CITY OF SACRAMENTO

1231 I Street, Sacramento, CA 95814

Permit No: 0603576
Insp Area: 3
Thos Bros: 318E3

PAID
CITY OF SACRAMENTO
MAR 16 2006
NEIGHBORHOOD SERVICES AND DEVELOPMENT

Site Address: 8270 BELVEDERE AV SAC
Parcel No: 061-0071-020

Sub-Type: COM
Housing (Y/N): N

CONTRACTOR
BOS SHEET METAL
3325 52ND AV
SACRAMENTO CA 95823

OWNER
MITCHELL SUSAN M
1500 FRANKLIN ST
SAN FRANCISCO CA 94109

ARCHITECT

Nature of Work: C/O ROOF MOUNT HVAC - SAME LOCATION, SAME SIZE, SAME WEIGHT

CONSTRUCTION LENDING AGENCY : I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C).

Lender's Name_____ Lender'sAddress_____

LICENSED CONTRACTORS DECLARATION: I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with section 7000) of Division 3 of the Business and Professions Code and my license is in full force and effect.

X License Class C-20 License Number 254689 Date 3-16-06 Contractor Signature Ken Dawson

OWNER-BUILDER DECLARATION: I hereby affirm under penalty of perjury that I am exempt from the contractors License Law for the following reason (Sec. 7031.5, Business and Professions Code; any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 8 of the Business and Professions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500.00);

_____ I, as a owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professional Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or herself or through his/her own employees, provided that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he/she did not build or improve for the purpose of sale.)

_____ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law).

_____ I am exempt under Sec._____ B & PC for this reason:_____

Date_____ Owner Signature_____

IN ISSUING THIS BUILDING PERMIT, the applicant represents, and the city relies on the representation of the applicant, that the applicant verified all measurements and locations shown on the application or accompanying drawings and that the improvement to be constructed does not violate any law or private agreement relating to permissible or prohibited locations for such improvements. This building permit does not authorize any illegal location of any improvement or the violation of any private agreement relating to location of improvements.

I certify that I have read this application and state that all information is correct. I agree to comply with all city and county ordinances and state laws relating to building construction and herby authorize representative(s) of this city to enter upon the abovementioned property for inspection purposes.

X Date 3-16-06 Applicant/Agent Signature Ken Dawson

WORKER'S COMPENSATION DECLARATION: I hereby affirm under penalty of perjury one of the following declarations:
_____ I have and will maintain a certificate of consent to self-insure for workers' compensation as provided for by Section 3700 of the Labor Code, for the performance of work for which the permit is issued.

X Yes I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier STATE COMP INS FUND Policy Number 1748379 Exp Date 07/01/2006

_____ (This section need not be completed if the permit is for $100 or less) I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

X Date 3-16-06 Applicant Signature Ken Dawson

WARNING: FAILURE TO SECURE WORKER'S COMPENSATION COVERAGE IS UNLAWFUL AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000) IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST AND ATTORNEY'S FEE.

~~**THIS PERMIT SHALL EXPIRE BY LIMITATION IF WORK IS NOT COMMENCED WITHIN 180 DAYS.**~~

Title 24 Report for:

Suite 100
8270 Belvedere Avenue
Sacramento, CA

Project Designer:

Report Prepared By:

Thomas Schroeder
Bos Sheet Metal, Inc.
3325 52nd Ave.
Sacramento, CA 95823
(916) 428-1780

Job Number:

Date:

3/14/2006

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2005 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC - www.energysoft.com.

TABLE OF CONTENTS

CERTIFICATE OF COMPLIANCE (Part 1 of 2) MECH-1-C

PROJECT NAME: Suite 100		DATE: 3/14/2006
PROJECT ADDRESS: 8270 Belvedere Avenue Sacramento		Building Permit #
PRINCIPAL DESIGNER - MECHANICAL: Bos Sheet Metal, Inc.	TELEPHONE: 916.428.1780	
DOCUMENTATION AUTHOR: Bos Sheet Metal, Inc.	TELEPHONE: (916) 428-1780	Checked by/Date Enforcement Agency Use

GENERAL INFORMATION

DATE OF PLANS	BUILDING CONDITIONED FLOOR AREA: 800 Sq.Ft.			CLIMATE ZONE: 12
BUILDING TYPE	[X] NONRESIDENTIAL	[ ] HIGH RISE RESIDENTIAL	[ ] HOTEL/MOTEL GUEST ROOM	
PHASE OF CONSTRUCTION	[ ] NEW CONSTRUCTION	[ ] ADDITION	[ ] ALTERATION	[ ] UNCONDITIONED (File Affidavit)
METHOD OF MECHANICAL COMPLIANCE	[X] PRESCRIPTIVE	[ ] PERFORMANCE		
PROOF OF ENVELOPE COMPLIANCE	[ ] PREVIOUS ENVELOPE PERMIT	[ ] ENVELOPE COMPLIANCE ATTACHED		

STATEMENT OF COMPLIANCE

This Certificate of Compliance lists the building features and performance specifications needed to comply with Title 24, Parts 1 and 6 of the California Code of Regulations. This certificate applies only to building mechanical requirements.

The documentation preparer hereby certifies that the documentation is accurate and complete.

DOCUMENTATION AUTHOR	SIGNATURE	DATE
Thomas Schroeder	Thomas Schroeder	3/14/06

The Principal Mechanical Designer hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application. The proposed building has been designed to meet the mechanical requirements contained in the applicable parts of Sections 100, 101, 102, 110 through115, 120 through 125, 142, 144, and 145.

[X] The plans & specifications meet the requirements of Part 6 (Sections 10-103a).

[X] The installation certificates meet the requirements of Part 6 (10-103a 3).

[X] The operation & maintenance information meets the requirements of Part 6 (10-103c).

Please check one: (These sectionsof the Business and Professions Code are printed in full in the Nonresidential Manual.)

[ ] I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer, or mechanical engineer or I am a licensed architect.

[X] I affirm that I am eligible under the exemption to Division 3 of the Business and Professions Code by Section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.

[ ] I affirm that I am eligible under the exemption to Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described pursuant to Business and Professions Code sections 5537, 5538, and 6737.1.

PRINCIPAL MECHANICAL DESIGNER - NAME	SIGNATURE	DATE	LIC. #
Bos Sheet Metal, Inc.		3-14-06	254689

INSTRUCTIONS TO APPLICANT

[X] MECH-1-C: Certificate of Compliance. Part 1, 2, 3 of 3 are required on plans for all submittals.

[X] MECH-2-C: Certificate of Compliance. Part 1, 2 of 2 are required for all submittals, but may be on plans.

[X] MECH-3-C: Certificate of Compliance are required for all submittals with mechanical ventilation, but may be on plans.

