





45MU(A,H)A Thermostat Choices:

Controls

- Most 24-Volt thermostats will work for a 45MU(A,H)A 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, not Conventional.

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

The 45MU(A,H)A with an Electric Heat package does not require the thermostat to sense outside temperature to operate.



45MUAA Control Overview (not same as 45MBAA)

- The 45MUAA is <u>NOT</u> powered from the outdoor unit.
- The 45MUAA can be powered with 115VAC or 208/230VAC, same terminals must change wire harness for 115VAC.
- Electric Heat Kits are always wired to 208/230VAC.
- The 45MUAA must use a 24-Volt thermostat or a 1401 Wired Controller. (all controls purchased separately).
- The 24-Volt control can be wired to the fan coil using 18 gauge solid or stranded wire.
- Do not connect a 1401 Wired Controller and a 24-Volt Thermostat at the same time.





45MUHA Control Overview

- The 45MUHA control and DIP switch configurations are same as 45MUAA
- The 45MUHA is <u>NOT</u> powered from the outdoor unit.
- The 45MUHA can be powered with 115VAC or 208/230VAC, same terminals auto selects
- The 45MUHA must use a 24-Volt thermostat or a 1401 Wired Controller. (all controls purchased separately).
- The 24-Volt control can be wired to the fan coil using 18 gauge solid or stranded wire.
- Do not connect a 1401 Wired Controller and a 24-Volt Thermostat at the same time.







NOTE: The 45MU(A,H)A will also "Auto Detect" the type of control if SWI DIPs are left OFF (default setting)











37MU(R,H)A Set Up Options (needs to match indoor control scenario)

Control Scenario 1 & 2: S1, S2 Connections Outdoor unit S1 DIP switch settings

All SI OFF for SI, S2 Connections (default)



Control Scenario 3: 24-Volt Connections Outdoor unit S1 DIP switch settings



Set SI-2 to ON for 24-Volt Connections



Attention:

R & C at the ODU do not provide 24-Volts. Scenario 3 supplies 24-Volts to the ODU from the MU(A,H)A.



37MU(R,H)A DIP Switches Located above low voltage terminal block



45MU(A,H)A Control Scenario 1

Control Selection – SWI DIP Switches

Control Scenario 1: 24-Volt Thermostat (new install) Control Wire ODU to IDU: 16 gauge Stranded (Shielded) 2-wire 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



Indoor Unit – MU(A,H)A



45MU(A,H)A Communication Board

Scenario 1 24-Volt Option



45MU(A,H)A Control Scenario 1 (cont.)

37MU(R,H)A Set Up Options (needs to match indoor control scenario)

Control Scenario 1: S1, S2 Connections Outdoor unit S1 DIP switch settings

All SI OFF for SI, S2 Connections (default)





Attention:

R & C at the ODU do not provide 24-Volts.

Scenario 3 supplies 24-Volts to the ODU from the MU(A,H)A.



37MU(R,H)A DIP Switches Located above low voltage terminal block





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 without an Electric Heat Kit



Heat Pump Wiring Diagram

45MU(A,H)A Control Scenario 1 (cont.)

Control Scenario 1 24-Volt Staging Options (cont.)

Control Scenario 1: 24-Volt Thermostat (new install)

Control Wire ODU to IDU: 16 gauge Stranded (Shielded) 2-wire

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



CONNECTOR PURPOSE 24V Power Connector R С Common G Fan Control Y1 Low Demand Y/Y2 High Demand В Heating Reverse Valve W Conventional Heat Control W1 Stage 1 Electric Housing W2 Stage 2 Electric Housing E/AUX **Emergency Heating** DH Dehumidification

Reserved Signal

System Fault

DS

L

Indoor Unit Terminal Info

| CONNECTOR | PURPOSE |
|-----------|---------------------------|
| R | 24V Power Connector |
| C | Common |
| G | Fan Control |
| Y1 | Low Demand |
| Y/Y2 | High Demand |
| В | 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 |

