



ENGINEERING DATA

PACKAGED HEAT PUMPS - 50HZ

CHP16

-024-036-048-060

7.0 to 17.6 kW (2 to 5 Ton)

Cooling Capacity - 5.6 to 14.8 kW (19 200 to 50 500 Btuh)

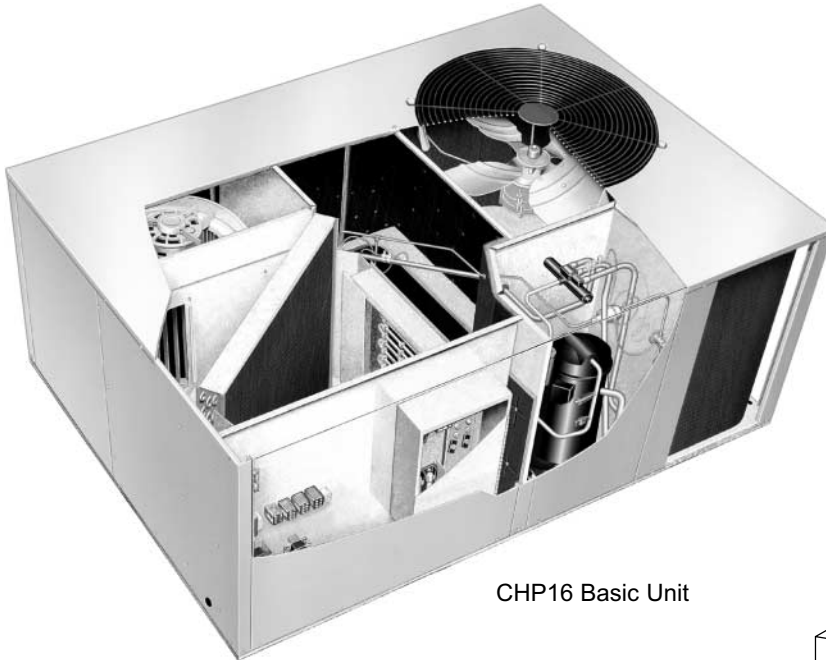
Heating Capacity - 0.0 kW to 00.0 kW (00 000 to 00 000 Btuh)

Supplemental Electric Heat - 5 to 25 kW

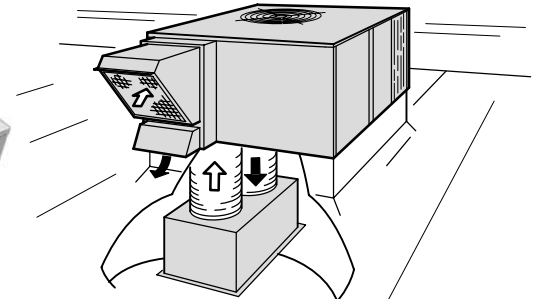
Bulletin Number 490103

February 2001

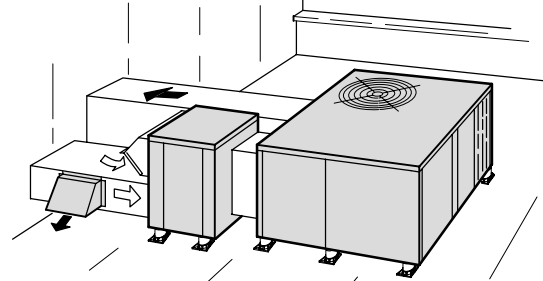
Supersedes 490036 (October 1994)



CHP16 Basic Unit



CHP16 Rooftop Installation With Combination Supply and Return Air System



CHP16 Rooftop Installation With Horizontal Economizer

MODEL NUMBER IDENTIFICATION

CHP 16 - 036 - 1 M

Unit Type  
CHP = Packaged Heat Pump

Series

Nominal Cooling Capacity kW (Tons)

- 024 - 7.0 (2)
- 036 - 10.6 (3)
- 048 - 14.1 (4)
- 060 - 17.6 (5)

Voltage

- M = 380/420v-3 phase-50hz
- T = 220/240v-1 phase-50hz

Minor Revision Number

FEATURES

Air Flow Choice

- Bottom (down-flow) or horizontal supply and return air.

Cabinet

- Heavy gauge, galvanized steel cabinet with five station metal wash process.
- Powder enamel paint, electrostatically bonded to the metal, provides superior rust and corrosion protection.
- Control box is conveniently located with all controls factory wired.
- Large removable panels provide service access.
- Base section and cabinet panels exposed to conditioned air are lined with thick fiberglass insulation.
- Flanged supply and return air openings.
- Electrical inlets furnished for entry into the cabinet.
- Indoor coil drain pan constructed of painted, corrosion resistant galvanized steel with galvanized pipe drain outlet.
- Lifting brackets factory installed.

Refrigeration System

- All models include: check/expansion valve, reversing valve, drier, suction and liquid line service gauge ports, high pressure switch (manual reset), and full refrigerant charge.
- Freezestat prevents coil freeze-up during low ambient operation or loss of air flow.
- Low ambient operation down to -1°C (30°F).

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.



## FEATURES - CONTINUED

### Compressor

- Designed for dependable efficiency with minimum operating cost.
- Suction cooled and overload protected with internal pressure relief.
- Hermetically sealed with built-in protection from excessive current and temperatures.
- Crankcase heater assures proper compressor lubrication.
- Running gear assembly resiliently suspended internally inside case. Compressor installed in unit on resilient rubber mounts assuring low sound and vibration free operation.
- Scroll compressor furnished with -036-048-060 models.
- Reciprocating compressor furnished with -024 models.

### Outdoor Coil Fan

- Direct drive fan moves large air volumes uniformly through entire outdoor coil for high refrigerant cooling capacity.
- Vertical air discharge keeps air up and away from building.
- Permanently lubricated, permanent split capacitor (PSC) motor.
- Motor totally enclosed for maximum protection from weather, dust and corrosion.
- Corrosion resistant polyvinyl chloride (PVC) coated steel wire fan guard is furnished as standard.

### Copper Tube/Enhanced Fin Coil

- Lennox designed and fabricated coil.
- Ripple-edged aluminum fins.
- Long life copper tubing for ease of field servicing.
- Enhanced tubing for improved efficiency.
- Lanced fins provide maximum exposure of fin surface to air stream resulting in excellent heat transfer.
- Fin collars grip tubing for maximum contact area.
- Flared shoulder tubing connections/silver soldering construction.
- Coil is factory tested under high pressure to insure leakproof construction.

### Defrost 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 1.7°C (35°F).
- A sensing element mounted on the low pressure side of the outdoor thermal expansion valve determines when the defrost cycle is required. Pressure switch mounted on discharge vapor line terminates defrost cycle.

### Blower

- Multi-speed direct drive blowers.
- Each blower assembly statically and dynamically balanced.
- Multiple-speed permanent split capacitor (PSC) motor resiliently mounted.
- Blower speeds are easily changed on the blower motor.
- See blower performance tables.

### Air Filter

- Washable or vacuum cleanable 25mm (one inch) thick polyurethane frame type air filter.
- Filter rack is furnished for field installation in down-flow applications.
- Filter rack will accept up to 51mm (two inch) thick filter.
- Filters must be field installed in return air duct for horizontal applications without economizer.
- See dimension drawings.

### Economizer Wiring

- Furnished and factory installed.
- Economizer wiring harness with jack plug connections.
- See page 3 for economizer options.

### Unit Testing

- Rated test conditions are those included in Air Conditioning and Refrigeration Institute (ARI) Standard 210/240 while operating at rated voltage and air volumes.
- Sound numbers rated at test conditions included in Air Conditioning and Refrigeration Institute (ARI) Standard 270.
- Units and components are bonded for grounding to meet safety standards for servicing required by Underwriter's Laboratories (UL) and the International Electrotechnical Commission (IEC).
- Blower data is from unit tests conducted in the Lennox Laboratory air test chamber.
- Developed in accordance with ISO 9002 quality standards.

## OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA

Model Number		CHP16-024	CHP16-036	CHP16-048	CHP16-060
<b>Ceiling Diffusers</b> - 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 - Net Weight	<b>Step-Down</b> - double deflection louvers	RTD9-65 - 30 kg (67 lbs.)			
	<b>Flush</b> - fixed blade louvers	FD9-65 - 17 kg (37 lbs.)			
<b>Ceiling Diffuser Transitions (Supply and Return)</b> — Used with diffusers, installs in roof mounting frame, galvanized steel construction, flanges furnished for duct connection, fully insulated - Net Weight		SRT16 - 20 lbs.) (9 kg)			
<b>Coil Guards</b> - Polyvinyl Chloride (PVC) coated steel wire guards to protect outdoor coil.		LB-82199CF ( <b>47J23</b> ) 2 guards per order		LB-82199CG ( <b>47J24</b> ) 3 guards per order	
<b>Control Systems</b> - See pages 4-5 for complete listing.		See pages 4-5			
<b>Economizer with Gravity Exhaust Dampers (Down-Flow)</b> - Installs directly in cabinet, recirculated air dampers with pressure operated gravity exhaust damper, formed, gasketed damper blades, nylon bearings, 24v damper motor has adjustable minimum position switch, electronic discharge air sensor, adjustable outdoor air enthalpy control. Utilizes filter furnished with unit, filter rack will accept up to 51 mm (2 in.) filter. Removable exhaust air hood and outdoor air intake hood with cleanable aluminum mesh filter. Choice of economizer controls. Model Number - Net Weight - Number and size of filter - mm (in.)	3 position	REMD16-41 - 22 kg (48 lbs.)		REMD16-65 - 30 kg (66 lbs.)	
	Fully modulating	REMD16M-41 - 22 kg (48 lbs.)		REMD16M-65 - 30 kg (66 lbs.)	
	☐ Indoor Filter	(1) 406 x 635 x 25 (16 x 25 x 1)		(1) 508 x 635 x 25 (20 x 25 x 1)	
	Outdoor Filter	(1) 356 x 635 x 25 (14 x 25 x 1)		(1) 457 x 635 x 25 (18 x 25 x 1)	

