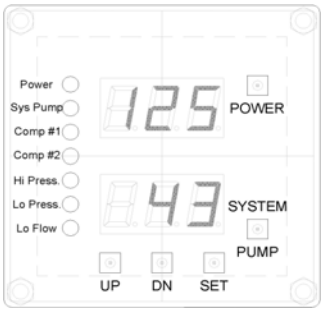
Legacy Micro Processor chiller control



Important!

Do not proceed with turning on your chiller until a qualified technician has completed the required sections of the Factory Startup Checklist located towards the back of this booklet. Failure to follow recommended startup can result in chiller damage and void your factory warranty

NOTE: PRIOR TO STARTUP, YOU MUST ACTIVATE YOUR CHILLERS WARRANTY. YOU CAN DO THIS BY CALLING 877-988-5464 OR GOING TO OUR WEBSITE AT:

http://www.legacychillers.com/warrantyactivation.asp

NOTE: TO TURN THE CONTROL OR THE SYSTEM PUMP ON, THE PROPER BUTTON NEEDS TO BE PRESSED AND HELD FOR 3-5 SECONDS.

Review: (To change the operating parameters: This mode will display the program variables and settings, allowing the user to view refrigerant operating pressures.

1. To enter the Review mode, momentarily press the "Set" key. The control will continue to run normally during the review mode.
2. Use the UP or DN key to step through each parameter.
3. There are six (6) additional parameters viewable; "Hi1", "Hi2", "Lo1", "Lo2" (refrigerant operating pressure readings) which appear first in the list, and "Hr1" and "Hr2" (compressor run hours) which appear after the "LtA" setpoint.
4. To exit the Review mode, momentarily press the "Set" key. There is no timeout to automatically exit the review mode.

Note: In the event of an alarm, the Review mode will terminate and the control and alarm settings will be active. You can re-enter the review mode during an alarm to check system temperatures and pressures by momentarily press the "Set" key.

Programming: (To change the operating parameters)

Press and hold both the "UP" and "DN" switches for 3-5 seconds to enter programming mode from the run mode. The control will continue to operate while changes are made using the existing parameters. The parameter name will be displayed on the upper numeric LED and the parameter value will be displayed on the lower numeric LED.

1. Use the UP/DN keys to change the value, use the "Set" key to keep that value and advance to the next parameter.
2. The last parameter is "Upd", which will save the settings to memory and make them the active the control parameters when the "Set" key is pressed. When the "Set" key is pressed after the "Upd" screen, the controller lights and LED's will flash momentarily, indicating the program adjustments have been updated. This also exits the programming mode.
3. If no keys are pressed after 30 seconds in any programming display, the programming mode is aborted and any changes are discarded.

The following are the parameters and the order of display when in programming mode:

"dEG"	Degrees F or degrees C
"TC "	Chiller controls on inlet or outlet fluid temperature (Inlet for non-tank models – outlet for tank model chillers)
"SP1"	Temperature setpoint for compressor #1 (limits: -40 to +99)
"SP2"	Temperature setpoint for compressor #2 (limits: -40 to +99) (requires dual compressor model)
"dF1"	Temperature differential for compressor #1 (limits: 1 to 10)
"dF2"	Temperature differential for compressor #2 (limits: 1 to 10) (requires dual compressor model)
"HP1"	High pressure setpoint for compressor #1 (limits: 200 to 490 psi)
"HP2"	High pressure setpoint for compressor #2 (limits: 200 to 490 psi) (requires dual compressor model)
"LP1"	Low pressure setpoint for compressor #1 (limits: 1 to 100 psi)
"LP2"	Low pressure setpoint for compressor #2 (limits: 1 to 100 psi) (requires dual compressor model)
"HtA"	High temperature outlet water alarm (limits: max setpoint + max differential +2)
"LtA"	Low temperature outlet water alarm (limits: min setpoint – max differential - 2)
"Upd"	Update settings to permanent memory, exits programming mode to active mode.