Advanced Wiring



Controls

Heat Pump Wiring Diagram

45MU(A,H)A Control Scenario 1 (end)

Control Scenario 1 24-Volt Staging Options (end)

Control Scenario 1: 24-Volt Thermostat (new install) Control Wire ODU to IDU: 16 gauge Stranded (Shielded) 2-wire

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





5-wire Simplest Wiring W Υ G С Rc Thermostat Y1 Y/Y2 B W G W1 W2 R С L Indoor Unit 1 Stage Heat Pump & 1 Stage Cool

Preferred connection without an Electric Heat Kit



Advanced Wiring



Controls Conventional Wiring Diagram 45MU(A,H)A Control Scenario 1 (end) Control Scenario 1 24-Volt Staging Options (end) Control Scenario 1: 24-Volt Thermostat (new install) Control Wire ODU to IDU: 16 gauge Stranded (Shielded) 2-wire

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



| CONNECTOR | PURPOSE |
|-----------|---------------------------|
| R | 24V Power Connector |
| С | Common |
| G | Fan Control |
| Y1 | Low Demand |
| Y/Y2 | High Demand |
| В | 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 |

Scenario 2 1401 Wired

Control

Board

* □935*
 * 0 0 0 0
 * 0 0 0

45MU(A,H)A Control Scenario 2

Control Selection - SWI DIP Switches

Control Scenario 2: Wired Control 1401 (new install) Control Wire ODU to IDU: 16 gauge Stranded (Shielded) 2-wire Control Wire IDU to Control: 16 gauge Stranded 2-wire Set SW1-4 to ON



SW1

Function DIP switch

CP)



Scenario 2 1401 Wired Control



45MU(A,H)A Control Scenario 2 (end)

37MU(R,H)A Set Up Options (needs to match indoor control scenario)

Control Scenario 2: S1, S2 Connections Outdoor unit S1 DIP switch settings

All SI OFF for SI, S2 Connections (default)



Attention: R & C at the ODU do not provide 24-Volts. Scenario 3 supplies 24-Volts to the ODU from the MU(A,H)A.



37MU(R,H)A DIP Switches Located above low voltage terminal block



45MU(A,H)A Control Scenario 3

Control Selection – SWI DIP Switches

Control Scenario 3: 24-Volt Stat (typically for retrofit application)

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

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

Set SW1-1 & SW1-4 to ON





45MU(A,H)A Communication Board

Scenario 3 24-Volt Option



45MU(A,H)A Control Scenario 3 (cont.)

37MU(R,H)A Set Up Options (needs to match indoor control scenario)

Control Scenario 3: 24-Volt Connections Outdoor unit SI DIP switch settings

Set S1-2 to ON for 24-Volt Connections





Attention: R & C at the ODU do not provide 24-Volts. Scenario 3 supplies 24-Volts to the ODU from the MU(A,H)A.



37MU(R,H)A DIP Switches Located above low voltage terminal block





Set S1-2 to ON at ODU for 24-Volt Connections



Applications would include:

45MU(A,H)A Control Scenario 3 (cont.)

Controls

• Thermostats that accept a 24-Volt Error signal from outdoor unit (L-terminal).

37MU(R,H)A Set Up Options (needs to match indoor control scenario)

Only in applications where a Defrost (D-terminal) or Error (L-terminal) signal is

needed, an R wire from the Indoor Unit to the Outdoor would be required.

• Applications that use a Defrost signal (D-terminal) to activate a relay to shut down the indoor fan during defrost.

CONNECTOR

R

С

Y1

Y2

В

W

D

1

PURPOSE

24V Power Connection

Heating Reverse Valve

Common

Low Demand

High Demand

Heating Control

Defrost Control

System Fault Signal

• Applications that use a Defrost signal (D-terminal) to bring on the electric heat kit, field supplied relay required.



