CROSSOVER SOLUTIONS: INSTALLATION AND STARTUP

Jesse “Dutch” Van Atta

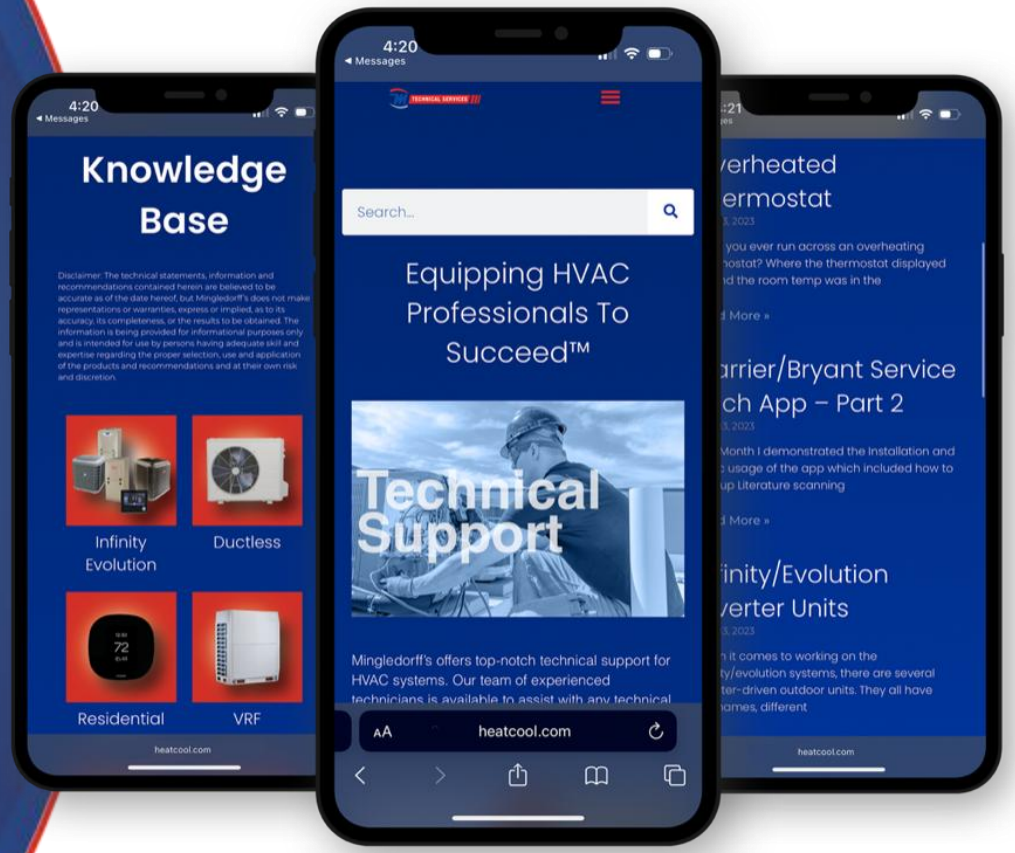
VRF/DLS Tech Support and Quality Assurance

Last Updated 10/24/2025

Thursday, November 6, 2025

Disclaimer: The technical statements, information and recommendations contained herein are believed to be accurate as of the date hereof, but Mingledorff's does not make representations or warranties, express or implied, as to its accuracy, its completeness, or the results to be obtained. The information is being provided for informational purposes only and is intended for use by persons having adequate skill and expertise regarding the proper selection, use and application of the products and recommendations and at their own risk and discretion.

EQUIPPING HVAC PROFESSIONALS TO SUCCEED™



TECHNICAL SERVICES

WARRANTY EXPERTS

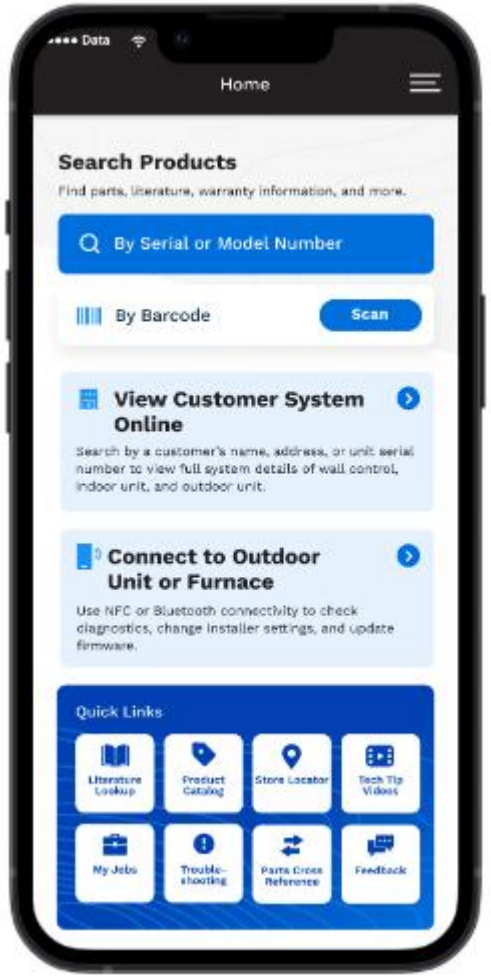
Everything technical and warranty related under a simple URL – **heatcool.com**.

- **Technical Support**
  - Product Knowledgebase
  - Access to Factory Manuals
  - Technical Services Contacts
- **Warranty Support**
  - Helpful Links & Resources
  - Online Warranty Tips
  - Warranty Experts Contacts
- **Tech Tips – Monthly News Articles**
- **Training Calendar and Online Learning**
- **Managed by Techs for Techs**

WWW.HEATCOOL.COM

Mingledorff's INC

SERVICE TECH APPS



- **Barcode scanning** of unit's serial or model number
- **Warranty** entitlement & service history
- **Communications** with select equipment
  - NFC and Bluetooth
- **Literature** list by model or search of all available literature
- **Product Catalog** model lookup
- **Bill of Material** parts list including part supersession
- **Aftermarket components** cross reference tool

Carrier

bryant

Mingledorff's INC

Crossover Solutions

454B Equipment

CROSSOVER SOLUTIONS
40MUAA TO 45MUAA TRANSITION

		Minimum Circuit Ampacity (MCA) 208/230V	Maximum Overcurrent Protection Ampacity (MOPA)			Minimum Circuit Ampacity (MCA) 115V	Minimum Circuit Ampacity (MCA) 208/230V	Maximum Overcurrent Protection Ampacity (MOPA)
Tier	Current SKU	A	A	Tier	2024 SKU	A	A	A
Performance	40MUAAQ18XA3	2.5	15	Comfort	45MUAAQ18XX3	5.5	4	15
	40MUAAQ24XA3	4	15		45MUAAQ24XX3	5.5	4	15
	40MUAAQ30XA3	4.5	15		45MUAAQ30XX3	8	6	15
	40MUAAQ36XA3	5	15		45MUAAQ36XX3	8	6	15
	40MUAAQ48XA3	7.5	15		45MUAAQ48XX3	14.5	11	15
	40MUAAQ60XA3	9	15		45MUAAQ60XX3	14.5	11	15

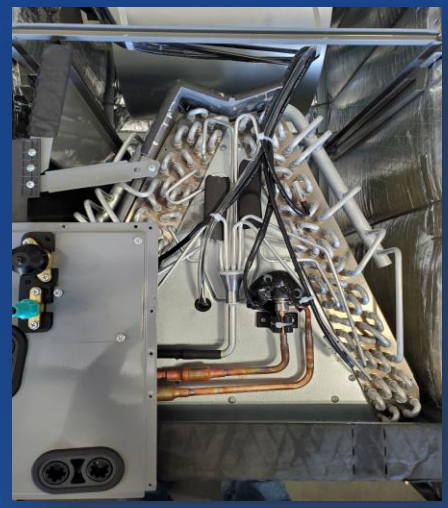
Notable Change

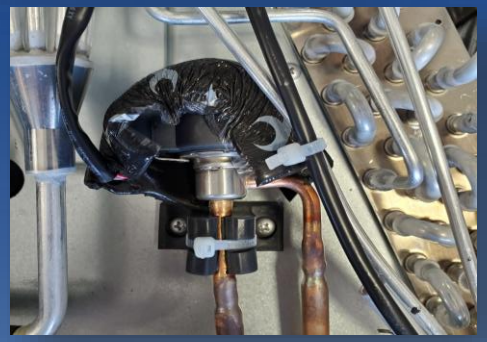
Improvement over Legacy

Mingledorff's INC

CROSSOVER SOLUTIONS

45MUAA CROSSOVER FANCOIL



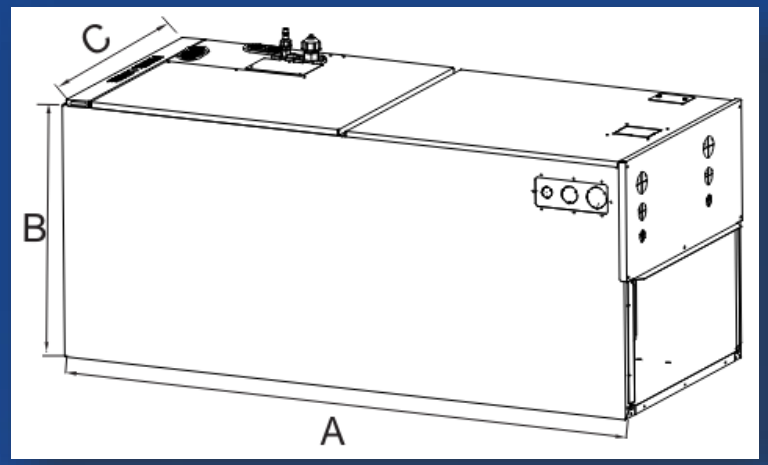


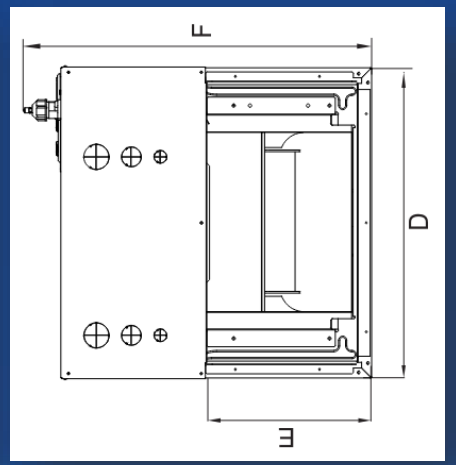
Mingledorff's INC

Featuring Puron ADVANCE™

CROSSOVER SOLUTIONS

45MUAA CABINET SIZES





Model	Dimensions					
	A (Height)	B (Depth)	C (Width)	D	E	F
18K-24K	45in	21in	17.5in	15.75in	10.25in	23in
	(1143mm)	(534mm)	(445mm)	(400mm)	(260mm)	(585mm)
30K-48K	49in	21in	21in	19.31in	10.25in	23in
	(1245mm)	(534mm)	(534mm)	(490mm)	(260mm)	(585mm)
60K	53in	21in	24.5in	22.88in	10.25in	23in
	(1346mm)	(534mm)	(622mm)	(580mm)	(260mm)	(585mm)

Mingledorff's INC

Featuring Puron ADVANCE™

CROSSOVER SOLUTIONS

45MUHAQ MID-TIER CROSSOVER FANCOIL

- "M" coil
- Modular design
- Right side connections
- 115 or 230VAC input
- Up to 1" static pressure (18-36K only)

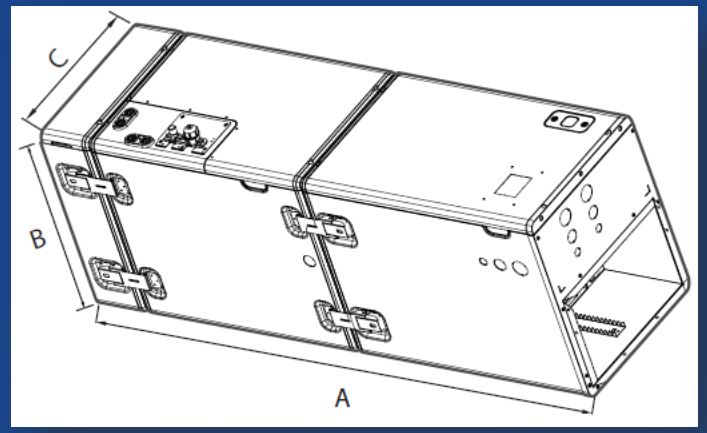
- Qualifies for Energy Star Most Efficient 2024 Criteria
- SEER2 Up to 19
- EER2 Up to 12.5
- HSPF2 Up to 10.2
- COP@5°F Up to 2.1

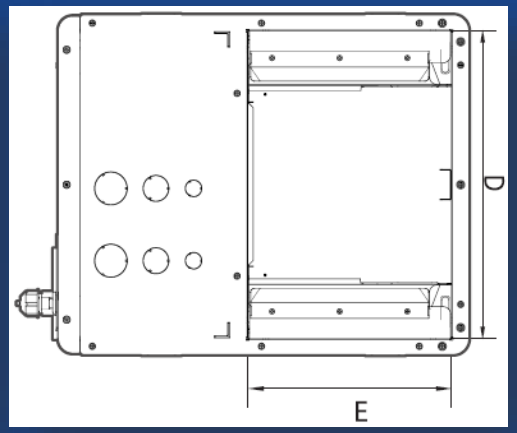
Mingledorff's INC

Featuring Puron ADVANCE™

CROSSOVER SOLUTIONS

45MUHAQ MID-TIER CROSSOVER FANCOIL





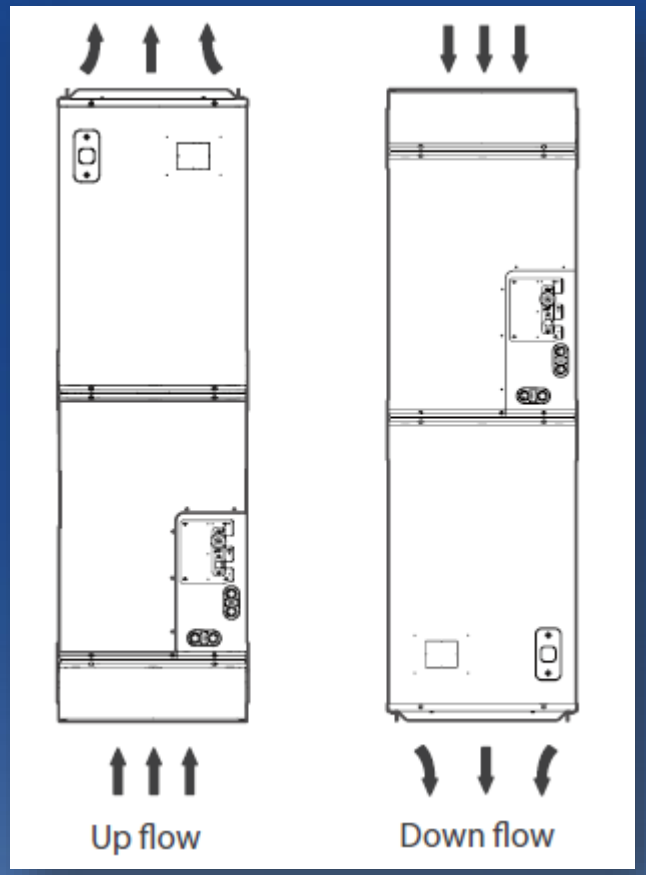
MODEL (BTU/H) DIMENSIONS		18K-24K	30K-36K	48K-60K
A	inch	53-7/8	58-1/8	60-1/8
	mm	1368	1476	1526
B	inch	21-1/2	21-1/2	21-1/2
	mm	546	546	546
C	inch	14-1/2	17-1/2	21-1/2
	mm	368	445	546
D	inch	13	13	20
	mm	330	407	508
E	inch	10-1/4	10-1/4	10-1/4
	mm	273	273	273

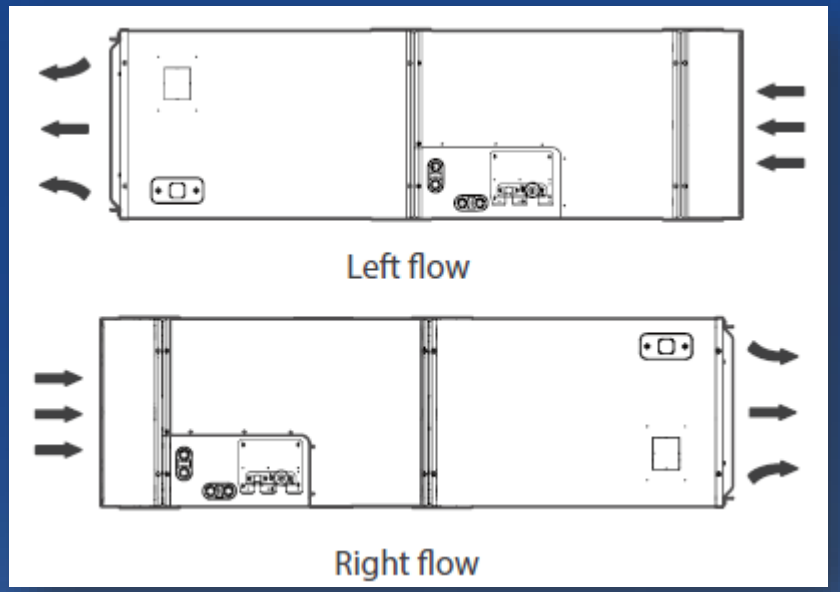
Mingledorff's INC

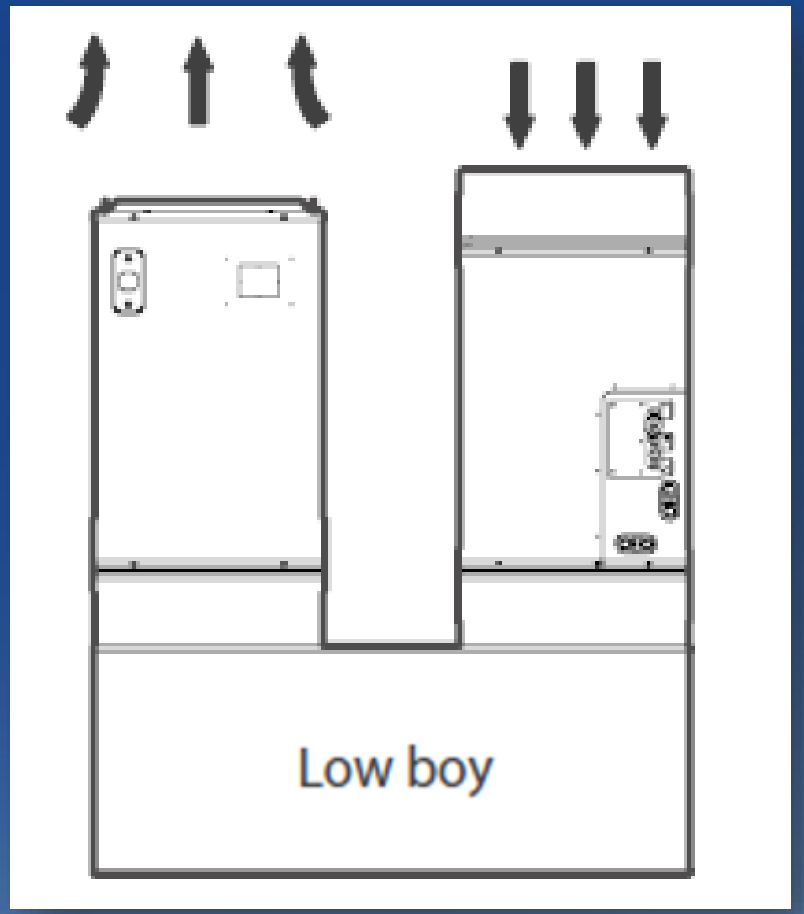
Featuring Puron ADVANCE™

CROSSOVER SOLUTIONS

45MUHAQ MID-TIER CROSSOVER FANCOIL







Mingledorff's INC

Featuring Puron ADVANCE™

CROSSOVER SOLUTIONS

45MUHAQ MID-TIER CROSSOVER FANCOIL

24K(18K) AHU3

ENC1 Dip Switch Instruction for Capacity Change

ENC1 dip switch is used for capacity change.

When matching with 37MUHA single zone condensers S1 S2 communication, the indoor unit will automatically adjust to 18,000 BTU/H or 24,000 BTU/ according to condensers capacity.

When matching with 37MUHA single zone condensers 24V communication, it needs to set the ENC1.
Change the capacity of indoor unit to 18,000 BTU/H by adjusting the dip switch ENC1 from "0" to "5". Change the capacity of indoor unit to 24,000 BTU/H by adjusting the dip switch ENC1 from "0" to "8".

Power needs to be OFF BEFORE DIP SWITCH adjustment.

(Default setting "0")

(Dip switch change to be "5" for 18,000BTU/H)

(Default setting "0")

(Dip switch change to be "8" for 24,000BTU/H)

36K(30K) AHU3

ENC1 Dip Switch Instruction for Capacity Change

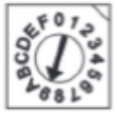
ENC1 dip switch is used for capacity change.

When matching with 37MUHA single zone condensers S1 S2 communication, the indoor unit will automatically adjust to 30,000 BTU/H or 36,000 BTU/ according to condensers capacity.

When matching with 37MUHA single zone condensers 24V communication it needs to set the ENC1. Change the capacity of indoor unit to 30,000 BTU/H by adjusting the dip switch ENC1 from "0" to "9". Change the capacity of indoor unit to 36,000 BTU/H by adjusting the dip switch ENC1 from "0" to "A".

Power needs to be OFF BEFORE DIP SWITCH adjustment.

(Default setting "0")



(Dip switch change to be "9" for 30,000BTU/H)

(Default setting "0")

(Dip switch change to be "A" for 36,000BTU/H)

60K(48K) AHU3

ENC1 Dip Switch Instruction for Capacity Change

ENC1 dip switch is used for capacity change.

When matching with 37MUHA single zone condensers S1 S2 communication, the indoor unit will automatically adjust to 48,000 BTU/H or 60,000 BTU/ according to condensers capacity.

When matching with 37MUHA single zone condensers 24V communication, it needs to set the ENC1.
Change the capacity of indoor unit to 48,000 BTU/H by adjusting the dip switch ENC1 from "0" to "C". Change the capacity of indoor unit to 60,000 BTU/H by adjusting the dip switch ENC1 from "0" to "E".

Power needs to be OFF BEFORE DIP SWITCH adjustment.

(Default setting "0")

(Dip switch change to be "C" for 48,000BTU/H)

(Default setting "0")

(Dip switch change to be "E" for 60,000BTU/H)

Mingledorff's INC

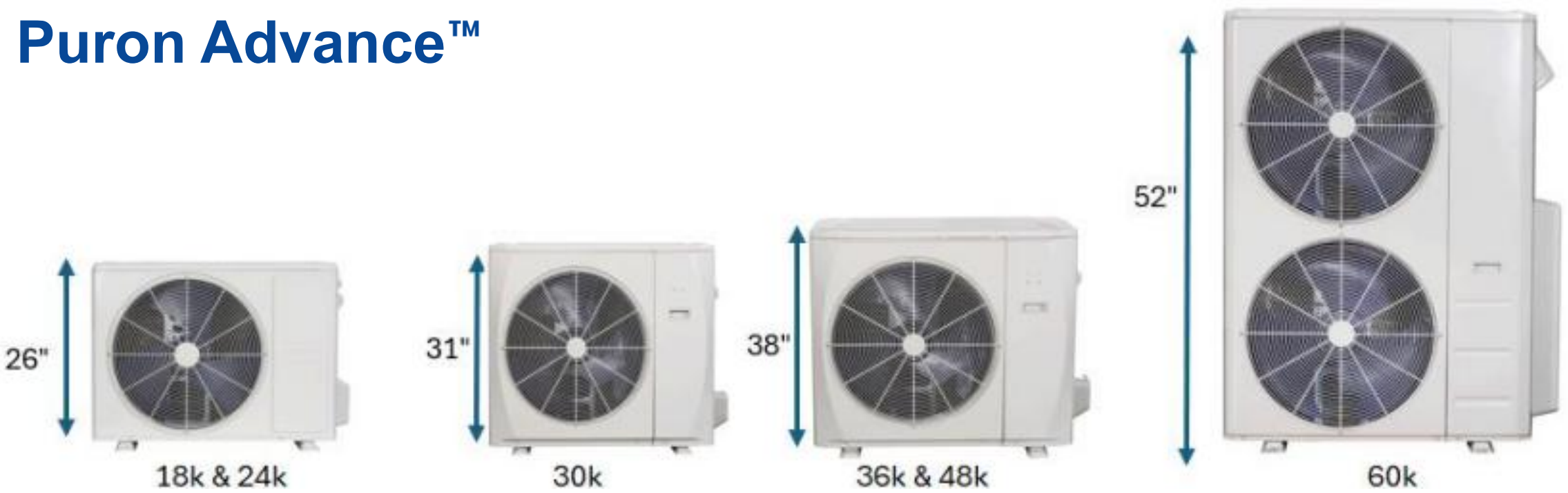
Featuring Puron ADVANCE™

CROSSOVER SOLUTIONS
37MURA LEGACY AND COMFORT LINES

Puron Advance™

CROSSOVER SOLUTIONS
37MUHA PREFERRED AND PERFORMANCE LINES

Puron Advance™



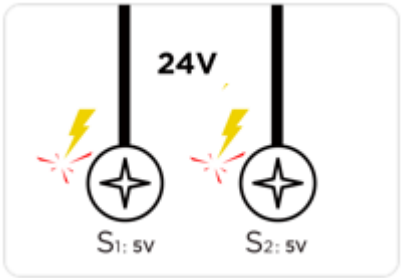
Mingledorff's INC

CROSSOVER SOLUTIONS

37MURA / 37MUHA IMPROVEMENTS

Puron Connection Board

(24V and S1/S2 terminals put together)



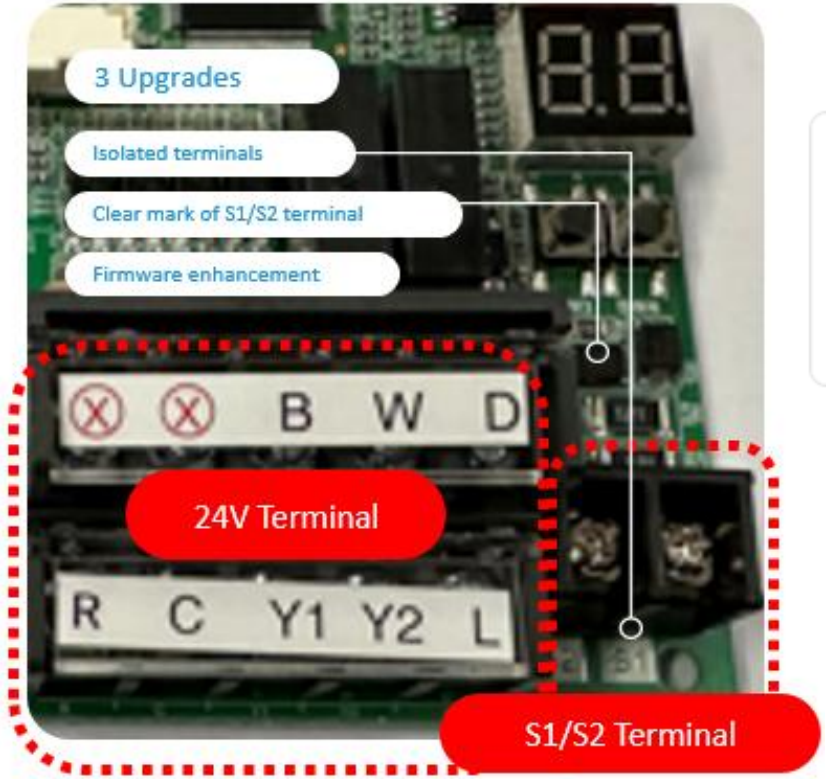
Misconnection & Burnout Risk

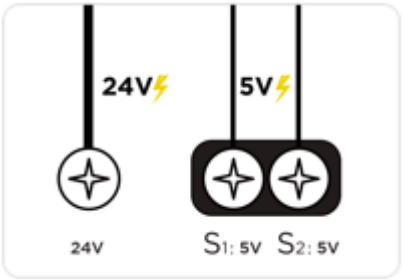
The 24V & s1/s2 terminal are put together in the traditional connection board, so it's quite often that the installers connect the 24v wires to the wrong terminals.

