

Waiter Legacy

Electronic Climate Controller

May 14, 2023



Operation Manual

www.WaiterECC.com

INTRODUCTION

Waiter Legacy is a direct plug and play replacement for a failed or aging Intellitec ECC system.

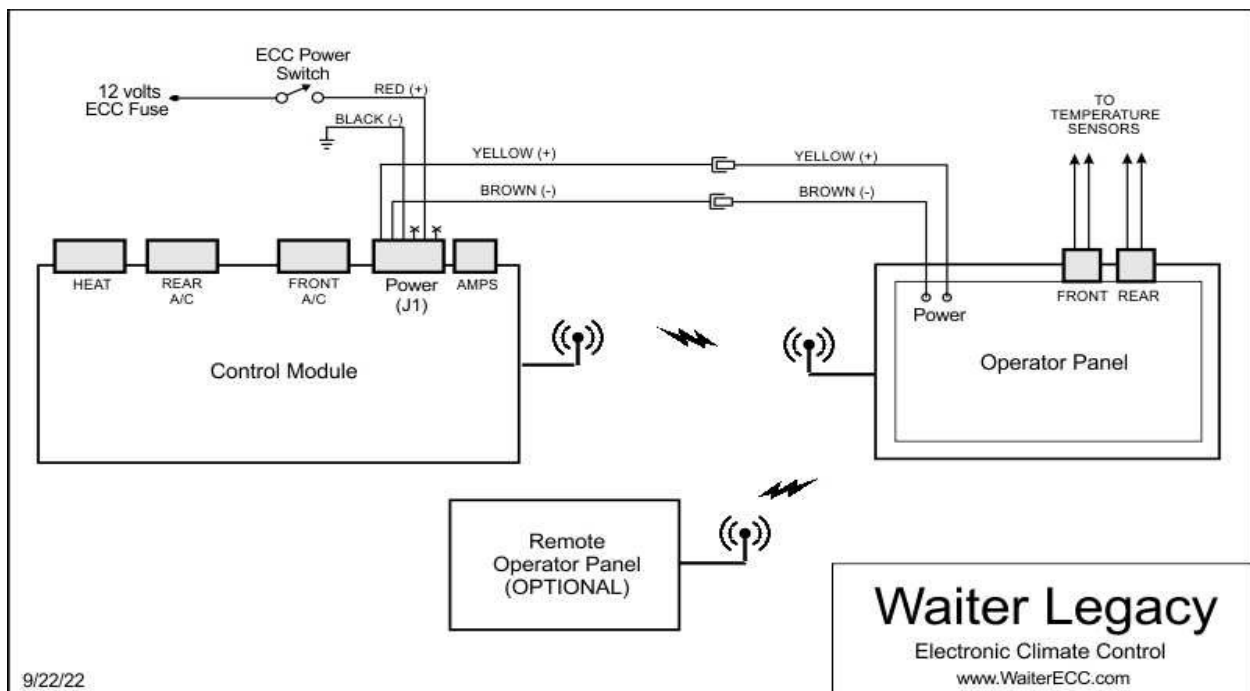
The Waiter Legacy kit includes two major components; 1) A new operator panel (OP), and 2) a replacement circuit board for the control module (CM).

Operation and control is similar to the Intellitec system with minor differences in how operational status is presented to the operator, and how temperature, shedding and A/C control functions operate.

Operation modes and set points are selected with slider controls. System status is provided by two multi color LEDs, one for the front and one for the rear.

Control of the furnace(s) and A/C units is performed in the control module. The control module monitors the current draw (amps) and provides load shedding and power management of the A/C unit compressors as needed. The control module provides 5.6 volt power to the operator panel via the existing yellow (+) and brown (-) wires.

The operator panel and the control module communicate with each other using a dedicated wireless link similar to what you'd find in a wireless mouse or keyboard. The basic wireless channel number is set at the factory during assembly. There are four sub channel addresses that can be selected by the end user. The basic and sub channel addresses must match in order for the operator panel and control module to communicate with each other.