[X] MECH-4-C: Certificate of Compliance are required for all prescriptive submittals, but may be on on plans.

[ ] MECH-5-C: Mechanical Equipment Details are required for all performance submittals.

CERTIFICATE OF COMPLIANCE (Part 2 of 2) MECH-1-C

PROJECT NAME	DATE
Suite 100	3/14/2006

Designer:

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for mechanical systems. The designer is required to check the boxes by all acceptance tests that apply and list all equipment that requires an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems to be tested in parentheses. The NJ number designates the Section in the Appendix of the Nonresidential ACM Manual that describes the test. Also indicate the person responsible for performing the tests (i.e. the installing contractor, design professional or an agent selected by the owner). Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Building Departments:

SYSTEM ACCEPTANCE. Before an occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance.

In addition a Certificate of Acceptance, MECH-1-A Form shall be submitted to the building department that certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of Section 10-103(b) and Title 24 Part 6.

STATEMENT OF COMPLIANCE

☑ MECH-2-A: Ventilation System Acceptance Document
-Variable Air Volume Systems Outdoor Air Acceptance
☒ -Constant Air Volume Systems Outdoor Air Acceptance
Equipment requiring acceptance testing HP-1

Test required on all New systems both New Construction and Retrofit.

☑ MECH-3-A: Packaged HVAC Systems Acceptance Document
Equipment requiring acceptance testing HP-1

Test required on all New systems both New Construction and Retrofit.

☐ MECH-4-A: Air-Side Economizer Acceptance Document
Equipment requiring acceptance testing _____

Test required on all New systems both New Construction and Retrofit. Units with economizers that are installed at the factory and certified with the commission do not require equipment testing but do require construction inspection.

☐ MECH-5-A: Air Distribution Acceptance Document
Equipment requiring acceptance testing _____

This test required if the unit serves 5,000 ft2 of space or less and 25% or more of the ducts are in nonconditioned or semiconditioned space like an attic. New systems that meet the above requirements. Retrofit systems that meet the above requirements and either extend ducts, replace ducts or replace the packaged unit.

☐ MECH-6-A: Demand Control Ventilation Acceptance Document
Equipment requiring acceptance testing _____

All new DCV controls installed on new or existing packaged systems must be tested.

☐ MECH-7-A: Supply Fan Variable Flow Control Acceptance Document
Equipment requiring acceptance testing _____

All new VAV fan volume controls installed on new or existing systems must be tested

☐ MECH-8-A: -Hydronic System Control Acceptance Document
-Variable Flow Controls *Applies to chilled and hot water systems.*
-Automatic Isolation Controls *Applies to new boilers and chillers and the primary pumps are connected to a common header.*
-Supply Water Temperature Reset Controls
Applies to new constant flow chilled and hot water systems that have a design capacity greater than or equal to 500,000 Btu/hr.
-Water-loop Heat Pump Controls
Applies to all new waterloop heat pump systems where the combined loop pumps are greater than 5 hp.
-Variable Frequency Controls *Applies to all new distribution pumps on new variable flow chilled, hydronic heat pump or condenser water systems where the pumps motors are greater than 5 hp.*
Equipment requiring acceptance testing _____

AIR SYSTEM REQUIREMENTS

Part 1 of 2 **MECH-2-C**

PROJECT NAME	DATE
Suite 100	3/14/2006

SYSTEM FEATURES

		AIR SYSTEMS, Central or Single Zone		
ITEM OR SYSTEM TAG(S)		HP-1		
Number of Systems		1		
MANDATORY MEASURES	**T-24 Section**	**Reference on Plans or Specification [1]**		
Heating Equipment Efficiency	112(a)	7.60 HSPF		
Cooling Equipment Efficiency	112(a)	13.0 SEER / 10.0 EER		
Heat Pump Thermostat	112(b)	Yes		
Furnace Controls	112(c), 115(a)	n/a		
Natural Ventilation	121(b)	Yes		
Minimum Ventilation	121(b)	120 cfm		
VAV Minimum Position Control	121(c)	No		
Demand Control Ventilation	121(c)	No		
Time Control	121(c), 122(e)	Programmable Switch		
Setback and Setup Control	122(e)	Heating & Cooling Required		
Outdoor Damper Control	122(f)	Auto		
Isolation Zones	122(g)	n/a		
Pipe Insulation	123			
Duct Insulation	124	R-8.0		
PRESCRIPTIVE MEASURES				
Calculated Heating Capacity x 1.43 [2]	144 (a & b)	53,892 btuh		
Proposed Heating Capacity [2]	144 (a & b)	40,943 btuh		
Calculated Sensible Cooling Capacity x 1.21[2]	144 (a & b)	42,357 btuh		
Proposed Sensible Cooling Capacity [2]	144 (a & b)	41,708 btuh		
Fan Control	144 (c)	Constant Volume		
DP Sensor Location	144 (c)			
Supply Pressure Reset (DDC only)	144 (c)	Yes		
Simultaneous Heat/Cool	144 (d)	No		
Economizer	144 (e)	No Economizer		
Heating Air Supply Reset	144 (f)	Constant Temp		
Cooling Air Supply Reset	144 (f)	Constant Temp		
Duct Sealing for Prescriptive Compliance[3]	144 (k)	No		

1: For each central and single zone air systems (or group of similar units) fill in the reference to sheet number and/or specification section and paragraph number where the required features are documented. If a requirement is not applicable, put "N/A" in the column.

2: Not required for hydronic heating and cooling. Either enter a value here or put in reference ot plans and specificatons per footnote 1.

3: Enter Yes if System is: Constant Volume, Single Zone; Serves < 5,000 sqft; Has > 25% duct in unconditioned space. Duct sealing is required for Prescriptive Compliance, see PERF-1 for performance method duct sealing requirements.

NOTES TO FIELD - For Building Department Use Only

MECHANICAL VENTILATION — MECH-3-C

PROJECT NAME	DATE
Suite 100	3/14/2006

MECHANICAL VENTILATION (Section 121(b)2)

		AREA BASIS			OCCUPANCY BASIS					PRESCRIPTIVE REHEAT LIMITATION (Section 144(d)) VAV MINIMUM				
A	B	C	D	E	F	G	H	I	J	K	L	M	N
ZONE/SYSTEM	Condition Area (SF)	CFM per Square Foot	Min CFM by Area (B x C)	Number of People	CFM per Person	Min CFM by Occupant (E x F)	REQ'D V.A Max of (D or G)	Design Vent. Air CFM	30% of Design Zone Supply CFM	B x 0.4 CFM/sq. ft.	Max of Columns H, J, K or 300 CFM	Design Min. Air Setpoint	Transfer Air
Office	800	0.15	120				120	120					
HP-1						Total	120	120					

C	Minimum ventilation rate per Section 121, Table 121-A.
F	Based on fixed seat or the greater of the expected number of occupants and 50% of the CBC occupant load for egress purposes for spaces without fixed seating.
H	Required Ventilation Air (REQ'D V.A.) is the larger of the ventilation rates calculated on and AREA or OCCUPANCY BASIS (column D or G).
I	Must be greater than or equal to H, or use Transfer Air (column N) to make up the difference.
J	Design fan supply cfm (Fan CFM) x 30%; or
K	Condition area (ft. sq.) x 04 cfm/ft. sq.; or
L	Maximum of Columns H, J, K, or 300 cfm
M	This must be less than or equal to Column L and greater that or equal to the sum of Columns H + N.
N	Transfer air must be provided where the Required Ventilation Air (column H) is greater than the Design Minimum Air (column M). Where required, transfer air must be greater than or equal to the difference between the Required Ventilation Air (column H) and the Design Minimum Air (column M), column H - M.

