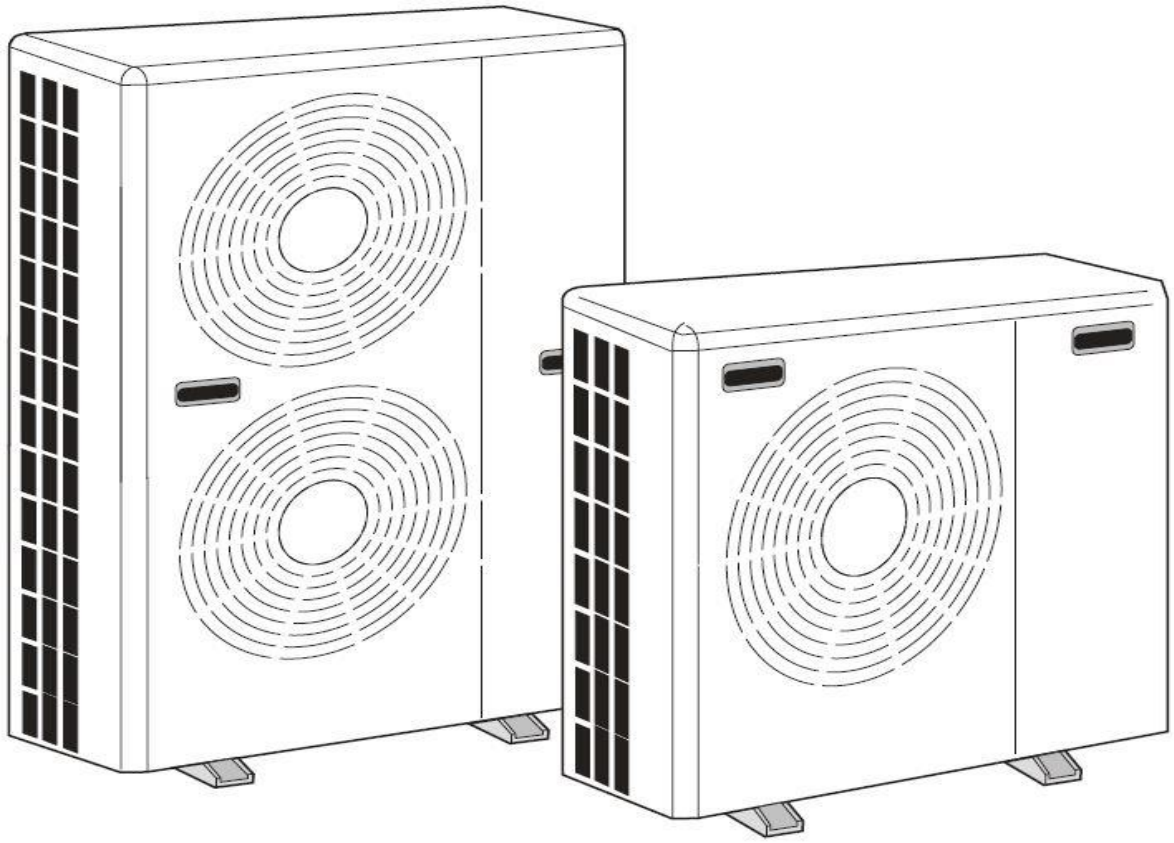
DC INVERTER

# AIR TO WATER HEAT PUMP

**For Use with units shipped after 10-12-2018**
**(If unsure, contact Chiltrix technical support dept. with the serial number)**

## Installation and Operation Manual CX34-2
## Options for Heating, Cooling and Domestic Hot Water



Version 1.8

**Table of Contents**

IMPORTANT NOTE – MAKE SURE TO PROVIDE YOUR DESIGN DRAWING FOR APPROVAL BEFORE GETTING STARTED, INCLUDING DESIRED OPERATING TEMPERATURES.

# Safety Precautions

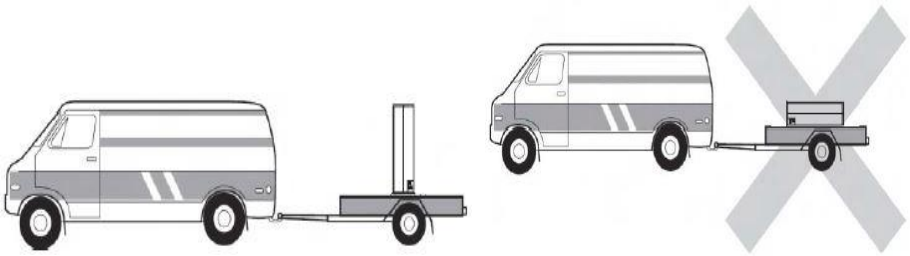
**NOTE: It is required to read the Safety precautions in detail before operation. The precautions listed below are very important for safety, please follow all safety precautions.**

## General

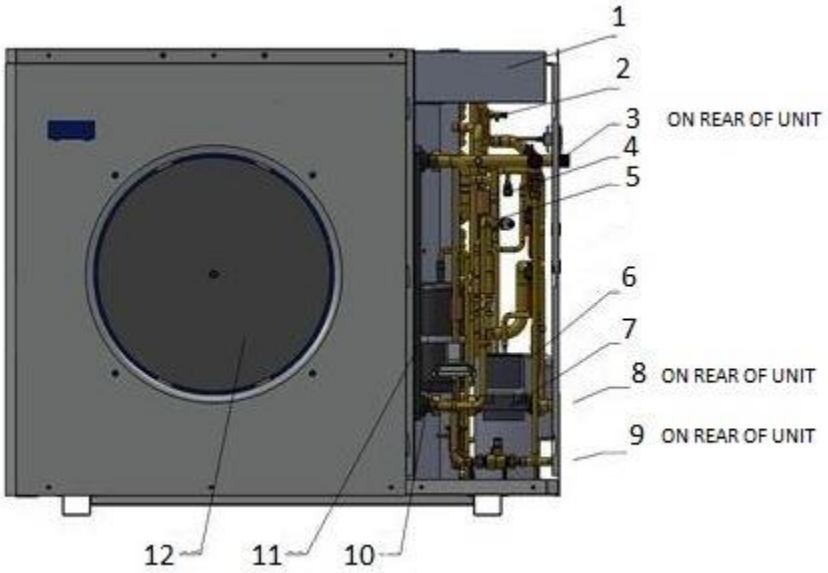
- Make sure that the ground wire in the building is securely connected to earth.
  Wiring tasks should be carried out by qualified electricians only, in addition, they should check the safety conditions of power utilization, for example, verify that the line capacity is adequate, and the power cable isn't damaged.
- Users must not install, repair or relocate the unit. Improper procedures might lead to accidents e.g. personal injury caused by fire, electrical shock or unit's falling off its base, and water leaking into the machine. Please contact a professional service department if problems arise.
- The unit shall not be installed at a spot with the potential hazard of leaking flammable gas. If gas is leaking near the machine, there might be the risk of explosion.
- Make sure that the foundation of the unit is stable. If the foundation is unstable, the outdoor unit may come loose from its base and cause injury.
- Make sure that the GFCI installed at the service panel is working properly to avoid shock or fires.
- If any abnormity occurs in the unit (such as a burning smell is noticed inside the unit), cut off the power supply immediately, and contact a professional service department.
- Please observe the follow items when cleaning the unit. Before cleaning, shut off the electric supply of the unit first to avoid injuries caused by the fan operation.
- Do not rinse the unit with water because the rinsed unit may cause electric shock.
- Make sure to shut off the electric supply before maintaining the unit.
- Please do not insert fingers or sticks into air outlet or air inlet.

## Transporting and storage

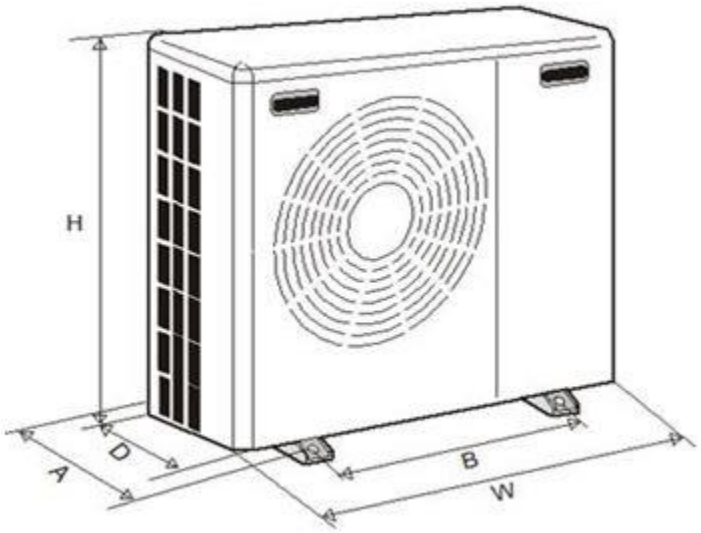
- The machine must be transported and stored vertically.



## CX34 Components



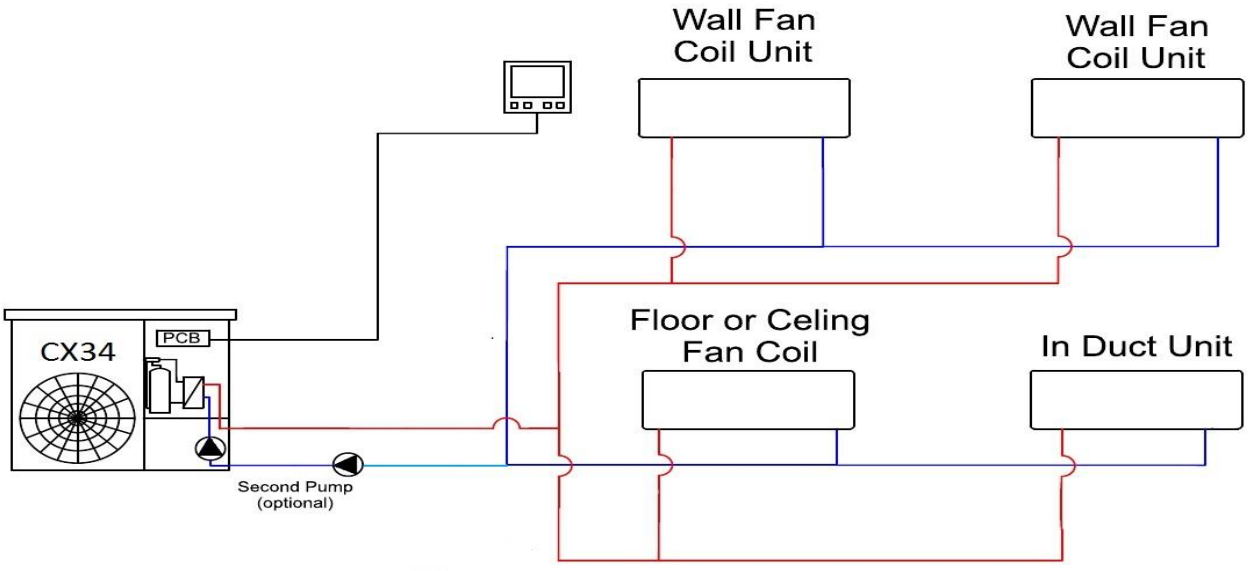

| Position | Component | Position | Component |
|---|---|---|---|
| 1 | Electronics Box | 7 | Water Pump |
| 2 | Air Discharge Valve | 8 | Heat Pump Inlet |
| 3 | Heat Pump Outlet | 9 | Plate H.E. Drain |
| 4 | Needle Valve | 10 | Accumulator |
| 5 | 4 Way Valve | 11 | Plate Heat exchanger |
| 6 | Compressor | 12 | Fan |




| | |
|---|---|
| W | 44" |
| D | 16.75" |
| H | 38" |
| A | 17.5" |
| B | 29.5" |

## Hydronic Piping and Design Guide

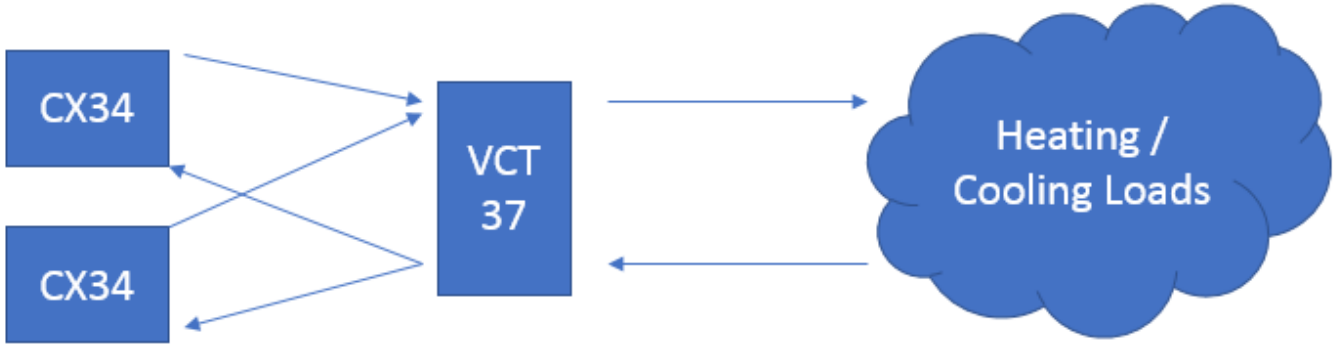
**Installation Methods Heating and Cooling (Heating Shown)**
**Note: <u>Primary Secondary Piping</u> or Closely Spaced Tees are NOT supported recommended for use with this chiller. A buffer tank must be used for radiant heating. An "additional volume" tank must be used when there is less than 15 gallons of total system fluid volume.**



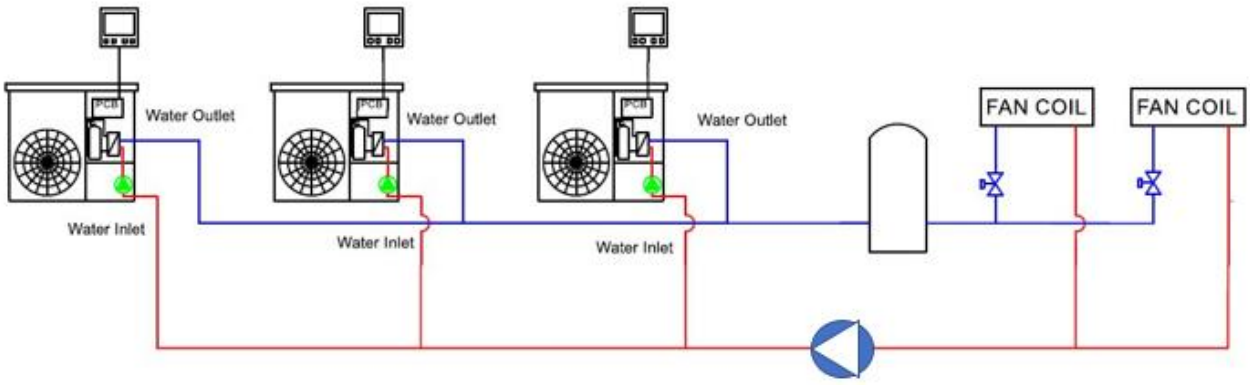

1. Minimum pipe size should be no less than 1”, CPVC or Oxygen Barrier PEX, reverse return piping is preferable to eliminate balancing valves or pressure regulators. The installer should calculate the pipe and fitting resistance to determine the head pressure. See the examples on the following pages, maximum water flow for the CX34 is 6 gpm, design flow is 4.8 gpm. If necessary, a second PWM pump may be added to the loop and controlled by the CX34. The second water pump connections are always in parallel with the internal pump.
2. The loop example above is designed with wild coils. Water flows through the coil at all times, if there is a call for heating or cooling the FCU controls will turn the fan on.
3. An air discharge valve should be installed at the top of the circulation system if possible for easy air discharge. As an alternative an automatic/manual air vent can be used inline before the pumps.
4. Always install a water filter or wye strainer on the supply pipe to the chiller to prevent blockage of the heat exchanger.
5. Do not use CPVC if glycol percentage will be above 25%.

## Piping Examples: Stacked Chillers

## Preferred Method For 2 or 3 Units:

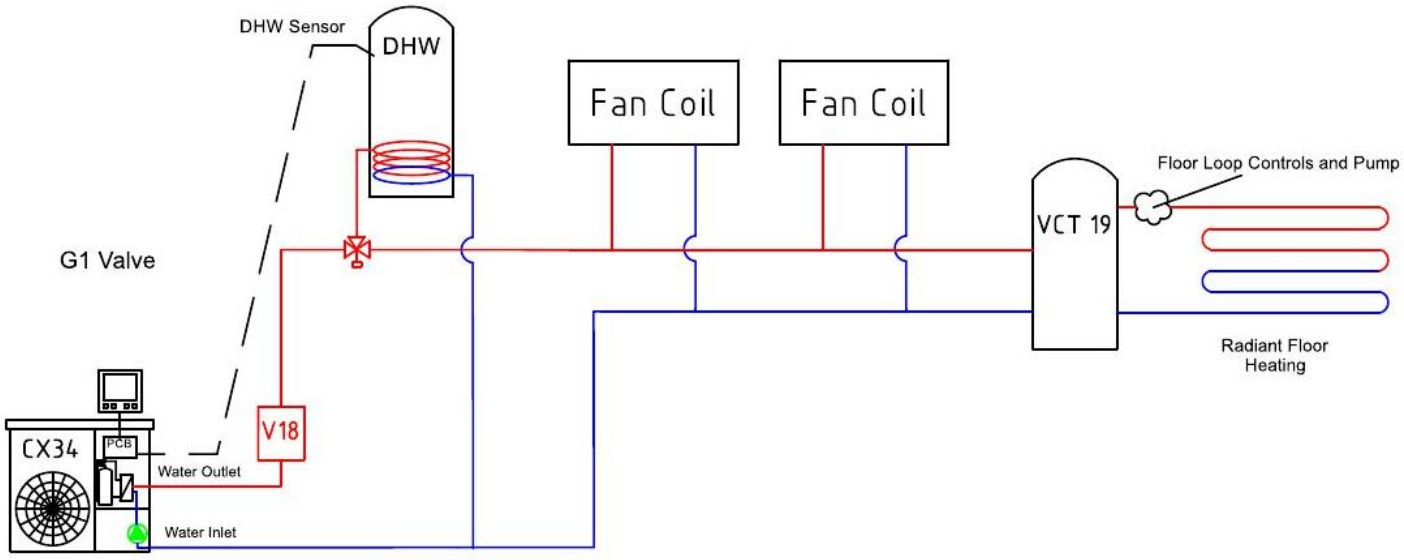



## Chillers piped in parallel:



# Using a Buffer Tank w/ Radiant

Example below shows optional DHW, optional V18 backup heater, fan coils, and radiant. The radiant is attached to the load side of a buffer tank. For V18 information please see the V18 Manual available on the Chiltrix website documents page.




**Primary / secondary piping is not supported, when connecting to a floor heating loop always use a buffer tank. Buffer tanks are generally used only with floor heating.**

**IMPORTANT NOTE ABOUT BACKUP HEAT**

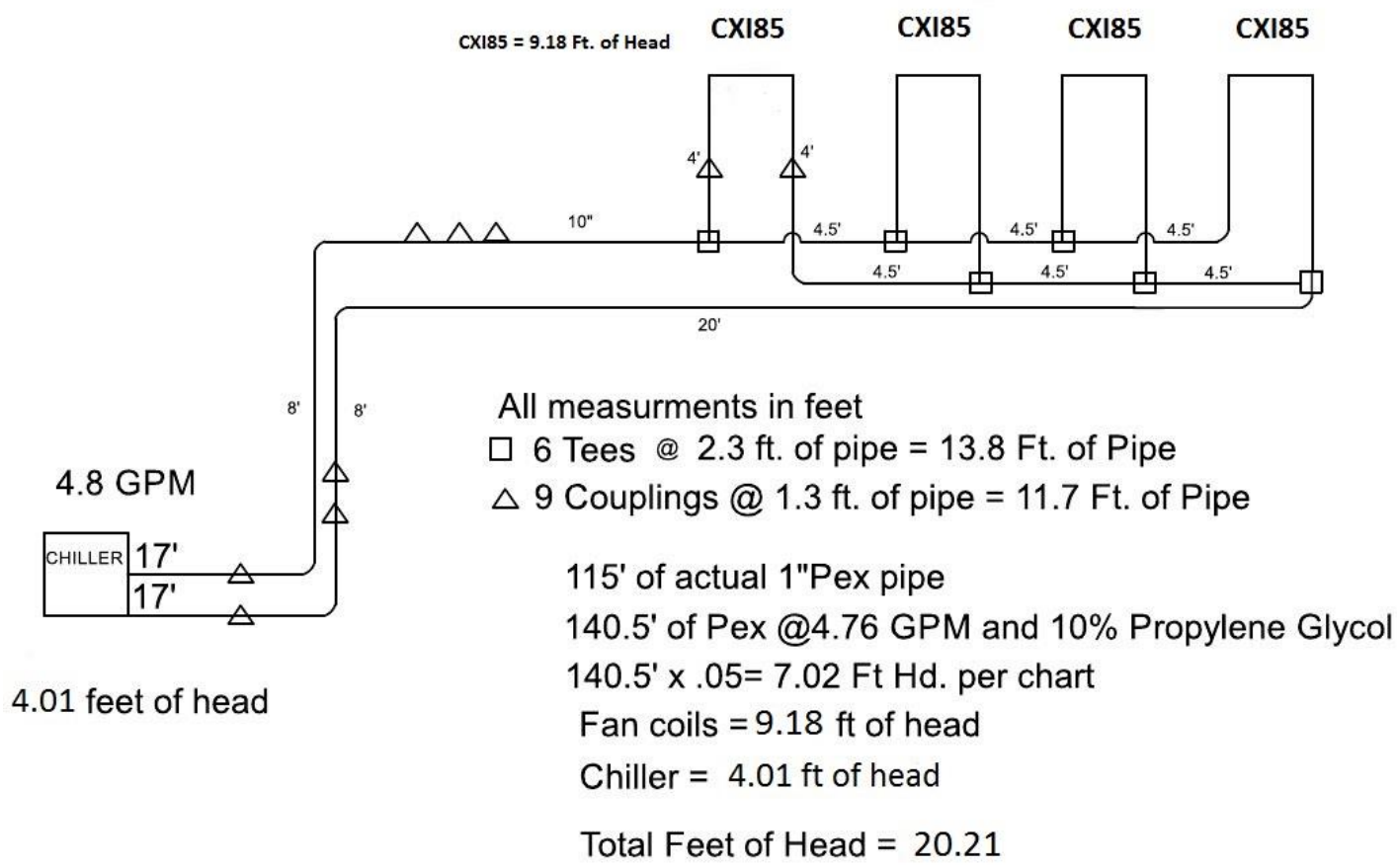
**Do not use buffer tanks for backup heat. The element capabilities of the buffer tank are for emergency heat only. Contact Chiltrix with any questions about emergency or backup heat options.**

The pump in the buffer tank drawing is controlled by the customer's floor loop controls. A 15-20 gallon buffer tank is used generally for best performance with a single CX34. 35-50 gallons is used for two or three CX34s combined. A G3 seasonal valve may be used to isolate the tank in cooling mode.

See more designs here:
https://www.chiltrix.com/documents/chiller-options.pdf

**PLEASE SEND YOUR PROPOSED FINAL DESIGN TO CHILTRIX SUPPORT DEPARTMENT FOR COMMENTS & SUGGESTIONS**

## Head Calculation Example:




To calculate the head pressure for the correct water flow, the pipe length must be measured and all fittings counted. It is advisable to use flexible red oxygen barrier PEX piping to avoid as many elbows as possible. All fittings have an equivalent length of pipe already calculated, available on the next page under PEX Fittings Pressure Drops. Add up the equivalent length of pipe for the fittings, 13.8’ + 11.7’ =25.5’. Then, add this to the actual pipe, 25.5’+115” = 140.5’ of 1” pipe. Once you know the total length of pipe, use a (1” PEX 10% Glycol, feet of head per 100 feet of tubing chart), to get the head for 1’ of pipe, at 40°F and 4.76 GPM. This comes to (.0500) feet of head per foot. 140.5 x .0500=7.02 ft. of head. Add up all head calculations, 7.02 + 9.18 + 4.01 = 20.21 ft. of head. Next we will look at the Wilo Pump curve on page 13. Maximum head at 4.76 GPM is 23.67 ft.

If using the CX30SE (Free Cooling option) the CX30SE’s pressure drop is 4.5 PSI when active.

## Notes:

The example loop above has a volume of 4.5 gallons. The internal thermal expansion tank is 2 liters or .52 Gallons. The volume of the CX34 is 4.5 liters. An additional thermal expansion tank may be required for larger loops. There are many thermal expansion calculators on the internet, the following is an example. http://westank.com/calculator/

Minimum loop pressure is 14.5 psi, maximum pressure is 43.5 psi, and ideal pressure is 29 psi. The lowest temperature is 44°F, the highest temperature is 131°F, the Initial pressure is 14.5 psi, and the final pressure is 29 psi.

A microbubble air separator should be installed in the loop preferably in the higher part of the loop to remove any air in the circulation loop.