WAITER LEGACY – PLUG AND PLAY FOR INTELLITEC ECC SYSTEMS

There were three variations of Intellitec ECC systems used in 30 amp Fleetwood motor homes between 1994 and 2008. You **MUST** verify your system part number(s) before ordering to ensure you order the correct replacement kit.

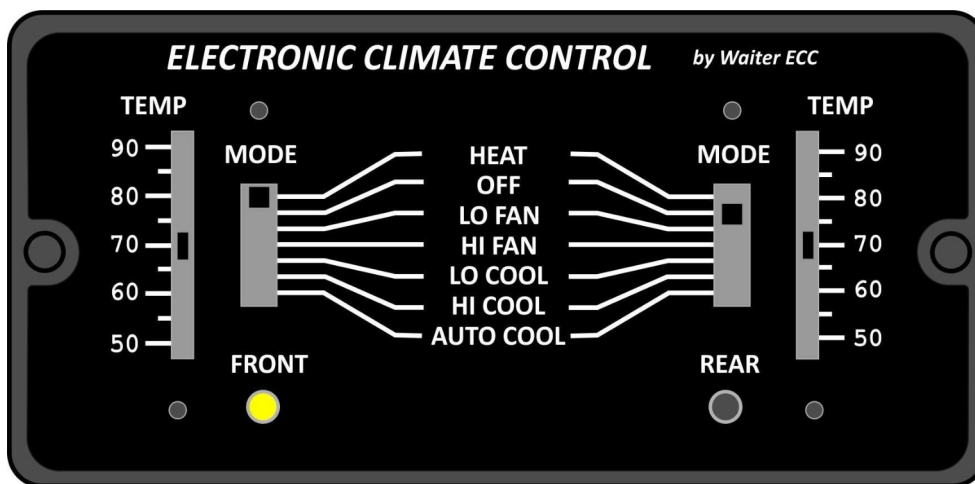
EARLY MODEL - Early model systems were installed from about 1994 to 1998 and have part numbers 000-003xx-xxx on the operator panel and control module. These early systems used two 2.2k ohm temperature sensors and connectors that aren't compatible with the Waiter Legacy System. The Waiter Legacy kit for these early model systems includes new temperature sensors and connectors that are compatible with the Waiter Legacy system. The old sensors and connectors will need to be replaced.

COMMON MODEL – This model is probably the most common, installed between 1998 and 2005. Normal model systems can be identified with part numbers 000-005xx-xxx. These units are completely plug and play with no wiring changes required.

LATE MODEL – Late model ECC II systems use a completely different operator panel, part numbers 000-008xx-xxx. The control module for these late systems is physically smaller and the power connections to the operator panel are different. The Waiter Legacy kit for late model units includes a new 3d printed control module housing and a power plug adapter for the operator panel. No wiring changes are required.

OPERATOR PANEL

The Operators panel looks similar to its Intellitec counterpart with minor differences in appearance and functionality. The controls on the left side control the front system and the controls on the right side control the rear system. On motor homes equipped with only one furnace, HEAT mode isn't functional for the rear system.



In order to reduce costs, the same operator panel is used in motorhomes equipped with one or two furnaces. If your motorhome has only one furnace (front), selecting the rear HEAT mode

doesn't do anything.

To improve operator functionality, a configuration setting (SW4) is available in the operator panel to select one or two furnaces. This effects how the rear LED displays status if the rear HEAT is selected.

When SW4 is OFF (two furnaces) , rear HEAT can be selected and the LED shows normal status commands to the rear furnace.

When SW4 is ON (one furnace), selecting rear HEAT is the same as selecting rear OFF. The LED is off and no commands are sent to the rear furnace.

TEMP – Sets the operating set point for both heat and air conditioning. The range is approximately 50 – 90 degrees F.

MODE – Selects the operational mode for the front or rear systems.

HEAT – The furnace is command to run when the temperature drops below the set point. The furnace continues to run until the temperature is 2 degrees or more above the set point.

If your motorhome has only one furnace, the REAR furnace mode has no functionality. If SW4 is ON (one furnace) selecting rear HEAT will be the same as selecting OFF

OFF – Turns the system OFF.