MU(R,H)A



45MU(A,H)A Control Scenario 3 (cont.)

This cable must be used for scenario 3. Located in accessory box packed with indoor unit

| Wire | Color |
|------|--------|
| Com | Black |
| OW | Green |
| OB/O | Yellow |
| OYI | Red |
| OY2 | Blue |





Heat Pump Wiring Diagram 45MU(A,H)A Control Scenario 3 (cont.)

Control Scenario 3 24-Volt Staging Options

Control Scenario 3: 24-Volt Stat (typically for retrofit application)

Control Wire ODU to IDU: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Set SW1-1 & SW1-4 to ON



Indoor Unit Terminal Info

| CONNECTOR | PURPOSE |
|-----------|---------------------------|
| R | 24V Power Connector |
| С | Common |
| G | Fan Control |
| Y1 | Low Demand |
| Y/Y2 | High Demand |
| В | 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 |

Controls

Heat Pump Wiring Diagram

45MU(A,H)A Control Scenario 3 (cont.)

Control Scenario 3 24-Volt Staging Options (cont.)

| CONNECTOR | PURPOSE |
|-----------|---------------------------|
| R | 24V Power Connector |
| С | Common |
| G | Fan Control |
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Indoor Unit Terminal Info

Control Scenario 3: 24-Volt Stat (typically for retrofit application)

Control Wire ODU to IDU: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Set SW1-1 & SW1-4 to ON



Heat Pump Wiring Diagram

45MU(A,H)A Control Scenario 3 (cont.)

Control Scenario 3 24-Volt Staging Options (cont.)

Control Scenario 3: 24-Volt Stat (typically for retrofit application)

Control Wire ODU to IDU: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Set SW1-1 & SW1-4 to ON



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| W1 | Stage 1 Electric Housing | |
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| E/AUX | Emergency Heating | |
| DH | Dehumidification | |
| DS | Reserved Signal | |
| L | System Fault | |

Heat Pump Wiring Diagram

45MU(A,H)A Control Scenario 3 (cont.)

Control Scenario 3 24-Volt Staging Options (cont.)

Control Scenario 3: 24-Volt Stat (typically for retrofit application)

Control Wire ODU to IDU: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Set SW1-1 & SW1-4 to ON



| CONNECTOR | PURPOSE | |
|-----------|---------------------------|--|
| R | 24V Power Connector | |
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| W1 | Stage 1 Electric Housing | |
| W2 | Stage 2 Electric Housing | |
| E/AUX | Emergency Heating | |
| DH | Dehumidification | |
| DS | Reserved Signal | |
| L | System Fault | |

Heat Pump Wiring Diagram

45MU(A,H)A Control Scenario 3 (cont.)

Control Scenario 3 24-Volt Staging Options (cont.)

Control Scenario 3: 24-Volt Stat (typically for retrofit application)

Control Wire ODU to IDU: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Set SW1-1 & SW1-4 to ON



| CONNECTOR | PURPOSE |
|-----------|---------------------------|
| R | 24V Power Connector |
| С | Common |
| G | Fan Control |
| Y1 | Low Demand |
| Y/Y2 | High Demand |
| В | 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 |
| 1 | System Fault |

Heat Pump Wiring Diagram

45MU(A,H)A Control Scenario 3 (cont.)

Control Scenario 3 24-Volt Staging Options (cont.)

Control Scenario 3: 24-Volt Stat (typically for retrofit application)

Control Wire ODU to IDU: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Set SW1-1 & SW1-4 to ON



| CONNECTOR | PURPOSE | |
|-----------|---------------------------|--|
| R | 24V Power Connector | |
| С | Common | |
| G | Fan Control | |
| Y1 | Low Demand | |
| Y/Y2 | High Demand | |
| В | 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 | |
| 1 | System Fault | |

Conventional Wiring Diagram

45MU(A,H)A Control Scenario 3 (cont.)

