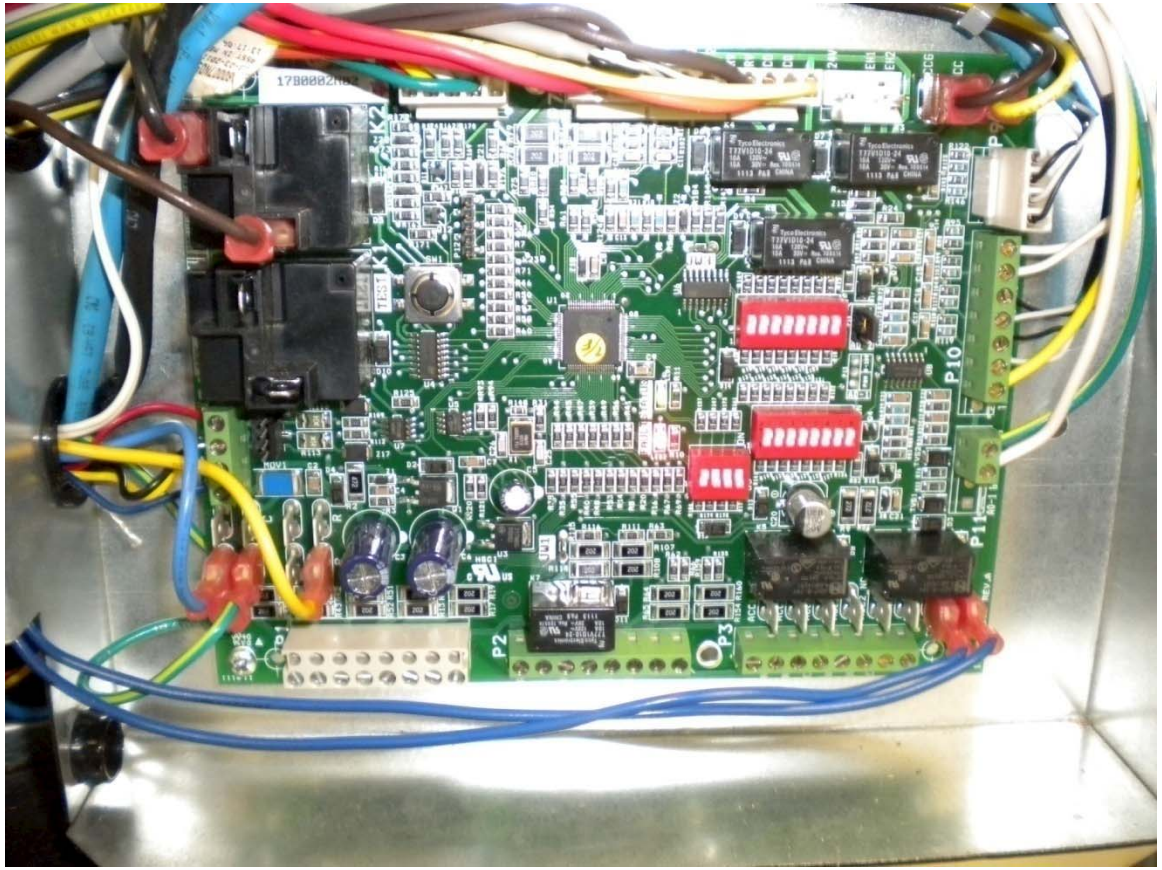
CLIMATEMASTER®

Geothermal Heat Pump Systems

DXM2 Controls & Plug and Play

New DXM2 Controls



DXM2 Controls

BEFORE

Blower motor

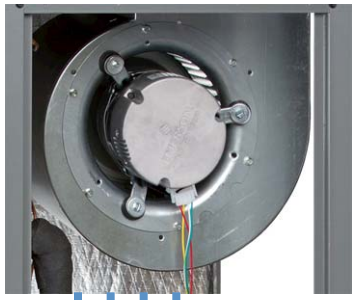
16 Wires

9 Wires

"old" CXM / ECM control

"old" non-communicating thermostat

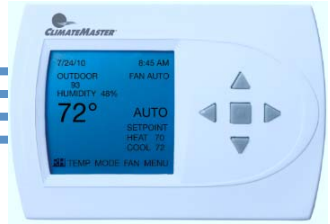
DXM2



Blower motor

4 Wires
No board

4 Wires



"New" DXM2 control

"New" communicating thermostat

DXM2 Control Features

- **5 minute Anti-short cycle protection**
- **High Pressure cutout safety(600psi)**
- **Loss of Charge monitoring(35psi)**
- **Accurate thermistor sensing for water and air coil freeze protection (LT1 & LT2)**
- **Over/Under Voltage Sensing (18-31)**
- **Thirty second fault recognition**
- New **HWG control built in able to produce up to 150 degree water (Factory setting 125)**

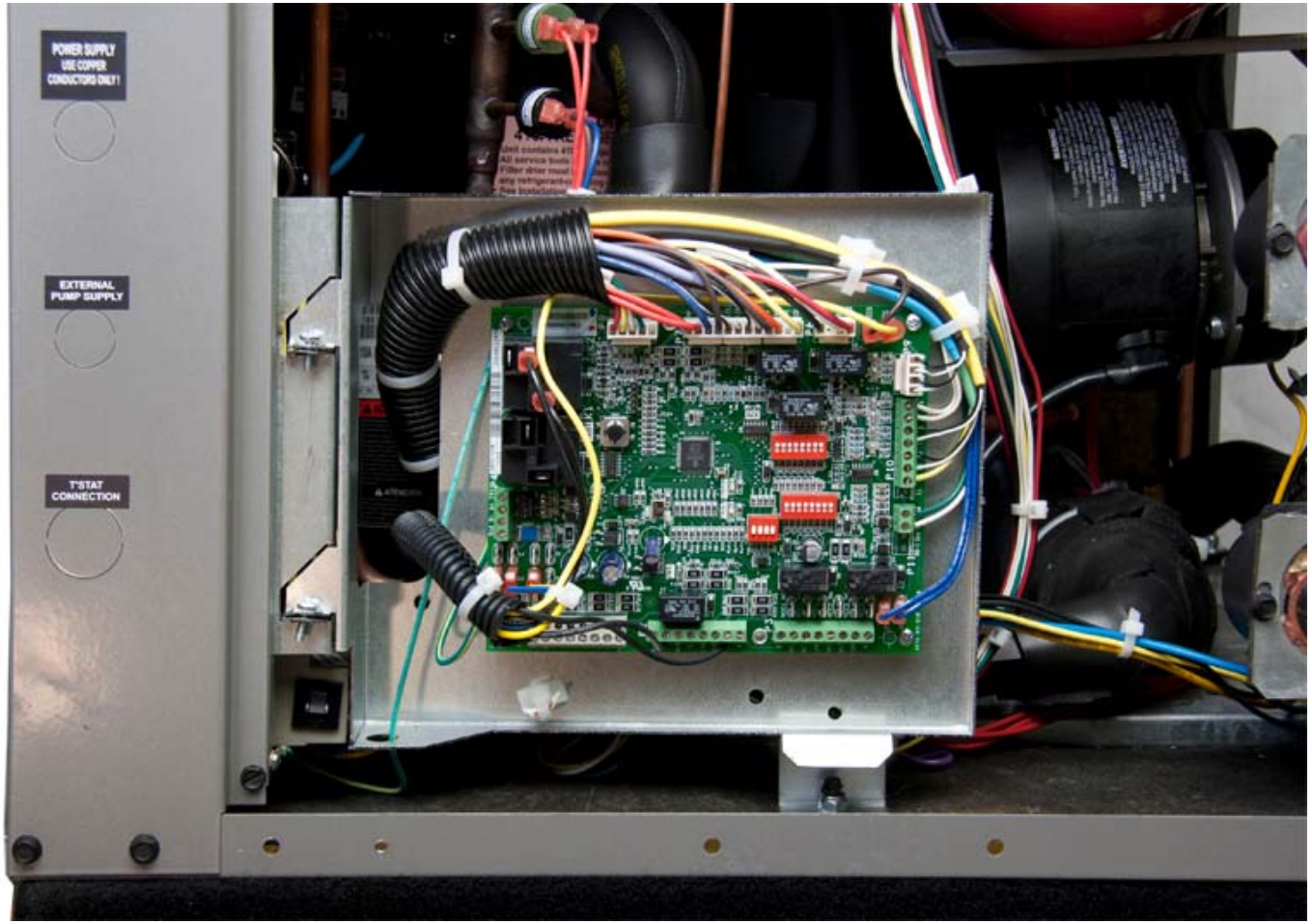
DXM2 Features

- 120 second Low Temp (LT1 & LT2), LOC bypass at startup
- Intelligent reset - Fault retry twice before locking out (5 Min. between retries)
- Impedance sensing condensate sensor
- New **Test mode** via test Button, stat, or service tool. {disables after 20 min.}
- Auxiliary Electric heat outputs{ two stage }
- New Controls ECM motor 4 wire communicating.

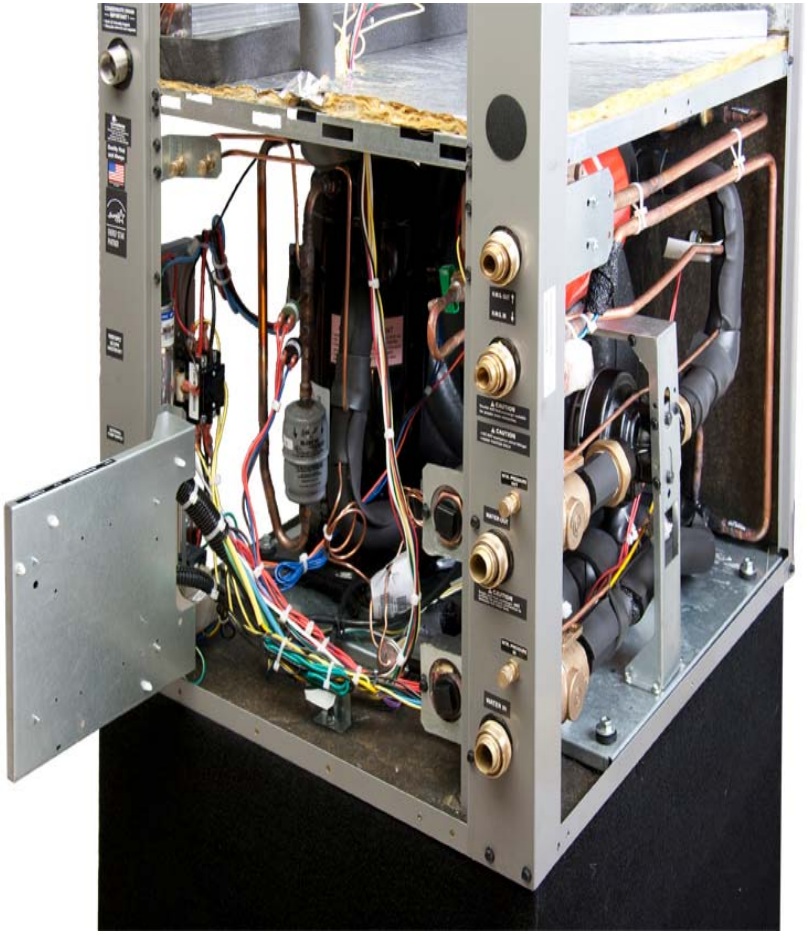
DXM2 Features

- New 4 wire communicating Stat (Non shielded)
- New EWT and LWT sensors.
- New LAT sensor
- New On Plug And Play models controls variable speed pump 3 wires.
- New Stores the last 5 faults in the board.
- New Controls two stage rectifier for Y2 call.
- New Accessory terminals