LO FAN – Operates the A/C blower at low speed.

HI FAN – Operates the A/C blower at high speed

LO COOL – The A/C blower continuously runs at low speed, The compressor is commanded to run if the temperature is greater than set point. Compressor turns off if temperature is 2 degrees or more below the set point.

HI COOL – The A/C blower continuously runs at high speed. The compressor is commanded to run if the temperature is greater than set point. Compressor turns off if temperature is 2 degrees or more below the set point.

AUTO COOL – Blower speed changes according to the temperature. The compressor is commanded to run the if temperature is greater than set point. Compressor turns off if compressor is 2 degrees or more below the set point.

Blower high speed is commanded on if the temperature is greater than 5 degrees above the set point.

Blower low speed is commanded if the temperature is less than 4 degrees above set point. When the temperature drops 2 degrees or more below the set point, the compressor is commanded









OFF. 30 seconds later the blower is commanded OFF.




NOTE – If the compressor is SHED during the AUTO COOL operation, the blower continues to run at its commanded speed.

LED Indicators

The front and rear systems have dedicated multi color LED indicators that announce various system status and provide greater detail than the Intellitec system.

Waiter Legacy

LED STATUS	
	LED OFF - OFF, LO FAN, HI FAN
	HEAT or A/C mode but not commanded to run
	HEAT mode - Furnace commanded to run A/C mode - Compressor commanded to run
	A/C mode. Compressor Hard Start delay
	A/C mode. Compressor SHED
	A/C mode. pre-SHED. Waiting for more amps to become available
	Communications failure
	Temperature sensor failure

SENSOR TEST	
FRONT LED - blinks the current temperature REAR LED blinks the current set point	
To place the FRONT or REAR system in test mode, select FAN LO, and place the other system in OFF. Momentarily press the TEST button.	
To stop test, place both systems in OFF. Momentarily press the TEST button.	
	One long blink indicates a negative number. One short blink indicates a "100" digit
	Blink the "10"s digit
	Blink the "1"s digit

SENSOR TEST - TEMPERATURE / SET POINT TEST

A unique feature of the Waiter Legacy system is the ability to test the temperature sensor and set point adjustment by displaying a series of blinks with the two LEDs. In test mode, the left LED (FRONT) blinks the temperature and the right LED (REAR) blinks the set point for the system that's selected.

To select the front system for test, place the front mode switch to the LO FAN position and the rear mode switch to the OFF position. Momentarily press the TEST button on the back of the operator panel until both LEDs turn red.



The rear system is selected in a similar manner by placing the rear system to LO FAN and the front system to OFF, then momentarily press the TEST button until both LEDs turn red.

To exit the test mode, place both systems to OFF and momentarily press the TEST button until both LEDs turn red. If not exited using the TEST button, the system will automatically exit the test mode after 10 minutes.

In test mode, the LED on the left (FRONT) blinks the temperature and the LED on the right (REAR) blinks the set point for the selected system.

The temperature sensor range is -99 to 199. If the temperature is a minus, the blue LED will do a long blink to signify a "-XX". If the temperature is greater than 99 degrees, the blue LED will do a short blink to signify a "1XX" temperature. If the temperature is between 0 and 99 degrees, the blue LED will not blink.

The red LED then blinks the "10s" digit, and the green LED blinks the "1s" digit.

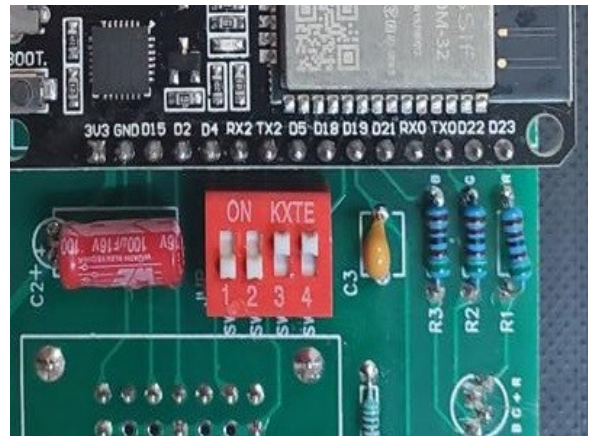
The "set point" range is 50 – 90 degrees. The right LED (REAR) blinks in a similar fashion to show the current set point for the selected system.