Control Scenario 3 24-Volt Staging Options (cont.)

Control Scenario 3: 24-Volt Stat (typically for retrofit application)

Control Wire ODU to IDU: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Set SW1-1 & SW1-4 to ON



| CONNECTOR | PURPOSE |
|-----------|---------------------------|
| R | 24V Power Connector |
| С | Common |
| G | Fan Control |
| Y1 | Low Demand |
| Y/Y2 | High Demand |
| В | 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 |

Conventional Wiring Diagram

45MU(A,H)A Control Scenario 3 (cont.)

Control Scenario 3 24-Volt Staging Options (cont.)

Control Scenario 3: 24-Volt Stat (typically for retrofit application)

Control Wire ODU to IDU: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Control Wire IDU to stat: Minimum 5-wire, up to 8-wire may be needed, 18 gauge solid or stranded. Set SW1-1 & SW1-4 to ON



| CONNECTOR | PURPOSE | |
|-----------|---------------------------|--|
| R | 24V Power Connector | |
| С | Common | |
| G | Fan Control | |
| Y1 | Low Demand | |
| Y/Y2 | High Demand | |
| В | 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 | |

| Controls | Scenario 1 & 3 24-Volt Control | Scenario 2 1401 Wired Control |
|--|--------------------------------------|-------------------------------------|
| Anti-blow, Cooling Only Settings - SWI DIP Switches Scenarios - 1, 2, 3 SWI-2: Anti-cold Blow Protection Option Default value is OFF - Anti-Cold is active. SWI-3: Single cooling / heating and cooling options Default is OFF for Heating and Cooling, ON for Cooling Only System. | | |
| | Board | |

| $(\circ \circ)$ | 1CO | C |
|-------------------|-----|---|
| COL | | |
| | | |

45MU(A,H)A Set Up Options (cont.)

Electric Heat & Staging Settings – SW2 DIP Switches Scenario – 2

SW2-1: Control Scenario 1

Compressor Running Compensation (Demand working with heat pump+ Electric heat) Default is OFF for Faster Compressor, ON for Slower Compressor

SW2-1: Control Scenario 2 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

Scenario - 1 & 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.



45MU(A,H)A Communication Board

| Controls | |
|-------------|------------------------|
| 45MUA(A,H)4 | Set Up Options (cont.) |

| S3 | S3 ([°] F) | S3 | S3 ([°] F) | S3 | S3 ([°] F) |
|----|----------------------|----|----------------------|----|----------------------|
| 0 | OFF | 5 | -8 | А | 25 |
| 1 | -22 | 6 | -4 | В | 32 |
| 2 | -18 | 7 | 3 | С | 36 |
| 3 | -15 | 8 | 10 | D | 39 |
| 4 | -11 | 9 | 18 | E | 43 |
| | | | | F | 46 |

Solution Scenarios – 1, 2

Scenario – 1

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 2

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:

- 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.



45MU(A,H)A Communication

Board

| Controls |
|--|
| 45MUA(A,H)A Set Up Options (cont.) |
| Runtime, Temp Differential Settings – SW3 DIP Switches |
| Scenario – 1 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 hea Default is OFF for Faster Compressor, ON for Compressor slower speed |
| Scenario – 2 SW3-3: Temperature differential to activate second stage auxiliary heating Default is OFF for 6°F, ON for 4°F |
| Scenarios – 1, 3 SW3-4: 3 Fan speed of cooling mode when 24V Thermostat is applied for. Default is OFF for High, ON for Turbo |