Always install a water filter or wye strainer on the supply pipe to the chiller to prevent blockage of the heat exchanger.

| Nominal size | OD | Wall thickness | ID | Voulme gal/100' |
|---|---|---|---|---|
| 3/8" | 0.500 | 0.070 | 0.350 | 0.50 |
| 1/2" | 0.625 | 0.070 | 0.475 | 0.92 |
| 5/8" | 0.750 | 0.083 | 0.574 | 1.34 |
| 3/4" | 0.875 | 0.097 | 0.677 | 1.83 |
| 1" | 1.125 | 0.125 | 0.863 | 3.03 |

**PEX PIPE VOLUME**

**WYE STRAINER (from supplyHouse.com)**

Watts AS-MB
Microbubble Air Separator

## PEX Fittings Pressure Drops

**PEX Brass Crimp Fittings**
**Friction Loss - Equivalent Feet of PEX Tubing**

| Size | Coupling | Elbow | Tee Run | Tee Branch |
|---|---|---|---|---|
| 3/8" | 2.9 | 9.2 | 2.9 | 9.4 |
| 1/2" | 2.0 | 9.4 | 2.2 | 10.4 |
| 3/4" | 0.6 | 9.4 | 1.9 | 8.9 |
| 1" | 1.3 | 10.0 | 2.3 | 11.0 |

## Freeze protection

| Vol% Propylene Glycol | Wt% Propylene Glycol | Freezing Point °F | Freezing Point °C | Burst Point °F | Burst Point °C |
|---|---|---|---|---|---|
| 0 | 0 | 32 | 0.0 | 32 | 0.0 |
| 5 | 5.2 | 29 | -1.7 | 27 | -2.7 |
| 10 | 10.5 | 26 | -3.3 | 22 | -5.6 |
| 15 | 15.6 | 23 | -5.0 | 18 | -7.5 |
| 20 | 20.8 | 19 | -7.2 | 11 | -11.8 |
| 21 | 21.8 | 17 | -8.3 | 9 | -12.9 |
| 22 | 22.9 | 17 | -8.3 | 7 | -14.2 |
| 23 | 23.9 | 16 | -8.9 | 4 | -15.5 |
| 24 | 24.9 | 15 | -9.4 | 2 | -16.9 |
| 25 | 25.9 | 14 | -10.1 | -1 | -18.4 |
| 26 | 27.0 | 13 | -10.6 | -4 | -20.1 |
| 27 | 28.0 | 12 | -11.1 | -7 | -21.8 |
| 28 | 29.0 | 10 | -12.2 | -10 | -23.6 |
| 29 | 30.1 | 9 | -12.8 | -14 | -25.5 |
| 30 | 31.1 | 8 | -13.3 | -18 | -27.5 |
| 31 | 32.1 | 7 | -13.9 | -21 | -29.6 |
| 32 | 33.1 | 5 | -15.0 | -24 | -31.1 |
| 33 | 34.1 | 4 | -15.6 | -30 | -34.4 |
| 34 | 35.1 | 2 | -16.7 | -38 | -38.9 |
| 35 | 36.1 | 1 | -17.2 | -46 | -43.3 |
| 36 | 37.2 | -1 | -18.3 | -53 | -47.2 |
| 37 | 38.2 | -3 | -19.4 | -60 | -51.1 |
| 38 | 39.2 | -4 | -20.0 | -60 | -51.1 |
| 39 | 40.2 | -6 | -21.1 | -60 | -51.1 |
| 40 | 41.2 | -8 | -22.2 | -60 | -51.1 |
| 41 | 42.2 | -10 | -23.3 | -60 | -51.1 |

| Vol% Propylene Glycol | Wt% Propylene Glycol | Freezing Point °F | Freezing Point °C | Burst Point °F | Burst Point °C |
|---|---|---|---|---|---|
| 42 | 43.2 | -12 | -24.4 | -60 | -51.1 |
| 43 | 44.2 | -14 | -25.5 | -60 | -51.1 |
| 44 | 45.2 | -16 | -26.7 | -60 | -51.1 |
| 45 | 46.2 | -18 | -27.8 | -60 | -51.1 |
| 46 | 47.2 | -21 | -29.4 | -60 | -51.1 |
| 47 | 48.2 | -23 | -30.6 | -60 | -51.1 |
| 48 | 49.2 | -26 | -32.2 | -60 | -51.1 |
| 49 | 50.2 | -28 | -33.3 | -60 | -51.1 |
| 50 | 51.2 | -31 | -35.0 | -60 | -51.1 |

**NOTE:**

When using **CPVC piping** it is highly recommended that you do not exceed a 25% glycol to water ratio. Environmental Stress Cracking, also referred to as ESC, may occur.

**Required flow per ton for various glycol % changes with the glycol %.**
Cooling is generally OK as you will see but pay attention to heating. Note the “500” formula is adjusted as follows:
Cooling is generally OK as you will see but pay attention to heating. Note using the “500” formula 500 X GPM X ΔT = BTU, is adjusted as follows:

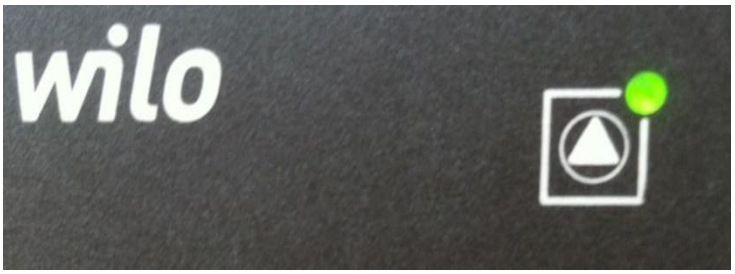
| | COOLING | HEATING |
|---|---|---|
| 0% glycol use 500 x 1.0 | (500) 24,000/500/10=4.8 | 33,000/500/10=6.6 GPM |
| 10% glycol use 500 x .98 | (490) 24,000/490/10=4.89 GPM | 33,000/490/10=6.73 GPM |
| 20% glycol use 500 x .96 | (480) 24,000/480/10=5.00 GPM | 33,000/480/10=6.87 GPM |
| 30% glycol use 500 x .935 | (467) 24,000/467/10=5.14 GPM | 33,000/467/10=7.06 GPM |
| 40% glycol use 500 x .895 | (447) 24,000/447/10=5.36 GPM | 33,000/447/10=7.38 GPM |
| 50% glycol use 500 x .85 | (425) 24,000/425/10=5.64 GPM | 33,000/425/10=7.76 GPM |

Example:
Flow needed per ton cooling:
2 tons: 0% glycol 2.4 GPM/ton (4.8 GPM total)
2 tons: 30% glycol 2.57 GPM/ton (5.14 GPM total)

Flow needed per ton heating:
2.75 tons: pure water 2.4 GPM/ton (6.6 GPM total)
2.75 tons: 30% glycol 2.57 GPM/ton (7.06 GPM)
In the above example (and using Wilo head curve) you can see that head can be max 22 ft. for CX34 to deliver full heating capacity with 30% glycol. The CX34 unit adds 6 ft. head leaving net usable head of 16 ft. A booster pump may be needed for non-optimal designs, longer piping distances, complex or larger systems.

## Internal CX34 WILO Pump

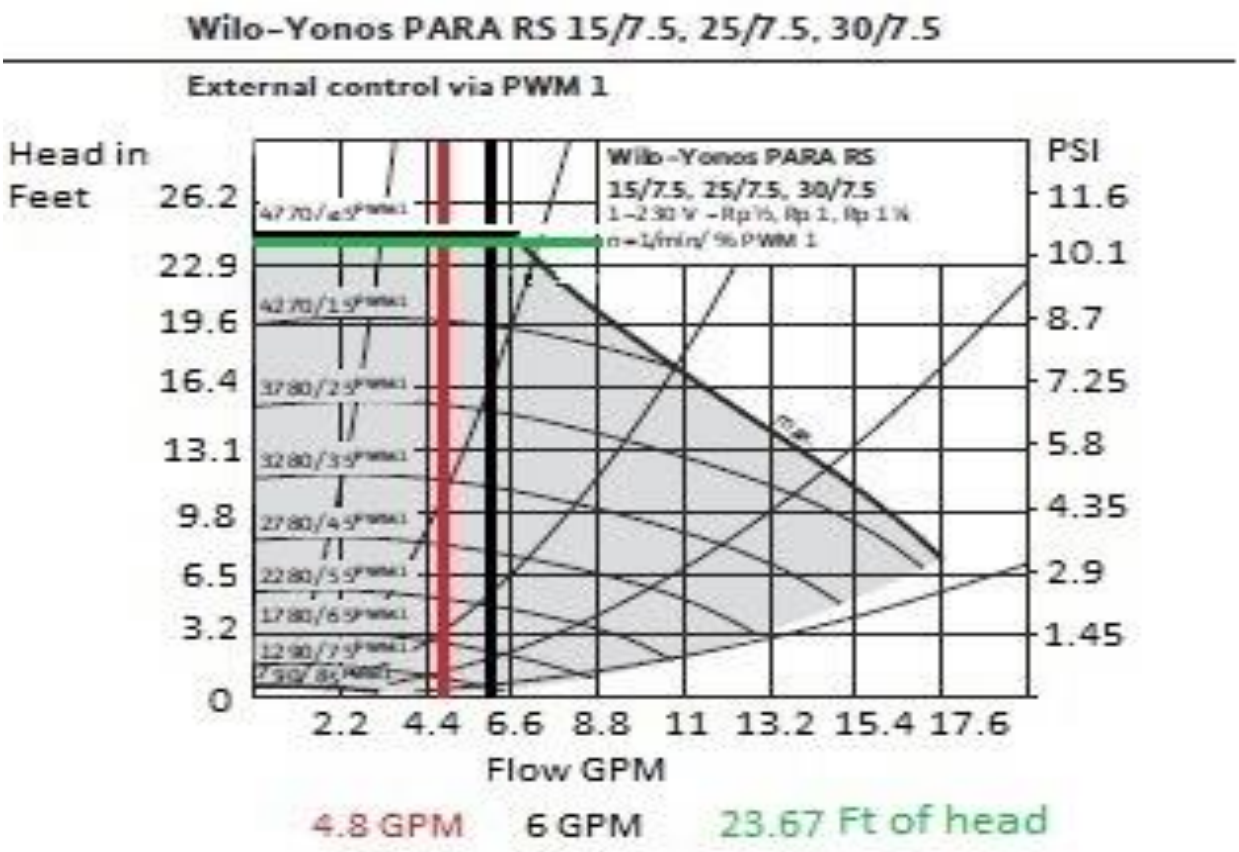
| LED | Meaning | Diagnostic | Cause | Remedy |
|---|---|---|---|---|
| On-Green | Pump in Operation | Pump is Running | Normal Operation | |
| Green Flashing | PWM Model | Pump in Standby | Normal Operation | |
| Blinks Red/Green | Pump is Functional but has stopped | Pump will restart after fault is cleared | Under Voltage < 160 vac | Check Power supply 195 vac – 253 vac |
| | | | Pump Over heating | |
| Blinks Red | Pump is not Functional | Pump Stopped | Pump will not start due to a permanent failure | Replace Pump |
| LED Off | No Power | No Voltage to Electronics | Pump Has no Power | Check Cable Connections |
| | | | Led is Damaged | Check if the Pump is Running |
| | | | Electronics are damaged | Replace Pump |




Minimun pump speed can be set at P53, minimun speed should not be lower than 40%.

Pump speed can be monitored at C48, 1 is lowest and 10 is highest speed.

Actual water flow can now be monitored on the desktop and at C13, liters per miniute.




Pump Specifications
Voltage AC 1-230, 50-60 Hz
Power consumption 4-75 Watts
Speed 800-4770 RPM
Max Head 25 ft
Max Flow 15 GPM

# Pipe Insulation

All loop piping must be insulated per local and national mechanical codes.
For design tips and a thickness calculator please visit http://www.armacell.us/knowledge-center/

**NOTE: The CX34 is shipped with the pump in a separate box attached to the top of the chiller. Please follow the directions below to install the "C4" internal pump.**

# Heat Pump Installation

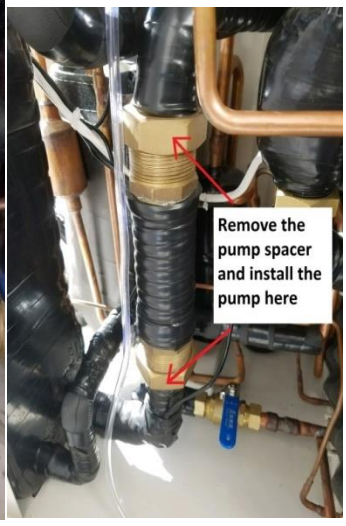
## Installation position

**Note:** ***Installation must be carried out by professional personnel.***

1. The recommended mounting pad should be 1" to 1 ½" above ground level.
2. Proper drainage is required at each outdoor unit to avoid flooding the outdoor unit.
3. To install the unit on a balcony or on top of a building, the installation site must meet the allowable bearing capacity of the building structure without affecting the structural safety.
4. Ensure the unit is well ventilated; the direction of air exhaust should be kept away from the windows of neighboring buildings. Adequate service clearance should be kept around the unit.
5. The unit should not be installed in places accompanied with oil, inflammable gases; corrosive components e.g. sulfur compound, or high-frequency equipment.

**Internal pump installation (Remove Top, Front, and Right Side Covers) DO NOT bend or stress the piping, this may case a broken joint or leak where it joins the heat exchanger.**


Peel back the insulation

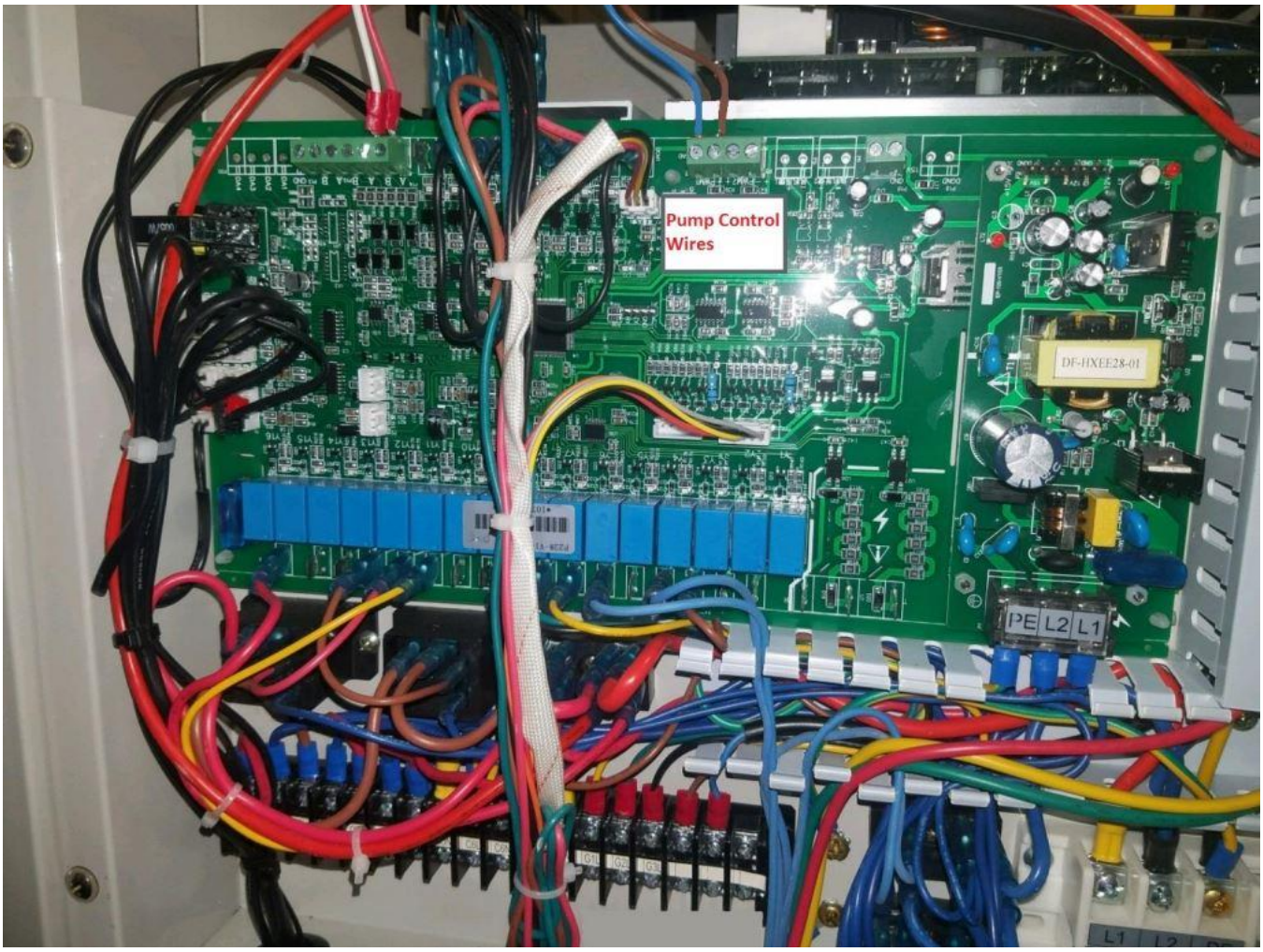



Removing the shipping spacer


Verify flow direction (UP)

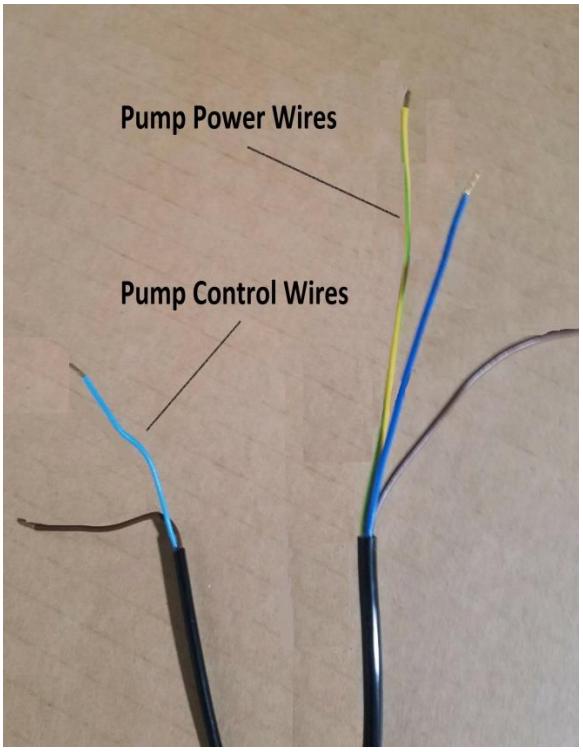

Installed properly

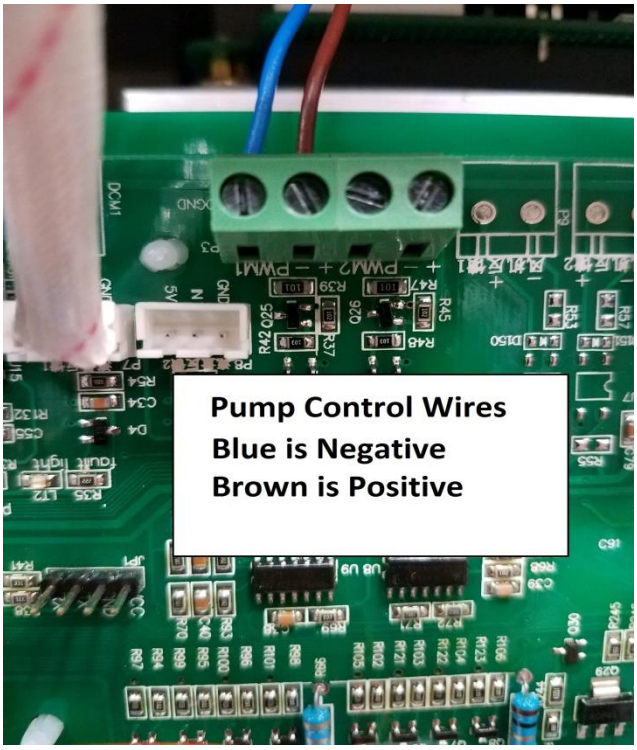
## Internal Pump Wiring



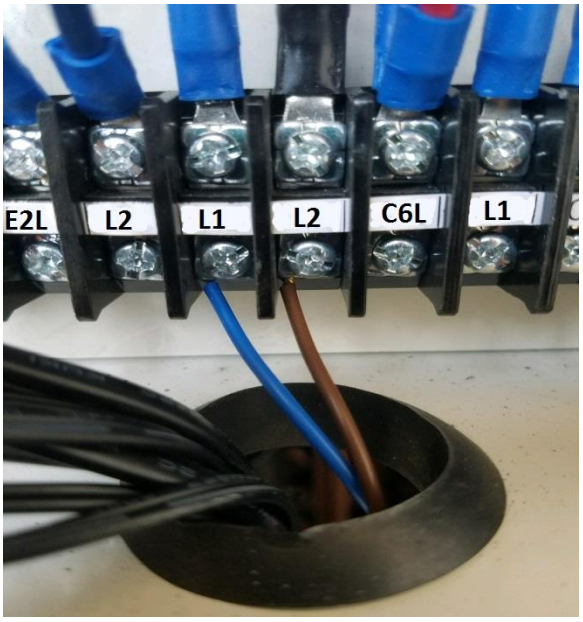

Electronics cabinet

If the Wilo RS 25/7.5 PWM pump does not have the required pressure at the targeted flow rate, a second Wilo RS 25/7.5 may be added to increase the total pump pressure. This will double the head pressure at the targeted flow rate. When adding a booster pump wire both power and control wires in parallel with the internal Wilo pump wiring. Use the same terminals. See diagrams below.

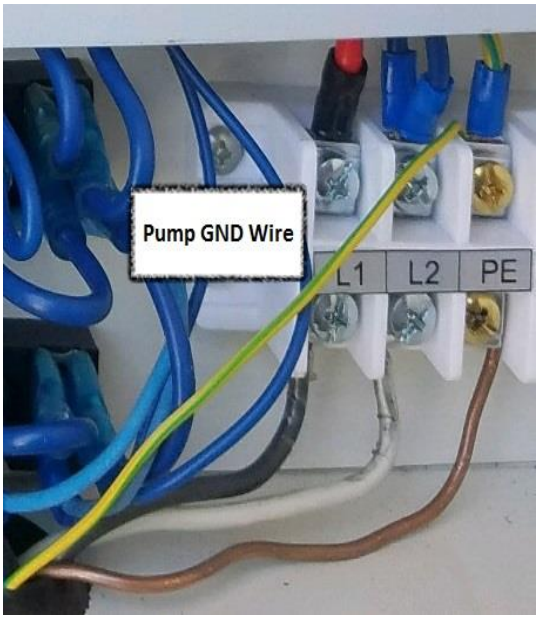



The blue and brown pump **CONTROL WIRES** are connected to the (+ & -) on the PWM1 terminal connector at the top or the main control pcb.



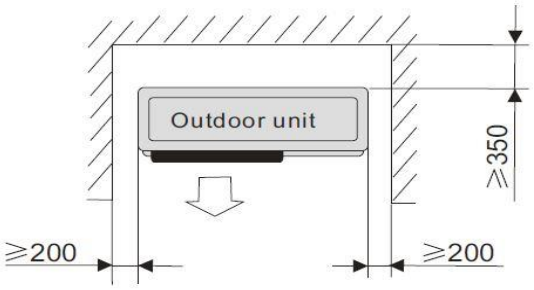

Pump **POWER** wires.



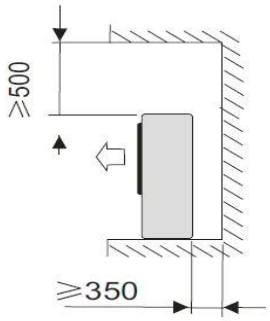

Pump **GROUND** wire.

