CLIMATEMASTER
Geothermal Heat Pump Systems
An LSB Industries, Inc. Company (NYSE: LXU)

ClimateMaster
TRANQUILITY DIGITAL PRODUCTS

Mike Hammond

January 2013

CLIMATEMASTER PRODUCTS 2011

Product Group	Current
Package 30	*TT Rev A*
Package 20	*TS Rev A*
Split Outdoor	*TTP Rev A*
Split Indoor	*TTS Rev A*
Air Handler	*TAH Rev A*
Cased coil	*TAC*
Med temp WW	*TMW Rev A*
High temp WW	*THW*

CLIMATEMASTER PRODUCTS 2013 January

DXM2

CXM

Product Group	Family	2011	Next Gen	Change
Water-Air Packaged	Package 30 *Digital*		TE	iGate, vFlow on TT; No ClimaDry; New layout inside; Microchannel on 038
	Package 30	*TT Rev A*	TT Rev B/C	Higher efficiency; Microchannel on 038

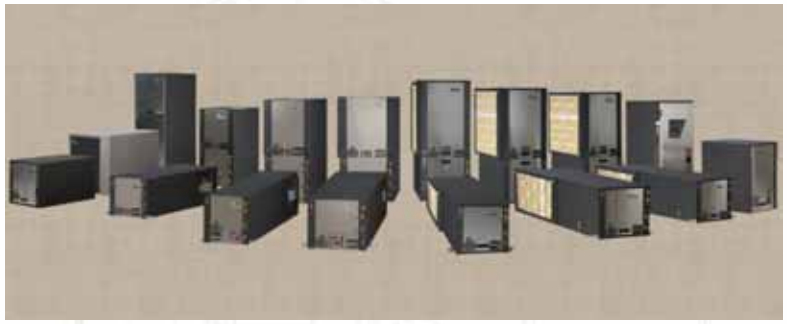
CLIMATEMASTER PRODUCTS 2013 January

DXM2

CXM

Product Group	Family	2011	Next Gen	Change
Water-Air Packaged	Package 30 *Digital*		TE	iGate, vFlow on TT; No ClimaDry; New layout inside; Microchannel on 038
	Package 30	*TT Rev A*	TT Rev B/C	Higher efficiency; Microchannel on 038
	Package 22 *Digital*		TZ REV B	New Product (REV B = new coax on 024, 036 and 060)
	Package 20	*TS Rev A*	TS Rev A	
Water-Air Splits	Split Outdoor Digital		TEP	iGate, vFlow on TTS; New layout inside
	Split Indoor Digital		TES	iGate, vFlow on TTP; New layout inside
	Split Outdoor	*TTP Rev A*	TTP Rev A	
	Split Indoor	*TTS Rev A*	TTS Rev A	
	Air Handler	*TAH Rev A*	TAH Rev B	iGate (AXM board) on TAH REV A
	Cased coil	*TAC*	TAC	
Water-Water	Med temp WW	*TMW Rev A*	TMW Rev A	
	High temp WW	*THW*	THW	

TRANQUILITY DIGITAL
TOP 2 Selling points



Highest Efficiency = Lowest operating cost

Up to
29.6 EER/4.8 COP + 60-80% reduction in pumping watts

vFlow™
Variable Water Flow

iGate™
monitor. control. diagnose.

Quickest installation

Easiest Troubleshooting

TRANQUILITY® 30 DIGITAL
BIG Changes – sales / competitive

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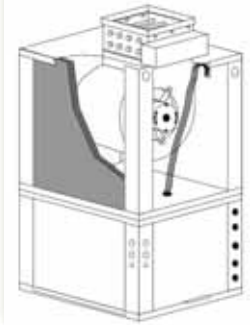
- Up to 30 EER / 4.8 COP (Most Efficient of ENERGY STAR)
- Lowest operating cost in industry including pumping op cost
- Capacities: 2, 3, 4, 5, 6 ton
- Same size as TT27, Stainless panels, 2” MERV 11 filter
- Comfort comes standard with Copeland 2-stage compressor / Emerson ECM motor
- vFlow™ Variable Water Flow Standard – save 2-3 hours in installation and 60-80% on pumping operating cost (w/VS pump models)
- iGate™ Information gateway Standard – Monitor, Control and Diagnose from the thermostat with 4-wire connection.
- No ClimaDry® (will be available at a later date)

TRANQUILITY® 22 DIGITAL
BIG Changes – sales / competitive



- Up to 22 EER / 4.1 COP (qualifies for *Federal Tax Credit*)
- Capacities: 2, 2.5, 3, 3.5, 4, 5 ton
- Compact size, Bond silver finish, 1” filter MERV 8
- Copeland 2-stage compressor / Emerson ECM motor standard @ / near Single Stage price
- vFlow – internal variable speed water control
- iGate - Industry’s first true 4-wire, two-way communicating system
- No Downflow configuration
- No ClimaDry®
- External Auxiliary heat (vertical)

TRANQUILITY DIGITAL SPLITS
BIG Changes – sales / competitive

- Up to 26.3 EER / 4.6 COP
- Lowest operating cost in industry including pumping op cost
- Capacities: 2, 3, 4, 5 ton
- vFlow™ Variable Water Flow Standard – save 2-3 hours in installation and 60-80% on pumping operating cost (w/VS pump models)
- iGate™ Information gateway Standard – Monitor, Control and Diagnose from the thermostat with 4-wire connection.
- TES has same design as compressor section of TE
- Still ship with LT2 sensor to connect to non-communicating air handler/ furances
- Improved water connections in TEP (vs TTP)

TRANQUILITY DIGITAL AIR HANDLER

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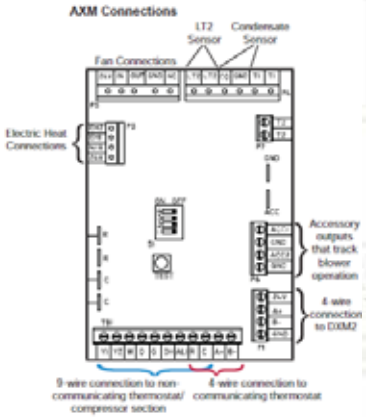
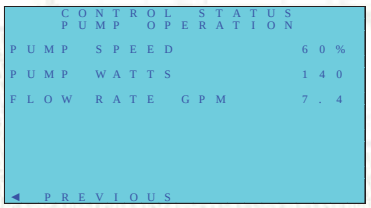
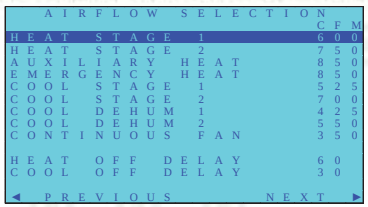


- *New* AXM communicating board
  - 4-wire connection to communicating compressor section and thermostat (and fan motor)
  - Optional 9-wire connection to non-communicating compressor section and thermostat
  - No dip switches to set airflow – connect communicating thermostat (ATC) or Diagnostic tool (ACD) to AXM or DXM2 board to configure airflow
- Capacities: 2, 3, 4, 5 ton
- More airflow options – increments of 25 CFM in 9-modes
- Configure, monitor and Diagnose from connection to DXM2 or AXM
- Comes standard with LT2 sensor installed and connected to AXM board

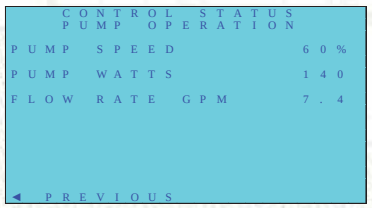
TRANQUILITY® DIGITAL PACKAGED
BIG Changes – install / service

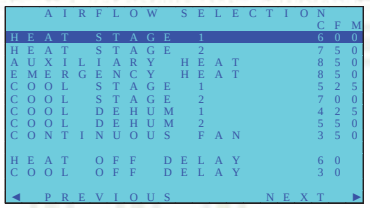




1. vFlow: Built-in VARIABLE Water Flow
2. iGate Information Gateway: Configure, Monitor and Diagnose at Thermostat
3. Swing-out control box – access to components
4. 4-wires between thermostat and unit
5. External auxiliary heater (TZ only)
6. External condensate trap
7. High/Low refrig. Pressure ports – easy access

TRANQUILITY DIGITAL SPLITS
BIG Changes – install / service





1. vFlow: Built-in VARIABLE Water Flow
2. iGate Information Gateway: Configure, Monitor and Diagnose at Thermostat

   Swing-out control box – access to components (TES)

4. 4-wires between thermostat, Compressor section and air handler
5. High/Low refrig. Pressure ports – easy access
6. 4-wire connection to External HWG (TEP)

TRANQUILITY DIGITAL SPLITS
iGate™ System

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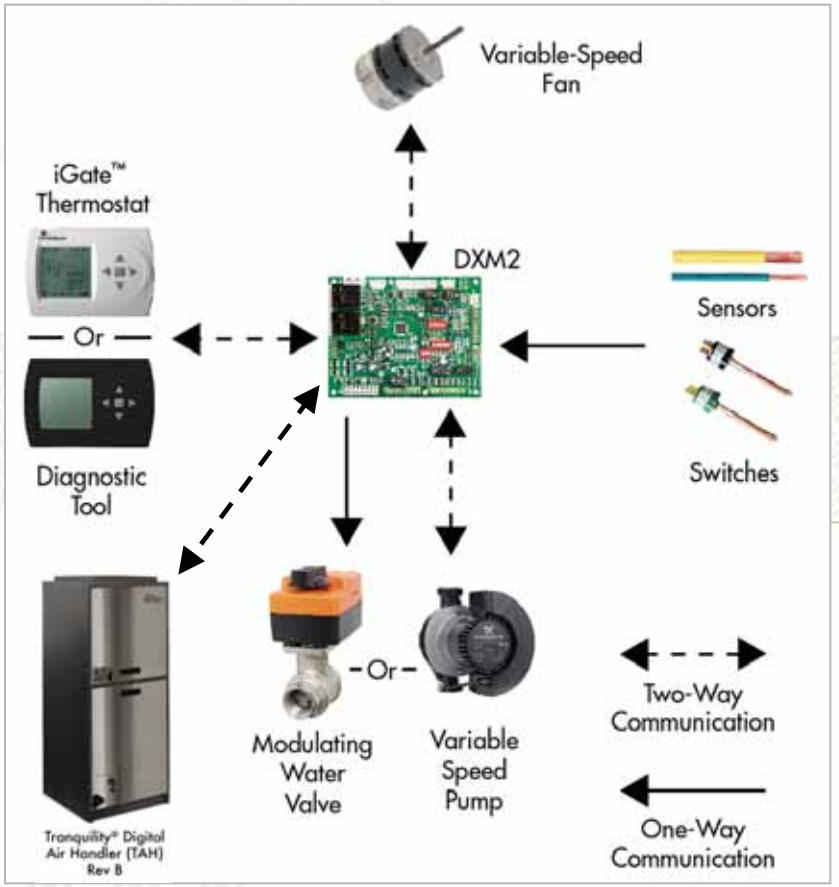
iGate™
monitor. control. diagnose.



Next generation in Intelligent Controls

Uses 2-way communication to provide GATEWAY into the system

Monitor, Configure (without touching the unit) and Diagnose issues, all from the thermostat

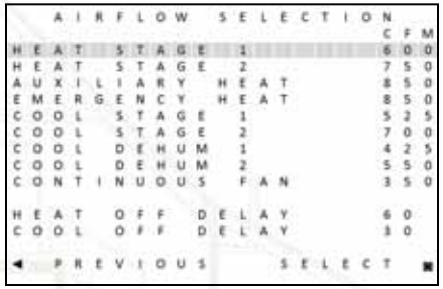
DXM2 intelligent controller is the communications hub - analyzes status of sensors and smart components to optimize operation for comfort, efficiency and long-term reliability

Information is passed to the iGate thermostat (or diagnostic tool) to be displayed in PLAIN English

Future accessories for communication over the Internet

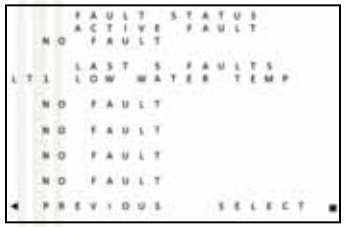
TRANQUILITY DIGITAL SPLITS
iGate Information Gateway

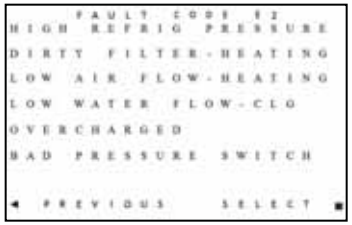
Configure



Monitor

Diagnose





CONFIGURE:

- CFM, Water ΔT
- Unit info. + Accessory configuration
- Water circuit option

MONITOR:

- Entering / Leaving Water Temperature
- GPM (w/ IFC)
- Leaving Air Temperature
- Compressor discharge temperature
- Blower RPM

DIAGNOSE:

- Fault code
- Fault History
- Conditions AT TIME OF FAULT!

TRANQUILITY DIGITAL SPLITS
vFlow Variable Water Flow

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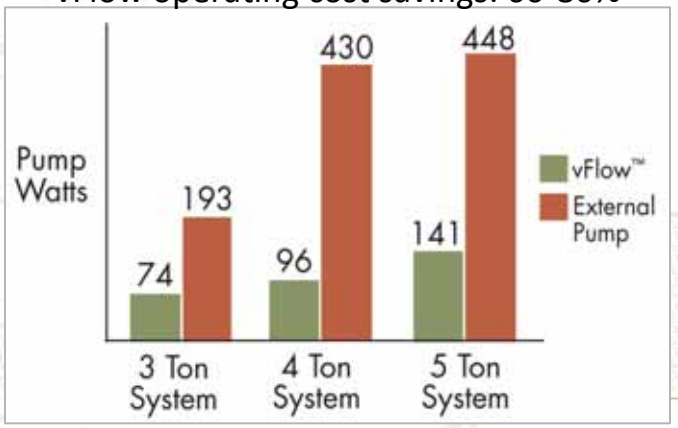
vFlow™
Variable Water Flow

vFlow operating cost savings: 60-80%



Major advance in geothermal system performance made possible by iGate™ system

Builds the major water circulation components right into the unit and Varies water flow to

- Minimize pump energy consumption
- Improve system reliability
- Save on installation time
- Make for a very clean and compact installation.

Water flow is automatically varied to maintain optimum system performance based on:

- Changes in unit capacity level (stage)
- Source water temperature

Protects the unit against extreme operating conditions, extending the life of the compressor and air coil

TRANQUILITY® 30 DIGITAL Models

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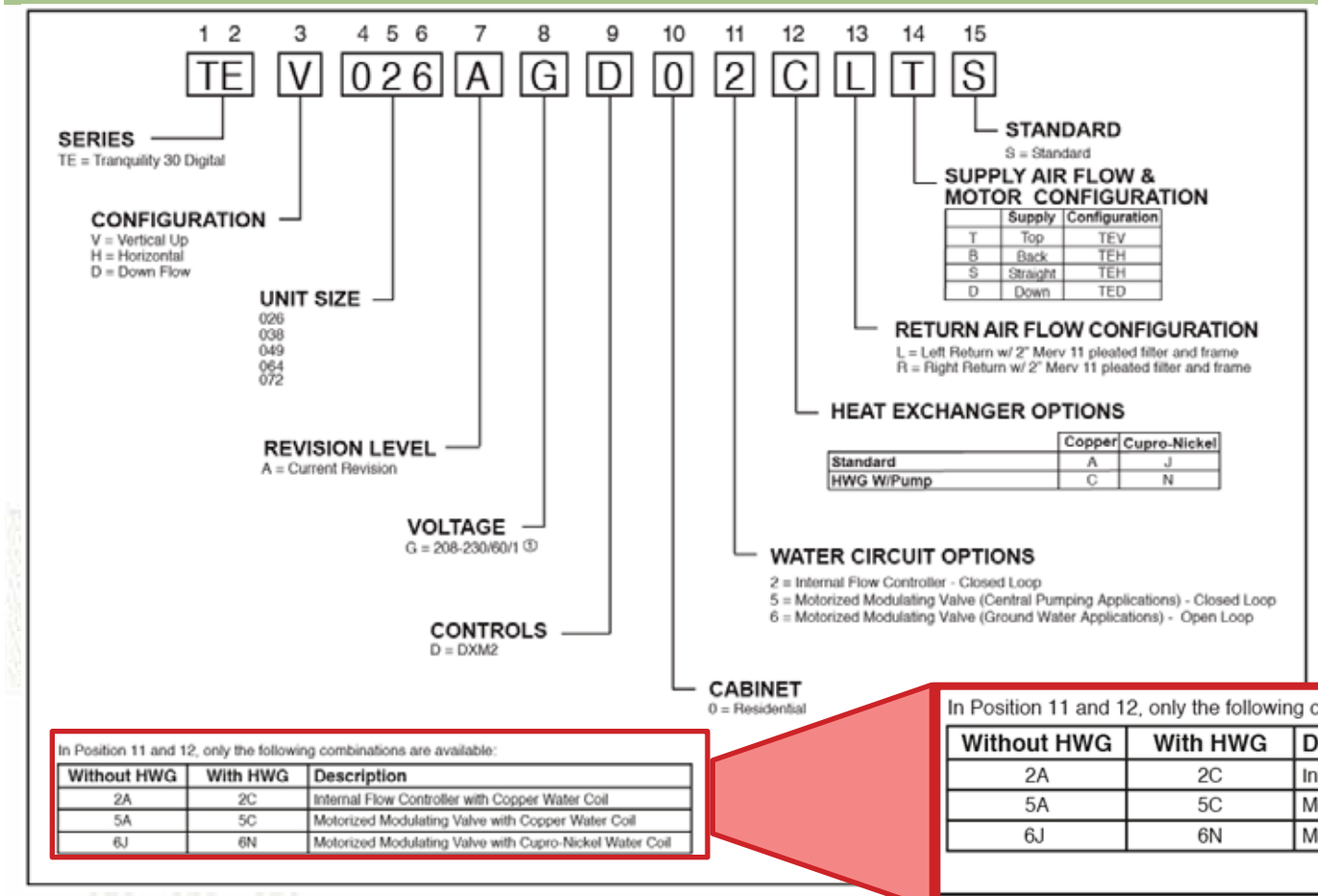

In Position 11 and 12, only the following combinations are available:

Without HWG	With HWG	Description
2A	2C	Internal Flow Controller with Copper Water Coil
5A	5C	Motorized Modulating Valve with Copper Water Coil
6J	6N	Motorized Modulating Valve with Cupro-Nickel Water Coil

In Position 11 and 12, only the following combinations are available:

Without HWG	With HWG	Description
2A	2C	Internal Flow Controller with Copper Water Coil
5A	5C	Motorized Modulating Valve with Copper Water Coil
6J	6N	Motorized Modulating Valve with Cupro-Nickel Water Coil