Continued On Next Page ►

<b>OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA</b>					
<b>Model Number</b>		<b>CHP16-024</b>	<b>CHP16-036</b>	<b>CHP16-048</b>	<b>CHP16-060</b>
<b>Economizer Dampers (Horizontal)</b> - Installs directly in cabinet, combination outdoor air and recirculated air damper, formed, gasketed damper blades, nylon bearings, 24v damper motor has adjustable minimum position switch, electronic discharge air sensor, adjustable outdoor air enthalpy control. 25 mm (1 in.) fiberglass filter furnished, filter rack will accept up to 51 mm (2 in.) filter, outdoor air intake hood with aluminum mesh filter. Choice of economizer controls. Model Number - Net Weight - Number and size of filter - mm (in.)	3 position	EMDH16-41 - 50 kg (110 lbs.)		EMDH16-65 - 59 kg (130 lbs.)	
	Fully modulating	EMDH16M-41 - 50 kg (110 lbs.)		EMDH16M-65 - 59 kg (130 lbs.)	
	Indoor Filter	(1) 508 x 610 x 25 (20 x 24 x 1)		(1) 406 x 635 x 25 (16 x 25 x 1) (1) 356 x 635 x 25 (14 x 25 x 1)	
	Outdoor Filter	(1) 203 x 610 x 25 (8 x 24 x 1)		(1) 203 x 711 x 25 (8 x 28 x 1)	
<b>Economizer Differential Enthalpy Control</b> - Used in conjunction with outdoor air enthalpy control. Determines and selects which air has the lowest enthalpy. Return air enthalpy sensor field installs in economizer damper section		<b>54G44</b>			
<b>Economizer Gravity Exhaust Dampers (Horizontal)</b> - For use with EMDH16. Pressure operated assembly field installs in the return air duct adjacent to the economizer assembly. Includes bird screen. - Net Weight		GEDH16-65 - 2 kg (4 lbs.)			
<b>Electric Heat</b> - Field installed, helix wound nichrome elements, time delay for element staging, individual element limit controls, wiring harness, may be two-stage controlled. <b>ECH16R</b> - Supplemental thermal cutoff safety fuses and thermal relay sequencer. <b>ECH16</b> - Supplemental secondary limits, heating control relay, fuse block and galvanized steel control box.		See Electric Heat Data Tables Pages 8-11			
<b>Electric Heat Single Point Power Source Sub-Fuse Box</b> - Use with ECH16R electric heaters, use in conjunction with ECH16 fuse box for single point power source applications, installs internal to unit, fuses furnished, constructed of galvanized steel with prepunched mounting holes		See Electric Heat Data Tables, Pages 8-11			
<b>Hail Guards</b> - Heavy duty field installed guards protect coil from damage. Not used with Coil Guards.		<b>90N90</b>		<b>90N91</b>	
<b>Low Ambient Control Kit</b> - Units operate down to -1°C (30°F) outdoor air temperature in cooling mode without any additional controls. A Low Ambient Kit can be field installed, enabling unit to operate properly down to -17.7°C (0°F).		LB-57113BM (27J00)			
<b>Outdoor Air Damper Section</b> - For down-flow applications, damper assembly replaces blower access panel, manually adjustable, 0 to 25% (fixed) outdoor air, outdoor air hood with cleanable filter included, number and size of filter - Net Weight		OAD16-41 - 5 kg (12 lbs.) (1) 127 x 432 x 25 mm (5 x 17 x 1 in.)		OAD16-65 - 5 kg (12 lbs.) (1) 203 x 432 x 25 mm (8 x 17 x 1 in.)	
<b>Outdoor Air Damper Section</b> - For horizontal applications, installs in return air duct adjacent to unit, manually adjustable (fixed) outdoor air - Net Weight		OAD3-46/65 - 4 kg (8 lbs.)			
<b>Outdoor Thermostat Kit</b> - 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 line	Thermostat Kit	LB-29740BA (56A87)			
	Mounting Box	M-1595 (31461)			
<b>Roof Curb Power Entry Kit</b> - Allows power entry through roof mounting frame, knockouts provided in roof frame, kit contains 40 in. (1016 mm) armored conduit and installation hardware, two kits are required, one for 24V and one for high voltage. See Dimension Drawing	13 mm (1/2 in.)	<b>18H70</b>			
	26 mm (1 in.)	<b>18H71</b>			
	39 mm (1-1/2 in.)	<b>18H72</b>			
<b>Roof Mounting Frame</b> - Nailer strip furnished, mates to unit, U.S. National Roofing Contractors Approved, shipped knocked down. RMF16-41 may be used on all sizes, with a slight unit overhang on CHP16-048 and CHP16-060 units - Net Weight NOTE - Sound Reduction Plate must be ordered separately for field installation.		RMF16-41 - 35 kg (75 lbs.) (97G59) Plate (ordered separately) (73H80)		RMF16-41 - 35 kg (75 lbs.) (97G59) Plate (ordered separately) (73H80) RMF16-65 - 39 kg (86 lbs.) (97G60) Plate (ordered separately) (73H82)	
<b>Timed Off Control</b> — 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 time delay between compressor shutoff and start-up.		LB-50709BK (47J27)			
<b>Unit Single Point Power Source Sub Fuse Box</b> - Installs internal to unit, provides sub-fusing to the unit, used in conjunction with ECH16 or ECH16R for single point power source applications, fuses furnished, constructed of galvanized steel with prepunched mounting holes and electrical inlet and outlet holes, hinged box cover		See Electric Heat Data Tables, Pages 8-11			
<b>Unit Stand-Off Mounting Kit</b> — Elevates horizontal application units above mounting surface. Includes six high impact polystyrene stand-off mounts. See dimension drawings.		<b>38H18</b>			

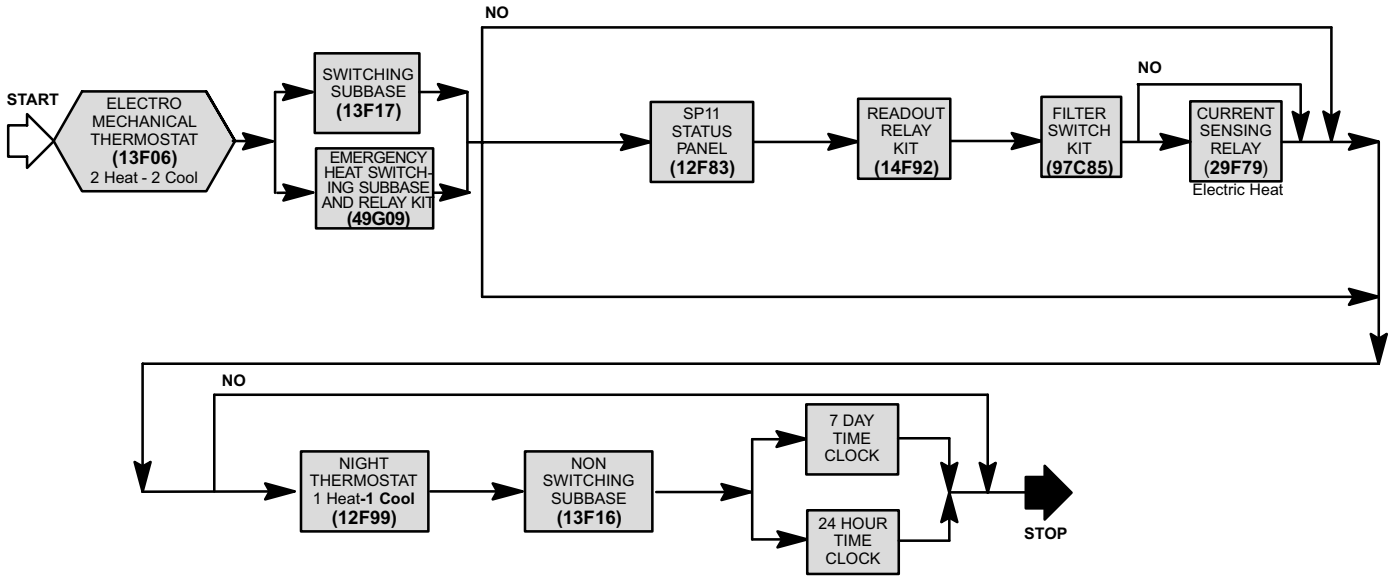
□ Indoor filter is not furnished with economizer. REMD16 utilizes existing filter furnished with CHP16 unit.

**OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS (FIELD INSTALLED)**

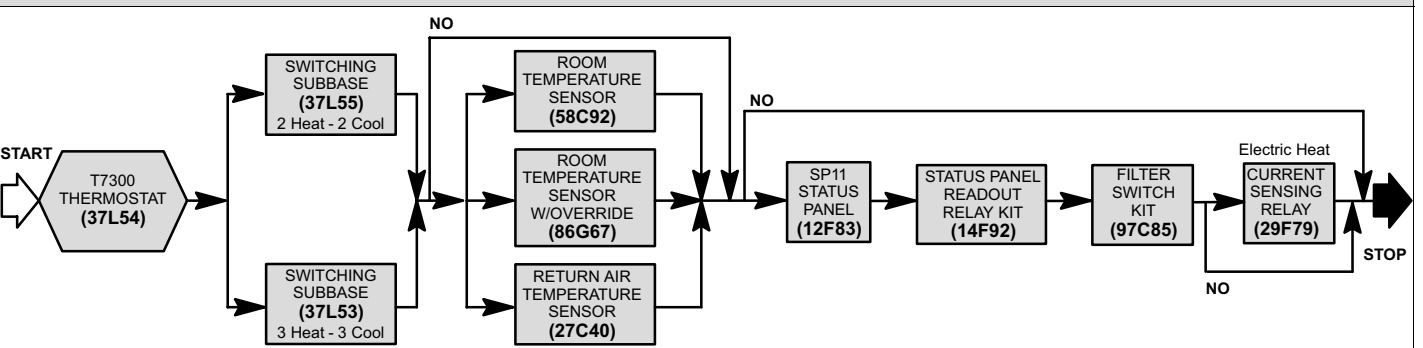
System and Component Description		Catalog Number																								
<b>ELECTRO-MECHANICAL THERMOSTAT</b>																										
<b>Thermostat</b> — Two stage heat & two stage cool with dual temperature levers, subbase choice		13F06																								
<b>Subbase</b> — Manual system switch (Off-Heat-Auto-Cool), fan switch (Auto-On)		13F17																								
Emergency Heat Subbase and Relay Kit		49G09																								
<b>Status Panel</b> — May be ordered extra		See Page 5 for Selection																								
<b>Night Setback Operation</b> — Order components below		—																								
<b>Thermostat</b> — One stage heat & one 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 for Selection																								
<b>Time Clock</b> — 24 hour night setback operation, 15 minute increments, battery back-up		See Price Book for Selection																								
<b>HONEYWELL T7300 THERMOSTAT</b>																										
<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	Up to two stage heat & two stage cool	37L55																								
	Up to three stage heat & three stage 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>Status Panel</b> — May be ordered extra		See Page 5 for Selection																								
<b>HONEYWELL T8600/T8611/T8624 THERMOSTAT</b>																										
<b>Thermostat</b> — Programmable, touch sensitive keypad, automatic heat/cool switching, °F or °C readout, indicator LED's, four temperature settings per daily schedule, override capabilities, time and operational mode readout, battery back-up (batteries included)		—																								
<b>T8600 Thermostat</b> — 1 heat/1 cool, 7 day programming, wiring wall plate included		T8600D (37L59)																								
<b>T8611 Thermostat</b> — 2 heat/1 cool, 7 day programming, switching subbase included		T8611G (37L60)																								
<b>T8624 Thermostat</b> — 2 heat/2 cool, 7 day programming, switching subbase included		T8624D (37L61)																								
<b>Status Panel</b> — May be ordered extra		See Below for Selection																								
<b>STATUS PANEL/SWITCHING STATUS PANEL</b>																										
<b>SP11 Status Panel</b> — Allows remote monitoring of unit through status lights, requires Status Panel Readout Kit		12F83																								
	<table border="0"> <thead> <tr> <th></th> <th>Status Light</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Cool Mode</td> <td>Green</td> <td>Cooling operation</td> </tr> <tr> <td>Heat Mode</td> <td>Green</td> <td>Heating operation</td> </tr> <tr> <td>Compressor 1</td> <td>Green</td> <td>Compressor operation</td> </tr> <tr> <td></td> <td>Red</td> <td>Compressor malfunction</td> </tr> <tr> <td>Compressor 2</td> <td></td> <td>Not used</td> </tr> <tr> <td>No Heat</td> <td>Red</td> <td>Requires service</td> </tr> <tr> <td>Filter</td> <td>Red</td> <td>Requires service</td> </tr> </tbody> </table>			Status Light	Definition	Cool Mode	Green	Cooling operation	Heat Mode	Green	Heating operation	Compressor 1	Green	Compressor operation		Red	Compressor malfunction	Compressor 2		Not used	No Heat	Red	Requires service	Filter	Red	Requires service
	Status Light		Definition																							
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Filter	Red	Requires service																								
<b>Status Panel Readout Kit</b> — Required to interface SP11 to unit operation																										
<b>Filter Switch Kit</b> — Required with Filter light option on SP11																										
<b>Current Sensing Relay</b> — For operation of No Heat light with electric heat on SP11																										