## Clearances (unit: mm) 200mm = 8” , 350mm =14 “, 400=16”, 500=20”,1000=40”

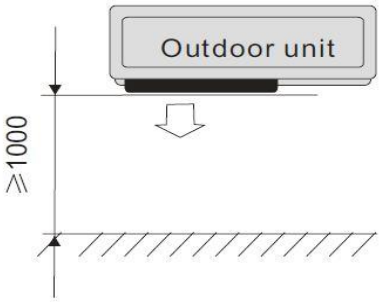
**No obstacle in front of the unit**



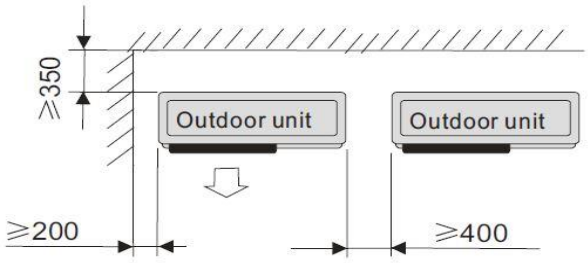

**Obstacle above the unit**

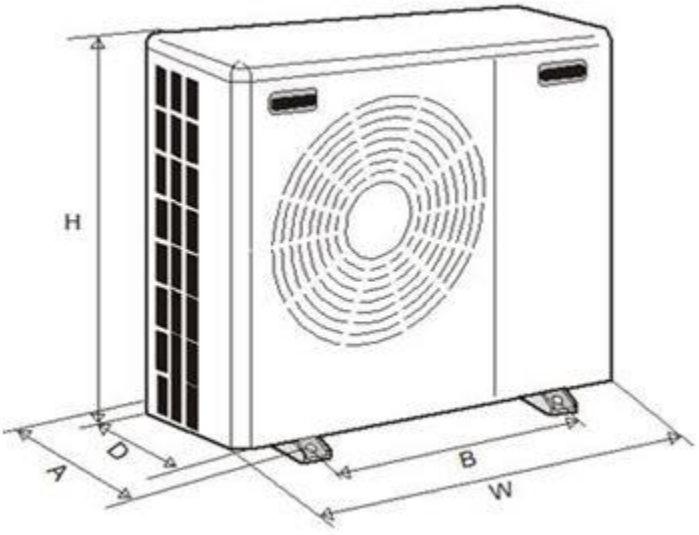



**Obstacle in front of the unit**




**Several units in a row**




| | |
|---|---|
| W | 44" |
| D | 16.75" |
| H | 38" |
| A | 17.5" |
| B | 29.5" |

## Electric connection

### General

***Note!***

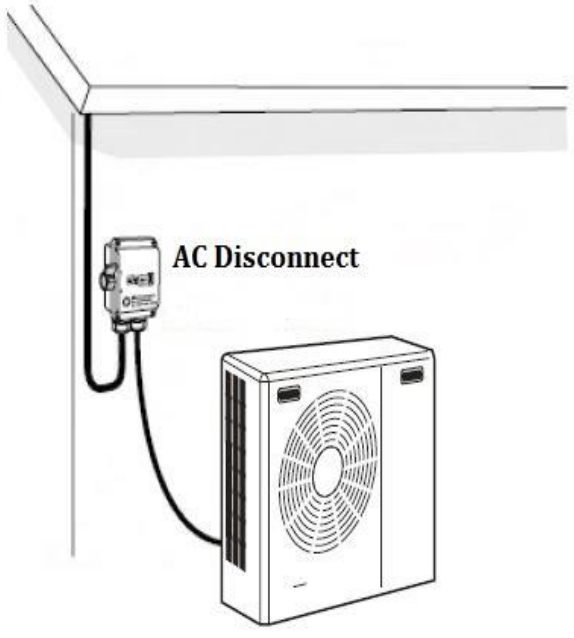
***Electrical installation and service must be carried out under the supervision of a qualified electrician. Electrical installation and wiring must be carried out in accordance with the NEC.***

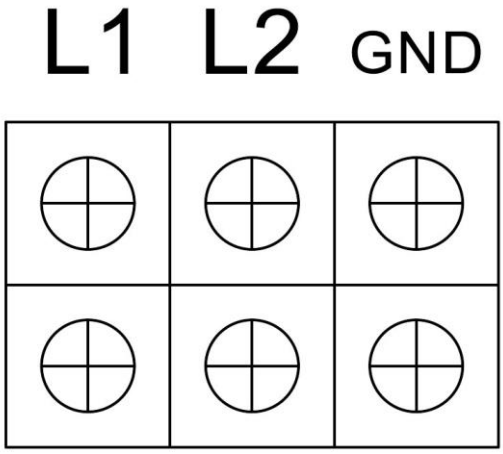
The heat pump must not be connected without the permission of the electricity supplier and must be connected under the supervision of a qualified electrician. Wires, spare parts and materials etc. must satisfy the relevant standards issued by the host country or region.
The heat pump does not include an AC disconnect or switch on the incoming electrical supply. The power supply cable must be connected to a circuit-breaker with at least a 3 mm breaking gap. Incoming supply must comply with the technical requirements, with a frame ground wire (neutral is not used), via a distribution box with breakers.

**Voltage range is 208-240vac**

**Maximum current draw is 13 amps, minimum wire size is 12 AWG, minimum breaker size is 20 AMP.**

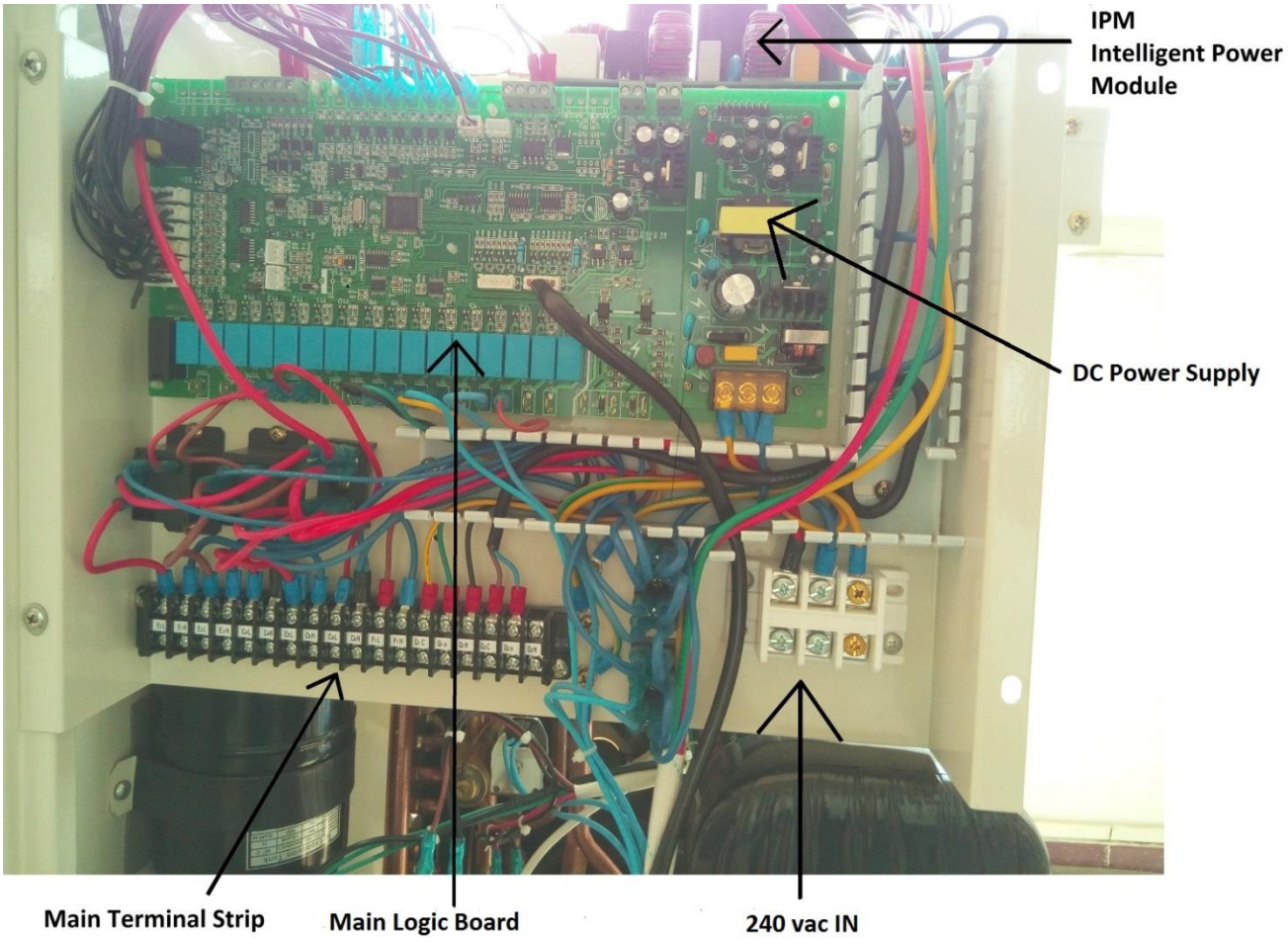
# It is advisable to add surge suppression and transient voltage protection to the circuit powering the chiller.



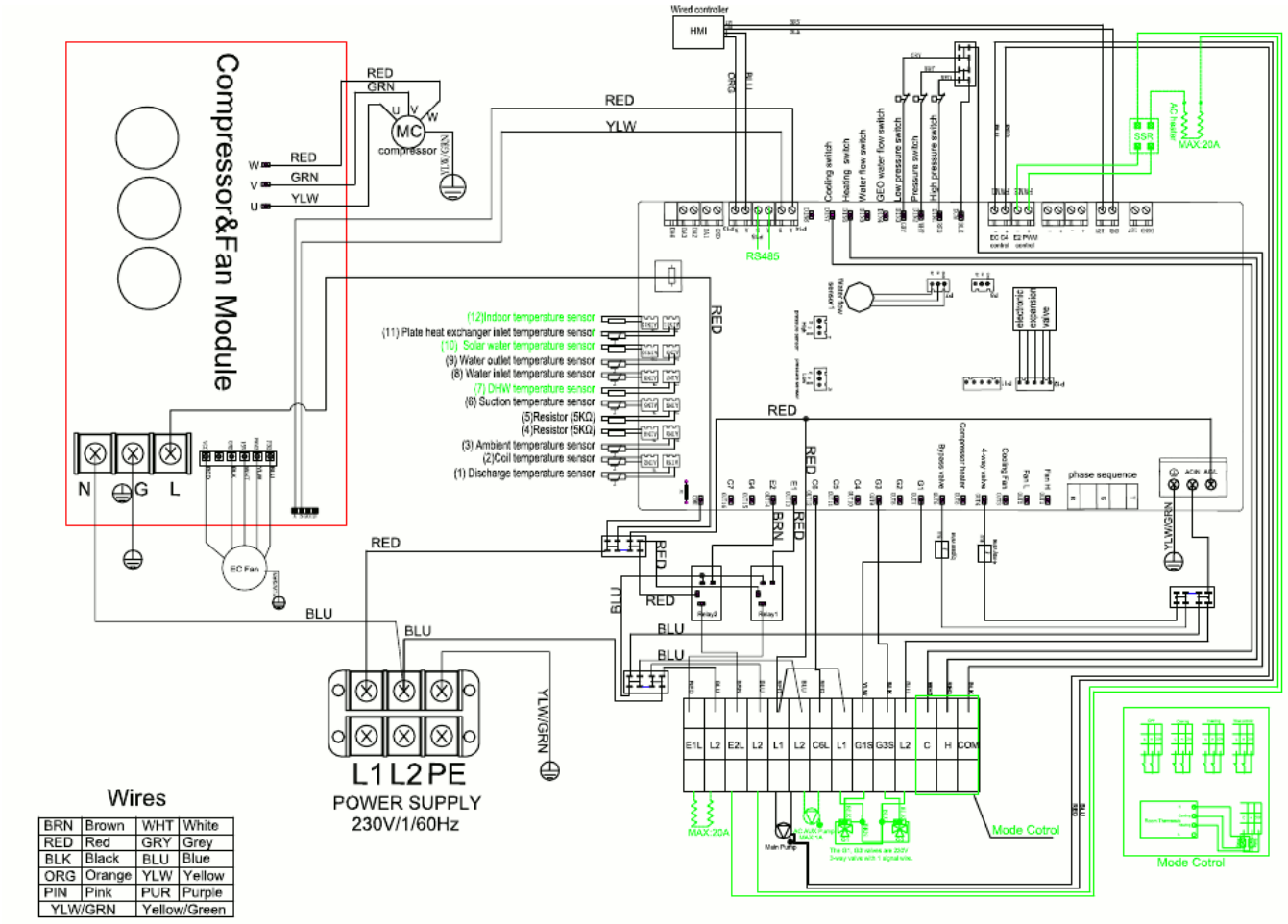




Main terminal block inside electronics box

# Electric Connections and Component Locator



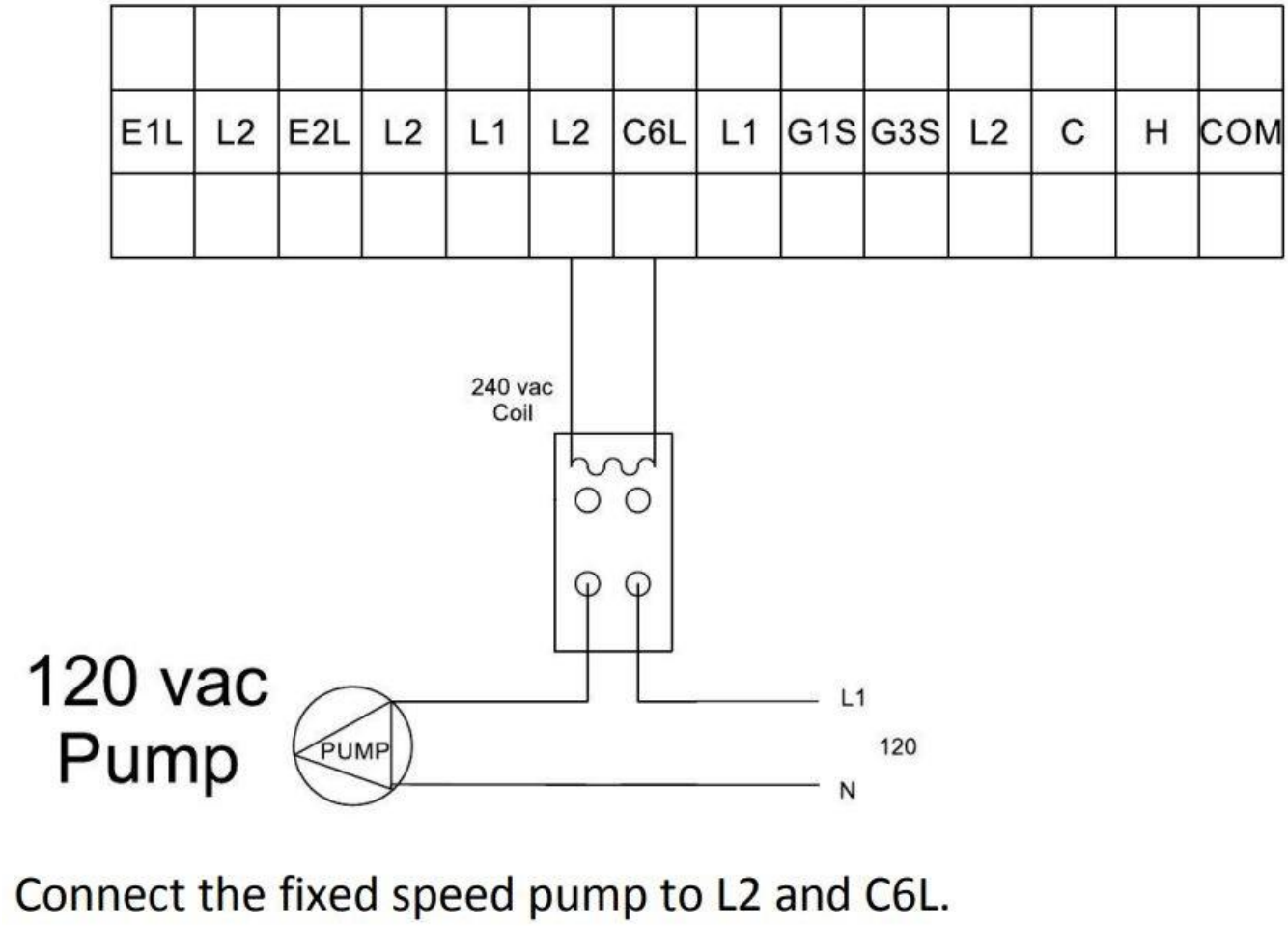
## CX34 System Wiring Diagram




Wires

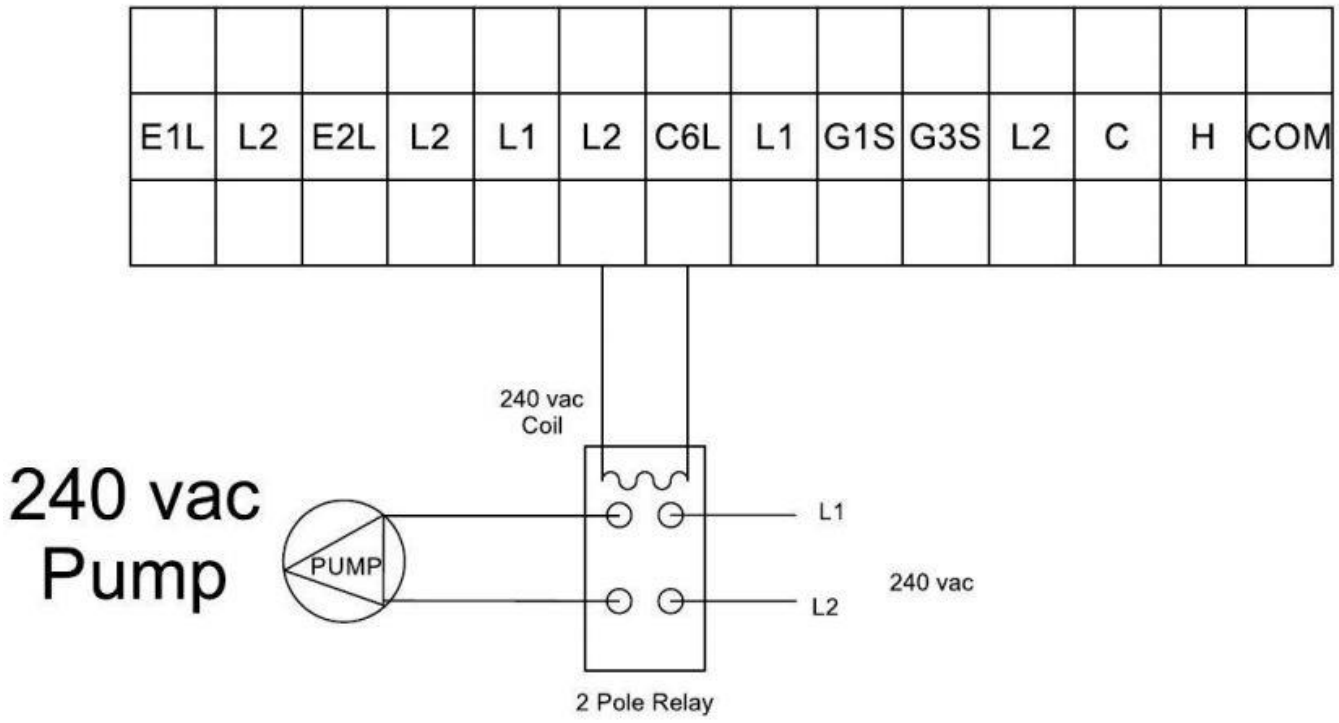
| | | | |
|---|---|---|---|
| BRN | Brown | WHT | White |
| RED | Red | GRY | Grey |
| BLK | Black | BLU | Blue |
| ORG | Orange | YLW | Yellow |
| PIN | Pink | PUR | Purple |
| YLW/GRN | | Yellow/Green | |

## When using a second NON-PWM water pump




Connect the fixed speed pump to L2 and C6L.

**When using a second NON-PWM water pump, use terminals L2 and C6L for relay coil power only. Do not connect a pump directly to L2 and C6L, always use a relay with a 240 vac coil. This pump will only run when the PWM pump is running. Setting P54=0 and P52=1, will shut C6 off when the chiller reaches its set point.**




**When using a second NON-PWM water pump, use terminals L2 and C6L for relay coil power only. Do not connect a pump directly to L2 and C6L, always use a relay with a 240 vac coil. This pump will only run when the PWM pump is running. Setting P54=0 and P52=1, will shut C6 off when the chiller reaches its set point.**

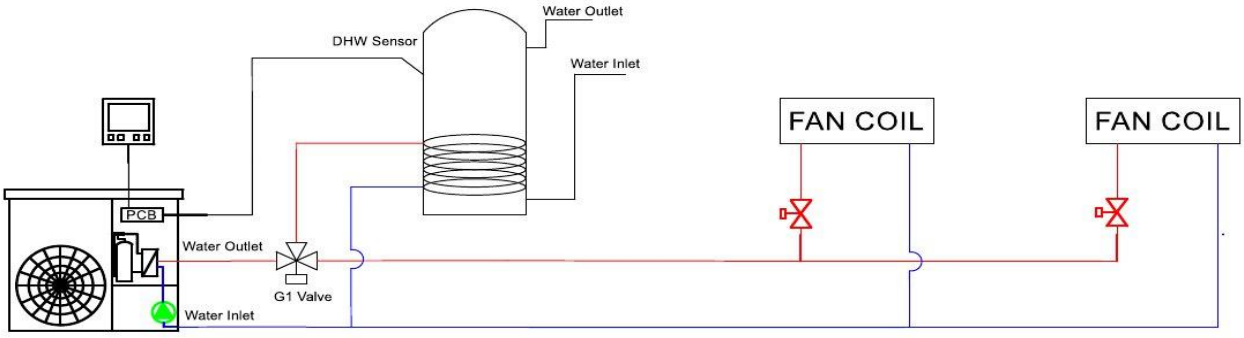
# G1 Valve

# DHW and AC / Heating

## G1: DHW/AC / Heating Valve

In DHW mode, the G1 valve is powered off. In AC mode, G1 is powered on.
Parameter P08 must be “0” to enable DHW, C19 will show the switch status.

**G1 and G3 valves use 220v Primary from the CX34. Use conduit and install per local code.**



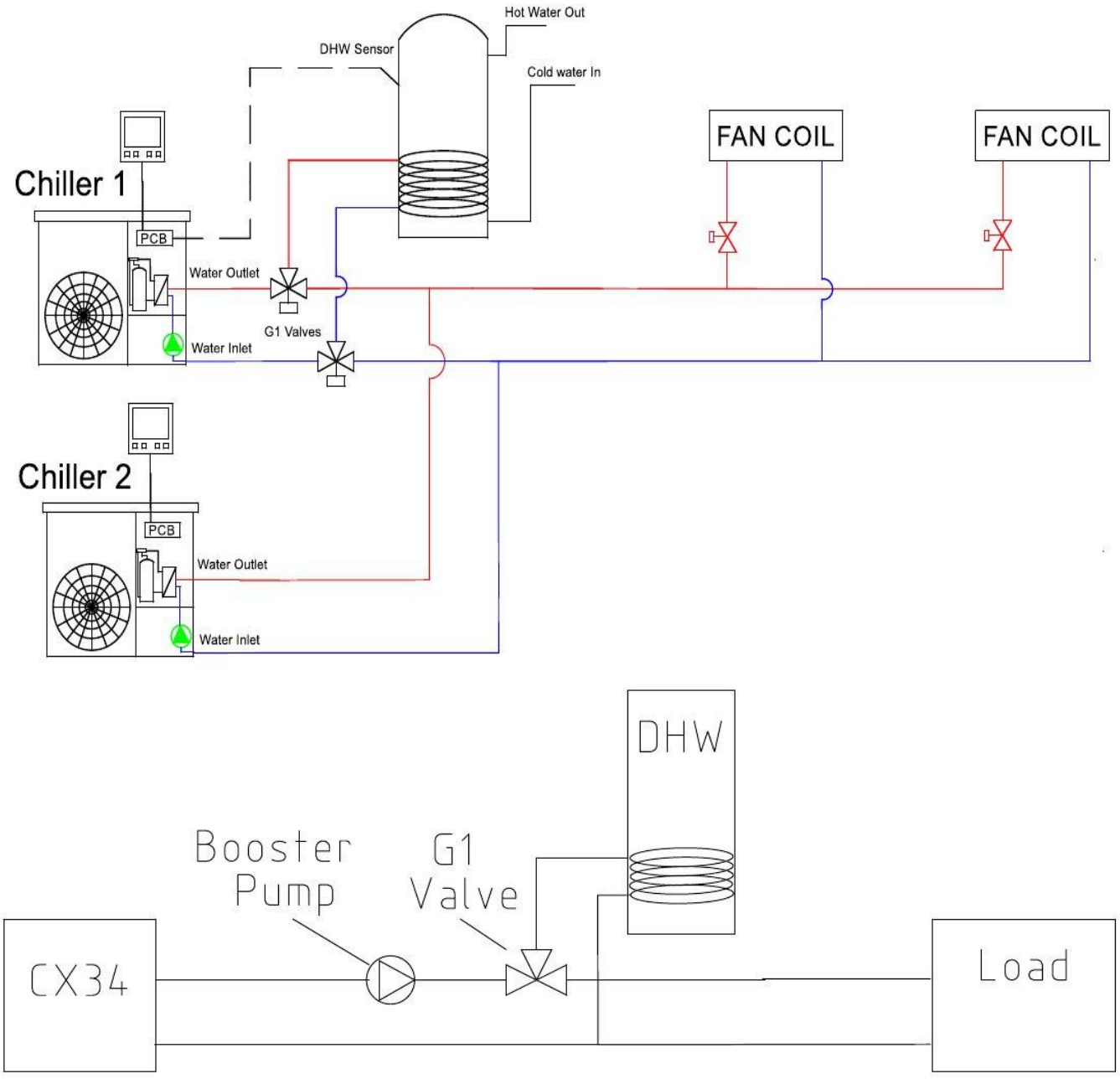

DHW target setting temperature is the tank water temperature measured with the DHW sensor, not the inlet water temperature. If the target temperature is 122°F, (refer to page 43 to set the DHW temp), and the differential is 2°c, it means, when the DHW tank reaches 122°F, the compressor will stop. When the DHW tank temperature is lower than 119°F, the compressor will start.