Due to the 24V current is overloading for the s1/s2 terminal, the misconnection might cause burning out of the board.

Puron Advance Connection Board

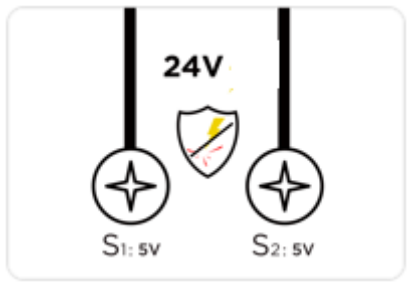
(24V and S1/S2 terminala are separated)





Easy connection

The 24V & s1/s2 terminal are put separately in the new connection board, so it's easier for the installers to find the right terminals.



No burnout when misconnection

The firmware is also upgraded for the new board, so the board will not burn out even when the communication wires are misconnected.

CROSSOVER SOLUTIONS

FEATURES AND SPECIFICATIONS

- One-to-one system only
- Inverter compressor can ramp down to roughly 20% of capacity
- Indoor and outdoor units must have separate power sources
- Extremely quiet outdoor unit, comparable to Infinity/Evolution
- Low ambient cool - down to 5F
- Hyper Heat models can heat 100% down to 5F (Standard models 17F)
- Will work with a ductless KSACN1401AAA controller OR a standard 24V TSTAT
- On retrofits, will work with the existing connections
  - Liquid line does not have to be insulated
  - Can use existing TSTAT wire to drive the system

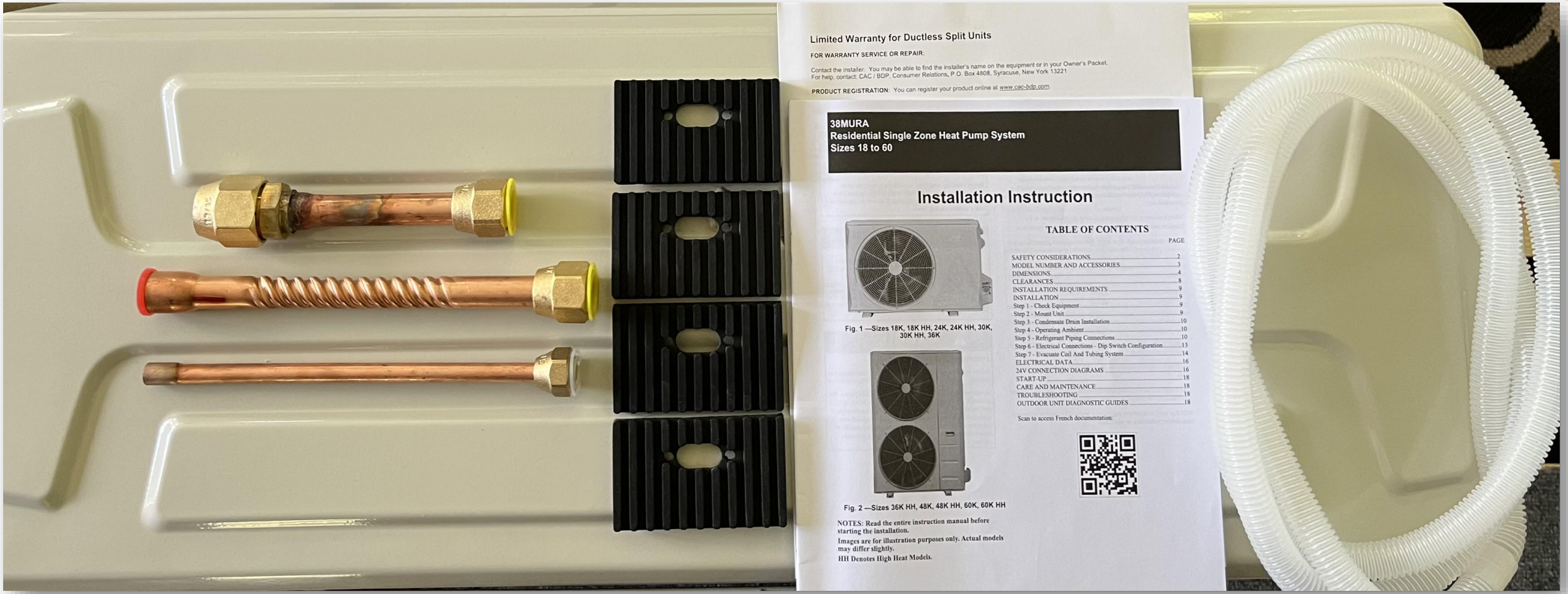
CROSSOVER SOLUTIONS

INDOOR PACKAGE CONTENTS – 454B

Located inside the blower wheel shipping stop contents box

CROSSOVER SOLUTIONS

OUTDOOR PACKAGE CONTENTS – 410A OR 454B



Limited Warranty for Ductless Split Units

FOR WARRANTY SERVICE OR REPAIR:

Contact the installer. You may be able to find the installer's name on the equipment or in your Owner's Packet.
For help, contact: CAC / BDP, Consumer Relations, P.O. Box 4808, Syracuse, New York 13221

PRODUCT REGISTRATION: You can register your product online at www.cac-bdp.com

38MURA
Residential Single Zone Heat Pump System
Sizes 18 to 60

Installation Instruction

Fig. 1 —Sizes 18K, 18K HH, 24K, 24K HH, 30K, 30K HH, 36K

Fig. 2 —Sizes 36K HH, 48K, 48K HH, 60K, 60K HH

NOTES: Read the entire instruction manual before starting the installation.
Images are for illustration purposes only. Actual models may differ slightly.
HH Denotes High Heat Models.

TABLE OF CONTENTS

Scan to access French documentation:

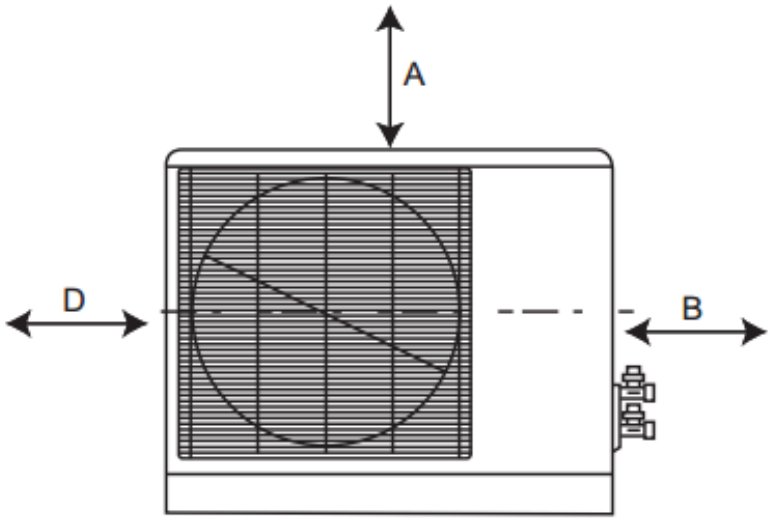
Located inside the box with the outdoor unit

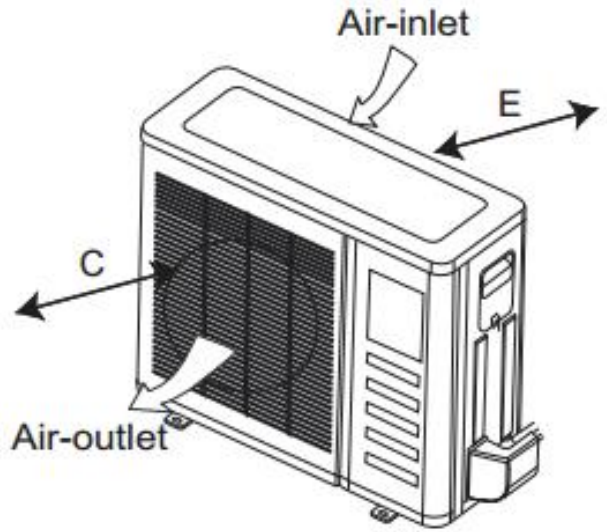
Crossover Solutions

454B Equipment Installation and Setup

INSTALLATION

OUTDOOR UNIT – CLEARANCE AND PLACEMENT





DO NOT:

- Mistake the discharge side of the unit for the intake side
- Wall mount a DLS outdoor unit above an occupied area where water drippage would be problematic
- Position the unit so that prevailing wind will cause the fan blade to “free wheel”
- Mount multiple ODUs in a manner where the discharge from one unit affects the operation of another

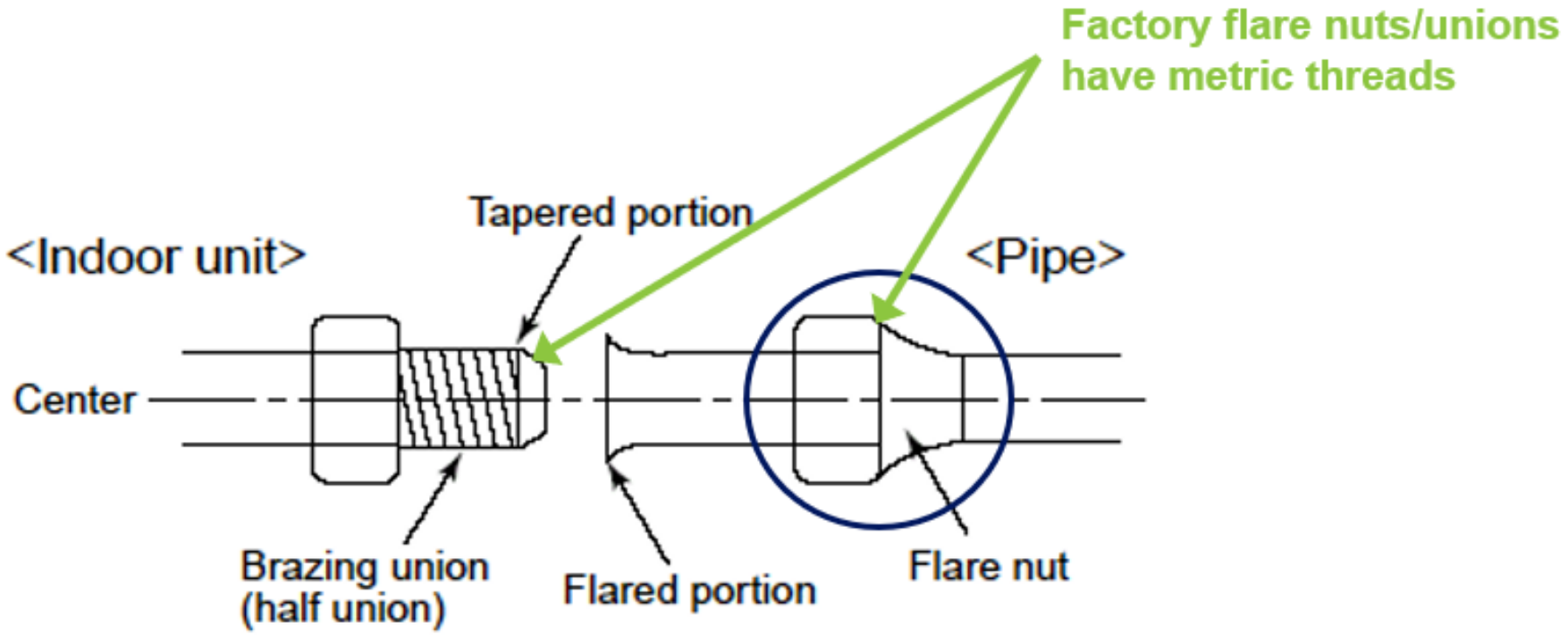
Unit Side	Minimum Value: in. (mm) R-410A	Minimum Value: in. (mm) R-454B
A	24 (610)	20 (500)
B	24 (610)	14 (350)
C	24 (610)	20 (500
D	4 (100)	4 (100)
E	4 (100)	4 (100)

INSTALLATION

REFRIGERANT PIPING

- Deburr inside and outside before flaring
- Use the nuts that come with the equipment
- No Leak Lock or 3rd party sealers
- Lubricate with oil (back side of the flare)
- Use a backup wrench
- Torque properly

INSTALLATION
REFRIGERANT PIPING



*USE THE FLARE NUTS THAT COME WITH THE EQUIPMENT.

Mingledorff's INC

INSTALLATION
REFRIGERANT PIPING

*410A flares are now 454B flares.

Mingledorff's INC

INSTALLATION
REFRIGERANT PIPING

410A Flaring Tool

R410A systems operate at high pressures

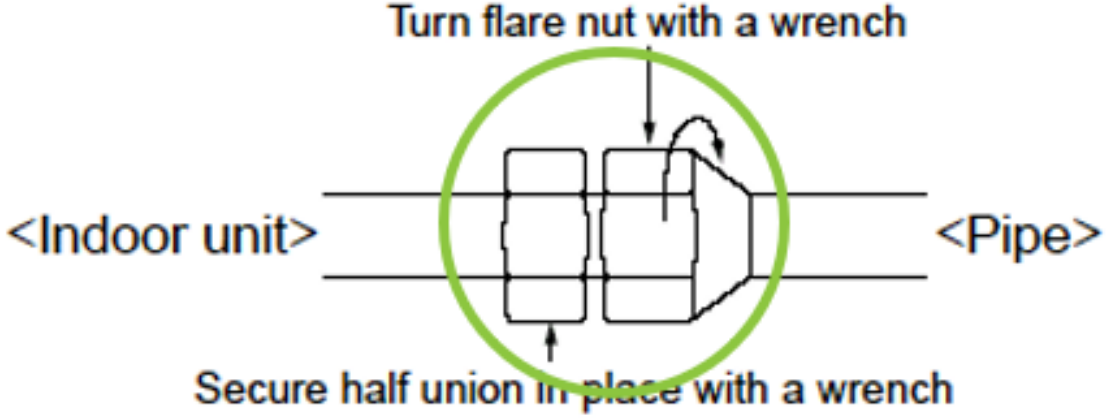
- The clutched handle prevents the crushing of the copper tube at the point of the flare. This helps maintain the strength and integrity of the copper tubing so it will withstand the higher operating pressures.
- The concentric cone helps make a uniform flare and reduces the thinning of the tube wall, this also eliminates the need of oil on the inside of the flare which can result in contamination and acid formation within the operating system.

Mingledorff's INC

INSTALLATION
REFRIGERANT PIPING

***See the installation manuals for specific torque values**

Torque wrench



Be sure to always use a backup wrench

Pipe Gauge	Tightening Torque	Flare Dimension (A) (Unit: MM/Inch)	
		Min	Max
3/8 in (Ø9.52)	18-19 ft-lb (25-25 N.m)	0.52/13.2	0.53/13.5
3/4 in (Ø19)	48-49 ft-lb (65-67 N.m)	0.91/23.2	0.93/23.7

Indoor Unit

PIPE GAUGE IN (MM)	TIGHTENING TORQUE Ft-lbs (N.m)		FLARE DIMENSIONS (A) in (mm)	
	Ft-lbs	N.m	Min.	Max.
Ø3/8 (9.52)	23.6-27.75	(32-39)	0.52 (13.2)	0.53 (13.5)
Ø5/8 (16)	42-52.37	(57-71)	0.76 (19.2)	0.78 (19.7)
Ø3/4 (19)	49.4-74.5	(67-101)	0.91 (23.2)	0.93 (23.7)

Outdoor Unit

Mingledorff's INC

INSTALLATION

REFRIGERANT PIPING

VACUUM PUMP OIL

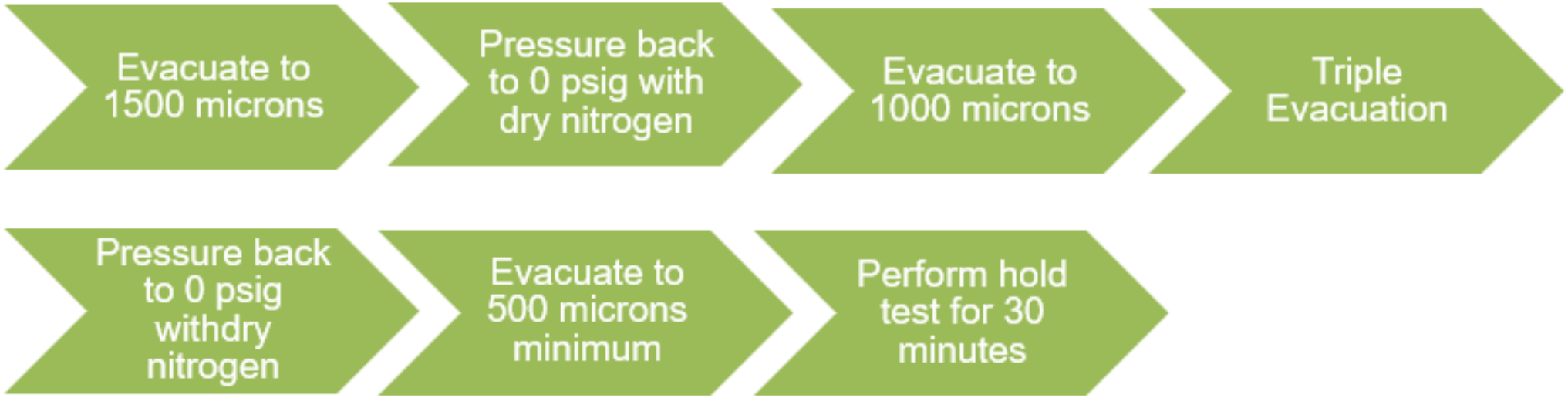
POE OIL

INSTALLATION
REFRIGERANT PIPING

LEAK TEST

Pressure test piping to 500 psig for 1 hour

TRIPLE EVACUATION:



Mingledorff's INC

CROSSOVER SOLUTIONS

REFRIGERANT PIPING – 37MURA

System Size		18K	24K	30K	36K	48K	60K
208/230V							
Min. Piping Length	ft. (m)	10 (3)					
Standard Piping Length	ft. (m)	24.6 (7.5)					
Max. outdoor-indoor height difference (OU higher than IU)	ft. (m)	65.6 (20)	82 (25)	82 (25)	98.4 (30)	98.4 (30)	98.4 (30)
Max. outdoor-indoor height difference (IU higher than OU)	ft. (m)	65.6 (20)	82 (25)	82 (25)	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)
Liquid Pipe (size-connection)	in (mm)	ø3/8" (9.52)					
Refrigerant Type	Type	R454B					
Charge Amount	lb. (kg)	4.63 (2.1)	4.63 (2.1)	6.61 (3.0)	7.94 (3.6)	8.38 (3.8)	11.46 (5.2)
Additional Refrigerant Charge (when Pipe length > 24.6 ft)	Oz/ft (g/m)	0.7(65)	0.7(65)	0.7(65)	0.7(65)	0.7(65)	0.7(65)
Total Maximum Piping Length per system	ft. (m)	98.42 (30)	164.04 (50)	164.04 (50)	246 (75)	246 (75)	246 (75)

- **Factory charge is good for 25 ft. of line set**
- **Add .7 oz per ft. over factory charge**

CROSSOVER SOLUTIONS

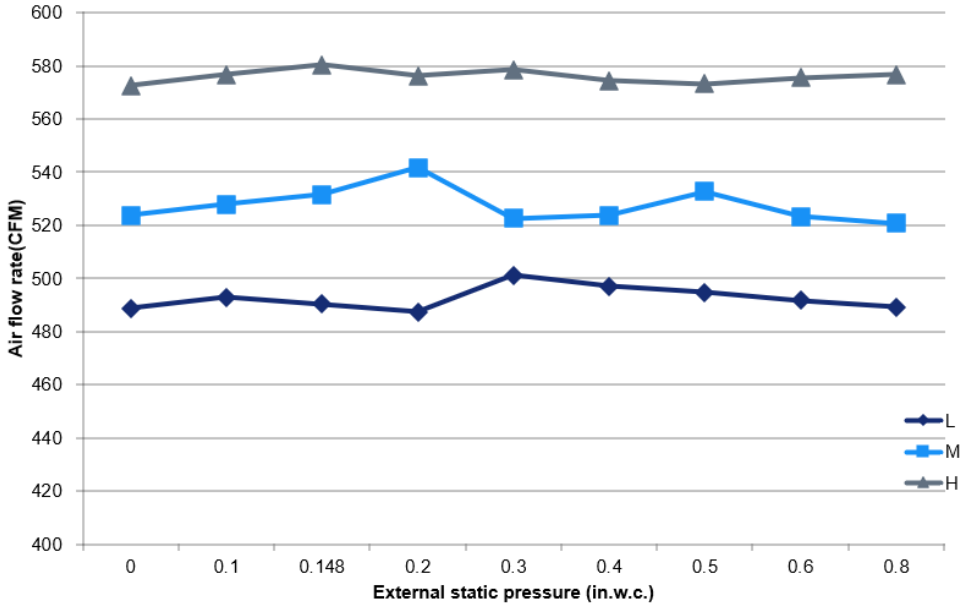
37MURA LINE SIZES & LENGTHS VS CAPACITY LOSS CHART

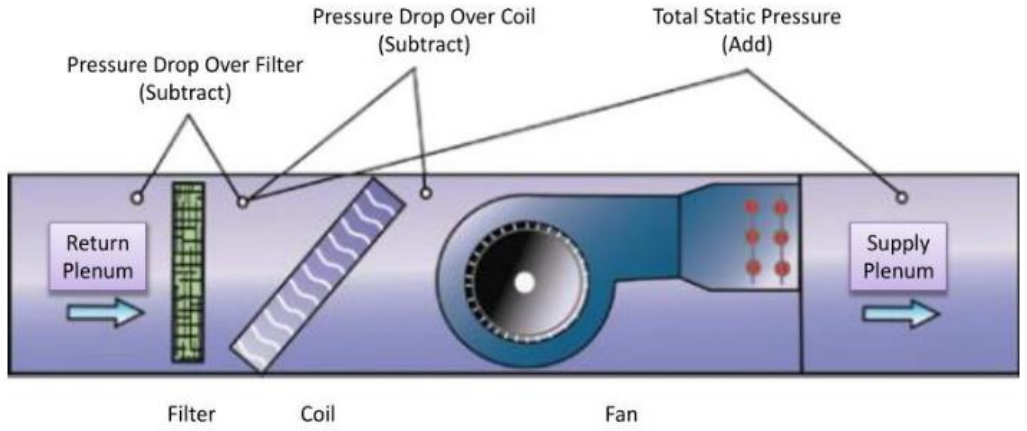
VAPOR LINE SIZE AND COOLING CAPACITY LOSSES										
UNIT NOMINAL SIZE (BTU/HR)	MAXIMUM LIQUID LINE DIAMETERS (IN. OD)	VAPOR LINE DIAMETERS (IN. OD)	COOLING CAPACITY LOSS (%) TOTAL EQUIVALENT LINE LENGTH FT. (M)								
			26-50 (7.9-15.2)	51-80 (15.5-24.4)	81-100 (24.7-30.5)	101-125 (30.8-38.1)	126-150 (38.4-45.7)	151-164 (46.0-50.0)	165-213 (50.2-65.0)	214-225 (65.3-68.6)	226-250 (68.9-76.2)
18000	3/8	1/2	2	4	6	NA	NA	NA	NA	NA	NA
		5/8	1	2	3	NA	NA	NA	NA	NA	NA
		3/4	0	1	2	NA	NA	NA	NA	NA	NA
24000	3/8	5/8	1	2	3	5	7	8	NA	NA	NA
		3/4	0	1	2	3	4	4	NA	NA	NA
		7/8	0	1	1	2	2	3	NA	NA	NA
30000	3/8	5/8	1	2	3	4	5	5	NA	NA	NA
		3/4	0	1	1	2	2	3	NA	NA	NA
		7/8	0	0	1	1	1	2	NA	NA	NA
36000	3/8	5/8	2	3	4	5	7	7	10	11	12
		3/4	1	1	2	2	3	4	5	5	6
		7/8	0	1	1	1	2	2	3	3	4
48000	3/8	3/4	1	2	3	4	5	5	7	8	9
		7/8	0	1	1	2	3	3	4	5	5
		11/8	0	0	0	1	1	1	2	2	3
60000	3/8	3/4	1	2	3	4	6	6	8	9	10
		7/8	0	1	2	2	3	3	5	5	6
		11/8	0	0	0	1	1	1	2	2	3