Only these water circuit and heat exchanger combinations are available

TRANQUILITY DIGITAL SPLITS Nomenclature

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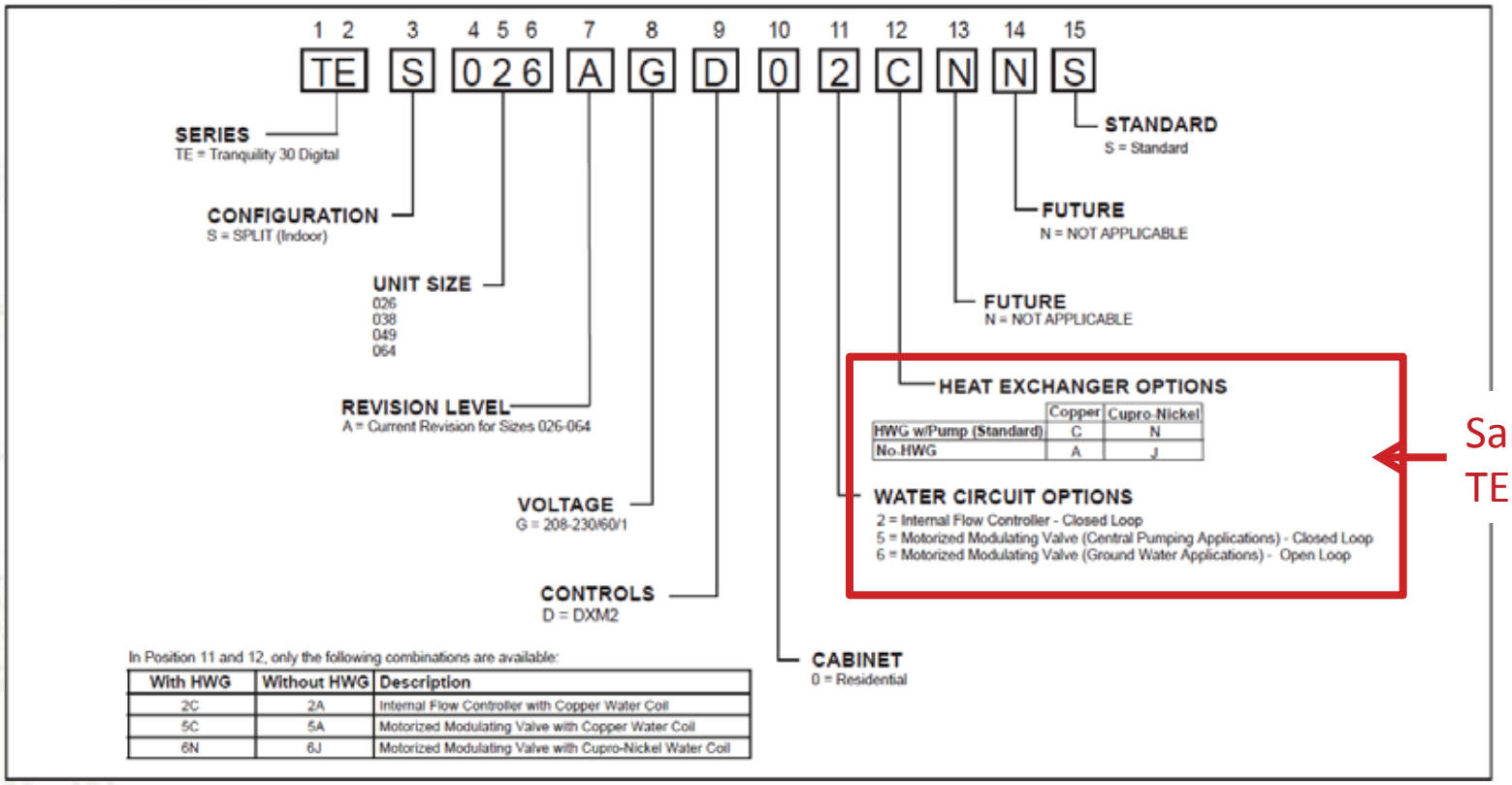
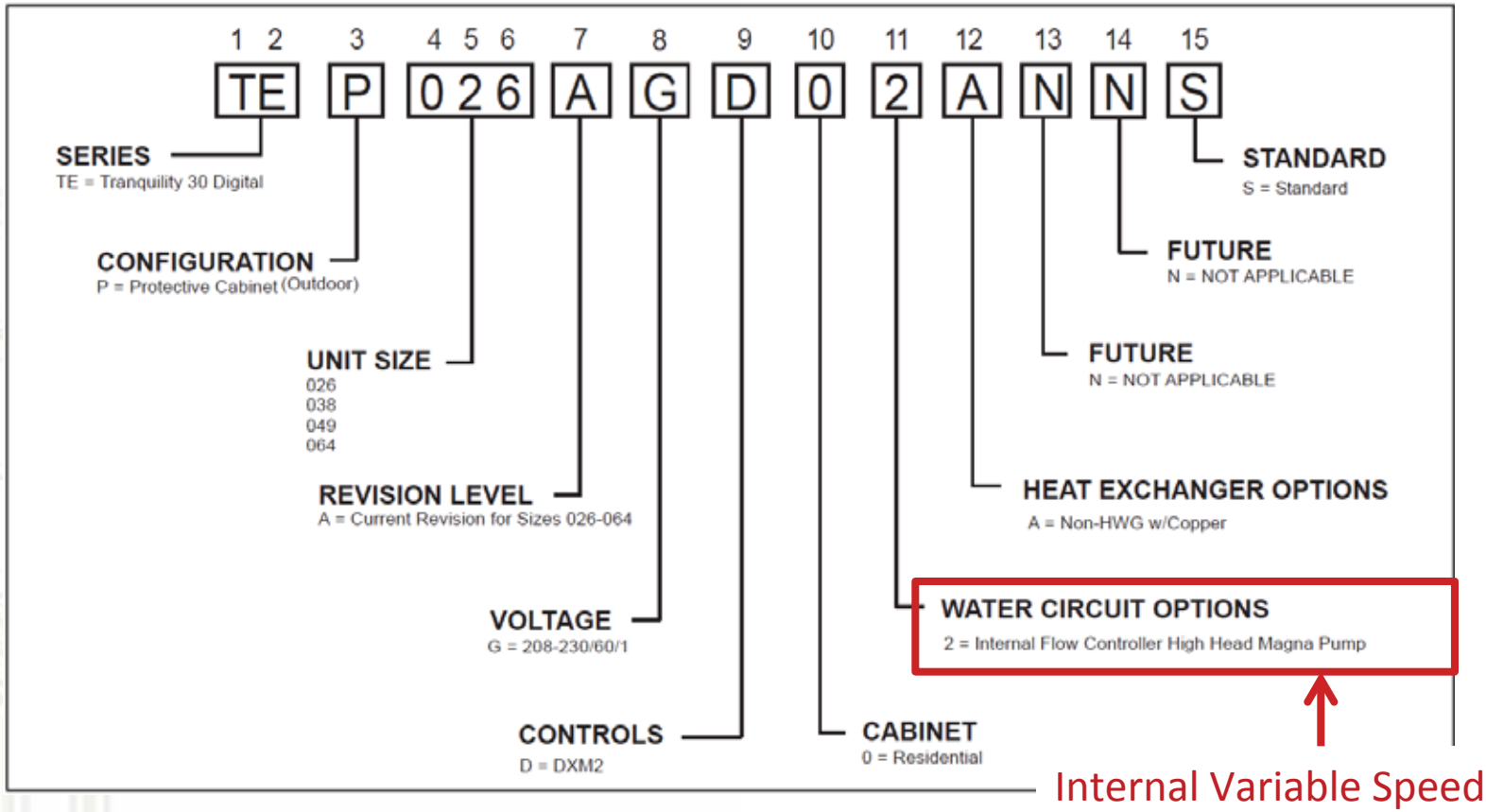


Same as TE

TRANQUILITY DIGITAL SPLITS Nomenclature - TTP



Internal Variable Speed flow controller (with copper coil) option only

TRANQUILITY® PACKAGED System comparisons

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System Comparison

● Standard
O Optional

		Indoor Split		Outdoor Split	
		Tranquility® 27 Digital (TES)	Tranquility® 27 (TTS)	Tranquility® 27 Digital (TEP)	Tranquility® 27 (TTP)
Efficiency*	Cooling	26.3	26.2	26.3	26.2
	Heating	4.6	4.7	4.6	4.7
ENERGY STAR Designation		Most Efficient	Tier 3	Most Efficient	Tier 3
30% Federal Tax Credit Eligible		Yes	Yes	Yes	Yes
Compressor		Two Stage	Two Stage	Two Stage	Two Stage
Front panel		Stainless Steel	Stainless Steel	Painted	Painted
vFlow™ Internal Variable Water Flow		●		●	
External Fixed Speed Flow Controller			O		●
iGate™ Communicating System		●		●	
Non-Communicating Electronic Controls			●		●
Hot Water Generator	Built-In	O	O		
	Accessory			O	O
Warranty - 10-Year Parts; 5-Year Labor Allowance		●	●	●	●
Warranty - 10-Year Parts; 10-Year Labor Allowance		O	O	O	O

*When matched with Tranquility® Air Handler

TRANQUILITY SPLITS

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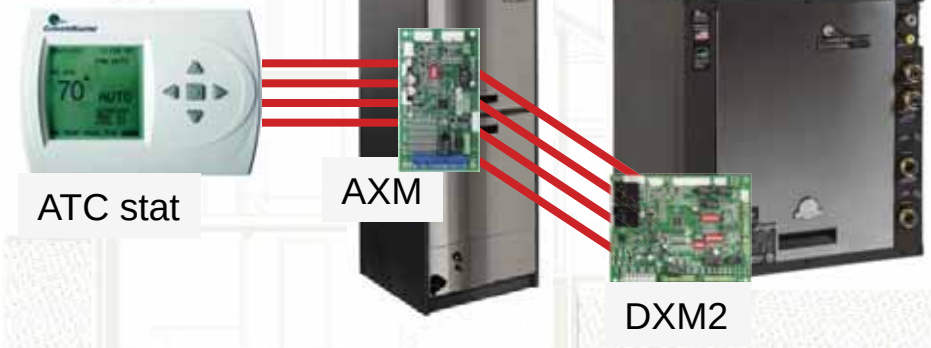
Tranquility® Split Series ● Standard ○ Optional		Tranquility® 27 Digital (TES)	Tranquility® 27 (TTS)	Tranquility® 27 Digital (TEP)	Tranquility® 27 (TTP)
Tranquility® Compressor Section		Indoor Split		Outdoor Split	
Efficiency*	Cooling	26.3	26.2	26.3	26.2
	Heating	4.6	4.7	4.6	4.7
ENERGY STAR Designation		Most Efficient	Tier 3	Most Efficient	Tier 3
30% Federal Tax Credit Eligible		Yes	Yes	Yes	Yes
Compressor		Two Stage	Two Stage	Two Stage	Two Stage
Front panel		Stainless Steel	Stainless Steel	Painted	Painted
vFlow™ Internal Variable Water Flow		●		●	
External Fixed Speed Flow Controller			○		●
iGate™ Communicating System		●		●	
Non-Communicating Electronic Controls			○		●
Hot Water Generator	Built-in	○	○		
	Accessory			○	○
Warranty - 10-Year Parts; 5-Year Labor Allowance		●	●	●	●
Warranty - 10-Year Parts; 10-Year Labor Allowance		○	○	○	○

* When matched With Tranquility® Air Handler

TRANQUILITY DIGITAL SPLITS
iGate Information Gateway



Communicating programmable Thermostat (ATC32U01)

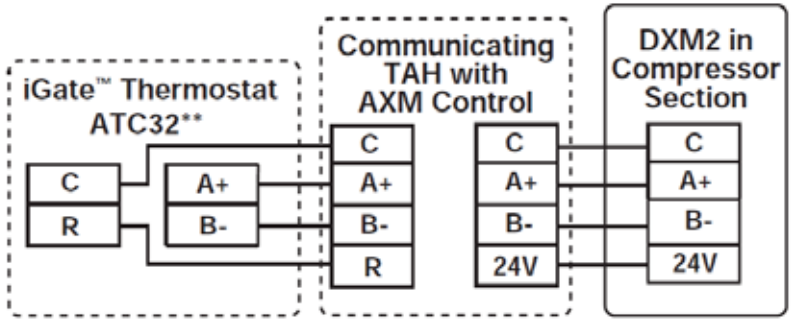
Configuration / Diagnostic tool (ACDU01)

4-wires to thermostat

Need either CONFIGURATION / DIAGNOSTIC tool (ACDU01) or Communicating stat (ATC32U01) to configure / troubleshoot

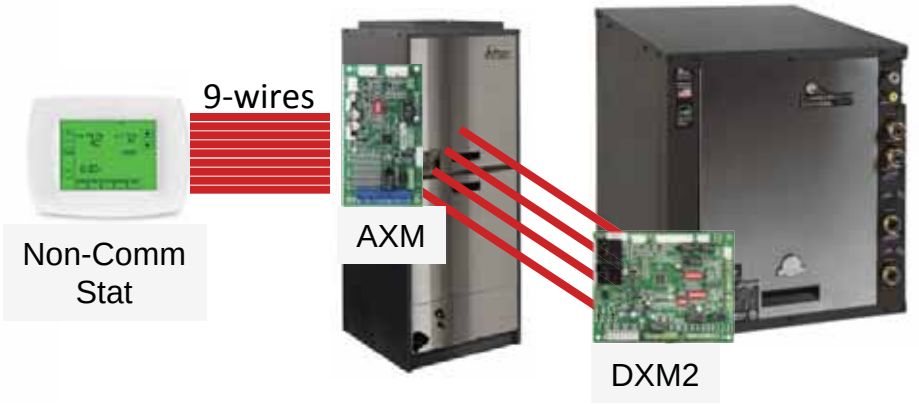
Integrates ECM and HWG boards

Fewer Dip Switches to configure (not needed for most initial configuration)

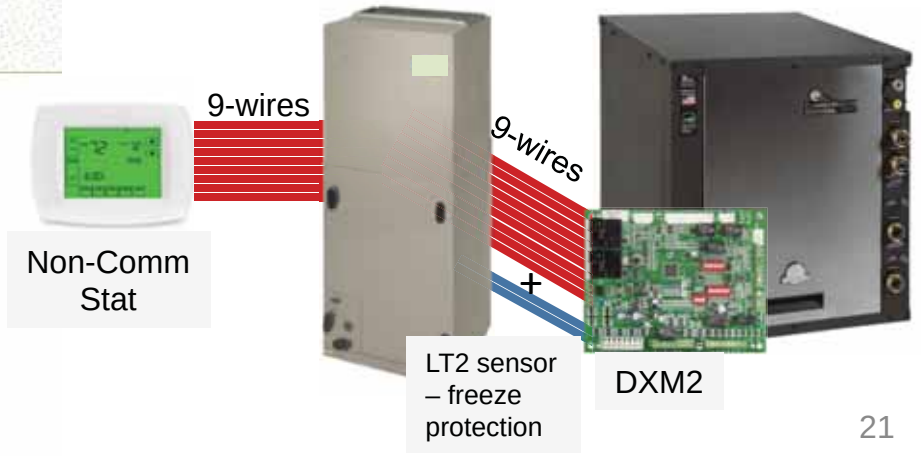


TRANQUILITY DIGITAL SPLITS
Non-communicating connections

Option 1: non-communicating thermostat, communicating split, air-handler



Option 2: non-communicating thermostat, non-communicating air-handler

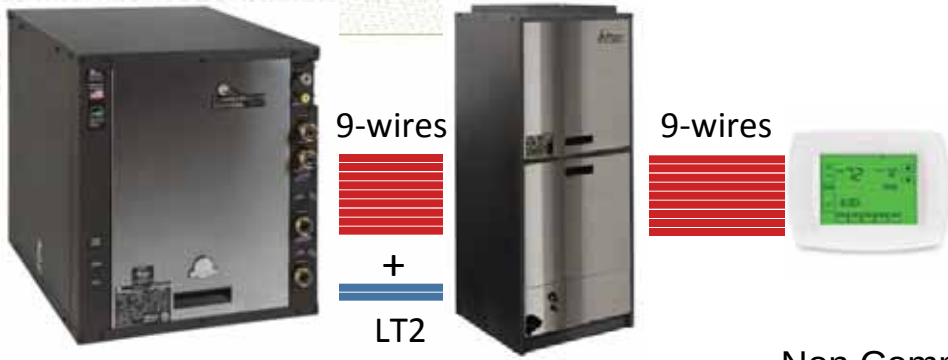


LT2 sensor is shipped on both TES and TEP

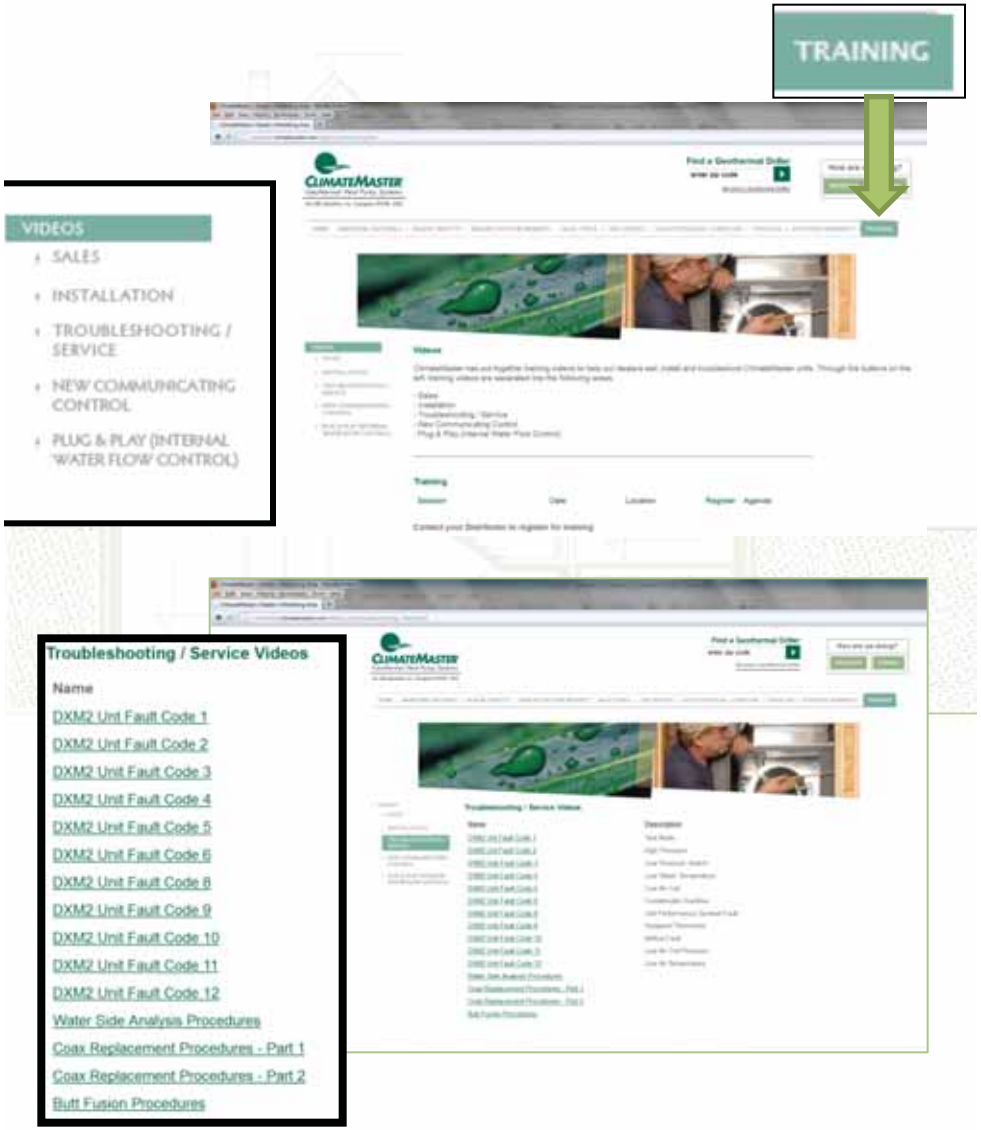
FIELD REPLACEMENT

Scenario 1:

Scenario 2:



TRAINING - Videos



- Significantly enhanced videos at: http://residential.climatemaster.com/dealers_area/training.html
- Sales, Installation, Troubleshooting sections
- Walk through fault codes
- Can reach YouTube videos only through link on website
- *More to come..*

DXM2 controller

N02

Original version
Still in production on TZ, TE
3 silver and 2 yellow dots
Version 1.2

N05

New version
Used on Splits (TES/TEP)
2 yellow dots
Version 1.2 or 1.3

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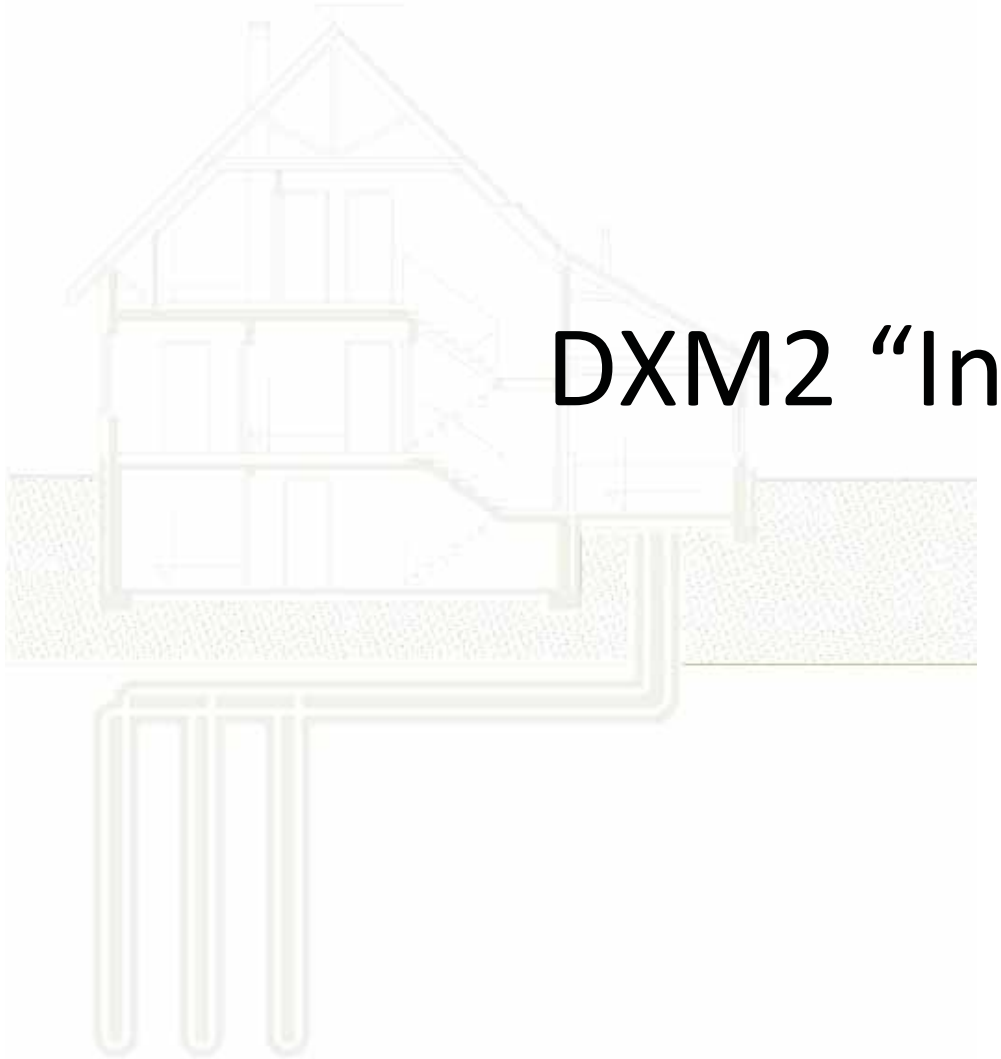

DXM2 “In-Depth”

