

MULTI F MAX OUTDOOR UNIT

Features and Benefits

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Multi F MAX inverter-driven heat pump systems can operate up to eight indoor units, providing cooling or heating for an entire home and zoning capabilities. Compact refrigerant pipes work in tandem with wiring to link the outdoor unit with all indoor units through a single or pair of branch distribution (BD) unit(s). Most indoor units include its own remote control, allowing the user to set the temperature individually in different rooms. The indoor units are available in a variety of capacities and styles, including Art Cool™ Mirror and Gallery Wall Mount, Standard Wall Mount, Four-Way Ceiling Cassette, Horizontal Ceiling Concealed Duct, and Vertical-Horizontal Air Handling models.

Features

- Advanced climate control for up to eight (8) zones
- Inverter (Variable speed compressor)
- DC inverter technology – load matches to reduce power consumption
- Low ambient operation to 14°F (Cooling)
- Heating operation down to 0°F
- Defrost
- Restart delay (three [3] minutes)
- Self diagnosis
- Soft start
- Auto operation / auto restart operation
- Gold Fin™ anti-corrosion

Benefits

- Refrigerant piping lengths allow for extra design flexibility in indoor unit installation
- Easy installation: Little to no ductwork required; most indoor units can mount on any wall
- Indoor unit and outdoor unit dimensions ensure space saving convenience
- All-season use—heat pump models have both cooling and heating capabilities

Figure 18: Multi F MAX Heat Pump Inverter System — Mix and match for 24,000-73,000 Btu/h.



Multi F MAX Heat Pump Condensing Units

General

A Multi F MAX multi-zone system is comprised of one heat pump outdoor unit connected up to eight indoor units through a branch distribution unit (BD) using a single refrigerant piping circuit, and includes integrated controls supplied by LG. Factory-designed and supplied Y-branches may be used as well.

The outdoor unit is internally assembled, wired, and piped from the factory; all LG components are manufactured in a facility registered to ISO 9001 and ISO 14001, set by the International Organization for Standardization (ISO). The LG Multi F MAX multi zone heat pump system components comply with Underwriters Laboratories (UL) 1995 Heating and Cooling Equipment Standard for Safety, and bear the Electrical Testing Laboratories (ETL) mark. The units are certified to AHRI 210 / 240.

Temperature Ranges

The heat pump outdoor units are capable of operating in cooling mode from 14°F to 118°F ambient dry bulb. The heat pump outdoor units are capable of operating in heating mode from 0°F to 64°F ambient wet bulb without additional low ambient controls.

Frame

Multi F MAX condensing unit case is constructed from pre-coated metal that has been tested in accordance with ASTM B-117 salt spray procedure for a minimum of 1,000 hours. Case has a removable front panel to allow access to major components and control devices, and legs to secure the unit during installation.

Refrigerant System

Multi F MAX systems have a single refrigerant circuit field piped with a manufacturer-supplied BD unit(s) and Y-branches (if applicable) to multiple (ducted, non-ducted or mixed) indoor units to effectively and efficiently control the heating or cooling operation of the multi zone system. All refrigerant lines from the outdoor unit to the BD unit(s) and from the BD unit(s) to indoor units are field-installed and must be insulated separately.

Multi F MAX systems use R410A refrigerant. The outdoor units are equipped with a refrigerant strainer, check valves, oil separator, accumulator, four-way reversing valve, electronic expansion valve(s) (EEV), high side and low side refrigerant charging ports, and a service port. The outdoor unit also includes sensors for suction temperature, discharge temperature, high-pressure, low-pressure, heat exchanger temperature, and outdoor temperature conditions.

Refrigeration Oil Control

The outdoor unit has an oil separator to separate oil mixed with the refrigerant gas during compression and return oil to the compressor. The outdoor unit also has an oil injection mechanism to ensure a consistent film of oil on all moving compressor parts at low speed.

Compressor

Multi F condensing units are equipped with one hermetically sealed, digitally controlled, inverter driven twin-rotary compressor that

Figure 19: Multi F MAX LMU540HV Outdoor Unit.



includes Teflon™ coated bearings. The inverter motor is capable of providing a modulation range of 20Hz to 100Hz with control in 1Hz increments. The compressor is protected with phase-reversal protection, uses a factory-charge of Polyvinyl Ether (PVE) oil, and is mounted to avoid the transmission of vibration. Compressor in the Multi F MAX outdoor unit is equipped with a hot gas bypass valve.

Fan and Motors

The Multi F MAX outdoor unit includes two direct drive variable speed propeller fans with Brushless Digitally Controlled (BLDC) motor with a horizontal air discharge.

Fan blades are statically and dynamically balanced propeller fans made of durable Acrylonitrile Butadiene Styrene (ABS) plastic, and include a raised fan guard to limit contact with moving parts. The motors have inherent overload protection, permanently lubricated bearings, and a maximum speed up to 950 rpm. Multi F MAX outdoor unit has a horizontal discharge airflow.

Outdoor Unit Coil

The outdoor unit coils are factory-built of aluminum fins mechanically bonded on copper tubing. Coils have a minimum of two rows, a minimum of 14 fins per inch, and have been factory pressure-tested.

Coil fins also have a factory applied corrosion-resistant GoldFin™ material with hydrophilic coating that has been tested in accordance with ASTM B-117 salt spray test procedure for a minimum of 1,000 hours.

