



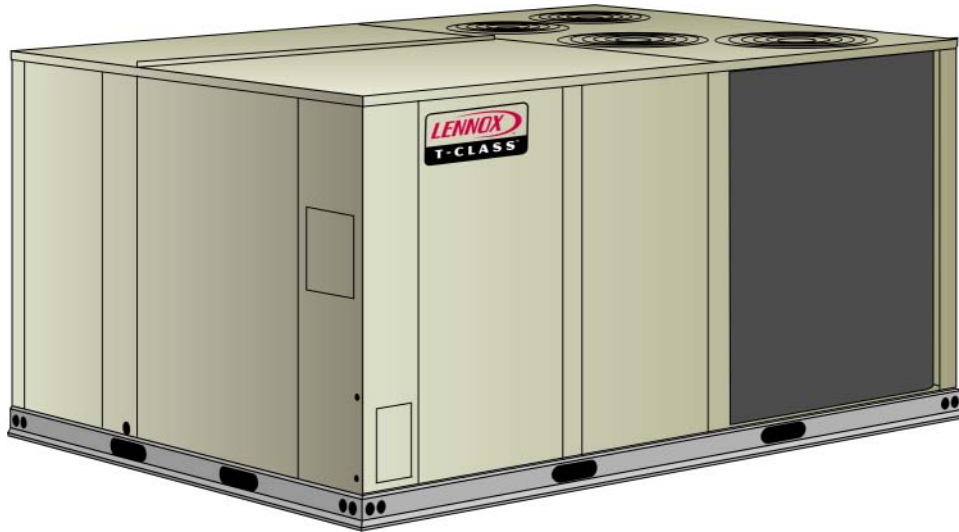
ENGINEERING DATA

PACKAGED HEAT PUMP

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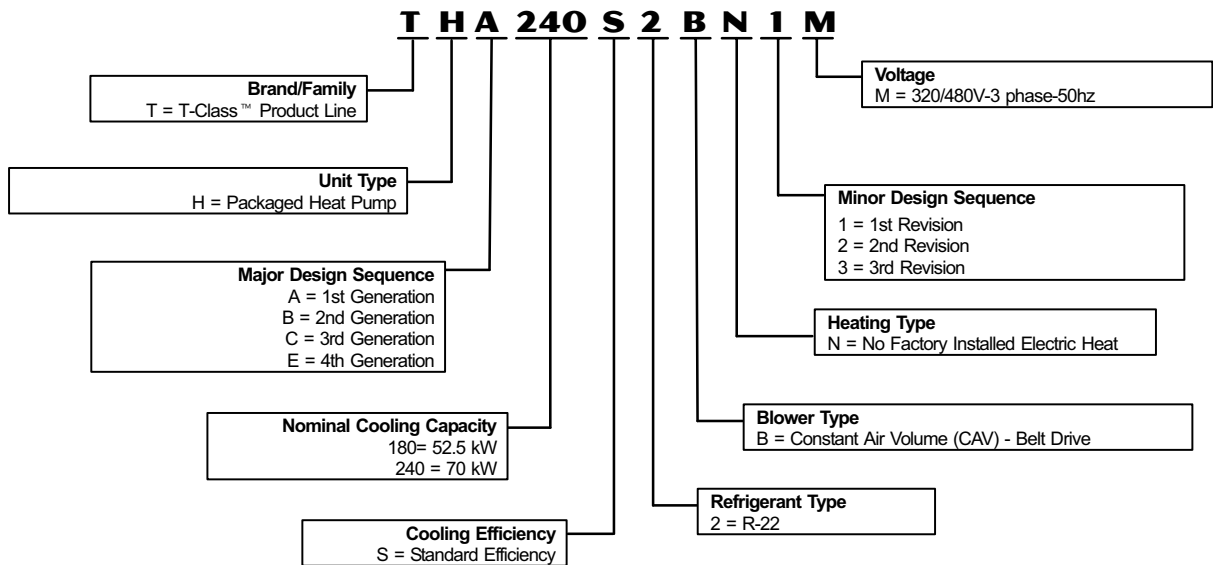
T-CLASS™ ROOFTOP UNITS - 50HZ

Bulletin No. 490111  
July 2005



**Net Cooling Capacity - 47.7 to 57.7 kW**  
**Net Heating Capacity - 48.3 to 57.1 kW**  
**Optional Electric Heat - 15 to 90 kW**

MODEL NUMBER IDENTIFICATION



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## FEATURES AND BENEFITS

### PERFORMANCE/QUALITY

Components bonded for grounding to meet safety standards for servicing required by Underwriters Laboratories (UL) and the International Electrotechnical Commission (IEC).

Cooling performance is rated at test conditions included in Air-Conditioning and Refrigeration Institute (ARI) Standard 340/360-2000 while operating at rated voltage and air volumes.

International Organization for Standardization (ISO) 9001 Registered Manufacturing Quality System

### COOLING/HEATING SYSTEM

Designed to maximize sensible and latent cooling performance at design conditions.

System can operate from -1°C to 52°C without any additional controls.

#### 1 Compressors

Resiliently mounted on rubber grommets for quiet operation.

Copeland Scroll™ compressors for high performance, reliability and quiet operation.

#### Compressor Crankcase Heaters

Protects against refrigerant migration that can occur during low ambient operation.

#### 2 Check/Thermal Expansion Valves

Assures optimal performance throughout the application range.

Removable element head.

#### Filter/Driers

High capacity filter/driers protect the system from dirt and moisture.

#### Freezestats

Protects the indoor coil from damaging ice build-up due to conditions such as low/no air flow, or low/no refrigerant charge.

#### High Pressure Switches

Protects the compressor from overload conditions such as dirty condenser coils, blocked refrigerant flow, or loss of outdoor fan operation.

#### Low Pressure Switches

Protects the compressor from low pressure conditions such as low refrigerant charge, or low/no air flow.

#### Defrost Control

Provides a defrost cycle, if needed, every 30 or 60 or 90 minutes (adjustable) of compressor “on” time at outdoor coil temperature below 2°C.

Pressure switch mounted on outdoor coil vapor line terminates defrost cycle.

#### 3 Reversing Valves

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.

#### 4 Coil Construction

Copper tube construction, enhanced rippled-edge aluminum fins, flared shoulder tubing connections, silver soldered construction for improved heat transfer. Factory leak tested.

#### Indoor Coil

Cross row circuiting with rifled copper tubing optimizes both sensible and latent cooling capacity. Low fin per inch count minimizes air pressure drop.

#### Outdoor Coil

Two independent formed coils allows separation for cleaning.

#### Condensate Drain Pan

Painted, galvanized pan with positive slope.

Drain connection extends outside unit.

#### 5 Outdoor Coil Fan Motors

Thermal overload protected, totally enclosed, permanently lubricated ball bearings, shaft up, independent motor mount.

#### Outdoor Coil Fan

PVC coated fan guard furnished.

### REQUIRED SELECTIONS

#### Capacity

Specify the nominal capacity of the unit.

### ACCESSORIES - Field Installed

**Condensate Drain Trap** - Available in copper or PVC.

**Low Ambient Kit** - Cycles the outdoor fan while allowing compressor operation in the cooling cycle. This intermittent fan operation allows the system to operate without icing the evaporator coil and losing capacity. Designed for use in ambient temperatures no lower than -17.8°C.

### ELECTRICAL

#### ACCESSORIES - Field Installed

##### 6 Electric Heat

Helix wound nichrome elements, time delay for element staging, individual element limit controls, wiring harness, may be two-stage controlled. The following must be ordered extra when field installed electric heat is used: Unit Fuse Block and Electric Heat Control Module. See Electrical / Electric Heat tables for ordering information.

##### 7 BLOWER

Supply air fan provides a wide range of air flow capability. Stocked models (units typically in-stock at warehouses) are equipped with standard static motor/drive combinations. Special order high and low static motor and drive options are available CTO (configure to order) offering an even wider range of capability.

#### Supply Air Motor

Overload protected with permanently lubricated ball bearings ensures durable operation. Special order high and low static motors provide a higher level of air performance for demanding applications.

#### Supply Air Blower

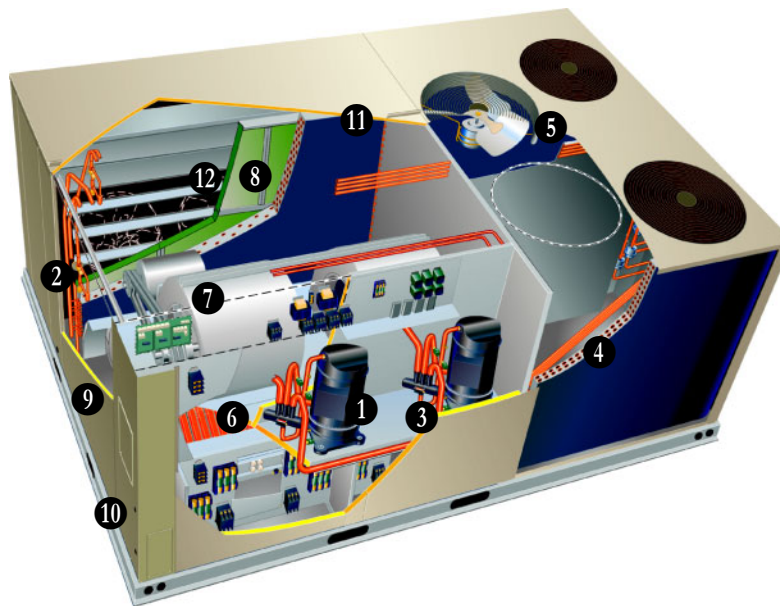
A double inlet wheel with forward curve blades provide maximum air performance and quiet operation. Dynamically balanced with permanently lubricated ball bearings assure long, reliable operation. Adjustable pulleys allow air to be precisely tuned to the needs of the application.

### REQUIRED SELECTIONS

#### Supply Air Blower

Specify Blower drive kit (See Blower Data Tables for specifications).

## FEATURES AND BENEFITS



### 8 AIR FILTERS

Disposable 51 mm pleated MERV 7 filters (Minimum Efficiency Reporting Value based on American Society of Refrigeration and Air-Conditioning Engineers (ASHRAE) 52.2) meet the requirements for ASHRAE 62 for improved indoor air quality.

#### ACCESSORIES - Field Installed

**MERV 11 Filters** - Disposable 51 mm pleated MERV 11 filters (Minimum Efficiency Reporting Value based on American Society of Refrigeration and Air Conditioning Engineers (ASHRAE) 52.2) are available for improved indoor air quality.

#### Replaceable Media

Permanent, metal frame filters with 51 mm polyester, replaceable media.

#### CONTROLS

##### Unit Controller

Solid-state microprocessor-based control board that provides flexible control of cooling functions. All control voltage is provided via a 24V (secondary) transformer with built-in circuit breaker protection. Built-in functions include:

**Blower On/Off Delay** - Time delay between blower on and off cycles provides a more even supply air temperature during heating.

**Built-in Control Parameters** - Saves installation time as no programming is required.

**Minimum Compressor Run Time** - Ensures proper oil return to the compressor.

**Night Setback Mode** - Saves energy by closing outdoor air dampers and operating supply fan on thermostat demand only.

**Heat/Cool Staging** - Capable of up to 2 heat / 2 cool staging with a third party DDC control system or compatible thermostat.

**Thermostat Bounce Delay** - Protects compressor from short cycling when a mechanical thermostat is used.

#### ACCESSORIES - Field Installed

##### Blower Proving Switch

Uses a static pressure sensor to monitor blower operation and shuts down unit if blower fails.

##### Temperature Control Systems

See Page 15

##### Dirty Filter Switch

Senses static pressure increase indicating dirty filter condition.

##### Smoke Detector

Photoelectric type, installed in supply air section or return air section or both sections

##### Indoor Air Quality (CO<sub>2</sub>) Sensor

Monitors CO<sub>2</sub> levels.

#### CABINET

### 9 Construction

Heavy-gauge steel panels and full perimeter heavy-gauge galvanized steel base rail provides structural integrity for transportation, handling, and installation.

Base rails have rigging holes. Three sides of the base rail have fork slots.

Raised edges around duct and power entry openings in the bottom of the unit provide additional protection against water entering the building.

#### Air-Flow Choice

Units are available in down-flow (vertical) or horizontal return air flow configuration.

Horizontal air flow requires Horizontal Roof Curb.