MECHANICAL SIZING AND FAN POWER — MECH-4-C

PROJECT NAME	DATE
Suite 100	3/14/2006
SYSTEM NAME	FLOOR AREA
HP-1	800

FAN POWER CONSUMPTION

A	B	C	D	E	F
FAN DESCRIPTION	DESIGN BRAKE HP	EFFICIENCY		NUMBER OF FANS	PEAK WATTS B x E x 746 / (C X D)
		MOTOR	DRIVE		
Supply Fan	0.200	60.0%	100.0%	1.0	249

FILTER PRESSURE ADJUSTMENT EQUATION 144-A

A) If filter pressure drop is greater than 1 inch W.C. enter filter pressure drop. SPa on line 4 and Total Fan pressure SPf on Line 5.

B) Calculate Fan Adjustment and enter on Line 6.

C) Calculate Adjusted Fan Power Index and enter on Line 7.

1) TOTAL FAN SYSTEM POWER (Watts, Sum Column F)	249
2) SUPPLY DESIGN AIRFLOW (CFM)	2,000
3) TOTAL FAN SYSTEM POWER INDEX (Row 1/Row 2)[1]	
4) SPa	
5) SPf	
6) Fan Adjustment = 1-(SPa - 1)/SPf	
7) ADJUSTED FAN POWER INDEX (Line 3 x Line 6)[1]	0.124

1. TOTAL FAN SYSTEM POWER INDEX or ADJUSTED FAN POWER INDEX must not exceed 0.8 W/cfm for Constant Volume systems or 1.25 W/cfm for VAV systems.

ITEM or SYSTEM TAG(S)

PRESCRIPTIVE MEASURES	T-24 Section	Capacity	Exception	Notes
Electric Resistance Heating [1]	144 (g)			
Heat Rejection System [2]	144 (h)			
Air Cooled Chiller Limitation [3]	144 (l)			

1. Total installed capacity (MBtu/hr) of all electric heat on this project exclusive of electric auxiliary heat for heat pumps. If electric heat is used, explain which exception(s) to Section(g) apply.

2. Are centrifugal fan cooling towers used on this project? (Enter "Yes" or "No") If centrifugal fan cooling tower are used, explain which exception(s) to Section 144(h) apply.

3. Total installed capacity (tons) of all water and air cooled chillers under this permit. If there are more than 100 tons of air-coolad chiller capacity being installed, explain which exception(s) to Section 144(l) apply.

MECHANICAL MANDATORY MEASURES — Part 1 of 2 — MECH-MM

PROJECT NAME	DATE
Suite 100	3/14/2006

	DESCRIPTION		Designer	Enforcement
	Equipment and Systems Efficiencies			
☐	§ 111	Any appliance for which there is a California standard established in the Appliance Efficiency Regulations will comply with the applicable standard.		
☐	§ 115(a)	Fan type central furnaces shall not have a pilot light.		
☐	§ 123	Piping, except that conveying fluids at temperatures between 60 and 105 degrees Fahrenheit, or within HVAC equipment, shall be insulated in accordance with Standards Section 123.		
☒	§ 124	Air handling duct systems shall be installed and insulated in compliance with Sections 601, 603 and 604 of the Uniform Mechanical Code.		
	Controls			
	§ 122(e)	Each space conditioning system shall be installed with one of the following:		
☐	§ 122(e)1A	Each space conditioning system serving building types such as offices and manufacturing facilities (and all others not explicitly exempt from the requirements of Section 112 (d)) shall be installed with an automatic time switch with an accessible manual override that allows operation of the system during off-hours for up to 4 hours. The time switch shall be capable of programming different schedules for weekdays and weekends and have program backup capabilities that prevent the loss of the device's program and time setting for at least 10 hours if power is interrupted; or		
☐	§ 122(e)1B	An occupancy sensor to control the operating period of the system; or		
☐	§ 122(e)1C	A 4-hour timer that can be manually operated to control the operating period of the system.		
☒	§ 122(e)2	Each space conditioning system shall be installed with controls that temporarily restart and temporarily operate the system as required to maintain a setback heating and/or a setup cooling thermostat setpoint.		
☐	§ 122(g)	Each space conditioning system serving multiple zones with a combined conditioned floor area more than 25,000 square feet shall be provided with isolation zones. Each zone: shall not exceed 25,000 square feet; shall be provided with isolation devices, such as valves or dampers, that allow the supply of heating or cooling to be setback or shut off independently of other isolation areas; and shall be controlled by a time control device as described above.		
☒	§ 122(a&b)	Each space conditioning system shall be controlled by an individual thermostat that responds to temperature within the zone. Where used to control heating, the control shall be adjustable down to 55 degrees F or lower. For cooling, the control shall be adjustable up to 85 degrees F or higher. Where used for both heating and cooling, the control shall be capable of providing a deadband of at least 5 degrees F within which the supply of heating and cooling is shut off or reduced to a minimum.		
☒	§ 122(c)	Thermostats shall have numeric setpoints in degrees Fahrenheit (F) and adjustable setpoint stops accessible only to authorized personnel.		
☒	§ 112(b)	Heat pumps shall be installed with controls to prevent electric resistance supplementary heater operation when the heating load can be met by the heat pump alone.		

