

Guide Specifications

Multi-Zone Mini-Split Heat Pump Systems

Indoor and Outdoor Units

June 18, 2015

Section 238126





HVAC Guide Specifications

Multi-Zone Mini-Split Heat Pump Systems, Indoor and Outdoor Units

Size:

0.75 to 2 Tons Nominal Indoor Units
1.5 to 4 Tons Nominal Outdoor Units

Lennox Model Number:

Indoor Units:

MWMA009S4-1P	Wall-Mounted Non-Ducted
MWMA012S4-1P	Wall-Mounted Non-Ducted
MWMA018S4-1P	Wall-Mounted Non-Ducted
MWMA024S4-1P	Wall-Mounted Non-Ducted
M22A009S4-1P	Ceiling Cassette Non-Ducted
M22A012S4-1P	Ceiling Cassette Non-Ducted
M22A018S4-1P	Ceiling Cassette Non-Ducted
M33A024S4-1P	Ceiling Cassette Non-Ducted
MMDA009S4-1P	Medium Static Ducted
MMDA012S4-1P	Medium Static Ducted
MMDA018S4-1P	Medium Static Ducted
MMDA024S4-1P	Medium Static Ducted
MCFA012S4-1P	Ceiling / Floor Non-Ducted
MCFA018S4-1P	Ceiling / Floor Non-Ducted
MCFA024S4-1P	Ceiling / Floor Non-Ducted

Outdoor Units:

MPA018S4M-1P
MPA030S4M-1P
MPA036S4M-1P
MPA048S4M-1P



Part 1 – GENERAL

1.01 SYSTEM DESCRIPTION

The multi-zone mini-split heat pump system shall be the Lennox Mini-Split System. The system shall be capable of providing heating and cooling in a two-to-one, three-to-one, four-to-one, or five-to-one configuration.

1.02 QUALITY ASSURANCE

- A. The units shall be tested by a Nationally Recognized Testing Laboratory (NRTL) in accordance with ANSI/UL 1995 – Heating and Cooling Equipment and shall bear the Listed mark.
- B. All wiring shall be in accordance with the National Electric Code (NEC).
- C. The System shall be rated in accordance with Air Conditioning Refrigeration Institute (AHRI) Standard 210/240-2008 Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment and bear the AHRI label.
- D. The System shall be rated in accordance to the U.S. Department of Energy (DOE) test procedures.
- E. The units and components within bonded for grounding shall meet safety standards for servicing required by Underwriters Laboratories Inc. (UL), in accordance with Standard for Safety UL 1995 Heating and Cooling Equipment, and that of the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI).
- F. Units shall be Intertek (ETL) certified for the U.S. and Canada.

1.03 DELIVERY, STORAGE, AND HANDLING

Equipment shall be stored and handled according to the manufacturer’s recommendation.

Part 2 – WARRANTY

2.01 LIMITED WARRANTY

Warranty commences on the date of initial installation. For the compressors only, the parts shall be covered by the manufacturer’s limited warranty for a period of 7 years. Other covered components shall be covered by the manufacturer’s limited warranty for a period of 5 years.

2.02 INSTALLATION REQUIREMENTS

The system shall be installed per manufacturer’s recommendation.

Part 3 – PERFORMANCE

3.01 PERFORMANCE

The system performance shall be rated in accordance with AHRI 210/240-2008 Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment test conditions. The system efficiency shall meet or exceed the following performance criteria:

Non-Ducted Indoor Units

Outdoor Unit	Voltage	Cooling Capacity	Heating Capacity	EER	SEER	HSPF
MPA018S4M-1P	208-230 V	18000	18900	12.5	21	9.6
MPA030S4M-1P	208-230 V	25000	32000	12.5	22	9.6
MPA036S4M-1P	208-230 V	36000	36000	8.8	18	10
MPA048S4M-1P	208-230 V	42000	49000	12.5	20	10



Ducted Indoor Units

Outdoor Unit	Voltage	Cooling Capacity	Heating Capacity	EER	SEER	HSPF
MPA018S4M-1P	208-230 V	17000	18000	12.5	18	8.5
MPA030S4M-1P	208-230 V	27000	32000	9.5	16.5	8.8
MPA036S4M-1P	208-230 V	34000	36000	8.2	15	9.3
MPA048S4M-1P	208-230 V	42000	51000	11	18	9.5

3.02 COOLING OPERATING RANGE

The operating range in the cooling mode shall be 5°F – 122°F.

