



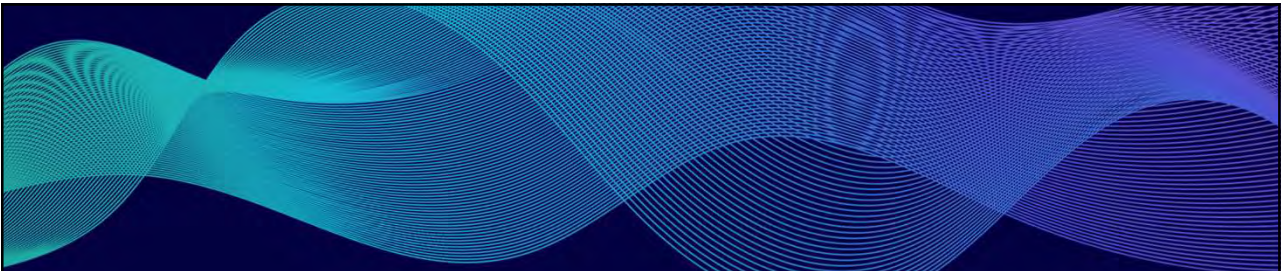
HEAT PUMP

38MURA/40MUAA & 38MBRC/40MBAB

Michael Sardina

Sigler
Wholesale Distributors

1

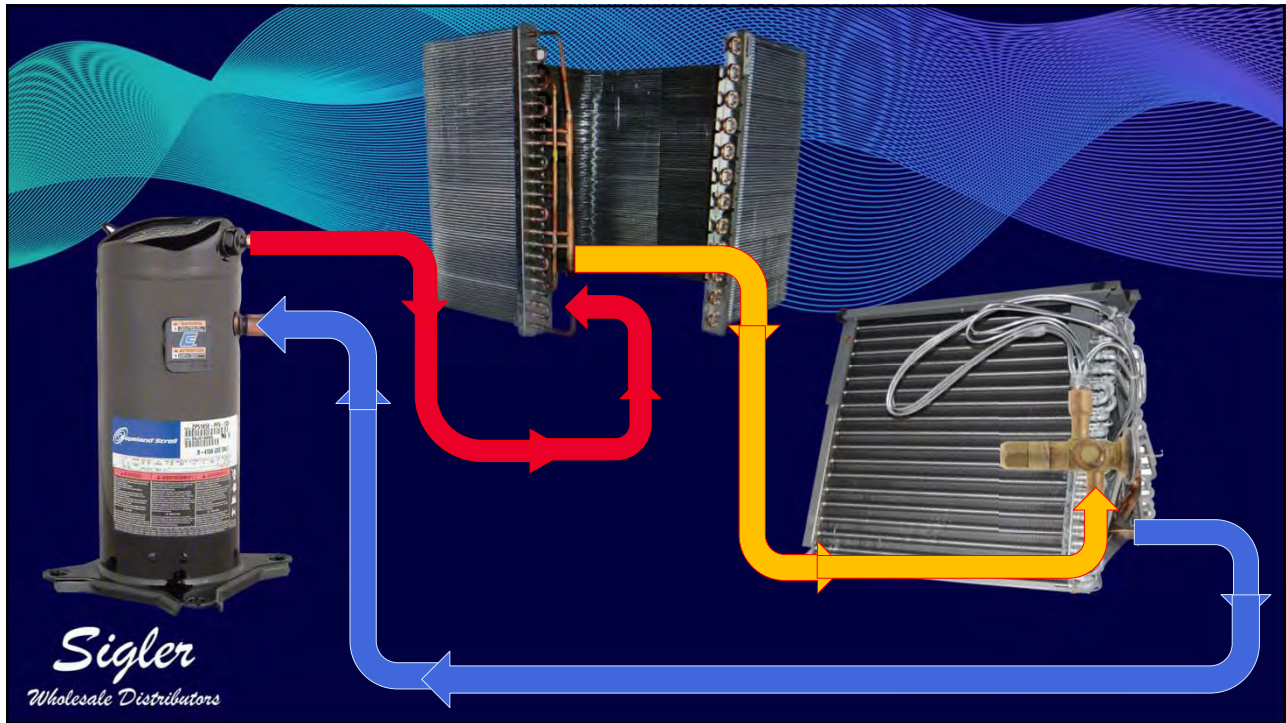


Let's look at a basic system first.

A/C system 101.

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2

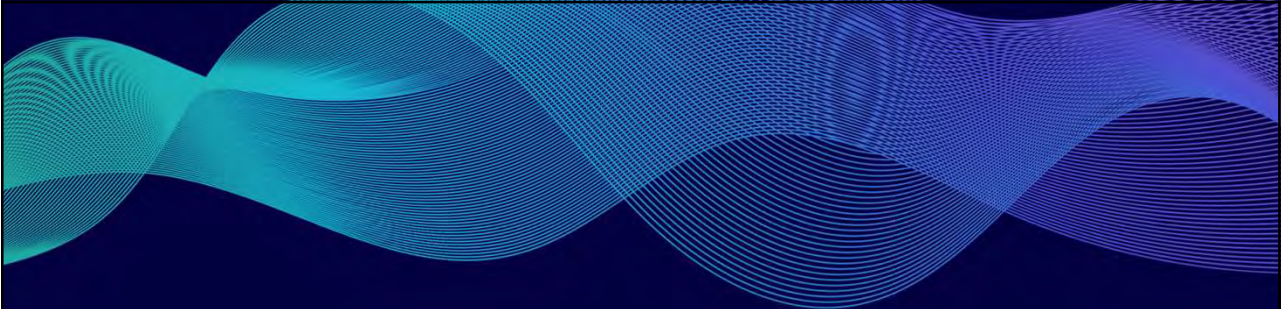


3

Let's look at a basic heat pump.
Heat Pump system 101.

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What makes it a heat pump? This is a two-part question.

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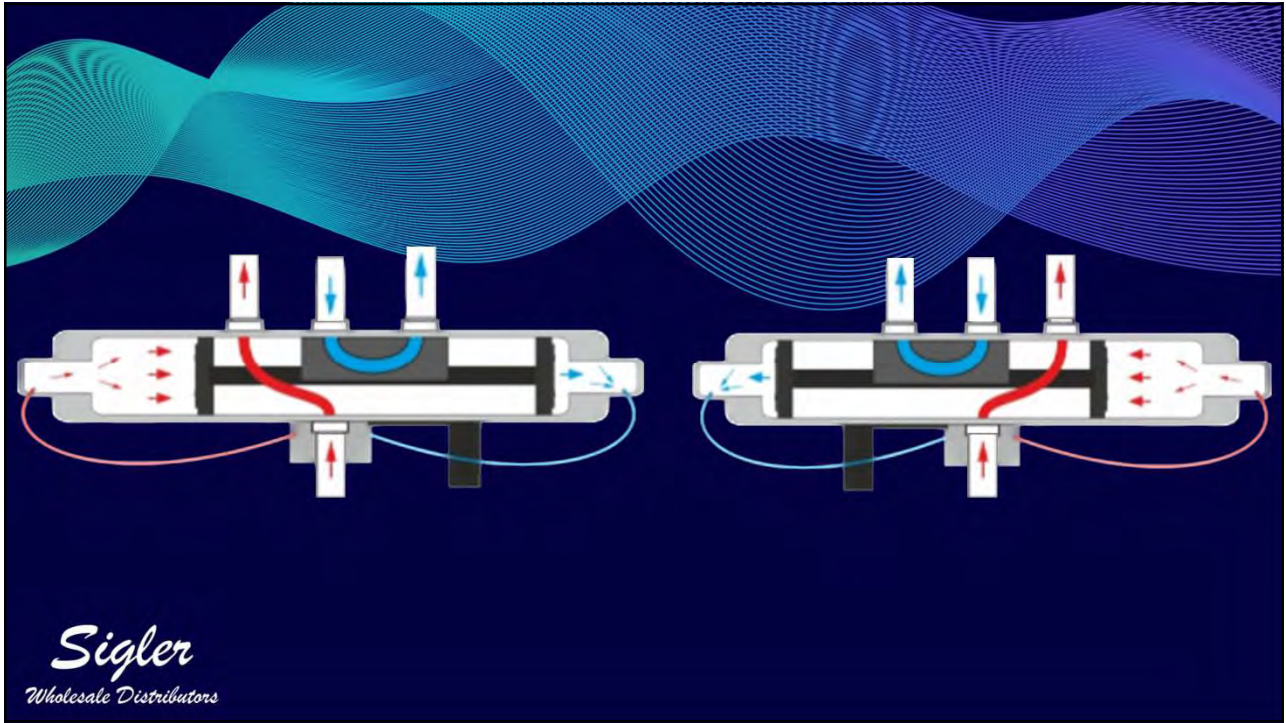
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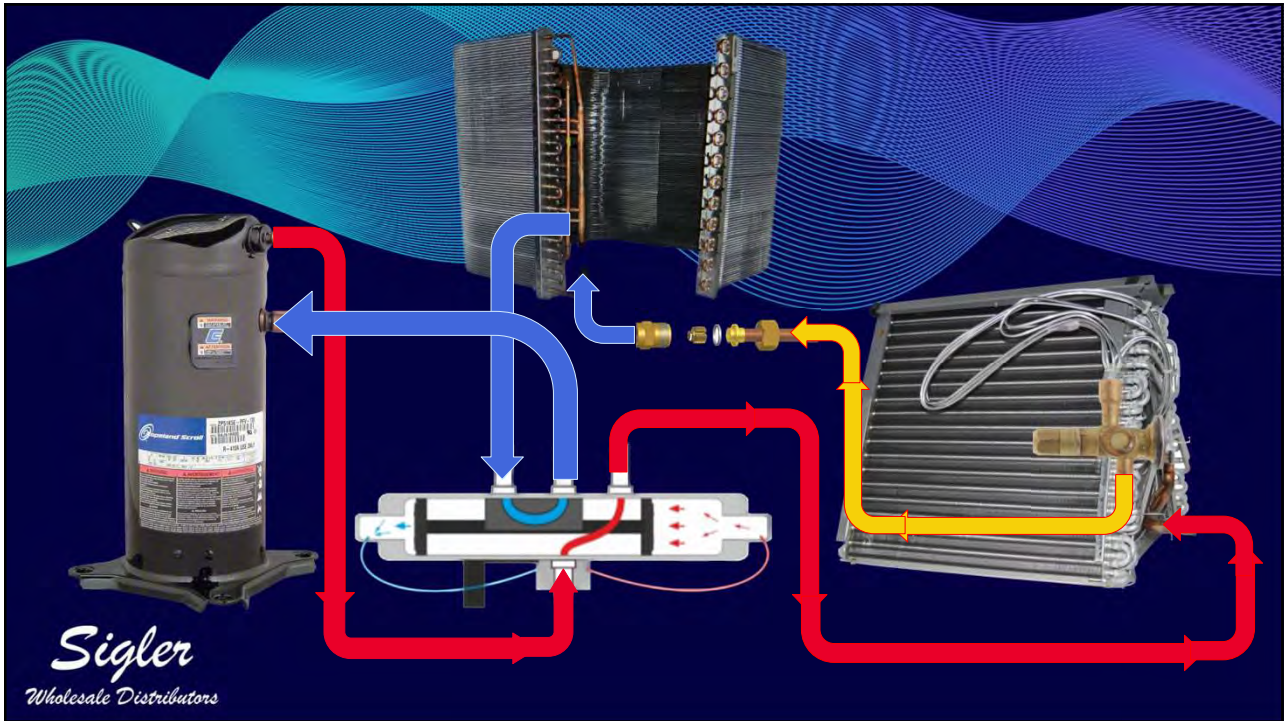
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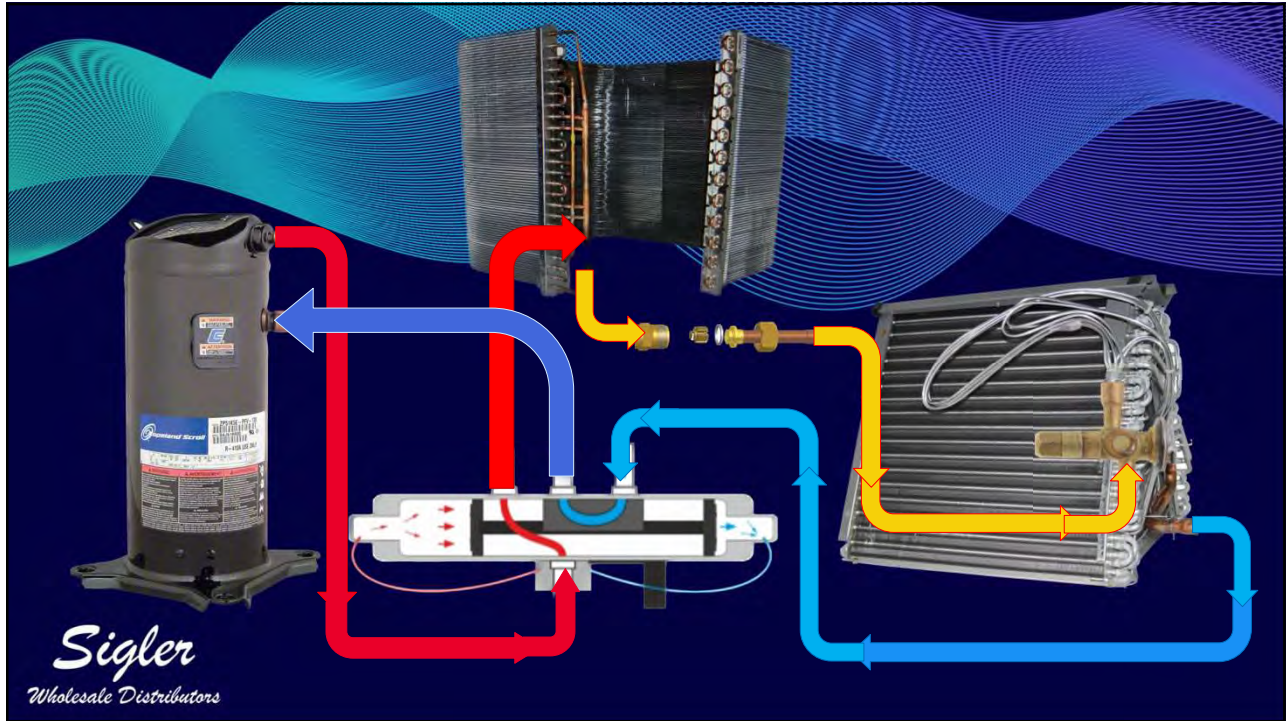
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Difference between
40MBAB and 40MUAA

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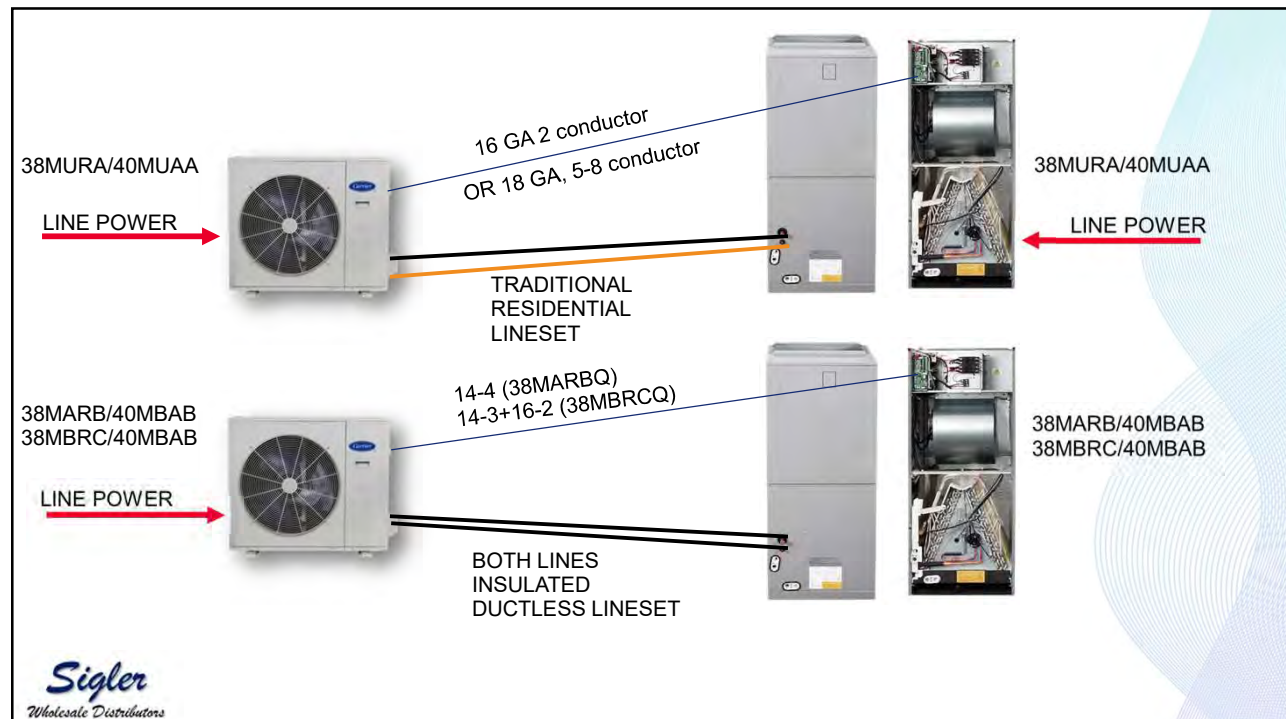
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First What is Different?

