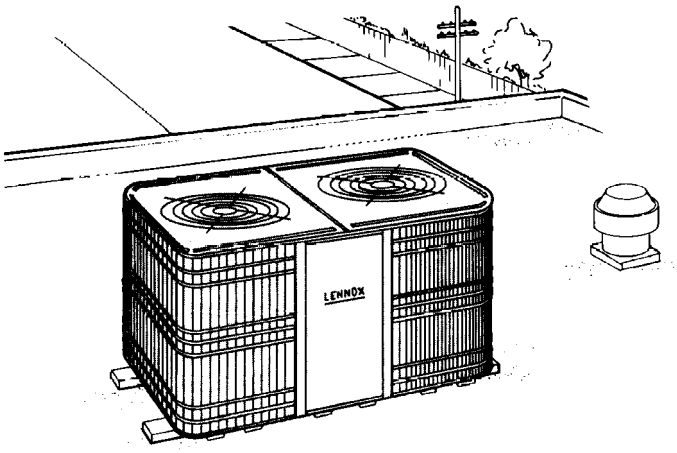
HP17-953 AND HP17-1353
Heat Pump Outdoor Units

23.0 to 62.4 kW (78 500 to 212 800 Btuh) Cooling Capacity
22.1 to 58.5 kW (75 500 to 199 500 Btuh) Heat ing Capacity