Horizontal Return Air Panel Kit is also required if converting a down-flow configured unit to horizontal air flow.

### 10 Power Entry

Electrical lines can be brought through the unit base or through horizontal access knock-outs.

#### Exterior Panels

Constructed of heavy-gauge, galvanized steel with a two-layer enamel paint finish.

### 11 Insulation

All panels adjacent to conditioned air are fully insulated with non-hygroscopic fiberglass insulation.

Unit base is fully insulated. The insulation also serves as an air seal to the roof curb, eliminating the need to add a seal during installation.

#### Access Panels

Access panels are provided for the compressor/controls/heating section and the blower access and air filter/economizer section.

#### REQUIRED SELECTIONS

##### Air Flow Configuration

Specify horizontal or down-flow (vertical).

#### OPTIONS - Factory Installed

##### Corrosion Protection

A completely flexible immersed coating with an electrodeposited dry film process. (AST ElectroFin E-Coat) Meets Mil Spec MIL-P-53084, ASTM B117 Standard Method Salt Spray Testing, ASTM 1153 Standard Specification for Methyl Isobutyl Ketone.

#### ACCESSORIES - Field Installed

##### Coil Guards

Painted, galvanized steel wire guards to protect outdoor coil. Not used with Hail Guards.

##### Hail Guards

Constructed of heavy gauge steel, painted to match cabinet, helps protect outdoor coils from hail damage. Not used with Coil Guards.

##### Horizontal Return Air Panel Kit

Required for horizontal applications with Horizontal Roof Curb, contains panel with return air opening for field replacement of existing unit panel and panel to cover bottom return air opening in unit, see dimension drawings.

## FEATURES AND BENEFITS

### SERVICEABILITY

Designed to streamline general maintenance and decrease troubleshooting time.

#### Marked & Color-Coded Wiring

All electrical wiring is color-coded and marked to identify which components it is connecting.

#### Electrical Plugs

Positive connection electrical plugs are used to connect common accessories or maintenance parts for easy removal or installation.

#### Access Panels

Large access panels are provided for quick and easy access to maintenance areas.

## OPTIONS/ACCESSORIES

### ECONOMIZER/OUTDOOR AIR/EXHAUST ACCESSORIES

#### Factory or Field Installed

##### 12 Economizer

Parallel, gear-driven action return air and outdoor air dampers, plug-in connections to unit, nylon bearings, neoprene seals, 24 volt, spring return motor, adjustable minimum damper position, damper assembly slides in unit, outdoor air hood must be ordered separately, choice of economizer controls. Economizer modulates dampers to maintain a 13°C discharge air temperature.

#### Economizer Enthalpy Control

Senses outdoor air enthalpy and enables economizer if the enthalpy is less than the setpoint of the control.

#### Down-Flow Barometric Relief

##### Dampers

Allows relief of excess return air static when economizer is near full open. Aluminum blade dampers prevent blow back and outdoor air infiltration during off cycle. Bird screen furnished.

#### Outdoor Air Damper Section

25% Manual Outdoor Air Dampers - Parallel blade dampers are manually adjustable to a fixed position.

25% Automatic Outdoor Air Damper - Parallel blade, gear-driven dampers are automatically adjusted with a two-position damper motor.

#### Economizer and Outdoor Air Damper

**Application Note** - Minimum mixed air temperature in heating mode -1°C

Maximum mixed air temperature in cooling mode: 32°C

#### Blower Access

Blower assembly slides out of the unit for easy access.

#### TXV Access

Thermal expansion valves are located near the perimeter of the unit for easier access.

#### Check/Thermal Expansion Valves

Removable element head allows change out of element and bulb without removing the TXV.

#### Coil Cleaning

Independently formed condenser coils allow separation for easier cleaning.

#### Standard Components

A large number of common maintenance parts are standard throughout the entire range of sizes, reducing the need to carry a lot of different parts to the job or in inventory.

#### Compressor Access

Compressors are located near the perimeter of the unit for easier access.

#### Compressor Compartment

Compressors are isolated from the condenser air flow allowing system operation checks to be done without changing the air flow across the outdoor coils.

#### Power Exhaust Fans

C1PWRE20C-1 models have two, 249 W (1/3 hp) motors with 508 mm (20 in.), five blade propeller-type fans with a total power input of 575 Watts and a total air volume of 3395 L/s (7190 cfm) at 0 Pa (0 in. w.g.).

Motor is inherently protected and enclosed for maximum protection from weather, dust and corrosion. Installs internal to unit for down-flow applications only with economizer option, provides exhaust air pressure relief, interlocked to run when return air dampers are closed and supply air blower is operating, fan runs when outdoor air dampers are 50% open (adjustable), motor is overload protected, steel cabinet and hood painted to match unit, requires optional Down-flow Economizer Barometric Relief Dampers.

See Power Exhaust Blower Tables.

#### Field Installed

##### Economizer Control

Sensible Control - Senses outdoor air temperature and enables the economizer if the temperature is less than the set point of the control.

Differential Sensible Control - Two temperature sensors allow the control to select between outdoor air or return air, whichever has lower temperature.

Enthalpy Control - Senses outdoor air enthalpy and enables economizer if the enthalpy is less than the setpoint of the control.

Differential Enthalpy Control - Two solid-state enthalpy sensors allow the control to select between outdoor air or return air, whichever has lower enthalpy.

##### Outdoor Air Hood

Required with Economizer, Outdoor Air Damper Sections, cleanable aluminum mesh fresh air filters furnished.

##### Down-Flow Barometric Relief

##### Damper Hood

Protects exhaust air from recirculating into outdoor air stream.

#### Horizontal Barometric Relief

##### Dampers

Allows relief of excess air when economizer is near full open. Aluminum blade dampers prevent blow back and outdoor air infiltration during off cycle. Field installed in return air duct. Bird screen furnished.

### CEILING DIFFUSERS

#### ACCESSORIES - Field Installed

##### Ceiling Diffusers

Aluminum grilles, large center grille, insulated diffuser box with flanges, hanging rings furnished, interior transition (even air flow), internally sealed (prevents recirculation), adapts to T-bar ceiling grids or plaster ceilings.

##### Transitions (Supply and Return)

Used with diffusers, installs in roof curb, galvanized steel construction, flanges furnished for duct connection to diffusers, fully insulated.

### ROOF CURBS

#### ACCESSORIES - Field Installed

Nailer strip furnished, mates to unit, shipped knocked down.

##### Standard Down-Flow

US National Roofing Contractors Approved, available in 356 mm and 610 mm heights

##### Horizontal

Converts unit from down-flow to horizontal (side) air flow, return air is on unit, supply air is on curb, see dimension drawings. Curbs for rooftop applications meet National Roofing Code requirements. Requires Horizontal Return Air Panel. Available in 660 mm, 762 mm, 940 mm and 1041 mm heights. Optional Insulation Kit is available to help prevent sweating.

##### Cliplock 1000 Full Perimeter

##### Down-Flow

Available in 356 mm, 457 mm, and 610 mm heights.

## OPTIONS / ACCESSORIES

	Item	180	240
<b>COOLING SYSTEM</b>			
Condensate Drain Trap	PVC - LTACDKP09/36	x	x
	Copper - LTACDKC09/36	x	x
Corrosion Protection		○	○
Low Ambient Kit	T1SNSR12C-1	x	x
<b>ELECTRIC HEAT</b>			
15 kW	EHA240-7.5 (order 1) and EHA240S-7.5 (order 1)	x	x
30 kW	EHA360-15 (order 1) and EHA360S-15 (order 1)	x	x
45 kW	EHA360-22.5 (order 2)	x	x
60 kW	EHA150-30 (order 2)	x	x
90 kW	EHA360-45 (order 2)	x	x
Electric Heat Control Kit	T1EHKT01C-1Y	x	x
Unit Fuse Blocks	See Electric Heat Tables for Ordering Information		
<b>BLOWER - SUPPLY AIR</b> - See Blower Data Tables for Specifications			
	Low Static Motor/Drive Combination	○	○
	Standard Static Motor/Drive Combination (stock unit)	○	○
	High Static Motor/Drive Combination	○	○
	<sup>2</sup> Standard to Low Static Conversion Kit - Drive Kit #A - C1DRKT044-1	x	
	<sup>2</sup> Standard to Low Static Conversion Kit - Drive Kit #2 - C1DRKT045-1		x
	<sup>3</sup> High to Standard Static Conversion Kit - Drive Kit #3 - C1DRKT038-1	x	
<b>CONTROLS</b>			
Control Systems	See Page 15	x	x
Blower Proving Switch	LTABPSK	x	x
Dirty Filter Switch	LTADFSK	x	x
Smoke Detector - Supply	LTASASDK10/36	x	x
Smoke Detector - Return	LTARASDK10/30	x	x
<b>Indoor Air Quality (CO<sub>2</sub>) Sensors</b>			
CO <sub>2</sub> Sensor Duct Mounting Kit	LTIAQSDMK03/36	x	x
Sensor - white case CO <sub>2</sub> display	LTAIAQSWDK03/36	x	x
Sensor - white case no display	LTAIAQSWN03/36	x	x
Sensor - black case CO <sub>2</sub> display	LTAIAQSND03/36	x	x
Sensor - black case, no display	LTAIAQSDMBN03/36	x	x
Aspiration Box for duct mounting	LTIAQABD03/36	x	x
Handheld CO <sub>2</sub> Monitor	LTAIAQSHM03/36	x	x
<b>CABINET</b>			
Coil Guards	C1GARD20C-1	x	x
Hail Guards	C1GARD10C-1	x	x
Horizontal Return Air Panel Kit	C1HRAP10C-1	x	x
<b>AIR FILTERS</b>			
MERV 11 High Efficiency	610 x 610 x 51 order 6 per unit - C1FLTR10C-1	x	x
Replaceable Media Filter Kit with Frame	610 x 610 x 51 order 6 per unit - C1FLTR30C-1	x	x

○ - Configure to Order (Factory Installed) Factory installed items are special order with extended lead times and must be ordered with the unit.

x - Field Installed.

<sup>2</sup> Standard static drive can be converted to low static drive with field installed kit.

<sup>3</sup> High static drive can be converted to standard static drive with field installed kit.

**OPTIONS / ACCESSORIES**

	Item	180	240
<b>CEILING DIFFUSERS</b>			
Step-Down	RTD11-185	x	
Order one	RTD11-275		x
Flush	FD11-185	x	
Order one	FD11-275		x
Transitions - (Supply and Return)	LASRT18	x	
Order one	LASRT21/24		x
<b>ECONOMIZER</b>			
<b>Economizer</b>			
Economizer - Order Hood Separately	T1ECON10C-1	⊗	⊗
<b>Economizer Controls</b>			
Differential Enthalpy	C1SNSR07AE1-	x	x
Single Enthalpy	C1SNSR06AE1-	⊗	⊗
Sensible	TASEK03/36	x	x
Differential Sensible	TASEK03/36	<sup>1</sup> x	<sup>1</sup> x
<b>Barometric Relief</b>			
Down-Flow Barometric Relief Dampers - Order Hood Separately	LAGED18/24	⊗	⊗
Hood for Down-Flow LAGED	C1HOOD20C-1	x	x
Horizontal Barometric Relief Dampers - Hood Furnished	LAGEDH18/24	x	x
<b>OUTDOOR AIR</b>			
<b>Outdoor Air Dampers</b>			
Damper Section (down-flow) - Automatic - Order Hood Separately	T1DAMP20C-1	⊗	⊗
Damper Section (down-flow) - Manual - Order Hood Separately	LAOAD18/24	⊗	⊗
<b>Outdoor Air Hoods</b>			
Outdoor Air Hood (down-flow) includes 3 - 406 x 635 x 25 mm (16 x 25 x 1 in.) filters	C1HOOD10C-1	⊗	⊗
<b>Power Exhaust</b>			
Standard Static	C1PWRE20C-1M	x	x
<b>ROOF CURBS - CLIPLOCK 1000</b>			
<b>Down-Flow</b>			
356 mm height	LARMF18/30S-14	x	x
457 mm height	LARMF18/30S-18	x	x
610 mm height	LARMF18/30S-24	x	x
<b>Horizontal</b>			
660 mm height	LARMFH18/24S-26	x	x
940 mm height	LARMFH18/24S-37	x	x
<b>ROOF CURBS - STANDARD</b>			
<b>Down-Flow</b>			
356 mm height	LARMF18/36-14	x	x
610 mm height	LARMF18/36-24	x	x
<b>Horizontal</b>			
660 mm height	LARMFH18/24-26	x	x
940 mm height	LARMFH18/24-37	x	x
<b>Insulation Kits for Standard Horizontal Roof Curbs</b>			
for LARMFH18/24-26	C1INSU11C-1	x	x
for LARMFH18/24-37	C1INSU13C-1	x	x

⊗ - Field Installed or Configure to Order (factory installed). Factory installed items are special order with extended lead times and must be ordered with the unit.

x - Field Installed.