# CONVENTIONAL COMMERCIAL TEMPERATURE CONTROL SELECTION FLOWCHARTS

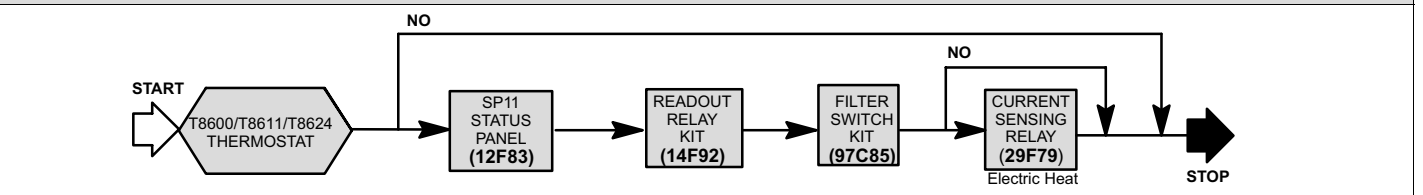
## ELECTRO-MECHANICAL THERMOSTAT



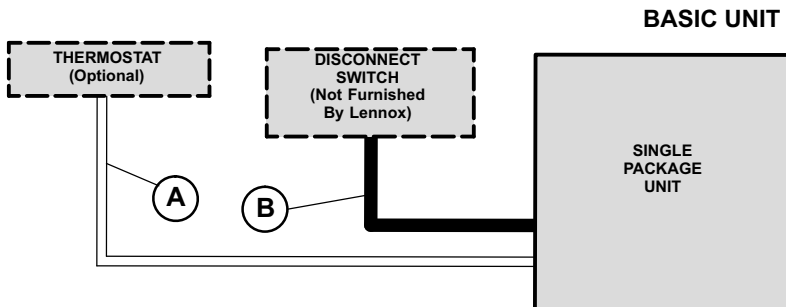
## HONEYWELL T7300 THERMOSTAT



## HONEYWELL T8600/T8611/T8624 THERMOSTAT



## FIELD WIRING



A — \*Four Wire 24V (Electro-mechanical)

— \*Six Wire 24V (Electronic)

B — Single or Three Phase with neutral

(See Electrical Data Table)

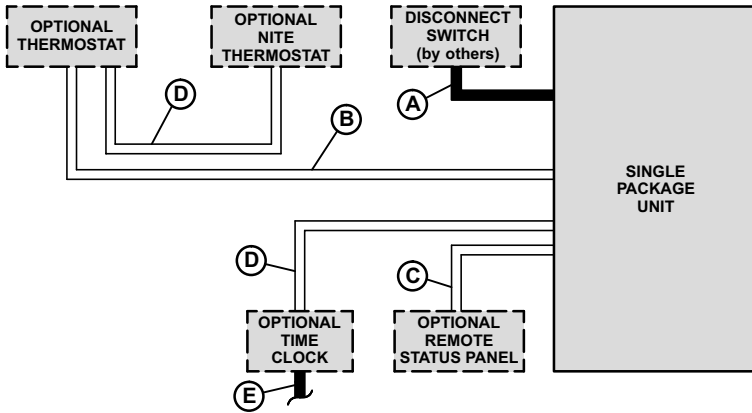
— Field Wiring Not Furnished —

\*When economizer with two stage thermostat is used, one additional wire is required

NOTE - All wiring must conform to local electrical codes.

# FIELD WIRING

## ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM

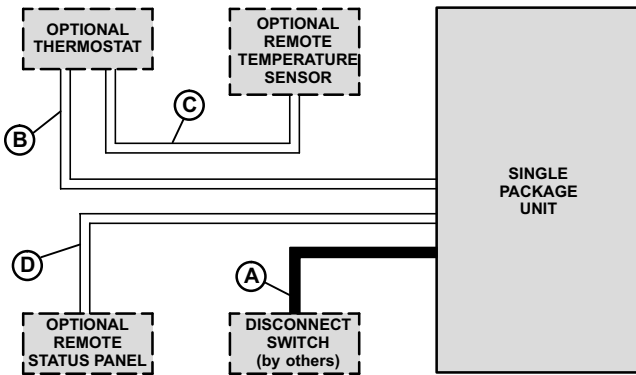


- A - Single or Three Phase with neutral (See Electrical Data Table)
- B - Six wire 24V
  - Ten wire 24V - with Emergency Heat Switching Subbase
- C - Eleven wire 24V
- D - Two wire 24V
- E - Two wire 24V

- Field wiring not furnished -

NOTE - All wiring must conform to local electrical codes.

## T7300/T8600/T8611/T8624 THERMOSTAT CONTROL SYSTEM



- A - Single or Three Phase with neutral (See Electrical Data Table)
- B - Nine wire 24V
- C - Two wire 24V
  - Nine wire 24V (T7300 Room Sensor with override)
- D - Eleven wire 24V

- Field wiring not furnished -

NOTE - All wiring must conform to local electrical codes.

## ELECTRICAL DATA

Model Number		CHP16-024	CHP16-036	CHP16-048	CHP16-060
Line voltage data (50hz)		220/240v 1 phase	380/420v 3 phase with neutral		
Recommended maximum fuse size (amps)		25	15	15	20
†Minimum Circuit Ampacity		17	12	13	15
Compressor	Rated load (A)	9.6	6.2	6.4	7.5
	Locked rotor (A)	58	39	48	60
Outdoor Coil Fan Motor (1 phase)	Full load (A)	1.4	1.4	1.1	1.1
	Locked rotor (A)	2.9	2.9	2.0	2.0
Indoor Coil Blower Motor	Full load (A)	2.9	2.8	3.4	3.4
	Locked rotor (A)	4.7	8.3	7.8	7.8

†Refer to local electrical codes to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 75°C (167°F).

<b>SPECIFICATIONS</b>					
<b>Model Number</b>		<b>CHP16-024</b>	<b>CHP16-036</b>	<b>CHP16-048</b>	<b>CHP16-060</b>
Nominal KW (Tons)		7.0 (2)	10.5 (3)	14.0 (4)	17.5 (5)
Cooling Ratings	Total cooling capacity - kW (Btuh)	6.0 (20 400)	9.1 (31 200)	12.5 (42 500)	14.7 (50 000)
	Total power input - kW	2.2	3.8	4.5	5.7
	Coefficient of performance - Output/Input	2.7	2.4	2.8	2.6
	Energy Efficiency Ratio (Btuh/Watts)	9.1	8.3	9.5	8.9
High Temperature Heating Ratings	Total cooling capacity - kW (Btuh)	6.0 (20 600)	9.7 (33 000)	13.0 (44 500)	15.3 (52 200)
	Total power input - kW	2.0	3.2	4.1	5.2
	Coefficient of performance - Output/Input	3.0	3.0	3.2	3.0
Low Temperature Heating Ratings	Total cooling capacity - kW (Btuh)	3.3 (11 200)	6.2 (21 000)	7.4 (25 400)	9.0 (30 600)
	Total power input - kW	1.7	3.0	3.6	4.5
	Coefficient of performance - Output/Input	1.9	2.1	2.0	2.0
*Sound Rating Number (db)		80		82	
Refrigerant Charge (HCFC-22)		2.6 kg (5 lbs. 10 oz.)	3.2 kg (7 lbs. 0 oz.)	4.9 kg (10 lbs. 12 oz.)	4.7 kg (10 lbs. 5 oz.)
Indoor Coil Blower	Blower wheel nominal diameter x width - mm (in.)	229 x 203 (9 x 8)	254 x 178 (10 x 7)	254 x 203 (10 x 8)	292 x 229 (11-1/2 x 9)
	Motor output - W (hp)	249 (1/3)	373 (1/2)		
Indoor Coil	Net face area - m <sup>2</sup> (ft. <sup>2</sup> )	0.30 (3.2)	0.38 (4.1)	0.54 (5.8)	
	Tube outside diameter - mm (in.) & Number of rows	9.5 (3/8) - 2			
	Fins per m (inch)	591 (15)			
Outdoor Coil	Net face area m <sup>2</sup> (ft. <sup>2</sup> )	Outer coil	0.80 (8.6)		1.33 (14.3)
		Inner coil	0.49 (5.3)	0.77 (8.3)	1.28 (13.8)
	Tube outside diameter - mm (in.) & Number of rows	9.5 (3/8) - 1.6	9.5 (3/8) - 2		
	Fins per m (inch)	787 (20)			
Outdoor Coil Fan	Diameter - mm (in.) & Number of blades	508 (20) - 4		610 (24) - 4	
	Air volume - L/s (cfm)	945 (2000)		1415 (3000)	
	Motor output - W (hp)	149 (1/5)		187 (1/4)	
	Total motor input - W	200		285	
Condensate drain size male pipe thread - in.		3/4			
Number and size of cleanable polyurethane filters - mm (in.)		(1) 406 x 635 x 25 (16 x 25 x 1)		(1) 508 x 635 x 25 (20 x 25 x 1)	
Net weight of basic unit - kg (lbs.)		151 (332)	161 (354)	243 (535)	
Shipping weight of basic unit - kg (lbs.) 1 package		187 (417)	198 (436)	277 (610)	
Electrical Characteristic - (50hz)		220/240v - 1 phase	380/420v - 3 phase		

\*Sound Rating Numbers rated at test conditions for Air Conditioning and Refrigeration Institute (ARI) Standard 270.

★ The rating test conditions are those that are in accordance with the Unitary Small Equipment certification program, which is based on Air Conditioning and Refrigeration Institute (ARI) Standard 210/240 while operating at rated voltages and conditions.