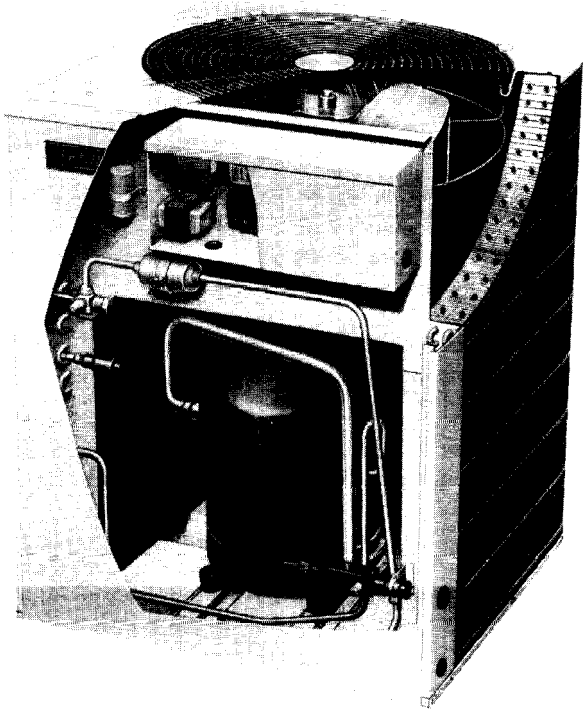
HP17

Bulletin #490025
August 1994
Supersedes October 1990

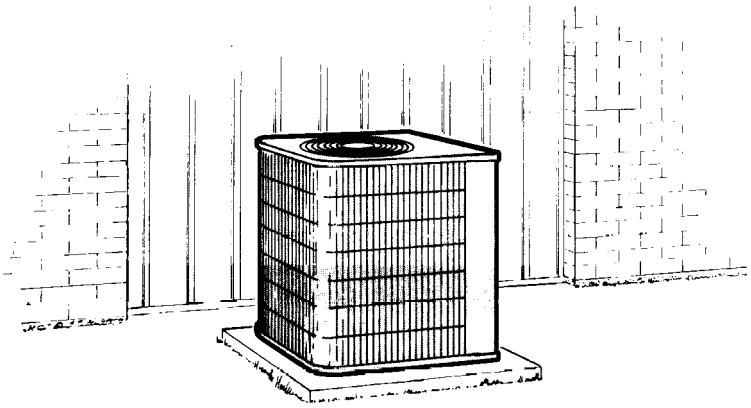
Typical Applications



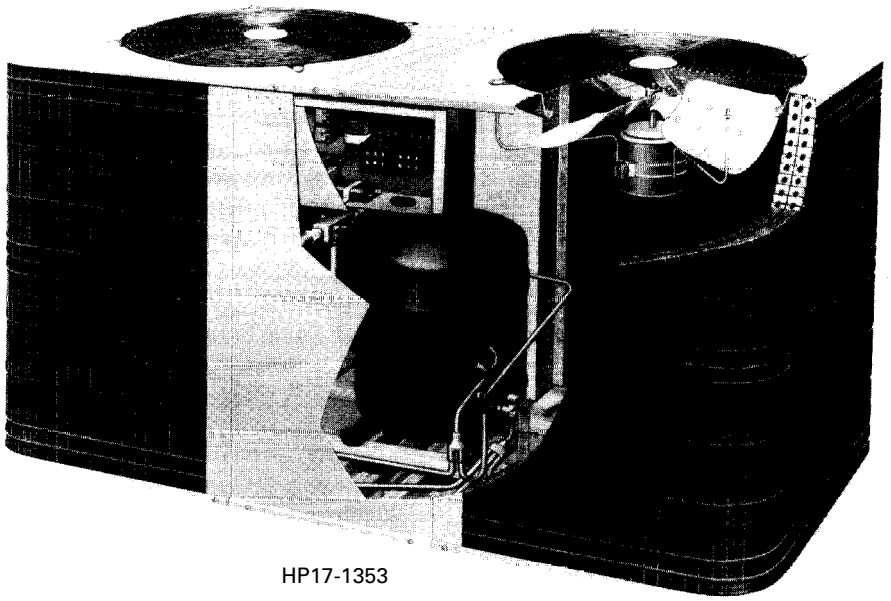
Rooftop Installation



HP17-953



Unit on Slab at Ground Level



HP17-1353

NOTE — Due to Lennox' ongoing committent to quality,
Specifications, Ratings and Dimensions subject to change without notice.

FEATURES

Application — The HP17 series air-cooled outdoor units are designed for efficient and economical installation with Lennox blower-coil units. Compact, low height outdoor unit cabinet design will allow concealed installation on a slab at grade level or behind a parapet wall on a rooftop. Upward discharge of air reduces sound level, protects walkways and prevents lawn damage. Matching blower powered indoor units with supplemental electric or hot water heat are available in up-flo and horizontal models. For complete data see blower-coil unit bulletin indexed in tab section, Cooling Units-Coils-Blower Coil Units. Outdoor units are shipped factory assembled, piped and wired. In addition, units are test operated at the factory. Installer has only to connect refrigerant lines, charge system and make electrical connections.

Completely Tested — HP17 units have been tested in the Lennox Research Laboratory Environmental Test Rooms which meet American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standard 37 requirements. The rating test conditions are those included in Air-Conditioning and Refrigeration Institute (ARI) Standards 210/240-89 or 340-86 while operating at rated voltages and air volumes. In addition, HP17 units have been sound rated in the Lennox reverberant sound test room in accordance with test conditions for Air-Conditioning and Refrigeration Institute (ARI) Standard 270-84. Outdoor units and components within are bonded for grounding to meet safety standards for servicing required by Underwriter's Laboratories (U.L.) and the International Electrotechnical Commission (IEC).

Cabinet — Heavy gauge galvanized steel cabinet is subject to a five station metal wash process. This preparation process results in a perfect bonding surface for the finish coat of baked-on outdoor enamel. The attractive enamel finish gives the cabinet long lasting protection from the weather. Drainage holes are furnished in base section for moisture removal. Heavy duty steel base channels raise the unit off of the mounting surface away from damaging moisture. Large removable panel provides service access. Control box is conveniently located for easy access. Controls are pre-wired at the factory.

Compressor — Compressor is hermetically sealed and provides trouble free operation and long service life. Built in protection devices assure protection from excessive current and temperature. Equipped with internal motor protection, vertical crankshaft, ringed valves and pistons, tuned discharge muffler, efficient oil pump and positive gas venting of lube system. Crankcase heater assures proper compressor lubrication. The entire running gear assembly is internally suspended. In addition, the compressor is installed in the unit on resilient rubber mounts assuring quiet and vibration free operation.