CROSSOVER SOLUTIONS

4*MUAA AIRFLOW BEST PRACTICES

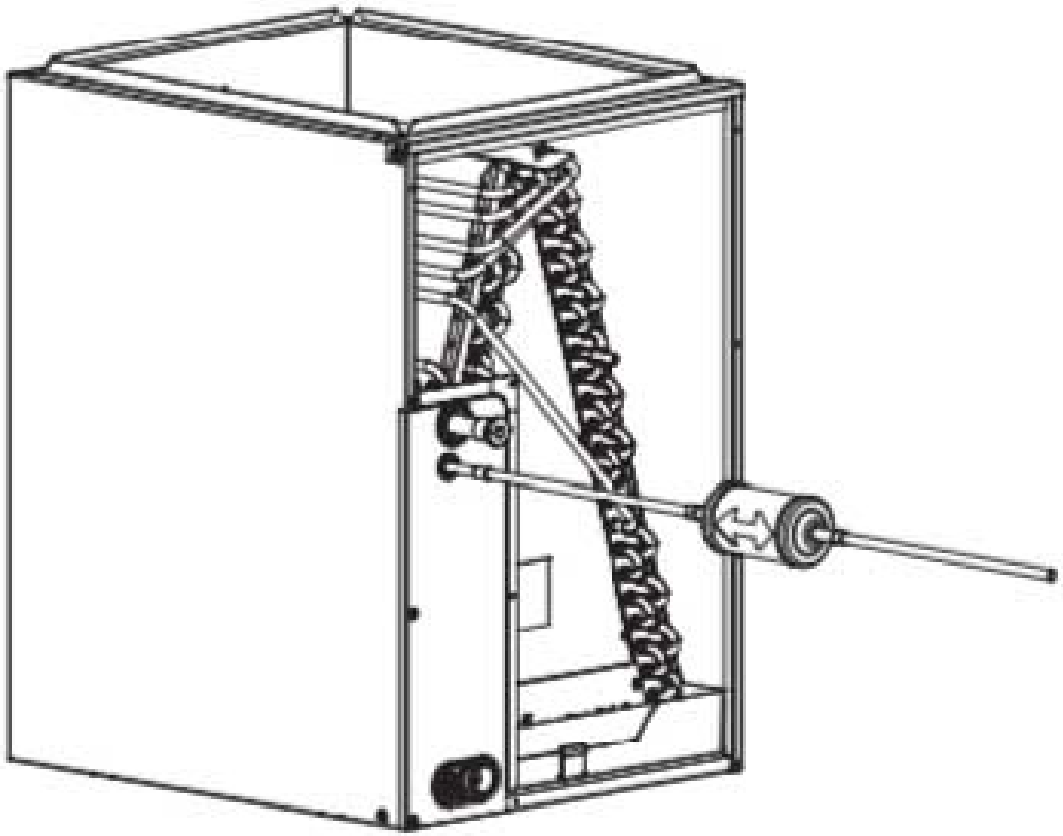
- Only Scenario 2 uses Auto Fan Logic
- Auto Fan Logic is driven by ▲T1 & Target Setpoint
- Any static pressure issue (dirty filter, dirty coil, etc.) will affect fan speed and take priority over Auto Fan Logic
- All Scenario 2 heat demands involving electric heat will use Turbo Speed
- Constant Air Technology maintains constant CFM up to .8” ESP (varies by model – see product data)
- Operation of the system above .8" ESP will create performance issues and poor ▲T
- On retrofit, measure the static of the existing system before decommissioning
- The 4*MUAA can’t compensate for undersized ductwork





CROSSOVER SOLUTIONS

WHERE TO PUT THE FILTER DRIER (USE BI-FLOW DRIER ONLY)

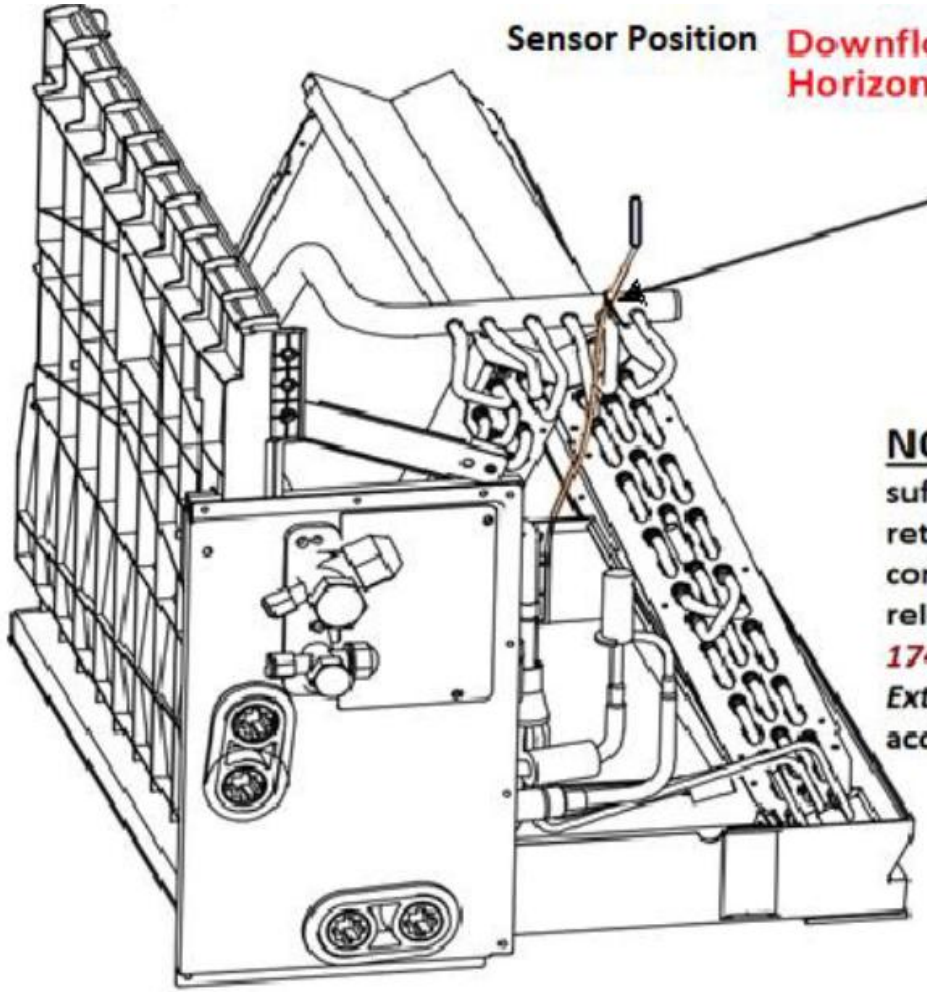


1. Cut a minimum 4” length of 3/8” tubing and assemble
   a. 3/8” adapter
   b. Short tubing
   c. Bi-flow filter drier
   d. Liquid line
2. Wrap the filter drier with a wet rag
3. Flow nitrogen
4. Braze assembled components from step 1

A drier is not necessary if using new refrigerant lines

CROSSOVER SOLUTIONS

45MUAA T1 RETURN AIR SENSOR POSITION



Sensor Position Downflow and Horizontal right airflow.

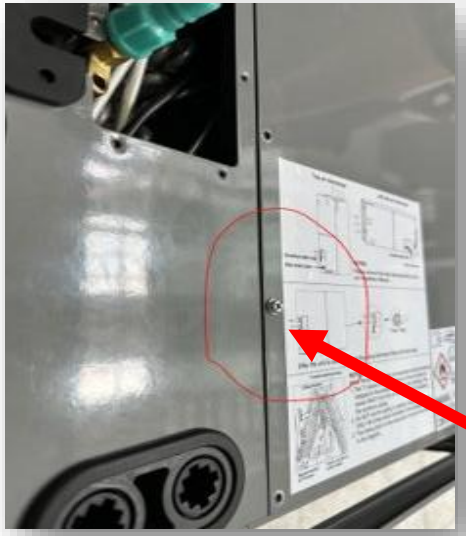
Strap this sensor to the header. Strap to the tubing that surrounds the cable. Make sure that the sensor is at least 3 inches away from the piping.

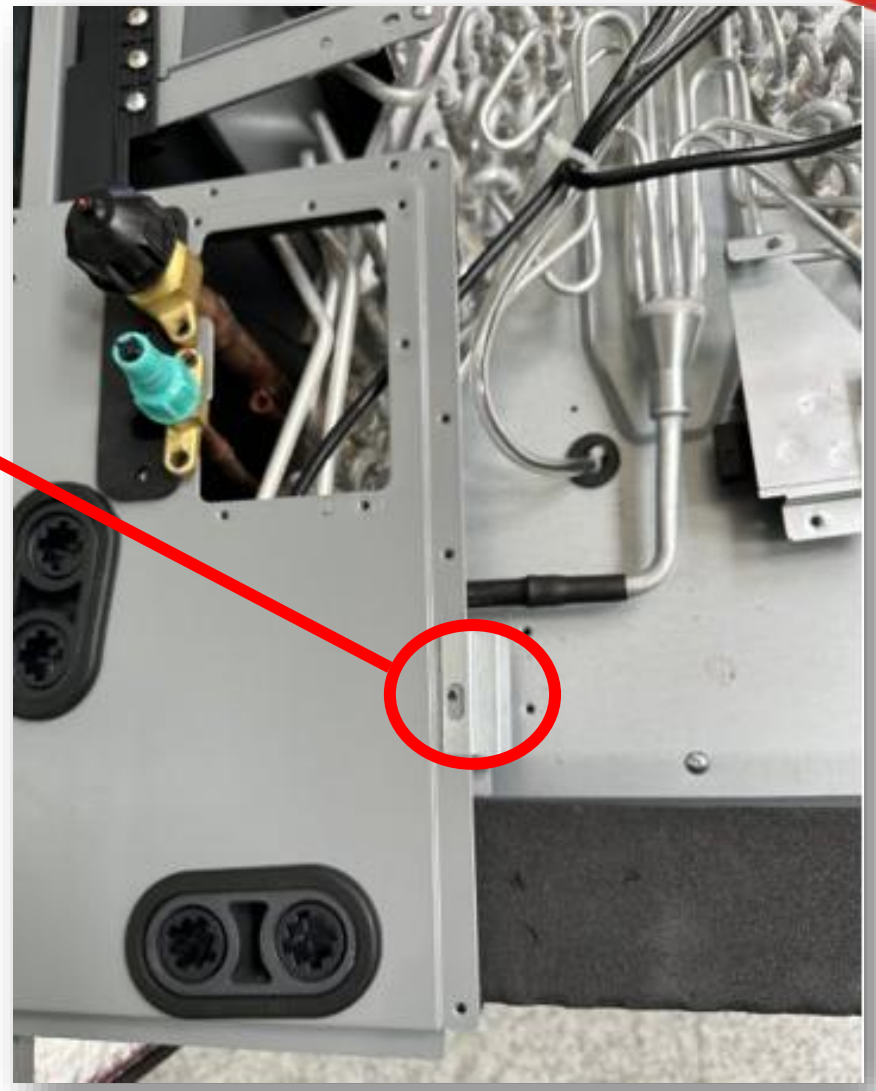
NOTE: This procedure should be sufficient for most applications. If return air ductwork or other conditions require sensor relocation, use RC part number *17401204010126, Return Air Extension,* to extend the sensor to acceptable placement in the duct.

For more information see TIC 2024-0017

CROSSOVER SOLUTIONS

45MUAA DISSIPATION SENSOR POSITION



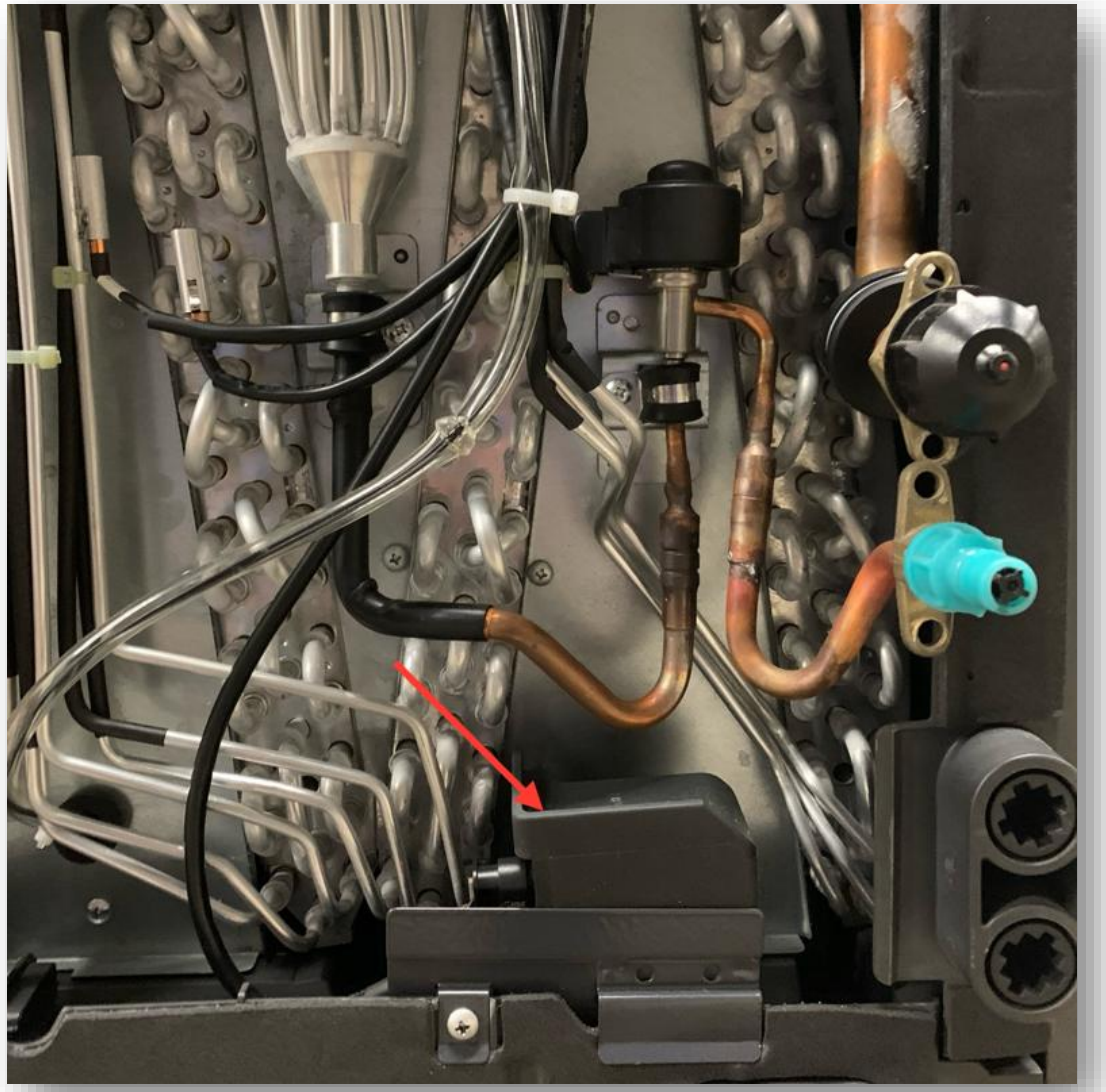


- Remove one screw on the lower panel to remove the sensor bracket
- In horizontal applications, relocate the bracket and sensor to the pan mount location

CROSSOVER SOLUTIONS

45MUHA DISSIPATION SENSOR POSITION

- Sensor clip attached to the top of the drain pan with one screw
- In horizontal applications, relocate the clip and sensor to the other pan mount location



INSTALLATION
DISSIPATION FOR 454B CROSSOVER SYSTEMS

When a leak is detected above the LFL threshold:

- Error code EHC1 will be displayed
- IDU fan sets to turbo
- Continuous audible alarm from IDU
- ODU shuts down

If leak drops below the LFL threshold:

- Audible alarm resets after 2 minutes
- Error code clears after 5 minutes

*If the leak is above the LFL threshold, the audible alarm can be turned off by pressing the power button on the wireless remote/wired controller or the forced operation button on the air handler interface board (but it will not remove the error code)

Subject to change

CROSSOVER SOLUTIONS

THREE SCENARIOS OF OPERATION

Scenario 1: Partial Communication

- Third party TSTAT with 24VAC wiring to the fancoil
- RS485 wiring between the fancoil and heat pump

Scenario 2: Full Communication

- RS485 wired ductless controller to the fancoil
- RS485 wiring between the fancoil and the heat pump

Scenario 3: Non-Communicating

- Third party TSTAT with 24VAC wiring to the fancoil
- 24VAC wiring between the fancoil and heat pump

CROSSOVER SOLUTIONS

CARRIER CROSSOVER SYSTEM BEST PRACTICES

Configuration characteristics of the 38MURA

- S1/S2 connection allows full RS485 communication
- 24VAC connections have no means of communication
- 37MURA paired with 45MUAA - S1/S2 ***recommended***
  - Outdoor unit uses all standard DLS thermistors for the capacity request (compressor frequency) algorithm
  - Outdoor target coil temp algorithm adjusts with a request for dehumidification (allows for a colder evap coil)
  - No indoor fan operation on defrost with scenario 1 (defrost will not signal heat strips [if used] to turn on)
- Outdoor 24VAC connections are for crossover solution (37MURA matched with a standard furnace or fancoil)

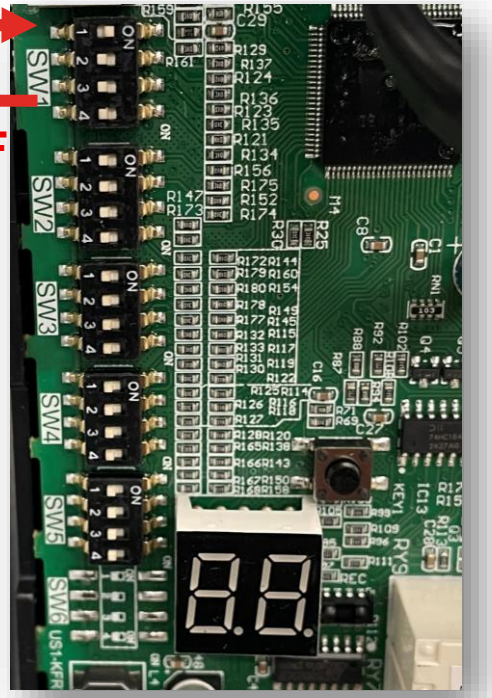
Also applies to the mid-tier 37MUHA and 45MUHA

CROSSOVER SOLUTIONS

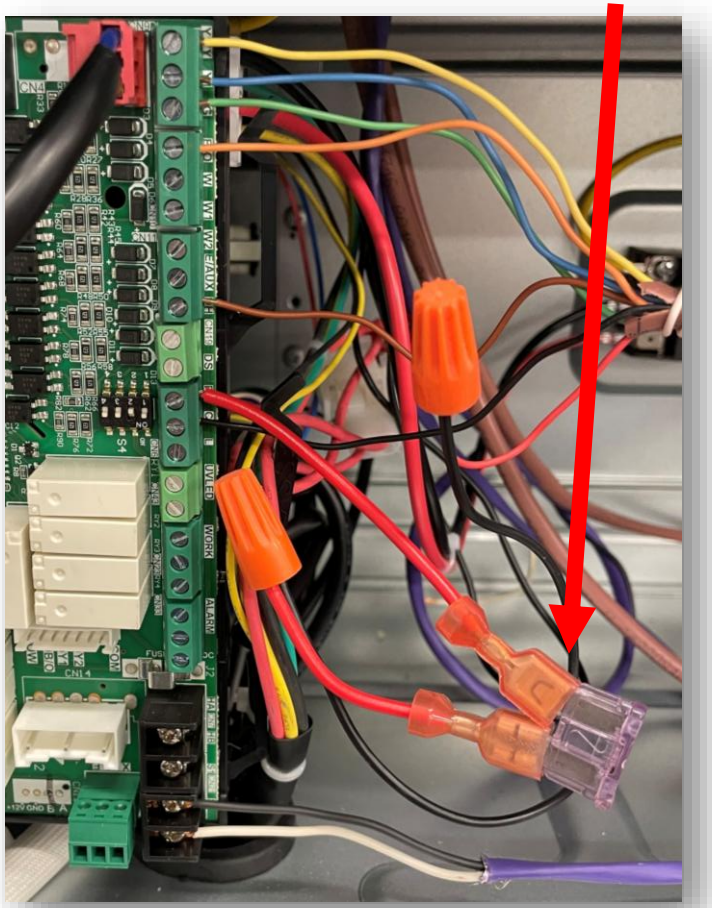
SCENARIO 1: 454B 24VAC TO TSTAT AND RS485 TO ODU

SW1-1 ON

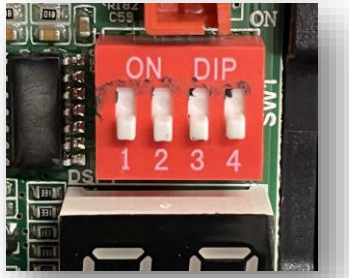
SW1-4 OFF

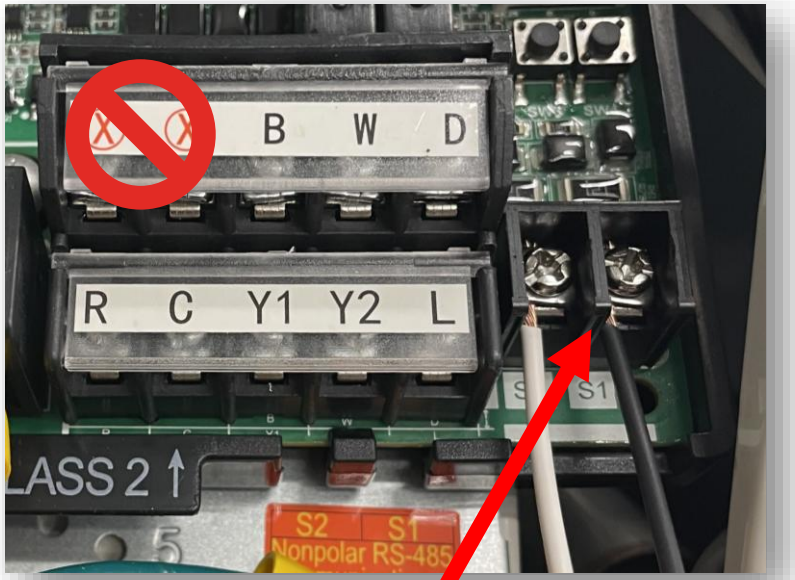


Add an in-line fuse on R!



