
Sigler
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MINI-SPLIT HANDS ON!
Michael Sardina
Sigler
Wholesale Distributors

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Sigler
Wholesale Distributors
Home
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INFINITY SERIES
Carrier
Turn to the experts
Available Only to
Carrier Dealers
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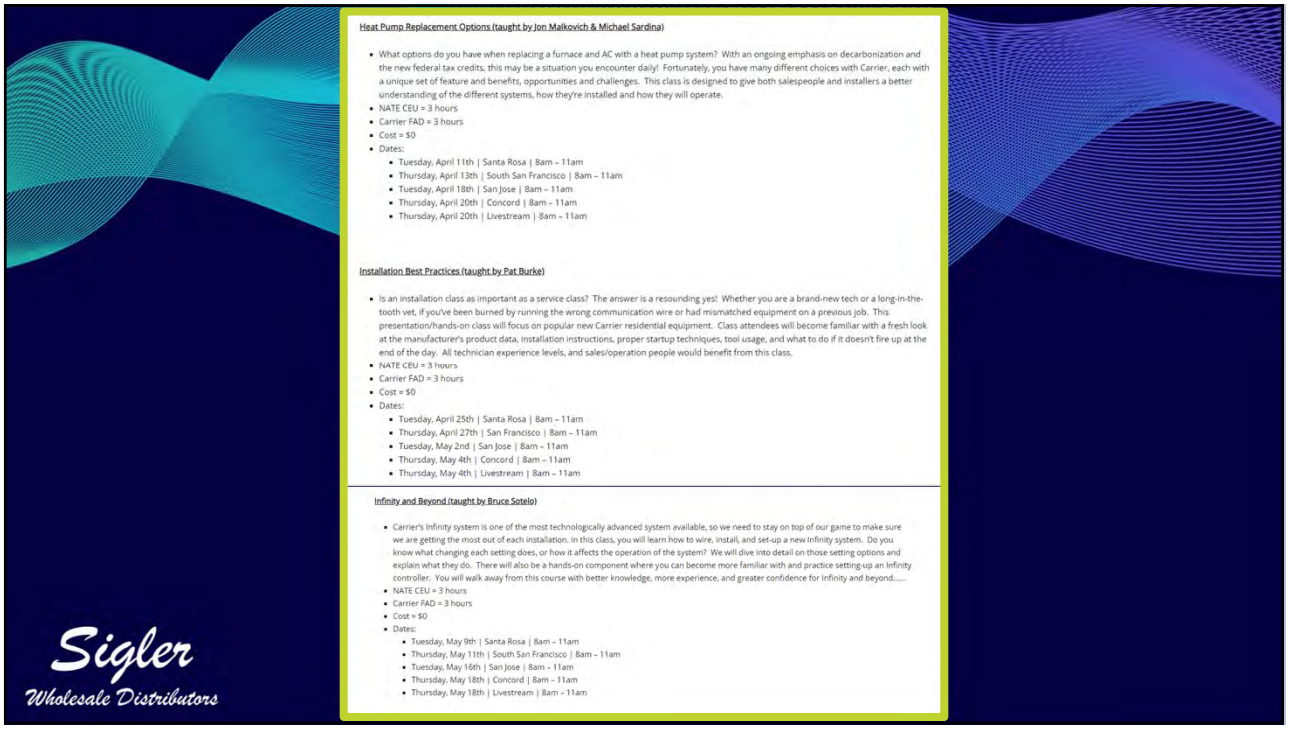
SIGLERNORCAL.COM/TRAINING

3


Heat Pump Replacement Options (taught by Jon Malkovich & Michael Sardina)
What options do you have when replacing a furnace and AC with a heat pump system? With an ongoing emphasis on decarbonization and the new federal tax credits, this may be a situation you encounter daily! Fortunately, you have many different choices with Carrier, each with a unique set of feature and benefits, opportunities and challenges. This class is designed to give both salespeople and installers a better understanding of the different systems, how they're installed and how they will operate.
NATE CEU = 3 hours
Carrier FAD = 3 hours
Cost = $0
Dates:
Tuesday, April 11th | Santa Rosa | 8am – 11am
Thursday, April 13th | South San Francisco | 8am – 11am
Tuesday, April 18th | San Jose | 8am – 11am
Thursday, April 20th | Concord | 8am – 11am
Thursday, April 20th | Livestream | 8am – 11am
Installation Best Practices (taught by Pat Burke)
Is an installation class as important as a service class? The answer is a resounding yes! Whether you are a brand-new tech or a long-in-the-tooth vet, if you've been burned by running the wrong communication wire or had mismatched equipment on a previous job. This presentation/hands-on class will focus on popular new Carrier residential equipment. Class attendees will become familiar with a fresh look at the manufacturer's product data, installation instructions, proper startup techniques, tool usage, and what to do if it doesn't fire up at the end of the day. All technician experience levels, and sales/operation people would benefit from this class.
NATE CEU = 3 hours
Carrier FAD = 3 hours
Cost = $0
Dates:
Tuesday, April 25th | Santa Rosa | 8am – 11am
Thursday, April 27th | San Francisco | 8am – 11am
Tuesday, May 2nd | San Jose | 8am – 11am
Thursday, May 4th | Concord | 8am – 11am
Thursday, May 4th | Livestream | 8am – 11am
Infinity and Beyond (taught by Bruce Sotelo)
Carrier's Infinity system is one of the most technologically advanced system available, so we need to stay on top of our game to make sure we are getting the most out of each installation. In this class, you will learn how to wire, install, and set-up a new Infinity system. Do you know what changing each setting does, or how it affects the operation of the system? We will dive into detail on those setting options and explain what they do. There will also be a hands-on component where you can become more familiar with and practice setting-up an Infinity controller. You will walk away from this course with better knowledge, more experience, and greater confidence for Infinity and beyond.....
NATE CEU = 3 hours
Carrier FAD = 3 hours
Cost = $0
Dates:
Tuesday, May 9th | Santa Rosa | 8am – 11am
Thursday, May 11th | South San Francisco | 8am – 11am
Tuesday, May 16th | San Jose | 8am – 11am
Thursday, May 18th | Concord | 8am – 11am
Thursday, May 18th | Livestream | 8am – 11am
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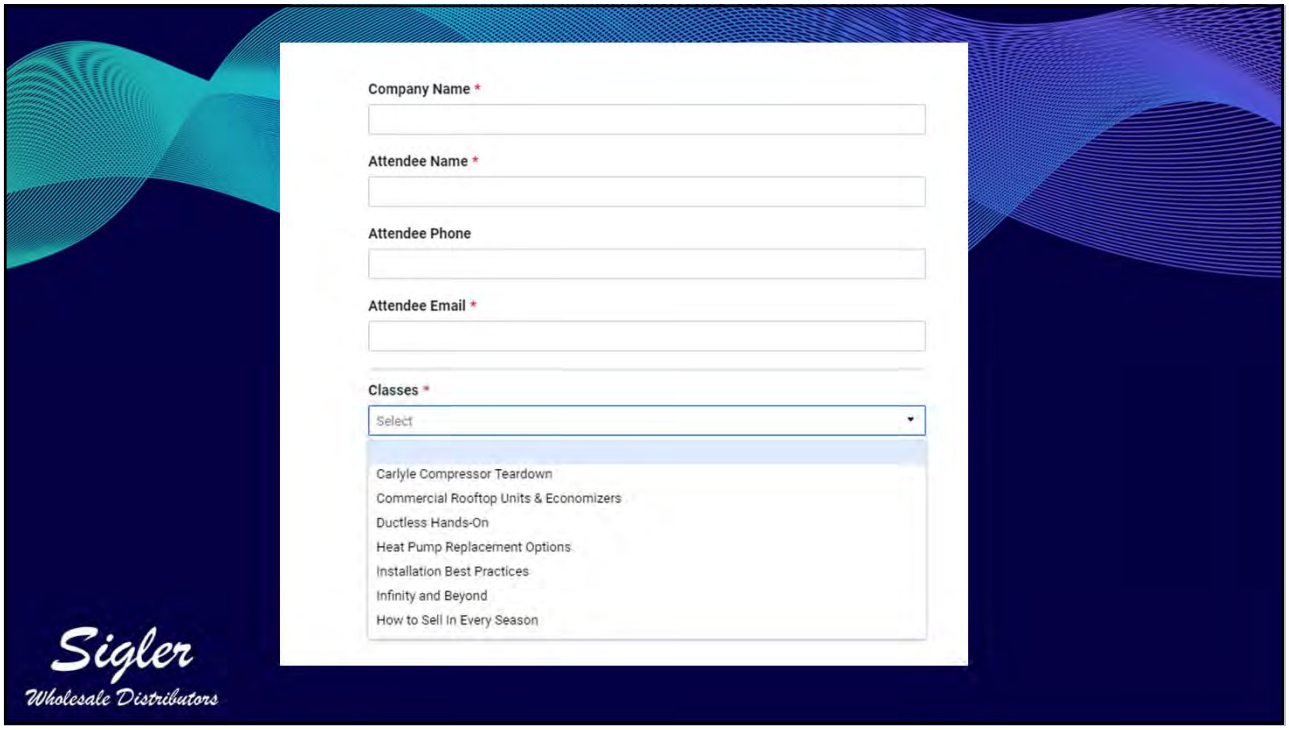
Company Name *
Attendee Name *
Attendee Phone
Attendee Email *
Classes *
Select
Carlyle Compressor Teardown
Commercial Rooftop Units & Economizers
Ductless Hands-On
Heat Pump Replacement Options
Installation Best Practices
Infinity and Beyond
How to Sell In Every Season
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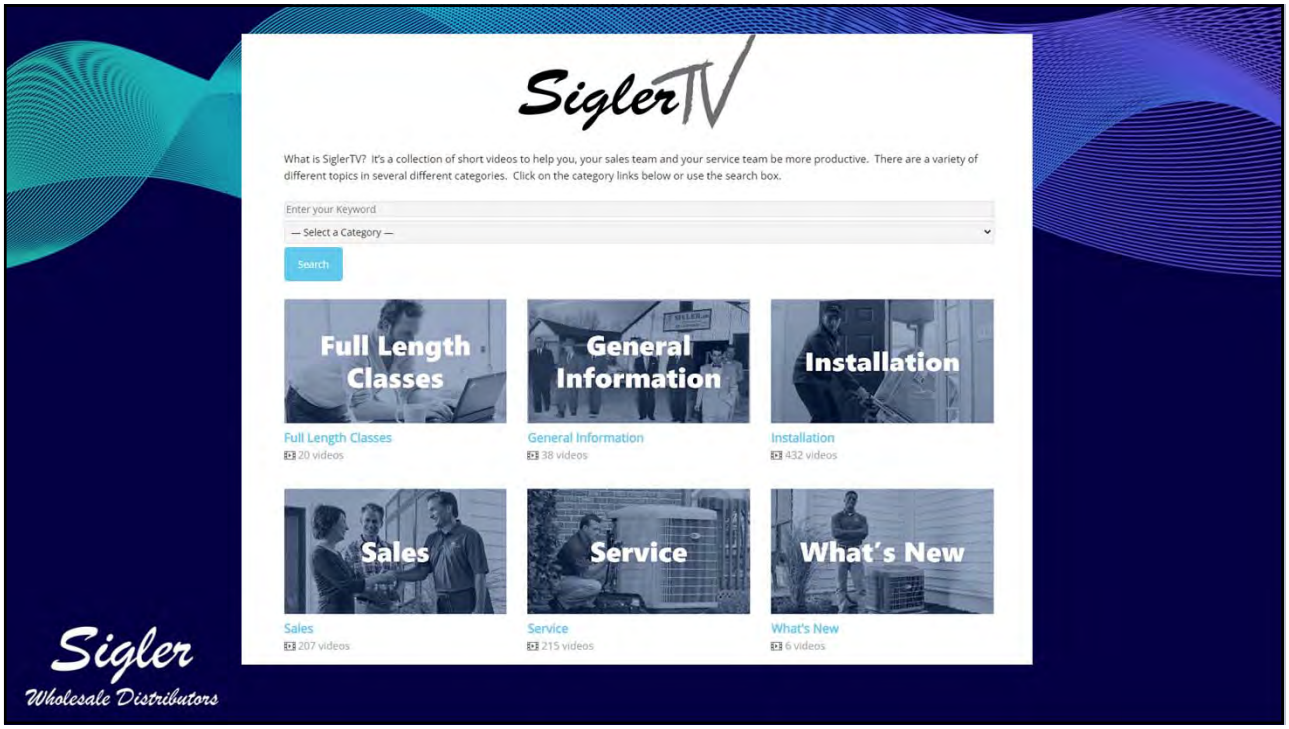
SiglerTV
What is SiglerTV? It's a collection of short videos to help you, your sales team and your service team be more productive. There are a variety of different topics in several different categories. Click on the category links below or use the search box.
Enter your Keyword
— Select a Category —
Search
Full Length Classes
General Information
Installation
Full Length Classes
20 videos
General Information
38 videos
Installation
432 videos
Sales
Service
What's New
Sales
207 videos
Service
215 videos
What's New
6 videos
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6


Residential Technical
Support Direct
Text and Voicemail Line!
415-330-6666
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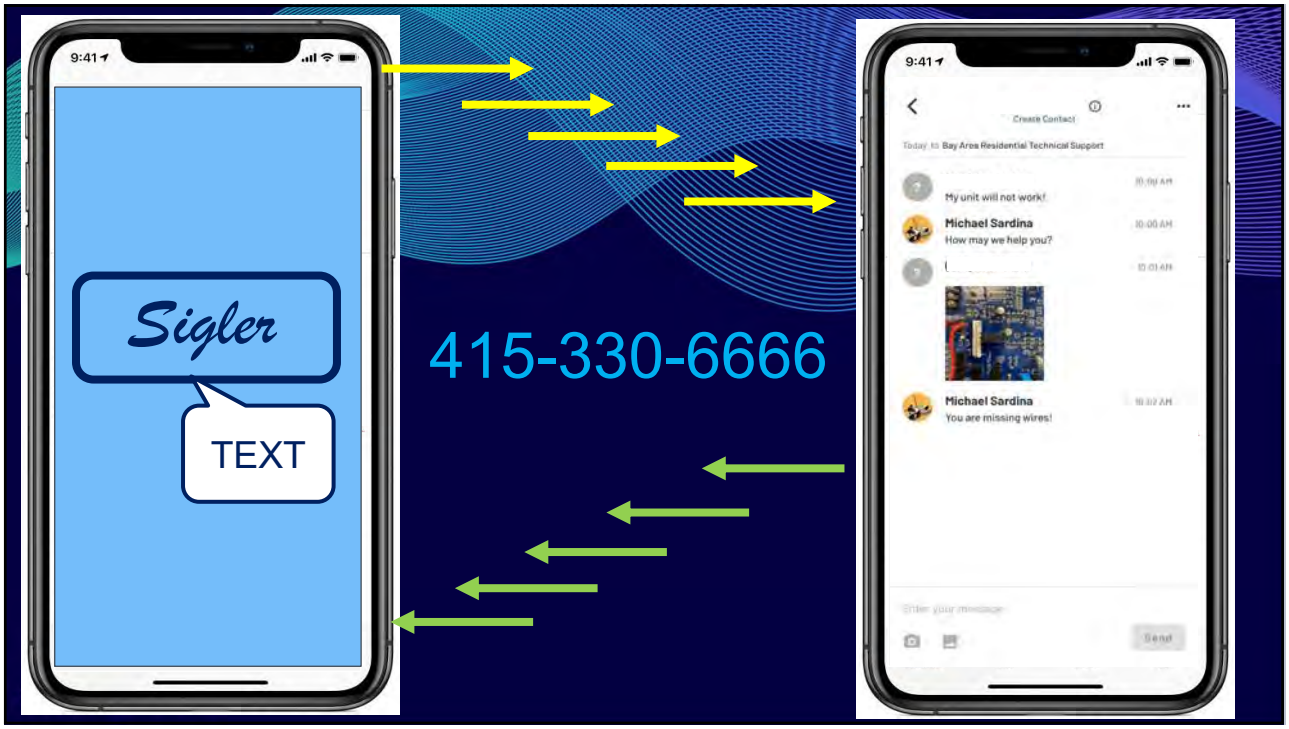
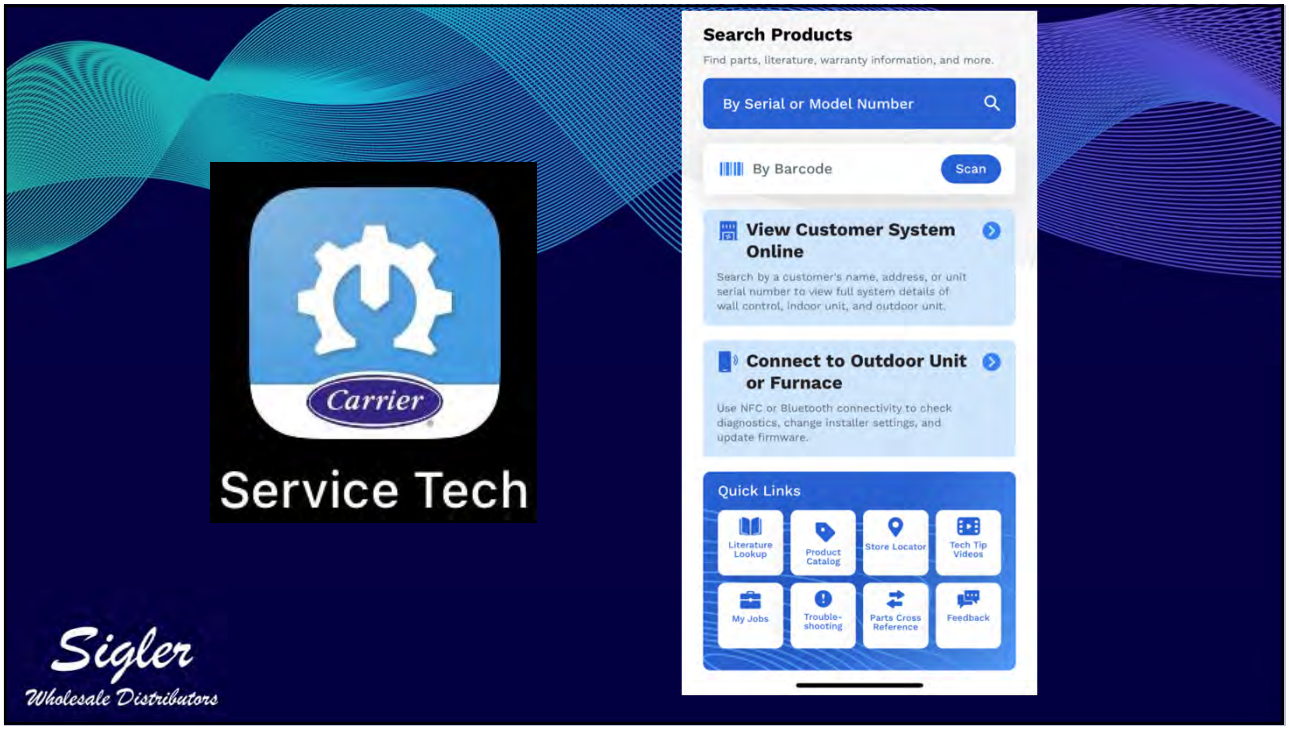

9:41
Sigler
TEXT
415-330-6666
9:41
Create Contact
Today to Bay Area Residential Technical Support
My unit will not work!
Michael Sardina
How may we help you?
Michael Sardina
You are missing wires!
Send

8


Carrier
Service Tech
Search Products
Find parts, literature, warranty information, and more.
By Serial or Model Number
By Barcode
Scan
View Customer System Online
Search by a customer's name, address, or unit serial number to view full system details of wall control, indoor unit, and outdoor unit.
Connect to Outdoor Unit or Furnace
Use NFC or Bluetooth connectivity to check diagnostics, change installer settings, and update firmware.
Quick Links
Literature Lookup
Product Catalog
Store Locator
Tech Tip Videos
My Jobs
Trouble-shooting
Parts Cross Reference
Feedback
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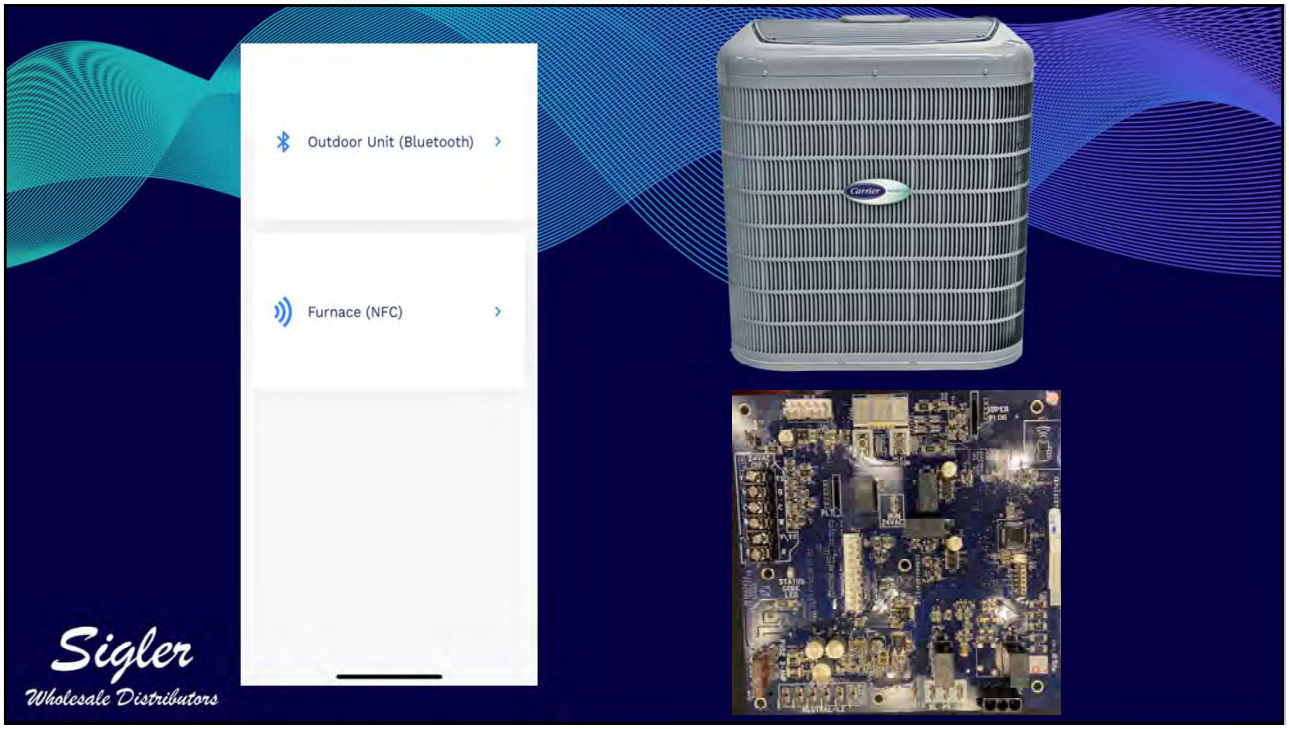
Outdoor Unit (Bluetooth)
Furnace (NFC)
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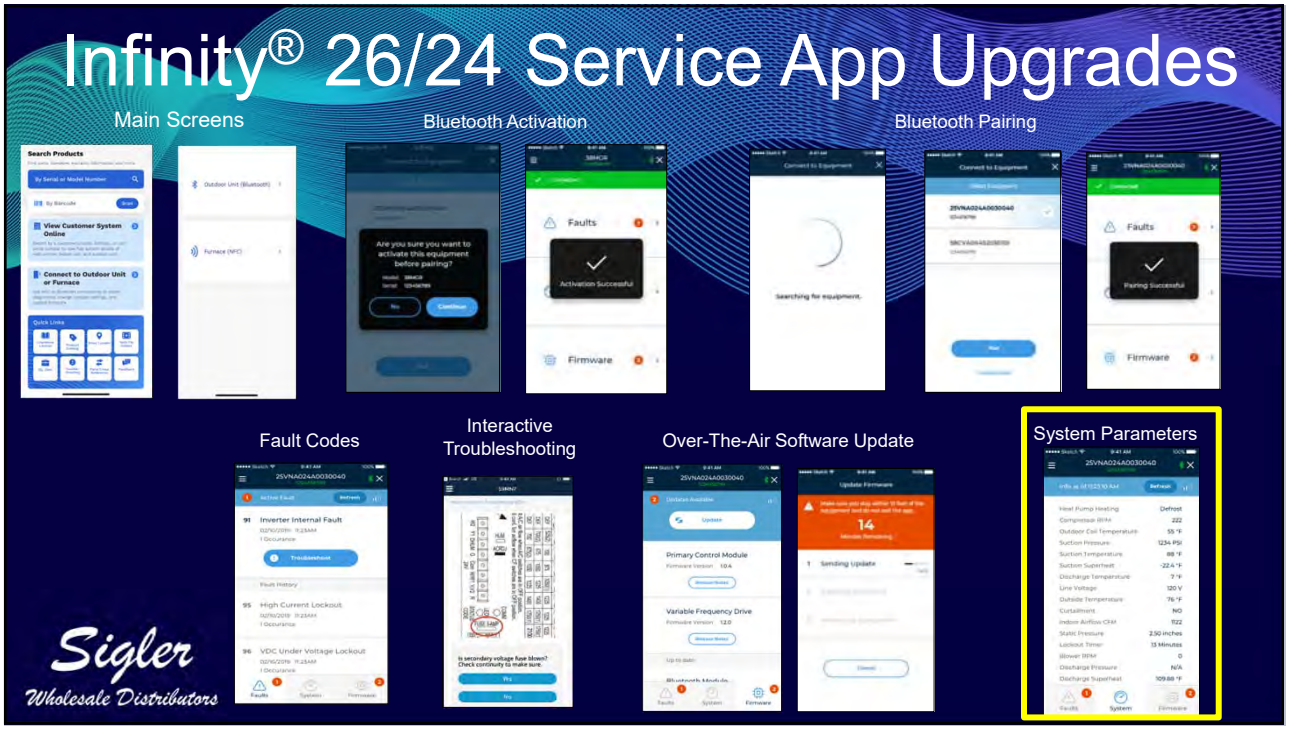
Infinity® 26/24 Service App Upgrades
Main Screens
Bluetooth Activation
Bluetooth Pairing
Fault Codes
Interactive Troubleshooting
Over-The-Air Software Update
System Parameters
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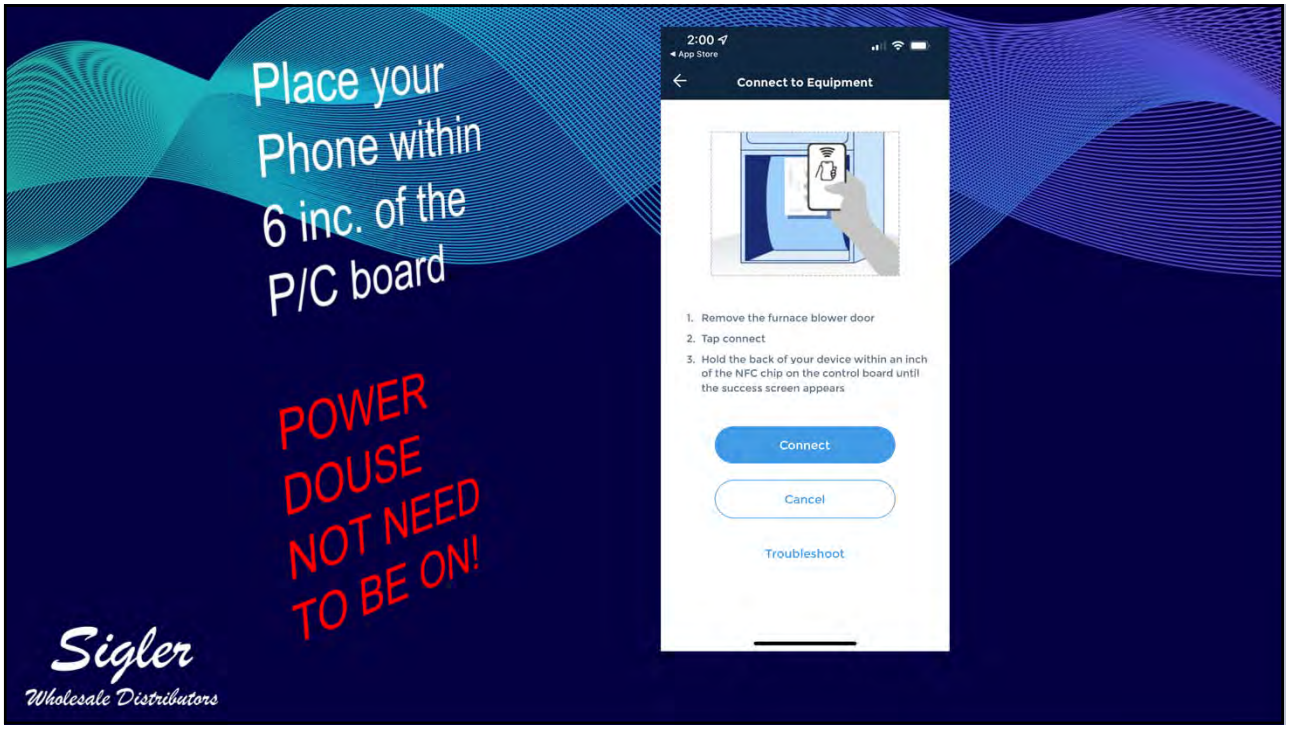
Place your Phone within 6 inc. of the P/C board
POWER DOUSE NOT NEED TO BE ON!
2:00
App Store
Connect to Equipment
1. Remove the furnace blower door
2. Tap connect
3. Hold the back of your device within an inch of the NFC chip on the control board until the success screen appears
Connect
Cancel
Troubleshoot
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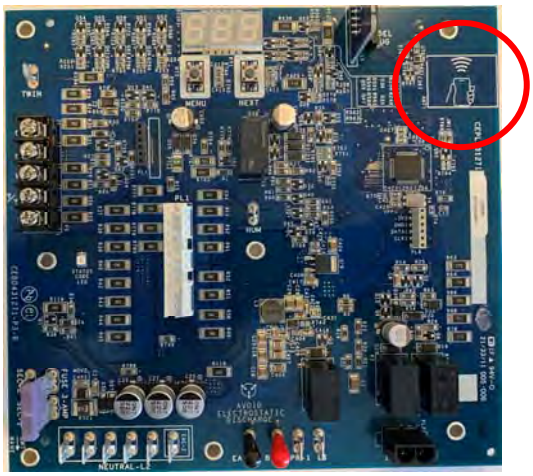
Near Field Communication