<sup>1</sup> - Order two each

## SPECIFICATIONS

General Data		Model No.	THA180S2B	THA240S2B
		Efficiency Type	Standard	Standard
<b>Cooling Performance</b>	Gross Cooling Capacity - kW (Btuh)		50.9 (174,000)	60.3 (206,000)
	<sup>1</sup> Net Cooling Capacity - kW (Btuh)		47.7 (163,000)	57.7 (197,000)
	Total Unit Power - kW		17.5	21.9
	<sup>1</sup> EER (Btuh/Watt)		9.3	9.0
	<sup>2</sup> Integrated Part Load Value (Btuh/Watt)		9.6	9.3
		Refrigerant Type	R-22	R-22
		Refrigerant Charge Furnished	Circuit 1 11.1 kg (24 lbs. 8 oz.)	Circuit 2 11.8 kg (26 lbs. 0 oz.)
<b>Heating Performance</b>	<sup>1</sup> Total High Heating Capacity - kW (Btuh)		48.3 (165,000)	57.1 (195,000)
	Total Unit Power - kW		15.6	18.4
	<sup>1</sup> C.O.P.		3.1	3.1
	<sup>1</sup> Total Low Heating Capacity - kW (Btuh)		27.8 (95,000)	30.5 (104,000)
	Total Unit Power - kW		13.8	15.3
		<sup>1</sup> C.O.P.	2.0	2.0
<b>Electric Heat Available</b> - See page 14 for capacities			See Table below for capacities	
<b>Compressor Type (No.)</b>			Scroll (2)	Scroll (2)
<b>Outdoor Coils</b>	Net face area - m <sup>2</sup> (sq. ft.) total		5.2 (56.0)	5.2 (56.0)
	Tube diameter - mm (in.)		9.5 (3/8)	9.5 (3/8)
	Number of rows		2	2
	Fins per M (inch)		787 (20)	787 (20)
<b>Outdoor Coil Fans</b>	Motor Watts (horsepower)		(4) 249 (1/3)	(4) 249 (1/3)
	Motor rpm		896	896
	Total Motor watts		1065	1065
	Diameter - mm (in.) - Number of blades		(4) 610 (24) - 3	(4) 610 (24) - 3
	Total Air volume - L/s (cfm)		6075 (12,875)	6075 (12,875)
<b>Indoor Coils</b>	Net face area - m <sup>2</sup> (sq. ft.) total		2.07 (22.3)	2.07 (22.3)
	Tube diameter - mm (in.)		9.5 (3/8)	9.5 (3/8)
	Number of rows		3	4
	Fins per m (inch)		551 (14)	551 (14)
	Drain connection - number and size		(1) 1 in. NPT coupling	(1) 1 in. NPT coupling
		Expansion device type	Balanced Port Thermostatic Expansion Valve, removeable power head	
<b>3, 4 Indoor Blower and Drive Selection</b>	Nominal motor size	Low Static	2.2 kW (3 hp)	3.7 kW (5 hp)
		Standard Static	2.2 kW (3 hp)	5.6 kW (7.5 hp)
		High Static	3.7 kW (5 hp)	7.5 kW (10 hp)
	Drive Kit	Low Static	#A - 446-604 rpm	#2 - 571-721 rpm
		Standard Static	#1 - 592-804 rpm	#7 - 708-871 rpm
		High Static	#4 - 788-988 rpm	#6 - 871-1071 rpm
	Field Installed Drive Kits	Standard to Low Static	#A - 446-604 rpm	#9 - 571-721 rpm
		Wheel nominal diameter x width	(2) 381 x 381 mm (15 x 15 in.)	
<b>Filters</b>	Type of filter		Disposable, pleated MERV 7	
	Number and size - mm		(6) 610 x 610 x 51	
<b>Electrical characteristics</b>			380/420V - 50 hertz - 3 phase	

NOTE — Net capacity includes evaporator blower motor heat deduction. Gross capacity does not include evaporator blower motor heat deduction.

<sup>1</sup> Rating test conditions are those included in Air-Conditioning and Refrigeration Institute (ARI) Standard 340/360 while operating at rated voltage and air volumes  
**Cooling Ratings** - 35°C (95°F) outdoor air temperature and 27°C (80°F) db/19°C (67°F) wb entering indoor coil air.

**High Temperature Heating Ratings** - 8°C (47°F) db/6°C (43°F) wb outdoor air temperature and 21°C (70°F) entering indoor coil air.

**Low Temperature Heating Ratings** - -8°C (17°F) db/-9°C (15°F) wb outdoor air temperature and 21°C (70°F) entering indoor coil air.

<sup>2</sup> Integrated Part Load Value rated at 27°C (80°F) outdoor air temperature.

<sup>3</sup> Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required.

<sup>4</sup> Stocked models are available with standard static drives. High static drives are factory installed (configure to order). Low static drive can be factory installed (configure to order) or standard static drives can be converted to low static with field installed kit. High static models can be converted to standard static with field installed kit.

# COOLING AND COOLING RATINGS

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

## 15 TON STANDARD EFFICIENCY - COOLING CAPACITY - ONE COMPRESSOR OPERATING

THA180

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			18°C (65°F)						24°C (75°F)						29°C (85°F)						35°C (95°F)					
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb		
			kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	2.26	4800	24.5	83.7	5.35	.65	.81	.96	23.9	81.4	5.87	.66	.82	.97	23.1	78.8	6.50	.67	.84	.99	22.3	76.0	7.23	.68	.86	1.00
	2.83	6000	25.5	87.0	5.41	.70	.89	1.00	24.8	84.6	5.94	.72	.91	1.00	24.0	81.9	6.56	.73	.93	1.00	23.2	79.0	7.28	.75	.95	1.00
	3.40	7200	26.3	89.8	5.45	.76	.96	1.00	25.6	87.4	5.98	.78	.98	1.00	24.8	84.7	6.61	.80	.99	1.00	24.0	82.0	7.34	.82	1.00	1.00
19°C (67°F)	2.26	4800	26.2	89.3	5.45	.51	.63	.76	25.4	86.7	5.97	.51	.63	.78	24.6	83.9	6.59	.52	.64	.79	23.7	80.9	7.33	.53	.65	.81
	2.83	6000	27.0	92.2	5.50	.54	.68	.85	26.2	89.5	6.02	.54	.69	.87	25.4	86.6	6.65	.55	.70	.89	24.4	83.4	7.37	.56	.72	.91
	3.40	7200	27.6	94.3	5.54	.57	.74	.93	26.8	91.6	6.06	.57	.75	.95	25.9	88.5	6.68	.58	.77	.97	25.0	85.2	7.42	.59	.79	.98
22°C (71°F)	2.26	4800	28.0	95.4	5.55	.39	.49	.60	27.2	92.7	6.08	.39	.50	.61	26.3	89.7	6.70	.39	.50	.62	25.4	86.5	7.44	.39	.51	.63
	2.83	6000	28.8	98.4	5.61	.39	.52	.65	28.0	95.5	6.13	.40	.53	.66	27.1	92.3	6.76	.40	.54	.68	26.1	88.9	7.47	.40	.55	.69
	3.40	7200	29.4	100.4	5.64	.40	.55	.71	28.5	97.4	6.17	.41	.56	.72	27.6	94.1	6.79	.41	.57	.74	26.6	90.6	7.51	.41	.58	.76

## 15 TON STANDARD EFFICIENCY - COOLING CAPACITY - BOTH COMPRESSORS OPERATING

THA180S

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			29°C (85°F)						35°C (95°F)						41°C (105°F)						46°C (115°F)					
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb		
			kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	2.26	4800	47.4	161.9	13.11	.70	.86	.99	45.8	156.2	14.58	.71	.87	1.00	43.9	149.8	16.27	.73	.89	1.00	41.9	143.0	18.13	.74	.92	1.00
	2.83	6000	49.3	168.3	13.22	.76	.94	1.00	47.6	162.4	14.68	.77	.96	1.00	45.7	156.0	16.35	.79	.98	1.00	43.7	149.2	18.26	.82	.99	1.00
	3.40	7200	51.0	174.1	13.33	.82	.99	1.00	49.4	168.5	14.80	.84	1.00	1.00	47.6	162.3	16.49	.86	1.00	1.00	45.6	155.6	18.38	.89	1.00	1.00
19°C (67°F)	2.26	4800	50.6	172.5	13.29	.55	.68	.82	48.7	166.2	14.77	.55	.69	.83	46.7	159.4	16.44	.56	.70	.86	44.5	152.0	18.31	.57	.72	.88
	2.83	6000	52.1	177.9	13.41	.58	.73	.90	50.2	171.4	14.86	.59	.75	.92	48.2	164.3	16.53	.60	.77	.94	45.9	156.5	18.43	.61	.79	.97
	3.40	7200	53.3	181.9	13.47	.61	.80	.97	51.3	175.1	14.96	.62	.81	.99	49.2	167.8	16.63	.63	.84	1.00	46.8	159.8	18.49	.65	.86	1.00
22°C (71°F)	2.26	4800	54.0	184.3	13.51	.41	.53	.65	52.1	177.7	15.00	.41	.54	.67	50.0	170.5	16.66	.41	.55	.68	47.7	162.6	18.53	.42	.56	.69
	2.83	6000	55.6	189.7	13.63	.42	.57	.71	53.5	182.7	15.07	.42	.57	.73	51.3	175.1	16.75	.43	.59	.74	48.9	166.8	18.62	.43	.60	.76
	3.40	7200	56.7	193.4	13.69	.43	.60	.77	54.6	186.2	15.15	.44	.61	.79	52.2	178.2	16.84	.44	.63	.81	49.7	169.7	18.69	.45	.64	.84

## 15 TON STANDARD EFFICIENCY - HEATING CAPACITY

THA180S

Indoor Coil Air Volume 21°C db (70°F db)	Air Temperature Entering Outdoor Coil																			
	18°C (65°F)				7°C (45°F)				minus 4°C (25°F)				minus 15°C (5°F)				minus 28°C (minus 15°F)			
	Total Heating Capacity		Comp. Motor kW Input	Total Heating Capacity		Comp. Motor kW Input	Total Heating Capacity		Comp. Motor kW Input	Total Heating Capacity		Comp. Motor kW Input	Total Heating Capacity		Comp. Motor kW Input	Total Heating Capacity		Comp. Motor kW Input		
kW	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh				
2.27	4800	60.8	207.6	14.53	45.8	156.3	13.36	30.4	103.7	12.21	18.7	63.7	10.54	9.6	32.7	7.99				
2.83	6000	61.5	210.0	13.57	46.5	158.7	12.40	31.1	106.1	11.26	19.4	66.1	9.59	10.3	35.1	7.03				
3.40	7200	62.2	212.2	13.76	47.2	160.9	12.59	31.7	108.3	11.45	20.0	68.3	9.78	10.9	37.3	7.22				