SW1-2 OFF

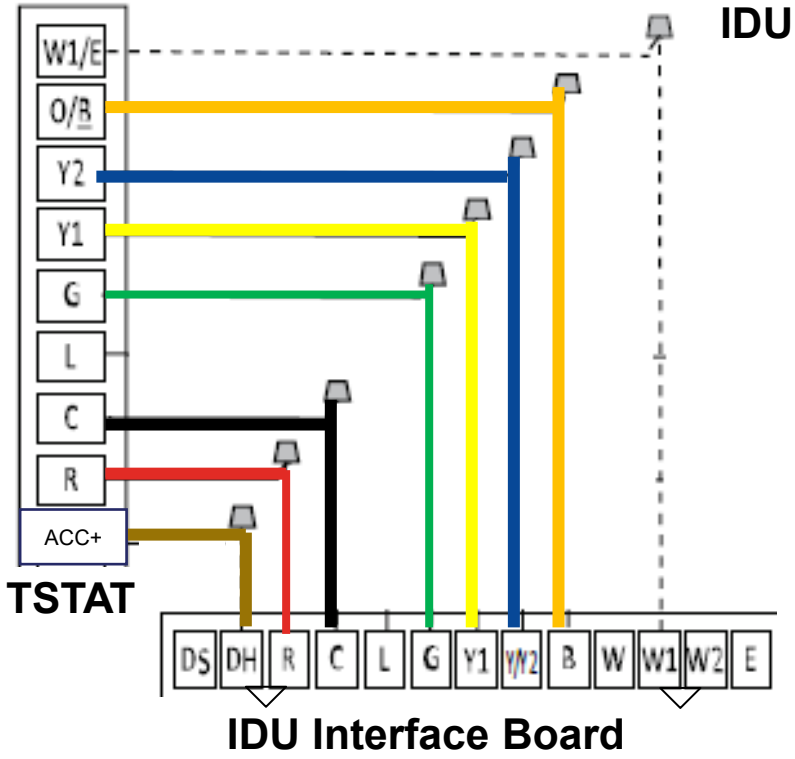


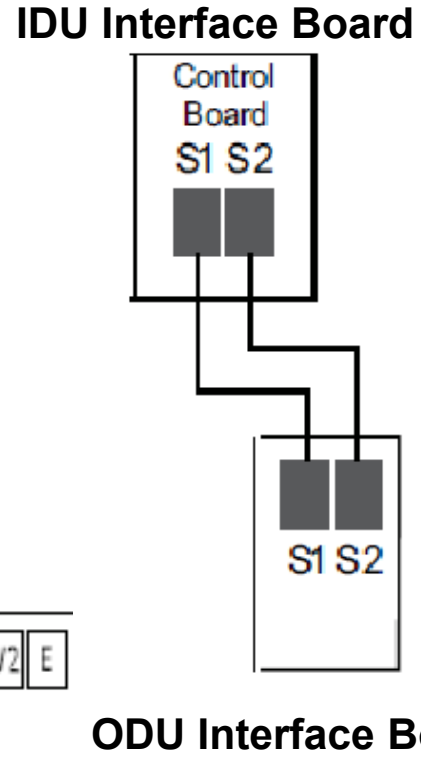


S1/S2 have moved

CROSSOVER SOLUTIONS

SCENARIO 1: WIRING FOR 24VAC 3H/2C HEAT PUMP WITH AUX HEAT STRIPS AND DEHUMIDIFICATION USING RS485 COMMUNICATION TO THE OUTDOOR





- **W** is not used in heat pump configuration
- **E/AUX** is not used except for TSTATs with a separate tap
- **L** is only used if you have a TSTAT with an alarm light

***Always use 16/2 stranded cable for RS485**

CROSSOVER SOLUTIONS

SCENARIO 1 OR 3 ONLY: ELECTRIC HEAT STAGING

40MUAA Information for W1/W2 Staging:

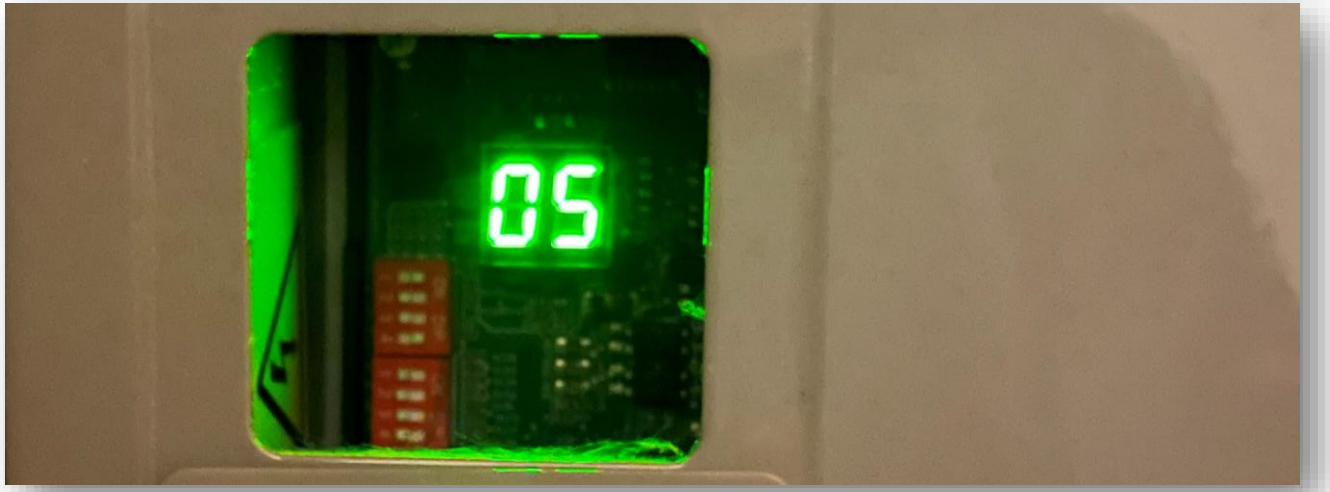
- Dipswitch S4-4 is default ON for single stage supplementary heat (jumps out W1 & W2)
- Set to OFF for independent control of W1 and W2 with a third-party thermostat

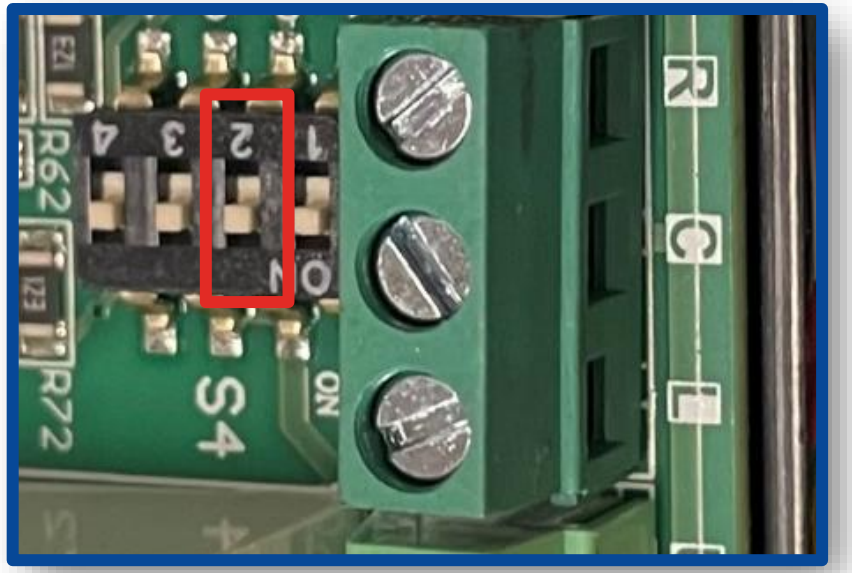
CROSSOVER SOLUTIONS

SCENARIO 1 OR 3 ONLY: 24VAC TO THE TSTAT AND HEAT PUMP

DEHUM SETUP WITH THE CO-BRANDED ECOBEE 6

- S4-2 is Default ON (jumps R & DH)
- Turn off for dehumidification capability
  (Carrier dehumidification uses reverse logic)
- Wire ACC+ on the Ecobee to DH on the terminal strip
- With demand for DH the indoor fan slows to 80% capacity
- Y1 & DH (Mode 04) will drop compressor to low turndown
- Y2 & DH (Mode 05) will drop compressor to medium turndown





CROSSOVER SOLUTIONS
DISPLAY MODES OF OPERATION

IDLE/STANDBY	00
CONSTANT FAN	01
COOLING Y1	02
COOLING Y2	03
COOL/DEHUM Y1	04
COOL/DEHUM Y2	05
HP HEATING Y1	06
HP HEATING Y2	07
W1 ELECTRIC HEAT	08
W2 ELECTRIC HEAT	09
Y1/Y2/W1 AUX HEAT	10
Y1/Y2/W2 AUX HEAT	11
EMERGENCY HEAT	12

*Note: modes of operation for scenario 1 or 3

CROSSOVER SOLUTIONS

4*MUAA DISPLAY MODE 13
ANY CALL FOR HEAT AND DEHUM

Possible causes:

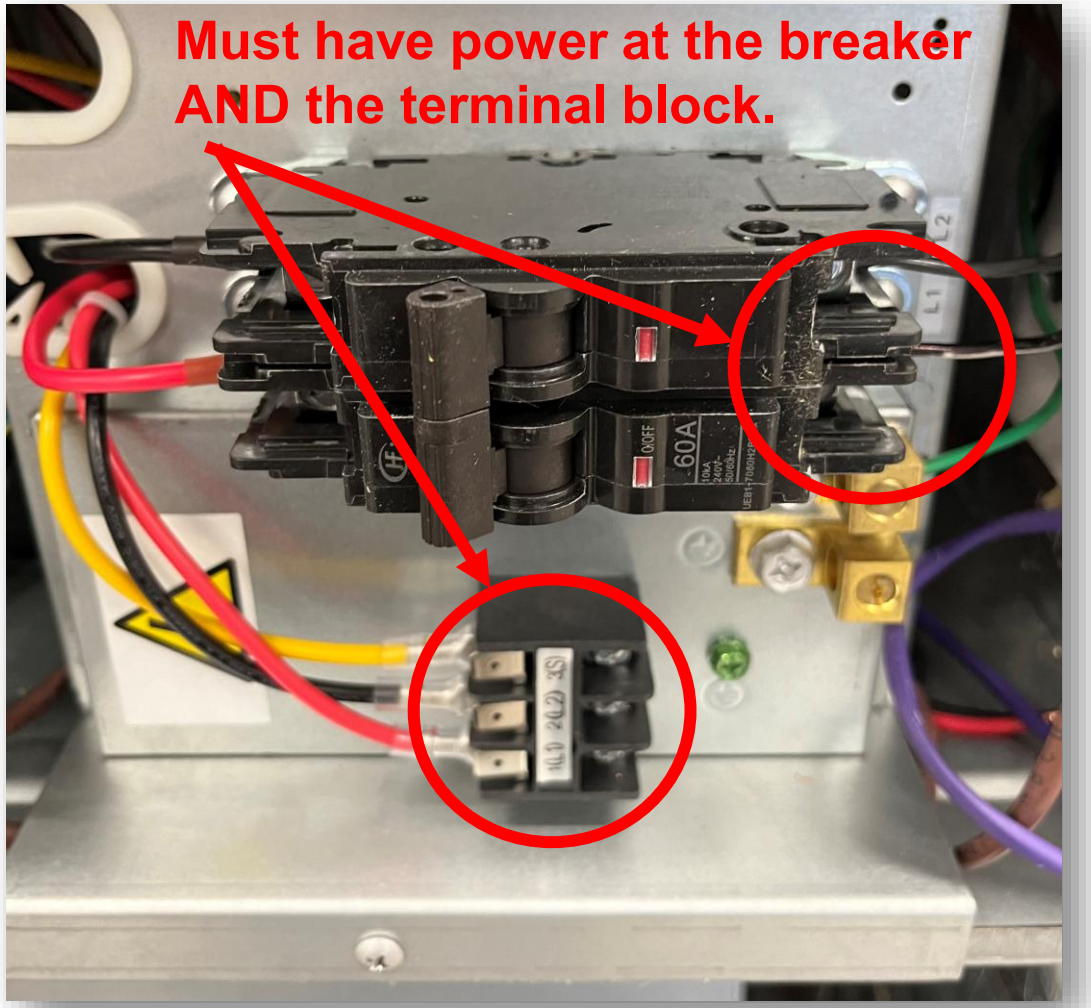
- Improper TSTAT setup
- Improper dip switch S4-2 setting
- Shorted TSTAT wire

***Note: modes of operation for scenario 1 or 3**

CROSSOVER SOLUTIONS
ELECTRIC HEAT INSTALLATION

- No single point entry kit

- Ground “S” wire (yellow)

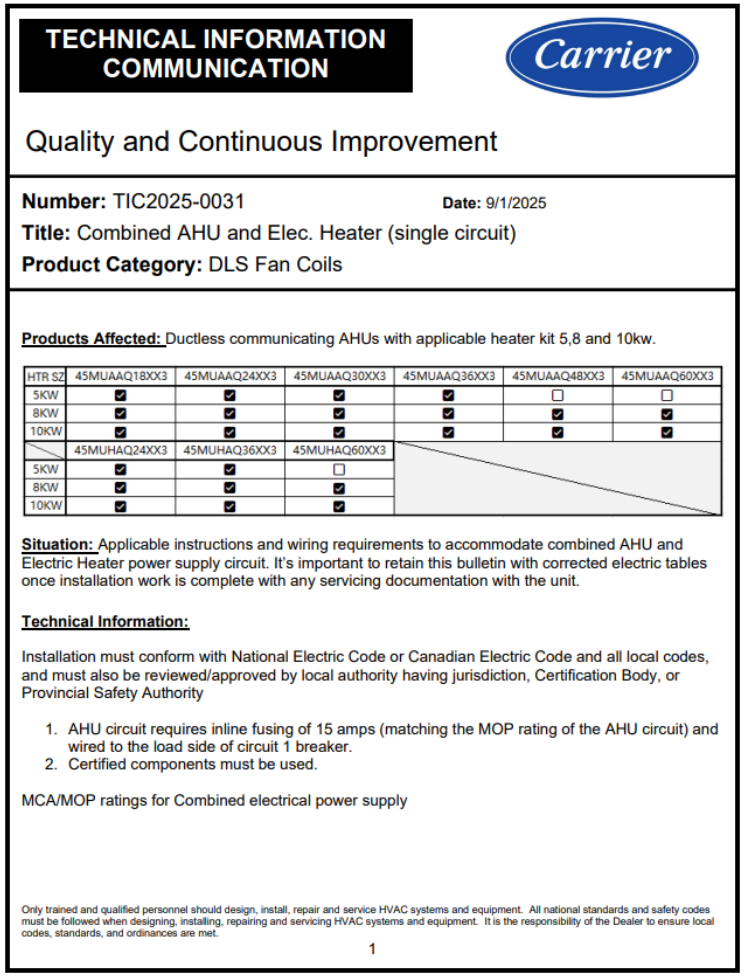


*Note: See TIC2025-0031 for single point entry instructions

CROSSOVER SOLUTIONS
ELECTRIC HEAT INSTALLATION

***Note: See TIC2025-0031 for single point entry instructions**

- **Single point entry is now an option for the 45MUAA and 45MUHA AHUs**
- **Must conform to code**
- **AHU circuit requires inline fusing of 15 amps wired to the load side of circuit 1 breaker (matching the MOP rating of the AHU)**
- **Use certified components only**
- **Print a copy of the TIC and leave it with all other service documentation**



TECHNICAL INFORMATION COMMUNICATION

Carrier

Quality and Continuous Improvement

Number: TIC2025-0031 **Date:** 9/1/2025

Title: Combined AHU and Elec. Heater (single circuit)

Product Category: DLS Fan Coils

Products Affected: Ductless communicating AHUs with applicable heater kit 5,8 and 10kw.

HTR SZ	45MUAAQ18XX3	45MUAAQ24XX3	45MUAAQ30XX3	45MUAAQ36XX3	45MUAAQ48XX3	45MUAAQ60XX3
5KW	☑	☑	☑	☑	☐	☐
8KW	☑	☑	☑	☑	☑	☑
10KW	☑	☑	☑	☑	☑	☑

	45MUHAQ24XX3	45MUHAQ36XX3	45MUHAQ60XX3
5KW	☑	☑	☐
8KW	☑	☑	☑
10KW	☑	☑	☑

Situation: Applicable instructions and wiring requirements to accommodate combined AHU and Electric Heater power supply circuit. It's important to retain this bulletin with corrected electric tables once installation work is complete with any servicing documentation with the unit.

Technical Information:

Installation must conform with National Electric Code or Canadian Electric Code and all local codes, and must also be reviewed/approved by local authority having jurisdiction, Certification Body, or Provincial Safety Authority

1. AHU circuit requires inline fusing of 15 amps (matching the MOP rating of the AHU circuit) and wired to the load side of circuit 1 breaker.
2. Certified components must be used.

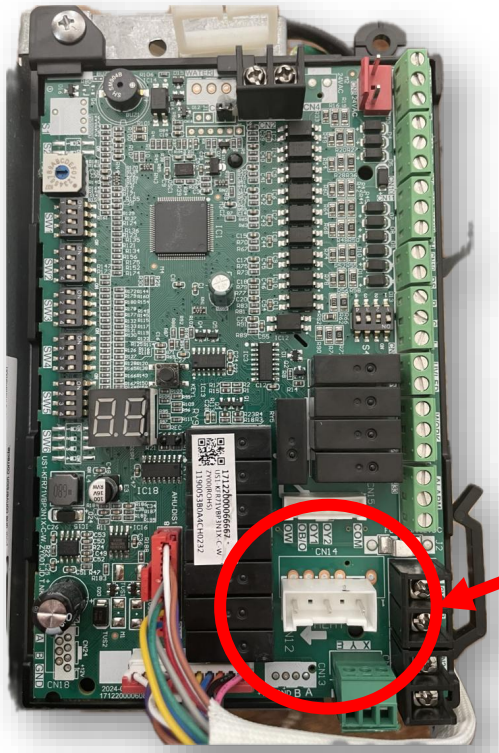
MCA/MOP ratings for Combined electrical power supply

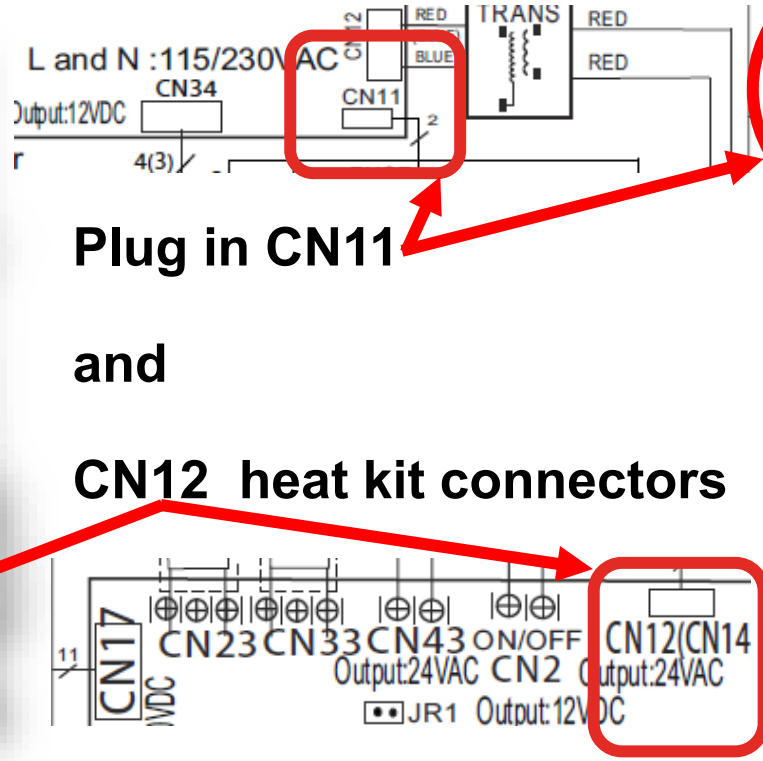
Only trained and qualified personnel should design, install, repair and service HVAC systems and equipment. All national standards and safety codes must be followed when designing, installing, repairing and servicing HVAC systems and equipment. It is the responsibility of the Dealer to ensure local codes, standards, and ordinances are met.

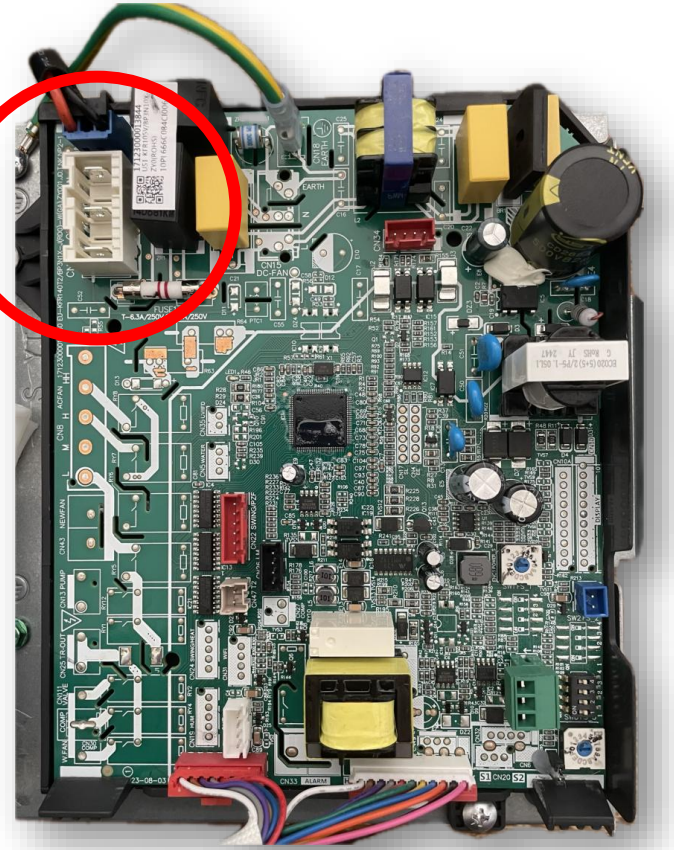
1

Mingledorff's INC

CROSSOVER SOLUTIONS
ELECTRIC HEAT INSTALLATION 45MUAA







CROSSOVER SOLUTIONS
ELECTRIC HEAT INSTALLATION

Set SW4 bits 1, 2, and 3 to desired CFM

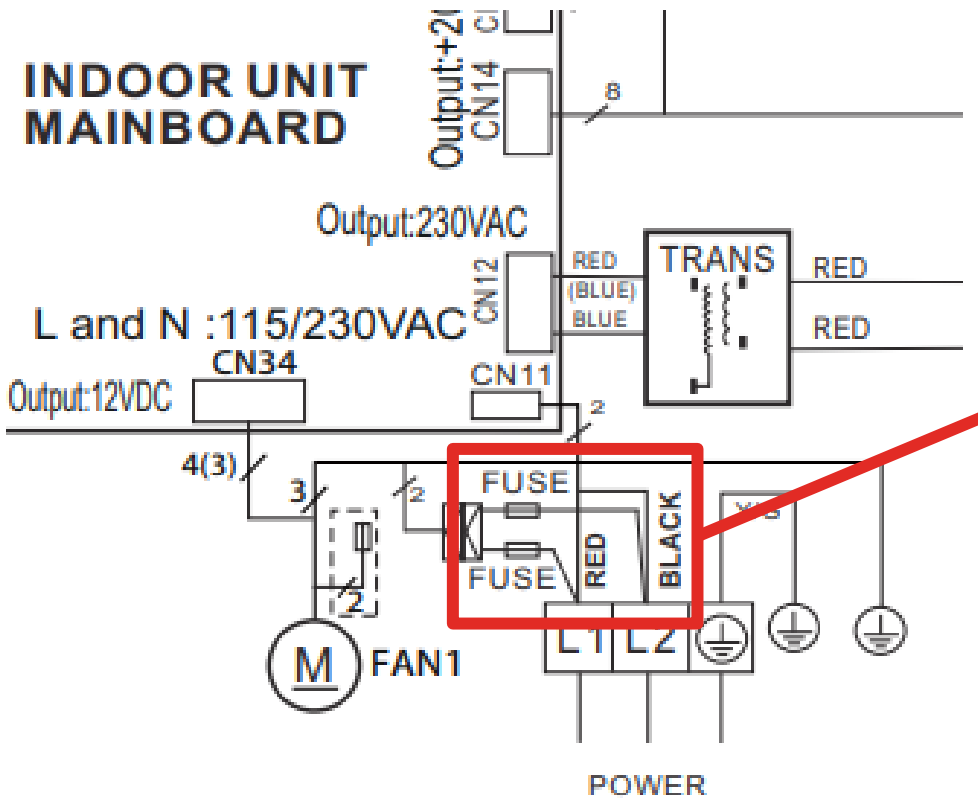
SW4

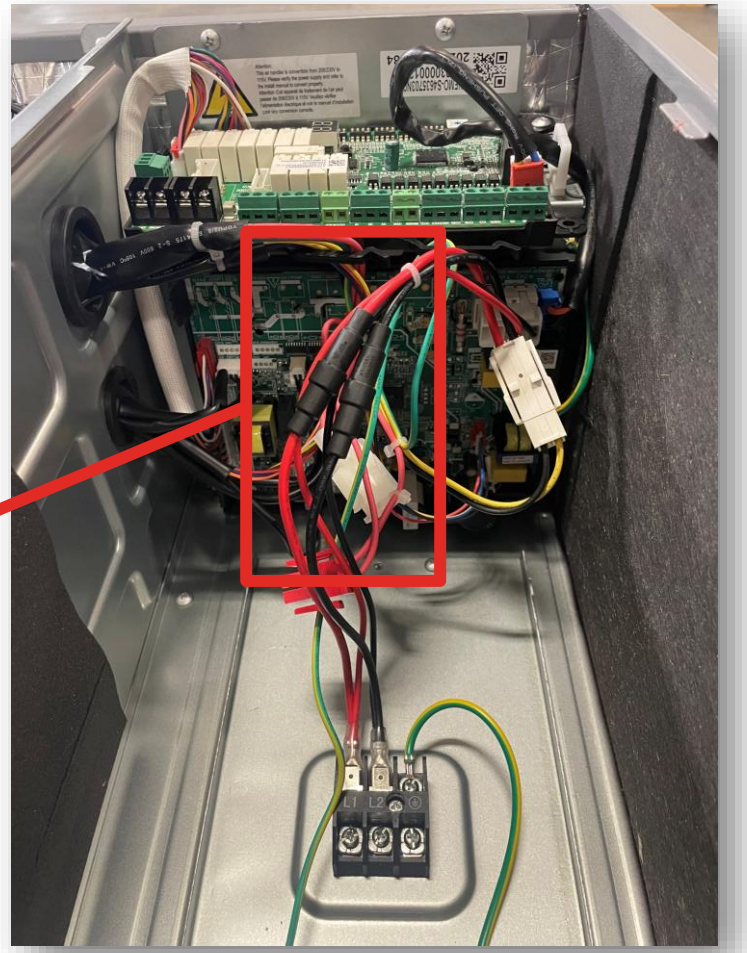
Model	SW4-1, 2, 3 Setting (Default) Air Volume (CFM)	001 - Air Volume (CFM)	010 - Air Volume (CFM)	011 - Air Volume (CFM)
18K	660	630	600	570
	10KW	10KW, 8KW	8KW	5KW, 3KW
24K	880	850	830	800
	15KW	15KW, 8KW	10KW, 8KW	5KW, 3KW
30K	1100	1040	990	930
	15KW	15KW, 10KW	10KW, 8KW	8KW, 5KW
36K	1320	1255	1190	1125
	20KW	15KW	10KW, 8KW	8KW, 5KW
48K	1760	1675	1580	1490
	20KW	15KW, 10KW	10KW, 8KW	8KW
60K	2195	2055	1920	1775
	25KW	20KW, 15KW	15KW, 10KW	10KW

0 = OFF 1 = ON (Default 000)

CROSSOVER SOLUTIONS

45MUAA 30-60K BLOWER IN-LINE FUSES

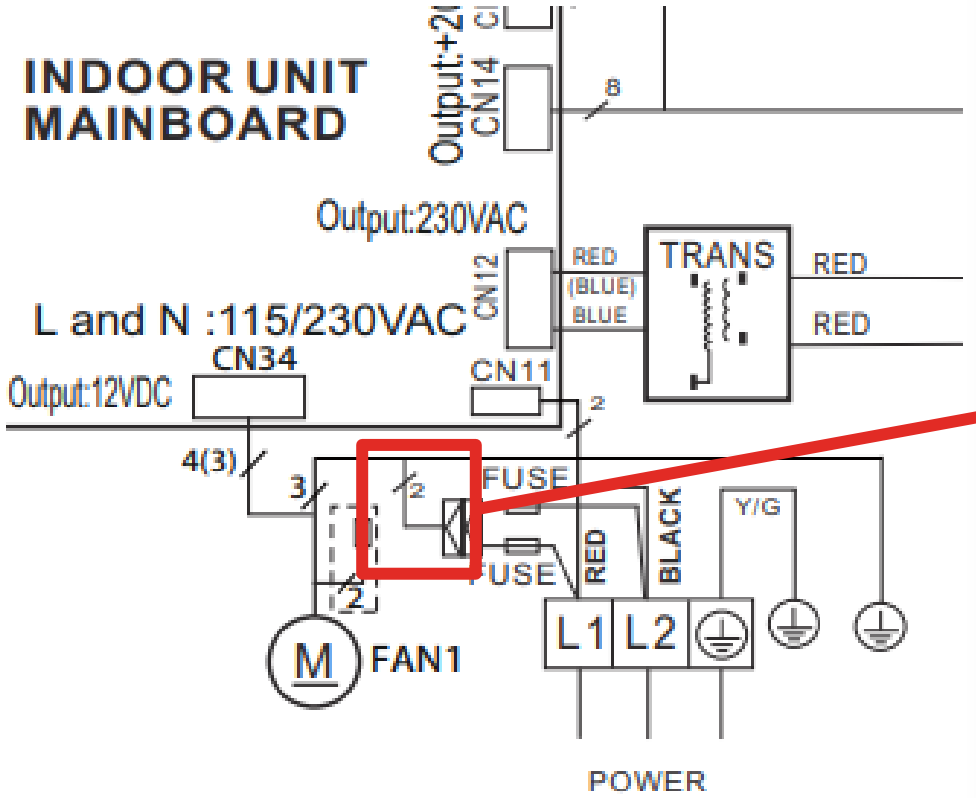


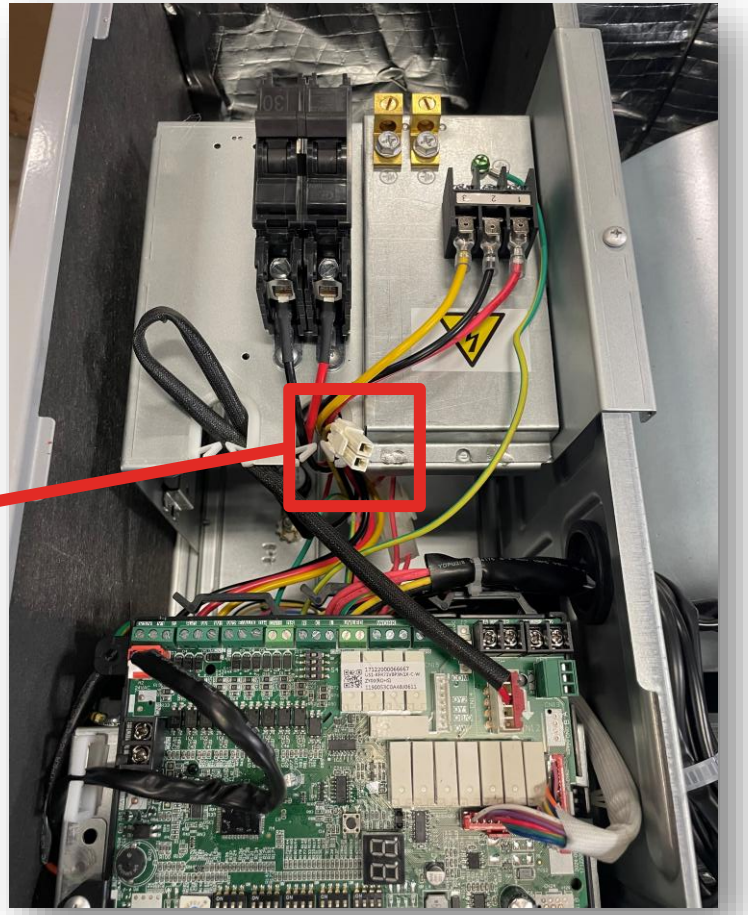


CROSSOVER SOLUTIONS

45MUAA 30-60K BLOWER IN-LINE FUSES

What's wrong with this?

