

BLOCK

671

LOT

3

ADDRESS (SITE)

BRICK PLAZA Space 25B

PERMIT NO.

154-95

RECEIVED

JAN 24 1995



CONSTRUCTION PERMIT APPLICATION

Applicant Completes Sections I, II, III (optional), IV, VI and VII

OLD CoRBa

I. IDENTIFICATION

- Proposed Work-site at: BRICK PLAZA Space 25B Rt 70
- Name of Owner in Fee: Federal Realty Invest TRUST Tel. (215) 657-8740
Address: 1600 Hampdon Ln Bethesda Md
street municipality zip code
- Ownership in Fee: Public _____ Private ☒
- Principal Contractor: Russ Kelly Inc. Tel. (609) 235-6164
Address: 12 Orchard Way Mt. Laurel NJ 08054
- License No. OR, if new home, Builder Reg. No. _____ Exp. Date _____
Federal Emp No. 22-21546-68 Social Security No. _____
- Architect or Engineer: RALPH PANDRAX Tel. (609) 795-2525
Address: 6 Hadden Ave Haddonfield NJ
- Responsible Person In Charge of Work: Russ Kelly Tel. (609) 235-6164

II. PROPOSED WORK

- ☐ Minor Work (single trade)
- ☐ Small Job (\$5,000 and no prior approvals)
- ☐ New Building
- ☐ Addition
- ☒ Alteration
- ☒ Fire Protection
- ☒ Plumbing
- ☒ Electrical
- ☐ Asbestos Abatement
- ☐ Demolition

Est. Cost

TOTAL COSTS

4000

OPTIONAL (for office use only)

Plans Rec'd By	Date Rec'd	Rejection Date	Approval Date	Re-viewer	Resubmission Dates Approval	Rejection	Re-viewer
WS	1/24/95		2-2-95	RA	5/10/95		WS
			4/2/95	JK	6/12/95		JK
			2-2-95	PH	5/12/95		PH
					3/29/95		May
En	1/1/95		En	hst			

III. DO YOU WANT: (optional) 1. ☐ Partial Releases 2. ☐ Prototype Processing

IV. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

- ☐ Elevators/Escalators/Lifts/Dumbwaiters/Moving Walks
- ☐ High Pressure Boilers
- ☐ Pressure Vessels
- ☐ Refrigeration Systems
- ☐ Cross-Connections/Backflow Preventers
- ☐ Hazardous Uses/Places of Assembly
- ☐ Sprinklers
- ☐ Smoke Control Systems in Open Wells
- ☐ Underground Storage Tanks

V. FEE SUMMARY (for office use only)

		Update	Update
1. Building	\$ 30-		
2. Electrical	64-		
3. Plumbing	33-		
4. Fire Protection			
5. Other			
6. Subtotal	\$ 127-		
7. Less 20% for State Plan Review	13-		
8. Subtotal	\$ 3-		
9. DCA Training Fee			
10. Subtotal	\$ 20-		
11. Cert. of Occupancy			
12. Other ZPA \$1500			
13. TOTAL	\$ 178-		

VI. BUILDING/SITE CHARACTERISTICS

- Number of Stories _____
- Height of Structure _____ ft.
- Area—Largest Floor 400000 sq. ft.
- Building Area—All Floors _____ sq. ft.
- Volume of Structure _____ cu. ft.
- Construction Classification C-1
- Total Land Area Disturbed _____ sq. ft.
- Flood Hazard Zone _____
- Base Flood Elevation _____ ft.
- Wetlands yes _____ sq. ft.
no _____
- Fire Grading _____
- Max. Live Load _____
- Max. Occupancy Load _____

VII. DESCRIPTION OF BUILDING USE

A. RESIDENTIAL

- ☐ Hotels (R-1)
 - ☐ Multi-Family (R-2)
 - ☐ Two-Family (R-3) BOCA
 - ☐ Two-Family (R-4) CABO
 - ☐ One-Family (R-3) BOCA
 - ☐ One-Family (R-4) CABO
- No of dwelling units: _____
Before Construction _____
After Construction _____
Net gain or loss _____

B. NON-RESIDENTIAL

- State Specific Use: VACANT space
- Use Group: RD
- Change in Use Group. Indicate Former: RD

LDS BR 10404744

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

- A. ☐ I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

- B. ☐ I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(e)1.vii:

I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

- C. ☐ I further certify that I will perform or supervise the following work:

C.1. ☐ Building C.2. ☐ Fire Protection

I further certify that I will perform the following work:

C.3. ☐ Electrical C.4. ☐ Plumbing

- D. ☐ I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature _____ Date _____

II. AGENT SECTION

(to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:32-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

☒ Check if contractor.