3.03 HEATING OPERATING RANGE

The operating range in the heating mode shall be -13°F – 86°F for units below 3 tons. 3 ton units and above shall have a heating mode operating range from -13 - 76°F.

3.04 REFRIGERANT PIPING

All refrigerant piping shall be installed in accordance with manufacturer's recommendations. No additional sight glasses or filter/dryers shall be required. All field installed refrigerant piping shall be applied using nitrogen ACR copper tubing and shall be meet ASTM B280. All branch piping joints shall be approved by the manufacturer.

Fully serviceable brass service valve shall prevent corrosion and provide access to refrigerant system. Flare connection lines shall be located on side of unit cabinet. Shut-off valve and 2-way service valve (with service port) may be accessed to manage refrigerant charge while servicing system. Refrigerant lines shall be individually insulated to prevent sweating and bundled in line set with UV-rated tape.

The system shall be capable of the following refrigerant piping lengths:

1. Maximum line set length for furthest indoor unit: 98 ft (30 m)
2. Maximum total length of all pipework: 246 ft (75 m)
3. Maximum line set elevation from outdoor unit to indoor unit, when outdoor unit is above: 33 ft (10 m)
4. Maximum line set elevation from outdoor unit to indoor unit, when outdoor unit is below: 49 ft (15 m)
5. Maximum line set elevation between indoor units: 33 ft (10 m)

Part 4 – PRODUCTS

4.01 MPA SINGLE ZONE OUTDOOR UNIT

A. General

1. The MPA single zone outdoor unit shall be factory assembled and pre-wired with all controls necessary for operation.
2. All refrigerant piping lines shall be insulated separately in accordance with the adopted state or local energy code requirements.
3. Outdoor unit sound pressure level for an individual condensing unit module shall not exceed 62 dB(A).
4. The system shall be capable of automatically restarting operation when power is restored after a power failure.



5. The unit shall have a terminal strip furnished for easy wiring connections.
6. The unit shall have an automatically enabled function to defrost the unit when frost build-up is detected. Outdoor and indoor blower operations terminate and status is displayed on the indoor unit panel.
7. The unit shall be equipped with a 4-way interchange reversing valve to implement rapid changes in direction of refrigerant flow to result in quick changeover from heating to cooling and vice versa. Valve operates on pressure differential between outdoor unit and indoor unit.
8. The unit shall be equipped with a base pan heater.

B. Unit Cabinet

1. The outdoor unit cabinet shall be constructed of heavy gauge steel and shall be finished with a weatherproof and corrosion resistant baked enamel finish.
2. The unit shall have access covers for power and control wiring connections.
3. The unit shall have access covers for service valves.
4. The outdoor unit shall utilize a base pan heater to prevent build-up of ice during heating operation.
5. The unit shall feature tabs on base to allow secure mounting to slab.
6. Condensate drain outlets shall be furnished on unit base. Drain shall be field furnished.

C. Fan

1. The outdoor unit direct fan drive moves large air volumes uniformly through entire outdoor coil for high refrigeration capacity.
2. The outdoor unit fan motor shall be powered by an inverter drive capable of 5 steps of fan speed control.
3. An outdoor unit fan guard shall be provided.

D. Condenser Coil

1. The condenser coil shall be manufactured from copper tubes with aluminum fins.
2. A wire grille guard shall be provided.
3. The condenser coil shall be factory coated with a hydrophilic treatment for increased corrosion resistance.

E. Compressor

1. The unit shall have a compressor that features high-efficiency operation.
2. The compressor shall be balanced to reduce vibration and promote quiet operation.
3. The brushless DC motor shall use powerful Neodymium magnets, 15-20 times stronger than the ferrite magnets within conventional AC compressors.
4. The unit shall utilize a compressor crankcase heater to protect against refrigerant migration that can occur during low ambient operation.

F. Controls

1. The system utilizes DC inverter control to provide continuous operation while adjusting capacity according to room temperature. The system's accurate sensing of heating and cooling loads prevents frequent changes in capacity and ensures efficient, economical operation.
2. The microprocessor shall control the electronic expansion valve. It shall also assist the automatic compressor timed-off protection feature, indoor fan-on delay in heating mode after coil is warm, and 4-way reversing valve.