- Near Field Communication allows two devices placed within a few centimeters of one another to exchange information
- Used by Apple Pay and other contactless payment systems
- Installer recipe and user settings can be read, adjusted, and loaded into furnace control without switches or contact with the furnace control
- Non-powered, so information can be exchanged with furnace power in OFF state
- Allows for information transfer from existing control to new control easily
- Allows for runtime data
  - Fault code history
  - Runtime cycles/hours

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Service Tech

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Furnace App Integration

Utilizing existing Service Tech App featuring patent-pending Near Field Communication (NFC)

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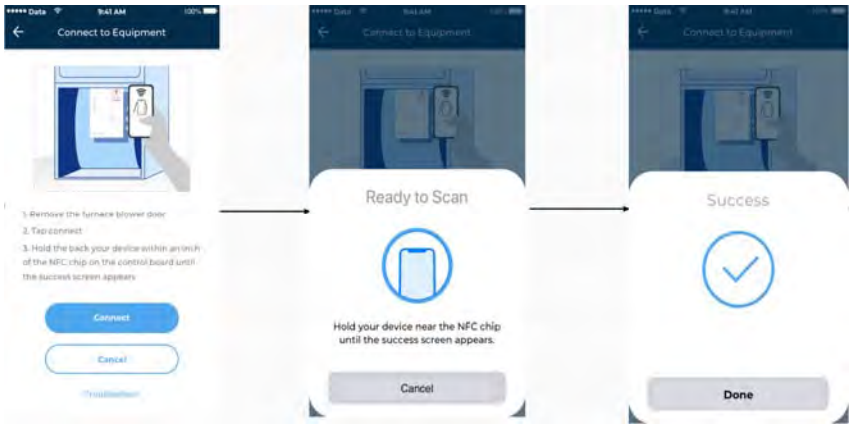
Furnace App Integration

Utilizing existing Service Tech App featuring patent-pending Near Field Communication (NFC)



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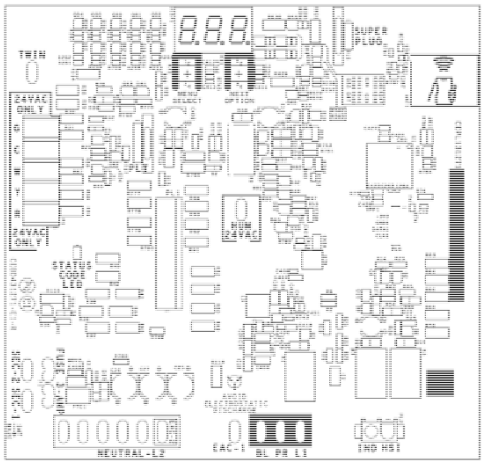
Increased flexibility



- New control for all entry tier units to better align with 2023 cooling products
- Will convert blower motors to PWM driven units –

18 speeds

  - Greatly increased airflow selections for all modes of operation
  - Reduced motor stocking
- Will utilize Near-Field communication or pushbuttons to allow for adjustments

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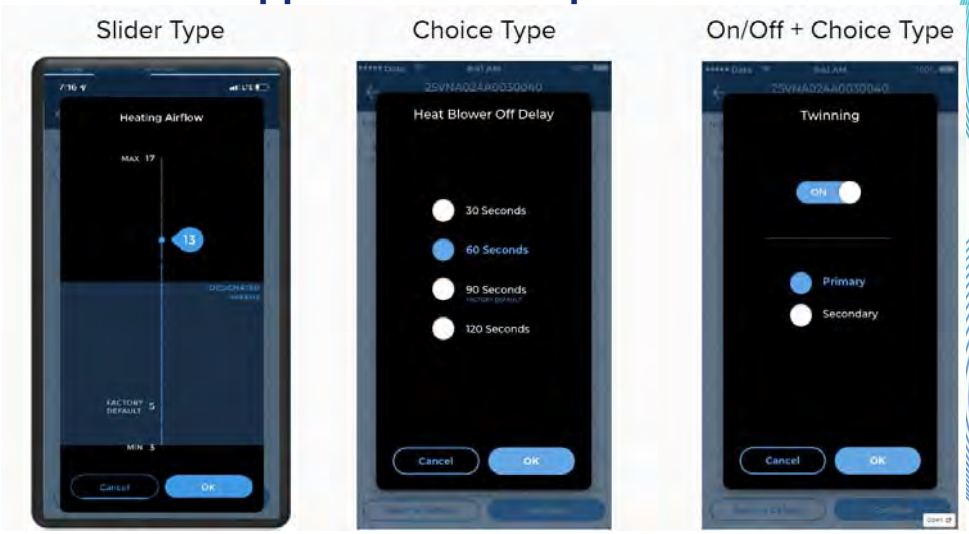
Furnace App Integration

App Screen Examples



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• App Alternates - Super Plug

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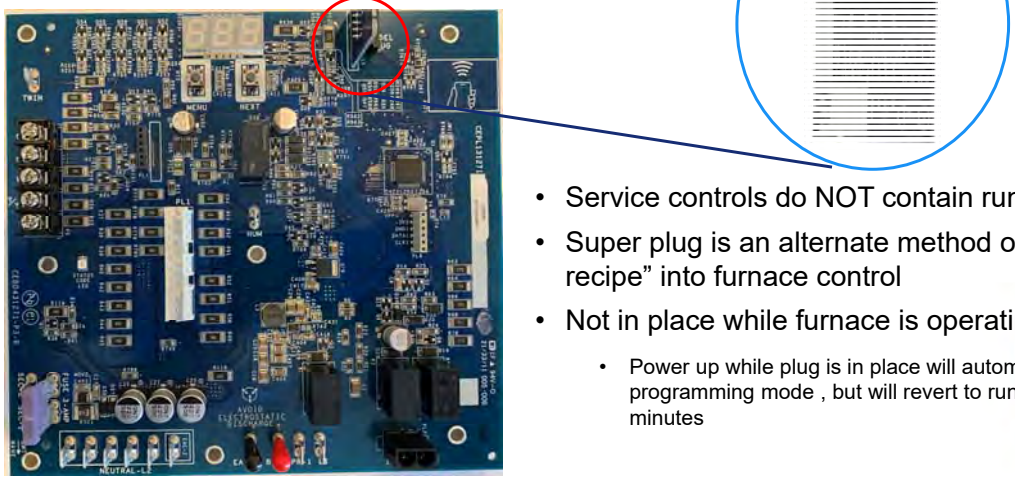

- Service controls do NOT contain run parameters
- Super plug is an alternate method of loading “run recipe” into furnace control
- Not in place while furnace is operating
  - Power up while plug is in place will automatically initiate programming mode , but will revert to run mode after 2 minutes

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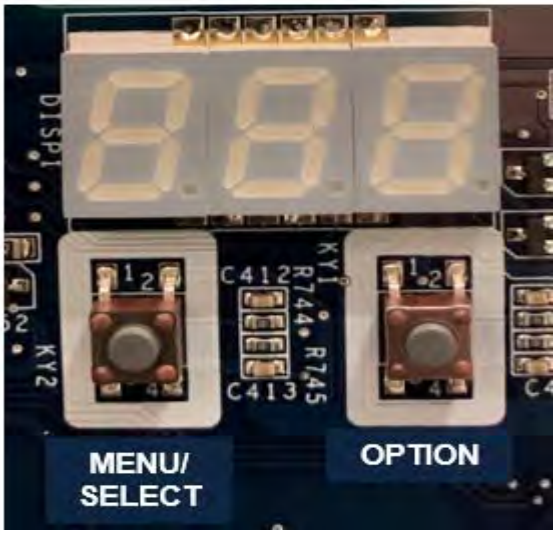
• App Alternate Pushbuttons and 7 segment Display



- Allows for manual selection for recipe load on new “blank” furnace controls
- Allows for manual adjustment of run parameters
  - Heating, cooling, and cont. fan speeds
  - Heating cooling off delays
  - Orientation
  - Twinning master and slave
- Used to initiate component self test
- 3 number display allows for more defined fault codes
  - Like NGIP, fault codes will have a base code and index allowing more concise troubleshooting

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• App Alternate Pushbuttons and 7 segment Display

3-digit 7 segment display w/ 2 push buttons

- Setup Options
- Fault Code Communication

Main Menu		
Display	**7-Segment Visual**	**Function**
FLt	*FLt*	Fault History Retrieval Menu
Ht	*Ht*	Heating Blower Speed Index
CL	*CL*	Cooling Blower Speed Index
CFn	*CFn*	Continuous Fan Blower Speed Index
Hod	*Hod*	Heating Blower Off Delay
Cod	*Cod*	Cooling Blower Off Delay
dir	*dir*	Direction; Unit Orientation Menu
CFn	*CFn*	Continuous Fan Blower Speed Index
tnn	*tnn*	Twinning Furnace Select
inF	*inF*	Startup Information (Software Version)
Ct	*Ct*	Component Test
rSt	*rSt*	Reset to Default Settings

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- Let's Talk about production oil verses refrigeration oil.
- **IF** you come across a unit that is covered in oil do not panic and think
- that you have a unit that has a leak.
- One easy step, rub the oil on your fingers if the oil dissipates from you fingers after 5 min it is production oil!

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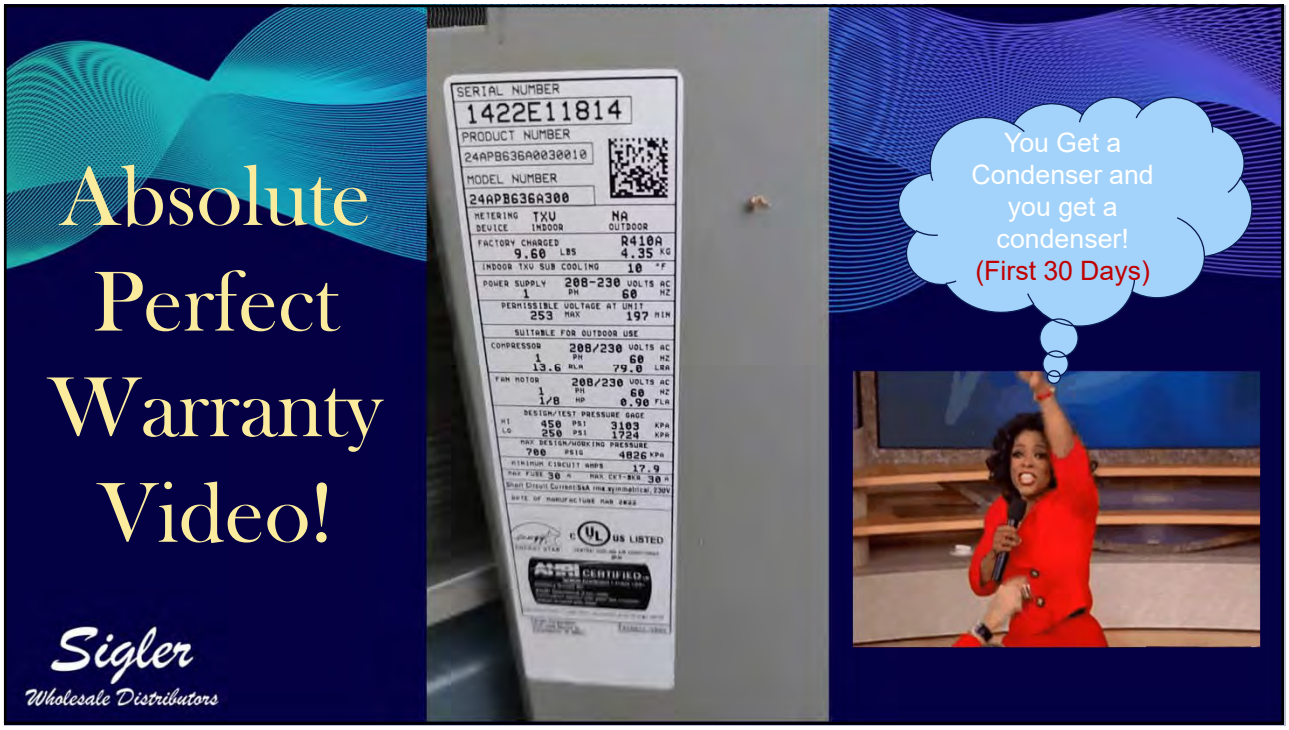
Absolute Perfect Warranty Video!
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SERIAL NUMBER
1422E11814
PRODUCT NUMBER
24APB636A003010
MODEL NUMBER
24APB636A300
You Get a Condenser and you get a condenser!
(First 30 Days)

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QR Hyper Link For Warranty
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Due to COVID-19 some of our branch hours have temporarily changed. Please check with your local branch for current hours of operation.
SCA NorCal Form
https://www.siglers.com/sca/norcal
This Claim Form can NOT be used for Equipment Exchanges (to exclude CBP Evaporative Coils and Thermostats). Please contact your local Technical Support Manager for consideration.
Next

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DUCTLESS ADVANCED SERVICES

Knowing What You Are Working On Is The First Step to Troubleshooting!

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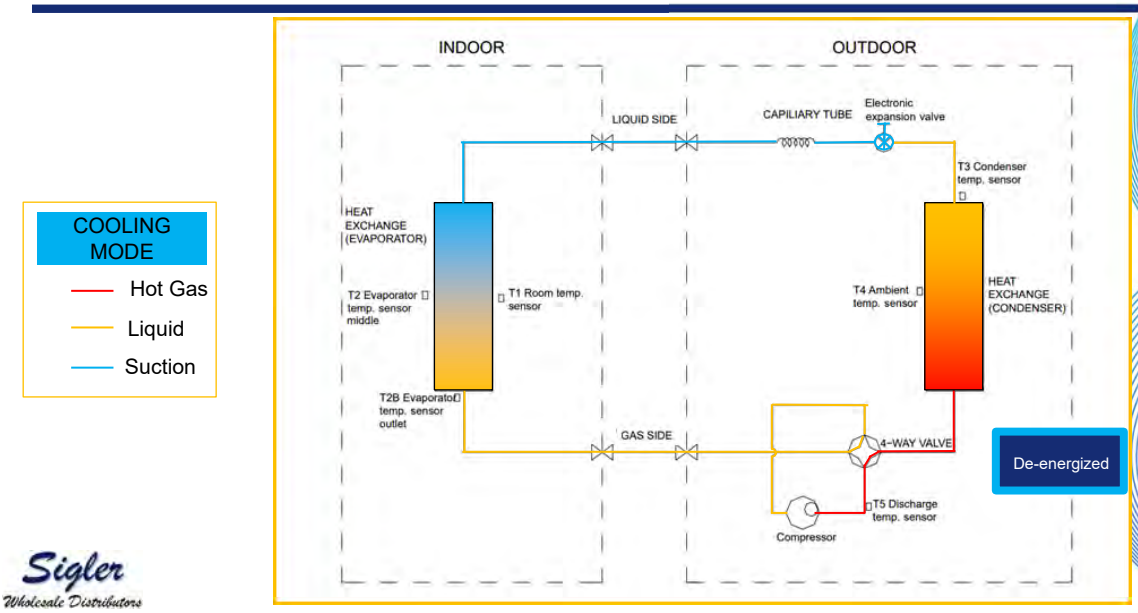
PIPING MA*R PIPING *COOLING*



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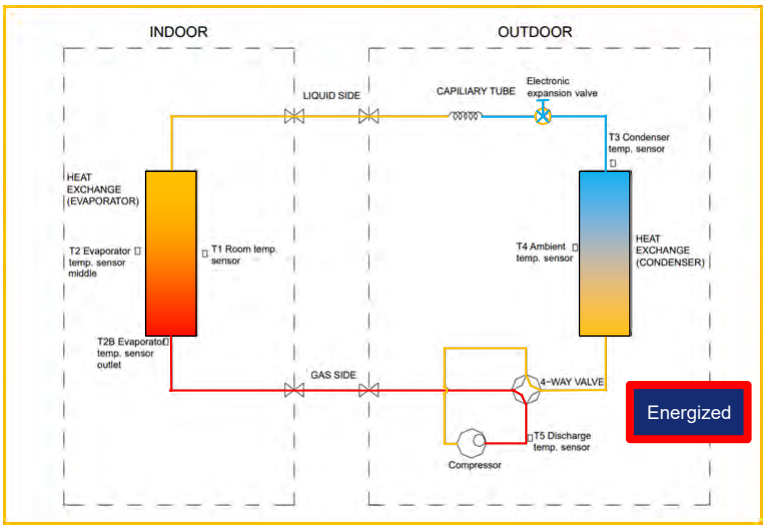
PIPING MA*R PIPING *HEATING*

HEATING MODE
- Hot Gas
- Liquid
- Suction



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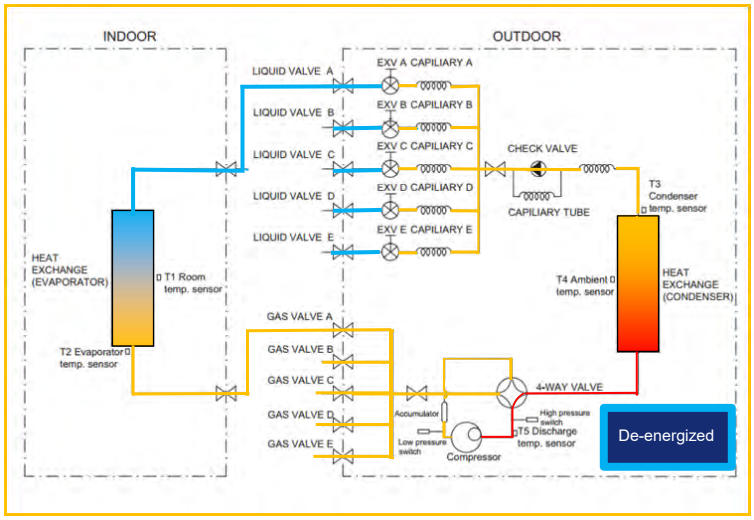
PIPING MG*R PIPING *COOLING*

COOLING MODE
- Hot Gas
- Liquid
- Suction



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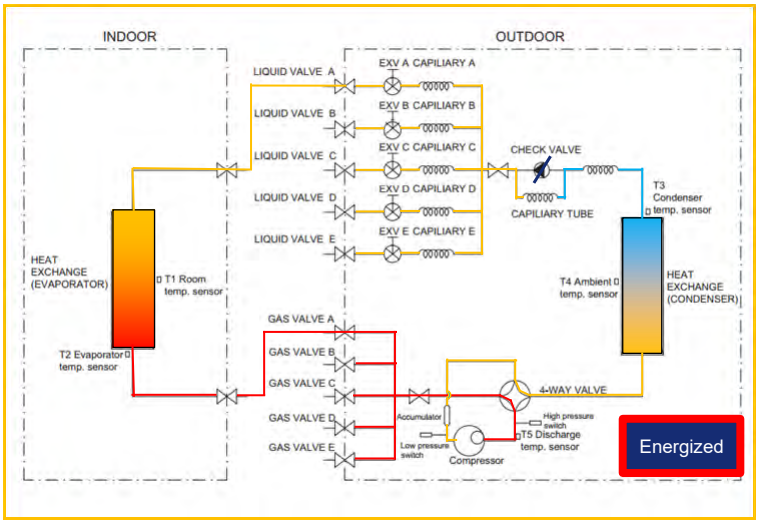
PIPING MG*R PIPING *HEATING*



HEATING MODE

- Hot Gas
- Liquid
- Suction

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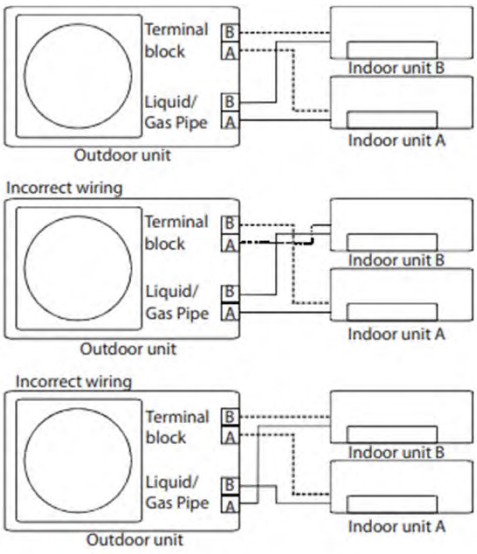


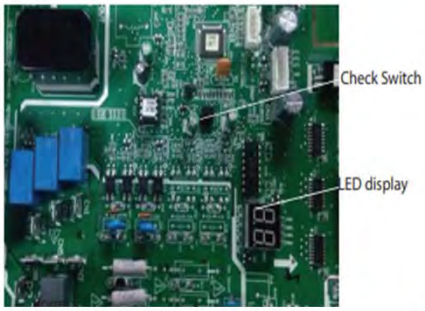
Fig. 13 — Automatic Wiring/Piping Correction

AUTOMATIC WIRING/PIPING CORRECTION

The unit is capable of automatically correcting a wiring/piping error. Indoor units do not have to be in the run mode. The outdoor temperature should be above 41°F (5°C) to use this feature. Press the **CHECK** button on the outdoor unit PCB board for 6 seconds until the display shows "CE" ("FA" may appear first – continue to press **CHECK**).

The outdoor unit takes control of the indoor units and adjust fan speed(s) according to the program. Setpoint display (if available) will be "76" and outdoor unit will start the compressor and fan to dispense refrigerant to the indoor heads to determine piping setup versus physical wiring. When the controller has adjusted control so that each indoor unit is synced to its piping port (approximately 5-10 minutes, depending on temperature, unit size, etc.), "CE" is replaced with "00" on the display and the control program terminates.

NOTE: The indoor units will not automatically release from the "76" setting or return to previous control. Use the indoor units' remote controllers to restore them to normal function.



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Please Note If you use a 24-volt interface board

It **will not auto** correct the Pipping.

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Let's get into setting these up.

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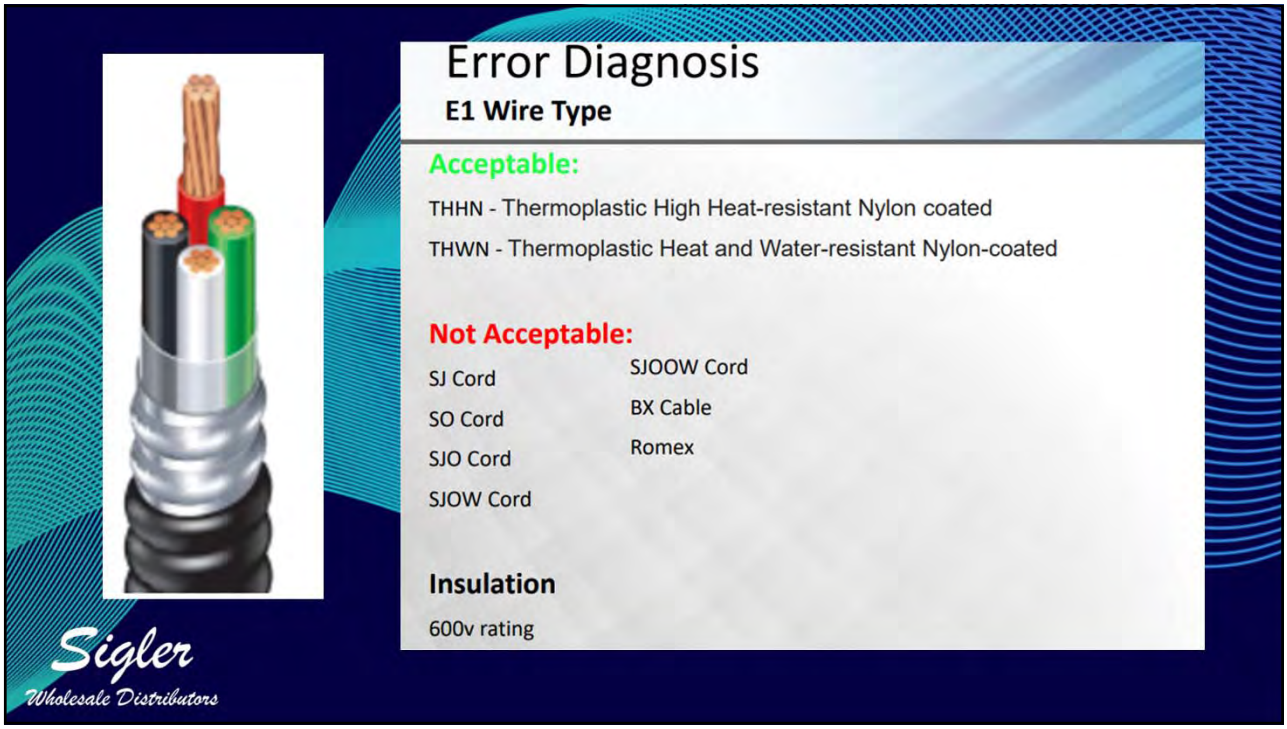
Error Diagnosis
E1 Wire Type
Acceptable:
THHN - Thermoplastic High Heat-resistant Nylon coated
THWN - Thermoplastic Heat and Water-resistant Nylon-coated
Not Acceptable:
SJ Cord
SO Cord
SJO Cord
SJOW Cord
SJOOW Cord
BX Cable
Romex
Insulation
600v rating
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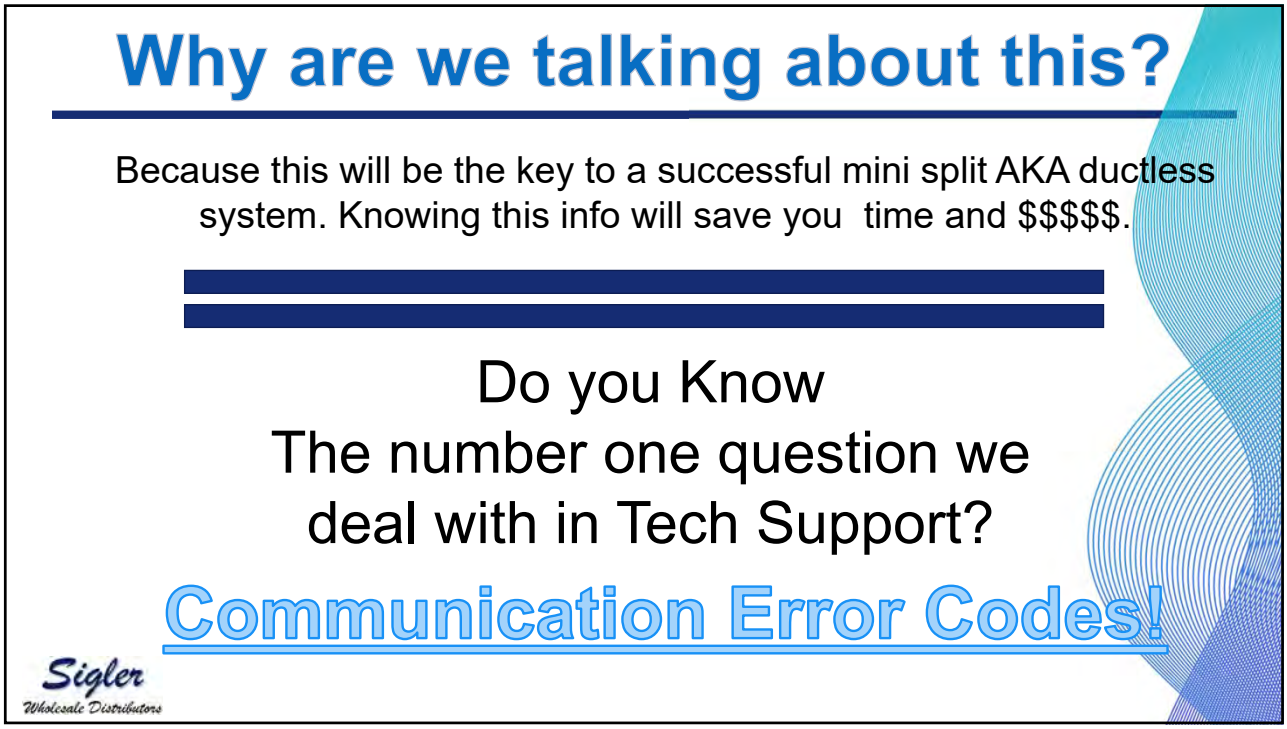
Why are we talking about this?
Because this will be the key to a successful mini split AKA ductless system. Knowing this info will save you time and $$$$$.
Do you Know
The number one question we deal with in Tech Support?
Communication Error Codes!
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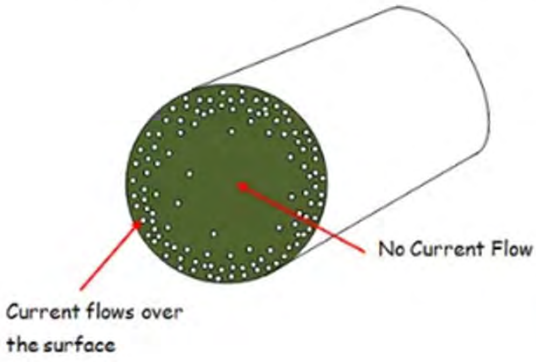
What is Skin Effect in Transmission Lines?



