



# Up to 18 SEER Smart Variable Speed Ducted Split Heat Pump

## Quick Start-up Guide



# Smart Variable Speed (SVS) Ducted Split Heat Pump and Fault Detection and Diagnostics(FDD) Device

The InverterCool Smart Variable Speed (SVS) heat pump is one of the industry's most innovative and efficient systems, with ratings up to 18 SEER and 10 HSPF per AHRI standard 210/240-2017. With InverterCool's patented technology, the SVS heat pump automatically adjusts itself while maintaining constant and consistent speeds to avoid temperature swings.

Compared with fixed speed systems, InverterCool SVS system have a much wider capacity range which helps to achieve faster heating and cooling. With more than 30 variable stage settings, InverterCool SVS system provide more accurate and efficient temperature control while using less energy.

With the Fault Detection and Diagnostics(FDD) device, InverterCool provides an easy way for dealers to help their customers complete registration via InverterCool FDD App in just minutes. Then dealers can monitor the units' live data and perform remote field settings for the condensing unit. Working alongside the InverterCool Service Team, the dealer can guarantee installation and servicing quality.

## Features

- Up to 18.0 SEER and 10.0 HSPF
- Variable Speed Compressor (25%-110% speed)
- 24x7 Fault Detection and Diagnostics(FDD) service\*
- 9 Speed ECM outdoor unit blower
- Easy to install – compatible with most traditional 24V AC thermostats
- AUTO charge mode to make accurate refrigerant coefficient for the system
- Back-up running for maximum 2 failed sensors
- 10-year Residential Limited Parts Warranty\*\*
- 10-year Labor Warranty\*\*



\*FDD service provide monitoring your HVAC system in real time so that our installer can remotely view how your system is performing. We will send you a notice if the system doesn't run well and make an appointment for a site-check under your permission. An agreement need to be signed by the home owner before we provide such service.

\*\*Residential: To receive 10-Year Parts Limited Warranty and 10-year Labor Warranty, online registration must be completed within 60 days of installation, otherwise 5-Year will be applied for Part Limited Warranty and Labor Warranty . Online registration is not required in California or Quebec.

Commercial: 3-Year Parts Limited Warranty ONLY.

# Specification

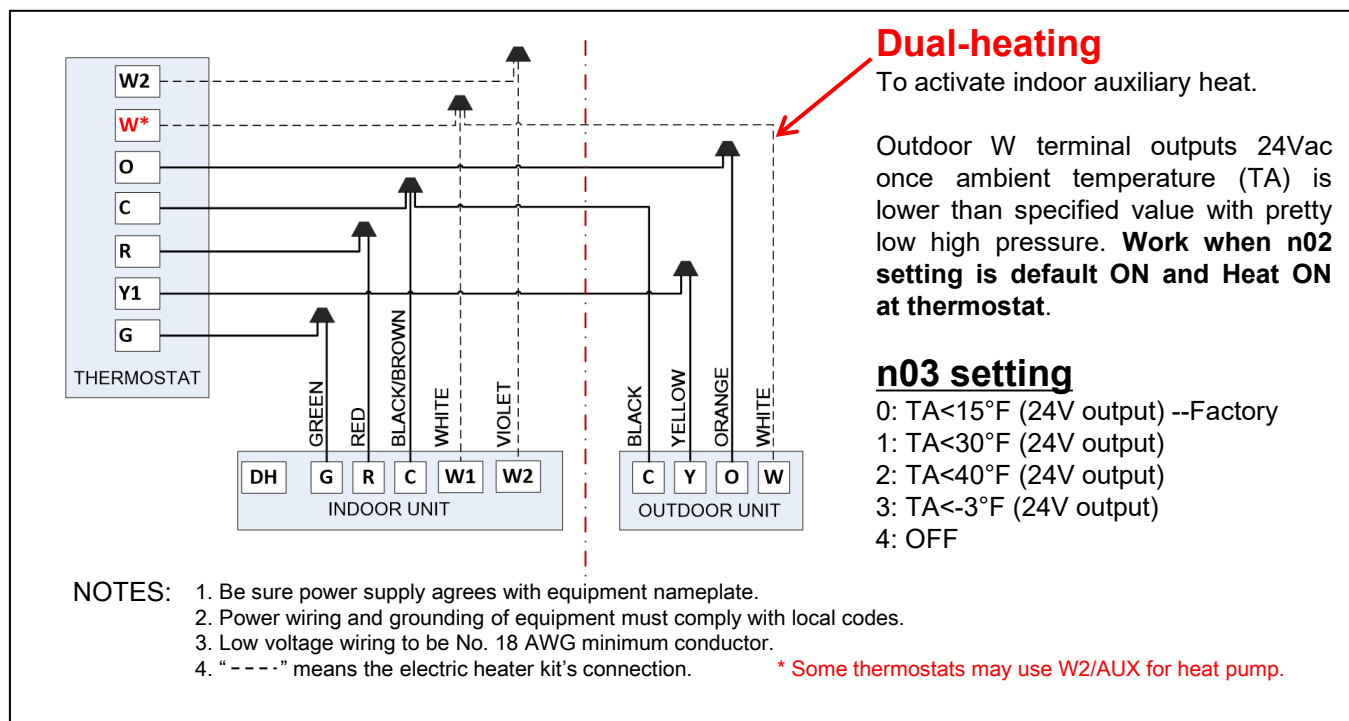
Outdoor Unit Model	Description
G910L	Fault Detection and Diagnostics(FDD) Device
COH16S-36AAA	36 kBtu/h (3Ton), Heat Pump
COH16S-60AAA	60 kBtu/h (5Ton), Heat Pump
CVTAN-24AA	24 kBtu/h (2 Ton), Air Handler Unit
CVTAN-36AA	36 kBtu/h (3 Ton), Air Handler Unit
CVTAN-48AA	48 kBtu/h (4 Ton), Air Handler Unit
CVTAN-60AA	60 kBtu/h (5 Ton), Air Handler Unit