Copper Tube Outdoor Coil(s) — Lennox designed and fabricated coil is constructed of precisely spaced ripple-edge aluminum fins machine fitted to seamless copper tubes in a wrap-around "U" shaped configuration providing extra large surface area for low air resistance and excellent heat transfer. Fins are equipped with collars that grip tubing for maximum contact area. Flared shoulder tubing connections and silver soldering provide tight, leakproof joints. Long life copper tubing is corrosion-resistant and easy to field service. Coil is thoroughly factory tested under high pressure to insure leakproof construction. Entire coil is accessible for cleaning. A non-corrosive polyvinyl chloride (PVC) coated steel wire coil guard is furnished.

Defrost Control — A clock timer defrost control is furnished as standard equipment. It gives a defrost cycle for every 30 or 90 minutes (adjustable) of compressor "on" time at outdoor temperature below 7°C (45°F). A sensing element mounted on the outdoor coil determines when the defrost cycle is required. Defrost pressure switch on the liquid line terminates cycle.

Refrigerant Lines and Service Valves — Vapor and liquid lines require sweat connections and are made inside the unit. Non-corrosive vapor and liquid line service valves with gauge ports provide access to refrigerant system. Sight glass is furnished and factory installed. Thermometer well is provided for checking the refrigerant charge.

Outdoor Coil Fan(s) — HP17-953 model has a single fan and the HP17-1353 is equipped with dual fans. Efficient direct drive fan(s) moves large volumes of air uniformly through the entire outdoor coil(s) resulting in high efficiency. Vertical discharge of air minimizes operating sounds and eliminates hot air damage to lawn and shrubs. Fan motor(s) is inherently protected and totally enclosed for maximum protection from weather, dust and corrosion. A rain shield on the motor(s) provides additional protection from moisture. Fan service access is accomplished by removal of fan guard(s). Corrosion resistant polyvinyl chloride (PVC) coated steel wire guard(s) is furnished as standard.

Suction Line Accumulator — Factory installed and piped. Traps and prevents large amounts of liquid refrigerant from flooding directly into the compressor and causing damage on start-ups and refrigerant cycle change.

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 refrigerant pressure differential between outdoor unit and indoor unit of the system. Factory installed and piped.

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

Hi-Capacity Two Drier System — Two drier system is utilized in both the cooling and heating cycles. Driers are factory installed in the liquid line trapping any moisture or dirt that could contaminate the refrigerant system. HP17-953 driers have internal check valve. Factory installed.

High Pressure Switch — Shuts off unit if abnormal operating conditions cause the discharge pressure to rise above setting. Protects the compressor from excessive condensing pressure. Manual reset. Factory installed.

Loss of Charge Switch — Shuts off unit if suction pressure falls below setting. Provides loss of charge and freeze-up protection. Automatic reset.

Timed-Off Control — Prevents compressor short-cycling. Automatic reset control will shut the compressor off and hold it off for 5 minutes minimum. Factory installed.

Thermostat (Furnished) — A deluxe wall mounted combination heating-cooling dual setpoint thermostat and switching subbase is furnished as standard equipment. Thermostat is two stage cooling and two stage heating. It is equipped with a thermometer, temperature setting tabs in °C and °F, system selector switch (Off-Heat-Auto-Cool) and fan switch (Auto-On). Fan switch provides a choice of intermittent (Auto) or continuous (On) blower operation.

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

Low Ambient Kit (Optional) — Outdoor units will operate satisfactorily, in cooling mode, down to 10°C (50°F) outdoor air temperature without any additional controls. For cases where cooling operation of the unit is required at lower ambients, a Low Ambient Control Kit LB-57113BM **(27J00)** can be added in the field, enabling it to operate properly in the cooling mode down to minus 1°C (30°F). Kit must be ordered extra.

