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iHarmony® Zoning System - Damper Control Module (10C16)
Installation and Setup Guide

507132-04 6/2021
Supersedes 5/2020

Dallas, Texas, USA

THIS GUIDE MUST BE LEFT WITH THE OWNER FOR FUTURE REFERENCE

Shipping and Packing List

Kit (10C16) consists of the following:

Quantity	Part	Component
1	iHarmony Damper Control Module *(Wall fasteners are field-provided)*	
1	Discharge Air Temperature Sensor (88K3801)	
1	Warranty (W-031-L2-02)	

General

The damper control module is compatible with the following Lennox equipment:

- Lennox communicating variable speed or variable capacity (modulating) indoor and two-stage or variable capacity (modulating) outdoor units.
- Lennox communicating variable speed indoor unit and communicating or non-communicating (conventional) single-stage outdoor unit (two zones maximum supported).
- Lennox communicating variable speed indoor unit and communicating or non-communicating (conventional) two-stage outdoor unit (four zones maximum supported).

Required Items Sold Separately

The following items are also required for the zoning system to operate:

Part	Description		
iComfort S30 Ultra Smart Thermostat (12U67)			**Thermostat Only Power Consumption:** 24VAC, 2.96 VA
17A30 iHarmony Zone Sensor are required for zones 2 through 4.			**Power Consumption:** **17A30**: +10VDC TO +14VDC (12VDC nominal). Maximum Current Consumption: Less than 133mA
Zone damper transformer, see “Table 1. Zone Damper Transformer Selection Chart” for correct size.			
Optional freezestat, see “Table 7. Available Freezestats” on page 8 for available freezestats based on tubing sizes.			
Heat Pump Applications Only: HFC-410A high pressure switch (550PSI) (27W13) and valve depressor tee (87071) are required.			**27W13 Power Consumption:** 5VDC sensor supply and 0.5-4.5VDC sensor output
Zone dampers — recommended zone dampers are spring-open and power-close but you may also use power-open and spring-close, or power-open and power-close. Modulating dampers are not supported. For extended dampers, recommend using relay 56L68.			**Power Consumption:** 56L68: 24VAC, 240mA Damper: Manufacture dependent.

Zone Damper Transformer

The zone dampers are powered by a field−provided 24VAC transformer. Zone dampers typically require 6 to 12VA each depending on zone damper manufacturer being used. The zone damper transformer must have an adequate VA rating to serve all components (see recommendations in following table).

The damper control module (nominal 24VAC, 2AMP with 4 dampers closed) and three in-zone thermostats require a total of 6VA to operate.

Table 1. Zone Damper Transformer Selection Chart

Catalog Number	Size	Description	VA LOAD =
10P17	40VA	120 / 208 240VAC, 24VAC	Damper VA x number of dampers + 6VA (damper control module + 3 in-zone thermostats) = damper transformer VA requirement.
10P87	50VA		
12P61	75VA		

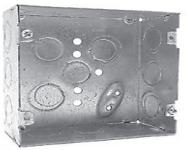
Recommended Items Sold Separately

Lennox recommends for furnace applications the use of air baffles to help in mixing the supply air for better Discharge Air Temperature Sensor accuracy.

Table 2. Recommended Air Baffles for Furnaces

Furnace Width Type	Cat #	Width
B	13X59	16”
C	13X60	19-1/2”
D	13X62	23”

Table 3. Electrical Box

Description	Catalog Number
Electrical Box (4-in. Square)	 83P74

Dimensions

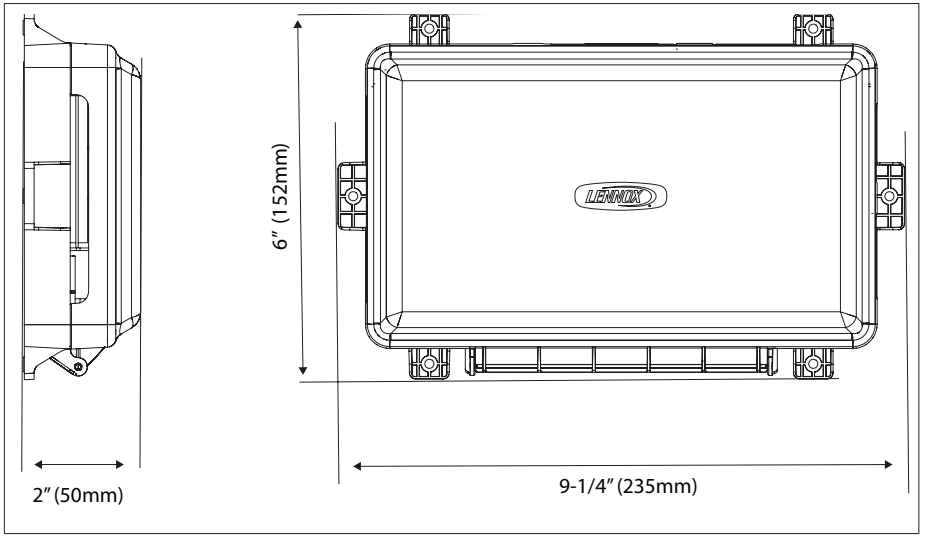


Figure 1. Dimension

Terminals, Wiring Recommendations and Electrical Characteristics

IMPORTANT

Use 18AWG unshielded thermostat cable (field-provided) for power terminals (R and C). Highly recommend using 18 - 22AWG shielded thermostat cable for communications terminals (I+ and I-) which will help eliminate any noise interference.

Table 4. Terminals and Wiring Recommendations

Component to Component	Terminal	Purpose	Recommended Wiring Specifications	Maximum Distance between Components
Damper Control Module to Indoor Unit or 17A20 Zone Sensor	**R**	24VAC input	18AWG, (unshielded thermostat cable (field-provided)	197 feet (50 meters)
	C	24VAC return		
	I+	RS-BUS I+	18 - 22AWG shielded (recommended) (field-provided)	
	I-	RS-BUS I-		
Damper Control Module to 50A93 Freezestat	Freezestat		18AWG, unshielded thermostat cable (field-provided)	197 feet (50 meters)
Damper Control Module to 93G35 Freezestat	Freezestat			
Damper Control Module to 27W13 High Pressure Switch	Pressure Switch		18AWG, unshielded thermostat cable (field-provided)	197 feet (50 meters)
Damper Control Module to Discharge Air Temperature Sensor	DATS		18AWG, unshielded thermostat cable (field-provided).	30 feet (9 meters)
Damper Control Module to Dampers	Dampers		18AWG, unshielded thermostat cable (field-provided)	Check with damper manufacturer

Table 5. Damper Control Module Electrical Characteristics

	Min	Nom	Max	Units	Comments
Input Voltage	18	24	30	VAC	System and Damper Power
Input Current			2	Amp	@ 24VAC and all four dampers closed

(All values are @ 25VAC, 60Hz. 25 Degrees Celsius [77°F] unless noted)

Sensors

Discharge Air Temperature Sensor (DATS)

Installation of discharge air temperature sensor (DATS) must comply with the following requirements:

- Installed downstream of the heat exchanger or electric heat elements.
- It must be placed in free airflow, where other accessories (such as humidifiers, UV lights, etc.) will not interfere with its accuracy.
- Wiring distance between the integrated furnace and air handler controls or damper control module and the discharge air sensor must not exceed maximum distance as referenced in “Table 4. Terminals and Wiring Recommendations” on page 4.
- DATS is highly recommended for all systems that include a variable capacity outdoor unit in order to provided more precise dehumidification operation.

The included discharge air temperature sensor (88K38) monitors the supply air. “Figure 2. Discharge Air Temperature Sensor Installation (Typical Up-Flow Furnace)” shows the discharge air temperature sensor. This electronic sensor’s probe is inserted into the discharge air plenum to gather air temperature data for the zone control module.

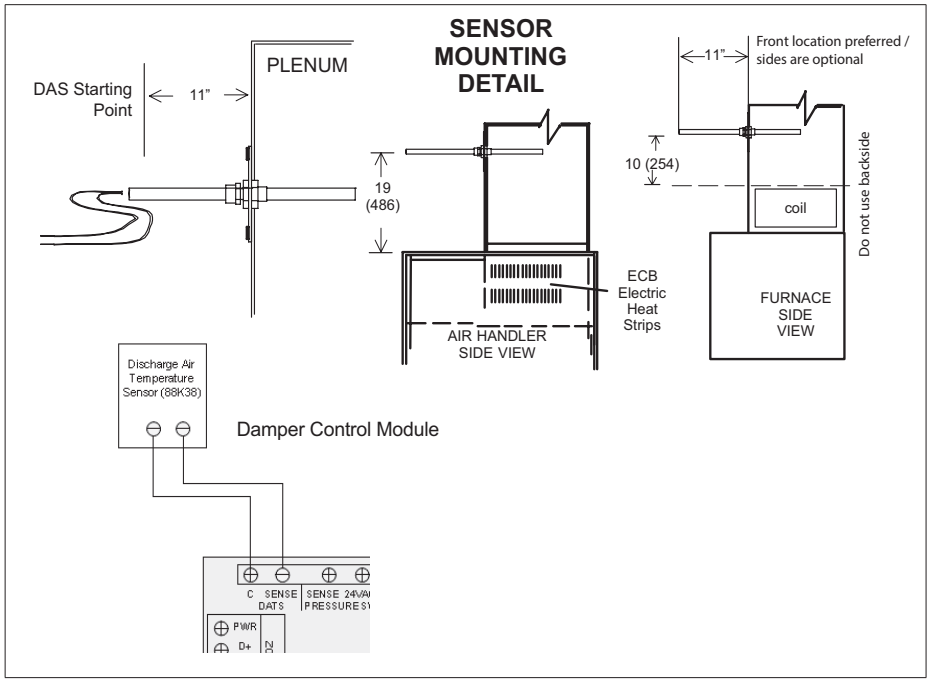


Figure 2. Discharge Air Temperature Sensor Installation (Typical Up-Flow Furnace)

- When possible, position the sensor some distance away from the coil rather than in the immediate coil area.
- The DATS should be located at least 19 inches above the air handler unit and 10 inches above cooling coil with a furnace.
- Locate the tip of the sensor 1/2 the depth of the plenum, and centered over the discharge airflow, side-to-side in the discharge plenum
- Fasten the sensor bracket to the plenum with two self-tapping sheet metal screws.
- Connect wires to DATS on damper control module, NOT on the Lennox communicating indoor unit control.

NOTE: *FOR UNITS WITH HUMIDITROL—Discharge air sensor temperature (DATS) MUST be located on the output side of the EDA (if used; see Humiditrol Zoning Accessory Installation 507944-xx).*

⚠ IMPORTANT

If the DAT sensor has failed, shorted or not installed, iHarmony will only operate in central mode. This mode is also indicated by the DCM central mode LED being on. There is no notification by the thermostat for this issue.

Discharge Air Temperature Sensor (88K38) Temperature, Resistance and Voltage Chart

Table 6. DATS Temperature / Resistance Chart

Sensor °C	Sensor °F	Sensor (ohm)	VDC (Volts)	Sensor °C	Sensor °F	Sensor (ohm)	VDC (Volts)
-6.6	20	46,134	1.513	46.2	115	4,169	0.304
-3.9	25	39,869	1.425	49.0	120	3,749	0.277
-1.1	30	34,520	1.335	51.8	125	3,368	0.252
1.7	35	29,936	1.247	54.5	130	3,037	0.229
4.4	40	26,104	1.161	57.3	135	2,750	0.209
7.2	45	22,764	1.077	60.0	140	2,489	0.191
10.1	50	19,842	0.993	62.8	145	2,250	0.174
12.8	55	17,406	0.916	65.7	150	2,033	0.158
15.6	60	15,294	0.842	68.5	155	1,847	0.145
18.4	65	13,442	0.772	71.3	160	1,678	0.132
21.2	70	11,849	0.706	73.9	165	1,536	0.121
23.9	75	10,501	0.647	76.8	170	1,397	0.111
26.7	80	9,282	0.589	79.7	175	1,272	0.101
29.5	85	8,233	0.537	82.2	180	1,170	0.094
32.3	90	7,322	0.489	85.1	185	1,070	0.086
35.0	95	6,523	0.445	87.8	190	982	0.079

Table 6. DATS Temperature / Resistance Chart

Sensor °C	Sensor °F	Sensor (ohm)	VDC (Volts)	Sensor °C	Sensor °F	Sensor (ohm)	VDC (Volts)
37.8	100	5,819	0.405	90.8	195	895	0.072
40.6	105	5,193	0.368	93.4	200	829	0.067
43.4	110	4,654	0.335				

Outdoor Air Temperature Sensor (OATS)

The optional outdoor air (temperature) sensor (OATS) (X2658) wiring distance to the iComfort S30 should not exceed 150 feet (45 meters) when wired as specified in “Table 4. Terminals and Wiring Recommendations” on page 4.