Thermostat Wiring Options

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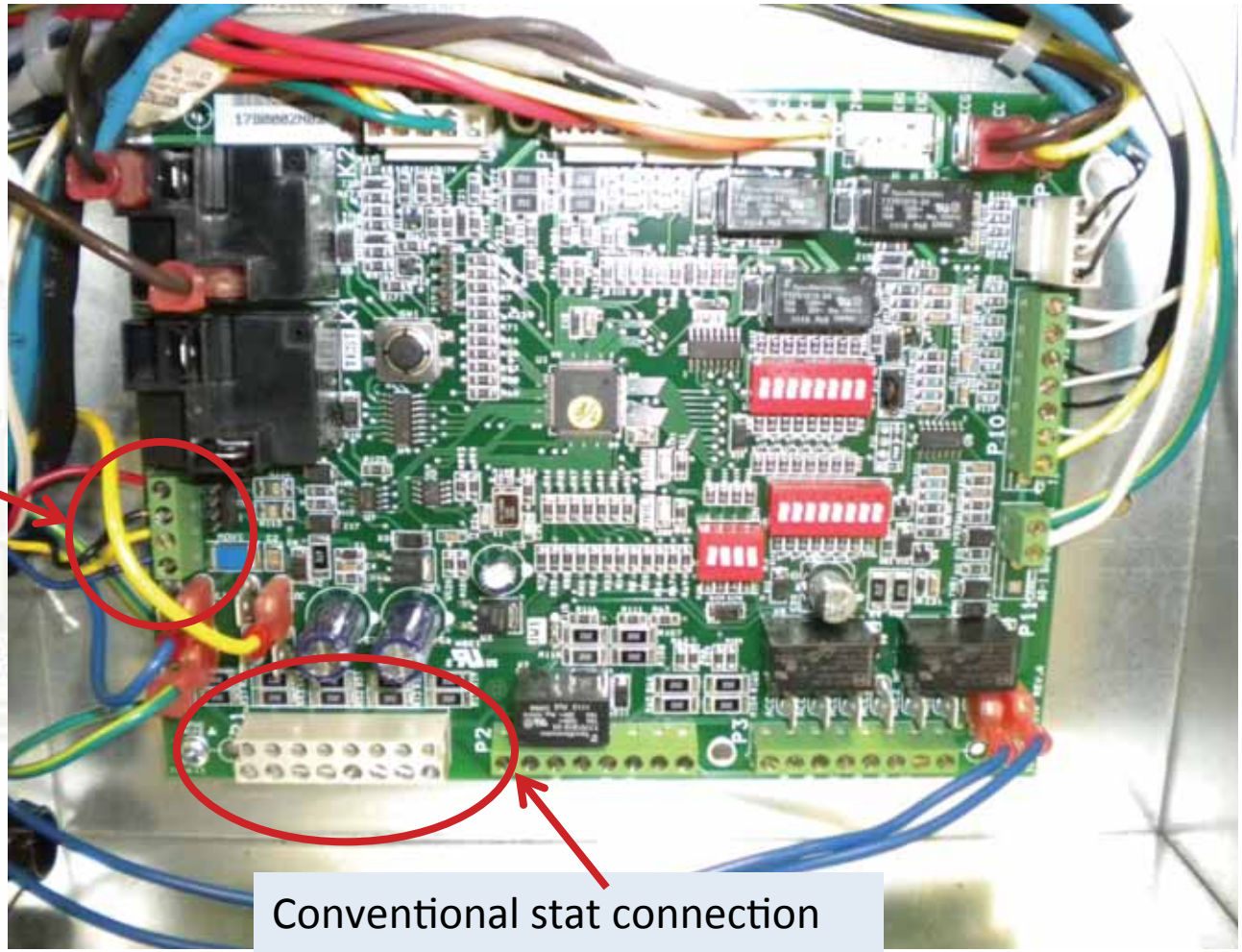
Communicating stat connection 4 wire



Conventional stat connection

Communications Dipswitch

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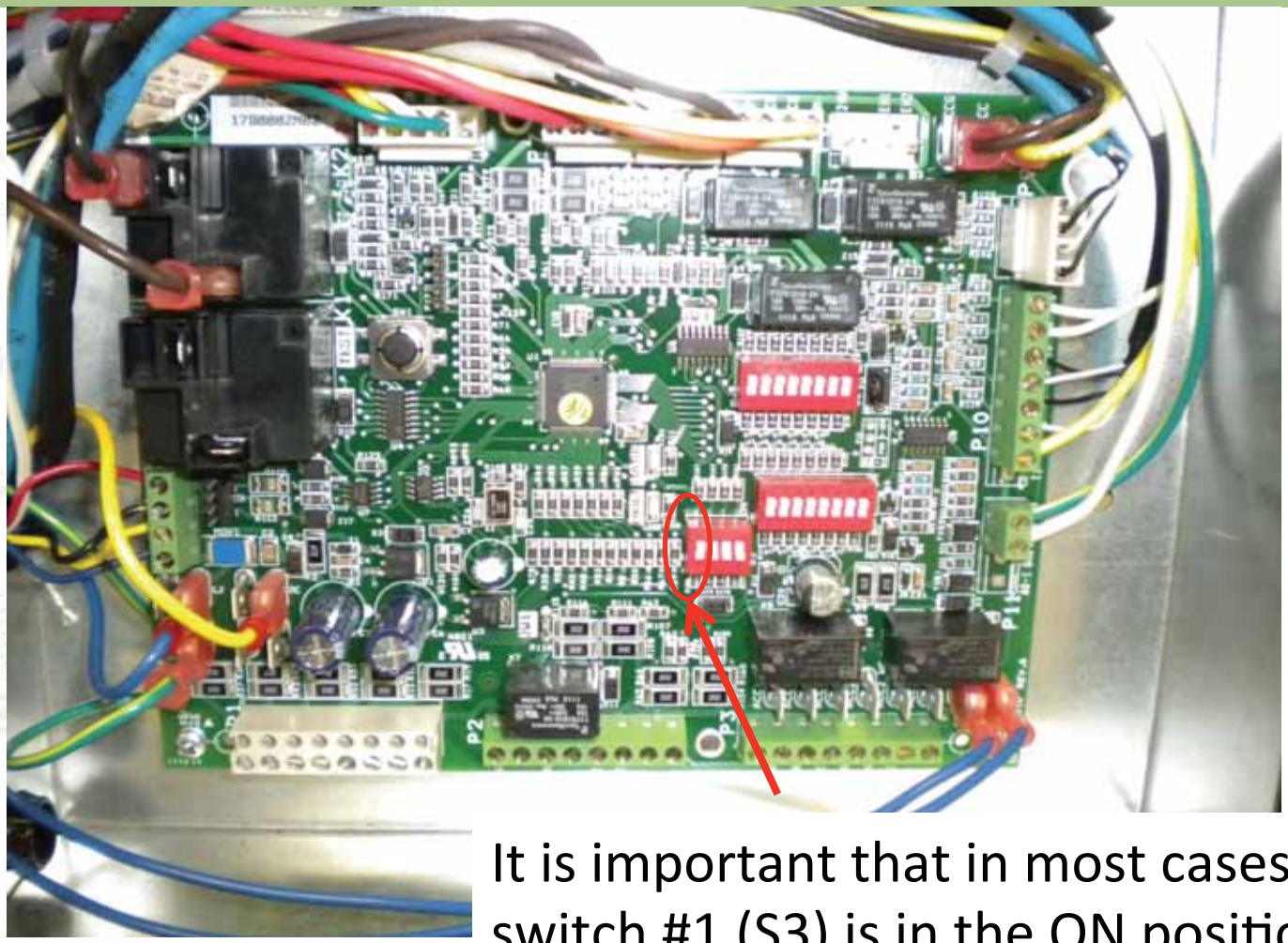

It is important that in most cases dip switch #1 (S3) is in the ON position

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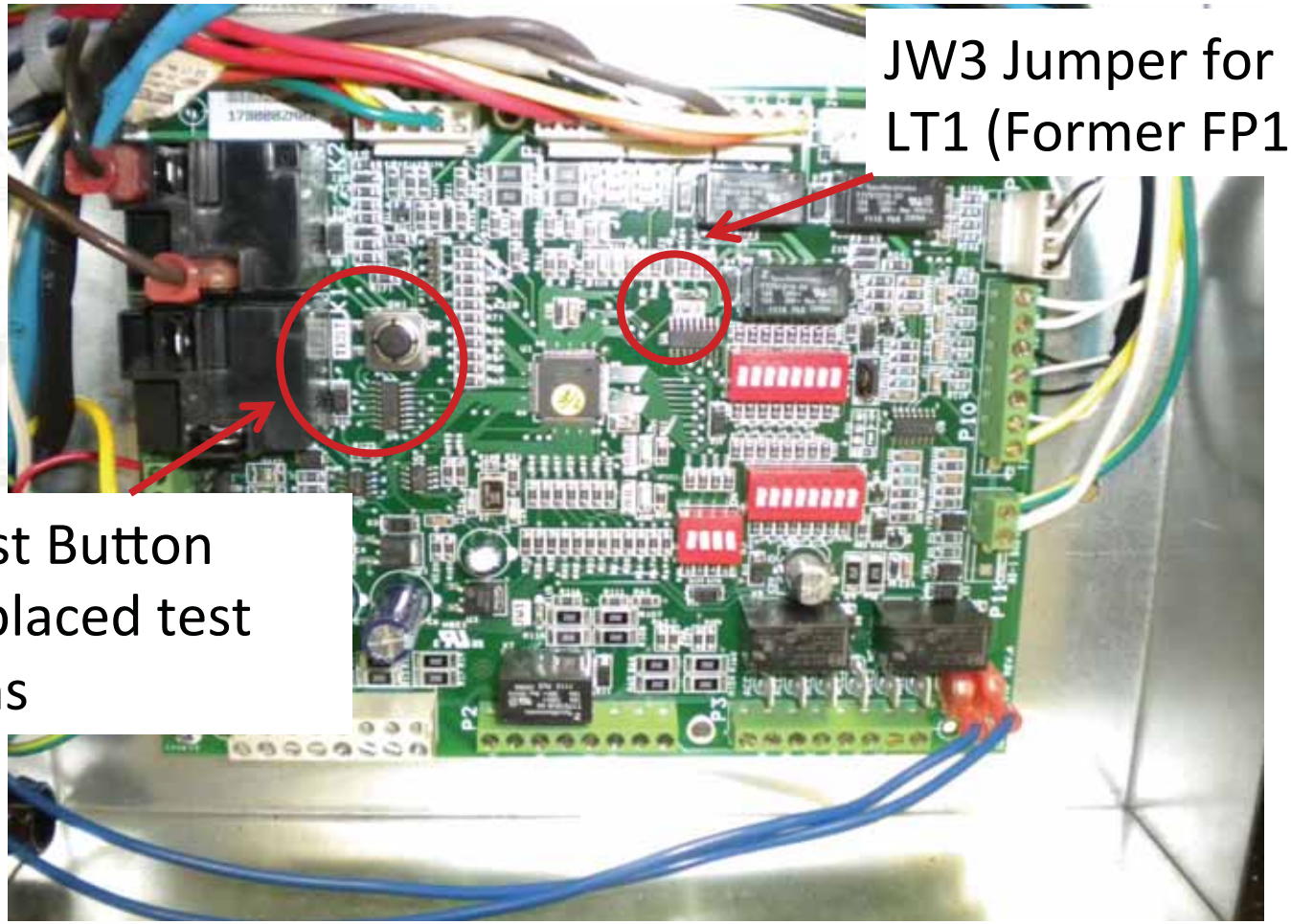

HWG Dipswitchs

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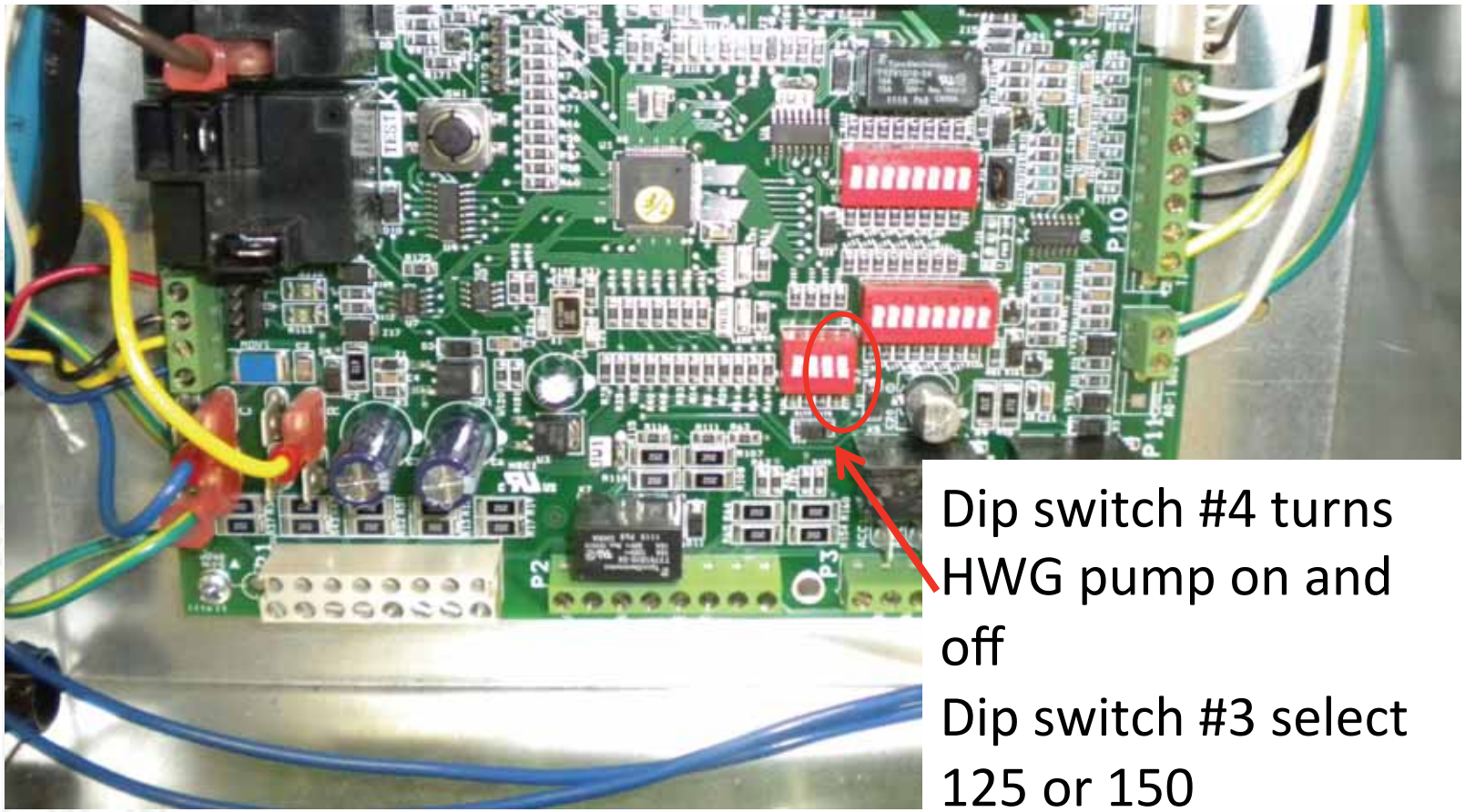

Dip switch #4 turns HWG pump on and off

Dip switch #3 select 125 or 150

Dip Switch #2 is test mode for pump.

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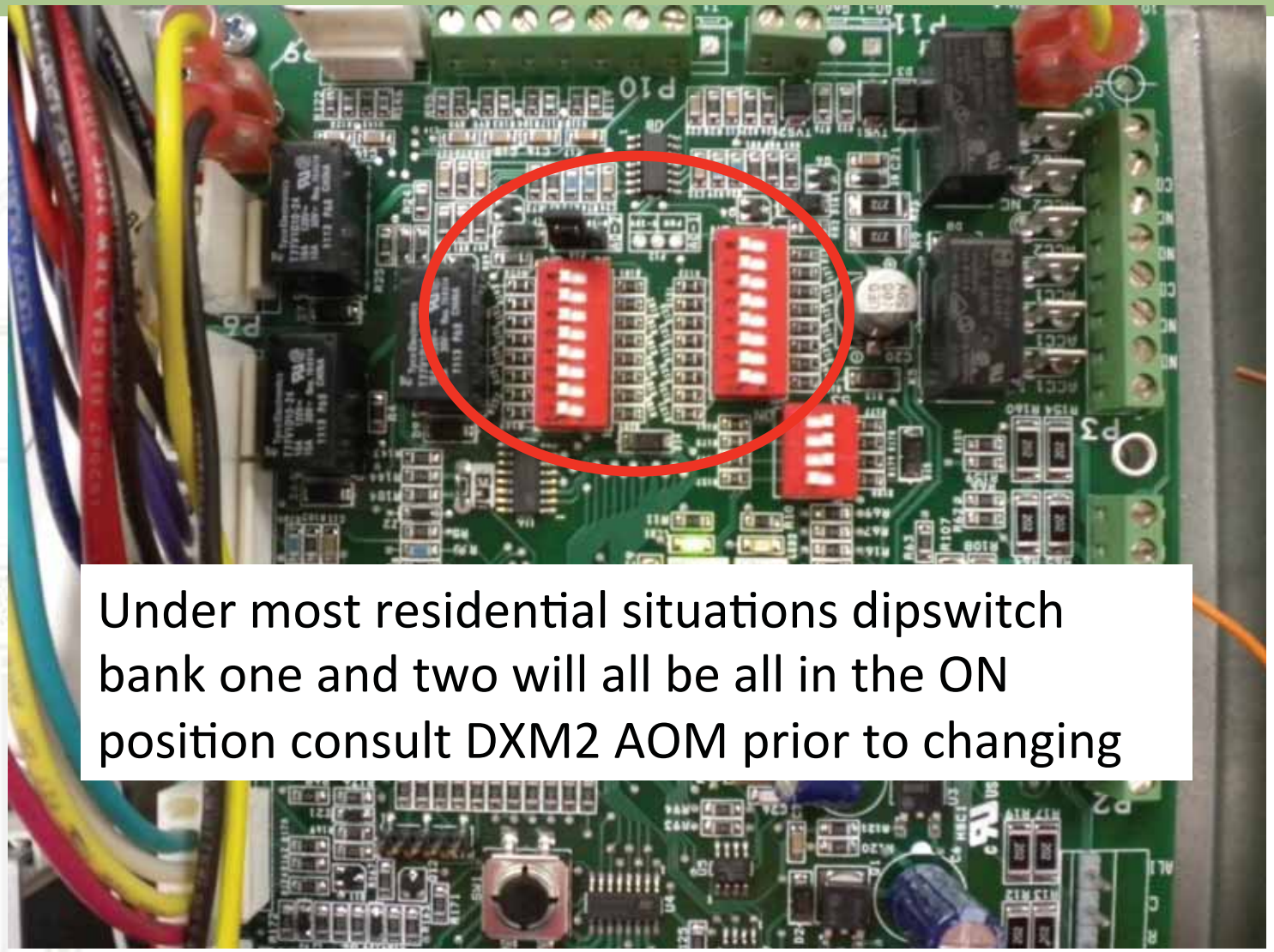

Under most residential situations dipswitch bank one and two will all be all in the ON position consult DXM2 AOM prior to changing

If you want a humidifier controlled by ATC Thermostat

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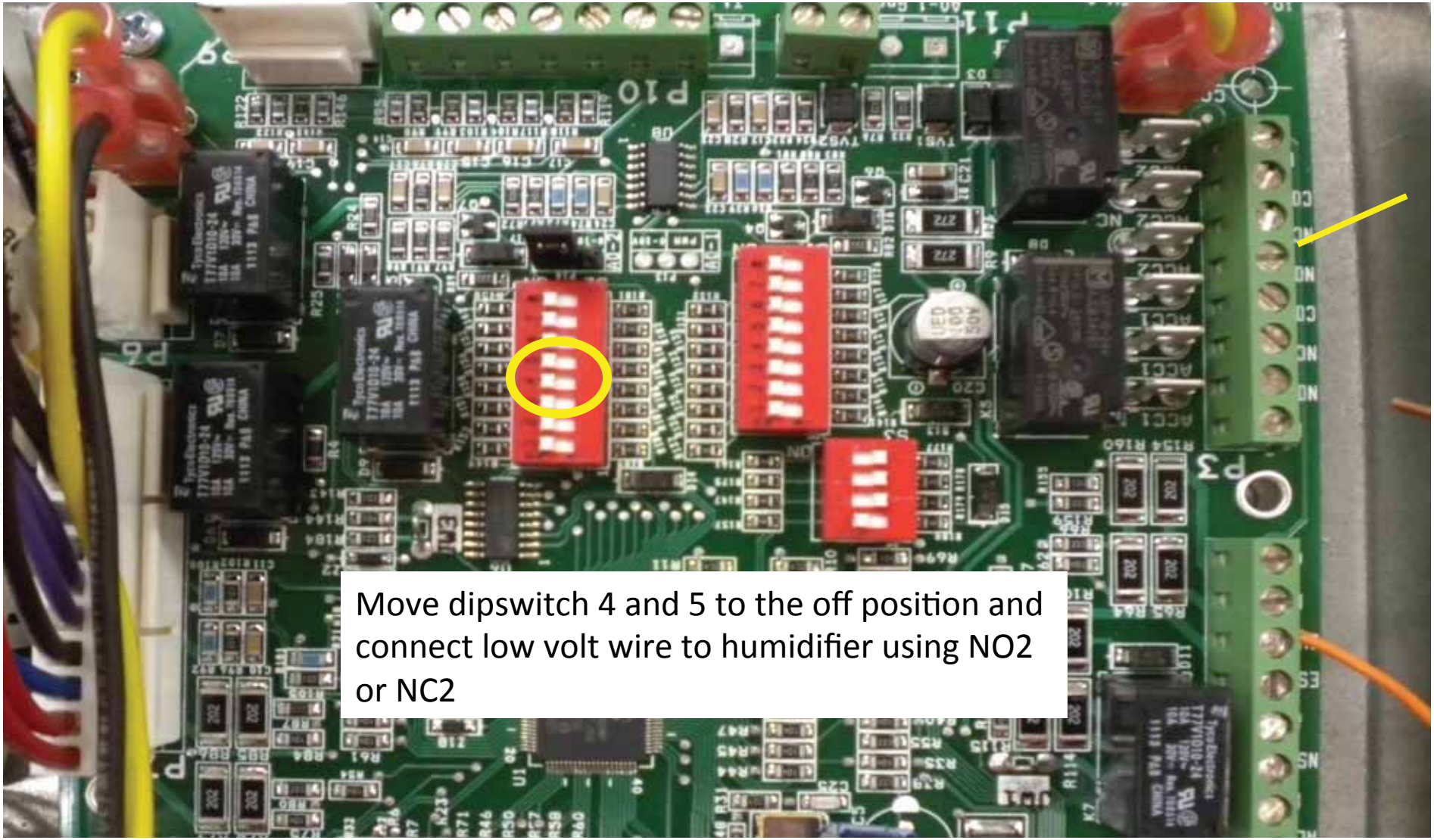