SYSTEM CONFIGURATION

System parameters can be selected on the control circuit board (switch settings) and/or the operator panel (jumpers). Configuration changes allow the user to optimize the performance of the Waiter Legacy system for their particular motor homes configuration



CONTROL MODULE



OPERATOR PANEL

Control Module (CM)

SW1 - ADDR1 (SW1 – SW2)	OFF - OFF = 0x00, ON - OFF = 0x10
SW2 - ADDR2 (SW1 – SW2)	OFF - ON = 0x20, ON - ON = 0x30
SW3 - Front A/C unit btu	OFF = 13k, ON = 15k
SW4 - Rear A/C unit btu	OFF = 13k, ON = 15k
SW5 - SHED sequence	OFF = Rear first, ON = AUTO
SW6 - SPARE	
SW7 - SPARE	
SW8 - Maintenance wireless packet	OFF = No Tx, ON = Tx

Operator Panel (OP)

SW1 - ADDR1 (SW1 – SW2)	OFF - OFF = 0x00, ON - OFF = 0x10
SW2 - ADDR2 (SW1 – SW2)	OFF - ON = 0x20, ON - ON = 0x30
SW3 - LED Brightness	OFF = Bright, ON = Dim
SW4 - Number of Furnaces	OFF = 2, ON = 1

The OP and CM must be rebooted to pick up any changes made to the Address.

LED BRIGHTNESS (Operator Panel)

The operator panel has two settings for LED brightness, bright (SW3 = OFF) and dim (SW3 = ON). The dim setting may be preferable if the operator panel is located in a bedroom

NUMBER OF FURNACES (Operator Panel)

SW4 (I-0) on the operator panel OFF = two furnaces, ON = one furnace.

To reduce costs, the same operator panel and control module are used in both the one and two furnace motorhomes. When configured for one furnace (SW4 = ON) if the REAR HEAT mode is selected, it'll be the same as selecting the REAR OFF mode. The rear LED doesn't illuminate and there are no rear heat commands sent to the control module.

WIRELESS COMMUNICATION ADDRESS (both)

SW1 (ADDR1), SW2 (ADDR2) on the control module and operator panel.

Communication between the operator panel (OP) and the control module (CM) is achieved by using a dedicated wireless link similar to what you'd find in a wireless mouse or keyboard.

The OP and CM are paired with each other before being shipped using any of the thousands of wireless base channels available. In the extreme remote possibility that two Waiter Legacy systems are in close proximity and interfering with each other, the user can select a different wireless sub channel by changing the address on the operator panel and the control module with the ADD1 and ADD2 switches / jumpers. The selected channel sub address for the OP and CM must match or they will not talk to each other.

The table below shows the sub address for the switch and jumper settings

	0x00	0x10	0x20	0x30
ADD1	OFF	ON	OFF	ON
ADD2	OFF	OFF	ON	ON

A/C UNIT BTU (Control Module)

SW3	FRONT A/C unit	OFF = 13k,	ON = 15k
SW4	REAR A/C unit	OFF = 13k,	ON = 15k

Jumpers can be set to tell the system what A/C unit BTU you have installed, select 13 or 15k btu. This selection is only used for estimating the compressor current draw prior to give the command to start a compressor. The 13k btu compressor is estimated at 8 amps, the 15k btu compressor estimated at 11 amps. Actual real time current draw (amps) is used for shedding.

Pre-shed - Before commanding an A/C compressor to start, the system estimates if there are enough amps available to start the compressor. It does this by adding either 8 or 11 amps to the current amps being drawn. If the sum exceeds 28 amps, the compressor will be placed in a “pre-shed” mode and won’t start until enough amps become available.