Outdoor Unit	Indoor Air Handlers	Cooling Performance			Heating Performance			CFM
		Total	EER (2)	SEER (1)	High	HSPF (3)	Low	
COH16S-36AA	CVTAN-24AA	23,600	12.5	18.0	24000	10.00	21000	850
COH16S-36AA	CVTAN-36AA	34,200	10.0	17.0	35,000	10.00	24000	1200
COH16S-60AA	CVTAN-36AA	35,000	12.5	18.0	35,400	10.00	30000	1200
COH16S-60AA	CVTAN-48AA	45,000	11.2	16.5	46,000	10.00	35000	1500
COH16S-60AA	CVTAN-60AA	54,000	10.0	16.0	54,000	9.50	40000	1700

\* Certified per AHRI 210/240-2017

(1) Seasonal Energy Efficiency Ratio; (2) Energy Efficiency Ratio @ Afull; (3) Heating Seasonal Performance Factor

# Wiring Diagrams



# Line Sets and Charging

The InverterCool SVS heat pump is factory pre-charged for 25ft of standard size line set and for the smallest rated indoor coil combinations. Up to 100ft of line set is allowed with a maximum of 50ft lift (see below).

Capacity Model	Liquid Line	Suction Line	Total Equivalent Length (FT)			
			25	50	75	100
	Dimensions in inches		Maximum Elevation Difference (FT)			
2Ton	3/8 Std.	3/4 Std.	25	50	45	40
	1/4 Opt.	5/8 Opt.	25	50	40	30
3Ton	3/8 Std.	3/4 Std.	25	50	50	50
	1/4 Opt.	5/8 Opt.	25	50	45	40
4Ton	3/8	7/8 Std.	25	50	50	40
		3/4 Opt.	25	50	50	40
5Ton	3/8	7/8 Std.	25	50	50	40
		3/4 Opt.	25	50	50	40

\* Standard line set is recommended, N/A: Not allowed

Refrigerant charge is suggested to be done by the following methods:

## (1) Charge by Weigh-In

This method can be used for the initial installation, or anytime a system charge needs to be replaced. This method can be used when power is not available on the job site or the ambient temperature is improper to use refrigerant coefficient and sub-cooling. A refrigerant adjustment may be necessary if the line set length is over or under the pre-charged 25ft (adding or removing 0.6 oz/ft on 3/8 liquid line respectively). An additional amount of refrigerant adjustment may be required for a large indoor coil.

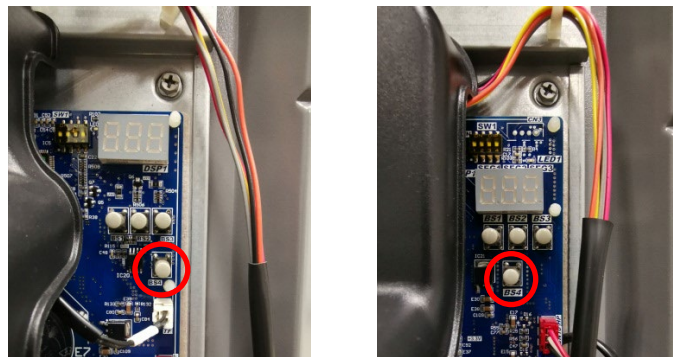
## (2) Charge by Refrigerant Coefficient

Ambient temperature must be between 50°F and 120°F and indoor temperature must be kept between 70°F and 80°F.