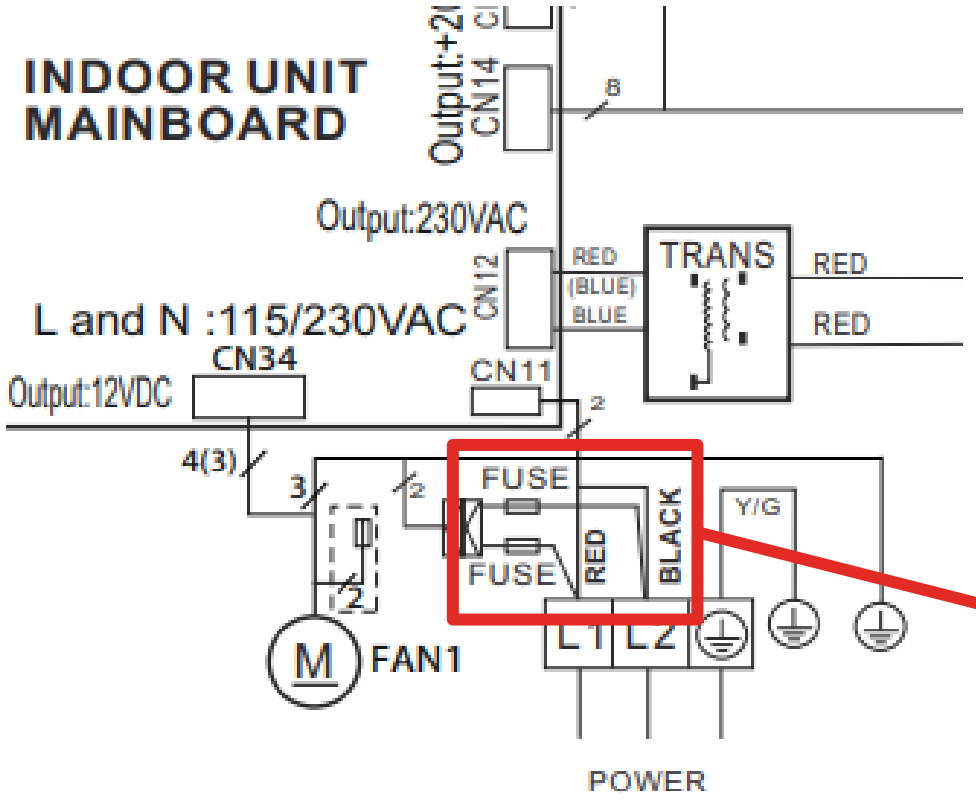


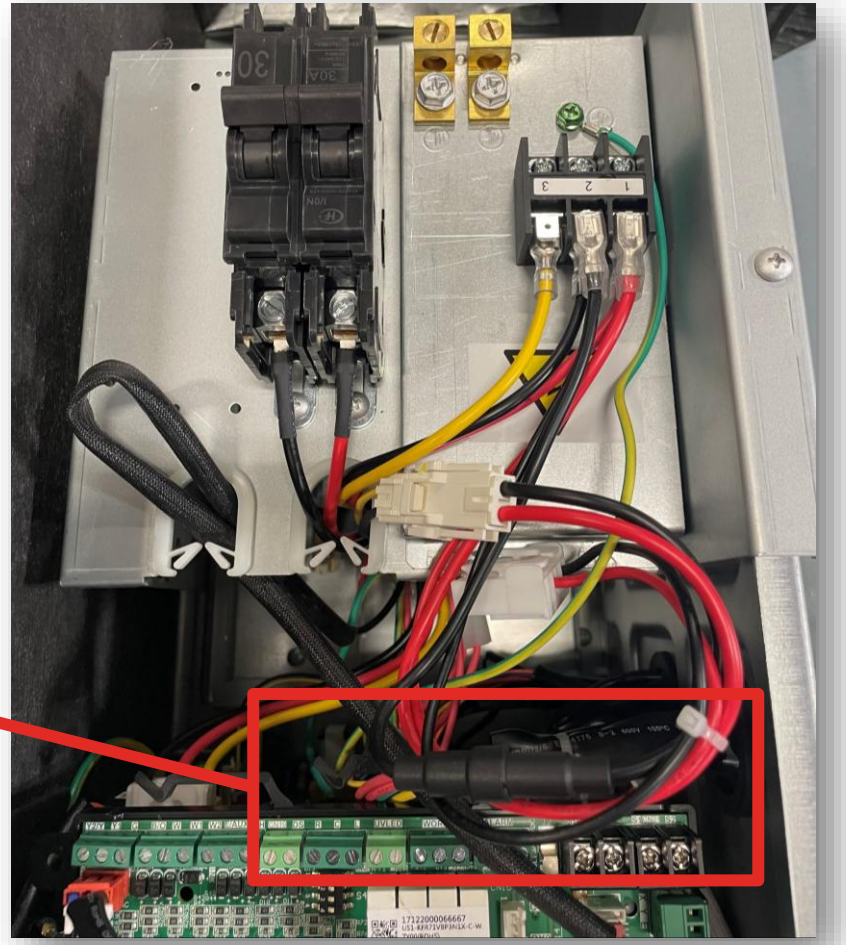


***When this unit starts up, it will throw an EHbA error code with any call for fan because of no feedback from the fan motor on CN34.**

CROSSOVER SOLUTIONS

45MUAA 30-60K BLOWER IN-LINE FUSES

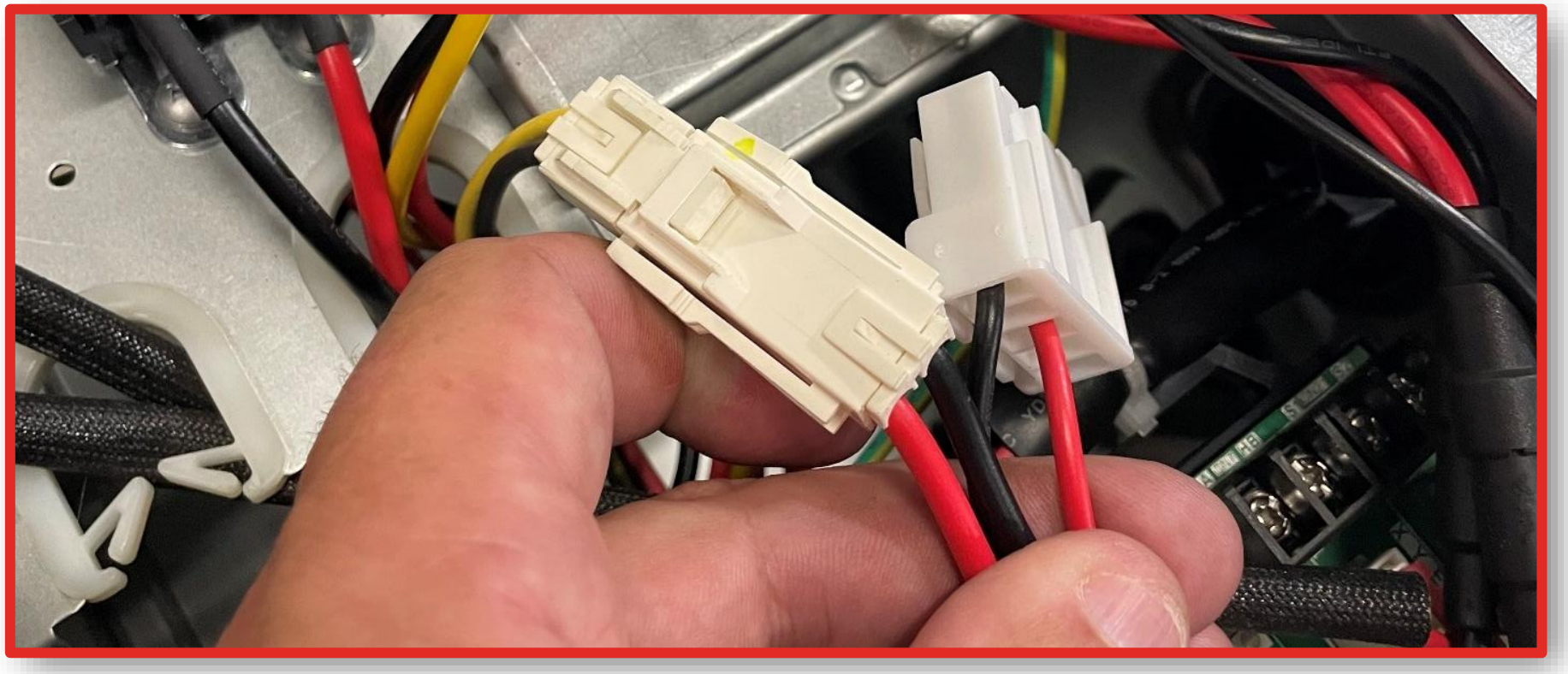




***When installing heat strips on any 30-60K, you must reuse the wire harness with the in-line fuses and blower plug from the original terminal block.**

CROSSOVER SOLUTIONS

45MUAA 30-60K BLOWER IN-LINE FUSES



*Now the blower has power and the EHbA code is cleared.
*Note: One plug for the main board CN11 will remain unused.

CROSSOVER SOLUTIONS

SCENARIO 1: 24V TSTAT AND RS485 COMMUNICATION

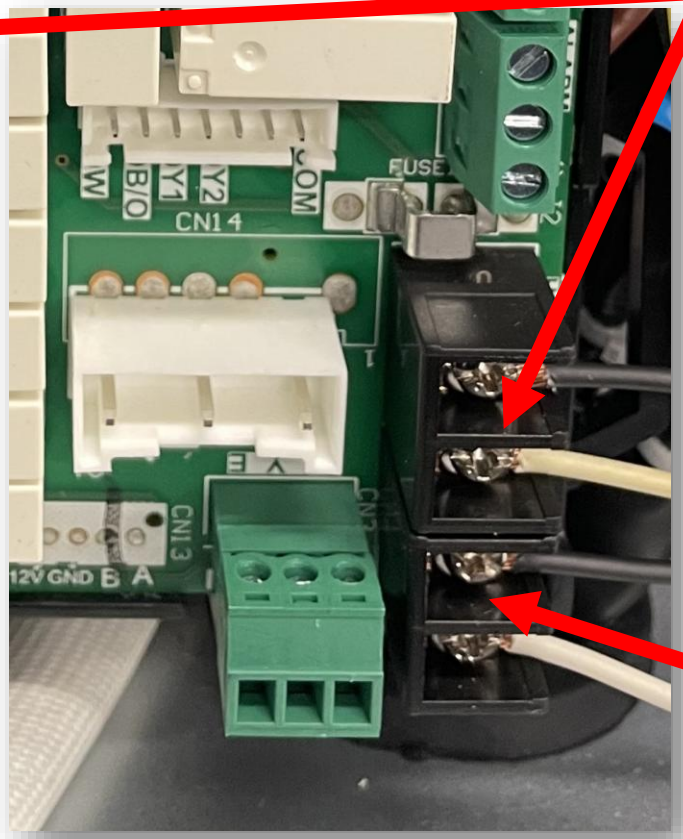
Wire TSTAT according to preference

- Can drive the heat pump as conventional using Y1 and Y2 for cool and W for heat
- Can be wired as up to a 4 heat/2 cool heat pump with electric heat & dehumidification
- Always setup a heat pump TSTAT to energize the reversing valve in heat (B)
- Y1 and Y2 are available to adjust the range of the capacity request algorithm
- S1/S2 allows full communication between the indoor and outdoor equipment
- S1/S2 RS485 are not polarity sensitive, however, treat them as if they are
- There will be no indoor fan operation during defrost (DLS cold blow prevention)
- **Defrost will not turn on heat strips**

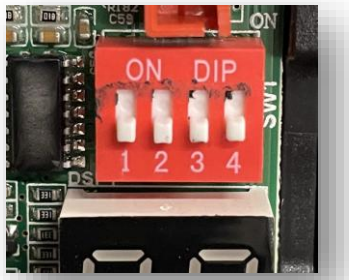
CROSSOVER SOLUTIONS

SCENARIO 2: 454B DLS CONTROL AND RS485 COMMUNICATION

Wire the wall control to Ha/Hb

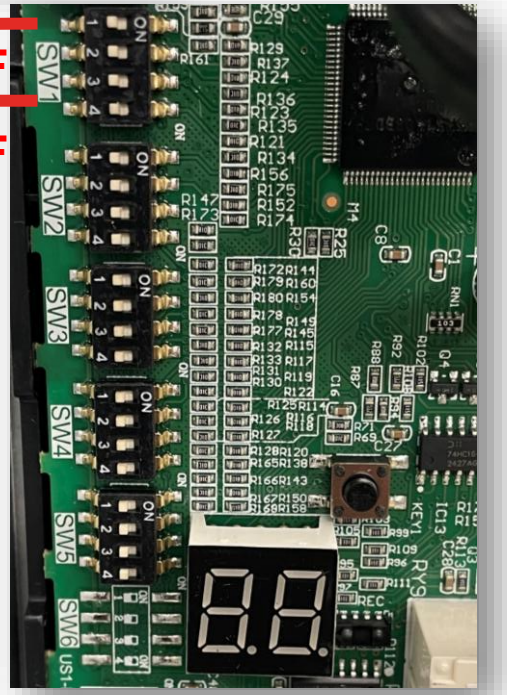


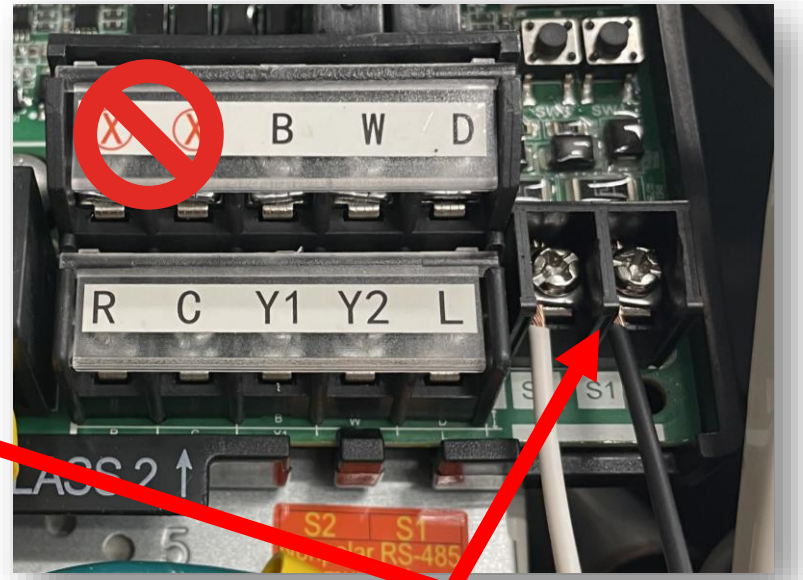
SW1-2 OFF



SW1-1 OFF

SW1-4 OFF





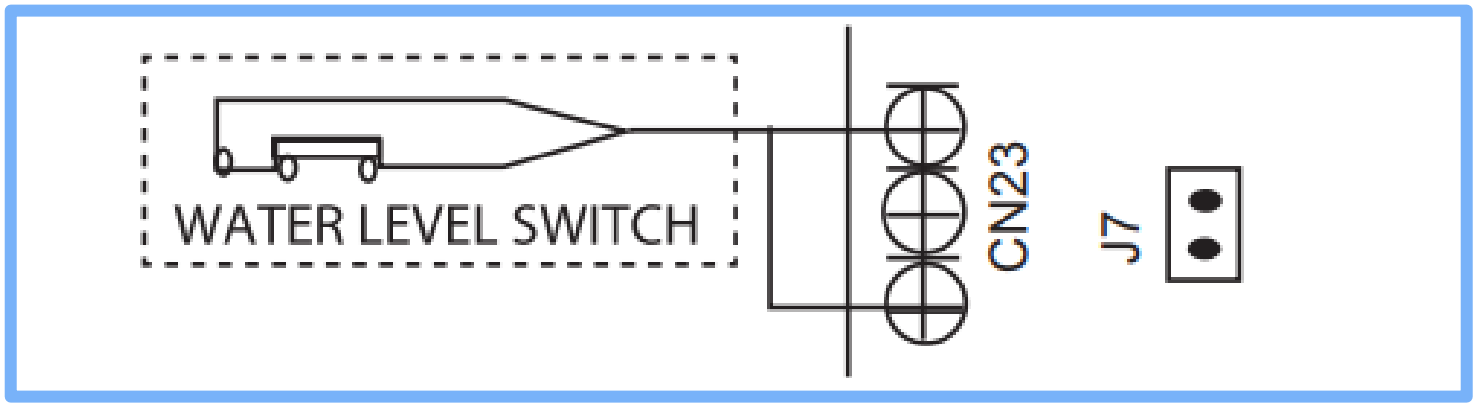
S1/S2 have moved

CROSSOVER SOLUTIONS

SCENARIO 2: 45MUAA CONDENSATE MANAGEMENT

WATER LEVEL SWITCH CN23 FOR SCENARIO 2 ONLY

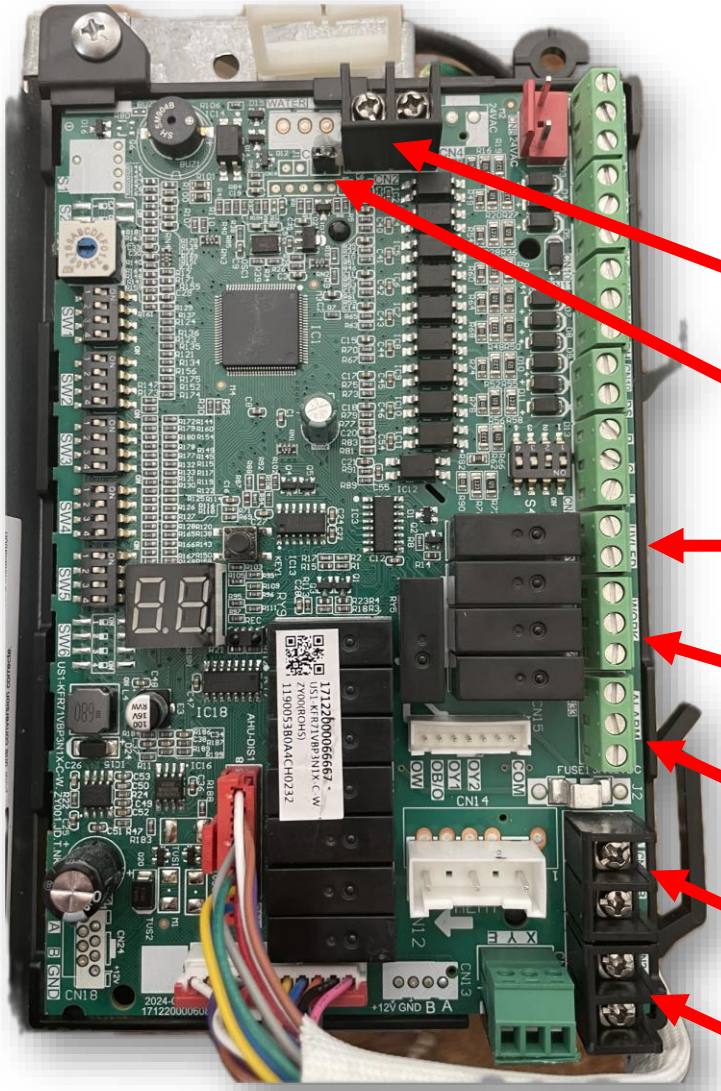
- To enable this switch, jumper **J7** must be removed
- A field supplied float switch can be directly connected to **CN23** (Main Power Board)
- Closed contacts = normal
  Open contacts = overflow
- When an overflow condition occurs, a signal is sent to the system to turn it off
- Alarm **EH0E** appears



SCENARIO 1 OR 3: BREAK R TO THE TSTAT AFTER AN IN-LINE FUSE HAS BEEN ADDED

CROSSOVER SOLUTIONS

45MUAA GENERAL WIRING AND CN TERMINAL CONNECTORS



CN23 WATER LEVEL

J7 JUMPER

CN2 ON/OFF

JR1 JUMPER

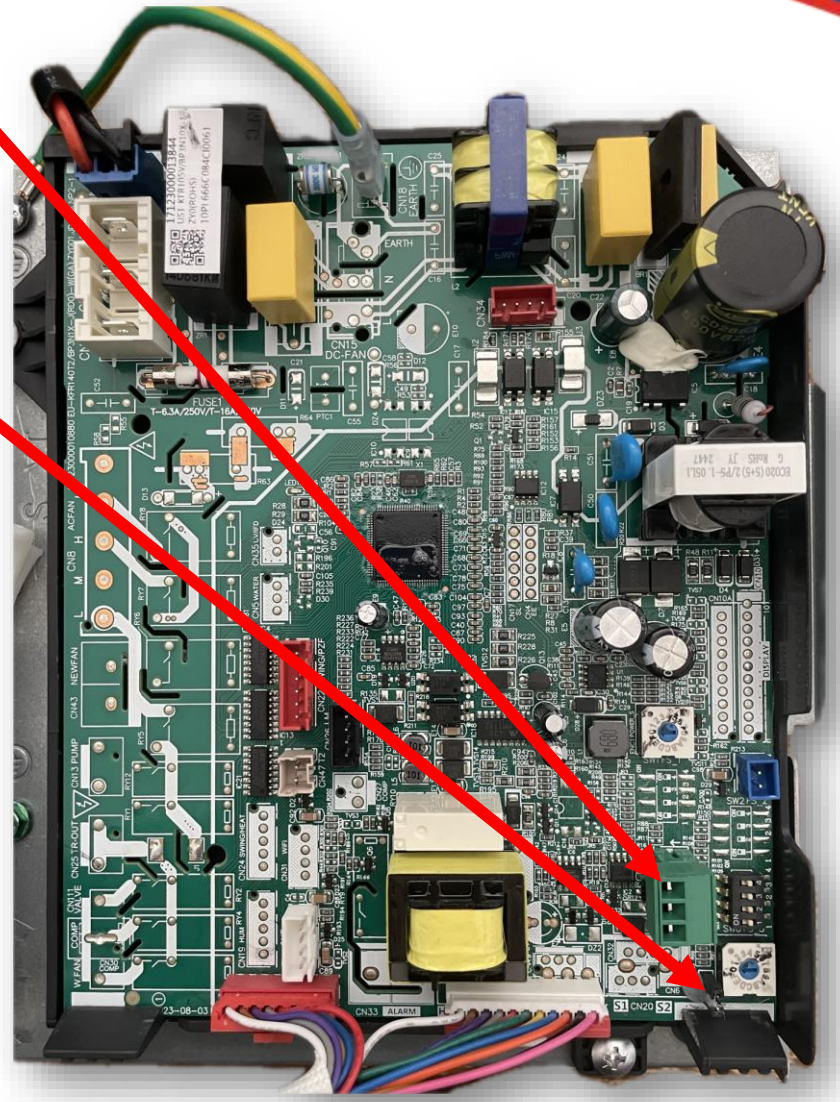
CN43 UV LED

CN23 WORK

CN33 ALARM

CN7 HA/HB

CN3 S1/S2



CROSSOVER SOLUTIONS

SCENARIO 2: DO NOT CONNECT 24 VOLT WIRING

- Uses 24VAC wiring in scenarios 1 and 3 only
- Never wire a native controller and a 24V TSTAT at the same time

CROSSOVER SOLUTIONS

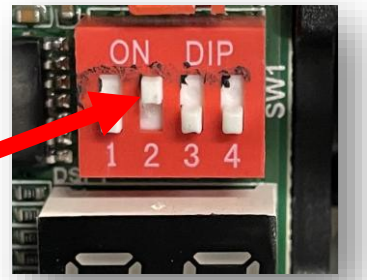
SCENARIO 3: 454B 24VAC TO TSTAT AND OUTDOOR UNIT

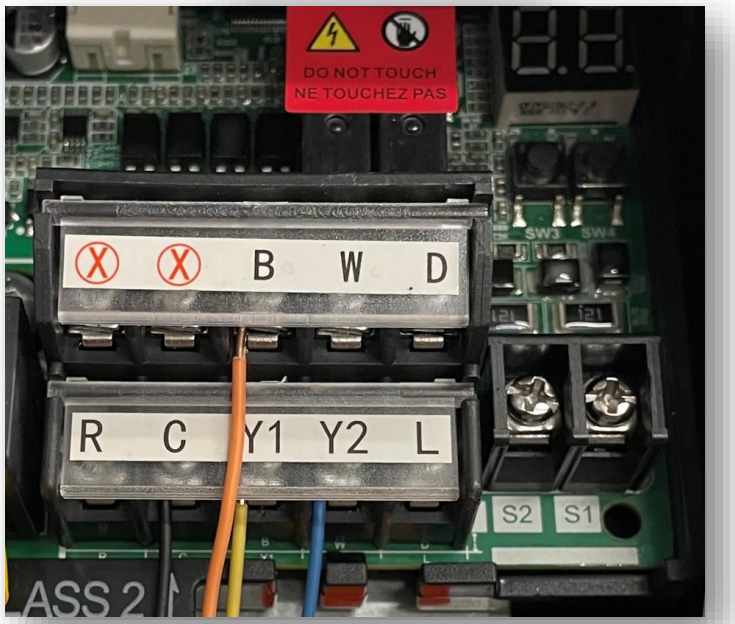
SW1-1 ON

SW1-4 ON

Add an in-line fuse on R!

