Controls

45MBAA Control Overview

- As of 10.20.2025, the Installation Manual included with the air handler and the version on HVACPartners do not have any DIP switch information.
- As of 10.20.2025, the Product and Service Manual on HVACPartners, have information, but appears to have the controls mixed up with the 45MU(H,A)A.
- This training has swapped all information to match the label on the unit.

Incorrect

Table 12 – Function Combination Table of SW1-1 and SW1-4

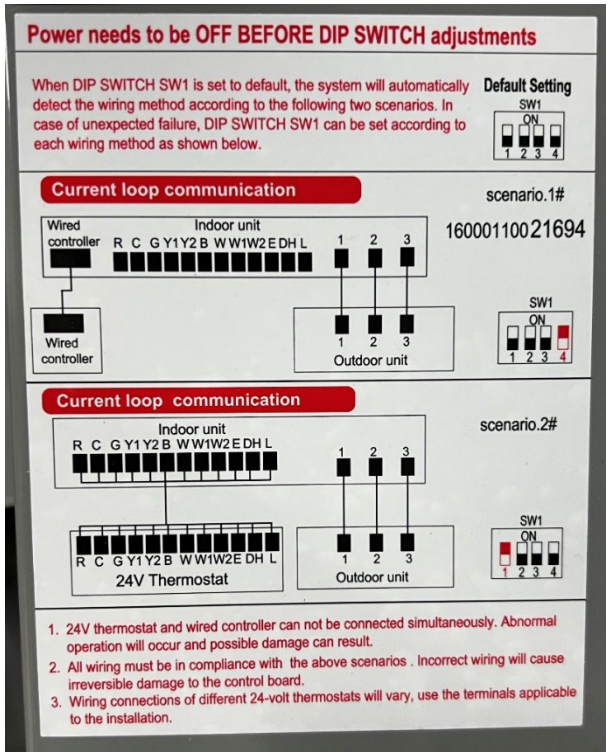
SW1	Control Type	IDU and ODU Connection	Note
ON 1 2 3 4	Wired Controller / 24V Thermostat	S1 + S2	Auto Discovery
ON 1 2 3 4	Wired Controller	S1 + S2	Scenario 2
ON 1 2 3 4	24V Thermostat	S1 + S2	Scenario 1
ON 1 2 3 4	24V Thermostat	24V Thermostat	This setting not applicable.

Page 12 from the Product Manual, all DIP setting was accidently left out of the Install Manual.

They do not match

Use label on the unit!

Label on unit



Correct

Controls

45MBAA Control Overview

- The 45MBAA can use a 1401 Wired Controller or standard 24-Volt thermostat (both purchased separately).
- The built-in 24-Volt interface can provide further flexibility, functionality and control by a 3rd party 24-Volt thermostat.
- The optional 24-Volt control can be wired to the fan coil using 18 gauge solid or stranded wire.
- Do not connect the 1401 Wired Controller & a 24-Volt Thermostat at the same time.

1401 Connections

KSACN1401AAA

or

24-Volt

or

Stat of choice

choice depends on features needed

Controls

KSACN1401AAA

45MBAA Thermostat Choices (if not using the optional 1401 Wired Control):

- Most 24-Volt thermostats will work for a 45MBAA with an Electric Heat package, refer to the Application/Installation instructions for specific details for the model installing.
- We strongly recommend that these systems are always wired to operate as a Heat Pump, Conventional will work, but will not allow H/P lockout.

Heat Pump Wiring –	Heat Pump Lock Out Available
Conventional Wiring –	No Heat Pump Lock Out Available

- The 45MBAA with an Electric Heat package does not require the thermostat to sense outside temperature to operate.

ecobee

Cielo

Honeywell

Nest

VIVE

Controls

Scenario 1

1401 Wired Control

Scenario 2

24-Volt Control

45MBAA Quick Setup Guide

Application: Heat Pump with or without Electric heat

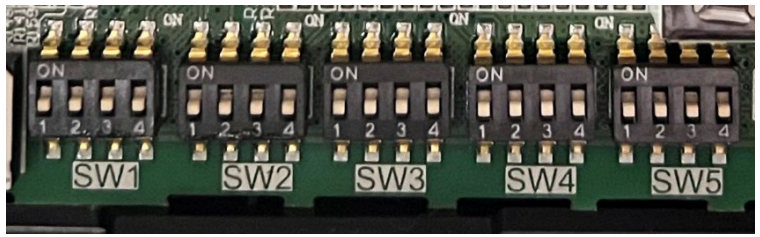
SW1-4 – Turn ON for 1401 Wired Control, Scenario 1
SW1-1 – Turn ON for 24-Volt Control, Scenario 2

SW4-1~3 – If electric heat kit is installed set using charts provided, if no kit leave all OFF.

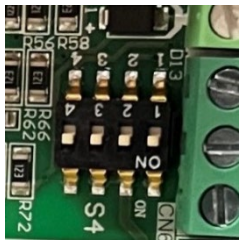
S4-4 – Leave ON if no electric heat kit.
S4-4 – Leave ON if using 24-Volt control with 5, 8 or 10kW electric heat kits
S4-4 – Turn OFF only if using 24-Volt control with 15, 20 or 25kW electric heat kits

For this application, all others can remain in their default position.

45MBAA – ALL Defaulted to OFF



S4 All defaulted to ON



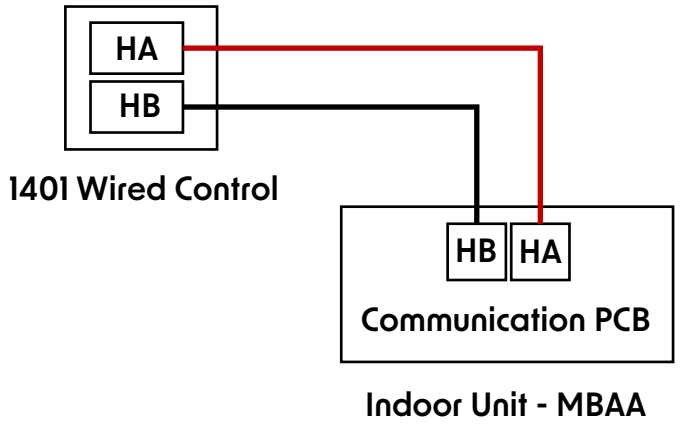
45MBAA Communication Board

Controls

45MBAA Control Scenario 1

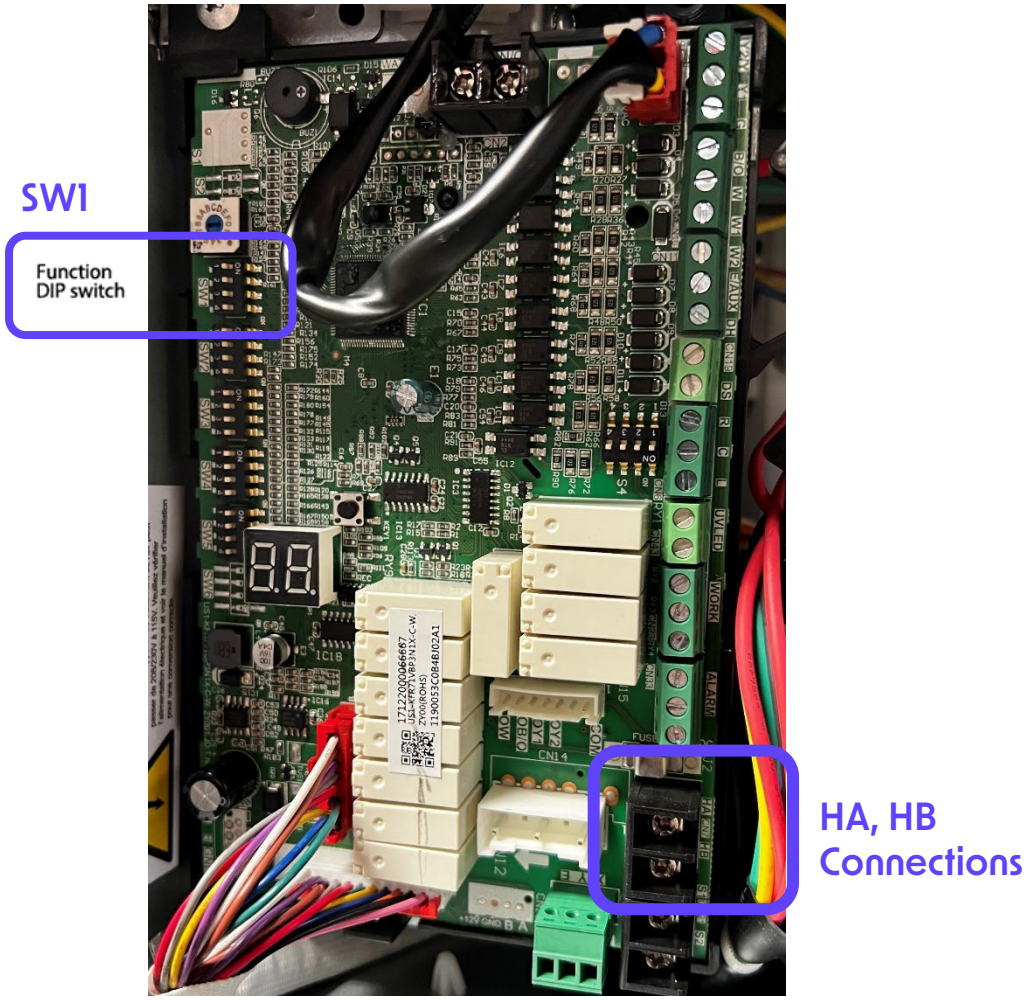
Control Selection – SW1 DIP Switches

Wired Control 1401
Control Wire IDU to Control: 16 gauge Stranded 2-wire
Set SW1-4 to ON



Scenario 1

1401 Wired Control



45MBAA Communication Board

Controls

45MBAA Control Scenario 2

Control Selection – SW1 DIP Switches

24-Volt Thermostat

Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded.

Set SW1-1 to ON

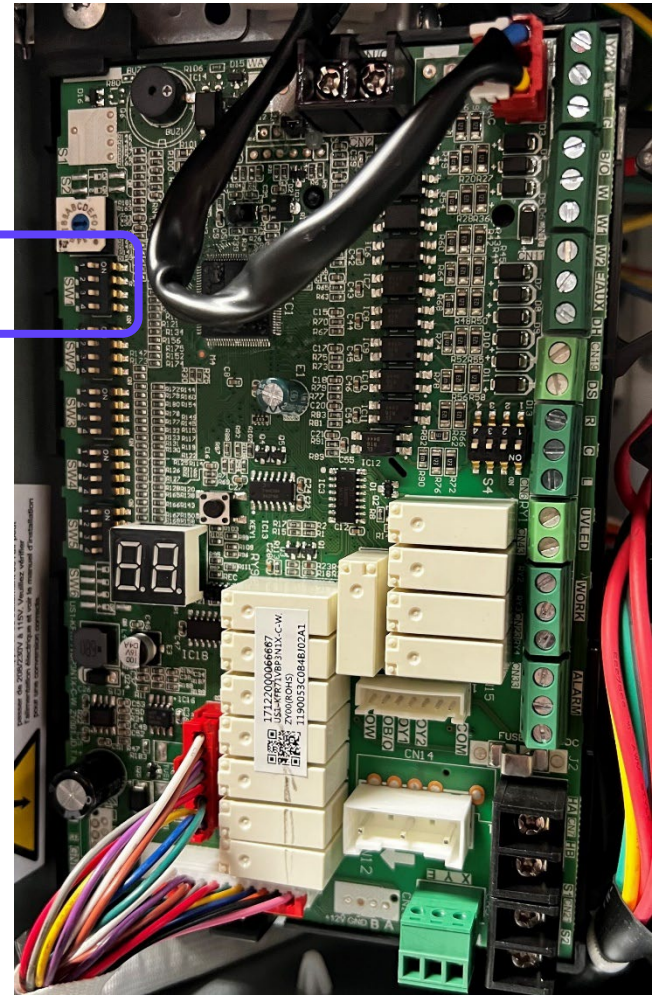
or

Stat of choice

depends on features needed

24-Volt Connections

Indoor Unit - MBAA



45MBAA Communication Board

Controls

Heat Pump Wiring Diagram

45MBAA Control Scenario 2 (cont.)