After starting the system in cooling mode, **Press and hold BS4 button for five seconds** until SEG1 displays **blinking 7**, and operate the system for a minimum of 20 minutes.

Check refrigerant coefficient number (here short for “X”,  $0 < X < 1$ ) on the display. If  $X > 0.6$ , remove refrigerant; or  $X < 0.4$ , add more refrigerant. Then wait for 5 minutes to allow pressure balanced. Check the new coefficient number to make sure you get 0.5. Basically, 0.4 to 0.6 is acceptable if  **$SH \leq 20$  °F**.

When the LED displays “--” for more than 20 minutes, adjust the TXV opening to ensure required compressor suction superheat ( **$SH > 7$  °F**).



COH16S-36AAA

COH16S-60AAA



Exit Charge Mode: **Press BS4 once** or **After 2 hours running** or **Turn off the system at thermostat**

# Control Board Settings

In most scenarios, it is recommended to keep all outdoor unit board dip switch positions in their manufacturer default positions. There are some specific scenarios when it makes sense to change dip switch settings.

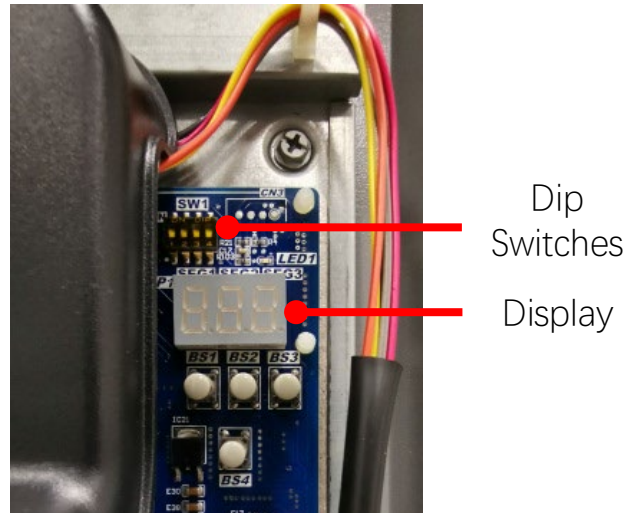
## Dip Switch SW1

SW1-1 is not used and should remain in the factory default position at all times.

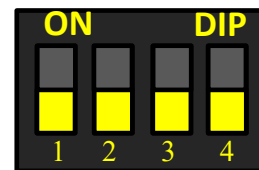
SW1-2 selects Tonnage of the condensing unit.

SW1-3 sets Air Conditioner or Heat Pump

SW1-4 is suggested to remain in the factory default position (OFF). FDD command responses such as remote field setting, troubleshooting, software programming etc. only work when this switch remains in the OFF position.



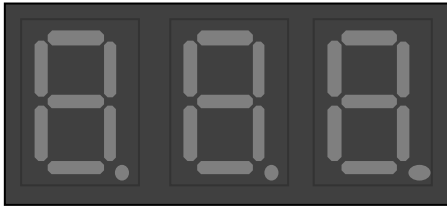
**SW1**



Use minor straight screwdriver to dial.

**Must power off the unit for at least two (2) minute to activate your dial of switches.**

SW1 Dip switch		Description	
No.	Setting item	Status	Content
1	Reserved	N/A	N/A
2	Capacity selection	ON	2 or 4 Ton
		OFF (factory)	3 or 5 Ton
3	AC only / Heat pump	ON	AC only
		OFF (factory)	Heat pump
4	Command response for FDD	ON	No
		OFF (factory)	Yes

**SEG1 SEG2 SEG3**

Display

**SEG1: Normally blank**

SEG1	Description
0	Software is updating via FDD device
1	High pressure sensor (HP) backup running
2	Low pressure sensor (LP) backup running
3	Compressor discharge temperature sensor (TD) backup running
4	IPM module temperature sensor (TF) backup running
5	Ambient temperature sensor (TA) backup running
6	Defrost sensor (TH) backup running
7	Compressor suction temperature sensor (TS) backup running
8	Liquid line temperature sensor (TL) backup running
9	FDD command response