SW1-2 ON

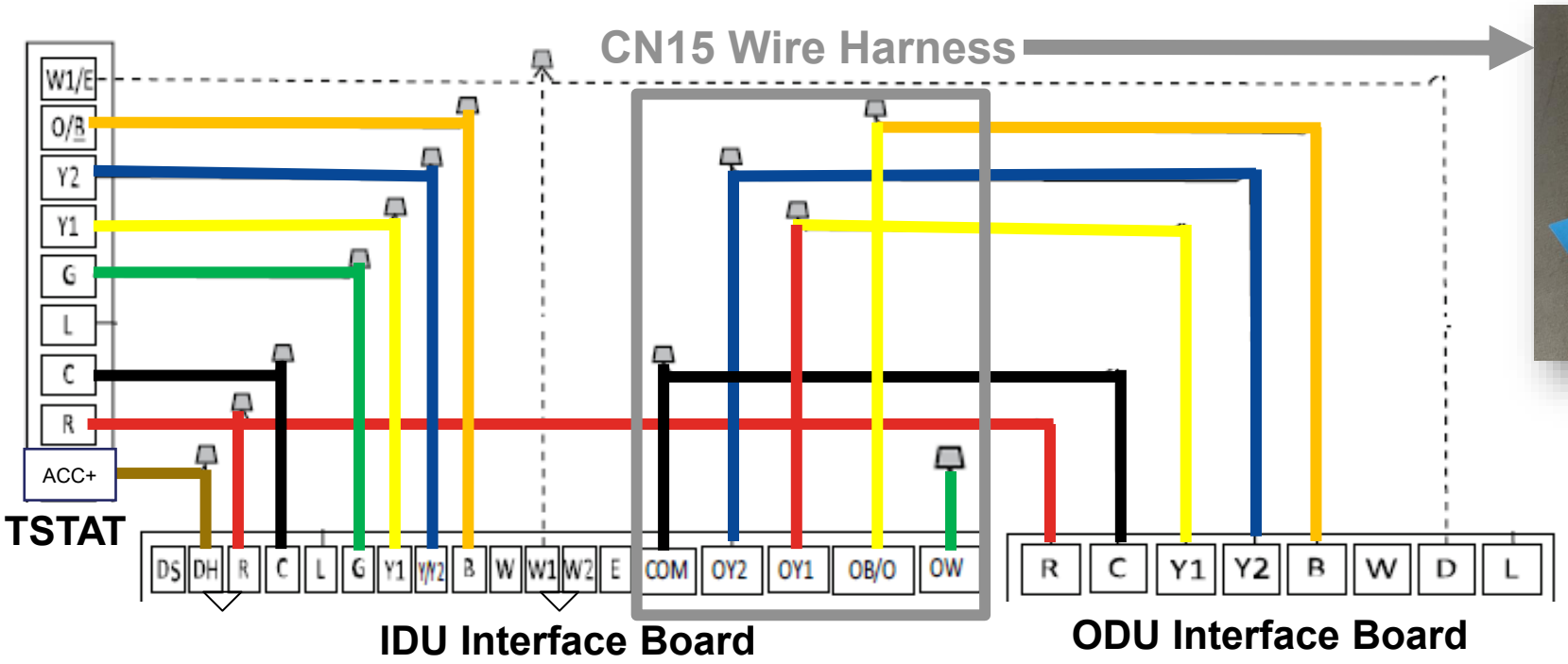


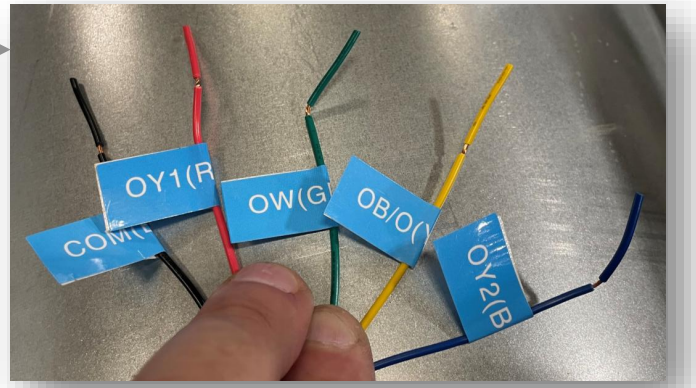


R is only needed with heat strips

CROSSOVER SOLUTIONS

SCENARIO 3: 454B 24VAC WIRING FOR 3H/2C HEAT PUMP WITH AUX HEAT STRIPS AND DEHUMIDIFICATION





- **W** is not used in heat pump configuration
- **E/AUX** is not used except for TSTATs with a separate tap
- **L** is only used if you have a TSTAT with an alarm light
- **R** os only necessary outside if you have heat strips and use **D**

CROSSOVER SOLUTIONS

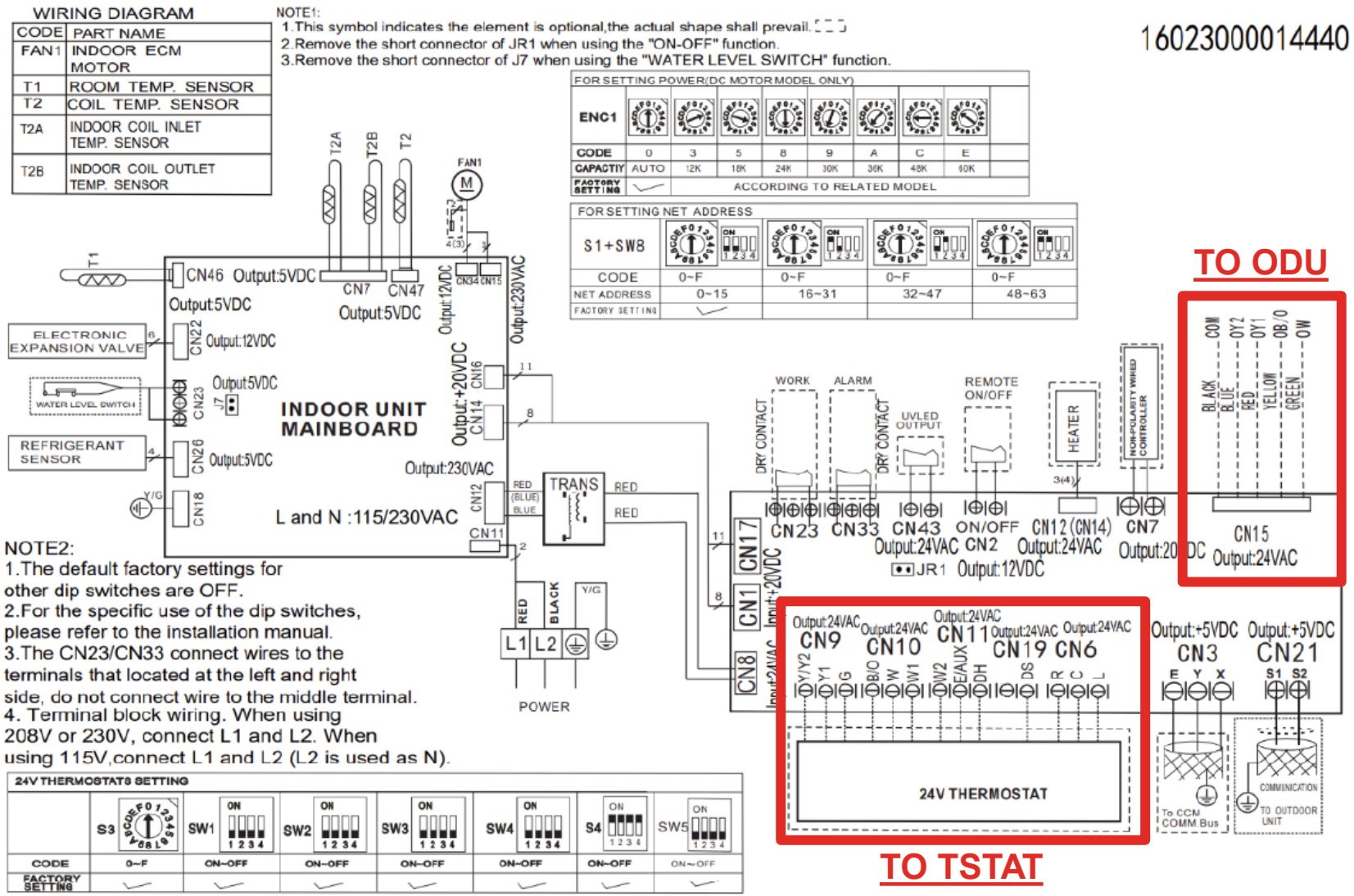
SCENARIO 3: 24VAC TO TSTAT AND OUTDOOR WIRING

Wire TSTAT according to preference

- Can be wired as conventional using Y1/Y2 for cool and W for heat pump heat
- Can be wired as up to a 4 heat/2 cool heat pump with electric heat & dehumidification
- Always setup a heat pump TSTAT to energize the reversing valve in heat (B)
- Y1 and Y2 are available to adjust the range of the capacity request algorithm
- There can be up to 3 minutes of cold blow during defrost
- If heat strips are used, wire 24VAC from D to W1/W2

CROSSOVER SOLUTIONS

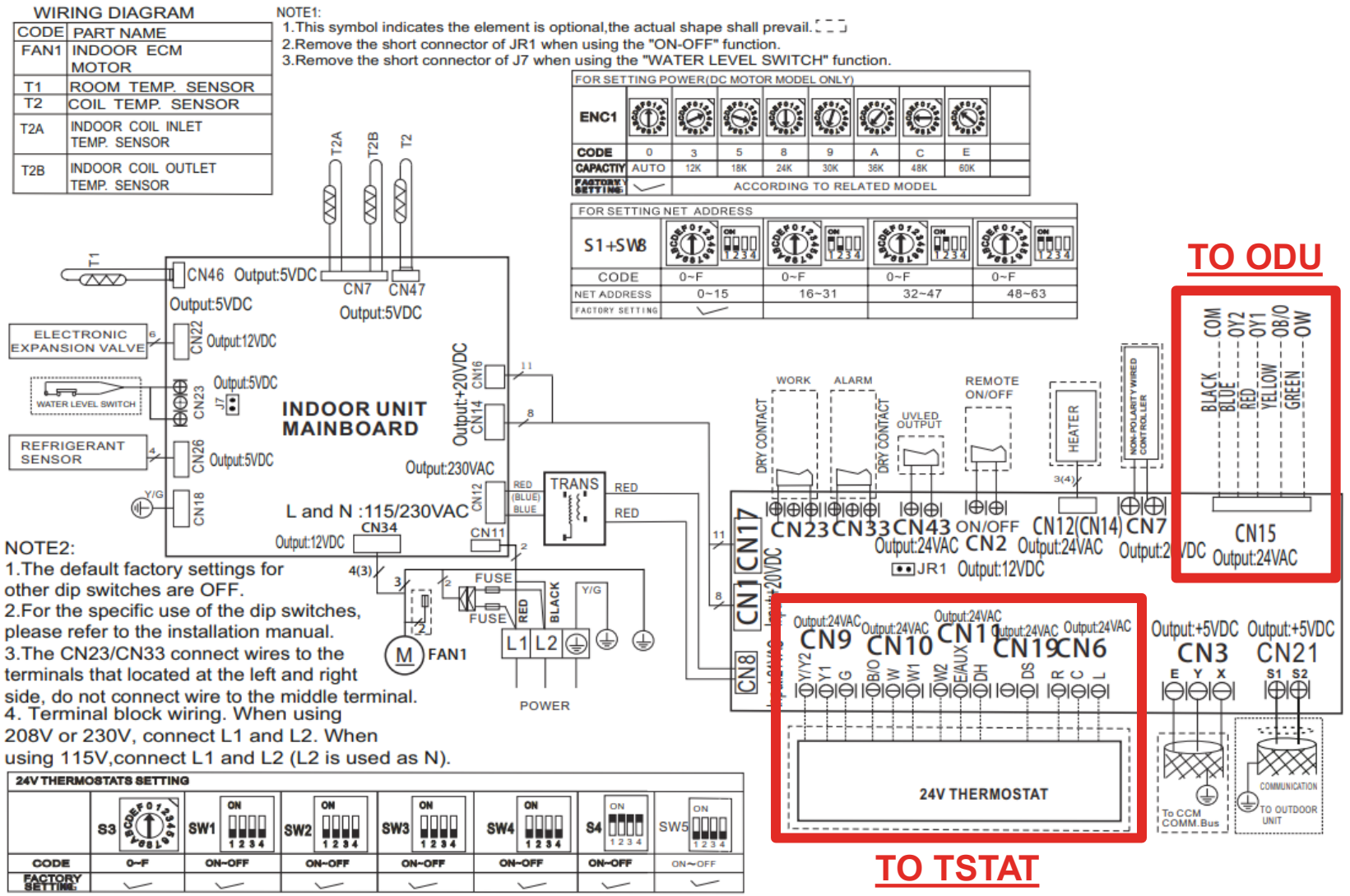
45MUAA WIRING DIAGRAM 18-24K



***Crossover dissipation breaks call for heat or cool and runs fan on turbo.**

CROSSOVER SOLUTIONS

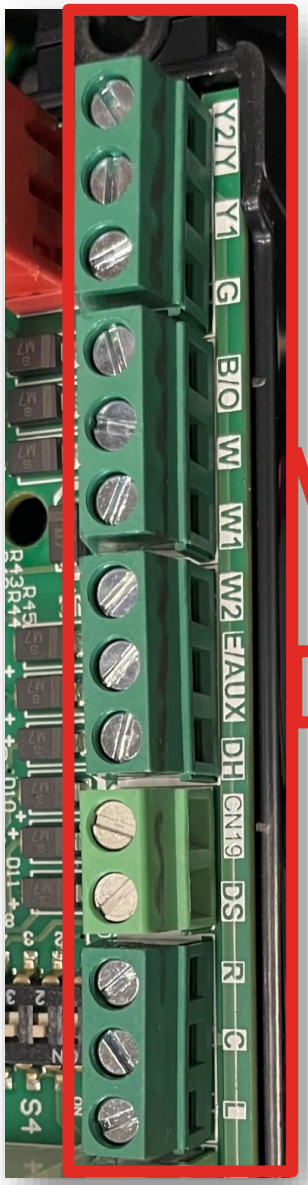
45MUAA WIRING DIAGRAM 30-60K



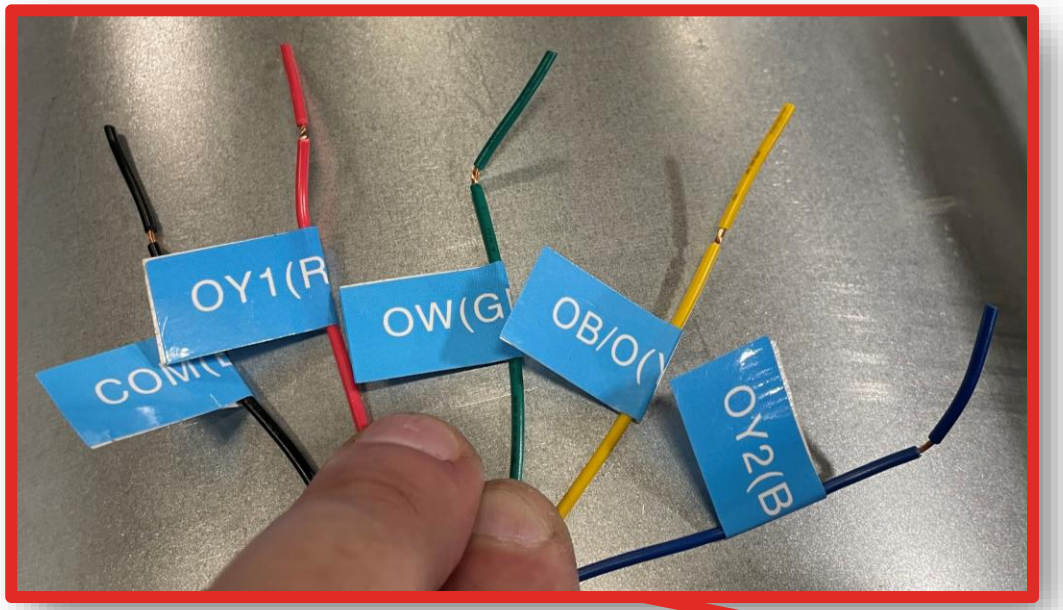
***Crossover dissipation breaks call for heat or cool and runs fan on turbo.**

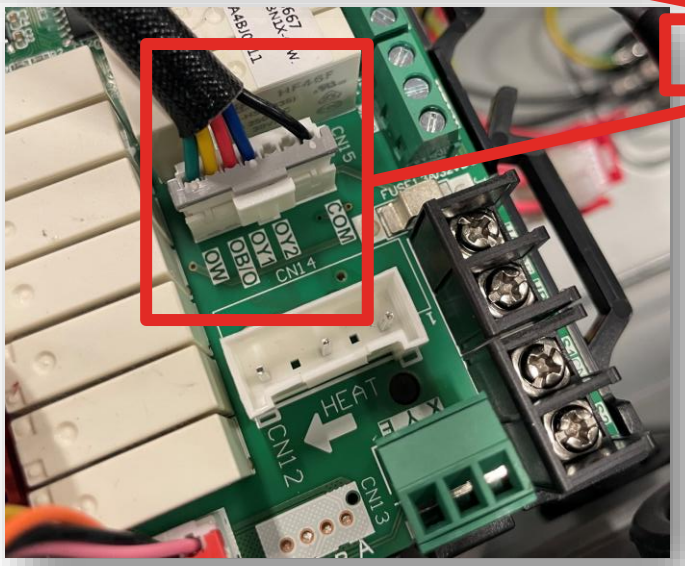
CROSSOVER SOLUTIONS

45MUAA 24V TSTAT AND ODU WIRING



TO TSTAT





TO ODU

CROSSOVER SOLUTIONS

45MUAA & 45MUHA DIP SWITCH SETTINGS

NO.	DIAL CODE	CONTROL SCENARIO	FUNCTION	ON	OFF	NOTE
1	SW1-2	1,2,3	Anti-cold blow protection option	NO	[Default] YES	
2	SW1-3	1,2,3	Single cooling / heating and cooling options	Cooling	[Default] Cooling & Heating	
3	SW2-1	1	Compressor Running (demand working with heat pump+ Electric heat)	Compressor slower speed	[Default] Faster Compressor	Only affects compressor and W1
4	SW2-1	2	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]	
5	SW2-2	2	Electric heat on delay	YES	[Default] NO	
6	SW2-3	2	Electric auxiliary heating delay to start time	30 minutes	[Default] 15 minutes	Based on SW2-2 is ON
7	SW2-4	1	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.	

CROSSOVER SOLUTIONS

45MUAA & 45MUHA DIP SWITCH SETTINGS

NO.	DIAL CODE	CONTROL SCENARIO	FUNCTION	ON	OFF	NOTE
8	SW2-4	2	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.	SW2-4 and S3 need to working together
9	Rotary Switch S3	1,2	Set outdoor temperature Limitation (for auxiliary heating or compressor)	Table A		
10	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	
11	SW3-2	1	Cooling and heating Y/Y2 temperature differential adjustment.	Compressor slower speed	[Default] Faster Compressor	Only affects compressor

CROSSOVER SOLUTIONS

45MUAA & 45MUHA DIP SWITCH SETTINGS

NO.	DIAL CODE	CONTROL SCENARIO	FUNCTION	ON	OFF	NOTE
12	SW3-3	1	Compressor Running (demand working with heat pump+ Electric heat)	Compressor slower speed	[Default] Faster Compressor	Only affects compressor and W2
13	SW3-3	2	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)	
14	SW3-4	1,3	Fan speed of cooling mode when 24V Thermostat is applied for.	Turbo	High	
15	SW4-1 SW4-2 SW4-3	1,2,3	Electric heat nominal CFM adjustment	Available settings are 000/001/010/011. Each digit corresponds an individual switch position. For example [SW4-1 OFF, SW4-2 ON, SW4 -3 OFF] = 010		
16	SW4-4	2	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.

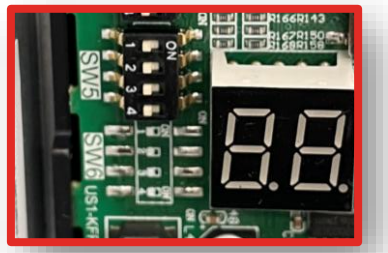
S3	S3 (°F)	S3 (°C)
0	OFF	OFF
1	-22	-30
2	-18	-28
3	-15	-26
4	-11	-24
5	-8	-22
6	-4	-20
7	3	-16

S3	S3 (°F)	S3 (°C)
8	10	-12
9	18	-8
A	25	-4
B	32	0
C	36	2
D	39	4
E	43	6
F	46	8

SW2-4 (scenario 2 only)
OFF = electric heater during aux heat will not operate above temperature set by S3 dial
ON = compressor during aux heat will not operate below temperature set by S3 dial

CROSSOVER SOLUTIONS
45MUAA / 45MUHA ADDED DIP SWITCHES

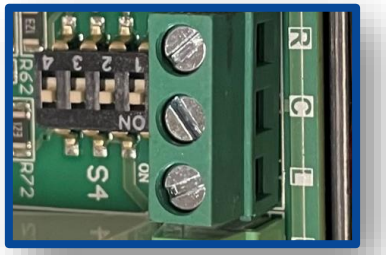
				ON	OFF
17	S4-4	1,3	Default ON	[Default] For single stage supplemental heat,W1 and W2 are connected	For dual stage supplemental heat, W1 and W2 are controlled independently.
18	S4-2	1,3	DH function selection	[Default] Dehumidification control not available	Dehumidification feature is enabled through thermostat
19	SW5-3	1,2,3	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	1,3	R output selection	R stop output 24V when refrigerant sensor fault or R454B refrigerant leakage be detected	[default] R keep output 24V even when refrigerant sensor fault or R454B refrigerant leakage be detected



- SW5-1 NA
- SW5-2 NA
- SW5-3 Sets the alarm relay
- SW5-4 Sets the R output

Mingledorff's INC

- S4-1 NA
- S4-2 ON: Jumps R to DH
- S4-3 NA
- S4-4 ON: Jumps W1 & W2



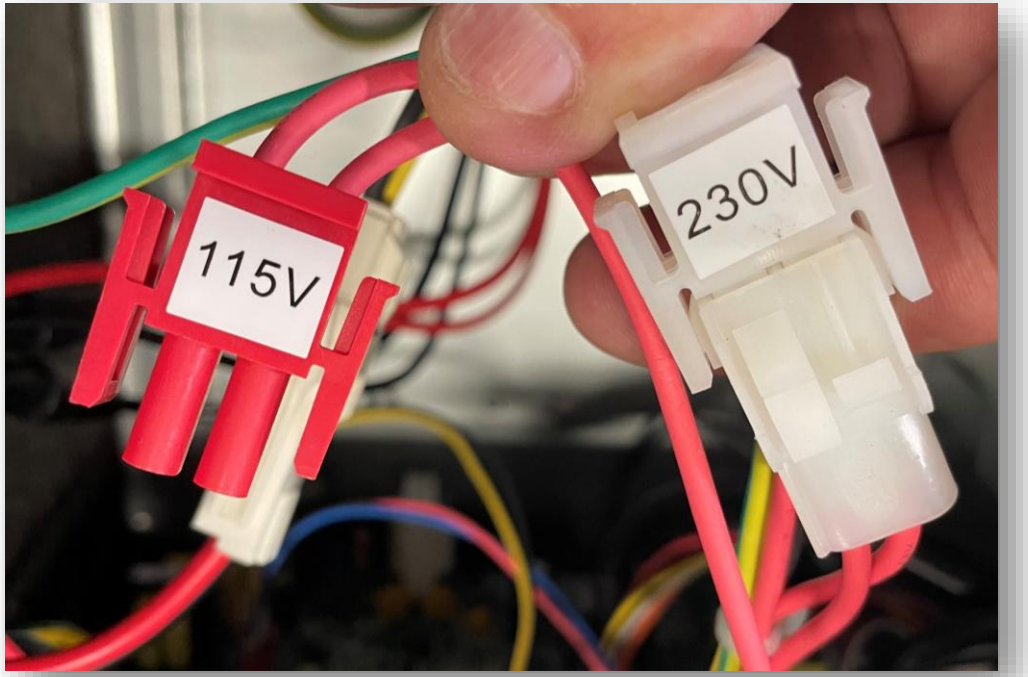
Crossover Solutions

45MUAA 230V to 115V Conversion

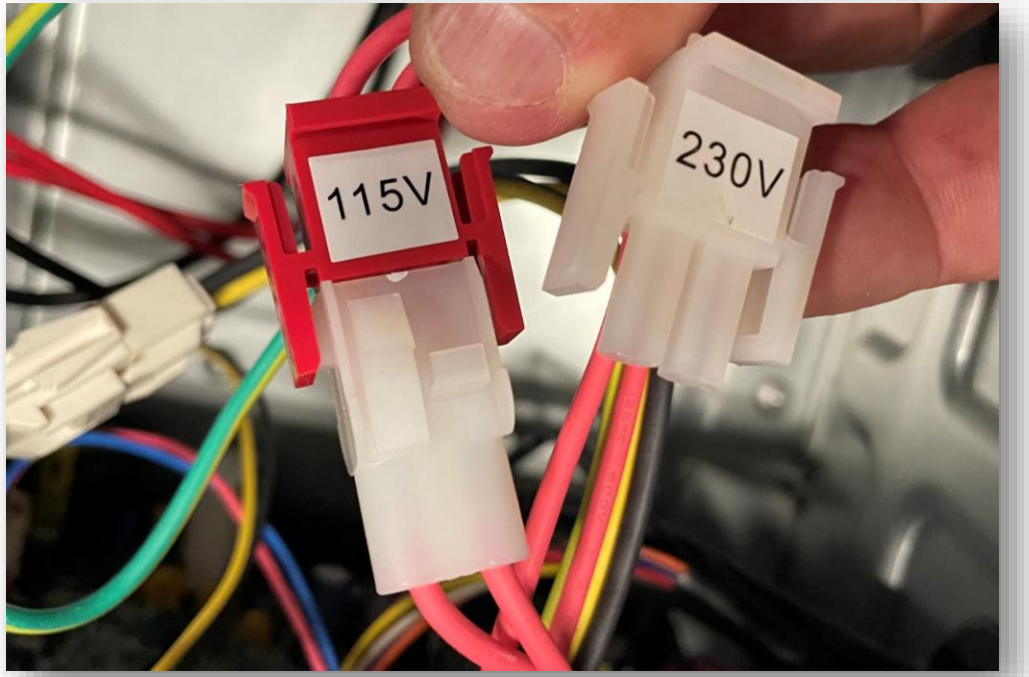
CROSSOVER SOLUTIONS
45MUAA 230V TO 115V CONVERSION

1. **Convert blower motor voltage**

WARNING: DAMAGE TO THE MOTOR WILL OCCUR ON INCORRECT VOLTAGE SETUP!



