. If your chiller is equipped with control package 2 or 3 the fault shut off may prevent the chiller from starting up. If the chiller displays an alarm after pushing the "ON" button disable the fault shutoff on the customer menu and restart the chiller.

2. Adjust the temperature set point using the controls on the keypad display as follows:

    - Press the "SET" key once to display the current coolant temperature set point.
    - Press the "UP" or "DOWN" arrow key until the set point is 20° C or 68° F.
    - Press the "SET" key again to accept the set point and return to normal operation.

3. Operate the chiller for a short time and then check the coolant level in the reservoir. If the level drops, add more coolant.

4. Check all fittings and hoses for fluid leaks. If a leak exists turn chiller off, disconnect power and take necessary action to repair the leak.

Please Note:

During initial start up the temperature display may occasionally appear to be dim. This is a normal occurrence and does not indicate that there is any problem with the chiller. If you wait for 5 to 10 seconds the display will brighten to its normal level.

Chiller Operation

The following sections explain how to perform other operations with the chiller's controller, using the keys and display on the front of the unit. Refer to the Control Panel illustration and table on page on page 13.

In normal operation the display shows the current temperature of the coolant (or the current temperature with an offset applied).

Customer Menu Options

Display Abbreviation	*Function*
DEGC	**English or Metric Units** Changes the temperature readings on the display from °C to °F and pressure from Bar to PSI.
CAL	**Calibration Offset** Adjusts the reading on the display by the offset that you enter, from -4°C to 4°C (-7°F to 7°F).
Ar	**Auto Restart** When enabled this allows the chiller to start automatically in the event of a power failure.
Ot	**Over temperature Fault Indication** (option) Indicator illuminates when the coolant temperature exceeds the over-temperature set point. The over-temperature set point should be at least 3°C (6°F) above the coolant set point to prevent nuisance alarms.
FS	***Fault chiller shutoff** (option) When enabled, this turns off the chiller when any fault occurs.

****Low flow shutoff cannot be disabled.*

DEGC – Temperature/Pressure scale

1. To enter the menu, press and hold both the “UP” and “DOWN” arrow keys for 3 seconds and release.
2. The first option to change will be “DEGC”**.**
3. The display toggles between “DEGC” and current setting. Use “UP” or “DOWN” arrows to degree Celsius display on and off. This will automatically change the pressure scale °F to psi and °C to bar.
4. Press, “SET” to accept the setting on the display and exit the menu.

CAL – Calibration offset

1. To enter the menu, press and hold both the “UP” and “DOWN” arrow keys for 3 seconds and release.
2. Use the SET key to scroll to “CAL”.
3. The display toggles between “CAL” and current offset setting.
4. Use “UP” or “DOWN” arrows to change the calibration offset, which must be between -4°C and +4°C. If you do not want to use an offset set it to zero (0).
5. Press, “SET” to accept the setting on the display and exit the menu.

Ar – Auto Restart Feature

If auto restart is enabled (ON),
And if the chiller is running,
And if the power is interrupted due to power outage, tripped circuit breaker, etc.
Then when the power is restored the chiller will automatically start.

If auto restart is enabled (OFF),
And if the chiller is not running,
And if the power is interrupted due to power outage, tripped circuit breaker, etc.
Then when the power is restored the chiller will stay off. Push “ON” to start the chiller.

To activate the auto restart feature:

1. Enter the customer menu by holding both the “UP” and “DOWN” arrow keys for 3 seconds.
2. Use the “SET” key to scroll to “Ar”.
3. The display toggles between “Ar” and its current setting.
4. Use “UP” or “DOWN” arrow key to toggle between “ON” and “OFF”.
5. Press, “SET” to accept the setting on the display and continue to the next feature.

Ot – Over temperature indication

1. To enter the menu, press and hold both the “UP” and “DOWN” arrow keys for 3 seconds and release.
2. Use the “SET” key to scroll to “Ot”.
3. The display toggles between “Ot” and current over temperature set point.
4. Use “UP” or “DOWN” arrows to change the over temperature set point, which should be at least 3°C (6°F) above the coolant set point temperature.
5. Press, “SET” to accept the setting on the display and continue to the next feature.

FS – Fault Chiller Shutoff

1. To enter the menu, press and hold both the “UP” and “DOWN” arrow keys for 3 seconds.
2. Use the “SET” key to scroll to “FS”.
3. The display toggles between “FS” and its current setting.
4. Use “UP” or "DOWN"arrow key to toggle between “ON” and “OFF.”
5. Press, “SET” to accept the setting on the display and continue to the next feature.

System Maintenance and Service

⚠WARNING A qualified service technician must perform all service and maintenance internal to the chiller. Unqualified individuals conducting service on the chiller could result in damage to the equipment, personal injury and/or death.

After your Kodiak Recirculating Chiller is up and running, it takes only a small amount of care and maintenance to keep it running well.
Note: Pumps shall be replaced upon failure. If low flow/no flow conditions exist, check pump strainer, pump bypass, and coolant quality before replacing.

PM Inspections (to be performed every 6 months):

Noise Level

Any abnormal sounds or a substantial increase in noise level since the last weekly inspection may indicate:

- An impending pump failure – strainer blockage.
- Fan motor or blade failure.

Investigate the cause and perform the necessary service. Refer to the troubleshooting section that in this manual.

Leakage

If you notice coolant on the floor near the chiller or dripping from the chiller enclosure turn off the chiller. Disconnect the power cord. Find and repair any leaks immediately.

Coolant Level

Any significant drop in the coolant level should be investigated further. If there is no visible system leak, then the loss may be due to equipment leakage elsewhere.

Fan Assembly

Clean dust from fan blade.

Condenser Fin

Remove the front grill by sliding it upward, pulling the bottom out and pulling it straight down. For maximum performance the condenser fin should be free of dust and debris. Use a vacuum cleaner or compressed air to remove any debris and keep the fin clean.

Pump Strainer

All positive displacement pumps have a strainer to protect the vanes inside the pump. It is installed in the hose between the pump and the tank. Periodically inspect and clean the strainer. If it becomes fouled the flow rate will decrease and the pump will wear prematurely.