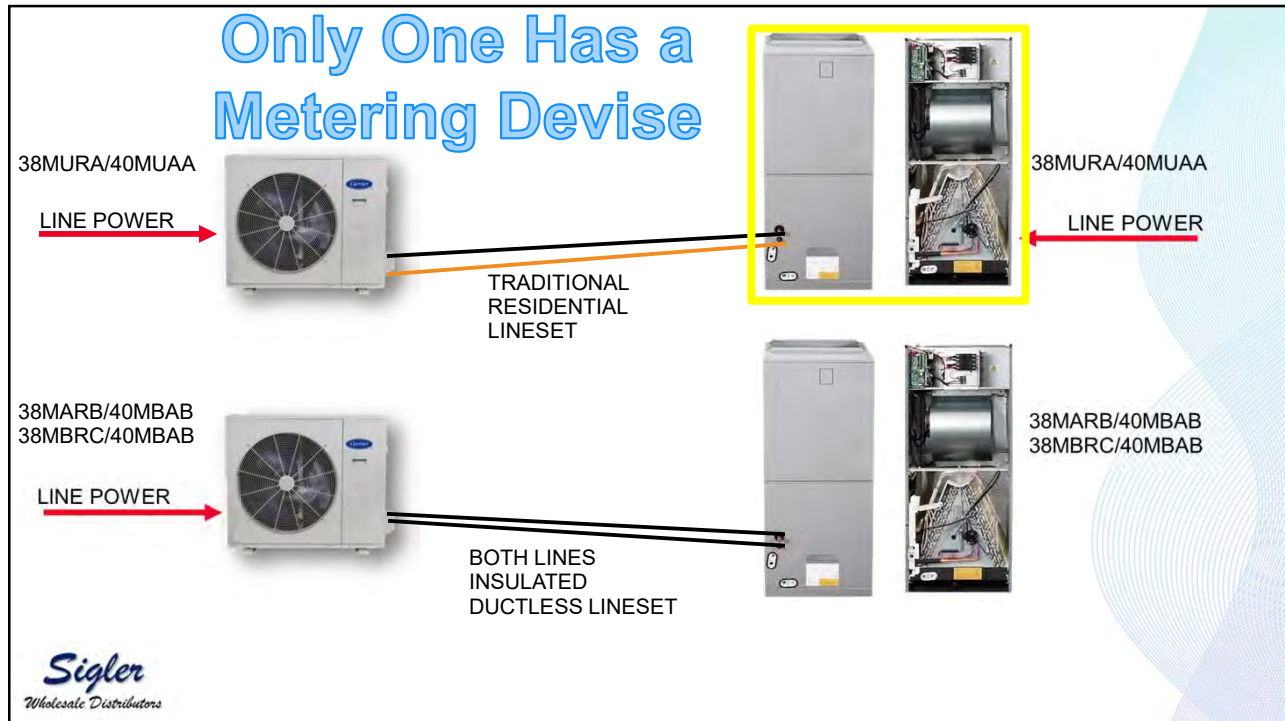
- 40MUAA matches up with the 38MURA and in the future will match up with conventional outdoor units. It **does not** match up with the 38MARB/38MGR
- 40MUAA has an electronic metering device controlled by its cpu. Can utilize a liquid line.
- 40MUAA needs line voltage separate from outdoor unit.
- 40MBAB gets line voltage from the outdoor unit.
- The 40MBAB has no metering device and uses the the outdoor EXV for refrigerant metering.
- 40MBAB plays in the ductless pool and can only be matched with ductless outdoor units. Not the 38MURA.
- The 40MBAB needs both linesets insulated.
- 40MUAA-**KSACN1001AAA Not included**
- 40MBAB-**KSACN1001AAA Included**

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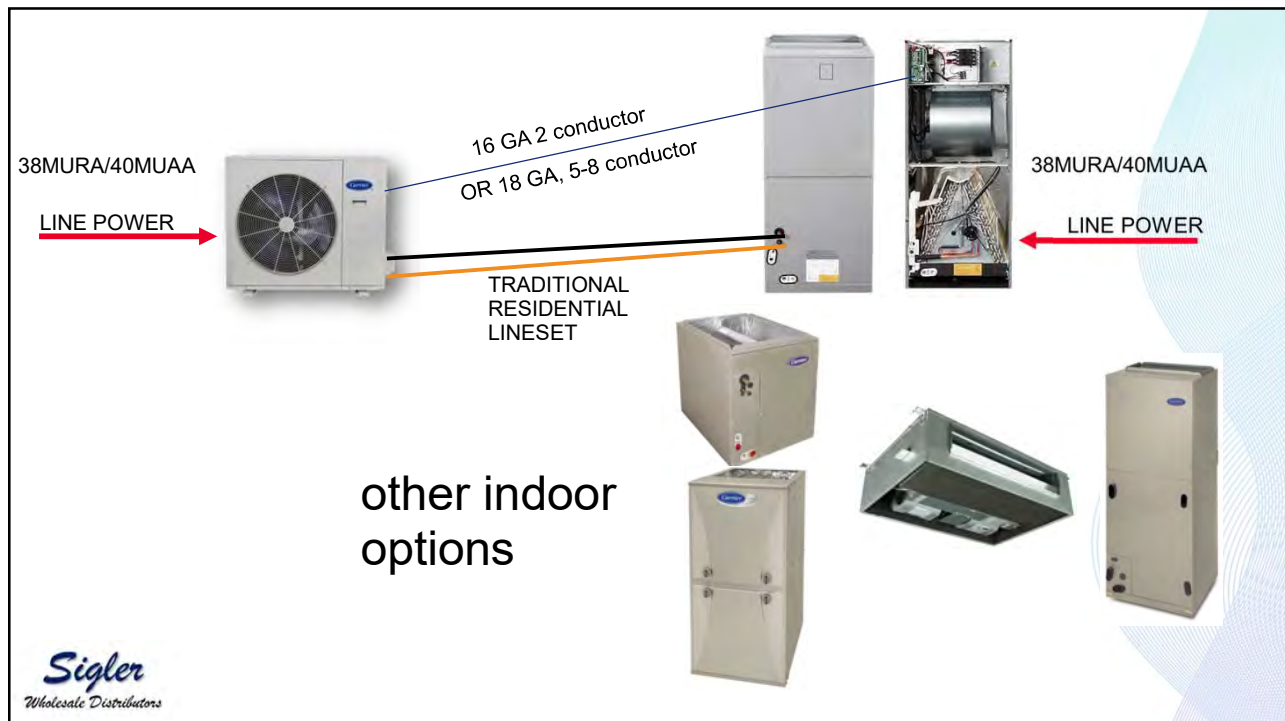
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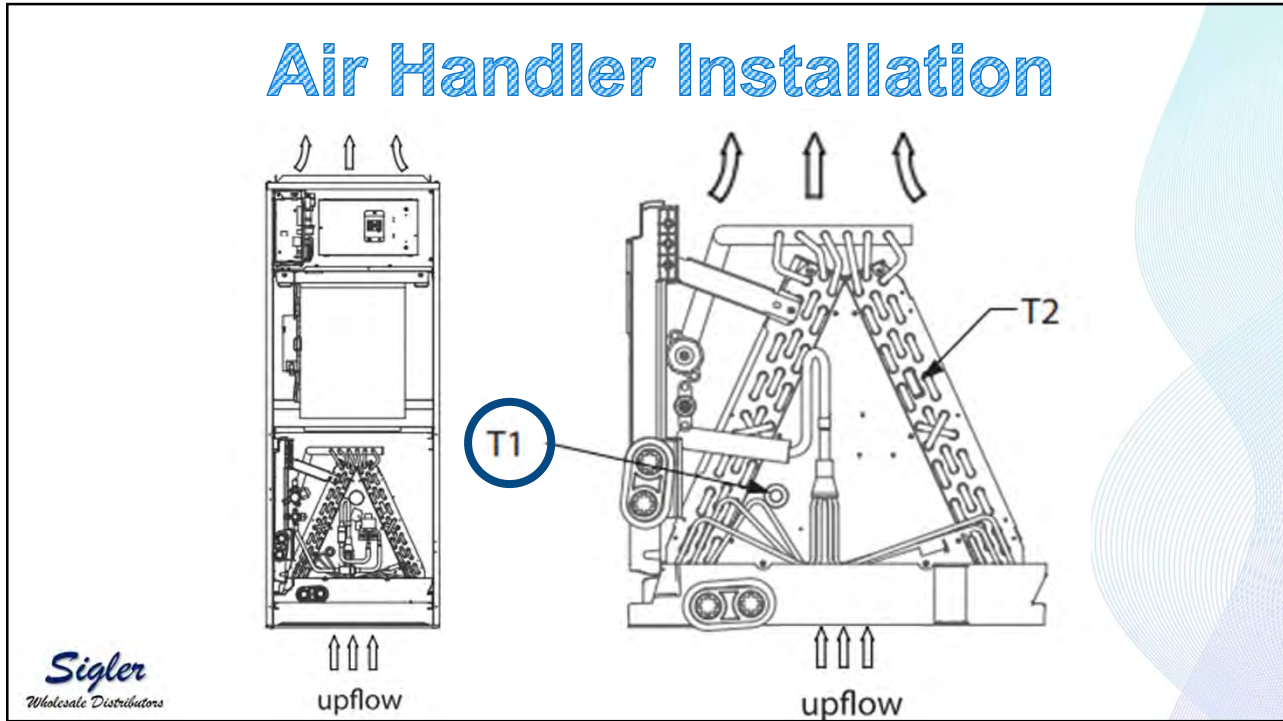
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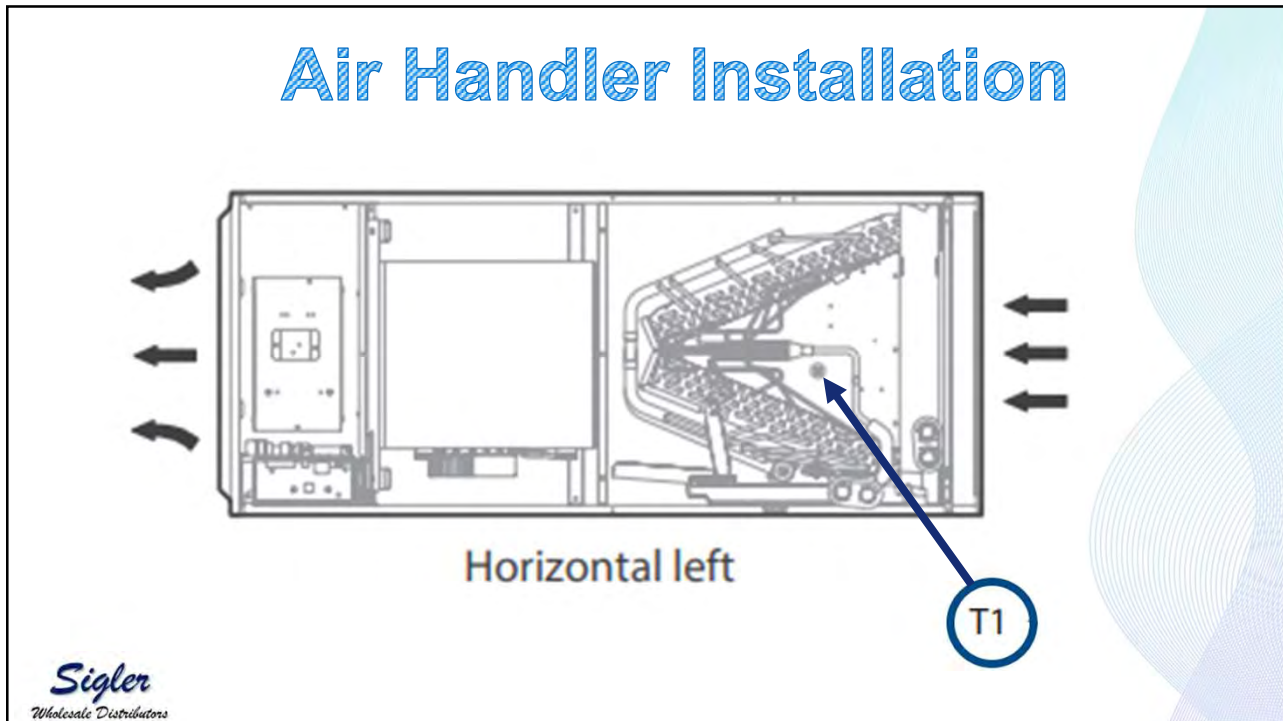
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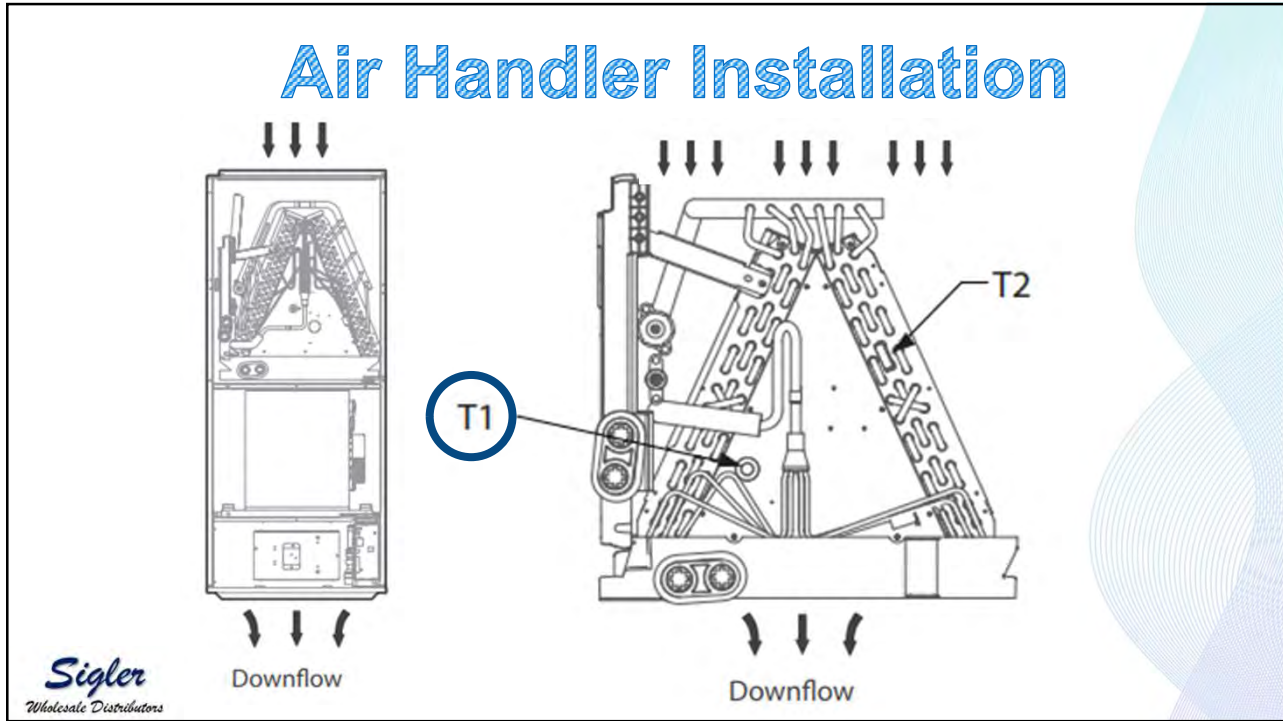
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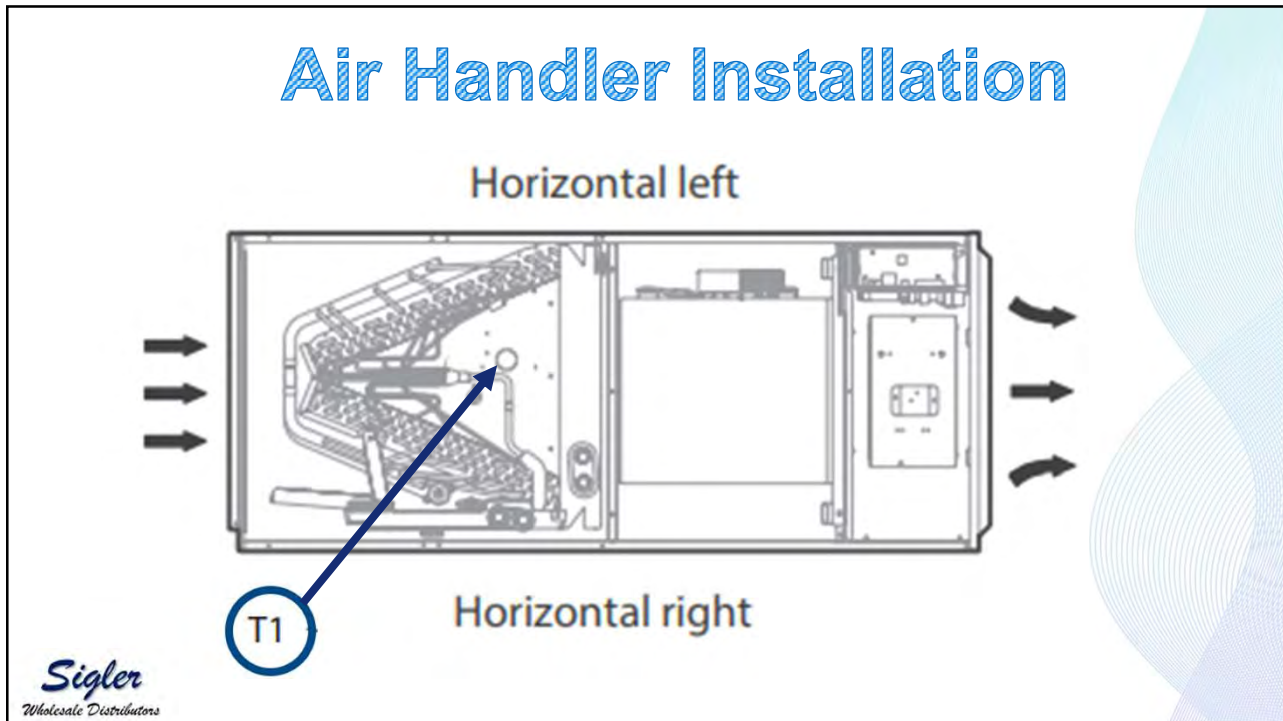
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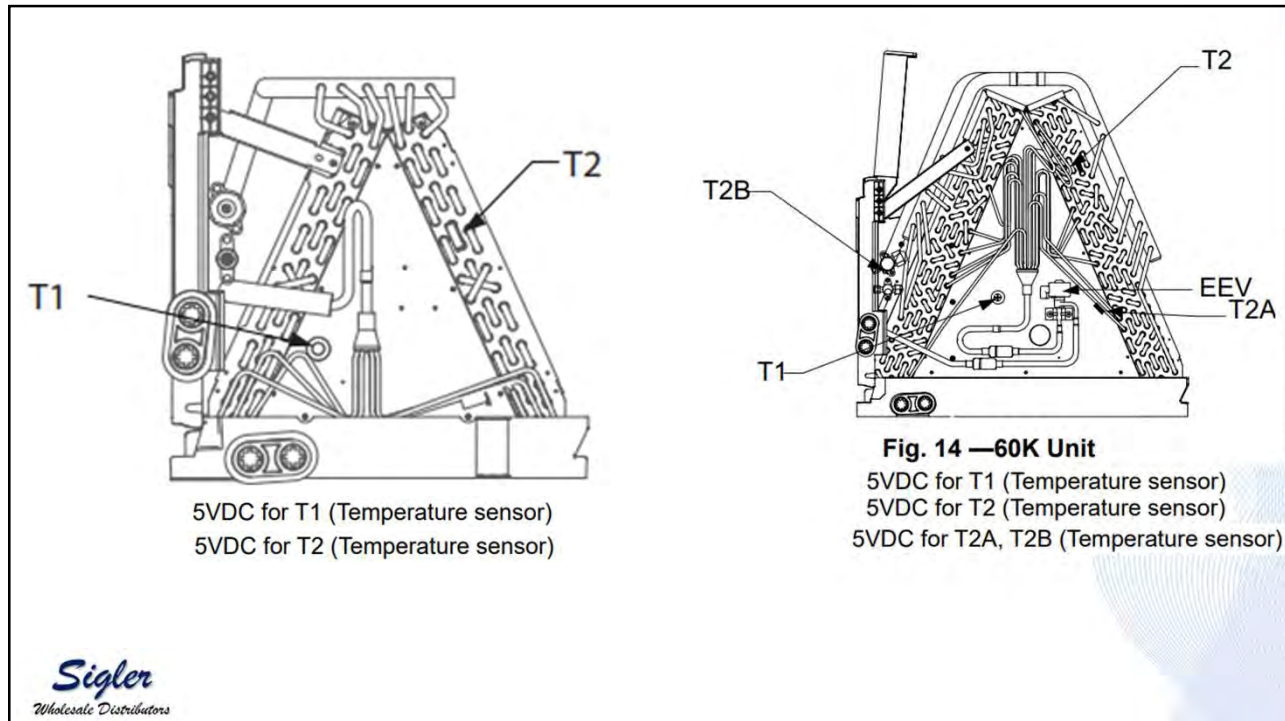
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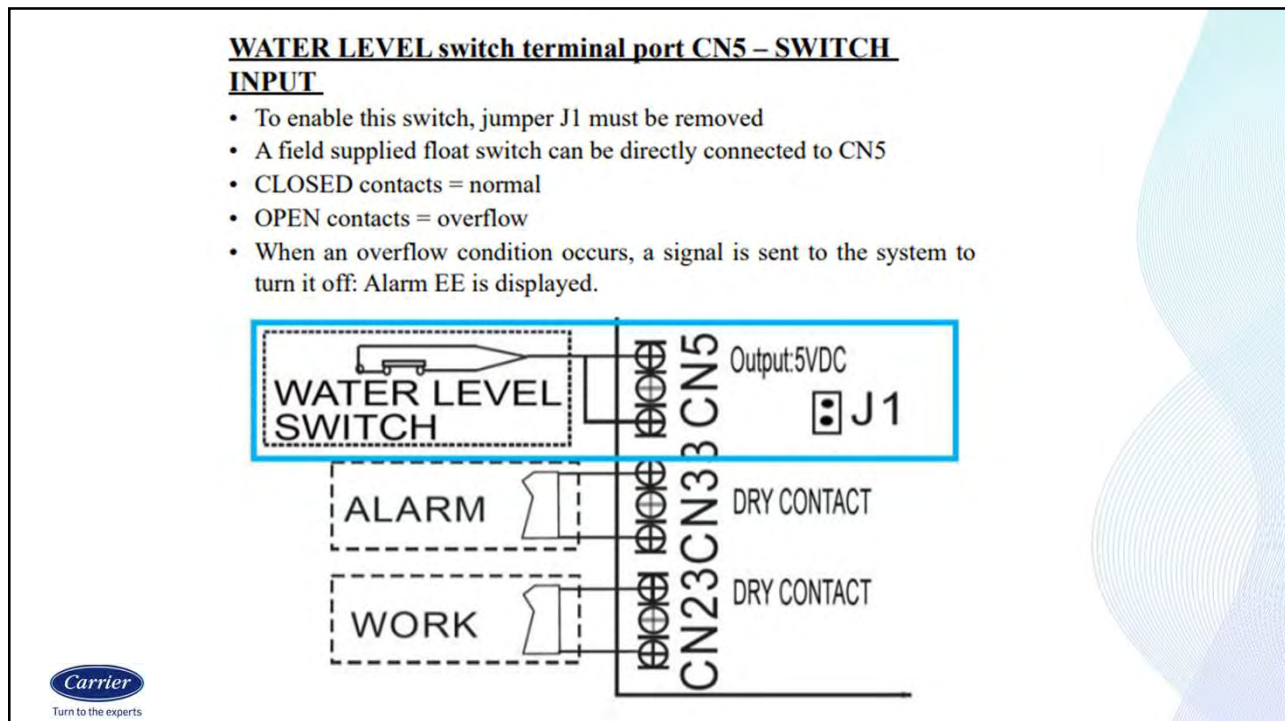
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21