AO-2 Jumper

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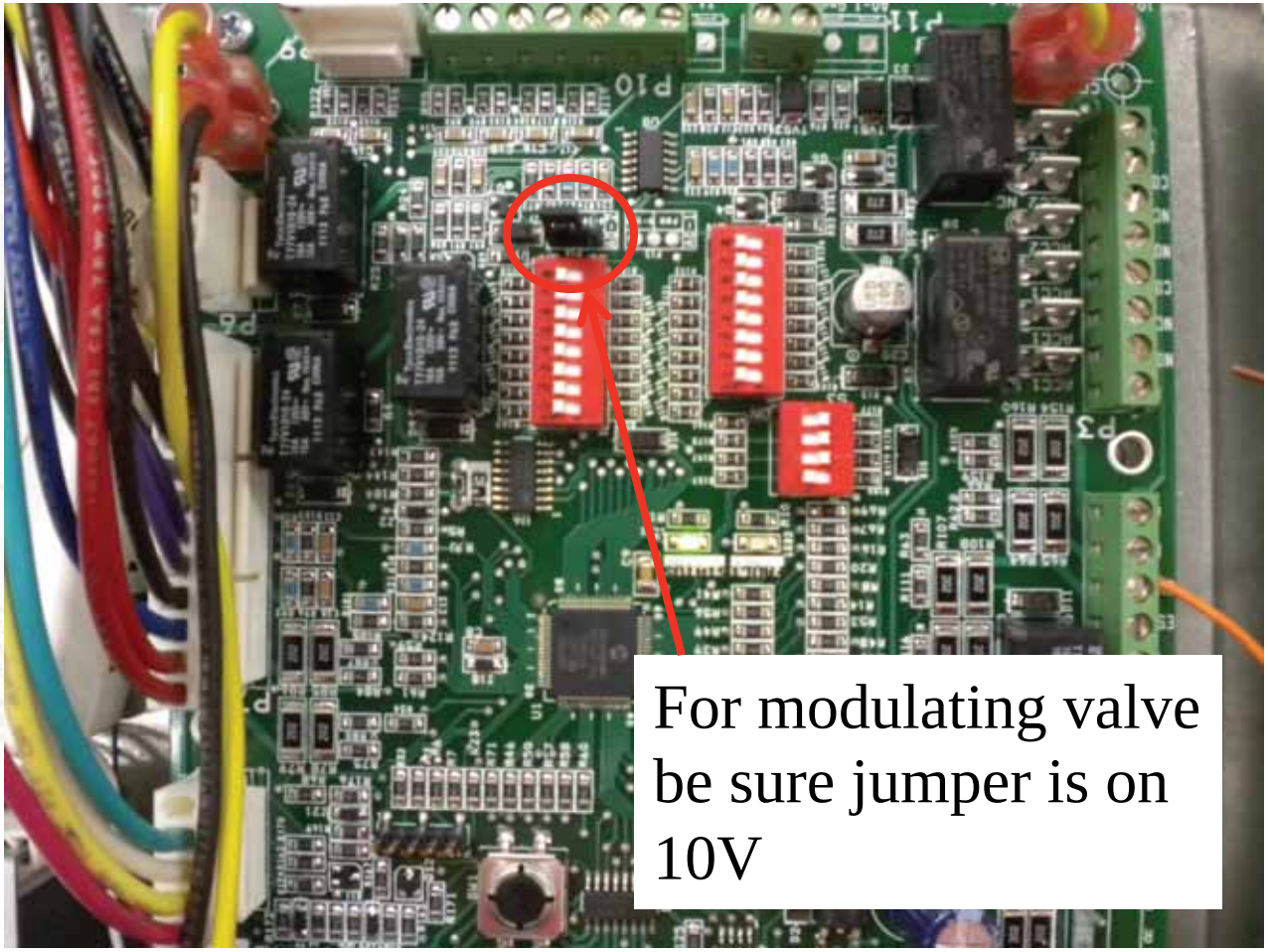

AO-2 Jumper

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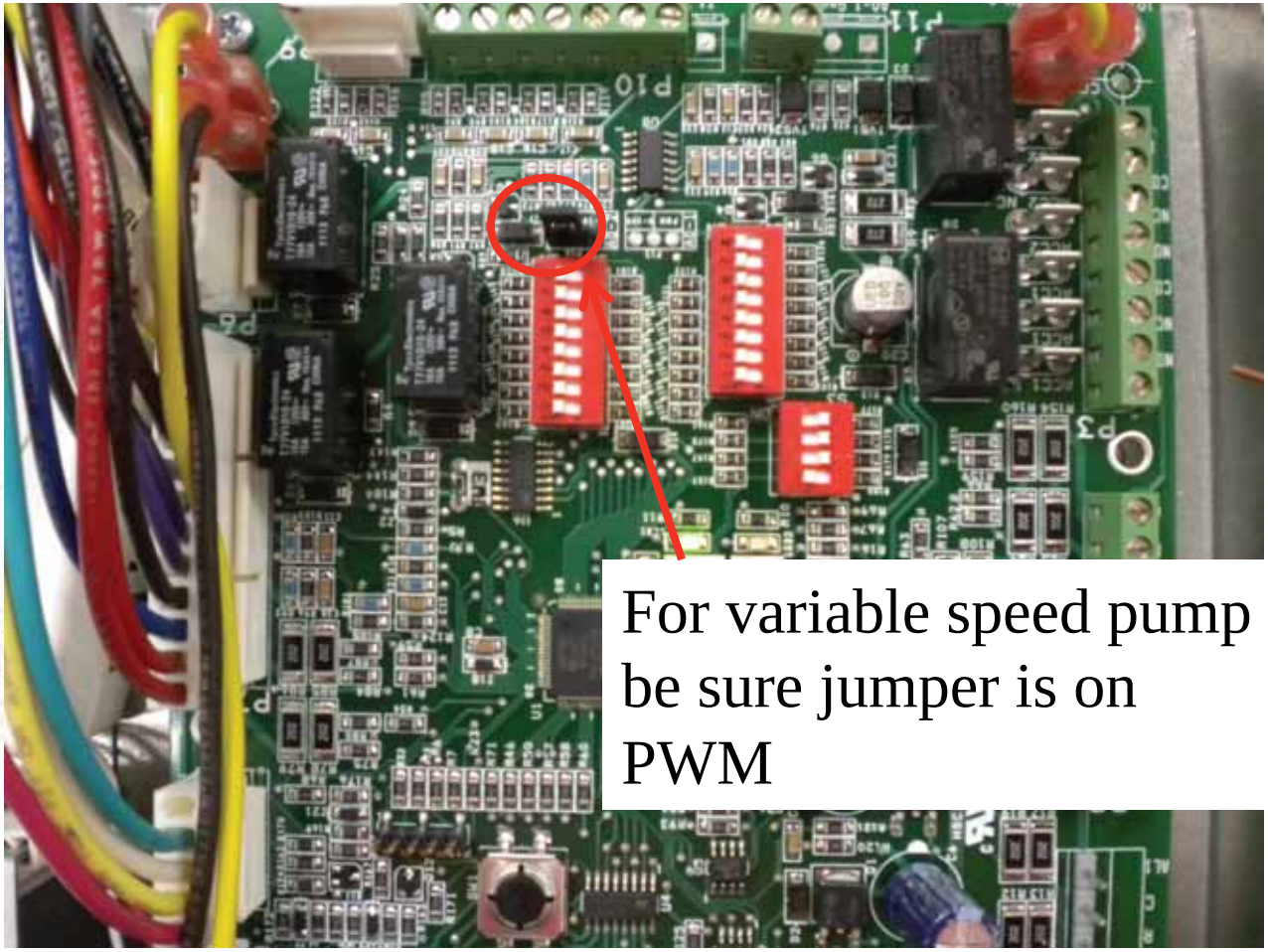

For variable speed pump be sure jumper is on PWM

PACKAGED UNITS

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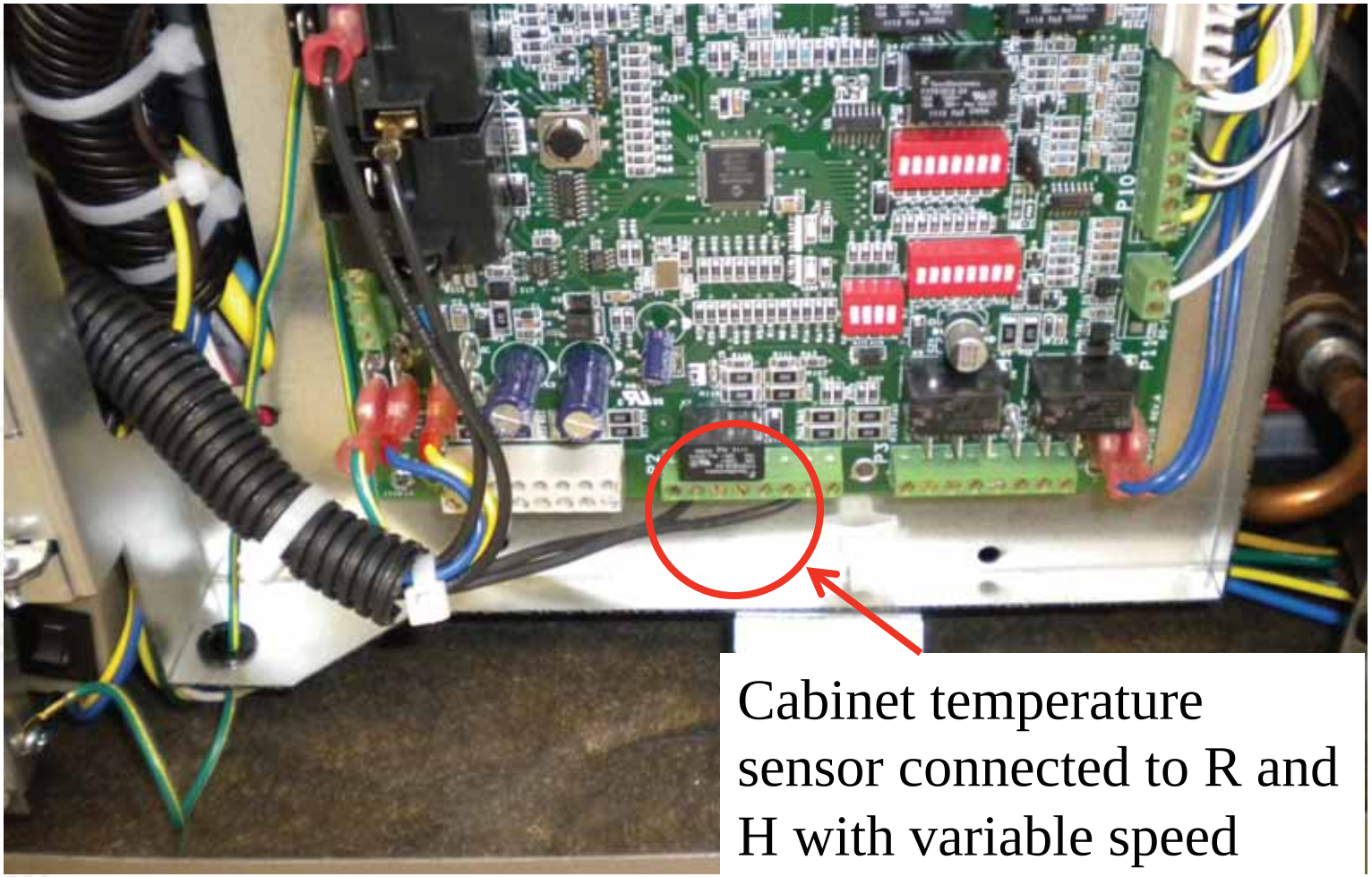

Cabinet temperature sensor connected to R and H with variable speed pump.

PACKAGED UNITS

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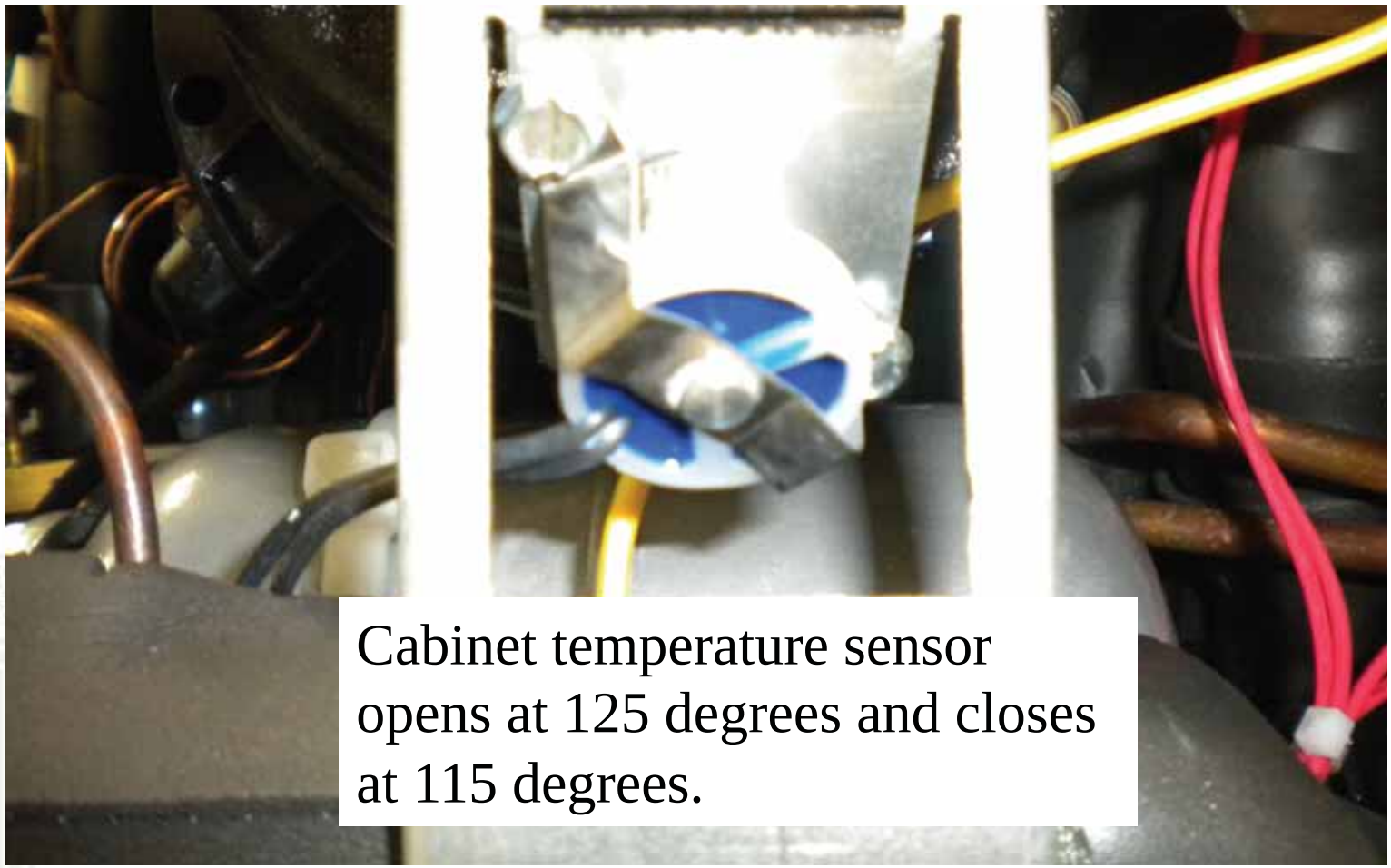

Cabinet temperature sensor opens at 125 degrees and closes at 115 degrees.

SPLIT UNITS

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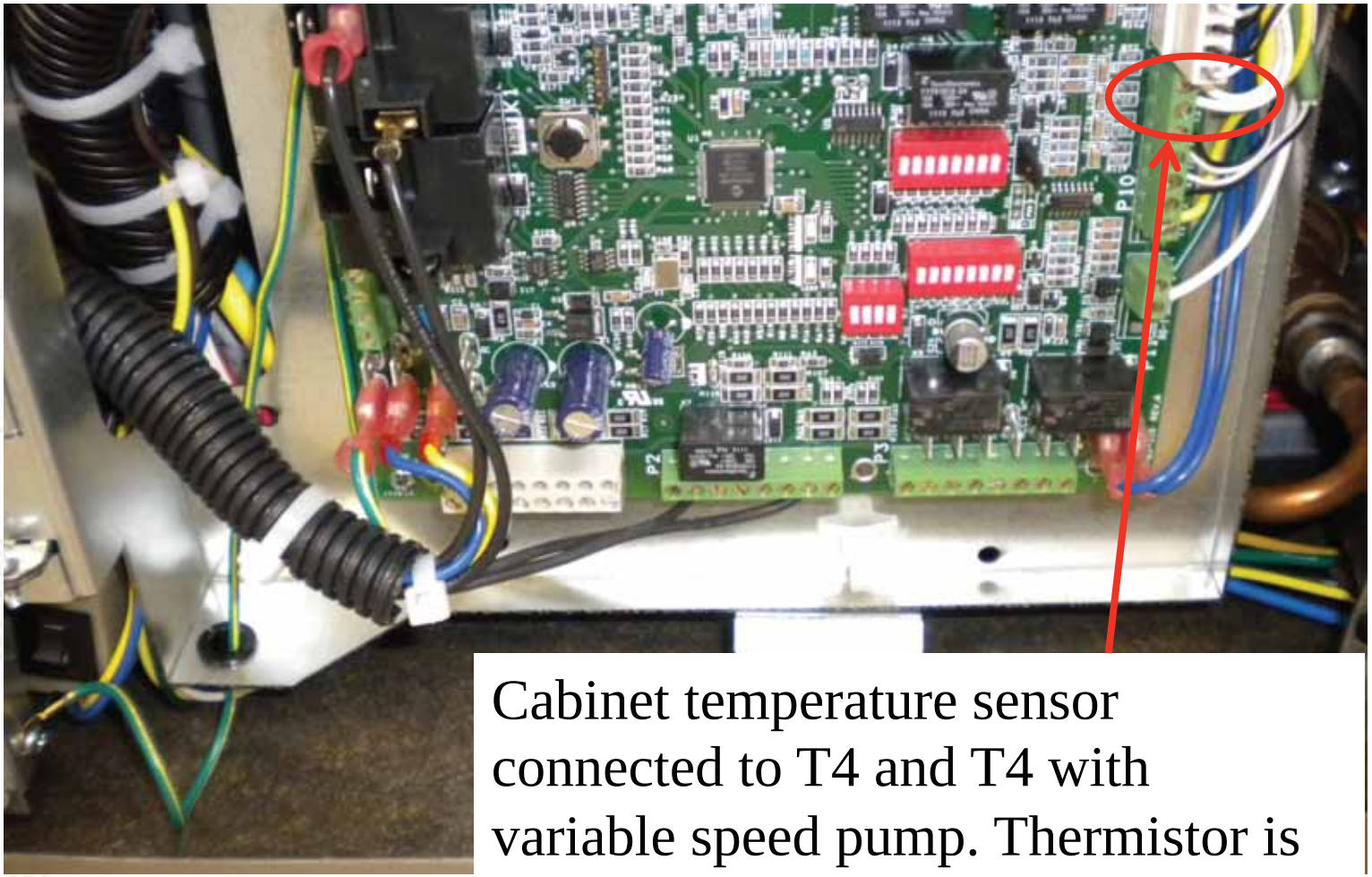

Cabinet temperature sensor connected to T4 and T4 with variable speed pump. Thermistor is used on splits.