DXM2 Digital Control



Swing-Out Control Box

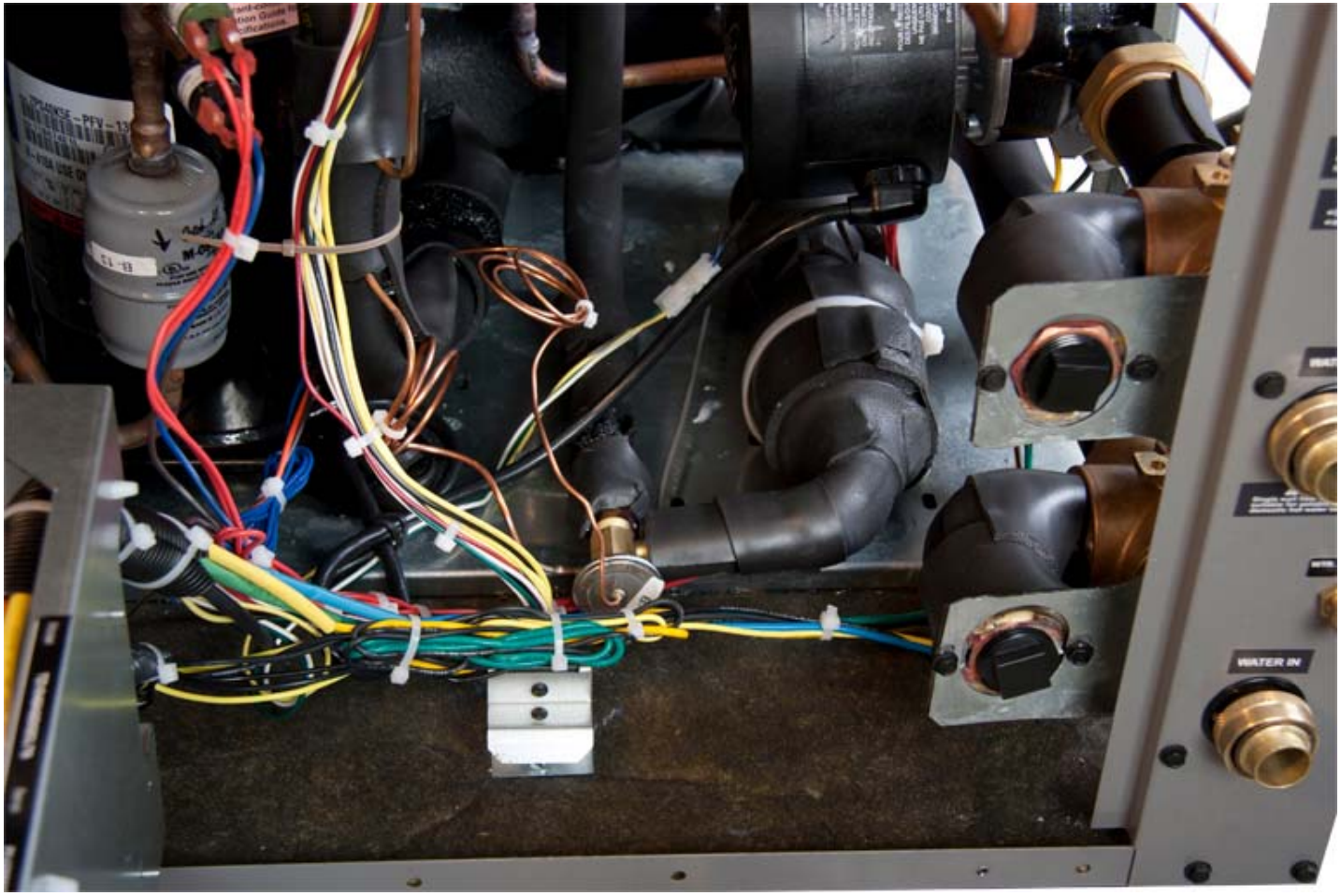


High Voltage side of control box

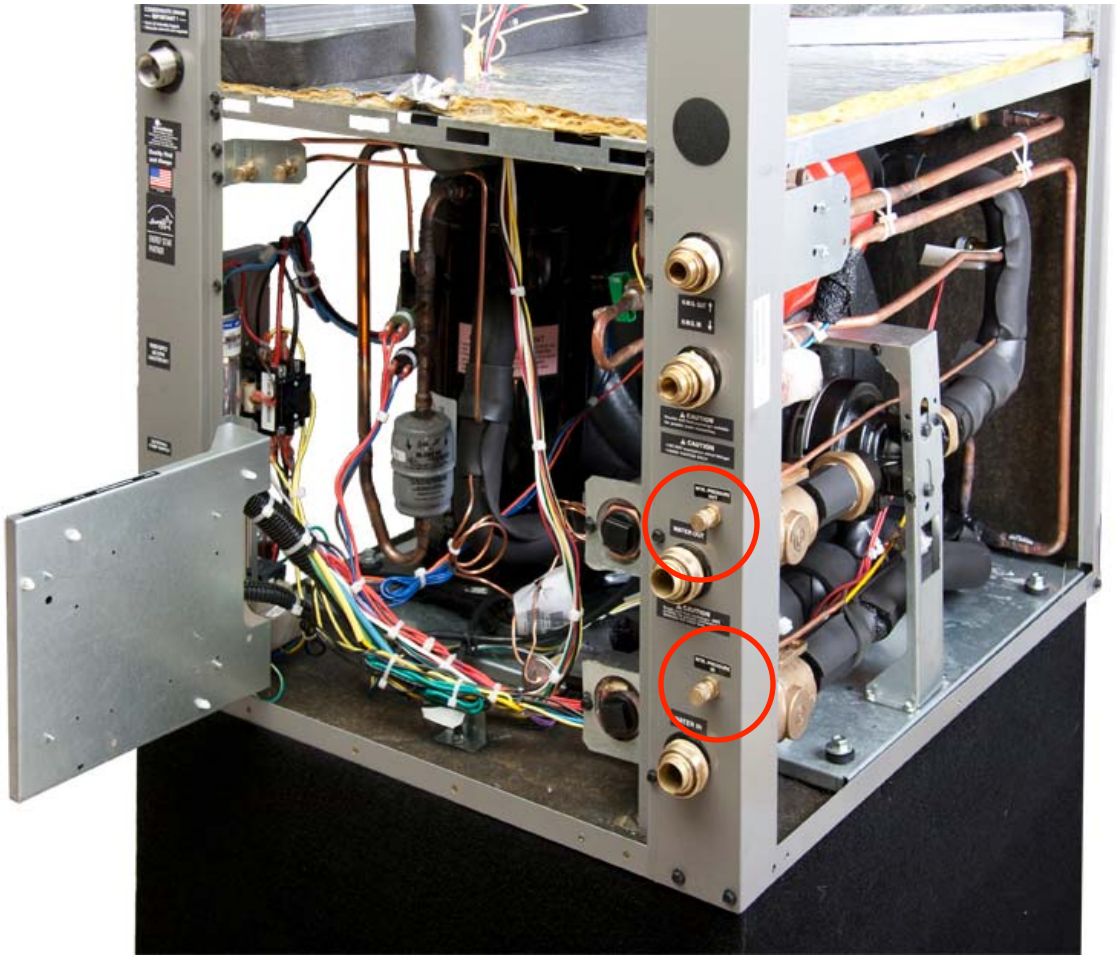
Expansion Tank part of Plug & Play

3 Way Full Port Flush Valve

Flush Port Connections



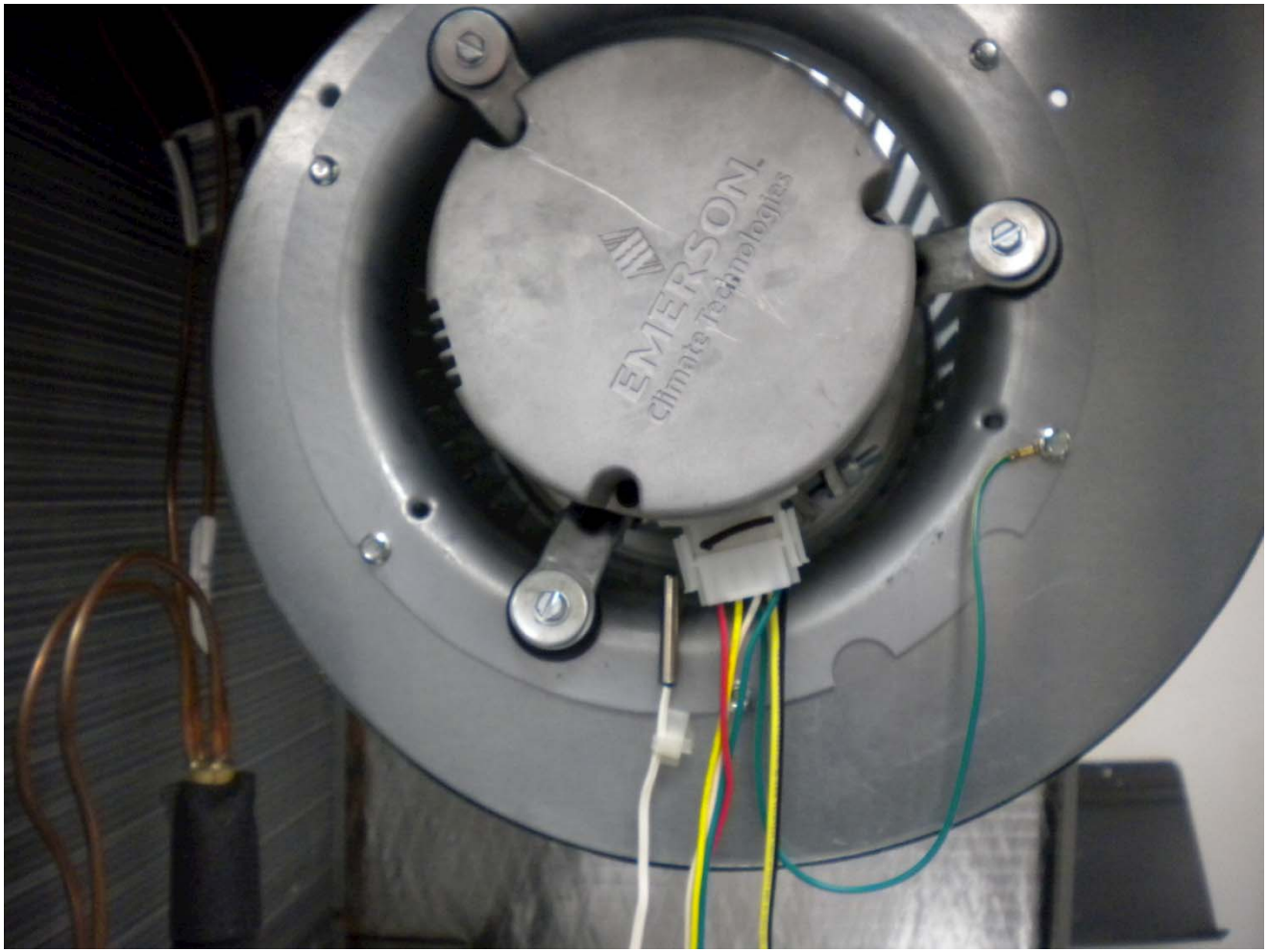
Pressure ports for measuring pressure drop.



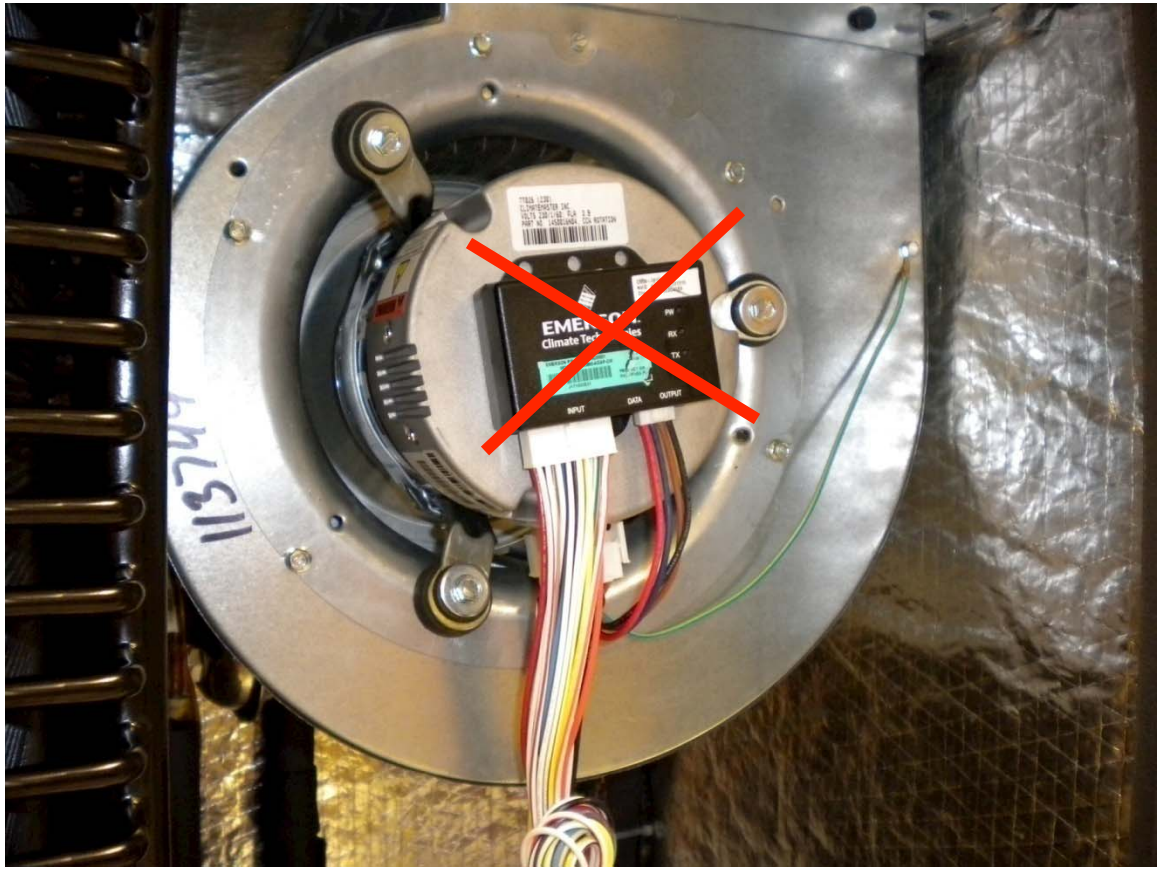
Pressure Ports

- To measure pressure drop across the Coax you have to use these ports. With an internal pump if you use PT ports you will get a pressure rise.
- The ports are a Schrader connection

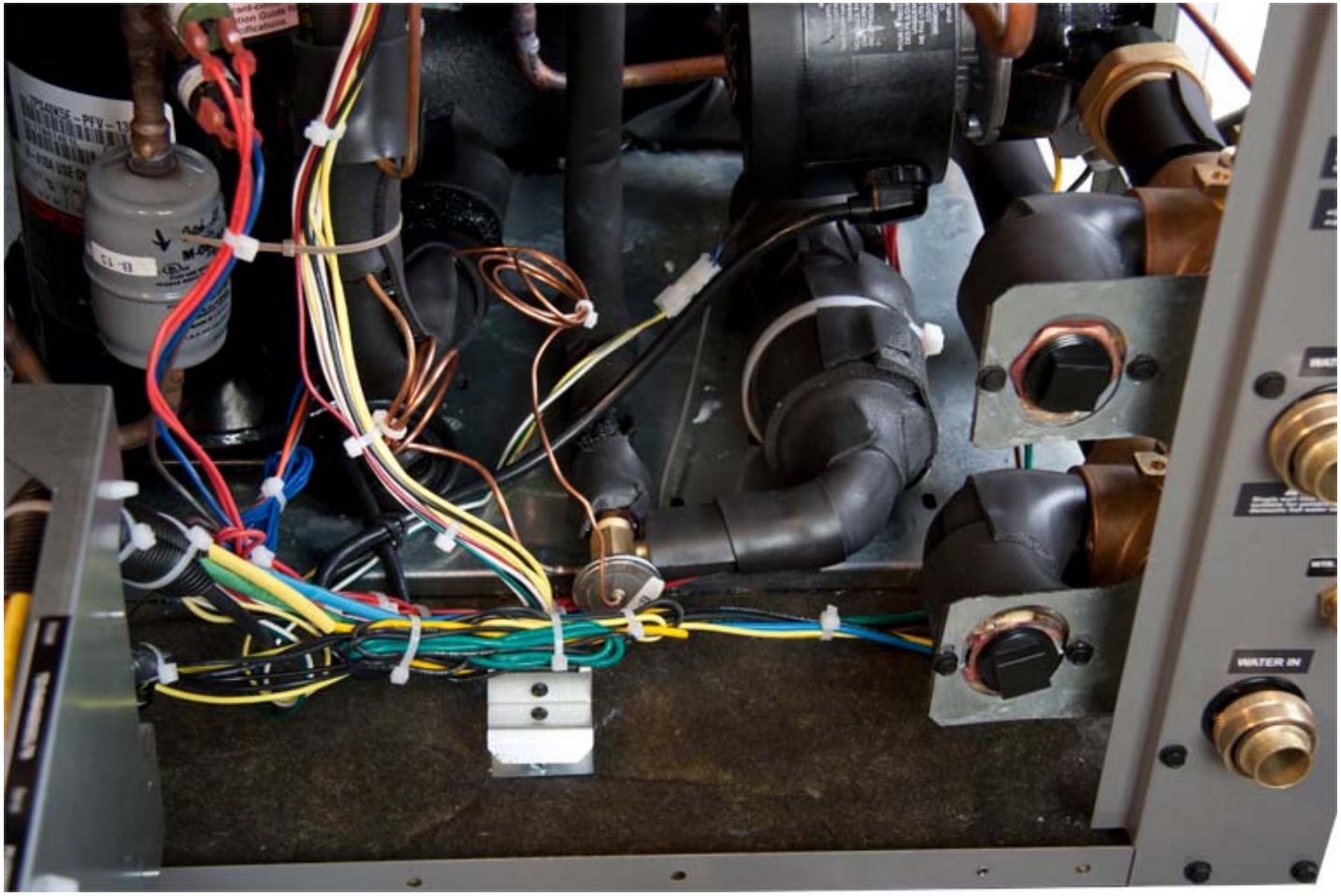
Communicating ECM Blower Motor



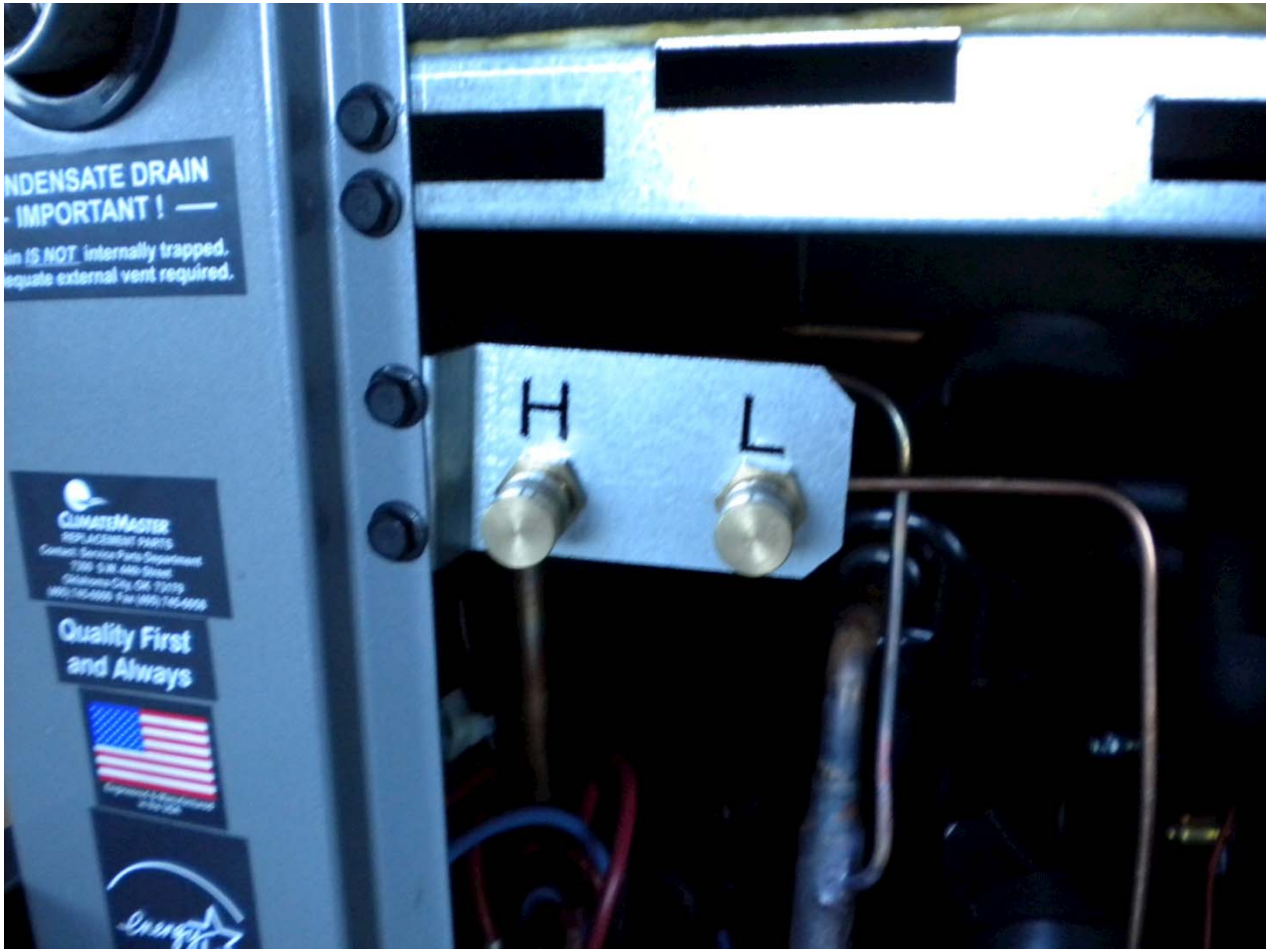
No Black box program is in the DXM2 Control



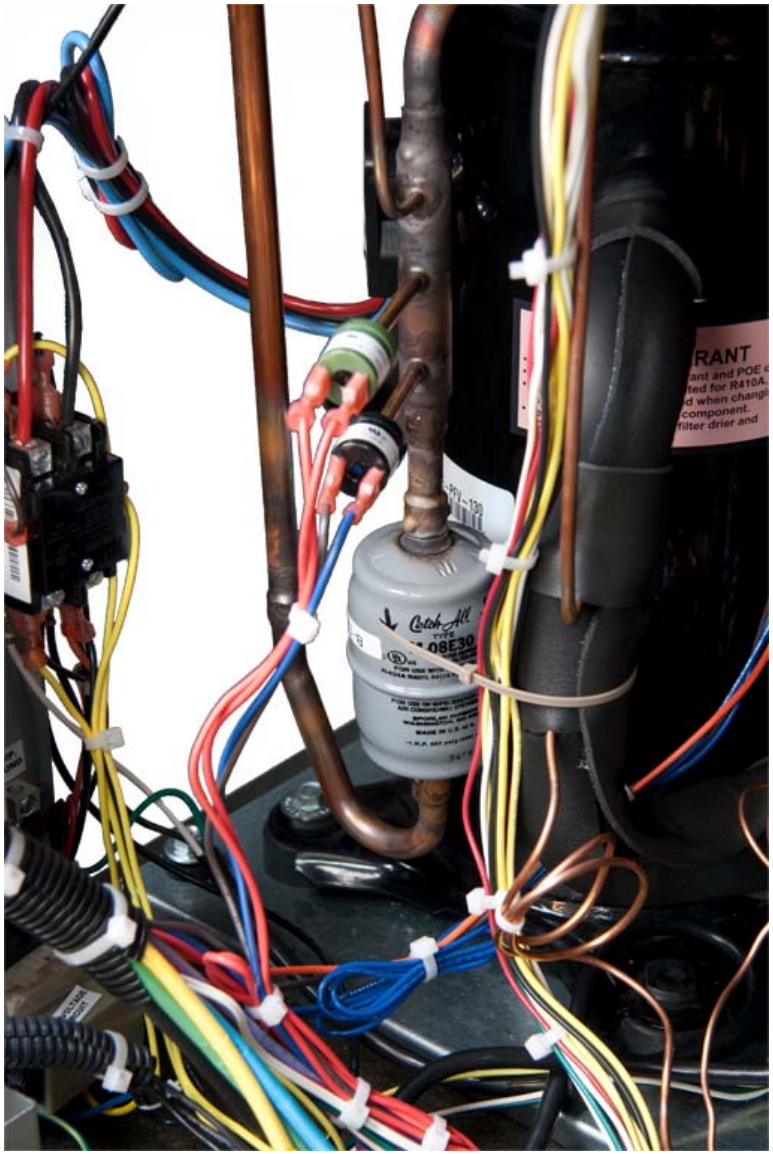
TXV in Front for easy access.