Installation of OATS must comply with the following requirements:

- Sensor wiring must be run to avoid touching or being close to high voltage wiring and light ballast.
- Choose a protected outdoor location away from direct sunlight or other heat sources (usually on the north side of the building).
- Ensure that water will neither collect on, nor wash over the sensor.
- Do not locate the sensor near driveways or similar heat-absorbing masses which may reflect stored heat energy onto the sensor and send inaccurate information to the thermostat.
- Locate the sensor away from attic and soffit vents, or furnace venting pipes.
- Do not locate the sensor directly above an air conditioner or heat pump.

Transformer Phasing

‘The indoor unit and zone damper transformers must be in-phase since both are connected to the damper control module. Follow the instructions below for phasing both transformers.

1. Connect the damper control module indoor **R** and **C** to the indoor unit **R** and **C**.
2. Connect the external 24VAC transformer to the damper control module **DMPR XFMR C** terminal only. Check voltage from indoor R to External XFMR wire R. If voltage is not phased then switch before connecting wires. This will keep damaging voltage off of the control module.
   - » In-phase voltage will be the difference of both XFMR voltages approximately less than 5VAC.
   - » Out-of-phase voltage will be the sum of both XFMR voltages approximately greater than 50VAC.
3. Verify voltage between the damper control module indoor **R** and **DPMR XFMR R** terminals after wires are connected.

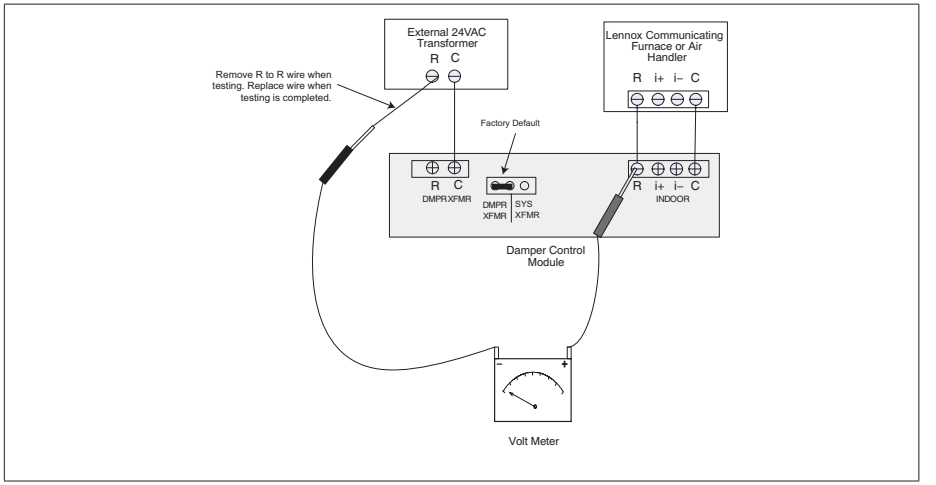


Figure 3. Confirming Correct Transformer Phasing

Damper Wiring

See table 1 to determine the minimum damper transformer VA requirements based on the number of zones being installed. If extended zone dampers are used then see figure 2 for damper, transformer and zone relay wiring requirements.

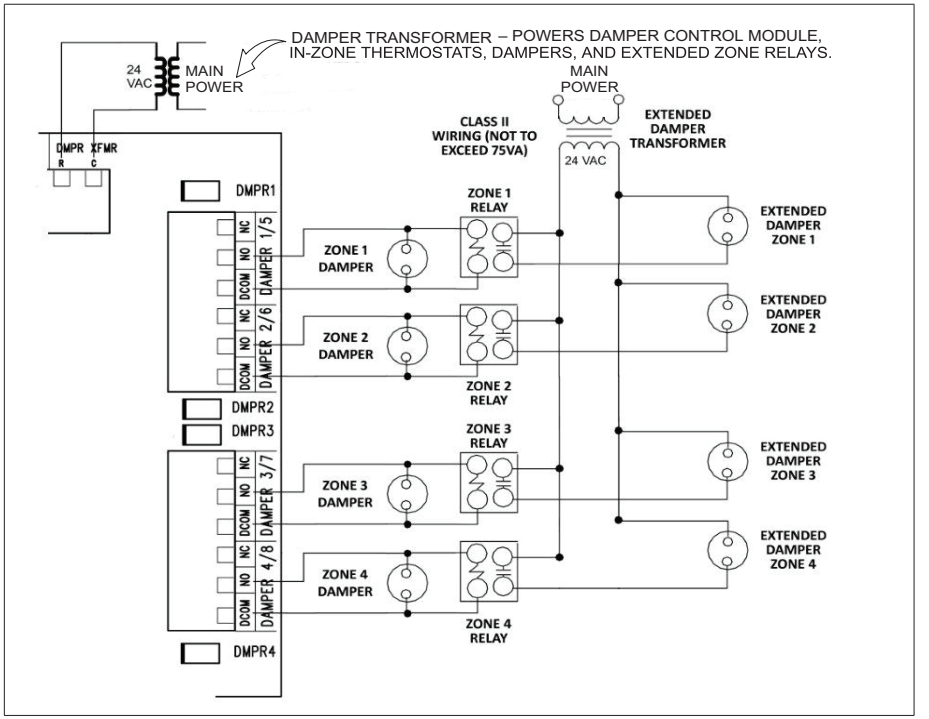


Figure 4. Damper and Extended Damper Wiring Diagram

Refer to the iHarmony® Zoning System Product Specification for ordering dampers and other various components.

Once the damper control module has been installed and the system energized, the damper control module will automatically populate the thermostat commissioning screens. All zone CFM settings will be selected from commissioning screens for continuous blower and both heating / cooling blower operations. Testing CFMs for each or all zones may also be performed.

1. The extended damper transformer will only supply power to extended dampers and relay contacts.
2. The system transformer powers the relay coils (0.4VA each).
3. Combined load of damper transformer (see "Table 1. Zone Damper Transformer Selection Chart" on page 3) and add 0.4VA per zone relay to determine the minimum damper transformer VA requirements. Total VA requirements should not exceed 60VA.

NOTE: *Connections illustrated here are for the Lennox recommended spring-open/power-close dampers. The connections would be different for other dampers.*

NOTE: *For extended dampers, use Lennox Part catalog number 56L68 for zone relays 1 through 4. (Pulse Control Relay, SPDT, 1 N.O. and 1 N.C., 24VAC)*

Pressure Switch

(Required for heat pump applications.)

⚠ IMPORTANT

Heat Pump Systems Only: Do not use jumper for pressure switch terminals at the damper control module. System will not function properly without pressure switch installed.

NOTE: *Outdoor unit (heat pump) will not operate if pressure switch is not installed). The location of the pressure switch may be installed at the indoor coil using the expansion valve equalizer line connection as an alternate pressure switch installation location. When the pressure switch is installed at the indoor coil expansion valve equalizer connection, a with flare tee will be required and the TXV equalizer line must be connected to the connection on the tee without a Schrader valve core.*

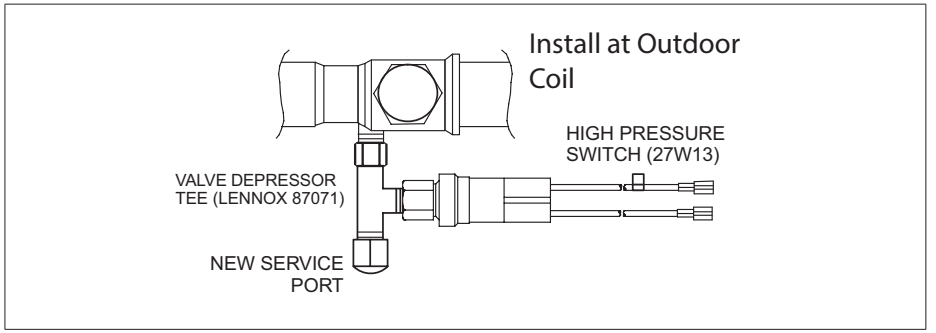


Figure 5. Tee and Vapor Line High Pressure Switch

A field-provided HFC-410A high pressure switch (catalog number 27W13) is required for applications with a Lennox heat pump. This switch protects the system in the event a high pressure condition occurs in the outdoor unit during heating mode.

The switch operates in tandem with the factory installed high pressure switch, but connects to the iHarmony control instead. The switch is an auto-reset type that opens at 550 psig and closes at 425 psig.

NOTE: *If a pressure switch is factory installed in the outdoor unit, do not remove the switch or switch wires.*

The damper control module pressure switch may also be fastened directly to the vapor valve service port using a field-provided tee adapter. This line becomes the discharge line in heat pump heating mode. Recommend using pressure switch valve tee adapter (catalog number 87071).

Other conditions:

- Pressure switch status is used only for the heat pump heating and does not have any affect on non-zone demands.
- Heat pump will stop after the pressure switch status remains open for 60 seconds.

⚠ CAUTION

High Pressure Switch must be installed on open side of tee first to prevent refrigerant loss.

Pressure switch 27W13 should be installed at indoor coil.

Staged Heat Pump Units

Should the pressure switch open during heat pump heating second stage operation:

- Lennox communicating thermostat will downstage the heat pump from second-stage to first-stage heating operation in order to bring the system pressure down to a point where the switch closes again.
- If the unit is already running in first-stage when the pressure switch opens, the unit will shut off.
- If the switch closes within 60 seconds, then the Lennox communicating series thermostat may send a demand for second-stage heat pump if needed.
- If the switch does not close within 60 seconds, the Lennox communicating thermostat stops heat pump heating and satisfies the heating demand with backup heat (backup heat is either electric or gas) regardless of the ambient temperature being above the high balance point.

The heat pump is used again on the next call provided the pressure switch has closed; otherwise backup heat is used on subsequent heating calls until the pressure switch closes.

Variable Capacity Heat Pump Units (XP20 and XP25)

If the pressure switch opens during heat pump heating operation:

- Lennox communicating series thermostat will respond by sending a HP heat demand with the demanded rate equal to the current rate 25%. (i.e. the switch opens during a 90% heating demand,
- Lennox communicating thermostat then sends a demand for 9025 = 65%) If new calculated rate is below the minimum for the unit, minimum demand is sent.
- If the switch closes within 60 seconds, then the Lennox communicating series thermostat may change the demand for the heat pump as determined by the DATS.
- If the switch does not close within 60 seconds, the Lennox communicating series thermostat stops heat pump heating and satisfies the heating demand with backup heat (backup heat is either electric or gas) regardless of the ambient temperature being above the hi balance point.

The heat pump is used again on the next call provided the pressure switch has closed; otherwise backup heat is used on subsequent heating calls until the pressure switch closes.

Freezestat (Optional)

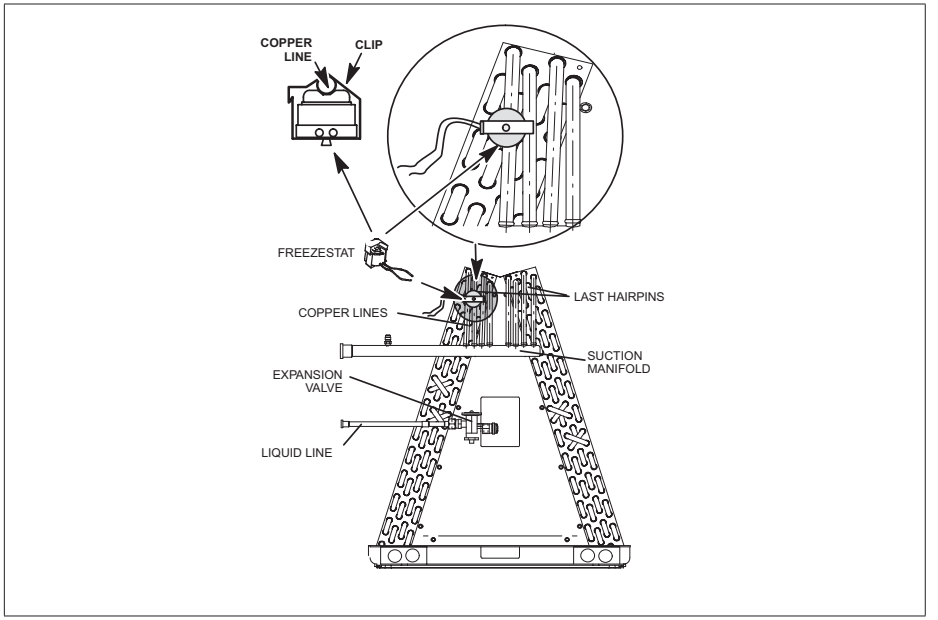


Figure 6. Typical Freezestat Installation - Indoor Coil

This optional component is only required if there is a small zone with little airflow which is causing the indoor coil to freeze up. However, normal return air temperature should prevent this from occurring. The addition of the freezestat will provide for added protection.