Service Tool
ACDU01

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Wire connector for service tool

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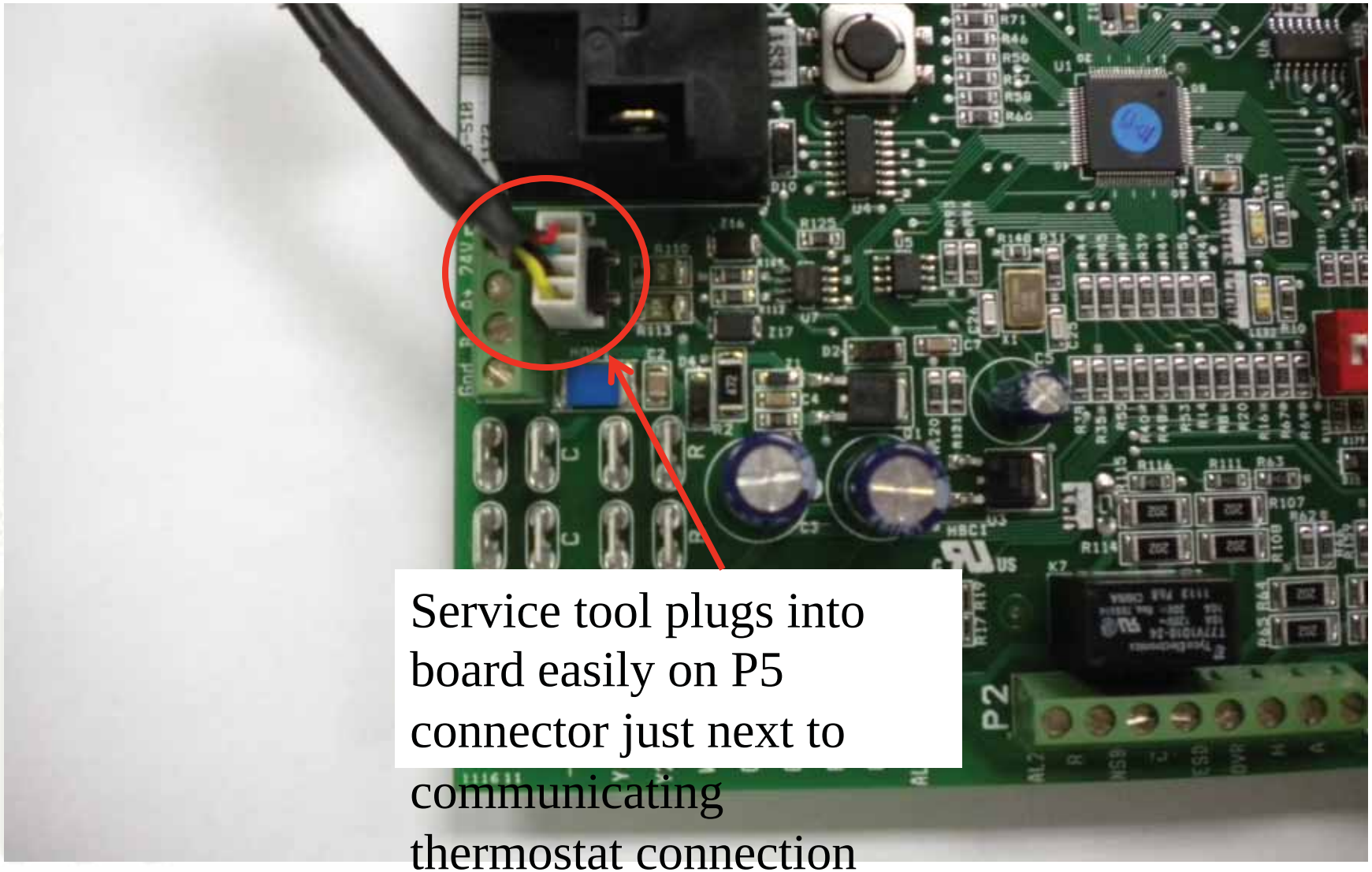
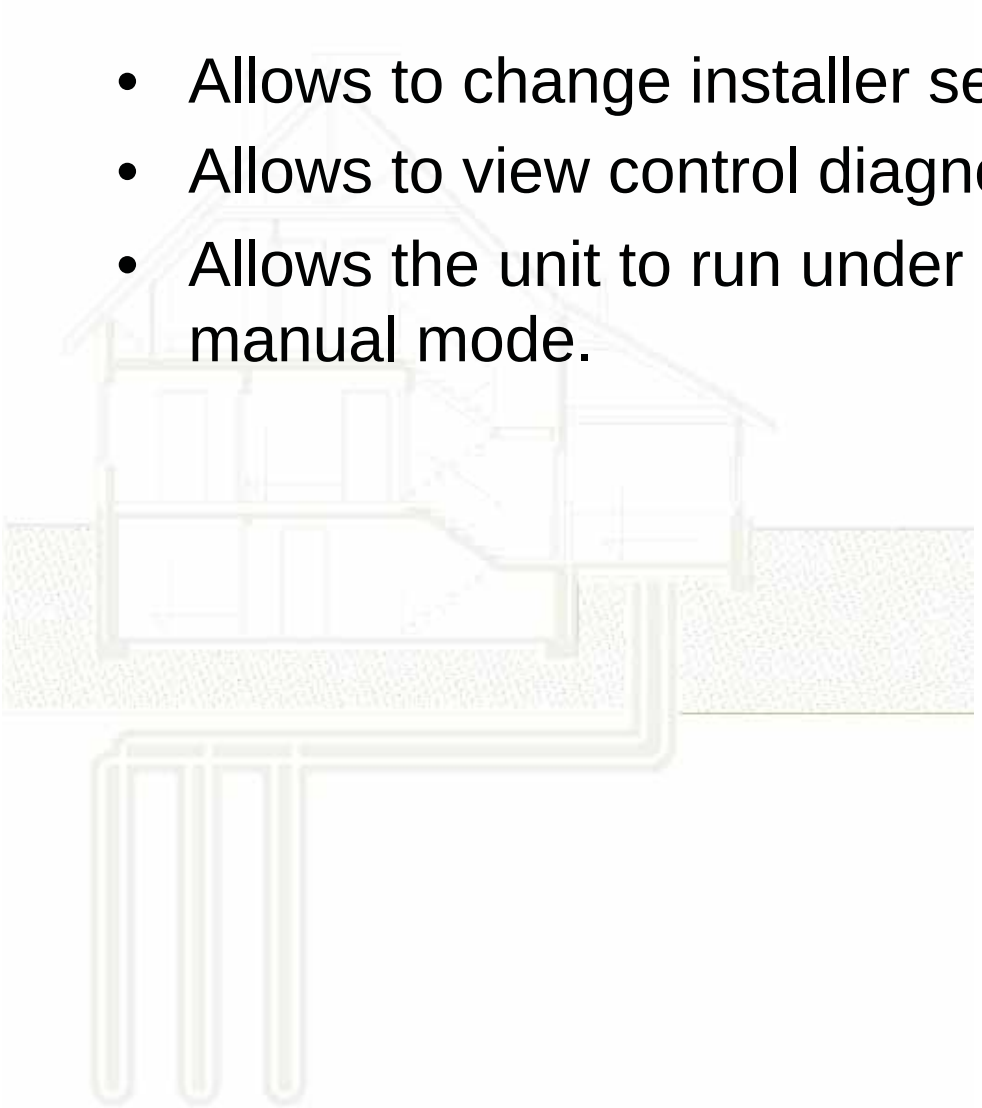


Service tool plugs into board easily on P5 connector just next to communicating thermostat connection

Service Tool

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



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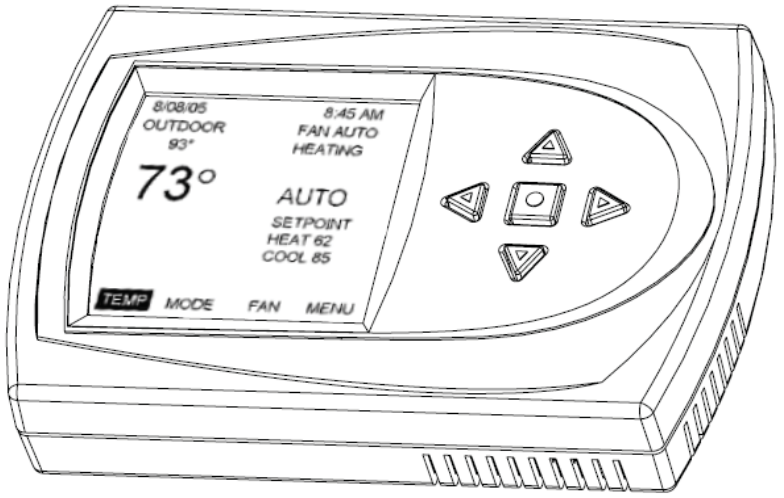
ATC32U01 Communicating Thermostat



4 Wire communicating Stat

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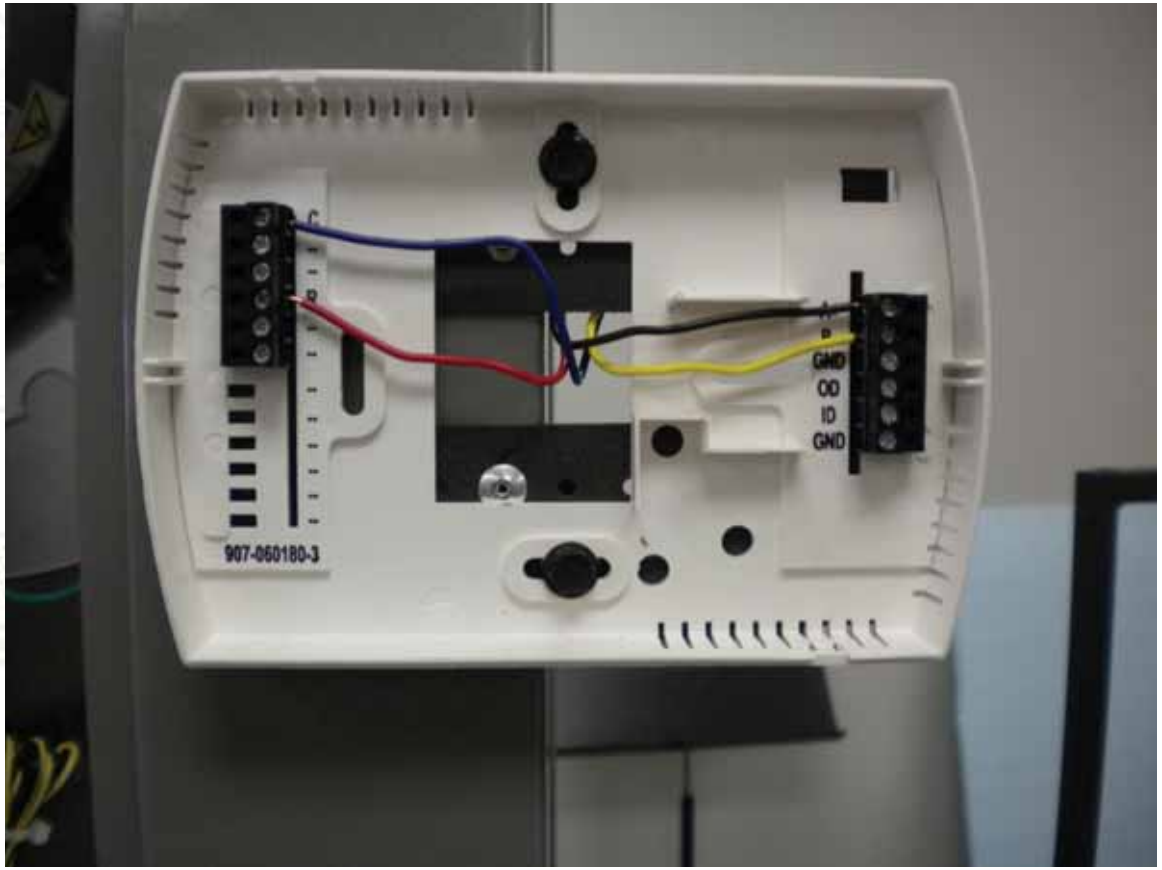
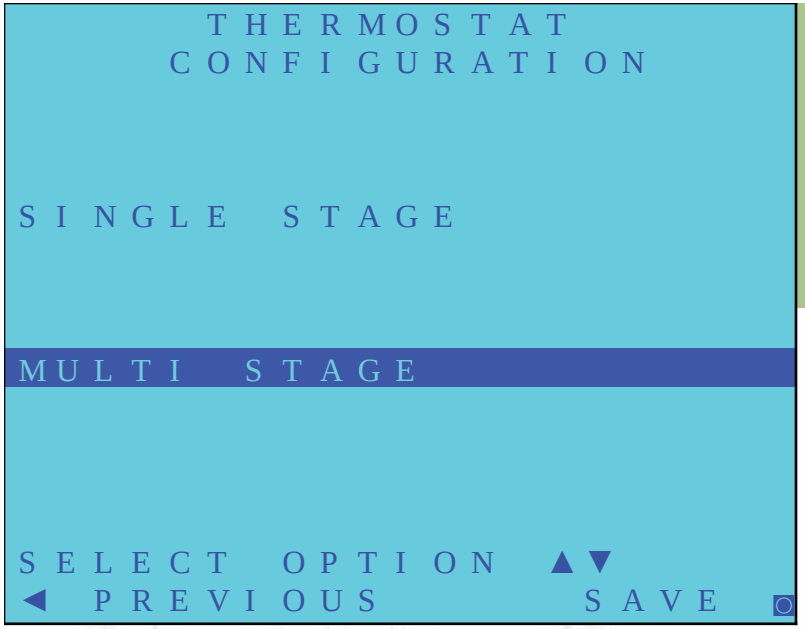
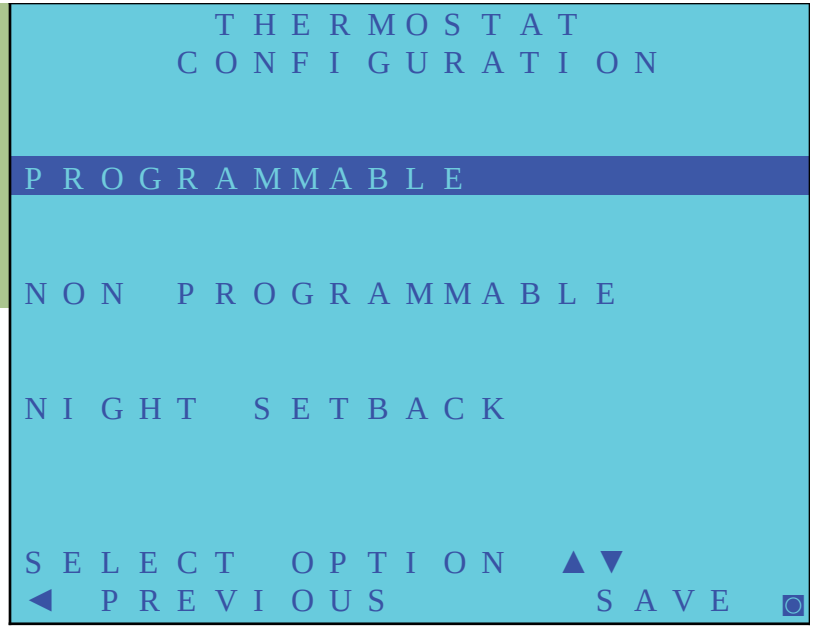
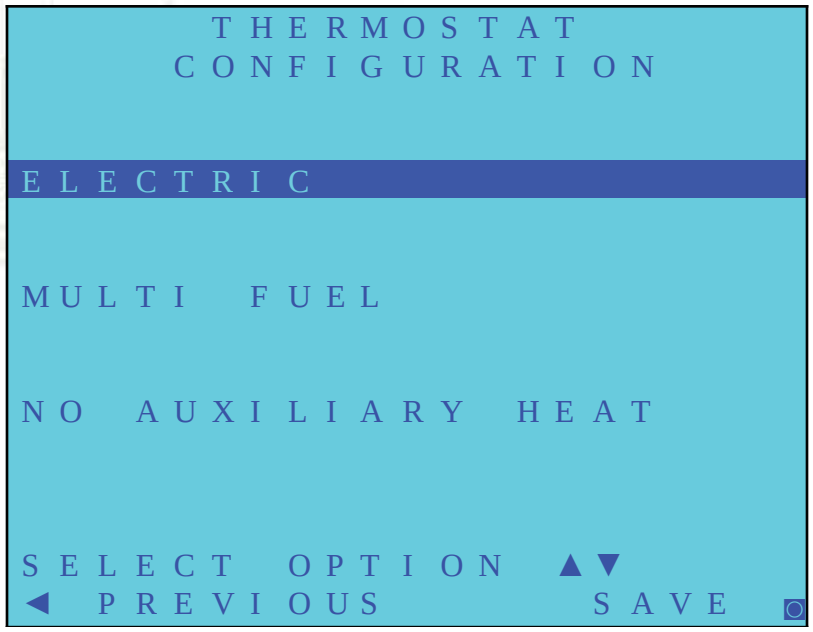






Initial Power-Up



Auxiliary Settings

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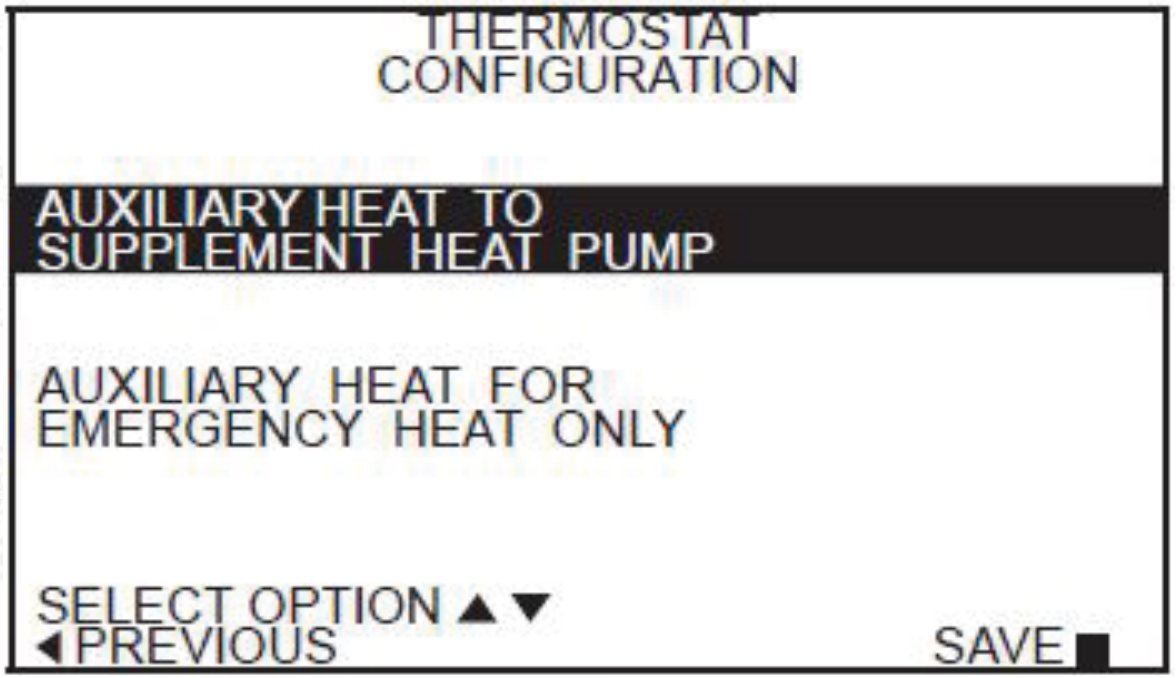
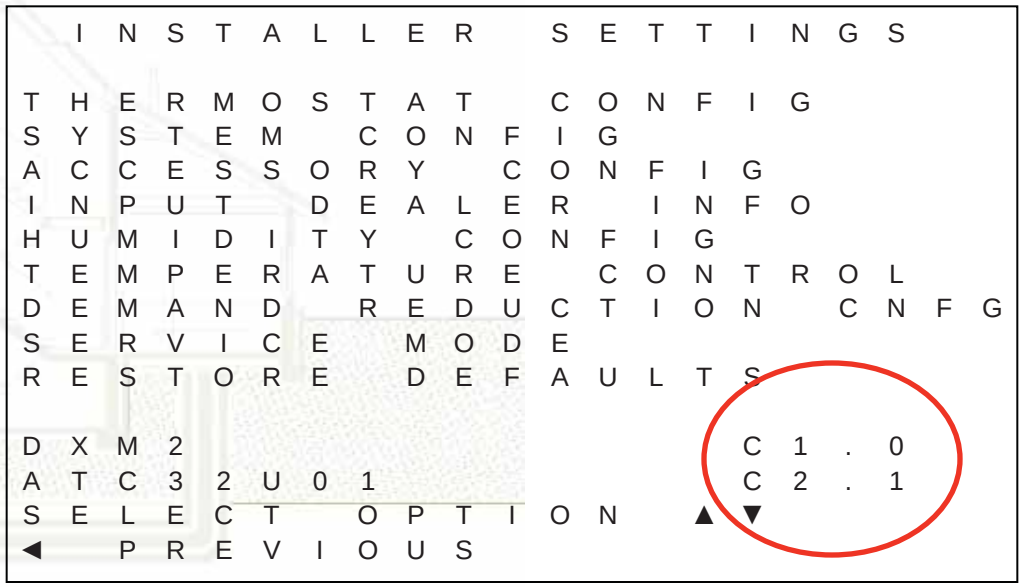


Board Version and Thermostat version can be verified.