Agent Name

Jim KREMMEL

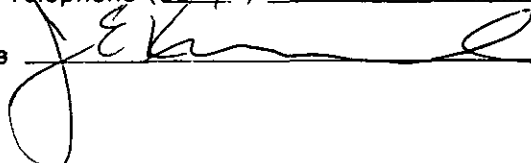
Address

12 Orchard way
Mt. Laurel NJ 08054

Telephone

(609) 235-6164

Signature



Date

1-24-95

OFFICE DATE RECEIVED: _____

COMMENTS

VIII. PRIOR APPROVALS CHECKLIST (office use only)	LOCAL APPROVAL		COUNTY APPROVAL		REGIONAL APPROVAL		STATE APPROVAL	
	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date
☐ Planning Board								
☐ Zoning Board								
☐ Sewer Authority								
☐ Water Authority								
☐ Fire Department								
☐ Police Department								
☐ Health Department								
☐ Soil Conservation								
☐ N.J. Dept. of Community Affairs								
☐ N.J. Department of Transportation								
☐ N.J. Dept. of Environmental Protect.								
☐ Utility Dig No.								
☐ Other								
☐								
☐								
☐								

IMPORTANT
A.H.B.T. - EXEMPT

IX. SUBCODES AND SPECIAL REGULATIONS APPLICABLE (office use only—optional)

Name of Code & Edition

Name of Code & Edition

Other

Building _____
Electrical _____
Plumbing _____
Fire Protection _____
Mechanical _____

Energy _____
Barrier Free _____
Flood Hazard _____
As Built Elevation Cert. _____
Other _____

X. CERTIFICATES ISSUED (office use only)

DATE EXPIRED

☐ Temporary Certificate of Occupancy	No. _____	_____
☐ Temporary Certificate of Occupancy	No. _____	_____
☐ Continued Certificate of Occupancy	No. _____	_____
☐ Certificate of Occupancy	No. _____	_____
☐ Certificate of Approval	No. _____	_____
☐ None		



CERTIFICATE

Date Issued
Control #
Permit # 154-95

IDENTIFICATION

Block 671 Lot 8
Work Site Location Brick Blvd. & Chambersbridge Rd.
Owner in Fee Federal Realty Investment Trust
Address 1600 Hampdon Lane
Bathesda, Md.
Tele. ()
Contractor Buss-Kelly Inc.
Address 12 Orchard Way
Mt. Laurel, NJ
Tele. ()
Lic. No. or Bids. Reg. No.
Federal Emp. No.
or Social Security No.

Home Warranty No. N/A
Use Group M 2 hrs. 1
Maximum Live Load
Description of Work/Use:

Alterations to space 25B
at Brick Plaza

Type of Warranty Plan: [] State [] Private
Construction Classification
Maximum Occupancy Load

CERTIFICATE OF OCCUPANCY/APPROVAL

☐ CERTIFICATE OF OCCUPANCY

This serves notice that said building, structure, or equipment has been constructed or installed in accordance with the New Jersey Uniform Construction Code, and is approved for use and/or occupancy.

☐ CERTIFICATE OF CONTINUED OCCUPANCY

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

☐ TEMPORARY CERTIFICATE OF OCCUPANCY

If this is a Temporary Certificate of Occupancy the following conditions must be met no later than , 19 or the owner will be subject to a fine or order to vacate:

Fee \$
Paid [] Check No.
Collected by:

CONSTRUCTION OFFICIAL



CONSTRUCTION PERMIT

Date Issued
Control #
Permit #

2/1/95

154-95

IDENTIFICATION Block 1011 Lot 8

Work Site Location _____ Contractor _____

Address _____

Owner in Fee _____

Address _____ Tele. (____) _____ 154#

Lic. No. or Bldrs. Reg. No. _____ Exp. Date _____ 0.00

Tele. (____) _____ Federal Emp. No. _____ 671 #

or Social Security No. _____ LDT _____ 0.00

is hereby granted permission to perform the following work:

☒ BUILDING ☒ PLUMBING ☐ OTHER _____
☐ ELECTRICAL ☒ FIRE PROTECTION

DESCRIPTION OF WORK:

CLUB HOUSE

NOTE: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

Estimated Cost of Work \$ 4000.00

PAYMENTS (Office Use Only)		
Building	30.00	30.00
Plumbing	14.00	14.00
Electrical	13.00	13.00
Fire Protection	3.00	3.00
Other	20.00	20.00
Other	15.00	15.00
DCA Training Fee	170.00	170.00
Cert. of Occ.	170.00	170.00
Other	0.00	0.00
Total		
Check No. <u>1111</u>		19:22
Cash		
Collected By:		



