¼ to 1HP Chiller

Service Manual

⚠	Before performing any service to the unit, reset the controller to its default settings. It is our experience that many problems can be resolved by doing so. See Sec. 3.1 of this manual for instructions.
⚠	Refrigeration service should only be performed by a qualified refrigeration technician. The refrigeration system contains no user-serviceable parts.
⚠	This manual is intended for use by qualified service personnel only. Disconnect power cord before removing cover, exposed voltage when cover is removed. Hazard from moving parts present when cover is removed.

110-378 08/06

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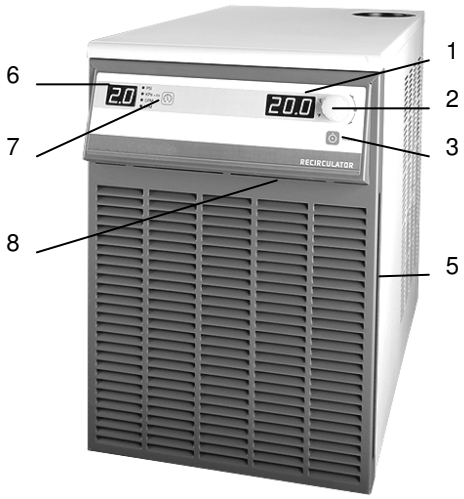
Section 1 – Specifications

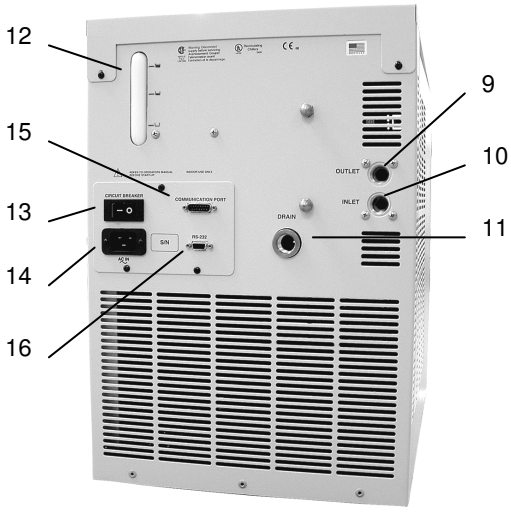
1.1 – General Description

Refrigerated Recirculating Chillers provide cooling power for demanding applications and serve as an economical alternative to tap water cooling systems. All models feature a microprocessor-based controller, digital temperature display (℃ or ℉), one-touch set point display, and digital pressure/flow rate display (PSI, kPa, GPM, LPM) with push-button selection.

To optimize cooling efficiency and performance, these sophisticated Chillers also feature a modulated refrigeration system. As a result, temperature stability is greatly enhanced and compressor life extended.

Refrigerated Recirculating Chillers are equipped with either a centrifugal, positive displacement, or regenerative turbine pump. Wetted parts within the recirculation system are brass, stainless steel, polyethylene, EPDM rubber, and nylon.





Front/Top

1. Temperature Display
2. Select/Set Knob
3. Power Button
4. Reservoir Cap and Internal Fluid Filter (top)
5. Air Filter
6. Pressure / Flow Rate Display
7. Units / Menu Select Button
8. Ambient Tracking Probe Connection (optional)

Rear

9. Fluid Outlet
10. Fluid Inlet
11. Drain
12. Reservoir Fluid Level Gauge
13. Circuit Breaker / Power Switch
14. IEC Power Connection
15. Remote I/O Connection (optional)
16. RS232 / RS 485 Connection (optional)

1.2 – General Specifications

Temperature Set Point Resolution	±0.1℃
Temperature Stability	±0.1℃
Temperature Units	℃ or ℉
Pressure Units	PSI or kPa
Pressure Display Resolution	1 PSI / 6.9 kPa
Pressure Display Accuracy	±3.5% of full scale (100PSI)
Flow Rate Units	GPM or LPM
Flow Rate Display Resolution	0.1 GPM or LPM
Flow Rate Display Accuracy	+/- 0.4 GPM / 1.5 LPM
Pump Inlet and Outlet	½ inch NPT

- Specifications subject to change without notice.
- Refer to the serial number plate on the rear of the Chiller for model and electrical data.
- Performance specifications determined at ambient temperature of 20℃ (68℉).
- For 50Hz models, de-rate cooling capacity 17%

1.2 – General Specifications (continued)