System Configuration Menu

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SYSTEM CONFIGURATION

AIRFLOW SELECTION

OPTION SELECTION

UNIT CONFIG TT026

PUMP CONFIGURATION

SELECT OPTION ▲▼
◄ PREVIOUS SELECT ▣

System Configuration

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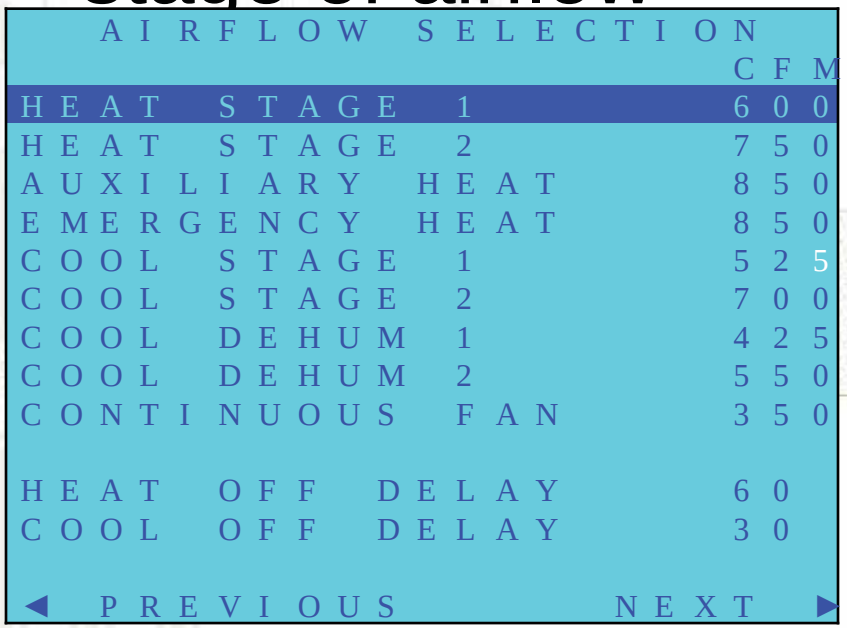
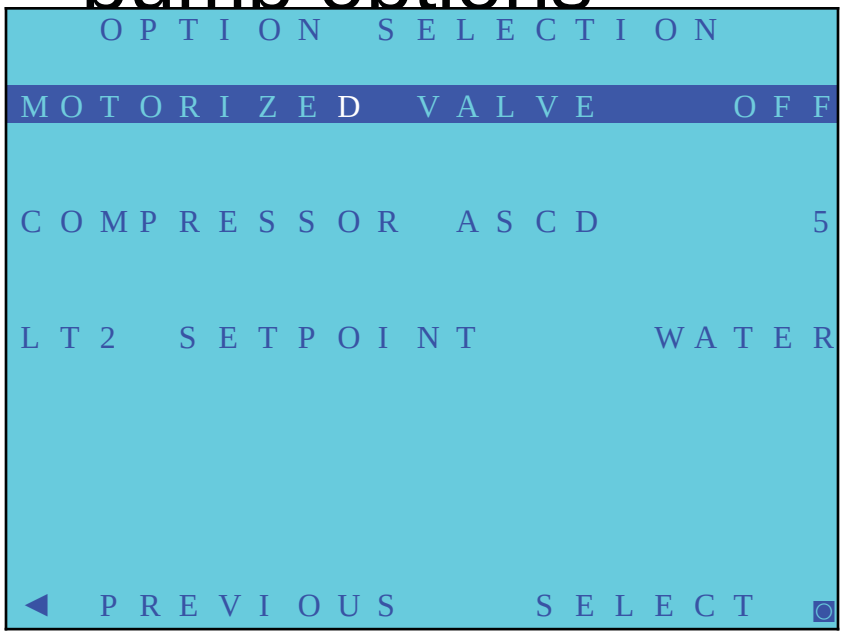
Airflow Selection

- Configure each stage of airflow

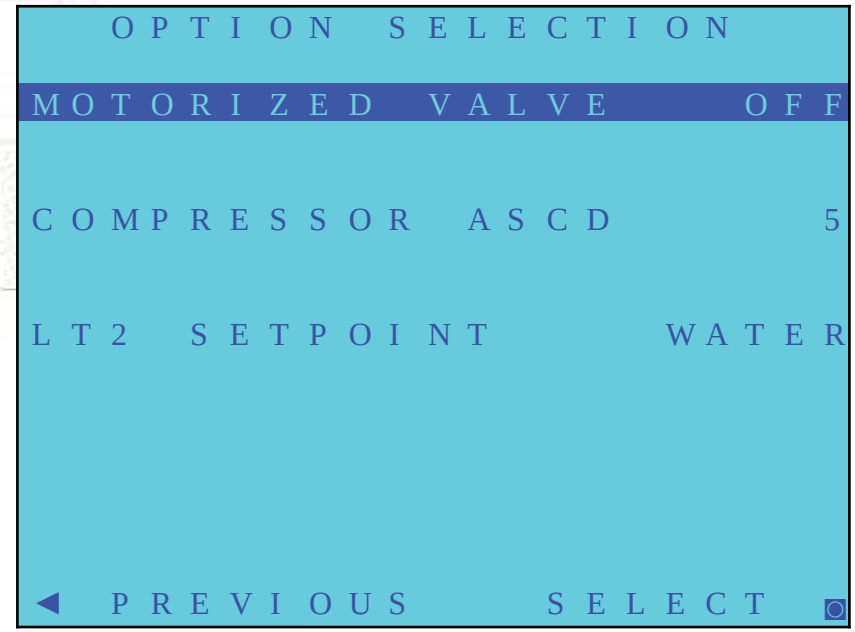


Option Selection

- Configure heat pump options



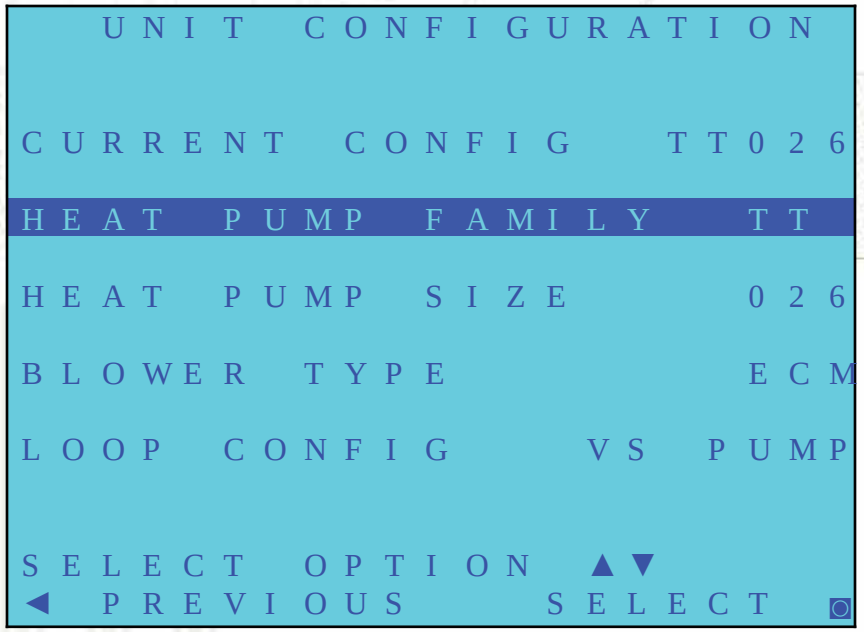
Motorized Valve in the Options menu is not the Modulating valve built into the unit. DO NOT turn on if using a modulating valve



System Configuration

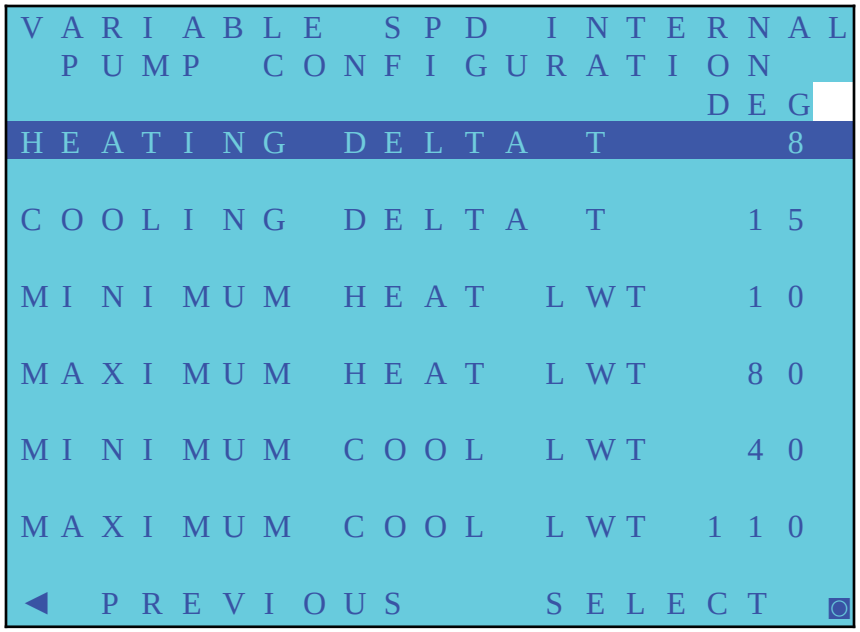
Unit Configuration

- Configure the heat pump (replacement part)



Pump/Valve Configuration

- Configure temperature settings for loop



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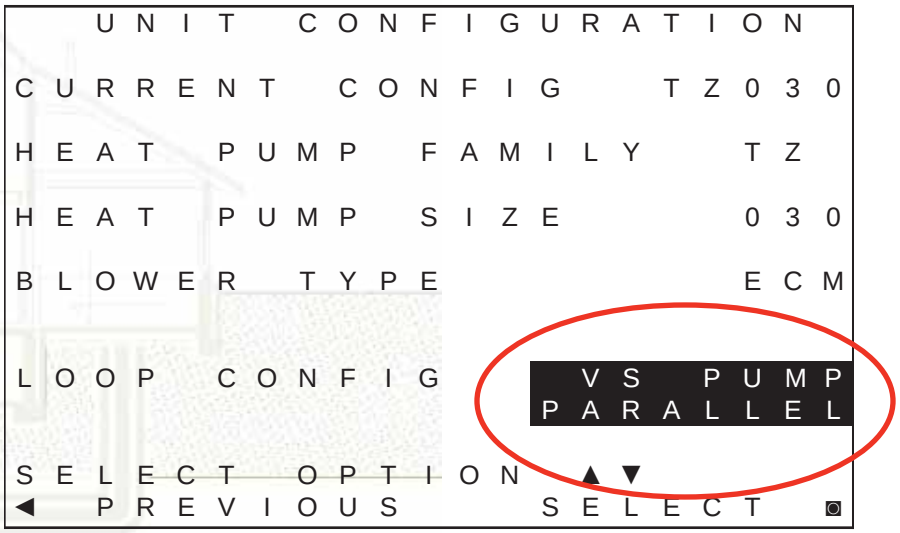
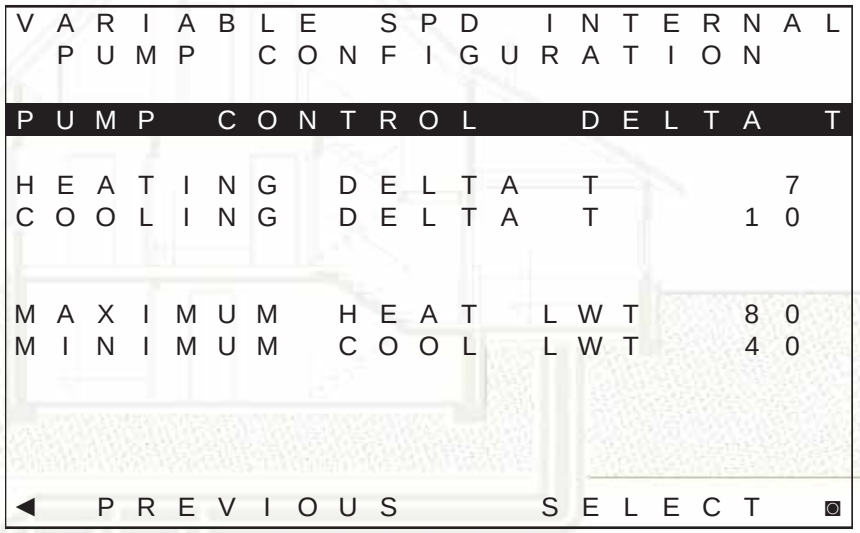
⚠ NOTICE! ⚠

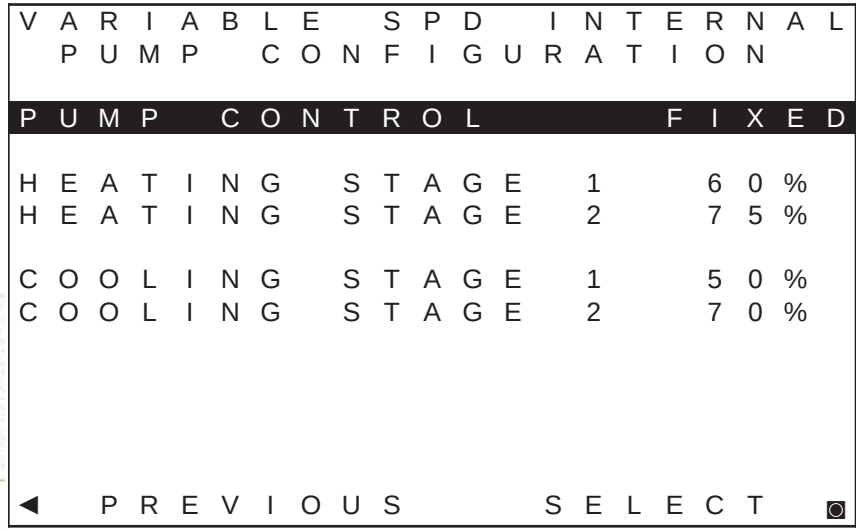
NOTICE: If installing MULTIPLE vFlow™ Internal VS Flow Controller units (in parallel) on one loop, ALWAYS select 'VS PUMP PARALLEL' under Installer Settings → System Config → Unit Config → Loop Config. Also, follow proper pump selection procedures for parallel pumping applications.

If using multiple units with internal pump on a common loop.



Can control pump by delta T or fixed pump speed.





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To control vs pump by fixed speed, select 'Pump Control', press ■, use down arrow to select 'Fixed', and press ■ to save.

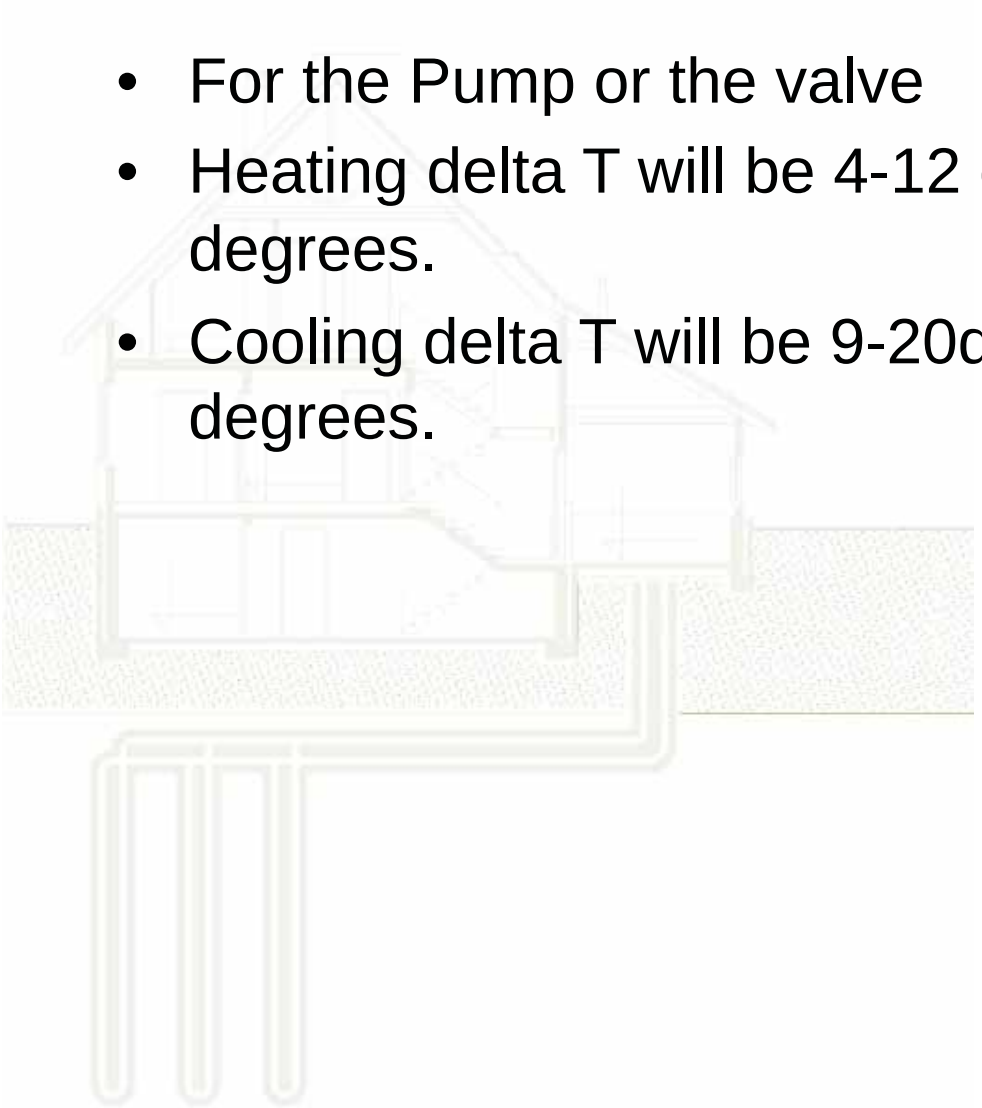
Default stored in control. Valid range: 15% - 90% (in 1% increments)

Heating Stage 1	Cooling Stage 1
Heating Stage 2	Cooling Stage 2

If Pump Configuration is set to 'VS PUMP PARALLEL', valid range changes to 50-90% (in 1% increments).

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

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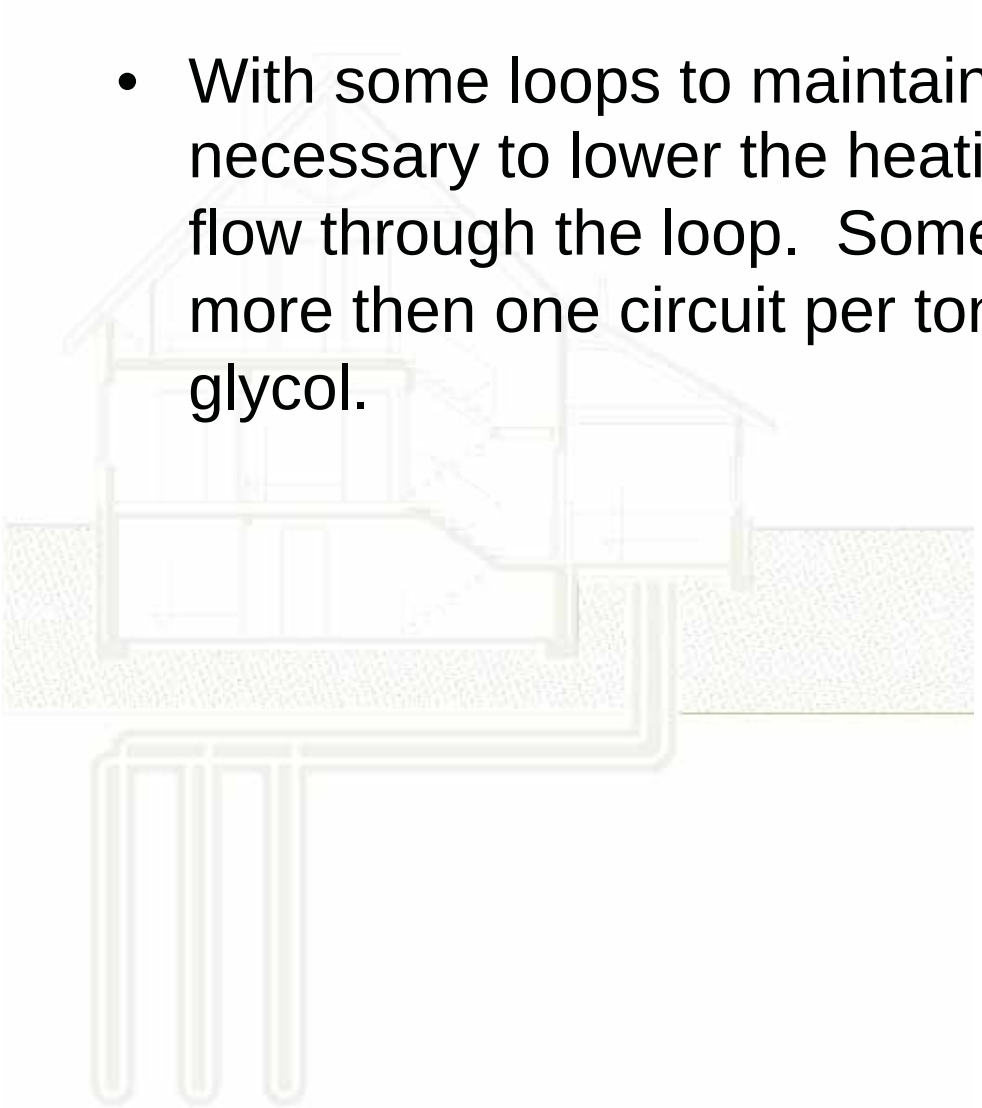
- With some loops to maintain turbulent flow it will be necessary to lower the heating delta T to increase GPM flow through the loop. Some things that will drive this more then one circuit per ton or the use of propylene glycol.