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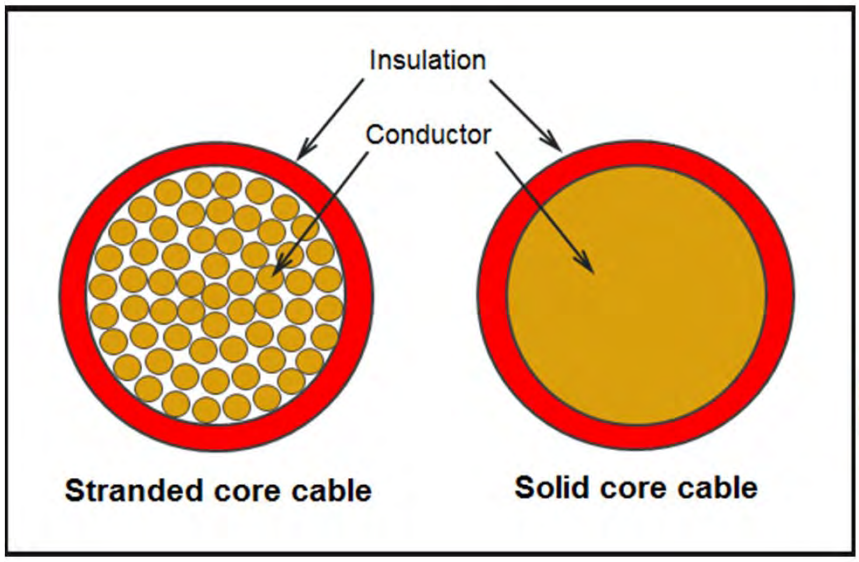

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SJO CORD

DO NOT USE!

BX Cable

Do not use These!

ROMEX

Don't Ever- Ever- Ever

USE THIS!

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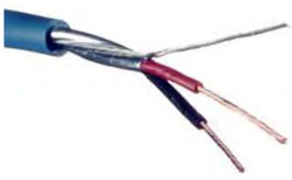
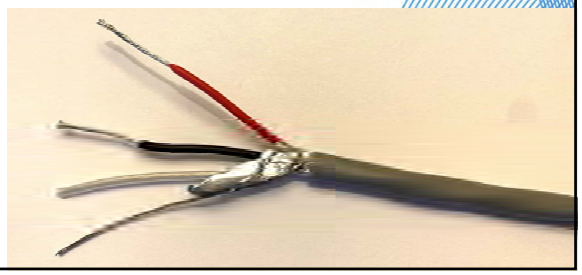


Regular 16-2 shielded cable

It also features a foil **shielding** that will ensure your signals are protected from any external interference. The **16-2 or 16-3 shielded cable** is ideal for access control, control systems, signaling, security systems, communications, intercom/PA systems, sound/audio, and nurse call installations.

High end 16-3 shielded cable.



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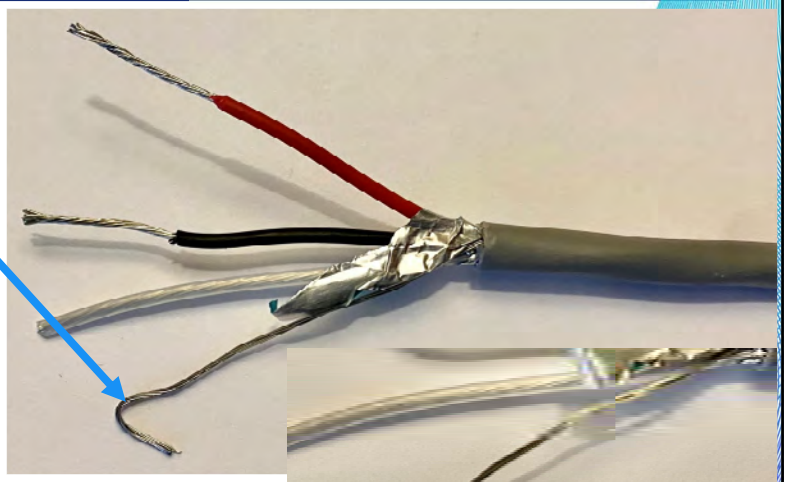
Factory Recommendation with connecting the Internal Ground! Fold over One Time Before inserting into socket.



Pinch and insert.
Indoor units only!

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Only one Disconnect At the Condenser..

Do not use a Disconnect switch on any Mini splits in door units!

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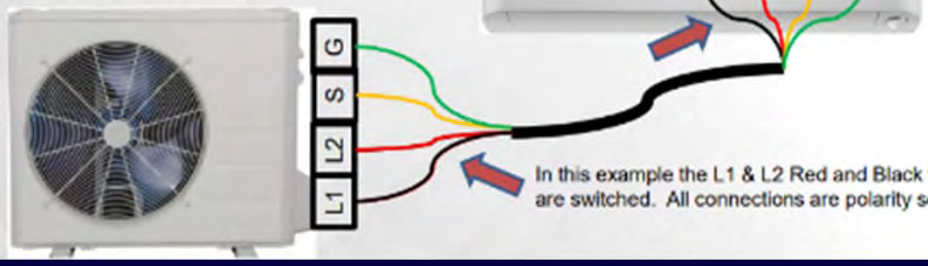
The Indoor unit does not receive feedback from outdoor unit during 110 seconds and this condition happens four (4) times continuously the E1 error code is generated.

Supposed Causes
- Wiring mistake
- Indoor or outdoor PCB faulty



In this example the L1 & L2 Red and Black wires are switched. All connections are polarity sensitive.

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INSTALLATION
DUCTED UNIT

ELECTRICAL

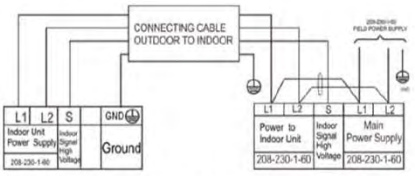
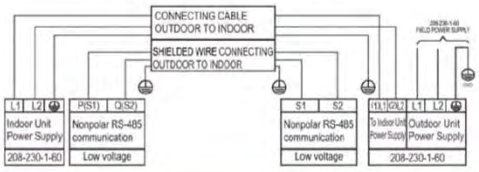


Fig. 29 – Connection Diagrams 09 to 24



9----24-ton BTU

ODU to IDU

14/3 power or 14/4 600v stranded mini split cable (L1,L2,S, ground)

3--5-ton BTU

Power ODU to IDU

14/2 w/ground stranded: L1,L2, ground

Communication

16awg stranded shielded

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MG*R & Every Model Verify

Table 3 — Piping and Refrigerant

System Size			18K	24K	30K	36K	48K
Piping	Min. Piping Length per each indoor unit	ft (m)	10 (3)	10 (3)	10 (3)	10 (3)	10 (3)
	Standard Piping Length per each indoor unit	ft (m)	25 (7.5)	25 (7.5)	25 (7.5)	25 (7.5)	25 (7.5)
	Max. outdoor-indoor height difference (OU higher than IU)	ft (m)	49 (15)	49 (15)	49 (15)	65 (20)	65 (20)
	Max. outdoor-indoor height difference (IU higher than OU)	ft (m)	49 (15)	49 (15)	49 (15)	65 (20)	65 (20)
	Max. height different between indoor units	ft (m)	32 (10)	32 (10)	32 (10)	32 (10)	32 (10)
	Max. Length per each indoor unit	ft (m)	82 (25)	98 (30)	115 (35)	115 (35)	115 (35)
	Max. Piping Length with no additional refrigerant charge per System (Standard Piping length x No. of Zones)	ft (m)	49 (15)	74 (22.5)	98 (30)	123 (37.5)	123 (37.5)
	Total Maximum Piping Length per system	ft (m)	131 (40)	197 (60)	263 (80)	328 (100)	328 (100)
	Additional refrigerant charge (between Standard – Max piping length)	Oz/ft (g/m)	0.16 (15)	0.16 (15)	0.16 (15)	0.16 (15)	0.16 (15)
	Suction Pipe Size	in (mm)	3/8"2 (9.5"2)	3/8"3 (9.5"3)	1/2"1+3/8"3 (12.7"1+9.5"3)	1/2 "2+3/8"2 (12.7"2+9.5"2)	1/2 "2+3/8"3 (12.7"2+9.5"3)
	Liquid Pipe Size	in (mm)	1/4 "2 (6.3"2)	1/4 "3 (6.3"3)	1/4 "4 (6.3"4)	1/4 "4 (6.3"4)	1/4 "5 (6.3"5)
Refrigerant	Refrigerant Type		R410A	R410A	R410A	R410A	R410A
	Charge Amount	Lbs (kg)	4.41 (2.0)	6.17 (2.8)	6.61 (3.0)	10.14 (4.6)	10.14 (4.6)

NOTE: For piping runs greater than the "Maximum Piping Length with no additional refrigerant charge per System", see Additional Refrigerant Charge (see Table 5).

Refrigerant Piping:

Line sets to be sized based on the connection size of the indoor unit. Each pipe should be insulated individually.

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Section 1
ERROR CODE IDENTIFICATION

MG*R

MA*R

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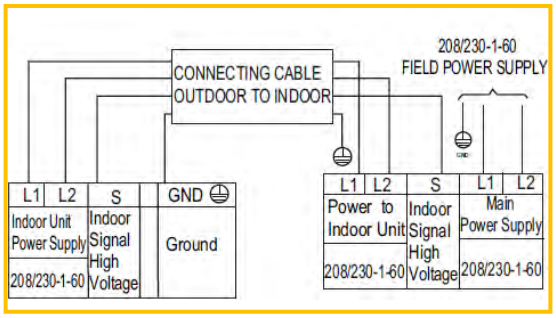
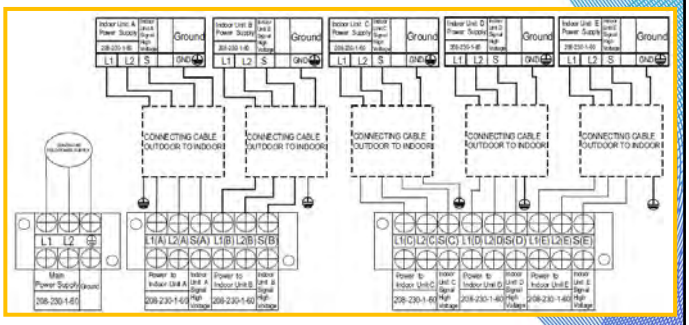
Error Diagnosis (E1)

- Verify Terminated ends
- Verify Length
- Verify Route (Not parallel to other high voltage wires)

1:1



5 Zone



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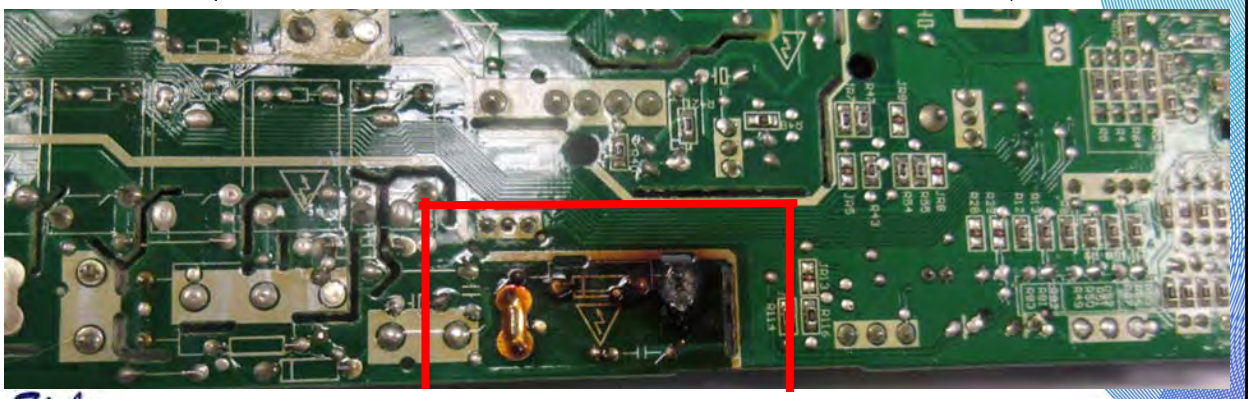
Error Diagnosis (E1)

Communication Circuit Failure



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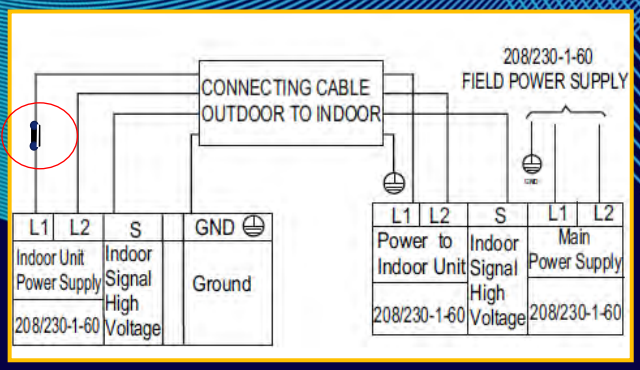
Error Diagnosis (E1)

External Components:

- Verify IDU Disconnects
- Verify External Float Switches

Float SW



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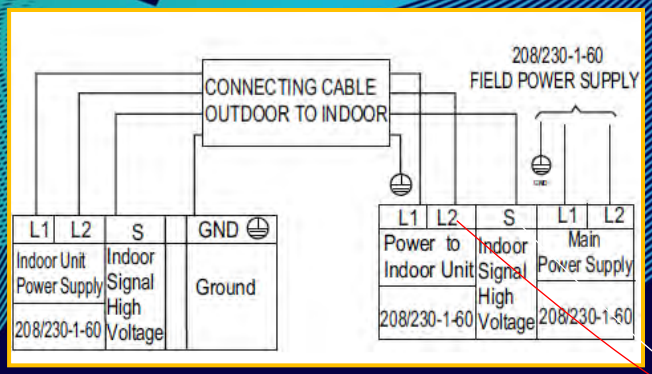
Error Diagnosis (E1)

Internal Components:

- Communication Verification

Meter DC Voltage

85
-50
30
-38
55
-80
44
-20
32



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The Most Important Slide to Have!

Use a multimeter to test the DC voltage between the outdoor unit's L2 port and S ports.

The red pin of the multimeter connects with the L2 port while the black pin is for the S port.

When the AC is running normally, the voltage moves alternatively between −50V to 50V.

If the outdoor unit has a malfunction, the voltage moves alternatively with a positive value.

If the indoor unit has a malfunction, the voltage will have a fixed value.

Example: 10−13VDC small fluctuating amount indicates an indoor unit malfunction.

Meter DC Voltage

85
-50
30
-38
55
-80
44
-20
32

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Error Diagnosis (E1)

Knowledge Check

How long does it take before an E1 will be displayed after system startup?

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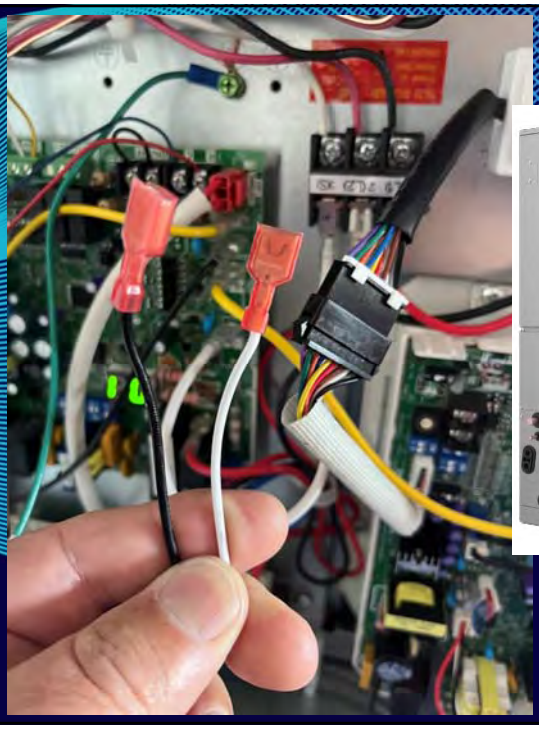
Do not plug in a separate Devices AKA Electronics Air Cleaner!



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Error Diagnosis MAR – P6 / MGR P4

Code: P4/P6

Compressor discharge temperature Protection (TP) (MA*R – P6)
Temperature protection of compressor discharge (MG*R – P4)

Possible Causes:

- Refrigerant charge
- No refrigerant flow
- Exceeded max line length
- Thermistor
- Compressor
- Board

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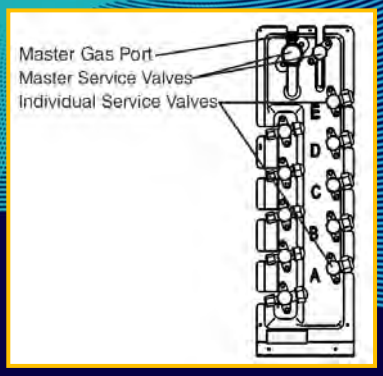
Error Diagnosis (P6)

No Refrigerant flow

- Check service valve
- Check master valves (MG*R)



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What is Wrong?

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Error Diagnosis (P6)

Thermistor
- Not secured on pipe

Compressor
- Resistance Check
- Wiring
- Tight bearings

Single Rotary

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Error Diagnosis (P6)

P6 Exception

P6 error on only the 36,000 MA*R means low pressure switch.

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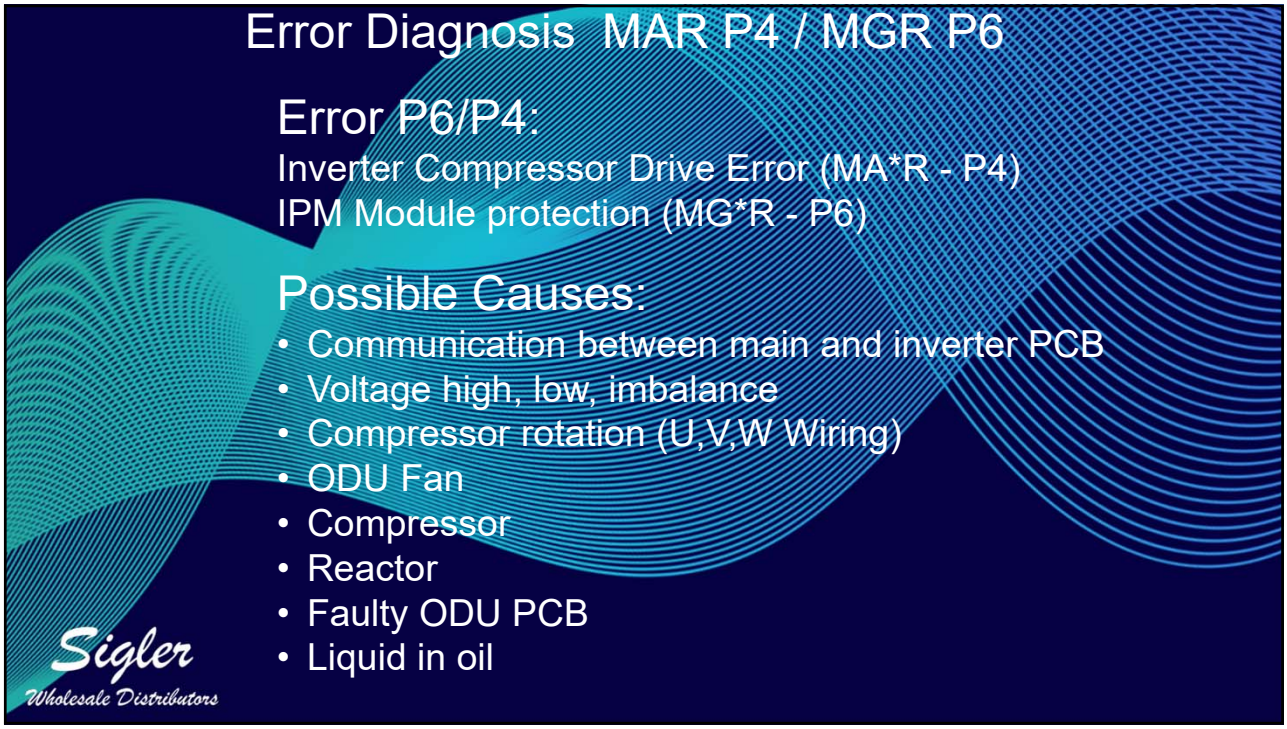
Error Diagnosis MAR P4 / MGR P6
Error P6/P4:
Inverter Compressor Drive Error (MA*R - P4)
IPM Module protection (MG*R - P6)
Possible Causes:
• Communication between main and inverter PCB
• Voltage high, low, imbalance
• Compressor rotation (U,V,W Wiring)
• ODU Fan
• Compressor
• Reactor
• Faulty ODU PCB
• Liquid in oil
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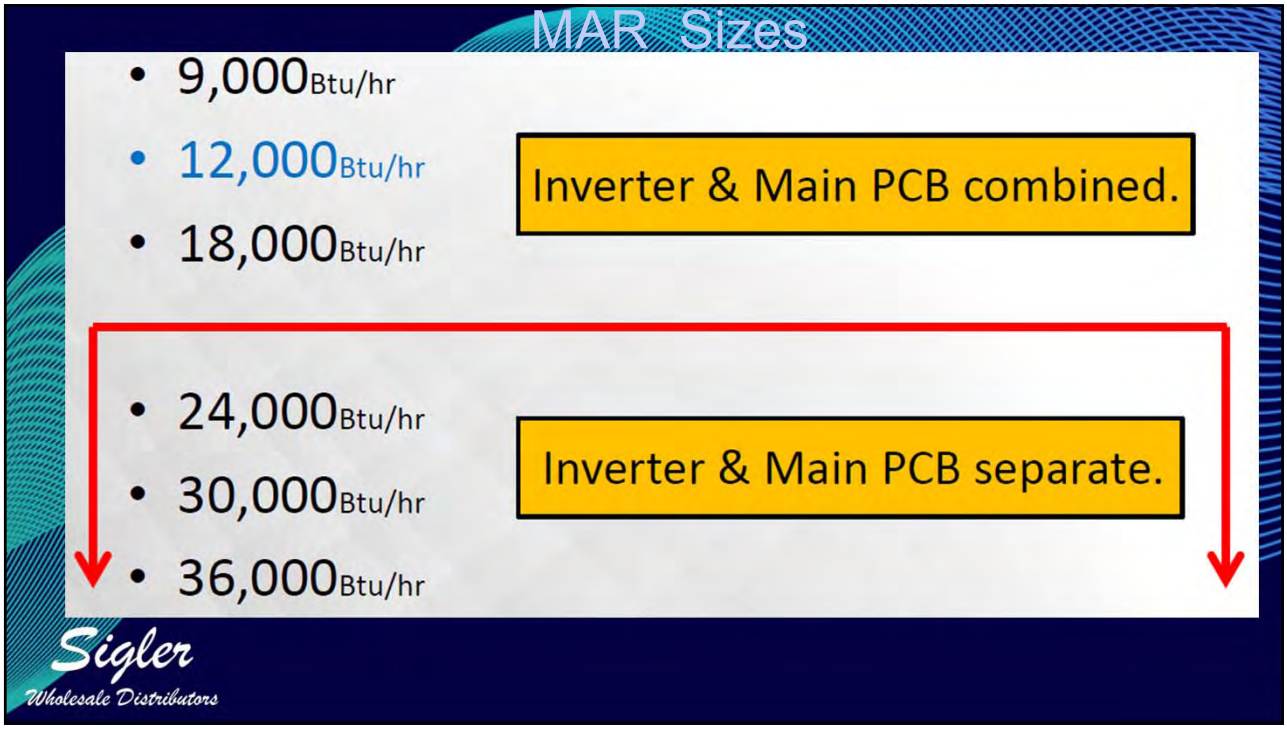
MAR Sizes
• 9,000Btu/hr
• 12,000Btu/hr
• 18,000Btu/hr
Inverter & Main PCB combined.
• 24,000Btu/hr
• 30,000Btu/hr
• 36,000Btu/hr
Inverter & Main PCB separate.
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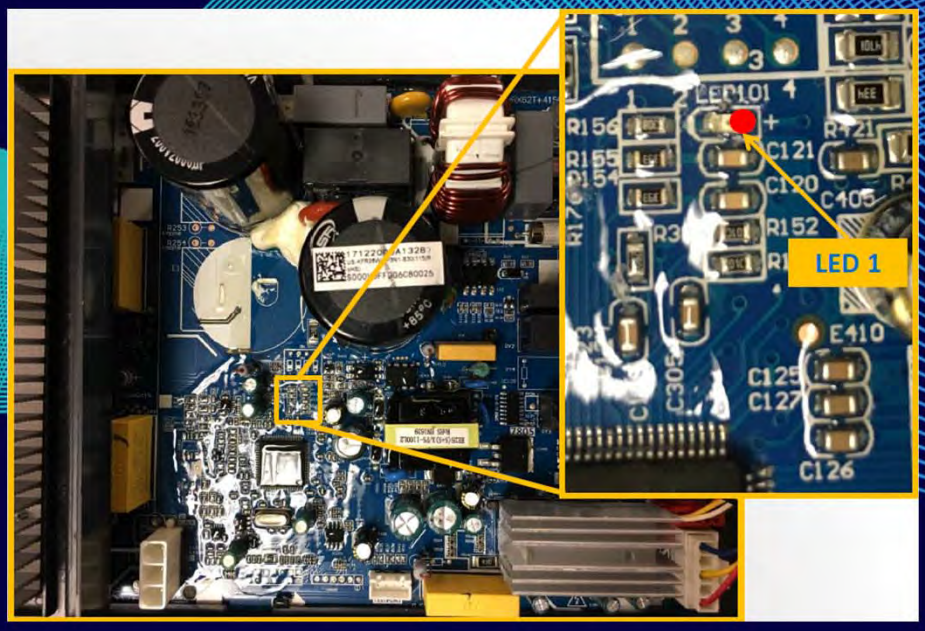
Sizes 9-12 (120 Volt) ODU Display



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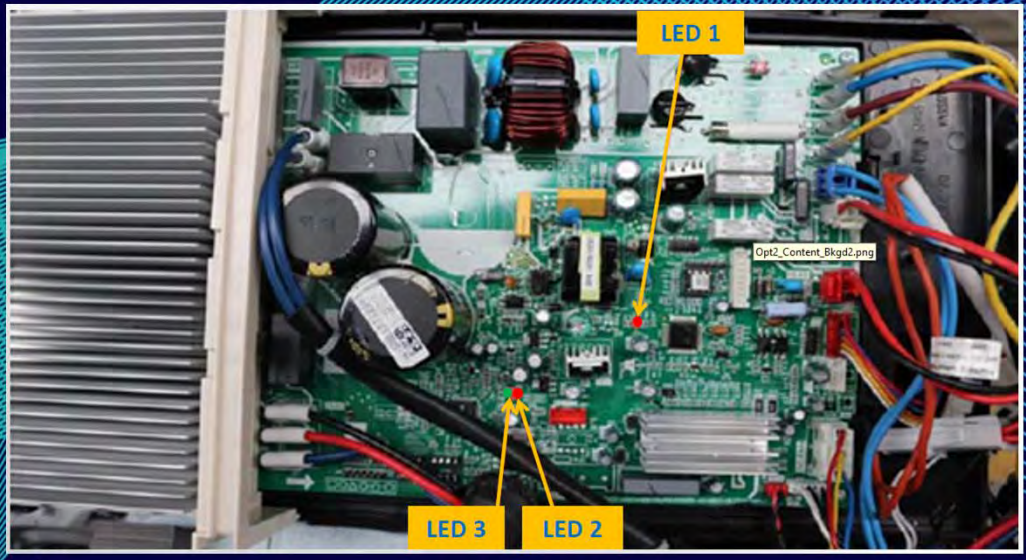
Sizes 9-18 (208-230v) ODU Display



