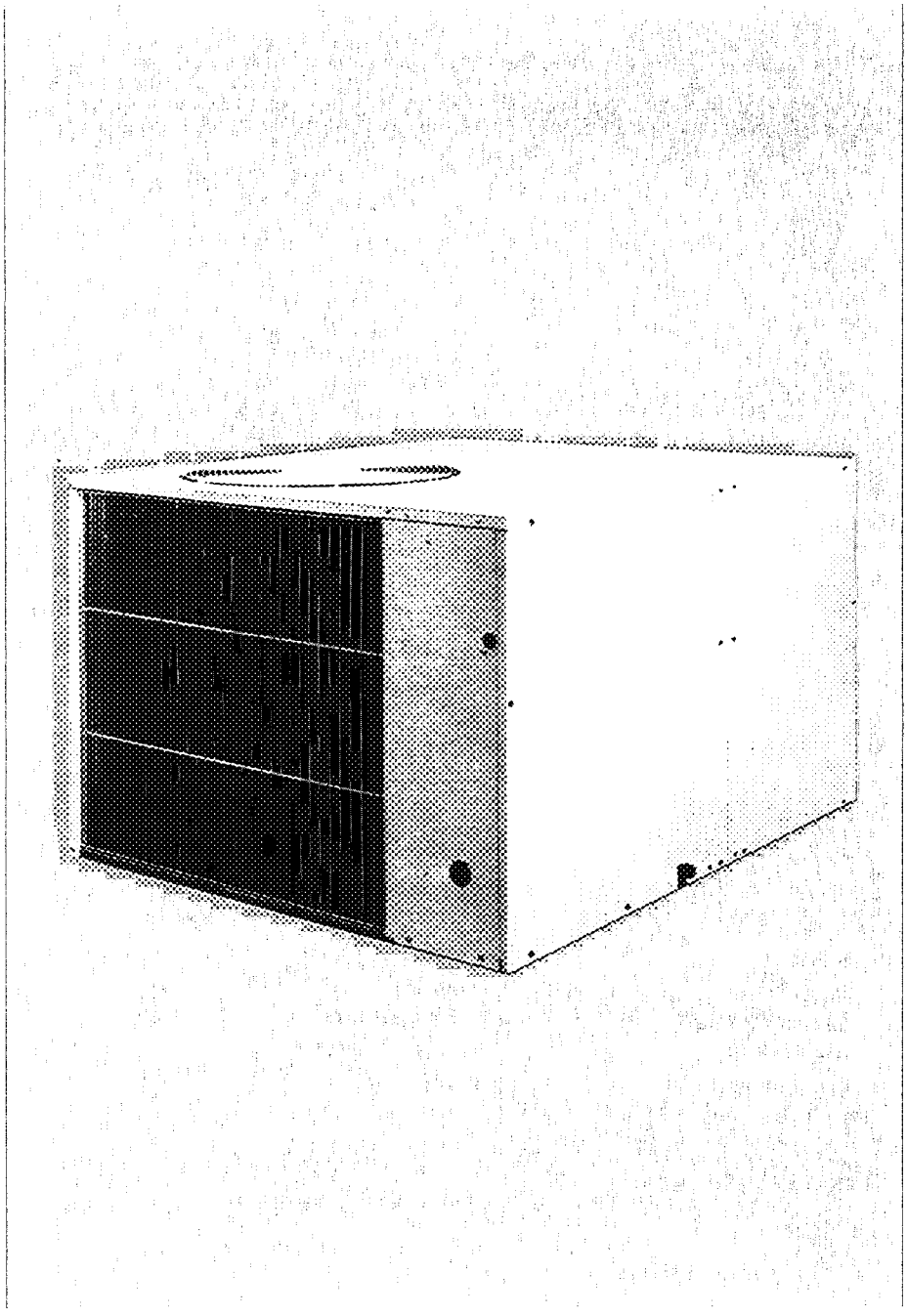
Carrier®
HEATING & COOLING

Product Data

50NQ Single-Package Heat Pump Units

1 1/2 to 5 Nominal Tons



Single-Package Heat Pumps with the following Features as Standard:

- compressors with internal high-pressure and overcurrent protection
- copper coils with aluminum fins
- Chronotemp™ defrost system
- compressor is protected against loss of phase

Features/Benefits

Compact, fully self-contained, combination heating/cooling unit that is prewired, prepiped, and precharged for minimum installation expense.

Easy maintenance and installation

Convertible duct configuration, designed to be easily converted to either a side or down discharge unit which does not require an accessory plenum.

Available in a variety of heating/cooling sizes with voltage options to meet most residential and light commercial requirements This model installs easily on a rooftop or a ground-level pad.

Quiet, efficient operation and dependable performance

High efficiency design with SEERs (Seasonal Energy Efficiency Ratios) up to 10.0 and 6 7 HSPF (Heating Seasonal Performance Factor).

Rugged, efficient compressors are designed for high energy efficiency Each compressor is hermetically sealed against contamination to help promote longer life and dependable operation, and is vibration isolated to provide quiet operation. All compressors have internal high-pressure and overcurrent protection.

Direct-drive multispeed, PSC (permanent split capacitor) blower motor on all models.

Direct-drive, PSC, outdoor fan motors are designed to help reduce energy consumption and provide for cooling operation down to 55 F outdoor temperature.

Crankcase heaters are standard on all units. Heaters are thermostatically controlled on all 208/230-1 models

Refrigerant system is designed with accumulators to provide dependability Liquid refrigerant strainers are used to ensure reliable operation. Each unit leaves the factory with a full refrigerant charge. Refrigerant service connections make checking operating pressures easier.

Indoor and outdoor coils are computer designed for optimum heat transfer and cooling efficiency. Outdoor coil is fabricated of copper tube and aluminum fins and is protected by a factory-installed coil guard Vertical outdoor-fan discharge carries sound and air up and away. Plastic drain pan ensures a durable, rust-free life.

Chronotemp™ defrost system uses time and temperature readings to ensure fast, troublefree defrost. A terminal block is located on the defrost board to provide quick and easy thermostat connection

Weatherized cabinets are constructed of heavy-duty, phosphated, zinc-coated, prepainted steel. Interior surfaces of the indoor coil compartment are insulated to help keep the conditioned air from being affected by the outdoor ambient temperature

Table of contents

Model number nomenclature

50NQ 018 3

Model No.

50NQ – Single-Package Heat Pump Units

Nominal Cooling Capacities

018 – 1-1/2 Tons
024 – 2 Tons
030 – 2-1/2 Tons
036 – 3 Tons
042 – 3-1/2 Tons
048 – 4 Tons
060 – 5 Tons

V–Ph–Hz

3 – 208/230-1-6-0
5 – 208/230-3-60
6 – 460-3-60

COOLING AND HEATING CAPACITIES AND EFFICIENCIES

UNIT 50NQ	NOMINAL TONS	STD CFM	NET COOLING† CAPACITIES (Btuh)	NET HEATING† CAPACITIES AT 47 F	COP AT 47 F	NET HEATING† CAPACITIES AT 17 F	COP AT 17 F	SEER†	HSPF†	SOUND RATINGS** (Bels)
018	1-1/2	600	18,000	18,400	3 0	9,700	1 9	10 0	6 6	7 8
024	2	800	23,800	24,200	3 0	12,300	1.9	10.0	6.7	7.8
030	2-1/2	1100	29,400	29,400	3.0	15,800	2.0	10 0	6.7	8 0
036	3	1350	35,200	35,000	2 9	19,500	1 9	10 0	6 6	8 0
042	3-1/2	1475	42,500	42,000	3 1	21,600	1 9	10 0	6.6	8.2
048	4	1725	48,000	48,500	2 9	24,300	1 9	10 0	6 6	8.4
060	5	2100	58,500	57,500	2 9	27,200	1 7	9 2	6 6	8 4

LEGEND
Bels – Sound Levels (1 bel = 10 decibels)
COP – Coefficient of Performance
db – Dry Bulb
DOE – Department of Energy
HSPF – Heating Seasonal Performance Factor
SEER – Seasonal Energy Efficiency Ratio
wb – Wet Bulb

* Air-Conditioning & Refrigeration Institute
† Rated in accordance with U.S. Government DOE test procedures and/or ARI Standard 210/240/89.
** Rated in accordance with ARI 270-84
NOTE Ratings are net values, reflecting the effects of circulating fan heat Ratings are based on:
Cooling Standard: 80 F db, 67 F wb indoor entering-air temperature and 95 F db air entering outdoor unit

Physical data

UNIT 50NQ	018	024	030	036	042	048	060
NOMINAL CAPACITY (ton)	1-1/2	2	2-1/2	3	3-1/2	4	5
PERFORMANCE							
ARI Capacity (Btuh)*	18,000	23,800	29,400	35,200	42,500	48,00	58,500
SEER	10 0†	10.0**	10.0**	10 0**	10.0**	10 0**	9 2**
OPERATING WEIGHT (lb)	326	334	356	370	375	450	483
ROOF CURB WEIGHT (lb)							
8-in. Curb	79	79	79	79	79	95	95
11-in. Curb	83	83	83	83	83	100	100
14-in. Curb	90	90	90	90	90	108	108
COMPRESSOR	Hermetic						
Temperature and Overcurrent Protection	Internal Inherent						
REFRIGERANT††							
Type	R-22						
Refrigerant Metering Device	AccuRater® Piston						
OUTDOOR FAN							
Fan Diameter (in.)...Pitch (deg)	22...24	22. 24	22. 24	22 .24	22 24	26...24	26.. 24
Motor Hp...Speed	1/8 ..1	1/8 ..1	1/8. .1	1/4 . 1	1/4.. 1	1/3...1	1/3 ..1
Nominal Rpm	825	825	825	1050	1050	825	825
OUTDOOR COIL							
Rows...Fins/in.	1 20	1 . 20	1 6. 20	2 20	2 .20	2 ..20	2 ..20
Face Area (sq ft)	12.1	12.1	12 1	12 1	12 1	15 2	15 2
INDOOR FAN	Centrifugal, Direct Drive						
Size (in.)	10 x 8	10 x 8	10 x 8	10 x 10	10 x 10	10 x 10	11 x 10
Motor Hp...Speed	1/4. 2	1/3 2	1/3 2	1/2 .2	1/2...2	3/4 .2	1. .2
Nominal Rpm	850	1100	1100	1100	1100	1100	1100
INDOOR COIL							
Rows...Fins/in.	3 14	3 14	3.. 14	3. .14	3 14	3.. 14	4.. 14
Face Area (sq ft)	2 5	3 3	3 9	3 9	3.9	5 4	5 4
LOW-PRESSURE SWITCH (psig)							
Cutout	7 ± 3						
Reset (Auto.)	22 ± 7						
REQUIRED FILTER AREA (sq in.)II							
Disposable	324	432	540	648	756	864	1030
Cleanable (High Capacity)	216	288	360	432	504	576	720

LEGEND
ARI – Air-Conditioning & Refrigeration Institute
DOE – Department of Energy
SEER – Seasonal Energy Efficiency Ratio

* Rated in accordance with U S Government DOE test procedures and/or ARI Standard 240-81
† Use of time-delay relay raises unit SEER to 10.3.
** All units except size 018 are shipped from the factory with a time-delay relay
†† Operating charge and piston size are listed on unit nameplate.
II Required filter areas shown are based on the larger of the ARI-rated cooling or heating airflow at a velocity of 300 ft/minute for disposable type or 450 ft/minute for high-capacity type.

ACCESSORY		PART NO.						
		Small-Cabinet Units					Large-Cabinet Units	
		50NQ018	50NQ024	50NQ030	50NQ036	50NQ042	50NQ048	50NQ060
Flat Roof Curb (One Piece Construction, Shipped Fully Assembled)	8 in.			48NT-900---241			–	
	11 in.			48NT-900---251			–	
	14 in.			48NT-900---261			–	
Pitched Roof Curb (One Piece Construction, Shipped Fully Assembled)	1:12 in.			48NT-900---321			–	
	2:12 in.			48NT-900---331			–	
	3:12 in.			48NT-900---341			–	
	4:12 in.			48NT-900---351			–	
	5:12 in.			48NT-900---361			–	
	6:12 in.			48NT-900---371			–	
Flat Roof Curb (One Piece Construction, Shipped Fully Assembled)	8 in.			–			48NT-900---781	
	11 in.			–			48NT-900---791	
	14 in.			–			48NT-900---801	
Pitched Roof Curb (One Piece Construction, Shipped Fully Assembled)	1:12 in.			–			48NT-900---811	
	2:12 in.			–			48NT-900---821	
	3:12 in.			–			48NT-900---831	
	4:12 in.			–			48NT-900---841	
	5:12 in.			–			48NT-900---851	
	6:12 in.			–			48NT-900---861	
Modulating Economizer – Downflow (With Barometric Relief and Hood)				48NT-900---101			48NT-900---111	
Modulating Economizer with Filter Rack – Downflow (With Barometric Relief and Hood)				48NT-900---661			48NT-900---671	
Two-Position Economizer – Downflow (With Barometric Relief and Hood)				48NT-900---581			48NT-900---591	
Two-Position Economizer with Filter Rack – Downflow (With Barometric Relief)				48NT-900---601			48NT-900---611	
Modulating Economizer – Horizontal				48NT-900---121			48NT-900---131	
Two-Position Economizer – Horizontal				48NT-900---521			48NT-900---531	
Barometric Damper Kit – Horizontal				48NT-900---301			48NT-900---311	
Manual Outdoor-Air Damper – Downflow					48NT-900---141			
High Capacity Filter Rack – Downflow (Field-Supplied Filters)				48NT-900---061			48NT-900---071	
High Capacity Filter Rack – Horizontal (Shipped with Filters)				48NT-900---081			48NT-900---091	
Concentric Diffuser Box Air Grille (Combination 4-Way Supply and Center Return)		48NT-900---181			48NT-900---151		–	
		–				48NT-900---161		48NT-900---171
Flexible Duct (48 in.) with Square-to-Round Adapters Adapters and Clamps (Carton of 2)		48NT-900---191			48NT-900---201		–	
		–				48NT-900---211		48NT-900---221
Flexible Duct (48 in.) with Special 16 in. Truss Square-to-Round Adapters and Clamps (Carton of 2)			48NT-900---731			–		
Square-to-Round Transition – Curb Mounted, Downflow		48NT-900---441			48NT-900---451		–	
		–				48NT-900---461		48NT-900---471
Special 16 in. Truss, Square-to-Round Transition – Curb Mounted, Downflow			48NT-900---721			–		
Square-to-Round Transition – Unit Mounted, Horizontal Discharge		48NT-900---481			48NT-900---491		–	
		–			48NT-900---501		48NT-900---511	
Thermostat and Subbase Two-Stage Heat and Single-Stage Cool – Automatic Changeover (Includes Emergency Heat Operation)					99TZ-900---521			
Two-Stage Heat and Single-Stage Cool – Manual Changeover (Includes Emergency Heat Operation)					99TZ-900---571			