MECHANICAL MANDATORY MEASURES — Part 2 of 2 — MECH-MM

PROJECT NAME	DATE
Suite 100	3/14/2006

		Description	Designer	Enforcement
		Ventilation		
[X]	§ 121(e)	Controls shall be provided to allow outside air dampers or devices to be operated at the ventilation rates as specified on these plans.		
[X]	§ 122(f)	Gravity or automatic dampers interlocked and closed on fan shutdown shall be provided on the outside air intakes and discharges of all space conditioning and exhaust systems.		
[X]	§ 122(f)	All gravity ventilating systems shall be provided with automatic or readily accessible manually operated dampers in all openings to the outside, except for combustion air openings.		
[X]	§ 121(f)1	Air Balancing: The system shall be balanced in accordance with the National Environmental Balancing Bureau (NEBB) Procedural Standards (1983), or Associated Air Balance Council (AABC) National Standards (1989); or		
[X]	§ 121(f)2	Outside Air Certification: The system shall provide the minimum outside air as shown on the mechanical drawings, and shall be measured and certified by the installing licensed C-20 mechanical contractor and certified by (1) the design mechanical engineer, (2) the installing licenced C-20 mechanical contractor, or (3) the person with overall responsibility for the design of the ventilation system; or		
[X]	§ 121(f)3	Outside Air Measurement: The system shall be equipped with a calibrated local or remote device capable of measuring the quantity of outside air on a continuous basis and displaying that quantity on a readily accessible display divice; or		
[X]	§ 121(f)4	Another method approved by the Commission.		
		Service Water Heating Systems		
[ ]	§ 113(b)2	If a circulating hot water system is installed, it shall have a control capable of automatically turning off the circulating pump(s) when hot water is not required.		
[ ]	§ 113(b)3B	Lavatories in restrooms of public facilities shall be equipped with controls to limit the outlet temperature to 110 degrees F.		
[ ]	§ 113(b)3C	Lavatories in restrooms of public facilities shall be equipped with one of the following: Outlet devices that limit the flow of hot water to a maximum of 0.5 gallons per minute. Foot actuated control valves, and outlet devices that limit the flow of hot water to a maximum of 0.75 gallons per minute. Proximity sensor actuated control valves, and outlet devices that limit the flow of hot water to a maximum of 0.75 gallons per minute. Self-closing valves, and outlet devices that limit the flow of hot water to a maximum of 2.5 gallons per minute, and 0.25 gallons/cycle (circulating system). Self-closing valves, and outlet devices that limit the flow of hot water to a maximum of 2.5 gallons per minute, and 0.50 gallons/cycle (non-circulating system). Self-closing valves, and outlet devices that limit the flow of hot water to a maximum of 2.5 gallons per minute, and 0.75 gallons/cycle (foot switches and proximity sensor controls).		

New

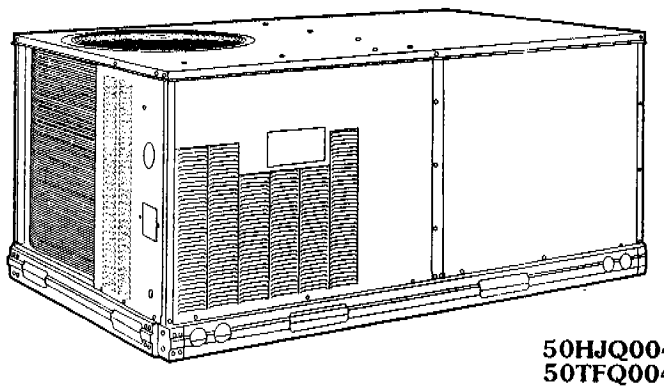
Carrier

Product Data

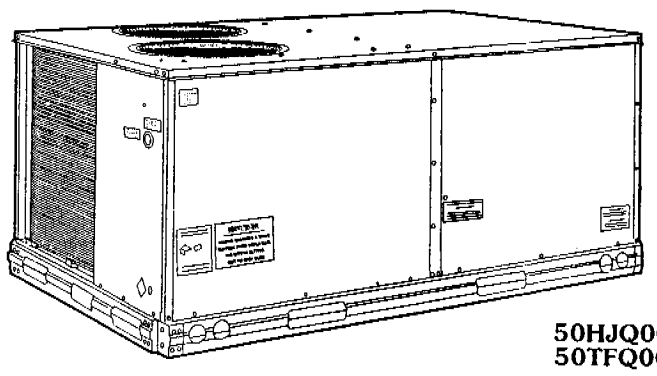
50HJQ004-016
50TFQ004-012
Single-Package Rooftop
Standard and High Efficiency
Heat Pump Units
60 Hz

3 to 15 Nominal Tons

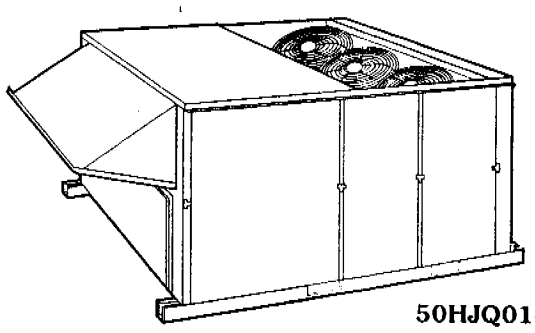
Carrier Comfort System
PremierLink



50HJQ004-007
50TFQ004-007



50HJQ008-012
50TFQ008-012



50HJQ014-016

ASHRAE 90.1 COMPLIANT

Standard-Efficiency (TFQ), and High-Efficiency (HJQ) heat pump units with:

- Pre-painted galvanized steel cabinet for long life and quality appearance
- Commercial strength base rails with built-in rigging capability
- Convertible design for vertical or horizontal supply/return
- Non-corrosive, sloped condensate drain pan, meets ASHRAE 62 (IAQ)
- Two-inch return-air filters
- A wide assortment of factory-installed options available, including high static drives that provide additional performance range
- Factory-installed PremierLink™ digital communicating controls
- Optional gear driven EconoMi$er with CO_2 ventilation control (2 to 10 vac actuator)
- Optional gear-driven EconoMi$er with 4 to 20 mA actuator for PremierLink and 3rd Party EMS controls
- State-of-the-art defrost system
- Dependable 4-way valve operation

Heat Options

- Field-installed electric heat available
- Glycol hydronic coils

Features/Benefits

Every compact one-piece unit arrives fully assembled, charged, tested, and ready to run.

Quiet, efficient operation and dependable performance

Compressors have vibration isolators for quiet operation. Efficient fan and motor design permits operation at low sound levels.

ARI* CAPACITY RATINGS — 50HJ004-014

UNIT 50HJ	NOMINAL TONS	NET COOLING CAP (Btuh)	TOTAL kW	SEER†	EER	SOUND RATING (decibels)	IPLV††
004	3	36,000	3.2	13.0	11.2**	76	N/A
005	4	46,000	4.1	13.0	11.1**	76	N/A
006	5	61,000	5.5	13.0	11.0**	80	N/A
007	6	74,000	6.7	—	11.1	80	N/A
008	7 1/2	73,000	8.2	—	11.0	82	11.6
009	8 1/2	104,000	8.8	—	11.8	82	13.1
012	10	120,000	10.9	—	11.0	84	11.4
014	12 1/2	140,000	14.3	—	9.8	86	10.5

LEGEND

EER — Energy Efficiency Ratio
IPLV — Integrated Part-Load Value
SEER — Seasonal Energy Efficiency Ratio

*Air-Conditioning and Refrigeration Institute.
†Applies only to units with capacity of 65,000 Btuh or less.
**ARI does not require EER ratings for units with capacity below 65,000 Btuh. For these units, the EER rating at ARI Standard conditions is provided for information only.
††IPLV is not applicable to single-compressor units.