# COOLING RATINGS

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

## 20 TON STANDARD EFFICIENCY - COOLING CAPACITY - ONE COMPRESSOR OPERATING

THA240S

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			18°C (65°F)						24°C (75°F)						29°C (85°F)						35°C (95°F)					
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb		
			kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	2.83	6000	29.7	101.3	6.79	.65	.82	.99	28.9	98.7	7.43	.66	.84	1.00	28.0	95.7	8.16	.67	.86	1.00	27.1	92.4	9.00	.68	.88	1.00
	3.54	7500	30.8	105.2	6.89	.71	.93	1.00	30.0	102.5	7.53	.72	.95	1.00	29.2	99.5	8.26	.74	.97	1.00	28.2	96.2	9.10	.76	.99	1.00
	4.25	9000	31.9	108.8	6.99	.79	1.00	1.00	31.2	106.3	7.63	.81	1.00	1.00	30.3	103.4	8.36	.83	1.00	1.00	29.4	100.2	9.20	.85	1.00	1.00
19°C (67°F)	2.83	6000	31.5	107.4	6.95	.51	.63	.78	30.7	104.6	7.58	.51	.64	.79	29.7	101.4	8.31	.52	.65	.81	28.7	97.9	9.14	.52	.66	.84
	3.54	7500	32.4	110.6	7.04	.54	.69	.89	31.6	107.7	7.67	.55	.69	.91	30.6	104.4	8.40	.55	.71	.93	29.5	100.6	9.23	.56	.73	.96
	4.25	9000	33.1	113.0	7.11	.57	.76	.98	32.2	109.9	7.73	.58	.78	.99	31.2	106.5	8.46	.59	.80	1.00	30.1	102.7	9.28	.60	.82	1.00
22°C (71°F)	2.83	6000	33.5	114.3	7.14	.38	.49	.61	32.6	111.3	7.77	.38	.50	.62	31.6	107.9	8.49	.38	.50	.63	30.5	104.2	9.32	.38	.51	.64
	3.54	7500	34.4	117.3	7.24	.39	.53	.67	33.5	114.2	7.85	.39	.54	.68	32.4	110.7	8.58	.39	.54	.69	31.3	106.7	9.40	.40	.55	.70
	4.25	9000	35.0	119.4	7.30	.40	.57	.73	34.0	116.1	7.92	.41	.57	.75	33.0	112.5	8.63	.41	.58	.77	31.8	108.5	9.45	.41	.59	.80

## 20 TON STANDARD EFFICIENCY - COOLING CAPACITY - BOTH COMPRESSORS OPERATING

THA240S

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			29°C (85°F)						35°C (95°F)						41°C (105°F)						46°C (115°F)					
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb		
			kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	2.83	6000	57.9	197.5	16.41	.74	.91	1.00	55.9	190.7	18.09	.75	.93	1.00	53.7	183.2	20.03	.76	.95	1.00	51.3	175.2	22.21	.78	.98	1.00
	3.54	7500	60.2	205.3	16.61	.80	1.00	1.00	58.2	198.5	18.30	.82	1.00	1.00	56.1	191.5	20.21	.84	1.00	1.00	53.9	183.9	22.40	.87	1.00	1.00
	4.25	9000	62.5	213.4	16.81	.88	1.00	1.00	60.6	206.8	18.50	.90	1.00	1.00	58.4	199.4	20.43	.92	1.00	1.00	56.1	191.3	22.62	.95	1.00	1.00
19°C (67°F)	2.83	6000	61.3	209.2	16.71	.57	.72	.87	59.2	202.0	18.38	.58	.73	.89	56.9	194.0	20.29	.59	.74	.91	54.2	184.9	22.50	.60	.76	.94
	3.54	7500	63.1	215.4	16.89	.61	.78	.97	60.9	207.7	18.56	.62	.79	.99	58.4	199.3	20.45	.63	.82	1.00	55.7	190.1	22.62	.64	.84	1.00
	4.25	9000	64.4	219.8	17.01	.65	.85	1.00	62.1	211.9	18.66	.66	.88	1.00	59.6	203.5	20.57	.67	.90	1.00	56.9	194.2	22.74	.69	.93	1.00
22°C (71°F)	2.83	6000	65.3	222.7	17.07	.42	.56	.69	63.0	215.0	18.74	.42	.56	.70	60.5	206.5	20.63	.43	.57	.72	57.7	196.9	22.84	.43	.58	.74
	3.54	7500	66.9	228.4	17.25	.44	.60	.76	64.5	220.2	18.90	.44	.61	.77	61.9	211.3	20.79	.45	.62	.79	59.0	201.4	22.96	.45	.64	.82
	4.25	9000	68.1	232.2	17.35	.45	.64	.83	65.6	223.9	19.00	.46	.65	.85	62.9	214.6	20.89	.46	.67	.88	60.0	204.7	23.05	.47	.68	.91

## 20 TON STANDARD EFFICIENCY - HEATING CAPACITY

THA240S

Indoor Coil Air Volume 21°C db (70°F db)	Air Temperature Entering Outdoor Coil																			
	18°C (65°F)				7°C (45°F)				minus 4°C (25°F)				minus 15°C (5°F)				minus 28°C (minus 15°F)			
	Total Heating Capacity		Comp. Motor kW Input	Total Heating Capacity		Comp. Motor kW Input	Total Heating Capacity		Comp. Motor kW Input	Total Heating Capacity		Comp. Motor kW Input	Total Heating Capacity		Comp. Motor kW Input	Total Heating Capacity		Comp. Motor kW Input		
kW	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh				
2.83	6000	72.0	245.8	17.61	53.6	182.9	15.49	34.8	118.6	13.39	20.6	70.3	11.07	10.5	35.9	8.34				
3.54	7500	73.2	249.7	17.22	54.7	186.8	15.10	35.9	122.5	13.00	21.7	74.2	10.68	11.7	39.8	7.95				
4.25	9000	74.4	253.7	16.78	55.9	190.8	14.66	37.1	126.5	12.56	22.9	78.2	10.24	12.8	43.8	7.51				

**BLOWER DATA**

**THA180**

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT WITH WET INDOOR COIL & AIR FILTERS IN PLACE.**

**FOR ALL UNITS ADD:** Any field installed accessories air resistance (duct resistance, diffuser, etc.). See page 12

Then determine from table the blower motor output and drive required.

**100 to 375 Pa**

**THA180**

Air Volume L/s	External Static (Pa)												
	100	125	150	175	200	225	250	275	300	325	350	375	
	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	
	<b>Low - 2.2 kW, Drive Kit A</b>					<b>Standard Static - 2.2 kW (3 hp), Drive Kit 1</b>				<b>High Static - 3.7 kW (5 hp), Drive Kit 4</b>			
2265	577 1.13	620 1.31	662 1.48	702 1.66	742 1.83	777 2.01	811 2.18	842 2.36	872 2.54	902 2.72	932 2.89	960 3.07	
2360	585 1.25	628 1.43	670 1.60	710 1.78	750 1.95	783 2.13	815 2.30	848 2.50	880 2.70	910 2.88	940 3.05	968 3.23	
2595	605 1.45	648 1.65	690 1.85	728 2.05	765 2.25	800 2.45	835 2.65	865 2.85	895 3.05	925 3.25	955 3.45	983 3.65	
2830	630 1.75	670 1.95	710 2.15	748 2.38	785 2.60	818 2.83	850 3.05	880 3.25	910 3.45	940 3.68	970 3.90	998 4.13	
3065	650 2.05	690 2.28	730 2.50	768 2.75	805 3.00	838 3.23	870 3.45	900 3.70	930 3.95	958 4.18	985 4.40	1013 4.63	
3305	675 2.35	715 2.63	755 2.90	790 3.15	825 3.40	858 3.68	890 3.95	920 4.20	950 4.45	978 4.70	1005 4.95	1030 5.18	
3540	687 2.55	725 2.81	763 3.06	798 3.33	833 3.60	866 3.86	898 4.11	926 4.36	954 4.61	984 4.90	1013 5.19	1038 5.44	

**400 to 650 Pa**

**THA180**

Air Volume cfm	External Static (Pa)											
	400	425	450	475	500	525	550	575	600	625	650	
	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	RPM BHP	
	<b>High - 3.7 kW, Drive Kit 4</b>											
	<b>Field Furnished Drive</b>											
2265	987 3.24	1014 3.42	1041 3.60	1064 3.78	1087 3.95	1112 4.13	1136 4.30	1159 4.50	1181 4.70	1204 4.88	1226 5.06	
2360	995 3.40	1020 3.60	1045 3.80	1070 3.98	1095 4.15	1118 4.33	1140 4.50	1163 4.70	1185 4.90	1208 5.10	1230 5.30	
2595	1010 3.85	1035 4.05	1060 4.25	1085 4.48	1110 4.70	1133 4.90	1155 5.10	1178 5.30	1200 5.50	1220 5.70	1240 5.90	
2830	1025 4.35	1050 4.58	1075 4.80	1098 5.00	1120 5.20	1145 5.43	1170 5.65	1193 5.88	1215 6.10	1235 6.33	1255 6.55	
3065	1040 4.85	1065 5.10	1090 5.35	1115 5.60	1140 5.85	1163 6.08	1185 6.30	1205 6.53	1225 6.75	1248 7.00	1270 7.25	
3305	1055 5.40	1080 5.68	1105 5.95	1130 6.20	1155 6.45	1178 6.70	1200 6.95	1220 7.20	1240 7.45	1263 7.73	1285 8.00	
3540	1063 5.68	1088 5.94	1113 6.19	1136 6.44	1159 6.69	1182 6.96	1204 7.23	1226 7.50	1248 7.77	1269 8.03	1289 8.28	

**AIR RESISTANCE (Pa) - Options**

Air Volume - L/s	Electric Heat	Economizer	Horizontal Roof Curb	MERV 11 Filter
2265	---	---	20	2
2360	---	---	20	2
2595	---	---	25	5
2830	2	---	27	5
3065	2	5	32	5
3305	2	10	37	7
3540	2	12	40	7

**BLOWER DATA**

**THA240**

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT WITH WET INDOOR COIL & AIR FILTERS IN PLACE.**

**FOR ALL UNITS ADD:** Any field installed accessories air resistance (duct resistance, diffuser, etc.). See page 12

Then determine from table the blower motor output and drive required.

**50 to 325 Pa**

**THA240**

Air Volume L/s	External Static (Pa)																								
	50		75		100		125		150		175		200		225		250		275		300		325		
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM
	<b>Low Static - 3.7 kW, Drive Kit 2</b>				<b>Standard Static - 5.6 kW (7.5 hp), Drive Kit 7</b>								<b>High Static - 5.6 kW (7.5 hp), Drive Kit 7</b>												
3020	648	1.99	688	2.22	728	2.46	764	2.69	801	2.92	834	3.15	866	3.39	896	3.62	926	3.85	954	4.08	981	4.30	1008	4.53	
3305	675	2.35	715	2.63	755	2.90	790	3.15	825	3.40	858	3.68	890	3.95	920	4.20	950	4.45	978	4.70	1005	4.95	1030	5.18	
3540	700	2.75	738	3.03	775	3.30	810	3.58	845	3.85	878	4.15	910	4.45	938	4.70	965	4.95	993	5.23	1020	5.50	1048	5.78	
3775	725	3.20	763	3.50	800	3.80	833	4.08	865	4.35	898	4.65	930	4.95	958	5.23	985	5.50	1013	5.80	1040	6.10	1065	6.40	
4010	750	3.65	788	3.98	825	4.30	858	4.60	890	4.90	920	5.23	950	5.55	978	5.85	1005	6.15	1033	6.48	1060	6.80	1085	7.10	
4250	780	4.20	815	4.53	850	4.85	880	5.18	910	5.50	940	5.83	970	6.15	998	6.48	1025	6.80	1053	7.15	1080	7.50	1105	7.83	
4530	811	4.87	845	5.22	879	5.57	910	5.94	941	6.31	970	6.67	999	7.02	1027	7.38	1054	7.74	1079	8.08	1104	8.41	1129	8.77	

**350 to 600 Pa**

**THA240**

Air Volume L/s	External Static (Pa)																						
	350		375		400		425		450		475		500		525		550		575		600		
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM
	<b>High Static -</b>				<b>Field Furnished Drive</b>																		
3020	1035	4.75	1060	4.98	1085	5.22	1110	5.45	1135	5.68	1157	5.91	1180	6.15	1202	6.40	1225	6.65	1246	6.88	1268	7.11	
3305	1055	5.40	1080	5.68	1105	5.95	1130	6.20	1155	6.45	1178	6.70	1200	6.95	1220	7.20	1240	7.45	1263	7.73	1285	8.00	
3540	1075	6.05	1100	6.33	1125	6.60	1148	6.88	1170	7.15	1193	7.40	1215	7.65	1238	7.95	1260	8.25	1280	8.50	1300	8.75	
3775	1090	6.70	1115	6.98	1140	7.25	1163	7.55	1185	7.85	1208	8.13	1230	8.40	1253	8.70	1275	9.00	1295	9.30	1315	9.60	
4010	1110	7.40	1135	7.73	1160	8.05	1183	8.35	1205	8.65	1228	8.95	1250	9.25	1270	9.55	1290	9.85	1310	10.15	1330	10.45	
4250	1130	8.15	1153	8.45	1175	8.75	1198	9.08	1220	9.40	1243	9.75	1265	10.10	1288	10.45	1310	10.80	1330	11.10	1350	11.4	
4530	1154	9.13	1177	9.46	1199	9.78	1222	10.14	1244	10.50	1267	10.87	1289	11.23	---	---	---	---	---	---	---	---	