NOTE: *The damper control module comes from the factory with a insertion bridge installed on the freezestat terminals (see "Figure 7. Damper Control Jumpers LEDs and Connections" on page 14). Do not remove unless a freezestat is connected. Outdoor unit will not operate if insertion bridge is removed (missing) and no freezestat is installed.*

The table following lists available freezestats for use with the damper control module.

Table 7. Available Freezestats

Catalog Number	Piping Size	Description
93G35	⅜"	Opens at 29°F, and closes at 58°F
50A93	⅝"	Opens at 36°F, and closes at 58°F

Suggested Freezestat Installation Method

The following is the recommended method for installation of the freezestat for connection to the damper control module.

1. A freezestat, sized per “Table 7. Available Freezestats” and ordered separately, can be installed. Install the freezestat on one of the copper lines between the last hairpins and the suction manifold (see “Figure 6. Typical Freezestat Installation - Indoor Coil”) of the indoor coil.
2. The freezestat senses the line temperature and cycles the compressor off when the line temperature fails below its setpoint. The freezestat will open and close as listed in “Table 7. Available Freezestats”
3. Connect freezestat wires to the freezestat terminals on the damper control module after removing the factory installed bridge (see “Figure 7. Damper Control Jumpers LEDs and Connections” on page 14).

Zoning 401 Setup and Configuration

Establishing the Baseline

- Verify voltages and recommended wiring procedures.
- All device wiring must be connected at the indoor unit control terminals.
- Install recommended wire as per “Table 4. Terminals and Wiring Recommendations” on page 4.

⚠ IMPORTANT

Multi-Conductor Applications

Communicating systems requires four thermostat wires between the damper control module and indoor unit. When a thermostat cable with more than four wires must be used, the extra wires must be properly connected to avoid electrical noise. The wires must not be left disconnected.

Use wire nuts to bundle the unused wires at each end of the cable. A single wire should then be connected to the indoor unit end of the wire bundle and attached to the “C” terminals

Wire nut unused wires of each bundle at device location and do not connect to any common.

- Install DATS as per recommendation “Figure 2. Discharge Air Temperature Sensor Installation (Typical Up-Flow Furnace)” on page 5.
- Phase transformers as per recommendation “Figure 3. Confirming Correct Transformer Phasing” on page 6.
- Verify iComfort voltages are consistent with the service and application note ACC-17-01 standards.

Mapping the Design

Using a specific setup technique to achieve a specific design operation.

- From the thermostat’s home screen select **settings** > **advanced settings** > **dealer control center** > **equipment** and select **furnace** or **Air Handler.** Then verify or adjust the following parameters as noted:
  - » **Verify High Cooling** airflow to default ((1 and 2 stage units only)..
  - » Set **Airflow Profile** - **Cooling** to option “D” for specific use in cooling test mode (1 and 2 stage units only).
  - » Verify **High HP Heating Airflow** is set to default (1 and 2 stage units only)
  - » For modulating unit airflows, see the modulating outdoor unit tab.
  - » Verify **Continuous Indoor Blower Airflow** is set to default.
  - » Set the **Heating Indoor blower off delay** to 180 seconds.
  - » Set **high heating airflow** to recommended model number value listed in “Zoning CFM Tables” on page 17 to insure mid-range temperature rise operation.
  - » From the selection screen now select **smart hub** and verify the following:
    - Verify gas heat control for modulating furnace is defaulted to **Load Tracking Variable Capacity**.
    - Verify **Zoning Gas Heating DAT Cooldown Target** is set to 90°F.
    - Verify **Zoning Anticipated Discharge Air Temperature Adjustment is set** to 0 seconds.
    - Verify **Zoning Target Air Supply Air Temp Cooling** is set to 45°F (+7° operation range is 45°- 52°F).
    - **Zoning Supply Air Limit for Cooling** - Recommend setting to 10˚F below **Zoning Target Supply Air Temp Cooling**. ***Example***: *If Zoning Target Supply Air Temp is left on default (45˚F), set Supply Air Limit for Cooling to 35˚F. (45 - 10 = 35)*
    - Verify **Zoning Target Supply Air Temp Gas/Electric Heating** is set to 100°F (10/20° overshoot range is 100°- 110/120°F).
      - ◊ Staged gas and electric units will have 20° overshoot.
      - ◊ Modulating gas units will have a 10° overshoot

Table 8. Zoning Target Supply Air Temp Gas/Electric Heating Pocket Formula and Recommended Airflow CFMs

Select temperature setting using pocket formula and recommended Max Airflow CFM values to achieve maximum capacity in overshoot operating range.	
(Output BTU / CFM / 1.08 = TEMP RISE) + DESIGN TEMP = OPERATING TEMP (DAT)	
Modulating furnace example:	64000 / 1025 / 1.08 = 57.8 + 70(RA) = 127.8 - 10°(overshoot) = 117.8°
	Round up to nearest 5°= set target air temp to 120°

Staged furnace example:	64000 / 1025 / 1.08 = 57.8 + 70(RA) = 127.8 - 20°(overshoot) = 107.8°
	Round up to nearest 5°= set target air temp to 110°
How to convert electric heat watts to BTUs/Hr	15KW = 15,000 Watts 15,000 Watts X 3.413 = 51,195 BTUs/Hr

» Verify **Zoning Target Air Temp for HP Heating** is 90°F (10° overshoot range is 90°- 100°F).

» Verify **Zoning Supply Air Temp Limit for Cooling** is set to 40°F.

» Adjust **Zoning Supply Air Temp Limit for Gas/Electric Heating** to160°F. Set high heating limit to minimum of 15° above operating target DAT and round up to the nearest 5° limit option setting. Recommend 160° limit temp to avoid short cycling and DAT cool down mode

» Verify **HP Heating Lockout Time is set to 60** min.

- Go to the Verify Airflow Per Zone Screen.
  - » From the Equipment list, select **reset** and on the right side of the screen, select **re-configure system**.
  - » Verify the **dealer info** is completed on the first screen.
  - » Continue to navigate through the various screens until you arrive at the **iHarmony zoning** screen. Verify the names for each zone are correct. Then select **continue**.
  - » Select the following for each zone and set the correct CFM for the zone.
    - **Blower Circulation Airflow** per zone: For up to four zones, each zone assigned airflow at least the minimum CFM value per tonnage, for example 250 CFM for 3-ton, 380 for 4-ton or 450 CFM for 5-ton. Adjustment are in 5 CFM increments.
    - **Heating Circulation Airflow** per zone:
      - ◊ Enter Recommended CFM Per Zone from “Zoning CFM Tables” on page 17.
      - ◊ On staged units, values are mid-range temp rise specific and should only be changed if the maximum of <79% Indoor Blower Power (IDBP) cannot be achieved.
      - ◊ Final adjustment will be made after IDBP testing.
      - ◊ If lower CFM is needed to maintain proper IDBP the value must remain within the recommended range listed in the blower tables.
      - ◊ On modulating units any value between the recommended and max airflow will operate at the same temp rise and can be selected based on the amount of BTU’s each zone requires as per load calculations.
      - ◊ The percentage of Max BTU is relative to the percentage of Max CFM.
      - ◊ If a lower CFM is needed to maintain proper IDBP the value must not go below the Absolute Min CFM per Zone listed in the blower tables.
    - **Cooling Circulation Airflow** per zone:
      - ◊ Enter the recommended CFM per zone for the cooling load per zone maintaining CFMs above the minimum CFM values per zone .
      - ◊ Final adjustment will be made after IDBP and target air temperature approach are determined
- Once adjustments have been completed, select **continue**. This will take you to the **test mode**.

Sizing the System

Select manual test then apply.

- Record and verify all blower settings were saved.
- Select **continue** at the bottom of the screen and select **manual tests** and then select **apply**.
- From the **select tests to run** screen, select the option **deselect all**.
- Select **maximum rate for the heating unit being tested**.
  - » Verify heating rate 100%.
  - » Verify CFM demand matches the high heating airflow setting.
  - » Verify IDBP <79%. The indoor blower power is helpful in determining if the zone ductwork has a high static pressure that the blower may not be able to overcome and cause the blower to run in cut back mode.
    - If IDBP is <79 % do not adjust high heating airflow.
    - This value is designed for mid-range temp rise operation vital to maximum heat exchanger life and performance.
  - » If IDBP is <79 % scroll down to the second discharge air temperature (S30) reading below the zoning section on the same screen.
  - » **Calibrate the DATS**
    - Move DATS probe in or out as required until discharge air sensor value (located in diagnostics) is close to the actual discharge air temperature target, the DAR is based on BTU/CFM/1.08+Return Air Temperature. This is a mapping value generated by the DATS not based on actual stratified plenum temperature.
    - If the DATS value exceeds the overshoot range the furnace will not maintain 100% capacity operation
  - » Return to previous screen
  - » Select maximum or 2nd stage cooling and start.
    - Verify cooling rate 100%.

- Verify CFM demand is the value selected. Set the assigned airflow equal-to, or greater-than the maximum airflow (airflow assigned for peak cooling load)
- Verify IDBP <79% and record value.
- Verify DAT has approached cooling target temp setting without exceeding it during 100% cooling rate.
  - ◊ If not, return to equipment and lower high cooling airflow CFM to achieve maximum cooling capacity at a lower discharge air temperature
  - ◊ The DAT should be approximately 2° above the setting to allow for air filter loading
- If any heating or cooling test results in IDBP >79% return to the dealer control center. A higher IDBP >79% is an indication of a high static duct system or loaded filter.
- Select > **equipment**.
  - ◊ Select furnace and lower the high heating airflow CFM according to the amount assumed needed and retest until IDBP value is confirmed <79%.
  - ◊ Select the associated outdoor unit and lower the high cooling and/or heat pump heating airflow to match the heating CFM value.
- Equipment maximum capacity is now properly sized to the duct system.
- Return to thermostat's home screen.

Testing the Zones

Verify proper operation of each or combination of zones.

- **Heating test** per zone.
  - » From the thermostat's home screen, navigate to the smallest zone.
  - » Select **modes and schedules** and select **heat only.**
  - » Initiate a 5° heating call and wait for "heating" status on the display
    - Then navigate to **settings**> **advanced settings** > **dealer control center** > **diagnostics** > **select all** > **start diagnostics**.
    - Select **Furnace**
      - ◊ Verify heating rate = 70% typical starting rate
      - ◊ For modulating furnace:
        - > If discharge air temperature (DAT) is less than target air temp the gas valve will increase in 5% increments until target air temp is achieved.
        - > If increased gas valve rate exceeds the overshoot operating temp range the gas valve will decrease by 5% increments until the thermal balance point is established in the adequate air range of the zoning map.
      - ◊ For staged units:
        - > Heating rate will remain at 70% unless DATS does not report advancement of the DAT quickly enough (approximately 180 seconds) then second-stage will initiate at that time.
        - > Second stage will drop out at overshoot operating temp range.
        - > The DAT will seek a thermal balance point based on the ratio of minimum CFM to minimum capacity BTU above the overshoot temp.
      - ◊ Verify CFM demand is the value selected in setup.
        - > The 50% cutback values are related to wiring terminal points, dirty voltage, and excessive IDBP >79%.
        - > Once a 50% cutback mode is learned by the ECM due to excessive IDBP it will always begin at 50% cutback.
        - > This mode is often associated with the alert code E250.
        - > Alert code E250 will occur on every heating call due to inadequate air as the zoning map indicates.
        - > Various small percentage cutbacks are most often associated with thermostat wires connected on the damper control module and not on the indoor unit control's terminals.
      - ◊ The indoor blower power is helpful in determining if the zone ductwork has a high static pressure that the blower may not be able to overcome and cause the blower to run in cut back mode.
        - > Verify Indoor Blower Power is <79%.
          - + **Lower velocity range is 1% - 30%**.

