



ENGINEERING DATA



CERTIFICATION APPLIES ONLY
WHEN THE COMPLETE
SYSTEM IS LISTED
WITH ARI

HEAT PUMP OUTDOOR UNITS

HP28

ELITE® SERIES

SEER - up to 13.75

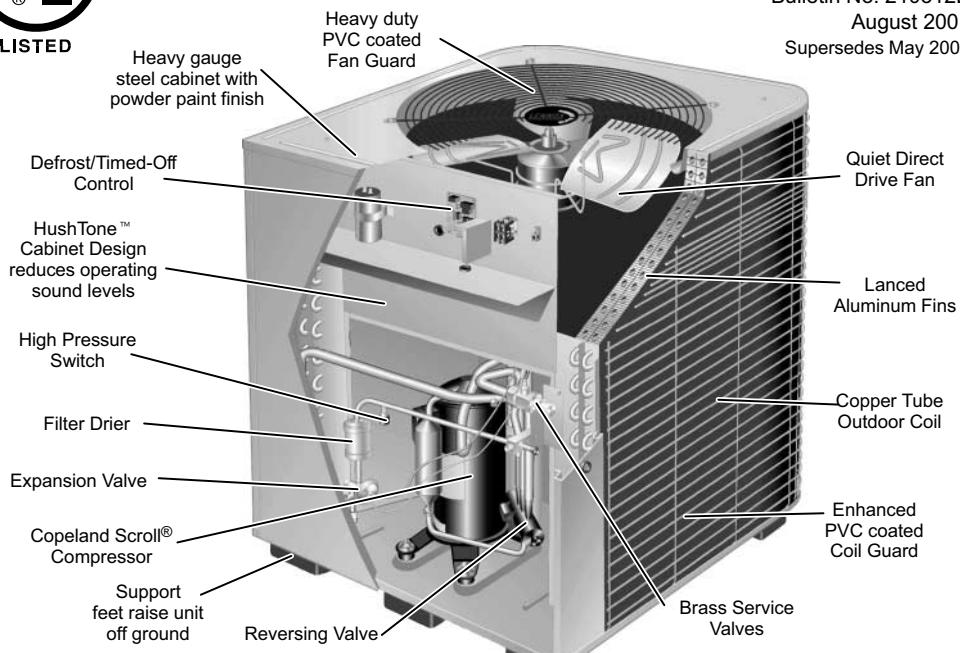
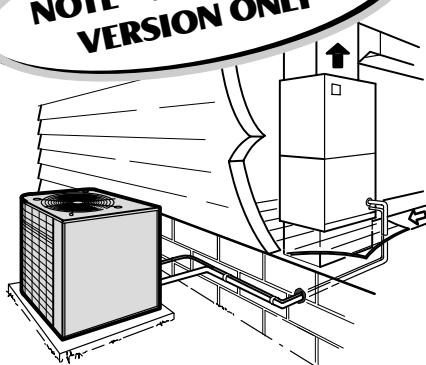
Cooling Capacity - 25,200 to 42,000 Btuh (7.4 to 12.3 kW)
Heat Capacity - 24,800 to 39,000 Btuh (7.3 to 11.4 kW)