45MU(A,H)A Communication Board



45MU(A,H)A Set Up Options – External Static Pressure Settings

| | EXTERNAL | | ELECTRIC | 24V THERMOSTAT | | WIRED CONTROLLER | | AIRELOW |
|--------------|-----------------|--|-------------------------------------|-----------------------------------|----------------------------------|-------------------------------------|------------------------------------|-----------------------|
| CAPACITY | PRESSURE | FAN SPEED | AUXILIARY HEAT MODULE | DIP SWITCH | 24V TERMINAL ENGAGED | DIP SWITCH | MODE | VOLUME (CFM) |
| | | Cooling Turbo | <u> </u> | SW3-4=ON | Y2/Y | | Cool | 618 |
| | | Cooling High | - | SW3-4=OFF | Y2/Y | 1 | Cool | 576 |
| | | Cooling Medium | - | — | Y1 | - | Cool | 529 |
| | | Cooling Low | | | | 1 | Cool | 488 |
| | | Heat Pump Turbo | Ι | - | - | ļ | Heat | 565 |
| | | Heat Pump High | () | - | B+Y2/Y, W | | Heat | 541 |
| | | Heat Pump Medium | _ | | B+Y1 | 3.000 | Heat | 435 |
| K Ton) | | Heat Pump Low | — | - | - | - | Heat | 400 |
| 18 (1.5 | 0 - 0.80 in.wc. | 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 |
| | ç | Cooling Turbo | | SW3-4=ON | Y2/Y | - | Cool | 824 |
| | | Cooling High | L | SW3-4=OFF | Y2/Y | | Cool | 759 |
| | | Cooling Medium | | 5 | Y1 | 1.000 | Cool | 694 |
| | | Cooling Low | - | - | - | - | Cool | 629 |
| | | Heat Pump Turbo | | <u> </u> | _ | | Heat | 788 |
| | | Heat Pump High | — | - | B+Y2/Y, W | 1 | Heat | 753 |
| | | Heat Pump Medium | L | — | B+Y1 | - | Heat | 641 |
| ¥Ű | | Heat Pump Low | | | | | Heat | 524 |
| 24F (2 To | 0 - 0.80 in.wc. | 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 |
| | | 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 |



45MU(A,H)A Communication Board



45MUA(A,H)A Set Up Options – External Static Pressure Settings (cont.)

| EXTERNAL | | ELECTRIC | | 24V THERMOS | WIRED CONTROLLER | | | |
|---------------|-----------------|--|-------------------------------------|-----------------------------------|----------------------------------|---|--|----------------------|
| CAPACITY | PRESSURE | FAN SPEED | AUXILIARY HEAT MODULE | DIP SWITCH | 24V TERMINAL ENGAGED | DIP SWITCH | MODE | VOLUME (CFM) |
| 8 | | Cooling Turbo | - | SW3-4=ON | Y2/Y | | Cool | 988 |
| | | Cooling High | <u></u> | SW3-4=OFF | Y2/Y | <u> </u> | Cool | 894 |
| | | Cooling Medium | (<u>111)</u> | | Y1 | | Cool | 806 |
| | | Cooling Low | | | Ţ | | Cool | 712 |
| | | Heat Pump Turbo | | 1 | - | L | Heat | 918 |
| | | Heat Pump High | 200 | _ | B+Y2/Y, W | | Heat | 876 |
| | | Heat Pump Medium | _ | _ | B+Y1 | - | Heat | 665 |
| | | Heat Pump Low | (<u>)</u> | | S <u>-</u> S | | Heat | 453 |
| 30K(2.5 Ton) | 0 - 0.80 in.wc. | 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 |
| | | 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 |



45MU(A,H)A Communication Board



45MUA(A,H)A Set Up Options – External Static Pressure Settings (cont.)