**PLUMBING
SUBCODE
TECHNICAL SECTION**



Date Received 2/3/95
Date Issued
Control #
Permit # 154-95

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION, WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 671 Lot 8
Work Site Location Beick Plaza Space 25B
5 Chambers Beick Rd
Owner in Fee Federal Realty Investment Trust
Address 1600 Battenside Ln
Baltimore MD
Tele. (410) 657-8746
Contractor PLUMBING SPECIALISTS INC
Address 629 Union Mill Rd
MD 21444
Tele. 609 234-2887
Lic. No. 6103
Federal Emp. No. 22245088 or Social Security No. _____

B. PLUMBING CHARACTERISTICS

Use Group Present 411 Proposed 411
Building Sewer Size 3/4" Public Sewer 4" Private Septic _____
Water Service Size 3/4" Public Water 4" Private Well _____
Estimated Cost of Plumbing Work \$ 1500

JOB SUMMARY (Office Use Only)

PLAN REVIEW:	INSPECTIONS	Dates (Month/Day)
	Type:	Failure Failure Approval Initial
☐ No Plans Required	Slab	
☐ Joint Plan Review Required:	Rough	
☐ Bldg. ☐ Elec.	Water	
☐ Fire ☐ Elevator	Sewer	
☐ Plumb. Plans Approved	Fixtures	
Date: <u>2-2-95</u>	Gas Equipment	
Approved by: <u>gmk</u>	Gas Piping	
SUBCODE APPROVAL:	Solar	
☐ CO ☐ CCO ☐ CA	TCO	
Approved By: <u>gmk</u>	CO	
Date: <u>2/3/95</u>	436	

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application and perform the work listed on this application.

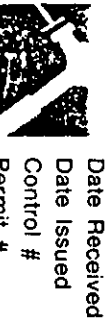
Signature—Contractor Seal

☒ Licensed Plumbing Contractor ☐ Exempt Applicant

D. TECHNICAL SITE DATA (List all fixtures.)

NO.	FIXTURE/EQUIPMENT	FEE (Office Use Only)
1	Water Closet	7
	Urinal/Bidet	
	Bath Tub	
	Lavatory	7
	Shower	
	Floor Drain	
	Sink	
	Dishwasher	
	Drinking Fountain	
	Washing Machine	
	Hose Bibb	
1	Water Heater	25
1	Fuel Oil Piping	15
	Gas Piping	
	Steam Boiler	
	Hot Water Boiler	
	Sewer Pump	
	Interceptor/Separator	
	Backflow Preventer	
	Greasetrap	
	Water Cooled A/C or Refrigeration Unit	
	Sewer Connection	
	Water Service Connection	
	Active Solar System	
	Other	10

Paid ☐ Check # _____	Administrative Surcharge \$ _____
	Minimum Fee \$ _____
	DCA Training Fee \$ _____
Collected by: _____	TOTAL \$ <u>64</u>



2/3/95
154-95

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 671 Lot 53 Space 25B
Work Site Location Brick Plaza
Owner in Fee Chen Bros Bridge Rd
Address Federal Realty Investment Trust
1600 Hampden Ln
Bethesda MD
Tele. (202) 457-8740
Contractor Russ Kelly Inc.
Address 12 Orchard Way
Mt. Laurel NJ 08054
Tele. (609) 235-6169
Lic. No. or Bldrs. Reg. No. _____
Federal Emp. No. 22-21546-68 or Social Security No. _____

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

Signature _____

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK

construct rest room partition
repair ceiling as per plan

JOB SUMMARY (Office Use Only)

PLAN REVIEW	Date	Initial	INSPECTIONS	Dates (Month/Day)
☒ No Plans Req.			Type: _____	Failure _____
☐ All			Footing	Approval _____
☐ Footing			Foundation	Initial _____
☐ Foundation			Slab	
☐ Frame			Frame	
☐ Other			Insulation	
Joint Plan Review Required:			Finishes:	
☐ Elec. ☐ Plumb. ☐ Fire			Energy	
SUBCODE APPROVAL			Mechanical	
☐ CO ☐ PCO ☐ Tex			TCO	
Date: <u>5/10/95</u>			Other	
Approved By: _____			Final	

B. BUILDING CHARACTERISTICS

Use Group R Present C-1 Proposed C-1
Constr. Class Present Proposed
No. of Stories 1
Height of Structure 18 ft Ft.
Area—Largest Floor 400,000 Sq. Ft.
New Bldg. Area/All Floors 0 Sq. Ft.
Volume of New Structure 0 Cu. Ft.
Total Land Area Disturbed 0 Sq. Ft.