EXAMPLE ; The system comes configured as having two 13k btu A/C units installed. The system is currently drawing 21 amps from the microwave (11amps) , A/C blower (3 amps) , Water heater (4), Refrigerator (2), and converter (1). The system wants to start the front compressor and does a pre-shed check. The sum of 21 actual amps and an estimated 8 amps for the compressor results in 29 amps. This exceeds the 28 amps maximum, so the compressor is placed in a pre-shed mode and doesn’t start.

The system continues to monitor the amps and if the microwave or water heater are turned off, there’ll be enough amps available and the compressor will start if its still needed..

SHED PRIORITY (Control Module)

SW5 SHED priority OFF = REAR, ON = AUTO

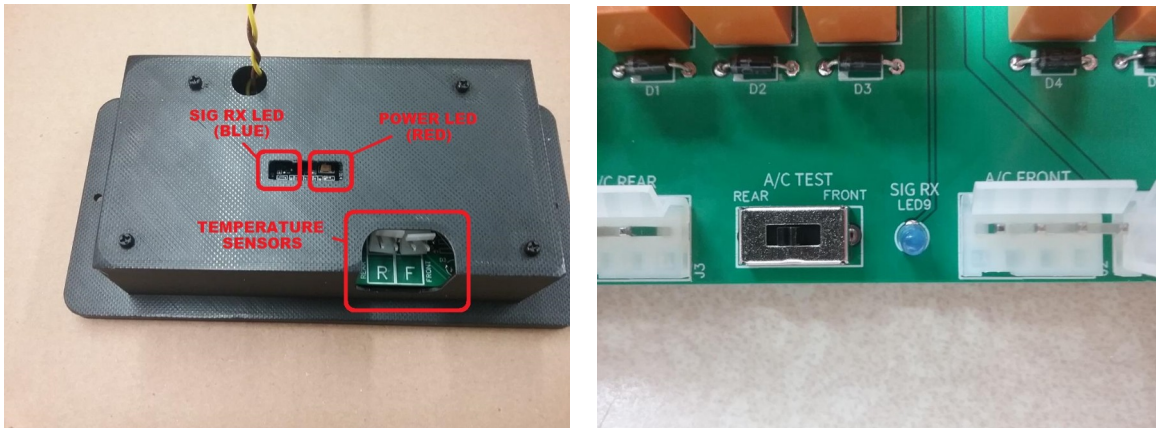
Shed priority provides two options on how / what A/C unit is shed. By default, the REAR setting will always shed the rear A/C unit first. The AUTO setting will alternate shedding between the front and rear A/C units.

In the REAR setting (default) if the front compressor wants to run, but there aren't enough amps available (pre-shed), the system will shed the rear compressor in an attempt to free up enough amps to start the front compressor.

MAINTENANCE WIRELESS PACKET TRANSMISSION (Control Module)

Mode, IO status, settings, etc are transmitted in a short packet about every 10 seconds. A special receiver is used to display this data. This packet can be turned ON and OFF with SW8. OFF = packet not transmitted, ON = packet transmitted

SIG RX LED (both)



The OP and CM have a small LED indicator to signal when it receives a communications packet. Information packets are exchanged at least every ten seconds or immediately if a temperature, set point, or status changes. The blue (or red) LED on the OP or the SIG RX LED on the CM blink whenever they receive a packet.

A/C TEST SWITCH (Control Module)

This switch provides a quick and easy way to verify the operation of an A/C unit. This switch forces the compressor and high speed fan to run, There's no hard start delay, no shedding, no temperature control, etc..