**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.

## ELECTRIC HEAT DATA

Single Package Unit Model Number	Electric Heater Model Number and Net Weight	Number of Steps and Phase	Volts Input	Heater Only †Minimum Circuit Ampacity	Electric Heat kW Input	Electric Heat Btuh Input	Optional Single Point Power Source Boxes		Total Unit & Electric Heat †Minimum Circuit Ampacity
							Heater Sub-Fuse Box	Unit Sub-Fuse Box	
CHP16-024	ECH16R-5 220/240v <b>(34H46)</b> 4 kg (9 lbs.)	1 step 1 phase	220	24	4.2	14 300	ECH16R-26/41-5 220/240v <b>(34H26)</b>	ECH16-261 220/240v <b>(31H10)</b>	41
			230	25	4.6	15 700			42
			240	26	5.0	17 100			43
	ECH16R-7 220/240v <b>(34H47)</b> 2 kg (5 lbs.)		220	34	5.9	20 100	ECH16R-26/65-7 220/240v <b>(34H25)</b>		50
			230	35	6.4	21 800			52
			240	37	7.0	23 900			53
	ECH16R-10 220/240v <b>(34H48)</b> 2 kg (5 lbs.)		220	48	8.4	28 700	ECH16R-26/65-10 220/240v <b>(34H24)</b>		65
			230	50	9.2	34 100			67
			240	53	10.0	34 100			69
	ECH16R-15 220/240v <b>(31H27)</b> 8 kg (18 lbs.)		220	72	12.6	43 000	----		88
			230	75	13.8	47 100			92
			240	79	15.0	51 200			95
CHP16-036	ECH16-7 380/420v <b>(31H36)</b> 8 kg (17 lbs.)	1 step (3 phase)	380	9	4.4	15 000	----	ECH16-413 380/420v <b>(31H18)</b>	21
			400	9	4.9	16 600			21
			420	10	5.4	18 300			22
	ECH16-10 380/420v <b>(31H37)</b> 8 kg (17 lbs.)		380	12	6.3	21 400			24
			400	13	6.9	23 700			25
			420	14	7.7	26 200			26
	ECH16-15 380/420v <b>(31H38)</b> 8 kg (17 lbs.)		380	18	9.4	32 100			30
			400	19	10.4	35 600			31
			420	20	11.5	39 200			32
	ECH16-20 380/420v <b>(31H39)</b> 9 kg (20 lbs.)		380	24	12.5	42 800			36
			400	25	13.9	47 400			37
			420	27	15.3	52 300			39
CHP16-048	ECH16-7 380/420v <b>(31H36)</b> 8 kg (17 lbs.)	1 step (3 phase)	380	9	4.4	15 000	----	ECH16-413/513 380/420v <b>(31H21)</b>	21
			400	9	4.9	16 600			22
			420	10	5.4	18 300			22
	ECH16-10 380/420v <b>(31H37)</b> 8 kg (17 lbs.)		380	12	6.3	21 400			25
			400	13	6.9	23 700			26
			420	14	7.7	26 200			26
	ECH16-15 380/420v <b>(31H38)</b> 8 kg (17 lbs.)		380	18	9.4	32 100			31
			400	19	10.4	35 600			32
			420	20	11.5	39 200			33
	ECH16-20 380/420v <b>(31H44)</b> 9 kg (20 lbs.)		380	24	12.5	42 800			37
			400	25	13.9	47 400			38
			420	27	15.3	52 300			39
ECH16-25 380/420v <b>(31H40)</b> 9 kg (20 lbs.)	380	30	15.6	53 400	43				
	400	32	17.4	59 300	44				
	420	33	19.2	65 400	46				
CHP16-060	ECH16-7 380/420v <b>(31H36)</b> 8 kg (17 lbs.)	1 step (3 phase)	380	9	4.4	15 000	----	ECH16-513/653 380/420v <b>(31H19)</b>	23
			400	9	4.9	16 600			23
			420	10	5.4	18 300			24
	ECH16-10 380/420v <b>(31H37)</b> 8 kg (17 lbs.)		380	12	6.3	21 400			26
			400	13	6.9	23 700			27
			420	14	7.7	26 200			28
	ECH16-15 380/420v <b>(31H38)</b> 8 kg (17 lbs.)		380	18	9.4	32 100			32
			400	19	10.4	35 600			33
			420	20	11.5	39 200			34
	ECH16-20 380/420v <b>(31H44)</b> 9 kg (20 lbs.)		380	24	12.5	42 800			38
			400	25	13.9	47 400			39
			420	27	15.3	52 300			41
ECH16-25 380/420v <b>(31H40)</b> 9 kg (20 lbs.)	380	30	15.6	53 400	44				
	400	32	17.4	59 300	46				
	420	33	19.2	65 400	47				

†Refer to local electrical codes to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 75°C (167°F).



## COOLING AND HEATING RATINGS

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

### CHP16-024 COOLING CAPACITY - 50HZ

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)					
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb						Dry Bulb		
m <sup>3</sup> /s	cfm	kW	kBtu/h	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h	24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	.30	640	6.2	21.0	1.36	.76	.90	1.00	5.7	19.4	1.58	.78	.94	1.00	5.2	17.9	1.79	.82	.97	1.00	4.8	16.4	2.00	.86	1.00	1.00
	.38	800	6.4	21.9	1.37	.82	.97	1.00	6.0	20.4	1.60	.85	1.00	1.00	5.6	19.0	1.82	.89	1.00	1.00	5.1	17.5	2.04	.93	1.00	1.00
	.45	960	6.7	22.9	1.38	.88	1.00	1.00	6.3	21.4	1.62	.91	1.00	1.00	5.8	19.9	1.85	.95	1.00	1.00	5.4	18.4	2.07	.99	1.00	1.00
19°C (67°F)	.30	640	6.6	22.5	1.38	.59	.73	.86	6.1	20.8	1.61	.60	.76	.90	5.6	19.1	1.83	.62	.79	.94	5.1	17.4	2.04	.65	.83	.98
	.38	800	6.8	23.3	1.38	.62	.79	.94	6.3	21.5	1.62	.64	.82	.98	5.8	19.7	1.85	.67	.86	1.00	5.3	18.0	2.06	.70	.91	1.00
	.45	960	7.0	23.9	1.39	.66	.85	1.00	6.5	22.1	1.63	.69	.88	1.00	5.9	20.3	1.86	.71	.93	1.00	5.4	18.5	2.08	.75	.97	1.00
22°C (71°F)	.30	640	7.1	24.2	1.39	.43	.57	.70	6.6	22.5	1.64	.44	.58	.72	6.1	20.7	1.87	.44	.60	.76	5.5	18.8	2.09	.46	.63	.79
	.38	800	7.3	25.0	1.40	.45	.60	.76	6.8	23.1	1.65	.45	.63	.79	6.2	21.3	1.89	.46	.65	.83	5.7	19.3	2.11	.47	.68	.88
	.45	960	7.5	25.5	1.40	.46	.65	.82	6.9	23.6	1.66	.47	.67	.86	6.4	21.7	1.90	.48	.70	.90	5.8	19.7	2.13	.50	.74	.95

### CHP16-024 HEATING CAPACITY - 50HZ

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		
m <sup>3</sup> /s	cfm	kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h
	640	7.4	25.1	1.55	5.4	18.5	1.38	3.4	11.6	1.21	2.2	7.4	1.03	1.1	3.7	.77					
300	800	7.5	25.6	1.50	5.6	19.0	1.34	3.5	12.1	1.17	2.3	7.9	.98	1.2	4.2	.73					
380	960	7.7	26.2	1.48	5.7	19.6	1.31	3.7	12.7	1.14	2.5	8.5	.96	1.4	4.8	.70					

### CHP16-036 COOLING CAPACITY - 50HZ

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)					
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb						Dry Bulb		
m <sup>3</sup> /s	cfm	kW	kBtu/h	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h	24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	.49	1050	9.7	33.1	2.35	.78	.92	1.00	9.2	31.4	2.76	.79	.95	1.00	8.7	29.6	3.26	.82	.97	1.00	8.1	27.7	3.88	.84	1.00	1.00
	.56	1200	9.9	33.8	2.36	.81	.97	1.00	9.4	32.1	2.77	.83	.99	1.00	8.9	30.3	3.28	.86	1.00	1.00	8.4	28.6	3.89	.89	1.00	1.00
	.63	1350	10.1	34.5	2.37	.85	1.00	1.00	9.6	32.8	2.78	.87	1.00	1.00	9.1	31.1	3.29	.90	1.00	1.00	8.6	29.3	3.92	.93	1.00	1.00
19°C (67°F)	.49	1050	10.3	35.0	2.38	.60	.75	.89	9.7	33.2	2.80	.61	.77	.91	9.1	31.2	3.30	.62	.79	.94	8.6	29.2	3.92	.64	.82	.98
	.56	1200	10.4	35.6	2.39	.62	.79	.94	9.9	33.8	2.81	.64	.81	.96	9.3	31.8	3.31	.65	.83	.99	8.7	29.7	3.93	.67	.86	1.00
	.63	1350	10.6	36.2	2.40	.64	.82	.98	10.0	34.2	2.82	.66	.85	1.00	9.4	32.2	3.32	.68	.88	1.00	8.8	30.1	3.94	.70	.91	1.00
22°C (71°F)	.49	1050	10.9	37.3	2.41	.44	.59	.73	10.4	35.4	2.84	.45	.60	.74	9.8	33.3	3.35	.45	.61	.77	9.1	31.1	3.97	.46	.63	.80
	.56	1200	11.1	37.9	2.42	.45	.61	.77	10.5	35.9	2.85	.46	.62	.79	9.9	33.8	3.36	.46	.64	.81	9.3	31.6	3.98	.47	.66	.84
	.63	1350	11.3	38.4	2.43	.46	.63	.80	10.6	36.3	2.86	.47	.65	.83	10.0	34.2	3.37	.47	.67	.85	9.3	31.9	3.99	.48	.69	.89

### CHP16-036 HEATING CAPACITY - 50HZ

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		
m <sup>3</sup> /s	cfm	kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h		kW	kBtu/h
455	1050	11.6	39.7	2.49	8.9	30.5	2.30	6.0	20.6	2.10	4.6	15.7	1.88	2.3	7.8	1.39					
495	1200	11.8	40.2	2.42	9.1	31.0	2.23	6.2	21.1	2.03	4.7	16.2	1.81	2.4	8.3	1.32					
565	1350	11.9	40.6	2.36	9.2	31.4	2.17	6.3	21.5	1.98	4.9	16.6	1.76	2.5	8.7	1.27					

# COOLING AND HEATING RATINGS

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

## CHP16-048 COOLING CAPACITY - 50HZ

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)					
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb						Dry Bulb		
m³/s	cfm	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	kW	kBtuh	24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	.66	1400	13.0	44.2	2.86	.78	.94	1.00	12.3	42.0	3.35	.80	.96	1.00	11.6	39.5	3.96	.83	.99	1.00	10.8	36.8	4.72	.86	1.00	1.00
	.75	1600	13.2	45.2	2.88	.82	.98	1.00	12.6	42.9	3.37	.84	1.00	1.00	11.9	40.5	3.98	.87	1.00	1.00	11.1	38.0	4.74	.90	1.00	1.00
	.85	1800	13.5	46.2	2.90	.86	1.00	1.00	12.9	44.0	3.39	.88	1.00	1.00	12.2	41.6	4.00	.91	1.00	1.00	11.4	39.0	4.76	.94	1.00	1.00
19°C (67°F)	.66	1400	13.7	46.8	2.91	.61	.76	.90	13.0	44.4	3.39	.62	.78	.93	12.2	41.6	4.01	.63	.80	.96	11.3	38.6	4.76	.65	.83	.99
	.75	1600	14.0	47.6	2.92	.63	.80	.95	13.2	45.1	3.41	.64	.82	.97	12.4	42.3	4.02	.66	.85	1.00	11.5	39.2	4.78	.68	.88	1.00
	.85	1800	14.2	48.3	2.94	.65	.83	.99	13.4	45.7	3.43	.67	.86	1.00	12.6	42.9	4.03	.68	.89	1.00	11.7	39.8	4.79	.71	.93	1.00
22°C (71°F)	.66	1400	14.6	49.8	2.96	.45	.59	.73	13.8	47.2	3.45	.45	.60	.75	13.0	44.3	4.06	.45	.62	.78	12.0	41.1	4.82	.46	.64	.81
	.75	1600	14.9	50.7	2.97	.45	.61	.77	14.0	47.9	3.47	.46	.63	.80	13.2	45.0	4.07	.47	.65	.82	12.2	41.6	4.84	.47	.67	.86
	.85	1800	15.0	51.3	2.98	.46	.64	.81	14.2	48.5	3.47	.47	.66	.84	13.3	45.4	4.08	.48	.68	.87	12.3	42.1	4.85	.49	.70	.91

## CHP16-048 HEATING CAPACITY - 50HZ

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					
kW	kBtuh	kW	kBtuh		kW	kBtuh		kW	kBtuh		kW	kBtuh		kW	kBtuh						
m³/s	cfm	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh				
635	1400	16.3	55.7	3.33	12.2	41.5	3.02	7.8	26.6	2.71	5.2	17.9	2.38	2.7	9.1	1.77					
660	1600	16.5	56.4	3.24	12.4	42.2	2.93	8.0	27.3	2.62	5.5	18.6	2.29	2.9	9.8	1.68					
755	1800	16.7	56.9	3.16	12.5	42.7	2.86	8.1	27.8	2.54	5.6	19.1	2.22	3.0	10.3	1.61					