ACCESSORY	PART NO.						
	SMALL-CABINET UNITS					LARGE-CABINET UNITS	
	50NQ018	50NQ024	50NQ030	50NQ036	50NQ042	50NQ048	50NQ060
Electric Heaters							
208/230-1-60							
3.8/5 – 1 Stage				50NQ390005000101			
5.6/7.5 – 1 Stage				50NQ390007500101			
7.5/10 – 1 Stage				50NQ340010000101			
11.3/15 (Fused) – 2 Stage	–				50NQ390015000101		
15.0/20 (Fused) – 2 Stage		–			50NQ390020000101		
18.8/25 (Fused) – 3 Stage				–			50NQ390025000101
11.3/15 (Fused) – 2 Stage*		–			50NQ390015000201		
15.0/20 (Fused) – 2 Stage*		–			50NQ390020000201		
18.8/25 (Fused) – 3 Stage*				–			50NQ390025000201
208/230-3-60							
7.5/10 – 1 Stage		–			50NQ590010000101		
13.1/17.5 – 2 Stage		–			50NQ590017500101		
18.8/25 (Fused) – 3 Stage				–			50NQ590025000101
18.8/25 (Fused) – 3 Stage*				–			50NQ590025000201
460-3-60							
10 – 1 Stage		–			50NQ690010000101		
15 – 2 Stage		–			50NQ690015000101		
20 – 2 Stage		–			50NQ690020000101		
25 – 2 Stage				–			50NQ590025000101
Solid-State Time Guard® Device				48SB-900---014			
Outdoor Thermostat				50LQ-900---001			
High-Pressure Switch Kit				48NT-900---011			
Service Sentry				50LQ-900---011			
0° F Low-Ambient Kit							
208/230-1, 208/230-3			48NT-900---771			48NT-900---741	
460-3		–			48NT-900---751		
40 F Low-Ambient Kit							
208/230-1, 208/230-3			48NT-900---981			48NT-900---031	
460-3		–		48NT-900---1011		48NT-900---991	
Hard Start Kit		48SB-900---001				48SB-900---002	

*Canadian-approved fused heaters.

NOTE: Electric heaters require a separate electrical service

The factory-assembled roof-mounting curbs are designed for use on downflow discharge applications. Heavy-gage, galvanized steel construction provides one-piece support. The curb complies with the standards of the NRCA (National Roofing Contractors Association) A wood nailing strip is provided for attaching the roofing to the curb.

The economizers are available for downflow discharge or horizontal applications. The horizontal economizers are designed for use in horizontal applications. The horizontal economizers can be attached directly over the unit return-air opening or they can be installed in the return-air duct in a remote location.

All of these economizers adjust their outdoor- and return-air dampers to economically blend cooler outdoor air with warmer return air for comfort cooling This process reduces energy costs and extends equipment life by allowing the use of outdoor air to supply "free" cooling when conditions are favorable.

Constant ventilation is recommended for light commercial application when the conditioned space is occupied.

The modulating economizers have a mixed-air controller that provides for full-range modulation of the outdoor- and return-air dampers. The enthalpy control selects the suitable outdoor-air quality for "free" cooling operation by measuring the outdoor-air dry bulb temperature and humidity mix. The modulating economizers also have a mixed-air controller and an adjustable, motor-mounted, minimum-position potentiometer and a compressor lockout switch. The motor operates through the unit 24-v low-voltage control circuit.

In the 2-position economizers, the enthalpy control selects the suitable outdoor-air quality for "free" cooling operation by measuring the outdoor-air dry bulb temperature and humidity. Whenever the outdoor air quality is acceptable for "free" cooling, the air damper opens fully and the return-air damper closes, allowing the cooler outdoor air to enter the building.

NOTE: The 2-position and modulating downflow economizers contain a built-in barometric relief damper

All economizers are shipped complete with a damper motor and linkage, enthalpy control, low-voltage wiring harness, and a rainhood. Adequate wire lengths are provided (additional field-supplied wires are not required). Horizontal economizers are also furnished with a 2-in. disposable air filter and gasket material.

The manual outdoor-air damper provides for minimum outdoor air and is manually adjustable to 3 positions. This device closes automatically whenever the indoor fan is not operating.

The high-capacity filter racks, downflow and horizontal, feature easy installation, serviceability, and high filtering performance.

The horizontal filter rack housing is constructed from heavy-gage steel and is fully insulated. Both sides of the filter rack are flanged for easy installation. Two-in. high-capacity, Farr 30/30 filters are factory supplied.

The downflow filter rack is internal to the unit One- or 2-in. filters are field supplied.

The concentric diffuser box is aerodynamicallly designed and equipped with a combination 4-way supply, and center return diffuser The box is designed for use with accessory flexible ducts and roof curbs to provide an easily installed concentric system. A special core is provided within the diffuser box to provide even 4-way air distribution.

The flexible duct kit consists of 2 flexible, UL-listed (Underwriters' Laboratories) ducts The duct construction includes vapor barrier and 1-in. fiberglass insulation. The 'K' factor is 0 23. Each duct has a square-to-round snap adapter for attachment to the accessory roof curb on one end, and a round clamp collar for attachment to the concentric diffuser box on the other end.

Supplemental electric heaters that mount inside the heat-pump blower compartment are available in a variety of kW and voltage options. A separate power supply is required for electric heaters.

Solid-state Time Guard® accessory protects the unit compressor by preventing short cycling. Device provides a 5-minute delay (± 2 minutes) before restarting the compressor after shutdown for any reason

Service Sentry device provides immediate warning when unit requires servicing. It turns on an indoor thermostat light if the compressor does not operate after a call for heating or cooling.

Outdoor thermostat is recommended for each stage of electric heat after the first stage Outdoor thermostats allow for staging of second and third stages as outdoor ambient temperature drops.

The 0° F low-ambient kit is designed to allow the use of mechanical cooling down to outdoor ambient temperatures as low as 0° F.

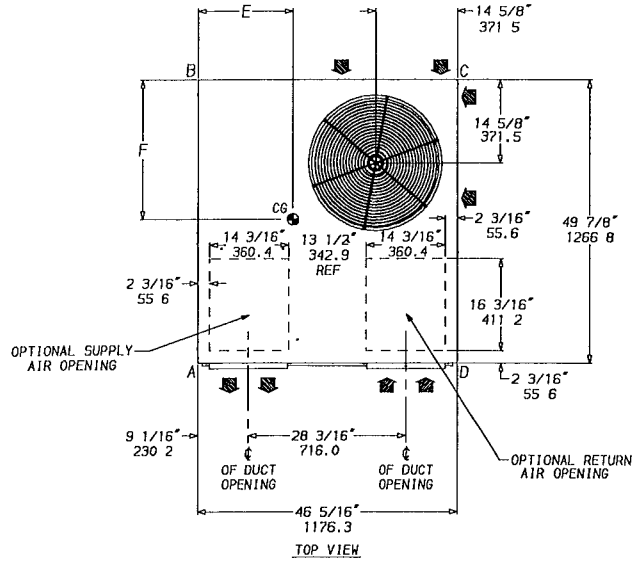
The 40 F low-ambient kit is designed to allow the use of mechanical cooling down to outdoor ambient temperatures as low as 40 F.

High-pressure switch kit protects the unit by turning the compressor off when compressor discharge pressure is too high.

Hard start kit improves compressor starting capability at high load or reduced voltage conditions.

UNIT	ELECTRICAL CHARACTERISTICS			UNIT WT LB/KG	CORNER WT LB/KG				CENTER OF GRAVITY in. (MM)	
	208/230 -1-60	208/230 -3-60	460 -3-60		A	B	C	D	E	F
50NQ018	X	0	0	326/148	100/45	102/46	63/29	61/28	17-1/2 (444 5)	24-1/2 (622.3)
50NQ024	X	0	0	334/152	102/46	108/49	63/29	60/27	17 (431 8)	25-15/16 (658 8)
50NQ030	X	0	0	356/161	88/40	103/47	89/40	76/34	21-1/4 (615 9)	22-3/4 (577 8)
50NQ036	X	X	X	370/168	101/46	108/49	83/38	78/35	20 (508 0)	25-15/16 (658.8)
50NQ042	X	X	X	375/170	120/46	112/51	85/39	76/34	19-3/4 (501 6)	23-1/2 (596 9)

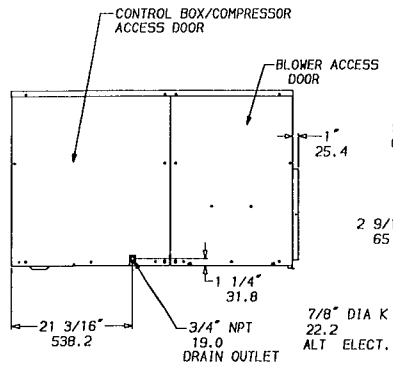
X= YES
0 = NO

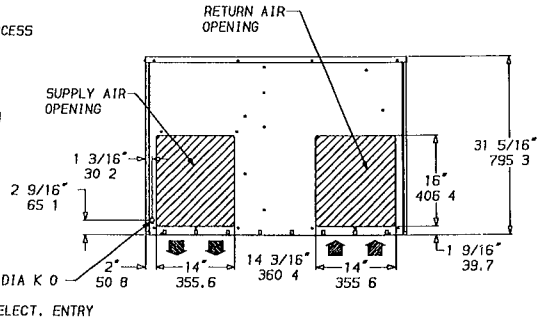


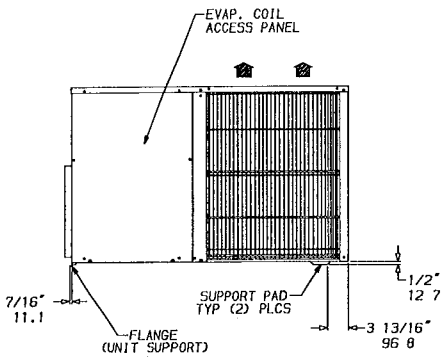
50NQ REQUIRED CLEARANCES (INCHES)

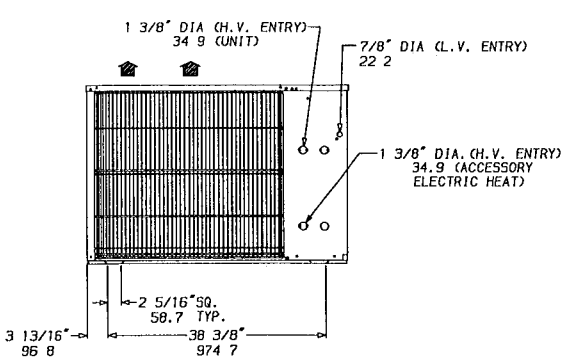
Unit Top	48	Blower Access Panel Side	30
Duct Side of Unit	6 Min	Control Access Side	30
Side Opposite Ducts	30	Bottom of Unit	0
First Eighteen Inches of Supply Duct	1		

NOTE: Provision must be made for fresh ambient air to reach the outdoor coil without recirculation of the air from the outdoor fan discharge

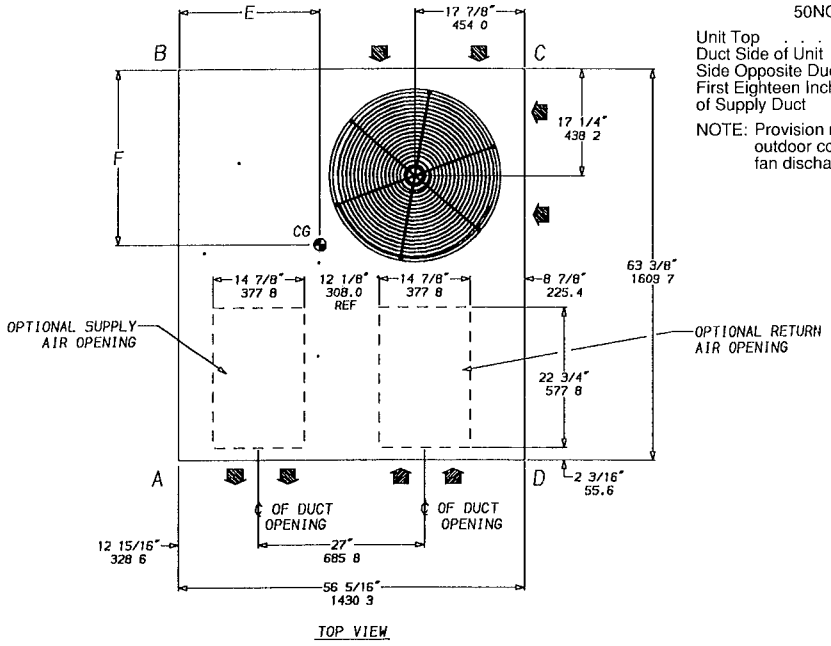








UNIT	ELECTRICAL CHARACTERISTICS 208/230 -1-60	208/230 -3-60	460 -3-60	UNIT WT LB/KG	CORNER WT LB/KG A	B	C	D	CENTER OF GRAVITY in. (MM) E	F
50NQ048	X	X	X	450/204	120/54	147/67	101/46	82/37	22-3/4 (577 8)	28-1/4 (717 5)
50NQ060	X	X	X	483/219	128/58	170/77	106/48	80/36	21-1/2 (546.1)	27-1/2 (698.5)