            These have a quiet operation but may require duct balancing for uniform room distribution.
          - + **Moderate velocity range is 30% - 65%.**

            These have more noticeable operation but may help overcome path of least resistance duct design.
          - + **High velocity range is 65% - 79%.**

            These are very noticeable but an alternative to remodeling the duct system without experiencing blower cutback alert codes E291, E311 and E312.

+ **Excessive velocity range is 79%-83%.**

  These are not recommended due to unwanted velocity and possible blower fluctuation with cutback mode operation. Occasional success may sometimes occur in this range but is highly sensitive to air filter loading restriction.

» Select **Zoning Control.**

- Verify the appropriate zone damper is 100% open and all others are closed.
- Verify from discharge air temperature using the following procedures:
  - ◊ On modulating units, the value will remain very constant between zones due to the gas valve modulating proportionally with the airflow.
  - ◊ On staged units the CFM will determine the DATS value based on a fixed BTU output.
    - > Excessive air per zone will drive the DAT below target air setting and initiate 2nd stage
    - > 2nd stage will then drive the temperature up to the overshoot limit and drop out with minimum air.
    - > The cycle is repeated with minimum 20° fluctuating discharge temperature.
    - > Adjust each zone to operate in the adequate air range of the zoning map within the proper IDBP percentage.
    - > The position of the DATS should not be changed as it is set for continuous maximum capacity operation within the adequate air range of the zoning map.
      - + Verify DATS is tracking slow and steady in .4 - .5 increments. Temperature reading in large increment indicate the CFM may need to be adjusted and IDBP % checked.
      - + Verify steady state DATS in diagnostics is approximately the same as DAT operating target as per zoning map. Pocket formula may be needed for this value.
      - + if minimum air CFM was selected to specifically accommodate duct sizes >79% IDBP the DAT will run higher as per the zoning map temperature ranges.
      - + Verify DAT operating temp is less than zoning heating limit or cool down mode will initiate, and short cycling will occur.

» Repeat for each zone installed

- Select the next larger zone.
- Initiate 5° heating call on subsequent zone while previous zone is still on.
- Wait for the “heating” status symbol to be displayed.
- Scroll to previous zone and terminate call.
  - ◊ This will prevent unit from cycling off.
  - ◊ Proceed to diagnostics and record results.

» If CFM changes need to be made do not use the test mode. Return to dealer control center > equipment > reset > reconfigure system> stop on the 6th commissioning screen.

- Adjust CFM per zone as needed.
- Changes will be saved and stored.

• **Cooling test** per zone

» Same sequence as heating.

» DATS position will not be changed.

» DATS calibration is sensitive to specific heating performance.

» DATS calibration in cooling mode.

- Adjust CFM to respond to target air cooling temp setting selected in zoning setup
- Adequate air on the zoning map will find a thermal balance point between target and 7° above that temp.
- If the CFM selected achieves a point inside that range the ODU will not continue to modulate up (staged or modulating units).
- If the thermal balance point is not close enough to the target air temp selected the CFM can be lowered to achieve that design condition.

» Good practice recommends a balance point within 2°F of target to accommodate for air filter loading restriction

» Discharge air temperature is subject to fluctuate based on differences in total heat load.

» Return to home screen and set all zones to normal operations.

Lennox Communicating Indoor Control Link Settings

When using the iHarmony® zoning system with a Lennox communicating Indoor unit and non-communicating (24VAC) outdoor unit all applicable control links illustrated in “Figure 7. Damper Control Jumpers LEDs and Connections” on page 14 should be configured as indicated. Failure to cut or not cut only the required links will result in the system being inoperable.

Table 9. Damper Control Connections, Insertion Bridge and Jumpers

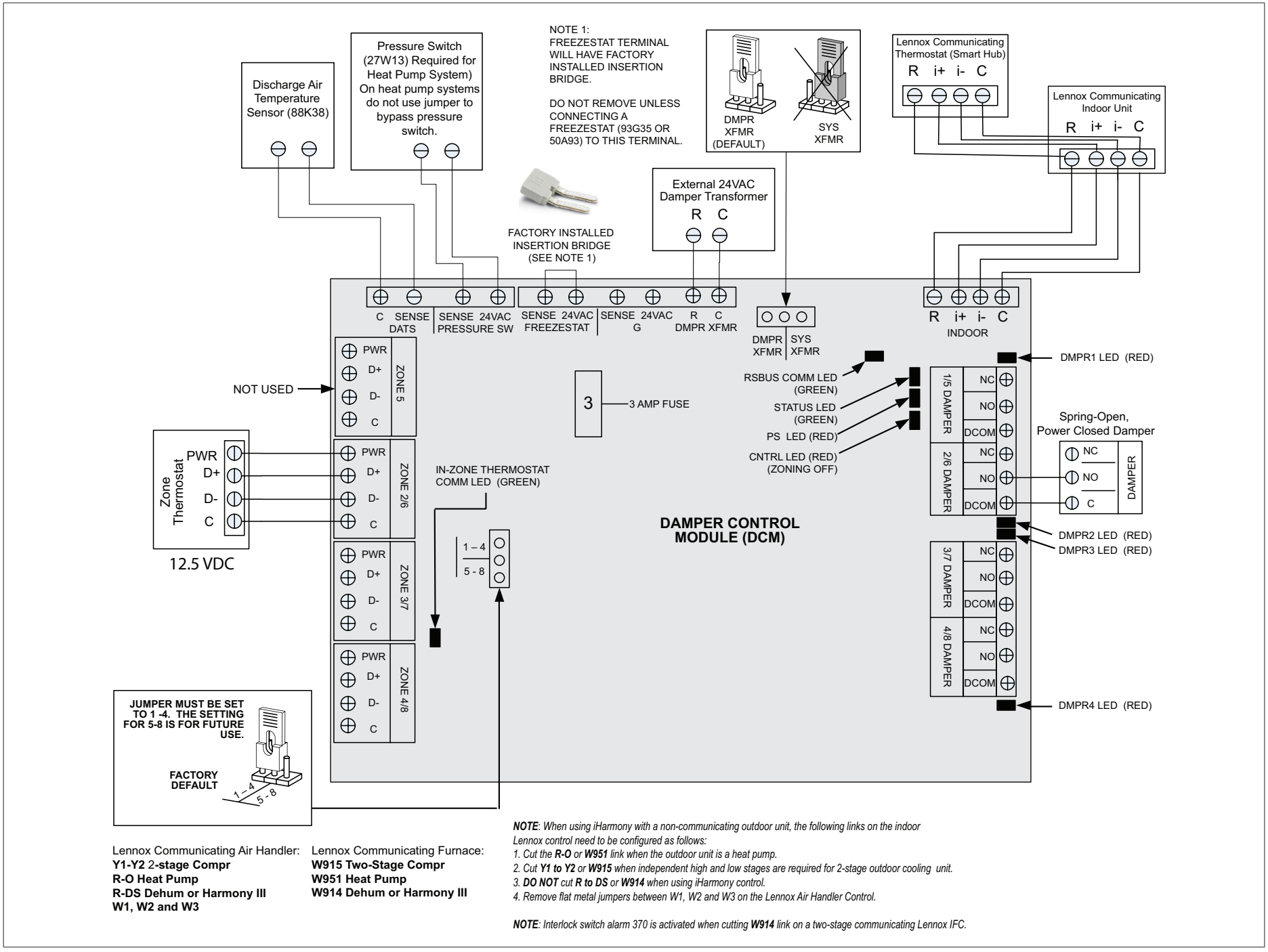
Damper Control Label	Description	
INDOOR	(Connection to iComfort furnace or air handler)	
C	RSBus 24VAC common	
i+	RSBus data positive	
I-	RSBus data negative	
R	RSBus 24VAC power	
DMPR XFMR / SYS XFMR	Use factory default position.	
DMPR XFMR	Connect zone damper 24VAC transformer wires to terminals DMPR R and XFMR C (see “Figure 3. Confirming Correct Transformer Phasing” on page 6). Factory default is DMPR XFMR.	
G	**SENSE**	Connect the IAQ device requiring blower operation to the indoor unit control G terminal as illustrated in the wiring diagrams located in the applicable iComfort Series Thermostat Installer Guide. Place a wire jumper between the indoor unit G and damper control module G sense terminals. This will allow the damper control module to adjust the indoor blower CFM from continuous blower speed to the correct zone heating or cooling blower speed when any zone has a demand for heating or cooling.
	24VAC	24VAC power (NOT USED)
FREEZESTAT	**SENSE**	From the factory, an insertion bridge is installed between these two terminals. If a freezestat is to be used, remove insertion bridge and replace with connections to freezestat. See table 3 on page 5 for ordering freezestat. NOTE: If jumper is missing and no freezestat is installed the outdoor unit will not operate.
	24VAC	
PRESSURE SW	**SENSE**	A HFC-410A high pressure switch (catalog number 27W13) is required for applications with a Lennox heat pump. This switch acts as a guard in case of high head pressures during first- and second-stage heating. The switch opens at 550 psig (3965 kPa) and closes (resets) at 425 psig (3102 kPa).
	24VAC	
DATS	**SENSE**	Terminals for the included discharge air temperature sensor (DATS). See figure 3 for installation requirements.
	24VAC	

Table 9. Damper Control Connections, Insertion Bridge and Jumpers

Damper Control Label	Description	
ZONE 5 (not used), ZONE 2/6, ZONE 3/7 and ZONE 4/8 (NOTE: ONLY ZONE CONNECTIONS 2, 3 and 4) are used.)	**PWR**	12VDC power.
	D+	Data positive
	D-	Data negative
	C	12VDC common
DAMPER 1/5, DAMPER 2/6, DAMPER 3/7 and DAMPER 4/8	**NC**	Normally closed.
	NO	Normally opened.
	DCOM	Common
ZONE 1 - 4 / 5 - 8	The factory default for this jumper is 1-4. Do not set jumper to 5-8, which is not is supported at this time. The damper control module only supports zones 1 through 4. Zone one being the iComfort Wi-Fi or S30 thermostat, and 2 through 4 actually being remote locations throughout the home.	

Table 10. LEDs

LED Indicator Label/Name	Color	Description
DMPR1, 2, 3, 4	Damper position LED. Illuminated when damper is power closed. LED will remain ON as as long as the damper is power-closed.	
CNTRL	Red	Illuminated when system zoning is OFF.
STATUS	Green	This green LED should blink at 1Hz, 50% duty cycle as a ”heartbeat” indicating that the device is operating normally. During device soft disable state, this LED will blink 3 seconds ON and 1 second OFF. See “Table 10. LEDs” on page 13 for further details.
RSBUS COMM	Green	RSBus activity. Active communications with external device (Lennox communicating external device).
IN-ZONE THERMOSTAT COMM	Green	Active communication with in-zone thermostats.
PS	Red	Illuminate when pressure switch is open (high pressure detected).



Lennox Communicating Air Handler:
Y1-Y2 2-stage Compr
R-O Heat Pump
R-DS Dehum or Harmony III
W1, W2 and W3

Lennox Communicating Furnace:
W915 Two-Stage Compr
W951 Heat Pump
W914 Dehum or Harmony III

***NOTE**: When using iHarmony with a non-communicating outdoor unit, the following links on the indoor Lennox control need to be configured as follows:*
*1. Cut the **R-O** or **W951** link when the outdoor unit is a heat pump.*
*2. Cut **Y1 to Y2** or **W915** when independent high and low stages are required for 2-stage outdoor cooling unit.*
*3. **DO NOT** cut **R to DS** or **W914** when using iHarmony control.*
4. Remove flat metal jumpers between W1, W2 and W3 on the Lennox Air Handler Control.

***NOTE**: Interlock switch alarm 370 is activated when cutting **W914** link on a two-stage communicating Lennox IFC.*

Figure 7. Damper Control Jumpers LEDs and Connections

iComfort S30 Ultra Smart Thermostat - Installer Zoning Control Settings

Zone Control Settings during Thermostat Initial Commissioning

If zoning control was added during initial installation of the S30 control system. Perform the following steps:

1. Navigate through the various commissioning screens until you reach **Equipment Found** screen. Verify that a Zone Control icon is present. If so, the system has detected the equipment. Press **continue** to proceed.

NOTE: *If zoning control is not listed, verify installation of the damper control module and all wiring connections. Make any corrections required and run Re-Configure System feature again.*

2. When the **iHarmony Zoning** screen appears, select each zone listed to rename it if desired. The system provides predefine names or a custom name can be added. Press **done** when completed and press **continue** to proceed.