NOTES:
1. Rated in accordance with ARI Standard 210-94 or 360-93.
2. Ratings are net values, reflecting the effects of circulating fan heat. Ratings are based on:
   Cooling Standard: 80 F db, 67 wb indoor entering-air temperature and 95 F db outdoor entering-air temperature.
   IPLV Standard: 80 F db, 67 F wb indoor entering-air temperature and 80 F db outdoor entering-air temperature.
3. All 50HJ004-014 units are in compliance with ASHRAE 90.1 2001 Energy Standard for minimum SEER and EER requirements. Refer to state and local codes or visit the following website: http://solstice.crest.org/efficiency/bcap to determine if compliance with this standard pertains to a given geographical area of the United States.

ARI* CAPACITY RATINGS — 50HJ015,017

UNIT 50HJ	NOMINAL TONS	NET COOLING CAPACITY (Btuh)	TOTAL WATTS	EER	SOUND RATING (decibels)	IPLV
015	12	152,000	14,074	10.80	8.8	11.8
017	15	176,000	16,296	10.80	8.8	11.7

LEGEND

db — Dry Bulb
EER — Energy Efficiency Ratio
IPLV — Integrated Part-Load Values
wb — Wet Bulb

*Air Conditioning and Refrigeration Institute.

NOTES:
1. Rated in accordance with ARI Standards 360-93 and 270-95.
2. ARI ratings are net values, reflecting the effects of circulating fan heat.
3. Ratings are based on:
   Cooling Standard: 80 F db, 67 F wb indoor entering-air temperature and 95 F db air entering outdoor unit.
   IPLV Standard: 80 F db, 67 F wb indoor entering-air temperature and 80 F db outdoor entering-air temperature.
4. All 50HJ015, 017 units are in compliance with ASHRAE 90.1 2001 Energy Standard for minimum SEER and EER requirements. Refer to state and local codes or visit the following website: http://solstice.crest.org/efficiency/bcap to determine if compliance with this standard pertains to a given geographical area of the United States.

Physical data — 50HJQ004-007

BASE UNIT 50HJQ	004	005	006	007
NOMINAL CAPACITY (tons)	3	4	5	6
OPERATING WEIGHT (lb)				
Unit	500	550	590	630
Durablade Economizer	34	34	34	34
EconoMi$er	47	47	47	47
Roof Curb	115	115	115	115
COMPRESSOR	Scroll			
Quantity	1	1	1	1
Oil (oz)	42	53	50	60
REFRIGERANT TYPE	R-22			
Operating Charge (lb)	6.9	9.6	10.8	17.7
OUTDOOR FAN	Propeller			
Quantity...Diameter (in.)	1...22	1...22	1...22	1...22
Nominal Cfm	3500	3500	3500	3500
Motor Hp...Rpm	1/8...825	1/8...825	1/4...1100	1/4...1100
OUTDOOR COIL	Enhanced Copper Tubes, Aluminum Fins, Acutrol™ Metering Device			
Rows...Fins/in.	1...17	2...17	2...17	2...17
Total Face Area (sq ft)	14.58	16.53	16.53	16.53
INDOOR FAN	Centrifugal			
Size (in.)	10 x 10	10 x 10	10 x 10	10 x 10
Type Drive	Belt	Belt	Belt	Belt
Nominal Cfm	1200	1600	2000	2400
Maximum Continuous Bhp	1.20	1.20	1.80	2.40
Motor Frame	48	48	48	56
Fan Rpm	760-1090	840-1185	1020-1460	1120-1585
Motor Bearing Type	Ball	Ball	Ball	Ball
Maximum Fan Rpm	1725	1725	1725	1725
Motor Pulley Pitch Diameter A/B (in.)	1.9/2.9	1.9/2.9	2.4/3.4	2.4/3.4
Fan Pulley Pitch Diameter (in.)	4.5	4.0	4.0	3.7
Belt — Type...Length (in.)	A...33	A...33	A...38	A...38
Pulley Center Line Distance (in.)	10.0-12.4	10.0-12.4	14.7-15.5	14.7-15.5
Speed Change per Full Turn of Movable Pulley Flange (rpm)	65	70	93	93
Movable Pulley Maximum Full Turns From Closed Position	5	5	6	5
Factory Setting Full Turns Open	3	3	3	3
Factory Speed Setting (rpm)	890	980	1240	1305
Fan Shaft Diameter at Pulley (in.)	5/8	5/8	5/8	5/8
INDOOR COIL	Enhanced Copper Tubes, Aluminum Double Wavy Fins, Acutrol Metering Device			
Rows...Fins/in.	2...15	2...15	4...15	4...15
Total Face Area (sq ft)	5.5	5.5	5.5	5.5
HIGH-PRESSURE SWITCH (psig)				
Standard Compressor Internal Relief	625			
Cutout	428			
Reset (Auto.)	320			
LOSS-OF-CHARGE/LOW-PRESSURE SWITCH (Liquid Line) (psig)				
Cutout	7 ± 3			
Reset (Auto.)	22 ± 5			
FREEZE PROTECTION THERMOSTAT				
Opens (F)	30			
Closes (F)	45			
OUTDOOR-AIR INLET SCREENS	Cleanable			
Quantity...Size (in.)	1...20 x 24 x 1			
RETURN-AIR FILTERS	Throwaway			
Quantity...Size (in.)	2...16 x 25 x 2			