Alarm conditions and indications

Notes: 1. In the event of an alarm the programming mode will terminate, control and alarm settings will be active; any new settings will be discarded. 2. SP1,SP2 SHOULD NOT BE SET BELOW 45F IF YOU ARE RUNNING ONLY WATER IN THE SYSTEM. IF YOU NEED CHILLER LEAVING WATER TEMP(LWT) LOWER THAN 45F, GLYCOL OF THE DESIRED CONCENTRACTION MUST BE ADDED TO THE SYSTEM. 3. DO NOT SET LP1,LP2 LOWER THAN 54 PSI WITHOUT GLYCOL. DOING SO CAN CAUSE DAMAGE TO THE CHILLERS REFRIGERATION COMPONENTS AND VOID YOUR WARRANTY.

- ***High pressure***: If the compressor discharge pressure exceeds the high pressure setpoint the "Hi Press" led will illuminate and the "HP1" or "HP2" alarm parameter name will begin flashing in the upper numeric LED. The compressor and hot gas valve will be de-energized and the alarm relay will energize. The parameter value will be displayed in the lower numeric LED. This fault locks out the chiller function and shuts down the refrigeration circuit in the event that the high side pressure climbs to unsafe levels. On systems using air cooled condensers, this switch is set to open in the range of 380 to 400 psig with R22, R404A and R507. With R134A it will open in the range of 250 to 270 psig. On systems using water cooled condensers, this switch is set to open in the range of 340 to 350 psig with R22, R404A and R507. With R134A it will open in the range of 220 to 230 psig. The fault is cleared by momentarily pressing the **"Power"** switch after the pressure is less than the set point. Once cleared the control will attempt to function normally.

- ***Low Pressure***: If the evaporator suction pressure is less than the low pressure setpoint for more than 60 seconds, the "Lo Press" red LED will illuminate and the "LP1" or "LP2" alarm parameter name will begin flashing on the upper numeric LED. The compressor will be de-energized and the alarm relay will energize. The parameter's value will be displayed in the lower numeric LED. Factory pressure settings vary with the refrigerant used and are the equivalent of 30°F saturated suction temperature. Do not lower this setting when chilling plain water since heat exchanger freeze up and rupture may occur. **This type of failure will void any warranty on the equipment.** This setting may be lowered when using heat exchangers that have been specially designed to produce water in the range of 34° - 42°F or when a glycol/water solution is used. The exact setting is than dependent on the minimum suction temperature that the heat exchanger can operate at or the freeze point of the glycol used. This fault locks out the chiller function until a service technician corrects the fault. The fault is cleared by momentarily pressing the "**Power**" switch after the pressure is greater than the setpoint. Once cleared the control will attempt to function normally.

Alarm conditions and indications

- ***High Temperature***: If the outlet water temperature exceeds the setpoint for 10 seconds the "Hi Temp" LED will illuminate and the "HtA" alarm parameter name will flash on the upper numeric LED. The control will continue to function normally. The chiller will continue to run to cool the fluid. This alarm assists the user for temperature critical applications. The alarm relay energizes. The parameter value will be displayed in the lower numeric LED. When the outlet water temperature recovers to below the setpoint the "HtA" LED will turn off and the alarm relay de-energizes (***auto reset***). Normal run display will resume.

- ***Low Temperature***: If the outlet water temperature is less than the setpoint the "LtA" alarm parameter name will flash on the upper numeric LED. The compressor(s) will be de-energized and the alarm relay energizes. The parameter value will be displayed in the lower numeric LED. When the outlet water temperature recovers to above the set point the "LtA" LED will illuminate steadily. The fault is cleared by momentarily pressing the **"Power"** switch after the temperature is greater than the reset point. Once cleared the control will attempt to function normally.

- ***Water Flow***: If the water flow drops below the point required to keep the flow switch closed, the "Lo Flow" alarm parameter name will flash on both numeric LED's and the control will de-energize the compressors and hot gas valves. The re-circulation pump remains energized. The control will automatically reset once flow is restored.