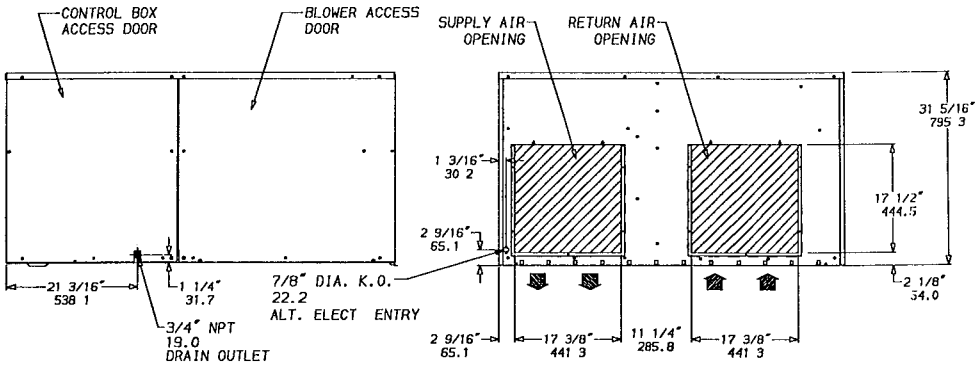


TOP VIEW

50NQ REQUIRED CLEARANCES (INCHES)

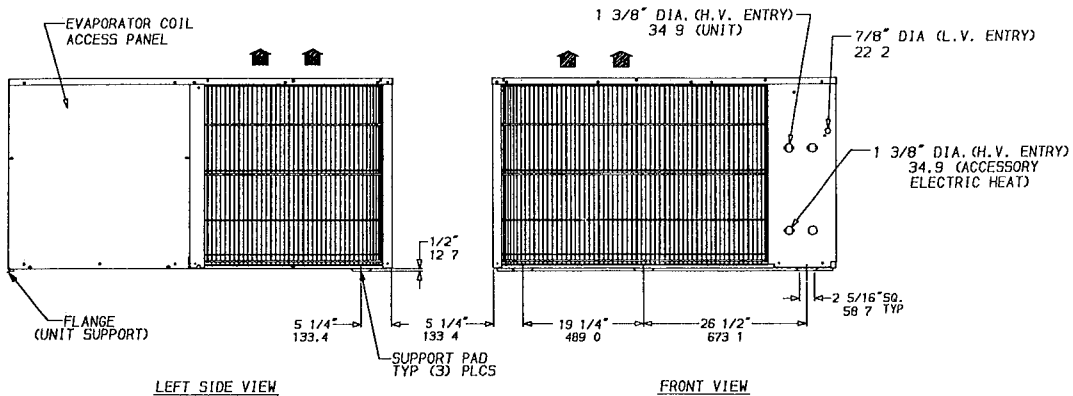
Unit Top	48	Blower Access Panel Side	30
Duct Side of Unit	6 Min	Control Access Side	30
Side Opposite Ducts	30	Bottom of Unit	0
First Eighteen Inches of Supply Duct	1		

NOTE: Provision must be made for fresh ambient air to reach the outdoor coil without recirculation of the air from the outdoor fan discharge



RIGHT SIDE VIEW

REAR VIEW

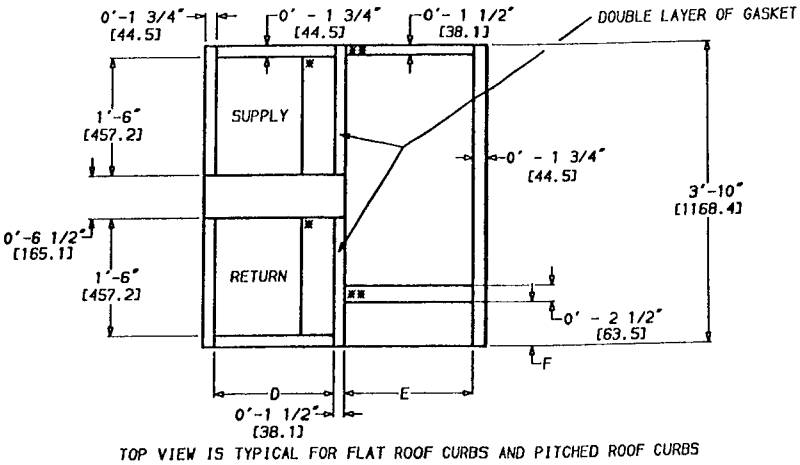


LEFT SIDE VIEW

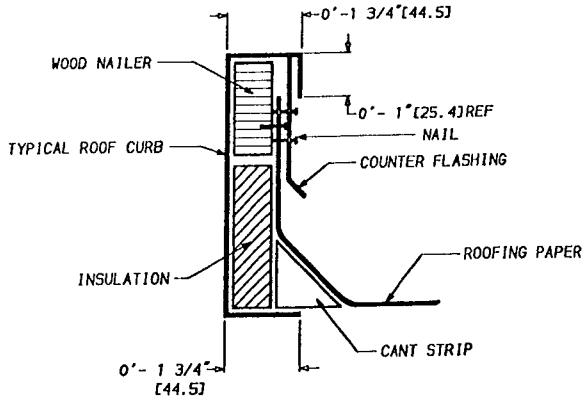
FRONT VIEW

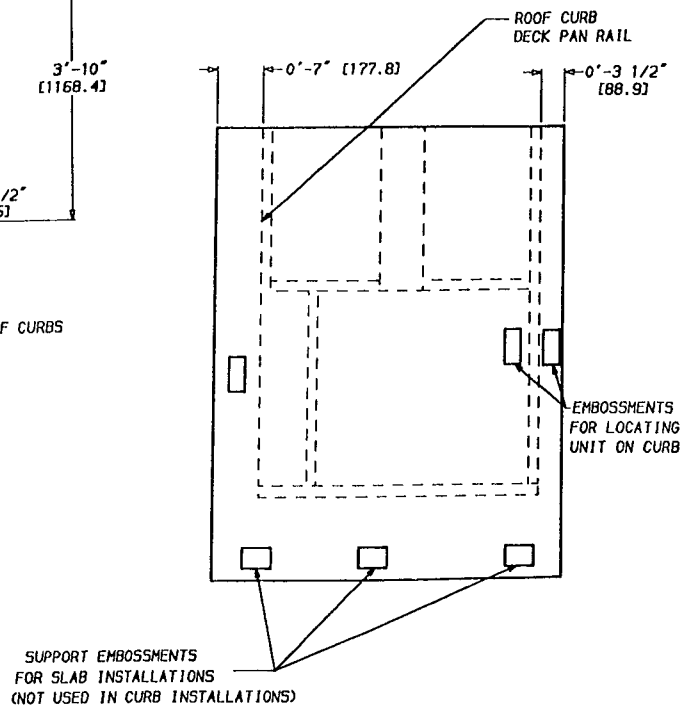
ROOF CURB

	50NQ UNIT SIZE	CURB	CURB P/N	A	B		C	D	E	F	ROOF PITCH
DEDICATED SMALL CABINET UNITS	018-042	FLAT	48NT900__241	3' 6-1/2" [1079 5]	0' 8"	[203 2]	–	1' 6" [457 2]	1' 7-1/2" [495 3]	–	–
			48NT900__251		0' 11"	[279 4]	–				
			48NT900__261		1' 2"	[355.6]					
		PITCHED	48NT900__321		0' 9-1/4"	[235]					1:12
			48NT900__331		1' 1/2"	[317 5]					2:12
			48NT900__341		1' 3-3/4"	[400]	–	1' 6" [457 2]	1' 7-1/2" [495 3]	–	3:12
			48NT900__351		1' 7"	[482 6]	–				4:12
			48NT900__361		1' 10-1/2"	[571 5]					5:12
			48NT900__371		2' 1-3/4"	[654 1]					6:12
LARGE OR SMALL CABINET UNITS	018-060	FLAT	48NT900__781	4' 11" [1498 6]	0' 8"	[203 2]	–	1' 11-1/4" [590 5]	2' 6-3/4" [781 1]	0' 7" [177 8]	–
			48NT900__791		0' 11"	[279 4]	–				
			48NT900__801		1' 2"	[355.6]					
		PITCHED	48NT900__811		0' 10-1/2"	[266 7]					1:12
			48NT900__821		1' 3-1/4"	[387 4]					2:12
			48NT900__831		1' 8"	[508]	–	1' 11-1/4" [590 5]	2' 6-3/4" [781 1]	0' 7" [177 8]	3:12
			48NT900__841		2' 1/2"	[622 3]	–				4:12
			48NT900__851		2' 5-1/4"	[743]					5:12
			48NT900__861		2' 10"	[863 6]					6:12

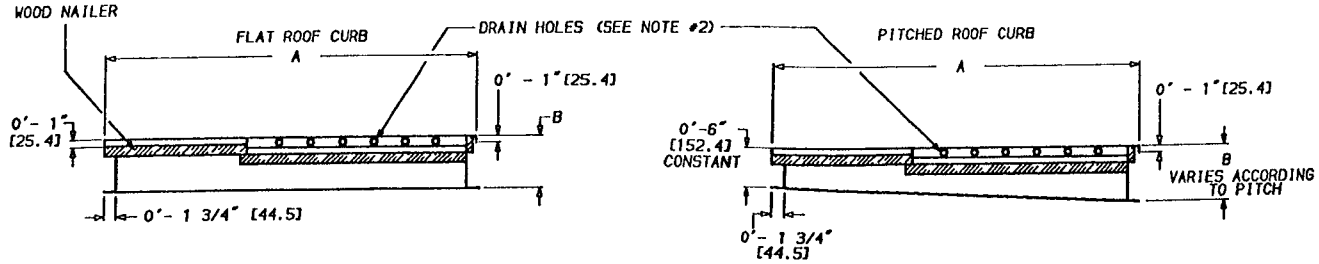


TOP VIEW IS TYPICAL FOR FLAT ROOF CURBS AND PITCHED ROOF CURBS
* - PANELS ON LARGE CURB ONLY
** - NOT PRESENT ON SMALL CURB

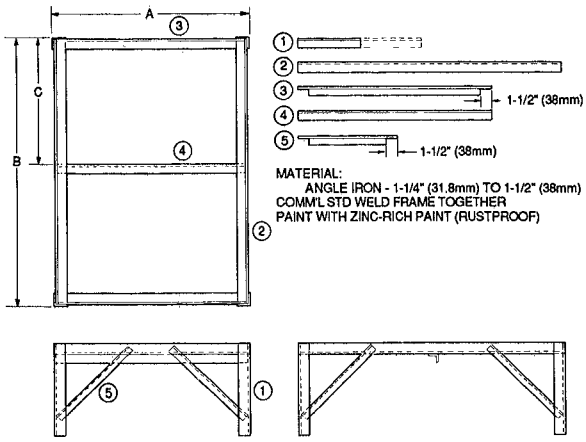




LARGE CABINET UNIT POSITIONED ON ROOF CURB



MOUNTING FRAME



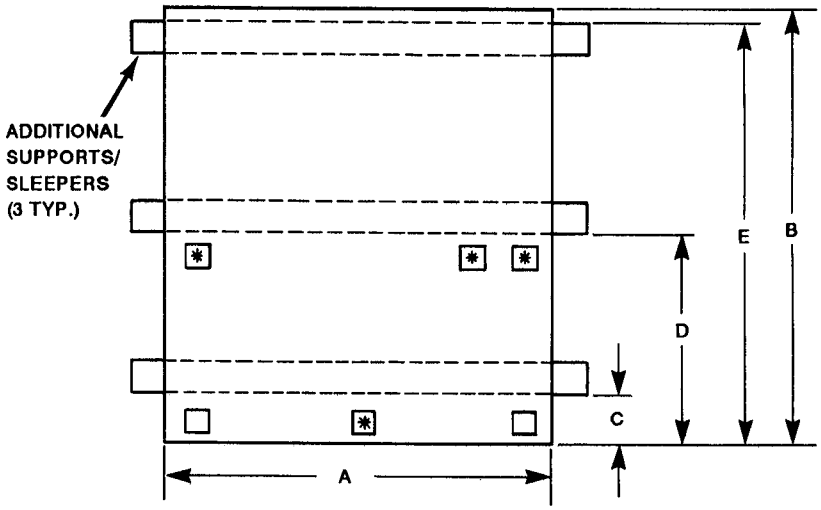
MOUNTING FRAME DIMENSIONS

ITEM NO.	LARGE CABINET* LENGTH in. (mm)	SMALL CABINET† LENGTH in. (mm)	QUANTITY
A	50 (1269)	40-3/8 (1024)	–
B	60-1/2 (1535)	47 (1193)	–
C	30-1/4 (766)	23-1/2 (597)	–
1	12 (305) to 24 (610)	12 (305) to 24 (610)	4
2	60 (1523)	46-1/2 (1181)	2
3	49-1/2 (1257)	39-7/8 (1012)	2
4	49-1/2 (1257)	39-7/8 (1012)	1
5	16 (406)	16 (406)	8

* Sizes 048-060

† Sizes 018-042. (Note that the 036 and 042 units with heating capacities above 96,000 Btuh output are in large cabinets)

ADDITIONAL SUPPORT/SLEEPER LOCATION



✱ THESE EMBOSSMENTS ARE LOCATED ON LARGE CABINET UNITS.

SUPPORT/SLEEPER DIMENSIONS

50NQ	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)
Small-Cabinet Units† (018-042)	46-5/16 (1176 3)	47-7/8 (1266 8)	7 (178)	28 (711)	49 (1245)
Large-Cabinet Units (048-060)	56-5/16 (1430 5)	62-11/32 (1430.5)	7 (178)	35 (889)	62-1/2 (1587)

† The 036 and 042 units with heating capacities above 96,000 Btuh output are in large cabinets.

I Determine cooling and heating requirements at design conditions:

Given:

Required Cooling Capacity (TC)	28,000 Btuh
Sensible Heat Capacity (SHC)	20,500 Btuh
Required Heating Capacity	30,000 Btuh
Outdoor Entering-Air Temperature	95 F
Outdoor-Air Winter Design Temperature	20 F
Indoor-Air Winter Design Temperature	70 F
Indoor Entering-Air Temperature	80 F edb, 67 F ewb
Indoor-Air Quantity	800 cfm
External State Pressure	0.50 in. wg
Field-Supplied Filter Pressure Drop	0.15 in. wg
Electrical Characteristics (V-Ph-Hz)	230-1-60

II Select unit based on required cooling capacity.

Enter Cooling Capacities table on page 13 at condenser entering temperature of 95 F, indoor air entering at 800 cfm and 67 F ewb. The 50NQ024 unit will provide a total cooling capacity of 23,800 Btuh and a sensible heat capacity of 17,800 Btuh.

For indoor-air temperature other than 80 F edb, calculate sensible heat capacity correction, as required, using the formula found in Note 3 following the cooling capacities tables.

NOTE: Unit ratings are net capacities.

III Select electric heat.