22

SW3-1	1	Maximum continuous runtime allowed before system automatically stages up capacity to satisfy set point. This adds 1 to 5°F to the user set point in the calculated control point to increase capacity and satisfy user set point	30 minutes	[Default] 90 minutes
-------	---	--	------------	----------------------


Turn to the experts

23



24

38MURA - 40MUAA

- *Compact footprint
- *Can probably reuse an existing line set
- *No accessories or interface kits are required
- *Inverter compressor
- *No cold blow in Defrost-----**Lets talk about this!**
- * **Filter Driers----- Do we need them?**

A three-phase compressor driven by an inverter

- Precise control of the compressor motor speed
- Modulating refrigerant flow
- Modulating cooling output

Very reliable because it sees a soft start

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Balance Point

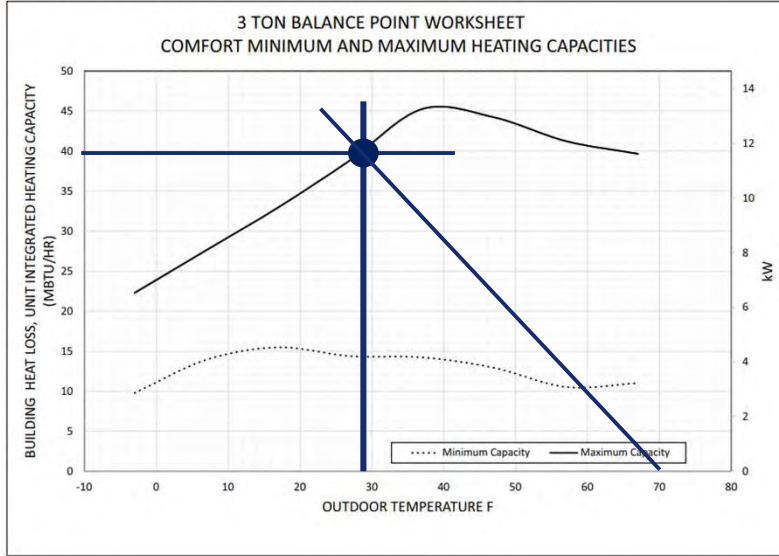


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Balance Point On a Greenspeed

25VNA36 Balance Point Worksheet



27

HEATING PERFORMANCE AT INDOOR DRY BULB TEMPERATURE- 50K HH (Sheet 2 of 2)

ABSLVW (CFM)	OUTDOOR (DB F)	HEATING PERFORMANCE AT INDOOR DRY BULB TEMPERATURE							
		TC: TOTAL CAPACITY IN BTU/HR				PI: TOTAL POWER IN KILOWATTS			
		Indoor Conditions (DB F)							
		60.8	68.0	71.6	75.2	60.8	68.0	71.6	75.2
1083	-22.0	31688	31482	31345	31207	4.21	4.37	4.19	4.18
	-10.0	36460	36223	36065	35908	4.93	5.12	4.91	4.90
	0.0	40437	40175	40000	39825	5.58	5.74	5.50	5.50
	5.0	42564	42288	42104	41920	5.86	6.09	5.83	5.82
	14.0	45450	45155	44958	44762	6.25	6.49	6.22	6.21
	17.0	47615	47305	47099	46893	6.64	6.90	6.61	6.60
	22.0	49722	49425	49227	49029	6.93	7.20	6.92	6.92
	27.0	49743	49447	49249	49051	6.77	7.11	6.88	6.85
	32.0	41367	40972	40774	40576	5.20	5.12	5.08	5.04
	37.0	40180	39784	39487	39289	4.67	4.56	4.50	4.45
	42.0	40279	39784	39487	39289	4.14	4.00	3.93	3.86
	44.6	40498	40000	40495	40198	3.87	3.40	3.65	3.58
	52.0	39505	38911	38514	38416	3.05	2.86	2.78	2.68
	57.0	38317	37723	37426	37129	2.50	2.29	2.18	2.08
	62.0	37129	36535	36238	35842	1.95	1.71	1.60	1.48
	64.4	36634	35941	35644	35248	1.69	1.44	1.31	1.18
1188	-22.0	33917	33811	33704	33597	4.25	4.42	4.23	4.23
	-10.0	36839	36602	36444	36287	4.98	5.17	4.96	4.95
	0.0	40857	40595	40420	40245	5.59	5.80	5.56	5.55
	5.0	43007	42730	42546	42362	5.92	6.15	5.89	5.89
	14.0	45922	45627	45431	45234	6.32	6.56	6.29	6.28
	17.0	48109	47800	47594	47388	6.71	6.97	6.68	6.67
	22.0	46222	45925	45727	45529	6.39	6.36	6.36	6.34
	27.0	44142	43748	43548	43350	5.83	5.77	5.74	5.70
	32.0	43767	43371	43173	43077	5.26	5.17	5.13	5.09
	37.0	40580	40184	39887	39689	4.72	4.61	4.54	4.50
	42.0	40780	40184	39887	39689	4.18	4.04	3.96	3.89
	44.6	40995	40400	40895	40598	3.50	3.43	3.48	3.63
	52.0	39905	39311	38913	38816	3.08	2.88	2.80	2.70
	57.0	38717	38123	37826	37529	2.52	2.31	2.19	2.10
	62.0	37428	36935	36638	36141	1.97	1.72	1.61	1.49
	64.4	37034	36341	36044	35547	1.70	1.45	1.31	1.18

28

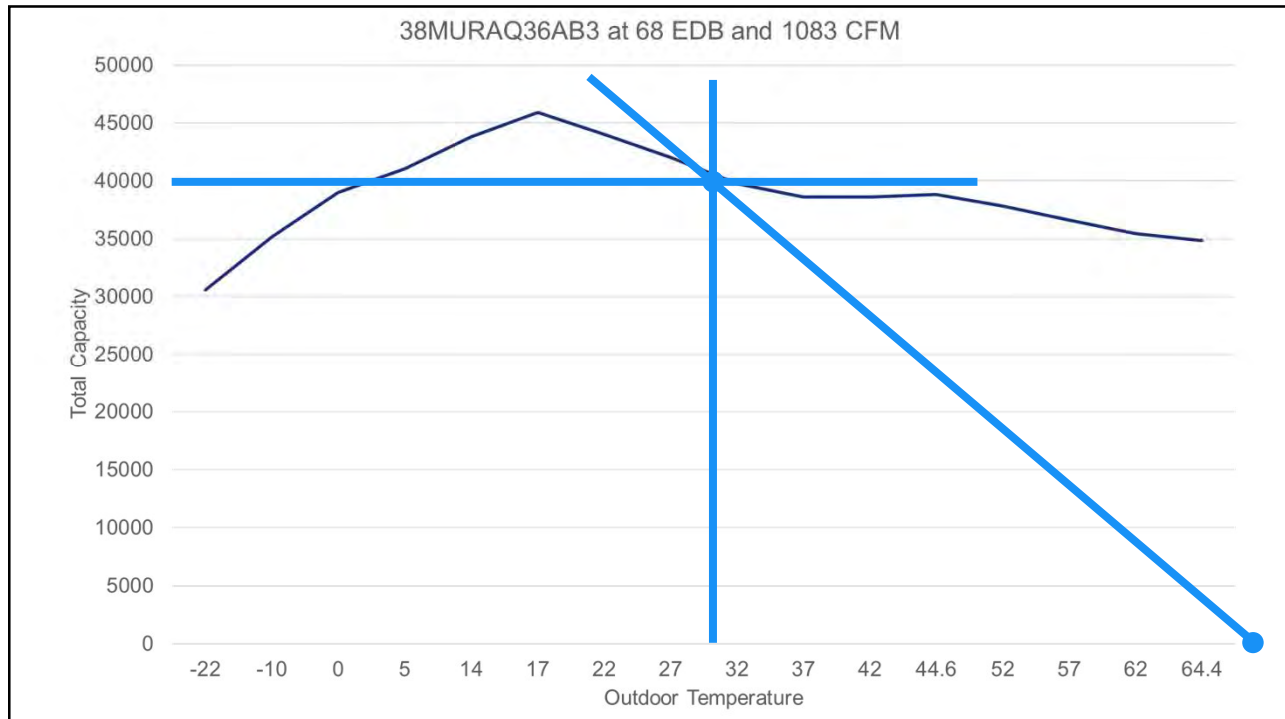
Balance Point

HEATING PERFORMANCE AT INDOOR DRY BULB TEMPERATURE: 58K_HH (Sheet 2 of 2)