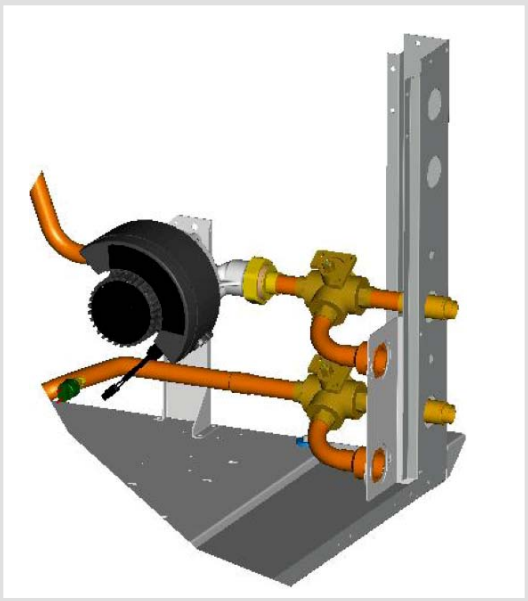
HP and LP service ports



High Pressure and Loss of Charge



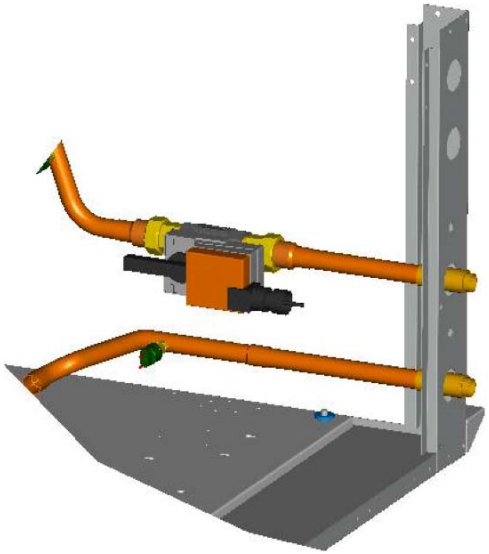
Internal Flow Controller



- Variable Speed ECM pump
- Configure by loop ΔT
- Geo source pump speed, watts, and GPM displayed at thermostat*

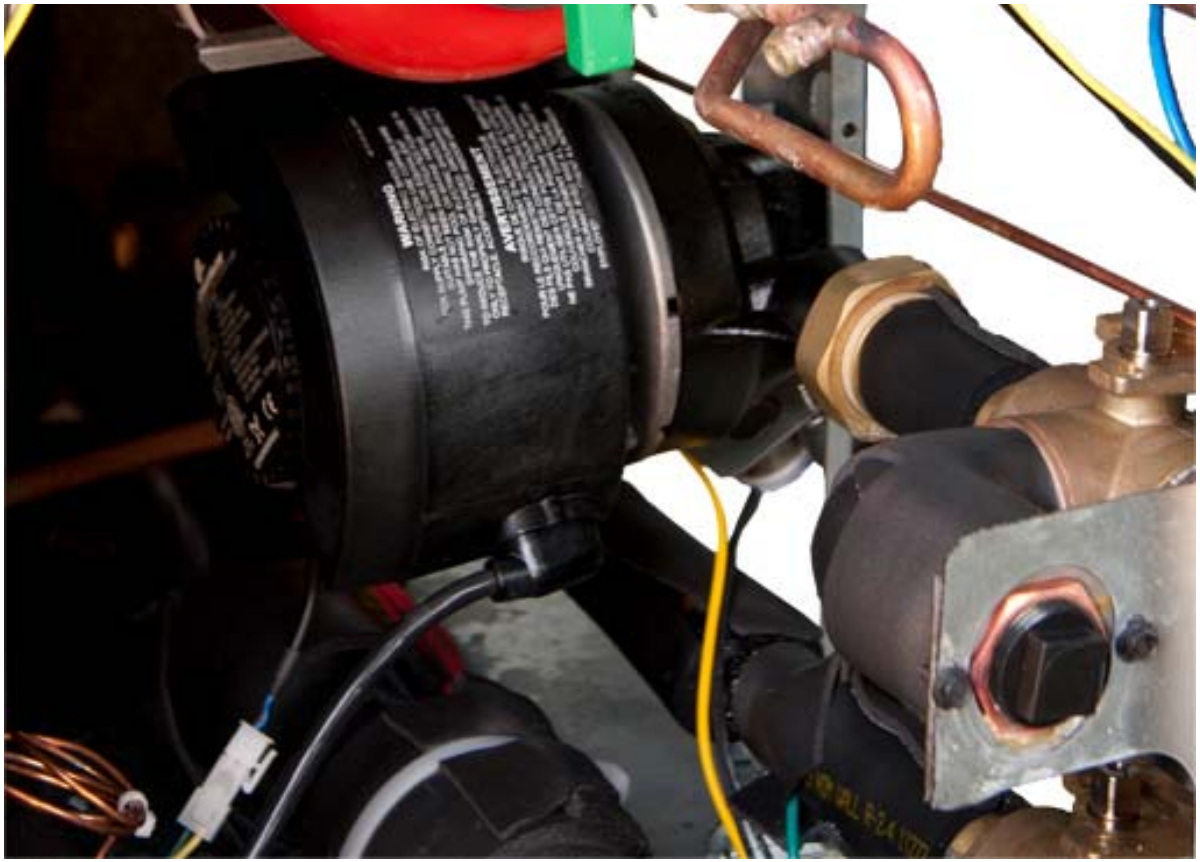
* - when using communicating thermostat

Modulating Water Valve

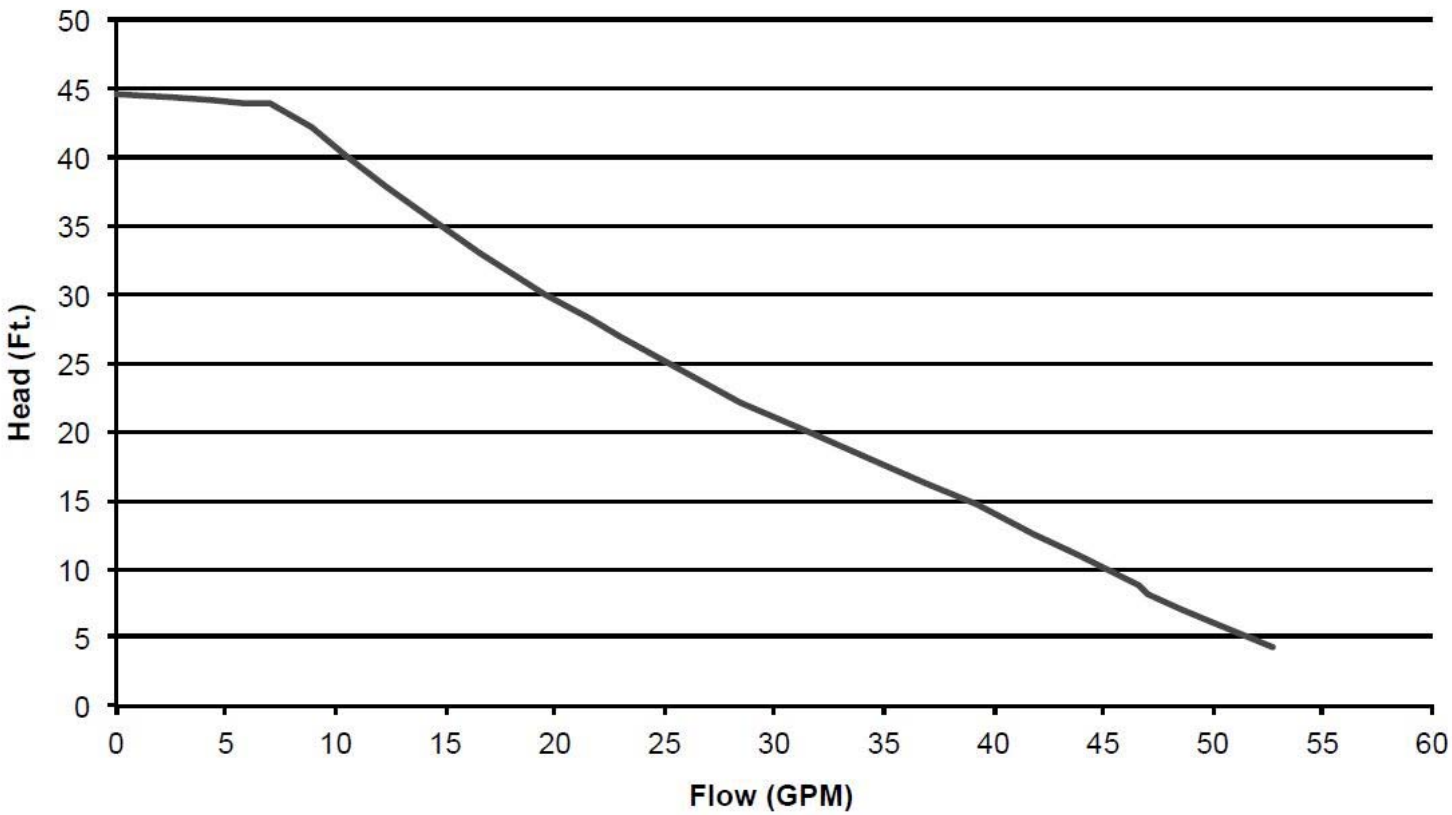


- Also functions as shutoff valve
- Configure by source/loop ΔT
- Available for Multiple Unit Closed Loop (Central pumping) or Open Loop Applications