LEGEND

Bhp — Brake Horsepower

Electrical data

UNITS WITHOUT ELECTRICAL CONVENIENCE OUTLET

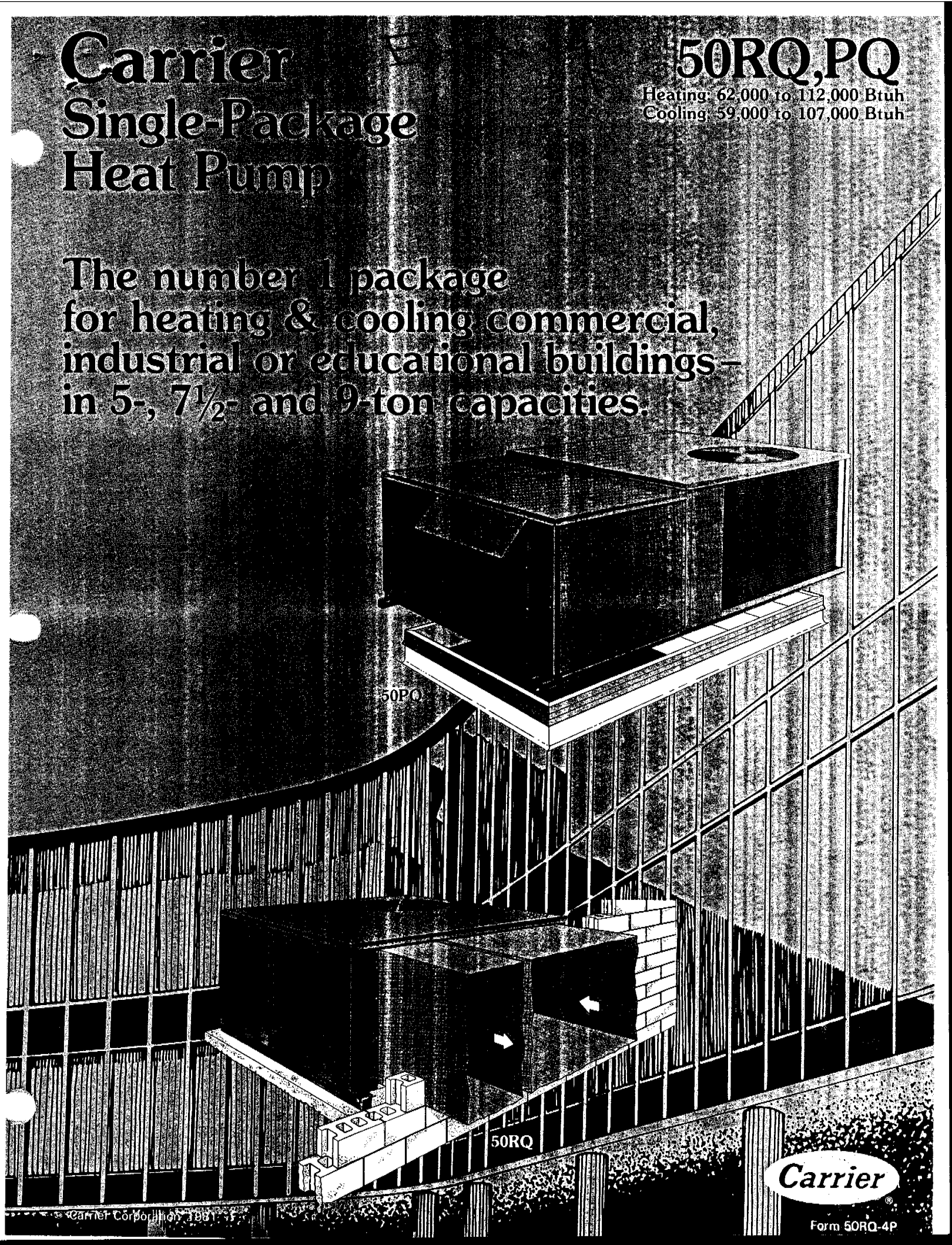
UNIT	NOMINAL VOLTAGE (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP	FLA	LRA
50HJQ004 (3 Tons)	208/230-1-60	187	254	16.0	88.0	0.7	4.9	—/—	—/—	25.6/ 25.6	30/ 30**	25/ 25	101/101
								3.3/ 4.4	15.9/18.3	45.5/ 48.5	50/ 50**	43/ 46	117/120
								4.9/ 6.5	23.6/27.1	55.1/ 59.5	60/ 60**	52/ 56	125/128
								6.5/ 8.7	31.3/36.3	64.7/ 71.0	70/ 80	61/ 67	133/138
								7.9/10.5	38.0/43.8	73.1/ 80.4	80/ 90	69/ 75	139/145
								9.8/13.0	47.1/54.2	84.5/ 93.4	90/100	79/ 87	148/155††
	208/230-3-60	187	254	10.3	77.0	0.7	4.9	—/—	—/—	18.5/ 18.5	20/ 20**	18/ 18	90/ 90
								3.3/ 4.4	9.2/10.6	30.0/ 31.7	30/ 35**	29/ 30	99/101
								4.9/ 6.5	13.6/15.6	35.5/ 38.0	40/ 40**	34/ 36	104/106
								6.5/ 8.7	18.0/20.9	41.0/ 44.6	45/ 45**	39/ 42	108/111
								7.9/10.5	21.9/25.3	45.9/ 50.1	50/ 60**	43/ 47	112/116
								12.0/16.0	33.3/38.5	60.1/ 66.6	70/ 70	57/ 63	124/129
	460-3-60	414	508	5.1	39.0	0.4	2.2	—	—	9.0	15**	9	46
								6.0	7.2	18.0	20**	17	53
								8.8	10.6	22.2	25**	21	57
								11.5	13.8	26.2	30**	25	60
								14.0	16.8	30.0	30**	28	63
50HJQ005 (4 Tons)	208/230-1-60	187	254	23.7	129.0	0.7	4.9	—/—	—/—	35.2/ 35.2	40/ 40**	34/ 34	142/142
								3.3/ 4.4	15.9/18.3	55.1/ 58.1	60/ 60**	52/ 55	158/161
								6.5/ 8.7	31.3/36.3	74.4/ 80.6	80/ 90	70/ 75	174/179
								9.8/13.0	47.1/54.2	94.1/103.0	100/110	88/ 96	189/196††
								13.1/17.4	63.0/72.5	114.0/125.9	125/150	106/117	205/215††
								15.8/21.0	76.0/87.5	130.2/144.6	150/150	121/134	218/230††
	208/230-3-60	187	254	13.5	99.0	0.7	4.9	—/—	—/—	22.5/ 22.5	25/ 25**	22/ 22	112/112
								4.9/ 6.5	13.6/15.6	39.5/ 42.0	40/ 45**	38/ 40	126/128
								6.5/ 8.7	18.0/20.9	45.0/ 48.6	45/ 50**	43/ 46	130/133
								12.0/16.0	33.3/38.5	64.1/ 70.6	70/ 80	60/ 66	146/151
								15.8/21.0	43.9/50.5	77.4/ 85.6	90/100	72/ 80	156/163
	460-3-60	414	508	7.4	49.5	0.4	2.2	—	—	11.9	15**	12	57
								6.0	7.2	20.9	25**	20	64
								11.5	13.8	29.1	30**	27	70
								14.0	16.8	32.9	35**	31	73
								23.0	27.7	46.5	50**	43	84
→ 50HJQ006 (5 Tons)	208/230-1-60	187	254	28.8	169.0	1.5	8.8	—/—	—/—	46.3/ 46.3	50/ 50**	45/ 45	216/216
								4.9/ 6.5	23.6/27.1	75.8/ 80.2	80/ 90	72/ 76	240/243
								6.5/ 8.7	31.3/36.3	85.4/ 91.7	90/100	81/ 87	247/252††
								9.8/13.0	47.1/54.2	105.2/114.1	110/125	99/107	263/270††
								13.1/17.4	63.0/72.5	125.1/136.9	150/150	117/128	279/289††
								15.8/21.0	76.0/87.5	141.3/155.7	150/175	132/146	292/304††
	208/230-3-60	187	254	17.3	123.0	1.5	5.8	—/—	—/—	28.9/ 28.9	30/ 30**	28/ 28	168/168
								4.9/ 6.5	13.6/15.6	45.9/ 48.4	50/ 50**	44/ 46	181/183
								7.9/10.5	21.9/25.3	56.3/ 60.6	60/ 70	53/ 57	190/193
								12.0/16.0	33.3/38.5	70.6/ 77.1	80/ 80	67/ 73	201/208
								15.8/21.0	43.9/50.5	83.8/ 92.1	90/100	79/ 86	212/218††
								19.9/26.5	55.2/63.8	97.9/108.7	100/110	92/102	223/232††
	460-3-60	414	508	9.0	62.0	0.8	2.6	—	—	14.7	15**	14	84
								6.0	7.2	23.7	25**	23	92
								11.5	13.8	31.9	35**	30	98
								14.0	16.8	35.7	40**	34	101
								23.0	27.7	49.3	50**	46	112
								25.5	30.7	53.0	60**	50	115
50HJQ007 (6 Tons)	208/230-3-60	187	254	20.5	156.0	1.4	5.8	—/—	—/—	32.8/ 32.8	35/ 35**	32/ 32	200/200
								4.9/ 6.5	13.6/15.6	49.8/ 52.3	50/ 60**	47/ 50	214/216
								7.9/10.5	21.9/25.3	60.2/ 64.5	70/ 70	57/ 61	222/225
								12.0/16.0	33.3/38.5	74.5/ 81.0	80/ 90	70/ 76	233/239
								15.8/21.0	43.9/50.5	87.7/ 96.0	90/100	82/ 90	244/251††
								19.9/26.5	55.2/63.8	101.8/112.6	110/125	95/105	255/264††
	460-3-60	414	508	9.6	70.0	0.6	2.6	—	—	15.2	20**	15	92
								6.0	7.2	24.2	25**	23	99
								11.5	13.8	32.5	35**	31	106
								14.0	16.8	36.2	40**	34	109
								23.0	27.7	49.8	50**	47	120
								25.5	30.7	53.6	60**	50	123