**AIR RESISTANCE (Pa) - Options**

Air Volume - L/s	Electric Heat	Economizer	Horizontal Roof Curb	MERV 11 Filter
3020	2	5	32	5
3305	2	10	37	7
3540	2	15	42	7
3775	5	22	47	10
4010	5	27	52	10
4250	10	35	60	10
4530	12	40	65	12

## BLOWER DATA

### CEILING DIFFUSER AIR RESISTANCE

Air Volume		Step-Down Diffuser												Flush Diffuser			
		RTD11-185						RTD11-275						FD11-185		FD11-275	
L/s	cfm	2 Ends Open		1 Side/2 Ends Open		All Ends & Sides Open		2 Ends Open		1 Side/2 Ends Open		All Ends & Sides Open		Pa	in. w.g.	Pa	in. w.g.
		Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.				
2360	5000	127	.51	109	.44	97	.39	---	---	---	---	---	---	67	.27	---	---
2455	5200	139	.56	119	.48	104	.42	---	---	---	---	---	---	75	.30	---	---
2550	5400	152	.61	129	.52	112	.45	---	---	---	---	---	---	82	.33	---	---
2645	5600	164	.66	139	.56	119	.48	---	---	---	---	---	---	90	.36	---	---
2735	5800	177	.71	147	.59	127	.51	---	---	---	---	---	---	97	.39	---	---
2830	6000	189	.76	157	.63	137	.55	90	.36	77	.31	67	.27	104	.42	72	.29
2925	6200	199	.80	169	.68	147	.59	---	---	---	---	---	---	114	.46	---	---
3020	6400	214	.86	179	.72	157	.63	---	---	---	---	---	---	124	.50	---	---
3065	6500	---	---	---	---	---	---	104	.42	90	.36	77	.31	---	---	85	.34
3115	6600	229	.92	191	.77	167	.67	---	---	---	---	---	---	134	.54	---	---
3210	6800	246	.99	206	.83	174	.72	---	---	---	---	---	---	144	.58	---	---
3305	7000	256	1.03	216	.87	189	.76	122	.49	102	.41	90	.36	154	.62	99	.40
3400	7200	271	1.09	229	.92	199	.80	---	---	---	---	---	---	164	.66	---	---
3490	7400	286	1.15	241	.97	209	.84	---	---	---	---	---	---	174	.70	---	---
3540	7500	---	---	---	---	---	---	127	.51	114	.46	102	.41	---	---	112	.45
3585	7600	301	1.20	254	1.02	219	.88	---	---	---	---	---	---	184	.74	---	---
3775	8000	---	---	---	---	---	---	147	.59	122	.49	107	.43	---	---	124	.50
4010	8500	---	---	---	---	---	---	172	.69	144	.58	124	.50	---	---	142	.57
4245	9000	---	---	---	---	---	---	196	.79	167	.67	144	.58	---	---	164	.66
4485	9500	---	---	---	---	---	---	221	.89	186	.75	162	.65	---	---	184	.74
4720	10,000	---	---	---	---	---	---	249	1.00	209	.84	182	.73	---	---	201	.81
4955	10,500	---	---	---	---	---	---	273	1.10	229	.92	199	.80	---	---	221	.89
5190	11,000	---	---	---	---	---	---	301	1.21	251	1.01	219	.88	---	---	239	.96

### POWER EXHAUST FANS

Return Duct Negative Static Pressure		Air Volume Exhausted	
Pa	in. w.g.	L/s	cfm
0	0	4070	8630
12	0.05	3875	8210
25	0.10	3645	7725
37	0.15	3355	7110
50	0.20	3055	6470
62	0.25	2730	5790
75	0.30	2390	5060
87	0.35	2030	4300
100	0.40	1655	3510
112	0.45	1270	2690
125	0.50	870	1840

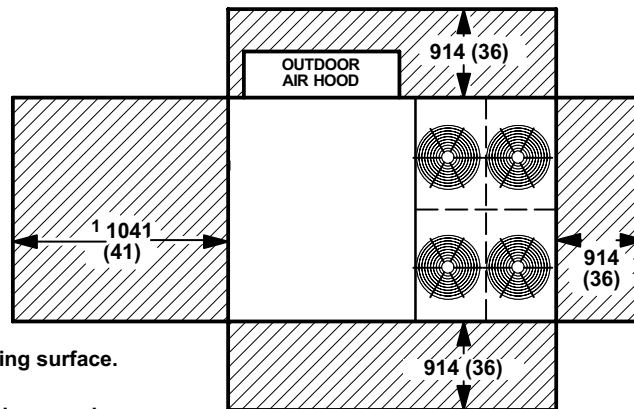
## BLOWER DATA

### CEILING DIFFUSER AIR THROW DATA

Model No.	Air Volume		<sup>1</sup> Effective Throw Range			
	L/s	cfm	Step-Down		Flush	
			m	ft.	m	ft.
180 Models	<b>Diffuser Model</b>		<b>RTD11-185</b>		<b>FD11-185</b>	
	2645	5600	12 - 15	39 - 49	9 - 11	28 - 37
	2740	5800	13 - 16	42 - 51	9 - 12	29 - 38
	2830	6000	13 - 17	44 - 54	12 - 15	40 - 50
	2925	6200	14 - 17	45 - 55	13 - 16	42 - 51
	3020	6400	14 - 17	46 - 55	13 - 16	53 - 52
	3115	6600	14 - 17	57 - 56	14 - 17	45 - 56
240 Models	<b>Diffuser Model</b>		<b>RTD11-275</b>		<b>FD11-275</b>	
	3400	7200	10 - 12	33 - 38	8 - 11	26 - 35
	3490	7400	11 - 12	35 - 40	9 - 11	28 - 37
	3585	7600	11 - 13	36 - 41	9 - 12	29 - 38
	3680	7800	11 - 13	38 - 43	12 - 15	40 - 50
	3775	8000	12 - 13	39 - 44	13 - 16	42 - 51
	3870	8200	12 - 14	41 - 46	13 - 16	43 - 52
	3965	8400	13 - 15	43 - 49	13 - 17	44 - 54
	4060	8600	13 - 15	44 - 50	14 - 17	46 - 57
	4155	8800	14 - 17	47 - 55	15 - 18	48 - 59

<sup>1</sup> Throw is the horizontal or vertical distance an airstream travels on leaving the outlet or diffuser before the maximum velocity is reduced to 15 m (50 ft.) per minute. Four sides open.

## INSTALLATION CLEARANCES - MM (INCHES)



NOTE - Top Clearance 1524 mm (60 in.)  
NOTE - Entire perimeter of unit base requires support when elevated above mounting surface.

<sup>1</sup> NOTE - 1676 mm (66 in.)  
Recommended service clearance for blower deck removal

## OUTDOOR SOUND DATA

Unit Model No.	Operating Mode	Octave Band Sound Power Levels dB, re 10 <sup>-12</sup> Watts							<sup>1</sup> Sound Rating Number (dB)
		Center Frequency - HZ							
		125	250	500	1000	2000	4000	8000	
180	Cooling	92	90	90	88	85	80	70	93
	Heating	92	90	91	89	85	80	72	93
240	Cooling	94	90	91	88	85	79	68	93
	Heating	94	90	91	89	85	80	69	93

<sup>1</sup> Tested according to ARI Standard 270-95 test conditions and ANSI Standard S1.32-1981.

## ELECTRIC HEAT CAPACITIES

Input Voltage	15 kW			30 kW			45 kW			60 kW			90 kW		
	No of Steps	kW input	Btuh Output	No of Steps	kW input	Btuh Output	No of Steps	kW input	Btuh Output	No of Steps	kW input	Btuh Output	No of Steps	kW input	Btuh Output
380	1	9.4	32,100	1	18.8	64,200	1 3	28.2	96,300	1 3	37.6	128,400	1 3	56.4	192,500
400	1	10.4	35,600	1	20.8	71,100	1 3	31.2	106,700	1 3	41.6	142,200	1 3	62.5	213,200
420	1	11.5	39,200	1	23.0	78,400	1 3	34.4	117,600	1 3	45.9	156,800	1 3	68.9	235,100

<sup>1</sup> Can be used with two stage control.

## ELECTRICAL/ELECTRIC HEAT DATA

Model Number				THA180				THA240			
Voltage - 50hz - 3 phase				380/420V				380/420V			
<b>Compressors (2)</b>	Rated Load	each		14.7				15.5			
	Amps	total		29.4				31.0			
	Locked Rotor	each		95				114			
	Amps	total		190				228			
<b>Outdoor Fan Motors (4)</b>	Full Load Amps	each		1.3				1.3			
		total		5.2				5.2			
	Locked Rotor	each		2.4				2.4			
	Amps	total		9.6				9.6			
<b>Power Exhaust Fans (2)</b>	Horsepower			249 (1/3)				249 (1/3)			
	Full Load Amps (total)			2.6 (5.2)				2.6 (5.2)			
	Locked Rotor Amps (total)			4.8 (9.6)				4.8 (9.6)			
<b>Indoor Blower Motor</b>	Horsepower		<b>3</b>	<b>5</b>	<b>7.5</b>	<b>5</b>	<b>7.5</b>	<b>10</b>			
	Rated Load Amps		5	7.8	11.8	7.8	11.8	15.2			
	Locked Rotor Amps		27	46	66	46	66	84			
<sup>1</sup> <b>Minimum Circuit Ampacity</b>	with power exhaust	<b>0 kW</b>	46	49	53	51	55	58			
		<b>15 kW</b>	66	69	73	71	75	78			
		<b>30 kW</b>	86	89	93	90	94	98			
		<b>45 kW</b>	106	108	112	110	114	118			
		<b>60 kW</b>	110	112	116	114	118	122			
		<b>90 kW</b>	---	---	---	146	150	153			
	without power exhaust		44	47	51	48	52	56			
<sup>2</sup> <b>Maximum Overcurrent Protection</b>	with power exhaust	<b>0 kW</b>	60	60	60	60	70	70			
		<b>15 kW</b>	70	70	80	80	80	80			
		<b>30 kW</b>	90	90	100	90	100	100			
		<b>45 kW</b>	110	110	125	110	125	125			
		<b>60 kW</b>	110	125	125	125	125	125			
		<b>90 kW</b>	---	---	---	150	150	175			
	without power exhaust		50	60	60	60	60	70			
<b>Unit Fuse Block</b> - only used with Electric Heat	with power exhaust		LAFB60A9				LAFB60A9	LAFB70A9	LAFB70A9		
	without power exhaust		LAFB50A8	LAFB60A9			LAFB60A9		LAFB70A9		
<b>Electric Heat Control Kit</b> - only used with Electric Heat			T1EHKT01C-1G				T1EHKT01C-1G				

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

<sup>1</sup> HACR (heating, air conditioning, refrigeration) type breaker or fuse.

<sup>2</sup> Refer to local codes to determine wire, fuse and disconnect size requirements.

<sup>3</sup> Circuit breaker must be field provided.

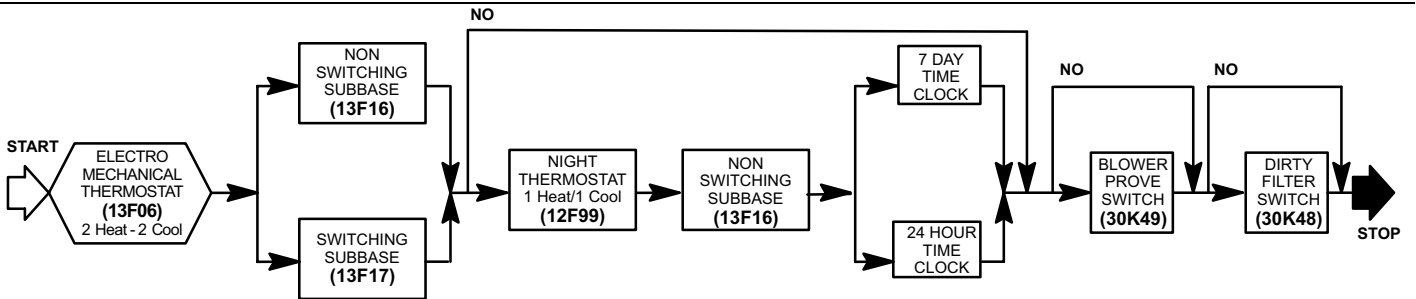
# OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS - FIELD INSTALLED

## System and Component Description

Field Installed  
Catalog No.