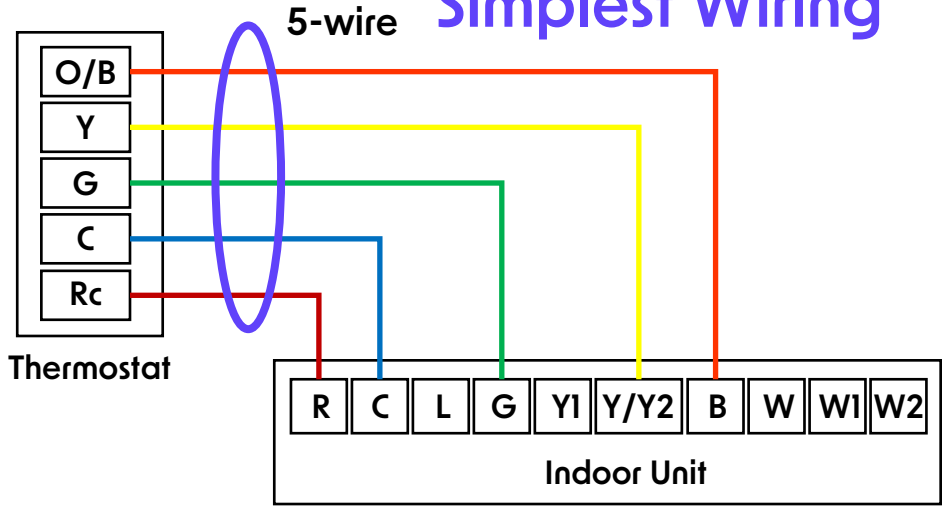
Control Scenario 2 – 24-Volt Staging Options

Indoor Unit Terminal Info

CONNECTOR	PURPOSE
R	24V Power Connector
C	Common
G	Fan Control
Y1	Low Demand
Y/Y2	High Demand
B	Heating Reverse Valve
W	Conventional Heat Control
W1	Stage 1 Electric Housing
W2	Stage 2 Electric Housing
E/AUX	Emergency Heating
DH	Dehumidification
DS	Reserved Signal
L	System Fault

Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded.
Set SW1-1 to ON

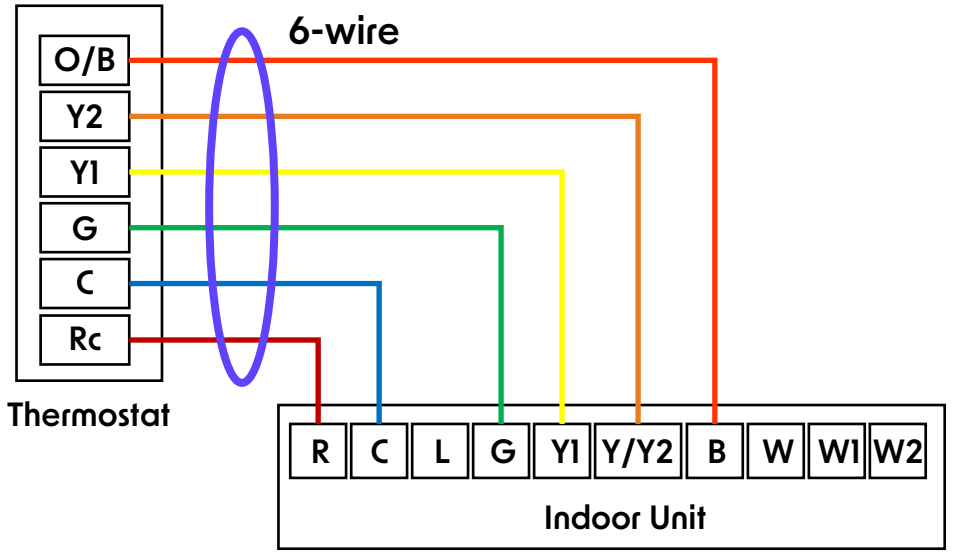
Simplest Wiring



1 Stage Heat Pump & 1 Stage Cool

Advanced Wiring

Preferred connection without an Electric Heat Kit



2 Stage Heat & 2 Stage Cool
2 Stage Heat Pump

Heat Pump Wiring Diagram

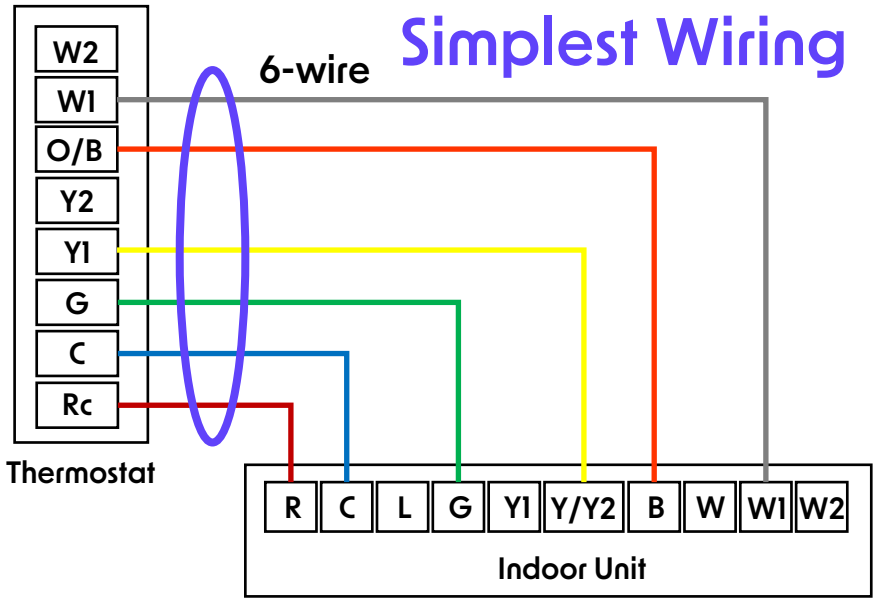
45MBAA Control Scenario 2 (cont.)

Control Scenario 2 – 24-Volt Staging Options (cont.)

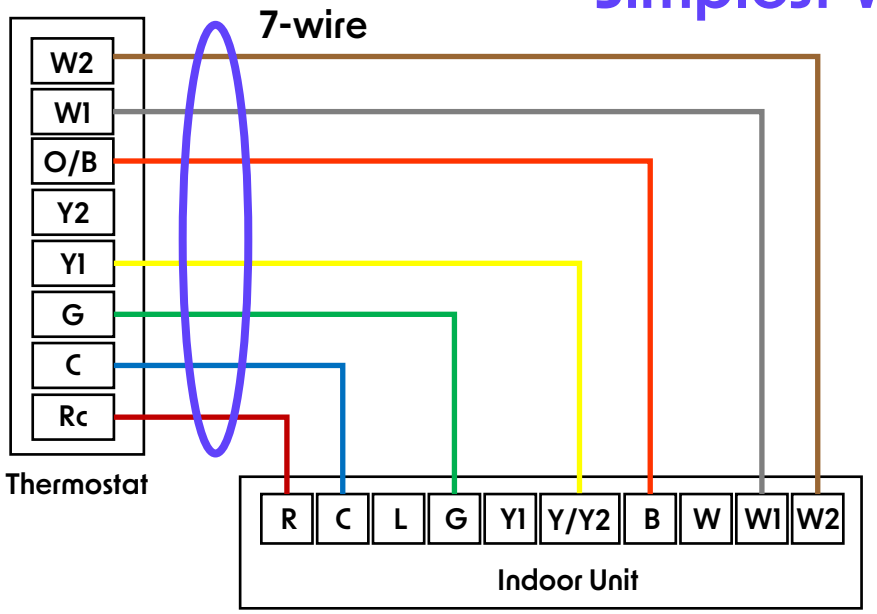
Indoor Unit Terminal Info

CONNECTOR	PURPOSE
R	24V Power Connector
C	Common
G	Fan Control
Y1	Low Demand
Y/Y2	High Demand
B	Heating Reverse Valve
W	Conventional Heat Control
W1	Stage 1 Electric Housing
W2	Stage 2 Electric Housing
E/AUX	Emergency Heating
DH	Dehumidification
DS	Reserved Signal
L	System Fault

Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded.
Set SW1-1 to ON

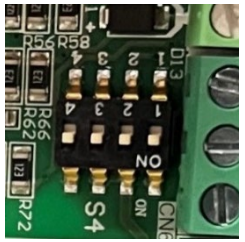


2 Stage Heat & 1 Stage Cool
1 Stage Heat Pump
1 Stage Electric Heat



3 Stage Heat & 1 Stage Cool
1 Stage Heat Pump
2 Stage Electric Heat

TURN OFF DIP Switch S4-4



Heat Pump Wiring Diagram

45MBAA Control Scenario 2 (cont.)

Control Scenario 2 – 24-Volt Staging Options (cont.)