Inside the CX34 there are three sensors wrapped in a bundle just above the compressor. DHW, Solar, and indoor ambient air temp. If you are using the DHW feature extend the sensor to the top of the tank, if you are using the solar feature extend the solar sensor to the solar tank. The indoor ambient air temp is not used at this time. Leave all unused sensors plugged in and wrapped in the bundle above the compressor.

# G1 Valve

## DHW and AC / Heating with two chillers in Parallel

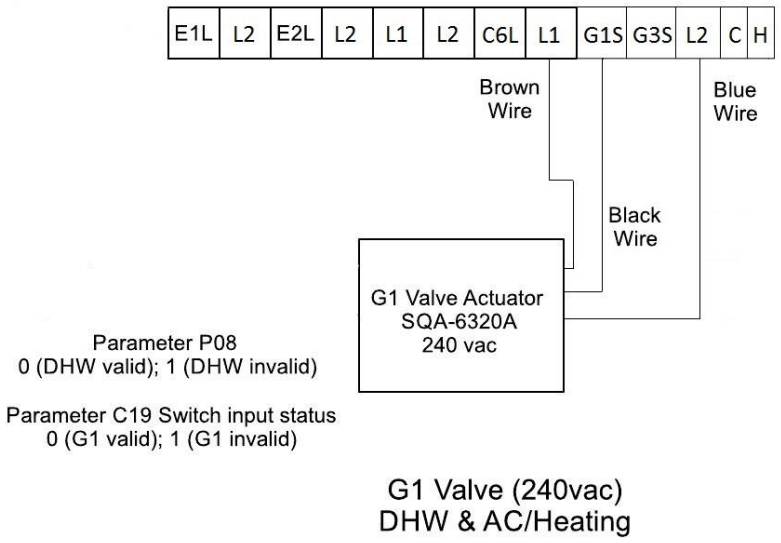
**G1 and G3 valves use 220v Primary from the CX34. Use conduit and install per local code.**



A booster pump may be installed in front of the G1 valve when installing the DHW option if the distance between the G1 valve and DHW tank exceeds 25 feet.

# G1 Valve Wiring and Parameters

**G1 and G3 valves use 220v Primary from the CX34. Use conduit and install per local code.**




G1 Valve (240vac)
DHW & AC/Heating

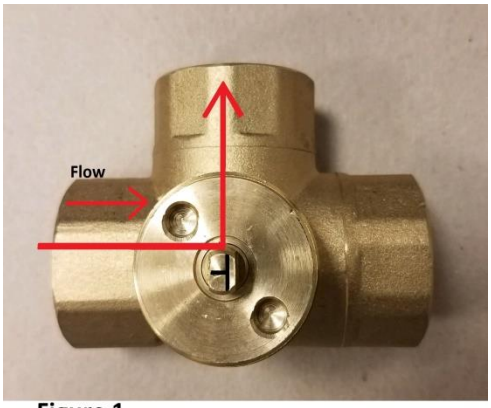



**Figure 1**
**G1 Valve Active, DHW Mode**

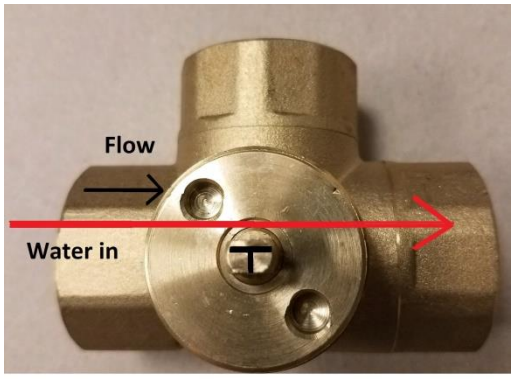
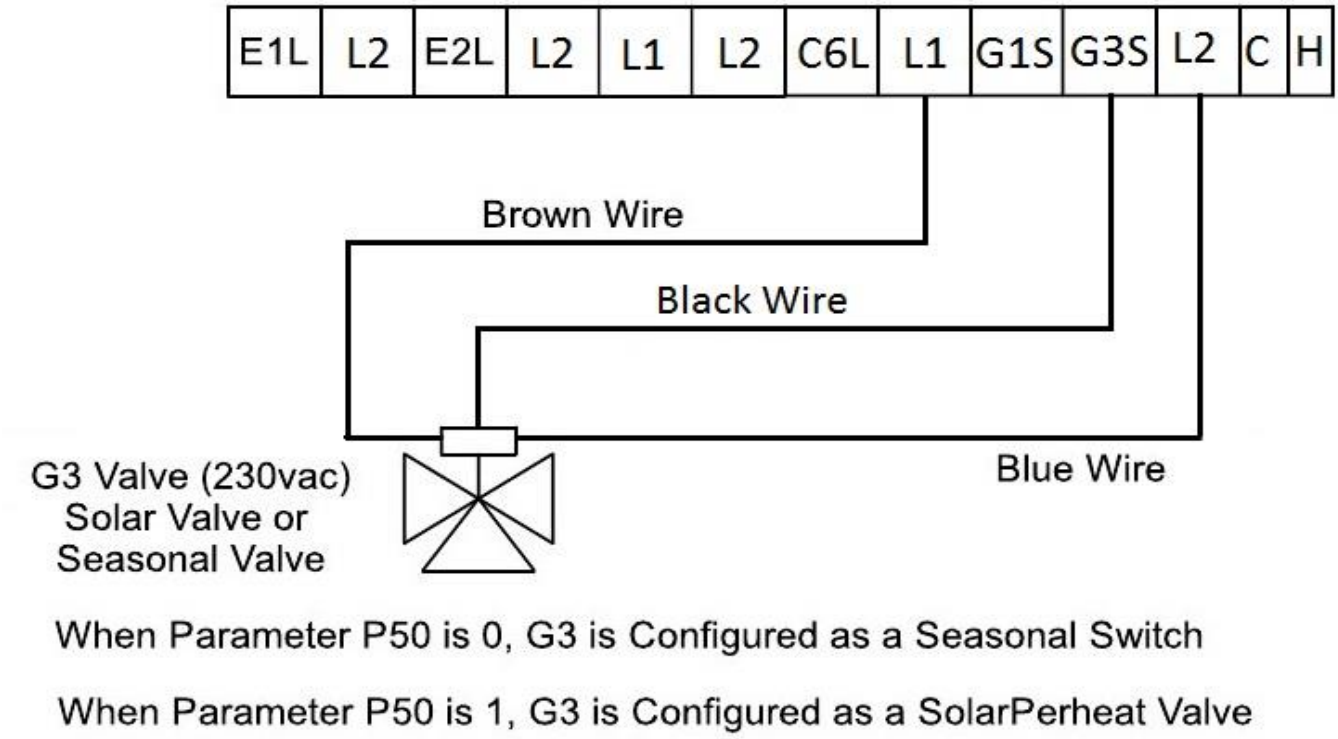



**Figure 2**
**Heating and Cooling Only**

Figure 1, this is the direction of flow when it is activated for DHW. Figure 2, this is the direction of flow when it is activated for Heating or Cooling. When the brown wire is connected to L1, the blue wire connected to L2, and the black control wire is connected to G1S the valve is controlled by voltage at L2 and G1S. Voltage at G1S activates the valve for DHW. No voltage at G1S activates the valve for Heating/Cooling. See wiring diagram above. A booster pump may be added to the loop between the chiller and the G1 valve if the distance from the G1 valve to the DHW tank exceeds 25'. The booster pump is always wired in parallel with the chillers internal pump. See pages 15-16 for details.

# G3 Valve: Seasonal Switch Valve or Solar Preheat Valve

**G1 and G3 valves use 220v Primary from the CX34. Use conduit and install per local code.**




The G3 port can be used to control a seasonal switch valve. The seasonal switch valve is used to isolate the floor coils from the fan coils when switching over from heating to cooling. The seasonal switch valve is controlled by parameter P50. When parameter P50 is 0, the valve is configured as a seasonal Switch.

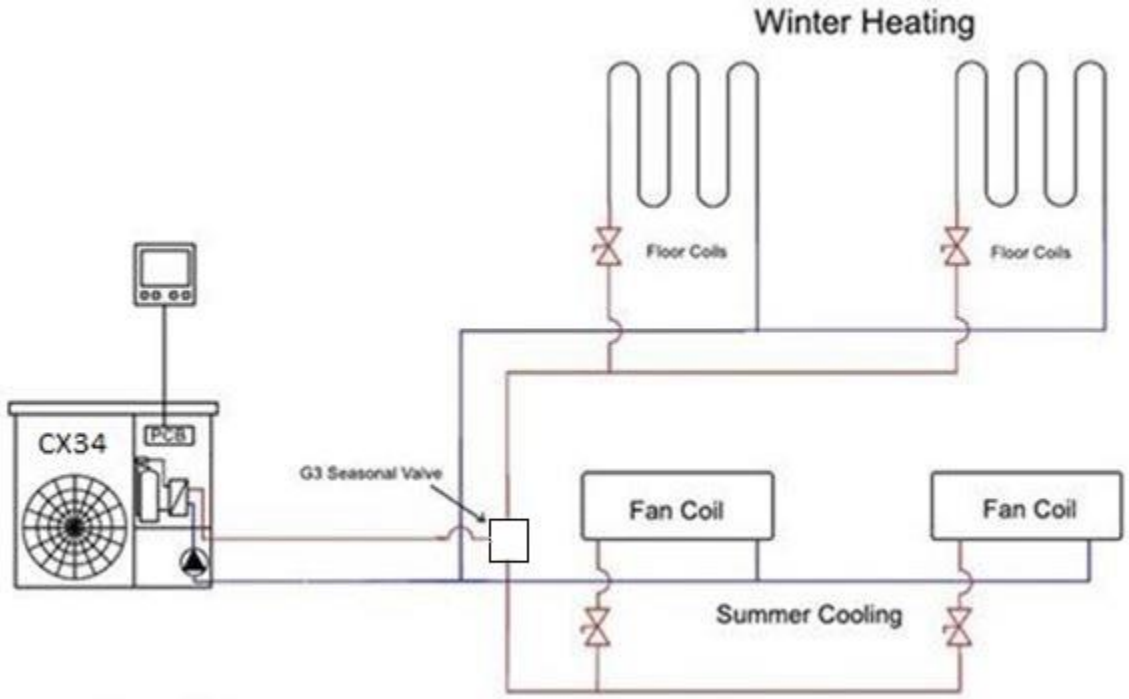
When parameter P50 is 1, the valve is configured as a solar pre-heat valve. The CX34 compares the solar tank temp and AC returned temp. When the solar tank temp – AC returned temp is ≥ 5 ℃, the 3-way valve G3S will be on; when solar water tank temperature minus the air conditioning returned temperature is less than 2°C, G3S will be off.

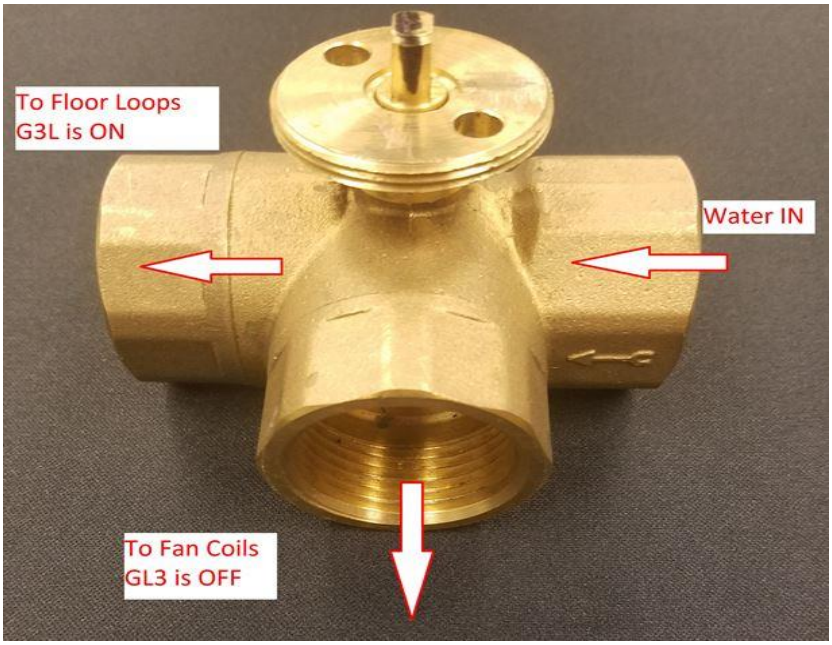
**Inside the CX34 there are three sensors wrapped in a bundle just above the compressor. DHW, Solar, and Indoor Ambient air temp. If you are using the DHW feature extend the sensor to the top of the tank, if you are using the solar feature extend the solar sensor to the solar tank. The indoor ambient air temp is not used at**

**this time. Leave all unused sensors plugged in and wrapped in the bundle above the compressor.**

**G3 VALVE**

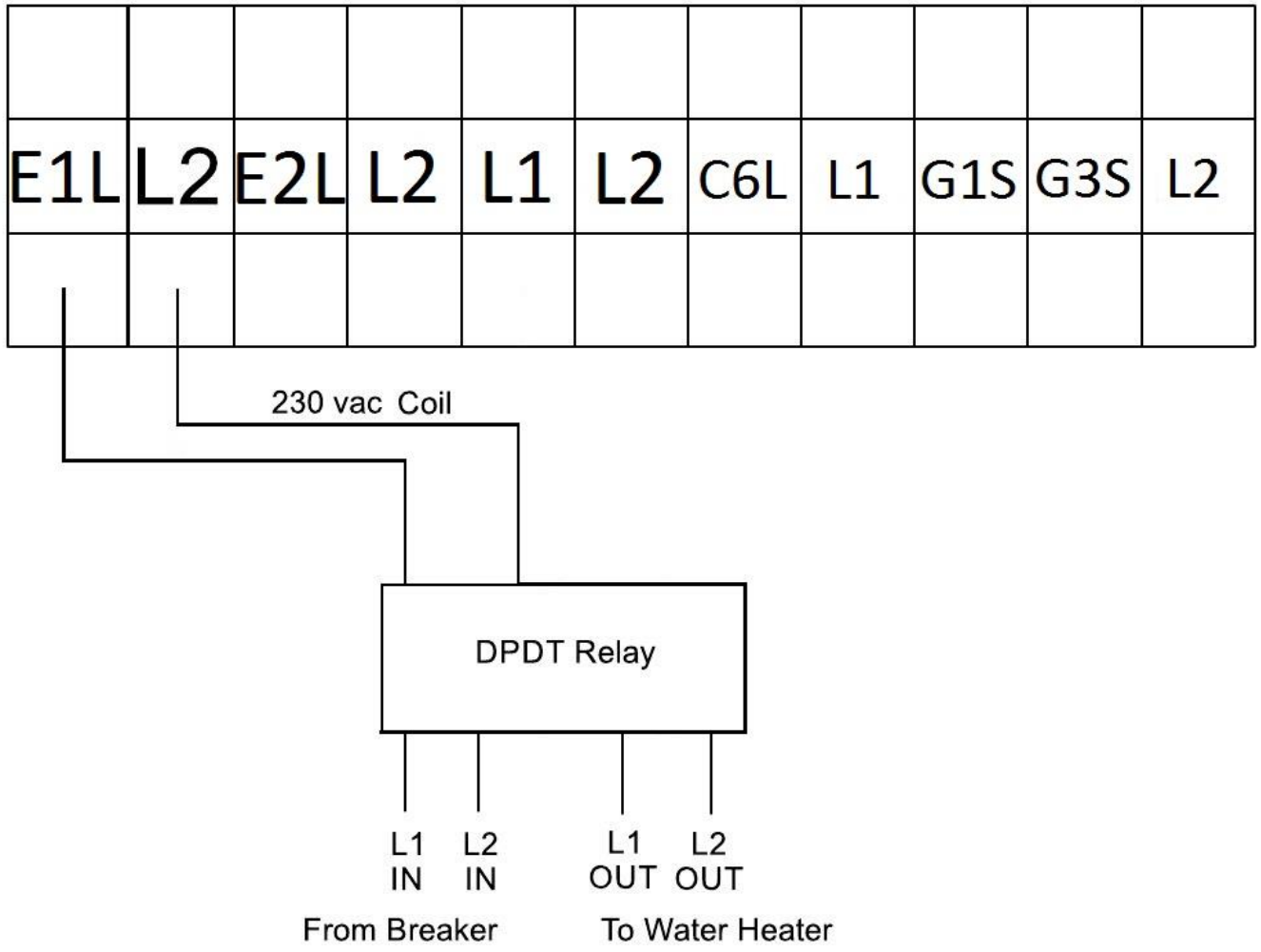
**Seasonal Switch Valve**






# G3 Ports

**Second Heat Source (Called E2 but connected to E1)**

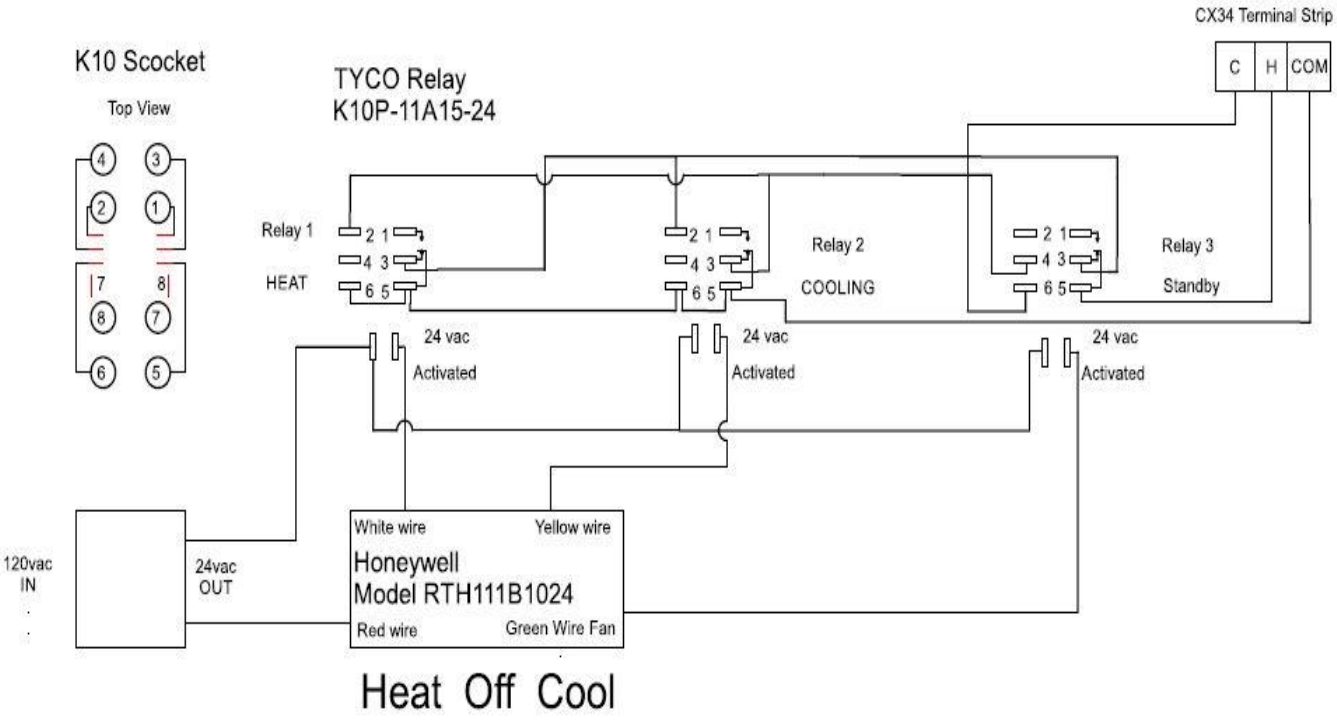


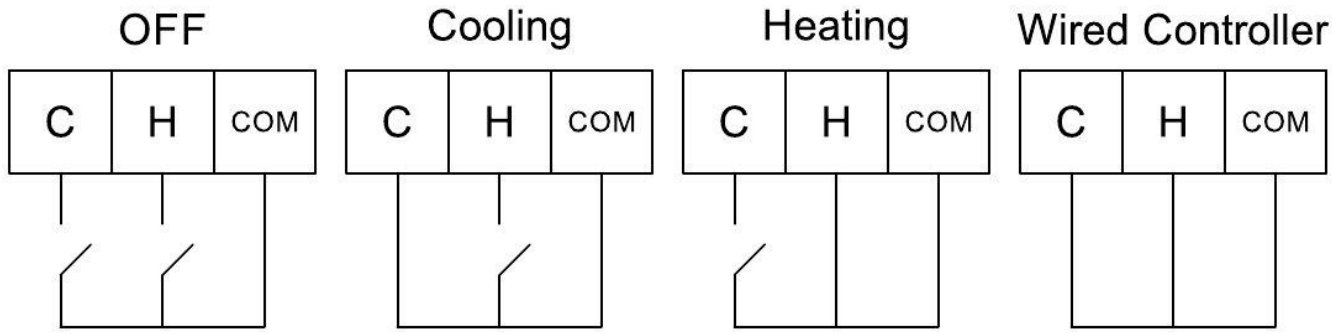

**Parameters 56, and 58**

When P56=1, the 2nd heat source function is valid. E2 will be controlled by P58 setting.
When the air temp is < P58, E2 is on, the compressor is off, all water pump and water valves will be working as normal. When the air Temp > P58 5C, the compressor will be on and E2 off. E1 will not activate during defrost.

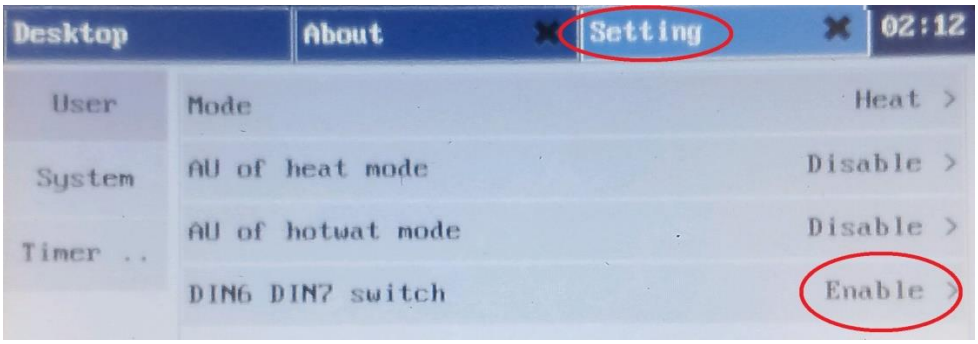
# External T-Stat Control

The internal T-Stat allows a heat pump thermostat to control the heating, cooling and standby modes of the CX34. The controller consists of a heat pump thermostat, a 120 vac to 24 vac transformer and two relays, Tyco K10P-11A15-24, and two relay sockets, 27E487. The relays can be located in the chiller next to the IPM. The transformer can be located in the house near the thermostat.



Once the relays are wired as shown the CX34 DIN setting must be changed




The switch status can be displayed in the C parameters

C63 is DIN6 AC heating switch mode status; 0=OPEN; 1=CLOSE

C64 is DIN7 AC cooling switch mode status; 0=OPEN; 1=CLOSE

# System filling with Propylene Glycol and water

At or near the chiller a flush/fill valve assembly must be installed. This can be made with three ball valves and a couple hose fittings. See example below.