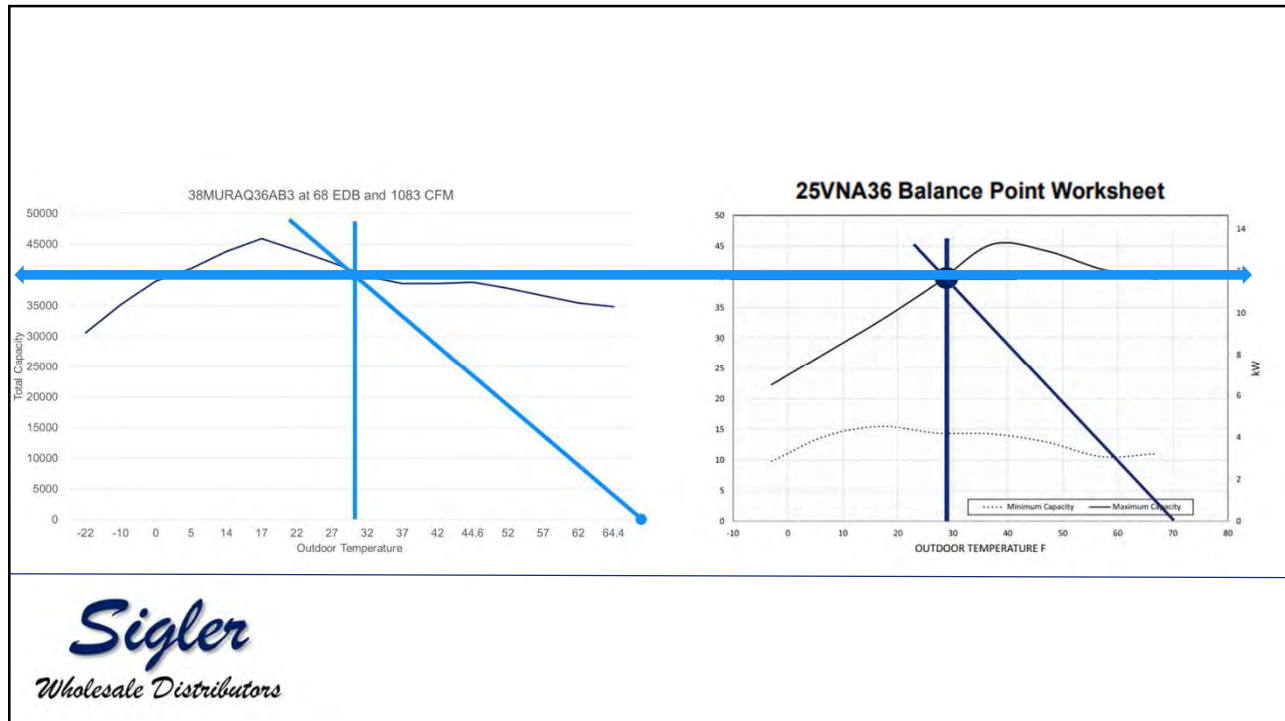
AIRFLOW (CFM)	OUTDOOR (DB F)	HEATING PERFORMANCE AT INDOOR DRY BULB TEMPERATURE							
		TC TOTAL CAPACITY IN BTU/HR				P/TOTAL POWER IN KILOWATTS			
		Indoor Conditions (DB F)							
		60.8	68.0	71.6	75.2	60.8	68.0	71.6	75.2
1083	-22.0	31688	31482	31345	31207	4.21	4.37	4.53	4.68
	-10.0	36460	36223	36055	35908	4.93	5.12	4.91	4.90
	0.0	40437	40175	40000	39825	5.53	5.74	5.50	5.50
	5.0	42564	42288	42104	41920	5.86	6.09	5.83	5.82
	14.0	45490	45155	44958	44762	6.25	6.48	6.22	6.21
	17.0	47615	47265	47095	46933	6.64	6.90	6.61	6.60
	22.0	49722	49245	49227	49209	6.93	6.90	6.29	6.27
	27.0	49743	49347	49349	49361	5.77	5.71	5.68	5.65
	32.0	49367	49072	49074	49076	5.20	5.12	5.08	5.04
	37.0	48180	47784	47887	47889	4.67	4.56	4.50	4.45
	42.0	46179	45784	45887	45889	4.14	4.00	3.93	3.88
	44.6	46098	46000	46095	46188	3.87	3.40	3.65	3.58
	52.0	39055	38911	38964	38966	3.05	2.96	2.78	2.68
	57.0	38317	37728	37426	37129	2.90	2.29	2.18	2.08
	62.0	37129	36536	36238	35842	1.95	1.71	1.60	1.48
	64.4	36634	35941	35644	35248	1.69	1.44	1.31	1.18
1188	-22.0	32017	31811	31674	31537	4.25	4.42	4.23	4.23
	-10.0	36839	36602	36444	36287	4.98	5.17	4.96	4.95
	0.0	40857	40595	40420	40245	5.59	5.80	5.54	5.55
	5.0	43007	42730	42546	42362	5.92	6.13	5.89	5.89
	14.0	45922	45627	45431	45234	6.32	6.58	6.29	6.28
	17.0	48109	47800	47594	47388	6.71	6.97	6.68	6.67
	22.0	48222	48225	48227	48229	6.39	6.36	6.34	6.34
	27.0	44342	44340	44348	44350	5.85	5.77	5.74	5.70
	32.0	41767	41761	41761	41761	5.26	5.17	5.13	5.09
	37.0	40580	40184	39887	39689	4.72	4.61	4.54	4.50
	42.0	40780	40184	39887	39689	4.18	4.04	3.96	3.89
	44.6	40699	40400	40595	40598	3.90	3.43	3.68	3.62
	52.0	39065	38911	38912	38916	3.08	2.88	2.80	2.70
	57.0	38717	38123	37826	37529	2.52	2.31	2.15	2.10
	62.0	37428	36935	36638	36141	1.97	1.72	1.61	1.49
	64.4	37034	36341	36044	35547	1.70	1.45	1.31	1.18



29



30



31

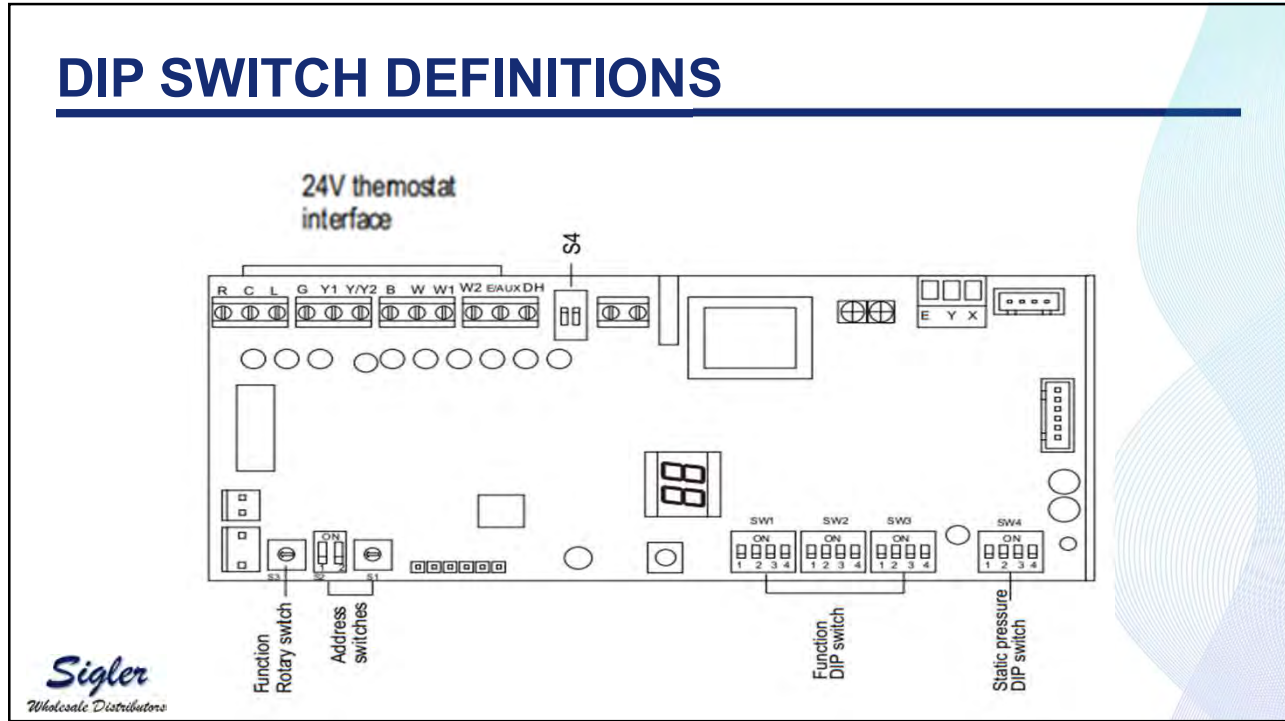
38MURA - 40MUAA

- Disadvantages
 - Requires 230-volt power at the fan coil
 - Only a three-speed indoor fan with KSACN control, one-speed with 24V thermostat
 - Separate circuit for electric heat (if desired)

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DIP SWITCH DEFINITIONS



33

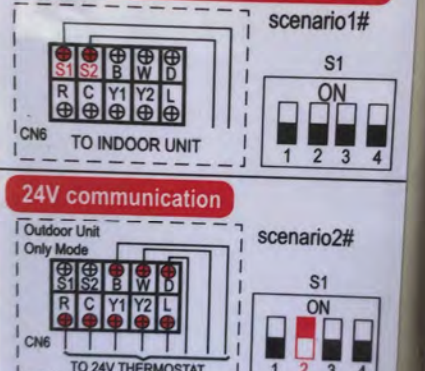
Please-Please-Please Slow Down Turbo

DC Voltage



Power needs to be OFF BEFORE DIP SWITCH adjustments

Non-polarity RS485 communication



24V wires must never be connected to S1 - S2. All wiring must be in compliance with the above scenarios. Incorrect wiring will cause irreversible damage to the control board.

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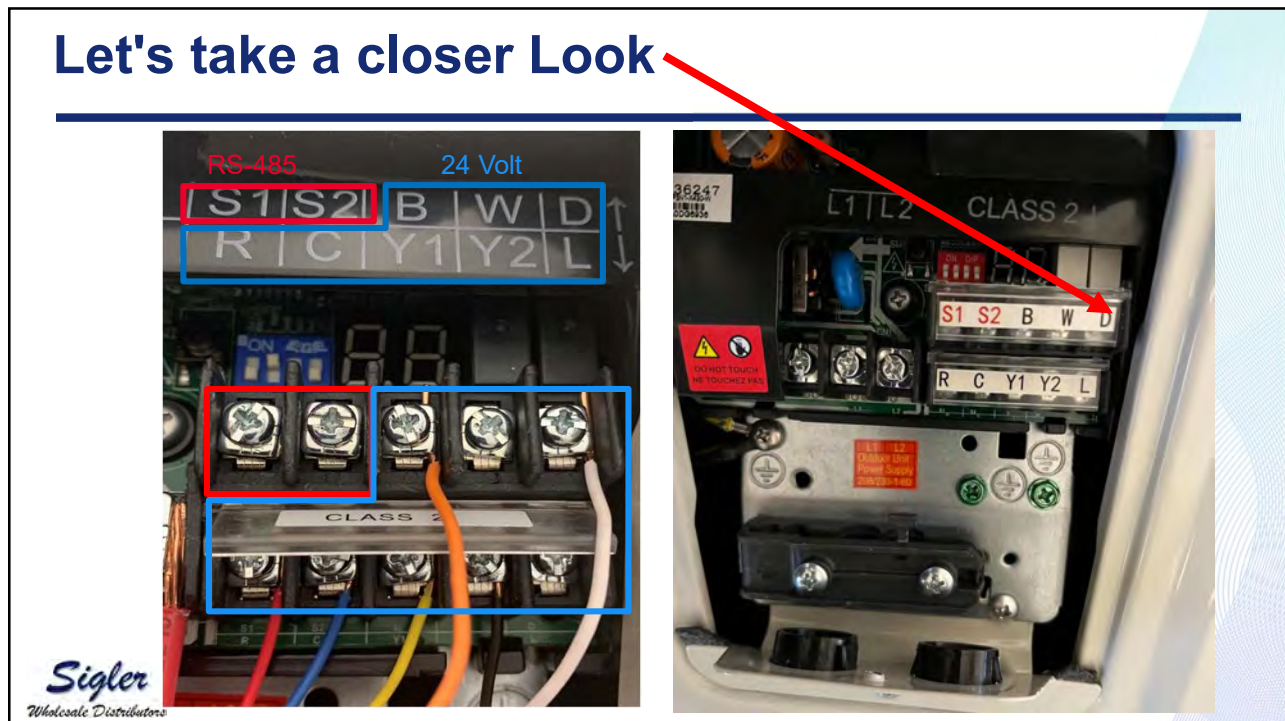
• ODU 485 + 24V Connect Guide
• 38MURA

485	
L1	Power
L2	
S1	To Carrier Unit IDU
S2	AHU /18K~60K

24V		
L1	Power	
L2		
R	24 V HOT	
C	24 V COMM	
Y1	HEAT/COOL STAGE 1	Thermostat
Y2	HEAT/COOL STAGE 2(High Demand)	
B	Changeover valve energized in heating	
W	Heat pump	
D	Defrost (out put , back to AHU/Furnace)	Thermostat or IDU
L	ODU Malfunction Indicator (out put to Thermostat or identification)	

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Let's take a closer Look



36

Zoning With a 38MURA?

- As of today's date 2023 it is not an approved application.
- If you zone a system, you are proceeding at your own descension.



- On a bright side Carrier and Sigler are performing investigations on this subject and the future is looking good.
- We will update you as soon as we have all the data.

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38MURA -- -- -- 40MUAA with 24-volt Thermostat

Scenario 1 - Non-Polarity RS485 Communication + 24V Heat-Pump Thermostat This is the preferred method when using a 24V heat pump thermostat and when the indoor unit communicates with the outdoor unit via RS485 protocol. The number of wires (#18AWG) needed for controlling the air handler should be decided based on unit size and Heat/Cool/Dehumidification requirements. A minimum of 5 wires is required. NOTE: Fan speed defaults to auto fan control logic.

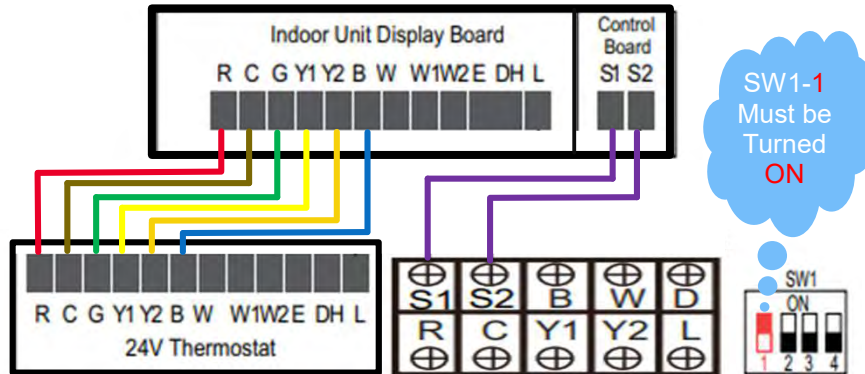


Fig. 51 —Scenario 1

Option 1: Non-polarity RS485 Communication

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38MURA -- -- -- 40MUAA with KSACN1001 Controller

Scenario 2 - Non-Polarity RS485 Communication This is the preferred method of control with wired controller **KSACN1001(not included)**.