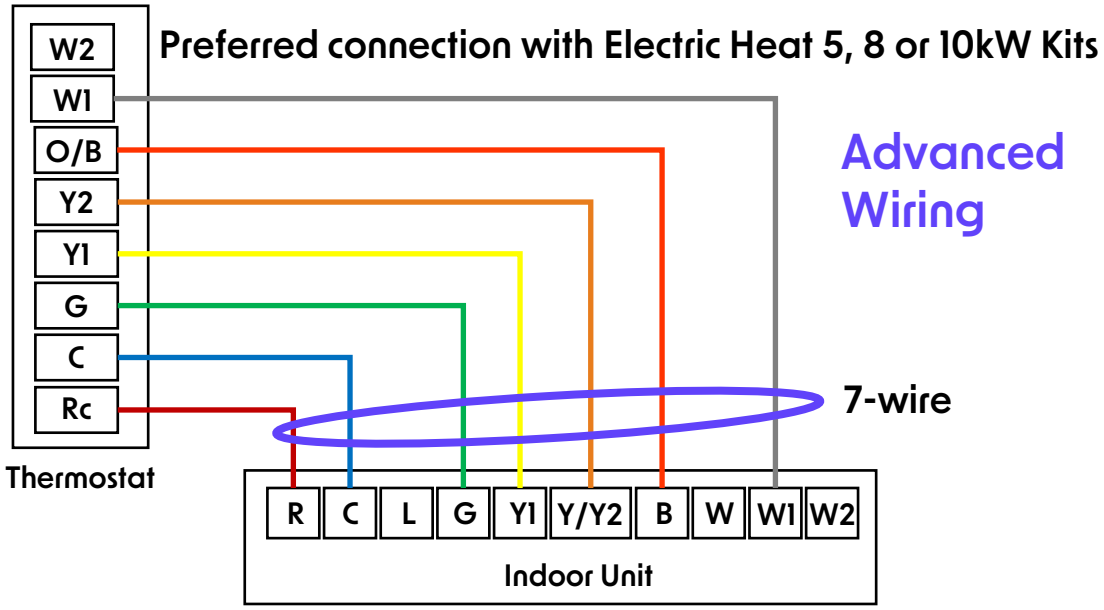
Indoor Unit Terminal Info

CONNECTOR	PURPOSE
R	24V Power Connector
C	Common
G	Fan Control
Y1	Low Demand
Y/Y2	High Demand
B	Heating Reverse Valve
W	Conventional Heat Control
W1	Stage 1 Electric Housing
W2	Stage 2 Electric Housing
E/AUX	Emergency Heating
DH	Dehumidification
DS	Reserved Signal
L	System Fault

Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded.
Set SW1-1 to ON

Advanced Wiring

Preferred connection with Electric Heat 5, 8 or 10kW Kits

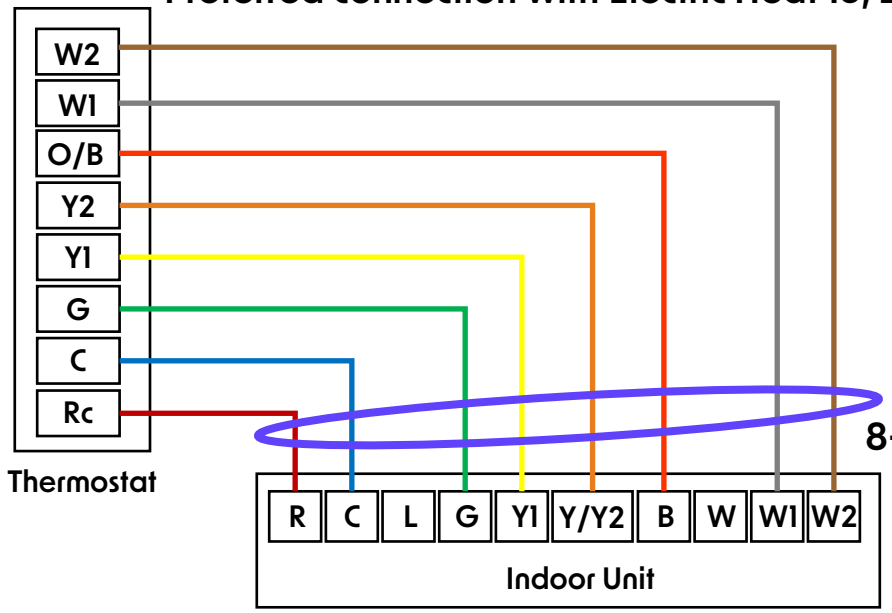


Advanced Wiring

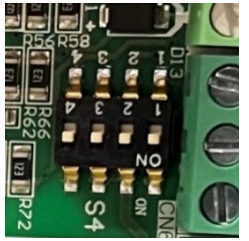
3 Stage Heat & 2 Stage Cool

2 Stage Heat Pump
1 Stage Electric Heat

Preferred connection with Electric Heat 15, 20 or 25kW Kits



TURN OFF DIP Switch S4-4



4 Stage Heat & 2 Stage Cool

2 Stage Heat Pump
2 Stage Electric Heat

Controls

Conventional Wiring Diagram

45MBAA Control Scenario 2 (cont.)

Control Scenario 2 – 24-Volt Staging Options (cont.)

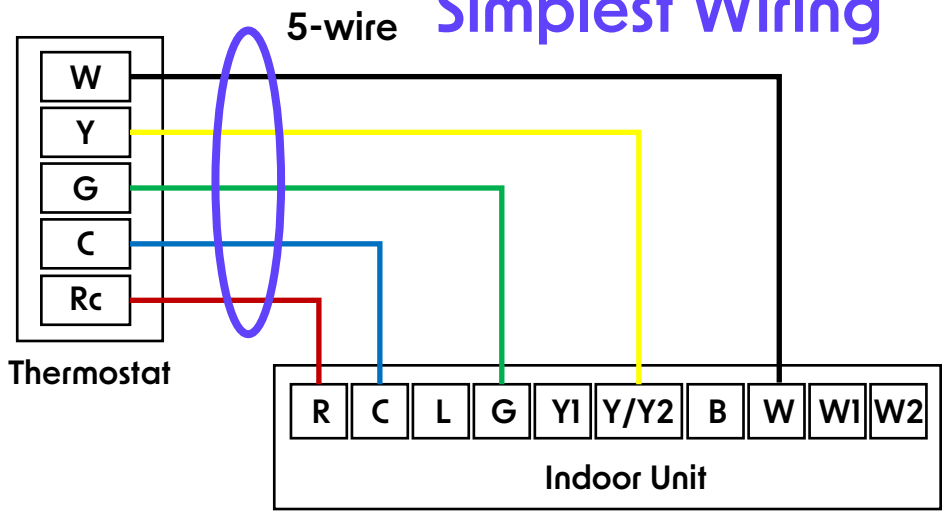
Indoor Unit Terminal Info

CONNECTOR	PURPOSE
R	24V Power Connector
C	Common
G	Fan Control
Y1	Low Demand
Y/Y2	High Demand
B	Heating Reverse Valve
W	Conventional Heat Control
W1	Stage 1 Electric Housing
W2	Stage 2 Electric Housing
E/AUX	Emergency Heating
DH	Dehumidification
DS	Reserved Signal
L	System Fault

Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded.
Set SW1-1 to ON

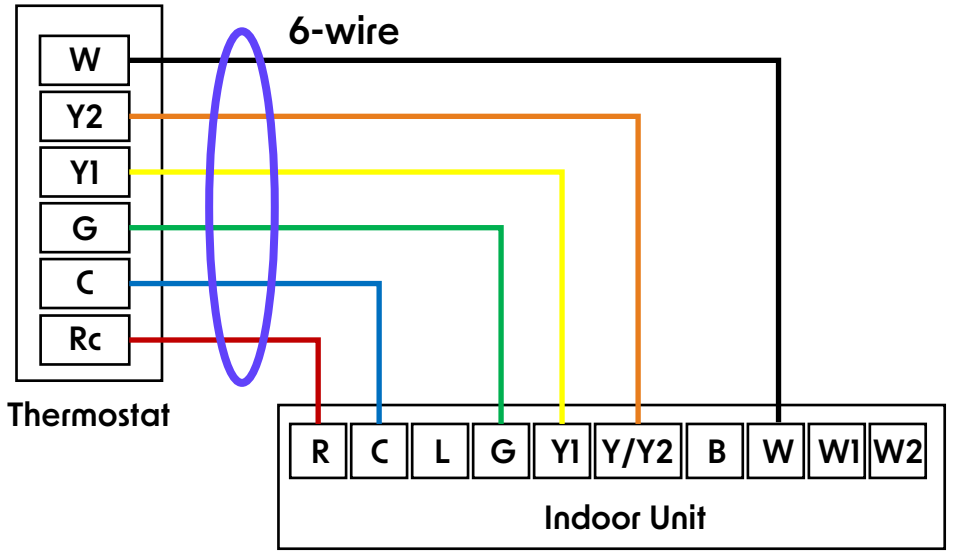
Advanced Wiring

Simplest Wiring



1 Stage Heat Pump & 1 Stage Cool

Preferred connection without an Electric Heat Kit



1 Stage Heat Pump & 2 Stage Cool

Controls

Conventional Wiring Diagram

45MBAA Control Scenario 2 (end)

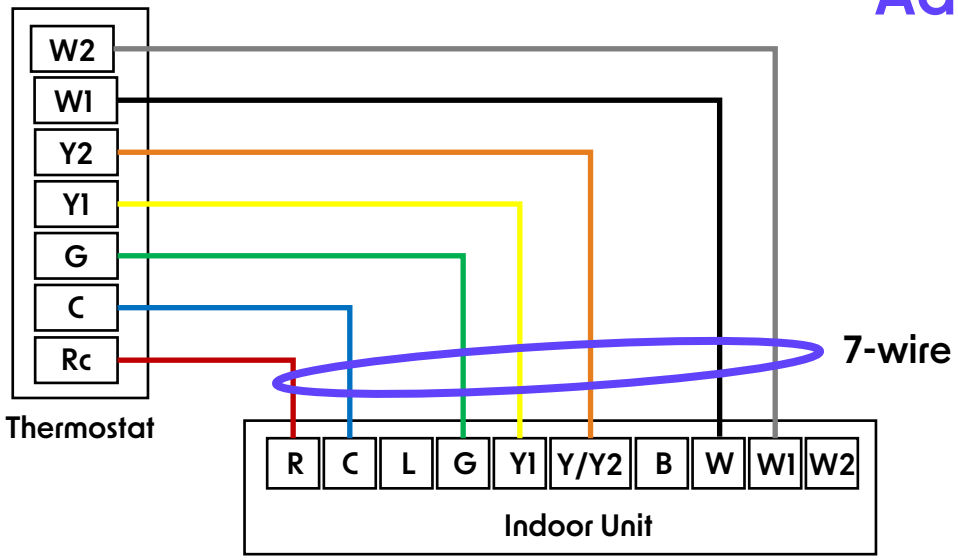
Control Scenario 2 – 24-Volt Staging Options (end)

Indoor Unit Terminal Info

CONNECTOR	PURPOSE
R	24V Power Connector
C	Common
G	Fan Control
Y1	Low Demand
Y/Y2	High Demand
B	Heating Reverse Valve
W	Conventional Heat Control
W1	Stage 1 Electric Housing
W2	Stage 2 Electric Housing
E/AUX	Emergency Heating
DH	Dehumidification
DS	Reserved Signal
L	System Fault

Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded.
Set SW1-1 to ON

Advanced Wiring



2 Stage Heat & 2 Stage Cool
1 Stage Heat Pump
1 Stage Electric Heat

Controls

Scenario 1

1401 Wired Control

Scenario 2

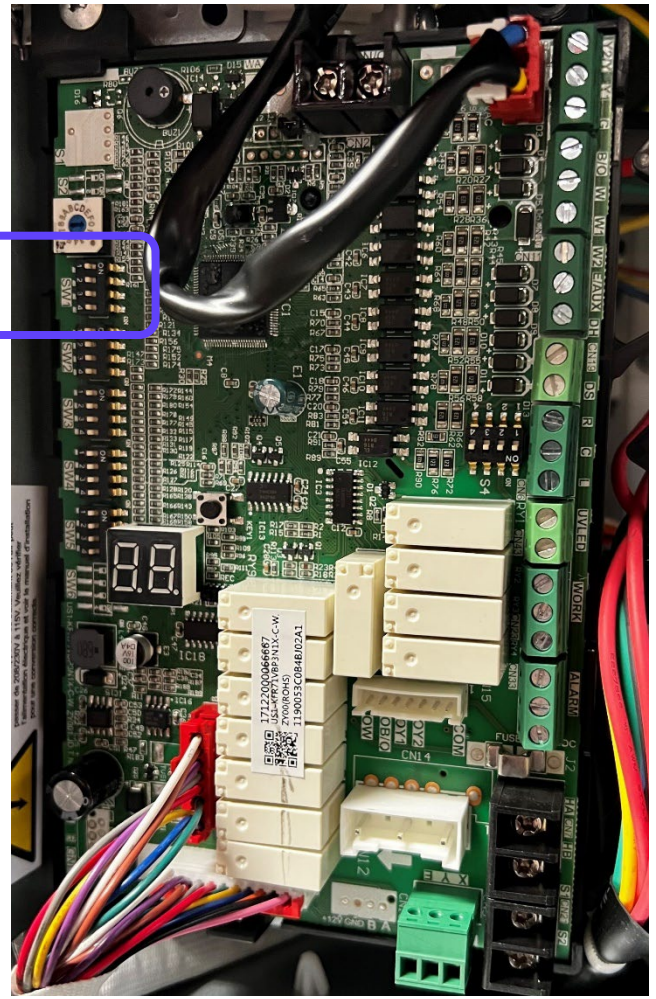
24-Volt Control

45MBAA Set Up Options

Anti-blow, Cooling Only Settings – SW1 DIP Switches
Scenarios – 1, 2

SW1-2: Anti-cold Blow Protection Option
Default value is OFF – Anti-Cold is active.