NOTE: *If a particular zone is missing from the list, verify that the zone sensor wiring is correct and that the zone address is set correctly on both types of zone sensors (17A30 and 10C17).*

3. The **Verify Airflow Per Zone** screen will appear. Make the requirement CFM adjustment for each zone on this screen. When done, press **continue** to proceed.

Zone Control Settings after Thermostat Initial Commissioning

If zoning control was added to an existing S30 control system. Perform the following steps:

1. Form the home screen, select the **Menu Icon**
2. Select **Settings**
3. Select **Advanced Settings**
4. Select **View Dealer Control Center**
5. Select **Equipment**
6. Select **Reset**
7. Select **Re-Configure System**. This will instruct the thermostat to scan for new equipment.
8. Navigate through the various commissioning screens until you reach **Equipment Found** screen. Verify that a Zone Control icon is present. If present, the system has detected the equipment. Press **continue** to proceed.

NOTE: *If zoning control is not listed, verify installation of the damper control module and all wiring connections. Make any corrections required and run Re-Configure System feature again.*

9. When the **iHarmony Zoning** screen appears, select each zone listed to rename it if desired. The system provides predefine names or a custom name can be added. Press **done** when completed and press continue to proceed.

NOTE: *If a particular zone is missing from the list, verify that the zone sensor wiring is correct and that the zone address is set correctly on both types of zone sensors (17A30 and 10C17).*

10. The **Verify Airflow Per Zone** screen will appear. Make the requirement CFM adjustment for each zone on this screen. When done, press **continue** to proceed.

Changing Zone Name

If at a later time the zone name needs to be change, use the following procedure to do so.

1. From the Home screen, select the **Menu** icon in the upper right-hand corner of the screen.
2. Press **settings**.
3. Press **iHarmony zoning** to bring up the zone list**. T**o rename each zone, select the applicable zone.
4. Enter the new zone name by pressing on the zone name filed on the right side of the screen.
5. When done, select <iHarmony Zoning to return to the previous screen.
6. Repeat the above procedure to rename any additional zones.

Setting Up Scheduling for Each Zone

To setup up schedule for each zone, perform the following:

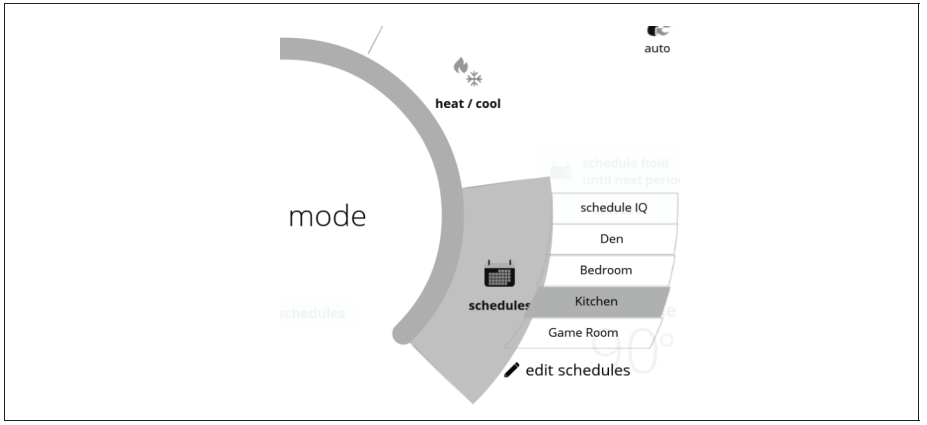


Figure 8. Unique Schedule for a Specific Zone

1. From the master thermostat's home screen, swipe from right side of the screen to the left to navigate through each zone screen.

2. Once the desire zone is on the screen, select **modes/schedules**.
3. Select **schedules**
4. From this screen, you may select from any predefined schedules (**schedule IQ**, **summer**, **winter**, **spring/fall** and **save energy)**.

NOTE: *When using predefine schedules, the settings will be the same for all zones that the selected schedule is used in. If you wish a unique schedule for a specific zone, edit one of the existing schedules and rename the schedule to match for example the zone it will be used in.*

5. There is also the option to edit schedules. From the edit schedules screen you can modify any of the predefined schedules.
6. Repeat the above procedure for each zone.

NOTE: *For more information concerning schedules, refer to the thermostat user guide.*

Design and Map Airflow Per Zone Using Target Air Temperatures

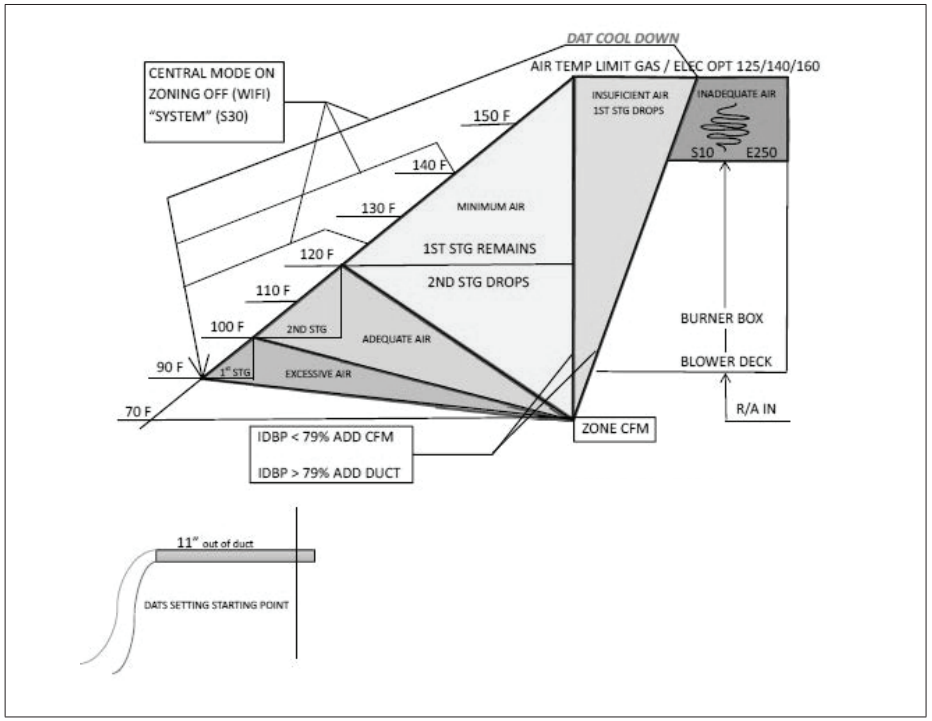


Figure 9. Design and Map Airflow Per Zone Using Target Air Temperatures

Mapping Overview

- Mapping the zoning will allow you to select an operating temperature design based on the blower tables.
- Recommended CFM values are listed at mid-range temperature rise values on the equipment name plate.
- Add the temperature rise to the desired room temperature to achieve Operating DAT.
- On staged units the target air temperature setting will be 20° less than your design rounded up to the nearest 5°.
- On modulating equipment the target air temperature will be 10° less than design rounded up to the nearest 5°.
- These values can be manipulated within the blower tables to create the exact Map of your system operation.
- On modulating systems that are oversized the map can configure smaller zones to operate at less BTU/CFM saturation.
- Basically only a portion of the capacity is used while supplying required capacities to smaller zones.
- For Temperature Rise and CFM Pocket formulas see “Table 21. Schedule A” on page 19.
- Excessive air operates below target set point and will initiate increased capacity
- Adequate air allows the system to operate at maximum capacity without staging the heat down. Higher CFM selections operate on lower target air temperatures.
- Minimum air allows the unit to operate at elevated temperatures on minimum capacity without tripping heating limits selected.
- Zoning heating limits can be selected to avoid cool down mode based on absolute minimum cfm allowed in blower tables.
- Insufficient air operates at very high temperatures based on CFM values selected below absolute minimum CFM per zone in blower tables. Non-recommended CFM values are available in the iHarmony minimum CFM design. Such values should be used for ventilation only. Verify maximum CFM per zone based on less than 79% indoor blower power. Cool down mode is forced resulting in continual short cycling of equipment and out of range temperature rises.
- Inadequate air is the absence of enough airflow to avoid complete heat saturation of the heat exchanger resulting in primary limit trips and Central Mode operation. This can be the result of using the lowest iHarmony CFM settings or inadequate ductwork not allowing blower motor to operate less than 79% indoor blower power.

Zoning CFM Tables

⚠ IMPORTANT

All recommended CFM settings are mid-range temperature rise values per stage per unit. All CFM combinations must be <79% indoor blower power.

Table 11. SLP98 Zoning

MODEL	SLP98UH070	SLP98UH 090-36	SLP98UH 090-48	SLP98UH 090-60	SLP98UH110	SLP98UH135	SLP98DF070	SLP98DF090	SLP98DF 090-48/60	SLP98DF110
Absolute Min CFM per zone	315 @ 64.7°	430 @ 64.6°	430 @ 64.6°	450 @ 61.7°	545 @ 64.6°	645 @ 64.6°	315 @ 64.7°	430 @ 64.6°	430 @ 64.6°	545 @ 64.6°
Recommended Min CFM Per Zone	350 @ 58.2°	440 @ 63.1°	485 @ 57.3°	485 @ 57.3°	620 @ 56.8°	705 @ 59.1°	350 @ 57.8°	445 @ 62.4°	485 @ 57.3°	615 @ 57.2°
Recommended Max Air Flow	1025 @ 57.8°	1250 @ 63.0°	1375 @ 57.2°	1400 @ 57.5°	1725 @ 56.9°	2000 @ 59.3°	1025 @ 57.8°	1250 @ 62.2°	1375 @ 57.2°	1725 @ 57.4°

Table 12. SLP99 Zoning

MODEL	SLP99UH070	SLP99UH 090-36	SLP99UH 090-48	SLP99UH 090-60	SLP99UH110	SLP99UH135	SLP99DF070	SLP99DF090	SLP99DF 090-48/60	SLP99DF110
Absolute Min CFM per zone	315 @ 64.7°	430 @ 64.6°	430 @ 64.6°	505 @ 55.0°	545 @ 64.6°	645 @ 64.6°	315 @ 64.7°	430 @ 64.6°	430 @ 64.6°	545 @ 64.6°
Recommended Min CFM Per Zone	350 @ 58.2°	440 @ 63.1°	485 @ 57.3°	525 @ 52.9°	620 @ 56.8°	705 @ 59.1°	350 @ 57.8°	445 @ 62.4°	485 @ 57.3°	615 @ 57.2°
Recommended Max Air Flow	1025 @ 57.8°	1250 @ 63.0°	1375 @ 57.2°	1525 @ 52.8°	1725 @ 56.9°	2000 @ 59.3°	1025 @ 57.8°	1250 @ 62.2°	1375 @ 57.2°	1725 @ 57.4°

Table 13. G71MPP Zoning

MODEL	G71MPP-36B-070	G71MPP-36C-090	G71MPP-60C-090	G71MPP-60C-110	G71MPP-60D-135
Absolute Min CFM Per Zone	335 @ 69.1°	450 @ 70.0°	450 @ 70.0°	560 @ 69.4°	680 @ 69.4°
High Heating Airflow Range 25 CFM inc	800 / 1100	1075 / 1250	1075 / 1500	1375 / 1900	1650 / 2050
Recommended Min CFM Per Zone	385 @ 60.1°	485 @ 64.9°	525 @ 60.0°	650 @ 59.8°	755 @ 62.5°
Recommended Max Air Flow	925 @ 60.1°	1150 @ 65.2°	1250 @ 60.0°	1600 @ 59.6°	1825 @ 62.4°

Table 14. SL280 Zoning

MODEL	SL280UH070	SL280UH 090-36/48/	SL280UH 090-60	SL280UH 110-60	SL280UH 135-60	SL280DF 070-36	SL280DF 090-48	SL280DF 090-60	SL280DF 110-60
Per Zone Airflow Range 5 CFM inc	590 - 1200	795 - 1600	795 - 1740	980 - 2145	1165 - 2150	590 - 1295	775 - 1700	775 - 1700	1000 - 2150
High Htg Airflow Range 25 CFM inc	700 - 1200	950 - 1600	1000 - 1850	1250 - 2150	1400 - 2150	750 - 1375	1000 - 1825	1000 - 1850	1250 - 2150
Recommended CFM Per Zone	810@ 40.0°	1090@ 39.9°	1090@ 39.9°	1345@ 39.9°	1595@ 40.1°	810@ 40.0°	1065@ 40.0°	1065 @ 40.0°	1365 @ 40.0°
Recommended Max AirFlow	875@ 55.0°	1175@ 55.2°	1300@ 49.9°	1600@ 50.3°	1775@ 54.8°	975@ 49.4°	1275@ 50.1°	1300 @ 49.9°	1600@ 50.3°