SP11 Remote Status Panel (Optional) — The operation of the unit can be checked at a glance on the Remote Status Panel **(12F83)** conveniently located within the conditioned area. Signal lights on the panel indicate "Cool Mode", "Heat Mode", "Compressor 1", "Compressor 2", "No Heat" and "Filter." The Cool Mode signal light is green when lit and indicates economizer damper operation or DX cooling operation for units without the economizer. Heat Mode light is green and reflects heating operation. Compressor 1 light is green when operating and will turn red if there is an operational malfunction. Compressor 2 light is not required and should be disregarded. The No Heat and Filter lights will show red and indicate a requirement for service. The following field installed controls are required for use with the status panel and must be ordered extra. Filter Switch Kit **(97C85)** is required for operation of the filter light. Status Panel Readout Relay Kit **(14F92)** is required to interface status panel with unit operation. Status Panel Resistor Kit **(31H62)** is required for status panel operation. Current Sensing Relay **(29F79)** is required with electric heat for operation of the No Heat light.

SSP11 Remote Switching Status Panel (Optional) — The operation of the unit can be controlled and observed on the Switching Status Panel **(12F84)** conveniently located within the conditioned area. Signal lights on the panel indicate "Cool Mode", "Heat Mode", "Compressor 1", "Compressor 2", "No Heat" and "Filter." The Cool Mode signal light is green when lit and indicates economizer damper operation or DX cooling operation for units without the economizer. Heat Mode light is green and reflects heating operation. Compressor 1 light is green when operating and will turn red if there is an operational malfunction. Compressor 2 light is not required and should be disregarded. The No Heat and Filter lights will show red and indicate a requirement for service. Additionally, panel is equipped with a system selector switch (Off-Heat-Auto-Cool-Emergency Heat) (Heat Pump Only), fan switch (Auto-On) and after hours timer. Fan switch provides a choice of intermittent (Auto) or continuous (On) blower operation. Manually operated after hours timer (0 to 12 hours) overrides night setback controls providing normal operation for time period set. A momentary push button switch is used to initiate the timer period. The following field installed controls are required for use with the status panel and must be ordered extra. Filter Switch Kit **(97C85)** is required for operation of the filter light. Status Panel Readout Relay Kit **(14F92)** is required to interface status panel with unit operation. Status Panel Resistor Kit **(31H62)** is required for status panel operation. Current Sensing Relay **(29F79)** is required with electric heat for operation of the No Heat light.

RATINGS

Outdoor Unit Model Number (*Sound Rating Number –bels)	●Cooling and Heating Ratings													Integrated Part Load Value	Lennox Indoor Unit	Check and Expansion Kit Required
	Cooling Capacity		High Temperature Heating Capacity		Low Temperature Heating Capacity		Cooling			High Temperature Heating		Low Temperature Heating				
	kW	Btuh	kW	Btuh	kW	Btuh	†Total Power Input kW	Coefficient of Performance (Out/Input)	Energy Efficiency Ratio (Btuh/Watt)	†Total Power Input kW	Coefficient of Performance (Out/Input)	†Total Power Input kW	Coefficient of Performance (Out/Input)			
HP17-953 (9.2)	23.0	78 500	22.1	75 500	12.9	43 900	9.0	2.55	8.70	7.4	3.00	5.9	2.20	- - - -	CB17-95V CBH17-95V	◆LB-51486CA
HP17-1353 (9.2)	31.1	106 000	27.5	93 800	16.4	55 900	12.6	2.45	8.40	10.0	3.00	8.1	2.15	- - - -	CB17-135V CBH17-135V	◆LB-51486CA
(1)▲HP17-953 (9.2) and (1)▲HP17-1353 (9.0)	48.0	163 800	46.1	157 400	26.7	91 200	18.5	2.60	8.90	17.2	2.70	13.6	2.00	10.8	CB17-185V CBH17-185V	◆LB-55674CA
(2)▲HP17-1353 (9.0)	62.4	212 800	58.5	199 500	34.8	118 700	25.5	2.40	8.30	20.2	2.90	16.0	2.20	10.6	CB17-275V CBH17-275V	☆LB-51486CB

*Sound rating number rated at test conditions for Air-Conditioning and Refrigeration Institute (ARI) Standard 270.