SW1-3: Single cooling / heating and cooling options
Default is OFF for Heating and Cooling, ON for Cooling Only System.



45MBAA Communication Board

Controls

Scenario 1

1401 Wired Control

Scenario 2

24-Volt Control

45MBAA Set Up Options (cont.)

Electric Heat & Staging Settings – SW2 DIP Switches

Scenario – 1

SW2-1: Control Scenario 1
Temperature differential to activate first stage auxiliary heat.
Default is OFF 4°F, ON for 2°F

SW2-2: Electric heat on delay.
Default is OFF for NO delay, ON for YES

SW2-3: Electric auxiliary heating delay to start time (works with SW2-2)
Default is OFF for 15 min, ON for 30 min

SW2-1: Control Scenario 2
Compressor Running Compensation (Demand working with heat pump+ Electric heat)
Default is OFF for Faster Compressor, ON for Slower Compressor

Scenario – 2

SW2-4: Compressor/Auxiliary heat outdoor ambient lockout.
Default OFF – Compressor allowed to operate to low limit set by S3
ON – Electric heating allowed to operate to high limit set by S3
See S3 switch info for more details.

45MBAA Communication Board

S3	S3 (°F)	S3	S3 (°F)	S3	S3 (°F)
0	OFF	5	-8	A	25
1	-22	6	-4	B	32
2	-18	7	3	C	36
3	-15	8	10	D	39
4	-11	9	18	E	43
				F	46

45MBAA Set Up Options (cont.)

S3 Rotary Switch & DIP SW2-4 – Ambient temperature controlled by electric heating or compressor.

Scenario – 1

SW2-4 ON – Compressor/Auxiliary heat outdoor ambient lockout

The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited.

The system makes judgments according to the following rules:

1) The compressor can be operated when the outdoor temperature is ≥ S3 DIP switch temperature +2 °C.
2) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch temperature.

Scenario – 2

SW2-4 OFF – Compressor

The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited.

The system makes judgments based on the following rules:

1) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch.
2) The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature +2 °C.

Scenario 1

1401 Wired Control

Scenario 2

24-Volt Control

45MBAA Communication Board

Controls

Scenario 1

1401 Wired Control

Scenario 2

24-Volt Control

45MBAA Set Up Options (cont.)

Runtime, Temp Differential Settings – SW3 DIP Switches

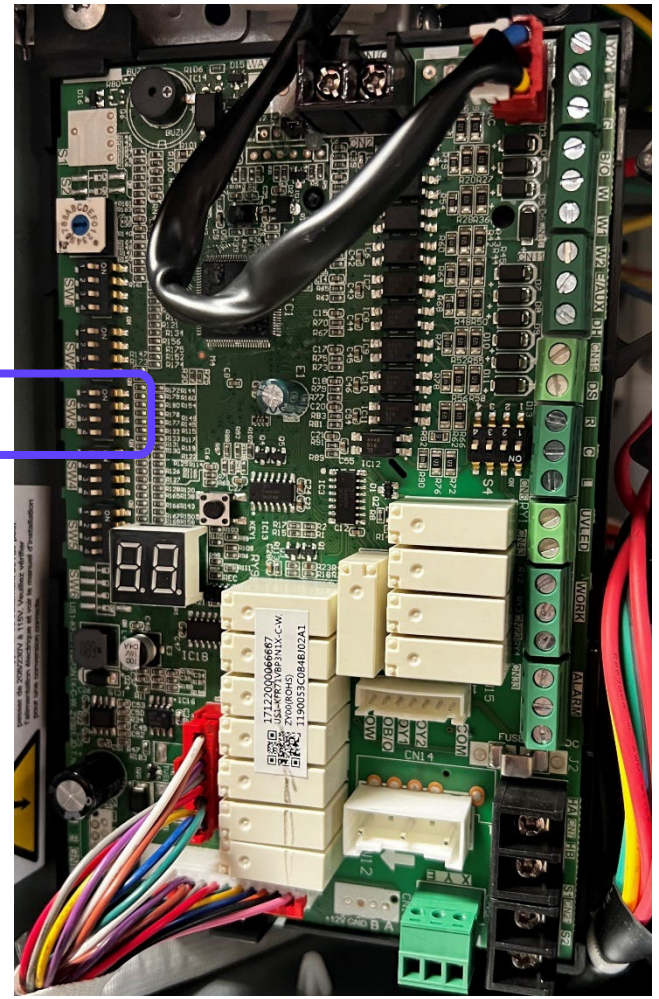
Scenario – 1
SW3-3: Temperature differential to activate second stage auxiliary heating
Default is OFF for 6°F, ON for 4°F

Scenario – 2
SW3-1: Continuous runtime
Default is OFF for 90 min, ON for 30 min

SW3-2: Cooling and heating Y2 temperature differential adjustment
Default is OFF for 4°F, ON for 2°F

SW3-3: Compressor Running (demand working with heat pump+ Electric heat)
Default is OFF for Faster Compressor, ON for Compressor slower speed

SW3-4: 3 Fan speed of cooling mode when 24V Thermostat is applied for.
Default is OFF for High, ON for Turbo

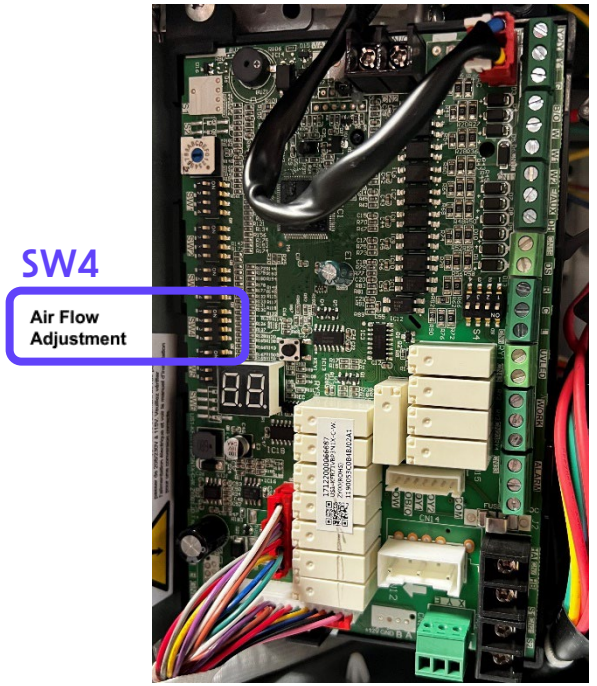


45MBAA Communication Board

Controls

45MBAA Set Up Options – External Static Pressure Settings (cont.)

CAPACITY	EXTERNAL STATIC PRESSURE RANGE	FAN SPEED	ELECTRIC AUXILIARY HEAT MODULE	24V THERMOSTAT		WIRED CONTROLLER		AIRFLOW VOLUME (CFM)
				DIP SWITCH	24V TERMINAL ENGAGED	DIP SWITCH	MODE	
18K (1.5 Ton)	0 - 0.80 in.wc.	Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	618
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	576
		Cooling Medium	—	—	Y1	—	Cool	529
		Cooling Low	—	—	—	—	Cool	488
		Heat Pump Turbo	—	—	—	—	Heat	565
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	541
		Heat Pump Medium	—	—	B+Y1	—	Heat	435
		Heat Pump Low	—	—	—	—	Heat	400
		Electric auxiliary heat module 0(Default)	10kW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	653
		Electric auxiliary heat module 1	10kW, 8kW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	624
		Electric auxiliary heat module 2	8kW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	594
		Electric auxiliary heat module 3	5kW, 3kW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	565
24K (2 Ton)	0 - 0.80 in.wc.	Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	824
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	759
		Cooling Medium	—	—	Y1	—	Cool	694
		Cooling Low	—	—	—	—	Cool	629
		Heat Pump Turbo	—	—	—	—	Heat	788
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	753
		Heat Pump Medium	—	—	B+Y1	—	Heat	641
		Heat Pump Low	—	—	—	—	Heat	524
		Electric auxiliary heat module 0(Default)	15kW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	871
		Electric auxiliary heat module 1	15kW, 10kW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	841
		Electric auxiliary heat module 2	10kW, 8kW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	818
		Electric auxiliary heat module 3	5kW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	788

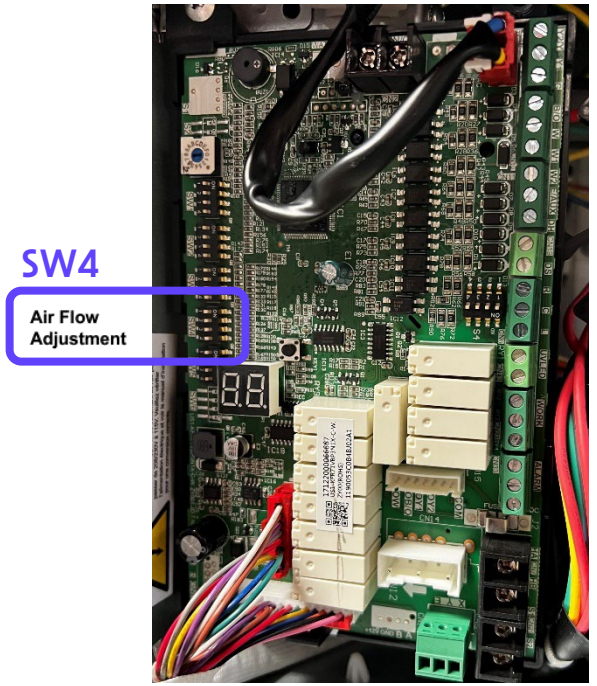


45MBAA
Communication Board

Controls

45MBAA Set Up Options – External Static Pressure Settings (cont.)