Grundfos 25-140 Variable Speed pump



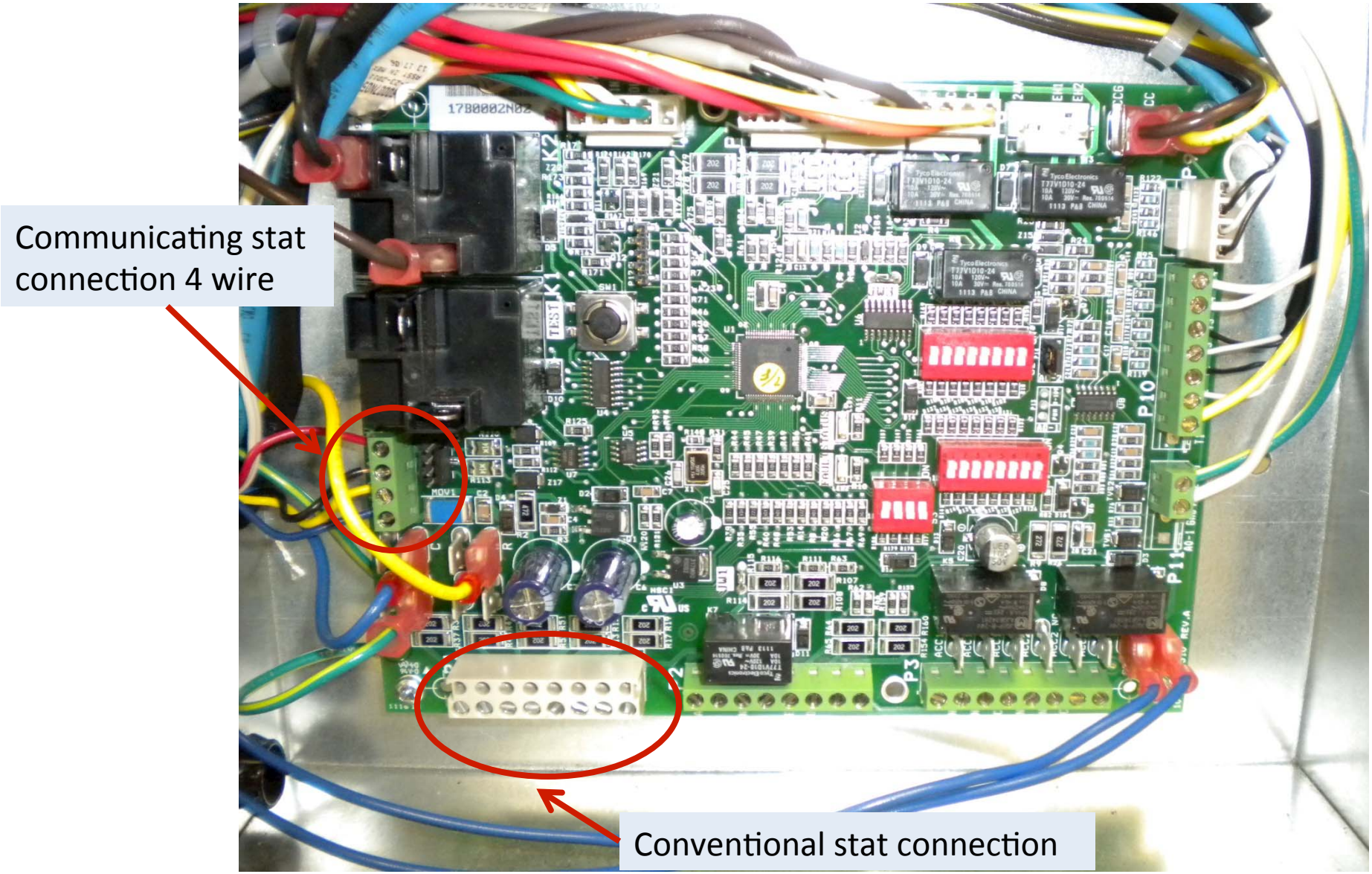
Variable Speed Max Pump Curve

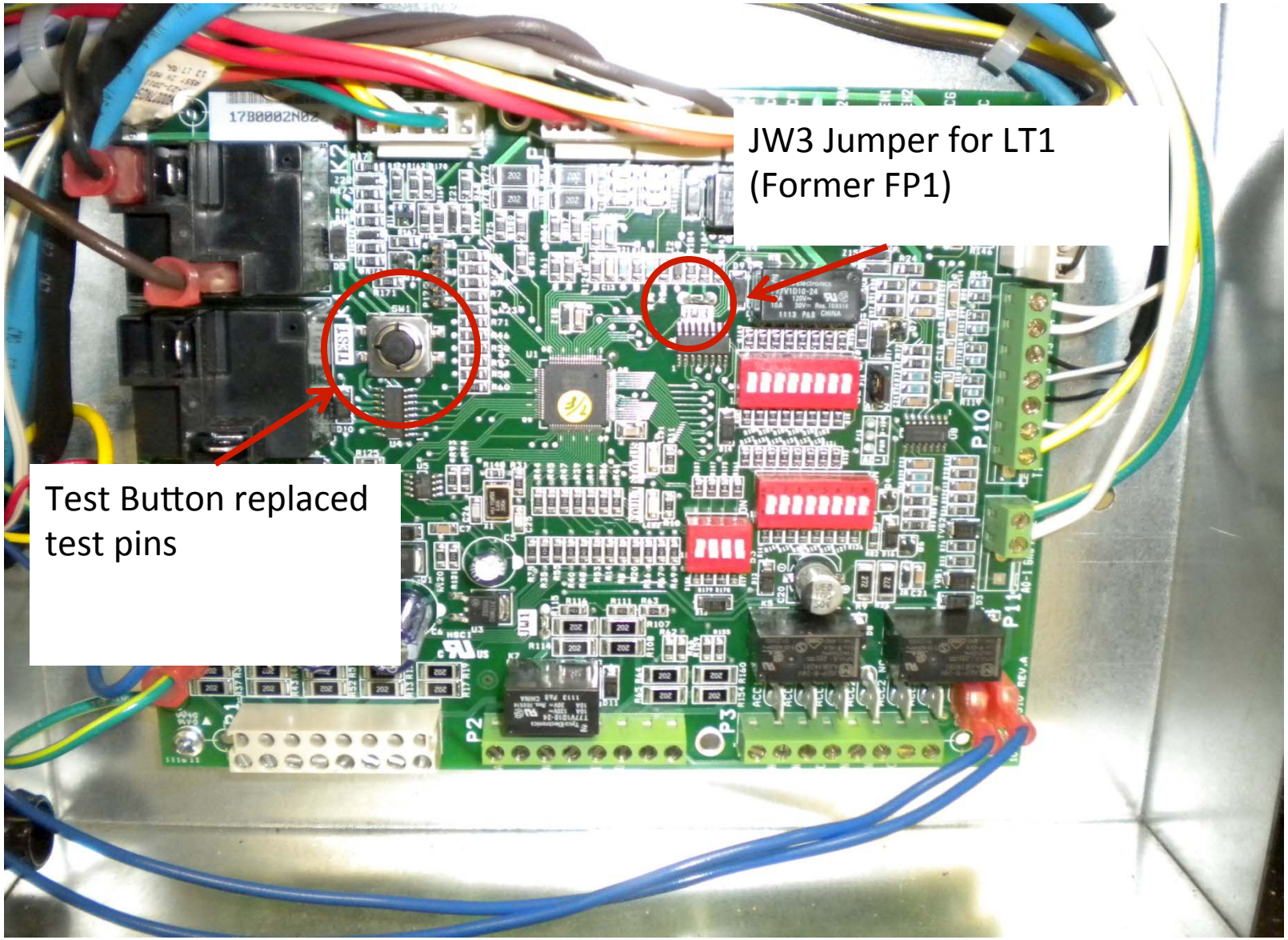


Cabinet Temperature Sensor

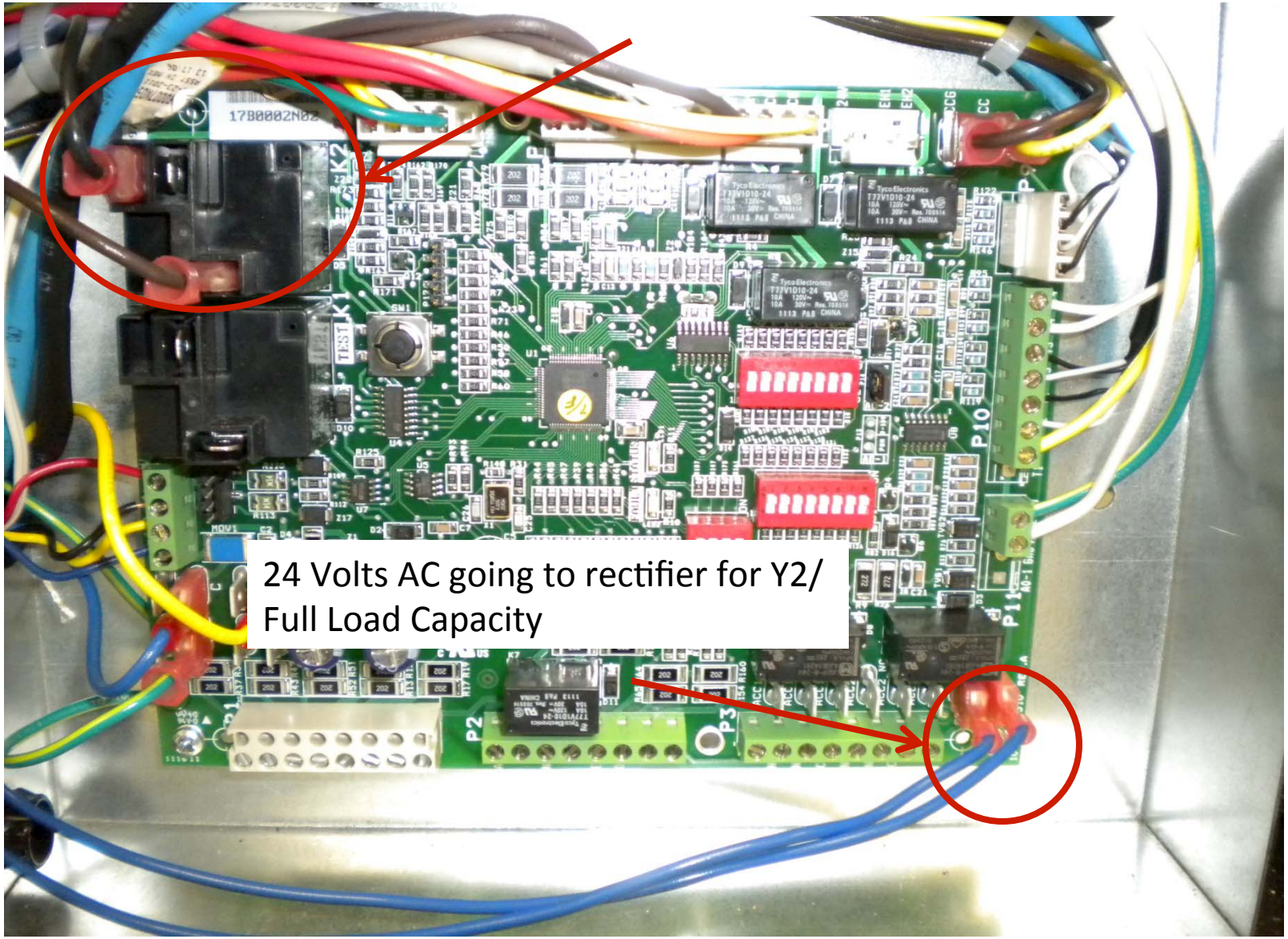
At 125 degrees inside the cabinet the pump speed will be slowed down. Once the cabinet temperature goes down to 115 degrees the pump can speed up to what every it needs.

Caution: Will need to pay attention to this with units installed in attics.

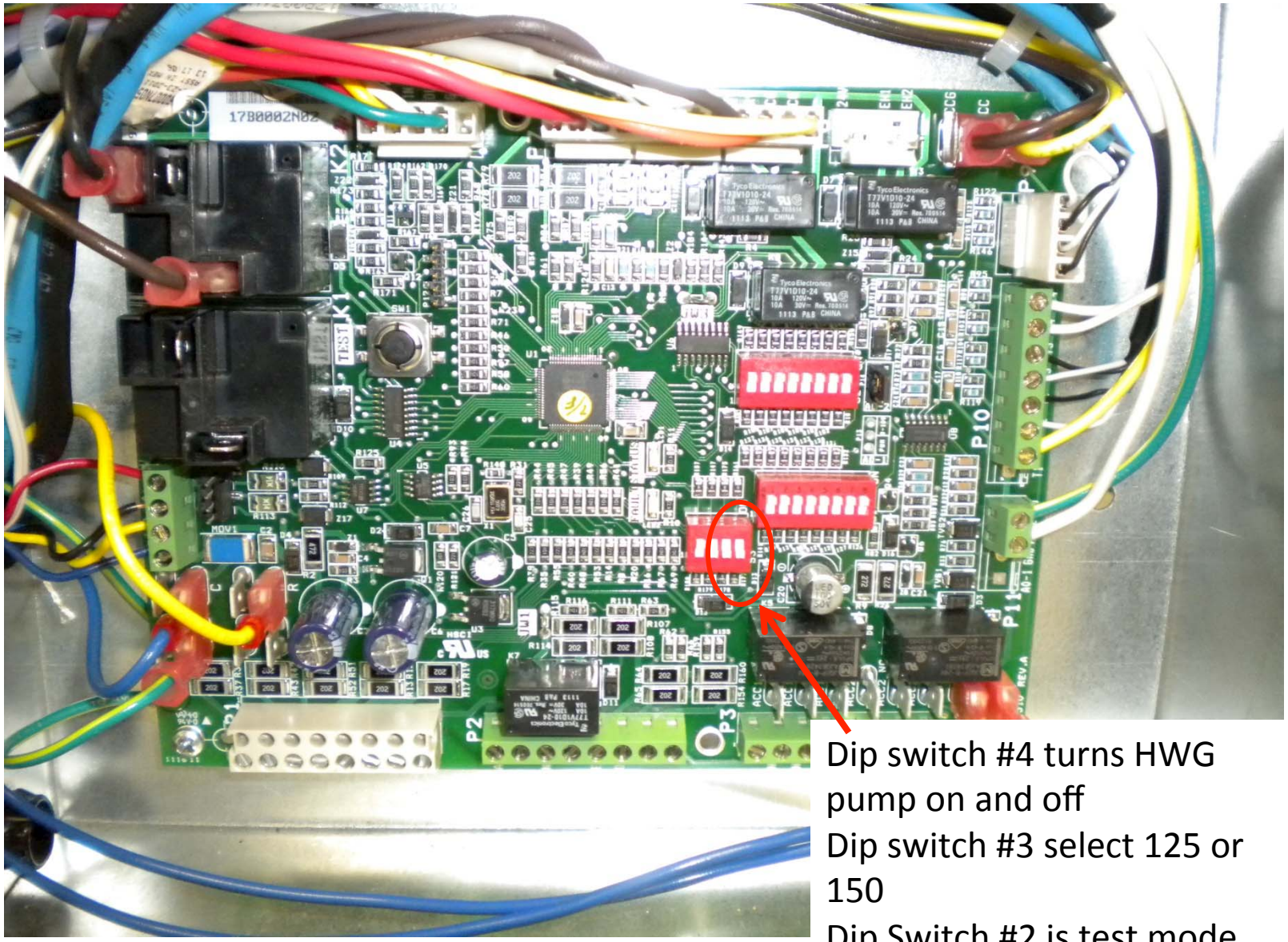

Communicating stat connection 4 wire
Conventional stat connection


JW3 Jumper for LT1
(Former FP1)
Test Button replaced
test pins

HWG relay for pump 230V



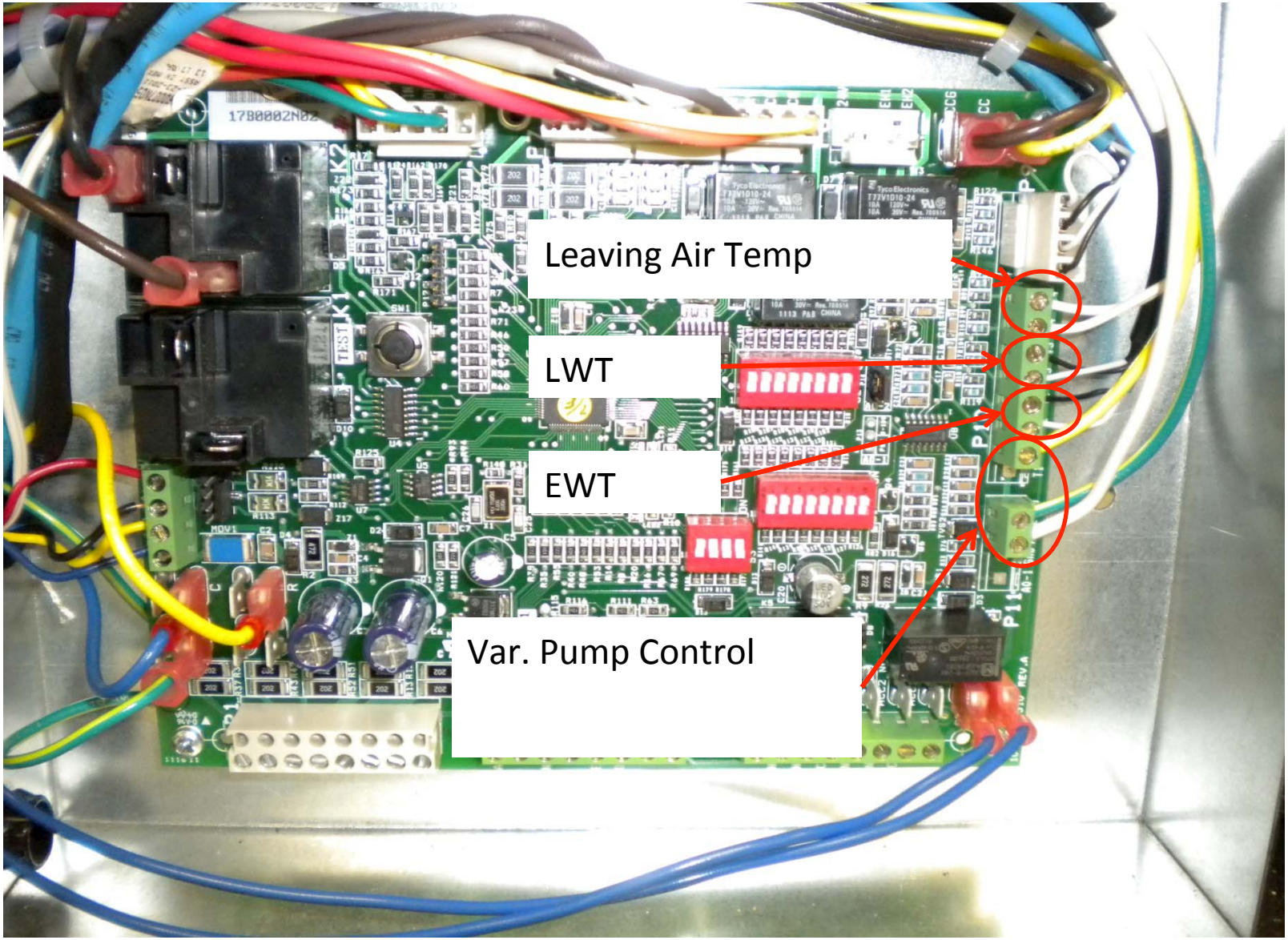
Y2 Rectifier on side of Next Generation UltraTech Scroll