How to Clean the Positive Displacement Pump Strainer

LYTRON
Total Thermal Solutions™

How-To:

Clean the Positive Displacement Pump Strainer

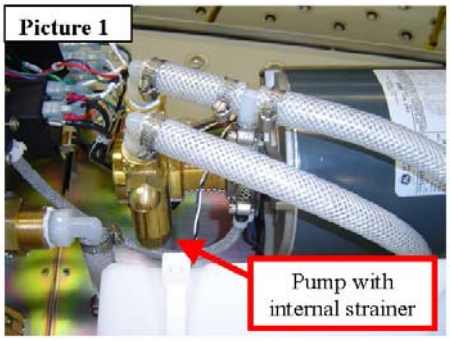
Safety Precautions:
- Always turn the unit "OFF" and unplug it from its power supply

Required Tools:
- Philips screwdriver
- Adjustable wrench

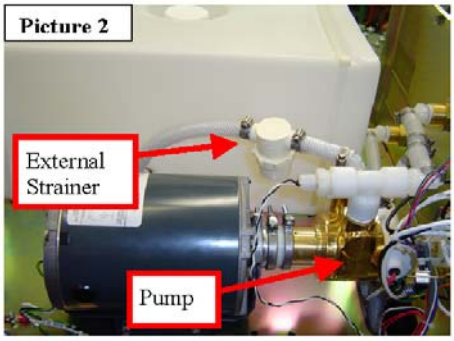
Procedure:

Locate the pump strainer. Certain pumps have a built in strainer, while other systems have pumps that do not have a strainer, so it is external, located on the suction side of the pump. Pictures 1 and 2 respectively show an internal and an external strainer.

Picture 1



Picture 2



A - For systems with an internal pump strainer:

1. Loosen the pump clamp, without removing it, as shown in picture 3. The pump clamp fastens the pump head to the pump motor. If you completely remove the clamp, it will be difficult to remove the strainer.

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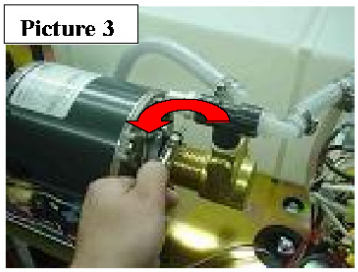
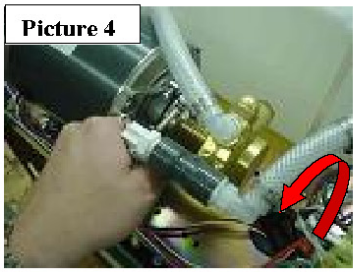
2. Rotate the pump as shown in picture 4. Again, remember not to remove the pump head from the pump motor.

Picture 3



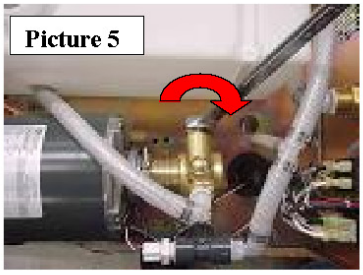
Picture 4



3. Unscrew and remove the strainer nut, as shown in picture 5.

4. A picture of the strainer itself is shown in picture 6.

Picture 5



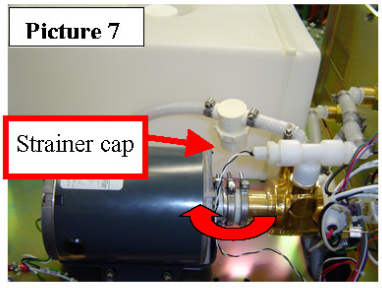
Picture 6

5. Clean the strainer by rinsing it with water or brushing it gently.

6. Reassemble the strainer and the nut, and reposition the pump head, following the above instructions in reverse order.

B - System has an external pump strainer:

Picture 7



1. Locate and unscrew the strainer cap, as shown in picture 7.

2. Remove and clean the strainer by rinsing it with water or brushing it gently.. A cleaned strainer and the strainer cap are shown in picture 8.

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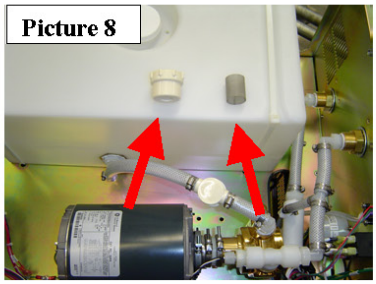
Picture 8



3. Reassemble the strainer and the cap.

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How to Adjust the Pump Bypass on Positive Displacement Pumps

LYTRON™
Total Thermal Solutions™

How-To:

Adjust the Pump Bypass on Positive Displacement Pumps

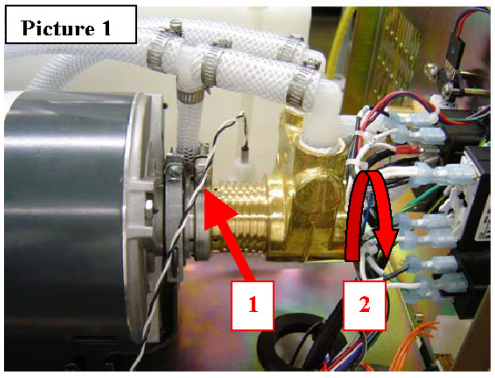
Safety Precautions:
- Always turn the unit "OFF" and unplug it from its power supply

Required Tools:
- Philips and a flat head screwdriver

Note:
- It is not recommended to set the bypass to its maximum setting (i.e. to turn the bypass screw clockwise to its maximum value). Needing to do this likely indicates that a pump's vanes have worn out and that the net flow out the pump is too low. In this case, the pump should be replaced

Procedure:

Picture 1



1. Disconnect the chiller from its power supply.
2. Loosen the pump clamp, without removing it, as shown in picture 1 by arrow 1. The pump clamp fastens the pump head to the pump motor, if you completely remove it, it will be difficult to adjust the pump bypass.
3. Rotate the pump as shown in picture 1 by arrow 2. Again, do not remove the pump head from the pump motor.