CAPACITY	EXTERNAL STATIC PRESSURE RANGE	FAN SPEED	ELECTRIC AUXILIARY HEAT MODULE	24V THERMOSTAT		WIRED CONTROLLER		AIRFLOW VOLUME (CFM)
				DIP SWITCH	24V TERMINAL ENGAGED	DIP SWITCH	MODE	
30K(2.5 Ton)	0 - 0.80 in.wc.	Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	988
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	894
		Cooling Medium	—	—	Y1	—	Cool	806
		Cooling Low	—	—	—	—	Cool	712
		Heat Pump Turbo	—	—	—	—	Heat	918
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	876
		Heat Pump Medium	—	—	B+Y1	—	Heat	665
		Heat Pump Low	—	—	—	—	Heat	453
		Electric auxiliary heat module 0(Default)	15kW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	1088
		Electric auxiliary heat module 1	15kW, 10kW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	1029
		Electric auxiliary heat module 2	10kW, 8kW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	976
		Electric auxiliary heat module 3	5kW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	918

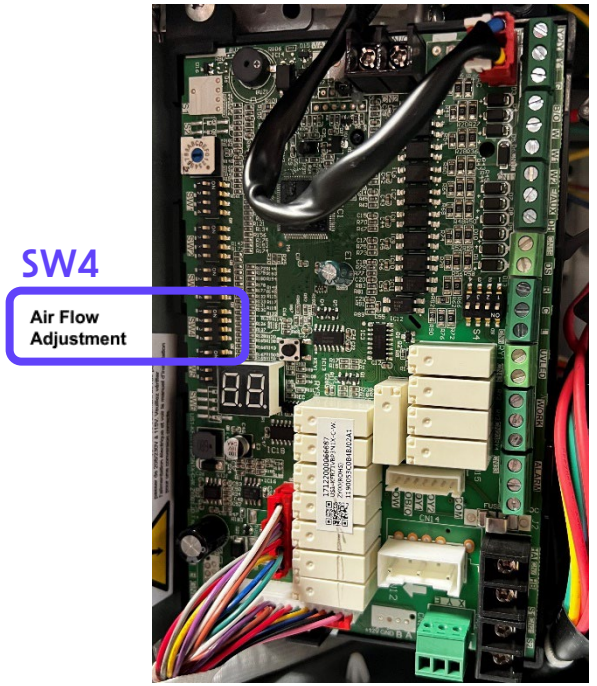


45MBAA
Communication Board

Controls

45MBAA Set Up Options – External Static Pressure Settings (cont.)

CAPACITY	EXTERNAL STATIC PRESSURE RANGE	FAN SPEED	ELECTRIC AUXILIARY HEAT MODULE	24V THERMOSTAT		WIRED CONTROLLER		AIRFLOW VOLUME (CFM)
				DIP SWITCH	24V TERMINAL ENGAGED	DIP SWITCH	MODE	
36K (3 Ton)	0 - 0.80 in.wc.	Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	1188
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	1082
		Cooling Medium	—	—	Y1	—	Cool	971
		Cooling Low	—	—	—	—	Cool	865
		Heat Pump Turbo	—	—	—	—	Heat	1112
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	1059
		Heat Pump Medium	—	—	B+Y1	—	Heat	794
		Heat Pump Low	—	—	—	—	Heat	582
		Electric auxiliary heat module 0(Default)	20kW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	1306
		Electric auxiliary heat module 1	15kW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	1241
		Electric auxiliary heat module 2	10kW, 8kW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	1176
		Electric auxiliary heat module 3	5kW, 8kW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	1112
		Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	1600
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	1471
		Cooling Medium	—	—	Y1	—	Cool	1282
		Cooling Low	—	—	—	—	Cool	1094
		Heat Pump Turbo	—	—	—	—	Heat	1471
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	1324
		Heat Pump Medium	—	—	B+Y1	—	Heat	1141
		Heat Pump Low	—	—	—	—	Heat	976



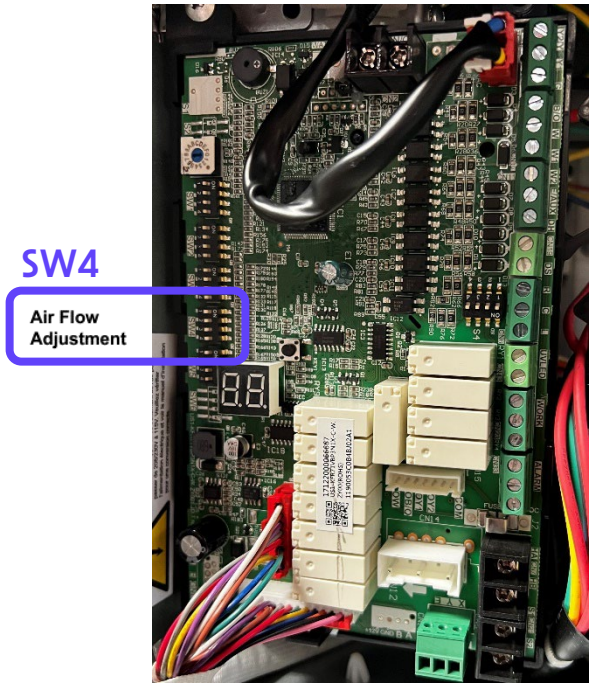
45MBAA
Communication Board

Controls

45MBAA Set Up Options – External Static Pressure Settings (cont.)

CAPACITY	EXTERNAL STATIC PRESSURE RANGE	FAN SPEED	ELECTRIC AUXILIARY HEAT MODULE	24V THERMOSTAT		WIRED CONTROLLER		AIRFLOW VOLUME (CFM)
				DIP SWITCH	24V TERMINAL ENGAGED	DIP SWITCH	MODE	
48K (4 Ton)	0 - 0.80 in.wc.	Electric auxiliary heat module 0(Default)	20kW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	1741
		Electric auxiliary heat module 1	15kW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	1653
		Electric auxiliary heat module 2	10kW, 8kW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	1559
		Electric auxiliary heat module 3	8kW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	1471
		Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	1806
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	1582
		Cooling Medium	—	—	Y1	—	Cool	1359
		Cooling Low	—	—	—	—	Cool	1135
		Heat Pump Turbo	—	—	—	—	Heat	1659
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	1582
		Heat Pump Medium	—	—	B+Y1	—	Heat	1247
		Heat Pump Low	—	—	—	—	Heat	976
60K (5 Ton)	0 - 0.80 in.wc.	Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	1806
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	1582
		Cooling Medium	—	—	Y1	—	Cool	1359
		Cooling Low	—	—	—	—	Cool	1135
		Heat Pump Turbo	—	—	—	—	Heat	1659
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	1582
		Heat Pump Medium	—	—	Y1	—	Heat	1247
		Heat Pump Low	—	—	—	—	Heat	976
		Electric auxiliary heat module 0(Default)	25kW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	2171
		Electric auxiliary heat module 1	15kW, 20kW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	2029
		Electric auxiliary heat module 2	10kW, 15kW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	1894
		Electric auxiliary heat module 3	10kW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	1753

NOTE: The constant airflow volume motor is applied. So the airflow volume is constant at all ESP within stated range.



45MBAA
Communication Board

Controls

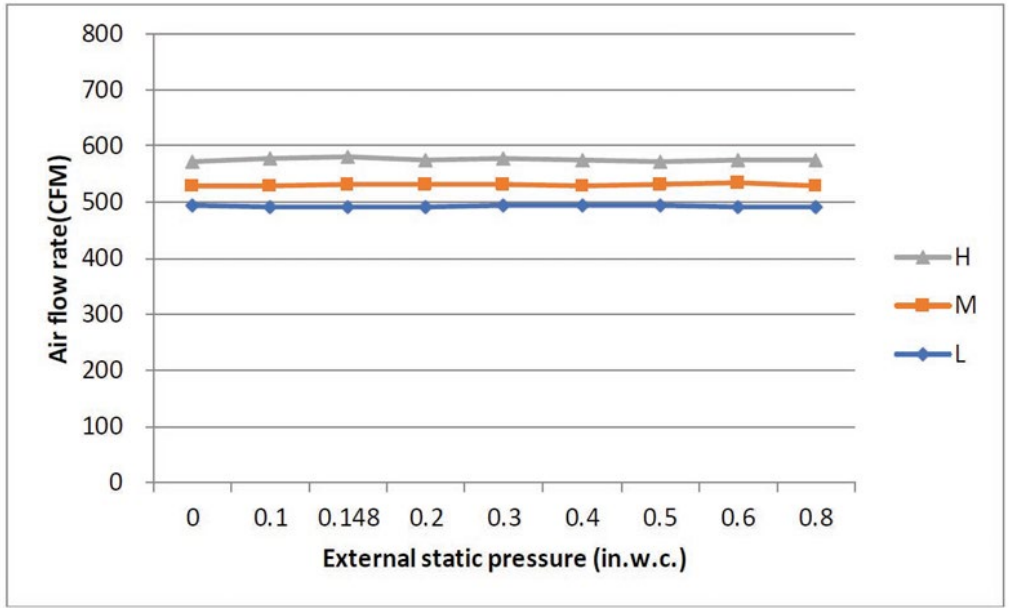
45MBAA Set Up Options – Maximum Cooling and Heating Fan Speed (cont.)

- "Fine turning" for Heating and Cooling CFM can be done through a service setting.
- These settings do not affect W1 and W2 fan speeds.
- For detailed explanation and all charts and settings go to the Install Manual for the Indoor Unit or the Appendix of this guide.

COOLING	Default	-1	-2	-3	-4	-5	-6	-7
TURBO	618	598	578	558	538	518	498	478
HIGH	576	556	536	516	496	476	456	436
MIDDLE	529	509	489	469	449	429	418	418
LOW	488	468	448	428	408	400	400	400
COOLING	Default	-8	-9 ~ -40	+1	+2	+3	+4	+5 ~ +20
TURBO	618	458	453	635	635	635	635	635
HIGH	576	435	435	596	616	618	618	618
MIDDLE	529	418	418	549	569	589	600	600
LOW	488	400	400	508	528	548	568	582

HEATING	Default	-1	-2	-3	-4	-5	-6 ~ -40	+1	+2
TURBO	565	545	525	505	485	465	453	585	605
HIGH	541	521	501	481	461	441	435	561	581
MIDDLE	435	418	418	418	418	418	418	455	475
LOW	400	400	400	400	400	400	400	420	440
HEATING	Default	+3	+4	+5	+6	+7	+8	+9	+10~+20
TURBO	565	625	635	635	635	635	635	635	635
HIGH	541	601	618	618	618	618	618	618	618
MIDDLE	435	495	515	535	555	575	595	600	600
LOW	400	460	480	500	520	540	560	580	582

18K



Images taken from 45MBAA Install Manual.

Controls

45MBAA Set Up Options (cont.)