Bill Of Materials

2 ea. 1" x 3/4" tee

1 ea. 1" Ball Valve

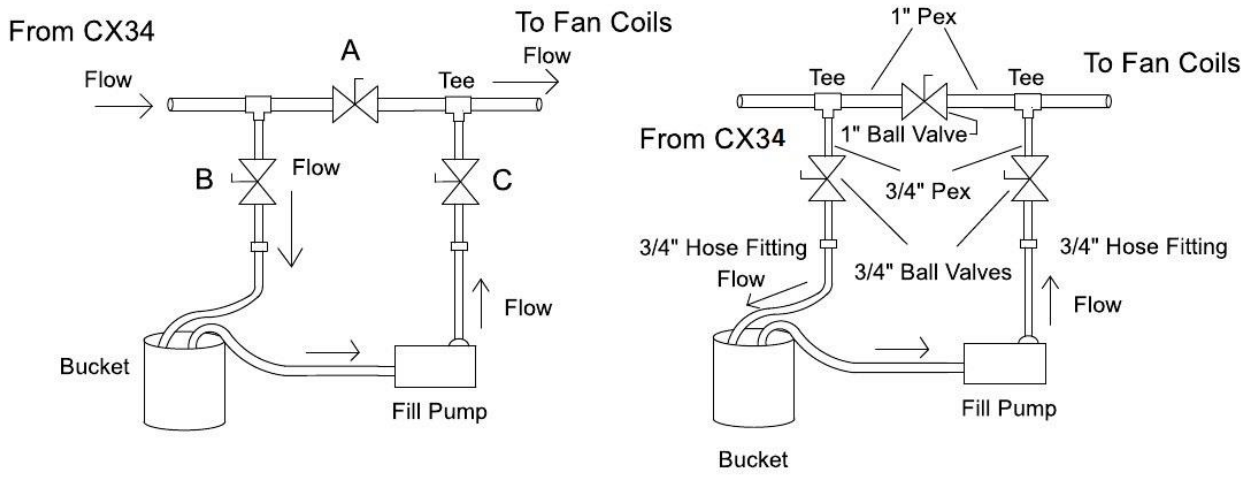
2 ea. 3/4" Ball Valve

2 ea. 3/4" Hose Fittings

10' of Garden Hose

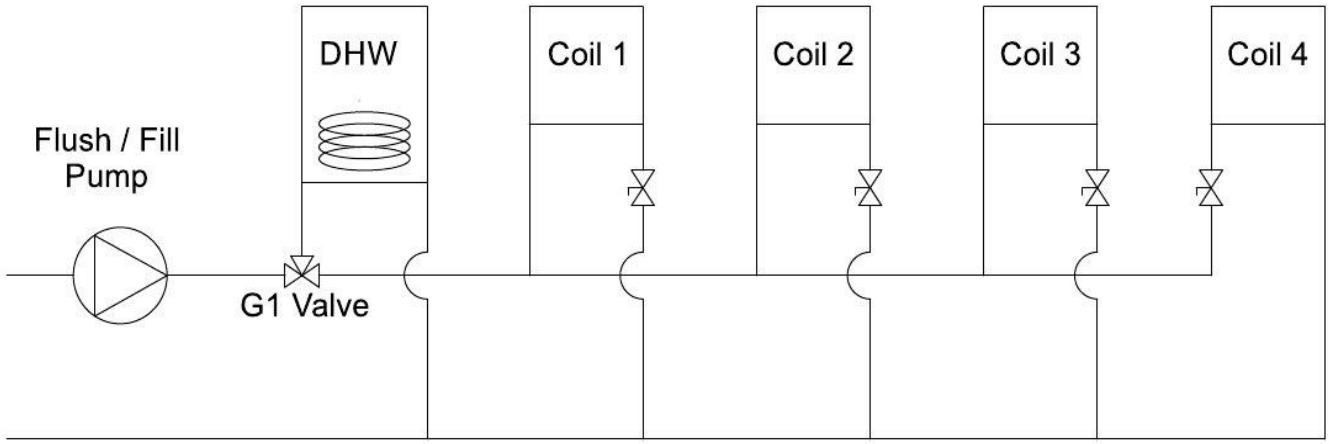
5 Gallon Bucket

High Head Fill Pump




Pre-mix the propylene glycol in a container large enough to hold the loop volume plus a few gallons. Using a filling pump and 3 hoses, place one hose in the glycol container and connect it to the suction side of the pump. Connect the second hose to the pump discharge and the other end to valve “C” that is closest to the fan coils. Using a third hose, connect it to valve ”B”, closest to the chiller and leave the open end in the glycol bucket. Close the middle ball valve “A”. The pump should be pumping away from the CX34 chiller. Run the pump until there are no more air bubbles coming out of the loop. After all air is expelled from the loop, close valve “B” and then open valve “A” with the pump running. When the pressure gage on the CX34 shows at least 30 psi close valve “C” and turn off the pump. Minimum loop pressure is 14.5 psi, maximum pressure is 43.5 psi, and ideal pressure is 30 psi.

## Purging Air from the Fan Coils




If a DHW tank is installed, it should be the first device on the loop as shown. To purge the air from its coil, remove the actuator from the valve body and rotate the valve stub 90° clockwise to force the water through the coil. Return the valve stub back to its original position when all of the air is purged. Close the input valve to each fan coil except the first coil (1). Turn the pump on and run it, when the bubbles stop coming out of the discharge hose turn on the ball valve on coil (2), wait for the bubbles to stop, then do the same for coil number (3), then (4). All CX Chillers have a flow switch installed in the loop. Air in the system may cause a flow switch alarm; the controller will display a P5 or P6 error code.

All **CXI fan coils** have an air purge screw near the water inlet port, always purge the fan coils before starting the chiller.

The **CX34 chiller** also has a bleeder valve with a ¼" clear tube attached to it located near the brazed plate heat exchanger.

Proper and even flow through each fan coil is critical for both heating and cooling. This can be done with balance valves or ball valves installed at each fan coil supply or return pipe. Set each fan coil to the same temperature and fan speed. Using an accurate digital thermometer adjust each ball valve until the coil temperatures are even. This must be done in heating mode so proper flow can be verified to protect the heat exchanger from freezing up in cooling mode.

If a fan coil is powered on but the fan isn't running, there is a good possibility that there is air trapped in that particular part of the loop. Also verify the parameters with the CXI FCU manual, page 34.

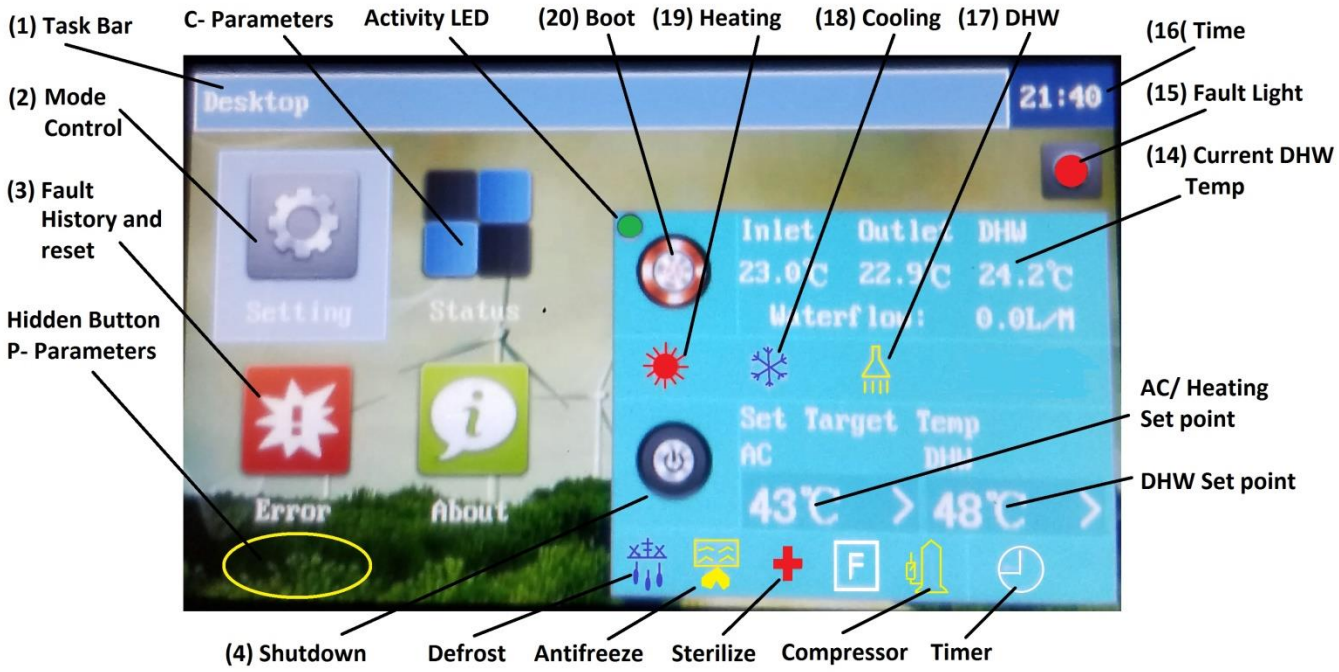
http://www.chiltrix.com/documents/Chiltrix-hydronic-FCU-ver-1.5.pdf

# Wired Controller

## 1. Functions and features

Cooling, Heating, DHW, cooling + DHW, heating + DHW mode of operation options, automatic fault detection, alarm processing, and energy control.

1. The 4 wire control cable can be extended up to 300 feet of 20 AWG or larger.
2. The controller handles all input and output signals, and system status to ensure that the unit is stable and reliable.
3. Full-touch color LCD display.
4. Modes and other factory parameter settings are entered directly on the LCD screen.
5. 100 fault records can be stored and retrieved to show the details of each fault that may occur.
6. All of the switch input / outputs can be directly observed on the LCD control panel making commissioning convenient.
7. The LCD display is wall-mountable.




(1) **Taskbar:** shows the current running applications, and the time. Clicking on the different application boxes will switch to different applications.

(2) **Main window:** Displays the main window of the application that is currently running.

(3) **Application icon:** A desktop application that first highlights the icon when it is first clicked, and then clicked again to launch the application.

(4) **Shutdown button:** Used to execute the **shutdown command**, when clicked it will pop up a confirmation window, click "OK" to execute the boot command, or click "Cancel" for no action. The shutdown command us used to take the chiller out of heating or cooling mode.
(5) **Defrost:** Is illuminated when system is in the Defrost State.
(6) **Antifreeze:** Is illuminated when system is in the antifreeze mode.
(7) **Sterilization:** Is illuminated when system is in the sterilization mode.
(8) **Ground source heat pump:** N/A
(9) **Compressor：** Illuminated when the compressor is on.

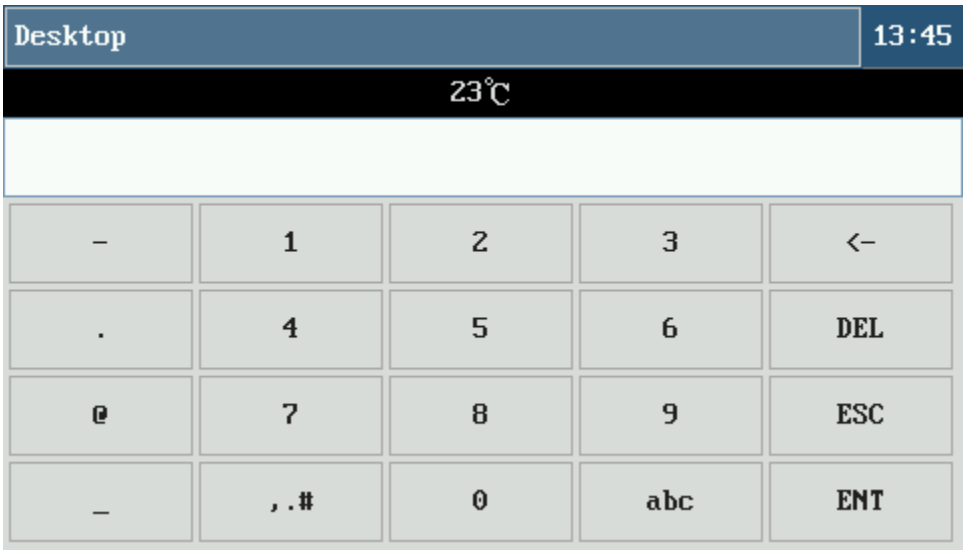



Figure 1-2

(10) **AC temp setting:** Temperature setting in the air conditioning mode (cooling or heating), touch the "**SET TARGET TEMP**" icon and the keyboard window will pop up, as shown in Figure 1-2, then, enter the required temperature. Use the ENT" key will confirm the input. Use the "DEL" key to delete the input, and the "ESC" to cancel the input and exit.
(11) **DHW temperature setting:** Sets the temperature in the (DHW) mode.
(12) **AU heat: Not used, please disable.**
(13) **AU DHW: Not used, please disable.**
(14) **Current DHW temperature:** This is used to check the current DHW mode temperature.
(15) **Fault light:** Illuminated if there is a fault.

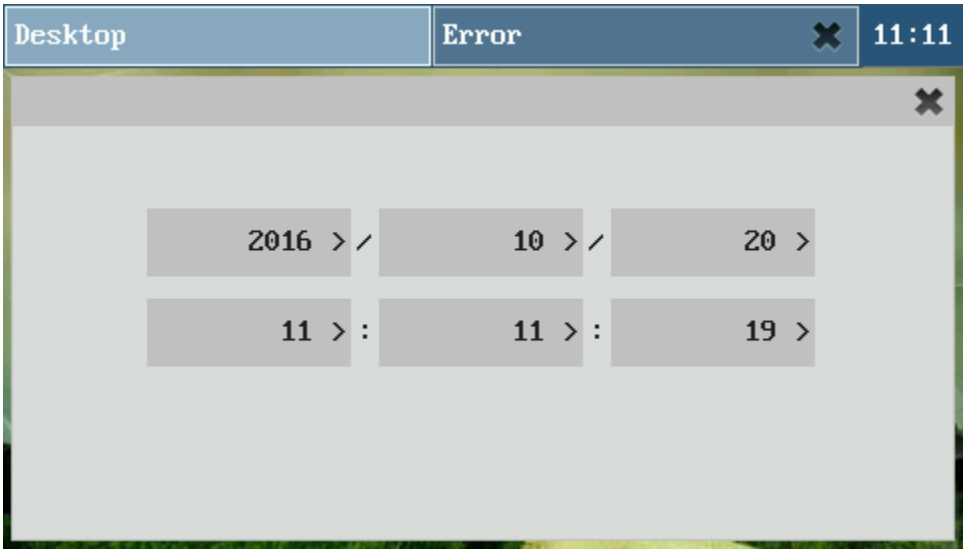



Figure 1-3

(16) **Time:** Used to display and set the current time. When clicked, a pop-up showing the date and time is displayed, Figure 1-3. From left to right, and from top to bottom is the year, month, day, hour, minute, and second. Clicking on each box will allow you to set its valve.
(17) **DHW:** If the hot water mode is enabled, this icon will be lit.
(18) **Cooling:** If the cooling mode is on in the user setting, this icon will be lit.
(19) **Heating:** If the heating model is on in the user setting, this icon will be lit.

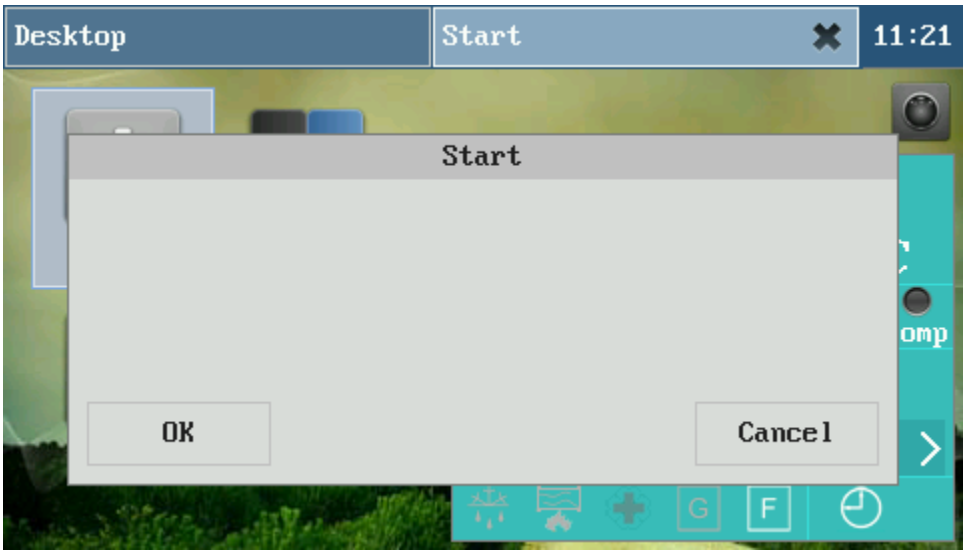



Figure 1-4

(20) **Boot button:** Used to execute the boot command operating mode.

## 1.1 SETTING PASSWORDS

The application is used to set the user parameters, and set a password, as shown in Figure 1-5, minimum of 6 characters, maximum of 127.

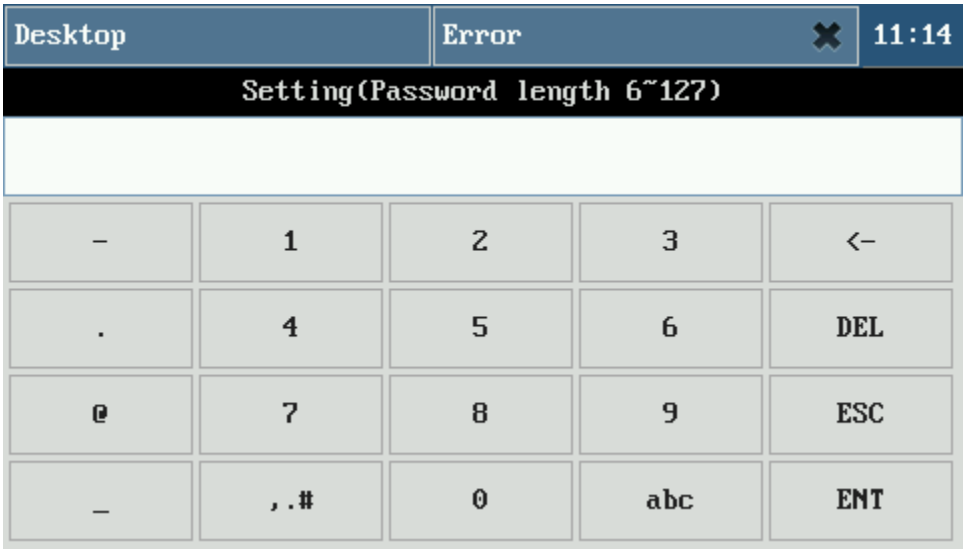



Figure 1-5

Description of the keypad function keys：

- “<-”： Backspace key, used to delete a character.
- “DEL”： Delete key, used to delete all characters.
- “ESC”： Exit key, used to exit the input state.
- “ENT”： ENTER key to confirm an input.
- “abc”： Toggles key for switching to lowercase alphabetic keyboards.
- “ABC”： Toggle key for switching to uppercase alphabetic keyboards.
- “123”： Numeric keypad toggle key for switching to the numeric keyboard.
- “,.#”： Symbol Keyboard toggle key for switching to the symbol keyboard.

Note: The password can be composed of numbers, letters, symbols, etc., the factory default password is empty, and any 6 characters can be used.

**Write the password on the back of the controller.**

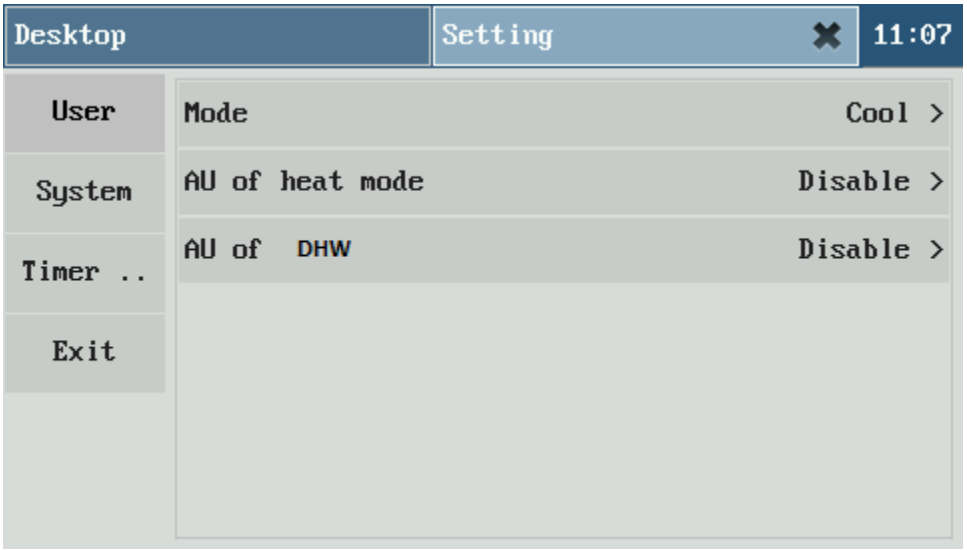



Figure 1-6

After the password is entered correctly, as shown in Figure 1-6, click "Exit" in the main menu or "X" in the task bar to exit the application.


Figure 1-7

**1.2 USER PARAMETERS (Figure 1-7)**

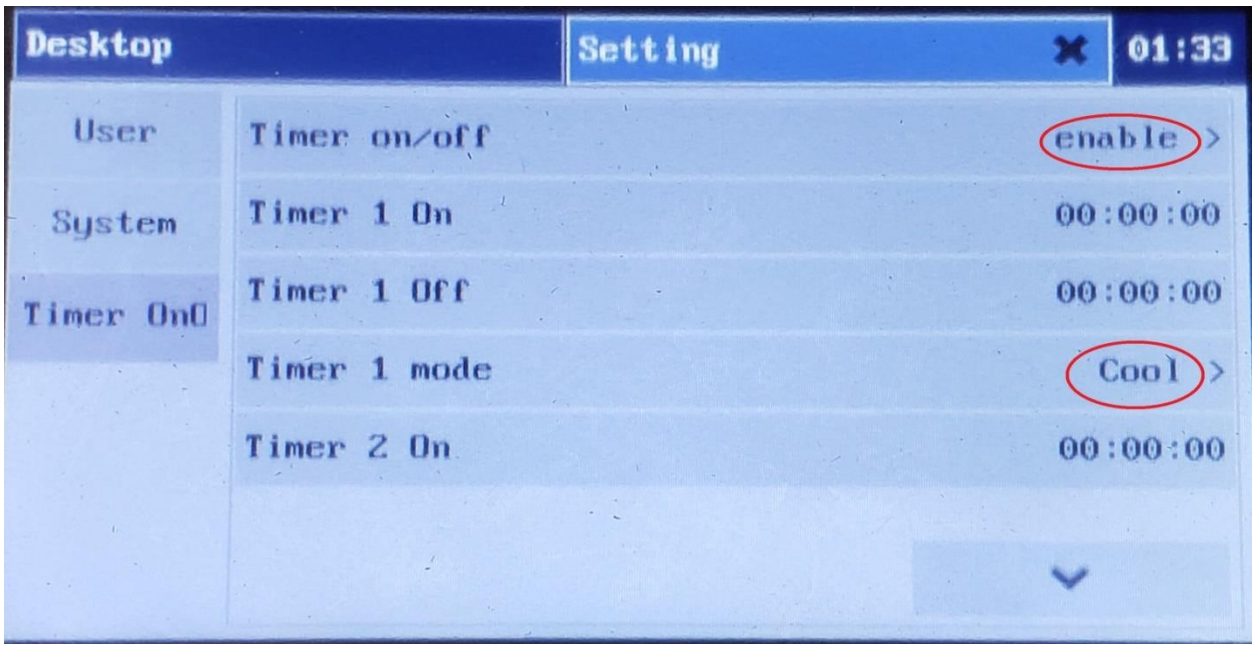
- Operation mode: Set the units' operation mode.
- Five optional modes：cooling、heating、DHW、cooling + DHW、heating + DHW

**1.3 SYSTEM**

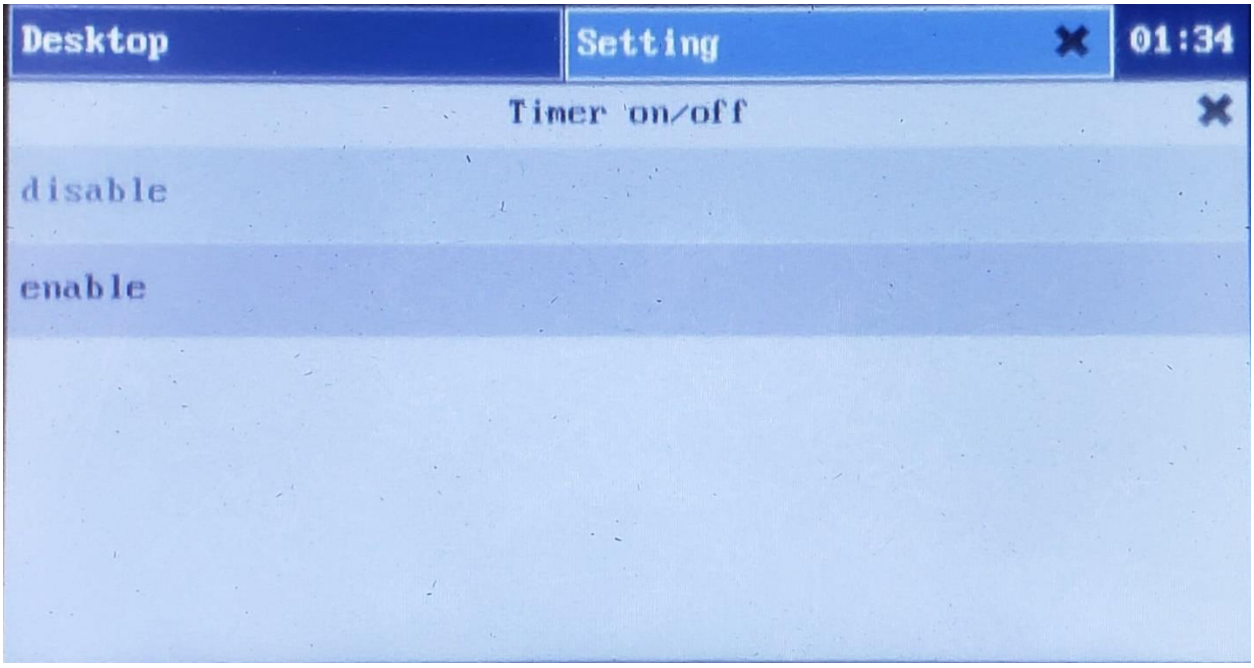
- Language: Default is English.
- Screensaver: Sets the screen saver pop-up time.
- Buzzer: Disables or uses the buzzer sound when the unit has an alarm.
- Date & Time: you can set the machine date and time.
- Password setting： Set the password to enter applications.