| CARACITY | ELECTRIC EXTERNAL FAN SPEED AUXILIARY HEAT 24V THERMOSTAT STATIC MODULE | | ELECTRIC AUXILIARY HEAT MODULE | 24V THERM | OSTAT | WIRED CONTROLLER | | AIRFLOW VOLUME (CFM) |
|----------------------------|---|---|--------------------------------------|---------------------------------------|----------------------------|---------------------------------------|-----------------------|-------------------------|
| CAPACITY PRESSURE RANGE | | | | DIP SWITCH | 24V TERMINAL ENGAGED | DIP SWITCH | MODE | |
| | | 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 | | | <u></u> | <u> </u> | Heat | 1112 |
| | | Heat Pump High | <u> </u> | <u></u> | B+Y2/Y, W | <u> </u> | Heat | 1059 |
| | | Heat Pump Medium | _ | | B+Y1 | | Heat | 794 |
| | | Heat Pump Low | — | <u>-</u> | | - | 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 |
| 36K | | 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 |
| (3 Ton) | 0 - 0.80 in.wc. | 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 | 8 <u>22</u> | SW3-4=ON | Y2/Y | | Cool | 1600 |
| | | Cooling High | | SW3-4=OFF | Y2/Y | _ | Cool | 1471 |
| | | Cooling Medium | _ | _ | Y1 | _ | Cool | 1282 |
| | | Cooling Low | - | | <u> </u> | — | Cool | 1094 |
| | | Heat Pump Turbo | — | | - | — | Heat | 1471 |
| | | Heat Pump High | — | | B+Y2/Y, W | 1 | Heat | 1324 |
| | | Heat Pump Medium | 1 | - | B+Y1 | 1 | Heat | 1141 |
| | | Heat Pump Low | - | | | i | Heat | 976 |



45MU(A,H)A Communication Board



45MUA(A,H)A Set Up Options – External Static Pressure Settings (end)

| CARACITY | EXTERNAL STATIC | FAN SPEED | ELECTRIC AUXILIARY HEAT MODULE | 24V THERM | OSTAT | WIRED CONTRO | LLER | AIRFLOW VOLUME (CFM) |
|----------------|--------------------|---|--------------------------------------|---------------------------------------|----------------------------|---------------------------------------|-----------------------|-------------------------|
| CAPACITY | PRESSURE RANGE | | | DIP SWITCH | 24V TERMINAL ENGAGED | DIP SWITCH | MODE | |
| | | 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 |
| 48K (4 Ton) | 0 - 0.80 in.wc. | 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 | <u></u> 2 | SW3-4=OFF | Y2/Y | | Cool | 1582 |
| | | Cooling Medium | 8 — 10 | <u> </u> | Y1 | <u></u> | Cool | 1359 |
| | | Cooling Low | 10_01 | <u></u> | _ | <u></u> | Cool | 1135 |
| | | Heat Pump Turbo | 3 <u>—</u> 3 | <u> </u> | - | | Heat | 1659 |
| | | Heat Pump High | | | B+Y2/Y, W | | Heat | 1582 |
| | | Heat Pump Medium | — | - | B+Y1 | | Heat | 1247 |
| | | Heat Pump Low | | | - | - | Heat | 976 |
| | 2 | Cooling Turbo | | SW3-4=ON | Y2/Y | | Cool | 1806 |
| | | Cooling High | | SW3-4=OFF | Y2/Y | _ | Cool | 1582 |
| | | Cooling Medium | . <u>_</u> | _ | Y1 | <u> </u> | Cool | 1359 |
| | | Cooling Low | 31 <u>1</u> 33 | - | _ | | Cool | 1135 |
| | | Heat Pump Turbo | <u> </u> | | _ | | Heat | 1659 |
| | | Heat Pump High | | | B+Y2/Y, W | | Heat | 1582 |
| | | Heat Pump Medium | 0-0 | | Y1 | | Heat | 1247 |
| | | Heat Pump Low | · · · · | _ | _ | _ | Heat | 976 |
| 60K (5 Ton) | 0 - 0.80 in.wc. | 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 |



45MU(A,H)A Communication Board



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

45MU(A,H)A Set Up Options (cont.)

Scenario - 2

- SI Net Address Setting
 - If one control per indoor unit (IDU), no change needed

1 CN20

• If two or more IDU per control, each S1 must have different value, up to 16 max



45MUA(A,H)A Set Up Options (cont.)