- ***Temperature Sensor:*** If the temperature sensor transmits an out of range temperature it will be perceived as bad. "Err" will begin flashing in the upper numeric LED while one of the following will be displayed on the bottom numeric LED: "tSi" for the inlet temperature sensor, and "tSo" for the outlet temperature sensor. The control will de-energize the compressors and hot gas valves and the alarm relay will energize. The re-circulation pump remains energized. The fault is cleared by momentarily pressing the **"**Power**"** switch after the error has been resolved. It will not reset automatically.

- ***Pressure Sensor***: If the voltage received from the pressure sensor(s) is < .4vdc or > 4.6vdc the pressure sensor will be perceived as bad since its normal operating parameters are .5vdc to 4.5vdc. "Err" will begin flashing in the upper numeric LED while one of the following will be displayed on the bottom numeric LED: "tL1" for compressor 1 low pressure sensor, "tL2" for compressor 2 low pressure sensor, "tH1" for compressor 1 high pressure sensor, and "tH2" for compressor 2 high pressure sensor. The compressor and hot gas valve will be de-energized and the alarm relay will energize. The fault is cleared by momentarily pressing the **"**Power**"** switch after the error has been resolved. It will not reset automatically.

Micro Fault ID's

Fault Name	Brief Description	Possible cause
HP1	High pressure circuit 1	Dirty or blocked condenser coil, fan motor is not running, refrigerant circuit is overcharged, access panel is loose or off of the chiller
HP2	High pressure circuit 2	
LP1	Low pressure circuit 1	Low water temperature, dirty evaporator, low flow rate through evaporator, low refrigerant charge, incorrect glycol concentration, liquid line solenoid is not energized
LP2	Low pressure circuit 2	
HtA	High temperature alarm	Rising outlet temperature during chiller operation indicates excessive load that the chiller can not handle.
LtA	Low temperature alarm	Chiller set point is lower than temperature alarm setpoint, chiller temperature control is set on outlet instead of inlet (for chillers without a reservoir tank), incorrect glycol concentration
Low Flow	Low evaporator flow	Pump failure, dirty or blocked filter or strainer, dirty or blocked evaporator, flow switch needs adjustment
Err tSi	Inlet temperature sensor	Check sensor connections at the back of microprocessor, cable and sensor probe.
Err tS0	Outlet temperature sensor	Check sensor connections at the back of microprocessor, cable and sensor probe.
Err tL1	Pressure transducer (lowside) stage one	Stage one (lowside) pressure transducer is not working properly. Check sensor connections at the back of microprocessor, cable and sensor probe.
Err tL2	Pressure transducer (lowside) stage two	**Dual Stage chillers only:** Stage two (lowside) pressure transducer is not working properly. Check sensor connections at the back of microprocessor, cable and sensor probe
Err tH1	Pressure transducer (Highside) stage one	Stage one (Highside) pressure transducer is not working properly. Check sensor connections at the back of microprocessor, cable and sensor probe.
Err tH2	Pressure transducer (Highside) stage one	**Dual Stage chillers only:** Stage two (Highside) pressure transducer is not working properly. Check sensor connections at the back of microprocessor, cable and sensor probe.

Factory micro-processor presets

DEG	TC	SP1, SP2	DIF1,DIF2	HP1,HP2	LP1,LP2	HTA,LTA
F	**IN = tankless chillers Out = tank chillers**	**50F**	**02F**	**375 PSI**	**54 PSI**	**60F, 40F**

- Refrigeration grade glycol should ALWAYS be used if the chiller has the potential to be exposed to ambient temperatures below 32F OR if the end-user of the chiller desires chiller leaving water colder than 45F. Glycol concentrations should be carefully measured as per the glycol manufactures recommendations. Before changing the factory presets above you MUST confirm your freeze point. **For a complete description on proper setup for glycol operation go the http:// www.LegacyChillers.com/kb/default.asp search for article "Glycol - Adding to chiller loop".**
- LP1,Lp2 setpoint(s) for glycol = Confirmed freeze point + 10F converted to refrigerant pressure.