**1.4 Machine Timing Switch**

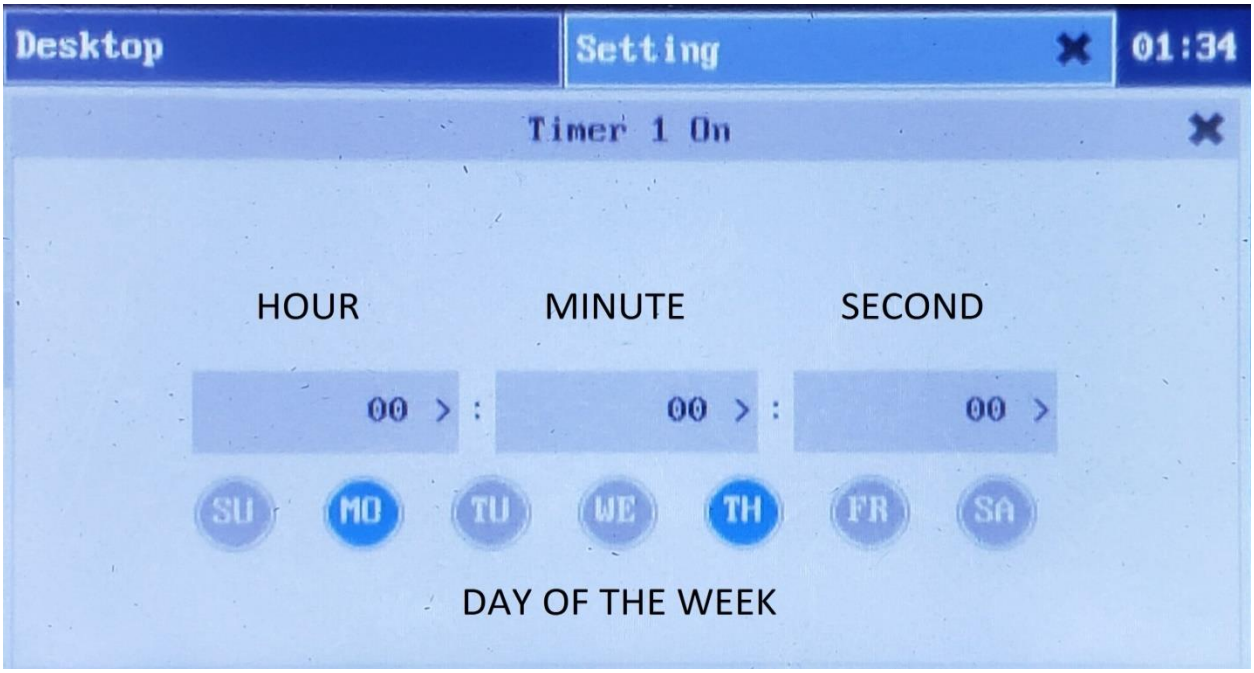
The timer functions can be found under “Settings” then Timer ON/OFF.

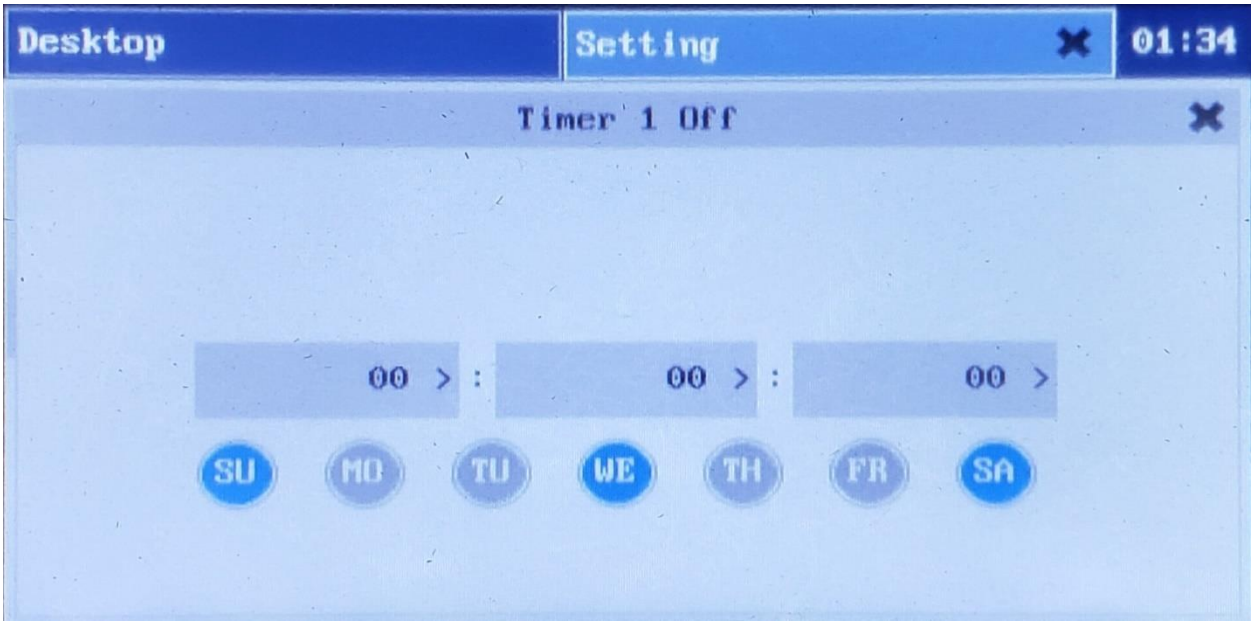



To use the timer functions the timer on/off must be enabled. There are 4 timers labeled timer 1-4 with a mode selection for each timer.

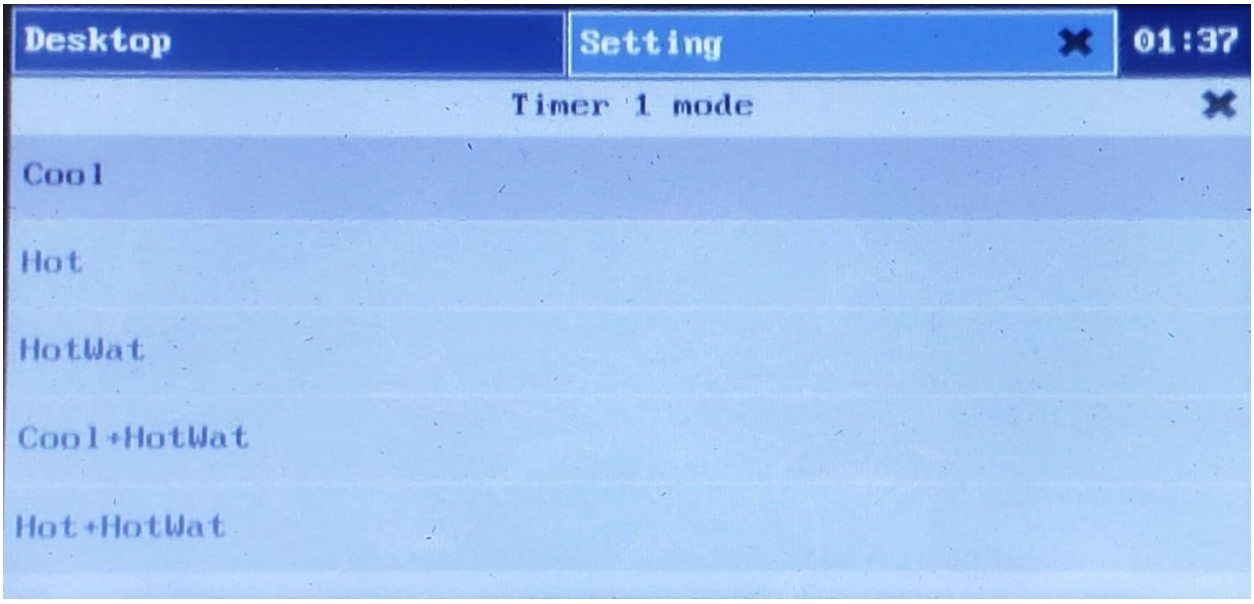



After enabling the timer function touch the X in the top right screen to return to the previous screen.

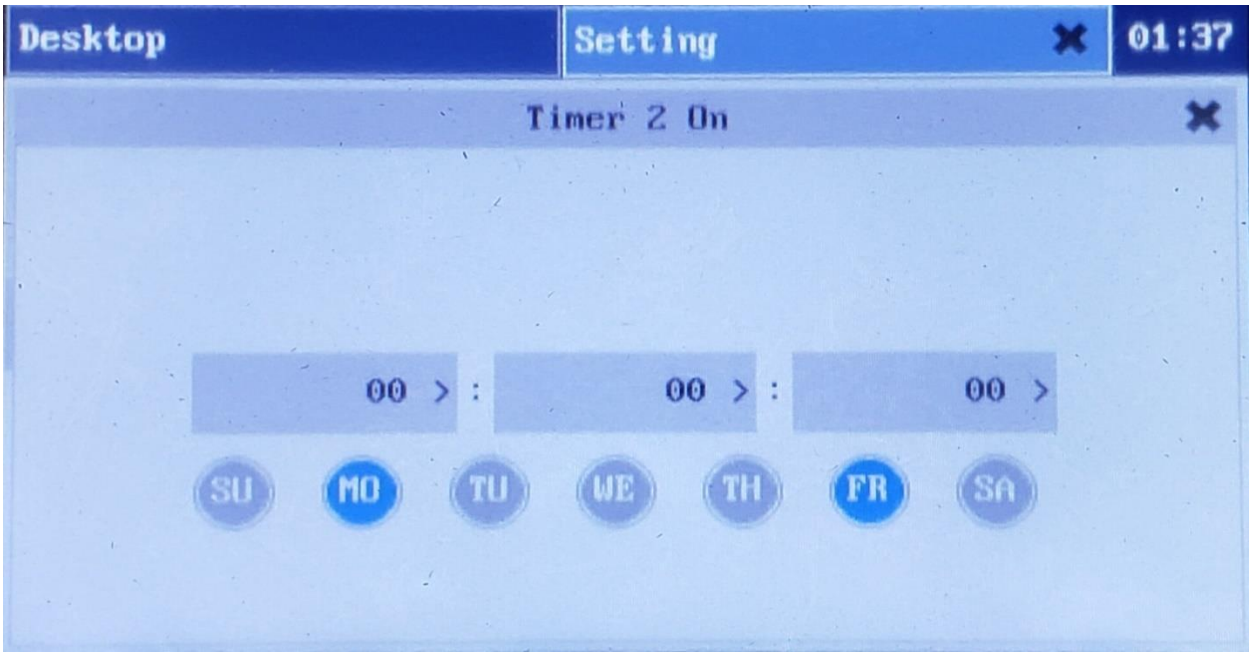




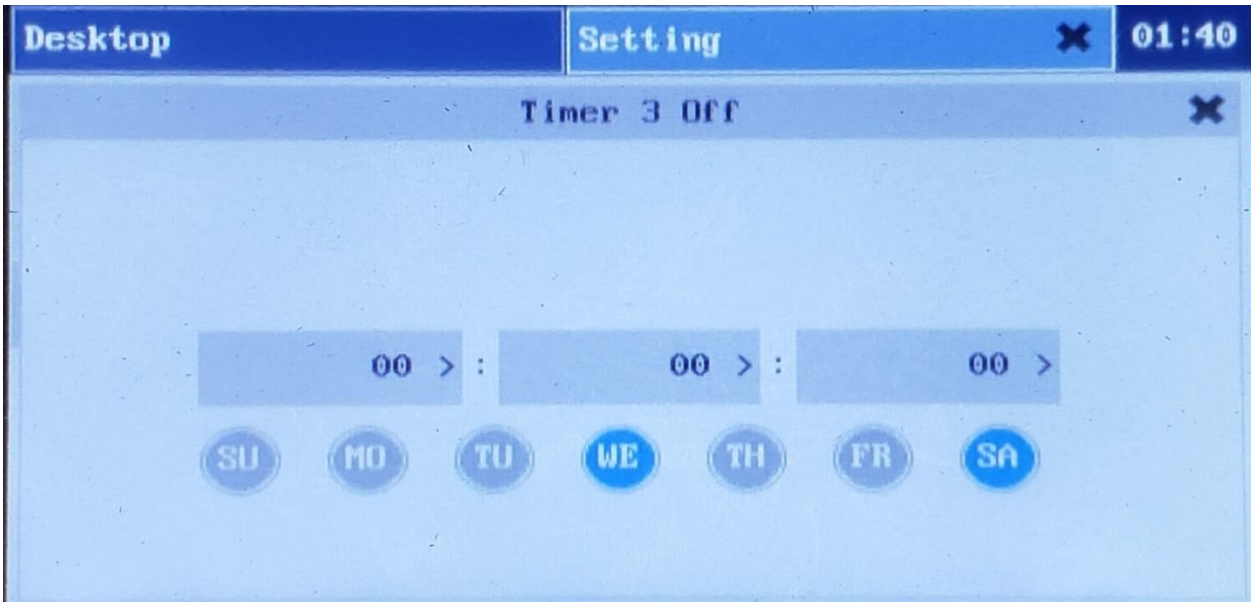

Touch the current time values to change the hour, minute and second. Touch the day of the week buttons to highlight them and make active.



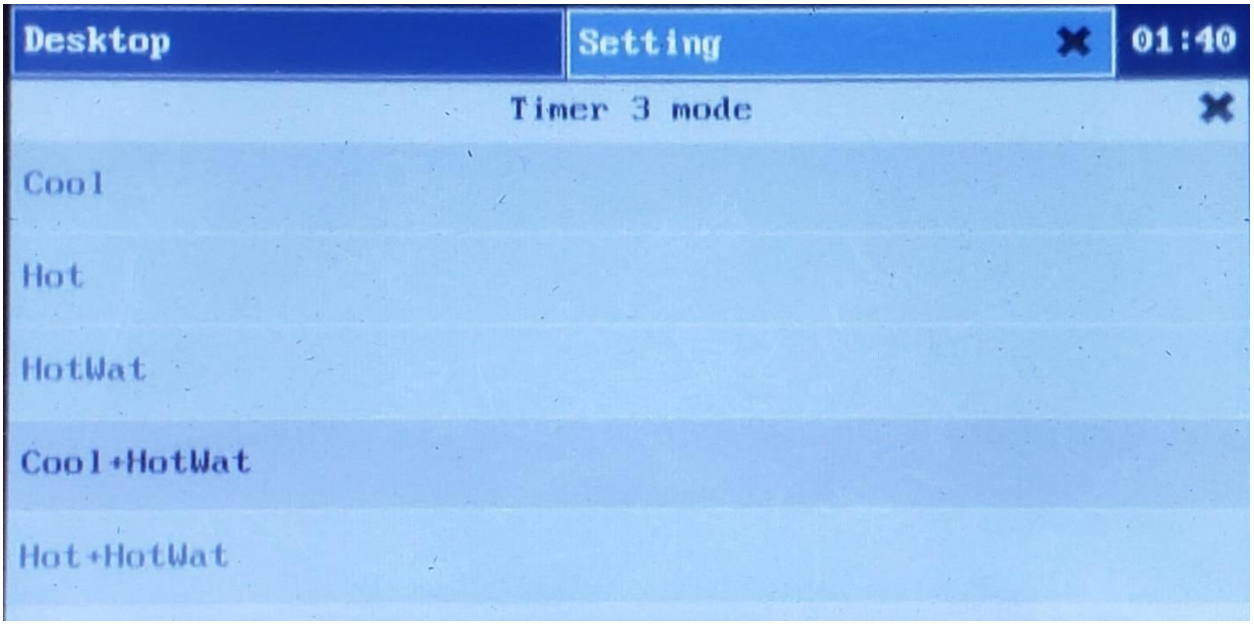

There are 5 modes that can be set to use electricity when the rate is lower. Only one mode can be set for each timer 1-4.



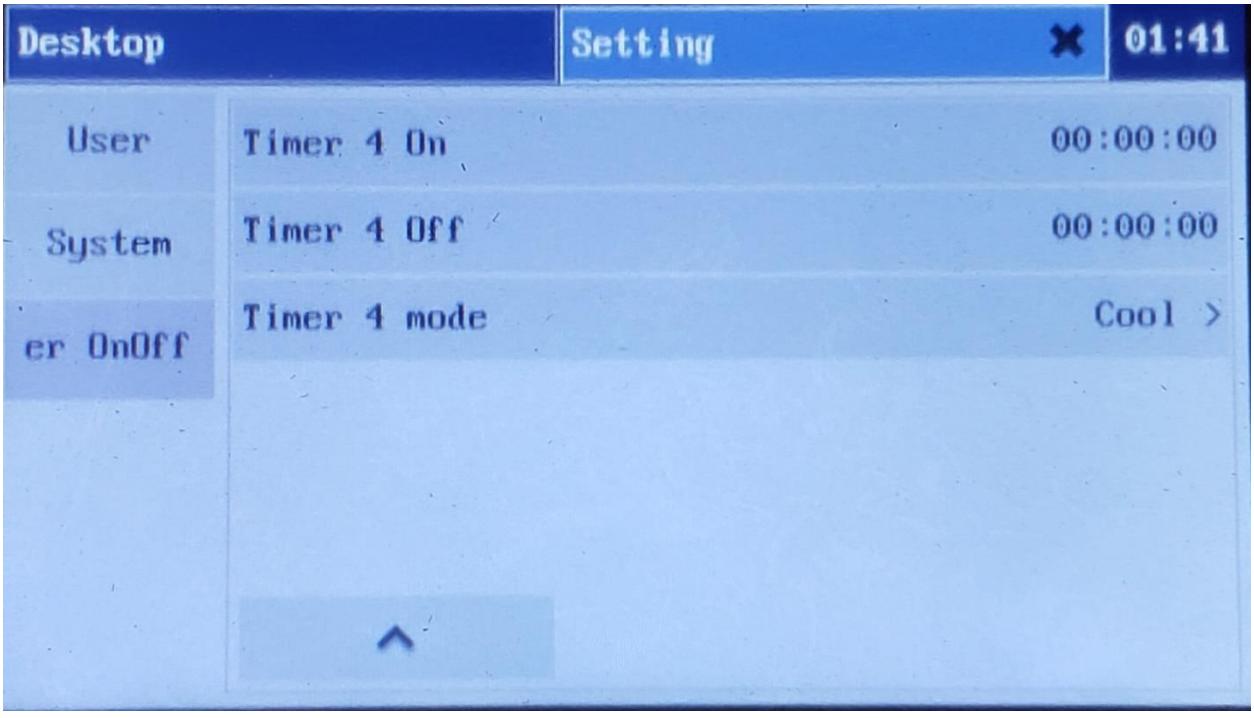

Program each timer the same way using the touch screen to set the values.



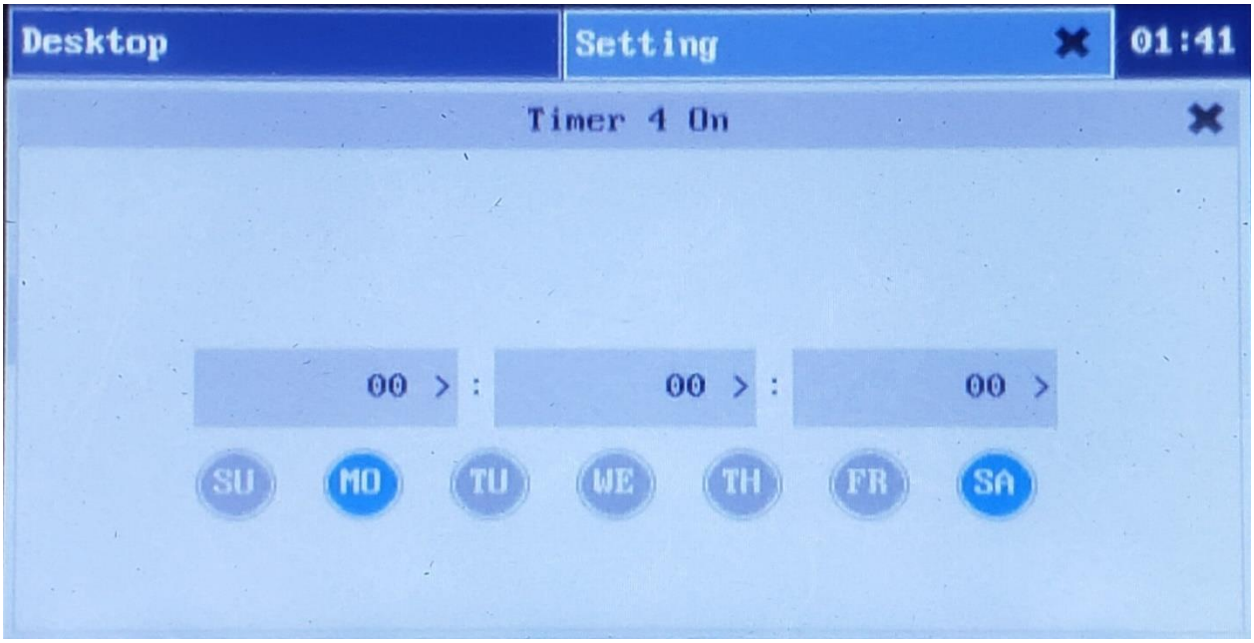

Timer 3 “OFF” settings.



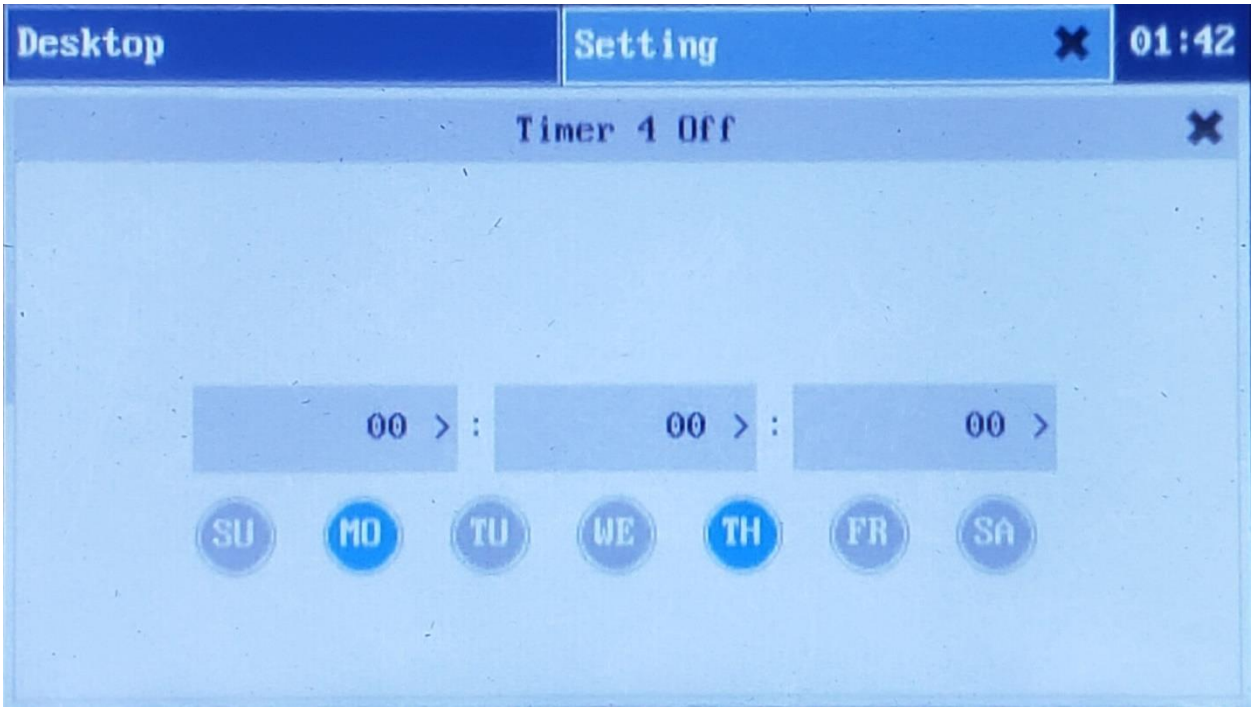

Timer 3 “Mode” settings.