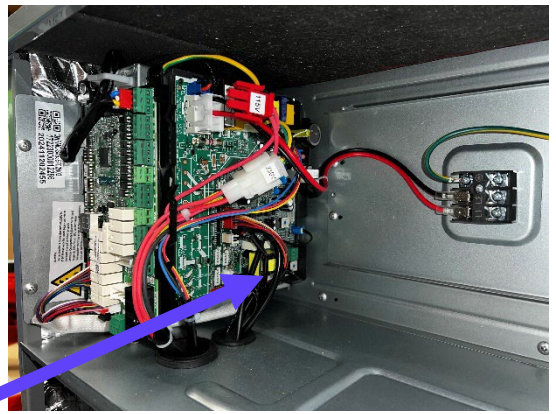
Scenario 1

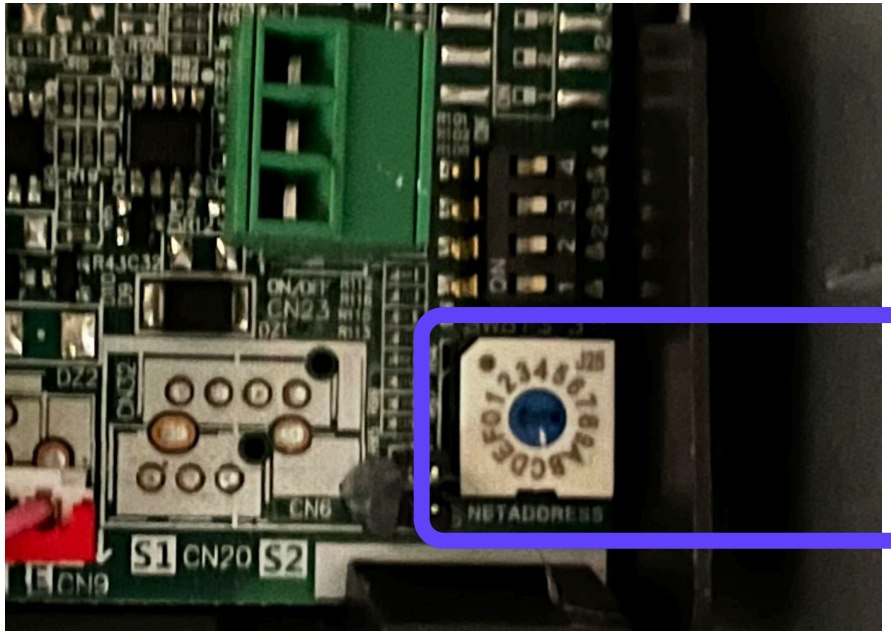
1401 Wired Control

Scenario – 1

S1 – Net Address Setting

- If one control per indoor unit (IDU), no change needed
- If two or more IDU per control, each S1 must have different value, up to 16 max





Rotary Switch

S1

Controls

Scenario 2

24-Volt Control

45MBAA Set Up Options (cont.)

S4 DIP Switch Function, both defaulted to ON
Scenario – 2

(only used with 24-Volt Control Option)

- S4-1 – No function currently, Do Not Use

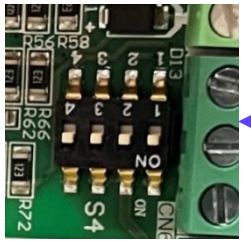
- S4-2 – ON Dehumidification Not Available
- S4-2 – OFF Dehumidification Available

See Install Manual for more details

- S4-3 – No function currently, Do Not Use

- S4-4 – ON = W1 & W2 close on W1 call
- S4-4 – OFF = Independent W1, W2 operation

We recommend Cooling mode over Dehumidification mode for most applications. If you have specific humidity needs, please consult with your sales representative.



45MBAA Communication Board

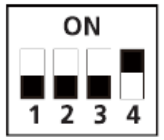
Controls

45MBAA Set Up Options (cont.)

Full DIP/Rotary Switch Explanations

Scenario 1
1401 Wired Control

Scenario 2
24-Volt Control

SW1	Control type	Note
	Wired controller / 24V thermostat	Auto Discovery
	Wired controller	Scenario 1
	24V Thermostat	Scenario 2

Scenario 1
1401 Wired Control

Scenario 2
24-Volt Control

No.	Dial Code	Control Scenario	Function	ON	OFF	Note
1	SW1-2	1,2	Anti-cold blow protection option	NO	[Default] YES	
2	SW1-3	1,2	Single cooling / heating and and cooling options	Cooling	[Default] Cooling & Heating	
3	SW2-1	2	Compressor Running (demand working with heat pump+ Electric heat)	Compressor slower speed	[Default] Faster Compressor	Only affects compressor and W1
4	SW2-1	1	Temperature differential to activate first stage auxiliary heat(the GAP of T1 and Ts),Wire controller demand with heat pump+Electric heat working together	2°F(1 °C)	[Default] 4°F(2°C)	
5	SW2-2	1	Electric heat on delay	YES	[Default]NO	
6	SW2-3	1	Electric auxiliary heating delay to start time	30 minutes	[Default] 15 minutes	Based on SW2-2 is ON
7	SW2-4	2	Compressor	The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited.The system makes judgments according to the following rules: 1) The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature +2 °C. 2) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch temperature.	[Default]The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited. The system makes judgments based on the following rules: 1) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch. 2) The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature +2 °C.	SW2-4 and S3 need to working together
8	SW2-4	1	Compressor/Auxiliary heat outdoor ambient lockout	The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited.The system makes judgments according to the following rules: 1) The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature +2 °C. 2) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch temperature.	[Default]Only one heat pump or auxiliary heat can be operated .The system makes judgments according to the following rules: 1) When the outdoor temperature is lower than the S3 DIP switch temperature,the compressor is not allowed to operated, but auxiliary heat is allowed to operated ; 2) When the outdoor temperature is ≥S3 DIP switch temperature +2(°C), the compressor can be operated, but auxiliary heat cannot be operated.	
9	Rotary Switch S3	1,2	Set outdoor temperature Limitation (for auxiliary heating or compressor)	Table A		
10	SW3-1	2	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	
11	SW3-2	2	Cooling and heating Y/Y2 temperature differential adjustment.	Compressor slower speed	[Default] Faster Compressor	Only affects compressor
12	SW3-3	2	Compressor Running (demand working with heat pump+ Electric heat)	Compressor slower speed	[Default] Faster Compressor	Only affects compressor and W2
13	SW3-3	1	Temperature differential to activate second stage auxiliary heating(the GAP of T1 and Ts)Wire controller demand with heat pump+Electric heat working together	4°F(2°C)	[Default] 6 °F(3°C)	

Controls

Scenario 1
1401 Wired Control

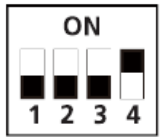
Scenario 2
24-Volt Control

45MBAA Set Up Options (end)

Full DIP/Rotary Switch Explanations

Scenario 1
1401 Wired Control

Scenario 2
24-Volt Control

SW1	Control type	Note
	Wired controller / 24V thermostat	Auto Discovery
	Wired controller	Scenario 1
	24V Thermostat	Scenario 2

No.	Dial Code	Control Scenario	Function	ON	OFF	Note
14	SW3-4	2	Fan speed of cooling mode when 24V Thermostat is applied for.	Turbo	High	
15	SW4-1 SW4-2 SW4-3	1,2	Electric heat nominal CFM adjustment	Available settings are 000/001/010/011. Each digit corresponds an indiviual swith position. For example [SW4-1 OFF, SW4-2 ON, SW4 -3 OFF] = 010		
16	SW4-4	1	Temperature differential to activate third stage auxiliary heating(the GAP of T1 and Ts)Wire controller demand with heat pump+ Electric heat working together	6°F(3°C)	[Default]8°F(4°C)	Only valid for product which has three stage auxiliary heating.
17	S4-4	2	Default ON	[Default] For single stage supplemental heat,W1 and W2 are connected	For dual stage supplemental heat, W1 and W2 are controlled independently.	
18	S4-2	2	DH function selection	[Default] Dehumidification control not available	Dehumidification feature is enabled through thermostat	
19	SW5-3	1,2	L or Alarm relay selection	L output 24V or alarm relay close only when refrigerant sensor fault or R454B refrigerant leakage be detected	[default] L output 24V or alarm relay close when any fault be detected	
20	SW5-4	1,2	R output selection	R stop ouput 24V when refrigerant sensor fault or R454B refrigerant leakage be detected	[default] R keep ouput 24V even when refrigerant sensor fault or R454B refrigerant leakage be detected	

Controls

45MBAA 24-Volt Signal Chart

Scenario 2

24-Volt Control

Note:
1: 24V signal
0: No 24V signal
*: 1 or 0
The AUU will turn off if the 24V input cannot meet the table.

Mode	Priority	G	Y1	Y/Y2	B	W	W1	W2	E/AUX	DH	Fan Speed	Display
OFF	/	0	0	0	0	0	0	0	0	*	OFF	00
FAN	7	1	0	0	*	0	0	0	0	*	Low	01
Cooling Stage 1	6	*	1	0	0	0	0	0	0	1	Mid	02
Cooling Stage 2		*	*	1	0	0	0	0	0	1	High	03
Dehumidification 1		*	1	0	0	0	0	0	0	0	Low	04
Dehumidification 2		*	*	1	0	0	0	0	0	0	Low	05
Heat Pump Stage 1	5	*	1	0	1	0	0	0	0	1	Mid	06
Heat Pump Stage 2		*	*	1	1	0	0	0	0	1	High	07
Heat Pump Stage 2		*	*	*	*	1	0	0	0	1	High	
Electric Auxiliary Heat Module 1	3	*	0	0	*	0	1	0	0	*	Turbo	08
Electric Auxiliary Heat Module 2		*	0	0	*	0	0	1	0	*	Turbo	
Electric Auxiliary Heat Module 1 & 2		*	0	0	*	0	1	1	0	*	Turbo	09
Heat Pump Stage 1 + Electric Auxiliary Heat Module 1	4	*	1	0	1	0	1	0	0	1	Turbo	10
Heat Pump Stage 1 + Electric Auxiliary Heat Module 2		*	1	0	1	0	0	1	0	1	Turbo	
Heat Pump Stage 2 + Electric Auxiliary Heat Module 1		*	*	1	1	0	1	0	0	1	Turbo	
Heat Pump Stage 2 + Electric Auxiliary Heat Module 1		*	*	*	*	1	1	0	0	1	Turbo	
Heat Pump Stage 2 + Electric Auxiliary Heat Module 2		*	*	1	1	0	0	1	0	1	Turbo	
Heat Pump Stage 2 + Electric Auxiliary Heat Module 2		*	*	*	*	1	0	1	0	1	Turbo	
Heat Pump Stage 1 + Electric Auxiliary Heat Module 1 & 2		*	1	0	1	0	1	1	0	1	Turbo	11
Heat Pump Stage 2 + Electric Auxiliary Heat Module 1 & 2		*	*	1	1	0	1	1	0	1	Turbo	
Heat Pump Stage 2 + Electric Auxiliary Heat Module 1 & 2		*	*	*	*	1	1	1	0	1	Turbo	
Emergency Heat	1	*	*	*	*	*	*	*	1	*	Turbo	12
Heating Zone Control	2	*	1	0	1	0	*	*	0	0	Low	13
Heating Zone Control		*	*	1	1	0	*	*	0	0	Low	
Heating Zone Control		*	*	*	*	1	*	*	0	0	Low	