Model	Temperature Range	Compressor HP	Cooling Capacity @ 20°C	Maximum Flow @ 0 psi	Max Pressure @ 0 flow
5206	-10° to 70°C	¼	800 watts / 2728 BTU	4.1 gpm / 15.5 lpm	10 psi / 69 kPa
5206P	-10° to 70°C	¼	800 watts / 2728 BTU	1 gpm / 3.75 lpm	20 to 100 psi / 138 to 689 kPa
5206T	-10° to 70°C	¼	800 watts / 2728 BTU	3.5 gpm / 13.2 lpm	20 to 90 psi / 138 to 621 kPa
5306	-10° to 70°C	⅓	1200 watts / 4092 BTU	4.1 gpm / 15.5 lpm	10 psi / 69 kPa
5306P	-10° to 70°C	⅓	1200 watts / 4092 BTU	1 gpm / 3.75 lpm	20 to 100 psi / 138 to 689 kPa
5306T	-10° to 70°C	⅓	1200 watts / 4092 BTU	3.5 gpm / 13.2 lpm	20 to 100 psi / 138 to 689 kPa
5506	-10° to 70°C	½	1700 watts / 5797 BTU	4.1 gpm / 15.5 lpm	10 psi / 69 kPa
5506P	-10° to 70°C	½	1700 watts / 5797 BTU	1 gpm / 3.75 lpm	20 to 100 psi / 138 to 689 kPa
5506T	-10° to 70°C	½	1700 watts / 5797 BTU	3.5 gpm / 13.2 lpm	20 to 90 psi / 138 to 621 kPa
5706	-10° to 70°C	¾	2500 watts / 8525 BTU	4.1 gpm / 15.5 lpm	10 psi / 69 kPa
5706P	-10° to 70°C	¾	2500 watts / 8525 BTU	3.5 gpm / 13.2 lpm	20 to 100 psi / 138 to 689 kPa
5706T	-10° to 70°C	¾	2500 watts / 8525 BTU	3.5 gpm / 13.2 lpm	20 to 90 psi / 138 to 621 kPa
5106	-10° to 70°C	1	2900 watts / 9889 BTU	4.1 gpm / 15.5 lpm	10 psi / 69 kPa
5106P	-10° to 70°C	1	2900 watts / 9889 BTU	3.5 gpm / 13.2 lpm	20 to 100 psi / 138 to 689 kPa
5106T	-10° to 70°C	1	2900 watts / 9889 BTU	3.5 gpm / 13.2 lpm	20 to 90 psi / 138 to 621 kPa
6206	0° to 40°C	¼	800 watts / 2728 BTU	4.1 gpm / 15.5 lpm	10 psi / 69 kPa
6206P	0° to 40°C	¼	800 watts / 2728 BTU	1 gpm / 3.75 lpm	20 to 100 psi / 138 to 689 kPa
6206T	0° to 40°C	¼	800 watts / 2728 BTU	3.5 gpm / 13.2 lpm	20 to 90 psi / 138 to 621 kPa
6306	0° to 40°C	⅓	1200 watts / 4092 BTU	4.1 gpm / 15.5 lpm	10 psi / 69 kPa
6306P	0° to 40°C	⅓	1200 watts / 4092 BTU	1 gpm / 3.75 lpm	20 to 100 psi / 138 to 689 kPa
6306T	0° to 40°C	⅓	1200 watts / 4092 BTU	3.5 gpm / 13.2 lpm	20 to 90 psi / 138 to 621 kPa
6506	0° to 40°C	½	1700 watts / 5797 BTU	4.1 gpm / 15.5 lpm	10 psi / 69 kPa
6506P	0° to 40°C	½	1700 watts / 5797 BTU	1 gpm / 3.75 lpm	20 to 100 psi / 138 to 689 kPa
6506T	0° to 40°C	½	1700 watts / 5797 BTU	3.5 gpm / 13.2 lpm	20 to 90 psi / 138 to 621 kPa
6706	0° to 40°C	¾	2500 watts / 8525 BTU	4.1 gpm / 15.5 lpm	10 psi / 69 kPa
6706P	0° to 40°C	¾	2500 watts / 8525 BTU	3.5 gpm / 13.2 lpm	20 to 100 psi / 138 to 689 kPa
6706T	0° to 40°C	¾	2500 watts / 8525 BTU	3.5 gpm / 13.2 lpm	20 to 90 psi / 138 to 621 kPa
6106	0° to 40°C	1	2900 watts / 9889 BTU	4.1 gpm / 15.5 lpm	10 psi / 69 kPa
6106P	0° to 40°C	1	2900 watts / 9889 BTU	3.5 gpm / 13.2 lpm	20 to 100 psi / 138 to 689 kPa
6106T	0° to 40°C	1	2900 watts / 9889 BTU	3.5 gpm / 13.2 lpm	20 to 90 psi / 138 to 621 kPa

Section 2 – Maintenance and Calibration

2.1 – Condenser, Air Vents, and Reusable Filter

To keep the system operating at optimum cooling capacity, the condenser, the air vents, and reusable filter should be kept free of dust and dirt. They should be checked on a scheduled basis and cleaned as required.

The reusable filter is easily accessed from either the left or right side of the unit. Use a mild detergent and water solution to wash off any accumulated dust and dirt and then rinse and dry thoroughly before reinstalling.

The condenser can be cleaned by blowing compressed air through it to remove any accumulated dust and dirt.

2.2 – Fluid Filter

A removable, highly efficient fluid filter is integrated into the fluid reservoir. To remove it for cleaning, simply remove the reservoir cap and lift the filter out of the reservoir. Rinse off accumulated particulate and reinstall.