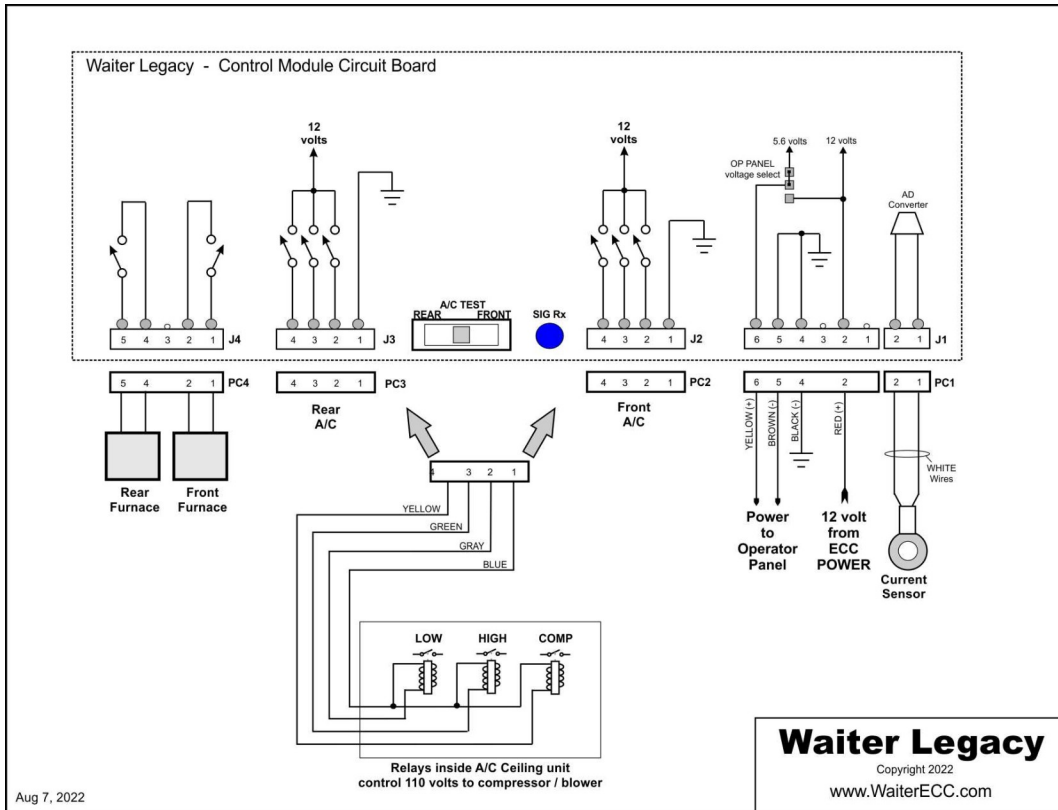
IMPORTANT NOTES ABOUT USING THE TEST SWITCH

- 1) The Waiter Legacy Control module must have 12 volts power in order for the TEST switch to function.
- 2) To safeguard against attempting to run the HI and LOW speed blower at the same time, its mandatory to place the front and rear systems in OFF position before using the TEST switch
- 3) The TEST switch bypasses shedding, hard start delay, and pre-shed functions. Before using the TEST switch, verify you have enough amps available to run the compressor without overloading the 30 amp service.

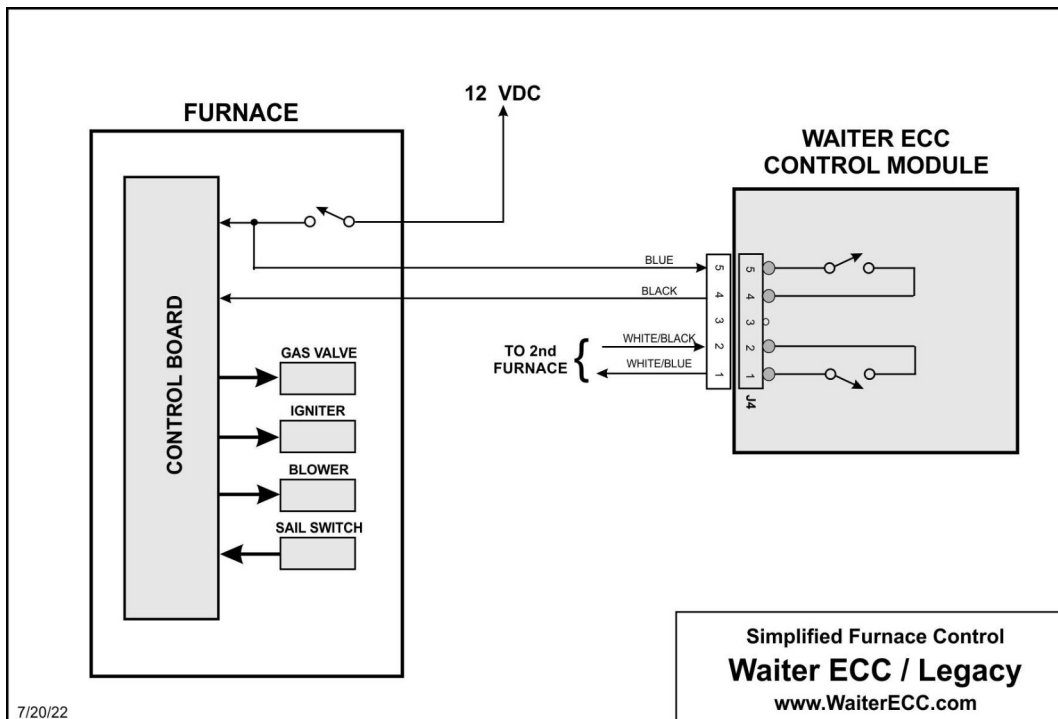
You should also allow enough time between compressor runs to allow high pressure to bleed off.