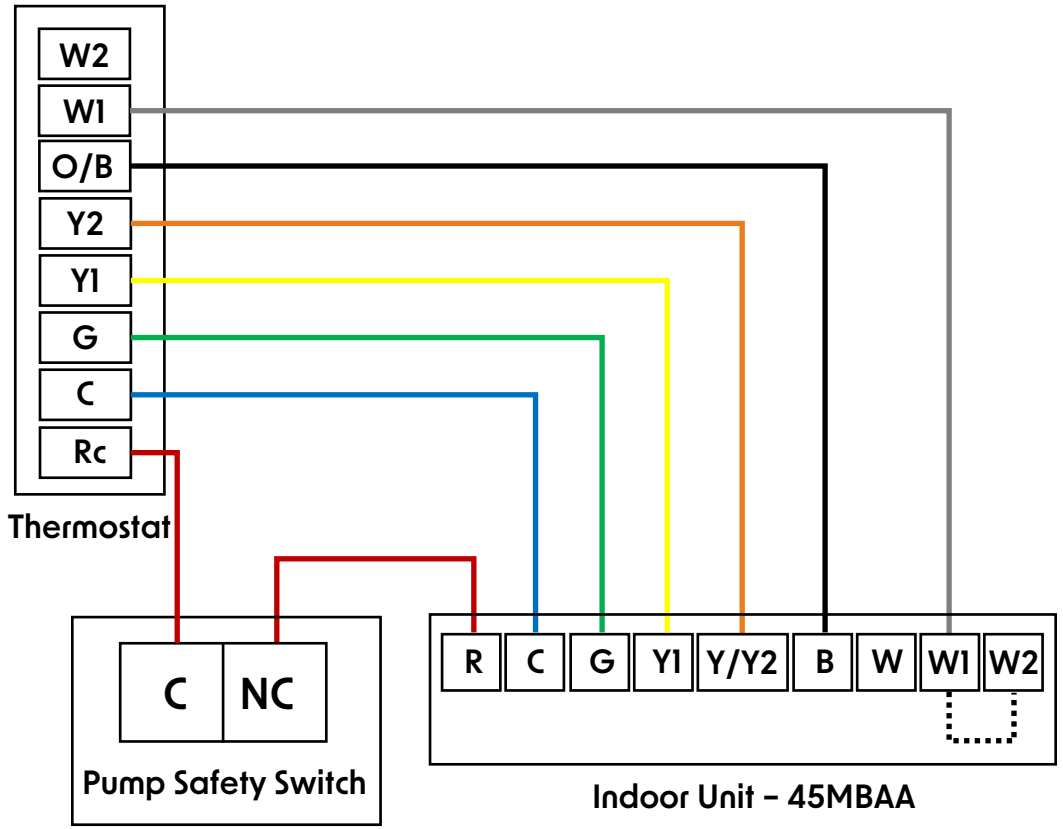
Accessory Options

Condensate Pump Connections – 24-Volt Systems

The Normally Closed (N.C.) safety switch should break the "R" wire supplying power to the Thermostat.

24-Volt Systems

Example: 45MBAA
3 Stage Heat & 2 Stage Cool



Accessory Options

Air Handler: 45MBAA

Remote ON/OFF (CN2) (must remove JR1 Jumper)
N.C. contacts – When contacts open a "CP" Code will appear and system will shut down.

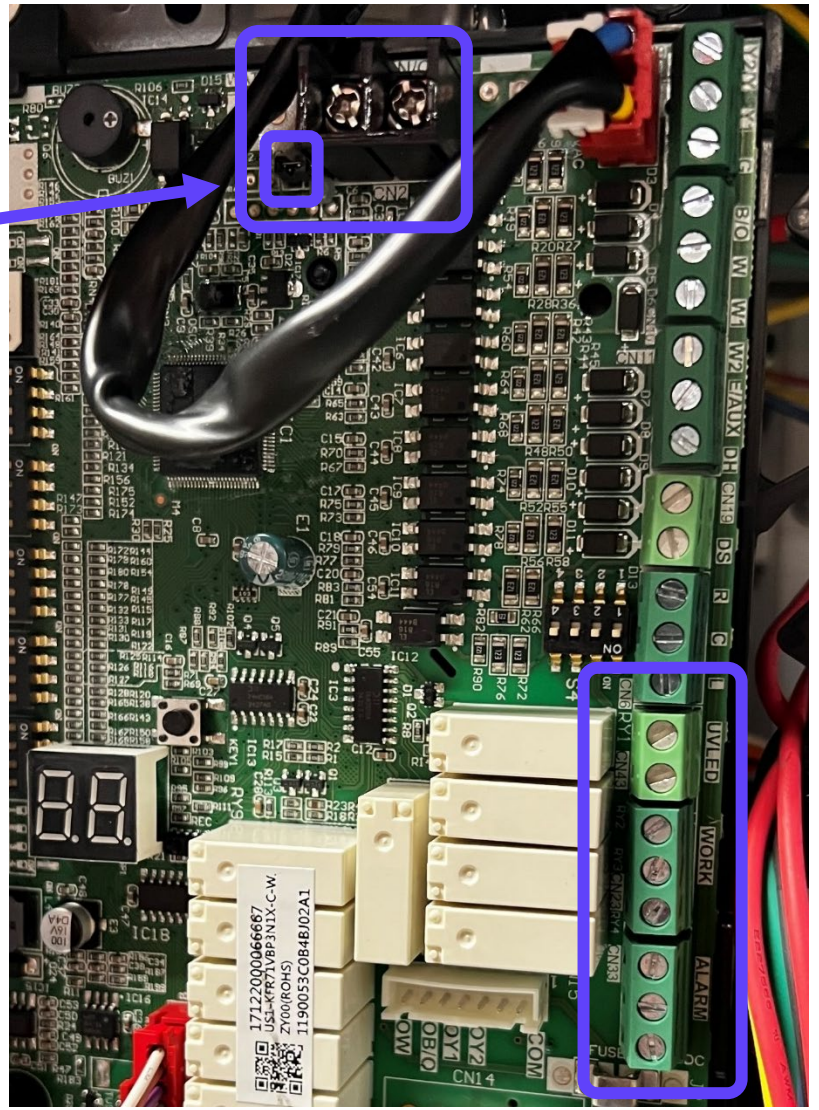
UV LED (CN43)
When Fan is ON, 24-Volts are available from contacts to power a pilot relay or other small device.

Alarm Output (CN33)
N.O. contacts – Contacts closes on Error.
Contacts rated: 250VAC, 10 Amps max.

Work (CN23)
N.O. contacts – Contacts closes when fan is ON,
Contacts rated: 250VAC, 10 Amps max.

Codes will only appear on the 1401 Wired Controller and/or the Communication PCB only.

Section of Communication PCB



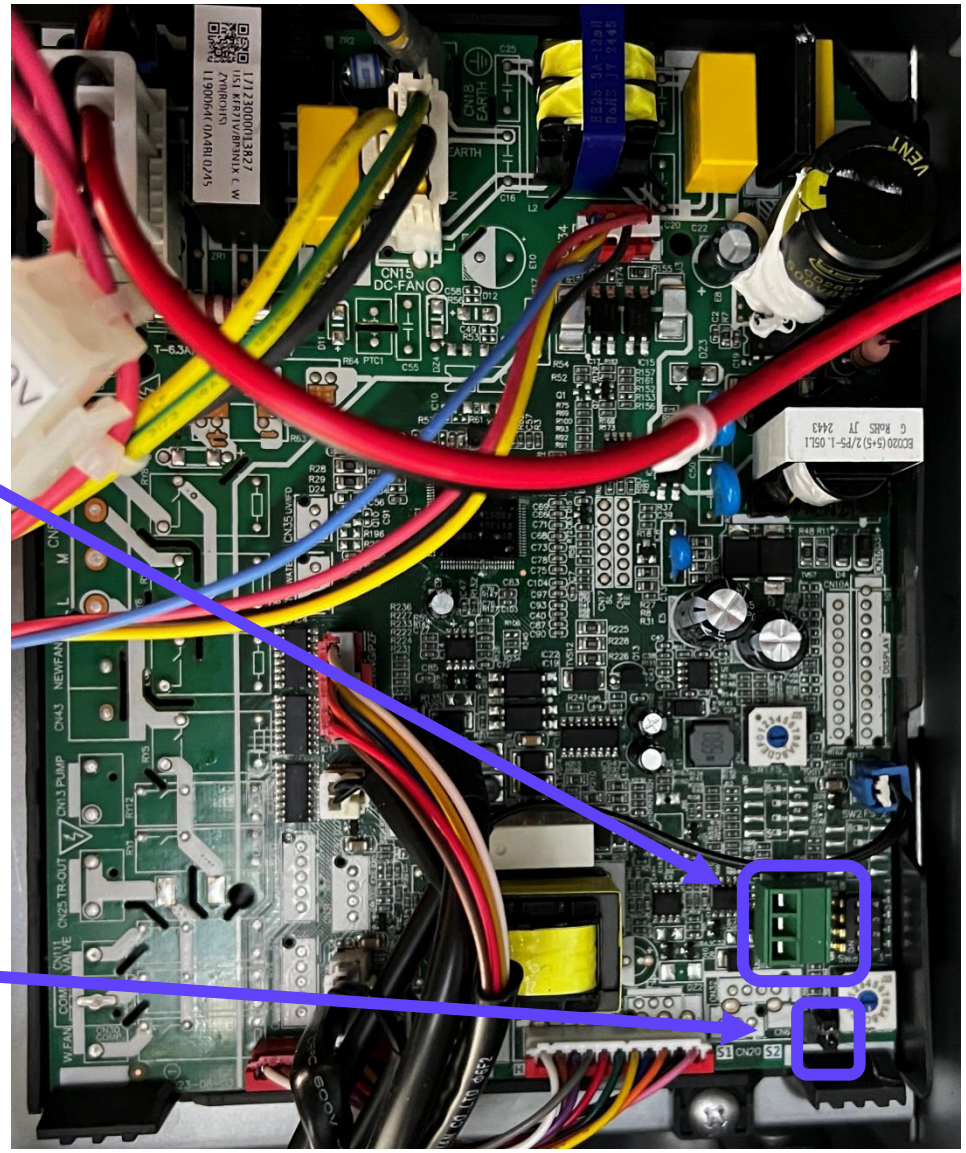
Accessory Options

Air Handler: 45MBAA

Water (CN23) (must remove J7 Jumper)
N.C. contacts – When contacts open an "EH0E" Code will appear, and system will shut down.

Codes will only appear on the 1401 Wired Controller and/or the Communication PCB only.