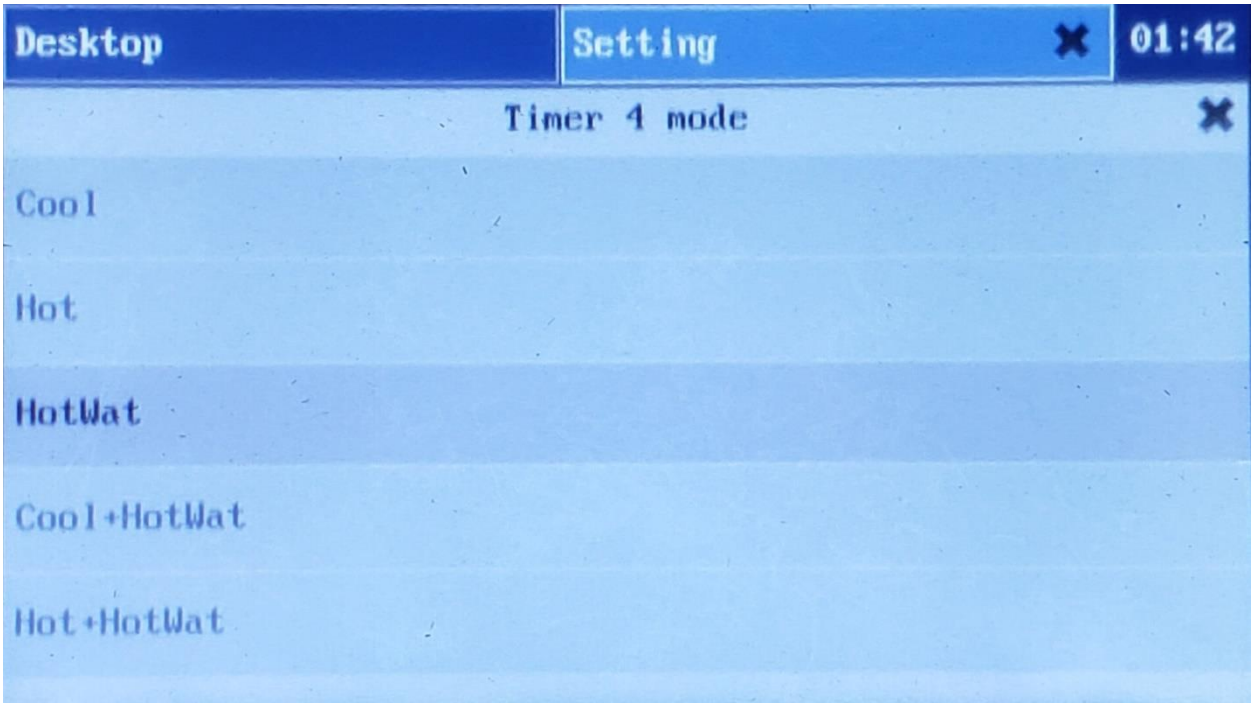

Timer 4 ON, OFF and MODE settings.




Timer 4 “ON” settings.



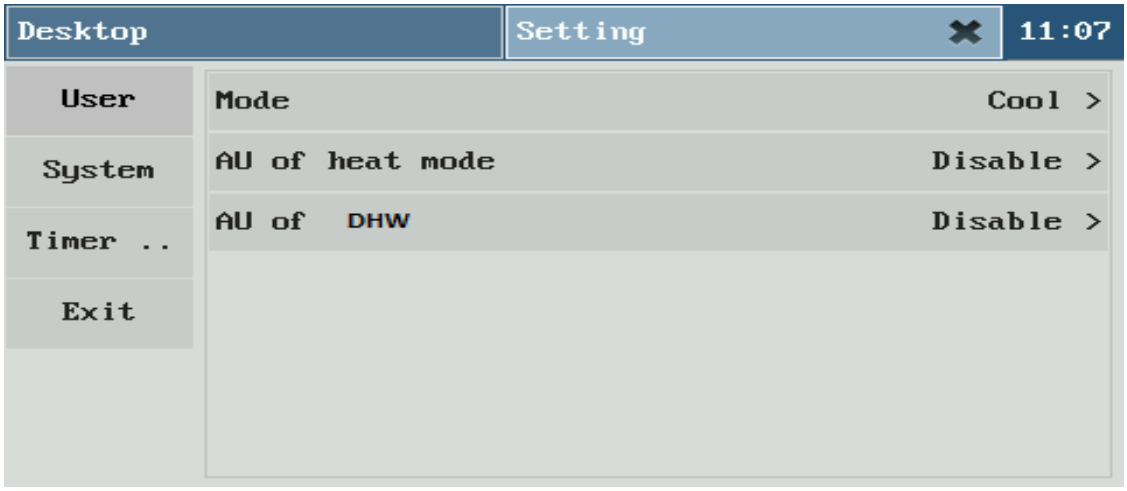

Timer 4 “OFF” settings.



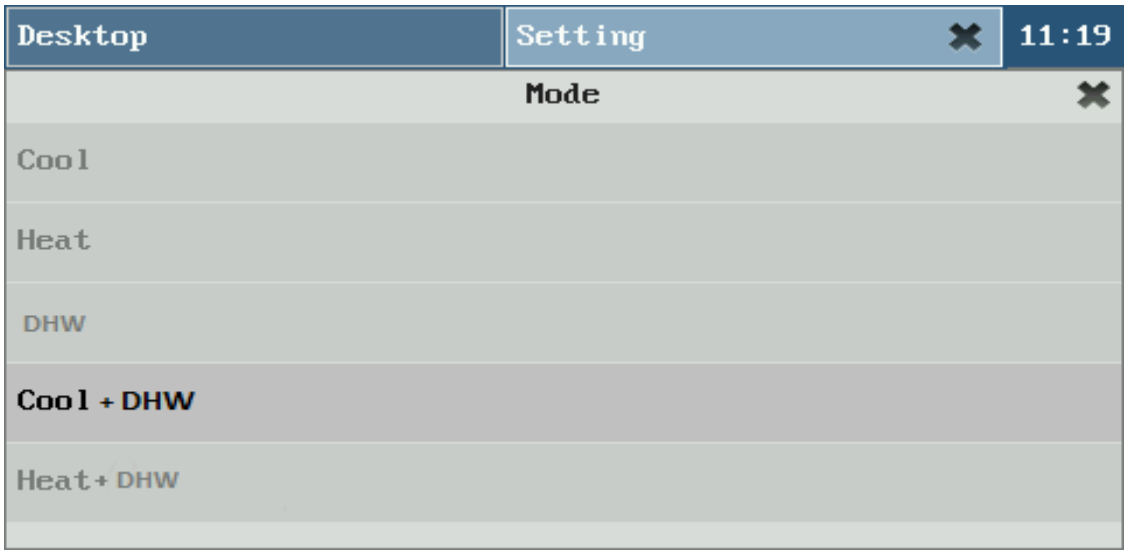

Timer 4 “Mode” settings.

# 2 Operating the CX34

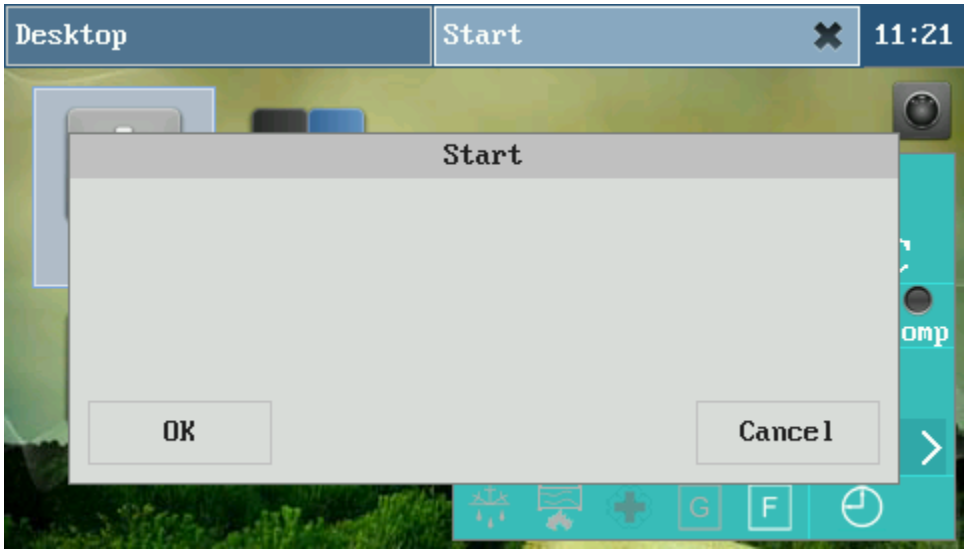
To select a mode to operate in, from the desktop, touch “settings”.
The screen below will appear.




Touch the mode bar and the screen below will appear. Select the mode you want by touching the bar associated with the mode. AU Heat Mode and AU DHW Modes are not used on the CX34 and should be disabled.

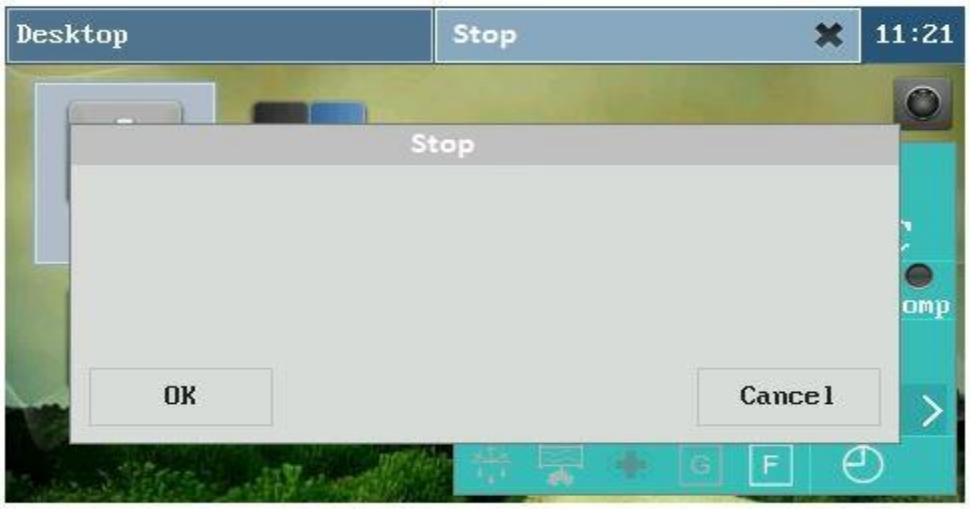


To **Start** the selected mode hit the Start button then “OK” 

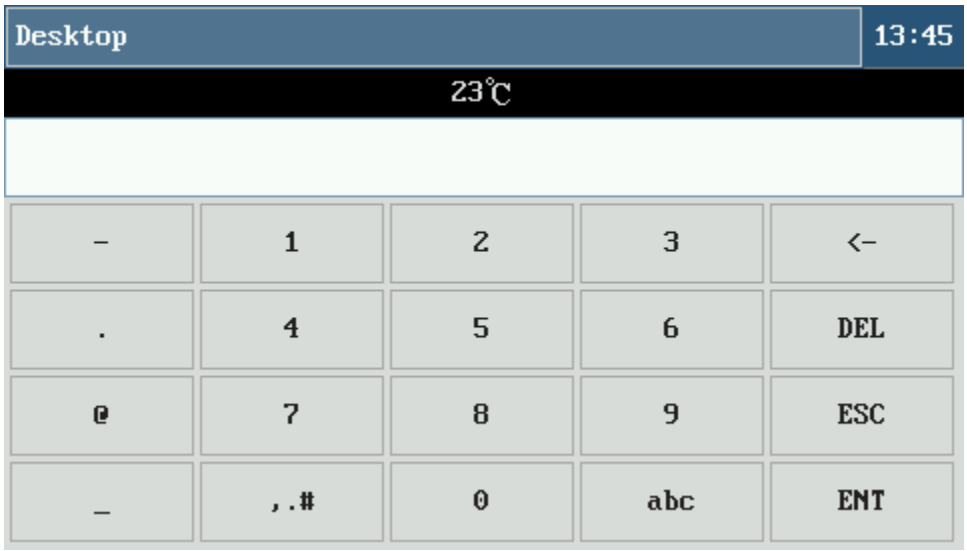



Use this same sequence for all of the modes. Always “shutdown” the chiller and wait for the compressor to turn off before removing the power.

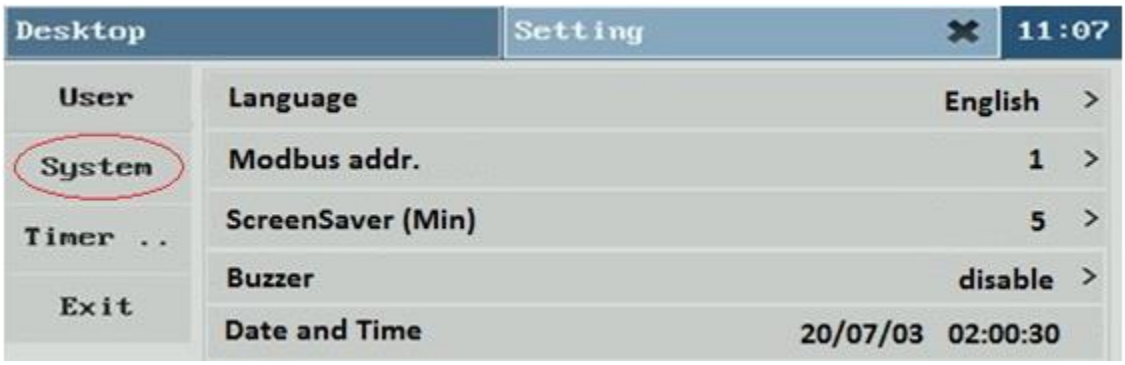
To shut down a mode, touch the “shutdown” icon.  Then touch “OK”.




# Setting the target or Set Point Temperature




Next, to set the temperature, go back to the desktop and touch the "set target AC" icon. Using the keypad select the desired temperature and touch the "ENT" icon.




The Modbus address can be changed by touching "System", then Modbus addr.

## 3 Manufacturing Setting (Parameter Checking and Setting) “P Parameters”

Touch and hold the lower left side of the main window for more than 3 seconds to enter the factory setting confirmation window as shown in Figure 3-1, press "Confirm" Factory setting, or press "Cancel" to exit.


“Press here” with finger turned sideways for 5 seconds.

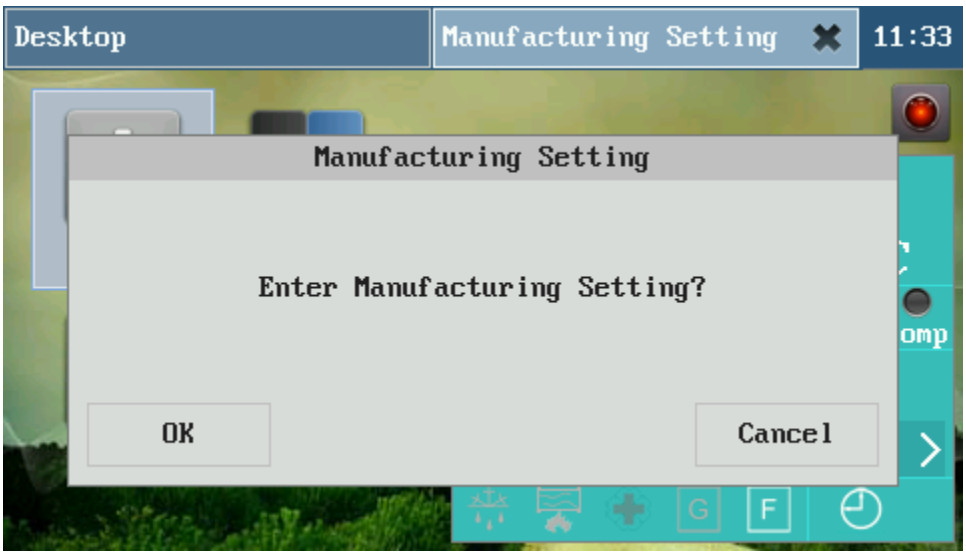



Figure 3-1

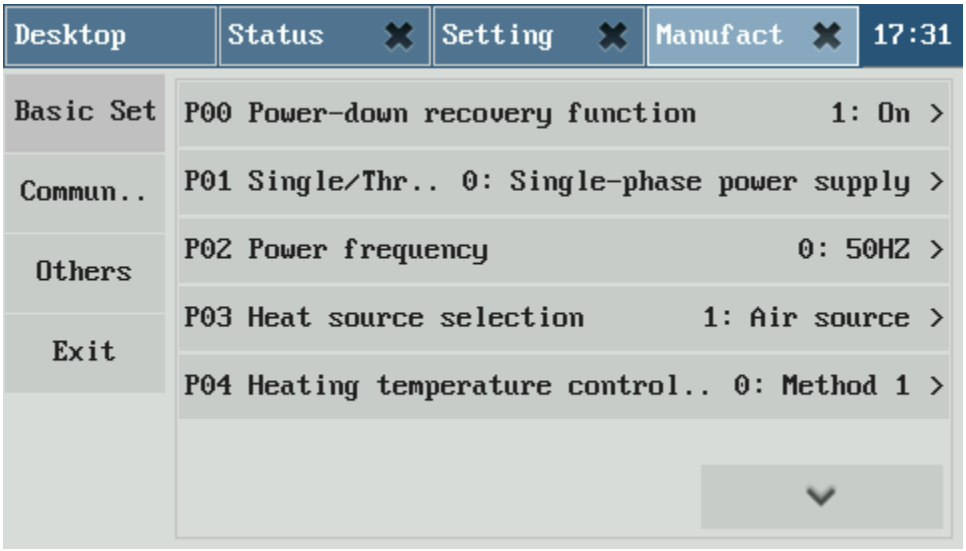



Figure 3-2

## 3.1 Communication Setting

Communication settings include settings for the protocol and baud rate. These settings should never be changed. Fig 3-3

Enter the factory settings menus as shown in figure 3-1, the left is the "main menu", on the right are the "P parameters".
A complete list of P parameters starts on page 51. For Multi-pages, click on the "Down arrow" to display the next page.
Main menu includes:
(1) Basic settings “P Parameters”
(2) Communication settings
(3) Others

## 3.2 OTHERS FUNCTIONS

**Initialize the control panel:** The initialization of the control panel function is used to initialize all parameters in the control panel back to factory settings. Figure 3-4
**Delete the fault history:** Deletes all historical faults, do not delete, let them roll over.
**Password setting:** To set the password to enter settings mode, do not change.

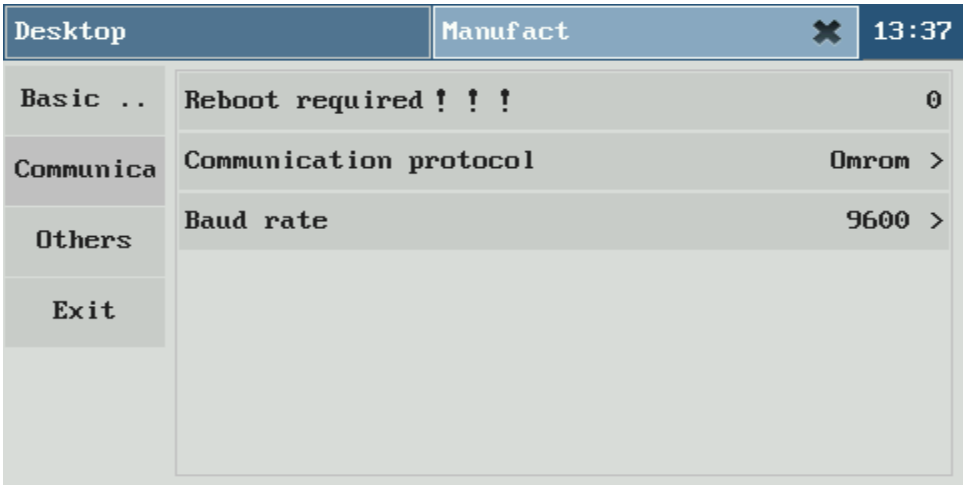

Desktop
Manufact
13:37
Basic ..
Communica
Others
Exit
Reboot required ! ! !
0
Communication protocol
Omrom >
Baud rate
9600 >

Fig. 3-3

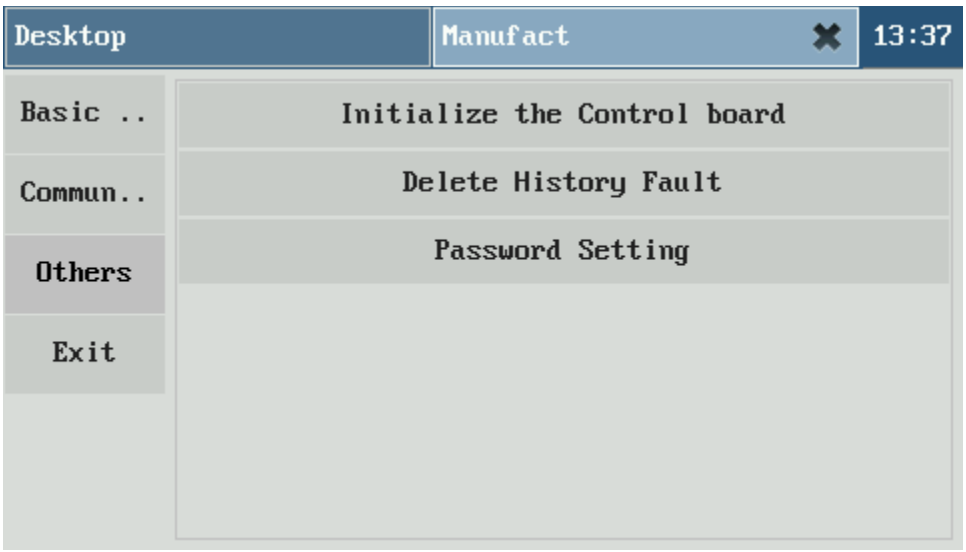

Desktop
Manufact
13:37
Basic ..
Commun..
Others
Exit
Initialize the Control board
Delete History Fault
Password Setting

Fig. 3-4

# 4. Parameter Checking and Setting “MFG MODE”

The detailed parameters of the manufacturer settings are described in the table below.