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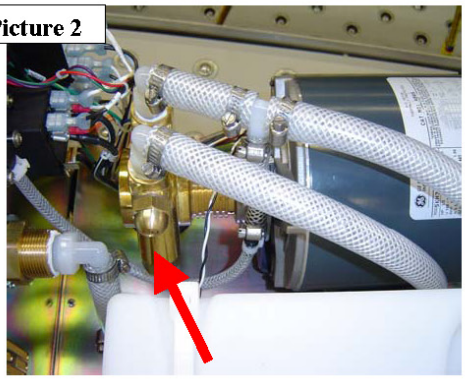
Picture 2



4. The arrow in picture 2 indicates the position of the pump bypass valve. To increase the bypass pressure (i.e. to decrease the amount of bypassed flow at a given pressure), use your flat head screwdriver to turn the bypass screw clockwise. Turn the bypass screw by ½ turn increments, and do not turn it more than 3 turns. The bypass is a safety mechanism and setting it too high will cause your system to operate at pressures that it was not designed for.

5. Rotate the pump back to its original position, and tighten the clamp.

6. Turn the chiller on and verify its proper performance.

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How to Replace the Positive Displacement Pump

LYTRON
Total Thermal Solutions™ 55 Dragon Court, Woburn, MA 01801, Tel: (781-933-7300), www.Lytron.com

ISO 9001 REGISTERED

SERVICE: General Maintenance

Instructions to replace the positive displacement pump and add the pump / motor coupling.

Safety Precaution:
- Disconnect electrical power before servicing chiller.

NOTES:
The pump / motor coupling is not used on the RC006 model chillers or MCS products. Do NOT install coupling on RC006/RC009 MCS10, MCS20, MCS39 systems.
Pressure relief setting is 90 PSI.

Tools Required:
- Phillips screwdriver
- Flat-head screwdriver
- Medium Channel-Lock pliers
- Container for capturing/filling coolant in chiller
- Dow Corning thread sealant #739 or Teflon tape

Parts included in this kit:

820-0148	Installation Instructions
410-xxxx-xx	PD Pump
410-0312	Pump / Motor Coupling

Figure 1

1. Disconnect power from the chiller and follow all Lock-out Tag-out procedures.
2. Remove top, right and left side covers.
3. Drain all coolant.
4. Remove hose clamps from the nipple fittings attached at the pump head noted in figure 2.

Figure 2

5. Remove the hoses from these fittings.

6. Remove the pump / motor clamp by loosening the screw until the clamp can be slid over the pump housing. (See Figure 3)

Figure 3

7. Remove pump from unit. Take precautions not to spill coolant inside chiller. Some coolant will remain in pump after draining.

8. Remove all fittings from the pump. Do not damage threads of fittings.

9. Attach fittings to replacement pump using thread sealant or Teflon tape.

NOTE: Do not leave Teflon tape or sealant near end of fittings. Foreign matter in coolant lines will damage the system.

10. Place the coupling with one clamp onto the pump and tighten just enough to keep in place.

11. Place the center of the coupling onto the pump shaft. (See Figure 4)

Figure 4

12. Place the original pump / motor clamp onto the coupling.

13. Place the pump / coupling assembly onto the motor. Ensure the coupling is seated into the pump shaft.

14. Tighten the clamp screws while ensuring the coupling is seated evenly on both the motor and pump. (See Figure 5)

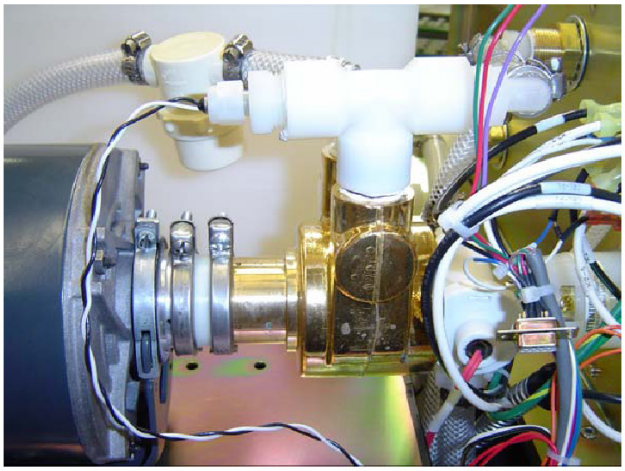


Figure 5

15. Reattach the hoses to the fittings and tighten the hose clamps.

16. Fill the reservoir tank with coolant.

17. Wipe up any spills before applying power.

18. Start chiller and check for leaks.

Pump Kit Installation Record

NOTE: For Warranty claims, return old pump with this sheet.

Please Record Chiller S/N _____

Date Replaced (MMDDYY) _____

Error Codes

There are a few different error codes that can occur during the operation of the chiller. These error codes are displayed on the front keypad of the system. See below for an explanation of each error code.

Err 01 – Controller Initialization Error

This error code signifies an error in the controller software initialization during power up. Contact the Lytron Service Department to resolve this type of error.

Err 02 – RTD Error

This error codes means that the resistance temperature device (RTD) is disconnected or damaged. The controller will display error 02 when the resistance of the RTD is outside of the expected range. This can be caused by:

Cut wire

Short to the RTD

Internal malfunction in the RTD or

The wires are disconnected.

Contact the Lytron Service Department for a replacement part number.

Err 03 – Controller Operational Error

This error code signifies an error in the controller software while the chiller is running. Contact the Lytron Service Department to resolve this type of error.

Err 04 – Low Flow Error

This error code signifies a low flow condition exists. The Low Flow light, coolant light and audible alarm will sound when error 4 occurs.

The controller will shut down the pump, compressor and fan. (See Low Coolant Flow Troubleshooting Section.)