- 4) If you run a compressor then stop it, you must allow enough time for the head pressure to bleed down. Failure to do this could result in a large overload when attempting to restart the compressor.

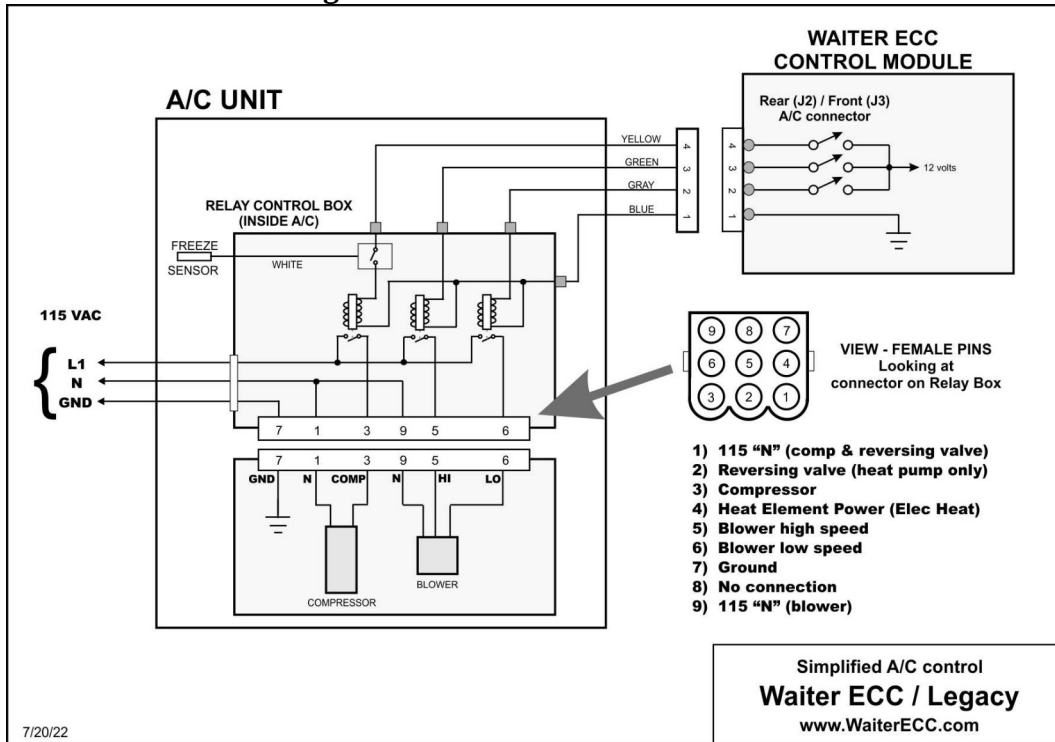
Waiter Legacy Control Module wiring



Typical furnace wiring



Typical Air Conditioner wiring



Typical 120 vac Air Conditioner Power distribution diagram