Electrical

Multi F MAX outdoor unit shall be 208/230V, 1 phase, 60Hz electrical power capable of operating within ±10% of the rated voltage.

Controls

Factory installed microprocessor controls in the outdoor unit, BD unit(s), and indoor units shall perform functions to efficiently operate the multi zone system. System wiring must be installed in a tree configuration from outdoor unit to BD unit(s) to indoor units through four conductor power/transmission cable. The system is capable of performing continuous operation, even when power is turned off to an individual indoor unit.

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General Data

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Table 115: Multi F MAX Outdoor Unit General Data.

Model Number	LMU540HV
Rated Cooling Capacity (Btu/h) ¹	52,500
Rated Heating Capacity (Btu/h) ¹	58,000
Operating Range	
Cooling (°F DB)	14 - 118
Heating (°F WB)	0 - 64
Compressor	
Inverter Quantity	Twin Rotary x 1
Oil/Type	FVC68D
Fan (Side Discharge)	
Type	Propeller
Motor Output (W) x Qty.	124.2 x 2
Motor/Drive	Brushless Digitally Controlled/Direct
Maximum Air Volume (CFM)	2,119 x 2
Unit Data	
Refrigerant Type	R410A
Refrigerant Control/Location	EEV / Outdoor Unit, Branch Distribution Unit
Min. Number Indoor Units/System ²	2
Max. Number Indoor Units/System ²	8
Maximum Allowable Total Indoor Unit Connected Capacity (Btu/h)	73,000
Sound Pressure ±3 dB(A) ³ (Cooling / Heating)	54 / 56
Net Unit Weight (lbs.)	213.8
Shipping Weight (lbs.)	236
Power Wiring / Communication Cables ⁴ (No. x AWG)	4 x 16
Heat Exchanger	
Material and Fin Coating	Copper Tube / Aluminum Fin and GoldFin™/Hydrophilic
Rows/Columns/Fins per inch x Qty.	(2 x 32 x 14) x 2
Piping	
Liquid Line Connection (in., OD) x Qty.	3/8 x 1
Vapor Line Connection (in., OD) x Qty.	3/4 x 1
Factory Charge lbs. of R410A	9.7
Piping Lengths	
Maximum Total System Piping (ft.) ⁵	476
Maximum Main Pipe Length (Outdoor Unit to Branch Distribution Unit [ft.])	180
Total Branch Piping (Branch Distribution Units to all Indoor Units [ft.])	295
Maximum Branch Pipe Length (Length between each BDU and IDU [ft.])	49
Maximum Outdoor Unit to Indoor Unit Pipe Length (ft.)	230
Piping Length (No Additional Refrigerant [ft.]; 16 ft. of Main Piping + 131 ft. of Branch Piping)	147
Maximum Elevation between Outdoor Unit and Indoor Unit (ft.)	98
Maximum Elevation between Indoor Unit and Indoor Unit (ft.)	49
Maximum Elevation between Branch Distribution Unit and Indoor Unit (ft.)	33
Maximum Elevation between Branch Distribution Unit and Branch Distribution Unit (ft.)	49

¹Rated capacity applied with non-ducted indoor units, and is rated 0 ft. above sea level with a 0 ft. level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95 – 105%.

Rated cooling capacity obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB) and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).
Rated heating capacity obtained with air entering the indoor unit at 70°F dry bulb (DB) and 60°F wet bulb (WB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

²At least one Branch Distribution Unit is required for system operation; a maximum of two can be installed per outdoor unit with use of Y-branch accessory (PMBL5620). At least two indoor units should

be connected. For allocated capacity information, see the combination tables on pages 131 to 136.

³Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745. These values can increase due to ambient conditions during operation.

⁴All power wiring / communication cable to be minimum 16 AWG from the outdoor unit to the BD unit, and 18 AWG from the BD unit to the indoor unit, stranded, shielded, and must comply with applicable local and national codes. For detailed electrical information, please refer to electric characteristics on page 165.

⁵Piping lengths are equivalent.

Table 116: LMU540HV Efficiency Ratings.^{1,2}

System	Combined With	Rated Cooling Capacity (Btu/h)	EER (95°F)	SEER	Rated Heating Capacity (Btu/h)	COP (47°F)	HSPF	Low Heating Capacity (Btu/h)	COP (17°F)	Energy Star
LMU540HV	Non-ducted Indoor Units	52,500	10.3	18.4	58,000	3.1	8.7	36,600	2.6	Yes
	Ducted Indoor Units	51,000	10.0	15.8	58,000	3.0	8.0	38,500	2.6	No
	Mixed Non-ducted and Ducted Indoor Units	51,750	10.15	17.1	58,000	3.0	8.35	37,550	2.6	No

¹Rated capacity is rated 0 ft. above sea level with Piping Length as Main pipe (16.4 ft.) + Branch pipe (98.4 ft.) = 115 ft., and a 0 ft. level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95 – 105%.

Rated cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB) and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

Rated heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and 60°F wet bulb (WB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

²Rated capacity is certified under AHRI Standard 210 / 240. EER, IEER, COP, and HSPF are subject to change. See www.ahrinet.org for the latest values.



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Dimensions

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Figure 20: LMU540HV External Dimensions.