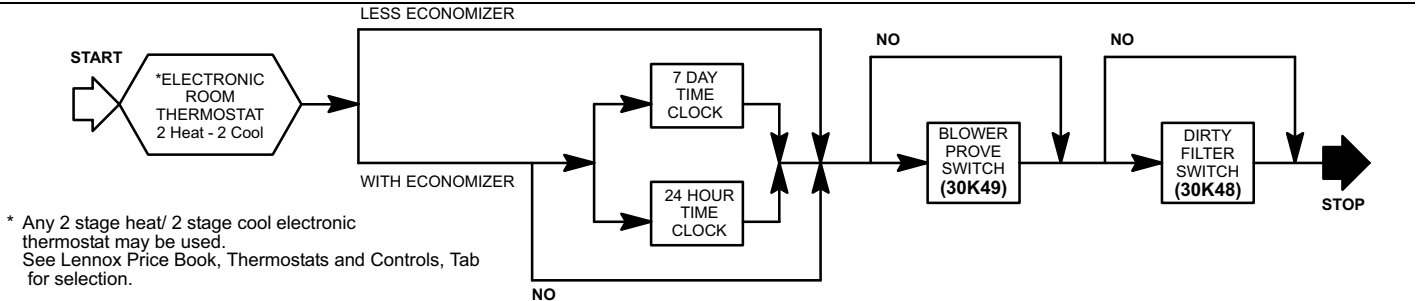
### ELECTRO-MECHANICAL THERMOSTAT

<b>Thermostat</b> - Two stage heat & two stage cool with dual temperature levers, subbase choice .....	13F06
<b>Subbase</b> - Manual system switch (Off-Heat-Auto-Cool), fan switch (Auto-On) .....	13F17
<b>Subbase</b> - Non-switching .....	13F16
<b>Night Setback Operation</b> - Order components below	
<b>Heating Thermostat</b> - Single stage heat / Single stage cool .....	12F99
<b>Subbase</b> - Non-switching .....	13F16
<b>Time Clock</b> - 7 day operation, indicates day and night periods, 2 hour increments, battery back-up .....	See Price Book
<b>Time Clock</b> - 24 hour night setback operation, 15 minute increments, battery back-up .....	See Price Book
<b>Blower Proving Switch</b> - Monitors blower operation, locks out unit in case of blower failure .....	30K49
<b>Dirty Filter Switch</b> - Senses static pressure increase indicating a dirty filter condition .....	30K48



### ELECTRONIC THERMOSTAT

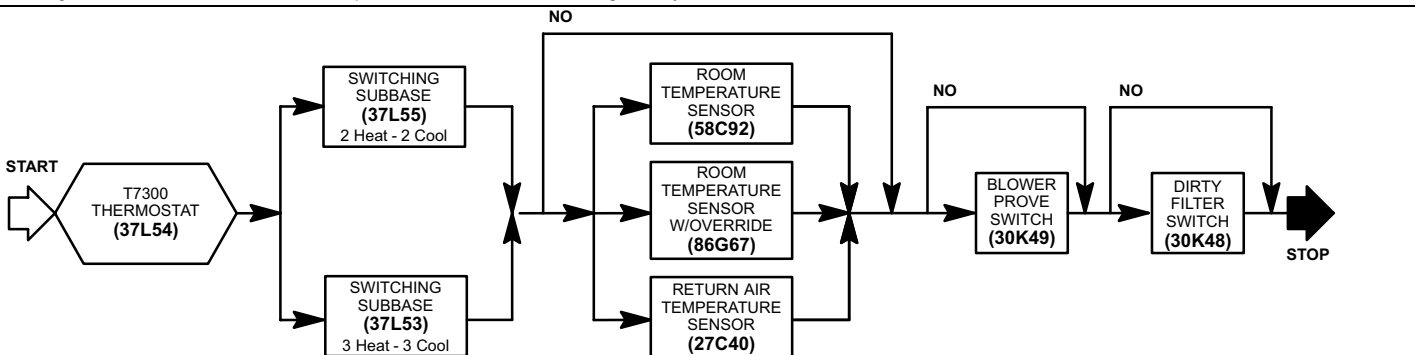
<b>Electronic Thermostat</b> - Any two stage heat/ two stage cool electronic thermostat may be used. ....	See Price Book
<b>Time Clock</b> - 7 day operation, indicates day and night periods, 2 hour increments, battery back-up .....	See Price Book
<b>Time Clock</b> - 24 hour night setback operation, 15 minute increments, battery back-up .....	See Price Book
<b>Blower Proving Switch</b> - Monitors blower operation, locks out unit in case of blower failure .....	30K49
<b>Dirty Filter Switch</b> - Senses static pressure increase indicating a dirty filter condition .....	30K48



\* Any 2 stage heat/ 2 stage cool electronic thermostat may be used.  
See Lennox Price Book, Thermostats and Controls, Tab for selection.

### HONEYWELL T7300 THERMOSTAT

<b>Thermostat</b> - Programmable, internal or optional remote temperature sensing (sensor required), touch sensitive keyboard, automatic switching, °F or °C readout, no anticipator, droop/no droop selection, indicator LED's, hour/day programming, override capabilities, time and operational mode readout, stage status indicators, battery back-up, subbase choice, manual system switch (Heat-Off-Auto-Cool), fan switch (Auto-On) .....	37L54
<b>Subbase</b> - Selectable staging, indicator LED's, auxiliary relay output for economizer operation	
2 Heat / 2 Cool .....	37L55
3 Heat / 3 Cool .....	37L53
<b>Sensor</b> - Room temperature .....	58C92
<b>Sensor</b> - Room temperature with 3 hour override and setpoint adjustment .....	86G67
<b>Sensor</b> - Return air temperature .....	27C40
<b>Blower Proving Switch</b> - Monitors blower operation, locks out unit in case of blower failure .....	30K49
<b>Dirty Filter Switch</b> - Senses static pressure increase indicating a dirty filter condition .....	30K48



**WEIGHT DATA**

Model Number	Net		Shipping	
	kg	lbs.	kg	lbs.
180 Base Unit	1039	2290	1166	2570
180 Max. Unit	1161	2560	1288	2840
240 Base Unit	1060	2340	1186	2615
240 Max. Unit	1179	2600	1304	2875

**OPTIONS / ACCESSORIES**

		Weight	
		kg.	lbs.
<b>CEILING DIFFUSERS</b>			
Step-Down	RTD11-185	178	392
	RTD11-275	183	403
Flush	FD11-185	135	289
	FD11-275	165	363
Transitions	LASRT18	36	80
	LASRT21/24	34	75

**ECONOMIZER / OUTDOOR AIR / EXHAUST**

Economizer	T1ECON10C-1	39	86
<b>Barometric Relief</b>			
Down-Flow Barometric Relief Dampers	LAGED18/24	14	30
Horizontal Barometric Relief Dampers	LAGEDH18/24	9	20
<b>Outdoor Air Dampers</b>			
Damper Section (down-flow) - Automatic	T1DAMP20C-1	24	52
Damper Section (down-flow) - Manual	LAOAD18/24	22	49
Outdoor Air Hood (down-flow)	C1HOOD10C-1	29	65
Power Exhaust	C1PWRE20C-1	28	62

**ELECTRIC HEAT**

15 kW		27	59
30 kW		27	59
45 kW		35	76
60 kW		35	76
90 kW		38	84

**PACKAGING**

LTL Packaging (less than truck load)		127	280
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**ROOF CURBS - STANDARD**

<b>Down-Flow</b>			
356 mm height	LARMF18/36-14	73	160
610 mm height	LARMF18/36-24	100	220
<b>Horizontal</b>			
660 mm height	LARMFH18/24-26	191	420
940 mm height	LARMFH18/24-37	263	580

**ROOF CURBS - CLIPLOCK 1000**

<b>Down-Flow</b>			
356 mm height	LARMF18/30S-14	74	164
457 mm height	LARMF18/30S-18	85	187
610 mm height	LARMF18/30S-24	101	222
<b>Horizontal</b>			
660 mm height	LARMFH18/24S-26	152	335
940 mm height	LARMFH18/24S-37	202	445

Base Unit - The unit with NO OPTIONS.

Max. Unit - The unit with ALL OPTIONS Installed. (Electric Heat, Economizer, Power Exhaust Fans, Controls)

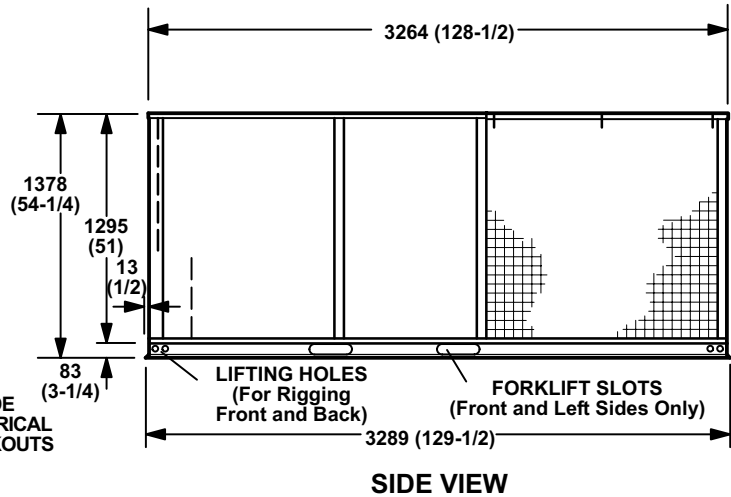
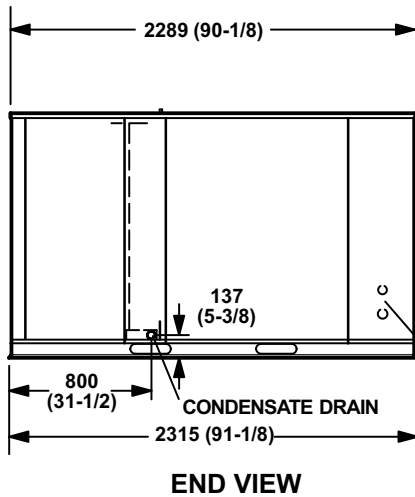
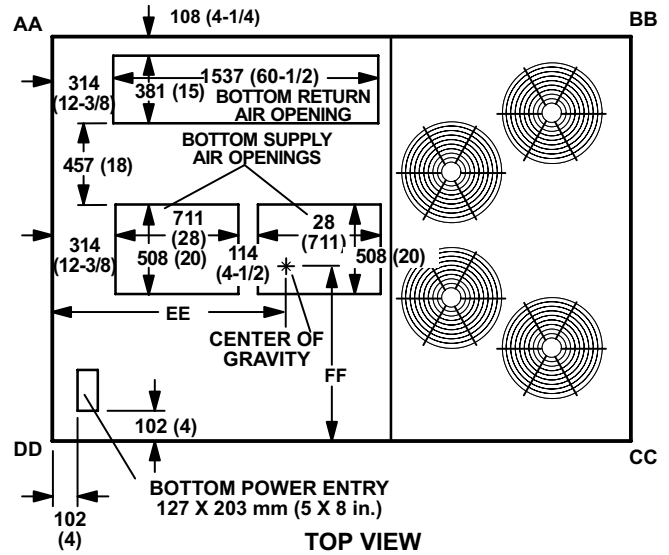


## DIMENSIONS - MM (INCHES)

Model Number	CORNER WEIGHTS								CENTER OF GRAVITY			
	AA		BB		CC		DD		EE		FF	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	mm	inch	mm	inch
180 Base Unit	249	550	200	440	263	580	327	720	1473	58	1003	39-1/2
180 Max. Unit	304	670	231	510	268	590	358	790	1422	56	1067	42
240 Base Unit	259	570	209	460	263	580	331	730	1461	57-1/2	1016	40
240 Max. Unit	313	690	236	520	272	600	358	790	1410	55-1/2	1080	42-1/2

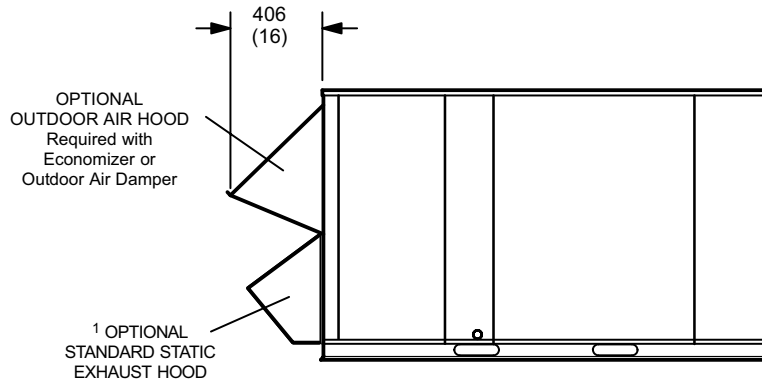
Base Unit - Unit with NO OPTIONS.