Enter the Instantaneous and Integrated Heating Ratings table on page 15 at 800 cfm. At 70 F return indoor air and 20 F air entering outdoor coil, the integrated heating capacity is 12,100 Btuh. (Select integrated heating capacity value since deductions for outdoor-coil frost and defrosting have already been made. No correction is required.)

The required heating capacity is 30,000 Btuh. Therefore, 17,900 Btuh (30,000 - 12,100) additional electric heat is required.

Determine additional electric heat capacity in kW.

$$\frac{17{,}900 \text{ Btuh}}{3414 \text{ Btuh/kW}} = 5.3 \text{ kW of heat required}$$

Enter the Electric Heater Data and Usage table on page 21 for 50NQ024 unit. The 5.0 kW heater at 240 v most closely satisfies the heating required. To calculate kW at 230 v:

5 kW x .92 = 4.6 kW

5 kW x .92 x 3414 = 15,704 Btuh

To calculate kW at 208 v, see Note 3 of Electric Heater Data and Usage table on page 21.

Total unit heating capacity is 27,804 Btuh (12,100 + 15,704).

IV Determine fan speed and power requirements at design conditions.

Before entering Air Delivery table, calculate the total static pressure required. From the given and the Electric Heat Accessory Pressure Drop table on page 21, find:

External static pressure	0.50 in. wg
Filter	0.15 in. wg
Electric heat	0.03 in. wg
Total static pressure	0.68 in. wg

Enter the Air Delivery table on page 19, at 800 cfm and 230 v high speed for dry coil, by interpolation, the standard motor will deliver 0.79-in. wg static pressure and 0.48 bhp. This will adequately handle job requirements.

COOLING CAPACITIES

50NQ018 (1-1/2 Tons)

Temp (F) Air Ent Cond		Evap Air – Cfm BF: 450/0.06				575/0.08				750/0.11			
		Evap Air – Ewb (F): 72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	20 9	19 0	17 5	17 2	21 7	19 7	18 2	18 1	22 4	20 4	18 9	19 0
	SHC	10 2	12 6	12 2	15 0	11 1	14 1	13 6	17 0	12 2	16 0	15 4	19 0
	kW	1 82	1 76	1 72	1 71	1 88	1 82	1 77	1 77	1 95	1 89	1 85	1 85
95	TC	19 7	17 9	16 5	16 3	20 4	18 6	17 2	17 1	21 0	19 2	17 7	18 1
	SHC	9 74	12 2	11 8	14 5	10 6	13 6	13 1	16 4	11.7	15 5	14 9	18 1
	kW	1 94	1 88	1 83	1 82	2 00	1 94	1 89	1 88	2 08	2 01	1 96	1 97
105	TC	18 6	16 8	15 5	15 3	19 2	17 4	16 1	16 1	19 7	18 0	16 6	17 1
	SHC	9 29	11 7	11 3	14 0	10 1	13 2	12 7	15 9	11 2	15 0	14 4	17 1
	kW	2 06	1 99	1 94	1 93	2 13	2 06	2 00	2 00	2 20	2 13	2 07	2 10
115	TC	17 4	15 8	14 5	14 3	17 9	16 3	15 0	15 1	18 3	16 7	15 4	16 1
	SHC	8 85	11 3	10 8	13 6	9 70	12 7	12 2	15 1	10 7	14 5	13 8	16 1
	kW	2 19	2 11	2 05	2 03	2 26	2 17	2 12	2 11	2 32	2 25	2 19	2 22

50NQ024 (2 Tons)

Temp (F) Air Ent Cond		Evap Air – Cfm BF: 600/0.05				800/0.07				1000/0.09			
		Evap Air – Ewb (F): 72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	26 8	24 3	22 4	22 0	27 9	25 3	23 4	23 2	28 5	25 9	23 9	24 2
	SHC	12 9	16 2	15 7	19 3	14 2	18 4	17 8	22 3	15 4	20 5	19 7	24 2
	kW	2 46	2 39	2 34	2 32	2 59	2 52	2 46	2 46	2 71	2 64	2 58	2 59
95	TC	25 3	22 9	21 1	20 8	26 2	23 8	22 0	21 9	26 7	24 3	22 4	23 0
	SHC	12 4	15 6	15 1	18 7	13 7	17 8	17 2	21 6	14 8	19 9	19 1	23 0
	kW	2 63	2 55	2 48	2 47	2 76	2 68	2 61	2 61	2 88	2 80	2 73	2 75
105	TC	23 8	21.5	19 8	19 5	24 6	22 3	20 6	20 7	25 0	22 8	21 0	21 8
	SHC	11 8	15 0	14 5	18 1	13 1	17 3	16 6	20 7	14 3	19 3	18 4	21 8
	kW	2 80	2.70	2 63	2 61	2 93	2 84	2 76	2 77	3 05	2 96	2 88	2 92
115	TC	22 3	20 1	18 4	18 2	23 0	20 8	19 1	19 5	23 3	21 2	19 5	20 5
	SHC	11 3	14 5	13 9	17 4	12 5	16 7	15 9	19 5	13 7	18 6	17 7	20 5
	kW	2 96	2 85	2 76	2 75	3 10	2 99	2 91	2 92	3 22	3 12	3 03	3 08

50NQ030 (2-1/2 Tons)

Temp (F) Air Ent Cond		Evap Air – Cfm BF: 750/0.06				1090/0.09				1250/0.10			
		Evap Air – Ewb (F): 72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	32 4	29 7	27 4	26 9	33 5	31 1	28 8	28 8	33 6	31 5	29 3	29 8
	SHC	15 8	20 0	19 3	23 9	17 6	23 7	22 9	28 7	18 3	25 3	24 5	29 8
	kW	2 91	2 84	2 77	2 75	3 09	3 03	2 97	2 97	3 16	3 11	3 06	3 07
95	TC	30 9	28 0	25 8	25 4	32 1	29 4	27 1	27 4	32 3	29 7	27 5	28 3
	SHC	15 2	19 3	18 6	23.2	17 3	23 1	22 2	27 4	18 1	24 7	23 7	28 3
	kW	3 12	3 03	2 95	2 93	3 31	3 23	3 15	3.16	3 39	3 32	3 24	3 27
105	TC	29 2	26 3	24 3	23 9	30 4	27 5	25 4	25 9	30 6	27 8	25 7	26 7
	SHC	14 6	18 6	17 9	22 4	16 8	22 4	21 4	25 9	17 7	24 0	22 9	26 7
	kW	3 33	3 21	3 12	3 10	3 53	3 42	3 33	3 35	3 61	3 51	3 42	3 46
115	TC	27 3	24 6	22 6	22 3	28 4	25 6	23 6	24 4	28 6	25 9	23.9	25 1
	SHC	13 9	17 9	17 2	21 6	16 1	21 6	20 7	24 4	17 0	23 2	22 1	25 1
	kW	3 52	3 39	3 29	3 27	3 73	3 60	3 50	3 54	3 82	3 69	3 59	3 66

50NQ036 (3 Tons)

Temp (F) Air Ent Cond		Evap Air – Cfm BF: 900/0.06				1300/0.09				1500/0.11			
		Evap Air – Ewb (F): 72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	39 0	35 6	32 9	32 2	40 3	37 5	34 6	34 5	40 4	37 8	35 1	35 4
	SHC	18 9	23 7	23 0	28 2	20 9	27 8	26 9	33 6	21 6	29 5	28 7	35 4
	kW	3 82	3 71	3 62	3 60	4 02	3 94	3 84	3 84	4 10	4 02	3 94	3 95
95	TC	36 8	33 4	30 7	30 1	38 2	35 1	32 5	32 6	38 4	35 6	33 0	33 6
	SHC	18 1	22 8	22 0	27 2	20 2	27 0	26 1	32 4	21 1	28 8	28 0	33 6
	kW	4 07	3 95	3 84	3 82	4 28	4 18	4 09	4 09	4 37	4 27	4 19	4 21
105	TC	34 5	31 2	28 6	28 1	35 8	32 7	30 1	30 6	36 1	33 1	30 6	31 7
	SHC	17 2	21 9	21 0	26 2	19 5	26 1	25 1	30 5	20 5	28 0	27 0	31 7
	kW	4 32	4 18	4 06	4 04	4 54	4 41	4 30	4 33	4 64	4 52	4 41	4 47
115	TC	32 2	28.9	26 4	26 0	33 4	30 3	27 7	28 7	33 6	30 7	28 2	29 7
	SHC	16 4	20 9	20 1	25 1	18 8	25 2	24 1	28 6	19 8	27 1	25 8	29 7
	kW	4 57	4 40	4 27	4 25	4 79	4 65	4 52	4 57	4 89	4 76	4 63	4 71

50NQ042 (3-1/2 Tons)

Temp (F) Air Ent Cond		Evap Air – Cfm BF: 1050/0.04				1450/0.06				1750/0.07			
		Evap Air – Ewb (F): 72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	47 4	43 0	39 7	39 1	49 5	45 0	41 6	41 6	50 4	45 9	42 5	43 3
	SHC	23 1	29 0	28 1	34 7	26 0	33 8	32 6	40 9	27 9	37 2	35 7	43 3
	kW	4 33	4 19	4 08	4 06	4 57	4 43	4 33	4 32	4 73	4 60	4 49	4 52
95	TC	44 8	40 6	37 5	37 0	46 7	42 4	39 2	39 4	47 4	43 2	39 9	41 2
	SHC	22 2	28 0	27 1	33 7	25 0	32 8	31 6	39 3	26 9	36 1	34 6	41 2
	kW	4 62	4 46	4 34	4 32	4 87	4 71	4 59	4 60	5 03	4 88	4 76	4 80
105	TC	42 2	38 2	35 2	34 8	43 8	39 8	36 7	37 4	44 4	40 5	37 4	39 0
	SHC	21 2	27 0	26 1	32 6	24 0	31 8	30 5	37 3	25 9	35 0	33 5	39 0
	kW	4 91	4 73	4 60	4 58	5 16	4.99	4 85	4 88	5 32	5 16	5 02	5 09
115	TC	39 5	35 8	32 9	32 6	40 9	37 2	34 2	35 2	41 4	37 8	34 8	36 7
	SHC	20 3	26 0	25 1	31 5	23 0	30 7	29 4	35 2	24 9	33 9	32 3	36 7
	kW	5 19	5 00	4 84	4 83	5 44	5 26	5 10	5 16	5 61	5 43	5 28	5 38

LEGEND
BF – Bypass Factor
Edb – Entering Dry Bulb
Ewb – Entering Wet Bulb
kW – Compressor Motor Power Input
SHC – Sensible Heat Capacity (1000 Btuh) Gross
TC – Total Capacity (1000 Btuh) Net

* At 75 F entering dry bulb (Tennessee Valley Authority [TVA] rating conditions), all others at 80 F entering dry bulb

NOTES

1 Direct interpolation is permissible Do not extrapolate

2. The following formulas may be used

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1\ 10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil (h_{lwb})

$$t_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4\ 5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering indoor coil

3 The SHC is based on 80 F edb temperature of air entering indoor coil

Below 80 F edb subtract (corr factor x cfm) from SHC
Above 80 F edb add (corr factor x cfm) to SHC.

Correction Factor = 1 10 x (1 - BF) x (edb - 80)

COOLING CAPACITIES (cont)

50NQ048 (4 Tons)

Temp (F) Air Ent Cond		Evap Air – Cfm BF: 1200/0.02				1650/0.04				2000/0.05			
		Evap Air – Ewb (F): 72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	53 3	48 2	44 5	43 7	55 5	50 5	46 6	46 5	56 2	51 6	47 8	48 8
	SHC	26 0	32 5	31 5	38 8	29 0	37 9	36 6	45 9	31 0	41 7	40 4	48 8
	kW	5.17	5 00	4 87	4 84	5 44	5 28	5.16	5 15	5.62	5.47	5 36	5.40
95	TC	50 2	45 3	41 8	41 1	52 2	47 4	43 7	44 0	53 0	48 4	44 6	46 2
	SHC	24 8	31 3	30 2	37 6	27 9	36 8	35 4	43 8	30 0	40 7	39 0	46 2
	kW	5 48	5 28	5.13	5.10	5.75	5.58	5.43	5.44	5.94	5 79	5.64	5 70
105	TC	47 0	42 4	38 9	38 4	48 8	44 2	40 7	41 4	49 4	45 1	41 5	43 5
	SHC	23 7	30 1	29 0	36 3	26 7	35 5	34 1	41 3	28 8	39 4	37 6	43 5
	kW	5 78	5 55	5.39	5 35	6 05	5.86	5.69	5.73	6.23	6.07	5 90	6 00
115	TC	43 8	39 3	35 7	35 3	45 4	40 9	37 5	38 9	46 1	41 7	38 3	40 7
	SHC	22 5	28 9	27 6	34 7	25 7	34 2	32 7	38 8	28 0	38 0	36 2	40 7
	kW	6 06	5 81	5 62	5 60	6 36	6 12	5 93	6 00	6 56	6 34	6 15	6 28

50NQ060 (5 Tons)

Temp (F) Air Ent Cond		Evap Air – Cfm BF: 1500/0.04				2100/0.05				2500/0.07			
		Evap Air – Ewb (F): 72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	65 6	59 6	55 1	54 1	68 4	62 2	57 5	57 2	69 3	63 1	58 4	59 5
	SHC	31 7	40 0	38 8	48 1	35 6	46 9	45 3	57 0	38 0	51 2	49 2	59 5
	kW	6 66	6 43	6 25	6 21	7 15	6 91	6 73	6 72	7 43	7 20	7 01	7 06
95	TC	62 0	56 2	52 0	51 0	64 3	58 5	54 0	54 4	65 1	59 3	54 8	56 5
	SHC	30 4	38 6	37 4	46 7	34 2	45 5	43 8	54 3	36 6	49 7	47 6	56 5
	kW	7 08	6 81	6 61	6 56	7 57	7 30	7 09	7 11	7 85	7 59	7 39	7 47
105	TC	58 3	52 8	48 7	48 0	60 3	54 7	50 5	51 5	60 9	55 4	51 1	53 4
	SHC	29 0	37 3	36 0	45 2	32 8	44 0	42 3	51 4	35 2	48 2	46 0	53 4
	kW	7 46	7 17	6 95	6 89	7 97	7 67	7 44	7 49	8 26	7 97	7 74	7 86
115	TC	54 6	49 4	45 0	44 3	56 2	51 1	46 9	48 5	56 7	51 5	47 4	50 2
	SHC	27 7	35 8	34 4	43 4	31 5	42 6	40 7	48 4	33 8	46 6	44 4	50 2
	kW	7 84	7 51	7 25	7 21	8 35	8 02	7 76	7 86	8 64	8 33	8 06	8 24