Carrier
Single-Package Heat Pump

50RQ,PQ

Heating: 62,000 to 112,000 Btuh
Cooling: 59,000 to 107,000 Btuh

The number 1 package for heating & cooling commercial, industrial or educational buildings– in 5-, 7½- and 9-ton capacities.



Carrier®

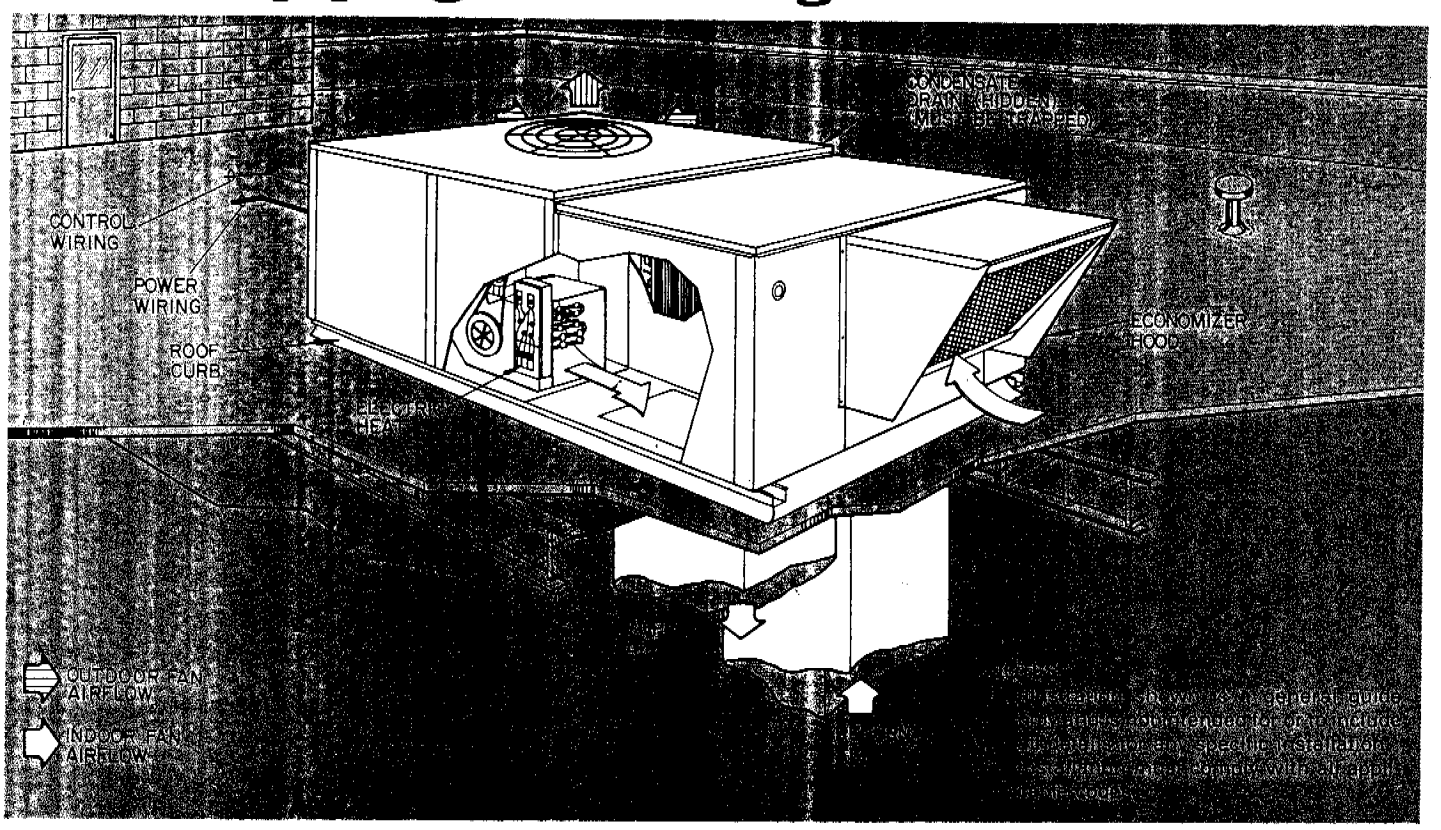
Form 50RQ-4P

Physical data

UNIT 50RQ,PQ	006	008	010
OPERATING WEIGHT (lb)			
Unit 50RQ (no plenum)	460	765	825
Unit 50PQ (plenum)	590	925	1005
With Economizer	620	955	1035
Roof Curb	175	225	225
COMPRESSOR		Carrier Full Hermetic, 2 Cylinders	
No. ...Type	1...6P	2...6P	2...P
Capacity Steps (%)	0, 100	0, 50, 100	0, 60, 100
REFRIGERANT	R-22	R-22	R-22
Charge (lbs) Sys 1, Sys 2	9.2, —	6.4, 7.0	10.5, 8.0
OUTDOOR COIL		2-Row, Copper Tube, 15 Aluminum Plate Fins/in.	
Total Face Area (sq ft)	11.7	17.0	22.5
OUTDOOR AIR FAN		Propeller Type, Direct Drive	
Nominal Cfm	4000	7000	7000
No. ...Diam (in.)	1...22	1...26	1...26
Motor Hp...Kw	1/2...0.8	3/4...1.1	1...1.35
INDOOR COIL		Copper Tube, 15 Aluminum Plate Fins/in.	
Total Face Area (sq ft)	4.0	6.56	8.5
Rows	4	4	4
INDOOR AIR FAN		One, Centrifugal Adjustable Belt Drive	
Size (in.)	10x9	12x11	12x11
Nominal Cfm	2000	3000	3600
Rpm Range Std	920-1300	690- 980	690- 980
Alt	1070-1460	805-1093	800-1090
Max Allowable Rpm	1600	1500	1500
Fan Pulley Pitch Diam (in.) Std	9.0	12	6
Alt	9.0	12	6
Center Line Distance (in.)	15-1/4	16-7/8	16-7/8
Motor Hp (See note) Std	3/4	1	1-1/2
Alt	1	1-1/2	2
Max Bhp Std	1.18	1.69	2.5
Alt	1.69	2.11	2.7
INDOOR AIR FILTERS (50PQ) TYPE		10% Efficient, Disposable Fiber Glass	
No. ...Size (in.)*	2...20x25x1	2...20x25x1 2...16x25x1	2...20x25x2 2...16x25x2

*Factory installed in plenum. Unit 50RQ,PQ008 will accept 2-in. thick filters, field supplied.
NOTE: Nominal rpm for 50RQ,PQ006,008 is 3450; for 50RQ,PQ010 is 1725.

Typical piping and wiring



Electrical data

50RQ,PQ006 and 008

UNIT MODEL # / NOMINAL V-PH-HZ	VOLTAGE RANGE		COMPRESSOR(S)*		OFM	IFM		FACTORY-INSTALLED HEATERS		POWER SUPPLY†	
	Min	Max	RLA	LRA	FLA	Hp	FLA	Kw	FLA	Min Ckt Amps	Max Fuse Amps
50RQ,PQ006300 230-1-60	207	264	35.3	135	4.4	.75	6.9	—	—	55	60
						1.0	8.2	—	—	57	60
						.75	6.9	13	28	80	90
						.75	6.9	20	55	124	125
						.75	6.9	26	83	154	150
						1.0	8.2	13	28	92	90