Max. Unit - Unit with ALL OPTIONS Installed. (Economizer, Power Exhaust Fans, Controls)



## ACCESSORY DIMENSIONS - MM (INCHES)

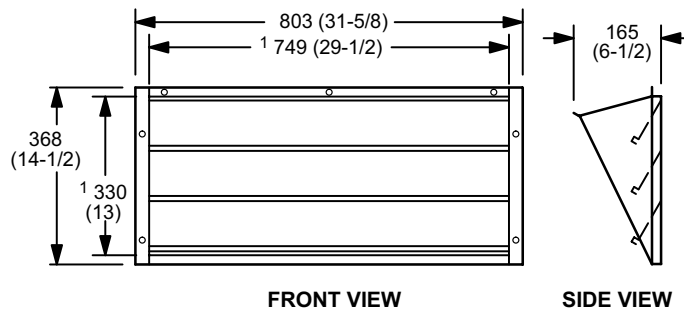
### OPTIONAL OUTDOOR AIR HOOD DETAIL



<sup>1</sup> Field Installed in Return Air Duct for Horizontal Applications.

### HORIZONTAL BAROMETRIC RELIEF DAMPERS

(Field installed in horizontal return air duct adjacent to unit)



FRONT VIEW

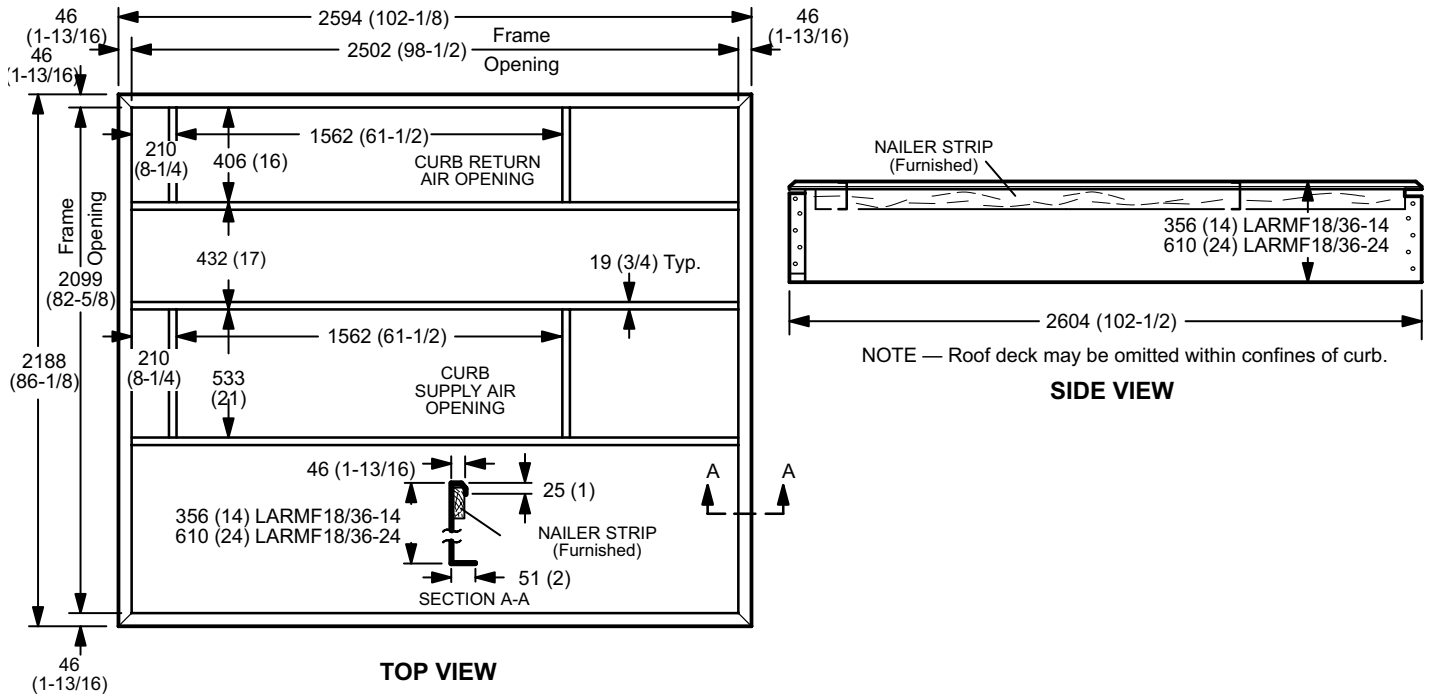
SIDE VIEW

NOTE - Two furnished per order no.

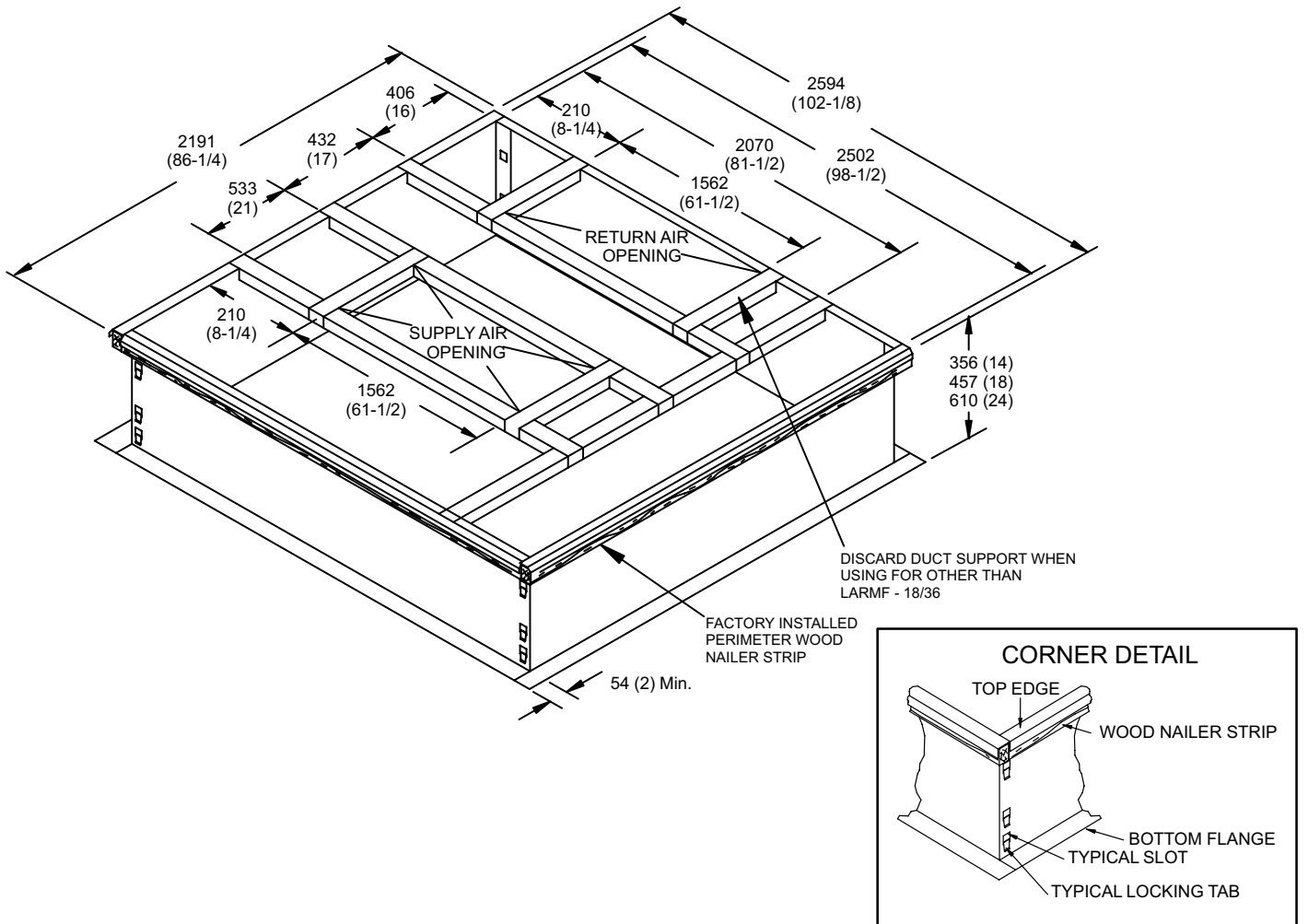
<sup>1</sup> NOTE - Opening size required in return air duct.