LEGEND
BF – Bypass Factor
Edb – Entering Dry Bulb
Ewb – Entering Wet Bulb
kW – Compressor Motor Power Input
SHC – Sensible Heat Capacity (1000 Btuh) Gross
TC – Total Capacity (1000 Btuh) Net

* At 75 F entering dry bulb (Tennessee Valley Authority [TVA] rating conditions); all others at 80 F entering dry bulb

NOTES:

1 Direct interpolation is permissible. Do not extrapolate

2 The following formulas may be used

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1\ 10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil (h_{lwb})

$$t_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4\ 5 \times \text{cfm}}$$

Where h_{ewb} = Enthalpy of air entering indoor coil

3 The SHC is based on 80 F edb temperature of air entering indoor coil

Below 80 F edb subtract (corr factor x cfm) from SHC
Above 80 F edb add (corr factor x cfm) to SHC

Correction Factor = 1 10 x (1 - BF) x (edb - 80)

INSTANTANEOUS AND INTEGRATED HEATING RATINGS

50NQ018 (1-1/2 Tons)

CFM (Std Air)	RETURN AIR (F db)		TEMPERATURE AIR ENTERING OUTDOOR COIL (F db at 70% rh): -10	0	10	17	20	30	45	47	50	60
400	60	Cap	4.63 4.26	6 31 5.80	8.21 7.54	9 71 8.86	10 4 9 44	13 0 11.4	17 7 17 7	18 4 18 4	19 5 19 5	23 2 23 2
		kW	1.10	1.21	1.33	1.42	1.46	1.60	1 85	1.89	1 94	2 12
	70	Cap.	4 15 3.82	5 83 5.36	7.77 7.13	9.26 8.45	9.95 9.02	12 4 10.9	17 0 1 70	17 7 17 7	18 8 18.8	22 6 22.6
		kW	1.12	1.24	1.37	1.47	1.52	1.67	1.94	1.98	2 04	2 25
	80	Cap	3 61 3.32	5 28 4.86	7.23 6.63	8.77 7.99	9 46 8.58	11 9 10.4	16 3 16.3	17 0 17 0	18 0 18 0	21 8 21.8
		kW	1.13	1.27	1.41	1 52	1.57	1.74	2.03	2.07	2 13	2 37
600	60	Cap	4 91 4 52	6 64 6.11	8 59 7 88	10 2 9 26	10 9 9.88	13 6 11.9	18 5 18 5	19 0 19.0	19 8 19 8	22 7 22 7
		kW	1.14	1.25	1.36	1.43	1.47	1.59	1 80	1.82	1.85	1 95
	70	Cap.	4 44 4.08	6.18 5.68	8.17 7.50	9 70 8.84	10 4 9 45	13 0 11.4	17 9 17 9	18 6 18 6	19 6 19 6	22 6 22 6
		kW	1.16	1.28	1.40	1.49	1.54	1.67	1 90	1 94	1 98	2 10
	80	Cap	3 89 3.58	5 63 5.18	7.67 7.04	9 23 8 42	9 94 9.02	12 5 10.9	17 2 17 2	17 9 17 9	19 0 19 0	22 3 22 3
		kW	1.18	1.31	1.45	1 55	1 59	1 74	2 00	2 03	2 09	2 24
800	60	Cap	5.12 4.71	6 87 6.32	8 85 8.12	10 5 9 53	11 2 10.2	14 0 12.2	18 3 18 3	18 8 18.8	19 8 19.8	22 5 22 5
		kW	1.19	1.29	1 39	1 47	1 50	1 61	1 77	1.79	1 83	1 92
	70	Cap.	4 65 4.28	6 44 5.92	8 44 7.74	10 0 9 13	10.7 9 74	13 4 11.7	18 1 18.1	18 8 18 8	19 5 19 5	22 5 22.5
		kW	1.21	1.33	1.44	1 53	1.57	1 69	1 89	1 92	1 94	2 06
	80	Cap	4 09 3.76	5 90 5.43	7.97 7.31	9 54 8 70	10 2 9 30	12 9 11.3	17 7 17 7	18 4 18 4	19.2 19.2	22.3 22 3
		kW	1 23	1 36	1.49	1 59	1 63	1 77	2.01	2 04	2 07	2 20

INSTANTANEOUS AND INTEGRATED HEATING RATINGS (cont)

50NQ024 (2 Tons)

CFM (Std Air)	RETURN AIR (F db)		TEMPERATURE AIR ENTERING OUTDOOR COIL (F db at 70% rh)									
			-10	0	10	17	20	30	45	47	50	60
600	60	Cap.	5.42 4.99	7.69 7.08	10.4 9.51	12.5 11.4	13.4 12.2	16 9 14.8	23.1 23.1	24.1 24.1	25 3 25.3	29 8 29.8
		kW	1.44	1.56	1.69	1.78	1.83	1.97	2.20	2.24	2 28	2.42
	70	Cap.	4.72 4.34	6 98 6.42	9.64 8 85	11 8 10 7	12.7 11 5	16 2 14.2	22.2 22.2	23 2 23.2	24 6 24.6	29.1 29.1
		kW	1.47	1 60	1.74	1 85	1 89	2.05	2.31	2.35	2 41	2.57
	80	Cap.	3.91 3.60	6.18 5.68	8 83 8 10	10 9 9.98	11 9 10 8	15 4 13.5	21 4 21.4	22.3 22.3	23 8 23.8	28.5 28.5
		kW	1 49	1 63	1.79	1.91	1 95	2 13	2.42	2.46	2.53	2.73
800	60	Cap	5 75 5 29	8 10 7.46	10 8 9 96	13 0 11 9	14 0 12 7	17 6 15.4	24 0 24.0	24 8 24.8	26.0 26.0	30.3 30.3
		kW	1.52	1 63	1 75	1 84	1 88	2.01	2.21	2.24	2 26	2.37
	70	Cap.	5 04 4 64	7 39 6 80	10 1 9.31	12 3 11 2	13 3 12 1	16 8 14.8	23 1 23.1	24 1 24.1	25 3 25.3	29 4 29.4
		kW	1 55	1 68	1.81	1.91	1 95	2 10	2.33	2 36	2 40	2.51
	80	Cap	4 22 3 88	6 57 6 05	9 34 8.57	11 5 10 5	12 5 11 3	16 1 14.1	22 2 22.2	23.2 23.2	24 6 24 6	28.7 28.7
		kW	1 57	1 71	1 86	1 97	2 01	2.18	2.43	2 47	2 53	2 65
1000	60	Cap	6 04 5 55	8 43 7.76	11 2 10 3	13 4 12 2	14.4 13 0	18 1 15 8	24 0 24.0	25.3 25.3	26 4 26 4	30 1 30.1
		kW	1 60	1 71	1 82	1 91	1 94	2 06	2 22	2 26	2 28	2 35
	70	Cap	5 32 4 90	7 73 7 12	10 5 9 68	12 8 11 7	13 8 12.5	17 4 15 2	23 7 23.7	24 2 24.2	25 8 25 8	29 9 29.9
		kW	1 63	1 75	1 88	1.97	2 01	2 15	2.36	2 36	2 41	2 51
	80	Cap.	4 48 4 13	6 93 6.37	9 75 8 95	12 0 10 9	13 0 11 8	16 6 14 6	22.9 22 9	23 9 23.9	24 7 24 7	28 8 28.8
		kW	1 65	1.79	1 94	2 04	2 08	2 23	2 47	2 51	2 52	2 64

50NQ030 (2-1/2 Tons)

CFM (Std Air)	RETURN AIR (F db)		TEMPERATURE AIR ENTERING OUTDOOR COIL (F db at 70% rh)									
			-10	0	10	17	20	30	45	47	50	60
750	60	Cap	7 35 6 76	10 1 9 31	13 3 12.2	15 7 14 4	16 9 15 3	21 0 18.4	27 9 27.9	29 1 29 1	30 6 30.6	36 1 36.1
		kW	1 72	1 87	2.03	2.15	2 20	2 38	2 68	2 73	2 79	2.99
	70	Cap	6 39 5 88	9 17 8.44	12 4 11.3	14 9 13.6	16 0 14 5	20.0 17.6	26 8 26 8	27.9 27 9	29 4 29 4	35 1 35.1
		kW	1 75	1 92	2.09	2 23	2 28	2 49	2 81	2 86	2 93	3 17
	80	Cap	5 31 4 89	8 10 7 45	11.3 10.4	13 8 12.6	14.9 13.5	19.0 16 6	25 8 25 8	26 8 26 8	28 3 28 3	33.8 33.8
		kW	1 78	1 96	2 15	2 30	2 36	2 58	2 93	2 99	3.06	3 34
1100	60	Cap	7 93 7.29	10 8 9 95	14.1 13 0	16 7 15.2	17.8 16 1	22 0 19.3	29 3 29.3	30 3 30 3	31 6 31.6	36.7 36 7
		kW	1 84	1 98	2 12	2 23	2 27	2 44	2 69	2 71	2 74	2 89
	70	Cap	6 96 6 41	9 87 9 08	13 2 12 1	15 8 14 4	16 9 15 4	21 1 18.5	28 2 28.2	29 4 29.4	30 9 30.9	36 2 36.2
		kW	1.88	2 03	2 20	2 31	2 36	2 55	2 83	2.87	2 92	3.09
	80	Cap	5 85 5 38	8 78 8.08	12 1 11.1	14 7 13.4	15 9 14 4	20 1 17.6	27 1 27 1	28 2 28.2	29.7 29.7	35 3 35.3
		kW	1 91	2 08	2 26	2 39	2 45	2 65	2 96	3.01	3 07	3 28
	60	Cap	8 12 7 47	11 0 10.2	14 4 13 2	16 9 15.4	18 0 16 4	22 4 19.6	29 5 29 5	30 5 30 5	31.7 31.7	36.9 36 9
		kW	1 89	2 03	2 17	2 27	2 31	2 47	2 69	2.72	2 75	2 89
1250	70	Cap.	7.15 6.58	10 1 9.30	13 5 12 4	16 1 14 7	17 2 15 6	21.5 18.8	28 7 28 7	29.9 29 9	31 3 31 3	36 3 36 3
		kW	1 93	2 08	2 24	2 36	2 41	2 58	2 85	2 89	2.93	3.08
	80	Cap	6 04 5 55	9 01 8.29	12 4 11 4	15 0 13 7	16 2 14 7	20 5 18.0	27 6 27.6	28 7 28 7	30 2 30 2	35 4 35.4
		kW	1 96	2 13	2 31	2 44	2 49	2 69	2 99	3 03	3 09	3 27

LEGEND
Cap. – Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
db – Dry Bulb
kW – Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)
rh – Relative Humidity

NOTES

1 Shading indicates integrated ratings

2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it

INSTANTANEOUS AND INTEGRATED HEATING RATINGS (cont)

50NQ036 (3 Tons)

CFM (Std Air)	RETURN AIR (F db)		TEMPERATURE AIR ENTERING OUTDOOR COIL (F db at 70% rh)									
			-10	0	10	17	20	30	45	47	50	60
900	60	Cap	9 39 8.64	12 9 11 8	16 8 15.4	19 6 17.9	20 9 18.9	25 5 22.4	33 6 33 6	34.7 34.7	36 5 36.5	42.6 42.6
		kW	2 36	2 53	2 69	2 82	2.87	3 04	3 33	3 37	3 43	3 61
	70	Cap	7 99 7.35	11 5 10.6	15 4 14 1	18 4 16.7	19 6 17.8	24 2 21.2	32.0 32.0	33 1 33.1	34 9 34.9	41.0 41.0
		kW	2 39	2 58	2 77	2 90	2 96	3 16	3 48	3 52	3.59	3 80
	80	Cap	6 43 5.92	9 96 9.17	13 9 12 7	16.8 15.4	18 2 16.5	22 9 20.0	30 5 30.5	31 6 31.6	33 3 33.3	39.4 39.4
		kW	2.41	2.62	2 83	2 98	3 04	3 26	3 61	3 66	3 73	3 98
1300	60	Cap	10 1 9.30	13 7 12 6	17 7 16 3	20.7 18.8	22 0 19.9	26 9 23.5	35 1 35 1	36 3 36.3	38 0 38.0	43 2 43 2
		kW	2 51	2 66	2 81	2 91	2 95	3 10	3 32	3 36	3 39	3.49
	70	Cap	8.69 7.99	12 3 11.3	16.4 15.1	19.5 17 7	20 7 18.8	25 5 22.3	33 7 33 7	35 0 35.0	36 6 36.6	41 9 41 9
		kW	2 54	2.72	2 89	3.01	3 06	3 23	3 50	3 53	3 57	3 69
	80	Cap	7 05 6 49	10 8 9.91	14.9 13 7	18 0 16.4	19 4 17.6	24.1 21.1	32 1 32 1	33 3 33.3	35 1 35.1	41 1 41.1
		kW	2 57	2 76	2 96	3.09	3 14	3.34	3 64	3 68	3 74	3.91
1500	60	Cap	10.4 9.59	14 1 13.0	18 1 16.6	21 1 19.2	22 4 20.3	27.4 24.0	35 7 35 7	36 9 36.9	38 1 38.1	44 0 44 0
		kW	2 58	2.72	2 87	2.96	3 00	3.14	3 34	3 36	3 37	3.49
	70	Cap	8 99 8 27	12 7 11.7	16.8 15.5	19 9 18.2	21.2 19.2	26 0 22.8	34 4 34.4	35 7 35.7	37 3 37.3	42 7 42.7
		kW	2 62	2 79	2 95	3 06	3 11	3.27	3 52	3 55	3 58	3 69
	80	Cap	7 34 6.75	11 1 10.2	15.3 14.0	18 5 16 8	19 9 18.0	24 7 21.6	32 8 32 8	34 0 34.0	35 9 35.9	41.3 41.3
		kW	2 64	2 83	3 02	3 15	3.20	3 39	3 67	3 71	3 77	3 88

50NQ042 (3-1/2 Tons)