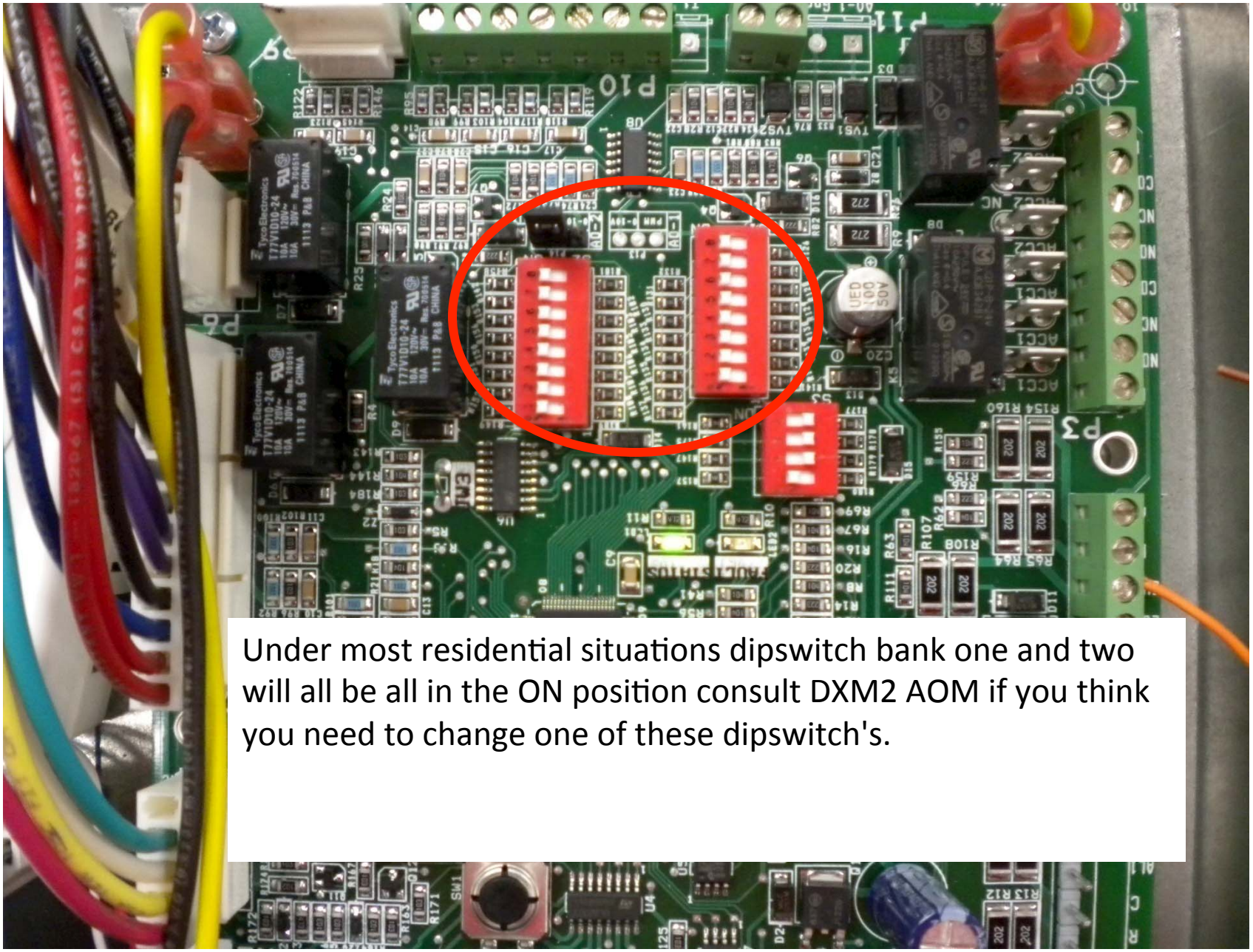


Dip switch #4 turns HWG pump on and off

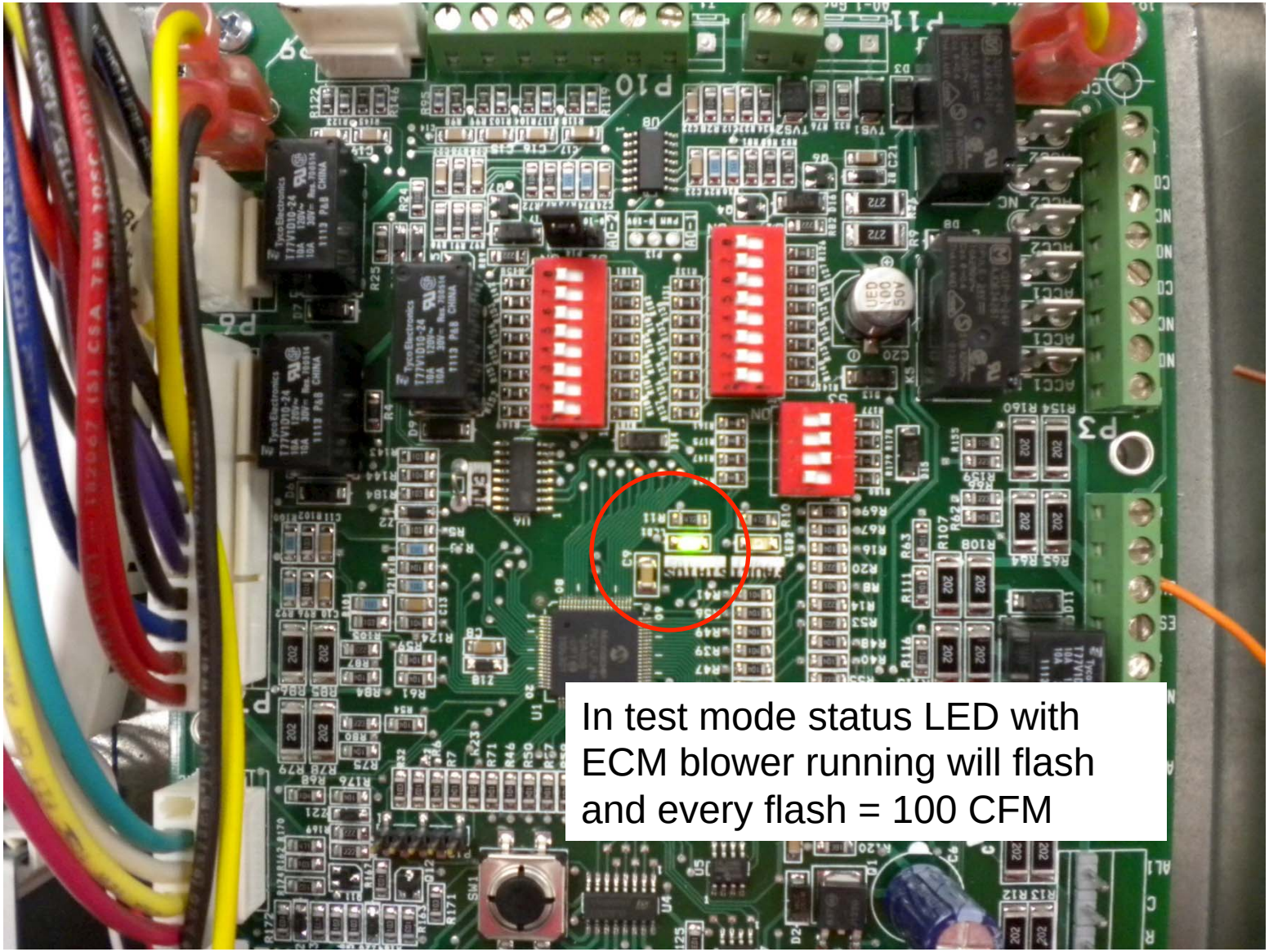
Dip switch #3 select 125 or 150

Dip Switch #2 is test mode for pump.


Leaving Air Temp
LWT
EWT
Var. Pump Control

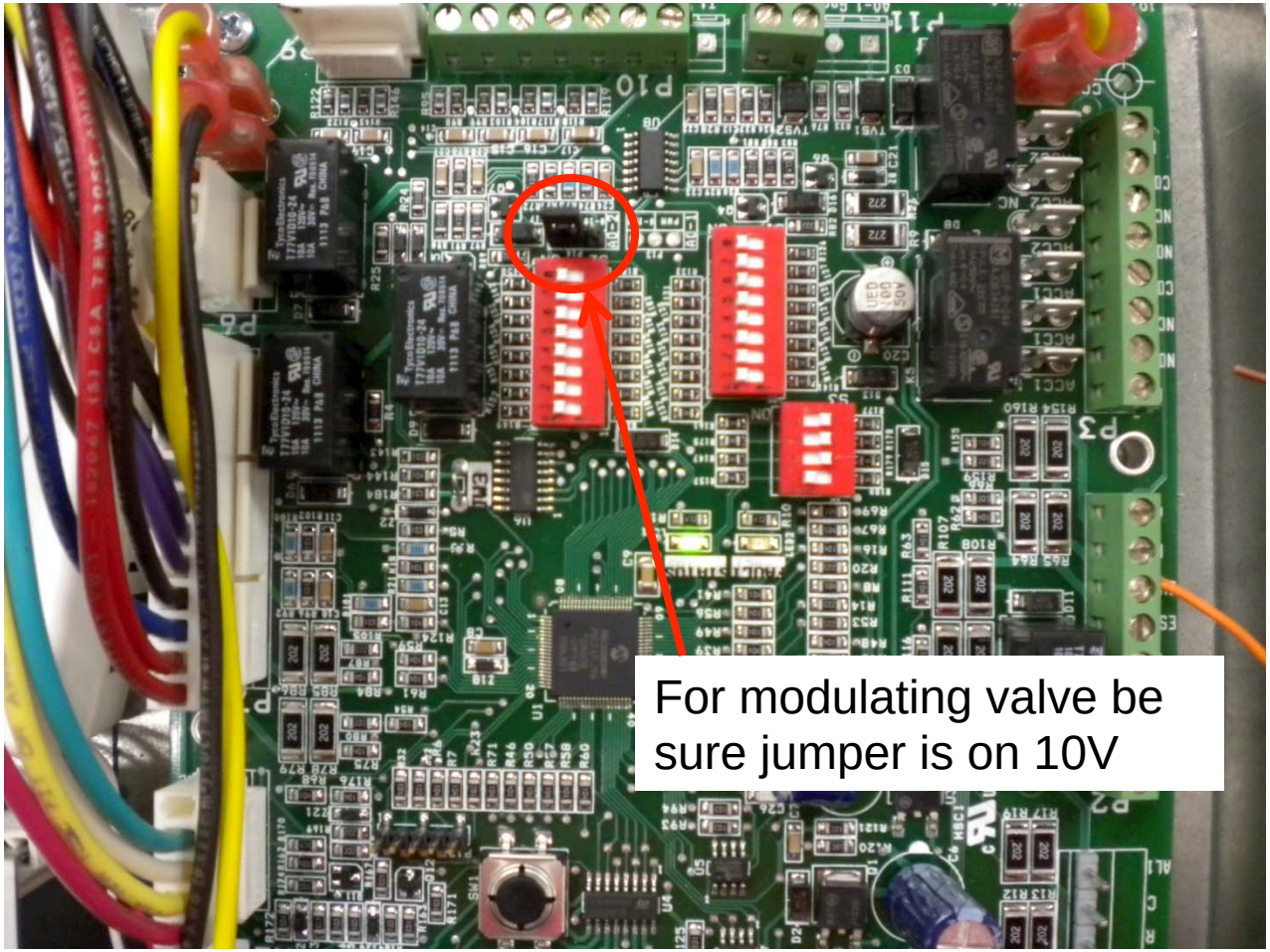


Under most residential situations dipswitch bank one and two will all be all in the ON position consult DXM2 AOM if you think you need to change one of these dipswitch's.

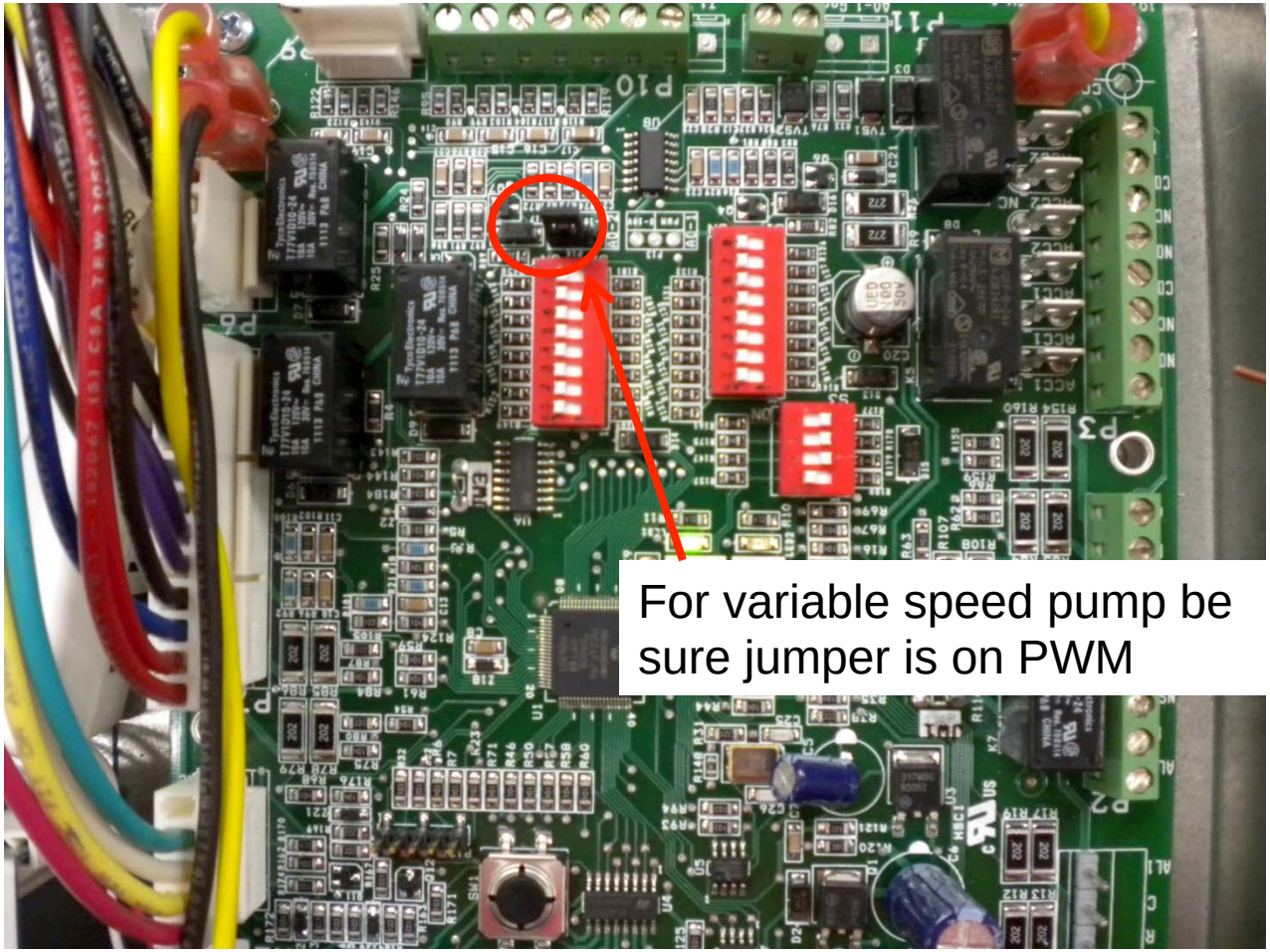


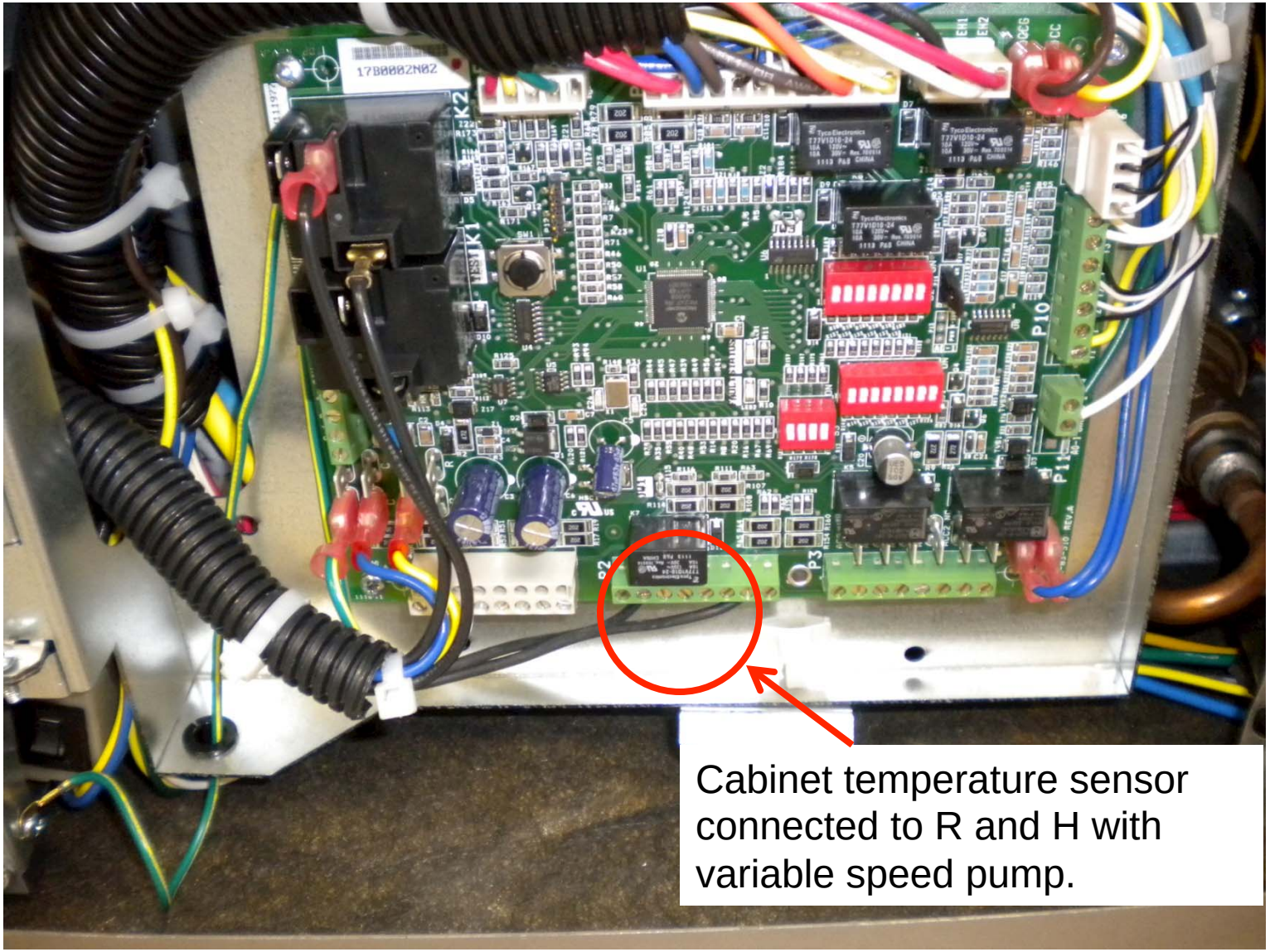
In test mode status LED with ECM blower running will flash and every flash = 100 CFM