Trouble Shooting Guide

Problem	Possible Cause	Recommended Remedy
Unit does not start or shuts off shortly after starting.	No power to the unit, circuit breaker "off" or tripped.	Make sure the unit is plugged in. Verify power to the unit. Turn circuit breaker to the "ON" (I) position. Turn on the unit with the ON (I) key on the keypad.
	Fault shutoff enabled.	Disable fault shutoff. Start unit. Enable shutoff after it is running, if desired.
	Low flow shut off will cause the chiller to stop after 10 seconds.	Fill external line prior to start up.
	Low Voltage.	Have a qualified electrician check the electrical service to the unit.
	Cooling load exceeds cooling capacity.	Reduce the cooling load on the unit.
	Controller set point temperature is too high.	Reset the set point to the proper temperature.
	Condenser coil fouled with dust or debris.	Remove the lower grill and vacuum the coil face clean.
	Unit has tripped the high-pressure cutout (RC030, RC045 and water cooled units only.)	Remove air obstructions from around the unit; manually reset the high-pressure control (Inside rear of unit, this is a blue button on a white box. Press to reset.)
	Compressor has tripped its internal overload.	Let the unit cool. The overload will reset itself, normally in 30 minutes or less.
Excessive noise on startup	Liquid refrigerant in the suction line to the compressor.	This should go away after the system runs for a few minutes.
Noisy compressor	Low voltage or wrong voltage to unit.	Verify power source; check electrical service.
	Unit stored in cool environment for a long period may have collected liquid refrigerant in the compressor.	This should go away after the system runs for a few minutes.
Noisy Pump Motor	Pump shaft seal damage	Replace pump.
	Excessive pressure drop.	Use either larger hoses or a shorter line length to reduce the pressure drop to equipment to be cooled.
	Positive displacement pump is worn out.	Replace pump with new one. Contact Lytron Service Department for part number and pricing.
Pump motor overheats	Improper voltage to the system.	Verify and correct the voltage to the chiller.
	Obstruction in pump head.	Shut down unit, clear obstructions and restart unit.
Low coolant flow	Pump suction strainer is clogged. (Positive displacement pumps only.)	Remove strainer, clean and reassemble.
	Low coolant level or no coolant in the reservoir.	Check for leaks. Repair any leaks and fill reservoir.
	Water filter dirty or clogged.	Change filter cartridge.
	Restriction in coolant lines external to the chiller.	Eliminate restrictions in the lines. Open any valves.
	Pump overload has tripped.	Turn unit off. Wait for overload to cool. It will reset on its own in 30 minutes or less.

Problem	Possible Cause	Recommended Remedy
	Leaks in external piping.	Repair leaks.
	Pump motor shaft is bound.	Replace pump motor.
	Damaged pump.	Replace pump.
Chiller shuts down during operation	Fault Chiller Shutoff is enabled in the controller set up menu.	Find out and correct the fault that is causing the shutoff. Disable Fault Chiller Shutoff (see controller set up).
Temperature display reads incorrectly	Temperature set point is not set properly.	Verify values in the controller, including offset. Reset as necessary.
	Offset incorrectly set.	Reset temperature offset.
Recirculating pressure is too high	Pressure drop through system is too large.	Reduce line length or increase line diameter.
	Pump internal pressure relief is set too high.	Reset pressure relief to 85 psig.
Temperature display dim at start up.	This is a normal part of the start up process. It does not indicate that there is a problem.	Wait 5 to 10 seconds and the display will brighten to its normal level.