CFM (Std Air)	RETURN AIR (F db)		TEMPERATURE AIR ENTERING OUTDOOR COIL (F db at 70% rh)									
			-10	0	10	17	20	30	45	47	50	60
1050	60	Cap.	9 74 8.96	13 6 12.5	18 1 16.6	21 5 19.6	23 2 21.1	29 6 25.9	40 3 40 3	42.2 42.2	44 3 44.3	53 9 53 9
		kW	2.16	2 48	2.83	3 10	3.22	3 66	4 36	4.48	4 62	5 18
	70	Cap	8 70 8.00	12 5 11.5	17.0 15.6	20 6 18 7	22 2 20.2	28 4 24.9	38 8 38.8	40.6 40.6	42 7 42.7	52 3 52.3
		kW	2.21	2 55	2 93	3 21	3.34	3 83	4 58	4 71	4 86	5 48
	80	Cap	7 51 6.91	11 3 10 4	15.8 14.5	19 3 17.6	21.0 19.0	27 2 23.9	37 3 37.3	39 0 39 0	41 1 41.1	50 3 50 3
		kW	2.25	2.61	3.02	3 32	3 46	3 97	4 79	4 92	5 08	5 77
1500	60	Cap.	10 4 9.55	14 3 13 2	19.0 17.4	22 5 20 5	24.2 22 0	30 8 27.0	42.1 42.1	43 9 43.9	46.0 46 0	54 6 54.6
		kW	2 29	2.61	2.95	3.20	3 32	3 73	4 38	4 46	4 58	5.02
	70	Cap	9 33 8.59	13 3 12 2	18 0 16.5	21 6 19 7	23 3 21 1	29 7 26.0	40.6 40.6	42 5 42.5	44.7 44.7	52 9 52.9
		kW	2 34	2 69	3 05	3 33	3 45	3 91	4,61	4 72	4 86	5.31
	80	Cap	8 13 7.48	12 1 11 1	16.8 15.4	20 4 18.6	22 1 20 1	28 5 25.0	39.1 39.1	40 9 40.9	43.1 43.1	52 5 52 5
		kW	2 39	2 75	3 15	3.44	3 58	4 07	4 83	4 95	5.10	5.68
1750	60	Cap	10 7 9.82	14.7 13.5	19 3 17.7	22 9 20 9	24 6 22 3	31 4 27 5	42 3 42.3	44 2 44.2	45 8 45.8	54 1 54.1
		kW	2 37	2 68	3 03	3.27	3.39	3.79	4 38	4 48	4 57	4 99
	70	Cap	9 64 8.87	13 7 12 6	18.4 16.9	22.0 20 1	23 7 21 5	30 2 26 5	41 3 41.3	43 0 43.0	45 1 45.1	53 7 53.7
		kW	2 42	2 76	3 13	3.40	3 53	3.97	4 66	4.774	4 86	5 33
	80	Cap	8 43 7.75	12.5 11 5	17 2 15.8	20 9 19.0	22 6 20 5	29 1 25 5	39.8 39 8	41 6 41.6	43.9 43.9	52.3 52.3
		kW	2.46	2 83	3 23	3 52	3 65	4 14	4 88	5 00	5 15	5 64

INSTANTANEOUS AND INTEGRATED HEATING RATINGS (cont)

50NQ048 (4 Tons)

CFM (Std Air)	RETURN AIR (F db)		TEMPERATURE AIR ENTERING OUTDOOR COIL (F db at 70% rh)									
			-10	0	10	17	20	30	45	47	50	60
1200	60	Cap.	10.9 9.98	15 3 14.1	20 5 18.8	24 5 22.3	26.2 23.8	33 0 28.9	44.9 44.9	46.8 46.8	49.5 49.5	58.7 58.7
		kW	2.74	3 01	3.30	3 52	3 61	3.94	4.47	4.56	4 68	5.03
	70	Cap	9 22 8.48	13 7 12.6	18.9 17.4	23 0 20.9	24 7 22.4	31 3 27.4	42 9 42.9	44 6 44.6	47.3 47 3	56.8 56.8
		kW	2.73	3 04	3 35	3 59	3.69	4 05	4 63	4 72	4 85	5 28
	80	Cap.	7.39 6.79	11 9 10.9	17.1 15.7	21 1 19.3	22 9 20 8	29 5 25 8	40 8 40.8	42 5 42.5	45 1 45.1	54.4 54.4
		kW	2 71	3 04	3.38	3 63	3.74	4 13	4 76	4 85	4.99	5.48
	60	Cap	11 7 10.7	16 4 15.0	21.6 19.8	25 7 23 4	27 6 25 0	34.7 30 4	47 1 47 1	48 5 48.5	51 3 51.3	59.8 59.8
		kW	2.93	3.19	3 47	3 66	3 75	4 05	4 53	4 56	4 66	4.94
1700	70	Cap.	10.0 9.23	14.7 13.6	20.2 18.5	24.3 22 1	26 0 23 6	32 9 28.8	45 1 45.1	47 0 47.0	49 7 49.7	58.5 58.5
		kW	2 93	3 22	3.53	3 75	3 84	4 18	4 70	4 79	4.89	5.20
	80	Cap.	8 13 7.48	12 9 11.8	18.3 16.8	22 6 20 6	24 4 22 1	31 1 27 3	43.0 43.0	44 7 44.7	47 5 47 5	56.8 56 8
		kW	2 91	3.23	3.57	3.81	3 91	4 28	4 85	4 94	5 06	5.45
	60	Cap	12 1 11.1	16.9 15.5	22.2 20.4	26 3 24 0	28 2 25 6	35 5 31 1	47 8 47.8	49 5 49.5	51 7 51 7	60.3 60.3
		kW	3 04	3.30	3.57	3 76	3 84	4.13	4 55	4 60	4 67	4.92
2000	70	Cap.	10 4 9.61	15.3 14.0	20.8 19.1	24 9 22 7	26.7 24 2	33 7 29.6	46 2 46.2	48 1 48 1	50 2 50 2	58 5 58.5
		kW	3 04	3 34	3.63	3 85	3 94	4 26	4.76	4 83	4.89	5.16
	80	Cap.	8.53 7.85	13.4 12.3	19 0 17.4	23 3 21 2	25.1 22 8	32 0 28 0	44 0 44 0	45 9 45.9	48 7 48.7	57.6 57.6
		kW	3 03	3.35	3 68	3 91	4 01	4 37	4 92	5 00	5 12	5.45

50NQ060 (5 Tons)

CFM (Std Air)	RETURN AIR (F db)		TEMPERATURE AIR ENTERING OUTDOOR COIL (F db at 70% rh)									
			-10	0	10	17	20	30	45	47	50	60
1500	60	Cap.	10.3 9.43	15.5 14.3	21 9 20.1	27 1 24.7	29.5 26.7	38 5 33.8	54.5 54.5	57 2 57.2	60 7 60.7	73 5 73.5
		kW	3.38	3 71	4 05	4 29	4.39	4 78	5.35	5.44	5.54	5 89
	70	Cap	8 83 8.12	14.0 12 9	20.4 18.7	25 6 23.4	28.0 25.4	37.1 32.5	52 7 52.7	55 3 55.3	58 7 58.7	72.0 72 0
		kW	3 40	3 77	4 15	4 42	4 54	4 97	5.61	5.71	5 84	6.27
	80	Cap	7 22 6.64	12 3 11.3	18.6 17.1	23.8 21.7	26 2 23.7	35 3 31.0	50 8 50.8	53 3 53 3	56.6 56.6	70 3 70.3
		kW	3 41	3.81	4 22	4 53	4 66	5 12	5 84	5 95	6 09	6.63
	60	Cap	11.1 10.2	16 6 15.3	23.2 21.3	28 5 26.0	30 9 28.0	40 3 35.3	56 7 56 7	58.5 58.5	61 7 61.7	73 7 73.7
		kW	3 68	4 00	4 32	4 54	4 64	4 98	5 45	5 49	5 56	5.83
2100	70	Cap	9 67 8.90	15.1 13.9	21.8 20.0	27.2 24.8	29 6 26.8	38 9 34 1	55.0 55.0	57.6 57.6	60 4 60.4	72.7 72 7
		kW	3.71	4.07	4 43	4 69	4 79	5 19	5 75	5 83	5.89	6 21
	80	Cap.	8 01 7.37	13.4 12.3	12 0 18.4	25 4 23.2	27.9 25 3	37 4 32 7	53 2 53.2	55 8 55.8	59 1 59.1	71 1 71.1
		kW	3 73	4.11	4 52	4.81	4 93	5.37	6 01	6 11	6 22	6 56
	60	Cap.	11 6 10.7	17.2 15.8	24 0 22.0	29 3 26.7	31.7 28 7	41 3 36 2	56 9 56 9	58 6 58.6	61 8 61.8	73 5 73.5
		kW	3.89	4 20	4.51	4 72	4.81	5 14	5 53	5.56	5 63	5.87
2500	70	Cap	10.2 9.38	15.8 14 5	22.6 20.7	28 0 25.6	30.5 27.6	39 9 35 0	55 8 55 8	58 3 58.3	61.0 61.0	73.4 73.4
		kW	3.92	4 27	4 63	4.87	4 98	5 36	5.84	5 92	5 97	6 28
	80	Cap	8.49 7.81	14 0 12.9	20.8 19.1	26 3 24.0	28 9 26.2	38 4 33.6	54 5 54.5	57 2 57.2	59 8 59.8	72 4 72.4
		kW	3 94	4.32	4 72	5.00	5.12	5.54	6 15	6.24	6 30	6 66

LEGEND
Cap. – Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
db – Dry Bulb
kW – Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)
rh – Relative Humidity

NOTES:

1. Shading indicates integrated ratings
2 Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it

AIR DELIVERY (CFM) AT 208-V HORIZONTAL FLOW SET-UP

50NQ UNIT SIZE	MOTOR SPEED	AIR DELIVERY	EXTERNAL STATIC PRESSURE (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
018	Low	Cfm	479	457	392	358	332	–	–	–	–	–	–
		Watts	137	128	113	102	94	–	–	–	–	–	–
	High	Cfm	650	638	555	487	446	379	–	–	–	–	–
		Watts	195	194	183	171	163	151	–	–	–	–	–
024	Low	Cfm	1052	1023	993	956	919	874	828	712	–	–	–
		Watts	415	409	403	395	387	376	365	337	–	–	–
	High	Cfm	1371*	1320	1268	1213	1158	1081	1004	908	812	–	–
		Watts	534	518	502	485	467	451	434	410	385	–	–
030	Low	Cfm	1090	1054	1018	980	941	894	–	–	–	–	–
		Watts	416	411	405	396	386	376	–	–	–	–	–
	High	Cfm	1364	1324	1284	1247	1210	1153	1095	1028	961	–	–
		Watts	552	542	531	519	507	489	470	451	432	–	–
036	Low	Cfm	1251	1230	1208	1199	1190	1110	–	–	–	–	–
		Watts	617	593	569	542	515	488	–	–	–	–	–
	High	Cfm	1709*	1697*	1685*	1650*	1614*	1461	1307	1116	–	–	–
		Watts	769	765	761	736	711	649	586	546	–	–	–
042	Low	Cfm	1251	1230	1208	1199	1190	–	–	–	–	–	–
		Watts	617	593	569	542	515	–	–	–	–	–	–
	High	Cfm	1709*	1697*	1685*	1650*	1614*	1461	1307	–	–	–	–
		Watts	769	765	761	736	711	649	586	–	–	–	–
048	Low	Cfm	1960	1902	1844	1794	1744	1674	1604	1488	–	–	–
		Watts	783	778	772	733	694	661	628	581	–	–	–
	High	Cfm	2263	2187	2110	2022	1934	1844	1753	1631	1508	–	–
		Watts	844	834	824	802	780	743	706	666	625	–	–
060	Low	Cfm	2120	2115	2109	2097	2085	2033	1981	1897	1812	–	–
		Watts	1235	1205	1175	1141	1107	1059	1011	961	910	863	–
	High	Cfm	2315	2308	2301	2266	2230	2194	2158	2058	1957	1831	–
		Watts	1409	1369	1328	1289	1249	1216	1183	1114	1045	986	–

AIR DELIVERY (CFM) AT 230- AND 460-V HORIZONTAL FLOW SET-UP

50NQ UNIT SIZE	MOTOR SPEED	AIR DELIVERY	EXTERNAL STATIC PRESSURE (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
018	Low	Cfm	914	840	692	586	499	407	–	–	–	–	–
		Watts	221	201	169	152	139	126	–	–	–	–	–
	High	Cfm	1099*	1013*	825	682	583	479	–	–	–	–	–
		Watts	291	281	257	245	237	229	–	–	–	–	–
024	Low	Cfm	1259	1222	1184	1151	1118	1053	988	921	828	–	–
		Watts	505	497	488	478	468	446	423	408	392	–	–
	High	Cfm	1545*	1480*	1414*	1304	1194	1115	1035	932	853	–	–
		Watts	612	593	573	546	518	497	476	451	425	–	–
030	Low	Cfm	1288	1245	1201	1161	1120	1067	1014	936	–	–	–
		Watts	511	502	493	481	469	453	437	415	–	–	–
	High	Cfm	1577	1514	1451	1385	1318	1244	1170	1074	977	–	–
		Watts	636	618	599	578	557	536	515	490	465	–	–
036	Low	Cfm	1540	1512	1484	1448	1412	1298	1183	–	–	–	–
		Watts	678	664	650	623	595	559	522	–	–	–	–
	High	Cfm	2091*	2031*	1971*	1876*	1781*	1612*	1442	1226	–	–	–
		Watts	898	864	830	798	765	709	652	606	–	–	–
042	Low	Cfm	1540	1512	1484	1448	1412	1298	–	–	–	–	–
		Watts	678	664	650	623	595	559	–	–	–	–	–
	High	Cfm	2091*	2031*	1971*	1876*	1781*	1612*	1442	1226	–	–	–
		Watts	898	864	830	798	765	709	652	606	–	–	–
048	Low	Cfm	2199	2099	1998	1948	1897	1803	1708	1585	1462	–	–
		Watts	883	877	871	812	753	715	676	628	579	–	–
	High	Cfm	2352	2294	2236	2108	1980	1881	1781	1669	1557	–	–
		Watts	915	896	877	856	834	800	765	729	693	–	–
060	Low	Cfm	2451*	2423*	2394	2346	2297	2231	2165	2049	1932	1801	–
		Watts	1418	1364	1309	1266	1222	1174	1126	1062	998	939	–
	High	Cfm	2647	2598	2549	2498	2446	2366	2285	2176	2067	1917	–
		Watts	1578	1524	1470	1424	1377	1329	1280	1216	1151	1085	–

*Airflow exceeds maximum coil velocity. Condensate may be blown off of coil.

