

## **SMART DUCT TRAINING**

Jonathan William Sep 12, 2019 Estimated Time – 45 Minutes

### Why we developed Smart Duct?

**Common Builder Issues** 

**Uneven Temperatures** 

**Equipment too Noisy** 

**Moisture / Condensation Problems** 

**LEAKY DUCTS ADD TO THESE PROBLEMS** 









#### Why we developed Smart Duct?

**Builders Asked For** 

Low Btu variable speed gas furnace

Needed to perform at lower Btu than designed HL

Look more like a household appliance

Easy to install / service / common parts









## What is Smart Duct?

Low-Medium Velocity Duct System

**Modulating Gas/Propane or Electric Furnace** 

#### **Optional Heat Pump**

Long Cycles w/ Continuous low-velocity airflow

6" or 8" Round Main Supply Trunks

2 <sup>1</sup>/<sub>2</sub>" Heat Runs Using Flexible Duct



## Who's Using It?



- Ideal application for :
  - High-Performance Builders
  - Net-Zero / Net-Zero Ready Builders
  - Townhomes / Low-Rise Condos
  - Home Additions (basement development, in-law suite, garage)
  - Modular (RTM) Builders







## What furnaces does it work with?



CC15-M-V C15-M-V C15-M-S C30-M-V C30-M-S

C45-M-V C45-M-S C60-M-V C75-M-V

# SUPREME

SUP10-M240V12 SUP15-M240V12 SUP18-M240V12 SUP20-M240V12 SUP20-M240V20

Only modulating models

### Why Variable-Speed is Necessary?



#### **Modulation = Long Cycles = Comfort** Mild Days: 0°C to -5°C (25°F- 32°F) 2-Day Period The furnace comes on when during the night when it gets cold. Modulation (%) / Temperature (°C) 50 40 ... and turns off 30 when the sun comes into the 20 house. 10 0

-10 05.00

4h.48

9h 36

146-24

19h12

0 h 00

4 h - 48

9h 36

14h24

19512

0h(

### Modulation = Long Cycles = Comfort

#### Colder Days: -20°C to -5°C (-4°F to 23°F)

2-Day Period



## What AC does it work with?



ACD

COND-09 COND-12 COND-18 COND-24 COND-30 COND-36

ELD Models OCD Models UHD Models

## How is it designed?



#### In-House duct design

- We require house plans & room by room heat loads
- We provide the duct design with complete material list
- Typical turnaround time is 1-2 days

PRODUCT	PRODUCT CODE	UNITS	DESCRIPTION
Chinook gas furnace	CC015-M-V	1	15,000 BTU Modulating gas Furnace (Chinook Compact)
Alizé heat pump	COND-12-01	1	Alizé outdoor Heat pump Unit 12,000, Includes Dettson Interface K03066
A coil - evaporator	CC1.0-10-M	1	Indoor cooling coil – 1 Ton
Thermostat	R02P032	1	Communicating thermostat
Saddle	B40705	0	6" Saddle
Saddle	B40706	15	8" Saddle
15' Flex	Z13I012		Packet of 15' of flex 2,5" dia. Duct
25' Flex	Z13I008	8	Packet of 25' of flex 2,5" dia. Duct
90 <sup>°</sup> collar	B40736	15	Collar attaching the Smart duct to the wall
Diffusor	B40708	15	Screwed to the collar on the face of the wall
Construction Cap	B40759	15	Installed to the collar temporarily during construction to block for debris
Diffuser Restrictor	B40701	15	Grid Restrictor



## How is it designed?



#### Feedback from builder & contractor is critical

#### Static Pressure

- We design with limit of 1.4" wc at supply / -0.2" at return
  - This limit sets max CFM at each diffuser at 33 (@ 12' of flex)
- We anticipate max airflow to occur less than 5% of the time.
  - System will typically run between 0.3" and 0.8" wc at supply / 0.2" and 0.6" at trunks.

## How is it designed?



#### Notes

Diffusers are usually on the inside wall, 6" from the ceiling.