S4 DIP Switch Function, both defaulted to ON Scenarios – 1, 3

(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.





45MUA(A,H)A Set Up Options (cont.)

Full DIP/Rotary Switch Explanations

Scenario 1 24-Volt Control – S1, S2 to ODU

Scenario 2 1401 Wired Control – S1, S2 to ODU

Scenario 3 24-Volt Control – 24-Volt to ODU

| SW1 | Control type | DU 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 | 24∨ Thermostat | S1+S2 | Scenario 1 |
| ON 1 2 3 4 | 24∨ Thermostat | 24V connection | This setting is not applicable to the units |

| 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 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 | |
| 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] 4°F(2°C) | Only affects compressor and W1 |
| 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 >53 DP switch temperature 2° C. 2) The compressor cannot be operated when the outdoor temperature is lower than the S3 DP switch temperature. | [Default]The operation of heat pump is limited by the outdoor temperature, and the operation of auxillary heat is not limited. The system makes judgments based on the following rules: 0) The compressor cannot be operated when the outdoor temperature is bower than the SJ OJP switch. 2) The compressor can be operated when the outdoor temperature is \geq SJ DJP switch temperature 42 °C. | SW2-4 and S3 need to |
| 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: 10 The compressor can be operated when the outdoor temperature is \geq 33 DJP switch temperature 4 ² °C, 2) The compressor cannot be operated when the outdoor temperature is lower than the S3 DJP 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 DJP switch temperature, the compressor is not allowed to operated, but auxiliary heat is allowed to operated; 2) When the outdoor temperature is >S3 DJP switch temperature +2(°C), the compressor can be operated, but auxiliary heat cannot be operated. | working together |
| 9 | Rotary Switch S3 | 1,2 | Set outdoor temperature Limitation (for auxiliary heating or compressor) | Tat | ble 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 |
| 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) | |

45MUA(A,H)A Set Up Options (end)

Full DIP/Rotary Switch Explanations

Scenario 1 24-Volt Control – S1, S2 to ODU

Scenario 2 1401 Wired Control – S1, S2 to ODU

Scenario 3 24-Volt Control – 24-Volt to ODU

| No. | Dial Code | Control | Function | ON | OFF | Note |
|-----|-------------------------|---------|--|---|--|---|
| 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 ind For example [SW4-1 OFF, | /011. Each digit corresponds an iviual swith position. . SW4-2 ON, SW4 -3 OFF] = 010 | |
| 16 | SW4-4 | 2 | Temperature differential to activate third stage auxiliary heating(the GAP of TI 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 | 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 | \$4 - 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 | 1,2,3 | 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 | |



Advanced Wiring

One thermostat with multiple systems. Use a relay bank to parallel each mode. Wiring from indoor units to stat shown only. Wiring to outdoor units not shown.



45MBAA / 45MU(A,H)A Hydronic Coil Option 1 – 24-Volt Control

Wire to WI 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.



45MBAA / 45MU(A,H)A Hydronic Coil Option 2 – 1401 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/MUAA/MUHA. ٠

Any setting a 1401 used for electric heat kits will now be used to control the water coil relay.



Indoor Unit – MU(A,H)A



KSACN01401AAA (purchased separately) **Thermostat Notes:**

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











45MBAA / 45MU(A,H)A Hydronic Coil Option 2 – 1401 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. To Hydronic Relay, Zone Panel or equivalent









S3

45MBAA / 45MU(A,H)A Hydronic Coil Option 2 – 1401 Control (end)

VERY IMPORTANT – You must change the S3 Rotary switch off from its default setting. If you do not, the Boiler and Heat Pump will operate at the same time.

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 |
| А | 25 |
| В | 32 |
| С | 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 $1 = -22^{\circ}F$, Dial point $6 = -4^{\circ}F$Dial point $F = 46^{\circ}F$

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



45MU(A,H)A Communication Board