NOTES:

1 Air deliveries are based on unit dry coil without air filter or optional electric heaters Deduct field-supplied air filter and electric heater pressure drop to obtain external static pressure available for ducting. Dashes indicate less than minimum airflow, coil frosting may occur.

2 If supplemental electric heaters are used, refer to Minimum Airflow for Safe Electric Heater Operation table on page 21 for minimum airflows These airflows will be slightly greater than those required for unit operation.

AIR DELIVERY (CFM) AT 208-V DOWNFLOW SET-UP

50NQ UNIT SIZE	MOTOR SPEED	AIR DELIVERY	EXTERNAL STATIC PRESSURE (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
018	Low	Cfm	485	462	395	360	334	–	–	–	–	–	–
		Watts	141	130	113	103	96	–	–	–	–	–	–
	High	Cfm	660	645	558	491	452	381	–	–	–	–	–
		Watts	200	198	186	175	166	154	–	–	–	–	–
024	Low	Cfm	1057	1026	994	962	930	883	836	751	–	–	–
		Watts	420	412	403	393	383	368	352	329	–	–	–
	High	Cfm	1325	1287	1248	1199	1149	1088	1026	929	831	–	–
		Watts	542	526	509	491	472	451	430	405	380	–	–
030	Low	Cfm	1082	1046	1009	983	957	915	873	–	–	–	–
		Watts	419	412	404	397	389	377	365	–	–	–	–
	High	Cfm	1340	1310	1280	1235	1189	1130	1071	984	897	–	–
		Watts	548	536	524	505	486	465	444	419	394	–	–
036	Low	Cfm	1207	1196	1173	1142	1101	1085	–	–	–	–	–
		Watts	534	529	523	513	503	486	–	–	–	–	–
	High	Cfm	1674*	1658*	1627*	1601	1543	1478	1386	1155	–	–	–
		Watts	765	745	724	700	675	643	611	545	–	–	–
042	Low	Cfm	1207	–	–	–	–	–	–	–	–	–	–
		Watts	534	–	–	–	–	–	–	–	–	–	–
	High	Cfm	1674*	1658*	1627*	1601	1543	1478	1386	1155	–	–	–
		Watts	765	745	724	700	675	643	611	545	–	–	–
048	Low	Cfm	1838	1817	1795	1778	1760	1697	1633	1517	1400	–	–
		Watts	972	916	859	804	749	712	675	619	563	–	–
	High	Cfm	2245	2196	2146	2077	2007	1908	1808	1685	1561	–	–
		Watts	1041	981	920	874	827	785	743	692	640	–	–
060	Low	Cfm	2085	2083	2081	2050	2019	1964	1909	1836	1763	–	–
		Watts	1215	1189	1162	1105	1048	1014	979	929	879	–	–
	High	Cfm	2313	2291	2269	2215	2161	2090	2018	1928	1837	–	–
		Watts	1382	1321	1260	1204	1147	1099	1051	1001	950	–	–

AIR DELIVERY (CFM) AT 230- AND 460-V DOWNFLOW SET-UP

50NQ UNIT SIZE	MOTOR SPEED	AIR DELIVERY	EXTERNAL STATIC PRESSURE (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
018	Low	Cfm	880	832	707	596	504	410	–	–	–	–	–
		Watts	225	202	171	155	143	129	–	–	–	–	–
	High	Cfm	1106*	1021*	832	687	586	483	–	–	–	–	–
		Watts	305	291	262	249	241	233	–	–	–	–	–
024	Low	Cfm	1244	1211	1178	1136	1093	1031	969	879	789	–	–
		Watts	505	491	476	459	442	426	409	383	356	–	–
	High	Cfm	1530*	1467*	1404*	1339*	1273	1197	1120	1013	906	706	–
		Watts	629	556	482	508	534	511	488	460	431	390	–
030	Low	Cfm	1256	1227	1197	1162	1126	1067	1008	934	–	–	–
		Watts	514	500	486	472	458	439	420	397	–	–	–
	High	Cfm	1570	1513	1455	1393	1330	1254	1177	1077	977	–	–
		Watts	638	615	592	570	548	524	499	472	445	–	–
036	Low	Cfm	1448	1440	1431	1400	1368	1307	1245	–	–	–	–
		Watts	655	644	633	616	598	570	542	–	–	–	–
	High	Cfm	1974*	1924*	1874*	1783*	1692*	1587	1481	1267	1053	–	–
		Watts	880	850	819	782	744	710	675	614	553	–	–
042	Low	Cfm	1448	1440	1431	1400	1368	1307	1245	–	–	–	–
		Watts	655	644	633	616	598	570	542	–	–	–	–
	High	Cfm	1974*	1924*	1874*	1783*	1692*	1587	1481	1267	–	–	–
		Watts	880	850	819	782	744	710	675	614	–	–	–
048	Low	Cfm	2125	2102	2079	2016	1952	1865	1777	1657	1536	–	–
		Watts	994	953	911	859	806	759	711	668	625	–	–
	High	Cfm	2441	2349	2256	2174	2092	1988	1884	1748	1612	–	–
		Watts	1083	1026	968	933	897	854	810	760	709	–	–
060	Low	Cfm	2401	2361	2321	2261	2201	2124	2046	1952	1857	1755	–
		Watts	1352	1314	1275	1222	1168	1115	1062	1011	960	911	–
	High	Cfm	2556*	2492*	2428*	2358	2287	2201	2115	2016	1917	1810	–
		Watts	1494	1432	1370	1311	1252	1207	1162	1107	1051	999	–

*Airflow exceeds maximum coil velocity. Condensate may be blown off of coil

NOTES:

1 Air deliveries are based on unit dry coil without air filter or optional electric heaters Deduct field-supplied air filter and electric heater pressure drop to obtain external static pressure available for ducting Dashes indicate less than minimum airflow; coil frosting may occur

2 If supplemental electric heaters are used, refer to Minimum Airflow for Safe Electric Heater Operation table on page 21 for minimum airflows These airflows will be slightly greater than those required for unit operation

WET COIL PRESSURE DROP

50NQ UNIT SIZE	WET COIL PRESSURE DROP (in. wg)
018, 024	0.054
030	0.060
036	0.070
042	0.075
048	0.086
060	0.100

ACCESSORY STATIC PRESSURE DROP (in. wg)

SMALL-CABINET* UNITS

ACCESSORY	AIRFLOW (CFM)									
	650	750	850	950	1050	1150	1250	1350	1450	1550
Downflow Economizer†	0.029	0.031	0.033	0.036	0.039	0.042	0.045	0.049	0.056	0.064
Horizontal Economizer (With 2-in. Filters)	0 270	0 270	0 290	0 310	0.310	0 320	0 350	0 350	0 350	0 360
High-Capacity Filter Rack – Downflow (With 2-in. Field-Supplied Filter)	0 037	0 040	0 043	0 046	0 049	0 052	0 055	0.058	0 064	0 069
High-Capacity Filter Rack – Horizontal (With 2-in. Factory-Supplied Filter)	0 080	0 100	0 120	0 130	0 150	0 160	0.180	0 200	0 210	0 220
Flexible Ducts and Concentric Diffuser Box (14 in.)	0 060	0 080	0 100	0 130	0 160	0 190	0 220	0 260	0 300	0.340
Flexible Ducts and Concentric Diffuser Box (16 in.)	0 040	0.060	0 080	0 110	0 140	0 170	0 200	0 240	0 280	0 320

LARGE-CABINET* UNITS

ACCESSORY	AIRFLOW (CFM)									
	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150
Downflow Economizer†	0.054	0.056	0.059	0.063	0.068	0.078	0.091	0.100	0.107	0 118
Horizontal Economizer (With 2-in. Filters)	0 270	0.280	0 290	0 300	0 310	0 320	0 330	0 350	0 380	0 410
High-Capacity Filter Rack – Downflow (With 2-in. Field-Supplied Filter)	0 013	0 017	0 022	0 026	0 034	0.040	0 045	0.051	0 056	0 062
High-Capacity Filter Rack – Horizontal (With 2-in. Factory-Supplied Filter)	0 070	0 090	0.100	0 120	0 130	0 140	0 150	0 160	0 170	0 180
Flexible Ducts and Concentric Diffuser Box (16 in.)	0 090	0 110	0 120	0 140	0.160	0 180	0 200	–	–	–
Flexible Ducts and Concentric Diffuser Box (18 in.)	–	–	–	–	–	0 140	0.160	0 180	0 200	0 220

* Refer to Accessories table on pages 5 and 6 for small- and large-cabinet model sizes
† Pressure drop is based on a natural air pressure in the conditioned space

ELECTRIC HEAT ACCESSORY PRESSURE DROP (in. wg)

HEATER kW	AIRFLOW (CFM)								
	600	800	1000	1200	1400	1600	1800	2000	2200
5.0-7.5-10.0	.020	030	040	045	050	055	.060	070	080
15.0-20.0-25.0	040	045	050	.055	060	070	080	090	.100

ELECTRIC HEATER DATA AND USAGE

50NQ UNIT SIZE	HEATER PART NO.	HTR V-PH	kW	CAPACITY (1000 Btuh)	BRANCH CIRCUIT						
					HEATER AMPS	MCA	MOCP AMPS	STAGES*	ELEMENTS	POWER WIRE SIZE†	GROUND WIRE SIZE
	50NQ390005000101	240-1	5.0	17 1	20 8	26 0	30	1	1	10	10
018-060	50NQ390007500101		7.5	25.6	31 3	39 1	40	1	2	8	10
	50NQ390010000101		10.0	34 1	41 6	52 0	60	1	2	6	10
030-060	50NQ390015000101**††		15 0	51 2	62 5	78 1	80	2	3	3	8
	50NQ390015000201**										
036-060	50NQ3900200000101**††		20 0	68 2	83 3	104 2	110	2	4	2	6
	50NQ390020000201**										
060	50NQ390025000101**††		25 0	85 4	104 0	130 0	150	3	5	1	6
	50NQ390025000201**										
036-060	50NQ590010000101	240-3	10 0	34 1	24 0	30 0	35	1	3	10	10
	50NQ590017500101		17 5	59 8	42 1	52 6	60	2	3	6	10
060	50NQ590025000101**††		25 0	85 4	60 1	75 2	80	2	6	3	8
	50NQ590025000201**										
	50NQ690010000101	480-3	10 0	34 1	12 0	15 0	20	1	3	14	14
036-060	50NQ690015000101		15 0	51 2	18 0	22 5	25	2	6	10	10
	50NQ690020000101		20 0	68 2	24 0	30 0	35	2	6	10	10
060	50NQ690025000101		25 0	85 4	30 1	37 6	40	2	6	8	10

LEGEND
CSA – Canadian Standards Association
MCA – Maximum Circuit Ampacity (Complies with Section 430-24 of NEC)
MOCP – Maximum Overcurrent Protection (Fuse or Circuit Breaker)
NEC – National Electrical Code
* The va draw per stage is 6 2.
† Wire size based on 75 C copper conductor
** Heater shipped with fuses
†† Heater not CSA approved

NOTES
1. Power supply electrical characteristics for unit and heater must be identical
2 Electric heaters require a separate electrical service
3 The heater kW ratings shown above are at 240 v. Use the following table to determine heater capacity for your particular voltage

HEATER kW RATING	VOLTAGE DISTRIBUTION V-Ph-60	MULTIPLICATION FACTOR
240	208	75
	230	92

MINIMUM AIRFLOW FOR SAFE ELECTRIC HEATER OPERATION

50NQ UNIT SIZE	018	024	030	036	042	048	060
AIRFLOW (Cfm)	600	800	1000	1200	1400	1600	2000

Electrical data

UNIT 50NQ	V–PH–HZ	VOLTAGE RANGE		COMPRESSOR		INDOOR-FAN MOTOR		OUTDOOR-FAN MOTOR	UNIT FLA	POWER SUPPLY		AWG MINIMUM WIRE SIZE	MAXIMUM WIRE LENGTH (ft)
		Min	Max	RLA	LRA	Hp	FLA	FLA		MCA	MOCP*		
018	208/230-1-60	187	253	10 4	49 0	1/4	1.8	0 9	13.1	15 7	25	12	95
024	208/230-1-60	187	254	12 4	61.0	1/3	2 5	0 9	15.8	18 9	30	12	85
030	208/230-1-60	187	253	16 0	82 0	1/3	2 5	0.9	19.4	23 4	35	10	130
	208/230 1-60	187	254	19 6	83 5	1/2	3 2	1 6	24 4	29.3	40	10	100
036	208/230-3-60	187	254	12 2	66 0	1/2	3 2	1 6	17 0	20.1	30	10	150
	460-3-60	414	508	5.7	35.0	1/2	1 6	0.8	8.1	9.5	15	14	120
042	208/230-1-60	187	254	20 4	102 0	1/2	3 2	1.6	25.2	30.3	50	8	150
	208/230-3-60	187	254	14 0	91 0	1/2	3 2	1 6	18 8	22 3	35	10	130
	460-3-60	414	508	6.4	42.0	1/2	1.6	0.8	8.8	10.4	15	14	110
048	208/230-1-60	187	254	25 0	114 0	3/4	4 2	2 2	31 4	37 7	60	8	100
	208/230-3-60	187	254	15 9	84 0	3/4	4 2	2 2	22 3	26 3	35	10	115
	460-3-60	414	508	7 8	42 0	3/4	2.8	1.0	11 6	13.6	20	14	90
060	208/230-1-60	187	253	27 9	140.0	1	6 7	2 2	36 8	43 8	60	8	150
	208/230-3-60	187	253	19 4	98.0	1	6 7	2 2	28 3	33 2	50	8	110
	460-3-60	414	506	9 7	49.0	1	3.5	1.0	14.2	16.6	25	12	100

LEGEND
AWG – American Wire Gage
FLA – Full Load Amps
HACR – Heating, Air Conditioning and Refrigeration
Hp – Nominal Horsepower
LRA – Locked Rotor Amps
MCA – Minimum Circuit Amps
MOCP – Maximum Overcurrent Protection
NEC – National Electrical Code
RLA – Rated Load Amps
*Fuse of HACR circuit breaker

NOTES:

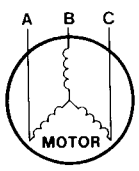
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker
2. Unbalanced 3-Phase Supply Voltage

   Never operate a motor where a phase imbalance in supply voltage is greater than 2% Use the following formula to determine the % voltage imbalance