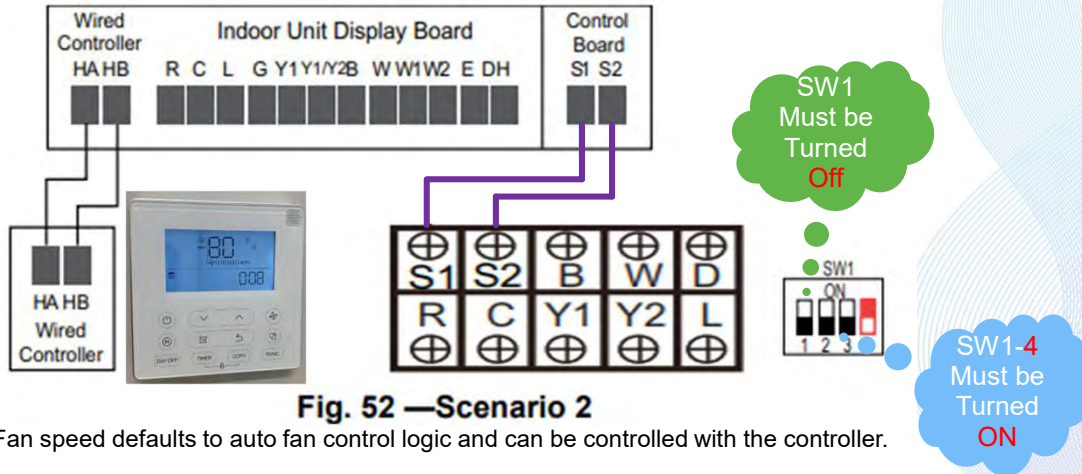


Fig. 52 —Scenario 2

NOTE: Fan speed defaults to auto fan control logic and can be controlled with the controller.



38MURA -- -- -- 40MUAA Full 24V Communication

Scenario 3 - Full 24V Communication This is the preferred method when using a 24-volt heat pump thermostat and the indoor unit communicates with the outdoor unit with 24-volt 18AWG wiring. The number of wires (#18AWG) needed for controlling the air handler should be decided based on unit size and Heat/Cool/Dehumidification requirements. **A minimum of 3 wires is required.**

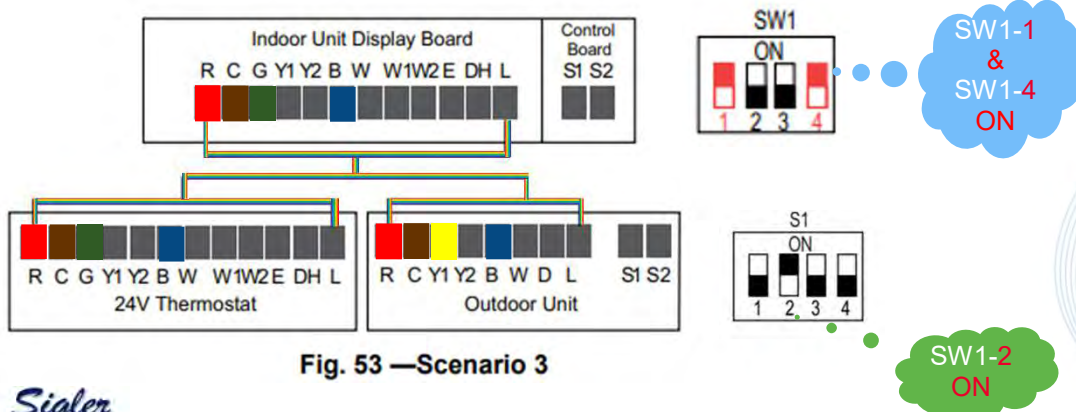


Fig. 53 —Scenario 3



L TERMINAL ACTIVE DURING ERROR CODE



- 24 Volt Output from L Terminal in Outdoor to L at Air Handler and Thermostat(If Available)
- Error Code Will Display on Outdoor LED

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38MURA -- -- 40MUAA Full 24V Communication

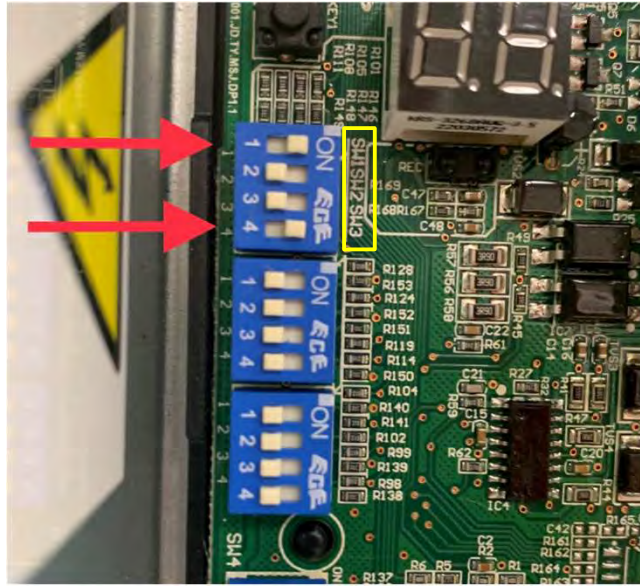


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SYSTEM OPERATION WITH 24 VOLT COMMUNICATION

**SET
DIPSWITCH
SW 1-1 AND
SW 1-4 TO
ON AT AIR
HANDLER**



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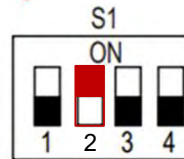
38MURA -- -- 40MUAA Full 24V Communication

38MURA

SW1-2
ON



Dip Switch



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Thermostat Options

- Two Stage Heat pump thermostat is required*
- Thermostat does not need to be connected to the internet or have an outside air temp sensor.*
- Thermostat application can be as simple or as advanced as your client would like.



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Piping Sizes

Step 5 - Refrigerant Piping Connections

Table 6 — Piping and Refrigerant

System Size	18K	18K High Heat	24K	24K High Heat	30K	30K High Heat	36K	36K High Heat	48K	48K High Heat	60K	60K High Heat
Min. Piping Length	(208/230 V) 9.8 (3)											
Standard Piping Length	24.6 (7.5)											
Max. outdoor-indoor height difference (OU higher than IU)	ft.(m)	65.6 (20)	65.6 (20)	82 (25)	82 (25)	82 (25)	82 (25)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)
Max. outdoor-indoor height difference (IU higher than OU)	ft.(m)	65.6 (20)	65.6 (20)	82 (25)	82 (25)	82 (25)	82 (25)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)
Suction Pipe (size - connection type)	in (mm)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø7/8" (22)	ø7/8" (22)
Liquid Pipe (size-connection)	in (mm)	ø3/8" (9.52)										
Refrigerant Type	Type	R410A										
Charge Amount	lb. (kg)	3.53 (1.6)	5.07 (2.3)	4.63 (2.1)	6.39 (2.9)	6.72 (3.05)	8.38 (3.8)	8.16 (3.7)	10.36 (4.7)	10.4 (4.7)	10.58 (4.8)	10.8 (4.9)

IMPORTANT: The suction line must be insulated. Use refrigeration grade tubing ONLY. No other type of tubing may be used. Use of other types of tubing will void the manufacturer's warranty.

- The minimum refrigerant line length between the indoor and outdoor unit is 10 ft. (3m).
- All outdoor units have an electronic expansion valve to manage the refrigerant flow of the fan coil connected.
- Do not open the service valves or remove the protective caps from the tubing ends until all connections are made.

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Electric Heat -- Optional

Table 6 — Auxiliary Heater Compatibility

MODEL (Btu/h)	5kW	8kW	10kW	15kW	20kW	25kW
18K	Y	Y	Y	-	-	-
24K	Y	Y	Y	Y	-	-
30K	Y	Y	Y	Y	-	-
36K	Y	Y	Y	Y	Y	-
48K	-	Y	Y	Y	Y	-
60K	-	-	Y	Y	Y	Y

Table 7 — Power Requirements for Heaters

Heater Kit Size (KW)	Model Number	MCA Circuit 1 208V/ 230V	MCA Circuit 2 208V/ 230V	MCA Circuit 3 208V/ 230V	MOPD Circuit 1 208V/ 230V	MOPD Circuit 2 208V/ 230V
5	EHKMB0 5KN	23.0/			25.0/	
		27.0			30.0	
8	EHKMB0 8KN	37.0/			40.0/	
		42.0			45.0	
10	EHKMB1 0KN	46.0/			50.0/	
		53.0			60.0	
15	EHKMB1 5KN	23.0/	46.0/		25.0/	50.0/
		27.0	53.0		30.0	60.0
20	EHKMB2 0KN	46.0/	46.0/		50.0/	50.0/
		53.0	53.0		60.0	60.0
25	EHKMB2 5KN	23.0/	46.0/	46.0/	25.0/	50.0/
		27.0	53.0	53.0	30.0	60.0

Heater Kits

- This unit is not equipped with an electric heater package. A factory-approved, field-installed, ETL listed heater package is available from your equipment supplier.
- Factory-authorized, field-installed electric heater packages are available in sizes 5kW through 25kW.
- Electric heaters that are not factory approved may cause damage which would not be covered under the equipment warranty. Review the product data literature for all available accessory kits.

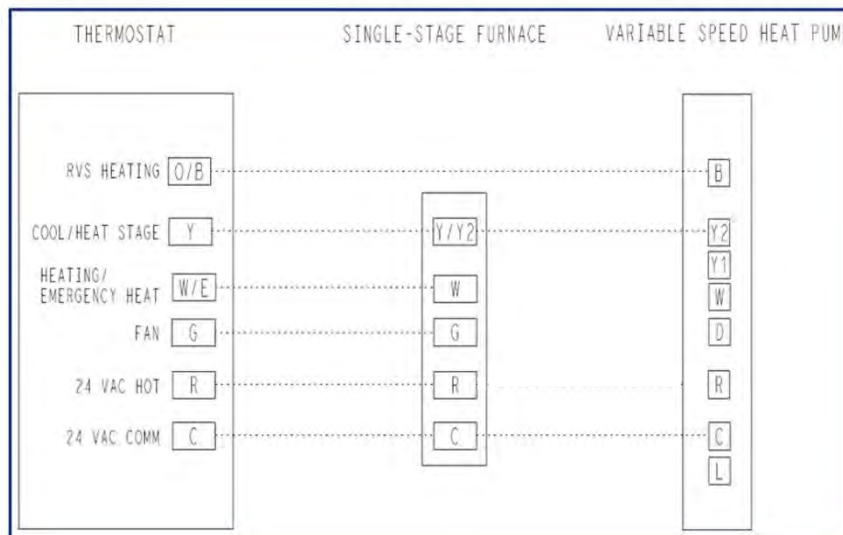
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Ok Now for the real deal

How many wire do you really need to make the heat pump work?



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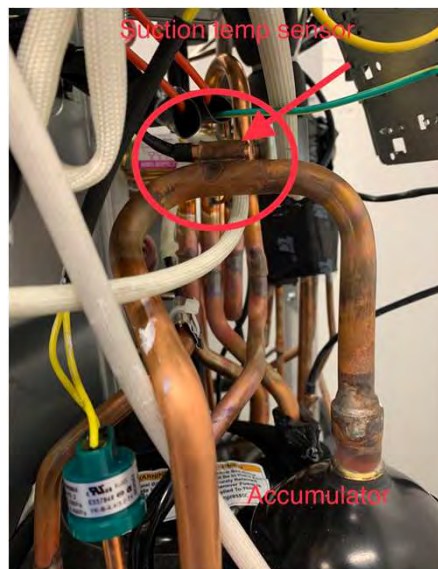
So how douse it work?

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OUTDOOR SUCTION SENSOR USED FOR DEMAND CALCULATION

Used to Calculate
Demand in
Conjunction with
Pressure Transducer



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OUTDOOR TRANSDUCER USED FOR DEMAND CALCULATION

Used to Calculate Demand

- No Longer Depends on T1 Thermistor to Set Target
- When the Demand is Removed the Values are Used for the Next Demand
- Y1=Low Demand=Lower Compressor Speed
- Y2=Hi Demand=Higher Compressor Speed



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Supper heat is the calculation.

Just think of a gas peddle.

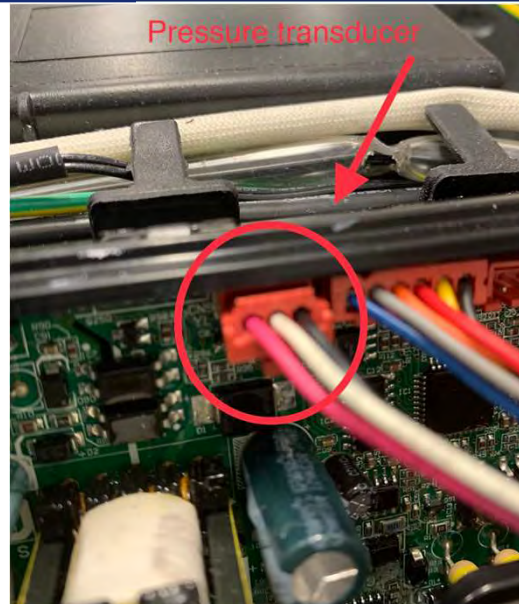
This unit will constanly adjust based on how much air flow is flowing over the coil.

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PRESSURE TRANSDUCER BOARD CONNECTION

- Black~White= 5 VDC
- Black~Red= 5.8 Mohms



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38MURA—FV4

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38MURA - FV4

- Advantages
 - Compact footprint
 - Can probably reuse an existing lineset
 - No accessories or interface kits are required

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38MURA - FV4

- Disadvantages
 - Requires 230-volt power at the fan coil
 - Only a single-speed indoor fan

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38MURA / FV4 Air Handler 24-volt heaters connection

Outdoor Unit Only Mode

TO 24V THERMOSTAT

S1 ON

LOW VOLTAGE TERMINAL BLOCK

EASY SELECT™

MOLEX 12-PIN CONNECTOR

EASY SELECT BOARD

- Configuration Taps (See Installation Instructions, for detailed description.)
 - A. AUX HEAT - Set for heater size (Ex: 0-10 for 10 kw)
 - B. AC/HP SIZE - Set for size of outdoor unit
 - C. SYSTEM TYPE - Select "HP COMFORT"
 - D. AC/HP CFM ADJUST - Select "LO"
 - E. ON/OFF DELAY - Select "ENH"
 - F. CONTINUOUS FAN - Select desired speed
- Install heater with Intelligent Heat Staging, and remove Jumper J2, except when using 5-, 8-, or 10-kw heater.
- Remove Jumper J1 to activate all dehumidify modes.
- Complete wiring and install outdoor temperature sensor according to Installation Instructions.

THERMIDISTAT™ CONTROL SETTINGS

- Set "DIP Switches" - Set the dip switches (back of Thermidstat Control Board) appropriately for specific system being installed.
- Thermidstat Control Configurations (See Thermidstat™ Control Installation Instructions for detailed description.)
 - Option 5 (Variable Speed Motors) - set to ON
 - Option 7 (Super Dehumidify) - set to ON
 - Option 9 (Intelligent Heat) - set to ON if installing with a single speed heat pump
 - Option 12 (Heaters during Defrost) - setting "2" is suggested for all heaters
 - Option 16 - Set to ON for warmer heat below 40° F.
 - Option 17 - Select programmable or non-programmable mode.
- Set desired humidity level on front of Thermidstat (50 to 55% RH recommended). For cool to dehumidify operation, both "dhu" and "cool" must be displayed.