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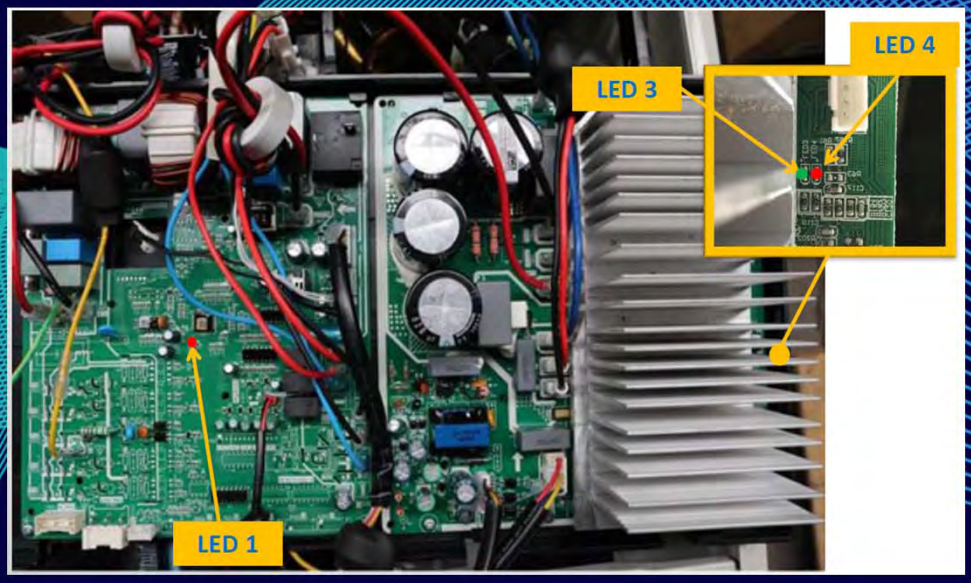
Sizes 24-36 (208-230) ODU Display



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LED Codes

LED1 (RED): Slow 1Hz = Standby, Fast 3Hz Error

Contents	LED3 (Green)	LED2 (Red)
Normal standby	On	Off
Normal operation	Off	On
DC voltage too high/too low protection	On	On
Compressor driven chip EEPROM error	On	Flash
Compressor speed malfunction	Off	Flash
Zero speed protection of compressor/ outdoor fan or lack of phase of compressor or outdoor fan	Flash	On
IGBT strong current protection	Flash	Off
Communication error between outdoor main chip and compressor driven chip	Flash	Flash

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MGR Sizes

- 18,000 – Two Zone
- 24,000 – Three Zone
- 30,000 – Four Zone

Smaller Chassis (1-fans)
Inverter & Main PCB Separate
(2 ODU PCBs)

- 36,000 – Four Zone
- 48,000 – Five Zone

Larger Chassis (2-fans)
Inverter, Fan, & Main PCB Separate
(3 ODU PCBs)

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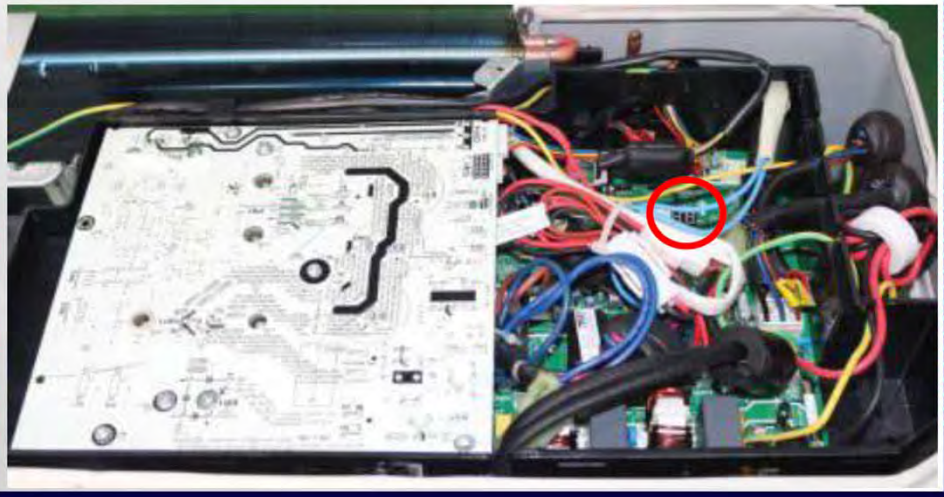
MGR Multi Zone Equipment

2 & 3 Zone boards



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MGR Multi Zone Equipment

4 Zone boards (30,000 BTU/hr)

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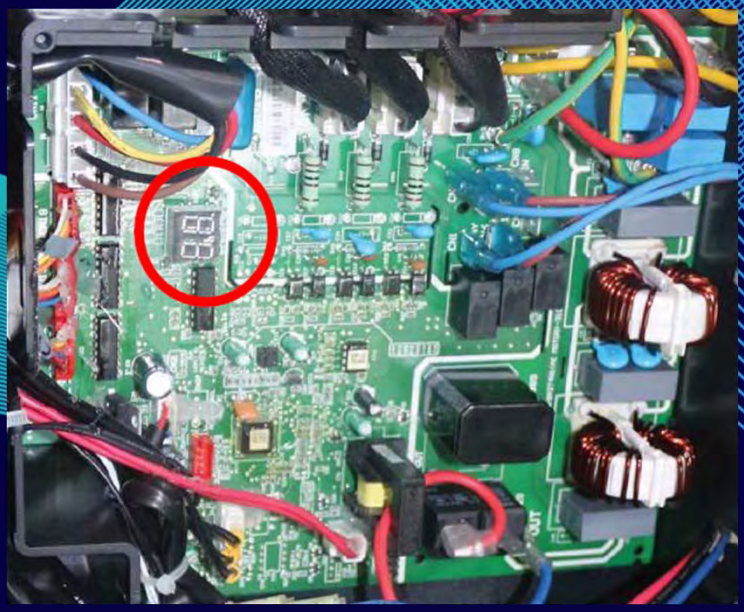
MGR Multi Zone Equipment

4 & 5 ZONE



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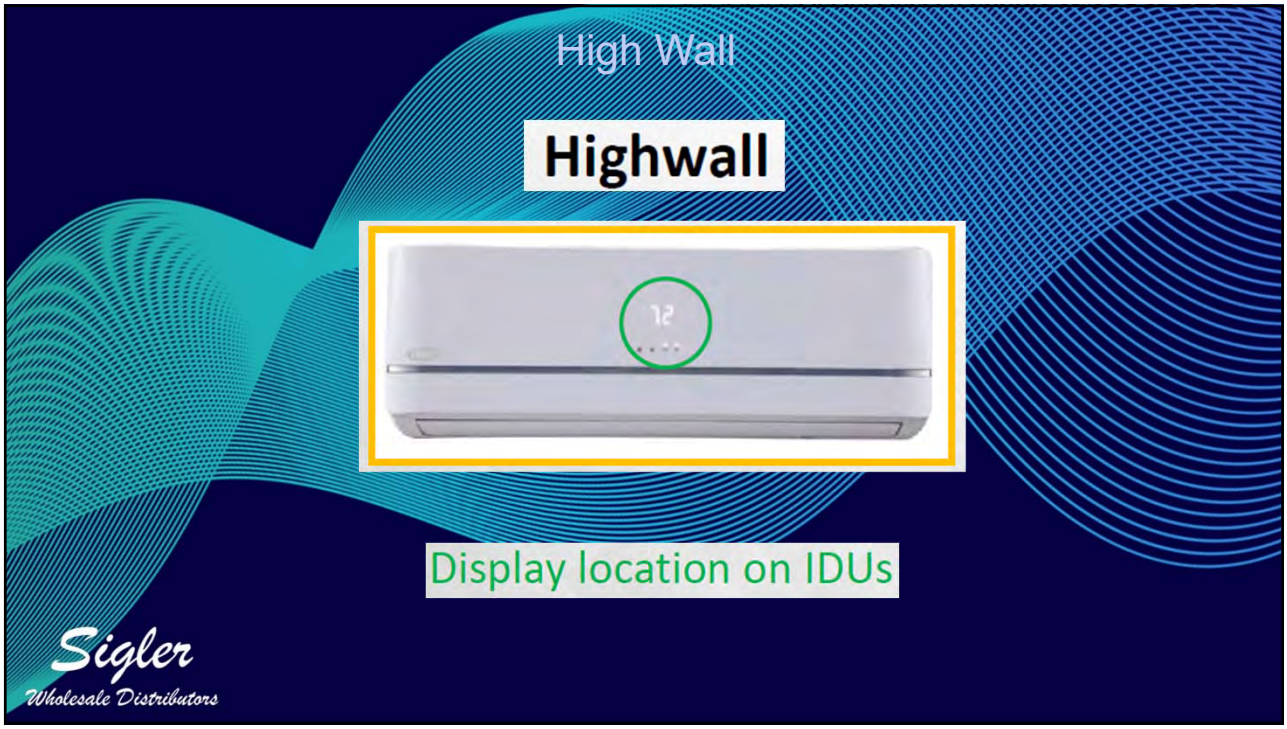
High Wall
Highwall
Display location on IDUs
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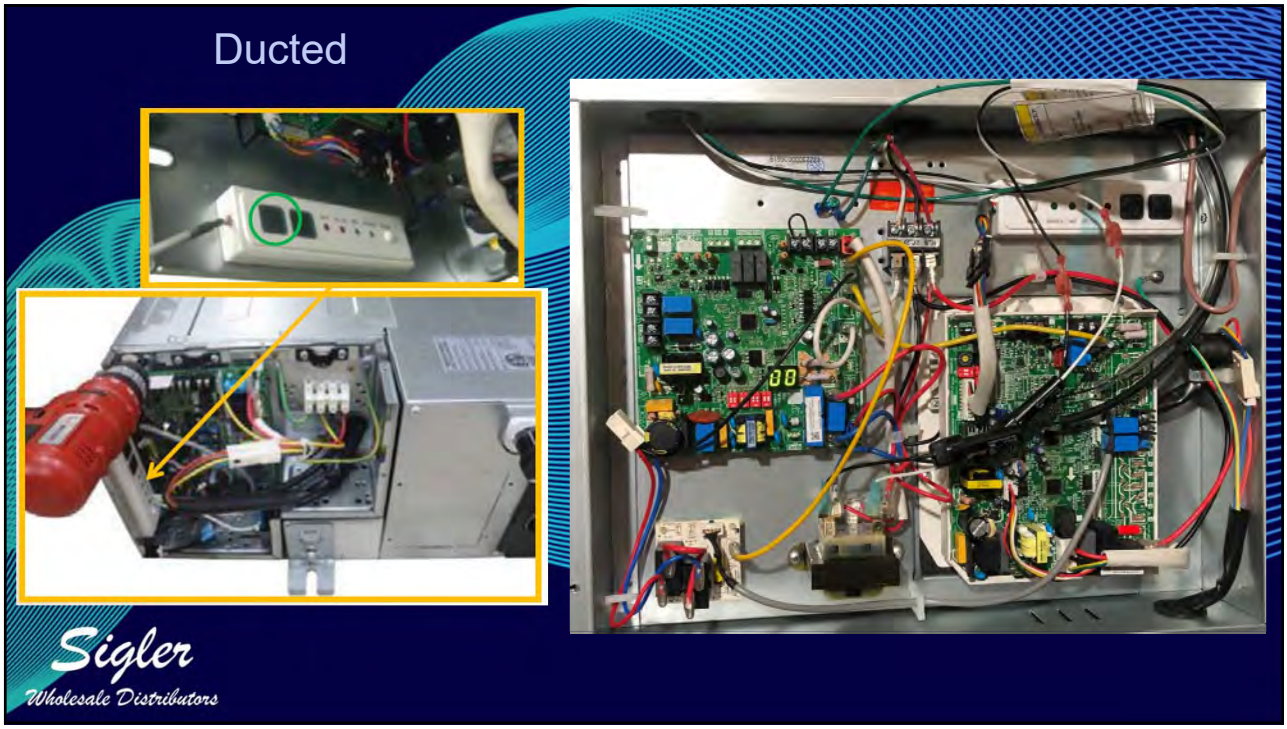
Ducted
Sigler
Wholesale Distributors

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4-Way & Floor Console

4-way

Infrared Receiver
NOT a display

Floor Console

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Wired Controller KSACN04/0501AAA 601AAA, 701AAA & KSACN801AAA

F0 displayed on the Wired Controller is a communication fault between the Wired Controller and the Indoor unit. The Wired Controller will also display any other Error Codes that are generated by the system at large.

Error Display

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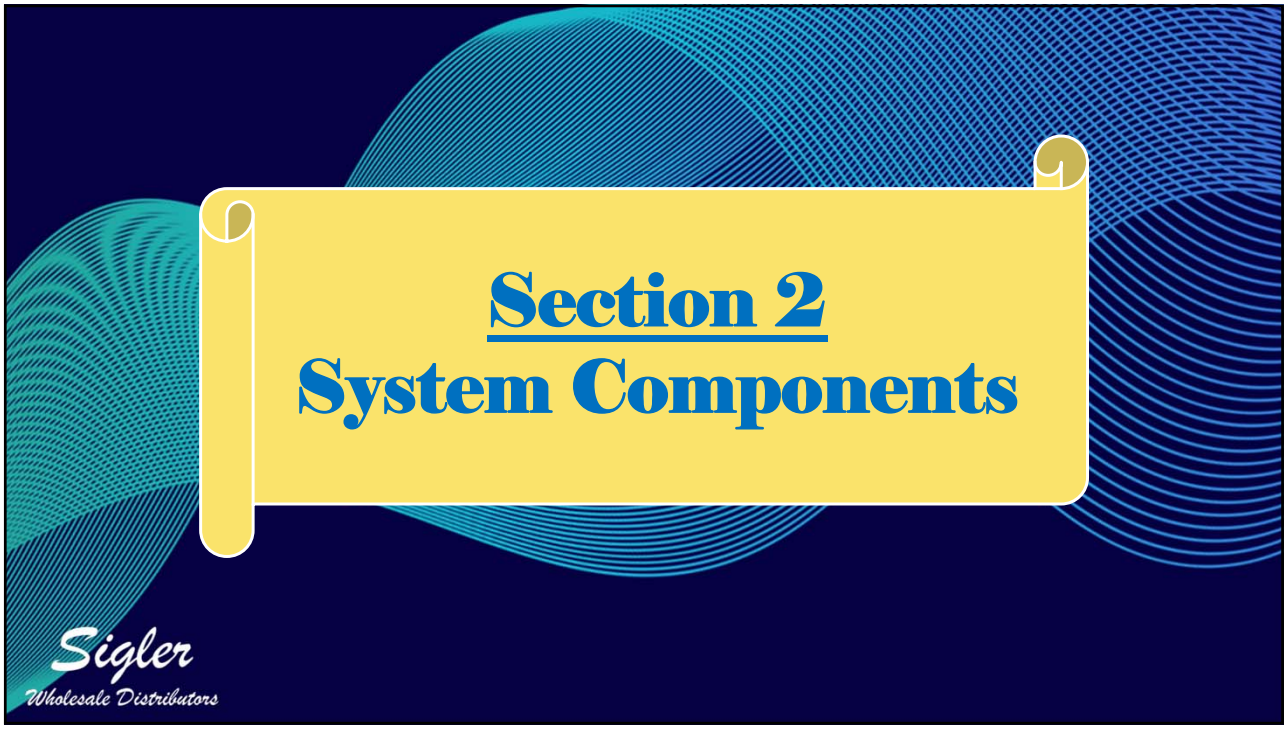
Section 2
System Components
Sigler
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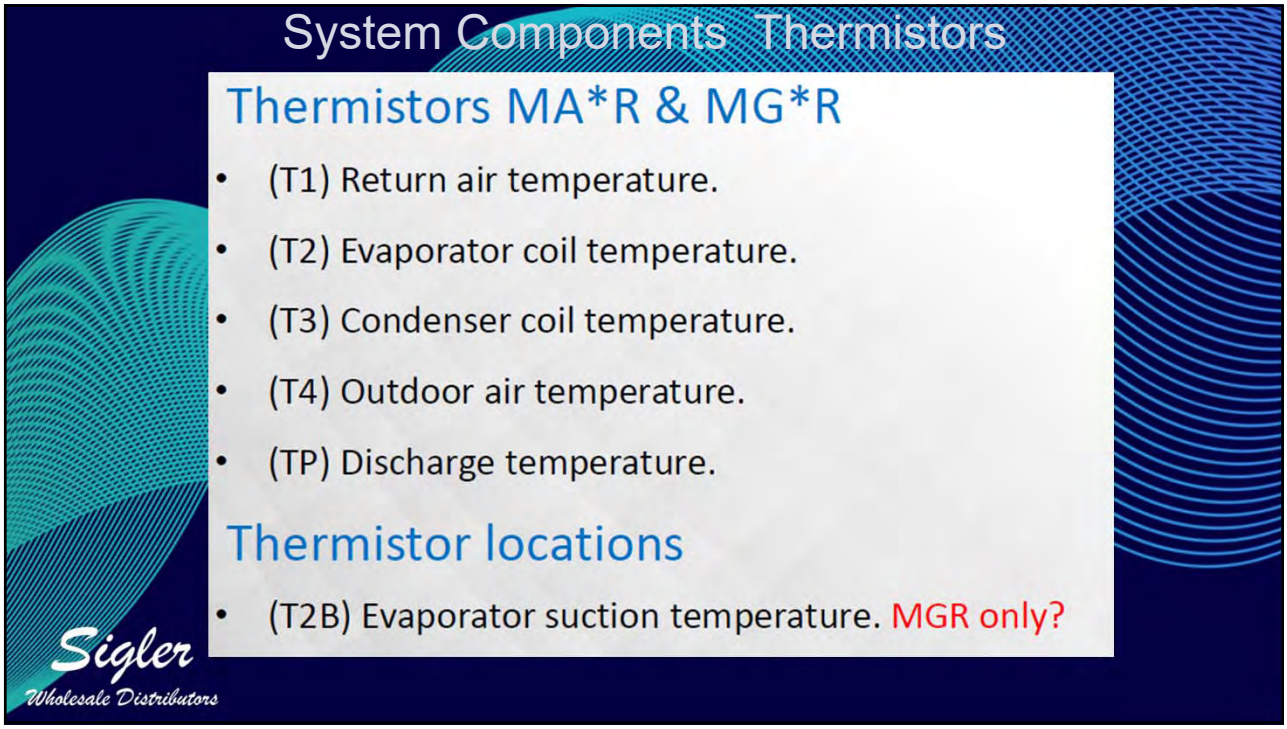
System Components Thermistors
Thermistors MA*R & MG*R
(T1) Return air temperature.
(T2) Evaporator coil temperature.
(T3) Condenser coil temperature.
(T4) Outdoor air temperature.
(TP) Discharge temperature.
Thermistor locations
(T2B) Evaporator suction temperature. MGR only?
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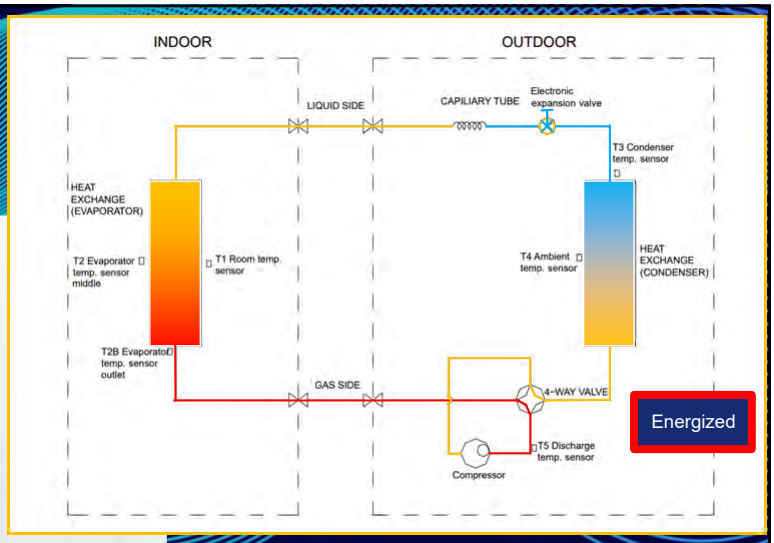
- (T1) Return air temperature.
- (T2) Evaporator coil temperature.
- (T3) Condenser coil temperature.
- (T4) Outdoor air temperature.
- (TP) Discharge temperature.

Thermistor locations

- (T2B) Evaporator suction temperature. MGR only?



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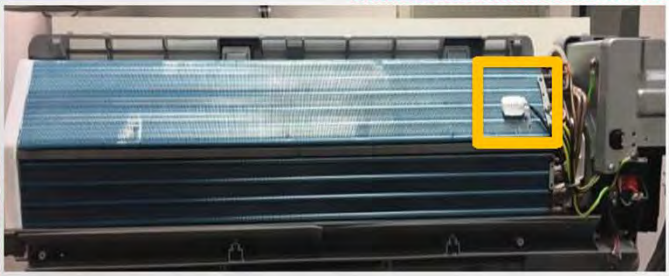
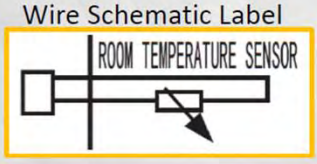
System Components Return Air Thermistors



Wire Schematic Label



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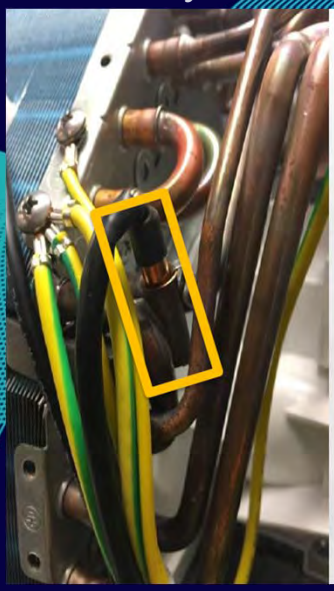
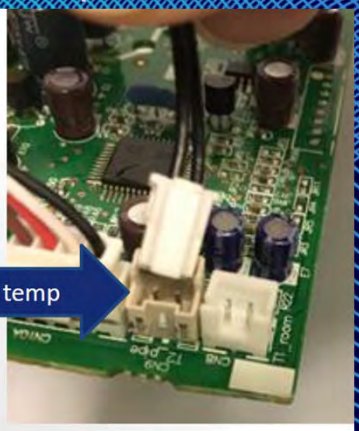
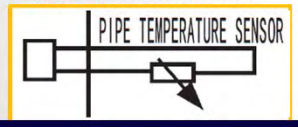
System Components Evaporator



Evaporator coil temp



Wire Schematic Label



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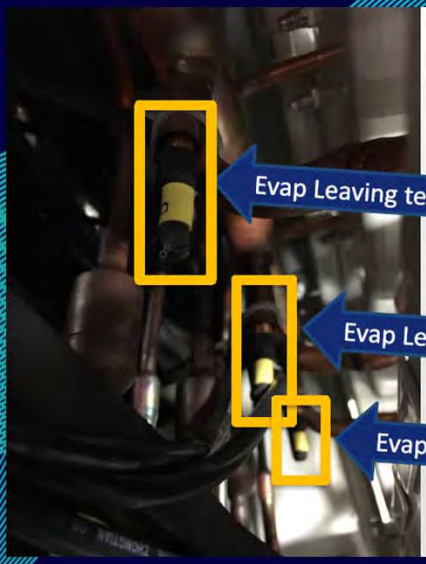
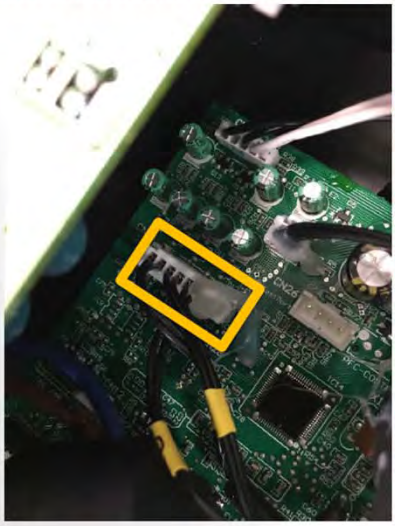
System Components Evaporator Thermistors



Evap Leaving temp C

Evap Leaving temp B

Evap Leaving temp A



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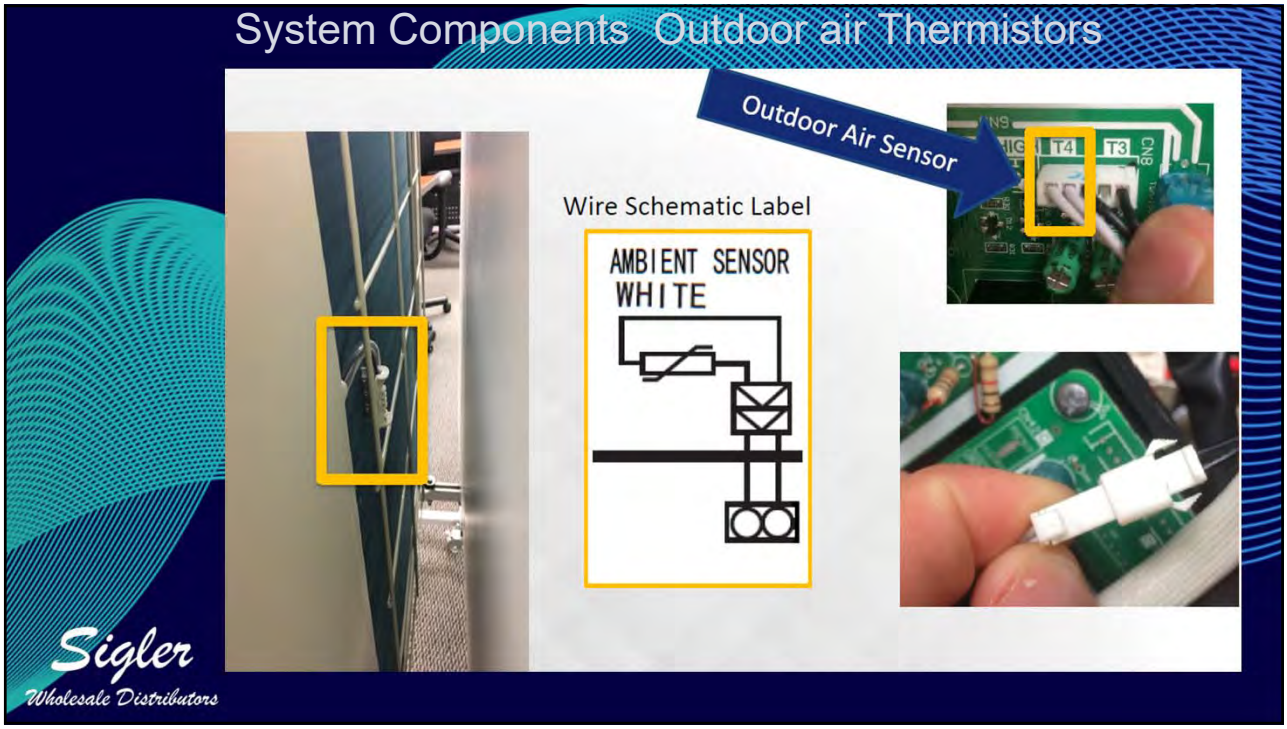
System Components Outdoor air Thermistors
Outdoor Air Sensor
Wire Schematic Label
AMBIENT SENSOR
WHITE
T4
T3
CN8
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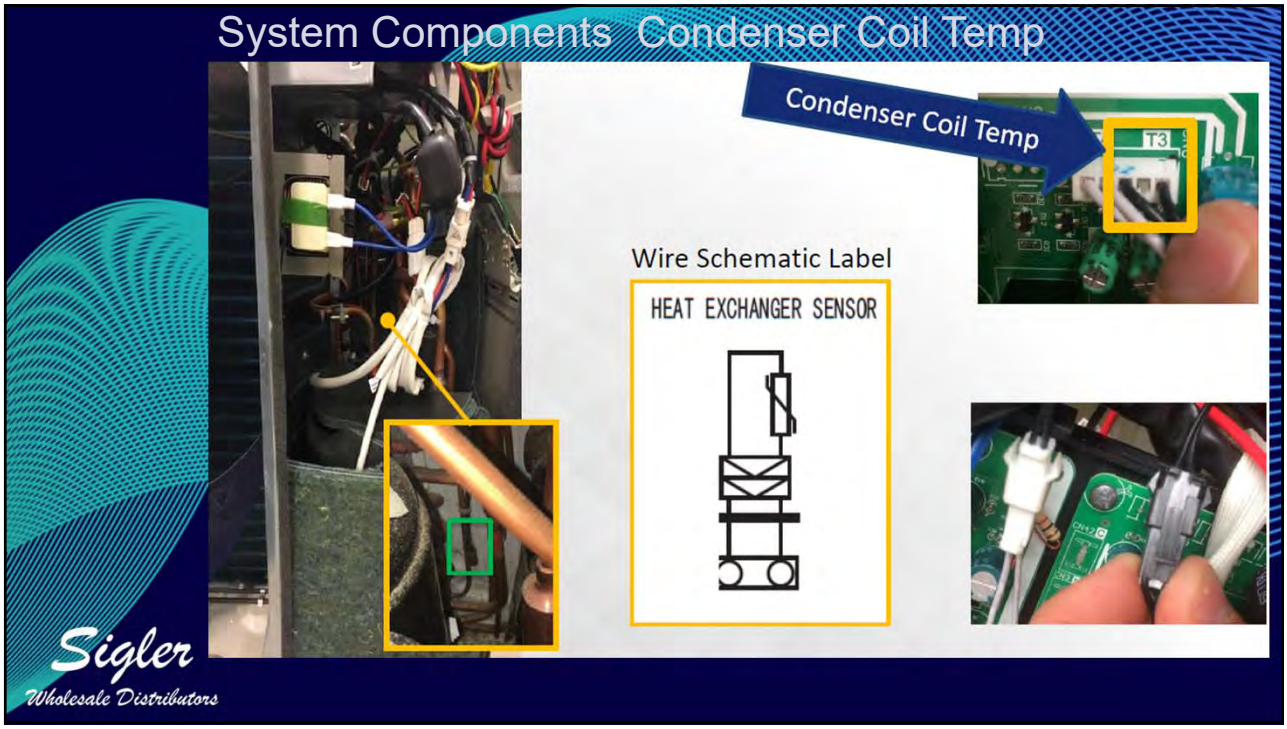
System Components Condenser Coil Temp
Condenser Coil Temp
Wire Schematic Label
HEAT EXCHANGER SENSOR
T3
Sigler
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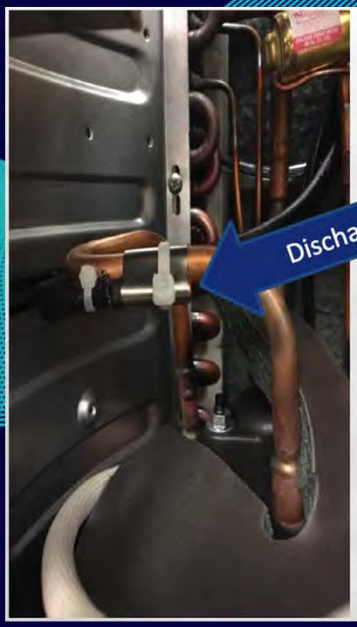
System Components Discharge Temp



Discharge Sensor

Wire Schematic Label

EXHAUST TEMPERATURE SENSOR

TP

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System Components (Board Change)

Old Board

New Board

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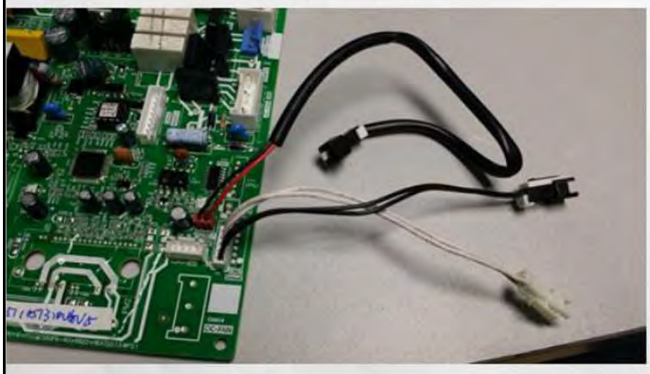
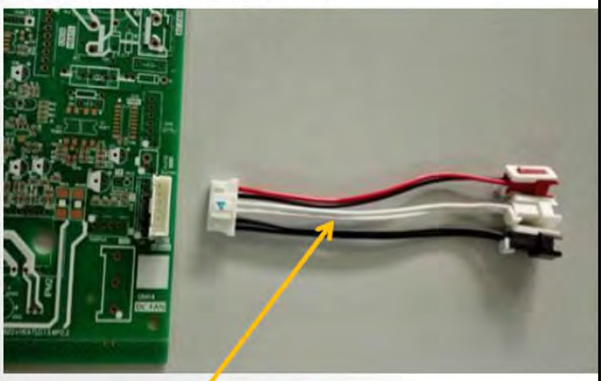
(Board Change)

Before V1.8



After V2.0



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System Components *Thermistors*

What it does:
Provides indoor unit circuit board different temperatures.