G. Electrical

1. The power supply to the outdoor unit shall be 208-230 volts, single phase, 60 Hz, or 115 volts, single phase, 60 Hz.

H. Refrigerant



1. Refrigerant shall be non-chlorine, ozone friendly R-410A.
2. Each unit shall be pre-charged from the factory with a holding charge. Additional refrigerant shall be added in the field in accordance with manufacturer's recommendations.
3. Flare refrigerant connection lines shall be located on side of unit cabinet.
4. The unit shall have a fully serviceable brass service valve to prevent corrosion and provide access to refrigerant system. Shut-off valve may be fully shut off while 2-way service valve with port may be accessed to manage refrigerant charge while servicing system.
5. The refrigerant oil shall be VG74 ester oil or FV50S polyvinyl ether (PVE) oil. Polyolester (POE) shall not be acceptable.

4.02 MWMA WALL-MOUNTED NON-DUCTED INDOOR UNIT

A. General

1. The Lennox MWMA wall-mounted non-ducted indoor unit shall be completely factory assembled and tested. The unit shall include all wiring, piping, electronic expansion valve, and printed circuit boards necessary for operation.
2. The unit shall allow a heating set temperature as low as 46°F to prevent space from freezing.
3. The unit shall have a pre-heat function to delay fan operation until the indoor coil has reached a field-adjustable temperature.
4. The unit will allow compensation for temperature due to installation height and ground height differentials.
5. The unit shall allow use of remote controller temperature sensor rather than indoor unit temperature sensor.
6. The unit will have a turbo mode to allow unit to initially operate at maximum output to reach set temp as quickly as possible.
7. The unit shall utilize a large diameter cross flow fan and evaporator temperature to minimize the sound level by lowering fan speed.
8. The unit shall have a self-cleaning function to allow unit to drying and cleaning of unit interior to prevent mold and bacteria growth.
9. The unit shall will a sleep mode to allow a slow increase or decrease in temperature before shutting off after a delay.
10. The unit shall have a low charge detection function to alert the user when refrigerant leakage is detected.
11. The unit will have an intelligent defrost mode that can vary the defrosting time according to the current system state.
12. The unit must allow continuation of operation in the event of a temperature sensor error.
13. The unit must have low ambient cooling in temperatures as low as 5°F.
14. The unit shall allow for restriction to heating operation only.
15. The unit shall restart automatically after power failure after 3 minutes with prior settings.
16. The unit will be paired with a wireless remote controller.
17. The unit must be compatible with primary VRF provider's product line.
18. The unit shall have a timer that allows the user to automatically turn on or turn off the unit up to 24 hours later.



19. The indoor unit shall include motor-driven louvers and shall support automatic vertical swing functionality.
 20. The unit shall include a factory-provided LED readout display and infrared receiver panel. The LED display shall indicate the current operational set point of the indoor unit, operation status, and codes for maintenance and servicing.
- B. Unit Cabinet
1. The indoor unit shall be constructed of galvanized steel.
 2. The front panel of the unit may be raised for wiring and maintenance accessibility.
- C. Fan
1. The fan motor shall be a DC motor capable of operating at 3 fan grades: low, medium, and high.
 2. The fan motor shall be thermally protected.
- D. Connections
1. The unit shall be equipped with liquid and gas flare fittings for quick and secure piping.
 2. The unit shall have refrigerant piping and drainage hose connections on the right and left side.
 3. The unit shall offer 3 access points for refrigerant outlet pipes in the right, left, or rear sides.
 4. The indoor unit coil shall be rifled copper tubing with hydrophilic coated aluminum fins.
 5. The coil shall have a design pressure of 340-550 psi.
- E. Filter
1. The unit shall be equipped with a cold catalyst filter to reduce odors and presence of volatile organic compounds.
- F. Electrical
1. The power supply to the indoor unit shall be 208-230 volts, single phase, 60 Hz.

4.03 M22A CEILING CASSETTE NON-DUCTED INDOOR UNIT

A. General

1. The Lennox M22A ceiling cassette non-ducted indoor unit shall be factory assembled and tested. The unit shall include all wiring, piping, electronic expansion valve, and printed circuit boards necessary for operation.
2. The air distribution panel shall allow for complete 360° airflow for immediate, uniform distribution of wide-range cooling and heating.
3. The unit shall intake outside air to increase air quality.
4. The unit shall have a pre-heat function to delay fan operation until the indoor coil has reached a field-adjustable temperature
5. The unit will allow compensation for temperature due to installation height and ground height differentials.
6. The unit shall allow use of remote controller temperature sensor rather than indoor unit temperature sensor.
7. The unit will have an intelligent defrost mode that can vary the defrosting time according to the current system state.
8. The unit must have low ambient cooling in temperatures as low as 5°F.
9. The unit shall restart automatically after power failure after 3 minutes with prior settings.
10. The unit will be paired with a wireless remote controller.
11. The unit shall feature a built-in lift pump to remove condensate.
12. The unit must be compatible with primary VRF provider's product line.