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38MURA WITH APPROVED TWO SPEED FAN COIL

THERMOSTAT TWO-STAGE FAN COIL VARIABLE SPEED HEAT PUMP

RVS HEATING O/B

COOL/HEAT STAGE 2 Y2

COOL/HEAT STAGE 1 Y1

HEATING/EMERGENCY HEAT W/E

FAN G

24 VAC HOT R

24 VAC COMM C

Applies To:

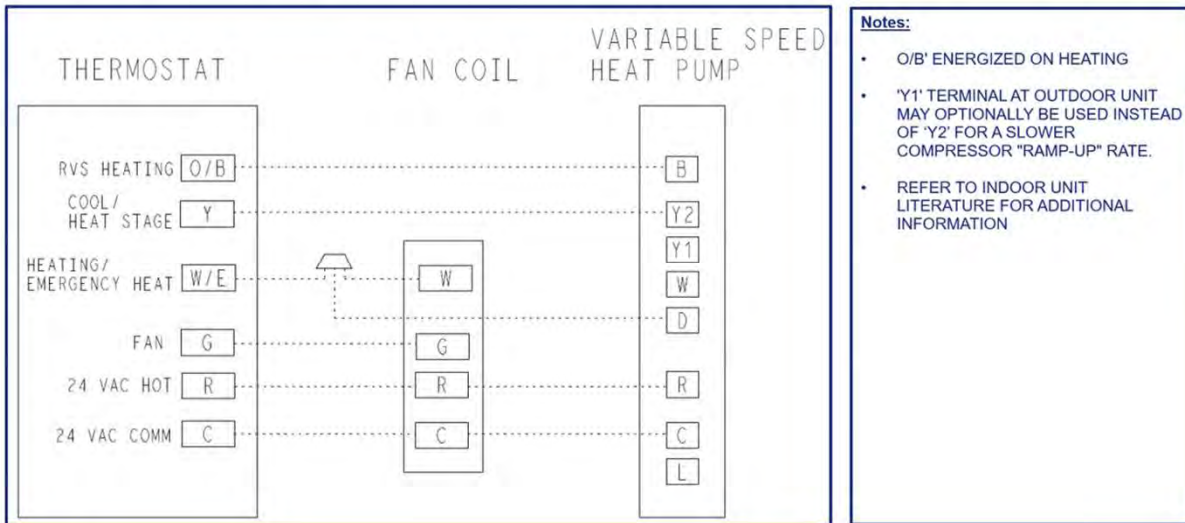
- FV4CN(B,F)

Notes:

- O/B' ENERGIZED ON HEATING
- RECOMMEND 'HP-EFF' SETTING ON EASY SELECT BOARD
- OPTIONAL HUMIDIFICATION AND DEHUMIDIFICATION SETUP NOT SHOWN. REFER TO INDOOR UNIT LITERATURE FOR ADDITIONAL INFORMATION
- 'Y1' TERMINAL AT OUTDOOR UNIT MAY OPTIONALLY BE USED INSTEAD OF 'Y2' FOR A SLOWER COMPRESSOR "RAMP-UP" RATE.
- REFER TO INDOOR UNIT LITERATURE FOR ADDITIONAL INFORMATION

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CROSSOVER APPLICATION WITH APPROVED SINGLE SPEED FAN COIL

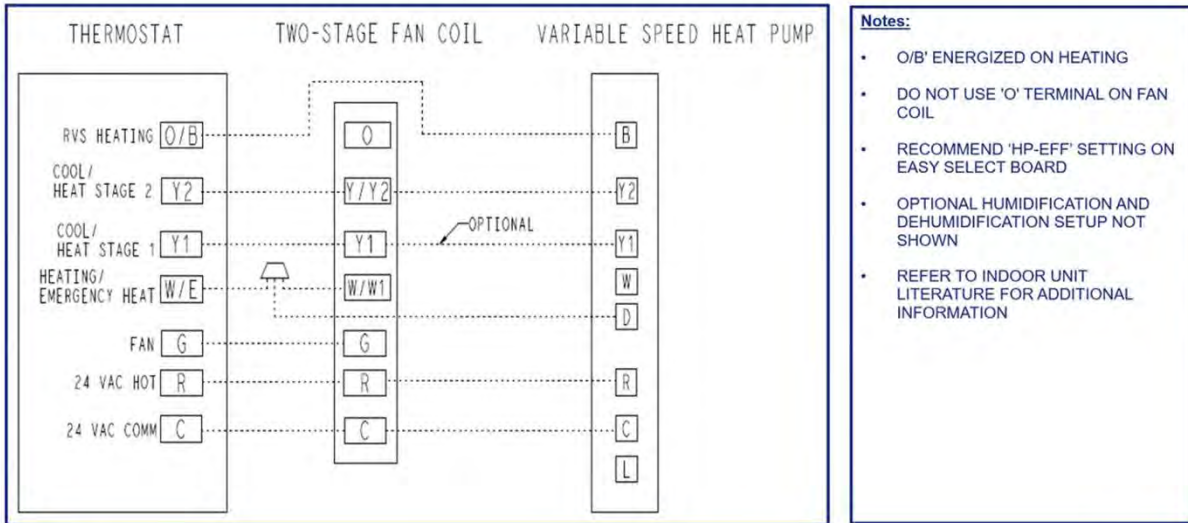


- Notes:**
- O/B' ENERGIZED ON HEATING
 - 'Y1' TERMINAL AT OUTDOOR UNIT MAY OPTIONALLY BE USED INSTEAD OF 'Y2' FOR A SLOWER COMPRESSOR "RAMP-UP" RATE.
 - REFER TO INDOOR UNIT LITERATURE FOR ADDITIONAL INFORMATION

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CROSSOVER APPLICATION WITH APPROVED TWO SPEED FAN COIL



- Notes:**
- O/B' ENERGIZED ON HEATING
 - DO NOT USE 'O' TERMINAL ON FAN COIL
 - RECOMMEND 'HP-EFF' SETTING ON EASY SELECT BOARD
 - OPTIONAL HUMIDIFICATION AND DEHUMIDIFICATION SETUP NOT SHOWN
 - REFER TO INDOOR UNIT LITERATURE FOR ADDITIONAL INFORMATION

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Thermostat Options

- Two Stage Heat pump thermostat is required*
- Thermostat does not need to be connected to the internet or have an outside air temp sensor.*
- Thermostat application can be as simple or as advanced as your client would like.



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Line Voltage and Strip Heater

Table 2 – Electric Heater Electrical Data

FC Size	HEATER PART NO.	kW		P H A S E	Internal Circuit Protection	HEATER AMPS* 208/230V ¹						BRANCH CIRCUIT								
		240V	208V			Single Circuit			Dual Circuit			Min Wire Size (AWG) 208/230V ²		Min Gnd Wire Size 208/230V ²		Max Fuse/Ckt Bkr Amps 208/230V				
						L1,L2	L3,L4	Single Circuit	L1,L2	L3,L4	Single Circuit	Dual Circuit	L1,L2	L3,L4	Single Circuit	Dual Circuit	Single Circuit	Dual Circuit		
24	KFFE0401N03	3	2.3	1	None	10.7/11.9	—	—	—	18.4/19.9	—	—	12/12	—	—	12/12	—	—	20/20	—
18	KFFE08401N03	3	2.3	1	None	10.7/11.9	—	—	—	17.0/18.5	—	—	12/12	—	—	12/12	—	—	20/20	—
24-42	KFFE0501N05	5	3.8	1	None	17.8/19.7	—	—	—	27.5/29.9	—	—	10/10	—	—	10/10	—	—	30/30	—
24-42	KFFE2401C05	5	3.8	1	Ckt Bkr	17.8/19.7	—	—	—	27.5/29.9	—	—	10/10	—	—	10/10	—	—	30/30	—
48-60	KFFE0501N05	5	3.8	1	None	17.8/19.7	—	—	—	29.9/32.3	—	—	10/8	—	—	10/10	—	—	30/35	—
48-60	KFFE2401C05	5	3.8	1	Ckt Bkr	17.8/19.7	—	—	—	29.9/32.3	—	—	10/8	—	—	10/10	—	—	30/35	—
18	KFFE0501N05	5	3.8	1	None	17.8/19.7	—	—	—	25.9/28.3	—	—	10/10	—	—	10/10	—	—	30/30	—
18	KFFE08401C05	5	3.8	1	Ckt Bkr	17.8/19.7	—	—	—	25.9/28.3	—	—	10/10	—	—	10/10	—	—	30/30	—
24-60	KFFE0801N08	8	6.0	1	None	28.5/31.5	—	—	—	43.3/47.0	—	—	8/8	—	—	10/10	—	—	45/50	—
24-60	KFFE2501C08	8	6.0	1	Ckt Bkr	28.5/31.5	—	—	—	43.3/47.0	—	—	8/8	—	—	10/10	—	—	45/50	—
18	KFFE0801N08	8	6.0	1	None	28.5/31.5	—	—	—	39.3/43.0	—	—	8/8	—	—	10/10	—	—	40/45	—
18	KFFE08501C08	8	6.0	1	Ckt Bkr	28.5/31.5	—	—	—	39.3/43.0	—	—	8/8	—	—	10/10	—	—	40/45	—
24-60	KFFE0901N10	10	7.5	1	None	35.6/39.4	—	—	—	52.1/56.9	—	—	6/6	—	—	10/10	—	—	60/60	—
24-60	KFFE2601C10	10	7.5	1	Ckt Bkr	35.6/39.4	—	—	—	52.1/56.9	—	—	6/6	—	—	10/10	—	—	60/60	—
18	KFFE0901N10	10	7.5	1	None	35.6/39.4	—	—	—	48.1/52.9	—	—	8/6	—	—	10/10	—	—	50/60	—
18	KFFE08601C10	10	7.5	1	Ckt Bkr	35.6/39.4	—	—	—	48.1/52.9	—	—	8/6	—	—	10/10	—	—	50/60	—
30-60	KFFE2901N09	9	6.8	1	None	32.2/35.6	—	—	—	47.9/52.1	—	—	8/6	—	—	10/10	—	—	50/60	—
30-60	KFFE0201N09	9	6.8	3	None	18.6/20.6	—	—	—	30.9/33.4	—	—	8/6	—	—	10/10	—	—	40/40	—
24-60	KFFE3001F15 ³	15	11.3	1	Fuse	53.4/59.1	35.6/39.4	17.8/19.7	74.4/81.5	52.1/56.9	22.3/24.6	4/4	6/6	10/10	8/8	10/10	10/10	80/90	60/60	25/25
24-60	KFFE0101C15	15	11.3	1	Ckt Bkr	53.4/59.1	35.6/39.4	17.8/19.7	74.4/81.5	52.1/56.9	22.3/24.6	4/4	6/6	10/10	8/8	10/10	10/10	80/90	60/60	25/25
36-60	KFFE1601315	15	11.3	3	Fuse	30.8/34.1	—	—	—	46.1/50.3	—	—	6/6	—	—	10/10	—	—	50/60	—
42-60	KFFE2001318	18	13.5	3	None	37.2/41.2	—	—	—	54.1/59.1	—	—	6/6	—	—	10/10	—	—	60/70	—
30-60	KFFE3201F20 ¹	20	15.0	1	Fuse	71.2/78.8	35.6/39.4	35.6/39.4	96.6/106.1	52.1/56.9	44.5/49.3	3/2	6/6	8/8	8/6	10/10	10/10	100/110	60/60	45/50
30-60	KFFE3301C20	20	15.0	1	Ckt Bkr	71.2/78.8	35.6/39.4	35.6/39.4	96.6/106.1	52.1/56.9	44.5/49.3	3/2	6/6	8/8	8/6	10/10	10/10	100/110	60/60	45/50
48-60	KFFE3401F24 ⁴	24	18.0	3	Fuse	49.3/54.6	—	—	—	69.3/75.9	—	—	4/4	—	—	8/8	—	—	80/80	—
48-60	KFFE3401C24	24	18.0	1	Fuse	65.9/64.5	—	—	—	114.5/125.8	—	—	2/1	—	—	6/6	—	—	125/150	—
48-60	KFFE3501F30 ²	30	22.5	3	Fuse	61.7/68.2	—	—	—	84.8/92.9	—	—	4/3	—	—	8/8	—	—	90/100	—
48-60	KFFE3501C30	30	22.5	1	Fuse	106.8/118.1	—	—	—	141.1/155.3	—	—	0/00	—	—	6/6	—	—	150/175	—

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Piping Sizes

Step 5 - Refrigerant Piping Connections

Table 6 — Piping and Refrigerant

System Size	18K	18K High Heat	24K	24K High Heat	30K	30K High Heat	36K	36K High Heat	48K	48K High Heat	60K	60K High Heat	
Min. Piping Length	(208/230 V) 9.8 (3)												
Standard Piping Length	24.6 (7.5)												
Max. outdoor-indoor height difference (OU higher than IU)	ft.(m)	65.6 (20)	65.6 (20)	82 (25)	82 (25)	82 (25)	82 (25)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)
Max. outdoor-indoor height difference (IU higher than OU)	ft.(m)	65.6 (20)	65.6 (20)	82 (25)	82 (25)	82 (25)	82 (25)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)
Suction Pipe (size - connection type)	in (mm)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø7/8" (22)	ø7/8" (22)
Liquid Pipe (size-connection)	in (mm)	ø3/8" (9.52)											
Refrigerant Type	Type	R410A											
Charge Amount	lb. (kg)	3.53 (1.6)	5.07 (2.3)	4.63 (2.1)	6.39 (2.9)	6.72 (3.05)	8.38 (3.8)	8.16 (3.7)	10.36 (4.7)	10.4 (4.7)	10.58 (4.8)	10.8 (4.9)	10.58 (4.8)

IMPORTANT: The suction line must be insulated. Use refrigeration grade tubing ONLY. No other type of tubing may be used. Use of other types of tubing will void the manufacturer's warranty.

- The minimum refrigerant line length between the indoor and outdoor unit is 10 ft. (3m).
- All outdoor units have an electronic expansion valve to manage the refrigerant flow of the fan coil connected.
- Do not open the service valves or remove the protective caps from the tubing ends until all connections are made.



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Crossover Solutions - How it works

38MARB/DLCSR

- Uses a conventional DLS ODU
- A 24V interface is required for communication
- Expansion valve must be removed from the IDU and a piping adaptor needs to be installed
- Both suction and liquid lines must be insulated



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38MURA/DLCURA

- Designed specifically to meet the Crossover requirements
- ODU has a 24V interface built-in
- No additional accessories are required
- Only the suction line needs to be insulated
- Uses conventional unitary line-set sizes



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38MURA - 58TP1

- Advantages
 - Compact footprint
 - Can probably reuse an existing lineset
 - Only requires 115-volt power at the furnace
 - No accessories or interface kits are required

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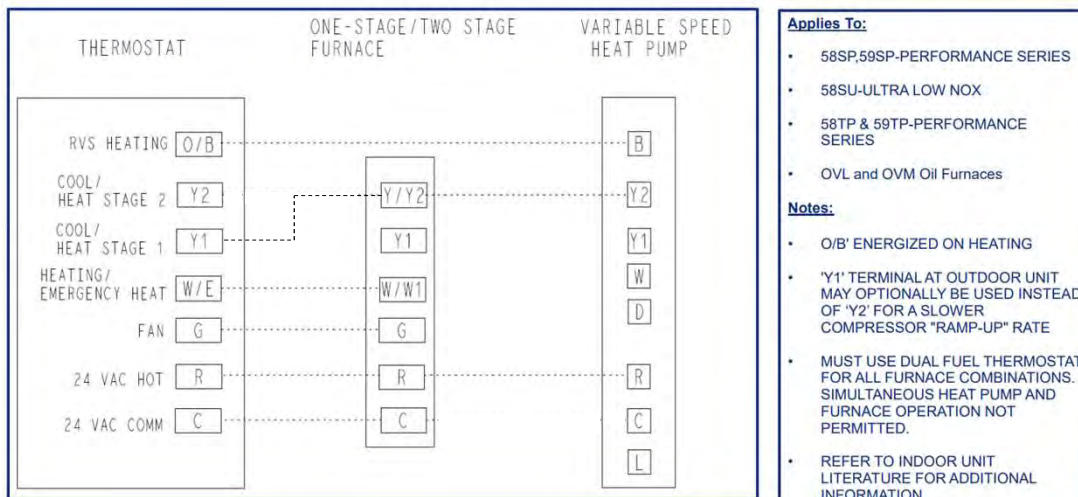
38MURA 58TP1

- Disadvantages
 - Only a single-speed indoor fan



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38MURA WITH APPROVED SINGLE/TWO STAGE FURNACES



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38MURA --- 58TP1 Full 24V Communication