**SEG2: Normally blank**

SEG2	Description
0	Running under high pressure limit
1	Running under low pressure limit
2	Running under discharge temperature limit
3	Running under IPM module temperature limit
4	Running under compressor current limit

**SEG3: Normally shows operation mode**

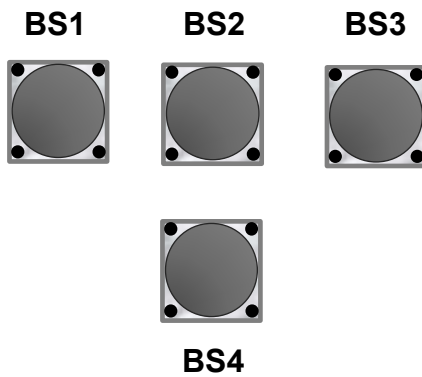
SEG3	Description
0	Stop (No Y signal)
1	Ready to start-up
2	Cooling
3	Heating
4	Oil return
5	Defrost
6	Manual defrost
7	AUTO charge mode in cooling
8	Pump down in heating

**SEG2 and SEG3: Show following codes when system is in fault****Code Description**

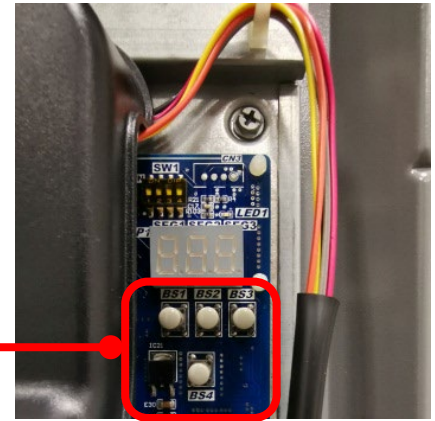
P1	High pressure protection
E1	System locks up when P1 has occurred six times in 3 hrs.
P2	Low pressure protection in cooling mode
E2	System locks up when P2 has occurred six times in 3 hrs
P3	Compressor discharge temperature (TD) protection
E3	System locks up when P3 has occurred six times in 3 hrs
P4	Compressor discharge temperature (TD) sensor error
P5	Inverter module temperature (TF) protection
E5	System locks up when P5 has occurred six times in 3 hrs
P6	Compressor over-current protection
E6	System locks up when P6 has occurred six times in 3 hrs
P7	Liquid slugging protection
E7	System locks up when P7 has occurred three times in 5 hrs
P8	Low compressor voltage protection
E8	System locks up when P8 has occurred three times in 1 hr
P9	Incorrect compressor line sequence
PA	DC fan motor over-load protection
F1	Ambient temperature (TA) sensor fault
F2	Compressor suction temperature (TS) sensor fault
F3	Liquid line temperature (TL) sensor fault
F4	Defrost temperature (TH) sensor fault
F5	Compressor discharge temperature (TD) sensor fault
F6	Inverter module temperature (TF) sensor fault
F7	High pressure (HP) sensor fault
F8	Low pressure (LP) sensor fault
E4	Communication fault between main chip and INV drive chip
H1	Ambient temperature limit operation in cooling
H2	Ambient temperature limit operation in heating
H3	Abnormal switch alarm for reversing valve
H4	Defrost temperature (TH) sensor error
H5	EEPROM fault
H6	Low voltage alarm
HF	Abnormal function control
C0-CC	Compressor INV module protection
E0	System locks up when C0~CA has occurred three times in 1 hr

**Troubleshoot based on service manual, or via InverterCool FDD App.**





Buttons



## BS1 Button - “Menu” or “Back” button

Shortly press “BS1” to query settings

- n00: Mode choice (Energy Saving, Dry, High Capacity)
- n01: Prohibited heat pump running temperature
- n02: Turn ON/OFF W output
- n03: W output settings
- n04: Defrost Mode (Heavy/light snow, standard)
- n05: Silent Mode (level 1 or 2, night silent level 1 or 2)
- n06: Night Silent Start Hour
- n07: Night Silent End Hour
- n08: Manual Defrost

Press and hold “BS1” for 5 seconds to set above functions (n01 to n08). Refer to install or service manual for details. You can change these settings besides n08 via InverterCool FDD App.

## BS2 Button - “UP” button

## BS3 Button - “Spot check” and “Confirm” button

1. After first pressing on the “BS3” button, it will display the sequence, and after 1 second it will display the value of the parameter.
2. After 20 seconds on same parameter, display will revert back to normal status.