2.3 – Temperature Calibration

This menu item allows you to adjust the Chiller's internal temperature reading to match that of a traceable standard. It allows you to offset the displayed temperature value by as much as ±2.9°C.

NOTE: Calibration offset values are always set and displayed in °C. To prevent the operator from accidentally changing the calibration offset, a special sequence of keystrokes is required to access this function.

1. Press and hold the Units/Menu Button until HL appears on the display.
2. Press and release the Units/Menu Button until rP appears on the display.
3. Press and hold the Units/Menu Button.
4. While holding the Units/Menu Button, press and release the Select/Set Knob.
5. When CAL appears on the temperature readout, release the Units/Menu Button. The current calibration offset value will appear on the temperature readout.
6. Rotate the Select/Set Knob until the desired calibration offset is displayed. Press the Select/Set Knob or simply allow the display to time out to accept the displayed value.

2.5 – Flow Rate Calibration

This menu item allows you to adjust the Chiller's displayed flow rate reading to match that of a traceable standard. It allows you to change the gain coefficient displayed value from 0.2 to 50.0.

1. Press and hold the Units/Menu Button until HL appears on the display.
2. Press and release the Units/Menu Button until C1 (C2 if the Chiller is equipped with an external temperature probe) appears on the display.
3. Press and hold the Units/Menu Button.
4. While holding the Units/Menu Button, press and release the Select/Set Knob.
5. When CAL appears on the temperature readout, release the Units/Menu Button. The current gain coefficient value will appear on the temperature readout.
6. Rotate the Select/Set Knob until the desired flow rate is displayed on the flow readout. Press the Select/Set Knob or simply allow the display to time out to accept the displayed value.

Section 3 – Servicing

3.1 – Resetting unit to Factory Defaults (all units)

Before performing any service to the unit, reset the controller to factory defaults. It is our experience that a number of common problems can be resolved by doing so.

To Reset the unit to Factory Defaults while operating in °C:

1. Place the Circuit Breaker/Power Switch on the rear of the instrument in the "Off" position.
2. Press and hold the Power Button on the front panel while returning the Circuit Breaker/Power Switch to the "On" position.

To Reset the unit to Factory Defaults while operating in °F:

1. Place the Circuit Breaker/Power Switch on the rear of the instrument in the "Off" position.
2. Press and hold the Units/Menu Select Button on the front panel while returning the Circuit Breaker/Power Switch to the "On" position.

3.2 – Removing Outer Case

1. Set circuit breaker to the OFF position and unplug power cord from unit.
2. Remove the two Phillips screws at the upper left and right corners of the Chiller's rear panel (see Figure A).
3. Slide the top panel back about 5 to 7 cm, and lift off.

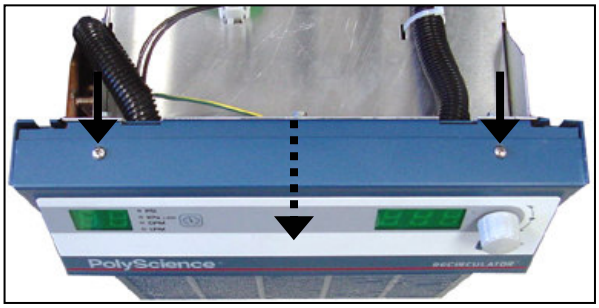
To remove the side panels, lift them straight up and off the chiller as necessary.

Figure A – Top panel screws

3.3 – Accessing Main Control Board

1. Set circuit breaker to the OFF position and unplug power cord from unit.
2. Remove the top cover of the chiller (see Section 3.2).
3. Remove the two Phillips screws located above the front control panel, making sure to also remove the lock washers (see Figure B).
4. Pull the control panel forward, allowing it to swing away from the chiller.