●The rating test conditions are those included in Air-Conditioning and Refrigeration Institute (ARI) Standard 210/240-89 or ▲340-86 while operating at rated voltage and air volumes;

Cooling Ratings — 35°C (95°F) outdoor air temperature, 26.7°C (80°F) dry bulb and 19.4°C (67°F) wet bulb entering indoor coil air.

High Temperature Heating Ratings — 8.3°C (47°F) dry bulb, 6.1°C (43°F) wet bulb outdoor air temperature and 21.1°C (70°F) entering indoor coil air.

Low Temperature Heating Ratings — minus 8.3°C (17°F) dry bulb, minus 9.4°C (15°F) wet bulb outdoor air temperature and 21.1°C (70°F) entering indoor coil air.

◆Kit contains 2 valves.

☆Kit contains 4 valves.

SPECIFICATIONS

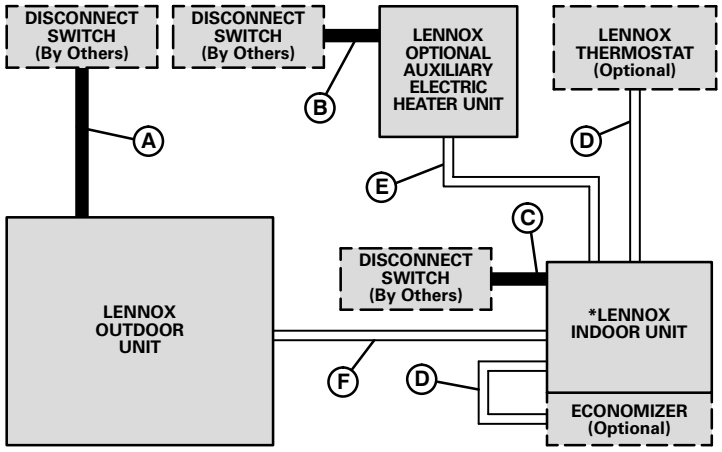
Model Number			HP17-953	HP17-1353
Outdoor Coil	Net face area — m^2 ($ft.^2$)	Outer coil	2.12 (22.8)	3.46 (37.2)
		Inner coil	2.03 (21.9)	3.32 (35.7)
	Tube outside diameter — mm (in.)		9.5 (3/8)	9.5 (3/8)
	Number of rows		2	2
	Fins per m (inch)		787 (20)	787 (20)
Outdoor Coil Fan	Diameter — mm (in.)		(1) 610 (24)	(2) 610 (24)
	Number of blades		4	4
	Motor output — W (hp)		(1) 373 (1/2)	(2) 187 (1/4)
	Air volume — m^3/s (cfm)		2.35 (5000)	3.20 (6790)
	Rev/Min		900	700
	Motor input — W		480	500 (total)
Refrigerant charge furnished (HCFC-22)			Holding charge	
Liquid line connection – outside diameter – mm (in.) sweat			15.9 (5/8)	15.9 (5/8)
Vapor line connection – outside diameter – mm (in.) sweat			34.9 (1-3/8)	34.9 (1-3/8)
Shipping weight — kg (lbs.) 1 package			192 (423)	263 (580)

ELECTRICAL DATA

Model Number		HP17-953	HP17-1353
Line voltage (50hz) 3 phase with neutral		380/420V	380/420V
Voltage range (minimum — maximum)		342 — 462V	342 — 462V
Compressor	Rated load amps	14.2	19.0
	Locked rotor amps	91.1	104.0
Outdoor Coil Fan Motor(s) (1 phase)	Full load amps	(1) 1.5	(2) 1.1
	Locked rotor amps	(1) 3.1	(2) 2.0

NOTE — Refer to local electrical codes to determine wire, fuse and disconnect size requirements.

FIELD WIRING



A — Three Phase with neutral — See Electrical Data
B — Three Phase with neutral — Size to heater capacity
C — Three Phase with neutral — Size to indoor coil blower motor
D — Eight wire 24V
E — Three wire 24V
F — Six wire 24V

NOTE — Field wiring not furnished by Lennox.