## CHP16-060 COOLING CAPACITY - 50HZ

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)					
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb						Dry Bulb		
m³/s	cfm	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	kW	kBtuh	24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	.75	1600	15.4	52.5	3.71	.78	.93	1.00	14.6	49.8	4.31	.80	.96	1.00	13.7	46.8	5.04	.82	.99	1.00	12.9	44.0	5.93	.85	1.00	1.00
	.85	1800	15.7	53.5	3.73	.82	.97	1.00	14.9	50.8	4.33	.84	.99	1.00	14.0	47.8	5.07	.86	1.00	1.00	13.2	45.1	5.96	.89	1.00	1.00
	.94	2000	16.0	54.5	3.74	.85	1.00	1.00	15.2	51.7	4.35	.87	1.00	1.00	14.3	48.9	5.10	.90	1.00	1.00	13.5	46.1	6.00	.93	1.00	1.00
19°C (67°F)	.75	1600	16.3	55.5	3.77	.61	.76	.90	15.4	52.6	4.37	.62	.78	.93	14.5	49.4	5.11	.63	.80	.95	13.5	46.2	6.01	.65	.83	.99
	.85	1800	16.5	56.3	3.79	.63	.79	.94	15.6	53.4	4.39	.64	.81	.97	14.7	50.1	5.14	.66	.84	.99	13.7	46.9	6.04	.67	.87	1.00
	.94	2000	16.7	57.0	3.80	.65	.82	.98	15.8	54.0	4.41	.66	.85	1.00	14.9	50.7	5.16	.68	.88	1.00	13.9	47.4	6.06	.70	.91	1.00
22°C (71°F)	.75	1600	17.3	58.9	3.84	.45	.59	.73	16.4	55.9	4.45	.45	.60	.75	15.4	52.6	5.20	.46	.62	.78	14.4	49.1	6.11	.46	.64	.80
	.85	1800	17.5	59.7	3.86	.46	.61	.77	16.6	56.6	4.47	.46	.63	.79	15.6	53.2	5.22	.47	.64	.82	14.6	49.7	6.13	.47	.66	.85
	.94	2000	17.7	60.4	3.88	.46	.63	.80	16.8	57.2	4.48	.47	.65	.83	15.7	53.7	5.24	.48	.67	.85	14.7	50.2	6.14	.49	.69	.89

## CHP16-060 HEATING CAPACITY - 50HZ

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					
kW	kBtuh	kW	kBtuh		kW	kBtuh		kW	kBtuh		kW	kBtuh		kW	kBtuh						
m³/s	cfm	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh				
850	1600	19.0	64.7	4.37	14.3	48.7	3.92	9.3	31.6	3.44	6.4	22.0	3.03	3.3	11.2	2.26					
755	1800	19.1	65.3	4.25	14.4	49.3	3.80	9.4	32.2	3.32	6.6	22.6	2.92	3.5	11.8	2.15					
850	2000	19.3	65.9	4.16	14.6	49.9	3.71	9.6	32.8	3.23	6.8	23.2	2.83	3.6	12.4	2.06					

## BLOWER DATA

CHP16-024 BLOWER PERFORMANCE - 50hz (With Down-Flow Air Openings)							
External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1445	680	1250	590	975	460
0.05	10	1430	675	1235	585	965	455
0.10	25	1420	670	1215	575	950	450
0.15	35	1400	660	1205	570	925	435
0.20	50	1380	650	1185	560	905	425
0.25	60	1360	640	1165	550	885	420
0.30	75	1340	635	1160	545	870	410
0.40	100	1295	610	1120	530	825	390
0.50	125	1235	585	1060	500	795	375
0.60	150	1200	565	1020	480	735	345
0.70	175	1140	540	965	455	640	300
0.75	185	1100	520	925	435	580	275

NOTE — All air data is measured external to the unit with dry coil and without air filter.

CHP16-036 BLOWER PERFORMANCE — 50 hz (With Down-Flow Air Openings)									
External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
Pa	in. w.g.	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm
0	0	1525	720	1325	625	1165	550	1030	485
0.05	10	1515	715	1320	620	1160	545	1020	480
0.10	25	1505	710	1305	615	1145	540	1005	475
0.15	35	1475	695	1295	610	1120	530	995	470
0.20	50	1460	690	1280	605	1110	525	970	460
0.25	60	1450	685	1255	595	1095	515	960	455
0.30	75	1420	670	1245	585	1085	510	950	450
0.40	100	1380	650	1210	570	1045	495	915	430
0.50	125	1340	635	1185	560	1010	475	880	415
0.60	150	1300	615	1135	535	970	460	845	400
0.70	175	1260	595	1100	520	935	440	800	375
0.75	185	1230	580	1085	510	910	430	775	365

NOTE — All air data is measured external to the unit with dry coil and without air filter.

CHP16-024 BLOWER PERFORMANCE - 50hz (With Horizontal Air Openings)							
External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1345	635	1155	545	905	430
0.05	10	1335	630	1145	540	895	420
0.10	25	1325	625	1130	535	880	415
0.15	35	1300	615	1115	525	865	410
0.20	50	1275	600	1100	520	855	405
0.25	60	1260	595	1090	515	840	395
0.30	75	1250	590	1075	505	810	385
0.40	100	1200	565	1045	495	785	370
0.50	125	1160	550	1000	470	745	350
0.60	150	1110	525	955	450	690	325
0.70	175	1075	505	915	430	630	300
0.75	185	1050	495	900	425	605	285

NOTE — All air data is measured external to the unit with dry coil and without air filter.

CHP16-036 BLOWER PERFORMANCE — 50 hz (With Horizontal Air Openings)									
External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
Pa	in. w.g.	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm
.00	0	1505	710	1255	595	1105	520	965	455
.05	10	1485	700	1250	590	1095	515	955	450
.10	25	1455	685	1240	585	1085	510	945	445
.15	35	1430	675	1225	580	1065	505	930	440
.20	50	1415	670	1205	570	1055	500	920	435
.25	60	1390	655	1195	565	1050	495	905	430
.30	75	1375	650	1180	560	1030	485	895	420
.40	100	1335	630	1150	540	1000	470	870	410
.50	125	1295	610	1115	525	970	460	845	400
.60	150	1250	590	1080	510	935	440	820	385
.70	175	1210	570	1045	495	905	425	780	370
.75	185	1200	565	1035	490	875	415	0	0

NOTE — All air data is measured external to the unit with dry coil and without air filter.

CHP16-048 BLOWER PERFORMANCE - 50 hz (With Horizontal or Down-Flow Air Openings)							
External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
Pa	in. w.g.	L/s	cfm	L/s	cfm	L/s	cfm
0	0	845	1790	710	1500	470	1000
25	0.10	820	1740	690	1460	470	1000
50	0.20	790	1670	680	1440	460	980
75	0.30	770	1630	660	1400	450	950
100	0.40	730	1550	640	1360	440	930
125	0.50	690	1460	620	1310	430	910
150	0.60	650	1380	590	1250	420	890
175	0.70	610	1290	560	1190	410	870
185	0.75	560	1190	530	1120	390	830

NOTE — All air data is measured external to the unit with dry coil and without air filter.

CHP16-060 BLOWER PERFORMANCE - 50 hz (With Down-Flow Air Openings)							
External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
Pa	in. w.g.	L/s	cfm	L/s	cfm	L/s	cfm
0	0	855	1810	780	1650	695	1470
25	0.10	840	1780	760	1610	680	1440
50	0.20	820	1740	740	1570	670	1420
75	0.30	800	1700	730	1550	660	1400
100	0.40	770	1630	700	1480	640	1360
125	0.50	750	1590	680	1440	630	1340
150	0.60	710	1510	650	1380	610	1290
175	0.70	690	1460	620	1310	590	1250
185	0.75	650	1380	590	1250	570	1210

NOTE — All air data is measured external to the unit with dry coil and without air filter.

CHP16-060 BLOWER PERFORMANCE — 50 hz (With Horizontal Air Openings)							
External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
Pa	in. w.g.	L/s	cfm	L/s	cfm	L/s	cfm
0	0	970	2060	860	1840	745	1580
25	0.10	950	2010	850	1800	730	1550
50	0.20	930	1970	830	1760	720	1530
75	0.30	910	1930	810	1720	700	1480
100	0.40	880	1870	780	1650	680	1440
125	0.50	850	1800	750	1590	660	1400
150	0.60	810	1720	720	1530	630	1340
175	0.70	770	1630	690	1460	610	1290
185	0.75	730	1550	650	1380	580	1230

NOTE — All air data is measured external to the unit with dry coil and without air filter.

## ACCESSORY BLOWER DATA

### FILTER AND ACCESSORY AIR RESISTANCE

Unit Model Number	Air Volume		Total Air Resistance — PA (inches water gauge)					
			25 mm (1 in.) Filter Furnished	REMD16 Down-Flow Economizer			EMDH16 Horizontal Economizer	
	L/s	cfm		Less Filter	With Optional Pleated Polyester 51 mm (2 in.) Filter	With Optional Fiberglass 51 mm (2 in.) Filter	With Furnished 25 mm (1 in.) Filter	Less Filter
CHP16-024 CHP16-036	285	600	32 (0.13)	12 (0.05)	52 (0.21)	22 (0.09)	30 (0.12)	17 (0.07)
	380	800	37 (0.15)	12 (0.05)	67 (0.27)	32 (0.13)	45 (0.18)	25 (0.10)
	470	1000	45 (0.18)	15 (0.06)	85 (0.34)	45 (0.18)	65 (0.26)	37 (0.15)
	565	1200	52 (0.21)	22 (0.09)	104 (0.42)	60 (0.24)	87 (0.35)	52 (0.21)
	660	1400	62 (0.25)	37 (0.15)	127 (0.51)	77 (0.31)	114 (0.46)	72 (0.29)
CHP16-048 CHP16-060	755	1600	37 (0.15)	12 (0.05)	99 (0.40)	67 (0.27)	75 (0.30)	42 (0.17)
	850	1800	42 (0.17)	15 (0.06)	119 (0.48)	82 (0.33)	87 (0.35)	47 (0.19)
	945	2000	50 (0.20)	20 (0.08)	139 (0.56)	97 (0.39)	99 (0.40)	55 (0.22)
	1040	2200	57 (0.23)	32 (0.13)	164 (0.66)	114 (0.46)	117 (0.47)	65 (0.26)

### DIFFUSER AIR RESISTANCE

Unit Model Number	Air Volume		Total Air Resistance — PA (inches water gauge)			
			RTD9-65 Diffuser			FD9-65 Diffuser
	L/s	cfm	2 Ends Open	1 Side 2 Ends Open	All Ends and Sides Open	
CHP16-024 CHP16-036	285	600	30 (0.12)	27 (0.11)	20 (0.08)	20 (0.08)
	380	800	37 (0.15)	32 (0.13)	27 (0.11)	27 (0.11)
	470	1000	47 (0.19)	40 (0.16)	35 (0.14)	35 (0.14)
	565	1200	62 (0.25)	50 (0.20)	42 (0.17)	42 (0.17)
	660	1400	82 (0.33)	65 (0.26)	50 (0.20)	50 (0.20)
CHP16-048 CHP16-060	755	1600	107 (0.43)	80 (0.32)	50 (0.20)	60 (0.24)
	850	1800	139 (0.56)	90 (0.40)	75 (0.30)	75 (0.30)
	945	2000	182 (0.73)	124 (0.50)	90 (0.36)	90 (0.36)
	1040	2200	236 (0.95)	157 (0.63)	109 (0.44)	109 (0.44)

NOTE - Electric heat has no appreciable air resistance.