AO-2 Jumper

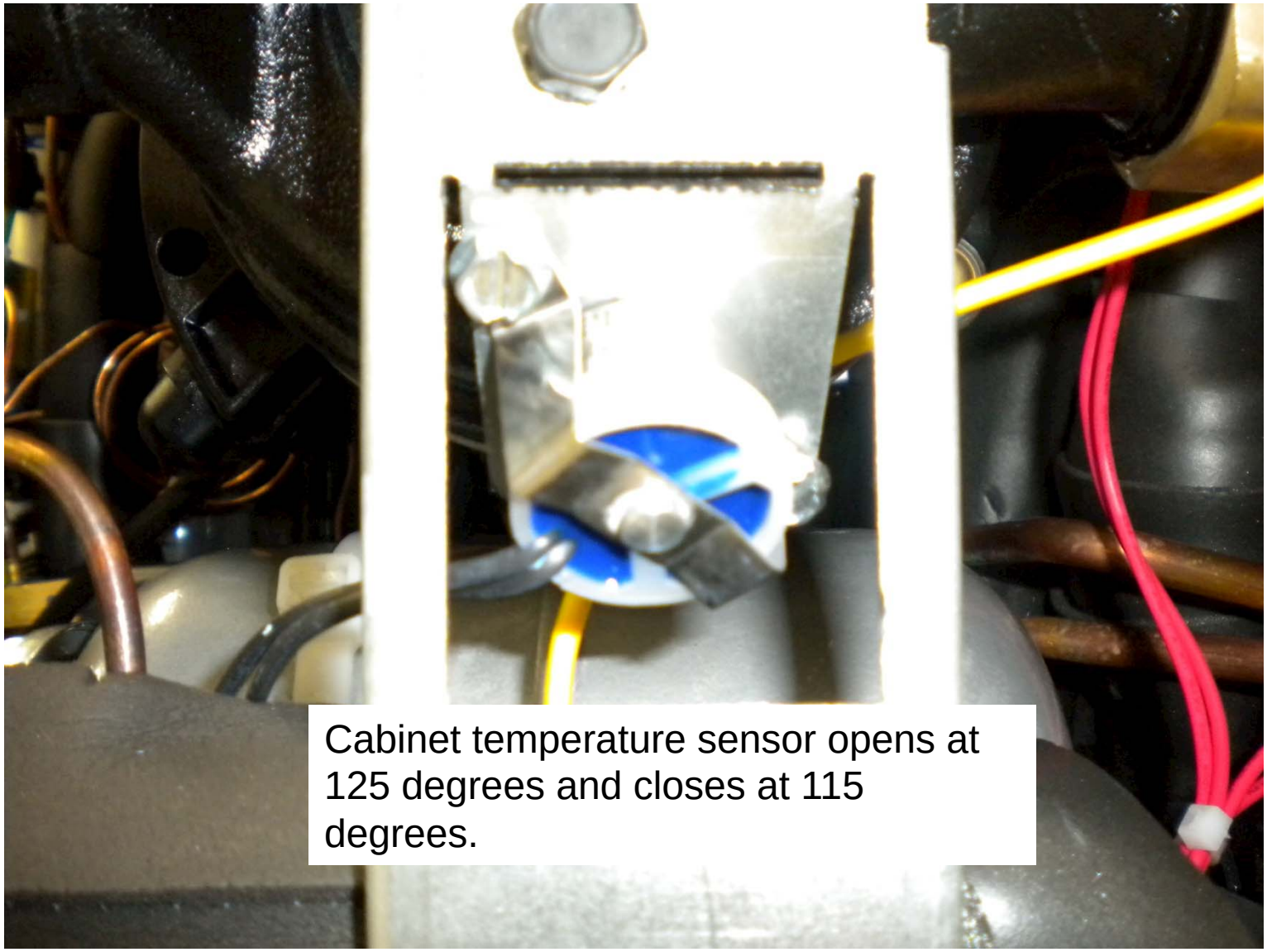


AO-2 Jumper





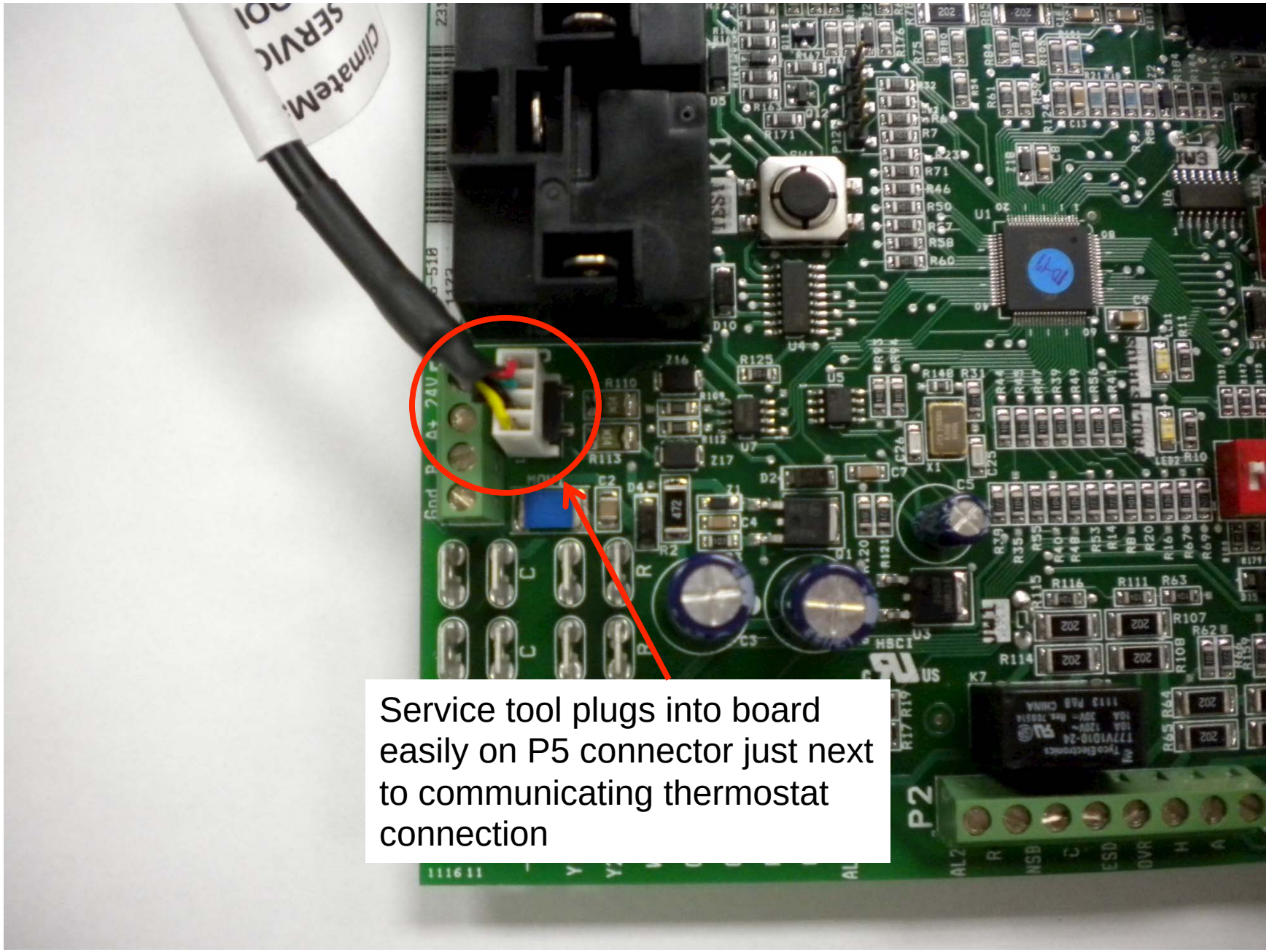
Cabinet temperature sensor connected to R and H with variable speed pump.



Cabinet temperature sensor opens at 125 degrees and closes at 115 degrees.

Service Tool

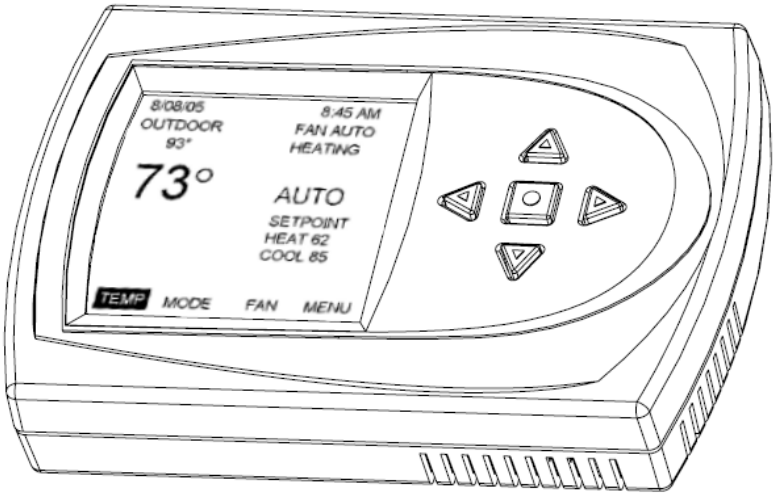
Wire connector for service tool


Service tool plugs into board easily on P5 connector just next to communicating thermostat connection

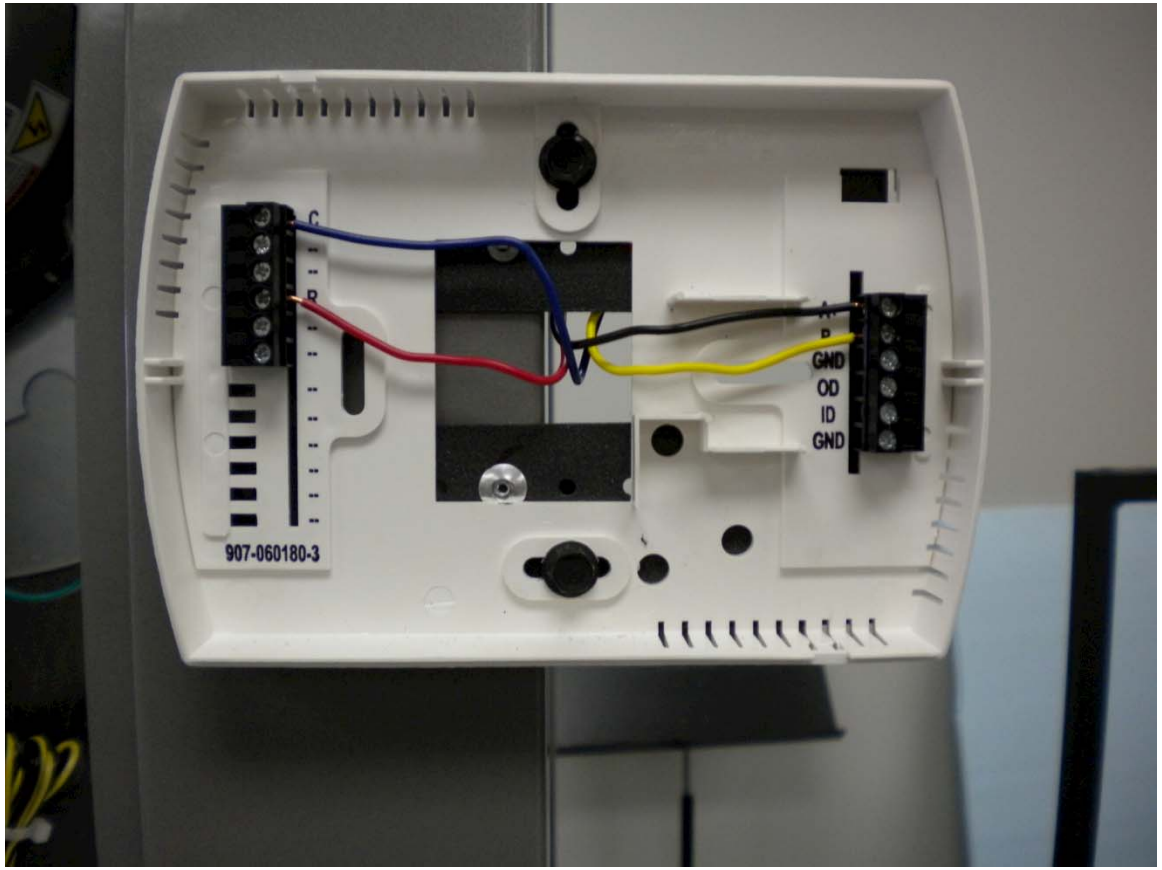
Service Tool

- Allows to change installer setup.
- Allows to view control diagnostics.
- Allows the unit to run under control diagnostics in the manual mode.