Default is 230V



Swap to the 115V plug

Mingledorff's INC

CROSSOVER SOLUTIONS
45MUAA 230V TO 115V CONVERSION

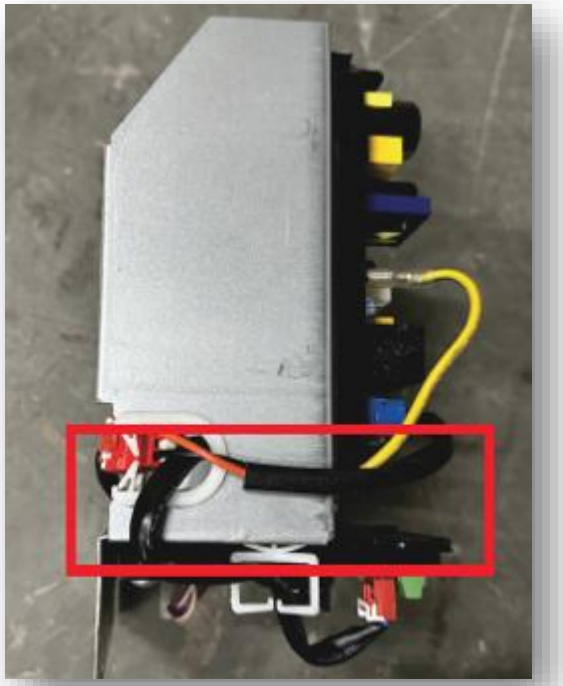
2. Remove 2 screws to access the transformer

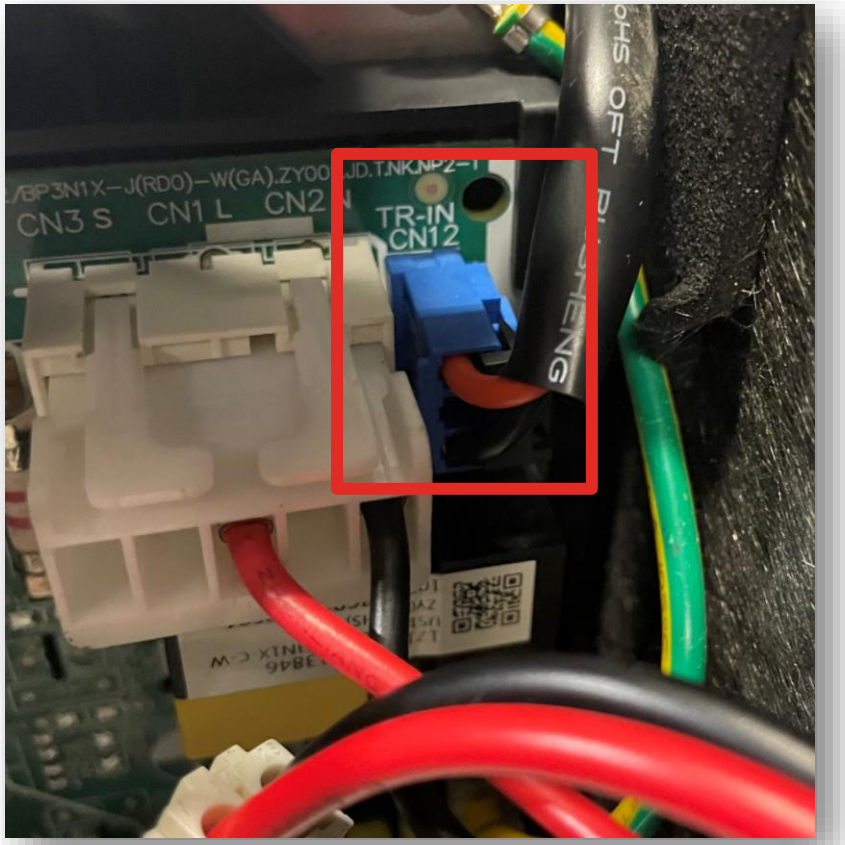
Mingledorff's INC

CROSSOVER SOLUTIONS
45MUAA 230V TO 115V CONVERSION

3. Disconnect and remove the 230V transformer harness

1st at the transformer

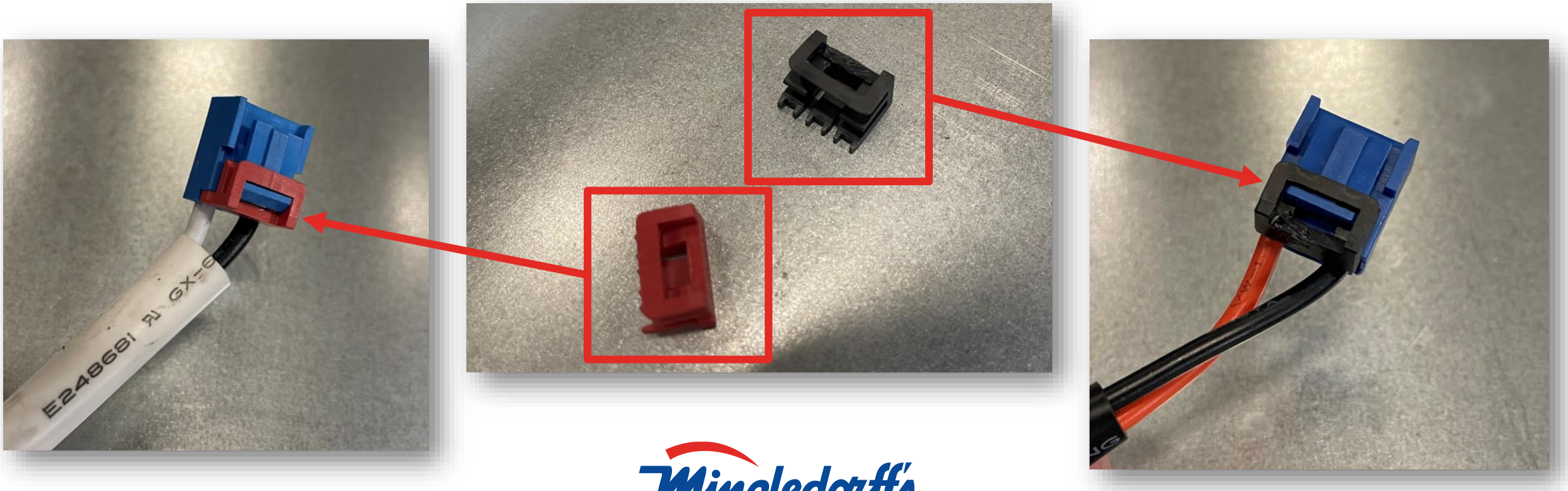




2nd at TR-IN CN12

CROSSOVER SOLUTIONS
45MUAA 230V TO 115V CONVERSION

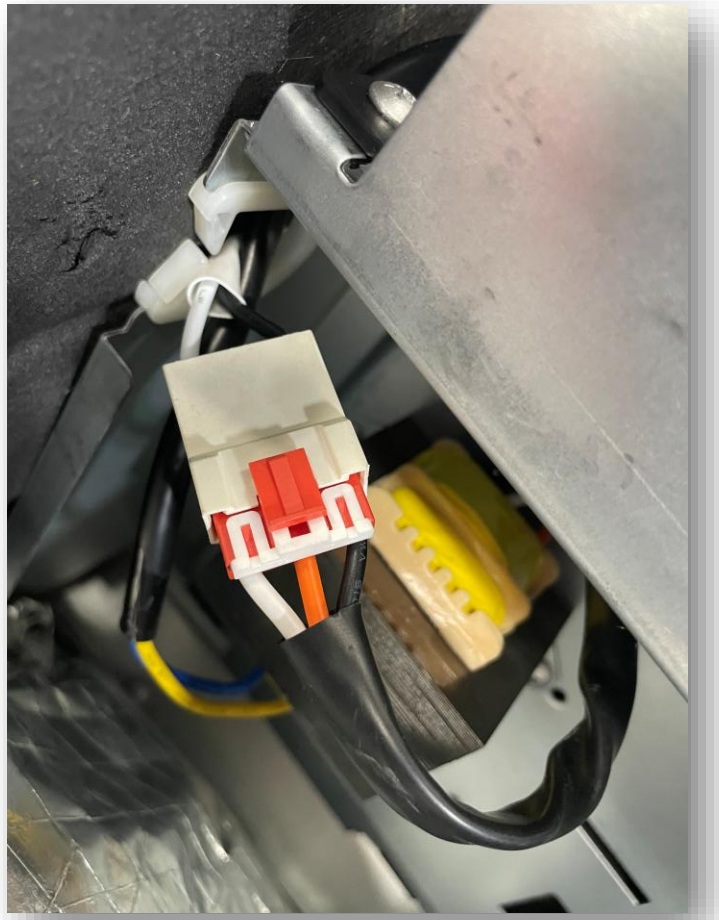
4. Remove the locks before disconnecting from CN12 on the board



Mingledorff's INC

CROSSOVER SOLUTIONS
45MUAA 230V TO 115V CONVERSION

5. Install and connect the 115V transformer harness



6. Put the 2 screws back in

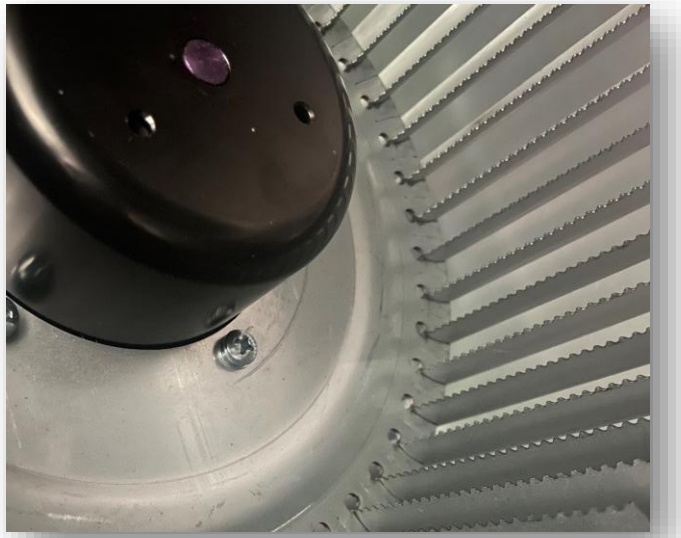
Mingledorff's INC

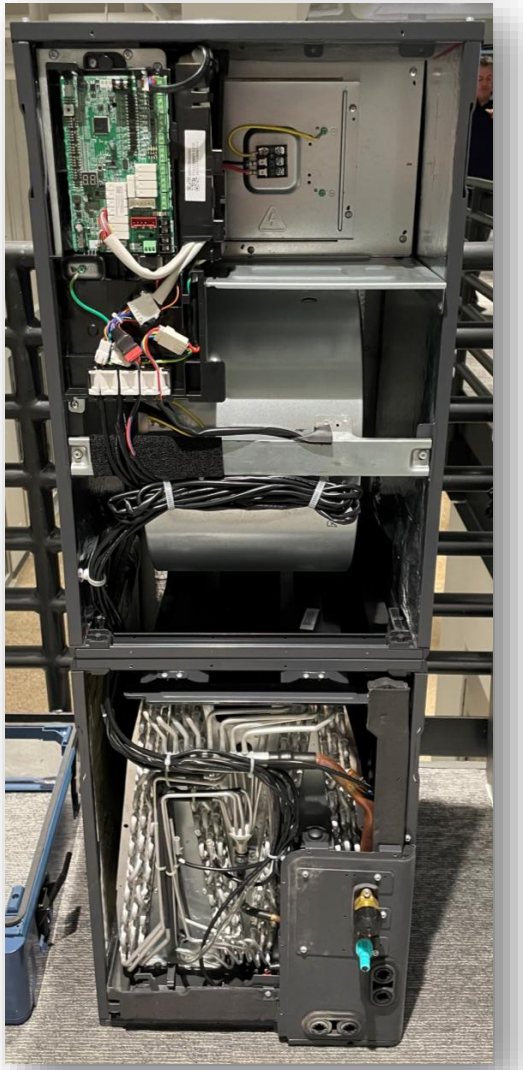
115V conversion complete!

CROSSOVER SOLUTIONS

45MUHA 230V/115V BOARD AUTO DETECTION

No conversion necessary!





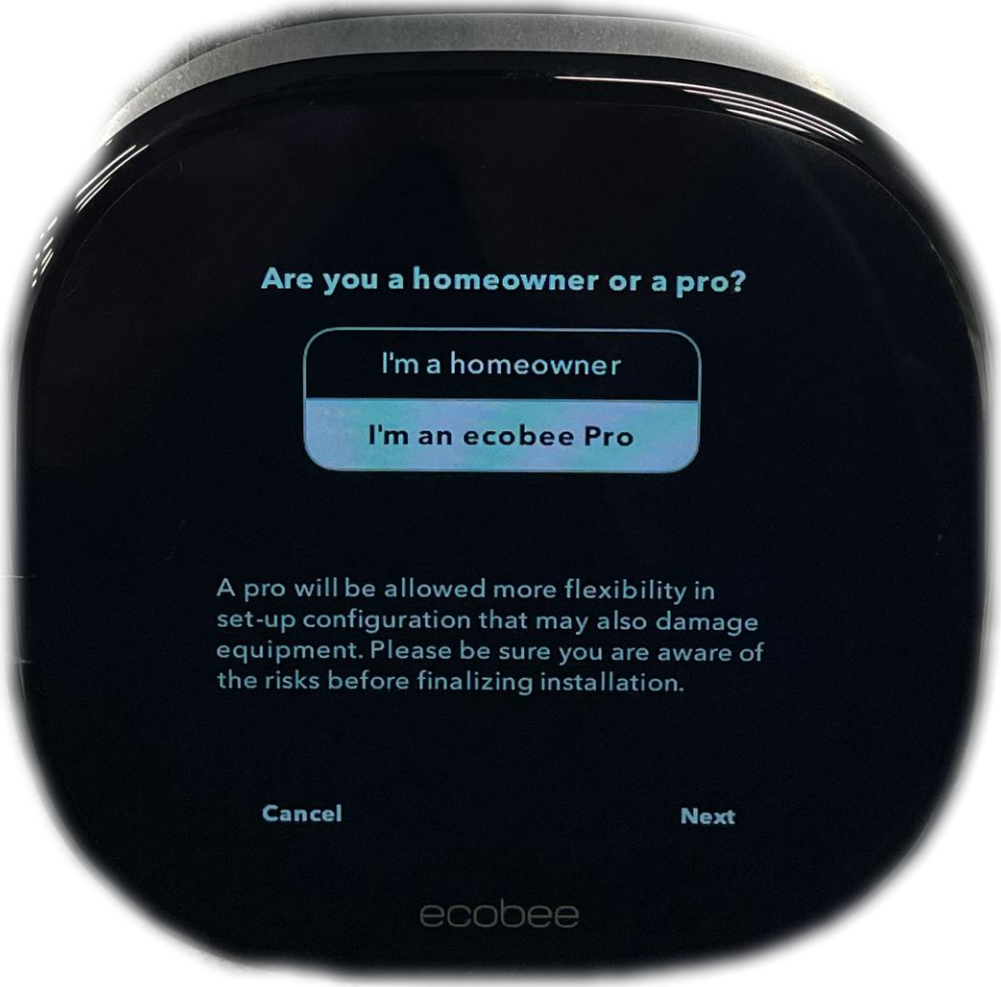
Crossover Solutions

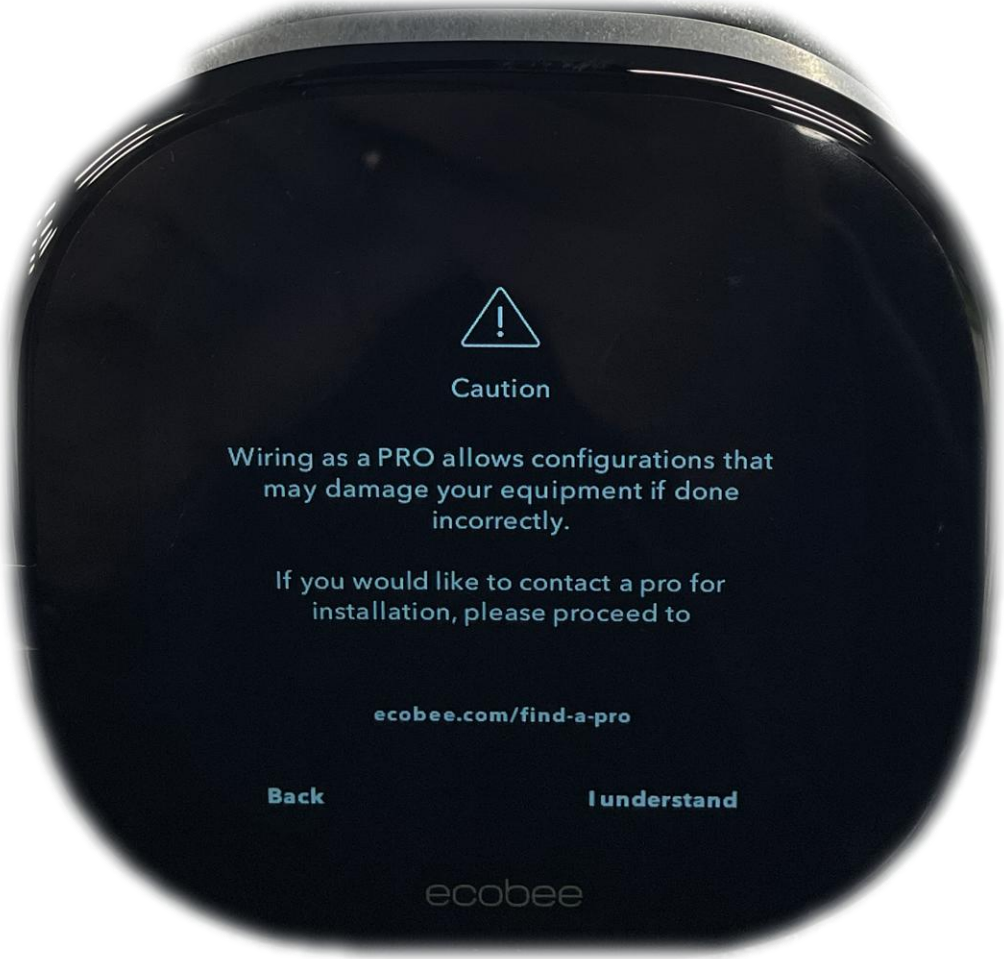
Ecobee Premium Setup

If an error was made during the wiring and configuration phase, no worries you can easily re-run the Equipment setup by tapping MENU → SETTINGS → INSTALLATION SETTINGS → EQUIPMENT → RECONFIGURE EQUIPMENT.

ECOBEE PREMIUM SETUP AT FIRST POWER UP

SELECT YOU'RE AN ECOBEE PRO & I UNDERSTAND!



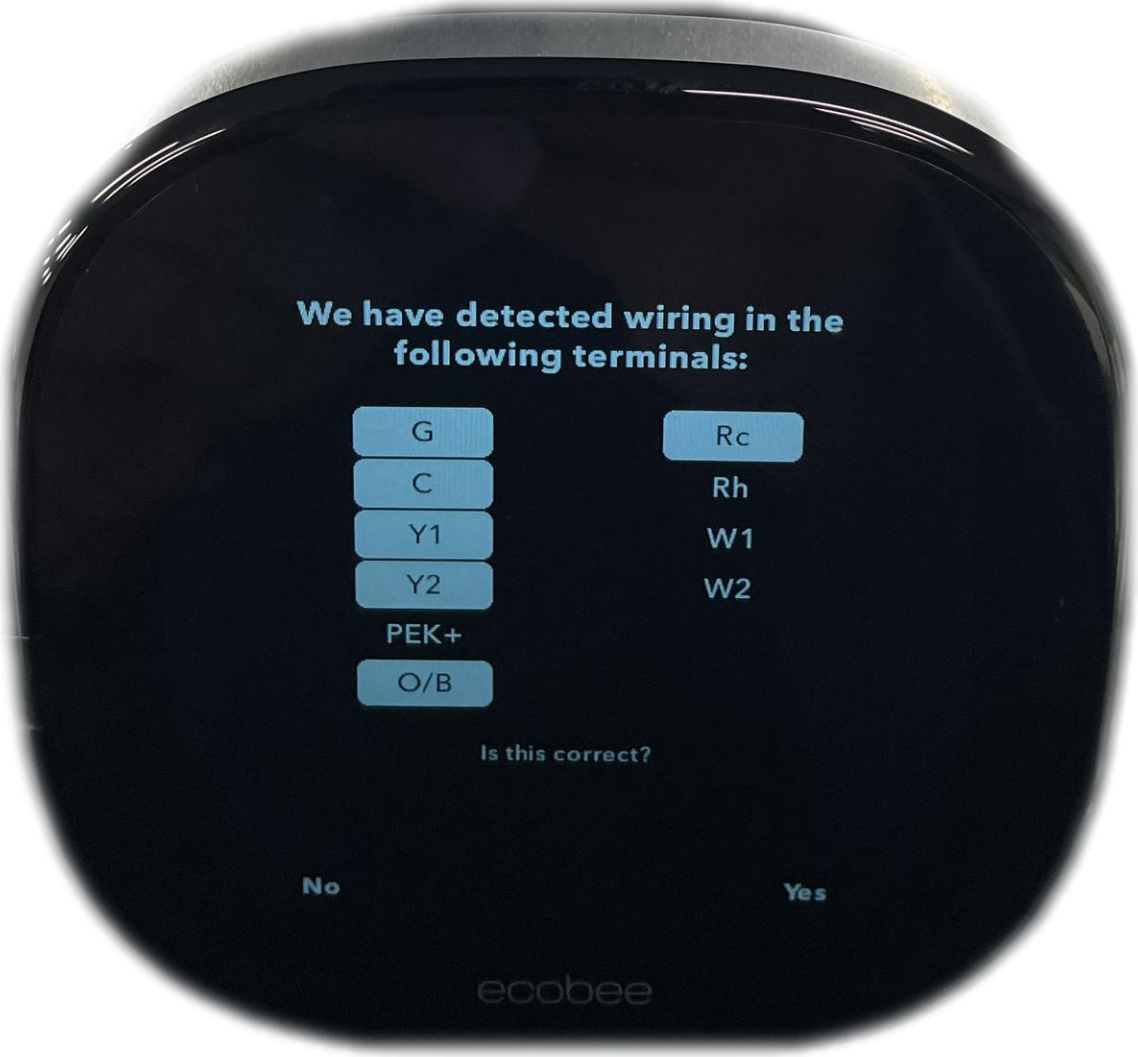


ECOBEE PREMIUM SETUP AT FIRST POWER UP

SELECT ONLY RC IS CONNECTED & SINGLE OR VARIABLE SPEED FAN

ECOBEE PREMIUM SETUP AT FIRST POWER UP

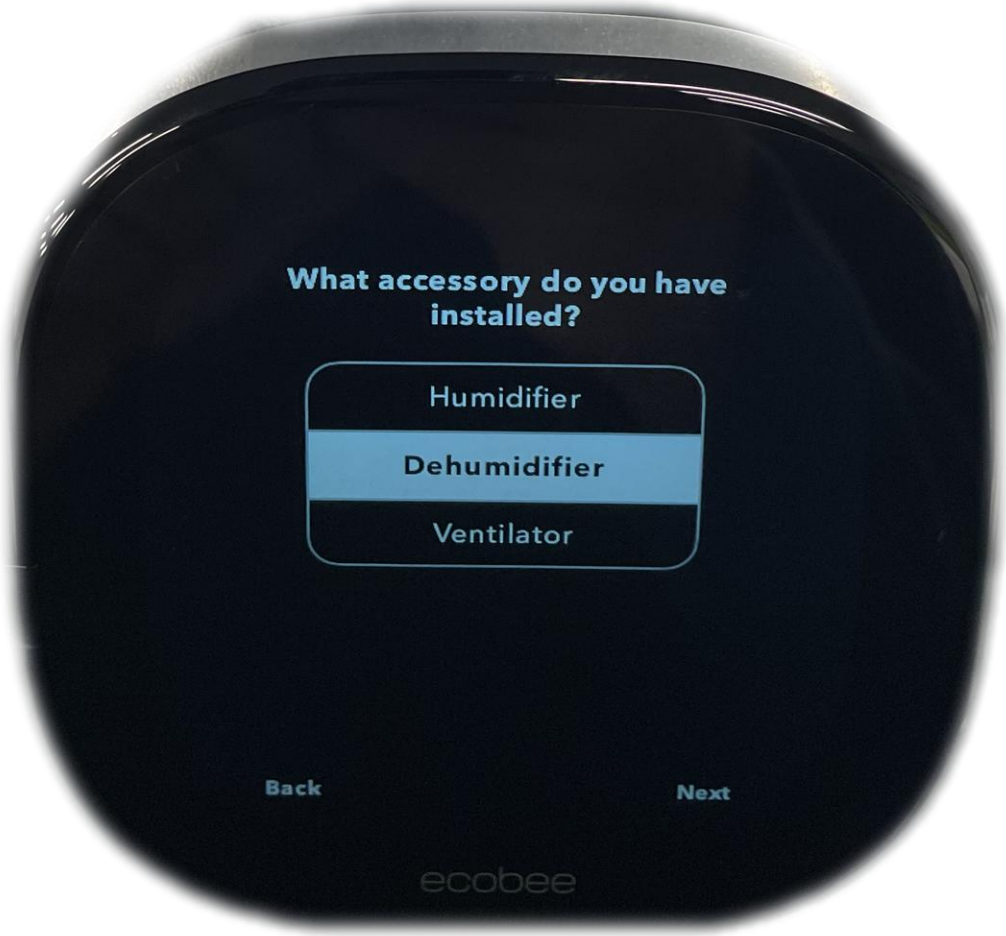
VERIFY THE ECOBEE SEES THE CORRECT WIRING



- G for fan circuit
- C for the common circuit
- Y1 for low range compressor
- Y2 for high range compressor
- O/B for reversing valve
- Rc for 24 VAC power
- W1 for first stage heat strips
- W2 for second stage heat strips