Bulletin No. 210312E

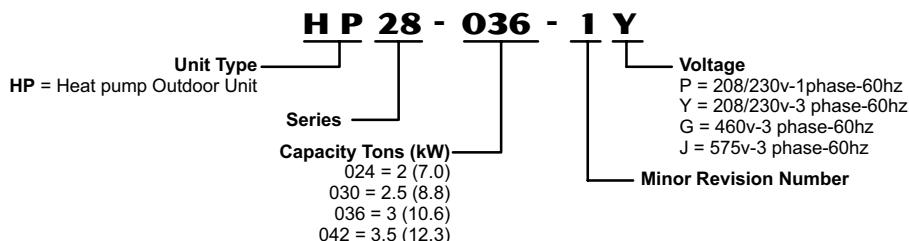
August 2001

Supersedes May 2001

**NOTE - ELECTRONIC
VERSION ONLY**



MODEL NUMBER IDENTIFICATION



FEATURES

Application

- SEER up to 13.75.
- HSPF (Region IV) up to 8.50.
- 2 through 3.5 ton (7.0 through 12.3 kW).
- Single phase power supply.
- Vertical air discharge allows concealment behind shrubs at grade level or out of sight on a roof.
- Designed for applications with indoor add-on coils with FM21 furnace control. See FM21 bulletin, Thermostats and Controls section. Also see Coils-Blower Coils section for indoor unit data.
- Units shipped completely factory assembled, piped and wired. Each unit is test operated at the factory insuring proper operation.
- Installer must set outdoor unit, connect refrigerant lines and make electrical connections to complete job.
- Each unit is test operated at the factory insuring proper operation.

Approvals

- Certified in accordance with USE certification program which is based on ARI Standard 210/240-94.
- Sound rated in Lennox reverberant sound test room in accordance with test conditions included in ARI Standard 270-95.
- Tested in the Lennox Research Laboratory environmental test room.
- Rated according to U.S. Department of Energy (DOE) test procedures.
- Units and components within bonded for grounding to meet safety standards for servicing required by UL and CEC.
- Units are UL and ULC listed.
- Developed in accordance with ISO 9002 quality standards.

Equipment Warranty

- Compressor — limited warranty for ten years in residential installations, five years in non-residential installations.
- All other covered components — limited warranty for five years in residential installations, one year in non-residential installations.
- Refer to Lennox Equipment Limited Warranty certificate included with unit for specific details.

NOTE - Due to Lennox' ongoing commitment to quality, Specifications, Ratings and Dimensions subject to change without notice and without incurring liability.
Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury.
Installation and service must be performed by a qualified installer and servicing agency.

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FEATURES

Refrigerant Line Connections, Electrical Inlets and Service Valves

- Vapor and liquid lines are located inside of the cabinet and are made with sweat connections. See dimension drawing.
- Fully serviceable brass service valves prevent corrosion and provide access to refrigerant system. Suction valve can be fully shut off, while liquid valve may be front seated to manage refrigerant charge while servicing system.
- Vapor and liquid line service valves and gauge ports are located inside the cabinet.
- Refrigerant line connections and field wiring inlets are located in one central area of the cabinet. See dimension drawing.

Copeland Scroll™ Compressor



- Compressor features high efficiency with uniform suction flow, constant discharge flow and high volumetric efficiency and quiet operation.
- Compressor consists of two involute spiral scrolls matched together to generate a series of crescent shaped gas pockets between them.
- During compression, one scroll remains stationary while the other scroll orbits around it.
- Gas is drawn into the outer pocket, the pocket is sealed as the scroll rotates.
- As the spiral movement continues, gas pockets are pushed to the center of the scrolls. Volume between the pockets is simultaneously reduced.
- When pocket reaches the center, gas is now at high pressure and is forced out of a port located in the center of the fixed scrolls.
- During compression, several pockets are compressed simultaneously resulting in a smooth continuous compression cycle.
- Continuous flank contact, maintained by centrifugal force, minimizes gas leakage and maximizes efficiency.
- Scroll compressor is tolerant to the effects of slugging and contaminants. If this occurs, scrolls separate, allowing liquid or contaminants to be worked toward the center and discharged.
- Low gas pulses during compression reduces operational sound levels.
- Compressor motor is internally protected from excessive current and temperature.
- Compressor is installed in the unit on resilient rubber mounts for vibration free operation.

Cabinet

- Heavy gauge galvanized steel cabinet with five station metal wash process.
- Powder paint finish provides superior rust and corrosion protection.
- Painted base section.
- Compressor and control box located in a separate compartment insulated with thick fiberglass insulation. Compartment provides protection from the weather and keeps sound transmission at a minimum
- Control box is conveniently located with all controls factory wired.
- Large removable panel provides service access.
- Drainage holes are provided in base section for moisture removal.
- High density polyethylene feet raise the unit off of the mounting surface away from damaging moisture.
- Non-corrosive PVC (polyvinyl chloride) coated steel wire outdoor coil guard is furnished.