Table 15. SL280UHNV Zoning

MODEL	SL280UHNV 060-36A	SL280UHNV 080-48C/60C	SL280UHNV 100-60C
Per Zone Airflow Range 5 CFM inc	575 - 1175	760 - 1575	965 - 2150
High Htg Airflow Range 25 CFM inc	750 - 1175	1000 - 1575	1250 - 2150
Recommended CFM Per Zone	820 @ 35.0°	1085 @ 35.0°	1375 @ 35.0°
Recommended Max AirFlow	1000 @ 44.4°	1325 @ 44.7°	1650 @ 44.9°

Table 16. SL297 Zoning

MODEL	SL297UH040NV36	SL297UH060NV36	SL297UH080NV48	SL297UH080NV60
Per Zone Airflow Range 5 CFM inc	465 - 1155	640 - 1050	790 - 1570	860 - 1800
High Heating Airflow Range 25 CFM inc	625 - 1200	675 - 1050	975 - 1600	1050 - 1800
Recommended CFM Per Zone	660 @ 35.1°	825 @ 42.6°	1050 @ 45.0°	1180 @ 40.0°
Recommended Max Air Flow	800 @ 45.1°	825 @ 65.1°	1200 @ 60.2°	1325 @ 54.5°

Table 17. EL296 Zoning

MODEL	EL296UH 045	EL296UH 070	EL296UH 090-36	EL296UH 090-48	EL296UH 090-60	EL296UH 110-48	EL296UH 110-60	EL296UH 135	EL296DF 045	EL296DF 070	EL296DF 090	EL296DF 110
Per Zone Airflow Range - 5 CFM inc	520 - 1100	690 - 1125	850 - 1275	850 - 1695	930 - 1950	1000 - 1600	1000 - 1850	1115 - 1940	520 - 1125	710 - 1555	745 - 1295	865 - 1440
High Htg Airflow Range 25 CFM inc	600 - 1100	725 - 1125	875 - 1275	1050 -1725	1125 - 1950	1100 - 1600	1325 - 1950	1375 - 2100	625 - 1125	925 - 1675	1325 - 1875	1525 - 2000
Recommended CFM Per Zone	740 @ 25.0°	875 @ 43.4°	1025 @ 49.7°	1130 @ 45.1°	1275 @ 39.9°	1295 @ 50.1°	1295 @ 50.1	1415 @ 55.0°	740 @ 35.0°	970 @ 40.1°	945 @ 54.9	1080 @ 60.0°
Recommended Max Airflow	775 @ 50.2°	875 @65.6°	1025 @ 75.9°	1300 @ 60.5°	1425 @ 55.2°	1300 @ 7°	1625 @ 60.4°	1675 @ 69.7°	800 @ 49.8°	1175 @ 50.4°	1750 @ 45.0°	1975 @ 49.7°

Table 18. CBX32MV CFM Per Kw Range

MODEL	CBX32MV-018/24 2.5 - 9 Kw	CBX32MV-024/30 4 - 15 Kw	CBX32MV-036 4 - 20 Kw	CBX32MV-048 4 - 25 Kw	CBX32MV-060 4 - 25 Kw	CBX32MV-068 5 - 25 Kw
Min CFM per Schedule A	250	250	250	450	450	450
Recommended CFM on Max Kw listed @ 60° Rise	475	800	1050	1325	1325	1325

Table 19. CBX40MV CFM Per Kw Range

MODEL	CBX40MV-024 2.5 - 9 Kw	CBX40MV-030 4 - 15 Kw	CBX40MV-036 4 - 20 Kw	CBX40MV-042 4 - 25 Kw	CBX40MV-048 4 - 25 Kw	CBX40MV-060 4 - 25 Kw
Min CFM per Schedule A	250	250	250	450	450	450
Recommended CFM on Max Kw listed @ 60° Rise	475	800	1050	1325	1325	1325

Table 20. CBA38MV CFM Per Kw Range

MODEL	CBA38MV-018/24 4 - 9 Kw	CBA38MV-030 4 - 15 Kw	CBA38MV-036 5 - 20 Kw	CBA38MV-042 4 - 25 Kw	CBA38MV-048 4 - 25 Kw	CBA38MV-060 4 - 25 Kw
Min CFM per Schedule A	250	250	250	450	450	450
Recommended CFM on Max Kw listed @ 60° Rise	475	800	1050	1325	1325	1325

Table 21. Schedule A

Notes:

- All gas heat BTU based on product specification output values.
- All electric heat BTU based on 3412 BTU per Kw at 240VAC. If another voltage is used the BTU value must be taken from the EHB.
- All Kw listed are single phase kits.
- All S15 limits open at 150° F.
- Pocket formulas (must be rounded to iHarmony increments).
- CFM = BTU / 1.08 / Target Temp Rise
- Temp Rise = BTU / CFM / 1.08.

250 CFM per zone	2.5 Kw = 31.6° F rise
	4 Kw = 50.5° F rise
	5 Kw = 63.2° F rise
380 CFM per zone	4 Kw = 33.3° F rise
450 CFM per zone	4 Kw = 28.1° F rise

Zoning Parameters

Zoning Control Parameters

1. Select **Menu**.
2. Select **Settings**.
3. Select **dealer control center**,
4. Select **equipment**.
5. Select **zoning control**.
6. Located and modified any setting related to zoning. See below for list of parameters available for modification.

Table 22. Zoning Control Parameters

Parameter	Description
About	This provides information on unit code, language supported, equipment type name, control software revision, control model number, control serial number, control hardware revision, protocol revision number, device product level, 24VAC average power consumption, 24VAC peak power consumption, compatible devices list, application code memory size, micro-controller part number, max number of zones, supported damper types, number of damper positions, zone temp sensor 1, zone temp sensor 2, zone temp sensor 3 and zone temp sensor 4.
Equipment Name	A unique name can be assigned to this component. Name can be up to 29 characters. Name can consist of letters, numbers, special characters and spaces.
Zones 1 through 4 Temp Reading Calibration	Allows adjustment to temperature reading displayed on zone thermostat.
Reset Zoning Control	Any installer modifications under the zoning control tab will be reset back to the factory defaults if the reset zoning control option is used.

Zoning Control Parameters Listed Under Smart Hub

1. Select **Menu**.
2. Select **Settings**.
3. Select **dealer control center**,
4. Select **equipment**.
5. Select **smart hub**.
6. Located and modified any setting related to zoning. See below for list of parameters available for modification.

Table 23. Smart Hub Parameters

Parameter	Description
About	This screen provides information concerning language supported, equipment type name, control software revision, model, control mode number, control serial number, control hardware revision, protocol revision number, device product level, 24VAC average power consumption, 24VAC peak power consumption, compatible devices list, application code memory size and micro-controller part number.
Equipment Name	A unique name can be assigned to this component. Name can be up to 29 characters. Name can consist of letters, numbers, special characters and spaces. Default name is subnet controller.
HP Heating Lockout Time	The HP could not get a zone to progress 0.5 degrees towards the set point in 120 minutes (Alert Code 40 - Minor alert). System will switch to secondary heat source. (Electric heat or furnace in dual fuel applications). Transition back to Heat Pump normal operation when termination setting times out. Range is 60 to 240 minutes. Default is 60 minutes. Adjustments are in increments of 30 minutes.
Zone 1 through 4 Continuous Blower CFM	The maximum airflow CFM is the factory default value for each particular unit. The per zone CFM value is the equal division of the number of zones into the maximum airflow default CFM. These values will be verified and/or adjusted in the procedure listed on pages 9-10 “Mapping the System”. Zones requesting the fan ON are only allowed while no other zone demand is present. The thermostat will sum all the zone continuous blower CFM requirements and send the command only after positioning the dampers and waiting for the damper close delay period to expire (30 seconds) Continuous blower demands are the lowest priority demands, all other conditioning demands will over-ride the continuous blower demand. The minimum CFM is 250 CFM for 3-ton, 380 for 4-ton or 450 CFM for 5-ton to the maximum . Adjustment are in 5 CFM increments.
Zone 1 through 4 Cooling CFM	The maximum airflow CFM is the factory default value for each particular unit. The per zone CFM value is the equal division of the number of zones into the maximum airflow default CFM. These values will be verified and/or adjusted in the procedure starting in “Mapping the Design” on page 9. The maximum airflow and per zone CFM is achieved by selecting adequate air volume to maintain the design DAT within the 7° operating range of the target air temperature value and the proper indoor blower power percentage during the test procedures “Sizing the System” on page 10 and “Testing the Zones” on page 11. iHarmony minimum CFM may exceed proper delta T operating ranges. The minimum CFM is 250 CFM for 3-ton, 380 for 4-ton or 450 CFM for 5-ton to the maximum . Adjustment are in 5 CFM increments.

Table 23. Smart Hub Parameters

Parameter	Description
Zone 1 through 4 Heating CFM	The maximum airflow CFM is the factory default value for each particular unit. Depending on each unit's configuration, the default values may be applied by the gas furnace, the heat pump unit, or the air handler electric heating value. The per zone CFM value is the equal division of the number of zones into the maximum airflow default CFM. These values will be verified and/or adjusted in the procedure listed in "Mapping the Design" on page 9. Specific maximum airflow and per zone CFM is achieved by selecting the mid-range temperature rise values from the CFM tables listed under "Zoning CFM Tables" on page 17, that will operate <79% IDBP during the test procedures listed under "Testing the Zones" on page 11 and "Sizing the System" on page 10. iHarmony minimum CFM listed below will exceed proper temperature rise operating ranges. Do not use any value less than the absolute minimum CFM listed in the blower tables regardless of tonnage value. The minimum CFM is 250 CFM for 3-ton, 380 for 4-ton or 450 CFM for 5-ton to the maximum . Adjustment are in 5 CFM increments.
Zoning Anticipated Discharge Air Temperature Adjustment	This parameter setting compensates for a rapid change of the discharge air temperature due to fast changing conditions. It examines the change in the discharge air temperature for the previous two minutes and extrapolates or looks forward by the number of seconds set in the parameter and uses this as the DATS value for staging. This parameter setting helps prevent limit trip/ frozen coil from occurring. Range is 0 to 120 seconds. Default is 0 seconds. Adjustments are in increments of 5 seconds.
Zoning Gas Heating DAT Cool Down Target	At the end of a gas cycle, the Heat Blower Off-Delay may not be long enough to completely cool the heat exchanger. This may result in a primary limit trip then, or at the beginning of the next heat demand. This parameter allows the blower to run after a gas heat call ends until the discharge air temperature sensor (DATS) cools to the temperature set in the parameter. If the temperature is set too low this will cause the temperature in the room to overshoot. Range is 80 to 90°F (26.67 - 32.22°C). Default is 90°F (32°C). Adjustments are in increments of 1°F (0.56°C).
Zoning Initial Staging Hold Time for Gas Heating	In zoning systems, the furnace was upstaging before the discharge air sensor reached a steady-state value and it would sometimes trip a limit due to staging up the gas before the blower would even come on (as occurs during pressure switch calibration). The furnace has satisfied the original call for heating and may still have residual heat in furnace when a second heat demand is called for. This parameter will not allow for the second call of heating before the delay timer has expired. This parameter allows an adjustment on top of the initial delay for a heating call. Range is 3.0-8.0 minutes with a default of 5.0 minutes. Can be adjusted in 1-minute increments
Zoning Minimum Zone Run-Time	Range is 90 to 600 seconds. Default is 120 seconds. Adjustments are in increments of 30 seconds.

Table 23. Smart Hub Parameters

Parameter	Description
Zoning Supply Air Temp Limit for Cooling	In cooling mode, this setting sets the discharge air temperature low limit. Below this temperature, the cooling is turned off. During cooling testing set the Zoning Supply Air Temp Limit for Cooling low enough (far enough away) so that the outdoor unit does not have nuisance low pressure switch trips caused by a sudden drop in supply air temperature as dampers close. Range is 35 to 45°F (1.67 - 7.22°C). Default is 40°F (4.44°C). Adjustments are in increments of 1°F (0.56°C).
Zoning Supply Air Temp Limit for Gas / Electric Heating	In heating mode, this setting sets the target discharge air temperature. Range is 120 to 160°F (48.88 to 54.44°C). Default is 125°F (52°C). Adjustments are in increments of 5°F (2.78°C).
Zoning Target Supply Air Temp for Cooling	In cooling mode, this setting sets the target discharge air temperature. Range is 40 to 60°F (4.44 - 15.56°C). Default is 45°F (7.22°C) plus 7 degrees operating range in all units above this setting. Adjustments are in increments of 1°F (0.56°C).
Zoning Target Supply Air Temp for HP Heating	In heat pump heating mode, this setting sets the target discharge air temperature. Range is 85 to 110°F (29.44 to 43.33°C). Adjustments are in increments of 1°F (0.56°C). Default 90°F (32°C) plus 10 degrees overshoot for both stage and variable capacity systems.
Zoning Target Supply Air Temp for Gas/ Electric Heating	Range is 100°F to 130°F with 5 degree increment adjustable. In heating mode, this setting sets the target discharge air temperature. Default 100°F (38°C) plus 20 degrees (staged units) 10 degrees (modulating units) overshoot for both stage and variable capacity systems.