More on the operation of the pump

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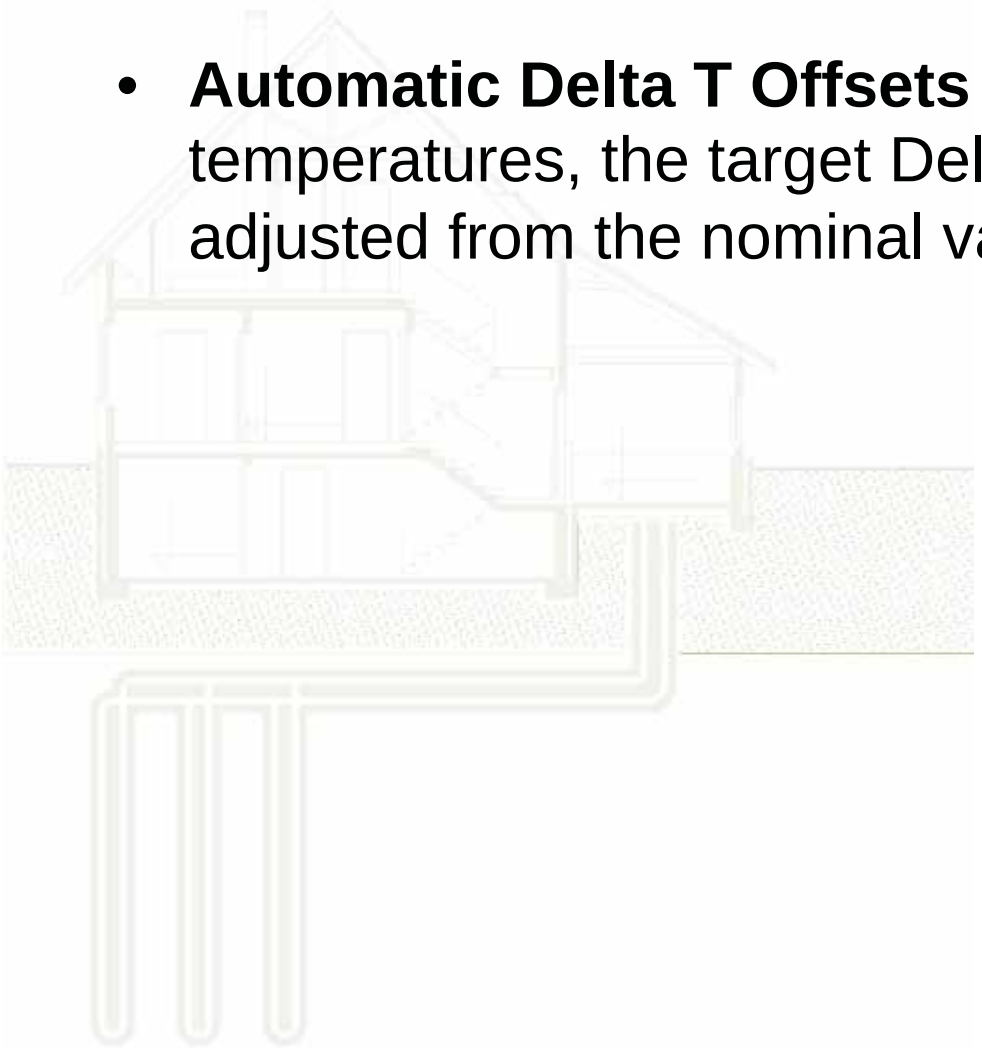
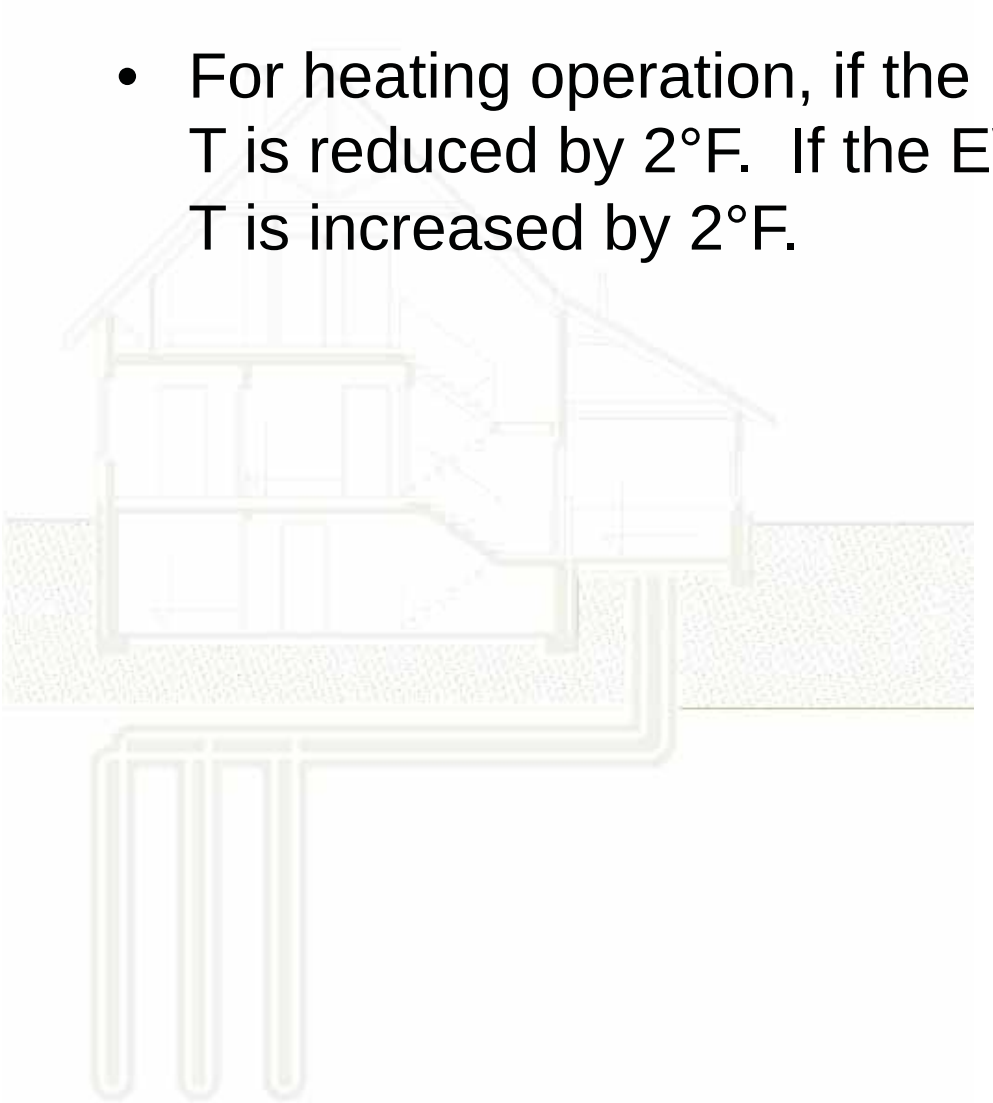
- **Automatic Delta T Offsets –**For high and low loop temperatures, the target Delta T is automatically adjusted from the nominal value.



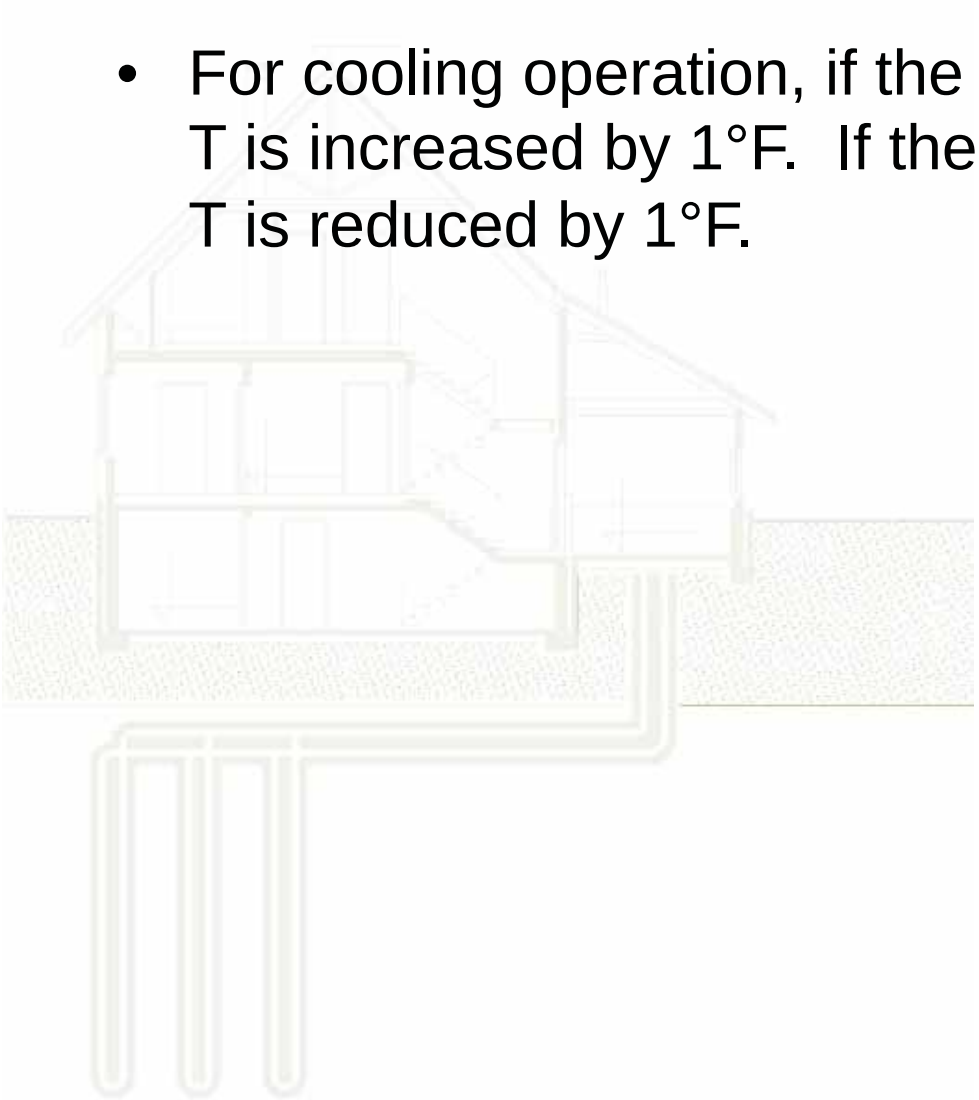
For Heating

- 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.



Service Mode Menu

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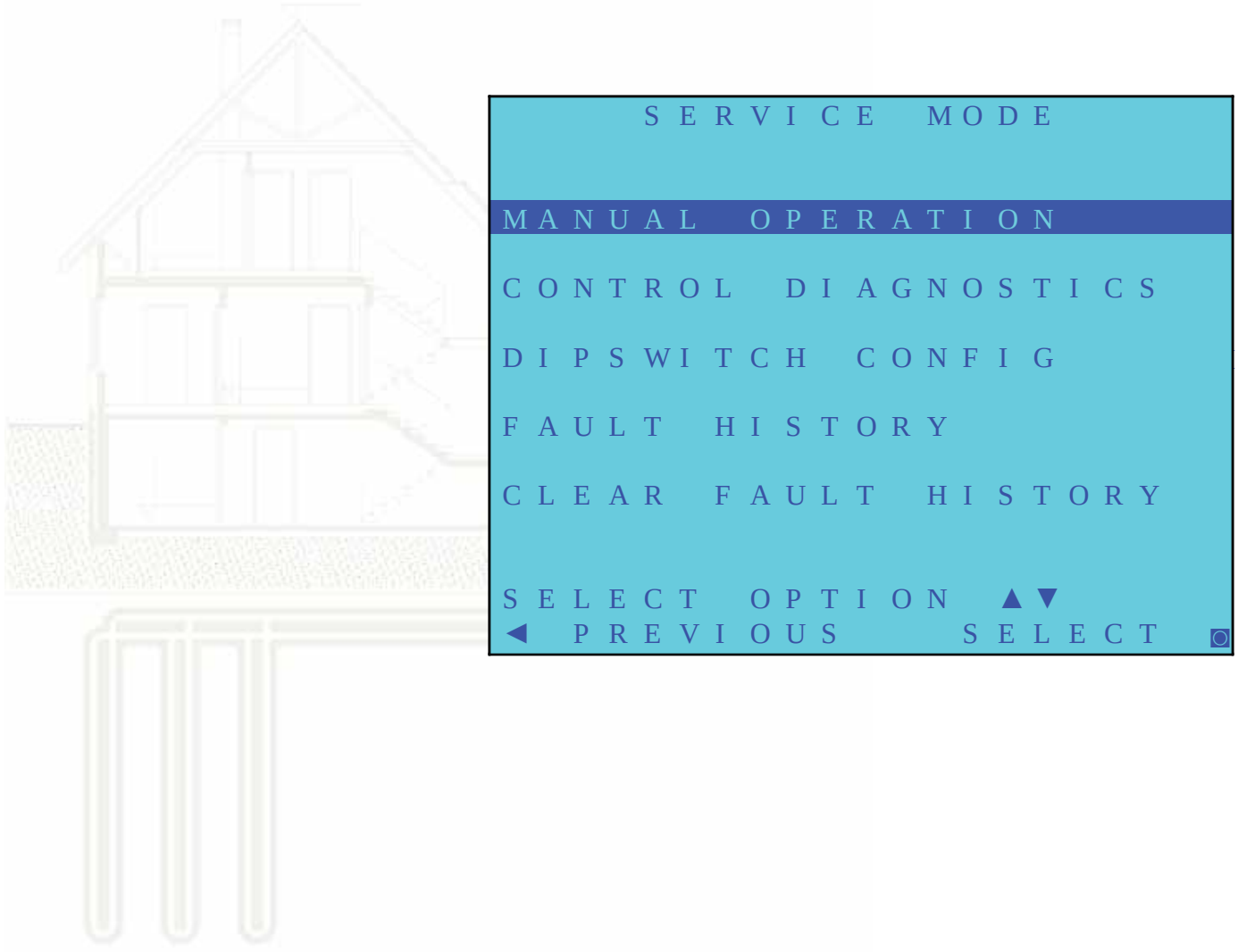
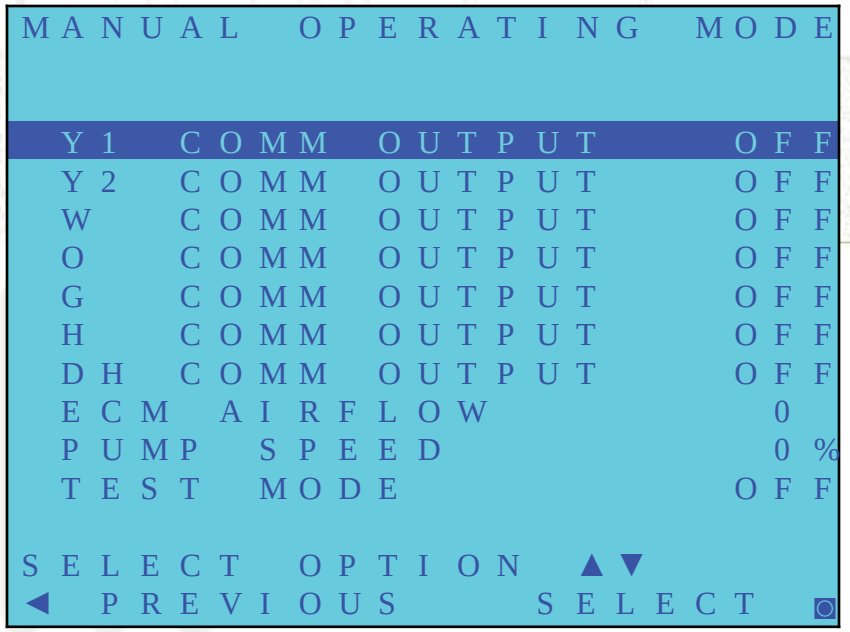


Service Mode

Manual Operation

- Direct manual control of all system outputs



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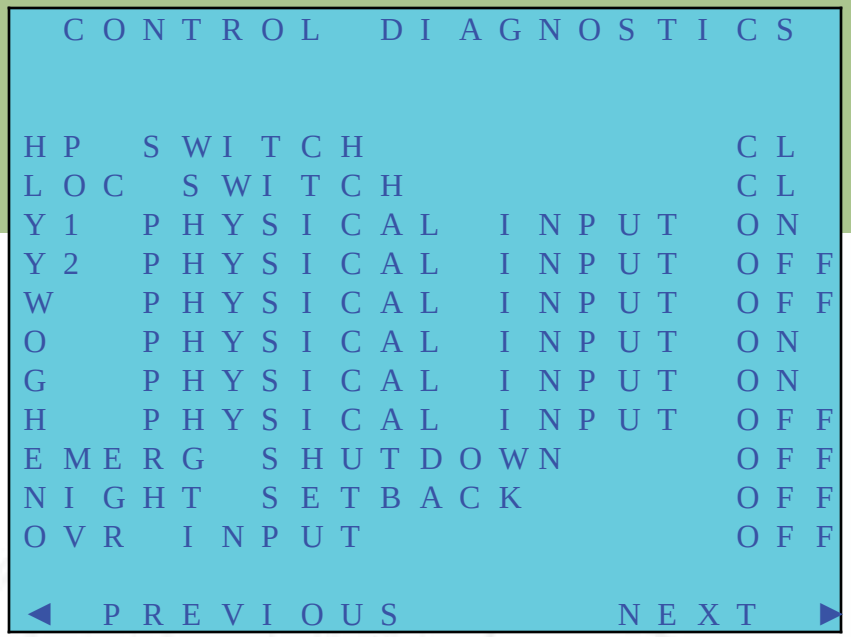
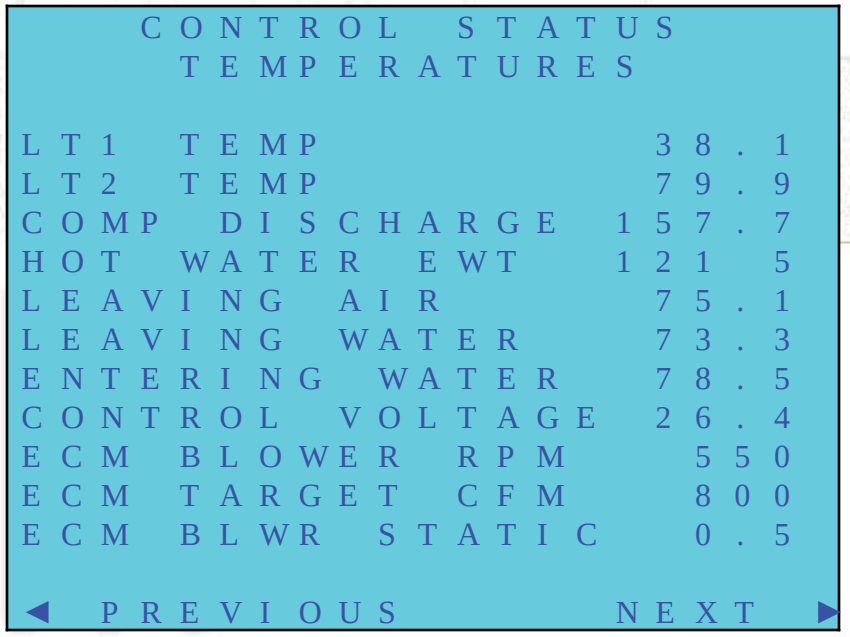
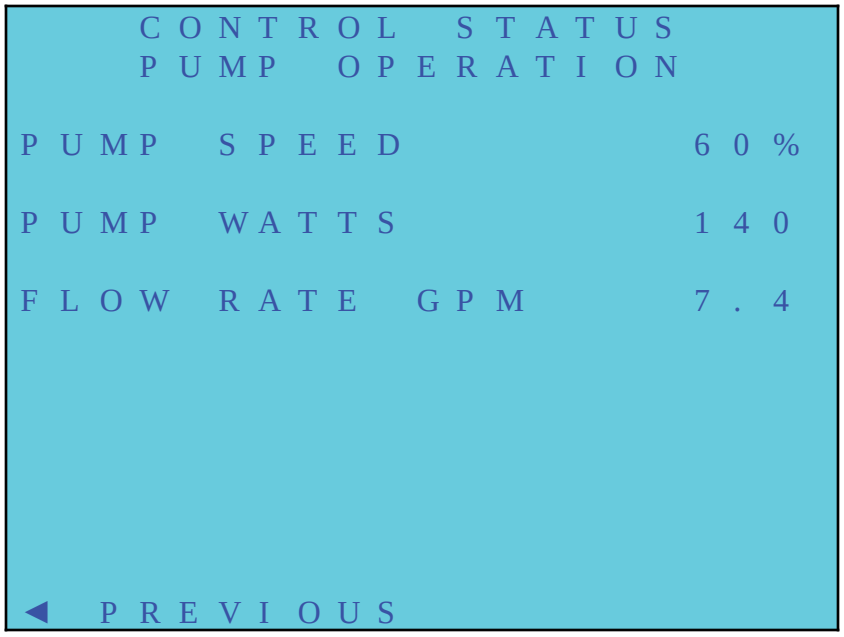
Control Diagnostics