Outdoor Fan

- Direct drive fan moves large air volumes uniformly through entire outdoor coil for high refrigerant cooling capacity.
- Vertical air discharge minimizes operating sounds and eliminates damage to lawn and shrubs.
- Fan motor is inherently protected.
- Motor totally enclosed for maximum protection from weather, dust and corrosion.
- Rain shield on motor provides additional protection from moisture.
- Corrosion resistant PVC (polyvinyl chloride) coated steel wire fan guard is furnished as standard.
- Fan service access accomplished by removal of fan guard.

Copper Tube/Enhanced Fin Coil

- Lennox designed and fabricated coil.
- Ripple-edged aluminum fins.
- Copper tube construction.
- Wrap around "U" shaped configuration provides extra large surface area with low air resistance.
- Lanced fins provide maximum exposure of fin surface to air stream resulting in excellent heat transfer.
- Fin collars grip tubing for maximum contact area.
- Fin spacing allows rapid and complete water drainage.
- Flared shoulder tubing connections/silver soldering construction.
- Coil is factory tested under high pressure to insure leakproof construction.
- Entire coil is accessible for cleaning.
- PVC (polyvinyl chloride) coated steel wire coil guard furnished as standard.
- Inverted coil circuiting prevents ice buildup at coil base in low ambients.

Defrost/Timed-Off Control

- A solid-state defrost control board is furnished as standard equipment. It gives a defrost cycle (14 minutes) for every 30, 60 or 90 minutes (adjustable) of compressor "on" time at outdoor temperature below 42°F (5.5°C).
- A sensing element mounted on the liquid line determines when the defrost cycle is required and also when to terminate a cycle.
- Diagnostic LED on control board furnished as an aid for servicing.
- Prevents compressor short-cycling and allows time for suction and discharge pressure to equalize, permitting the compressor to start in an unloaded condition.
- Automatic reset control provides a five minute time delay between compressor shutoff and start-up.

Bi-Flow Hi-Capacity Drier

- Traps moisture or dirt that could contaminate refrigerant system.
- Bi-flow operation during heating or cooling cycle.
- Furnished as standard and factory installed.

High Pressure Switch

- Shuts off unit if abnormal operating conditions cause the discharge pressure to rise above setting.
- Automatic reset.

FEATURES

Reversing Valve

- 4-way interchange reversing valve effects a rapid change in direction of refrigerant flow resulting in quick changeover from cooling to heating and vice versa.
- Valve operates on pressure differential between outdoor unit and indoor unit of the system.

Expansion Valve

- Designed and sized specifically for use in heat pump system.
- Sensing bulb is located on the suction line between reversing valve and compressor thus sensing suction temperature in any cycle.
- Factory installed and piped.

Service Light Thermostat

- Factory installed on the compressor discharge line.
- Required for operation of conditioned area thermostat with service light.

Ambient Compensating Thermistor

- Reduces thermostat droop to improve the operating characteristics of the heat pump system.
- The thermistor varies the heat anticipator resistance as ambient temperature changes.
- Factory installed in the discharge air stream.

OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA

Thermostat

- Thermostat is not furnished with the unit and must be ordered extra.
- See Thermostats and Controls section and Lennox Price Book.

Check and Expansion Valve Kit

- Field installed on certain indoor unit.
- See ARI Ratings table.

Refrigerant Line Kits

- Refrigerant lines (vapor & liquid) are shipped refrigeration clean. Lines are cleaned, dried, pressurized and sealed at factory.
- Vapor line fully insulated.
- L15 lines are stubbed at both ends.
- See Refrigerant Line Kit table for selection.
- Refrigerant line length should not exceed 50 ft. (15 m) in any installation. If longer length lines are required, contact your Lennox Field Technical Consultant.

Low Ambient Kit

- Units will operate satisfactorily down to 45°F (7°C) outdoor air temperature without any additional controls.
- Kit LB-57113BM (**24J00**) can be added in the field enabling unit to operate properly down to 30°F (-1°C).