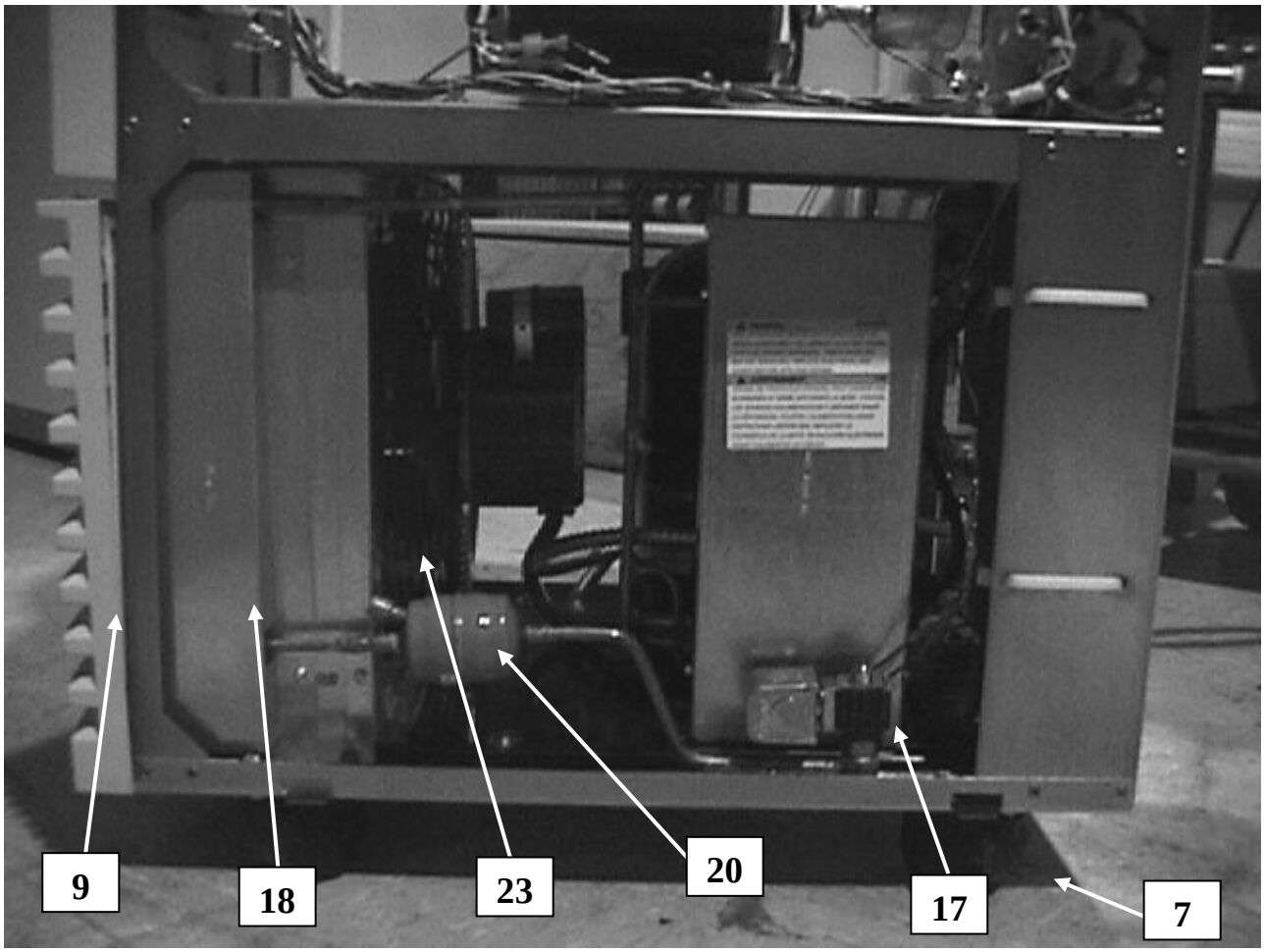
Kodiak Spare Parts

Item #	Description	Lytron Part Number	GEHC Part Number
1	Controller & Display with bracket.	200-0501-01-P	-
2	Circuit Breaker 230V~	230-0591	2222564-23
3	Pump and Compressor Relay	101903-03	-
5	Sensor, (RTD) Temperature	250-0072	-
6	Tank	340-0019	-
7	Casters with lock Casters without lock	531-0016 531-0017	-
9	Grille, Front	340-0017	-
10	Panel, Upper Front	340-0016	-
11	Keypad	230-0947	2222564-26
12	Cover	330-1172-06	-
13	Panel, Access	330-0880-06	-
14	Panel, Side	330-1173-06	-
15	Grille, Rear	330-1174	-
16	Valve, Hot Gas Bypass	All of these parts require service by a qualified refrigeration technician. Please contact Lytron if you have any problems with one of these parts.	-
17	Valve, Solenoid		
18	Heat Exchanger		
19	Tube, Capillary		
20	Liquid Line Filter Dryer		
21	Condenser		
22	Compressor		
23	Condenser Fan	Contact Lytron for replacement fan part number.	-
24	Fittings, Nylon (Chiller rear)	101510-07	2222564-28
25	Kit, Pump Pump, 4.3 gpm Brass	205-0008 410-0108	2222564-29 2222564-24
26	Motor, ½ Hp 115/230V	205-0107	2222564-25