### WET INDOOR COIL AIR RESISTANCE

Model Number	Air Volume		Air Resistance	
	L/s	cfm	Pa	in. w.g.
CHP16-024	385	600	12	0.05
	380	800	15	0.06
	470	1000	17	0.07
	565	1200	20	0.08
CHP16-036	380	800	22	0.09
	470	1000	25	0.10
	565	1200	27	0.11
	660	1400	30	0.12
CHP16-048	755	1600	27	0.11
	850	1800	30	0.12
	945	2000	32	0.13
	1040	2200	35	0.14
CHP16-060	755	1600	20	0.08
	850	1800	22	0.09
	945	2000	25	0.10
	1040	2200	27	0.11

### CEILING DIFFUSER AIR THROW DATA

Model Number		RTD9-65		FD9-65	
Air Volume		Effective Throw			
L/s	cfm	m	ft.	m	ft.
470	1000	3-5	10-17	5-6	15-20
565	1200	3-5	11-18	5-7	16-22
660	1400	4-6	12-19	5-7	17-24
755	1600	4-6	12-20	5-8	18-25
850	1800	4-6	13-21	6-9	20-28
945	2000	4-7	14-23	6-9	21-29
1040	2200	5-8	16-25	7-9	22-30

Effective throw based on terminal velocities of 23 m (75 ft.) per minute.

## GUIDE SPECIFICATIONS

### General

- Furnish and install a single package heat pump unit, complete with automatic controls.
- The single package unit shall be a standard product of a firm regularly engaged in the manufacture of heating-cooling equipment.
- The manufacturer shall test operate system at the factory before shipment.

### Air Distribution

- Equipment shall be capable of bottom (down-flow) or side (horizontal) handling of conditioned air.

### Refrigeration System

- The coils shall be non-ferrous construction with aluminum fins mechanically bonded to durable copper tubes. Coils shall be pressure leak tested.
- Outdoor coil shall be formed coil construction.
- Compressors shall be resiliently mounted, have overload protection and compressor crankcase heater. -036-048-060 models shall have scroll compressors. -024 models shall have reciprocating compressors.
- The refrigeration system shall have discharge, suction and liquid line service gauge ports, freestat, high pressure switch, liquid line filter drier, check and expansion valve, reversing valve, defrost control and full refrigerant charge.
- Control options available shall consist of low ambient controls, timed-off control and thermostat.

### Cabinet

- Shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal.
- Cabinet panels where conditioned air is handled shall be fully insulated to prevent sweating and minimize sound. Openings shall be provided for power connection entry.
- Supply and return air openings shall be flanged.
- Indoor coil condensate drain shall be provided.
- Lifting brackets shall be factory installed.

### Economizer Wiring

- Economizer wiring harness shall be furnished and factory installed.

### Service Access

- All components, wiring and inspection areas shall be completely accessible through removable panels.

### Supply Air Blowers

- Centrifugal supply air blower shall be direct driven by a multi-speed motor.
- Blower shall be statically and dynamically balanced.

### Outdoor Coil Fans

- Direct drive propeller type outdoor coil fans shall discharge vertically.
- Fan motor shall be permanently lubricated and inherently protected.
- Fans shall have a safety guard.

### Air Filters

- Cleanable 25 mm (1 inch) thick filters shall be furnished.

## OPTIONAL ACCESSORIES

### Ceiling Diffusers

- Furnish and install a (flush or stepdown) optional combination ceiling supply and return air diffuser.

### Ceiling Diffuser Supply and Return Air Transitions

- Supply and return transitions shall be available, for field installation in the roof mounting frame, to facilitate duct connection to the diffuser.

### Coil Guards

- Shall be available for field installation.
- Guards shall protect coil from damage.

### Control Systems

- Shall provide a selection of thermostats and related controls to automatically operate the mechanical equipment through the heating or cooling and ventilating cycles as required.

### Electric Heaters

- Shall be available for field installation.
- Heating elements shall be nichrome bare wire exposed directly to the air stream.
- ECH16R safety devices shall consist of limit controls and thermal cutoff safety fuses. ECH16 safety devices shall consist of limit controls and fuse block.
- Optional heater sub-fuse box shall be available for ECH16R electric heaters for single point power supply applications.

### Economizer Dampers

- Furnish and install, complete with controls, an air mixing damper assembly including outdoor air and recirculated air dampers.
- The assembly shall provide for the introduction of outside air for minimum ventilation and free cooling.
- Damper motor shall be 24 volt fully modulating or three position spring return.
- Down-flow model shall include pressure operated gravity exhaust dampers.
- Controls shall include electronic discharge air sensor, minimum position switch, and solid-state adjustable enthalpy control.
- Control option available shall consist of differential enthalpy control (return air sensor).

### Economizer Horizontal Gravity Exhaust Dampers (for Horizontal Economizer)

- Pressure operated dampers shall install in return air duct for horizontal applications with EMDH16.
- Damper blades shall ride in nylon bearings and be gasketed for tight seal and quiet operation.

### Hail Guards

- Shall be available for field installation.
- Guards shall protect coil from damage.

### Outdoor Air Damper Section

- Optional manual outdoor dampers shall be available to provide outdoor air requirements of up to 25%.
- Damper section field installs external to the unit.
- Shall be equipped with outdoor air hood filter for extra air filtering and bird screen protection.

### 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, No Heat and Filter.

### Roof Curb Power Entry Kit

- Optional kit shall provide power entry to the unit through the roof mounting frame.

### Roof Mounting Frame

- Mechanical contractor shall install a steel roof mounting frame for bottom discharge and return air duct connection.
- It shall mate to the bottom perimeter of the equipment.
- When flashed into the roof it shall make a unit mounting curb and provide weatherproof duct connection and entry into the conditioned area.
- Flashing shall be the responsibility of a roofing contractor.

### Stand-Off Mounting Kit

- Optional kit shall be available to elevate unit above mounting surface in horizontal applications.

### Unit Single Point Power Source Unit Sub-Fuse Box

- Optional box shall field install internal to the unit and provide single point power source connection and sub-fusing for unit.
- Shall be of galvanized steel with mounting holes, electrical inlets and hinged cover.

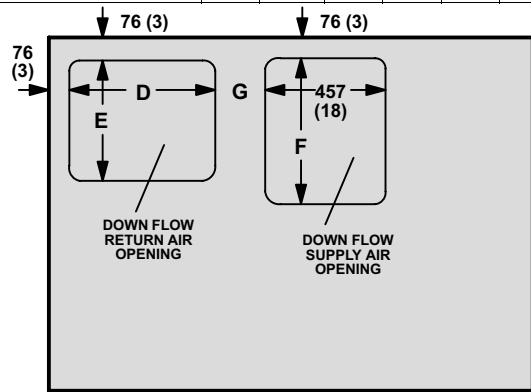
# DIMENSIONS - MM (INCHES) BASIC UNIT

## CORNER WEIGHTS

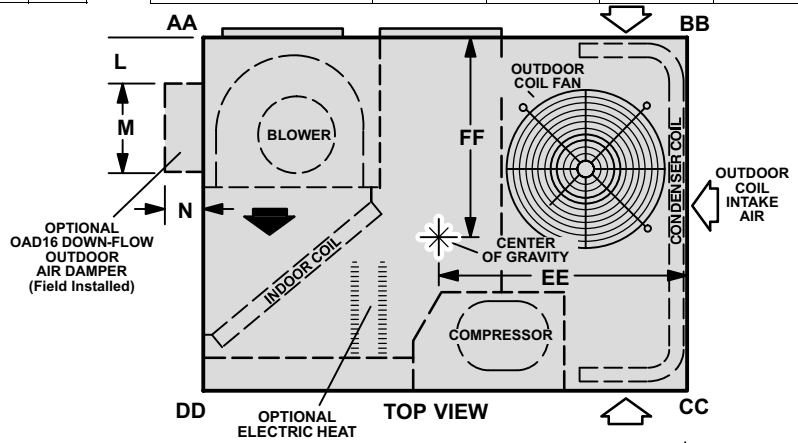
Model Number	AA		BB		CC		DD	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
CHP16-024	30	66	32	71	46	101	43	94
CHP16-036	32	71	34	76	49	107	46	100
CHP16-048	47	104	51	112	75	165	70	154
CHP16-060								

## CENTER OF GRAVITY

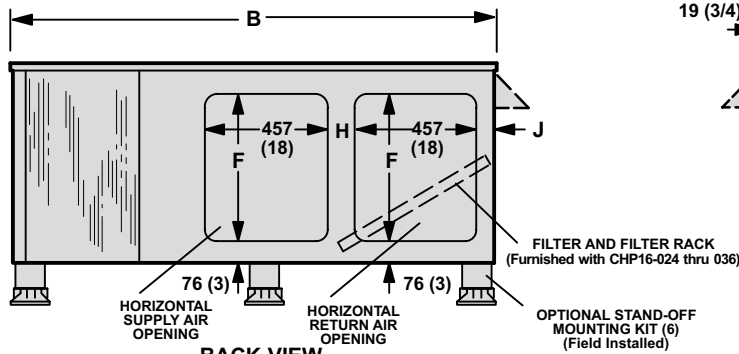
Model Number	EE		FF	
	mm	inch	mm	inch
CHP16-024	737	29	686	27
CHP16-036				
CHP16-048	889	35	787	31
CHP16-060				



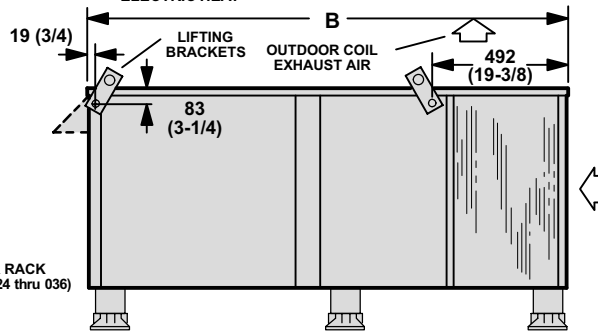
TOP VIEW BASE SECTION



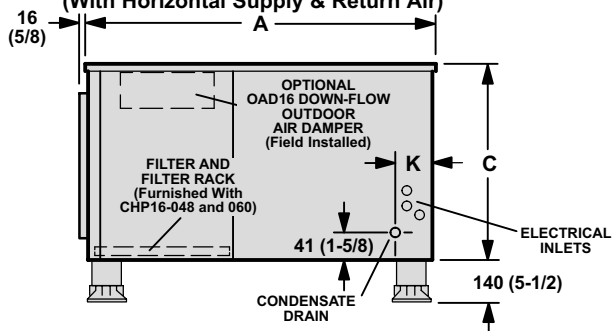
TOP VIEW



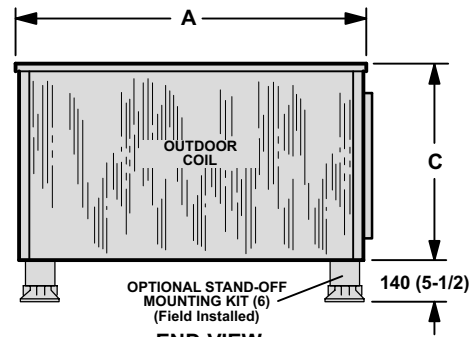
BACK VIEW



FRONT VIEW



END VIEW



END VIEW

Model Number	A		B		C		D		E		F		G	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
CHP16-024	1168	46	1524	60	584	23	457	18	330	13	330	13	254	10
CHP16-036														
CHP16-048	1321	52	1842	72-1/2	737	29	559	22	457	18	559	22	191	7-1/2
CHP16-060														

Model Number	H		J		K		L		M		N	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
CHP16-024	76	3	102	4	165	6-1/2	51	2	349	13-3/4	127	5
CHP16-036												
CHP16-048	127	5	76	3	156	6-1/8	127	5	349	13-3/4	203	8
CHP16-060												