13. The unit shall have a timer that allows the user to automatically turn on or turn off the unit up to 24 hours later.
14. The indoor unit shall include motor-driven louvers and shall support automatic vertical swing functionality.
15. The unit shall include a factory-provided LED readout display and infrared receiver panel. The LED display shall indicate the current operational set point of the indoor unit, operation status, and codes for maintenance and servicing.
16. The unit shall contain dry contacts for remote on/off and alarm output on the control board.

B. Unit Cabinet

1. The indoor unit shall be constructed of galvanized steel.
2. The unit must be capable of installing in a 24 inch by 24 inch lay-in ceiling grid.

C. Fan

1. The fan motor shall be a DC motor capable of operating at 4 fan grades: low, medium, high, and turbo.
2. The indoor unit shall be supplied with a turbo fan with backward curved blades to reduce sound levels and air resistance.
3. The fan motor shall be thermally protected.

D. Connections

1. The unit shall be equipped with liquid and gas flare fittings for quick and secure piping.
2. The indoor unit coil shall be rifled copper tubing with hydrophilic coated aluminum fins.
3. The coil shall have a design pressure of 340-550 psi.

E. Filter

1. The unit shall include an easily removable, washable mesh filter.

F. Electrical

1. The power supply to the indoor unit shall be 208-230 volts, 1 phase, 60 Hz.

4.04 M33A CEILING CASSETTE NON-DUCTED INDOOR UNIT

A. General

1. The Lennox M33A ceiling cassette non-ducted indoor unit shall be factory assembled and tested. The unit shall include all wiring, piping, electronic expansion valve, and printed circuit boards necessary for operation.
2. The air distribution panel shall allow for complete 360° airflow for immediate, uniform distribution of wide-range cooling and heating.
3. The unit shall intake outside air to increase air quality.
4. The unit shall have a pre-heat function to delay fan operation until the indoor coil has reached a field-adjustable temperature
5. The unit will allow compensation for temperature due to installation height and ground height differentials.
6. The unit shall allow use of remote controller temperature sensor rather than indoor unit temperature sensor.
7. The unit will have an intelligent defrost mode that can vary the defrosting time according to the current system state.
8. The unit must have low ambient cooling in temperatures as low as 5°F.
9. The unit shall restart automatically after power failure after 3 minutes with prior settings.
10. The unit will be paired with a wireless remote controller.
11. The unit shall feature a built-in lift pump to remove condensate.



12. The unit must be compatible with primary VRF provider's product line.
13. The unit shall have a timer that allows the user to automatically turn on or turn off the unit up to 24 hours later.
14. The indoor unit shall include motor-driven louvers and shall support automatic vertical swing functionality.
15. The unit shall include a factory-provided LED readout display and infrared receiver panel. The LED display shall indicate the current operational set point of the indoor unit, operation status, and codes for maintenance and servicing.
16. The unit shall contain dry contacts for remote on/off and alarm output on the control board.

B. Unit Cabinet

1. The indoor unit shall be constructed of galvanized steel.

C. Fan

1. The fan motor shall be a DC motor capable of operating at 4 fan grades: low, medium, high, and turbo.
2. The indoor unit shall be supplied with a turbo fan with backward curved blades to reduce sound levels and air resistance.
3. The fan motor shall be thermally protected.

D. Connections

1. The unit shall be equipped with liquid and gas flare fittings for quick and secure piping.
2. The indoor unit coil shall be rifled copper tubing with hydrophilic coated aluminum fins.
3. The coil shall have a design pressure of 340-550 psi.