Zoning Sequence of Operations

When power is first applied, the green Status LED will flash, indicating that the damper control is functioning normally. When the control is first powered on, there is a 5 minute minimum time delay during which only the fan output will respond.

Heating / Cooling Changeover

The following is an example of how the system operates during a heating / cooling changeover. When the system is satisfying a call from zone 1 for heating and receives a call for cooling from zone 2, the following will occur:

- Then system will continue to fulfill the demand from zone 1 until satisfied, or a maximum time of 20 minutes has occurred.
- If after 20 minutes the system is still operating based on satisfying the heating demand from zone 1, the system will terminate that demand.
- The system will then shut system down for five (5) minutes. This will allow for system temperatures and operating pressures to stabilize.

- After a five 5 minute delay the system will begin operations to satisfied the cooling demand from zone 2.

The system will continue to operate in this matter each time it receives a zone call that is opposite of the current mode of operation (heating or cooling).

Damper Operation

Cooling Operation Conventional Heat/Cool and Heat Pump Systems

When a zone thermostat makes a demand for cooling, the zone damper opens and the cooling equipment begins operating. Cooling demand is terminated when:

1. All zone demands for cooling are terminated.
2. The demand has exceeded the heat/cool changeover time limit (20 minutes) while a heat demand exists.

When cooling demand is terminated, a 5 minute minimum off time delay is initiated.

Second stage cooling is energized when the discharge air temperature is 7°F higher than the set point of the cooling staging temperature settings.

Heating Operation Conventional Heat/Cool and Heat Pump Systems

When a zone thermostat makes a demand for heating, the zone damper opens and heating equipment begins operating. Heating demand is terminated when:

1. All zone demands for heating are terminated.
2. The demand has exceeded the heat/cool changeover time limit (20 minutes) while a cooling demand exists.

When heating demand is terminated, a 5 minute minimum off time delay is initiated. Second-stage heating is energized if the discharge air temperature is lower than the set point of the heating staging temperature set point.

Dual-Fuel Operation

NOTE: *A 10T50 Interface Module is required for non-communicating dual-fuel applications.*

When both a gas furnace and a heat pump are present on the system, the thermostat uses the balance points to determine which source to use for heating.

When the outdoor temperature is above the low balance point, the heat pump is always attempted first before using the gas furnace.

In order to use the gas furnace as a primary heating source (not defrost tempering) when the outdoor temperature is between the high and low balance points, the following conditions must occur:

- Heat pump must be used for a minimum of 30 minutes.
- Temperature in the zone not increase by more than 0.5°F
- Heat pump has not gone into defrost in the 30 minute period

If any single-zone satisfies the specified conditions, the heat pump will stop and the gas furnace is used to satisfy all heat calls for the next duration of the parameter heat pump lockout time. After the heat pump lock out has expired, the heat pump is again used as the primary heat source on the next call after the equipment has stopped.

Emergency Heat Operation - Heat Pump Systems

When the Lennox communicating thermostat emergency heat is enabled the unit will satisfy all heating demand with either gas or electric backup heat. When the Emergency Heat setting is OFF, the heat pump is used to satisfy heating demands.

Humidity Control

Refer to Lennox communicating thermostat installation and setup guide for more information on humidity control settings and operating modes.

Note, there no controls modes, while in zoning mode, to actively humidify or dehumidify, to obtain a certain dew-point or relative humidity.

Various control modes to actively humidify or dehumidify would be available when the iComfort S30 or iComfort Wi-Fi are switched to whole-home mode (non-zoning).

Soft Disable

Soft disabling is when the Lennox communicating thermostat finds an unknown control on the S30 system communication bus. The thermostat sends the unknown control a message to go into soft disable mode until the component is properly configured or removed.

Sometimes soft disable will occur when a control is being replaced. Reconfiguring the system should resolve this issue.

The Lennox communicating thermostat will not show a alert code for a soft disabled control. When soft disabling occurs only the control that has been disabled will display the blinking LED status or seven-segment display indicator. Refer to the device's installation and setup guide for further guidance.

The iComfort control with the soft disable state will indicate so as follows:

- On air handler, integrated furnace and outdoor controls, the soft disable state is display by double horizontal lines on seven segment display.
- On iHarmony damper control module the green LED will blink 3 seconds on and 1 second off.

Possible Cause

- Soft disable may occur when a control has been replaced. Reconfiguring the system should resolve this issue.
- Sometimes Lennox communicating thermostat detects a new device or an existing device or a device on the system that is not communicating with the thermostat. If this occurs, an alert code 10 is activated and the thermostat

sends a soft disable command to the offending device on the communications bus (outdoor control, IFC, AHC, EIM, or damper control module).

Re-Configure System

Use the following procedure if any controls are displaying the soft disable indicator:

1. Confirm proper wiring between all devices such as thermostat and Smart Hub.
2. Cycle power.
3. Go to the **menu** > **settings** > **advanced settings** > **view dealer control center.** Touch **proceed** to continue.
4. Select **equipment**.
5. Touch **reset**.
6. Touch **re-configure** system.
7. Select **confirm** to continue.
8. The thermostat will reboot and start through the system commissioning procedure.

Troubleshooting

Steps to follow if the damper control module is displaying the soft disable code

1. Confirm proper wiring between all devices (thermostat, damper control module, indoor and outdoor).
2. Cycle power to the control that is displaying the soft disable code.

Resetting the Thermostat or HVAC Equipment

NOTE: *Resetting the thermostat or any HVAC component will remove all parameter adjustments. The system will need to be re-commissioned.*

1. From the home screen select menu / settings / advanced settings / view dealer control center / equipment / thermostat and scroll down to reset Thermostat.
2. From the home screen select menu / settings / advanced settings / view dealer control center / equipment / reset and scroll down to reset HVAC equipment.

NOTE: *Various control modes to actively humidify or dehumidify would be available when the iComfort S30 or iComfort Wi-Fi are switched to whole-home mode (non-zoning).*

Alert Code Types

To expand a specification notification to access a more detail description of the alert code, press the down arrow to expand the description.

- **Service Urgent** alerts are displayed on Home (user) screen under the homeowner and installer alert buttons. **Service Urgent** means that a service call is needed to get the system running.
- **Service Soon / Service Urgent** means that the system will likely recover on its own and no interaction is necessary. Typically, either after a specific timer period or a specific number of instances, some **Service Soon** alerts will escalate to **Service Urgent**.
- **Service Soon** alerts are found only in under the installer alert button.
- **Information Only-Dealer** is information only and helps Lennox interpret test results and understand complicated behaviors. **Information Only** are not reported to homeowner or dealer.

Communication System: When communication controls are operating in a communication system, all jumper and link setting on controls are ignored. Jumpers and link setting are treated as defaults and would only be active if the system was converted to a non-communicating system.

Zoning Alert Codes

Table 24. Alert Codes and Troubleshooting

GF= Gas Furnace, AH=Air Handler, ID=Indoor unit (GF or AH), HP=Heat Pump, AC=Air Conditioner, OD=Outdoor Unit (AC or HP), PA=Pure Air S, ZA=Zone system and TS=Thermostat

Alert Code	Inverter Flash Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
10		Service Urgent	Unknown Device Detected	The thermostat when NOT in configuration mode has detected an unknown device. Typically the thermostat will send a command to the unknown device and place the device into a soft disable state. The soft disable control will indicate so as follows: • On air handler, furnace and outdoor controls, the soft-disabled state is displayed by double horizontal lines on seven-segment display. • On the damper control module, the green LED will flash 3 seconds on and 1 second off. • On the equipment interface module, the green LED will flash 3 seconds on and 1 second off. • A new communicating device has been added to the system since the original configuration setup was completed. • Go to **menu** > **settings** > **advanced settings** > **view dealer control center** > **equipment** and press **reset all equipment**. This will allow the system to auto-detect any Lennox communicating devices attached.	Clear alert code by reconfiguring the system.
11		Service Urgent	Missing Device	The thermostat cannot find a previously installed system component. • Check all system components (devices) connections to make sure they are Lennox communicating compatible. • Cycle system power. • If problem persists, then check all system components (devices) connections to make sure they are Lennox communicating compatible. • Go to **menu** > **settings** > **advanced settings** > **view dealer control center** > **equipment** and press **reset all equipment**. This will allow the system to auto-detect any Lennox communicating components attached.	Cycle system power, and If problem persists then clear by reconfiguring the system.
12		Service Urgent	Indoor Unit Not Detected	Thermostat did not find an indoor unit. Make sure there is an Lennox communicating indoor unit on the system. • Check for voltage and missing component. • Check **R**, **i+**, **i-** and **C** connections at mag-mount or subbase, smart hub and all attached communicating components. • Ohm wires for electrical continuity. • Cycle power to both indoor unit first and then thermostat. • Verify that equipment interface module (if applicable) is configured as either an air handler or furnace when used with a non-communicating indoor unit. • Go to **menu** > **settings** > **advanced settings** > **view dealer control center** > **equipment** and press **reset all equipment**. This will allow the system to auto-detect any Lennox communicating components attached. • Replace indoor unit control if there is no response.	Automatically clears when the system detects that the issue no longer exists.

Table 24. Alert Codes and Troubleshooting

GF= Gas Furnace, AH=Air Handler, ID=Indoor unit (GF or AH), HP=Heat Pump, AC=Air Conditioner, OD=Outdoor Unit (AC or HP), PA=Pure Air S, ZA=Zone system and TS=Thermostat

Alert Code	Inverter Flash Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
105		Service Urgent	Communication Problem	One of the system components has lost communication with the system. The system component (device) is unable to communicate. • S30 - Access dealer control center, select notifications icon, review alert code details to determine which device or unit has the communication problem. Review both active and cleared alerts. • Wi-Fi – Press and hold the Lennox logo on the bottom right of stat for 5 seconds to access the dealer control center. Follow the prompts to access the dealer / installer screen and select the “Alerts” tab. Review alert code details to determine which device or unit has the communication problem. Review both active and cleared alerts. • Zoning - Remove wire from smart hub to iHarmony control and just have wiring from furnace. **Troubleshooting:** • Check each control for additional codes • In most cases issues are related to electrical noise. Verify that high voltage power is separated from the low voltage communication wires. • Check for proper grounding on line voltage and low voltage wiring, transformer and equipment. • Check for incorrectly wired or loose or spliced connections between system components (devices or units). • Make sure all unused wires are tied together and taken back to the C terminal on the indoor control board as shown in the installation and setup guide. • Disconnect all wiring to other system components (except thermostat to indoor unit) and reconnect one device at a time and recommission system each time a device is reconnected until the issue is located. • Zoning: If zoning is installed and is wired directly from smart hub to iHarmony control then disconnect that wiring. Run control wiring from the iHarmony control directly to the indoor unit control. Wiring diagrams are provided in the iHarmony Installation and Setup Guide. • Float Switch: When using a float switch, use isolation relay to break common wire to outdoor unit. For testing purposes, remove float switch from the circuit. • Firmware and Accessories: Make sure that smart hub has correct firmware version for added accessory. (Example: Pure Air S and/or Apple Home Kit must have software version 3.4 or higher before it will connect to system properly. (If software is not updated in system it will cause system operation issues). • Inductive voltage from surrounding sources. Check each wire in AC mode to C on circuit board. > Good voltage is .03-.3VAC inductive voltage is not an issue. > Acceptable can be up to .7VAC with moderate success. > Some units have worked with up to 1.2VAC with occasional success. > Voltage over 1.2VAC needs to be addressed.	Automatically clears when the system detects the issue no longer exists.