Outdoor Thermostat Kit

- An outdoor thermostat can be used to lock out some of the electric heating elements on indoor units where two stage control is applicable.
- Outdoor thermostat maintains the heating load on the low power input as long as possible before allowing the full power load to come on the line.
- Thermostat kit LB-29740BA (**56A87**) and mounting box M-1595 (**31461**) or BM-10260 (**33A09**) (Canada Only) must be ordered extra.

Mounting Base

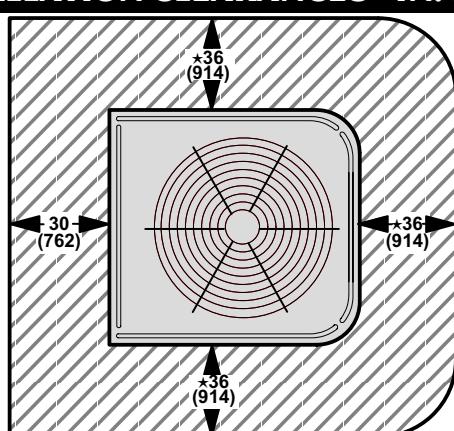
- Provides permanent foundation for condensing units.
- High density polyethylene structural material is lightweight, sturdy, sound absorbing and will withstand the rigors of the sun, heat, cold, moisture, oil and refrigerant. Will not mildew or rot.
- Can be shipped singly or in packages of 6 to a carton.
- All models use MB2-L (**69J07**), 32 x 34 x 3 in. (813 x 864 x 76 mm), shipping weight 15 lbs. (7 kg) each.

REFRIGERANT LINE KITS

Outdoor Unit Model No.	Line Set Model No.	Line Length		Liquid Line (o.d.)		Vapor Line (o.d.)	
		ft.	m	in.	mm	in.	mm
HP28-024 HP28-030	L15-41-20	20	6	3/8	9.5	3/4	19
	L15-41-30	30	9	3/8	9.5	3/4	19
	L15-41-40	40	12	3/8	9.5	3/4	19
	L15-41-50	50	15	3/8	9.5	3/4	19
HP28-036 HP28-042	L15-65-30	30	9	3/8	9.5	7/8	22.2
	L15-65-40	40	12	3/8	9.5	7/8	22.2
	L15-65-50	50	15	3/8	9.5	7/8	22.2

NOTE — Refrigerant line set should not exceed 50 ft. (15 m) in any installation.

INSTALLATION CLEARANCES - IN. (MM)



* One side of unit may be 12 in. (305 mm)
One of the remaining sides may be 6 in. (152 mm)
NOTE - 48 in (1219 mm) clearance required on top of unit
NOTE - 24 in. (610 mm) required between two units

SPECIFICATIONS

General Data		Model No.	HP28-024	HP28-030	HP28-036	HP28-042
		Nominal Tonnage	2	2.5	3	3.5
Connections (sweat)		Liquid line conn. o.d. - in. (mm)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)
		Vapor line conn. o.d. - in. (mm)	3/4 (19)	3/4 (19)	7/8 (22.2)	7/8 (22.2)
Refrigerant	*HCFC-22 charge furnished	12 lbs. 8 oz. (5.7 kg)	11 lbs. 13 oz. (5.4 kg)	13 lbs. 3 oz. (6.0 kg)	12 lbs. 15 oz. (5.9 kg)	
Outdoor Coil	Net face area sq. ft. (m ²)	Outer Coil Inner Coil Tube diameter - in. (mm) Number of rows Fins per inch (m)	21.77 (2.02) 21.11 (1.96) 5/16 (7.9) 2 22 (866)	21.77 (2.02) 21.11 (1.96) 5/16 (7.9) 2 22 (866)	24.06 (2.24) 23.33 (2.17) 5/16 (7.9) 2 22 (866)	24.06 (2.24) 23.33 (2.17) 5/16 (7.9) 2 22 (866)
Outdoor Coil Fan	Diameter in. (mm)	24 (610)	24 (610)	24 (610)	24 (610)	
	Number of blades	3	3	3	3	
	Motor hp	1/10 (75)	1/10 (75)	1/10 (75)	1/10 (75)	
	Cfm (L/s)	2800 (1320)	2800 (1320)	2800 (1320)	2800 (1320)	
	Rpm	825	825	825	825	
	Watts	165	165	170	170	
Shipping Data (1 package)		268 (122)	271 (123)	328 (149)	328 (149)	

OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA

Low Ambient Kit	27J00 (LB-57113BM)	27J00 (LB-57113BM)	27J00 (LB-57113BM)	27J00 (LB-57113BM)
Mounting Base - Net Weight	MB2-L (69J07) 15 lbs. (7 kg)	MB2-L (69J07) 15 lbs. (7 kg)	MB2-L (69J07) 15 lbs. (7 kg)	MB2-L (69J07) 15 lbs. (7 kg)
Outdoor Thermostat Kit	Thermostat Kit 56A87 (LB-29740BA)	56A87 (LB-29740BA)	56A87 (LB-29740BA)	56A87 (LB-29740BA)
Mounting Box				M-1595 (31461) or BM-10260 (Canada Only) (33A09)

*Refrigerant charge sufficient for 20 ft. (6.1 m) length of refrigerant lines.

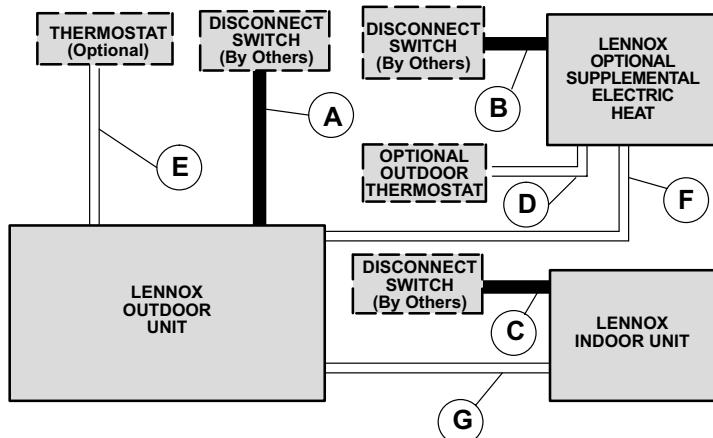
ELECTRICAL DATA

General Data	Model No.	HP28-024	HP28-030	HP28-036	HP28-042
	Line voltage data - 60hz	208/230v-1ph	208/230v-1ph	208/230v-1ph	208/230v-1ph
	Rec. max. fuse/circuit brkr size (amps)	20	30	35	40
	*Minimum circuit ampacity	13.8	17.7	20.9	23.4
Compressor	Rated load amps	10.3	13.5	16.0	18.0
	Power factor	.96	.96	.96	.97
	Locked rotor amps	56	72.5	88	104
Outdoor Coil Fan Motor	Full load amps	0.9	0.9	0.9	0.9
	Locked rotor amps	1.6	1.6	1.6	1.6

*Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

NOTE — Extremes of operating range are plus 10% and minus 5% of line voltage.