Figure B – Main PC Board access screws

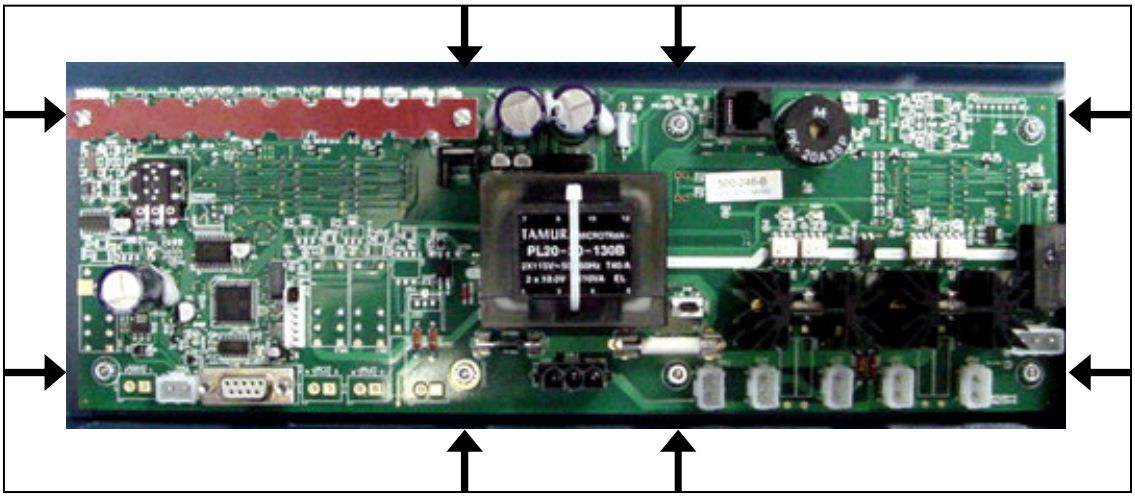


3.4 – Replacing Main Control Board

Figure C – Removing Control Knob

1. Set circuit breaker to the OFF position and unplug power cord from unit.
2. Remove the top cover of the chiller (see Section 3.2).
3. Pry the center cap off of the control knob using a small flat blade screwdriver.
4. Loosen nut (do NOT remove) in center of knob and slide knob off of shaft .
5. Open pc board access panel (see Section 3.3)
6. Note location of all Wires BEFORE removing. Refer to wiring diagram for additional guidance. Disconnect all wires from PC board.
7. Remove the 8 nuts that secure the PC board to the access panel (See Figure D). Make sure to retain the 8 spacers that are between the board and the access panel.

Figure D – Remove the 8 nuts that secure the PC board to the access panel

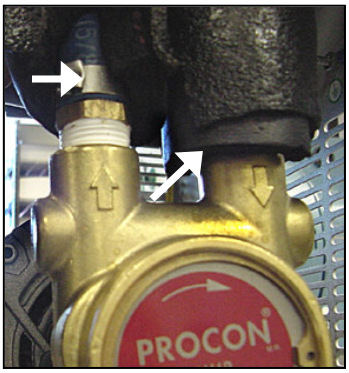


8. Remove circuit board. Be sure to observe all ESD precautions when handling both the defective and replacement PC boards. Install new board by following previous steps in reverse.
9. Upon complete installation, the board must be set to defaults for proper initialization (see Section 3.1)

3.5 – Replacing Pump Motor

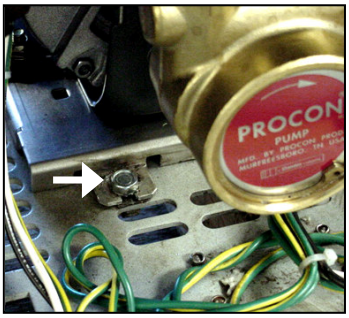
1. Set circuit breaker to the OFF position and unplug power cord from unit.
2. Remove the top cover and side panels of the chiller (see Section 3.2).
3. Drain all fluid from reservoir
4. Lift insulation at pump inlet and outlet to expose the clamps holding hoses in place. Remove the clamps (see Figure E).

Figure E –Insulation and Hose Clamps



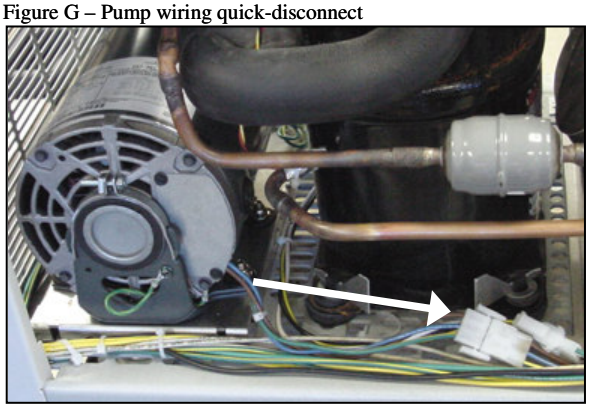
5. Remove the nut holding the pump/bracket assembly to the chiller base (see Figure F).

Figure F – Pump/bracket mounting nut



6. Unplug pump wiring quick-disconnect plug (see Figure G)

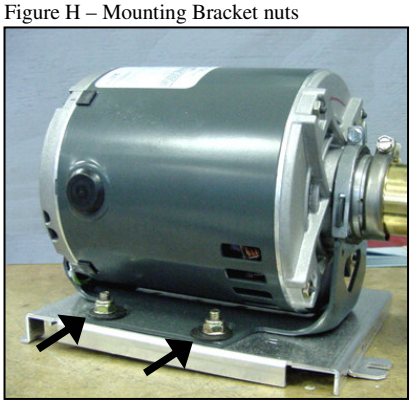
Figure G – Pump wiring quick-disconnect



7. Slide pump/bracket assembly out of the right side (when facing the rear) of the chiller. If replacing the motor in a chiller with a positive displacement pump, it will also be necessary to remove the pump head (see Section 3.6)

8. Be very careful not to pinch or crush any wires. Remove the 4 nuts that hold the pump onto the mounting bracket (see Figure H)