ATC32U01 Communicating Thermostat

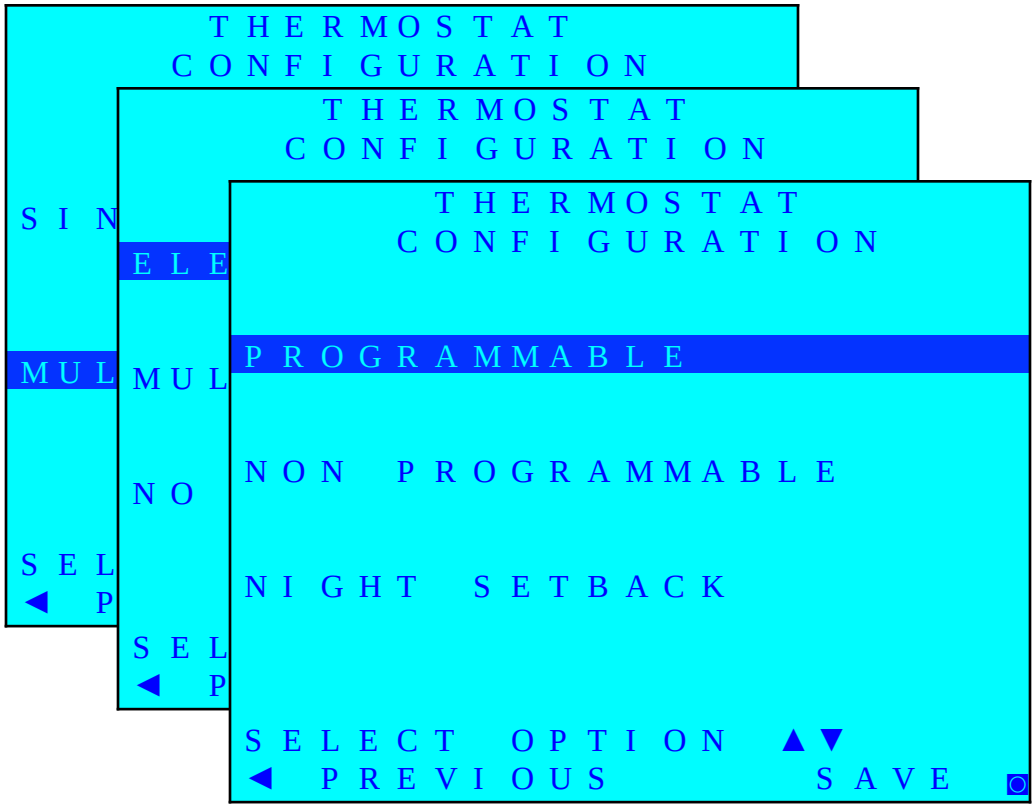


4 Wire communicating Stat

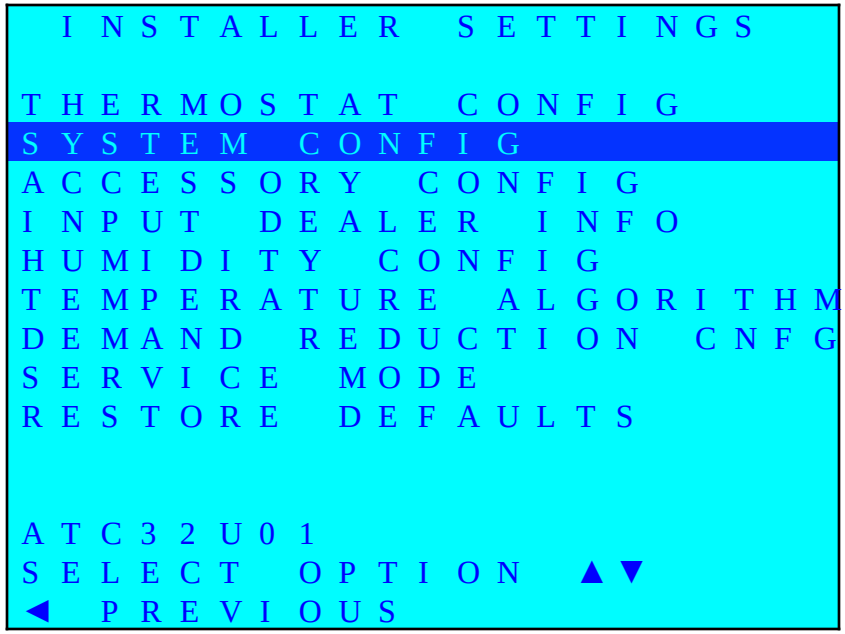


Initial Power-Up

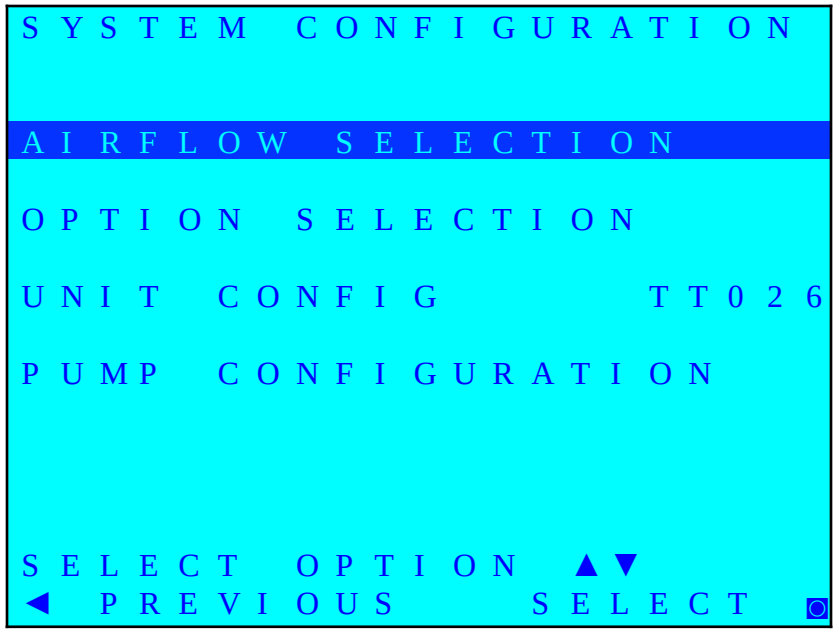
- Thermostat will need to be configured



Installer Menu



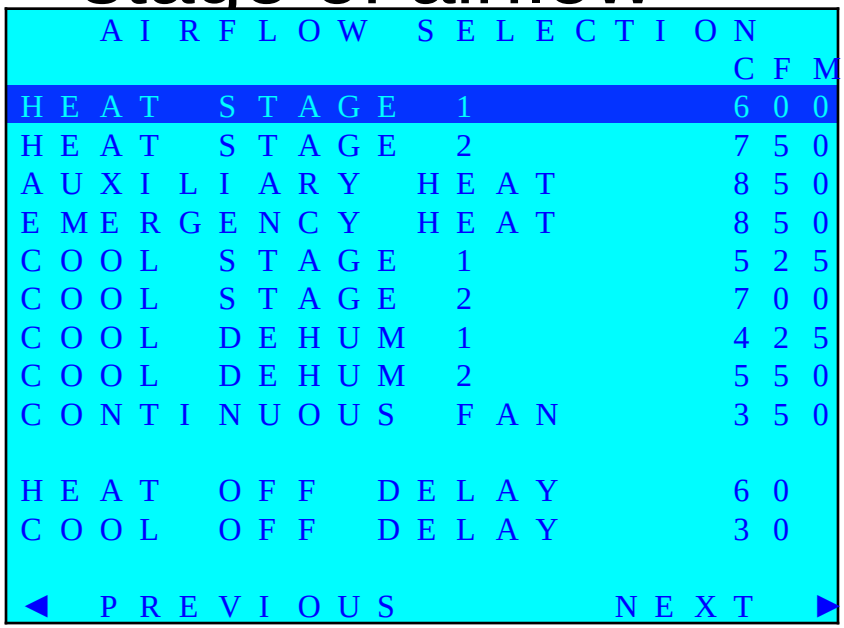
System Configuration Menu



System Configuration

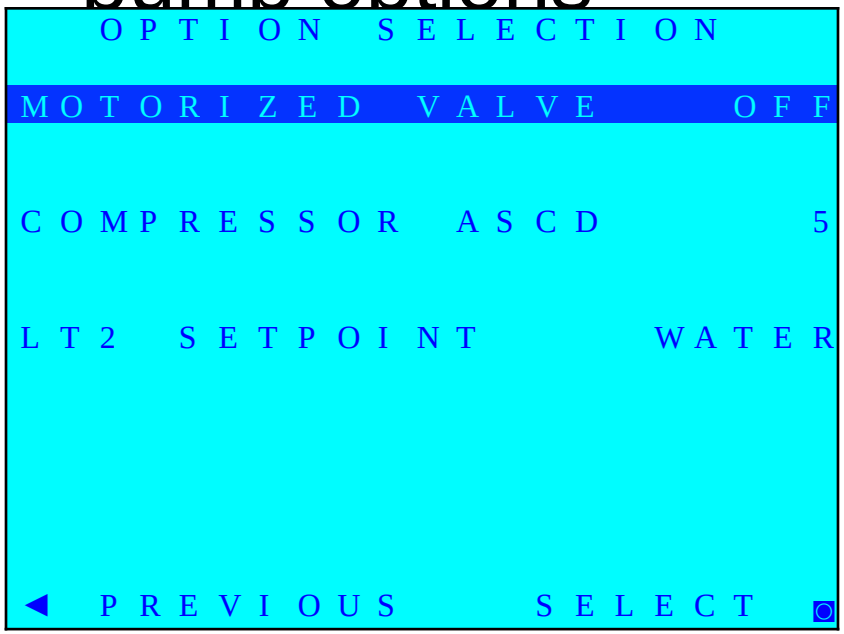
Airflow Selection

- Configure each stage of airflow



Option Selection

- Configure heat pump options



Air Flow Selection

- Can only be changed with a communicating thermostat or a service tool.
- Can adjust CFM in 25 CFM increments within a range for that model for all modes of operation.

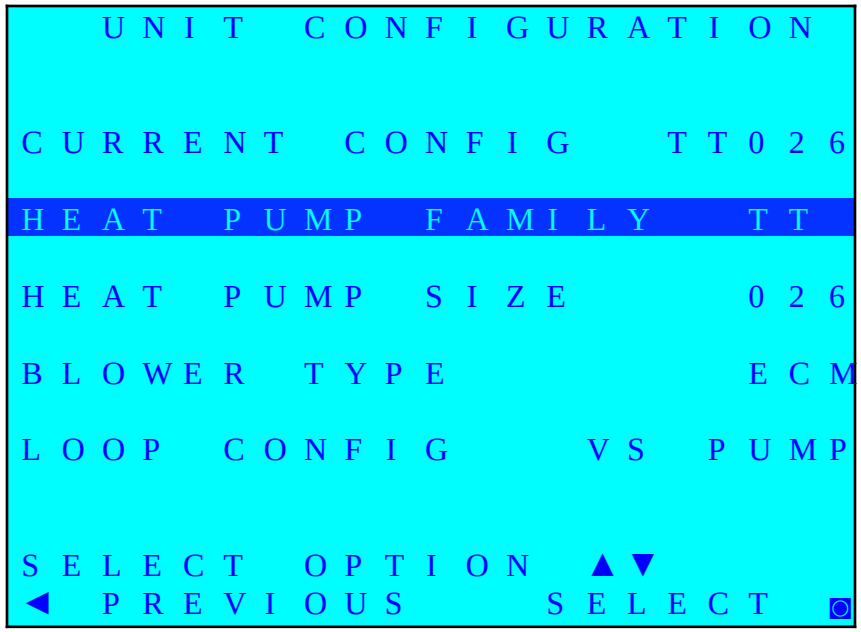
LT2 Adjustment

- Is not a physical jumper on the board.
- Shows up on the thermostat only when the unit is a TMW (water to water product)
- Options are WATER or ANTIFREEZE

System Configuration

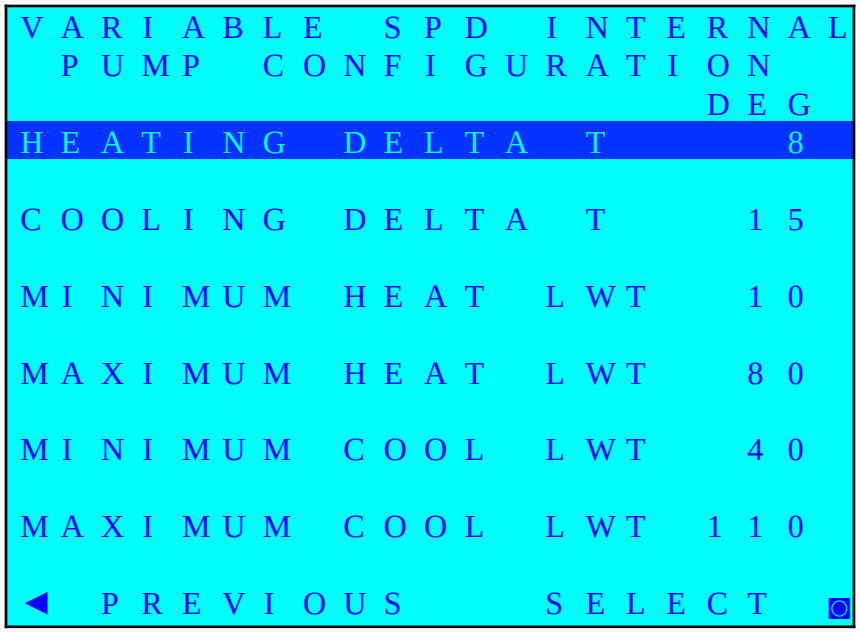
Unit Configuration

- Configure the heat pump (replacement part)



Pump/Valve Configuration

- Configure temperature settings for loop



System Configuration

- Units will be configured at the factory.
- If you need to make a change you can for instance TZ036 you can change the capacity to a TZ048 or even family of product to a TT038.
- This is also where you configure for an internal pump or proportional valve.

System Configuration

- This is also where you can choose between ECM blower motor or a PSC or none in case of a split.

Setting Up Delta T

- For the Pump or the valve
- Heating delta T will be 4-12 degrees default will be 7 degrees.
- Cooling delta T will be 9-20degrees default will be 10 degrees.

Things To Think About

- With some loops to maintain turbulent flow it will be necessary to lower the heating delta T to increase GPM flow through the loop. Some things that will drive this more then one circuit per ton or the use of propylene glycol.

More on the operation of the pump

- **Automatic Delta T Offsets –**For high and low loop temperatures, the target Delta T is automatically adjusted from the nominal value.

For Heating

- For heating operation, if the EWT < 40°F, the target Delta T is reduced by 2°F. If the EWT > 60°F, the target Delta T is increased by 2°F.

For Cooling

- For cooling operation, if the EWT <70°F, the target Delta T is increased by 1°F. If the EWT >90°F, the target Delta T is reduced by 1°F.

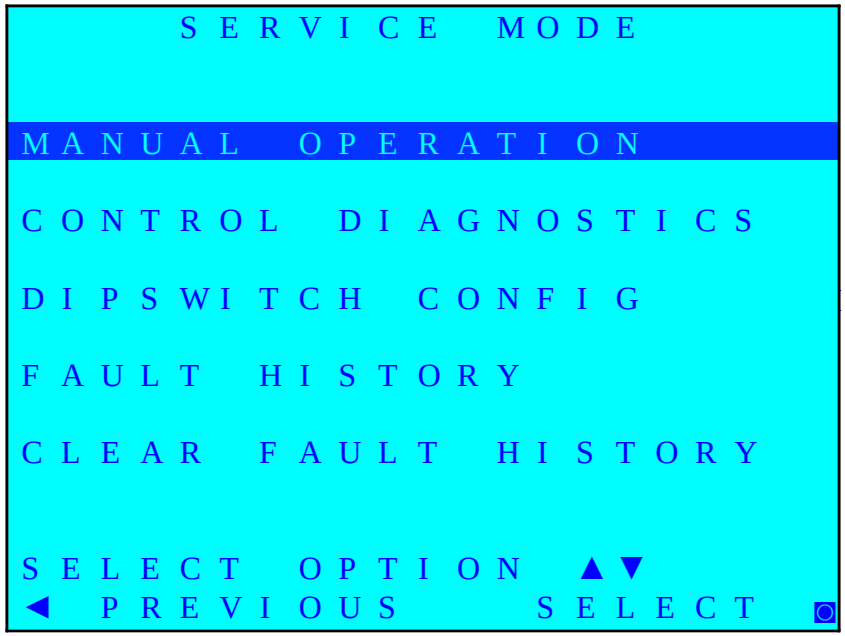
Pump at start up

- **Pump Starting Speeds –**When the pump is activated for heating or cooling operation, it will initially be set to the last operating speed of the current operating mode. If the pump has not operated in the current operating mode since power up, the pump will be activated at <u>full speed</u>.

Pump control

- The pump will stay at the same speed for 90 seconds and then adjust based on Delta T every 15 seconds. The minimum speed is based at 15%.

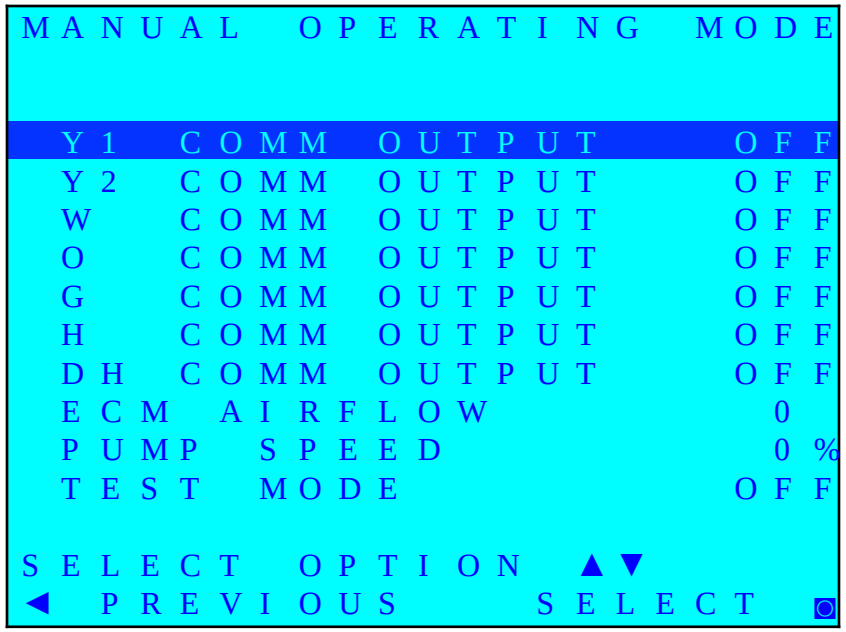
Service Mode Menu



Service Mode

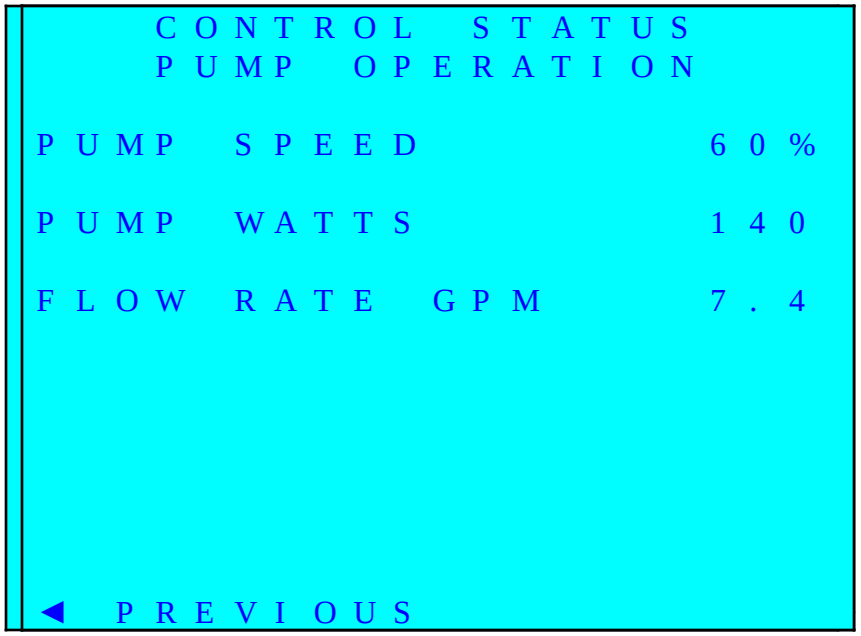
Manual Operation

- Direct manual control of all system outputs



Control Diagnostics

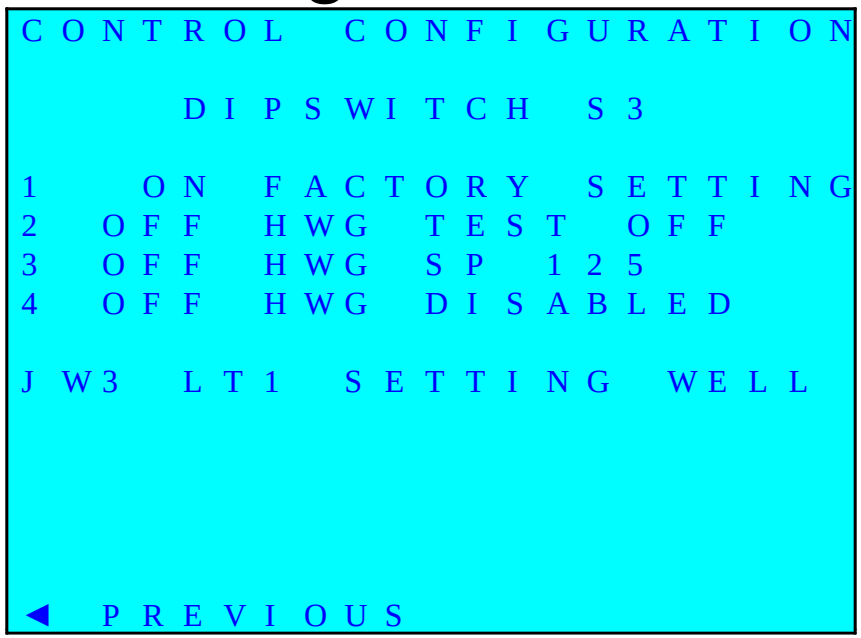
- Displays the status of inputs, outputs, and temperatures



Service Mode

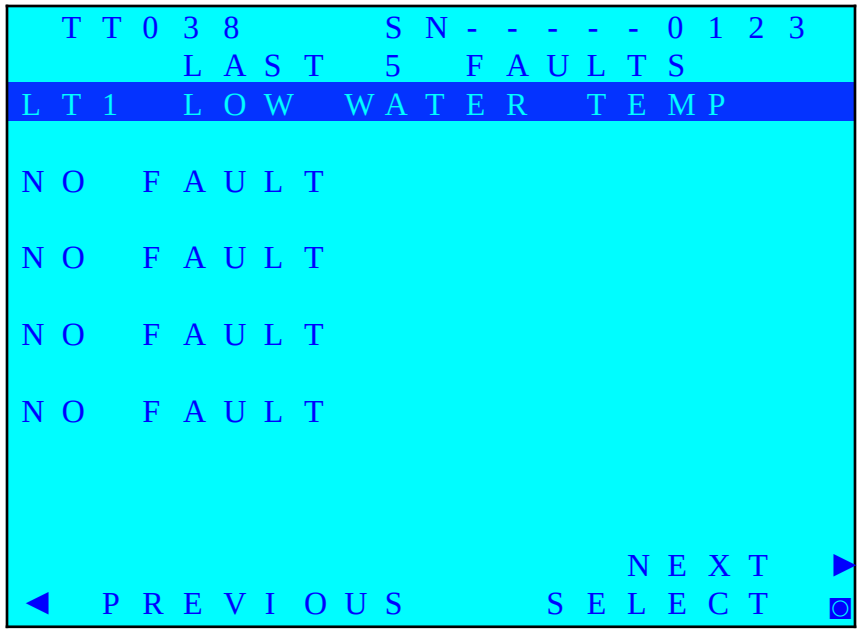
Dipswitch Configuration

- Displays the control dipswitch settings



Fault History

- Displays a detailed fault history for the control



Fault Condition Menu

```
FAULT CONDITION MENU

LT1 LOW WATER TEMP
COOL 1    11:11AM 12/25

FAULT TEMP CONDITIONS

FAULT FLOW CONDITIONS

FAULT I/O CONDITIONS

FAULT CONFIG COND

FAULT POSSIBLE CAUSES

◄ PREVIOUS      SELECT ◙
```