## ACCESSORY DIMENSIONS - MM (INCHES)

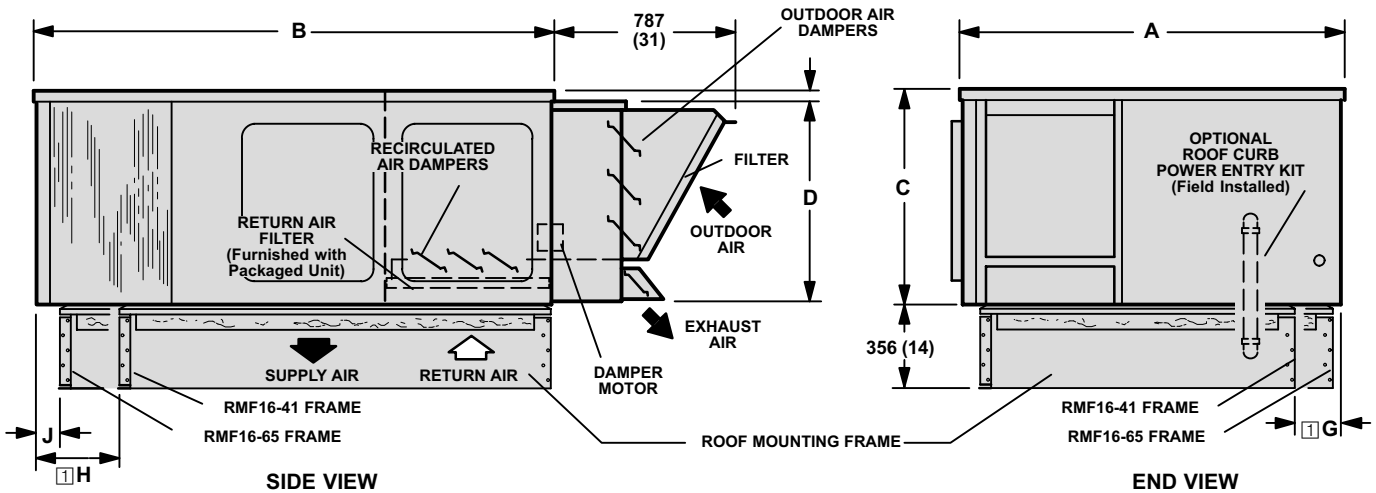
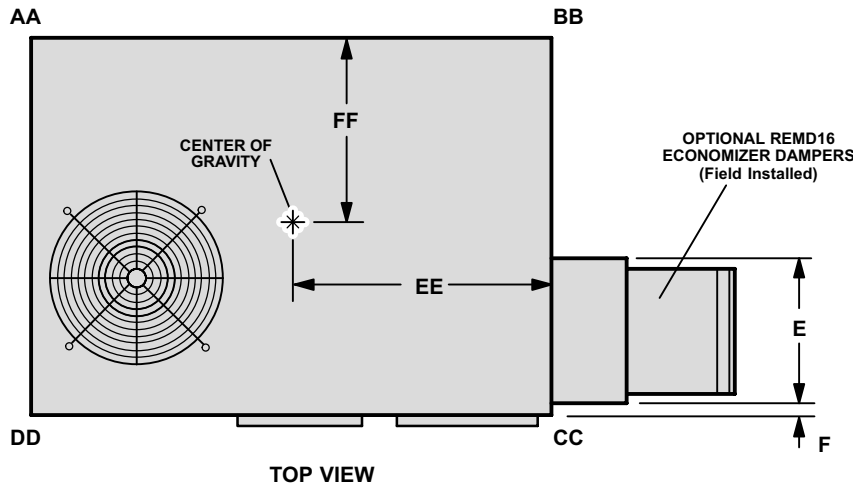
### CHP16 UNIT WITH REMD16 ECONOMIZER DAMPER SECTION AND RMF16 ROOF MOUNTING FRAME

#### CORNER WEIGHTS

Model Number	AA		BB		CC		DD	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
CHP16-024	51	112	59	131	52	115	45	98
CHP16-036	53	117	62	137	55	120	47	103
CHP16-048	79	174	91	199	76	168	66	146
CHP16-060								

#### CENTER OF GRAVITY

Model Number	EE		FF	
	mm	inch	mm	inch
CHP16-024	702	27-5/8	546	21-1/2
CHP16-036				
CHP16-048	857	33-3/4	603	23-3/4
CHP16-060				

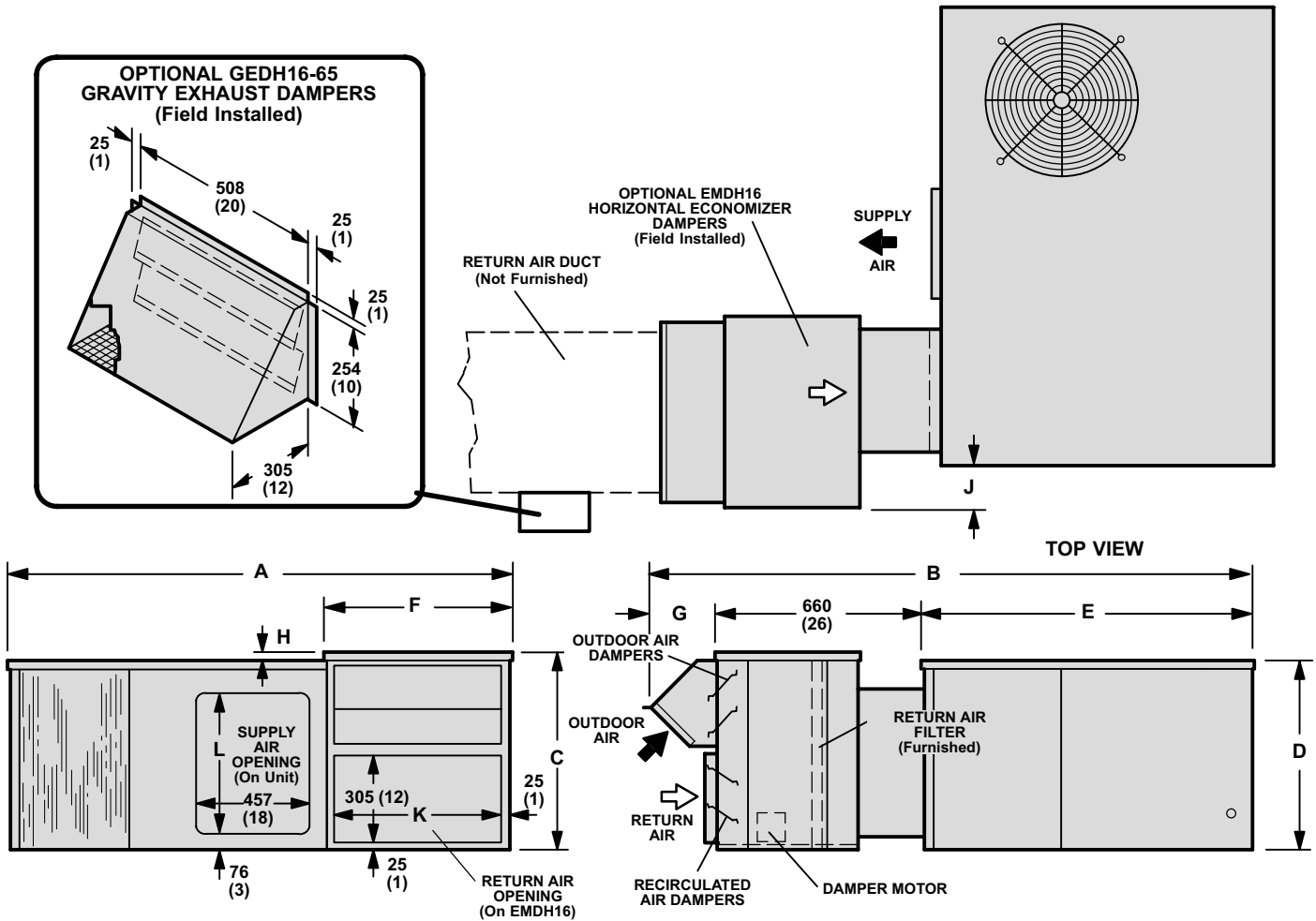


Model Number	A		B		C		D		E		F		G		H		J	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
CHP16-024	1168	46	1524	60	584	23	552	21-3/4	413	16-1/4	19	3/4	---	---	---	---	---	---
CHP16-036																		
CHP16-048	1321	52	1842	72-1/2	737	29	705	27-3/4	519	20-7/16	38	1-1/2	178	7	406	16	89	3-1/2
CHP16-060																		

Dimensions reflect usage with RMF16-41 mounting frame.

## ACCESSORY DIMENSIONS - MM (INCHES)

### CHP16 UNIT WITH EMDH16 HORIZONTAL ECONOMIZER DAMPER SECTION AND GEDH16-65 GRAVITY EXHAUST DAMPERS

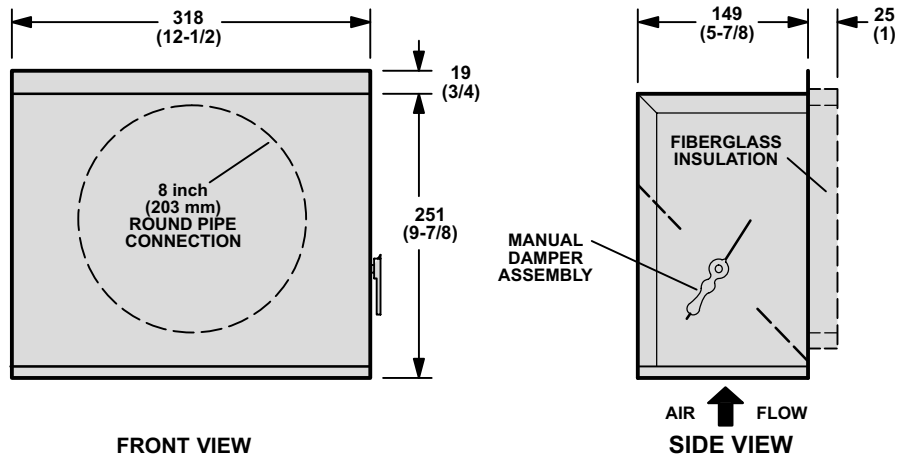


END VIEW

SIDE VIEW

Model Number	A		B		C		D		E		F		G		H		J		K		L	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
CHP16-024 CHP16-036	1600	63	2070	81-1/2	660	26	584	23	1168	46	660	26	241	9-1/2	76	3	76	3	610	24	330	13
CHP16-048 CHP16-060	2019	79-1/2	8100	90	772	30-3/8	737	29	1321	52	775	30-1/2	305	12	38	1-1/2	178	7	733	28-7/8	559	22