All wiring must conform to local electrical codes.

*Applications without auxiliary electric heat require a separate 20VA (minimum rating) transformer.

INSTALLATION CLEARANCES — mm (inches)

HP17-953

HP17-1353

GUIDE SPECIFICATIONS

Prepared for the guidance of architects, consulting engineers and mechanical contractors.

General — *Furnish and install an air cooled heat pump outdoor unit. The unit shall be shipped completely factory assembled, piped and wired internally ready for field connections. In addition, manufacturer shall test operate unit at the factory before shipment. The outdoor unit shall be a standard product of a firm regularly engaged in the manufacture of heating-cooling equipment.*

The installed weight shall not be more than . . . . . kg (lbs.). Entire unit shall have a width of not more than . . . . . mm (in.), a depth of not more than . . . . . mm (in.) and an overall height of not more than . . . . . mm (in.).

Cooling Capacity — *The total cooling capacity with matching indoor unit shall be . . . . . kW (Btuh) with an indoor coil air volume of . . . . . m^3/s (cfm), an indoor coil entering wet bulb temperature of . . . . . ° C (° F) and outdoor air temperature of . . . . . ° C (° F). The compressor power input shall not exceed . . . . . kW at the above conditions.*

Heating Capacity — *The total heating capacity with matching indoor unit shall be . . . . . kW (Btuh) with an indoor coil air volume of . . . . . m^3/s (cfm), an indoor coil entering air temperature of . . . . . ° C (° F) and . . . . . ° C (° F) outdoor air temperature. The compressor watts input shall not be more than . . . . . watts at the above conditions.*

Outdoor Coil(s) — *Coil(s) shall be non-ferrous construction with aluminum fins mechanically bonded to durable copper tubes. Coil(s) shall be pressure leak tested. Coil face area shall be not less than . . . . . m^2 (sq. ft.). Coil(s) shall be protected with steel guard(s).*

Compressor — *Shall be resiliently mounted, suction cooled, overload protected, and have internal excessive current and temperature protection. Shall have vertical crankshaft, ringed valves and pistons, tuned discharge muffler, efficient oil pump and crankcase heater.*

Refrigerant System — *Shall include liquid line service valve, vapor line service valve, gauge ports, two hi-capacity driers, thermometer well, high pressure switch, loss of charge switch, timed-off control, suction line accumulator, expansion valve, reversing valve and defrost control. Control options available shall include low ambient control kit, remote status panel and remote switching status panel.*

Cabinet — *Shall be constructed of galvanized steel which has been through a metal wash preparation and have a finish coat of baked-on outdoor enamel. Large access panel shall be provided to allow complete service. The base section shall be provided with moisture removal openings. Openings shall be provided for refrigerant lines and power connection entry.*

Air Mover — *Shall be direct drive blade type fan(s). Motor(s) shall have inherent protection devices and shall be protected from moisture. Motor(s) shall be . . . . . kW (hp) output with not more than . . . . . watts input. Fan(s) shall be protected with steel guard(s).*

OPTIONAL ACCESSORIES

Optional Remote Status Panel — *Shall be available for installation within the conditioned area to observe equipment operation. The panel shall include signal lights for Cool Mode, Heat Mode, Compressor 1, Compressor 2 (not required), No Heat and Filter.*

Optional Remote Switching Status Panel — *Shall be available for installation within the conditioned area to control and observe equipment operation. The panel shall include signal lights for Cool Mode, Heat Mode, Compressor 1, Compressor 2 (not required), No Heat and Filter. System selector switch and fan switch shall provide operational mode and blower operation. After hours timer switch shall override night setback controls and provide normal operation for time period set.*

DIMENSIONS — mm (inches)

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RATINGS — 50hz

NOTE — For Temperatures and Capacities not shown in tables, see bulletin — Cooling Unit Rating Table Correction Factor Data in Miscellaneous Engineering Data Section.

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