Do Not Follow the Furnace Install Manual

Use B for MURA Application

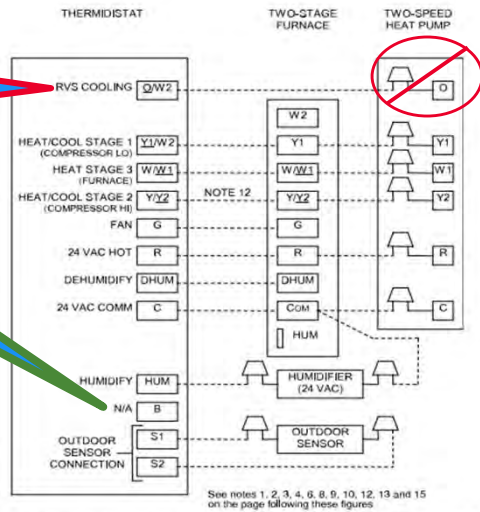
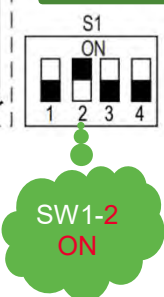
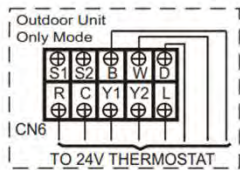
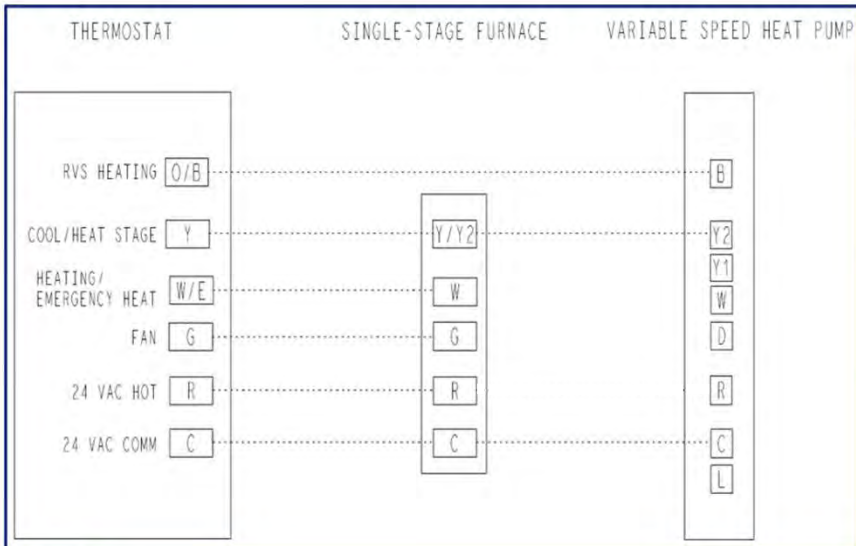


Fig. 31 – Two-Stage Furnace with Two-Speed Heat Pump (Dual Fuel)

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CROSSOVER APPLICATION WITH APPROVED SINGLE-STAGE FURNACES



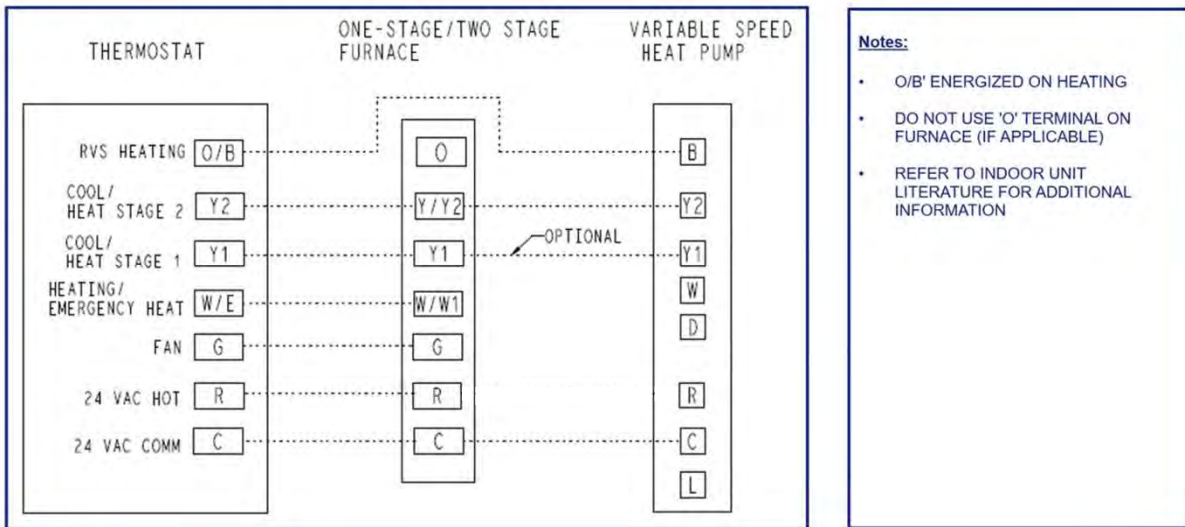
Notes:

- 'O/B' ENERGIZED ON HEATING
- 'Y1' TERMINAL AT OUTDOOR UNIT MAY OPTIONALLY BE USED INSTEAD OF 'Y2' FOR A SLOWER COMPRESSOR "RAMP-UP" RATE
- MUST USE DUAL FUEL THERMOSTAT FOR ALL FURNACE COMBINATIONS. SIMULTANEOUS HEAT PUMP AND FURNACE OPERATION NOT PERMITTED.
- REFER TO INDOOR UNIT LITERATURE FOR ADDITIONAL INFORMATION

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CROSSOVER APPLICATION WITH APPROVED TWO STAGE FURNACE



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Thermostat Options

- Heat pump Dual Fuel thermostat is required*
- Thermostat must be connected to the internet or have an outside air temp sensor.*
- Thermostat can be as advanced as your client would like.



**Simple
No
Internet**



Supper Advanced



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Piping Sizes

Step 5 - Refrigerant Piping Connections

Table 6 — Piping and Refrigerant

System Size	18K	18K High Heat	24K	24K High Heat	30K	30K High Heat	36K	36K High Heat	48K	48K High Heat	60K	60K High Heat	
Min. Piping Length	(208/230 V) 9.8 (3)												
Standard Piping Length	24.6 (7.5)												
Max. outdoor-indoor height difference (OU higher than IU)	ft.(m)	65.6 (20)	65.6 (20)	82 (25)	82 (25)	82 (25)	82 (25)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)
Max. outdoor-indoor height difference (IU higher than OU)	ft.(m)	65.6 (20)	65.6 (20)	82 (25)	82 (25)	82 (25)	82 (25)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)	98.4 (30)
Suction Pipe (size - connection type)	in (mm)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø3/4" (19)	ø7/8" (22)	ø7/8" (22)
Liquid Pipe (size-connection)	in (mm)	ø3/8" (9.52)											
Refrigerant Type	Type	R410A											
Charge Amount	lb. (kg)	3.53 (1.6)	5.07 (2.3)	4.63 (2.1)	6.39 (2.9)	6.72 (3.05)	8.38 (3.8)	8.16 (3.7)	10.36 (4.7)	10.4 (4.7)	10.58 (4.8)	10.8 (4.9)	10.58 (4.8)

IMPORTANT: The suction line must be insulated. Use refrigeration grade tubing ONLY. No other type of tubing may be used. Use of other types of tubing will void the manufacturer's warranty.

- The minimum refrigerant line length between the indoor and outdoor unit is 10 ft. (3m).
- All outdoor units have an electronic expansion valve to manage the refrigerant flow of the fan coil connected.
- Do not open the service valves or remove the protective caps from the tubing ends until all connections are made.

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Test Time!

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A/C Only APPLICATION WITH APPROVED TWO STAGE FURNACE

THERMOSTAT	ONE-STAGE/TWO STAGE FURNACE	VARIABLE SPEED HEAT PUMP	
RVS HEATING O/B	O	B	<p>Notes:</p> <p>HOW MANY WIRES DO WE NEED IF IT IS A/C ONLY?</p>
COOL/HEAT STAGE 2 Y2	Y/Y2	Y2	
COOL/HEAT STAGE 1 Y1	Y1	Y1	
HEATING/EMERGENCY HEAT W/E	W/W1	W	
FAN G	G	D	
24 VAC HOT R	R	R	
24 VAC COMM C	C	C	
		L	

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A/C Only APPLICATION WITH APPROVED FURNACE

THERMOSTAT	ONE-STAGE/TWO STAGE FURNACE	VARIABLE SPEED HEAT PUMP	
RVS HEATING O/B	O	B	<p>Notes:</p> <p>ANSWER:</p> <p>TWO WIRES</p> <p>Y1 IS OPTIONAL</p>
COOL/HEAT STAGE 2 Y2	Y/Y2	Y2	
COOL/HEAT STAGE 1 Y1	Y1	Y1	
HEATING/EMERGENCY HEAT W/E	W/W1	W	
FAN G	G	D	
24 VAC HOT R	R	R	
24 VAC COMM C	C	C	
		L	

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Situation:

Compatibility errors have been reported by the field as it pertains to connecting the above listed models to previous version ODU's. This includes the 38MGR(H), 38MBRB and 38MA*R chassis. This issue is now understood and corrective actions are in place. Updated software versions were implemented in production to make the 40MBAB models compatible with older version ODU's. Replacement PCB's are in transit to Replacement Components and will be used to update current field inventory as necessary.

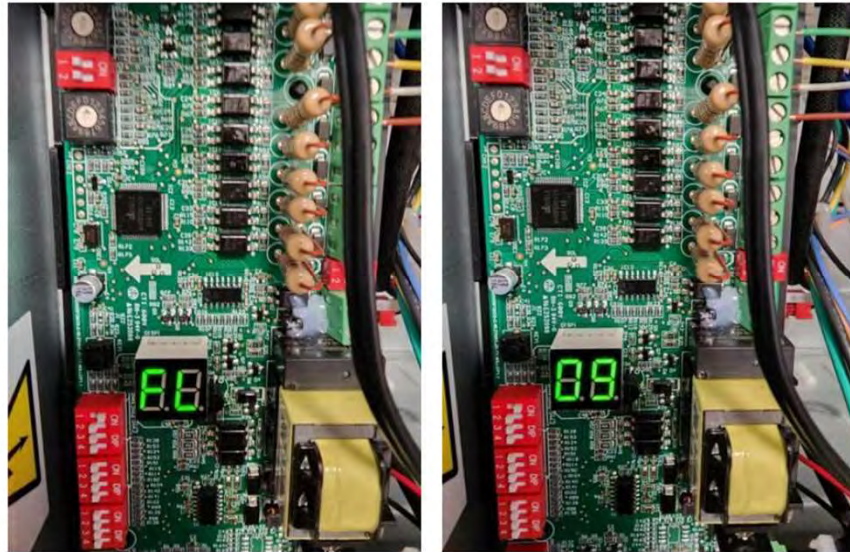
Technical Information:

The FL09 error code is caused by incompatibility of platforms. This error only occurs when using a 24V Thermostat configuration with outdoor units 38MAQ, 38MBRB and 38MGR offerings. Corrective PCB's will be available in a timely manner. Current and future installs of the 40MBAB that require a 24V thermostat **may be temporarily installed with the KSACN1001AAA Wired Controller**. This can be accomplished by running an additional 2 core stranded/shielded cable **ALONG WITH** the standard thermostat cable. This will allow the system to operate with the **onboard** controls using the KSACN1001AAA that ships with the equipment. **Refer to the Installation Manual for dip switch settings when using the Wired Controller.**

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Image 1: Error Code display 24V interface PCB



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38MBRBQ - 40MBAB

- Advantages
 - Indoor unit draws power from the outdoor unit
 - Inverter compressor



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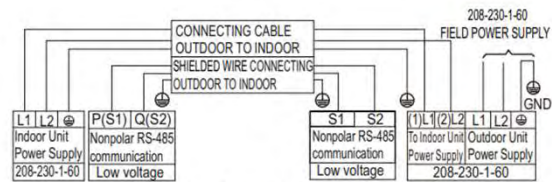
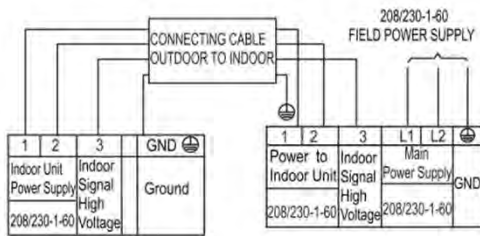


Fig. 22 — Connection Diagram sizes 36-48

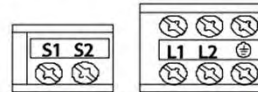


Fig. 23 — Control and Power Terminals on Indoor Unit sizes 36-48



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Carrier												Multi-Zone Quick Reference Guide						Ductless Systems		
Outdoor Unit With Factory Installed Base Pan Heater	Max Zones	Max Heating Capacity Btu's			Max Cooling Capacity Btu's			Port Combinations		Max Line Set Per Zone	Max Total Line Set Length	Pre-Charge Length	Max Lift	MCA	MOCP	Recommended Fuse/Breaker Size				
		@ 5° F	@ -10° F	@ -22° F	@ 95° F	@ 115° F	@ 122° F	Liquid	Suction											
<i>This Sheet is not intended to replace the installation instructions. It is a reference guide only. Always read through the installation instructions.</i>																				
Performance™ Series Multi-Zone Heat Pump Systems																				
38MGRBQ18BA3	2	14,191	11,432	9,225	26,901	15,126	11,342	2 @ 1/4"	2 @ 3/8"	82'	131'	49'	49'	18A	25A	20A				
38MGRBQ36DA3	4	25,394	22,594	20,353	46,983	34,808	29,960	4 @ 1/4"	3 @ 3/8" 1 @ 1/2"	115'	262'	98'	49'	25A	40A	30A				
38MGRBQ48EA3	5	32,692	27,197	22,802	58,505	45,575	40,225	5 @ 1/4"	3 @ 3/8" 2 @ 1/2"	115'	328'	123'	65'	40A	60A	45A				
Performance™ Series High Heat Multi-Zone Heat Pump Systems																				
38MGHBQ24CA3	3	20,540	17,043	14,246	39,913	30,563	27,810	3 @ 1/4"	3 @ 3/8"	98'	197'	74'	49'	24.5A	30A	25A				
38MGHBQ30DA3	4	25,394	22,594	20,353	46,983	34,808	29,960	4 @ 1/4"	3 @ 3/8" 1 @ 1/2"	115'	262'	98'	49'	25A	40A	30A				
38MGHBQ36DA3	4	34,701	31,484	28,911	55,509	39,641	33,500	4 @ 1/4"	2 @ 3/8" 2 @ 1/2"	115'	262'	98'	65'	40A	60A	45A				
38MGHBQ48EA3	5	46,199	42,096	38,813	55,419	43,725	38,839	5 @ 1/4"	3 @ 3/8" 2 @ 1/2"	115'	328'	123'	65'	40A	60A	45A				
Indoor Unit Types, Models, and Approved Btu/hr Combinations																				
Btu/hr	INFINITY™	HIGH WALL PERFORMANCE™	COMFORT™	4-WAY CEILING CASSETTES	CONCEALED SLIM DUCTED	FLOOR / CEILING CONSOLE	MULTI-POISE AIR HANDLER (AHU)	Btu/hr												
6K	N/A	40MAHBQ06XA3	N/A	N/A	N/A	N/A	N/A	6K												
9K	40MPHBQ09XA3	40MAHBQ09XA3	40MHHAQ09XA3	40MBCQ09—3	40MBDQ09—3	N/A	N/A	9K												
12K	40MPHBQ12XA3	40MAHBQ12XA3	40MHHAQ12XA3	40MBCQ12—3	40MBDQ12—3	40MBFQ12—3	N/A	12K												
18K	40MPHBQ18XA3	40MAHBQ18XA3	40MHHAQ18XA3	40MBCQ18—3	40MBDQ18—3	40MBFQ18—3	40MBABQ18XB3	18K												
24K	N/A	40MAHBQ24XA3	40MHHAQ24XA3	40MBCAQ24XA3	40MBDQ24—3	40MBFQ24—3	40MBABQ24XB3	24K												
30K	N/A	40MAHBQ30XA3	N/A	N/A	N/A	N/A	40MBABQ30XB3	30K												
36K	N/A	40MAHBQ36XA3	N/A	N/A	N/A	N/A	40MBABQ36XB3	36K												
Installation Notes:																				
Port adaptors included with the outdoor units and no branch boxes required.																				
1/4" minimum line length required per each zone.																				
Minimum 2 zones must be connected.																				
Up to 2 40MBAB AHUs can be used for 18k & 24k 40MBAB models. In the case that 2 40MBAB units are selected, no other units may be connected to the outdoor unit, regardless of remaining ports or capacity availability.																				
When a 30 or 36k AHU is utilized in combination with the 48k Multi-Zone ODU, 500 grams (17.6 Oz) of additional refrigerant should be added to the system.																				
Wi-Fi™ Kits and Wired Remote Controllers compatible with Single or Multi-Zone as per IDU Compatibility																				

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Port adaptors included with the outdoor units and no branch boxes required.
10' minimum line length required per each zone.
Minimum 2 zones must be connected.
Up to 2 40MBAB AHUs can be used for 18k & 24k 40MBAB models. In the case that 2 40MBAB units are selected, no other units may be connected to the outdoor unit, regardless of remaining ports or capacity availability.
When a 30 or 36k AHU is utilized in combination with the 48k Multi-Zone ODU, 500 grams (17.6 Oz) of additional refrigerant should be added to the system.
Wi-Fi™ Kits and Wired Remote Controllers compatible with Single or Multi-Zone as per IDU Compatibility

Up to (2) 40MBAB AHUs can be used for 18k & 24k 40MBAB models. In the case that (2) 40MBAB units are selected, **no other units may be connected to the outdoor unit, regardless of remaining ports or capacity available.**

When a 30 or 36k AHU is utilized in combination with the 48k Multi-Zone ODU, 500 grams (17.6 Oz) of additional refrigerant should be added to the system.