- You can install ceiling diffusers when necessary, but it's usually not necessary.
- The distance between diffusers in each room doesn't matter ... most of the time.
- All ductwork needs to be in conditioned space.



- Main Trunks
  - 6" or 8" round
  - 6" 250 CFM / 8" 430 CFM
  - Max equivalent length of 150'
  - 29 gauge minimum
  - Must be installed in conditioned space





#### Saddles

- 2 Types: Straight & 45°
- 6" (black) and 8" (grey)
- Drill 2.5" hole into trunk
- Screw flex into saddle
- Screw saddle into trunk w/ self-tapping screws
- No sealing is required



B40705 – 6" Saddle B40706 – 8" Saddle

### • 2.5" Uninsulated Flex

- Approved as UL 181, Class 1
- Min length 7'
- Max length 25'
- Flex comes as 15' or 25'
  piece and ships in quantities
  of 8
- Installed within conditioned space



Z13I008 – 25" Flex Z13I012 – 15" Flex

#### Collars

- Screw flex directly into collar
- Collar screws directly onto
  - stud behind drywall







B40736-90° Collar

- Construction Cap
  - Prevents debris from
    - entering
  - 4" hole should be cut in drywall

#### Diffuser

- Screws into collar after
  - install.
- Paintable.
- Adjustable diffuser offered soon.

B40708 – Diffuser

#### Restrictor

- Used on rooms with minimal
  - HLHG but require a heat run
  - by code
- Pops into the diffuser hole.
- Can used to block diffuser entirely, or for 1/3 or 2/3 of the CFM.











## Zoning

- 2, 3 or 4 zones
  - Can only be installed with Smart Duct
  - Connects to 8" trunk
  - Simple plug and play installation
- Each stat wires into zoning control, which connects to furnace board.
- No dump zone

## Zoning

- Each zone operates as a 2-stage and any 2-stage thermostat will work.
- Plenum is included in zoning package and has 8 pre-cut holes



### Thermostats

Modulating Chinook / Supreme requires our



 Except when you use Smart Duct Zoning.
 – Each zone operates as 2-stage so any 2-stage stat will work.

### Return Air



- Sized as per normal standards
- We do not require returns in every room
- We recommend low return in basement, high return in upper floors.
- Max static pressure of the return should be designed at -0.2" wc
- We recommend not to put returns directly above or below a diffuser



### **ALTERNATIVE TO GAS**

SUPPEME

# SUPREME

Modulating Electric Furnace down to 5% of capacity

#### Pairs with Alize heat pump

5kW – 23kW Models are Smart Duct Compatible

#### **HOMEOWNER BENEFITS**

#### **De-stratification**

Lower energy consumption

#### Quieter system

More floor space

#### Healthier home





#### **BUILDER BENEFITS**

#### Less soffits

Consistent installs from home to home

#### Less call-backs



Code change friendly



#### **INSTALLER BENEFITS**

# Less intensive installation

#### Labor savings

#### Duct design provided

Designed prebalanced





### **Solution** AVAILABLE RESOURCES

Dettson Background - http://bit.ly/DettsonBackground

Chinook - <u>http://bit.ly/ChinookOverview</u> Chinook Compact - <u>http://bit.ly/ChinookCompactOverview</u> Quick Overview - <u>https://youtu.be/PIMALOuGyDE</u> Recent Install for Habitat for Humanity - <u>https://youtu.be/7-HiuWsmjhc</u> Homeowner Testimonial - <u>http://bit.ly/HomeownerReview</u> Sell Sheets / Brochures - <u>http://bit.ly/ChinookUSA</u> AHRI Listings - <u>http://bit.ly/ChinookAHRI</u>

#### **Industry Articles:**

We Are the 99% — Design Temperatures & Oversized HVAC Systems - <u>http://bit.ly/EV99Percent</u> Choosing HVAC Equipment for an Energy-Efficient Home - <u>http://bit.ly/GBAChooseEquipment</u> AC Sizing Rules of Thumb Must Die - <u>http://bit.ly/OversizingAC</u>