Figure H – Mounting Bracket nuts

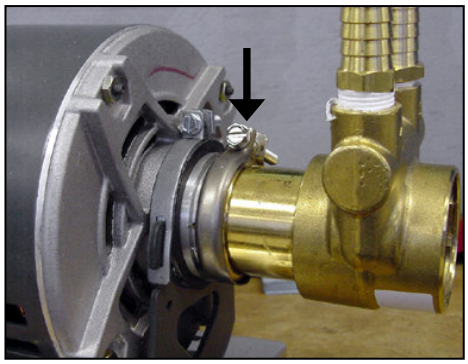


9. Mount new motor onto mounting bracket and install by following the previous steps in reverse.

3.6 – Replacing Pump Head (positive displacement pumps only)

1. Set circuit breaker to the OFF position and unplug power cord from unit.
2. Remove the top cover and side panels of the chiller (see Section 3.2).
3. Drain all fluid from reservoir
4. Lift insulation at pump inlet and outlet to expose the clamps holding hoses in place. Remove the clamps (see Figure E).
5. Locate and remove the clamp that holds the pump head to the motor using a flat blade screwdriver. The clamp is the one farthest from the pump motor (see Figure I).
6. The pump head can now be removed. Install the new pump head by following the previous steps in reverse.

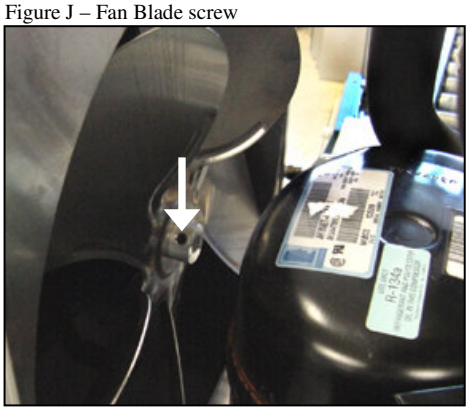
Figure I – Removing pump head clamp



3.7 – Replacing Fan Blade

1. Set circuit breaker to the OFF position and unplug power cord from unit.
2. Remove the top cover and side panels of the chiller (see Section 3.2).
3. Loosen the set screw that holds the fan blade to the fan motor shaft (see Figure J). Slide the fan blade off of the shaft.
4. Install new fan blade by following the previous steps in reverse.

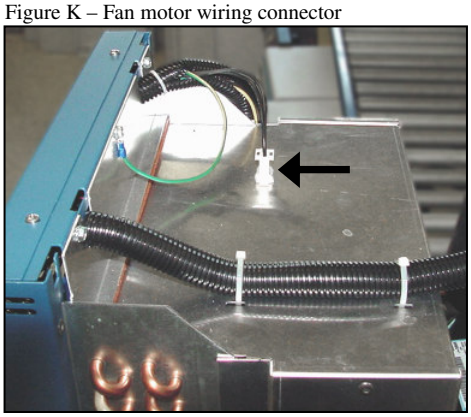
Figure J – Fan Blade screw



3.8 – Replacing Fan Motor

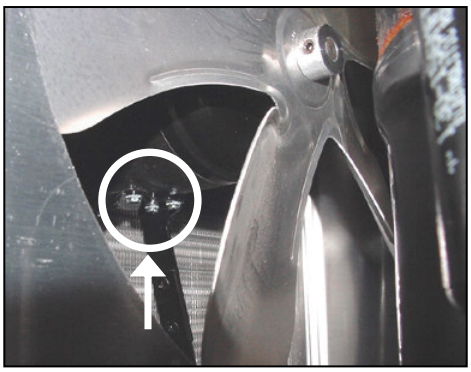
1. Set circuit breaker to the OFF position and unplug power cord from unit.
2. Remove the top cover and side panels of the chiller (see Section 3.2).
3. Remove fan blade (see Section 3.7)
4. Disconnect fan motor connector, located on top of the fan housing (see Figure K)

Figure K – Fan motor wiring connector



5. Remove 4 nuts located on the bottom of the fan motor (see Figure L)
6. Remove motor from chiller and install new motor by following the previous steps in reverse.

Figure L – Fan motor mounting nuts



3.9 – Replacing pressure sensor

1. Set circuit breaker to the OFF position and unplug power cord from unit.
2. Remove the top cover and side panels of the chiller (see Section 3.2).
3. Rotate bypass valve 45° counter-clockwise
4. Remove hose clamp and hose from front of manifold. Cut 3.5 inches from hose.
5. Remove insulation around pressure sensor. Disconnect wire harness from old pressure sensor and from FPS connection on PC board.
6. Remove old pressure sensor from manifold by removing single screw (if round sensor installed) or 4 screws (if square sensor installed). DO NOT remove O-ring.
7. Attach new sensor to manifold.
8. Attach new sensor wire harness to PC board at FPS connection.
9. Insulate pressure sensor and exposed manifold
10. Reattach hose and rotate valve 45° clockwise back into position.

3.10 – Refrigerant Charge

Please note: Units are factory charged by refrigerant weight, not pressure. There are no published refrigerant pressure specifications available as they will vary with temperature.