WHY?



Carrier		Multi-Zone Combination Chart Reference Guide							
Combinations valid for 38MG(H/R)B units. For combinations for 38MGR units please reference 38MGR Literature.									
	TWO ZONES		THREE ZONES			FOUR ZONES			
38MGRBQ18BA3	6+6	9+9							
	6+9	9+12							
	6+12	12+12							
38MGHBQ24C	6+6	9+12	6+6+6	6+9+12	9+9+18				
	6+9	9+18	6+6+9	6+9+18	9+12+12				
	6+12	12+12	6+6+12	6+12+12	12+12+12				
	6+18	12+18	6+6+18	9+9+9					
	9+9	18+18	6+9+9	9+9+12					
38MGHBQ30DA3	6+9	9+18	6+6+6	6+12+12	9+12+12	6+6+6+6	6+6+12+12	6+12+12+12	
	6+12	9+24	6+6+9	6+12+18	9+12+18	6+6+6+9	6+6+12+18	6+12+12+18	
	6+18	12+12	6+6+12	6+12+24	9+12+24	6+6+6+12	6+6+12+24	9+9+9+9	
	6+24	12+18	6+6+18	6+18+18	9+18+18	6+6+6+18	6+6+18+18	9+9+9+12	
	9+9	12+24	6+6+24	6+18+24	12+12+12	6+6+6+24	6+9+9+9	9+9+9+18	
	9+12	18+18	6+9+9	9+9+9	12+12+18	6+6+9+9	6+9+9+12	9+9+12+12	
			6+9+12	9+9+12	12+18+18	6+6+9+12	6+9+9+18	9+9+12+18	
			6+9+18	9+9+18	12+12+24	6+6+9+18	6+9+9+24	9+12+12+12	
			6+9+24	9+9+24		6+6+9+24	6+9+12+18	12+12+12+12	



38MGRBQ36DA3	6+9	9+18	6+6+6	6+12+12	9+12+12	6+6+6+6	6+6+12+12	6+12+12+12	
	6+12	9+24	6+6+9	6+12+18	9+12+18	6+6+6+9	6+6+12+18	6+12+12+18	
	6+18	12+12	6+6+12	6+12+24	9+12+24	6+6+6+12	6+6+12+24	9+9+9+9	
	6+24	12+18	6+6+18	6+18+18	9+18+18	6+6+6+18	6+6+18+18	9+9+9+12	
	9+9	12+24	6+6+24	6+18+24	12+12+12	6+6+6+24	6+9+9+9	9+9+9+12	
	9+12	18+18	6+9+9	9+9+9	12+12+18	6+6+9+9	6+9+9+12	9+9+12+18	
			6+9+12	9+9+12	12+18+18	6+6+9+12	6+9+9+18	9+9+12+18	
			6+9+18	9+9+18	12+12+24	6+6+9+18	6+9+9+24	9+12+12+12	
			6+9+24	9+9+24		6+6+9+24	6+9+12+18	12+12+12+12	
			6+6+24	9+9+9	9+24+24	6+6+6+18	6+6+18+18	6+9+12+36	9+9+12+12
38MHQBQ36DA3	9+24	18+18	6+9+12	9+9+12	12+12+12	6+6+6+24	6+6+18+24	6+9+18+18	9+9+12+18
	12+12	18+24	6+9+18	9+9+18	12+12+18	6+6+6+30	6+6+18+30	6+9+18+24	9+9+12+24
	12+18	24+24	6+9+24	9+9+24	12+12+24	6+6+6+36	6+6+24+24	6+9+18+30	9+9+18+18
			6+12+18	9+12+12	12+18+18	6+6+9+12	6+9+9+9	6+12+12+12	9+9+18+24
			6+12+24	9+12+18	12+18+24	6+6+9+18	6+9+9+12	6+12+12+18	9+12+12+12
			6+18+18	9+12+24	12+24+24	6+6+9+24	6+9+9+18	6+12+12+24	9+12+12+18
			6+18+24	9+18+18	18+18+18	6+6+9+30	6+9+9+24	6+12+12+30	9+12+12+24
			6+24+24	9+18+24	18+18+24	6+6+9+36	6+9+9+30	6+12+18+18	9+12+18+18
						6+6+12+12	6+9+9+36	6+12+18+24	9+18+18+18
						6+6+12+18	6+9+12+12	9+9+9+9	12+12+12+12
						6+6+12+24	6+9+12+18	9+9+9+12	12+12+12+18
						6+6+12+30	6+9+12+24	9+9+9+18	12+12+12+24
						6+6+12+36	6+9+12+30	9+9+9+24	12+12+18+18



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38MGRBQ48EA3	6+30	12+36	6+6+24	6+18+36	9+18+24	6+6+6+18	6+6+18+30	6+9+24+24	9+6+12+24	6+6+6+6+6	6+6+6+12+30	6+6+12+12+24	6+12+12+12+18
	6+36	18+18	6+6+30	6+24+24	9+18+30	6+6+6+24	6+6+24+24	6+12+12+12	9+9+12+30	6+6+6+6+9	6+6+6+18+18	6+6+12+18+18	9+9+9+9+9
	9+18	18+24	6+6+36	6+24+30	9+18+36	6+6+6+30	6+9+9+9	6+12+12+18	9+9+18+18	6+6+6+6+12	6+6+6+18+24	6+9+9+9+9	9+9+9+9+12
	9+24	18+30	6+9+12	9+9+9	9+24+24	6+6+6+36	6+9+9+12	6+12+12+24	9+9+18+24	6+6+6+6+18	6+6+9+9+9	6+9+9+9+12	9+9+9+9+18
	9+30	18+36	6+9+18	9+9+12	12+12+12	6+6+9+12	6+9+9+18	6+12+12+30	9+12+12+30	6+6+6+6+24	6+6+9+9+12	6+9+9+9+18	9+9+9+9+24
	9+36	24+24	6+9+24	9+9+18	12+12+18	6+6+9+18	6+9+9+24	6+12+18+18	9+12+12+18	6+6+6+6+30	6+6+9+9+18	6+9+9+9+24	9+9+9+12+12
	12+12	24+30	6+9+30	9+9+24	12+12+24	6+6+9+24	6+9+9+30	6+12+18+24	9+12+12+24	6+6+6+6+36	6+6+9+9+24	6+9+9+9+30	9+9+9+12+18
	12+18	24+36	6+9+36	9+9+30	12+12+30	6+6+9+30	6+9+9+36	6+18+18+18	9+12+18+18	6+6+6+6+36	6+6+9+9+30	6+9+9+9+36	9+9+9+18+18
	12+24	30+30	6+12+18	9+9+36	12+12+36	6+6+12+30	6+9+12+36	9+9+9+30	9+9+9+30	6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+12
	12+30		6+12+24	9+12+12	12+18+18	6+6+12+12	6+9+12+18	9+9+9+12	9+9+9+12	6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+9+9+12+18
			6+12+30	9+12+18	12+18+24	6+6+12+18	6+9+12+24	9+9+9+18	9+9+9+18	6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+12
			6+12+36	9+12+24	12+18+30	6+6+12+24	6+9+12+30	9+9+9+24	12+12+12+24	6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+18
			6+18+18	9+12+30	12+24+24	6+6+12+30	6+9+12+36	9+9+9+30	12+12+18+18	6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+18
			6+18+24	9+12+36	18+18+18	6+6+12+36	6+9+18+18	9+9+9+36		6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+18
			6+18+30	9+18+18	18+18+24	6+6+18+18	6+9+18+24	9+9+12+12		6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+18
38MHQBQ48EA3	6+30	12+36	6+6+24	6+18+36	9+18+24	6+6+6+18	6+6+18+30	6+9+24+24	9+6+12+24	6+6+6+6+6	6+6+6+12+30	6+6+12+12+24	6+12+12+12+18
	6+36	18+18	6+6+30	6+24+24	9+18+30	6+6+6+24	6+6+24+24	6+12+12+12	9+9+12+30	6+6+6+6+9	6+6+6+18+18	6+6+12+18+18	9+9+9+9+9
	9+18	18+24	6+6+36	6+24+30	9+18+36	6+6+6+30	6+9+9+9	6+12+12+18	9+9+18+18	6+6+6+6+12	6+6+6+18+24	6+9+9+9+9	9+9+9+9+12
	9+24	18+30	6+9+12	9+9+9	9+24+24	6+6+6+36	6+9+9+12	6+12+12+24	9+9+18+24	6+6+6+6+18	6+6+9+9+9	6+9+9+9+12	9+9+9+9+18
	9+30	18+36	6+9+18	9+9+12	12+12+12	6+6+9+12	6+9+9+18	6+12+12+30	9+12+12+30	6+6+6+6+24	6+6+9+9+12	6+9+9+9+18	9+9+9+9+24
	9+36	24+24	6+9+24	9+9+18	12+12+18	6+6+9+18	6+9+9+24	6+12+18+18	9+12+12+18	6+6+6+6+30	6+6+9+9+18	6+9+9+9+24	9+9+9+12+12
	12+12	24+30	6+9+30	9+9+24	12+12+24	6+6+9+24	6+9+9+30	6+12+18+24	9+12+12+24	6+6+6+6+36	6+6+9+9+24	6+9+9+9+30	9+9+9+12+18
	12+18	24+36	6+9+36	9+9+30	12+12+30	6+6+9+30	6+9+9+36	6+18+18+18	9+12+18+18	6+6+6+6+36	6+6+9+9+30	6+9+9+9+36	9+9+9+18+18
	12+24	30+30	6+12+18	9+9+36	12+12+36	6+6+12+30	6+9+12+36	9+9+9+30	9+9+9+30	6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+12
	12+30		6+12+24	9+12+12	12+18+18	6+6+12+12	6+9+12+18	9+9+9+12	9+9+9+12	6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+9+9+12+18
			6+12+30	9+12+18	12+18+24	6+6+12+18	6+9+12+24	9+9+9+18	9+9+9+18	6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+12
			6+12+36	9+12+24	12+18+30	6+6+12+24	6+9+12+30	9+9+9+24	12+12+12+24	6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+18
			6+18+18	9+12+30	12+24+24	6+6+12+30	6+9+12+36	9+9+9+30	12+12+18+18	6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+18
			6+18+24	9+12+36	18+18+18	6+6+12+36	6+9+18+18	9+9+9+36		6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+18
			6+18+30	9+18+18	18+18+24	6+6+18+18	6+9+18+24	9+9+12+12		6+6+6+6+36	6+6+9+9+36	6+9+9+9+36	9+12+12+12+18



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38MARBQ - 40MBAB

- Disadvantages
 - Additional power required if electric heat is needed
 - Requires a lineset with insulation on both tubes
 - 24V interface control algorithm can be easily tricked

- One-way communication from the thermostat
- Thermostat will tell the system whether or not to run
- Compressor speed is controlled based on return air thermistor and the assumed difference to setpoint
- Fan speed is controlled based on return air thermistor and the assumed difference to setpoint
- Upon reaching setpoint, airflow shuts off

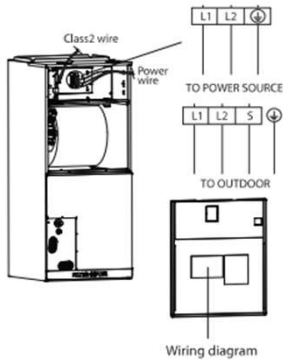


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Two air handler use Mini Split S wire for communication.

Table 12 — Wiring Sizes 12K-36K

Cable	Cable Size	Remarks
Connection Cable	14AWG	3 wire + Ground 1Ø 208/230 V (Stranded wire is required)



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NO!

Table 13 — Wiring Sizes 36K-60K

Cable	Cable Size	Remarks
Power Connection Cable	14AWG	2 wire + Ground 1Ø 208/230 V
Communication Cable	16AWG	2 wire stranded shielded control wire

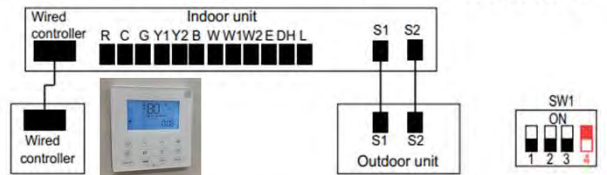
38MARBQ WITH 40MBAB

Only Compatible with Models listed below

38MARBQ36AB3 38MBRCQ36AA3 38MBRCQ48AA3 38MBRCQ58AA3

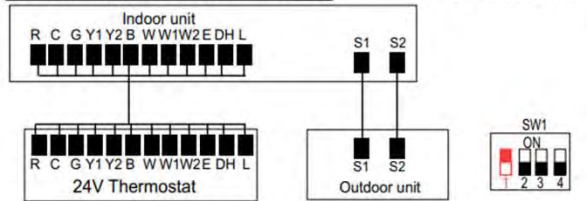
Non-polarity RS485 communication

Scenario 1



Non-polarity RS485 communication

Scenario 2



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Thermostat Options

- Two Stage Heat pump thermostat is required*
- Thermostat douse not need to be connected to the internet or have a outside air temp sensor.*
- Thermostat application can be as simple or as advanced as your client would like.

Simple



Advanced



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Strip Heat

Part numbers	Description
EHKMB05KN	Electric Heater for Air Handler 5 KW
EHKMB08KN	Electric Heater for Air Handler 8 KW
EHKMB10KN	Electric Heater for Air Handler 10 KW
EHKMB15KN	Electric Heater for Air Handler 15 KW
EHKMB20KN	Electric Heater for Air Handler 20 KW
EHKMB25KN	Electric Heater for Air Handler 25 KW

Compatibility

Air Handler Ductless system only. Refer to the product data of the air handlers 40MBAB / DLFSAB / DLFLAB / 40MUAA / DLFUAA for specific model numbers.

Electrical Specifications

Heater Kit Size (KW)	Model Number	MCA Circuit 1 208V/230V	MCA Circuit 2 208V/230V	MCA Circuit 3 208V/230V	MOCP Circuit 1 208V/230V	MOCP Circuit 2 208V/230V	MOCP Circuit 3 208V/230V
5	EHKMB05KN	23.0/27.0			25.0/30.0		
8	EHKMB08KN	37.0/42.0			40.0/45.0		
10	EHKMB10KN	46.0/53.0			50.0/60.0		
15	EHKMB15KN	23.0/27.0	46.0/53.0		25.0/30.0	50.0/60.0	
20	EHKMB20KN	46.0/53.0	46.0/53.0		50.0/60.0	50.0/60.0	
25	EHKMB25KN	23.0/27.0	46.0/53.0	46.0/53.0	25.0/30.0	50.0/60.0	50.0/60.0

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Piping Both Lines Insolated

Table 6 — Piping and Refrigerant Information

SYSTEM SIZE		36K	48K	58K	
PIPING	Min. Piping Length	ft (m)	10(3)	10(3)	9.8 (3)
	Standard Piping Length	ft (m)	25(7.5)	25(7.5)	24.6 (7.5)
	Max. outdoor-indoor height difference (OU higher than IU)	ft (m)	98(30)	98(30)	98.4 (30)
	Max. outdoor-indoor height difference (IU higher than OU)	ft (m)	98(30)	98(30)	98.4 (30)
	Max. Piping length with no additional refrigerant charge	ft (m)	26(8)	26(8)	24.6 (7.5)
	Max. Piping Length	ft (m)	213(65)	213(65)	213 (65)
	Additional refrigerant charge (between Standard - Max piping length)	Oz/ft (g/m)	0.32(30)	0.32(30)	0.32(30)
	Gas Pipe (size-connection type)	in (mm)	5/8(16)	5/8(16)	7/8(22)
	Liquid Pipe (size-connection type)	in (mm)	3/8(9.52)	3/8(9.52)	3/8(9.52)
REFRIGERANT	Refrigerant Type	--	R410A	R410A	R410A
	Charge Amount	Lbs (kg)	6.72(3.05)	9.26(4.2)	10.58 (4.8)

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