Table 24. Alert Codes and Troubleshooting

GF= Gas Furnace, AH=Air Handler, ID=Indoor unit (GF or AH), HP=Heat Pump, AC=Air Conditioner, OD=Outdoor Unit (AC or HP), PA=Pure Air S, ZA=Zone system and TS=Thermostat

Alert Code	Inverter Flash Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
114		Service Soon/Service Urgent	AC Line Frequency / Distortion Prob	In most cases the errors will have something to do with the transformer(s) phasing, input power or output loading (amperage load). For the air handler control only, alert code 114 is generated only if the measured line frequency is below 57Hz or above 63Hz and remains out of range for 10 consecutive seconds. We count power line cycles and determine line frequency every 1 second of time based on the processor's quartz crystal oscillator. We have a fair amount of filtering on when we consider a power line cycle to have occurred, so there would have to be really bad distortion for it to count an extra cycle or miss a real cycle. Voltage low enough to miss a cycle would generate an alert code 115. There are lots of events, such as power utility substation switching, that could occasionally make our power line frequency off by one count. These are rare one-time events and I don't know anything other than a generator with bad frequency that could cause problems long enough to cause this alert code. There is a frequency / distortion problem with the power to a specific system component. This alert code may indicate transformer overloading. • Check the voltage and line power frequency. • Check the generator operating frequency, if the system is running on back-up power. • Correct voltage and frequency problems. • System will resume normal operation five seconds after fault recovered. • All applicable system component outputs are disabled – moderate condition. • After 10 minutes, the priority condition is escalated – critical condition. • Damper control module will operate in central mode only until proper voltage is restored or frequency distortion is resolved – moderate condition. • If connected to iHarmony, set damper control module transformer jumper to system transformer. Check for proper wiring. Replace 40VAC furnace transformer with 70VAC transformer. Re-commission system. ***NOTE:*** *The unitary control (outdoor unit control board) whether it is a single, two-stage or multi-stage control is not displaying alert code 114.*	
120		Service Soon	Unresponsive Device	There is a delay in the system component responding to the system. Typically this alert code does not cause any operational issues and will clear on its own. • This alert code is usually caused by a delay in the outdoor unit responding to the thermostat. • Leaking voltage from strands within the bundle. > Land only the **R** wire on the **R** terminal to load the bundle with 24VAC. ► Typically only the **R** wire needs to be landed to identify if voltage is leaking. ► If voltage is present checking the other wires is informational only but not needed. ► If voltage is not present checking the other wires one at a time would be needed. > Check each loose wire in AC mode to **C** on circuit board. ► Good voltage is .03 -.3VAC leaking voltage is not the issue. ► Acceptable can be up to .7VAC with moderate success. ► Some units have worked with up to 1.2VAC with occasional success. ► Voltage over 1.2VAC needs to be addressed.	Automatically clears after an unresponsive system component (device) responds to any inquiry.

Table 24. Alert Codes and Troubleshooting

GF= Gas Furnace, AH=Air Handler, ID=Indoor unit (GF or AH), HP=Heat Pump, AC=Air Conditioner, OD=Outdoor Unit (AC or HP), PA=Pure Air S, ZA=Zone system and TS=Thermostat

Alert Code	Inverter Flash Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
124		Service Urgent	Tstat Lost Communication To Smarthub	The thermostat has lost communication with a system component for more than three minutes. System component has lost communication with the thermostat. . • Check the wiring connections between components. • Ohm wires. • Cycle power. • Any component that is miss-wired may cause a false component code to be shown on system component. • Disconnect all wiring to other system components and check communication one at a time. ***NOTE:*** *When using a float switch, use isolation relay to break common wire to outdoor unit. For testing purposes, remove float switch from the circuit* This alert code stops all associated system operations and waits for a heartbeat message from the system component that is not communicating.	Automatically clears after communication is re-established with applicable system component (device).
125		Service Urgent	Control Hardware Problem	There is a hardware problem on a system component control. There is a control hardware problem. • In system using iHarmony zoning, the system will remain in non-zone mode (all dampers open) for five minutes after priority condition no longer exist. • In systems using a Equipment Interface Module, remove jumper if present on indoor unit between **R** and **W2**. • In systems using a PureAir *S*, the pure air control board jumper selector is missing. If none of the above tips are applicable, then replace the control if the problem prevents operation and is persistent.	Automatically clears five minutes after the issue no longer exists.
126		Service Urgent	Control Internal Communication Prob	There is an internal hardware problem on the system component control. In addition, if you have zoning the alert code is triggered when your zone temperature is deviating away from set point persistently. • Typically the system component control will reset itself. • Replace the system component (device) control if the problem prevents operation and is persistent.	Automatically clears 300 seconds after the issue no longer exists.
132		Service Urgent	Device Control Software Fault	System component control software is corrupted. • Recycle power. • If failure re-occurs, replace the system component control.	Manual system power reset is required to recover from this alert code.

Table 24. Alert Codes and Troubleshooting

GF= Gas Furnace, AH=Air Handler, ID=Indoor unit (GF or AH), HP=Heat Pump, AC=Air Conditioner, OD=Outdoor Unit (AC or HP), PA=Pure Air S, ZA=Zone system and TS=Thermostat

Alert Code	Inverter Flash Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
250		Service Soon	GF Primary Limit Switch Open	The furnace primary limit switch is open. If limit switch is not closed within three minutes, the unit will go into a 60 minute soft lockout (Watchguard mode). Perform the following: • Check for high gas pressure. • Check for low supply air. Low supply air due to being plugged or restriction in system (example: dirty air filter or blockage in duct work). • Check for proper firing rate on furnace. • Check for non-functioning zone dampers. ***NOTE:*** *Limit trips will place the iHarmony zoning system into non-zone mode.* ***NOTE:*** *See ACC-14-01 for further details.*	Automatically clears when a heat call ends successfully. ***NOTE****: If this issue occurred on an iHarmony zoning system, the field will need to manually activate the zoning.*
252		Service Soon	ID Discharge Air Temperature High	A discharge air-temperature is high. Perform the following: • Check temperature rise, air flow and input rate. • Check for dirty air filter(s). ***NOTE:*** *See Service and Application Note ACC-14-01 for further details.*	Automatically clears when a heat call ends successfully.
310		Service Soon	Discharge Air Temp Sensor Problem	There is a discharge air temperature sensor issue. • Confirm there is no short or open circuits in the Lennox communicating thermostat connections to any of the other components in the communication system. • Compare discharge air temperature sensor (DATS) resistance to temperature / resistance charts in system component installation instruction. • Replace discharge air sensor if necessary. ***NOTE:*** *Issues with a DATS connected to a damper control module or equipment interface model will not generate an alert code.*	Automatically clears 30 seconds after condition is detected as recovered or after system restart.
530		Service Soon	ZS Low Damper 24VAC Voltage	• Check 24VAC voltage to all dampers. • Check 24VAC damper transformer. • Check connections.	Replace transformer if applicable.
532		Information Only-Dealer	ZS Zoning Pressure Switch Opened (High Pressure)	Zoning Pressure Switch Opened (high pressure). • Compressor pressure is above the specified limit. • Compressor is turned off. • Zoning will be restored once the high pressure switch closes. Occasionally we get this with an AC system and the fix is to just jump out the pressure switch terminals on the damper control module board.	Automatically clears after compressor pressure is within limits.

Table 24. Alert Codes and Troubleshooting

GF= Gas Furnace, AH=Air Handler, ID=Indoor unit (GF or AH), HP=Heat Pump, AC=Air Conditioner, OD=Outdoor Unit (AC or HP), PA=Pure Air S, ZA=Zone system and TS=Thermostat

Alert Code	Inverter Flash Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
542		Service Soon	ZS Zone 1 Temp Sensor Fault	Possible Causes: • Zone temperature sensor reading out of range. • Check for loose or incorrectly wired connections at the zone sensor or damper control module terminals. • Open or short zone temperature sensor detected for more than five second. • More than one zone sensor has the same assigned zone number. Check zone sensor(s) zone number assignment. System Response: • Both types of zone sensors will display "--" as the indoor temperature on the main screen. • Damper control module will operate in central mode (all dampers open) in both moderate and critical priority conditions. • If after 10 minutes the condition does not change, the applicable alert code (542, 543, 544 or 545) is escalate by the Lennox communicating thermostat to critical. System will continue to operate in central mode. • At the Lennox communicating thermostat, only zone 1 screen will be available. ***NOTE:*** *The Lennox communicating thermostat will display the alert code as "Problem (Zoning Control)". Email notifications will describe the issue as " Zone "X" Temp Sensor Problem.*	Automatically clears 30 seconds after condition no longer exist.
543		Service Soon	ZS Zone 2 Temp Sensor Fault		
544		Service Soon	ZS Zone 3 Temp Sensor Fault		
545		Service Soon	ZS Zone 4 Temp Sensor Fault		
546		Service Soon	ZS Parameters resetting from restored power	An EEPROM is a memory device that stores and remembers the information even after power has been removed from the device. It saves settings that the user might have selected like to desired heating and cooling temperatures. When power is removed and then comes back on, the zone sensors (or thermostat for zone 1) remembers what the users setting were. Code 546 is given if the zone sensor notices that the EEPROM has an issue right after power is first applied. The system will set itself to energy save mode and continue to operation	Zone sensor will have to be replaced.
547		Service Soon	ZS Parameters resetting from system interruption	An EEPROM is a memory device that stores and remembers the information even after power has been removed from the device. It saves settings that the user might have selected like to desired heating and cooling temperatures. When power is removed and then comes back on, the zone sensor remembers what the users setting were. Code 547 is given if the zone sensor notices that the EEPROM has an issue sometime later after the product has been on for a while. It will not raise the issue until it needs to again read from the EEPROM memory when it is first powering to retrieve the necessary information. System will operate in a normal mode operator until power off.	Zone sensor will have to be replaced.
548		Service Soon	ZS Humidity Sensor Error	Without humidifiers or dehumidifiers, sensor reads out of range 0% to 100%. This message indicates humidity sensor has malfunctioned.	Zone sensor will have to be replaced or if sensor auto corrects itself the alert will be automatically cleared and system will return to normal operations.
551		Service Soon	ZS Zone Sensor Lost Communication	Any lost communication between any zone sensor and the damper control module will result in applicable alert code(s) being displayed (543, 544 or 545) at the thermostat. • A pop-up display on the thermostat will appear indicating a communication error. • Indoor temperature for the specific zone in error will displayed as "--" on the home screen. • When any zone sensor loses communication with the damper control module, the entire system will go into central mode (single temperature control). Check for loose, damage or incorrect wiring between damper control module and the zone sensor reporting alert code 551.	Once communication is reestablished the zone sensor will return to normal zone operations.

Table 24. Alert Codes and Troubleshooting

GF= Gas Furnace, AH=Air Handler, ID=Indoor unit (GF or AH), HP=Heat Pump, AC=Air Conditioner, OD=Outdoor Unit (AC or HP), PA=Pure Air S, ZA=Zone system and TS=Thermostat

Alert Code	Inverter Flash Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
--		Service Soon	--	Possible loose or mis-wired connections or two zone sensors are assigned the same zone number. Two dashes will be displayed on the S30 thermostat for indoor temperature and/or zone sensor. The system will go into central mode. Individual zone functions is disabled. Anytime the zone sensor loses communication with the damper control module, the entire system will go into central mode. If two sensors are assigned the same zone number, this could result in the double dashes to appear as well.	If two zone sensors are assigned the same zone number, this could cause the double dashes to appear. If loose or mis-wired connection was confirmed, correct the issue and run the re-configuration procedure.

iHarmony Zoning

Airflow Setup Procedure by Static Pressure Worksheet

Job Name: _____ Date: _____

Dealer Name: _____ Technician: _____

1. Furnace: _____

2. Condensing Unit: _____

3. Indoor Coil: _____

4. How is the return connected to the furnace? _____

5. Total System CFM with all zones open:

a. Cont: _____ Heat: _____ Cool: _____

b. Highest fan speed – Supply SP: _____ Return SP: _____ TESP: _____

6. Zone CFM: Continuous Heat Cool

a. Z-1 Name: _____ CFM: _____ _____ _____

Highest fan speed – Supply SP: _____ Return SP: _____ TESP: _____

b. Z-2 Name: _____ CFM: _____ _____ _____

Highest fan speed – Supply SP: _____ Return SP: _____ TESP: _____

c. Z-3 Name: _____ CFM: _____ _____ _____

Highest fan speed – Supply SP: _____ Return SP: _____ TESP: _____

d. Z-4 Name: _____ CFM: _____ _____ _____

Highest fan speed – Supply SP: _____ Return SP: _____ TESP: _____