Compone nt check

How to check it:
Read Resistance and compare to temperature/resistance chart in appendix of Service Manual.
Check voltage

Findings:
Matches chart in service manual

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Knowledge Check

Why is inverter technology becoming so popular and how does it work?

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System Components IPM

DLS Technology

A ***fixed speed compressor*** is susceptible to electrical damage

An ***inverter-driven compressor*** is less likely to fail at start-up because it sees a soft-start, making it more **MORE RELIABLE**

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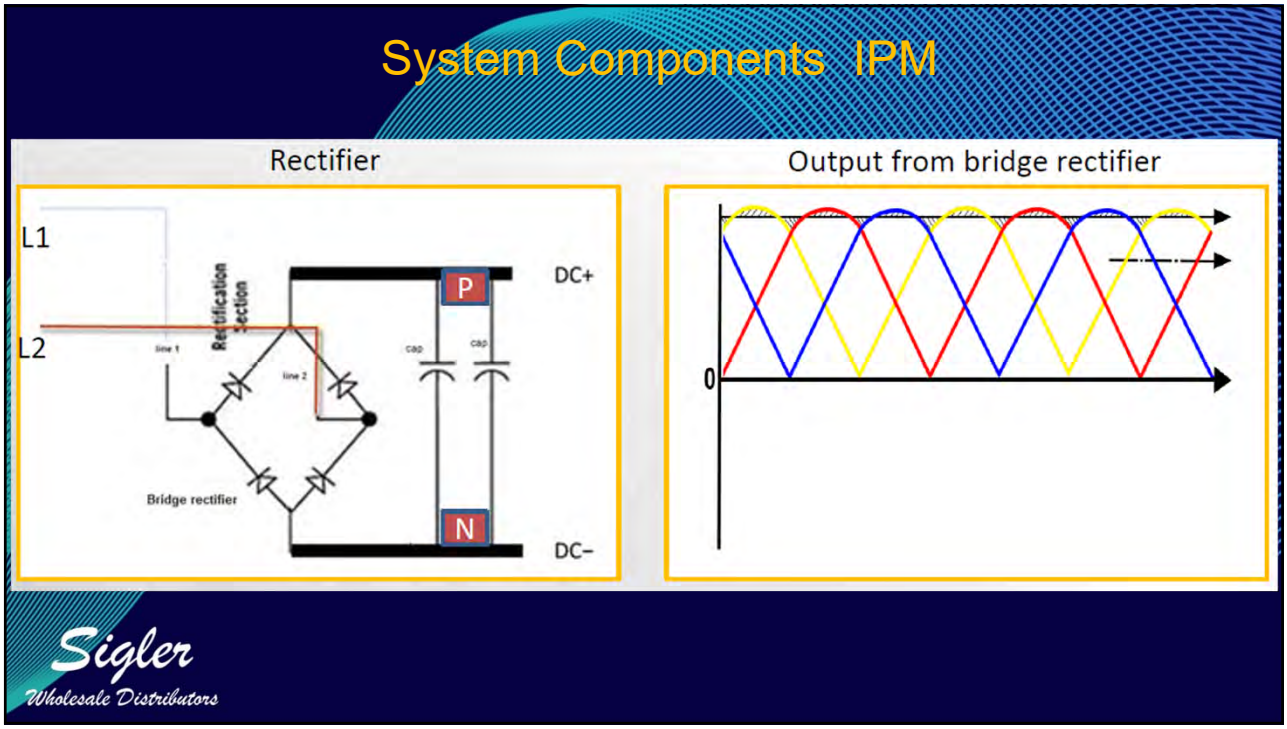
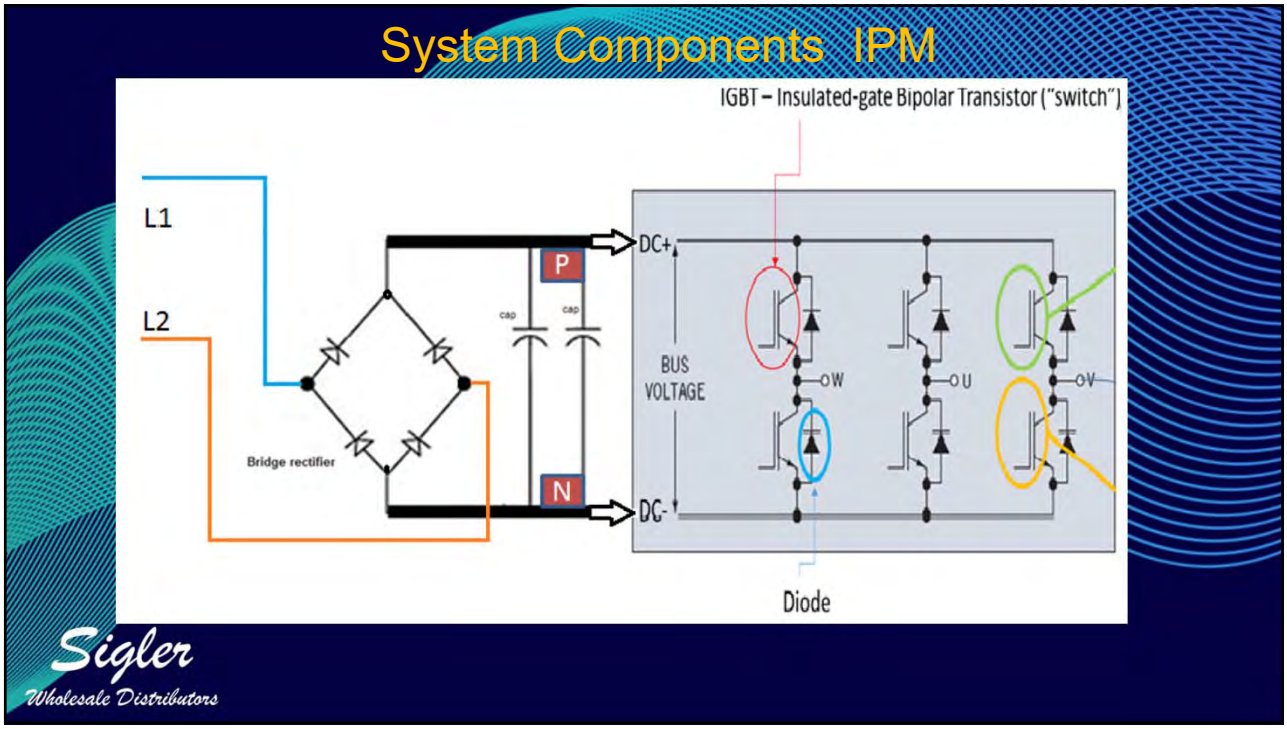
System Components IPM



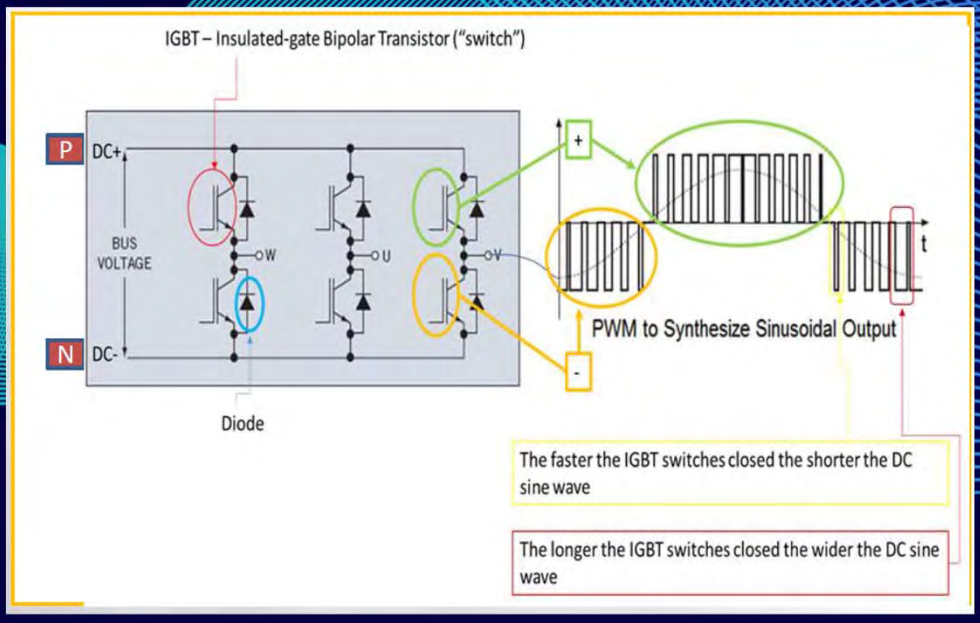
87

System Components IPM



88

System Components IPM



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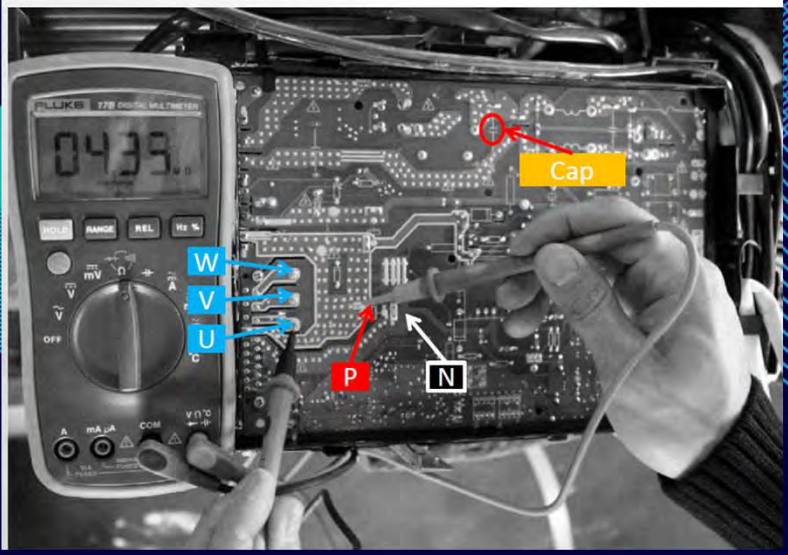
System Components IPM

Inverter and Main PCB Built in



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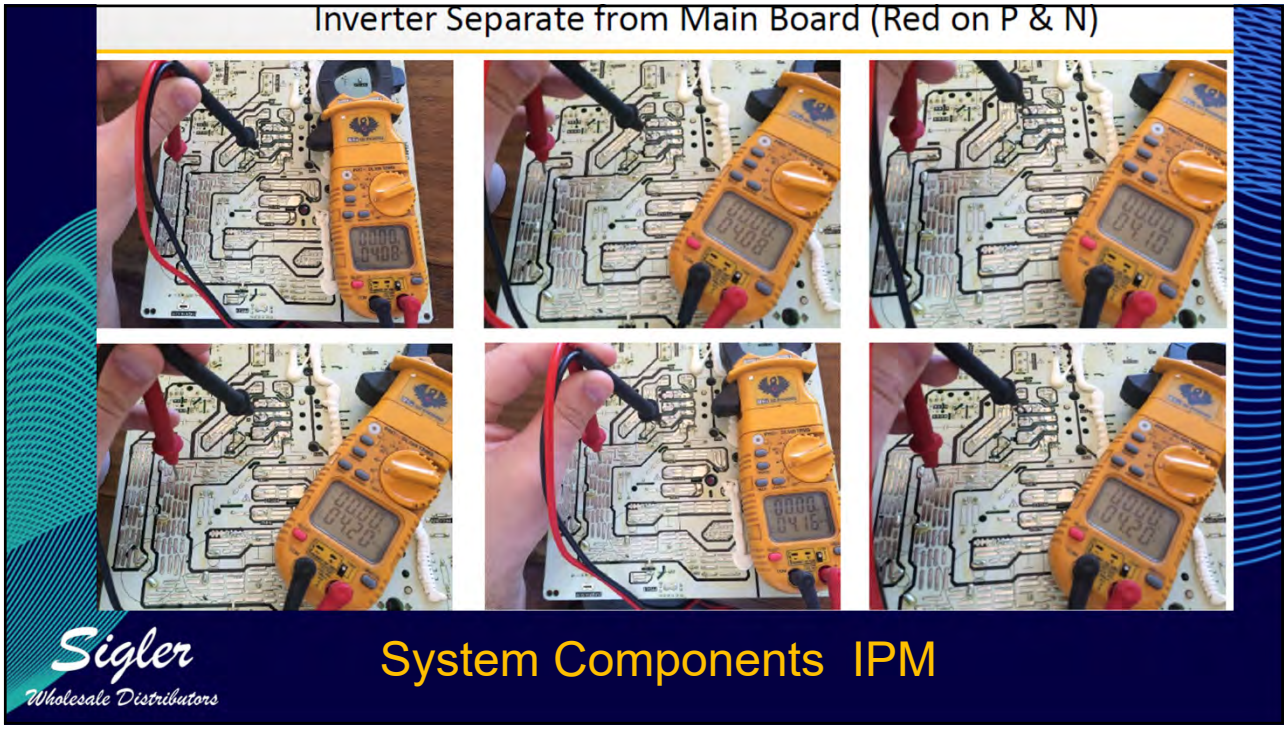
Inverter Separate from Main Board (Red on P & N)
Sigler
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System Components IPM

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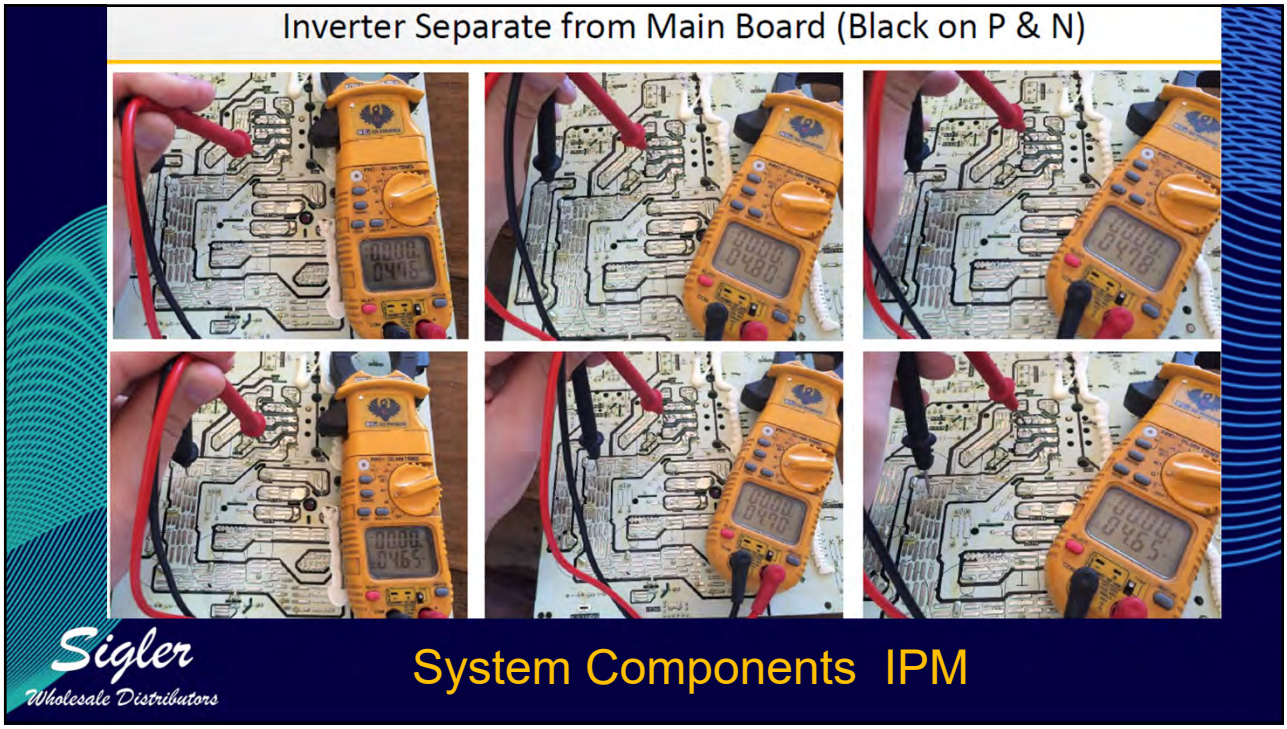
Inverter Separate from Main Board (Black on P & N)
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System Components IPM

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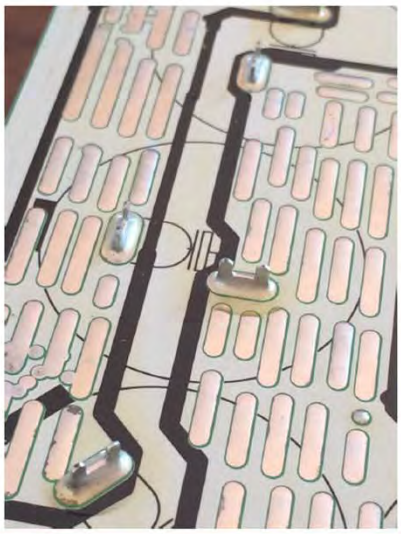
System Components IPM

Coating

Capacitor



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System Components IPM

What it does:

The IPM opens and closes the IGBTs at specific intervals to simulate a sine wave.

How to check it:

Power Off
Wait 10 minutes
Check resistance between P and UVW
Check resistance between N and UVW

Findings:

Several mega ohm
Look for consistency between transistors.

Component check

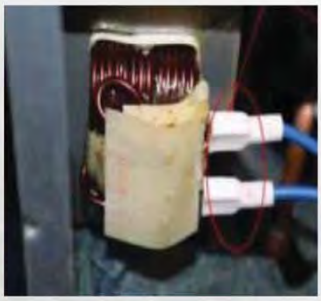
Sigler Wholesale Distributors

Next up… Reactor

94

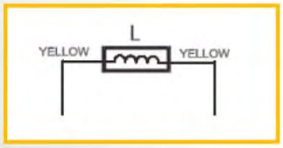
System Components - Reactor

MA*R 2 Zone Reactor



MG*R 2 Zone Reactor

MG*R 5 Zone Reactor

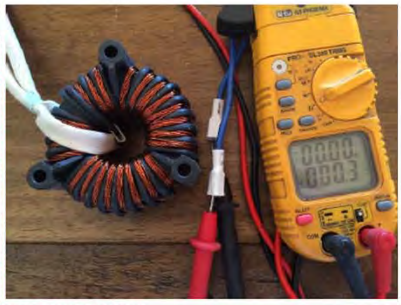


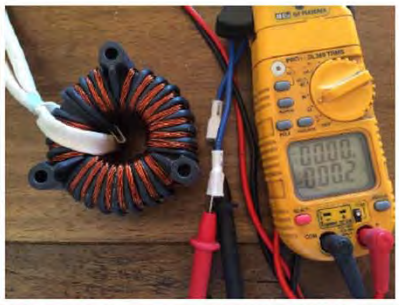
Sigler Wholesale Distributors

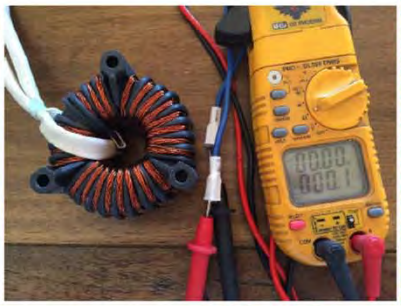
95

System Components - Reactor

Resistance check on windings







High and Fade is Okay!

Sigler Wholesale Distributors

96

System Components: Reactor

What it does:

A reactor opposes the change in current.

How to check it:

Measure Resistance

Findings:

Typically under 1 Ohm
Not OL (open load)
Not 0Ω (shorted)
No resistance to ground

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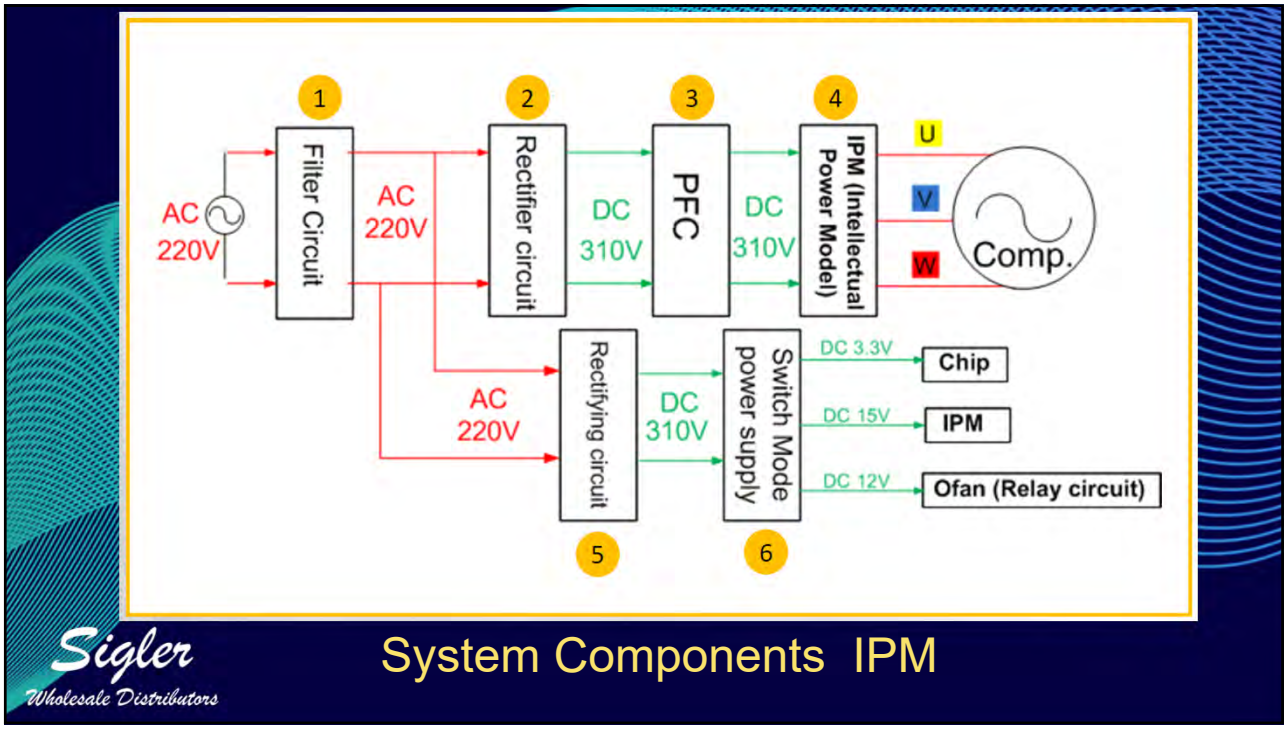
Next up….IPM