Models	Refrigerant Type	Charge (Grams)	Charge (Ounces)
1/4hp - 5206, 6206 (all pumps)	R-134a	225 g	7.94 oz
1/3hp - 5306, 6306 (all pumps)	R-134a	300 g	10.58 oz
1/2hp - 5506, 6506 (all pumps)	R-134a	400 g	14.11oz
3/4hp - 5706, 6706 (all pumps)	R-404a	500 g	17.64 oz
1hp - 5106, 6106 (all pumps)	R-134a	500 g	17.64 oz

3.11 – Parts List

ALL 1/4 HP UNITS	120V, 60Hz	240V, 50Hz
Condensing Unit, ¼ hp	750-157	750-158
Magnetic Drive Pump (6000 series units)	525-551	525-552
Magnetic Drive Pump 5000 series units	525-553	525-554
Positive Displacement Motor	215-102	215-102
Positive Displacement Pump (6000 series units)	215-105	215-105
Positive Displacement Pump 5000 series units	215-099	215-099
Turbine Pump	215-305	215-308
Circuit Breaker	215-388	215-330
PC Board without Ambient Temperature Tracking	500-245	500-246

ALL 1/2 HP UNITS	120V, 60HZ	240V, 50HZ
Condensing Unit, ½ hp,	750-155	750-156
Magnetic Drive Pump (6000 series units)	525-551	525-552
Magnetic Drive Pump 5000 series units	N/A	N/A
Positive Displacement Motor	215-103	215-103
Positive Displacement Pump (6000 series units)	215-105	215-105
Positive Displacement Pump 5000 series units	N/A	N/A
Turbine Pump	215-305	215-308
Circuit Breaker	215-388	215-388
PC Board without Ambient Temperature Tracking	500-245	500-246

ALL 1 HP UNITS	120V, 60HZ	240V, 50HZ
Compressor, 1 hp	750-304	750-303
Magnetic Drive Pump (6000 series units)	525-551	525-552
Magnetic Drive Pump 5000 series units	525-553	525-554
Positive Displacement Motor	215-103	215-103
Positive Displacement Pump (6000 series units)	215-106	215-106
Positive Displacement Pump 5000 series units	215-099	215-099
Turbine Pump	215-305	215-308
Circuit Breaker	215-330	215-330
PC Board without Ambient Temperature Tracking	500-245	500-246
Fan	215-450	215-450
Fan motor	525-578	525-578

ALL 1/3 HP UNITS	120V, 60HZ	240V, 50HZ
Condensing Unit, ⅓ hp	750-306	750-189
Magnetic Drive Pump (6000 series units)	525-551	525-552
Magnetic Drive Pump 5000 series units	525-553	525-554
Positive Displacement Motor	215-102	215-102
Positive Displacement Pump (6000 series units)	215-105	215-105
Positive Displacement Pump 5000 series units	215-099	215-099
Turbine Pump	215-305	215-308
Circuit Breaker	215-330	215-330
PC Board without Ambient Temperature Tracking	500-245	500-246

ALL 3/4 HP UNITS	120V, 60HZ	240V, 50HZ
Compressor, ¾ hp	750-304	750-303
Magnetic Drive Pump (6000 series units)	525-551	525-552
Magnetic Drive Pump 5000 series units	525-553	525-554
Positive Displacement Motor	215-103	215-103
Positive Displacement Pump (6000 series units)	215-106	215-106
Positive Displacement Pump 5000 series units	215-099	215-099
Turbine Pump	215-305	215-308
Circuit Breaker	215-330	
PC Board without Ambient Temperature Tracking	500-245	500-246
Fan	215-450	215-450
Fan motor	525-578	525-578

Additional Parts (for all units)	
Operations Manual	110-240
Tubing adapter kit	510-288
Air Filter	400-643
Fluid Filter	565-102
Flow Indicator Turbine	330-082
Reservoir Cap	300-460
Reservoir Spill Cup	300-459

Section 4 – Basic Troubleshooting

4.1 – Error Codes and Alarms

When certain conditions are detected, a message code flashes on the display and the local audio alarm sounds. Depending on the nature of the condition, power to various systems components, such as the compressor, heater, fan, and pump, is removed. When condition is rectified, push front panel Power button or turn circuit breaker off then on to clear the fault or error.