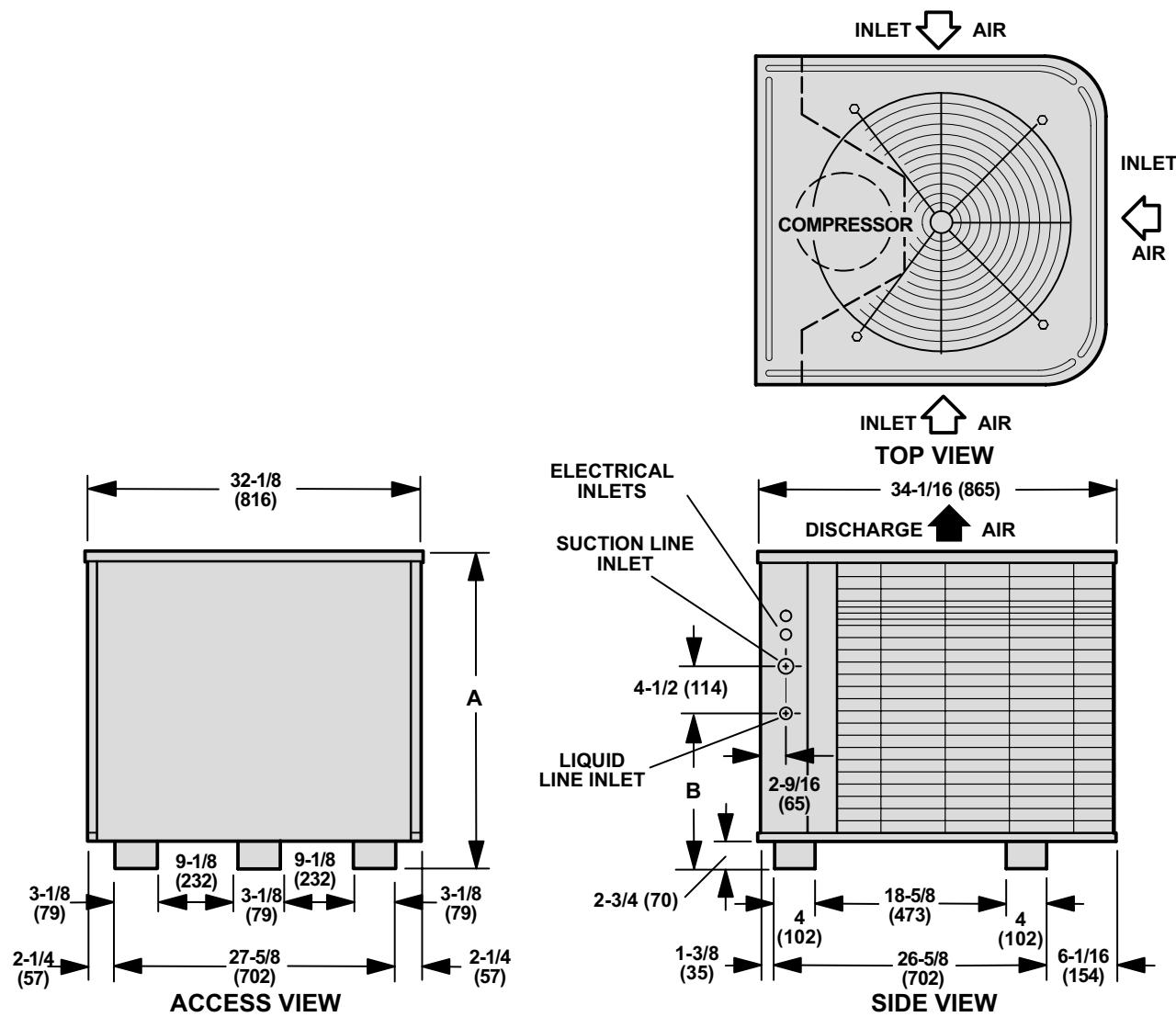
FIELD WIRING



- A — Two Wire Power (see Electrical Data)
- B — Two or Three Wire Power (size to heater capacity)
- C — Two Wire Power (size to indoor coil blower motor)
- D — Two Wire Low Voltage — 18 ga. minimum
- E — Eight Wire Low Voltage — 18 ga. minimum — with Electric Heat
— Ten Wire Low Voltage with Optional Outdoor Thermostat
- F — Four Wire Low Voltage — 18 ga. minimum
- G — Three Wire Low Voltage — 18 ga. minimum
— Field Wiring Not Furnished —

All wiring must conform to NEC or CEC and local electrical codes.

DIMENSIONS - INCHES (MM)



Model No.	A	B
HP28-024	in.	40-7/8
HP28-030	mm	1038
HP28-036	in.	44-7/8
HP28-042	mm	1140
		19-13/16
		503
		14-1/4
		362