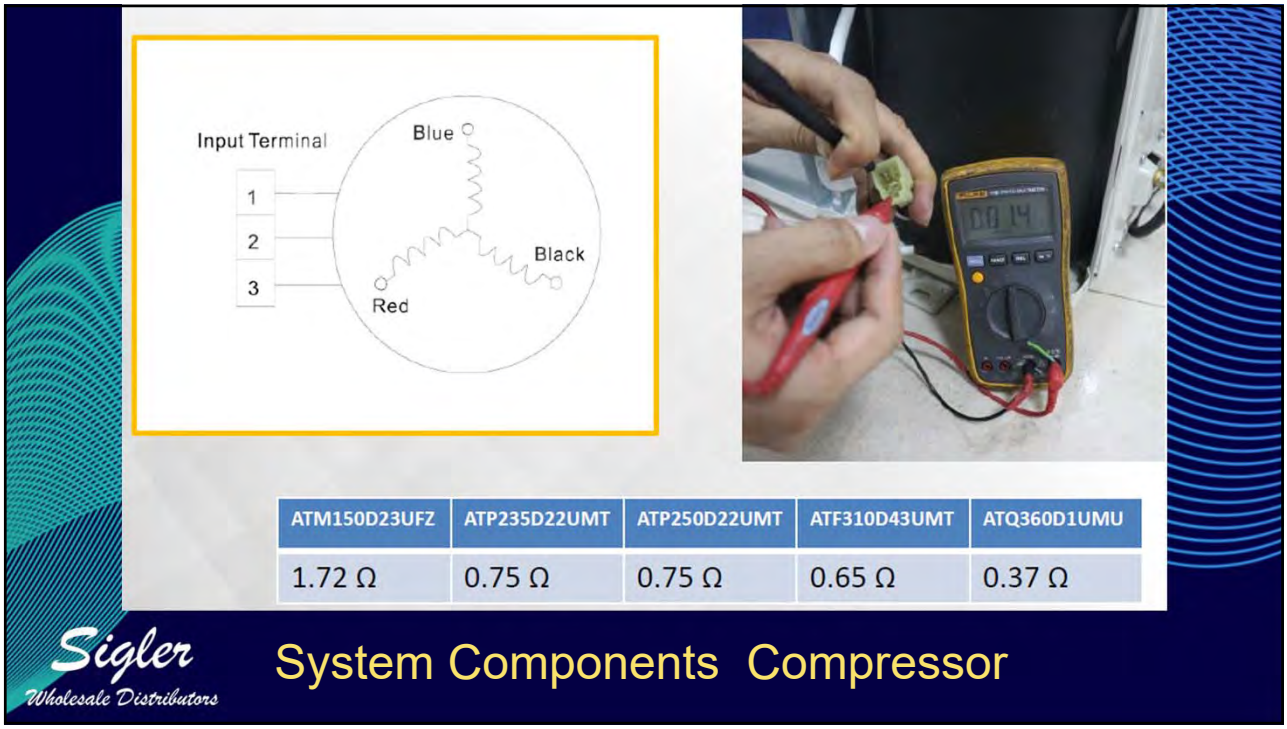
97



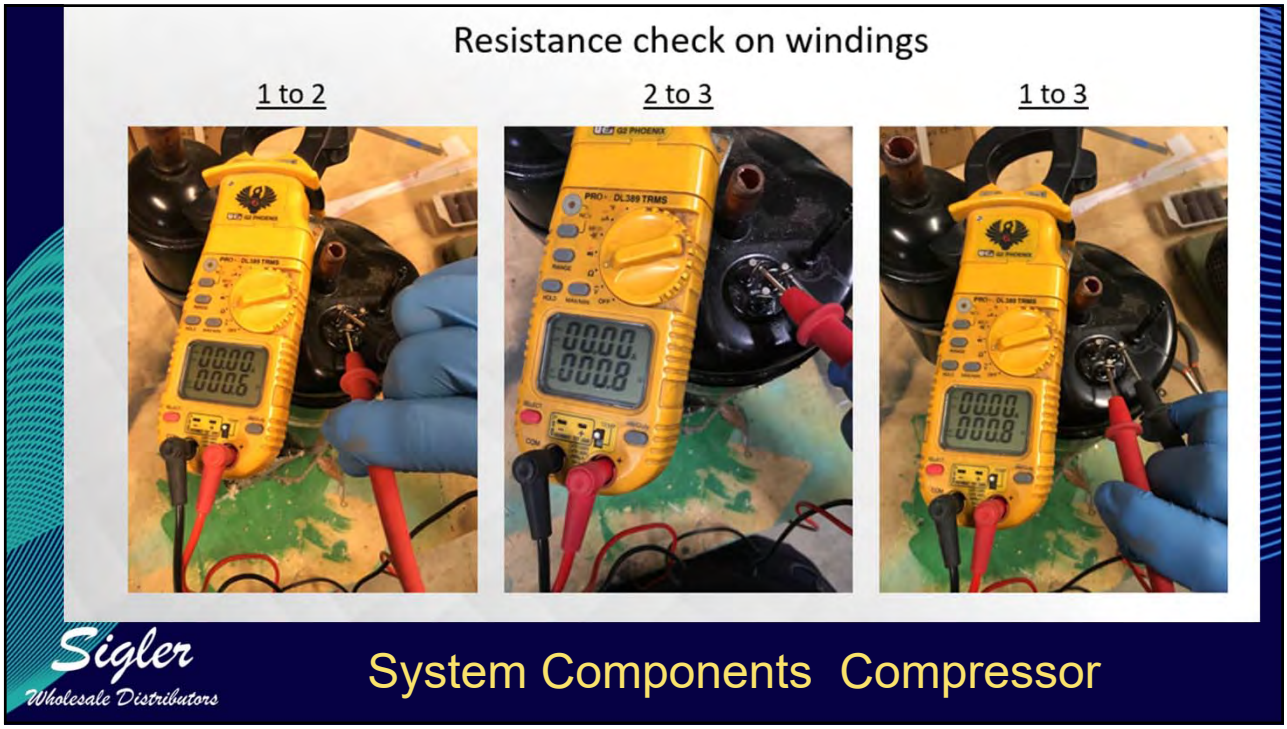
Sigler Wholesale Distributors

System Components IPM

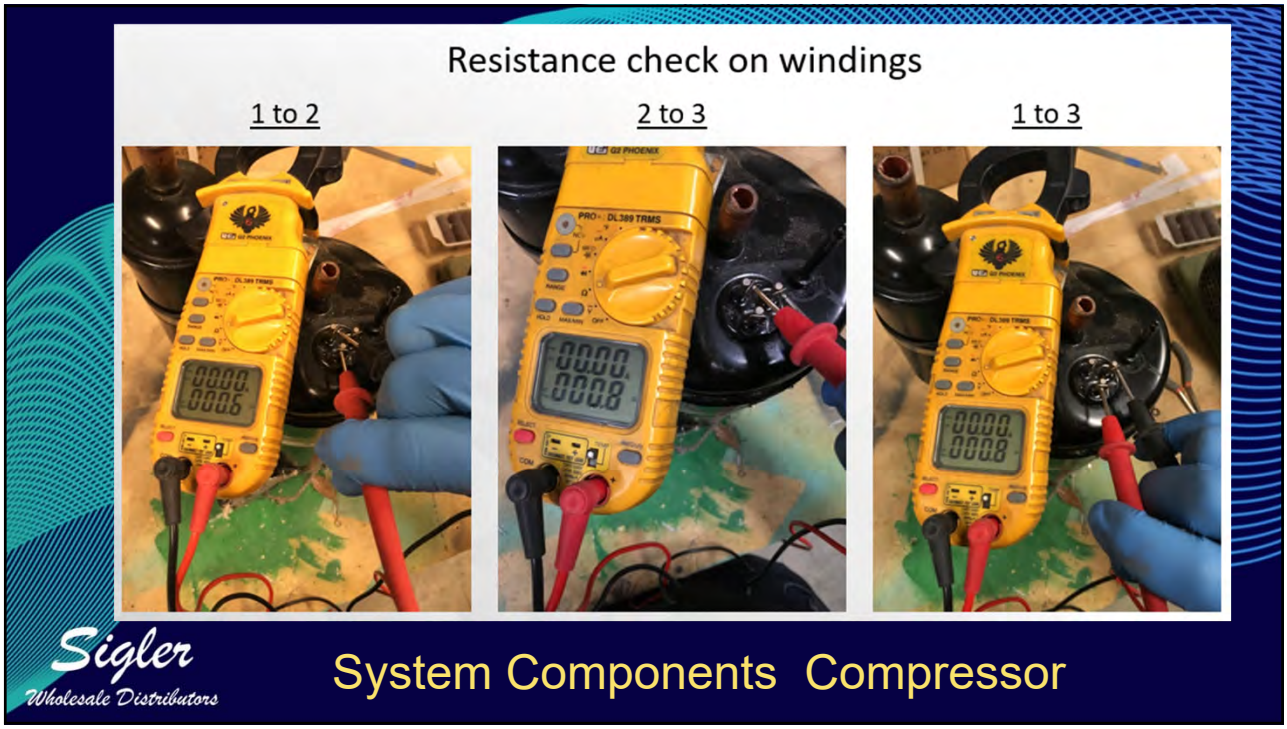
98


Input Terminal
1
2
3
Blue
Black
Red
ATM150D23UFZ
ATP235D22UMT
ATP250D22UMT
ATF310D43UMT
ATQ360D1UMU
1.72 Ω
0.75 Ω
0.75 Ω
0.65 Ω
0.37 Ω
Sigler
Wholesale Distributors
System Components Compressor

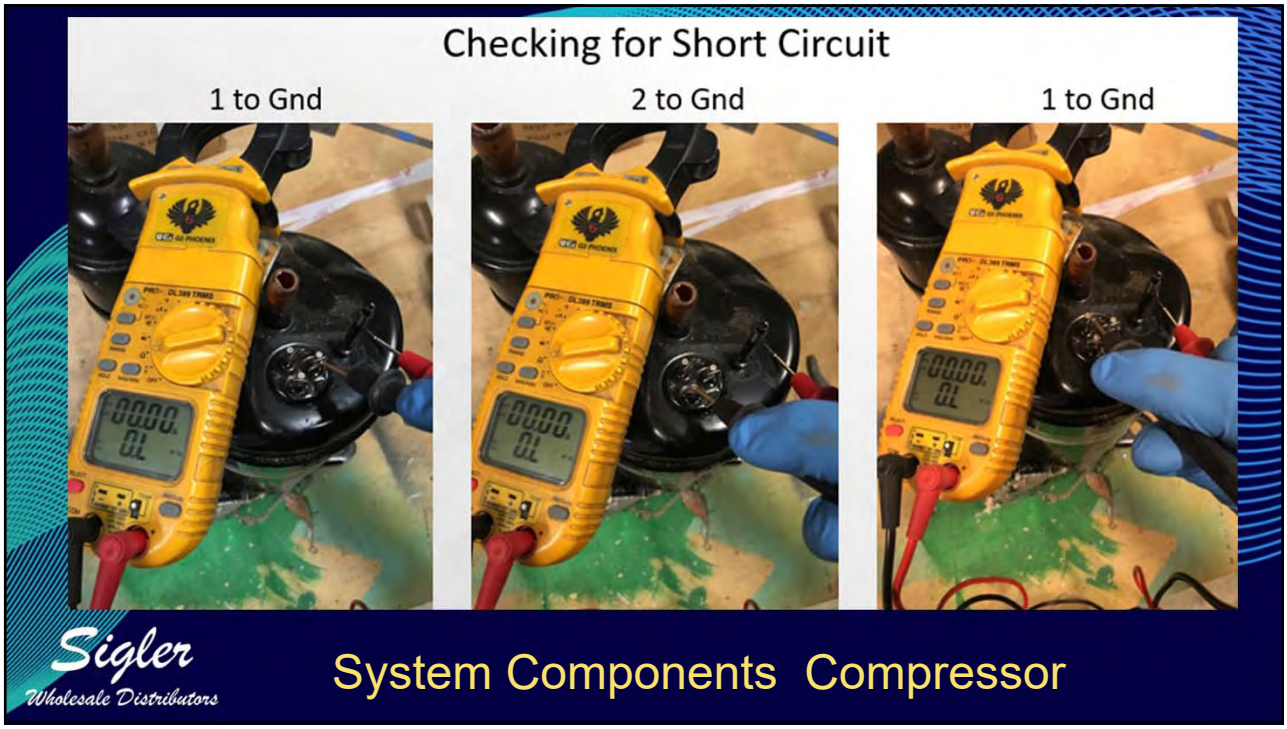
99


Resistance check on windings
1 to 2
2 to 3
1 to 3
Sigler
Wholesale Distributors
System Components Compressor

100


Resistance check on windings
1 to 2
2 to 3
1 to 3
Sigler
Wholesale Distributors
System Components Compressor

101


Checking for Short Circuit
1 to Gnd
2 to Gnd
1 to Gnd
Sigler
Wholesale Distributors
System Components Compressor

102

System Components Compressor

What it does:

Provides refrigerant flow through the coils.
Changes speed to meet the capacity of each indoor unit.

Component check

How to check it:

Power Off
Wait 10 minutes
Check resistance across windings
Check resistance from windings to ground

Findings:

Under 2 Ω and all equal
OL to ground

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Next Up…EEV

103

System Components EEV

EEV – Electronic Expansion Valve

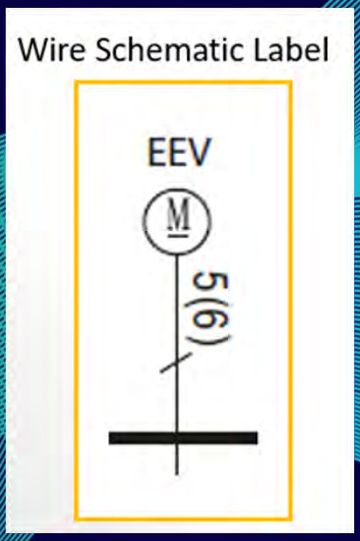
Detachable Coils

Expansion Valves

Sigler Wholesale Distributors

104

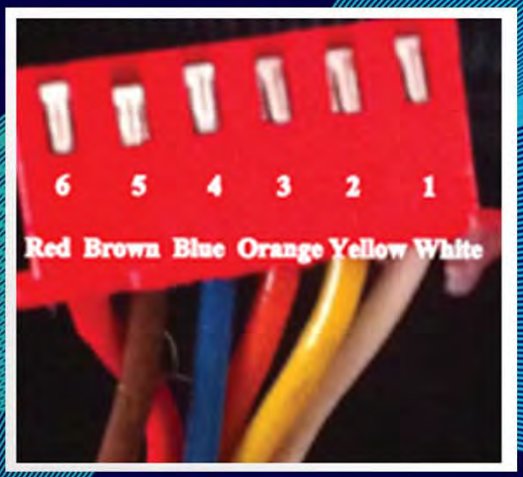
System Components EEV

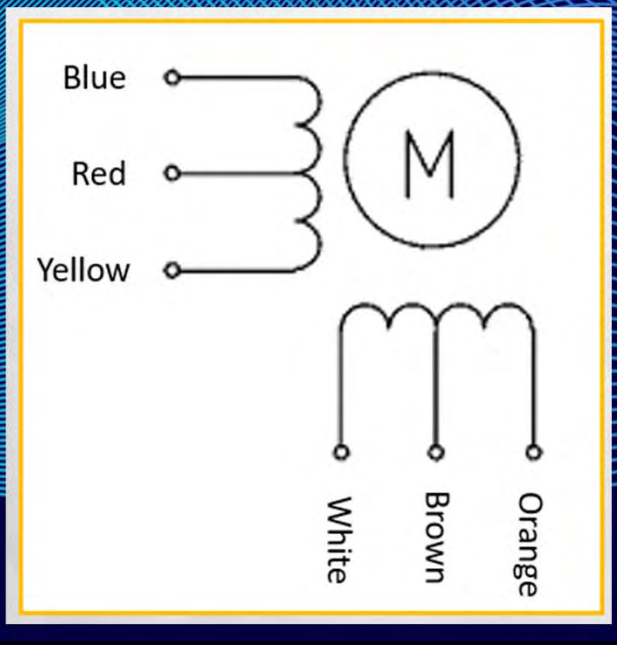


Sigler
Wholesale Distributors

105

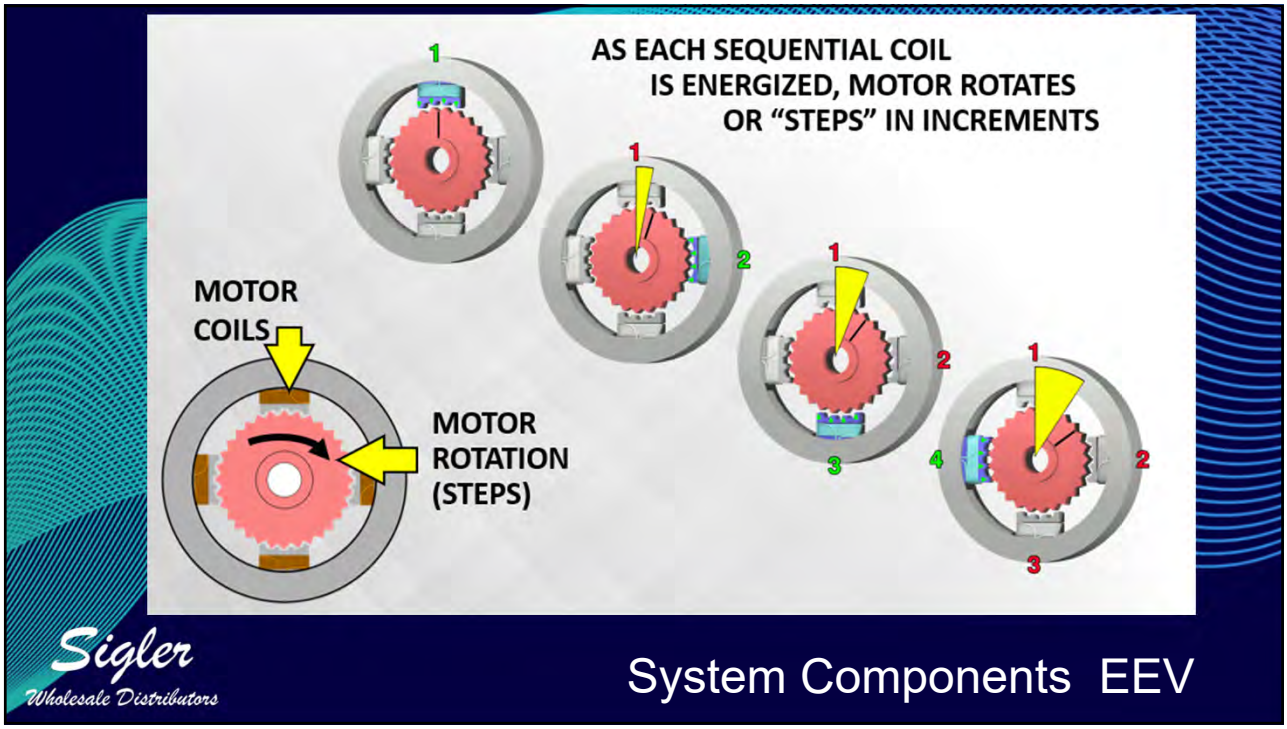
System Components EEV



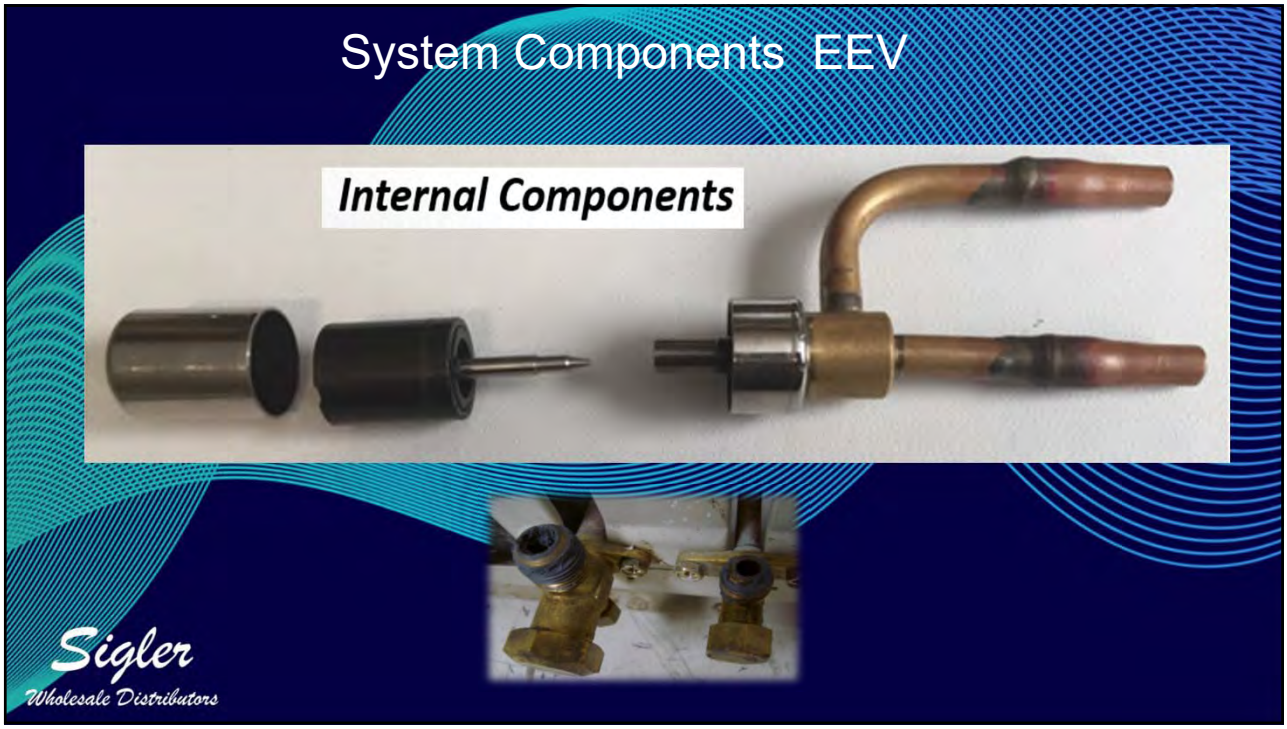


Sigler
Wholesale Distributors

106

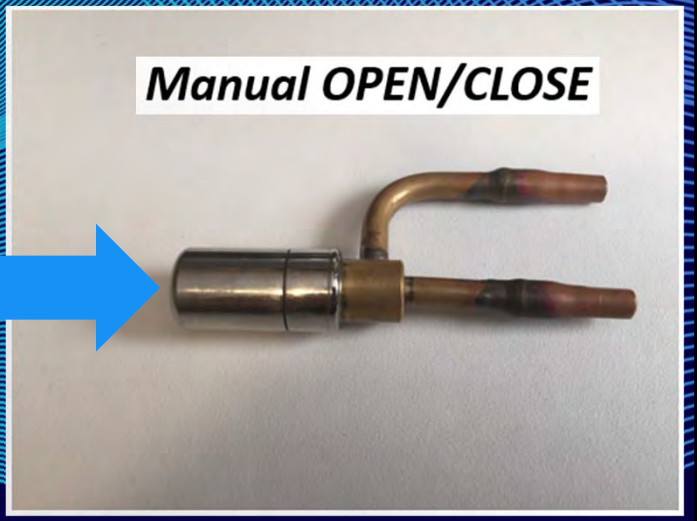

AS EACH SEQUENTIAL COIL
IS ENERGIZED, MOTOR ROTATES
OR "STEPS" IN INCREMENTS
MOTOR
COILS
MOTOR
ROTATION
(STEPS)
1
2
3
4
Sigler
Wholesale Distributors
System Components EEV

107


System Components EEV
Internal Components
Sigler
Wholesale Distributors

108

System Components EEV



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109

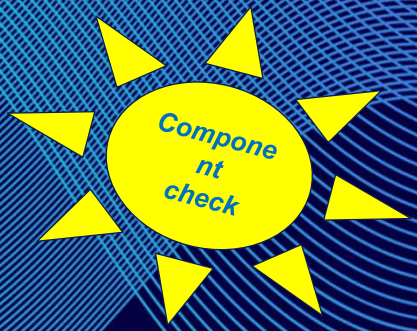
System Components EEV

What it does:
Meters refrigerant into IDU

How to check it:
Ohm out each winding from center tap to end.

Findings:

Wire Color	Resistance
Red to Blue	50 Ω
Red to Yellow	50 Ω
Brown to orange	50 Ω
Brown to White	50 Ω



Sigler Wholesale Distributors

Next up…4-way

110

Electronic Expansion Valve (EXV) Control

1 EXV is fully closed when power is turned on. The EXV will standby with the 350P open and then opens to the target angle after the compressor starts.

2 EXV will close with − 160P when the compressor stops. Then EXV will standby with the 350P open and then opens to the target angle after the compressor starts.

3 The action priority of the EXVs is A−B−C−D−E.

4 Compressor and the outdoor fan start operation only after the EXV is initialized.

Cooling mode

1 The initial open angle of EXV is dependent on indoor model size, adjustment range is 100−400p. When the unit starts to work for 3 minutes, the outdoor unit receives the indoor units' (of capacity demand) T2B information and calculates their average. After comparing each indoor' s T2B with the average. the outdoor gives the following modification commands: if the T2B>average, the relevant valve needs more 16p open. If the T2B = average, the relevant valve's open range remains. If the T2B<average, the relevant valve needs more 16p close. This modification will be carried out every 2 minutes.

Heating mode

The initial open angle of EXV is 250P, dependent on indoor model size, adjustment range is 100−400p. After the unit works for 3 minutes, the outdoor unit receives the indoor units' (of capacity demand) T2 information and calculates their average. After comparing each indoor units' T2 with the average, the outdoor unit gives the following modification commands.

If the T2<average +2, the relevant valve needs more 16p close. If average +2≥the T2≥ average−2, the relevant valve's open range remains. If the T2< average−2, the relevant valve needs more 16p open. This modification occurs every 2 minutes.

Sigler Wholesale Distributors

111

Knowledge Check (Charge Question)

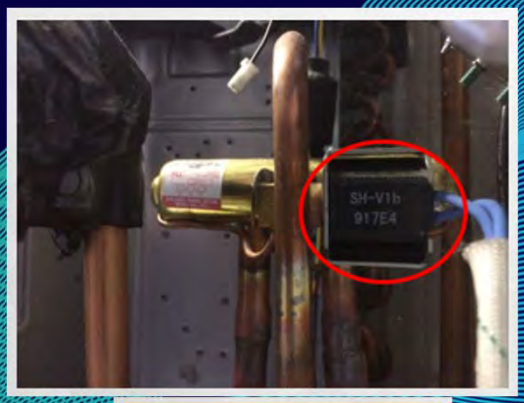
Knowledge Check

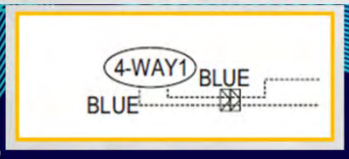
Can I tell if an EEV has a restriction based on a temperature drop?

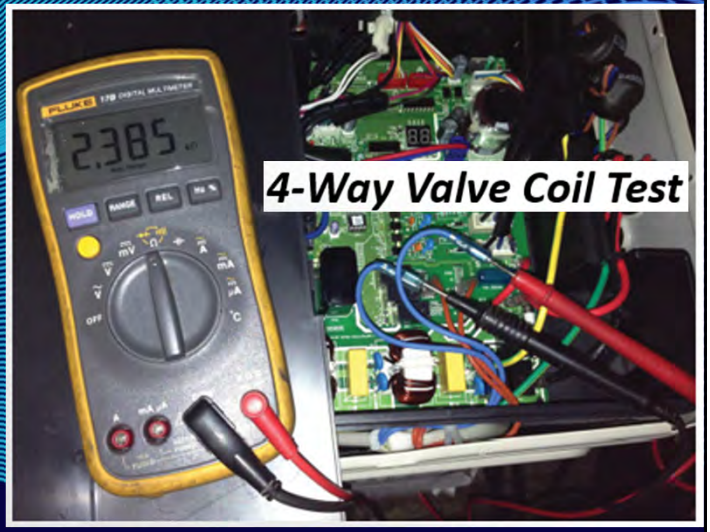
Sigler Wholesale Distributors

112

System Components (4-way valve)







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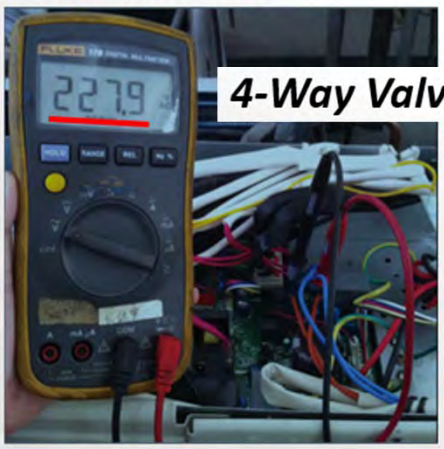
Wholesale Distributors

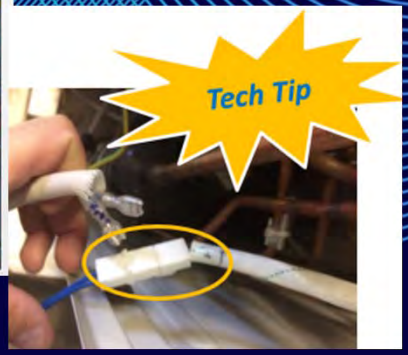
113

System Components (4-way valve)

Cooling Mode = OFF

Heating Mode = ON





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Wholesale Distributors

114

System Components (4-way valve)

What it does:

Reverses the refrigerant flow between coils to change between Heat and Cool mode.