# ACCESSORY DIMENSIONS - MM (INCHES)

## STANDARD ROOF CURBS - DOUBLE DUCT OPENING

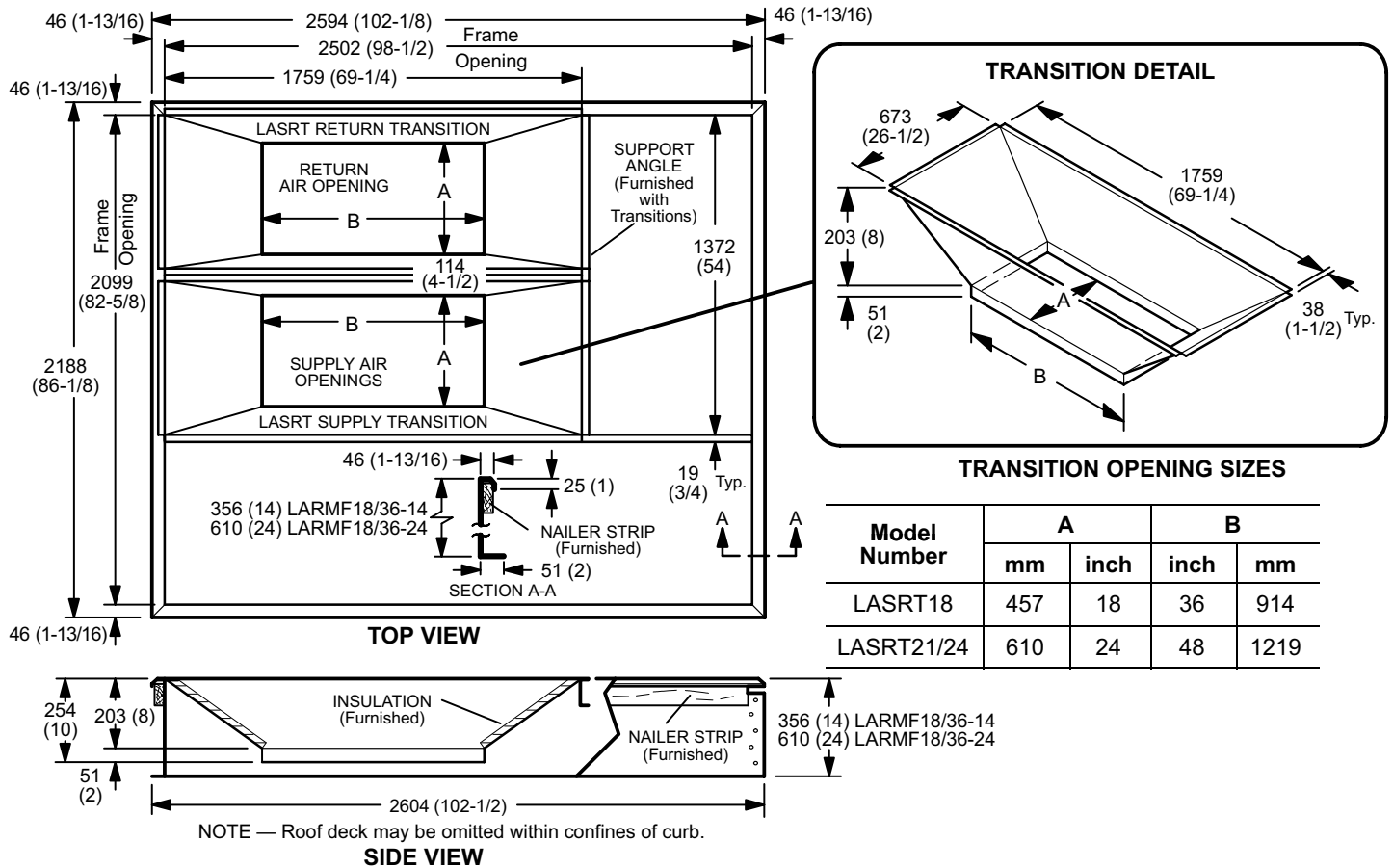


## CLIPLOCK 1000 ROOF CURBS - DOUBLE DUCT OPENING



## ACCESSORY DIMENSIONS - MM (INCHES)

### STANDARD ROOF CURBS WITH SUPPLY & RETURN AIR TRANSITIONS FOR CEILING DIFFUSERS



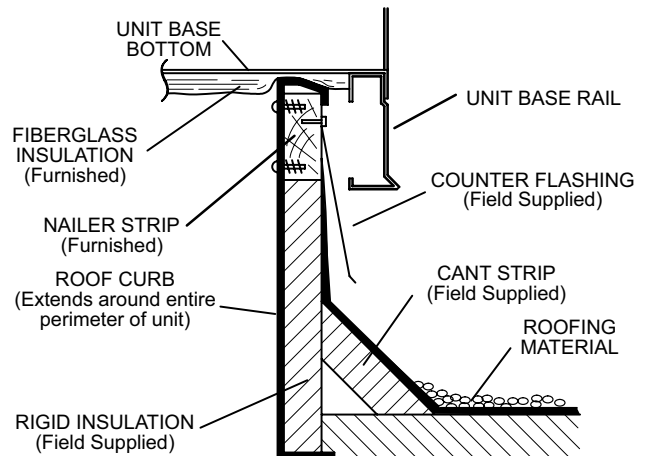
### ROOF CURB SPECIFICATIONS

Roof Curb is rigid enough to be spanned over its entire length or cantilevered if supported on both sides of center of gravity.

Roof Curb	LARMF18/36-14	LARMF18/36-24
<sup>1</sup> Moment of inertia (I) - cm <sup>4</sup> (in. <sup>4</sup> )	1634 (39)	6639 (160)
<sup>1</sup> Section Modulus $\frac{I}{C}$ cm <sup>3</sup> (in. <sup>3</sup> )	5.5 (90)	512 (13.1)
Curb weight. (kg/m) (lb/ft) of length	5.5 (8.2)	12.7 (8.5)
Design strength (kPa) (psi)	137,900 (20,000)	

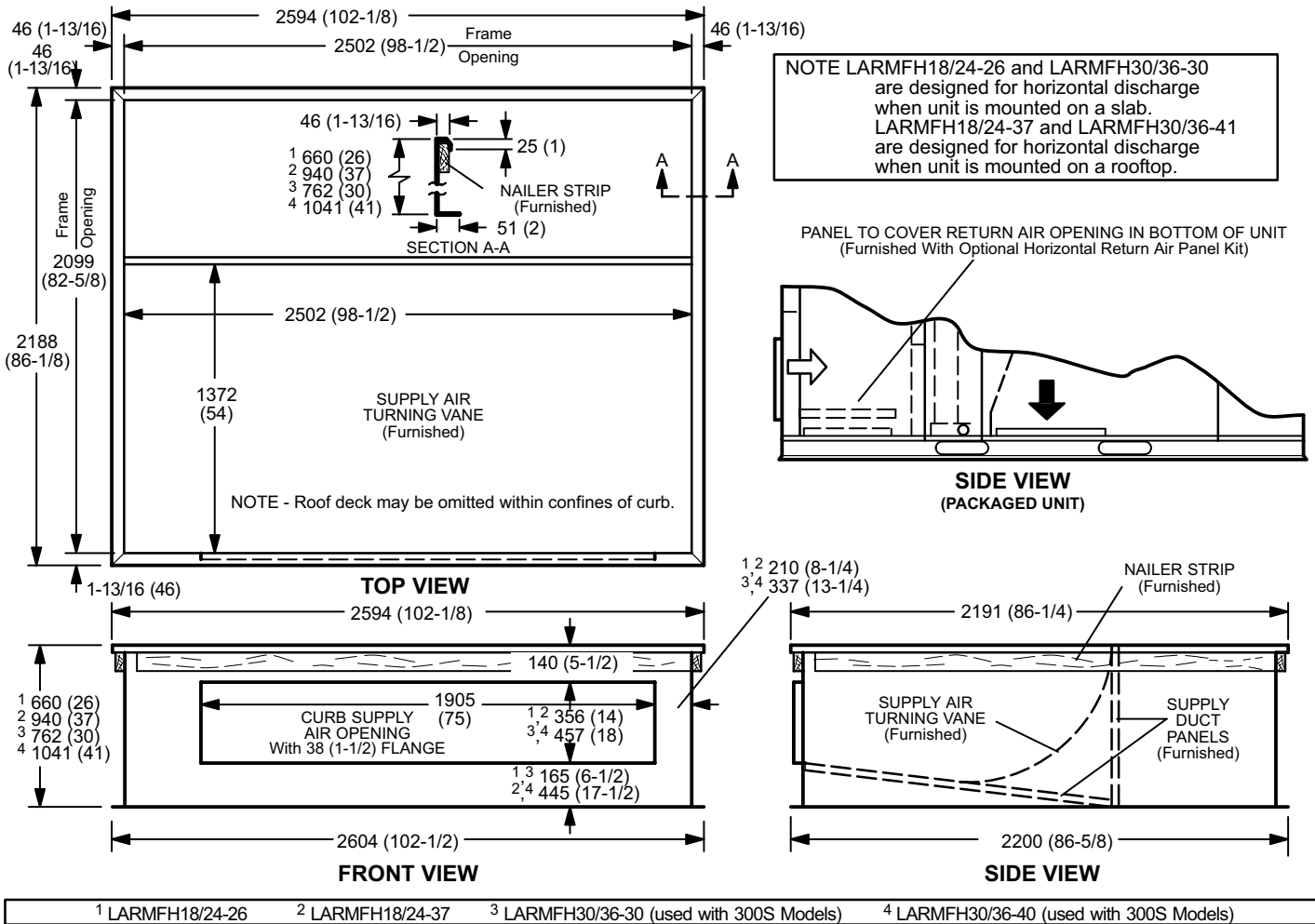
<sup>1</sup> Includes both sides of curb.

### TYPICAL FLASHING DETAIL FOR ROOF CURBS

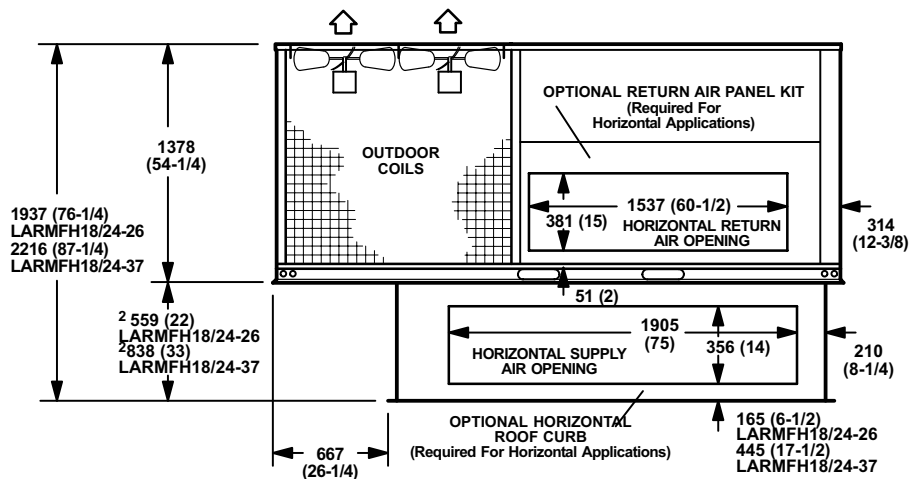


# ACCESSORY DIMENSIONS - MM (INCHES)

## HORIZONTAL ROOF CURBS - Requires Optional Horizontal Return Air Panel Kit



## HORIZONTAL SUPPLY AND RETURN AIR OPENINGS WITH HORIZONTAL ROOF CURB

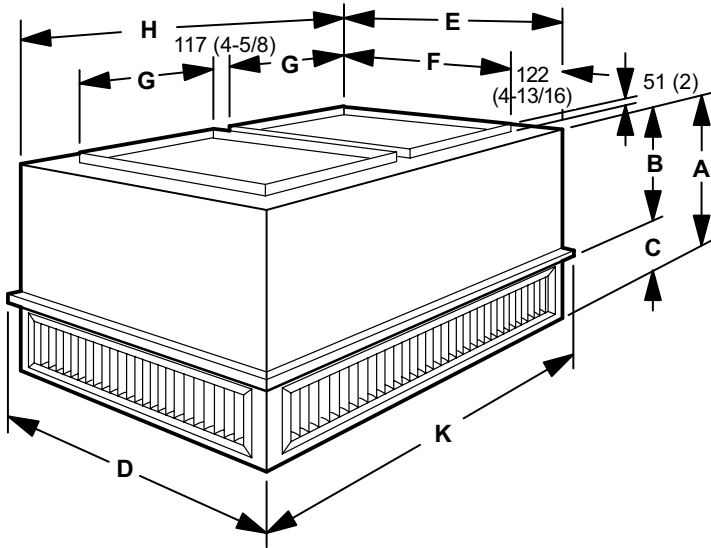


<sup>2</sup> NOTE - Top of Roof Curb extends 102 mm (4 inch) inside bottom of unit base. See Typical flashing detail.

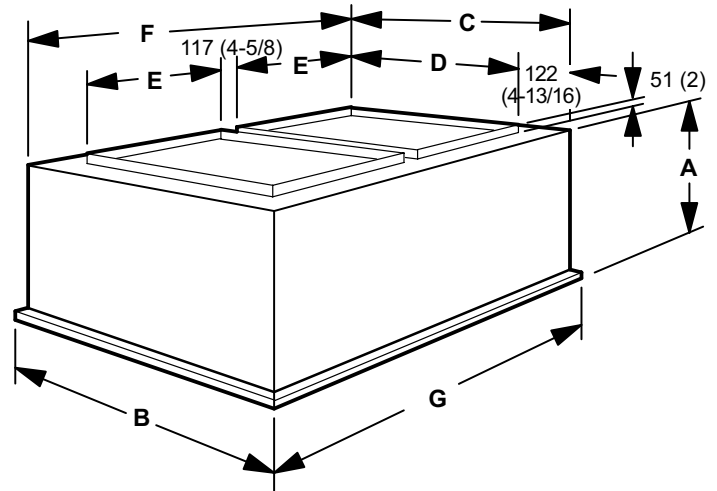
## ACCESSORY DIMENSIONS - MM (INCHES)

### COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

STEP-DOWN CEILING DIFFUSER



FLUSH CEILING DIFFUSER



Model Number		RTD11-185	RTD11-275
A	mm	864	1016
	in.	34	40
B	mm	606	225
	in.	23-7/8	28-7/8
C	mm	257	283
	in.	10-1/8	11-1/8
D	mm	1210	1514
	in.	47-5/8	59-5/8
E	mm	1159	1470
	in.	45-5/8	57-7/8
F	mm	914	1219
	in.	36	48
G	mm	457	610
	in.	18	24
H	mm	1159	1464
	in.	45-5/8	57-5/8
K	mm	1210	1521
	in.	47-5/8	59-5/8

Model Number		FD11-185	FD11-275
A	mm	613	918
	in.	30-1/8	36-1/8
B	mm	1210	1514
	in.	47-5/8	59-5/8
C	mm	1159	1464
	in.	45-5/8	57-5/8
D	mm	914	1219
	in.	36	48
E	mm	457	610
	in.	18	24
F	mm	1159	1464
	in.	45-5/8	57-5/8
G	mm	1210	1521
	in.	47-5/8	59-5/8





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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