						1.0	8.2	20	55	125	125
						1.0	8.2	26	83	160	150
50RQ,PQ006510 208/230-3-60	187	253	20.6	136	5.1	.75	7.9	—	—	29	45
						1.0	9.2	—	—	40	45
						.75	7.9	3.7/ 4.5	17/19	59/ 63	60/ 70
						.75	7.9	10.6/13.0	42/48	91/ 99	90/100
						.75	7.9	16.4/20.0	42/48	91/ 99	90/100
						.75	7.9	21.3/26.0	65/74	119/131	110/135
						1.0	9.2	3.7/ 4.5	17/19	61/ 64	60/ 70
						1.0	9.2	10.6/13.0	42/48	93/100	90/100
						1.0	9.2	16.4/20.0	42/48	93/100	90/100
						1.0	9.2	21.3/26.0	65/74	120/133	110/125
208-3-60								21	68	91	90
									68	92	90
50RQ,PQ006600 460-3-60	414	528	10.4	49	2.2	.75	1.4	—	—	17	20
						1.0	1.8	—	—	17	20
						.75	1.4	5.2	11	30	35
						.75	1.4	13.0	25	48	50
						.75	1.4	20.0	25	48	50
						.75	1.4	26.0	37	63	60
						1.0	1.8	5.2	11	31	35
						1.0	1.8	13.0	25	48	50
						1.0	1.8	20.0	25	48	50
						1.0	1.8	26.0	37	63	60
50RQ,PQ006100 575-3-60	518	660	8.3	41	4.4	.75	1.1	—	—	16	20
						1.0	1.4	—	—	16	20
						.75	1.1	10	18	36	35
						1.0	1.4	10	18	37	35
50RQ,PQ008510 208/230-3-60	187	253	13.3 (ea)	80 (ea)	4.5	1.0	9.2	—	—	43.6	50
						1.5	11.5	—	—	45.9	50
						1.0	9.2	5.3/ 6.4	26/29	76/ 80	80
						1.0	9.2	15.8/19.0	43/49	97/105	90/100
						1.0	9.2	21.0/26.0	65/75	125/137	125
						1.0	9.2	31.5/39.0	85/97	150/163	150
						1.5	11.5	5.3/ 6.4	26/29	78/ 82	80
						1.5	11.5	15.8/19.0	43/49	100/107	100
						1.5	11.5	21.0/26.0	65/75	127/140	125
						1.5	11.5	31.5/39.0	85/97	152/167	150
208-3-60									88	150	139
									88	150	140
50RQ,PQ008600 460-3-60	414	528	7.2 (ea)	35 (ea)	2.3	1.0	1.8	—	—	20	25
						1.5	2.6	—	—	21	25
						1.0	1.8	.64	15	39	40
						1.0	1.8	19.0	26	52	50
						1.0	1.8	26.0	39	69	60
						1.0	1.8	39.0	51	83	70
						1.5	2.6	6.4	15	40	40
						1.5	2.6	19.0	26	53	50
						1.5	2.6	26.0	39	69	50
						1.5	2.6	39.0	51	84	70
50RQ,PQ008100 575-3-60	518	660	6.8 (ea)	23 (ea)	4.5	1.0	1.4	—	—	21	25
						1.5	2.1	—	—	22	25
						1.0	1.4	24	24	49	50
						1.5	2.1	24	24	50	50

Canadian units only; use fuses or circuit breakers for power supply.

Compr — Compressor
FLA — Full Load Amps
Hp — Horsepower
IFM — Indoor Fan Motor
LRA — Locked Rotor Amps
OFM — Outdoor Fan Motor
RLA — Rated Load Amps

*All 008 units have 2 compressors; values apply to each.
†Fuse only.