How to check it:

Coil resistance check
Check voltage output from board

Findings:

1.8 to 2.5 KΩ
PCB output is line voltage
OL to ground

Compone nt check

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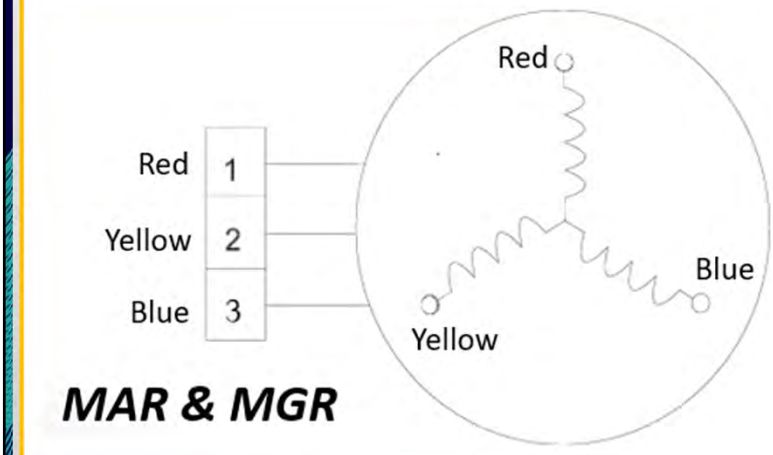
Next up…ODU FAN

115

System Components (Outdoor Fan)



Motor Tag:

Sigler Wholesale Distributors

116

System Components (Outdoor Fan)

Fan Motor Resistance Check

Blue to Yellow

Blue to Red

Yellow to Red

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117

Carrier

Ductless Debugger Tool

RCD Part Number is
17222000A55927

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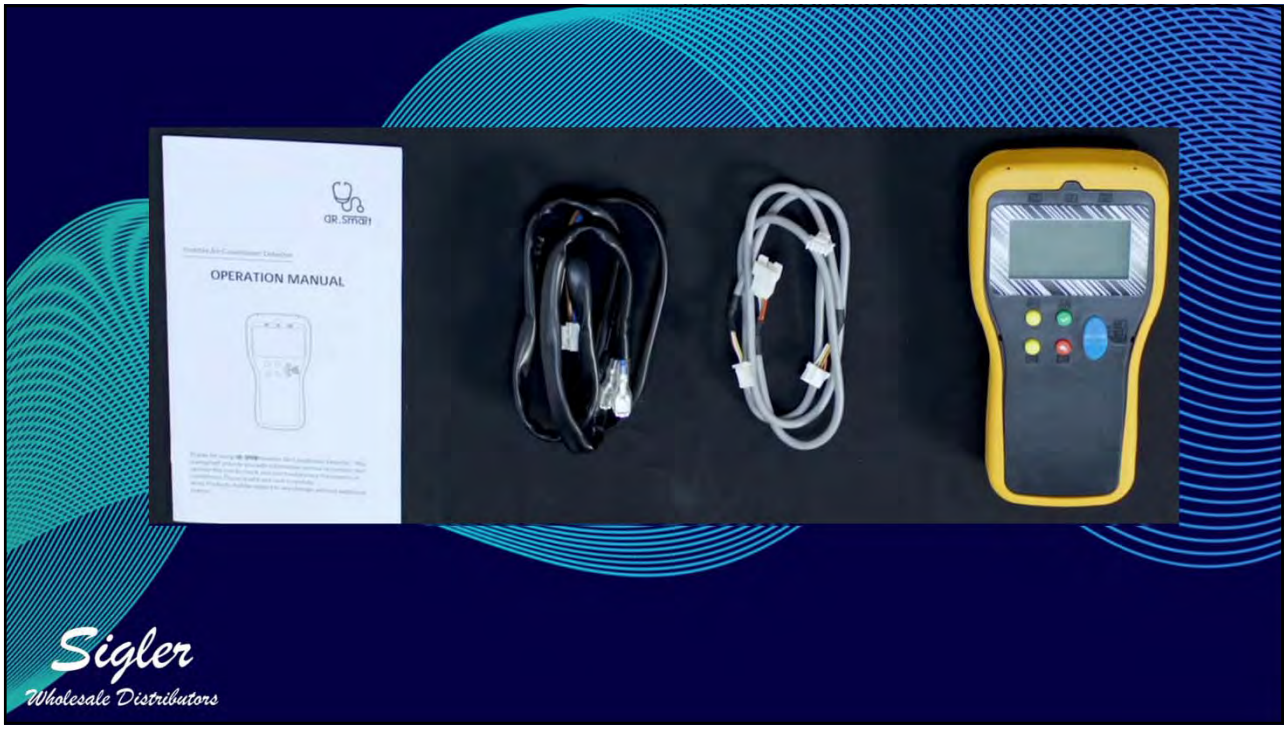
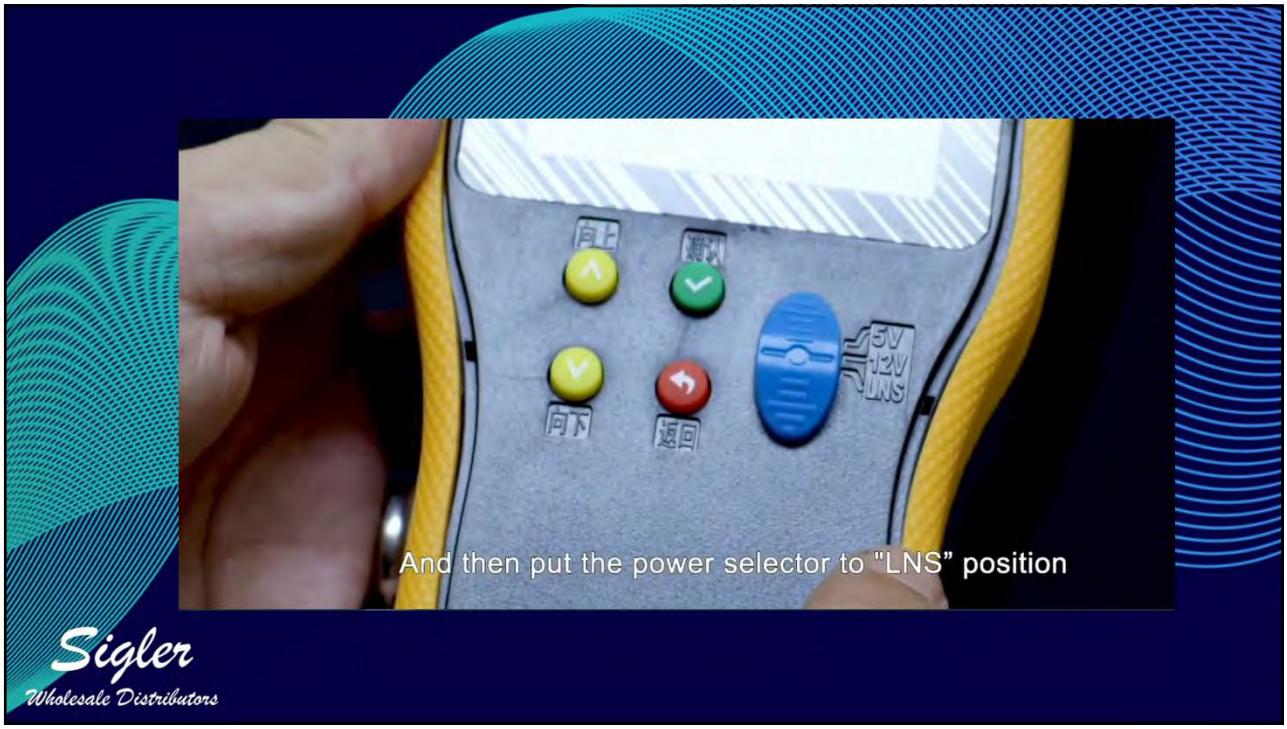
118


OPERATION MANUAL
Sigler
Wholesale Distributors

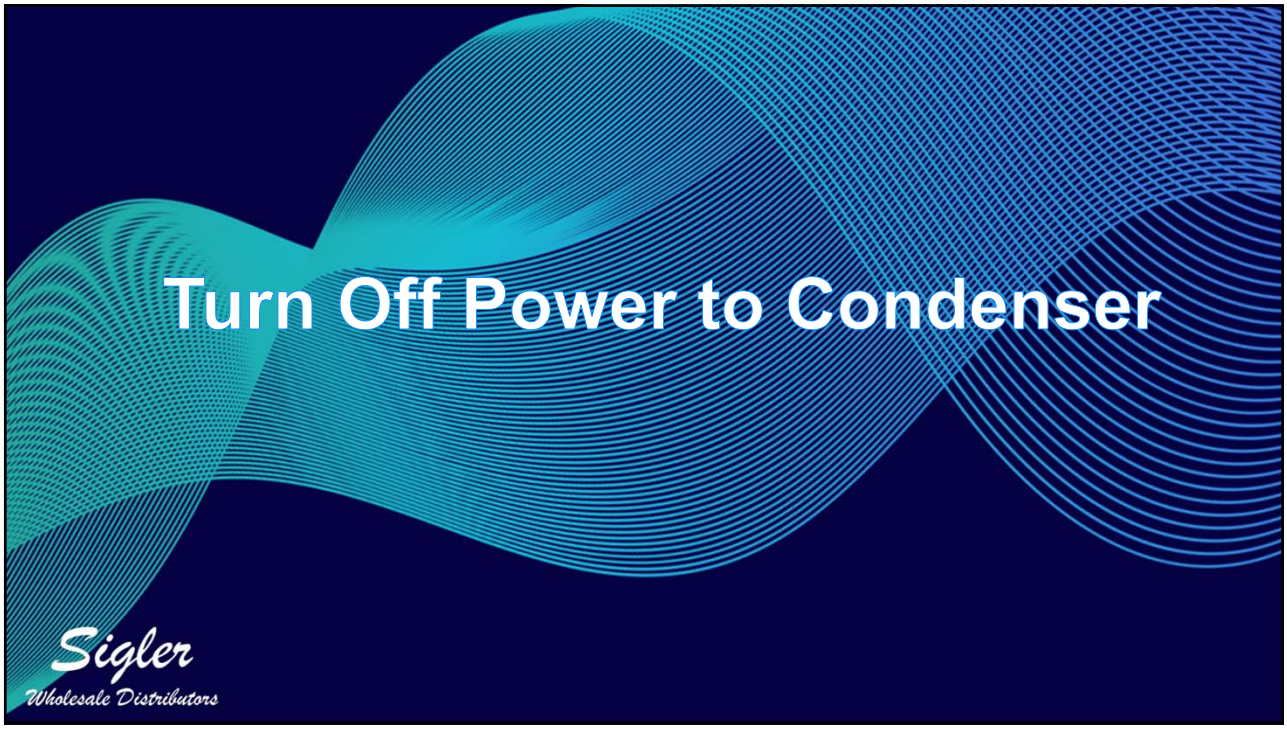
119


LNS CONECTOR
Snap In!
on the top of the device
Sigler
Wholesale Distributors

120


And then put the power selector to "LNS" position
Sigler
Wholesale Distributors

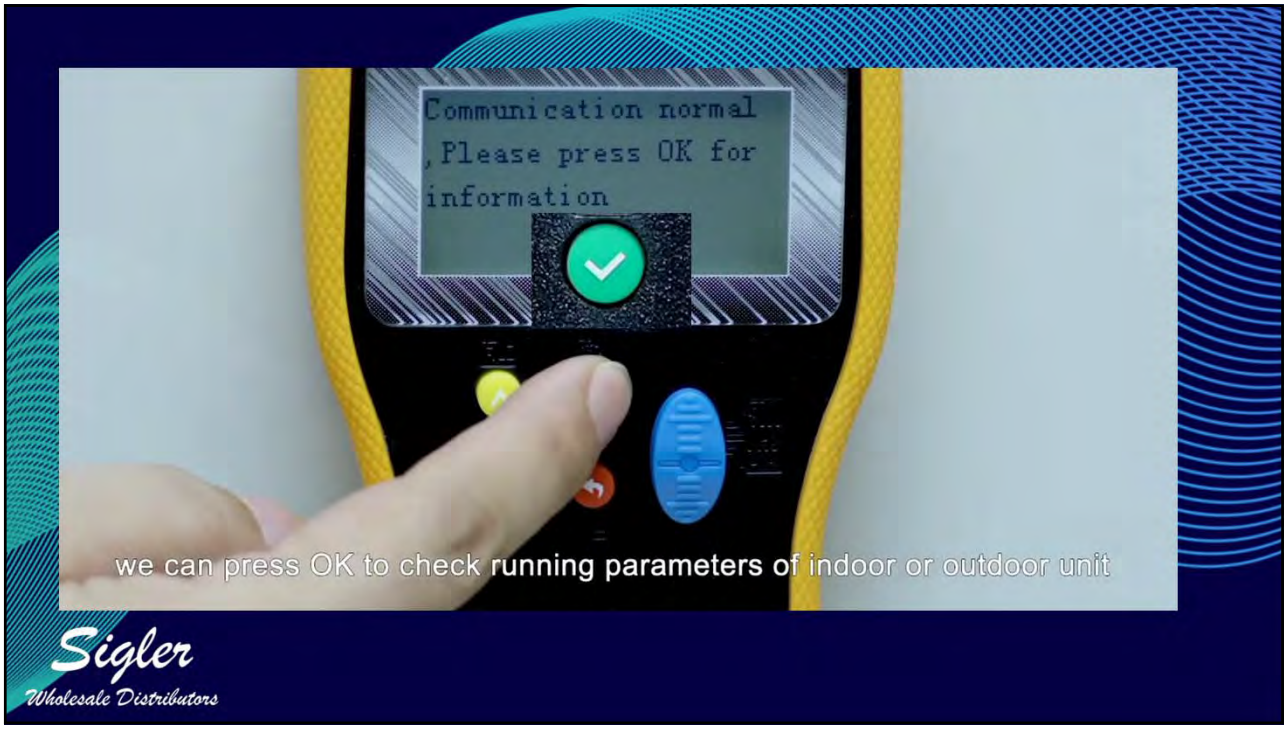
121


Turn Off Power to Condenser
Sigler
Wholesale Distributors

122


There are 2 magnets on the back of the device
Sigler
Wholesale Distributors

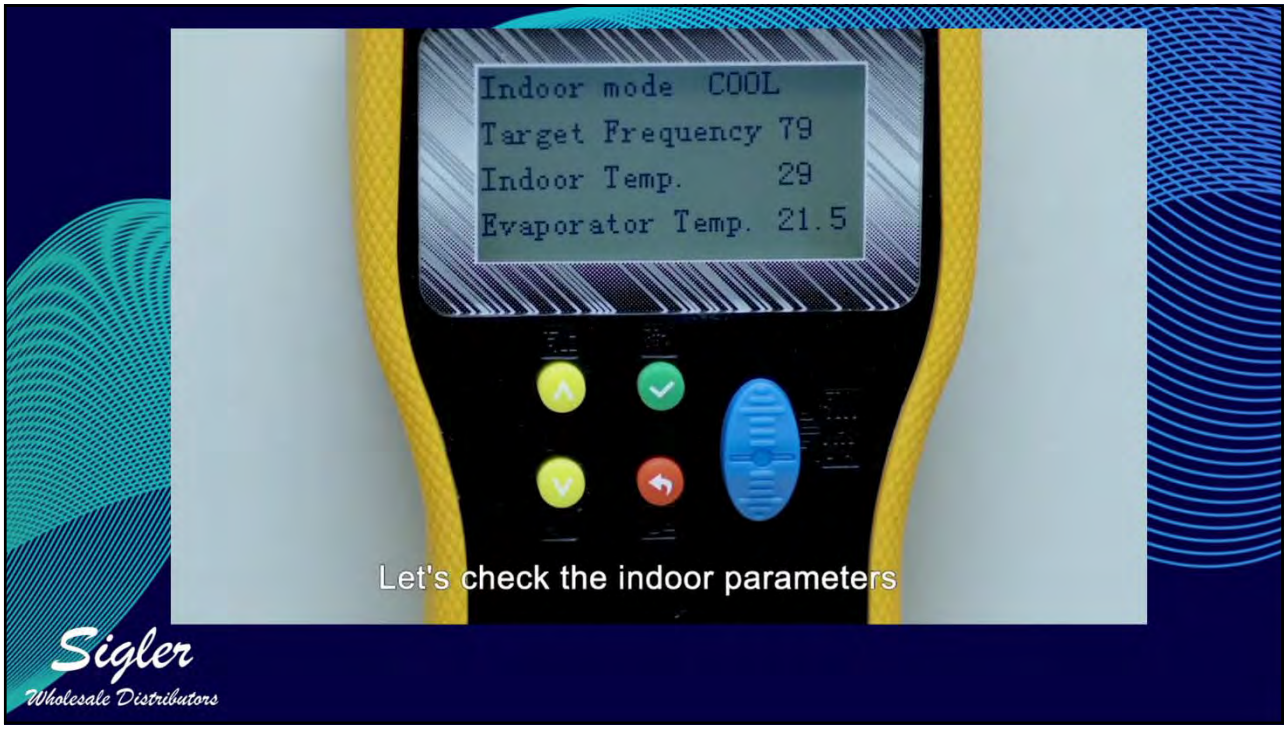
123


Communication normal
,Please press OK for
information
we can press OK to check running parameters of indoor or outdoor unit
Sigler
Wholesale Distributors

124


ODU Communication fa
ult
if communication has problem
Sigler
Wholesale Distributors

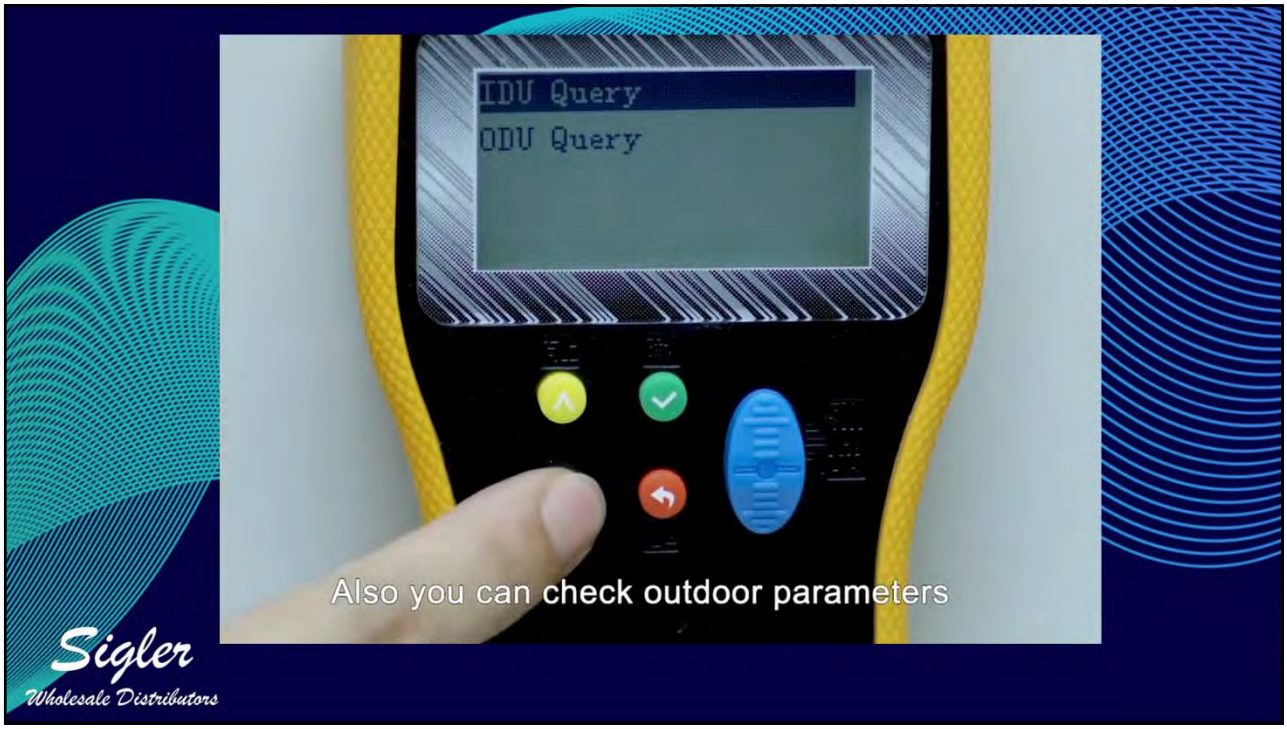
125


Indoor mode COOL
Target Frequency 79
Indoor Temp. 29
Evaporator Temp. 21.5
Let's check the indoor parameters
Sigler
Wholesale Distributors

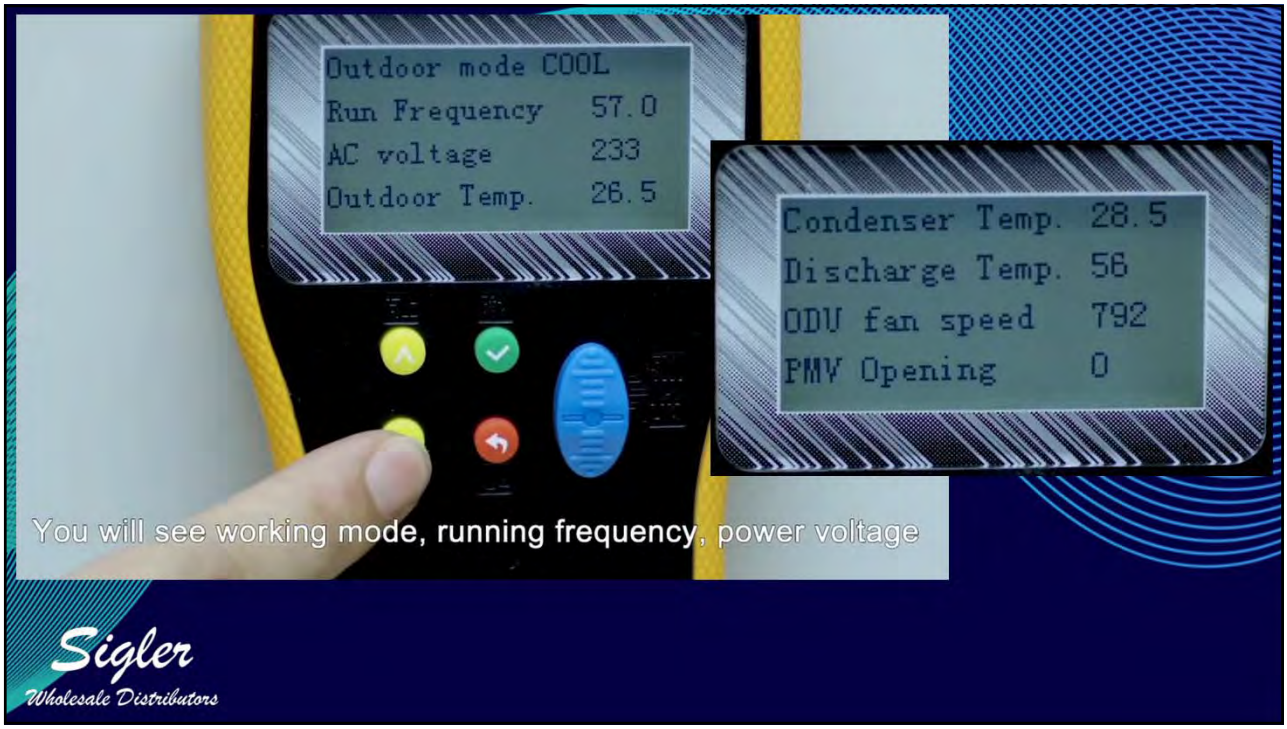
126


Indoor mode COOL
Target Frequency 79
Indoor Temp. 29.5
Evaporator Temp. 21.5
evaporator temperature, fan speed and set point
Sigler
Wholesale Distributors

127


IDU Query
ODU Query
Also you can check outdoor parameters
Sigler
Wholesale Distributors

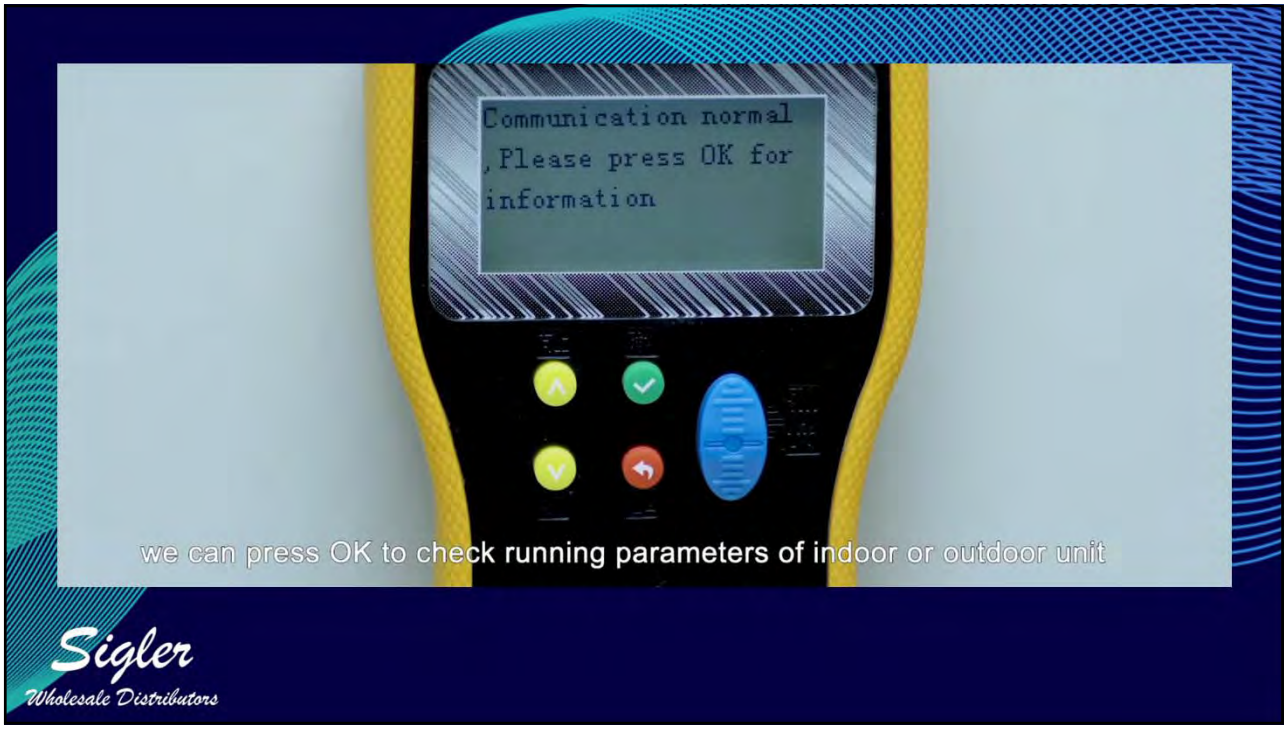
128


Outdoor mode COOL
Run Frequency 57.0
AC voltage 233
Outdoor Temp. 26.5
Condenser Temp. 28.5
Discharge Temp. 56
ODU fan speed 792
PMV Opening 0
You will see working mode, running frequency, power voltage
Sigler
Wholesale Distributors

129


Outdoor mode COOL
Run Frequency 57.0
AC voltage 233
Outdoor Temp. 26.5
Condenser Temp. 28.5
Discharge Temp. 56
ODU fan speed 792
PMV Opening 0
ambient temperature, condenser temperature, compressor discharge temperature
Sigler
Wholesale Distributors

130


Communication normal
,Please press OK for
information
we can press OK to check running parameters of indoor or outdoor unit
Sigler
Wholesale Distributors

131


Information inquiry
IDU Simulator
ODU Simulator
Now let's see an important function which is indoor unit simulator
Sigler
Wholesale Distributors

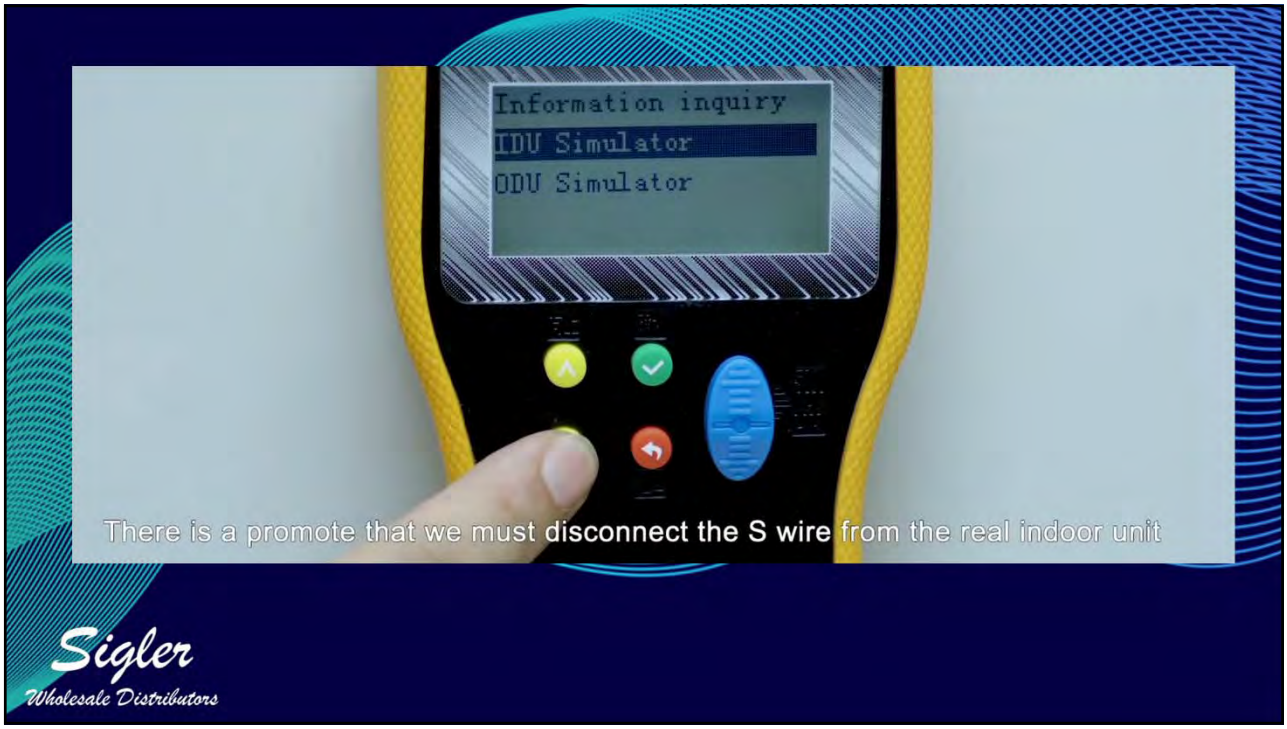
132


Data Inquiry
Running Para. Setting
Communication Detect
Commu. Simulation
The device will work as an indoor unit to start the outdoor unit directly with the function
Sigler
Wholesale Distributors

133


Data Inquiry
Running Para. Setting
Communication Detect
Commu. Simulation
Go into "Communication Simulation" of main menu
Sigler
Wholesale Distributors