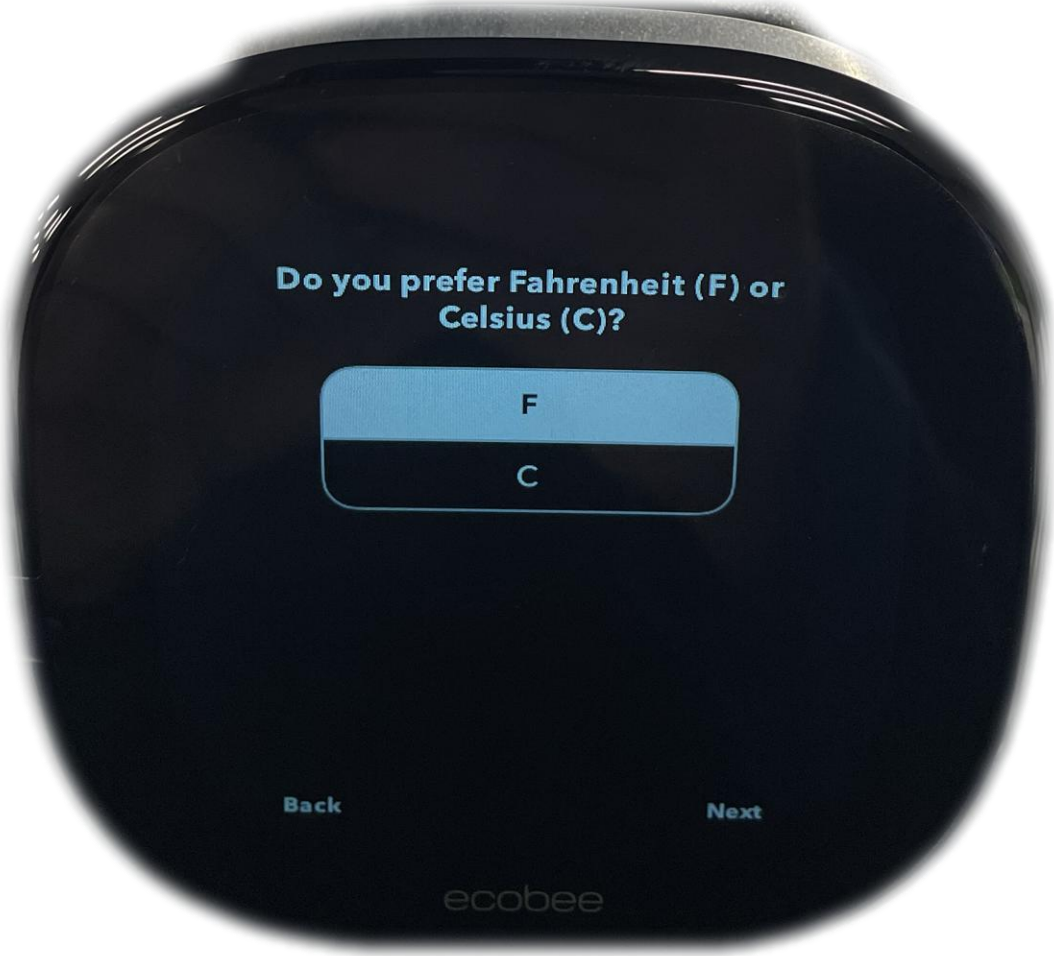
ECOBEE PREMIUM SETUP AT FIRST POWER UP

ACCESSORY SETUP: SELECT 1 ACCESSORY & DEHUMIDIFIER



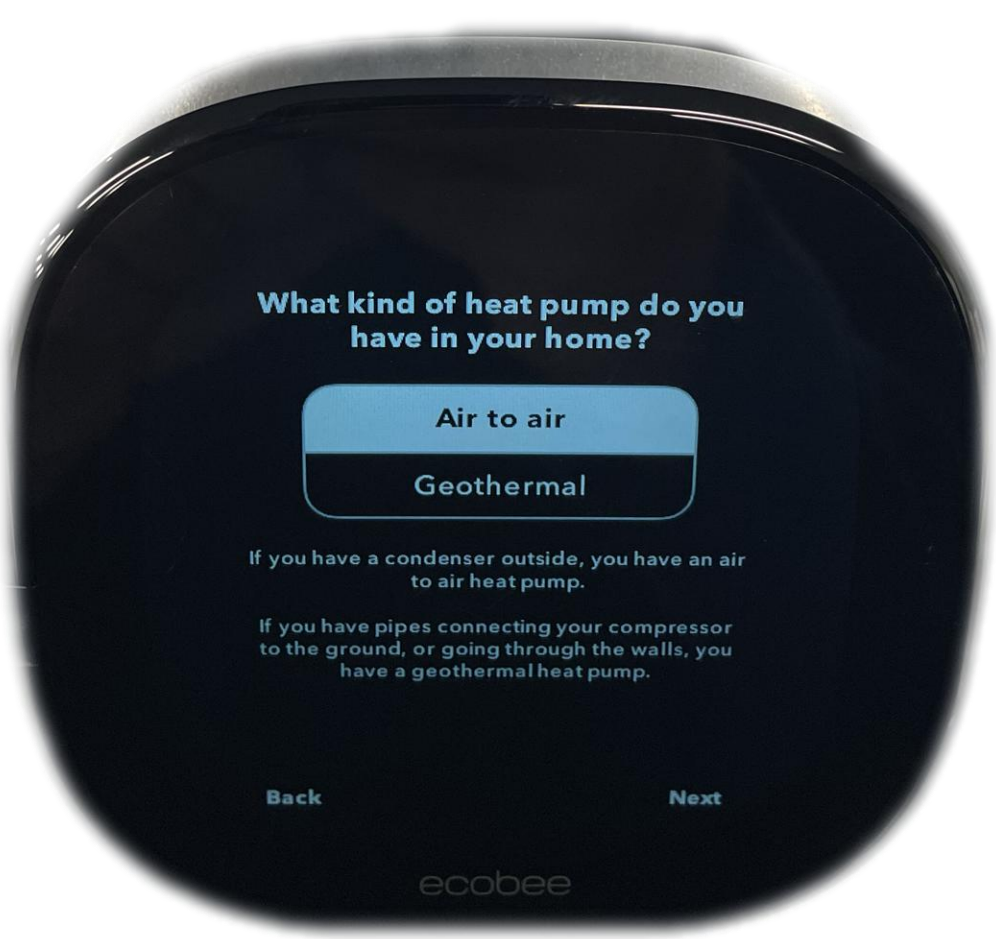
ECOBEE PREMIUM SETUP AT FIRST POWER UP

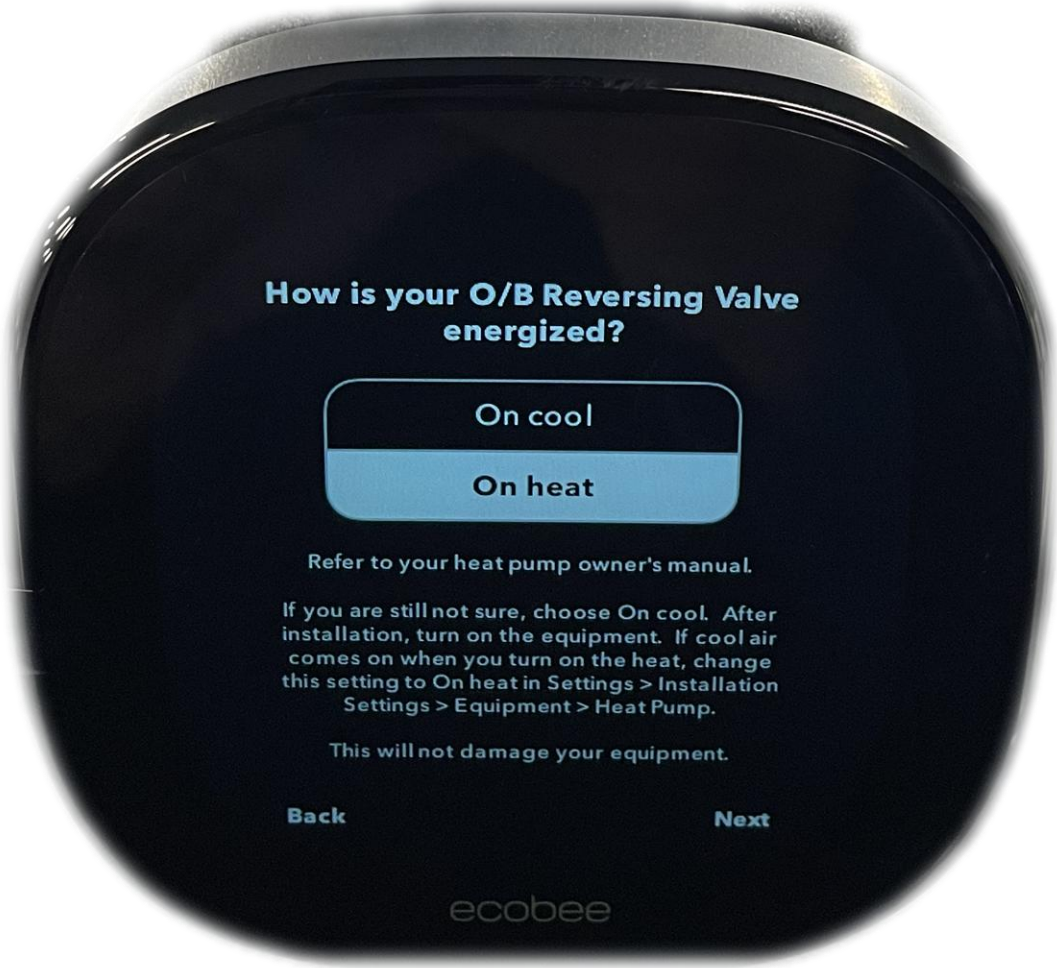
SELECT 1 WIRE (ACC+) & FAHRENHEIT (F)



ECOBEE PREMIUM SETUP AT FIRST POWER UP

SELECT AIR TO AIR AND ENERGIZE THE REVERSING VALVE IN HEAT





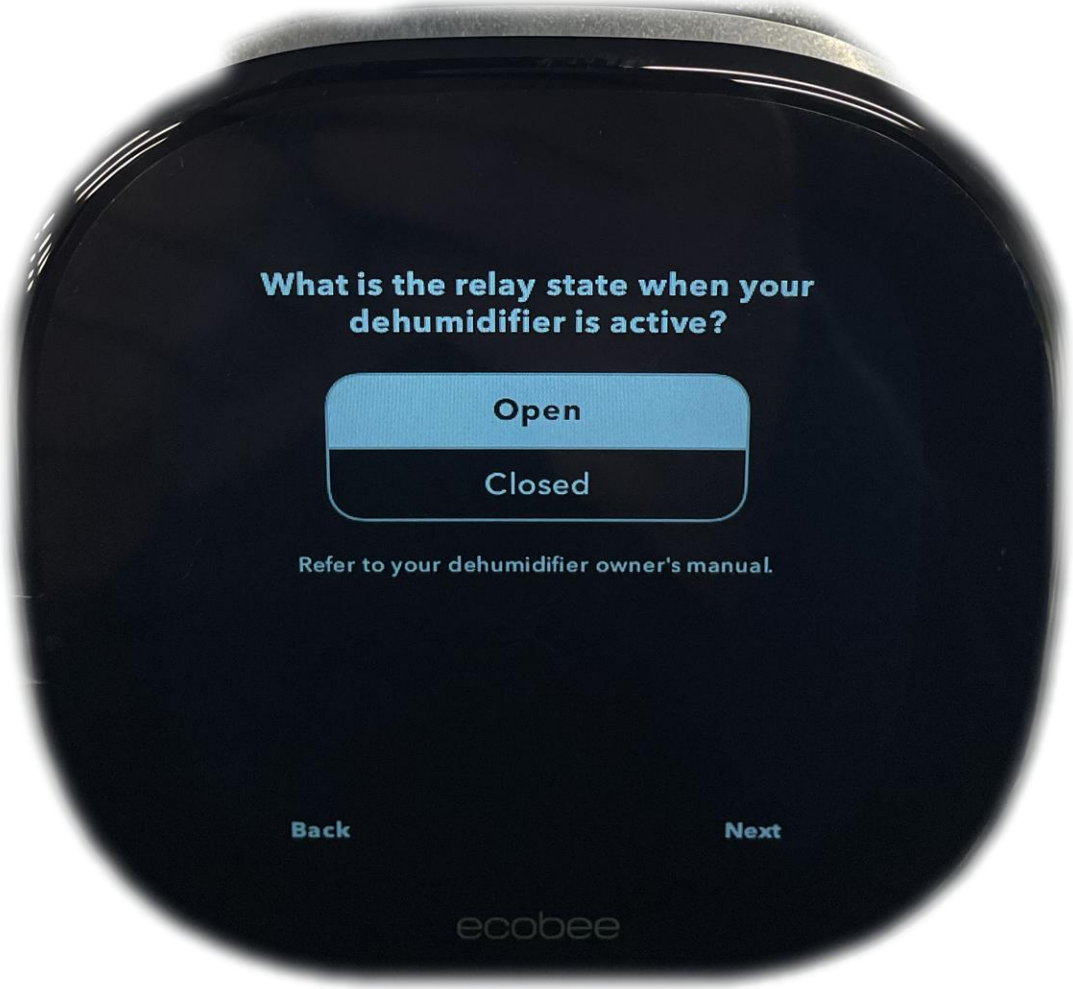
ECOBEE PREMIUM SETUP AT FIRST POWER UP

CONFIGURE THE COMPRESSOR MINIMUM OUTDOOR TEMPERATURE

- Disable or set below zero
- Prevent nuisance service calls by making sure you set this on all Ecobee installations (default 35F)

ECOBEE PREMIUM SETUP AT FIRST POWER UP

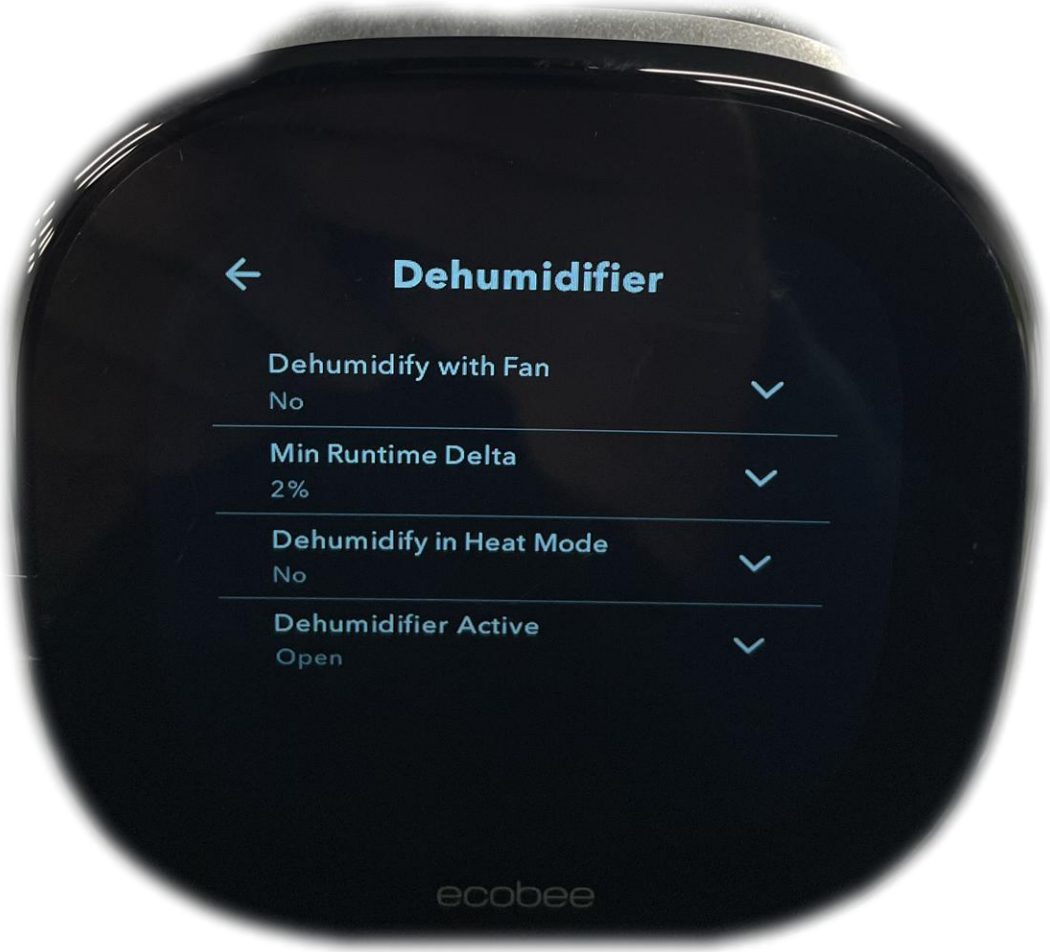
RELAY STATE FOR DEHUMIDIFICATION



- **Set the relay state when your dehumidifier is active to Open**

ECOBEE PREMIUM SETUP AT FIRST POWER UP

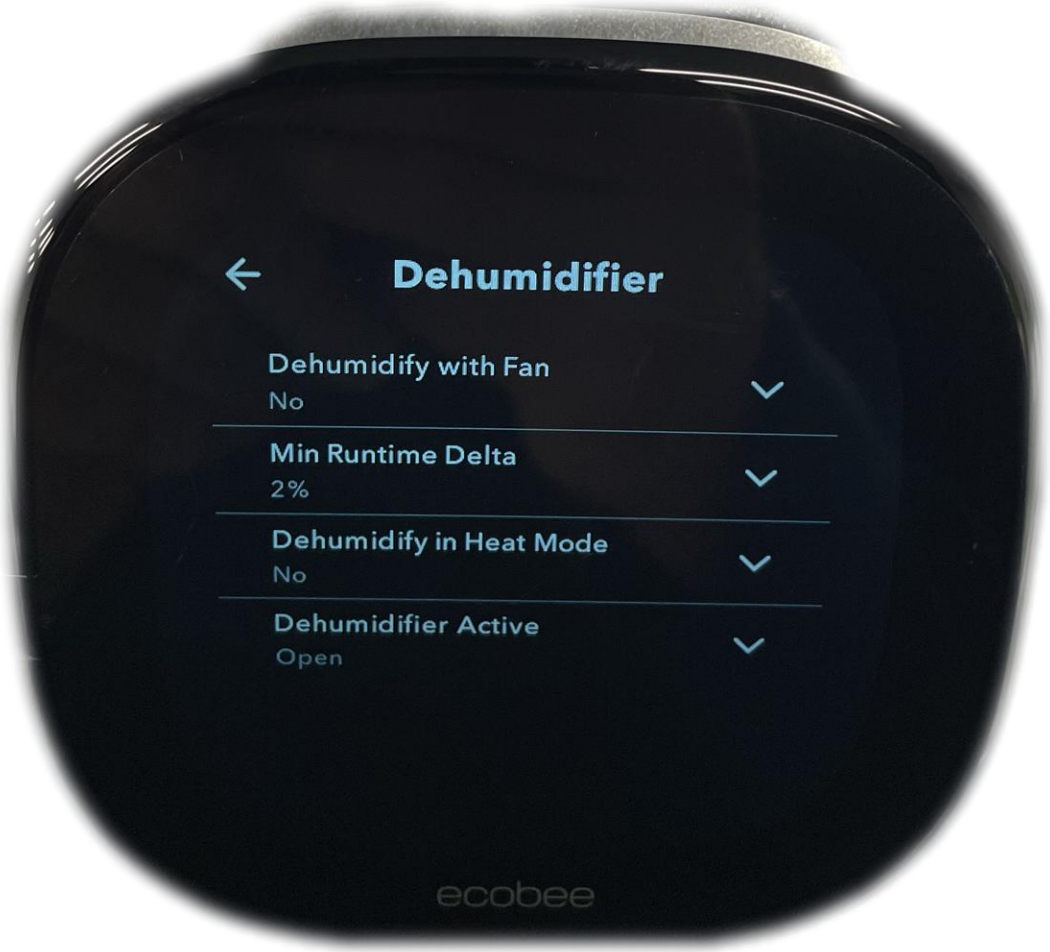
GO TO ☰ > ⚙ > SETTINGS > INSTALLATION SETTINGS > EQUIPMENT > DEHUMIDIFIER



- **Dehumidify with Fan -- NO**
- **Min Runtime Delta -- 2%**
- **Dehumidify in Heat Mode -- NO**
- **Dehumidifier Active -- OPEN**

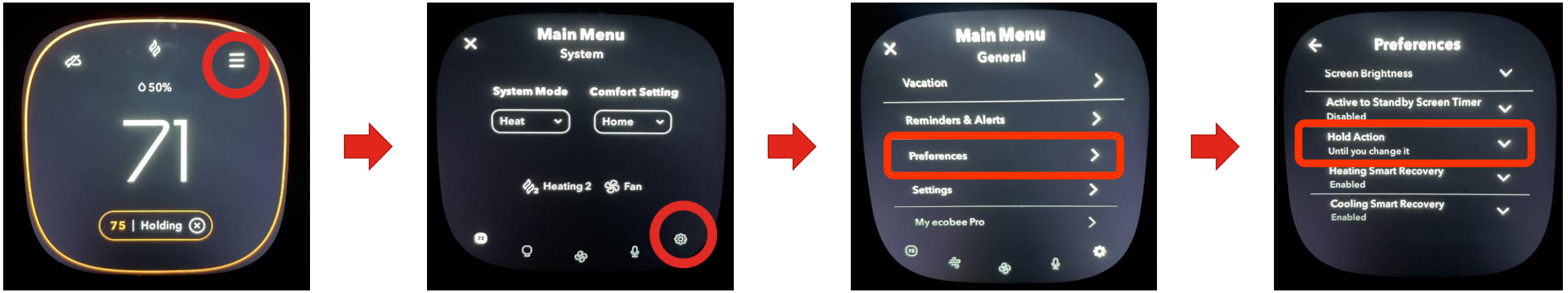
ECOBEE PREMIUM SETUP AT FIRST POWER UP

GO TO ☰ > ⚙ > SYSTEM > DEHUMIDIFIER



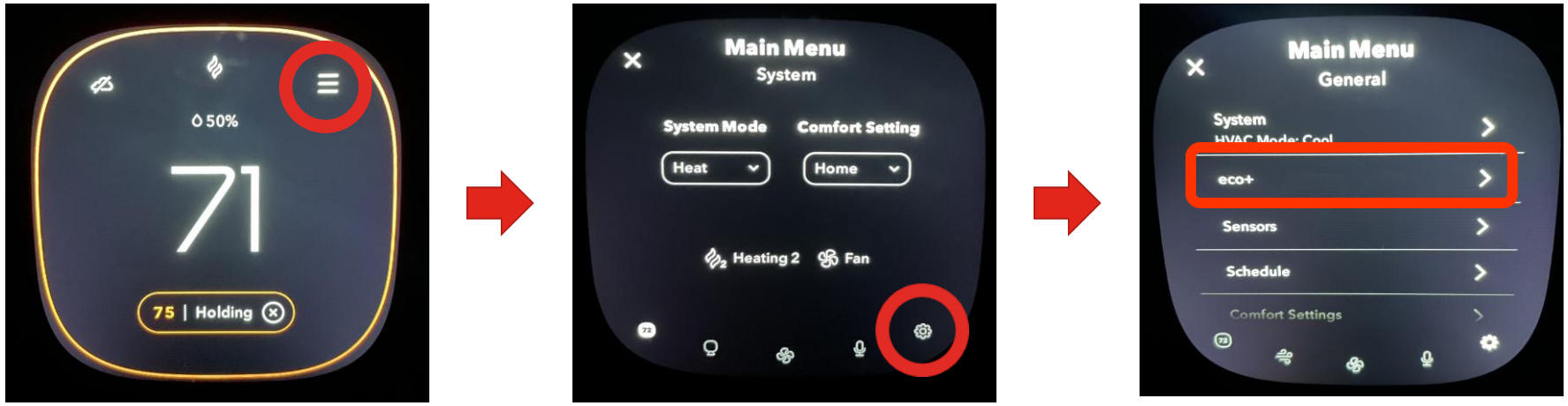
- **Set Dehumidifier to ON**
- **Set desired humidity to comfort**

HOLD PREFERENCE



- Access the Hold Action as shown above.
- Make the change that best suits the customers needs.

ECO +



- **Occupancy Sensor. With no motion detected it will go into an AWAY setting.**
- **Make the change that best suits the customers needs.**

*Disabling may affect energy savings estimates as stated by Ecobee

Questions/Discussions?

Mingledorff's INC

THANK YOU