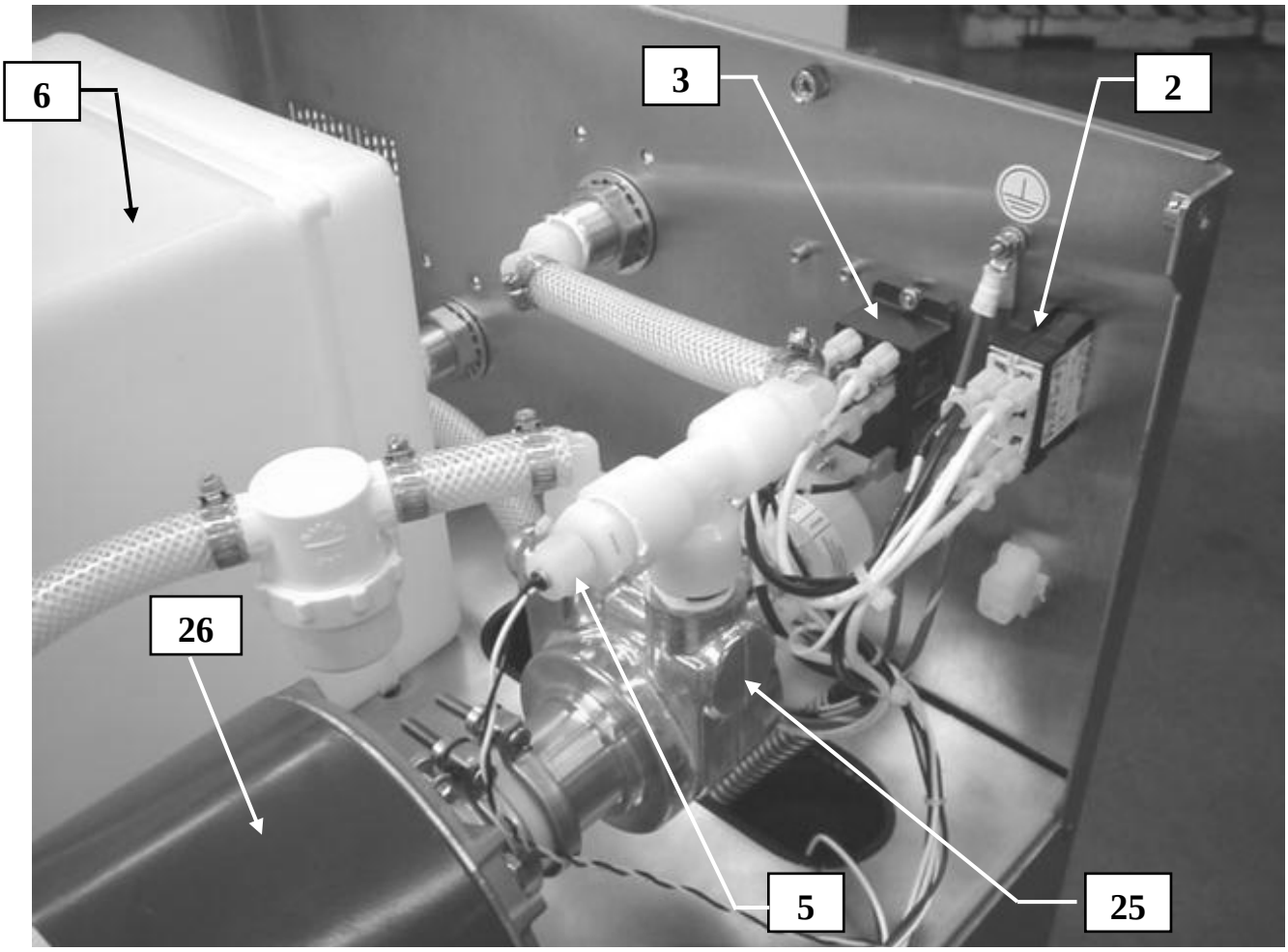
Front View

FRONT VIEW

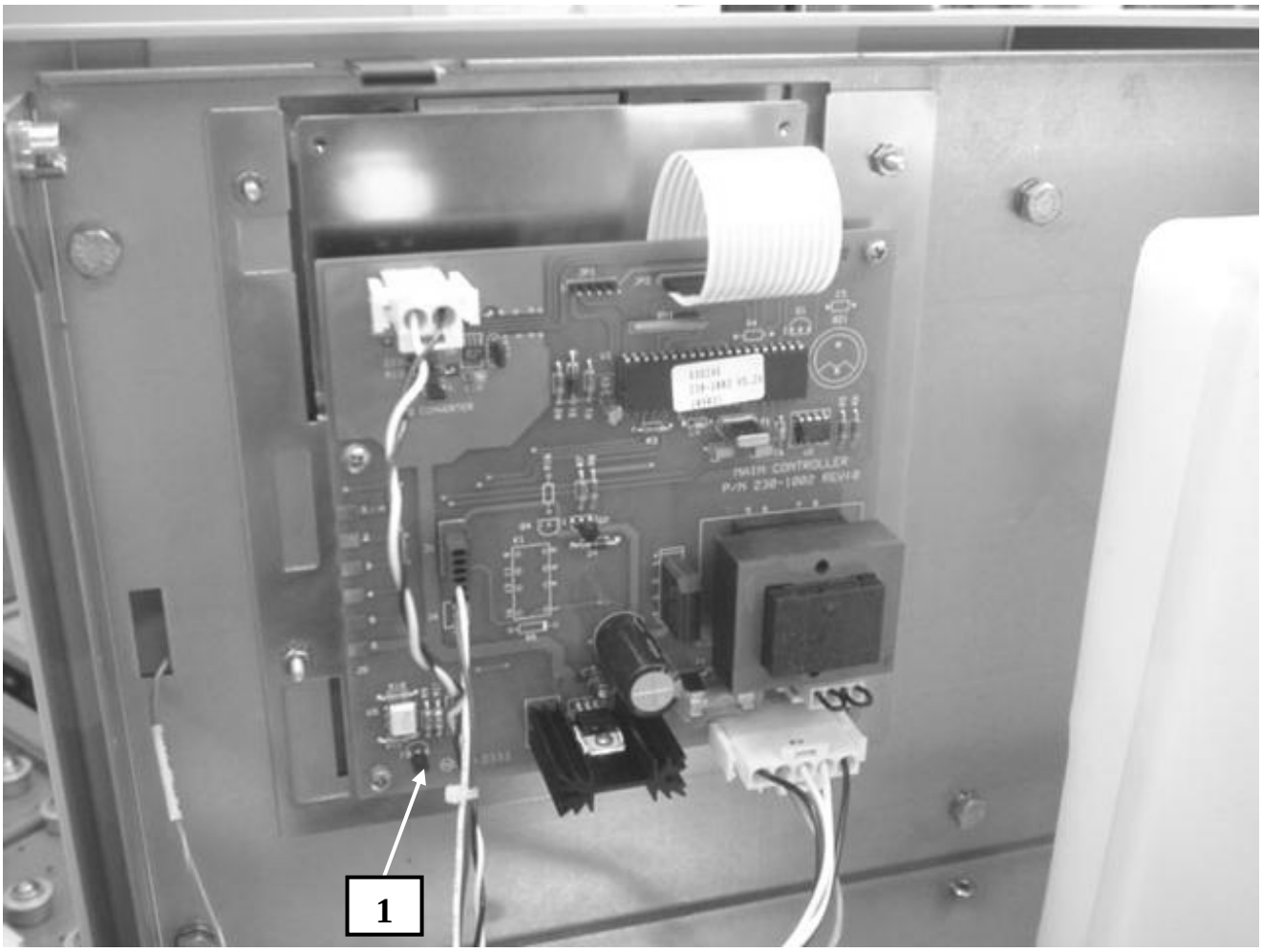
Side View



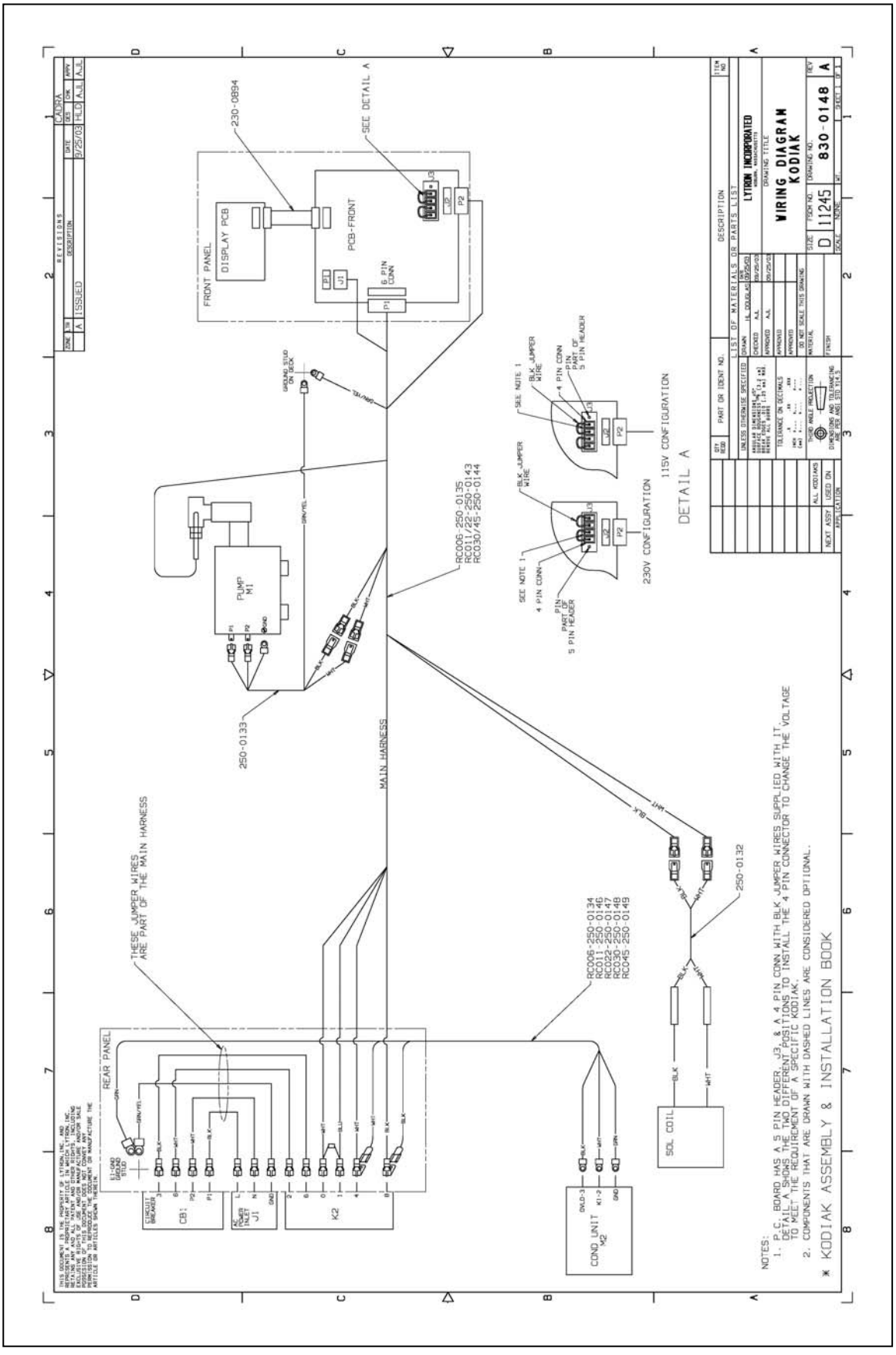
Top View



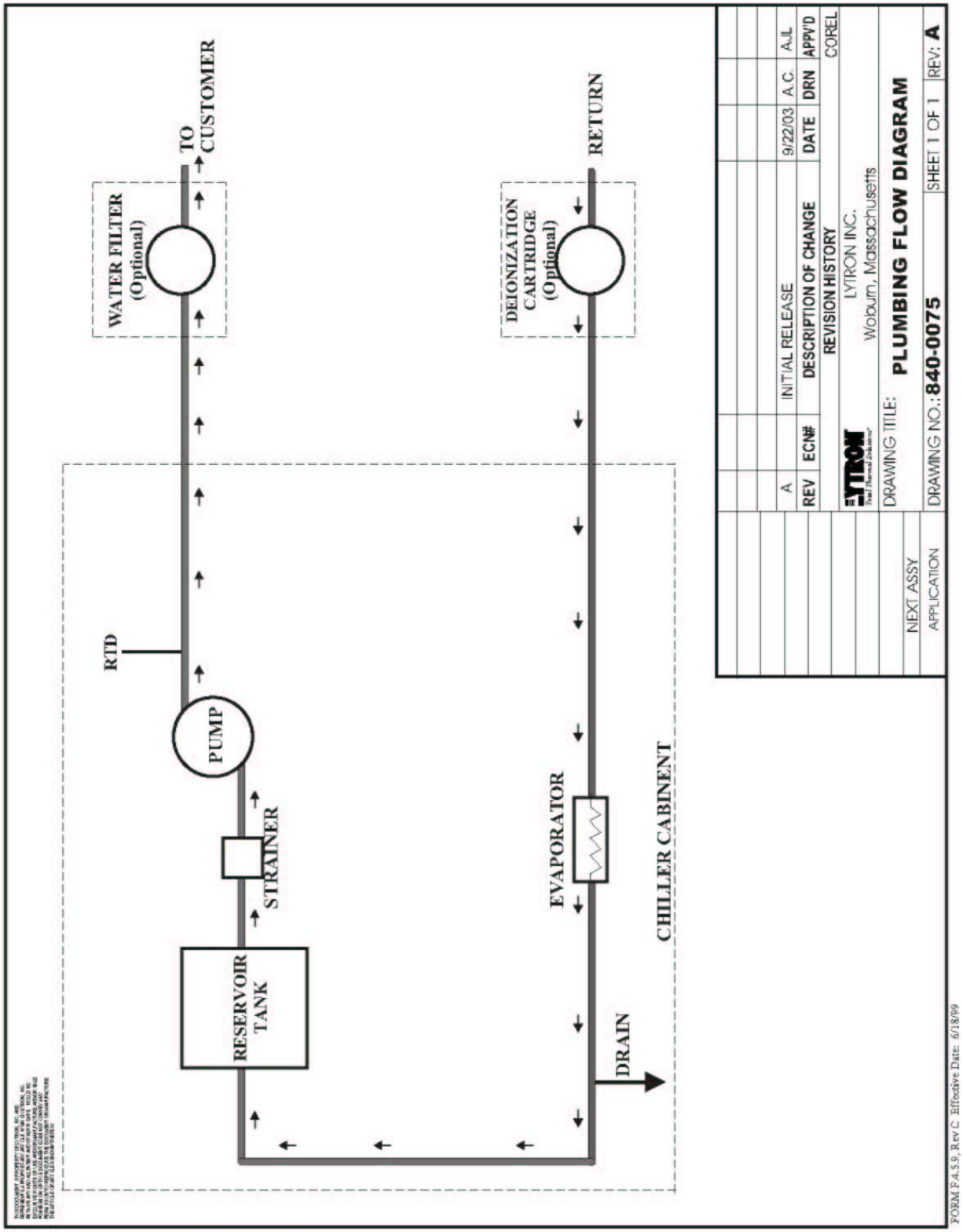
Front inside View



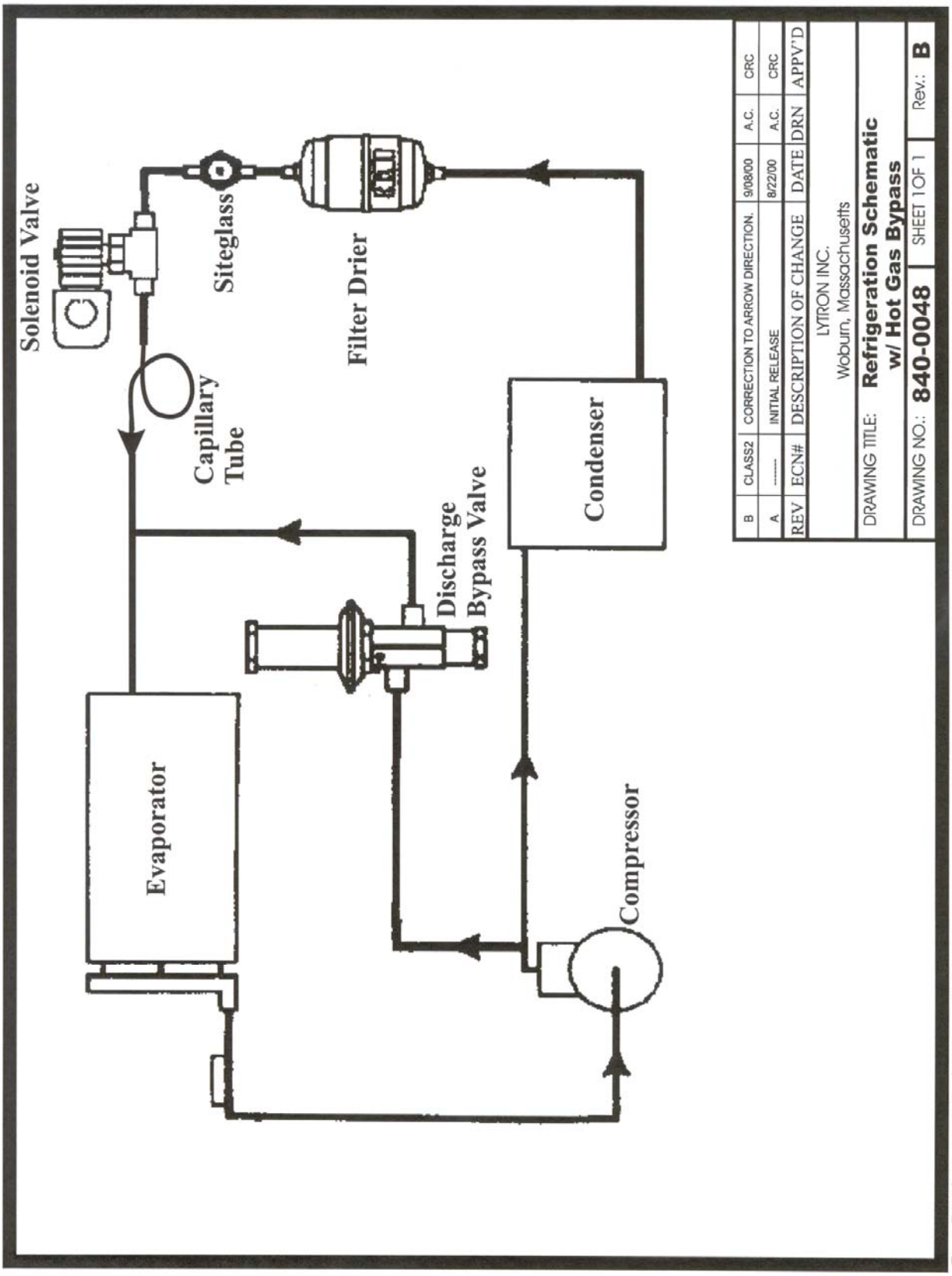
Kodiak Wiring Diagram



Plumbing Diagram



Refrigeration Diagram



Form F4.5.9, Rev A, Effective Date: 6/1/99

Replacement Parts

Replacement parts that are not identified as a GE FRU can be ordered at list price before using: A purchase order, MasterCard or Visa. Old parts should be returned using a Lytron issued RMA number. If the parts are found to be defective and the claim is within the warranty period, your account will be credited for the price of the parts and one-way ground shipping charges. If the parts are not defective or indicate customer damage, no credit will be issued. Lytron will not cover the incremental cost of air shipment of replacement parts, regardless of warranty status.

In-stock parts normally will be shipped the next business day; non-stocked parts will be shipped as quickly as reasonably possible.