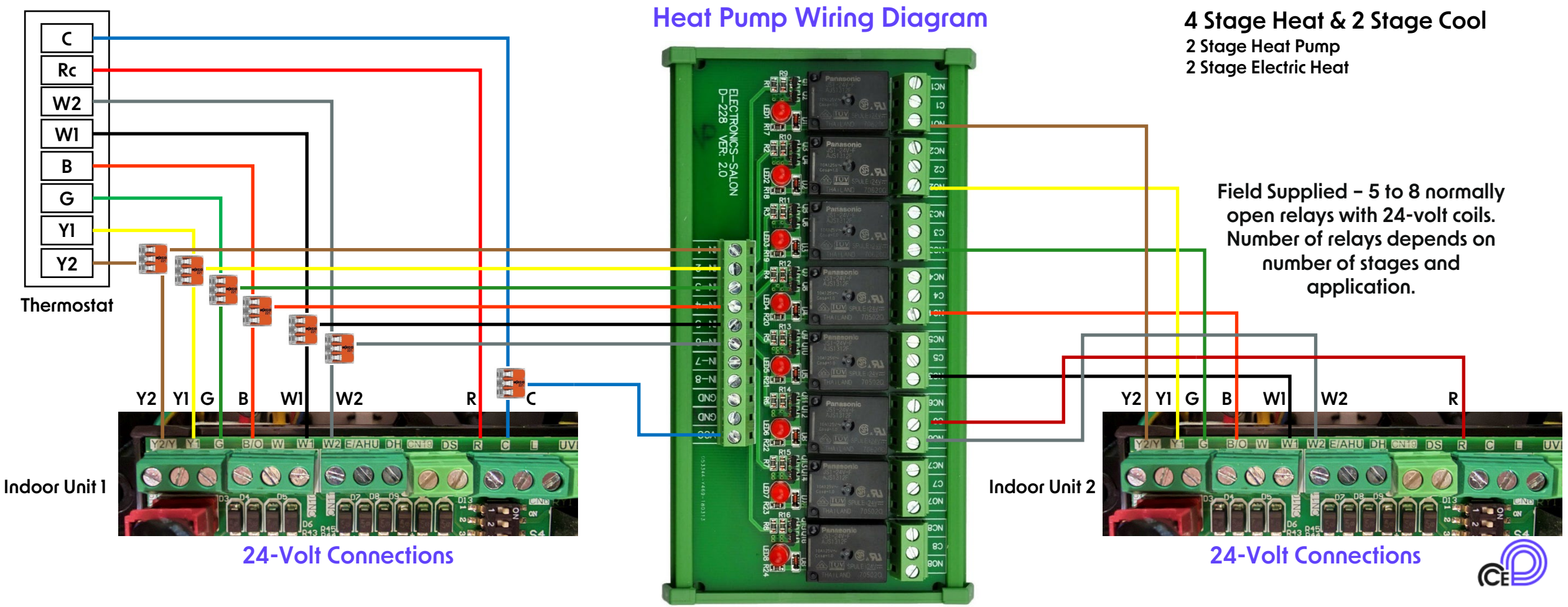
These Green Terminal Blocks can be removed for easier wire connections. Always use the outside connections, the middle terminal is not active.



Main PCB

45MBAA – One Thermostat Multiple Air Handlers

Use a relay bank or individual relays to parallel each mode/stage. Only low voltage wiring from indoor units to thermostat shown.



45MBAA Hydronic Coil Option 1 – 24-Volt Control

Wire and setup same as if an electric heat packed is installed. This will operate the fan for the hydronic coil.

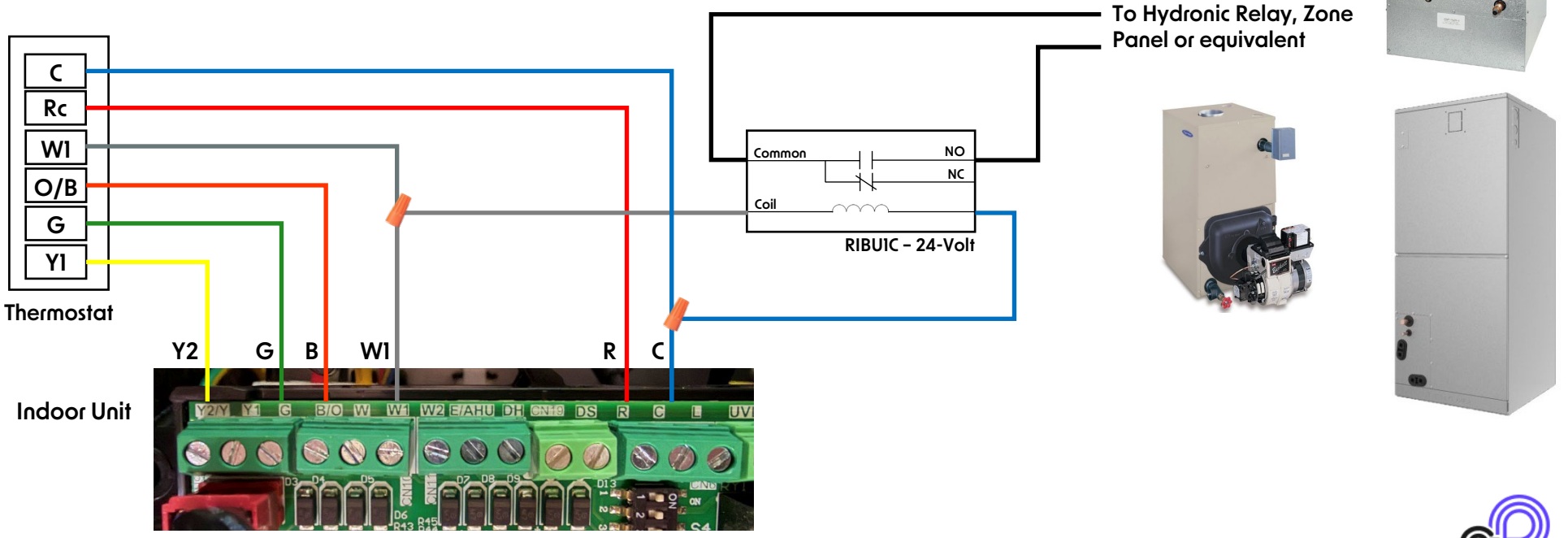
The SW4 DIP switches must be set to deliver the required CFM for the hydronic coil being installed.
Use SW4 DIP switch charts previously shown.

Control Setup Notes:

Depending on the water coil's operating temperature and BTU output, it may be advisable to not allow simultaneously operation of the H/P and water coil.
We recommend to set changeover around 5°F above balance point.

2 Stage Heat & 1 Stage Cool

1 Stage Heat Pump
1 Stage Hydronic Coil



24-Volt Connections

NOTES:

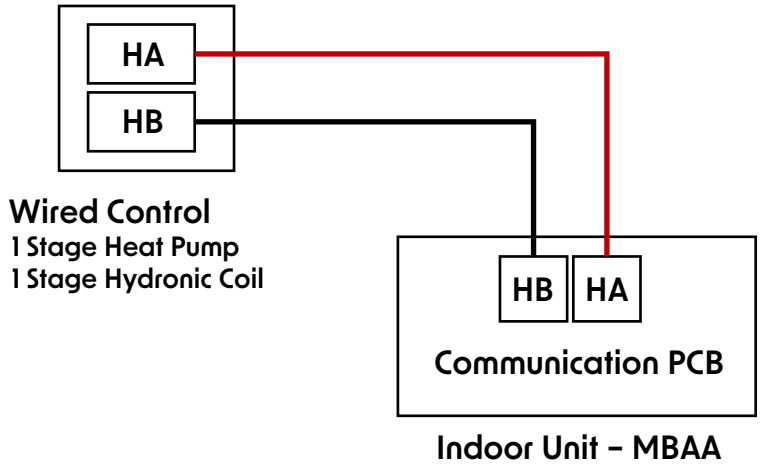
- Not all wiring is shown.
- RIB Relay or equivalent field supplied.

45MBAA Hydronic Coil Option 2 – Wired Control

A wire harness is required to use this control type and there are two ways to get it.

- Order by part number, please check availability.
- Buy and rob the wire harness from an electric heater kit made for MBAA.

Any setting a Wired Control used for electric heat kits will now be used to control the water coil relay.



Wired Control
1 Stage Heat Pump
1 Stage Hydronic Coil

Indoor Unit – MBAA

KSACN01401AAA
(purchased separately)

Thermostat Notes:

- Program the 1401 settings same as you would program for electric heat kit.

45MBAA Hydronic Coil Option 2 – Wired Control (cont.)

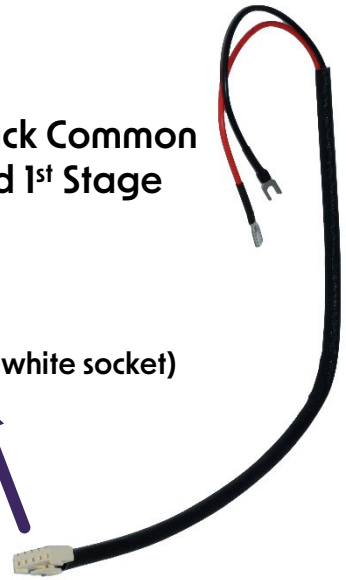
This cannot be done without the harness shown.

Use RIB or equivalent isolation relay to bring on circulator pump & boiler

Cut off ends and use colors as shown wiring to coil of isolation relay.

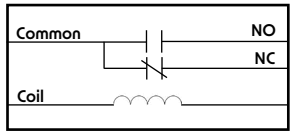
Communication PCB

Black Common
Red 1st Stage



CN12
(3 Pin white socket)

To Hydronic Relay, Zone Panel or equivalent



RIBU1C – 24-Volt (1 set contacts)
RIB2401D – 24-Volt (2 sets contacts)

Not all wiring is shown

Order Part #17401203022872

OR

Buy a small electric heater kit and rob the relay harness for use with this application.

EHKMC05KN

45MBAA Hydronic Coil Option 2 – Wired Control (end)

Control Setup Notes:

Depending on the water coil's operating temperature and BTU output, it may be advisable to not allow simultaneously operation of the H/P and water coil.

We recommend to set changeover around 5°F above balance point.

In addition, the SW4 DIP switches must be set to deliver the required CFM for the hydronic coil being installed. Use SW4 DIP switch charts previously shown.

S3	S3 (°F)
0	OFF
1	-22
2	-18
3	-15
4	-11
5	-8
6	-4
7	3
8	10
9	18
A	25
B	32
C	36
D	39
E	43
F	46

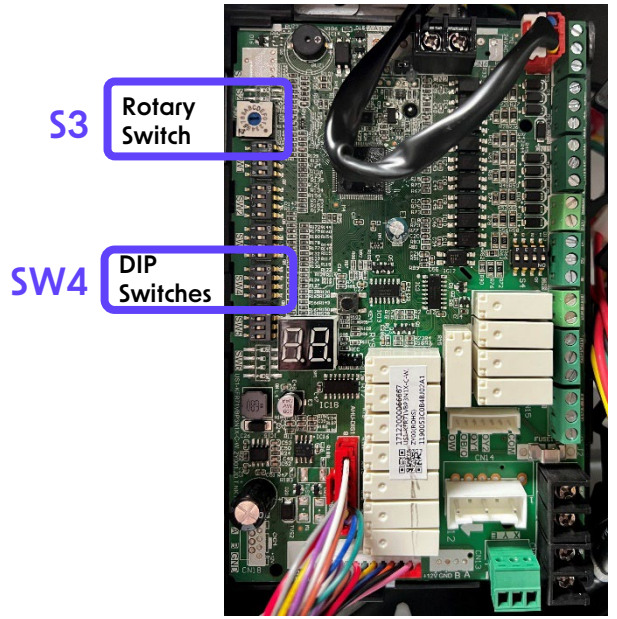
OFF (default) = Simultaneous Operation

S3 Rotary Switch (in air handler)

Balance Point – Where it switches from H/P to Hot Water Coil

Example: Set dial point 1 = -22°F, Dial point 6 = -4°F.
....Dial point F = 46°F

We recommend to set changeover around 5°F above calculated balance point.



Communication PCB