Message Code	Description	Action Required
EAF	Rear panel high ambient temperature (select models only)	Warning - The ambient temperature is higher than the set ambient limit. Lower ambient temperature.
E C	External remote control active, Chiller in standby (for units with remote control by 12 VDC option) (select models only)	Normal — Unit idle until remotely activated.
E-C	External remote control active, Chiller in standby Only appears when Chiller is equipped for remote control using a dry contact) (select models only)	Normal — Unit idle until remotely activated.
EFL	Low fluid level warning / alarm (for units with optional float switch) (select models only)	Warning/Alarm — Fluid level is too low. An alarm will sound once every 8 seconds for 5 occurrences. If the fluid level has not been raised 8 seconds after the fifth alarm, the unit will shut down.
EHA	Front panel high ambient temperature warning.	Warning - The ambient temperature is higher than the set ambient limit. Lower ambient temperature or raise temperature limit. Ensure that air flow is not blocked or limited by chiller location. Check/replace air filter, clean condenser. Verify that fan motor is functional.
EHL	High temperature set point warning	Warning — The temperature set point is higher than the high temperature limit value. If not corrected, the high temperature limit alarm will be activated when fluid temperature rises above established the HL value. Lower temperature set point or increase high temperature limit value.
ELL	Low temperature set point warning	Warning — The temperature set point is lower than the low temperature limit value. If not corrected, the low temperature limit alarm will be activated when fluid temperature falls below the established LL value. Increase temperature set point or decrease low temperature limit value.
LLO	Local Lockout	Normal — Indicates that Local Lockout feature is enabled. Appears momentarily when Select/Set Knob is pressed to view/change set point value.
CAn	Cancel Local Lockout	Normal — Indicates the Local Lockout feature has been disabled. Appears momentarily when Local Lockout status is changed from enabled (LLO) to disabled.
LO-H2O	No fluid flow and no fluid pressure	Warning — Indicates that the Chiller did not detect any fluid flow or pressure upon startup. Unit will normally run after 5 minutes after power on. Check that fluid level is adequate and that pump is working. If no flow problem is apparent, replace PC board.

4.1 – Error Codes and Alarms (continued)

Message Code	Description	Action Required
01	Factory Reserved	None.
02	Low limit temperature alarm	Alarm — Process fluid temperature has dropped to low temperature limit value. Compressor, heater, fan, and pump turned off. Increase heat load on Chiller or decrease low temperature limit value.
03	High limit temperature alarm	Alarm — Process fluid temperature has reached high temperature limit value. Compressor, heater, fan, and pump turned off. Decrease heat load on Chiller or increase high temperature limit value. Re-mount and insulate OTP sensor, insulate heater.
04	Over-temperature protection alarm	Alarm — Process fluid temperature is above Chiller's factory set high temperature safety cutoff. Power to compressor, heater, and fan turned off; pump remains on. Lower process temperature. Check that refrigeration system is functional.
05	Low liquid level alarm (select models only)	Delayed Alarm — Activated when the liquid level in the reservoir falls below an acceptable level for 30 seconds of longer. Compressor, heater, fan, and pump turned off. Add fluid to reservoir.
06	High bath temperature alarm	Alarm — Fluid temperature has exceeded 82°C (180°F). Compressor, heater, fan, and pump turned off. Lower fluid temperature. Check that refrigeration system is functional.
07	Low flow alarm	Alarm — Flow rate has dropped below minimum flow rate setting. Power to compressor, heater, fan, and pump turned off. Note: Disabled during first 2 minutes of operation. Correct cause of low flow rate or decrease minimum flow rate setting.
08	High pressure alarm	Delayed Alarm — Activated when fluid outlet pressure has exceeded high-pressure limit value for 30 seconds. Compressor, heater, fan, and pump turned off. Decrease outlet pressure by removing blockage or increase high-pressure limit value. Reduce pressure by using pressure bypass valve.
09	System fault	Fault — Power to compressor, heater, fan, and pump turned off. Contact service representative for corrective action.
10	Electronic power component fault (Triac)	Fault — Power to compressor, heater, fan, and pump turned off.
11	Internal probe fault	Fault — Faulty temperature probe. Power to compressor, heater, fan, and pump turned off. Contact supplier.
12	External temperature probe fault (select models only)	Fault — Faulty external temperature probe. Power to compressor, heater, fan, and pump turned off. Replace ambient tracking probe or operate instrument using internal temperature probe. Contact supplier if fault persists.
13	Communications fault	Fault — Internal electronics failure. Power to compressor, heater, fan, and pump turned off. Contact supplier.
14	ADC fault, internal probe	Fault — ADC for internal probe faulty. Power to compressor, heater, fan, and pump turned off. Contact supplier.
15	ADC fault, external probe	Fault — ADC for external probe faulty. Power to compressor, heater, fan, and pump turned off. Contact supplier.
16	Front panel high ambient temperature alarm	Alarm — Ambient temperature at front panel is higher than high ambient temperature limit. Compressor, heater, fan, and pump turned off. Occurs when the ambient temperature exceeds the set ambient limit by 5ºC or more. Lower temperature in area in which Chiller is located or increase high ambient temperature limit value. See "High Ambient Temperature Limit" Section.
17	Rear panel high ambient temperature alarm (select models only)	Alarm — Ambient temperature at rear panel is higher than high ambient temperature limit. Compressor, heater, fan, and pump turned off. Occurs when the ambient temperature exceeds the ambient limit. Lower temperature in area in which Chiller is located. Temperature limit is not adjustable.