E. Filter

1. The unit shall include an easily removable, washable mesh filter.

F. Electrical

1. The power supply to the indoor unit shall be 208-230 volts, 1 phase, 60 Hz.

4.05 MMDA MEDIUM STATIC DUCTED INDOOR UNIT

A. General

1. The Lennox MMDA medium static ducted indoor unit shall be completely factory assembled and tested. The unit shall include all wiring, piping, electronic expansion valve, and printed circuit boards necessary for operation.
2. The unit shall intake outside air to increase air quality.
3. The unit shall have a pre-heat function to delay fan operation until the indoor coil has reached a field-adjustable temperature.
4. The unit will allow compensation for temperature due to installation height and ground height differentials.
5. The unit shall allow use of remote controller temperature sensor rather than indoor unit temperature sensor.
6. The unit will have an intelligent defrost mode that can vary the defrosting time according to the current system state.
7. The unit shall run in temperatures as low as 5°F.
8. The unit shall restart automatically after power failure after 3 minutes with prior settings.
9. The unit will be paired with a wired remote controller.
10. The unit shall feature a built-in lift pump to remove condensate.
11. The unit must be compatible with primary VRF provider's product line.
12. The unit shall have a timer that allows the user to automatically turn on or turn off the unit up to 24 hours later.



13. The indoor unit shall include motor-driven louvers and shall support automatic vertical swing functionality.
14. The unit shall include a factory-provided LED readout display and infrared receiver panel. The LED display shall indicate the current operational set point of the indoor unit, operation status, and codes for maintenance and servicing. LED readout
15. The unit shall contain dry contacts for remote on/off and alarm output on the control board.

B. Unit Cabinet

1. The indoor unit shall be constructed of galvanized steel.

C. Fan

1. The fan motor shall be a DC motor capable of operating at 4 fan grades: low, medium, high, and super-high. Super-high speed shall be available with simple wiring change on main control board.
2. The fan motor shall be thermally protected.

D. Connections

1. The unit shall be equipped with liquid and gas flare fittings for quick and secure piping.
2. The unit shall have refrigerant piping and drainage hose connections on the right and left side.
3. Return air connections shall be made horizontally or from the bottom of the unit with interchangeable panel.
4. The indoor unit coil shall be rifled copper tubing with hydrophilic coated aluminum fins.
5. The coil shall have a design pressure of 340-550 psi.

E. Filter

1. The unit shall include an easily removable, washable mesh filter.

F. Electrical

1. The power supply to the indoor unit shall be 208-230 volts, single phase, 60 Hz.

4.06 MCFA CEILING/FLOOR NON-DUCTED INDOOR UNIT

A. General

1. The Lennox MCFA ceiling/floor non-ducted indoor unit shall be completely factory assembled and tested. The unit shall include all wiring, piping, electronic expansion valve, and printed circuit boards necessary for operation.
2. The unit shall intake outside air to increase air quality.
3. The unit shall have a pre-heat function to delay fan operation until the indoor coil has reached a field-adjustable temperature
4. The unit will allow compensation for temperature due to installation height and ground height differentials.
5. The unit shall allow use of remote controller temperature sensor rather than indoor unit temperature sensor.
6. The unit will have an intelligent defrost mode that can vary the defrosting time according to the current system state.
7. The unit must have low ambient cooling in temperatures as low as 5°F.
8. The unit shall restart automatically after power failure after 3 minutes with prior settings.
9. The unit will be paired with a wireless remote controller.
10. The unit must be compatible with primary VRF provider's product line.
11. The unit shall have a timer that allows the user to automatically turn on or turn off the unit up to 24 hours later.



12. The indoor unit shall include motor-driven louvers and shall support automatic vertical louver swing functionality.
 13. The unit shall include a factory-provided LED readout display and infrared receiver panel. The LED display shall indicate the current operational set point of the indoor unit, operation status, and codes for maintenance and servicing.
 14. The unit shall be capable of both vertical and horizontal orientation during installation with no field modification required.
 15. The unit shall contain dry contacts for remote on/off and alarm output on the control board.
- B. Unit Cabinet
1. The indoor unit shall be constructed of galvanized steel.
- C. Fan
1. The fan motor shall be a DC motor capable of operating at 3 fan grades: low, medium, and high.
 2. The fan motor shall be thermally protected.
- D. Connections
1. The unit shall be equipped with liquid and gas flare fittings for quick and secure piping.
 2. The unit shall have refrigerant piping and drainage hose connections on the right and left side.
 3. The unit shall allow for left, right, or rear access for refrigeration line connection.
 4. Return air connections shall be made horizontally or from the bottom of the unit with interchangeable panel.
 5. The indoor unit coil shall be rifled copper tubing with hydrophilic coated aluminum fins.
 6. The coil shall have a design pressure of 340-550 psi.
- E. Filter
1. The unit shall include an easily removable, washable mesh filter.
- F. Electrical
1. The power supply to the indoor unit shall be 208-230 volts, single phase, 60 Hz.



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