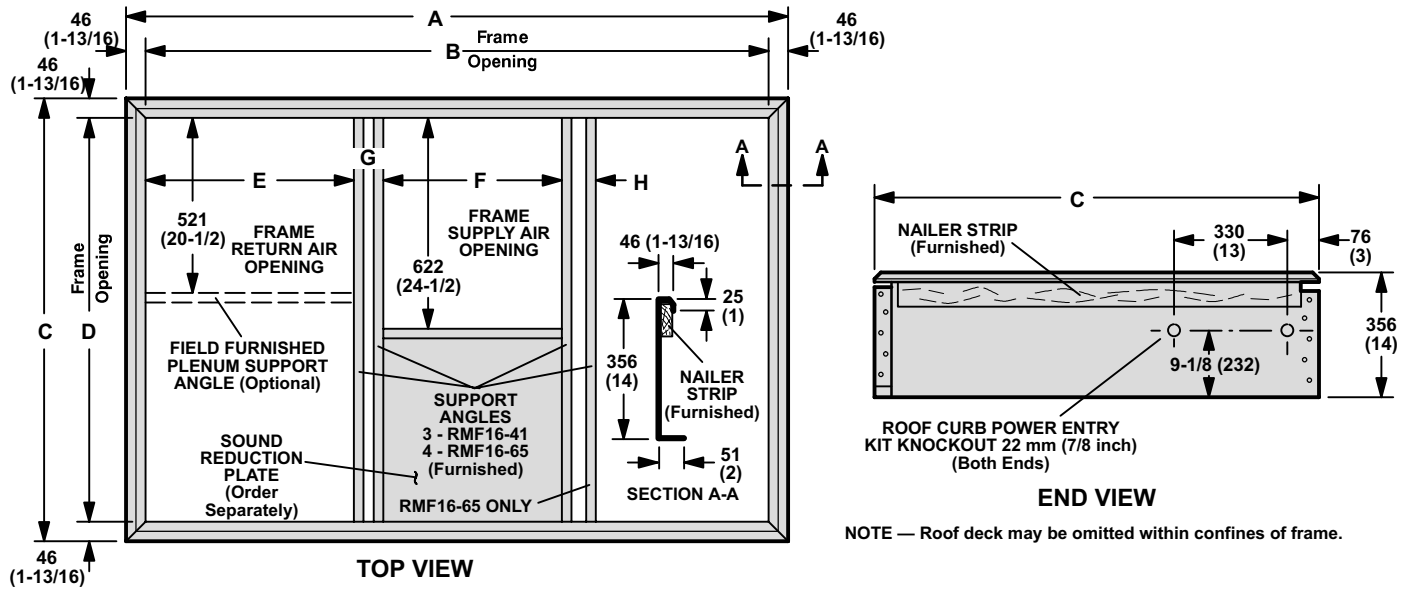
### OAD3-46/65 MANUAL MINIMUM OUTDOOR AIR DAMPER





## ACCESSORY DIMENSIONS - MM (INCHES)

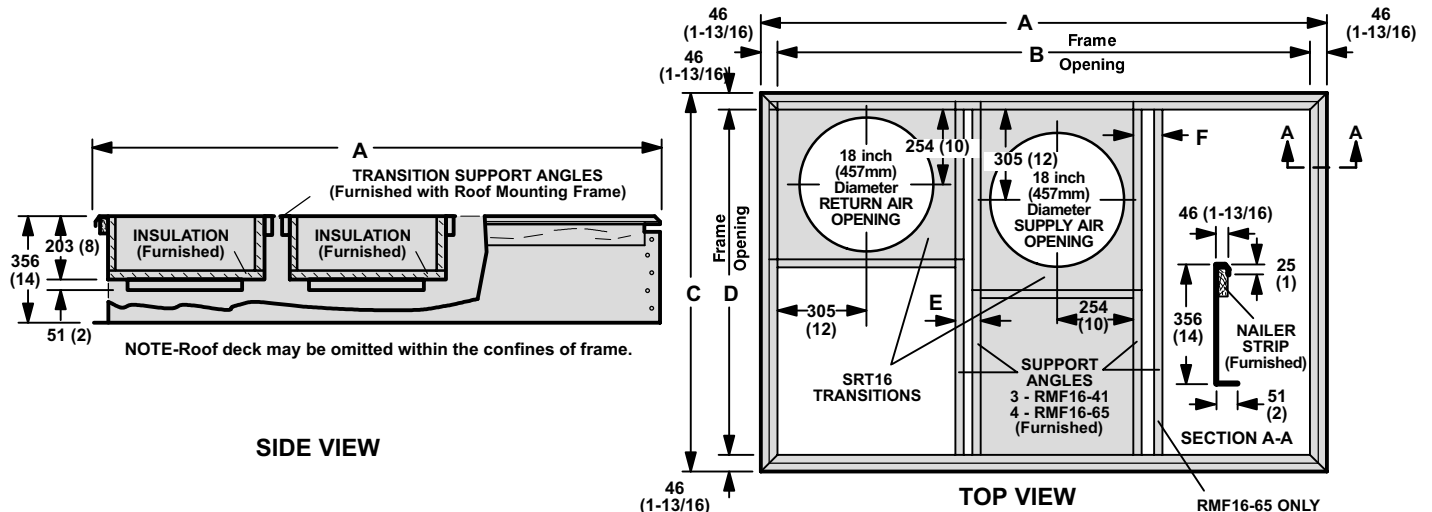
### RMF16-41 & RMF16-65 ROOF MOUNTING FRAME WITH DOUBLE DUCT OPENING FOR CHP16 UNITS



Model Number	A		B		C		D		E		F		G		H	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
RMF16-41	1432	56-3/8	1340	52-3/4	1121	44-1/8	1029	40-1/2	619	24-3/8	522	20-9/16	102	4	----	----
RMF16-65	1753	69	1661	65-3/8	1283	50-1/2	1191	46-7/8	616	24-1/4	521	20-1/2	102	4	102	4

83 mm (3-1/4 inches) for CHP16-024-036.

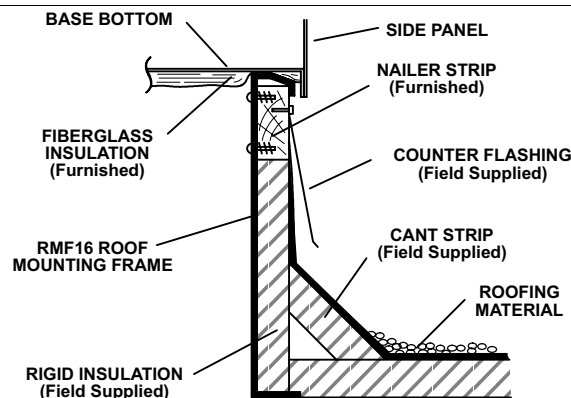
### RMF16-41 & RMF16-65 ROOF MOUNTING FRAMES WITH SRT16-65 SUPPLY AND RETURN AIR TRANSITIONS FOR FD9-65 & RTD9-65 CEILING DIFFUSERS



Model Number	A		B		C		D		E		F	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
RMF16-41 With SRT16-65	1432	56-3/8	1340	52-3/4	1121	44-1/8	1029	40-1/2	102	4	----	----
RMF16-65 With SRT16-65	1753	69	1661	65-3/8	1283	50-1/2	1191	46-7/8	102	4	102	4

83 mm (3-1/4 inches) for CHP16-024-036.

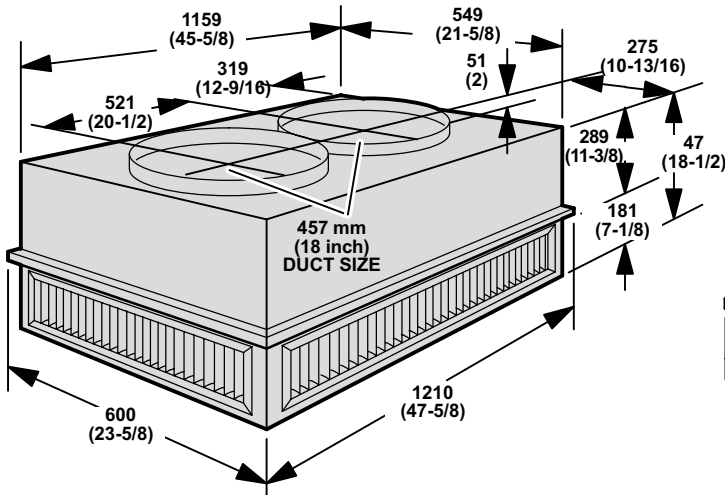
### TYPICAL FLASHING DETAIL FOR RMF16 ROOF MOUNTING FRAME



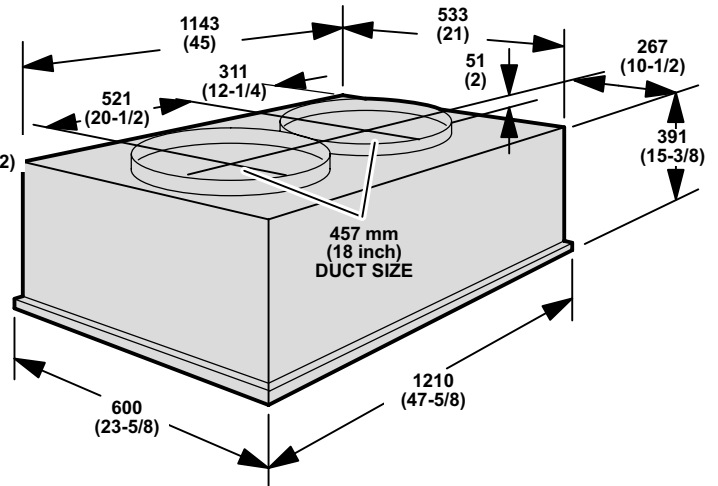
**ACCESSORY DIMENSIONS - MM (INCHES)**

**COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS**

**RTD9-65 STEP-DOWN CEILING DIFFUSER**

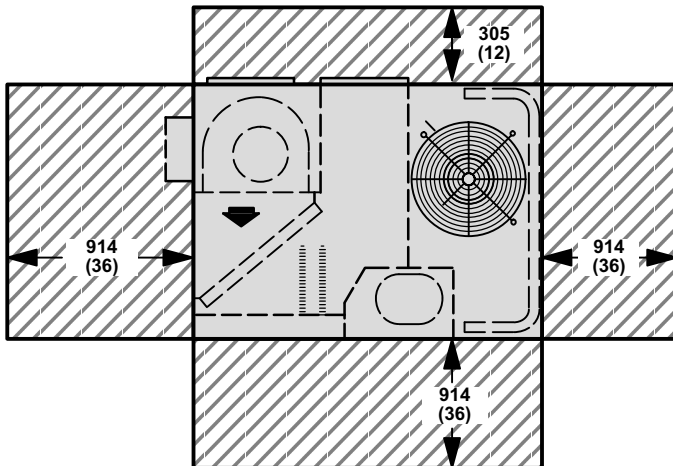


**FD9-65 FLUSH CEILING DIFFUSER**



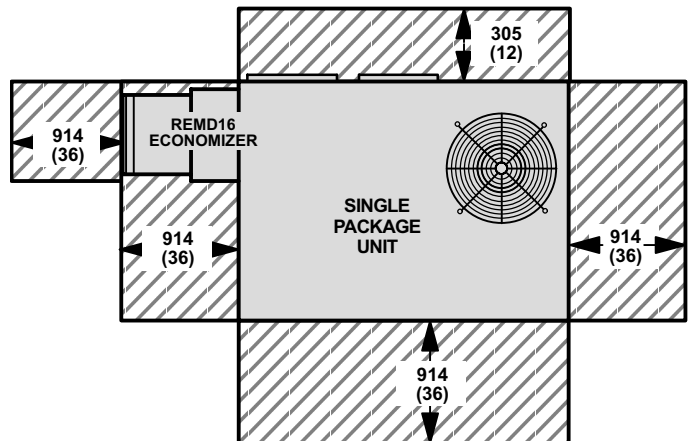
**INSTALLATION CLEARANCES - MM (INCHES)**

**CHP16 BASIC UNIT**



NOTE — Top Clearance 1525 mm (60 in.).  
NOTE — Entire perimeter of unit requires support when elevated above mounting surface.

**CHP16 UNIT WITH REMD16 ECONOMIZER**



NOTE — Top Clearance 1525 mm (60 in.).

**CHP16 UNIT WITH EMD16H ECONOMIZER AND GEDH16-65 GRAVITY EXHAUST DAMPER**

NOTE — Top Clearance 1525 mm (60 in.).