Fault Conditions

Temperature Conditions

- Control temperature conditions when the fault occurred

```
FAULT TEMP CONDITIONS

LT1 LOW WATER TEMP
COOL 1 11:11AM 12/25

LT1 TEMP 28.1
LT2 TEMP 79.9
HOT WATER EWT 121 5
COMP DISCHARGE 157.7
LEAVING AIR 75.1
LEAVING WATER 73.3
ENTERING WATER 78.5

CONTROL VOLTAGE 26.4

◄ PREVIOUS
```

Flow Conditions

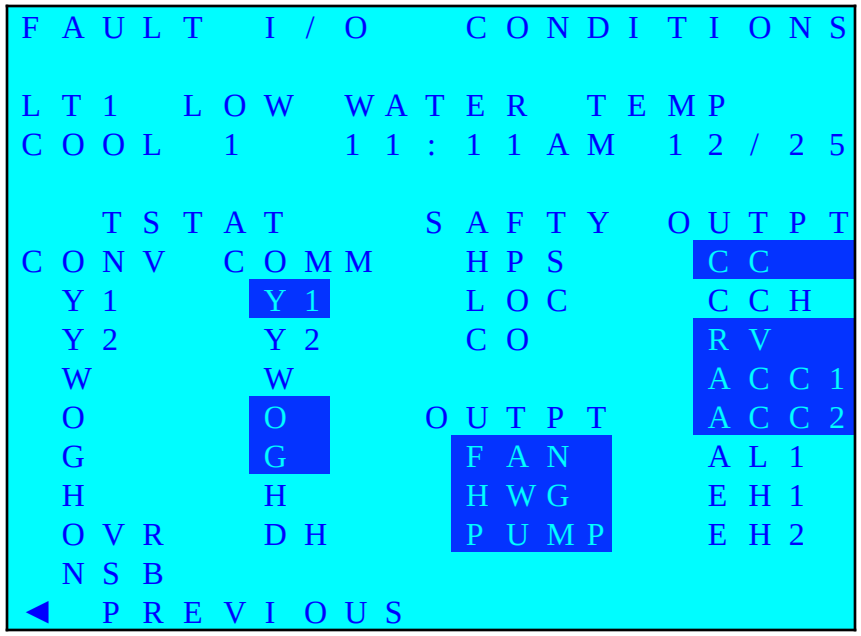
- Control flow conditions when fault occurred

```
FAULT FLOW CONDITIONS

LT1 LOW WATER TEMP
COOL 1 11:11AM 12/25

ECM TARGET CFM 800

ECM BLOWER RPM 550

FLOW RATE GPM 6.5

PUMP SPEED 60%

VALVE POSITION 0%

◄ PREVIOUS
```

Fault Conditions

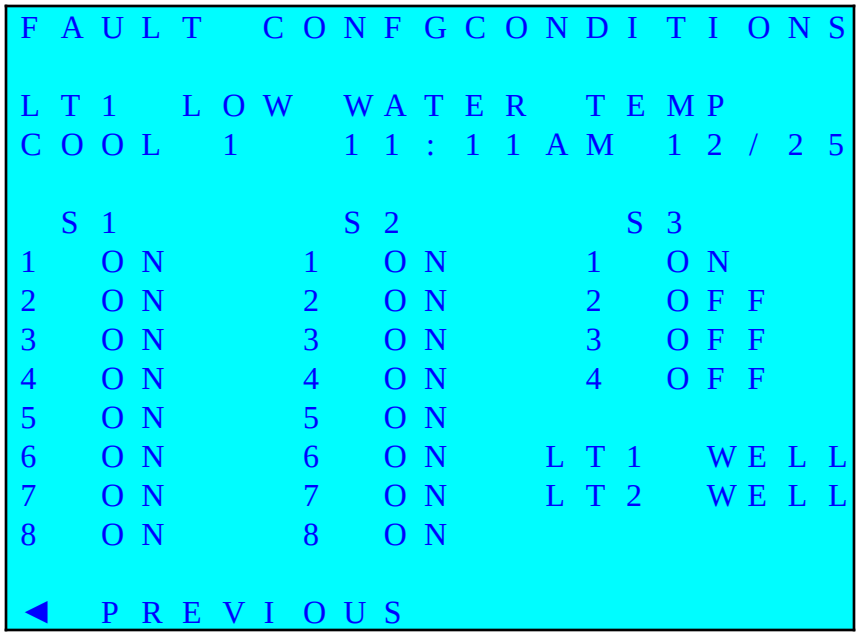
Input/Output Conditions

- Control inputs/ outputs when the fault occurred



Configuration Conditions

- Control configuration when the fault occurred



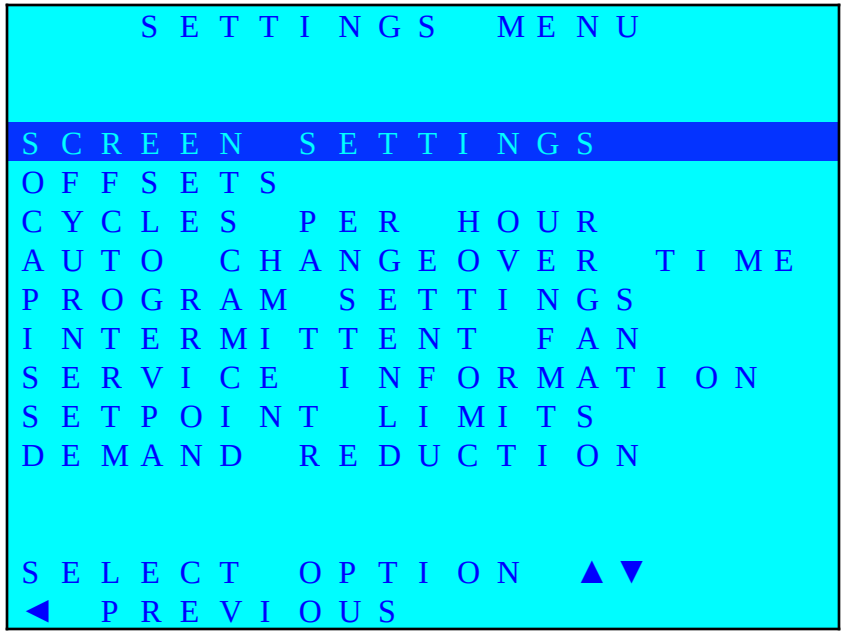
Fault Conditions

Possible Causes

- Possible causes as to why the fault occurred

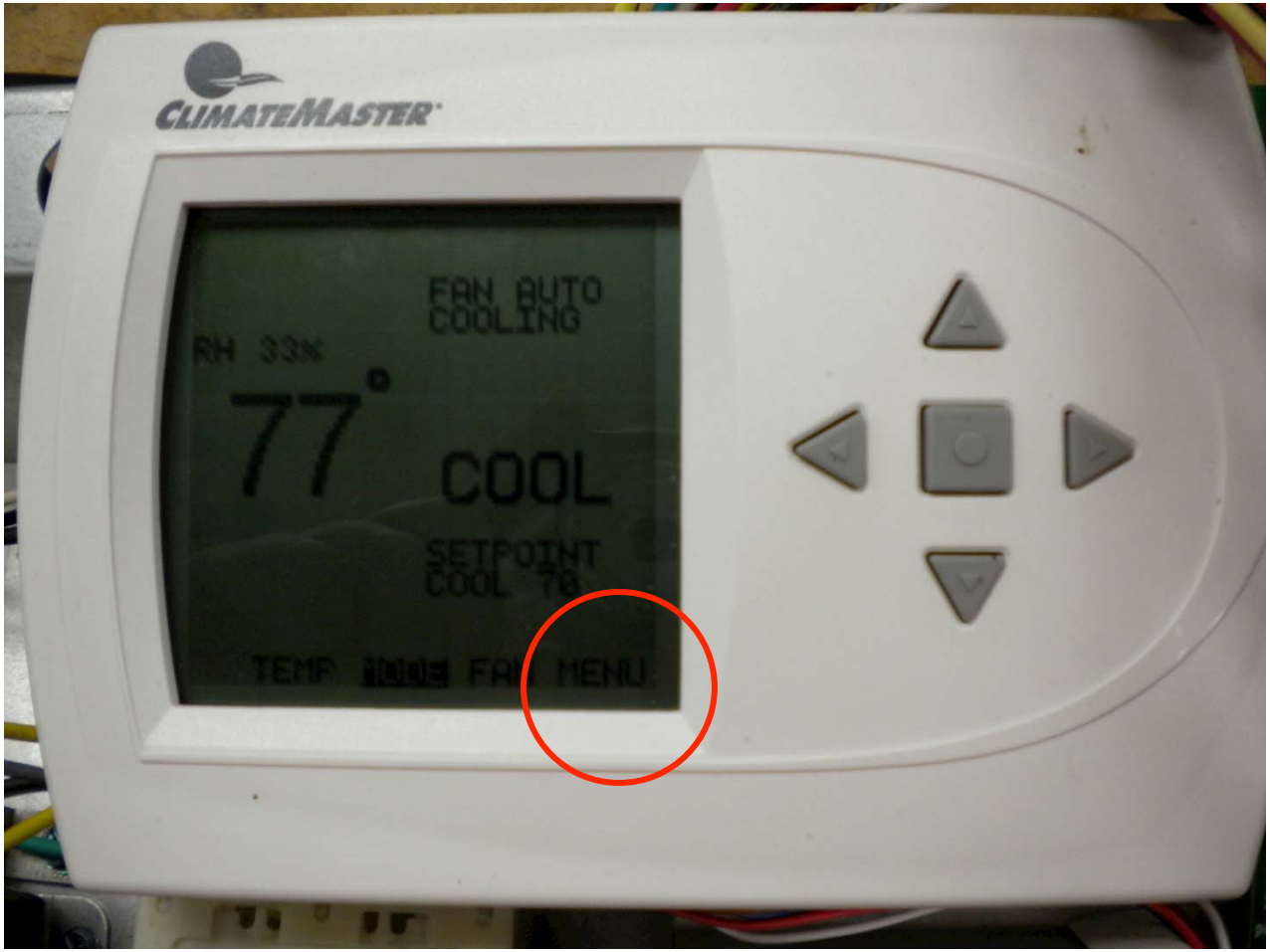
```
POSSIBLE FAULT CAUSES
 LOW WATER COIL TEMP

LOW WATER TEMP-HTG
LOW WATER FLOW-HTG
LOW REFRIG CHARGE-HTG
INCORRECT LT1 SETTING
BAD LT1 THERMISTOR
◄ PREVIOUS
```

Settings Menu

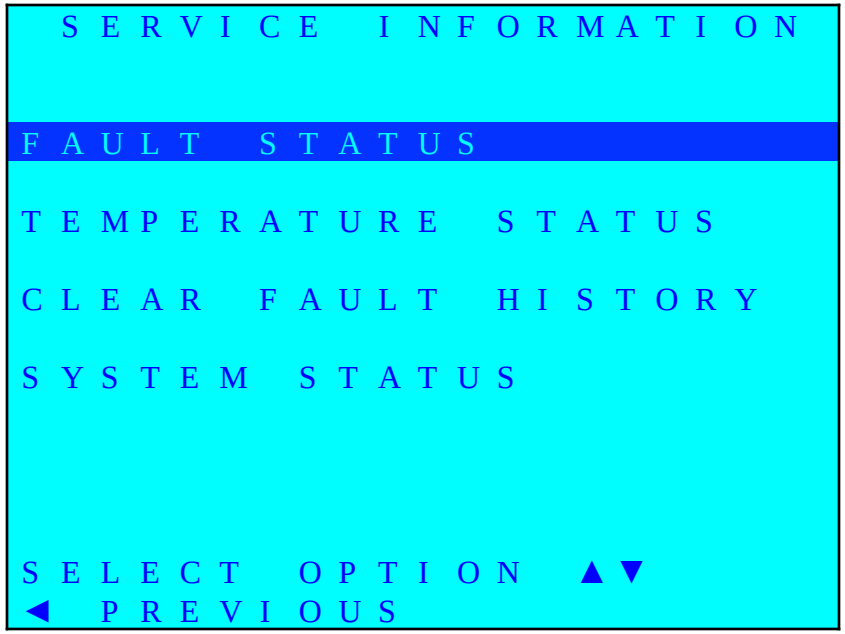


Normal Operating Screen

Under Menu You Can Get Into Service Information



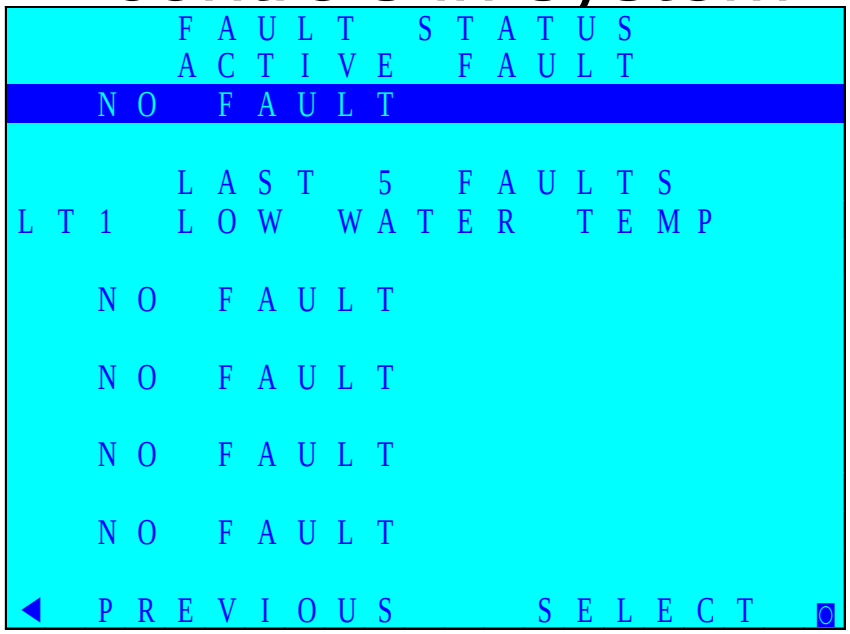
Service Information Menu



Service Information

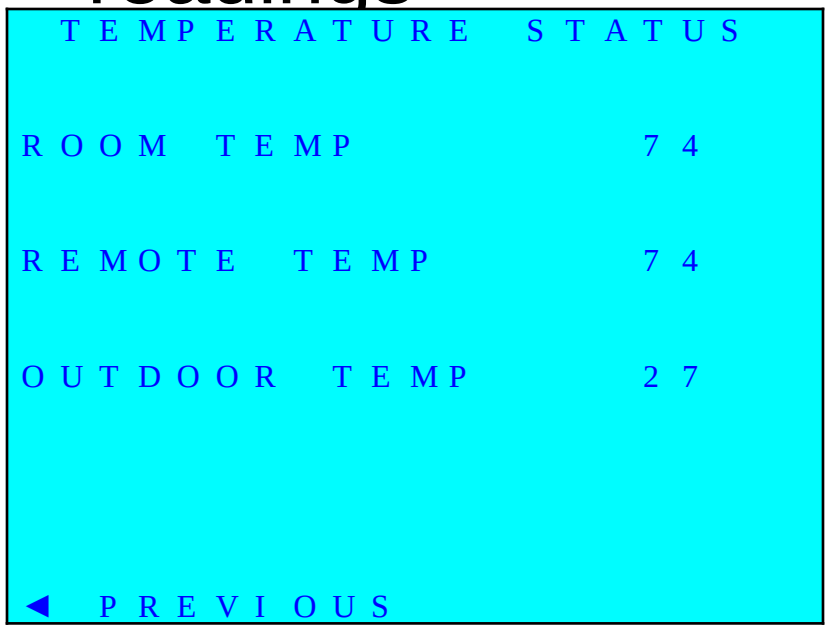
Fault Status

- Active and stored faults for all controls in system



Temperature Status

- Current temperature readings



Service Information

System Status

- Operating status of control temperatures, blower, and pump

```
        SYSTEM  STATUS

LT1   TEMP                 38.1
LT2   TEMP                 79.9
COMP  DISCHARGE   157.7
HOT   WATER  EWT    121  5
LEAVING  AIR          75.1
LEAVING  WATER        73.3
ENTERING  WATER       78.5
ECM  BLOWER  RPM        550
ECM  TARGET  CFM        800
ECM  BLWR  STATIC       0.5
PUMP  WATTS             140
FLOW  RATE  GPM         7.4
PUMP  SPEED             60%
◄  PREVIOUS
```

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Time For Questions!