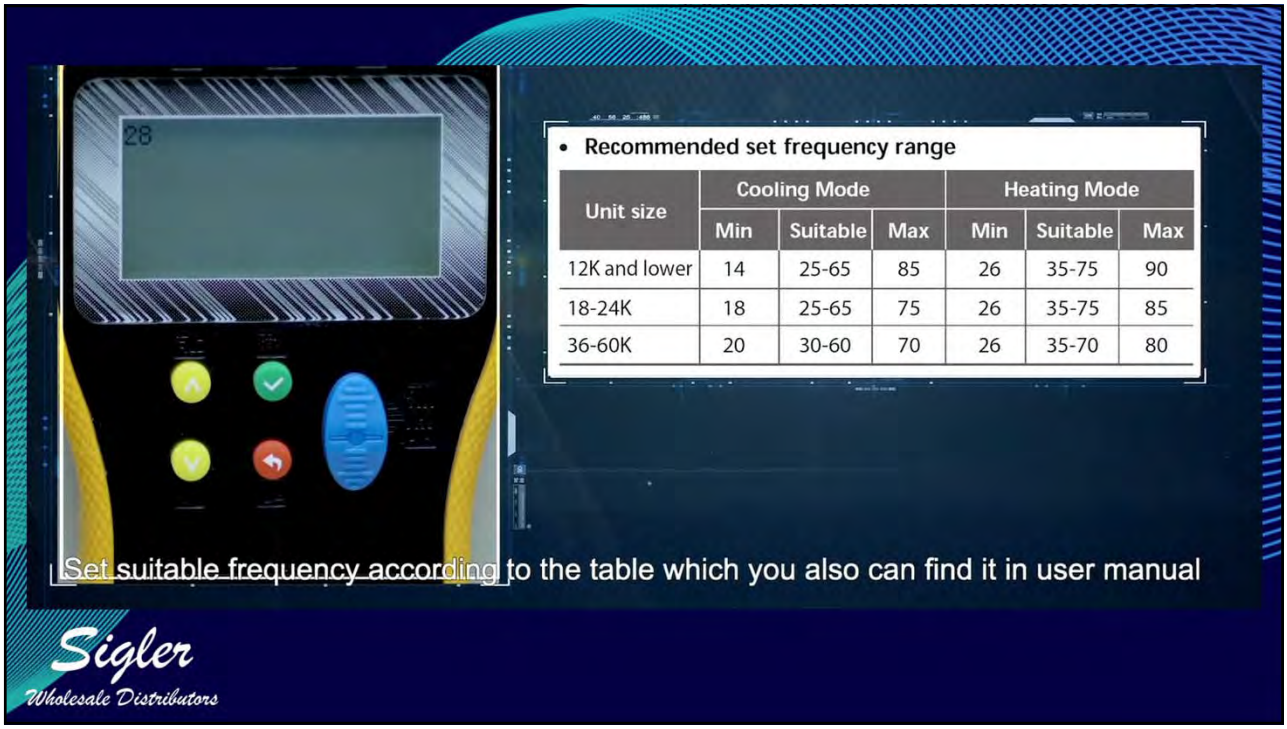
134


Information inquiry
IDU Simulator
ODU Simulator
There is a promote that we must disconnect the S wire from the real indoor unit
Sigler
Wholesale Distributors

135

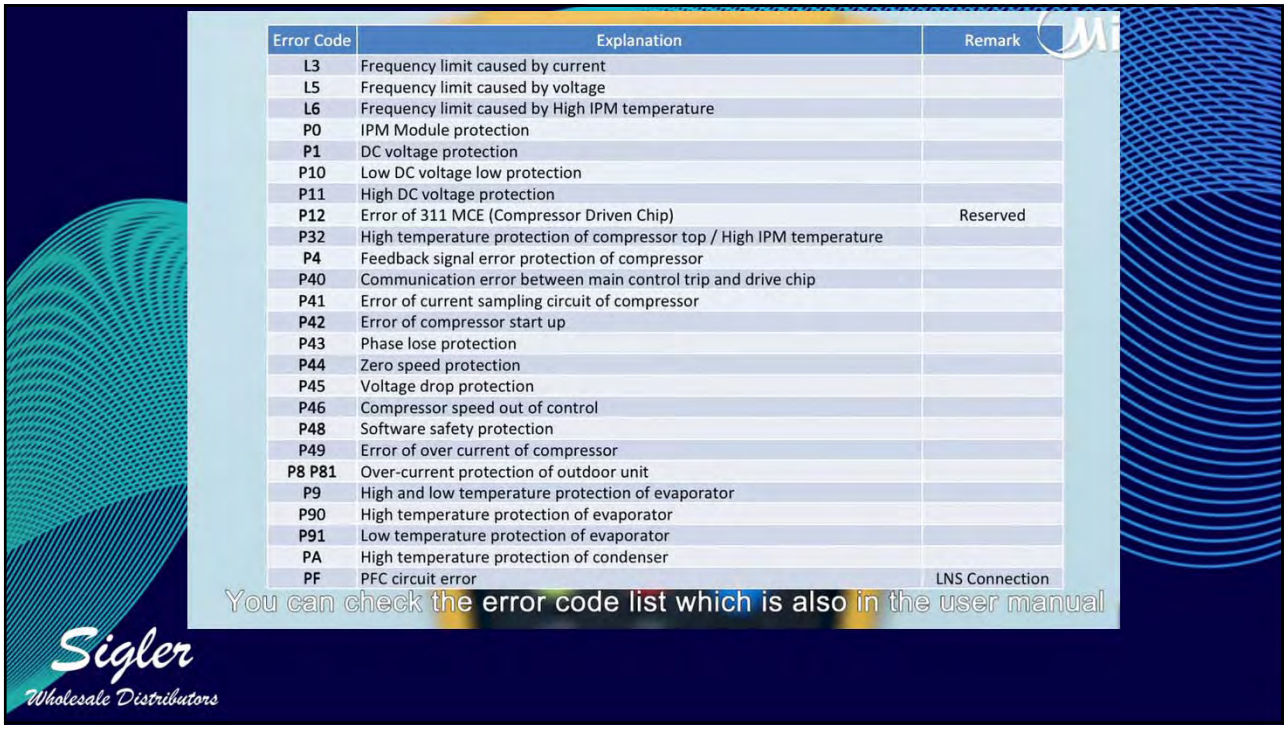

COOL
Set working mode to COOL, HEAT or DRY as you want
Sigler
Wholesale Distributors

136



Unit size	Cooling Mode			Heating Mode		
	Min	Suitable	Max	Min	Suitable	Max
12K and lower	14	25-65	85	26	35-75	90
18-24K	18	25-65	75	26	35-75	85
36-60K	20	30-60	70	26	35-70	80

137

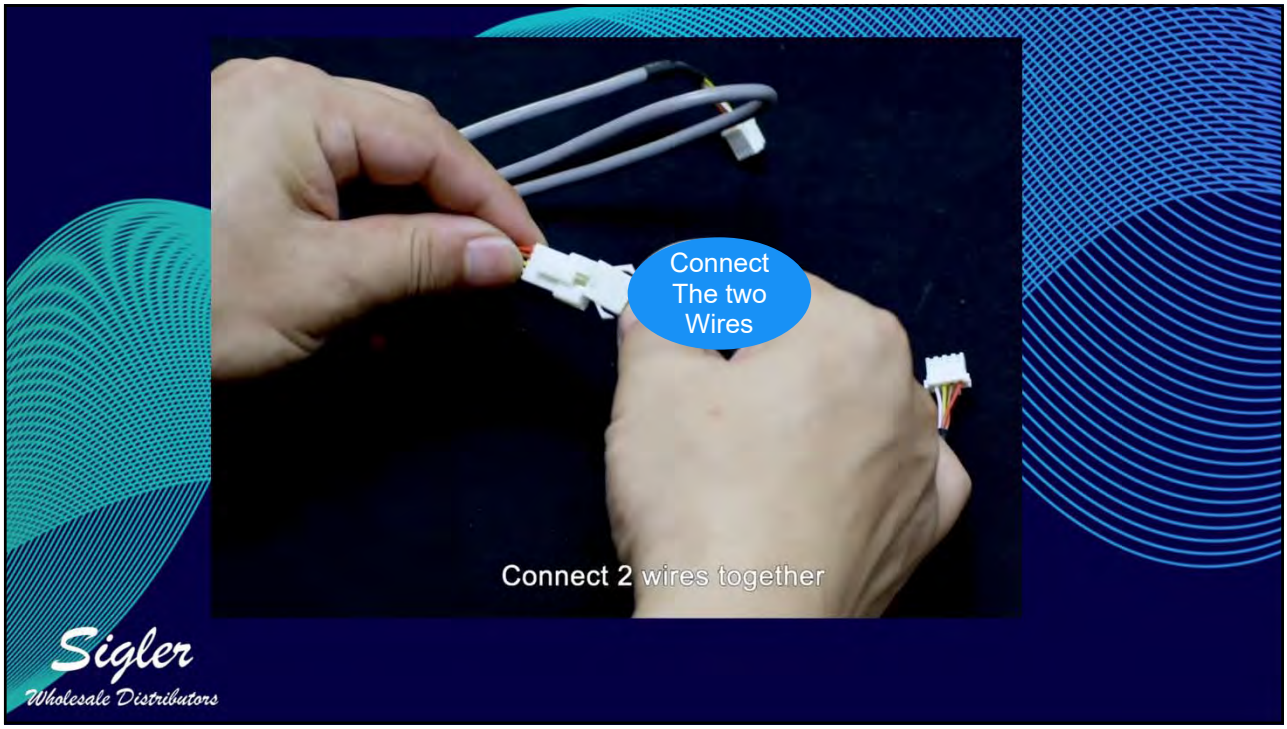


Error Code	Explanation	Remark
L3	Frequency limit caused by current	
L5	Frequency limit caused by voltage	
L6	Frequency limit caused by High IPM temperature	
P0	IPM Module protection	
P1	DC voltage protection	
P10	Low DC voltage low protection	
P11	High DC voltage protection	
P12	Error of 311 MCE (Compressor Driven Chip)	Reserved
P32	High temperature protection of compressor top / High IPM temperature	
P4	Feedback signal error protection of compressor	
P40	Communication error between main control trip and drive chip	
P41	Error of current sampling circuit of compressor	
P42	Error of compressor start up	
P43	Phase lose protection	
P44	Zero speed protection	
P45	Voltage drop protection	
P46	Compressor speed out of control	
P48	Software safety protection	
P49	Error of over current of compressor	
P8 P81	Over-current protection of outdoor unit	
P9	High and low temperature protection of evaporator	
P90	High temperature protection of evaporator	
P91	Low temperature protection of evaporator	
PA	High temperature protection of condenser	
PF	PFC circuit error	LNS Connection

138


5V connection
5v Connections are suitable for non-S communications
Condensers Like multizone units
S1/S2 or (PQE)
As communication wires
Sigler
Wholesale Distributors

139


Connect
The two
Wires
Connect 2 wires together
Sigler
Wholesale Distributors

140


Insert one end of connection wire into the 4-core socket signed 5V
Sigler
Wholesale Distributors

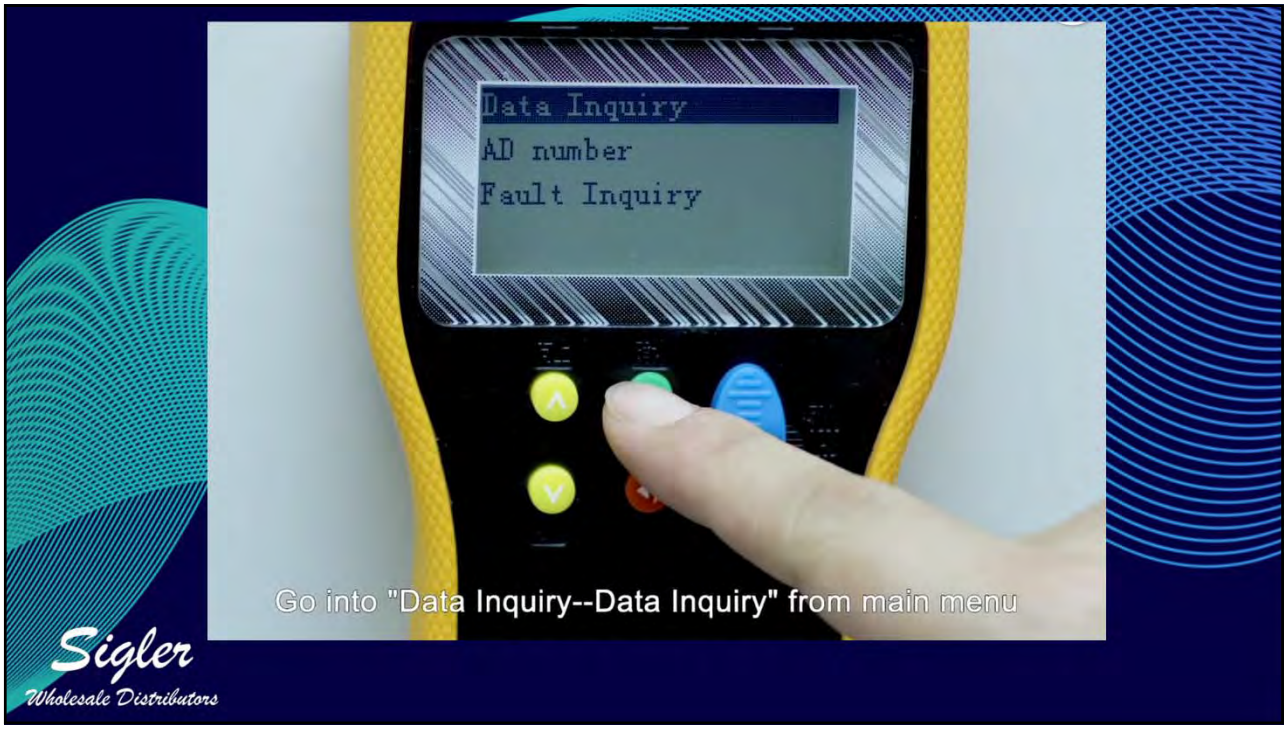
141


Put the power selection switch to 5V
because it locates on the main PCB of the unit.
Sigler
Wholesale Distributors

142


Other outdoor units might have different stucture or PCB shape,
but you will always find the test port on the main PCB
we can see the 4-core empty socket on the main PCB.
Sigler
Wholesale Distributors

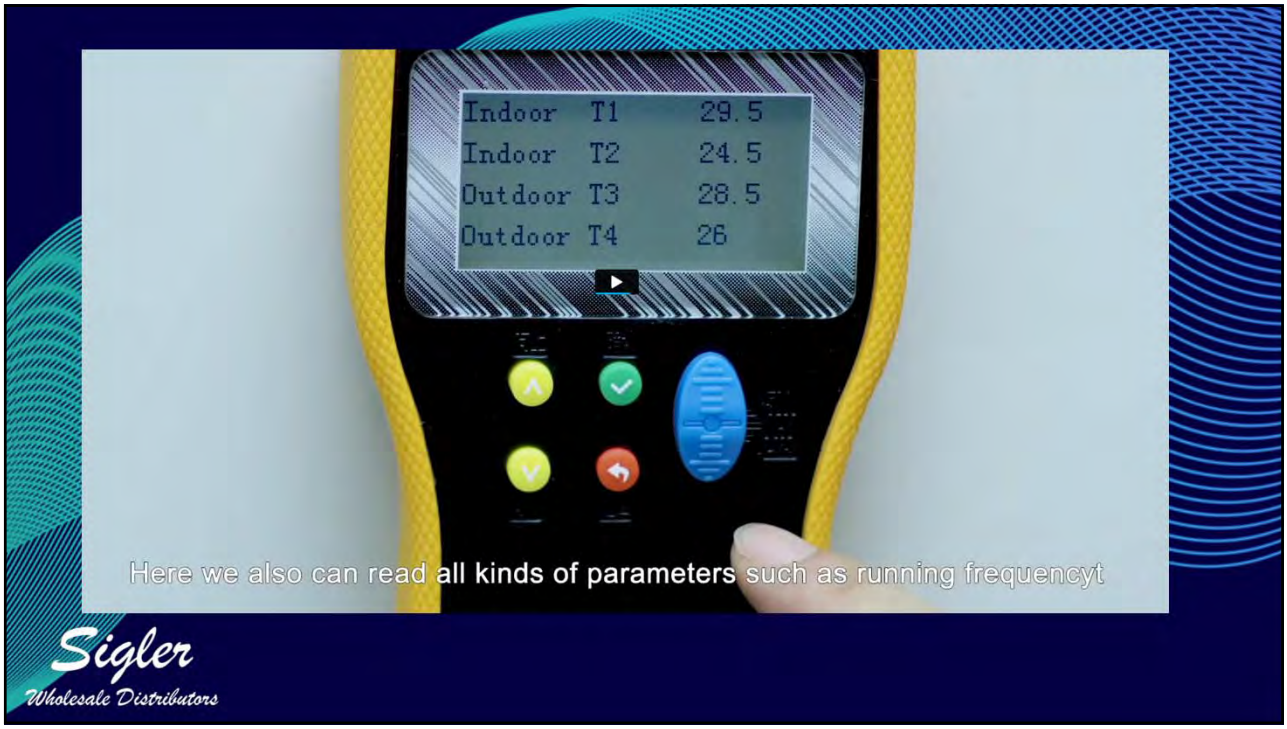
143


Data Inquiry
AD number
Fault Inquiry
Go into "Data Inquiry--Data Inquiry" from main menu
Sigler
Wholesale Distributors

144


IDU Target Freq. 79
ODU Target Freq. 57
ODU Ctrl. Freq. 57
ODU Run Freq. 56.92
to check the running parameters of the unit
Sigler
Wholesale Distributors

145


Indoor T1 29.5
Indoor T2 24.5
Outdoor T3 28.5
Outdoor T4 26
Here we also can read all kinds of parameters such as running frequencyt
Sigler
Wholesale Distributors

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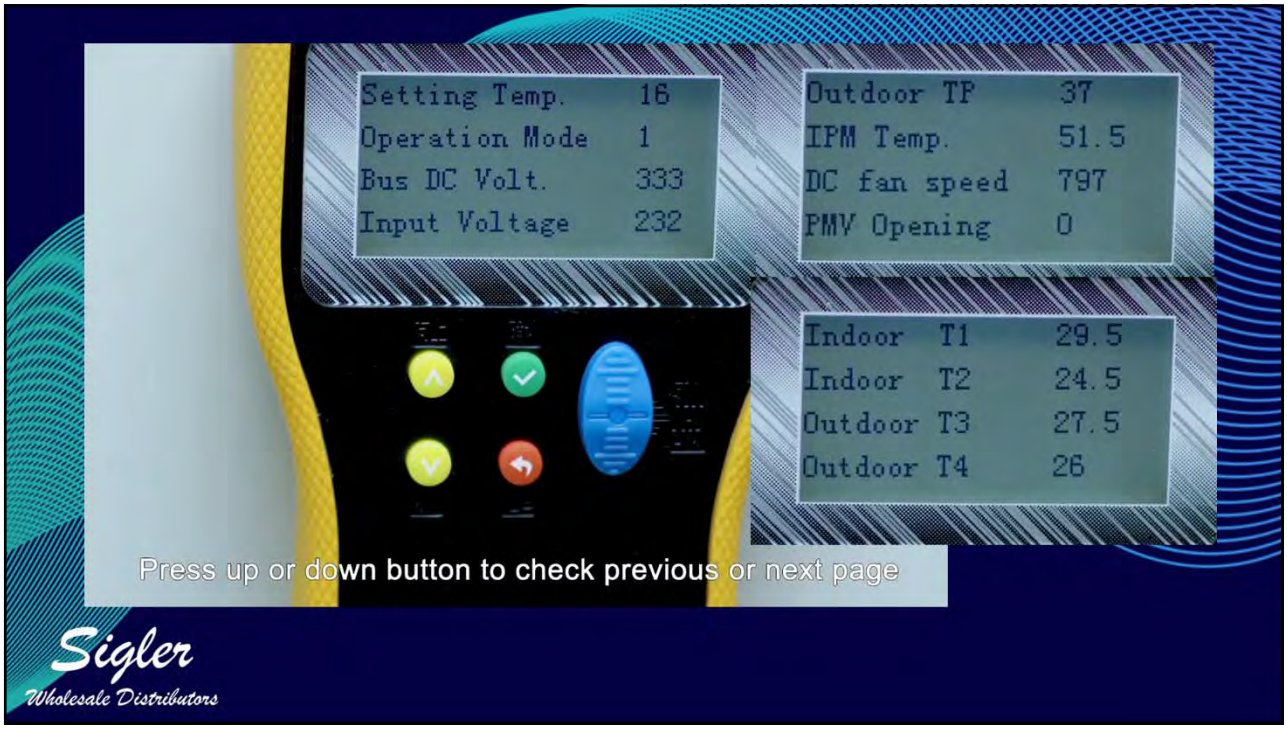
Setting Temp. 16
Operation Mode 1
Bus DC Volt. 333
Input Voltage 232
Outdoor TP 37
IPM Temp. 51.5
DC fan speed 797
PMV Opening 0
Indoor T1 29.5
Indoor T2 24.5
Outdoor T3 27.5
Outdoor T4 26
Press up or down button to check previous or next page
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Wholesale Distributors

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Data Inquiry
AD number
Fault Inquiry
Go into "Fault Inquiry" to check latest error code
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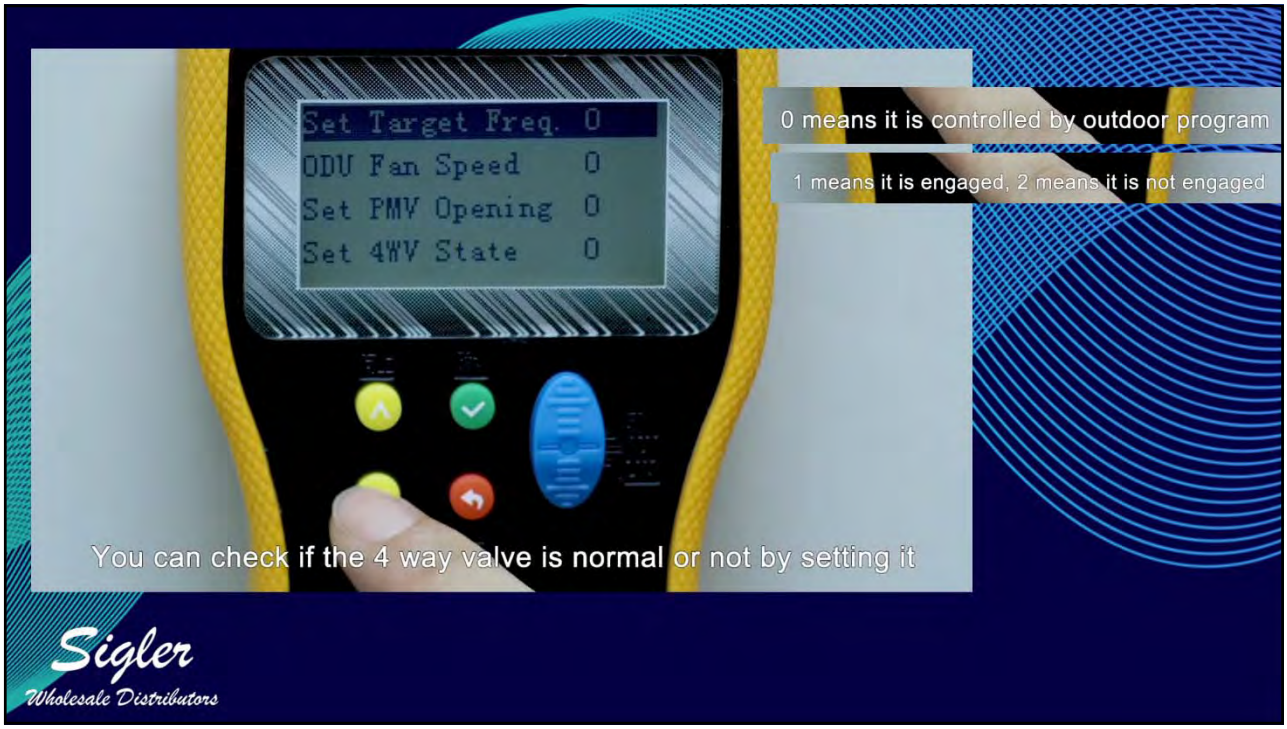
Set Target Freq. 0
ODU Fan Speed 0
Set PMV Opening 0
Set 4WV State 0
0 means it is controlled by outdoor program
1 means it is engaged, 2 means it is not engaged
You can check if the 4 way valve is normal or not by setting it
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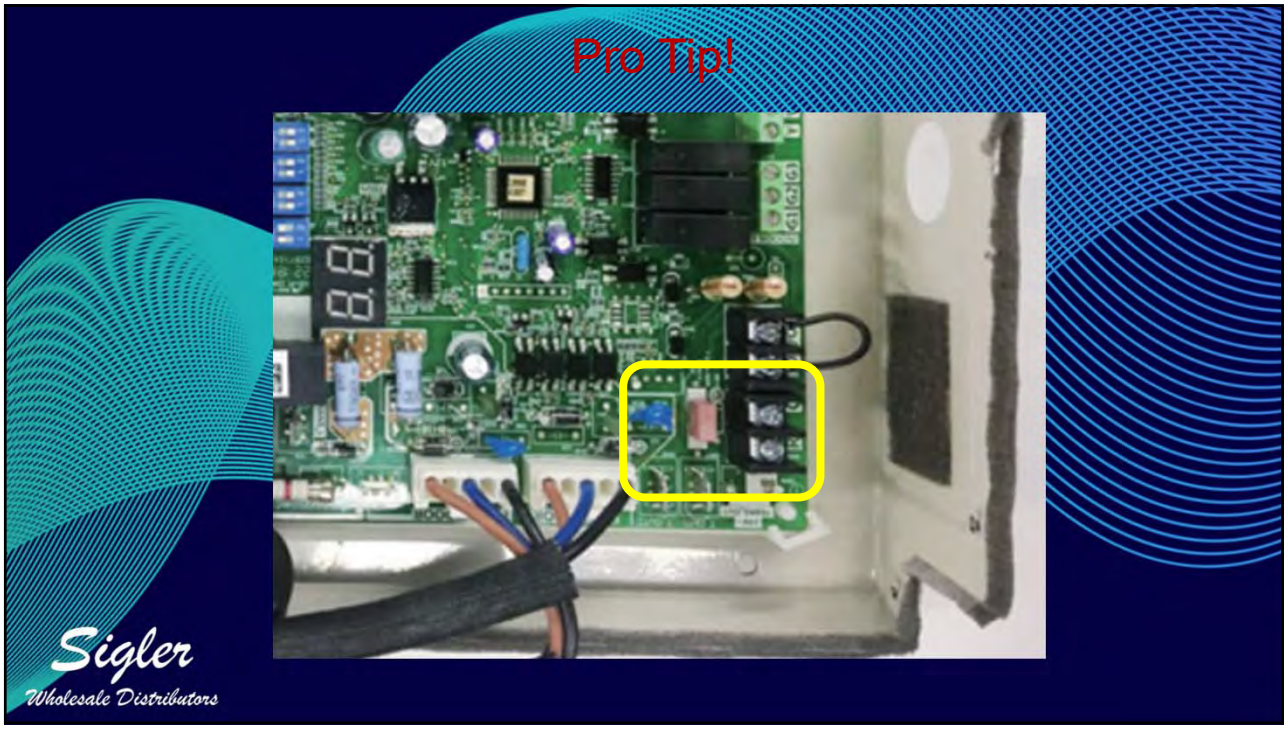
Pro Tip!
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Now let's go PLAY!
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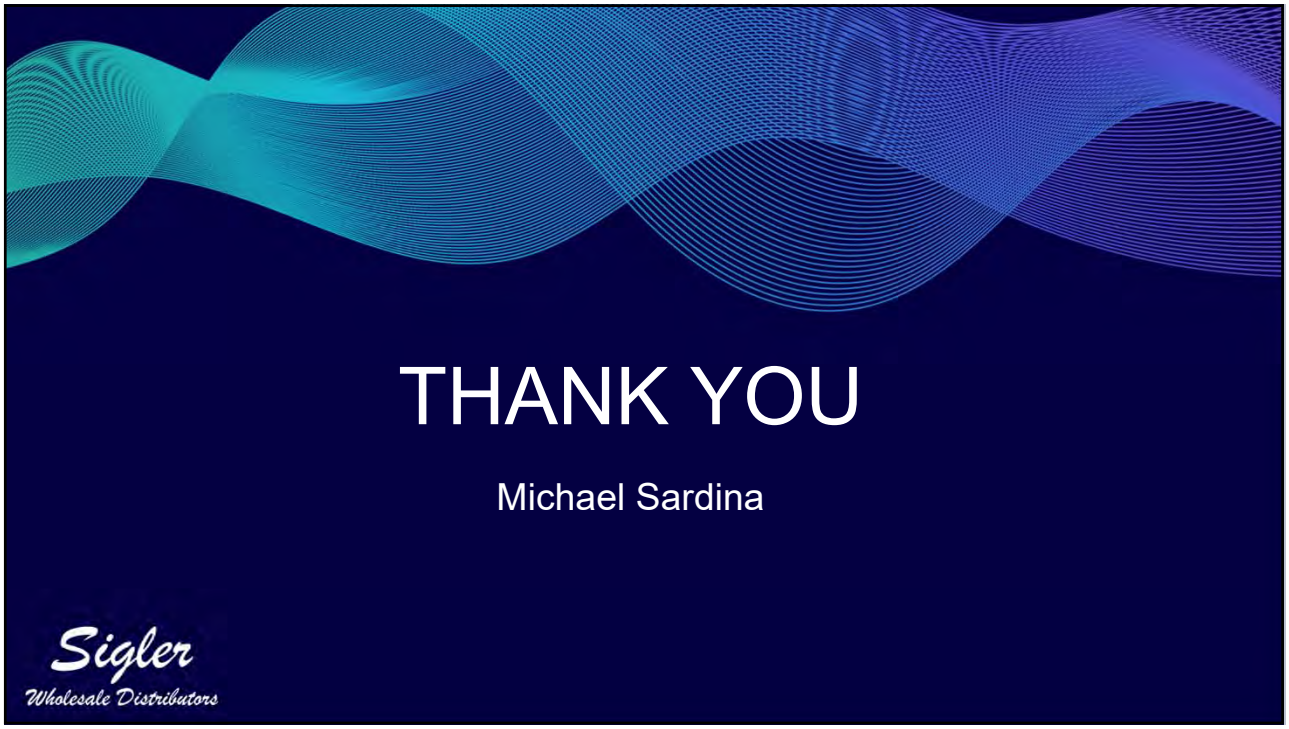
THANK YOU
Michael Sardina
Sigler
Wholesale Distributors

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