| NO | Name | scope/means | Range, Meaning | Default |
|---|---|---|---|---|
| P00 | Power-down recovery function | 0：off；1：on | 0：off；1：on | 1 |
| P01 | Input Power:<br>Single / three phase selection | 0：Single-phase 1：Three-phase | 0：Single-phase power Three-phase power | 0 |
| P02 | Power frequency | *0：50HZ； 1：60HZ* | 5：50HZ； 1：60HZ | 1 |
| P03 | Heat source selection | 0：ground source； 1：air source | 0；ground source<br>1：Air source | 1 |
| P04 | Heating temperature control method | 0：Method 1； 1：Method 2 | 0：Method 1： 1：Method 2 | 0 |
| P05 | Defrost method selection | 0：Method 1； 1：Method 2 | 0：Method 1： 1：Method 2 | 0 |
| P06 | FREECOOLING validation | 0：valid； 1：invalid | 0：valid； 1：invalid | 1 |
| P07 | Frequency control method | 0：Method 1； 1：Method 2 | 0：Method 1； 1：Method 2 | 0 |
| P08 | DHW validation G1 | 0：valid； 1：invalid | 0：valid； 1：invalid | 1 |
| P09 | Air conditioning and heating validation | 0：valid； 1：invalid | 0：valid； 1：invalid | 0 |
| P10 | Air conditioning and Cooling validation | 0：valid； 1：invalid | 0：valid； 1：invalid | 0 |
| P11 | DHW hot water temp hysteresis | 2～15℃， minus hysteresis | 2～15℃， minus hysteresis | 2℃ |
| P12 | AC temp hysteresis | 2～15℃， minus hysteresis | 2～15℃， minus hysteresis | 2℃ |
| P30 | fan motor Category | 0=AC fan, 1=EC fan1, 2=EC fan 2 | 0=AC Fan, 1=EC Fan1, 2= EC | 1 |
| P31 | Maximum speed of the fan | *10-100（100 show1 00%）* | 1-10（10=100%） | *100* |
| P32 | Heating fan speed control temperature difference | 2～15℃ | 2～15℃ | 1℃ |
| P33 | Cooling Fan speed control Temperature difference | 5～18℃ | 5～18℃ | 6℃ |
| P34 | Defrost method | 0：Method 1； | 0：Method 1； | 0 |
| P35 | defrost starting temp | -5~5℃ | C00 Pipe sensor | -1℃ |
| P36 | defrost interval time multiple rate | 0：Not defrost；1；2；3；4：（interval X 4） | 0：Not defrost；1；2；3；4：（interval X 4） | 1 |
| P37 | The first defrost interval | 15~99minu（1st interval after repower on） | 15~99minute（1st interval after repower on） | 35 |
| P38 | defrost exit temp | 10~35℃ | C00 Pipe sensor | 30℃ |
| *P47* | hot water frequency limitation | 2~10， max frequency 20~100% | 2~10= max frequency 20~100% | 100 |
| *P48* | AC heating AU mode highest temp | 30~50℃ | 30~50℃ | 45℃ |
| *P49* | AC Heating AU mode offset temperature | -10~10℃ | -10~10℃ | 0℃ |

| | | | | |
|---|---|---|---|---|
| *P50* | solenoid valve function parameters | 0=G3 seasonal valve,<br>1=G3 solar valve | 0= G3 is seasonal valve,<br>1=G3 is solar valve | 0 |
| *P51* | C4 Water pump type selection | 0=AC Water pump,<br>1=EC Water pump | 0=AC Water pump,<br>1=EC Water pump | 1 |
| *P52* | water pump working mode | 0=Not stop, 1=stop after reaching target temp） 2=start 1 minute after each stopping of 15 minutes） | 0=Not stop, 1=stop after reaching target temp, 2=start 1 minute after each stopping of 15 minutes） | 0 |
| *P53* | EC Water pump C4 Minimum speed | 40-80% | 40-80% 40, | 40 |
| *P54* | C5 Water pump type selection | 0=AC Water pump,<br>1=EC Water pump | 0=AC Water pump,<br>1=EC Water pump | 0 |
| *P55* | DHW e-heater activated ambient temp E1 | -20~20℃ | -20~20℃ | 0℃ |
| *P56* | Electric heating function | 0=electric heating,<br>1=the second heat source | 0=electric heating,<br>1=the second heat source | 0 |
| *P57* | AC e-heater activated ambient temp E2 | -20~20℃ | -20~20℃ | 0℃ |
| *P58* | 2nd heat source starting air temp | -30~15℃ | -30~15℃ | -15℃ |
| *P59* | AC anti-freezing temperature | -15~5℃ | -15~5℃ | 3℃ |
| *P60* | Virus killing interval days | 7~99day | 7~99 day | 99 |
| *P61* | Start virus killing time | 1~24hour | 1~24 hour | 1 |
| *P62* | Virus killing holding time | 5~99minu | 5~99 Min | 5 |
| *P63* | Target temperature of virus killing | 55~80℃ | 55~80℃ | 55℃ |
| *P64* | AC water flow switch type selection | 0=Water flow switch<br>1=flow meter | 0=Normal Water flow switch<br>1=Water flow meter switch | 1 |
| *P65* | AC minimum water flow (Sets P5) | 9-80L/m | 9-80L/m | 8 |
| *P68* | air source heat pump FREECOOLING function start ambient temp | -16~20℃ | -16~20℃ | 5℃ |
| *P69* | FREECOOLING function additional Temperature difference to start full free cooling. (compressor stops) | 3~15℃ | 3~15℃ | 5℃ |
| *P71* | Cooling Maximum set temperature | 15~35℃ | 15~35℃ | 25℃ |
| *P72* | Heating maximum set temperature | 25~55℃ | 25~55℃ | 55℃ |
| *P73* | DHW The highest set temperature | 25~60℃ | 25~60℃ | 60℃ |
| *P74* | Debugging fixed operating frequency | 10~100 HZ | 10~100 HZ | 50HZ |
| *P75* | run setting frequency | 0= Manual frequency, 1= Auto frequency | 00= Manual frequency, 1= Auto frequency | 1 |

| | | | | |
|---|---|---|---|---|
| *P76* | EEV manually open degree (heating) | *70~480* | 70~480 | *200* |
| *P77* | EEV manually open degree (cooling) | *70~480* | 70~480 | *250* |
| *P78* | EEV control mode | 0=No,1=table list,2=manually, 3=automatically | 0=No,1=table list,2=manually, 3=automatically | 3 |
| *P79* | target overheat degree (heating) | -5~10℃ | -5~10℃ | -1℃ |
| *P80* | target overheat degree (cooling) | -5~10℃ | -5~10℃ | 2°C |
| *P81* | night mode validation | 0= no start, 1= start | 0= no start, 1= start | 0 |
| *P82* | night mode starting point | 0-23（for relative time） | 0-23（for relative time） | 22 |
| *P83* | night mode ending point | 0-23（for relative time） | 0-23（for relative time） | 6 |
| *P88* | Model selection | 0~255 | 0~255 | 4 |
| *P94* | Whether to use high and low pressure transmitter | *0=Disabled*<br>*1= Enable* | *0= N/A*<br>*1= Enable* | 0 |
| *P95* | C4 Control the temperature difference (℃) | *2~8* | *2~8* | 5 |
| *P96* | Compressor Manufacturer | | *Mitsubishi* | |
| *P97* | Manual Virus Killing | | *NO* | 0 |
| *P98* | Reset Factory parameter | | *NO* | 0 |

# 5 STATUS

The status application is used to check the detailed status of the unit operation, such as compressor speed, fan speed, G1, G2, G3, G4 valves and so on. See Fig. 5-1

## 5.1 State preview display interface

a) **Compressor:** Displays the current working status of the compressor.
b) **Compressor Heating:** Displays compressor heating status.
c) **Outdoor fan:** show the working status of the outdoor fan.
d) **Reversing valve**, **electronic expansion valve**, **electrical heating**, **G1 valve** and other work status, query can be directly observed through this interface.

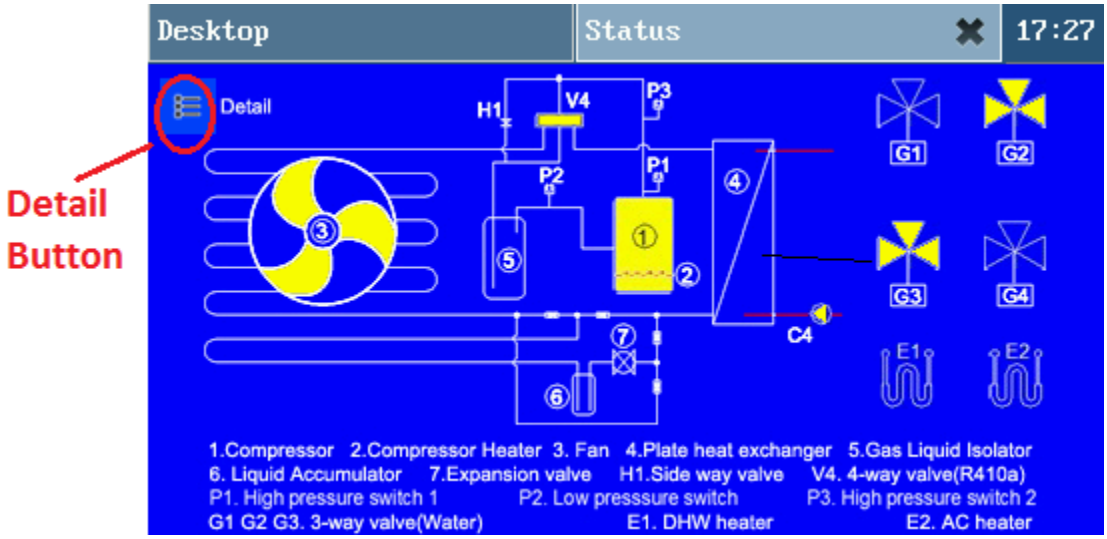



Figure 5-1

## 5.2 Detailed Status Interface “C Parameters”

Click "**detail**" in the status query interface to enter the detailed status interface of the machine, as shown in Figure 5-1. Click the arrow “->” button to return to the previous state interface. Specific C parameters can be found in Figure 5-2 below. The complete list of “C” parameters begins on page 55.

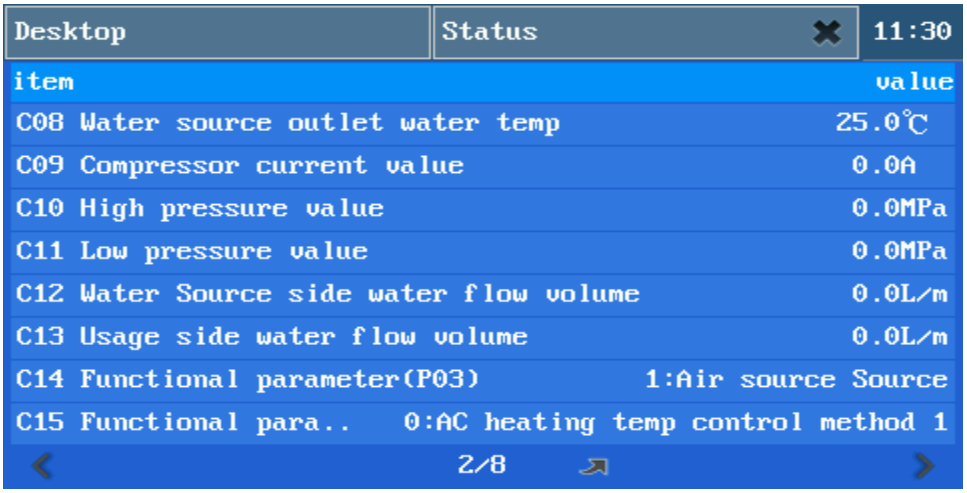



Fig 5-2

# 6. Parameter Checking Only

| No | Name | Scope/means | Range, Meaning |
|---|---|---|---|
| C00 | out pipe temp | -30~97℃ | -30~97℃ |
| C01 | compressor discharge temp | -30~128℃ | -30~128℃ |
| C02 | ambient temp | -30~97℃ | -30~97℃ |
| C03 | Suction temperature | -30~97℃ | -30~97℃ |
| C04 | Plate heat exchanger temp | -30~97℃ | -30~97℃ |
| C05 | AC outlet water temp | -30~97℃ | -30~97℃ |
| C06 | Solar temperature | -30~97℃ | -30~97℃ |
| C09 | Compressor current value P15 | *0.0~30.0A* | 0.00~30.00A |
| C13 | Usage side water flow volume | 0~100L/m Actual Flow | 0~100L/m |
| C14 | P03 Status | 0=Air source, 1= Ground source | 0=Air source, 1=Ground source |
| C15 | P04 Status | 0=Heating temperature control mode one, 1= Heating temperature control mode two | AC heating temp control method |
| C16 | P05 Status | 0=Defrost mode one,<br>1= Defrost mode two | Defrost method |
| C17 | P06 Status | 0= Free cooling valid, | Free cooling=0 valid, |

| | | | |
|---|---|---|---|
| | | 1= Free cooling invalid | 1=invalid |
| C18 | P07 Status | 0=Frequency mode one,<br>1= Frequency mode two | Frequency method |
| C19 | P08 Status | 0= DHW valid, 1= DHW invalid | 0=DHW valid, 1= DHW invalid |
| C20 | P09 Status | 0=Heating valid,<br>1= Heating invalid | AC heating valid= 0 valid<br>1= invalid |
| C21 | P10 Status | 0=cooling valid,<br>1=cooling invalid | 0=cooling valid,<br>1=cooling invalid |
| C22 | high pressure switch status | 1= on, 0= off | 1= on, 0= off |
| C23 | low pressure switch status | 1=on, 0= off | 1=on, 0= off |
| C24 | second high pressure switch status | 1=on, 0= off | 1=on, 0= off |
| C25 | inner water flow switch | 1=on, 0= off | 1=on, 0= off |
| C27 | Compressor Frequency | Displays the actual operating frequency | Show actual frequency |
| C28 | Thermal switch status | 1=on, 0= off | 1=on, 0= off |
| C29 | outdoor fan motor | 1= run, 0= stop | 1=on, 0= off |
| C30 | electrical valve 1 | 1= run, 0= stop | 1= run, 0= stop |
| C31 | electrical valve 2 | 1= run, 0= stop | 1= run, 0= stop |
| C32 | electrical valve 3 | 1= run, 0= stop | 1= run, 0= stop |
| C33 | electrical valve 4 | 1= run, 0= stop | 1= run, 0= stop |
| C34 | C4water pump | 1= run, 0= stop | 1= run, 0= stop |
| C35 | C5water pump | 1= run, 0= stop | 1= run, 0= stop |
| C36 | C6water pump | 1= run, 0= stop | 1= run, 0= stop |
| C37 | The accumulative days after last virus killing | 0-99 (From the last complete sterilization to the present, cumulative number of days） | 0-99 (from the last complete sterilization to the present, cumulative number of days) |
| C38 | outdoor modular temp | -30~97℃ | -30~97℃ |
| C39 | Expansion valve 1 opening degree | 0~500 | 0~500 |
| C40 | Expansion valve 2 opening degree | 0~500 | 0~500 |
| C41 | inner pipe temp display | -30~97℃ | -30~97℃ |
| C42 | Heating Method 2 target temperature | -30~97℃ | -30~97℃ |
| C43 | Indoor temperature control switch | 1=on, 0= off | 1=on, 0= off |

| | | | |
|---|---|---|---|
| C44 | fan type | 0= AC fan, 1= EC fan 1,<br>2= EC fan 2 | 0= AC fan, 1= EC fan 1,<br>2= EC fan 2 |
| C45 | EC fan motor 1 speed | 0~3000 | 0~3000 |
| C46 | EC fan motor 2 speed | 0~3000 | 0~3000 |
| C47 | water pump types | 0= AC Water pump<br>1= EC Water pump | 0= AC Water pump<br>1= EC Water pump |
| C48 | water pump1 speed (C4) | 1~10 （10 Show 100%） | 1~10 (10 means 100%) |
| C49 | water pump2 speed | 1~10 （10 Show 100%） | 1~10 (10 means 100%) |
| C50 | Inductor AC Current value P15 | 0~50A | 0~50A |
| C51 | Driver working status value | Hexadecimal value | Hexadecimal values |
| C52 | Compressor shut down Code | Hexadecimal value | Hexadecimal values |
| C53 | Driver allowed highest frequency | 30-120Hz | 30-120Hz |
| C54 | Reduce frequency temperature setting | 55~200℃ | 55~200℃ |
| C55 | input AC Voltage value | 0~550V | 0~550V |
| C56 | input AC current value | 0~50A（IPM test） | 0~50A（IPM Check） |
| C57 | Compressor phase current value | 0~50A（IPM test） | 0~50A（IPM Check） |
| C58 | Bus line voltage | 0~750V | 0~750V |
| C59 | Fan shutdown Code | Hexadecimal value | Hexadecimal values |
| C60 | IPM temp | 55~200℃ | 55~200℃ |
| C61 | Compressor total running time<br>Will reset after power cycle | 0~65000 | 0~65000 hour |

## 7 ABOUT

The interface displays the touch screen and PLC version information, as shown in Figure 7-1.


Figure 7-1

## 8 INITIAL TEMPERATURE SETTINGS

***Note – All set points refer to the CX34 return (inlet) temperature, and implies a leaving (outlet) temperature of ~10°F cooler/warmer than what you set. For example if you want heating output to be ~100°F you would set the heating target to 90°F. Default setting for cooling should be 54°F, therefore the leaving (outlet) temperature would be around 44°F. Standard settings would be as follows: heating, set at 30°c (90°F) return for radiant, or 35°C (95°F) for fan coils or fan coils + radiant. For cooling mode the standard setting would be 12°C (54°F) to get ~44°F outlet temperature. Detailed settings as follows:**

| N0. | Meaning | Selected temperature range | Recommended controller temperature initial setting |
|---|---|---|---|
| 1 | Cooling returned water temp | 50°F ~ 77°F | 63°F |
| 2 | Heating returned water temp | 50°F ~ 131°F | 95°F Fan coils<br>86°F for radiant |
| 3 | DHW temp | 50°F ~ 122°F | 122°F |

**9 FAULTS** Touch the **ERROR** icon to access the current error.

Fault application is used to query the current or historical fault. After entering the fault application, click on the main window of the "current fault" or "historical failure" to display errors.

### 9.1 CURRENT FAULT

To enter the current fault display as shown in Figure 8-1, the left side shows the fault item, the format is "fault number". On the right side of the three buttons are "on a page", "next" page, "reset", click the reset button to reset the current fault.

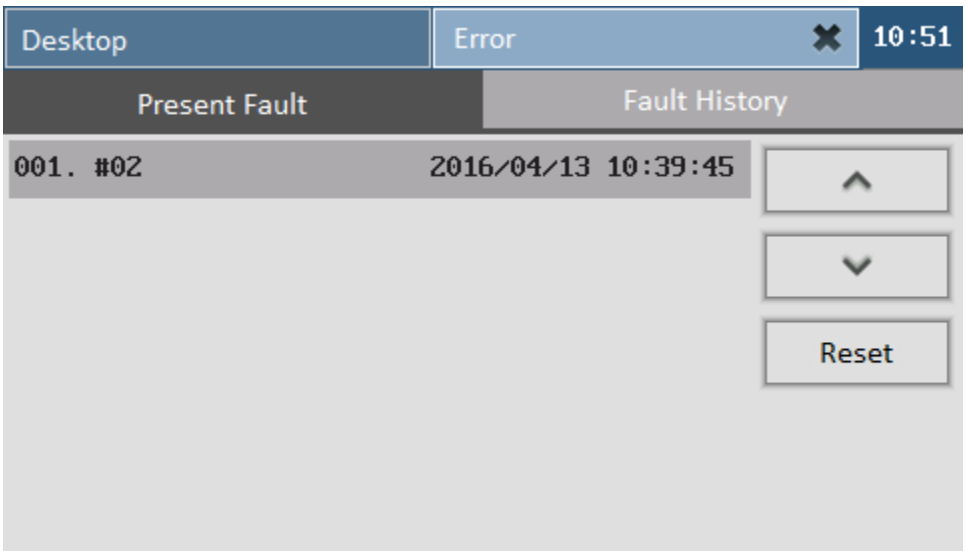



Figure 9-1

### 9.2 FAULT HISTORY

Enter the history fault display as shown in Figure 9-2, the left side is the fault item, the right side has the previous page, the next page and the query time of the fault history. The query time can be set by clicking the year / month / day.

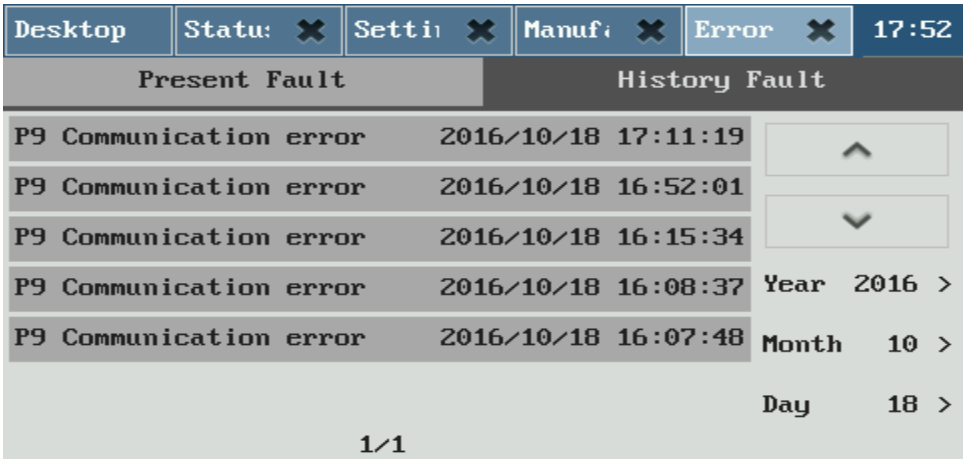



Figure 9-2

## 9.3 CX34 Error Codes, Error Meaning, and Reason

| Error code | Error Meaning | Reason |
|---|---|---|
| E1 | Compressor discharge high temp protection | Poor refrigerant or throttle is not normal (stop compressor) |
| E2 | Outdoor air temp sensor error | Outdoor air temp sensor open or short circuit (stop compressor) |
| E3 | Outer coil pipe temp sensor error | Outdoor coil pipe temp sensor open or short circuit (stop compressor) |
| E4 | Pipe returned gas sensor error | Outdoor coil pipe temp sensor open or short circuit (stop compressor) |
| E5 | indoor refrigerant pipe temp sensor error | Indoor pipe temp sensor open or short circuit (stop compressor) |
| E6 | Coil high temp protection | Outdoor coil pipe temp over 60℃ (stop compressor) |
| E7 | solar water temp sensor error | solar temp sensor open or short circuit (stop compressor) |
| E8 | AC inlet water temp sensor error | AC return water temp sensor open or short circuit (stop compressor) |
| E9 | AC outlet water temp sensor error | AC outlet water temp sensor open or short circuit (stop compressor) |

| | | |
|---|---|---|
| E10 | DHW temp sensor error | DHW temp sensor open or short circuit (stop compressor) |
| E11 | Indoor ambient sensor error | Indoor ambient sensor open or short circuit (stop compressor) |
| E12 | water source inlet water temp sensor error | water source inlet temp sensor open or short circuit |
| E13 | water source outlet temp sensor | water source outlet temp sensor open or short circuit |
| E14 | system anti-freeze twice | (stop compressor) |
| E15 | DHW anti-freeze twice | (stop compressor) |
| E16 | discharge Probe error | Poor outdoor unit heat transfer |
| E17 | System 2 antifreeze twice | (stop compressor) |
| P1 | high pressure protection | (1) too much refrigerant; (2) throttle mechanism failure; (3) high voltage switch failure |
| P2 | low pressure protection | (1) less refrigerant; (2) throttle failure; (3) low-voltage switch failure |
| P3 | compressor overheat protection | (1) less refrigerant; (2) throttle mechanism failure |
| P4 | over current protection Verify that P88 = 4 | (1) too much refrigerant; (2) throttle mechanism failure; (3) current sensor failure |
| P5 | indoor unit water flow error | (1) water flow is too small; (2) water switch failure |
| P6 | outdoor water flow error | (1) water flow side is too small; (2) water source side of the water flow switch failure |
| P7 | miss phase | Power failure |
| P8 | wrong phase | Power failure |
| P9 | communication error | The communication line is broken or the control board is damaged |

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|---|---|---|
| P10 | water source anti-freeze | (1) the water source side of the heat transfer or water temperature is too low; (2) water side of the water flow is insufficient |
| P11 | water source water flow not enough | (1) water side of the water flow is low |
| P12 | EPPRON initializes the fault | |
| P13 | Control board and inverter communication fault | (1) The inverter and the circuit board communication line is loose (2) inverter fault |
| P14 | The temperature difference between inlet and outlet is too large | (1) water flow is too small; (2) water switch failure |
| P15 | Current limit frequency fault | Caused by current limitation at lubricant oil return operation. Set P33=6°C |
| F1 | voltage protection | Power voltage is too high or too low, the voltage is normal after the machine to resume operation (motherboard detection) |
| F2 | IPM Fault | IPM module is damaged |
| F3 | Compressor Drive Fault | The compressor cannot start normally |
| F4 | Compressor over current protection 1 | IPM detects that the compressor current is excessive (IPM or compressor or wiring is faulty) |
| F5 | Compressor over current protection 2 | The motherboard detects that the compressor current is excessive |
| F6 | IPM Overheat | IPM temperature exceeds the set value |
| F7 | PFC Fault | PFC damage |
| F8 | DC bus over voltage | DC voltage exceeds 410V |
| F9 | DC bus under voltage | DC voltage less than 200V |
| F10 | AC input over or under voltage | Power voltage is too high or too low, the voltage is normal after the machine to resume operation (IPM detection) (175V ~ 255V) |
| F11 | AC input overcurrent | IPM detected AC current exceeded |
| F12 | Temperature sensor Fault | temp sensor is open or shorted |

| | | |
|---|---|---|
| F13 | DSP and motherboard communication Fault | Communication break or control board failure |
| F14 | EC fan failure 1 | EC fan 1 not connected or fan failure |
| F15 | EC fan failure 2 | EC fan 2 not connected or fan failure |

**An as-built design will need to be provided to Chiltrix by email before the commissioning call.**
**For Commissioning please arrange a commissioning call with Chiltrix Support Dept.**
**+1 757-410-8640 Ext. 112**
**PLEASE MAKE SURE TO CALL CHILTRIX BEFORE COMMISSIONING**

# Commissioning "In Heating Mode Only"

## Preparation

After finishing the installation tasks, please check the items below:

1. Check the Wired Controller P Parameters for the most updated settings.
2. Check that the power cable is securely connected and the screws are tight.
3. Is the display lit on the wired controller after the power is applied?
4. Verify that all the shut off valves and manual valves are open. Insulate all water supply and return pipes.
5. Test only in **heating mode** to verify proper water flow. Call us if it is your first install.

Water or Glycol Filling (See page 28) A 10% minimum glycol mixture is suggested to protect the unit from freezing and provide corrosion inhibition. Refer to the chart on page 10.

1. With a hose and filling pump connected to the CX34 water system, and all air exhaust valves open in the water system, fill the water loop with water and glycol mixture. Keep the air exhaust valves open until there is a continuous flow of water and glycol mixture coming out of the air exhaust valve. Then close the air exhaust valves. See page 30 and 31 for more details.
2. Discharge the air from both domestic hot water system and air conditioning water system. CXI fan coils have a bleeder valve located near the inlet and outlet ports. The CX34 has a bleeder tube attached to the Brazed plate heat exchanger.

***To avoid freezing the heat pump when the air temperature drops below 32F in winter, you must use an appropriate glycol and water mixture just in case the electricity is cut off. We recommend biodegradable non-toxic SPP Corn Glycol, any Propylene Glycol (PG) can be used.***

Running a Test- Call tech support if this is your first time commissioning a CX34.
Apply power to the CX34 and select **heating mode** using the wired controller. Return and leaving water temperature should be within 6-7 degrees. If more than 6-7 degrees, there is not enough flow in the system or air in the lines and you will get P5 and P1 errors. Call tech support if any error codes are displayed on the wired controller.
**Chiltrix Tech Support hours of operation, M-F, 9 am-6 pm EST, 757-410-8640 x112**

**MOST IMPORTANT!**

1. Always maintain an electrical connection with heat pump to enable the antifreeze function.2. Initial test should be done in **heating mode**. Make sure it is not in cooling mode during first operation or running a test until you make sure the air conditioning circulation pump is working properly and water is flowing smoothly. Failure to do so will void the warranty.