4.2 – Unit Does Not Power On

Check for proper line voltage	Voltage fluctuations in the building can cause problems with heating. Ensure that the included line cord is firmly plugged in at both ends. Make sure that the power outlet being used provides power that matches the unit requirements. The circulator's electrical requirements are located on the serial number tag at the back of the controller.
Check that the circuit breaker and front panel power switch are set to “ON”	
Check for loose wires or pinched wires	A loose connection or pinched wire can cause intermittent problems. Check to ensure that a good connection both at the PC board and on the components exists.
Check for fault codes or alarms. Fault codes on PCB	Fault codes will show up as "ft" on the left hand side display with a numeric code on the right hand side these can be cross referenced on section 4.8 of the operator’s manual
Check for blown fuse on pcb	Chillers are equipped with two fuses one is for incoming line voltage and the other for components such as pump motor, compressor, etc.

4.3 – No Pumping or insufficient pumping

Check for proper line voltage	Voltage fluctuations in the building can cause problems with heating. Ensure that the included line cord is firmly plugged in at both ends. Make sure that the power outlet being used provides power that matches the unit requirements. The circulator's electrical requirements are located on the serial number tag at the back of the controller.
Check for loose wires or pinched wires	A loose connection or pinched wire can cause intermittent problems. Check to ensure that a good connection both at the PC board and on the components exists.
Check fluid level to make sure pump is receiving fluid.	If the chiller is not properly filled with fluid, an air pocket can form causing circulation issues or lower flow then the chiller specified at.
Check tubing size, length, and look for restrictions/pressure drops	Achieving responsive heating with external applications requires that adequate fluid flow be maintained. Distance from the recirculator and number of external devices being controlled when troubleshooting performance problems with the recirculator.
Select proper fluid for temperature requirements	When the set point is 20℃ or lower, or for units with Magnetic Drive Centrifugal pumps, an anti-freezing agent must be used. PolyScience recommends a 50/50 mix of water and additive free glycol.
Check for fault codes or alarms. Fault codes on PCB	Fault codes will show up as "ft" on the left hand side display with a numeric code on the right hand side these can be cross referenced on section 4.8 of the operator’s manual
Check for blown fuse on pcb	our chiller is equipped with two fuses one is for incoming line voltage and the other for components such as pump motor, compressor, etc.

4.4 – No Cooling or Insufficient Cooling

Check for proper line voltage	Voltage fluctuations in the building can cause problems with heating. Ensure that the included line cord is firmly plugged in at both ends. Make sure that the power outlet being used provides power that matches the unit requirements. The circulator's electrical requirements are located on the serial number tag at the back of the controller.
Check for loose wires or pinched wires	A loose connection or pinched wire can cause intermittent cooling problems. Check to ensure that a good connection both at the PC board and on the components exists.
Check for clogged air filter or condenser	A dirty air filter or condenser will restrict cool air from flowing over the compressor and condenser fins. The user should set a regular schedule of preventive maintenance to avoid this from occurring.
Check for fault codes or alarms.	Fault codes will show up as "Ft" on the left hand side display with a numeric code on the right hand side. These can be cross referenced in section 4.8 of the operator's manual
Check for blown fuse on pcb	PolyScience chillers are equipped with two fuses: one for incoming line voltage and the other for components such as pump motor, compressor, etc. Replace blown fuses as needed.
Check fluid properties	PolyScience specifications are based on tests performed with water or water/glycol at 20c ambient room temps. Fluid properties, such as viscosity, density, specific gravity, etc. can greatly effect the performance of the unit.
Check for refrigerant leaks	Sudden changes in the cooling capacity of the unit, without changes in the application, often indicate a loss of refrigerant. To distinguish between a refrigerant loss and compressor failure, listen for unusual noise from the compressor. Run the unit with no load to determine if any cooling is taking place. If there is cooling and no unusual noise from the compressor, a leak is likely.

4.5 – Triac Failure

Triac fault message appears on the display	Triac fault message appears on the display, indicating that the triac has failed or the line supply voltage has a source of extreme interference from other equipment. Plug the unit into another power source. If it still displays triac failure, a triac or triac driver needs replacement.

4.6 – External Temperature Probe Failure

Check that the probe is plugged in	Check the integrity of the external temperature probe connection to make certain that the probe has not been unplugged or that no pins have been bent or damaged

4.7– Diagnostic Mode

The Chiller incorporates a Diagnostic mode, which displays important operational information that can aid in troubleshooting. To access the Diagnostic mode, place the Circuit Breaker/Power Switch in the “Off” position and then return it to the “On” position while pressing and holding the Select/Set Knob. The diagnostic menu appears on the Pressure/Flow Rate display; the current value for the diagnostic item appears on the temperature readout. Pressing the Units/Menu Button toggles through the various Diagnostic menu items

NOTE: Diagnostic items are display values only; they cannot be changed.

NOTE: The Chiller must be set up to display temperature in °C in order to access the diagnostic mode

Menu Item	**Description**
EC	External voltage control
Ut	Upper (head) temperature
Li	Percentage of Line voltage
Ct	Chiller type
Fb	Fuse bits (remote control voltage, contact closures, etc.)
EP	External probe temperature and “---.” displayed when external probe is not installed
03 (variable numeric value)	Fluid flow rate or pressure. Temperature display shows current fluid temperature.
At	Ambient temperature at front panel

Section 5 – Wiring Diagram