   % Voltage Imbalance

   $$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

   Example. Supply voltage is 460-3-60



   AB = 452-v
   BC = 464-v
   AC = 455-v

   Average Voltage = $\frac{452 + 464 + 455}{3}$

   $= \frac{1371}{3} = 457$

   Determine maximum deviation from average voltage

   (AB) 457 - 452 = 5-v

   (BC) 464 - 457 = 7-v

   (AC) 457 - 455 = 2-v

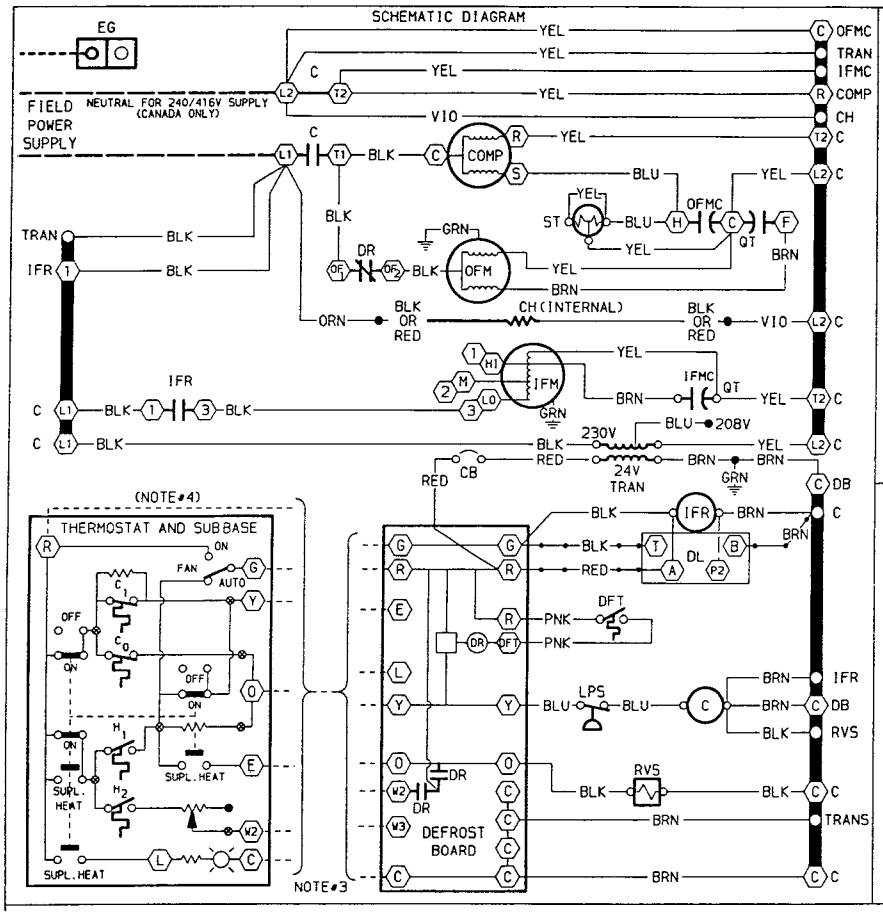
   Maximum deviation is 7 v Determine % voltage imbalance.

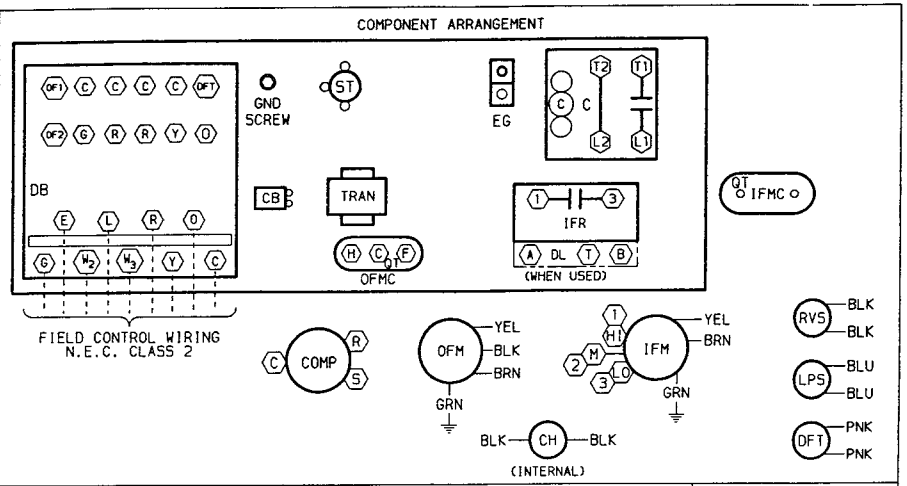
   % Voltage Imbalance = $100 \times \frac{7}{457} = 1\ 53\%$

   This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%

   IMPORTANT. If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

3. Minimum wire size is based on 60 C copper wire up to 100 amps, and 75 C copper wire over 100 amps. If longer lengths or other temperature-rated wire is required, determine wire size per NEC
4. Voltage drop of wire must be less than 2% of rated voltage.





- LEGEND -

C	CONTACTOR
CB	CIRCUIT BREAKER
CH	CRANKCASE HEATER
COMP	COMPRESSOR
DB	DEFROST BOARD
DFT	DEFROST THERMOSTAT
DR	DEFROST RELAY
EG	EQUIPMENT GROUND
GND	GROUND
IFM	INDOOR-FAN MOTOR
IFMC	INDOOR-FAN MOTOR CAPACITOR
IFR	INDOOR-FAN RELAY
LPS	LOW-PRESSURE SWITCH
OFM	OUTDOOR-FAN MOTOR
OFMC	OUTDOOR-FAN MOTOR CAPACITOR
QT	QUAD TERMINAL
RVS	REVERSING VALVE SOLENOID
ST	START THERMISTOR
TRAN	TRANSFORMER
DL	DELAY BOARD

- TO INDICATE COMMON POTENTIAL ONLY (NOT TO REPRESENT WIRE)
- FIELD POWER WIRING
- EQUIPMENT GROUND WIRING
- FACTORY WIRING
- FIELD CONTROL WIRING
- OPTIONAL COMPONENT WIRING
- COMPONENT CONNECTION (MARKED)
- COMPONENT CONNECTION (UNMARKED)
- JUNCTION
- JUNCTION (THERMOSTAT TO SUBBASE)

THERMOSTAT HH07AT171

THERMOSTAT SUBBASE HH93AZ188

NOTES:
1. COMPRESSOR AND FAN MOTORS THERMALLY PROTECTED.
2. USE COPPER CONDUCTORS ONLY
3. CONTROL WIRES: CONNECT Y TO Y, C TO C, ETC. IN PATTERN SHOWN.
4. MUST USE THERMOSTAT AND THERMOSTAT SUBBASE SPECIFIED IN ABOVE CHART.
5. CONTROL TRANSFORMER IS CONNECTED TO 230 V LEAD. IF 208 V POWER SUPPLY IS USED, CONNECT TO 208 V LEAD AND INSULATE 230 V LEAD.

Operating sequence

Cooling — On a call for cooling, thermostat makes circuit R-O, R-Y, and R-G. When room temperature rises to within 2° F of control setting of thermostat, circuit R-O makes, energizing reversing valve solenoid (RVS). Unit is now in standby condition for cooling. As room temperature rises, the second-stage bulb makes, allowing a circuit (R-Y) through low-pressure switch (LPS) to contactor (C), starting compressor (COMP) and outdoor-fan motor (OFM). Circuit R-G energizes indoor-fan relay (IFR), starting indoor-fan motor (IFM).

When thermostat is satisfied, contacts open, deenergizing contactor; compressor stops immediately. On 3-phase units, IFR opens immediately and indoor fan stops. On size 024 and 036-060 single-phase units, IFR delays 30 seconds before opening and stopping motor. On size 030 single-phase units, IFR delays 45 seconds before opening and stopping motor. There is no time delay on size 018 units.

Heating — On a call for heat, thermostat makes circuits R-Y and R-G. Circuit R-Y is completed, allowing circuit through low-pressure switch (LPS) to contactor (C), starting compressor (COMP) and outdoor-fan motor (OFM). Circuit R-G is also completed, energizing indoor-fan relay (IFR) and starting indoor-fan motor (IFM).

Should room temperature continue to fall, circuit R-W is made through second-stage thermostat bulb. If accessory electric heat package is used, a sequencer is energized, bringing on first bank of supplemental electric heat. When accessory outdoor-air thermostats are used with multi-stage heaters, the full electric heater will not be employed until the outdoor ambient temperature drops to the set point of the thermostat(s). When thermostat is satisfied, contacts open, deenergizing contactor and sequencer. Motors and heaters deenergize. On size 024 and 036-060 single-phase units, IFR delays 30 seconds before opening and stopping motor. On size 030 single-phase units, IFR delays 45 seconds before opening and stopping motor. There is no time delay on size 018 units.

Defrost — The defrost board (DB) is a time/temperature control which includes a field-selectable time period between checks for defrost (30, 50, and 90 minutes). Electronic timer and defrost cycle start only when contactor is energized and defrost thermostat (DFT) is closed.

Defrost mode is similar to Cooling mode, except outdoor-fan motor stops and a bank of accessory electric heat turns on to warm air supplying the conditioned space.

Packaged Rooftop Air-to-Air Heat Pump Constant Volume Application

HVAC Guide Specifications — Section 50NQ

Size Range: **1-1/2 to 5 Tons, Nominal (Cooling)**
18,000 - 60,000 Btuh, Nominal (Heating)

Carrier Model Number· **50NQ**

Part 1 — General

1.01 SYSTEM DESCRIPTION

Outdoor rooftop/slab mounted, electrically controlled, air-to-air heat pump utilizing a reciprocating-type compressor for heating and cooling duty. Unit shall discharge supply air downward or horizontally as shown on contract drawings.

1.02 QUALITY ASSURANCE

A. Unit shall be rated in accordance with ARI Standards 210/240-89 and 270-84.

B. Unit shall be designed in accordance with UL Standard 559.

C. Unit shall be designed to conform to ANSI B9.1.

D. Unit shall be UL listed and CSA certified as a total package for safety requirements.

E. Roof curb shall be designed to conform to NRCA standards

F. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Unit shall be stored and handled in accordance with manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

A General·

Factory-assembled, single piece, air-to-air heat pump. Contained within the unit enclosure shall be all factory wiring, piping, controls, and refrigerant charge (R-22).

B. Unit Cabinet.

1. Unit cabinet shall be constructed of phosphated, bonderized, zinc-coated, prepainted steel.
2. Indoor-blower compartment interior cabinet surfaces shall be insulated with a minimum 1/2-in thick, flexible fiberglass insulation, coated on the air side Aluminum-foil faced fiberglass insulation shall be used in the heating compartment.
3. Cabinet panels shall be easily removable for servicing
4. Filters shall be accessible through a removable access panel.
5. Unit shall be a factory-installed condensate drain.

C. Fans:

1. Indoor Fan (Evaporator Fan)·
   a. Fan shall be 2-speed, direct drive as shown on the equipment drawings.
   b. Fan wheel shall be made from steel, and be double-inlet type with forward curved blades with a corrosion resistant finish and shall be dynamically balanced.
2. Outdoor (condenser) fan shall be of the direct-driven propeller type with aluminum blades, riveted to corrosion resistant steel spiders, and shall be dynamically balanced and discharge air vertically upwards.

D Compressor.

1. Fully hermetic type with internal and external vibration isolation

E. Coils:

1. Indoor and outdoor coils shall have aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.
2. Tube sheet openings shall be belled to prevent tube wear

F. Refrigerant Components·

1. AccuRater® feed system.
2. Reversing valve
3. Accumulator.

G Controls and Safeties·

1. Unit Controls·
   a. Unit shall be complete with self-contained low-voltage control circuit.
   b. Unit shall incorporate an outdoor-coil defrost system to prevent excessive frost accumulation during heating duty, and shall be controlled as follows·
      1) Defrost shall be initiated on the basis of time and coil temperature.
      2) A 30/50/90 minute timer shall activate defrost cycle only if coil temperature is low enough to indicate a heavy frost condition.
      3) Defrost cycle shall terminate when defrost thermostat is satisfied, or shall have a positive termination time of 10 minutes.
2. Safeties:
   a Compressor overtemperature and overcurrent.
   b. Low-pressure switch.
   c. High-pressure switch
   d. Defrost thermostat.

H. Operating Characteristics:

1. Unit shall be capable of starting and running at 115 F ambient outdoor temperature per maximum load criteria of ARI Standard 240.
2. Compressor with standard controls shall be capable of operation down to 55 F ambient outdoor temperature in cooling duty
3. Compressor shall be capable of operation in heating duty down to 0° F ambient outdoor-air temperature.

4. Unit shall be capable of simultaneous heating duty and defrost cycle operation when using electric heaters indicated in Section K, Special Features

I. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single location. (NOTE Accessory electric heaters require a separate electrical service.)

J. Motors.

1. Compressor motors shall be of the refrigerant-cooled type with line break thermal and current overload protection.
2. All fan motors shall have permanently lubricated bearings, and inherent automatic-reset thermal overload protection.
3. Outdoor-fan motor shall be open drip-proof.

K Special Features

1. Roof Curb.
   a. Formed, 16-gage galvanized steel with wood nailer strip and capable of supporting entire unit weight
   b. Allows for installing and securing ductwork to curb prior to mounting unit on the curb.

* 2 Economizer:

a Economizer controls shall be capable of providing "free" cooling using outdoor air.

b. Equipped with low-leakage dampers not to exceed 3% leakage, at one-in wg pressure differential.

c. Capable of introducing up to 100% outdoor air.

d Equipped with barometric relief damper.

e. Spring-return motor shuts off the outdoor damper in the event of a power failure

* 3 Manual Damper·

Manual damper package shall consist of damper, birdscreen, and rainhood; damper can be preset to admit up to 50% outdoor air for year-round ventilation.

* 4. Two-Position Economizer:

Two-position economizer package shall include outdoor- and return-air damper, and motor. Admits up to 100% outdoor air

5. Electric Resistance Heaters:

a Open-wire nichrome elements with all the necessary safety and operating controls.

b. UL/CSA listed and indicated on basic unit informative plate

c. Each heater assembly shall include the following safety features.

1) Automatic reset switches.

2) Heat limiters for primary and secondary, overcurrent, and thermal protection

6. Compressor Cycle Delay.

Compressor shall be prevented from restarting for a minimum of 5 minutes after shutdown.