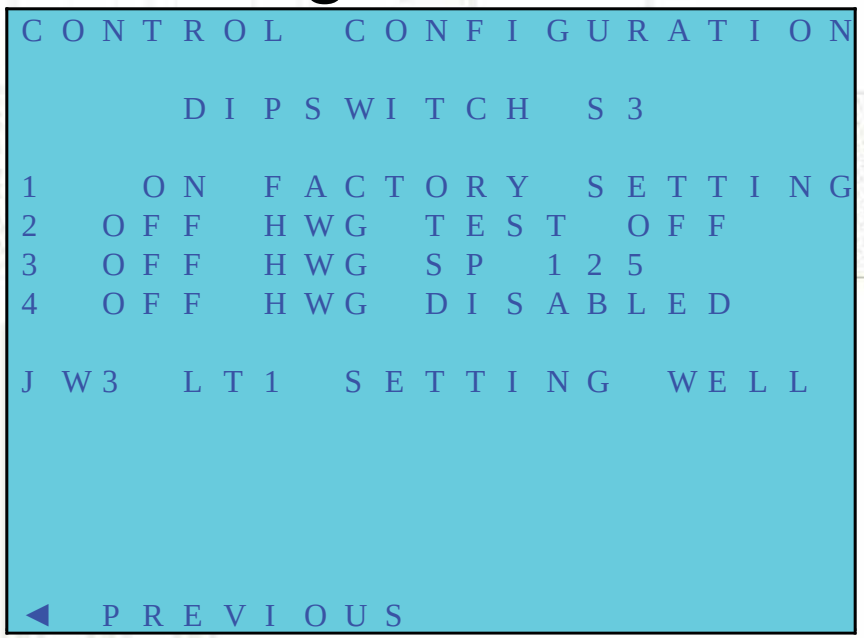




Service Mode

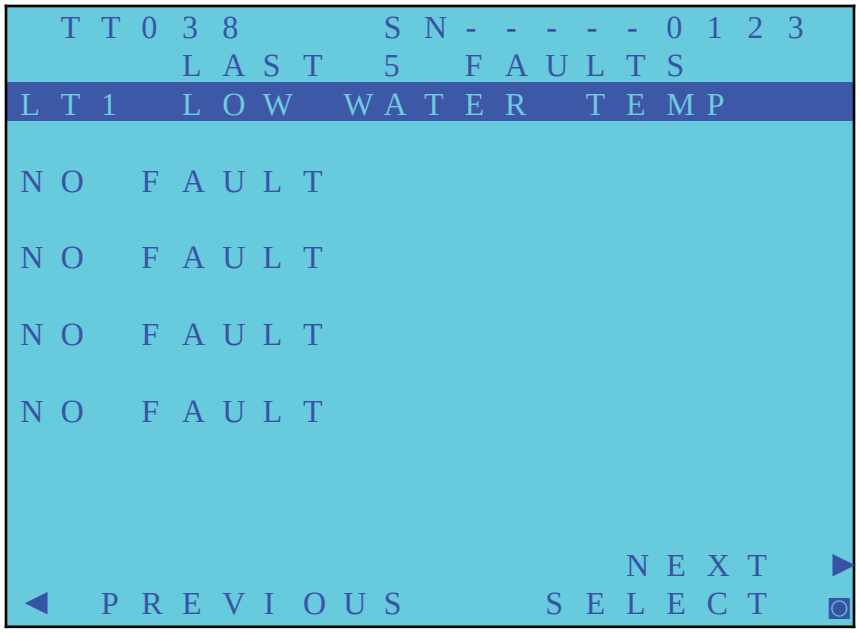
Dipswitch Configuration

- 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

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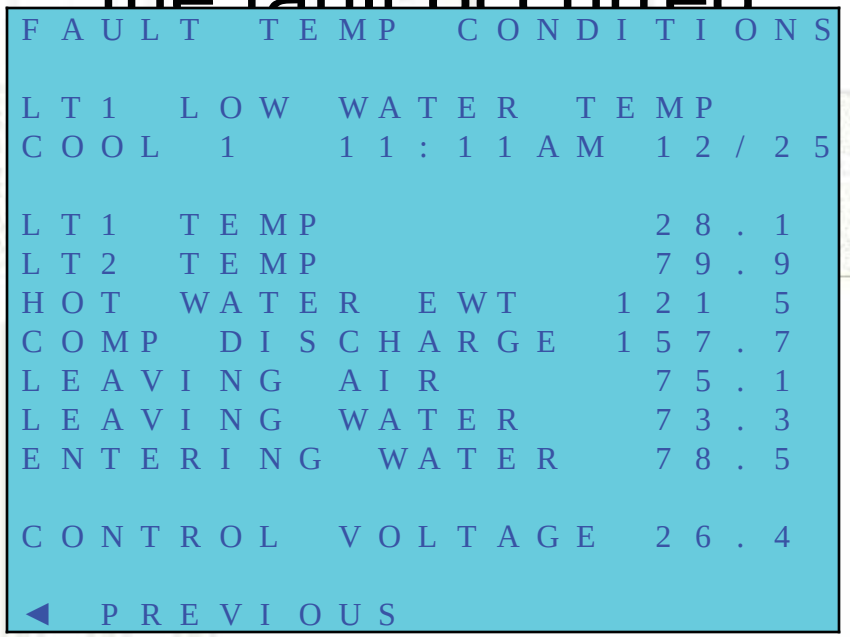
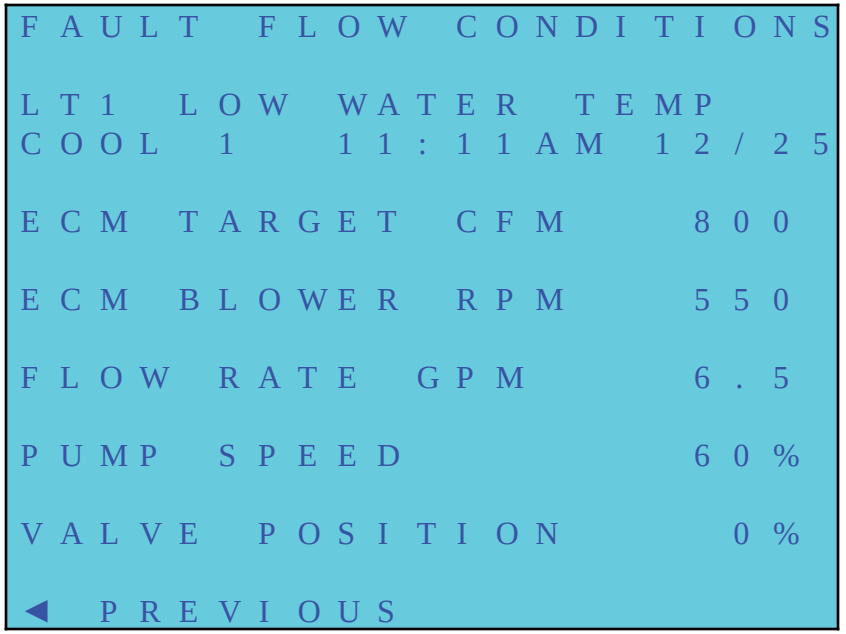
Temperature Conditions

- Control temperature conditions when the fault occurred



Flow Conditions

- Control flow conditions when fault occurred



Fault Conditions

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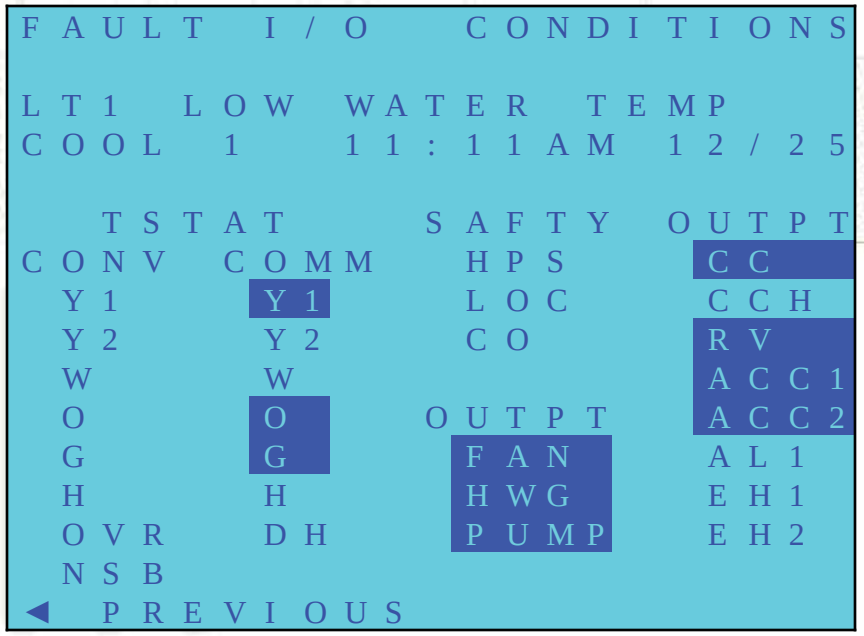
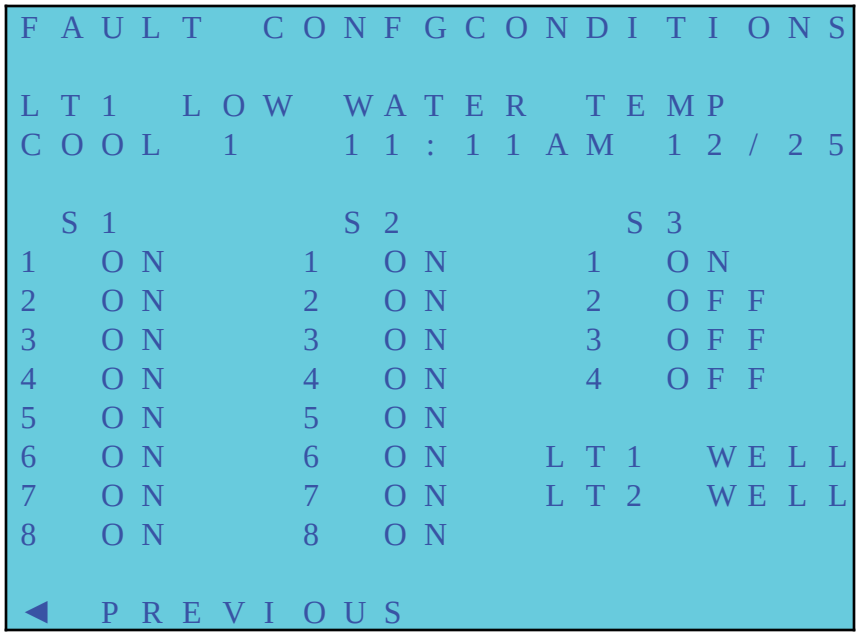
Input/Output Conditions

- Control inputs/ outputs when the fault occurred

Configuration Conditions

- Control configuration when the fault occurred





Fault Conditions

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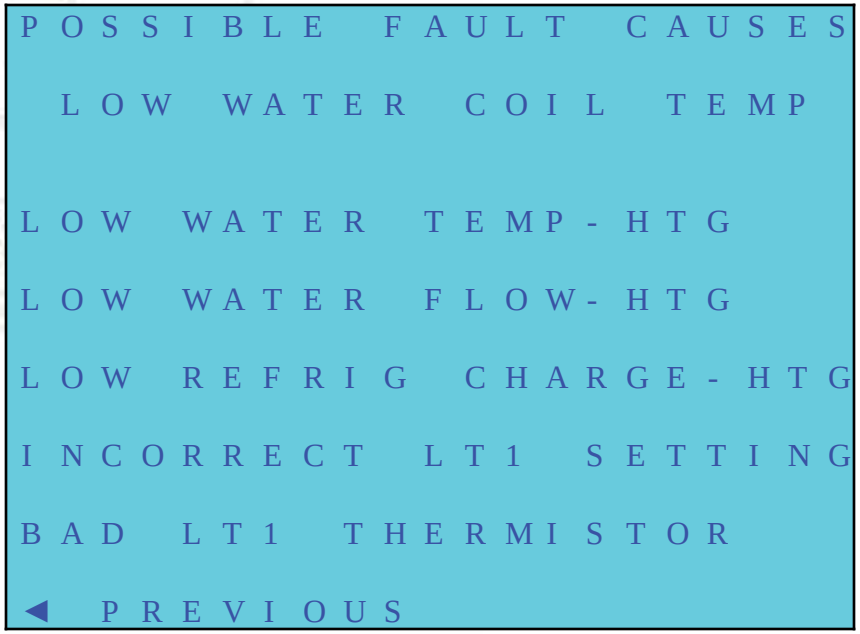
Possible Causes

- Possible causes as to why the fault occurred



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Time For Questions?

Use Service Tool Or Communicating Thermostat to run the unit in Manual Mode.

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Put Control In Manual Mode

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- Select Y1 &Y2
- Select O if you want to run in cooling.
- Select CFM and raise the CFM to the catalog specified CFM.
- Raise Pump speed % until you get catalog GPM or if a Modulating valve increase valve % until Pressure drop is where you need it for the correct GPM.

Manual Mode

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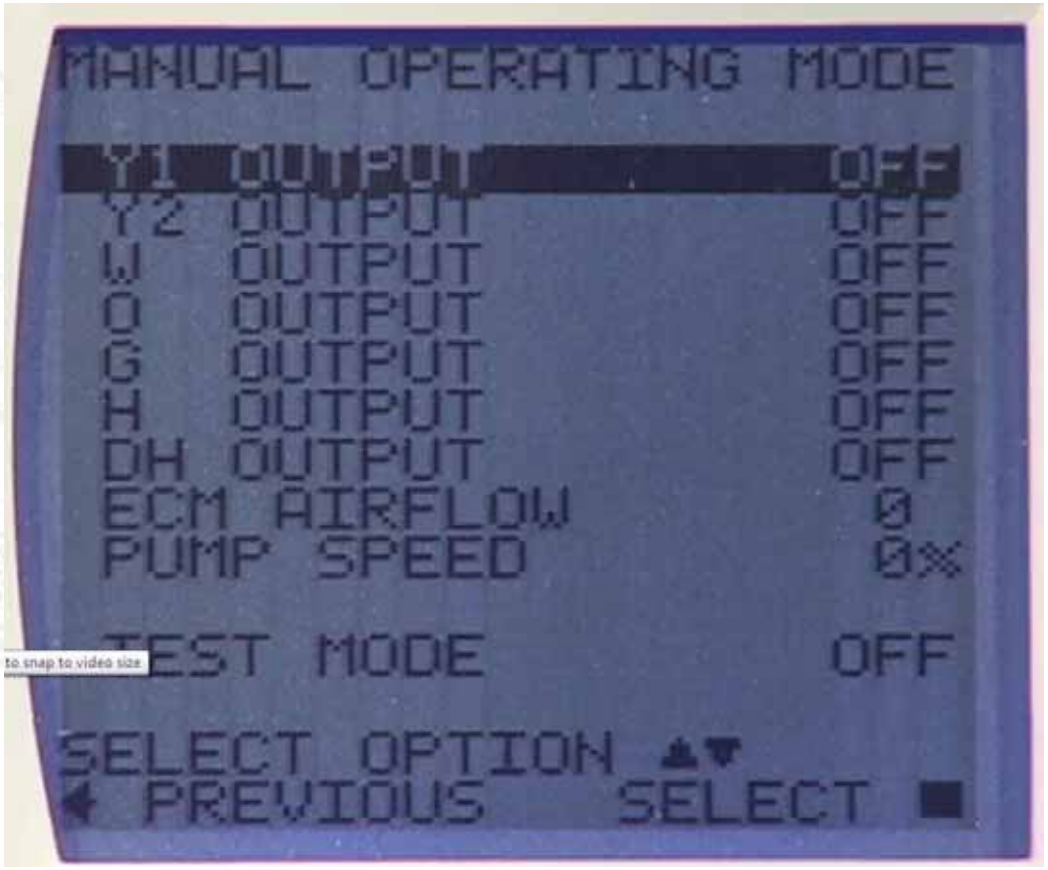

This Is Where I Get CFM and GPM

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Table 14c: Performance Data — Tranquility® 22 Model 036 - Full Load

1150 CFM Nominal (ISO Rated) Airflow Heating, 1150 CFM Nominal (ISO Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	Cooling - EAT 80/67°F										Heating - EAT 70°F									
	GPM	WPD		CFM	TC	SC	KW	EER	HR	LOOP ΔT	HWG CAP	GPM	WPD		CFM	HC	KW	COP	LOOP ΔT	HE	AIR ΔT	HWG CAP
		PSI	FT HD										PSI	FT HD								
20	Operation Not Recommended											9.0	9.2	21.3	920	24.8	2.42	3.0	3.8	16.8	25.0	3.3
												9.0	9.2	21.3	1150	25.3	2.32	3.2	4.0	17.3	20.3	3.4
30												4.5	2.4	5.6	920	27.0	2.48	3.2	8.6	18.7	27.2	3.3
												4.5	2.4	5.6	1150	27.5	2.39	3.4	8.9	19.3	22.1	3.5
												6.8	4.1	9.5	920	28.1	2.51	3.3	6.0	19.7	28.3	3.4
												6.8	4.1	9.5	1150	28.6	2.42	3.5	6.2	20.3	23.0	3.5
				920	39.3	24.4	1.73	22.7	45.1		2.0	9.0	7.6	17.5	920	28.7	2.53	3.3	4.6	20.2	28.9	3.5
				1150	40.3	26.5	1.85	21.8	46.6		2.0	9.0	7.6	17.5	1150	29.2	2.43	3.5	4.8	20.9	23.5	3.6
40												4.5	2.0	4.7	920	30.7	2.59	3.5	9.8	21.9	30.9	3.6
												4.5	2.0	4.7	1150	31.2	2.49	3.7	10.1	22.7	25.1	3.8
												6.8	3.1	7.2	920	32.0	2.63	3.6	6.8	23.1	32.2	3.7
												6.8	3.1	7.2	1150	32.5	2.53	3.8	7.0	23.9	26.2	3.9
												9.0	6.4	14.8	920	32.7	2.65	3.6	5.3	23.8	32.9	3.8
												9.0	6.4	14.8	1150	33.3	2.55	3.8	5.5	24.6	26.8	4.0
50	4.5	1.8	4.2	920	38.4	23.7	1.89	20.4	44.8	19.9	2.6	4.5	1.8	4.2	920	34.4	2.70	3.7	11.2	25.3	34.6	4.1
	4.5	1.8	4.2	1150	39.3	25.7	2.01	19.6	46.2	20.5	2.6	4.5	1.8	4.2	1150	35.0	2.59	4.0	11.6	26.2	28.2	4.2
	6.8	2.5	5.7	920	39.1	24.2	1.78	22.0	45.0	13.2	2.3	6.8	2.5	5.7	920	36.0	2.74	3.8	7.8	26.7	36.2	4.2
	6.8	2.5	5.7	1150	40.0	26.3	1.89	21.1	46.5	13.7	2.4	6.8	2.5	5.7	1150	36.6	2.64	4.1	8.1	27.6	29.5	4.3
	9.0	5.7	13.1	920	39.3	24.4	1.73	22.8	45.1	10.0	2.1	9.0	5.7	13.1	920	36.8	2.77	3.9	6.1	27.4	37.0	4.3
	9.0	5.7	13.1	1150	40.3	26.6	1.84	21.9	46.6	10.3	2.1	9.0	5.7	13.1	1150	37.4	2.66	4.1	6.3	28.4	30.1	4.4
60	4.5	1.6	3.8	920	37.1	22.9	2.06	18.0	44.1	19.6	3.3	4.5	1.6	3.8	920	38.2	2.81	4.0	12.7	28.7	38.5	4.6
	4.5	1.6	3.8	1150	38.0	24.9	2.20	17.3	45.5	20.2	3.4	4.5	1.6	3.8	1150	38.9	2.70	4.2	13.2	29.7	31.3	4.7
	6.8	2.1	4.9	920	38.0	23.4	1.94	19.6	44.6	13.1	3.0	6.8	2.1	4.9	920	40.0	2.86	4.1	8.9	30.3	40.2	4.7
	6.8	2.1	4.9	1150	39.0	25.5	2.07	18.9	46.0	13.5	3.1	6.8	2.1	4.9	1150	40.7	2.75	4.3	9.2	31.3	32.7	4.8
	9.0	5.2	11.9	920	38.4	23.7	1.88	20.4	44.8	10.0	2.7	9.0	5.2	11.9	920	40.9	2.89	4.2	6.9	31.1	41.2	4.8
	9.0	5.2	11.9	1150	39.4	25.8	2.00	19.6	46.2	10.3	2.8	9.0	5.2	11.9	1150	41.6	2.78	4.4	7.1	32.2	33.5	5.0

Unit will control flow to maintain stated performance

When water is used in lieu of anti-freeze, main-tain flow to keep LWT > 40°F.

Under Control Diagnostics

CLIMATEMASTER
Geothermal Heat Pump Systems
An LSB Industries, Inc. Company (NYSE: LXU)

Have EWT,LWT, and Flow(GPM)

CLIMATEMASTER
Geothermal Heat Pump Systems
An LSB Industries, Inc. Company (NYSE: LXU)

What Else Do I Need?

CLIMATEMASTER
Geothermal Heat Pump Systems
An LSB Industries, Inc. Company (NYSE: LXU)

- Fluid Factor 500 for water or 485 for antifreeze.
- Formula HE/HR= Delta T x GPM x Fluid Factor.
- Then compare to Specified HE or HR
- If within 10% you are in good shape.

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Geothermal Heat Pump Systems
An LSB Industries, Inc. Company (NYSE: LXU)

If I could Not Get GPM From Thermostat Or Service Tool.

If You Can Not Read GPM on Service Tool Or Thermostat.

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Geothermal Heat Pump Systems
An LSB Industries, Inc. Company (NYSE: LXU)

- You will need a digital tire pressure gauge.
- After getting pump to desired speed or valve to desired opening measure pressure drop using pressure ports at front of the unit.
- If you do not have correct flow go back into manual mode and and adjust speed.
- The Variable speed pump will only show GPM on screen if pump is between 50-90% pump speed.

Pressure Ports And Gauge

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Table 10a: TZ Coax Water Pressure Drop

Model	GPM	Pressure Drop (psi)			
		30°F*	50°F	70°F	90°F
024	2.3	2.2	1.5	1.2	1.1
	3.4	4.5	3.1	2.5	2.4
	3.0	3.7	2.4	1.9	1.8
	4.5	6.1	4.3	3.4	3.2
	6.0	12.8	10.0	8.6	8.0
030	3.0	1.1	0.9	0.8	0.8
	3.8	1.5	1.1	1.0	0.9
	4.5	2.1	1.6	1.3	1.3
	6.0	3.4	2.6	2.2	2.1
	7.5	4.7	3.5	3.0	2.8
036	3.0	1.0	0.7	0.6	0.6
	4.0	2.1	1.2	1.0	0.9
	6.0	3.6	2.0	1.6	1.5
	6.8	4.1	2.5	2.0	1.9
	9.0	7.6	5.7	4.8	4.3
042	3.8	1.3	1.1	0.9	0.8
	5.6	2.8	2.0	1.7	1.6
	7.5	4.5	3.4	2.9	2.7
	7.9	4.9	3.7	3.1	2.9
	10.5	7.3	5.8	5.1	4.8
048	4.5	1.6	1.1	0.9	0.8
	6.0	2.4	1.7	1.3	1.2
	6.8	2.9	2.0	1.7	1.5
	9.0	4.7	3.5	3.0	2.8
	12.0	7.4	5.6	4.9	4.7
060	6.0	4.0	2.6	2.4	2.4
	7.5	5.4	3.8	3.3	3.3
	9.0	6.8	4.9	4.4	4.3
	12.0	10.6	7.9	7.0	6.7
	15.0	16.2	12.8	11.1	10.1

* Based on 15% methanol antifreeze solution