This policy is subject to change. Please check with Lytron's service department for the current policy.

Diagnostic Consultation:

At no cost, Lytron will attempt to diagnose the problem over the phone. Our service department can be reached by calling +1-781-933-7305 and following the menu. Service technicians are available 24 hours/7 days for consultation. Lytron strongly encourages customers to take advantage of this service before returning a cooling system to Lytron for evaluation. Often a problem with a system can be fixed quickly in-house or is an application problem. By working with Lytron's service department to troubleshoot a cooling system, you do not have the downtime and expense associated with returning the system to our facility.

Phone diagnosis can be difficult and may actually be a trial and error process. Lytron will not assume any liability for misdiagnosis when diagnosing over the phone.

Declaration of Conformity

LYTRON
Total Thermal Solutions

DECLARATION OF CONFORMITY

Product Description: Kodiak Recirculating Chiller System

Model Number: RC006, RC009, RC011, RC022, RC030, and RC045
G03, H03, and J03 Series

We, Lytron Incorporated, 55 Dragon Court, Woburn, Massachusetts, 01801, USA, declare that the product described above is in conformity with 2006/95/EC Low voltage Directive and 2004/108/EC EU EMC Directive using the relevant sections of the following standards and other normative documents:

EN 61010-1: 2nd Edition

Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use. Part 1 General Requirements; Corrigendum 1:05/2002; Corrigendum 2:04/2003

EN 61326-1

Electrical Equipment for Measurement, Control and Laboratory Use EMC Requirements. Part 1 General Requirements - IEC 61326-1:2005;1997.

This product has been qualified in accordance with the requirements established in Low Voltage Directive 2006/95/EC and Electromagnetic Compatibility Directive 2004/108/EC and is manufactured in compliance with Lytron's registered BS EN ISO 9001:2008 Quality System.

David R. Olds
Authorized Lytron Representative

7/6/10
Date

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F4.3.42 Rev A 07/06/2010