Key parameters can be remotely monitored via InverterCool Smart Service Pro App.

## BS4 Button

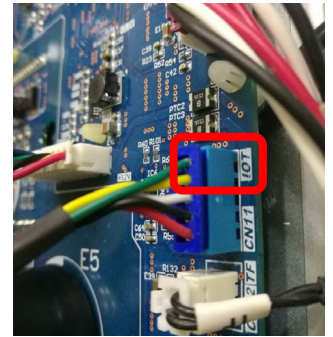
Press and hold “BS4” for 5 seconds to enter AUTO charge mode by coefficient number in cooling or pump down in heating.

No.	Spot check content via BS3
Default	Refer to default display instructions
01-	Outdoor unit type and capacity
02-	Liquid line sub-cooling
03-	Compressor suction superheat
04-	Compressor speed
05-	Electronic expansion valve opening
06-	Step of fan
07-	Low pressure (LP sensor)
08-	High pressure (HP sensor)
09-	Outdoor ambient temp. (TA)
10-	Compressor suction temp. (TS)
11-	Compressor discharge temp. (TD)
12-	Defrost sensor temp. (TH)
13-	Liquid line temp. (TL)
14-	Inverter module temp. (TF)
15-	Target evaporating temp. (Tes)
16-	Current evaporating temp. (Te)
17-	Target condensing temp. (Tcs)
18-	Current condensing temp. (Tc)
19-	Compressor DC current
20-	Undercharged refrigerant signal
21-	Main software version
22-	Inverter software version
23-	Current fault
24-	The last fault
25-	Fault before the last fault

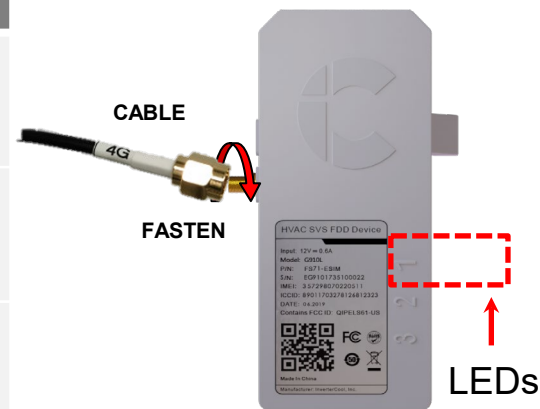
# FDD Connection and Registration

Hook the FDD device on the shell of control board inside the condensing unit, make sure it cannot move. Unscrew the cable locker cap and fasten the waterproof joint based on the FDD install guide.

Plug the male blue terminal of FDD device into CN11 (FDD) connector on main control board of condensing unit. **Power ON the condensing unit and check if the FDD device is working properly.** The normal working state of FDD device should be the blue LED (No.1) is blinking with other LEDs light OFF.

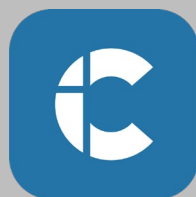


No.	Color	Indications	Description	
1	Blue	FDD Device status	Always OFF Always ON Blinking	Power off Booting Running
2	Red	LTE Status	Always OFF Always ON Blinking	LTE connected Booting LTE disconnected
3	Green	Connection to PCB	Always OFF Always ON Blinking	Local link connected Booting Local link disconnected



## Get the InverterCool FDD App

Download or update the InverterCool FDD App free on the App Store or Google Play.



## Steps of warranty registration

1. **Create an InverterCool account**
2. **Add Unit (Register a new HP)**
  - Sign an agreement with homeowner
  - Scan/Input serial numbers to submit





# About InverterCool

InverterCool (IC) is a technology company that centers its core competence and offering around the patent based Full-Fledged Inverter Control residential HVAC system. Bundled with world-class FDD (Fault Detection and Diagnostics) option, we offer consumers One-Stop Shop variable-speed HVAC system purchase, installation and maintenance (PIM) and guarantee their best experience.

Our mission is to provide consumers with Peace of Mind through higher quality product at lower Total Ownership Cost (TOC – comprised of costs of purchase, installation, service/maintenance and life-time electricity consumption). We make every effort to give our customers the best user experience, whether it's pre-, on or after sales.

©2022 InverterCool, Inc.  
6611 NW 84th Ave, Miami, FL 33166  
Tel: 1 (855) 632 0620  
[www.invertercool.com](http://www.invertercool.com)