Est. Cost of Bldg. Work:

1. New Bldg. \$ 2000
2. Alteration \$ 2000
3. Total (1+2) \$ 2000

(Office Use Only)
FEE

TYPE OF WORK:	(Office Use Only)
☐ New Building	\$ _____
☐ Addition	\$ _____
☒ Alteration	\$ _____
☐ Roofing	\$ _____
☐ Siding	\$ _____
☐ Fence	Height (6' or over) \$ _____
☐ Sign	Sq. Ft. \$ _____
☐ Pool	\$ _____
☐ Asbestos Abatement	\$ _____
☐ Other	\$ _____
☐ Other	\$ _____
☐ Demolition	\$ _____

Administrative Surcharge	Minimum Fee	DCA TRAINING FEE	TOTAL FEE
\$ _____	\$ _____	\$ _____	\$ _____

Paid ☐ Check # _____
Collected by: _____



**FIRE PROTECTION
SUBCODE
TECHNICAL SECTION**



Date Received 2/3/95
Date Issued
Control #
Permit # 154-95

A. IDENTIFICATION--APPLICANT: COMPLETE ALL APPLICABLE INFORMATION, WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 671 Brick Plaza 501 25B
Work Site Location 57 Chanbers Bldg Rd
Owner in Fee Federal Realty Investment Trust
Address 1600 Hampden Ln
City Dayton State MD
Tele. (25) 657-5740
Contractor Russ Key Inc
Address 12 Orchard Way City 0854
Tele. (609) 235 6104
Lic. No. _____
Federal Emp. No. 22-24546-08 or Social Security No. _____

B. FIRE PROTECTION CHARACTERISTICS

Use Group Present R Proposed R
Const. Class. Present C-1 Proposed C-1
Heating Systems ☒ New ☐ Existing
Type: ☒ Gas ☐ Oil ☐ Electrical ☐ Solar
☐ Other _____
Location: Room 709
Total Est. Cost of Fire Prot. Work \$ 500 ☐ Other _____

JOB SUMMARY (Office Use Only)

PLAN REVIEW:	INSPECTIONS:	Dates (Month/Day)
☐ No Plans Required	Type:	Failure Failure Approval Initial
Joint Plan Review Required:	Suppression Test	
☐ Bldg. ☐ Plumb.	Fire Alarm Test	
☐ Elec. ☐ Elevator	Smoke Test	
☒ Fire Plans Approved	Mechanical	
Date: _____	TCO	
Approved by: <u>2/2/95</u>	Other	
SUBCODE APPROVAL	Other	
☐ CO ☐ CCO <u>1/1/95</u>	Other	
Date: _____	Other	
Approved by: <u>6/2/95</u>		

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

[Signature]
SIGNATURE

D. TECHNICAL SITE DATA

Description of Work

Water Supply Source
Method of Valve Supervision
Local Alarm Supervision
Central Supervision
Proprietary Supervision

Flammable Liquid Storage Tanks
Combustible Liquid Storage Tanks
L.P.G. Storage Tanks
L.N.G. Storage Tanks

Wet Sprinkler Heads
Dry Sprinkler Heads
TOTAL

Smoke Detectors
Heat Detectors
TOTAL

Stand Pipes
Kitchen Hood Exhaust Systems

Pre-Engineered Systems
CO₂ Suppression
Halon Suppression
Foam Suppression
Dry Chemical
Wet Chemical

Gas or Oil Fired Appliance
OTHER _____

FEE (Office Use Only)

	Number	Fuel
Wet Sprinkler Heads	_____	() Capacity _____
Dry Sprinkler Heads	_____	() Capacity _____
TOTAL	_____	() Capacity _____
Smoke Detectors	_____	Fuel _____
Heat Detectors	_____	Fuel _____
TOTAL	_____	Fuel _____
Stand Pipes	_____	
Kitchen Hood Exhaust Systems	_____	
Pre-Engineered Systems	_____	
CO ₂ Suppression	_____	
Halon Suppression	_____	
Foam Suppression	_____	
Dry Chemical	_____	
Wet Chemical	_____	
Gas or Oil Fired Appliance	_____	
OTHER _____	_____	
Paid [] Check # _____	Administrative Surcharge \$ _____	
Minimum Fee \$ _____		
DCA Training Fee \$ _____		
Collected by: _____	TOTAL FEE \$ <u>33</u>	

TOWNSHIP OF BRICK

ZONING PERMIT

Date of Issue: Jan. 24, 1995 1995 Z 0080
Block 671 Lot 8 Zone B-3, H-D
Property Address: Brick Plaza
Owner: Federal Realty Investment Trust (Phone): 215-657-8740
Applicant: Russ Kelly Inc. (Phone): 609-235-6164
Use: Vacant retail unit, Space 25B
Proposed Construction (if any): Construct rest room and repair ceiling.

Conditions: _____

Please note that Building Permits, as well as Zoning Permits, must be obtained prior to any construction.

This permit shall be null, void and of no effect if any of the facts contained in the application upon the basis of which this permit was granted are false or untrue in any material respect. This permit shall expire one (1) year after the date of issuance if the use or substantial construction has not been commenced.

Sean Kinney

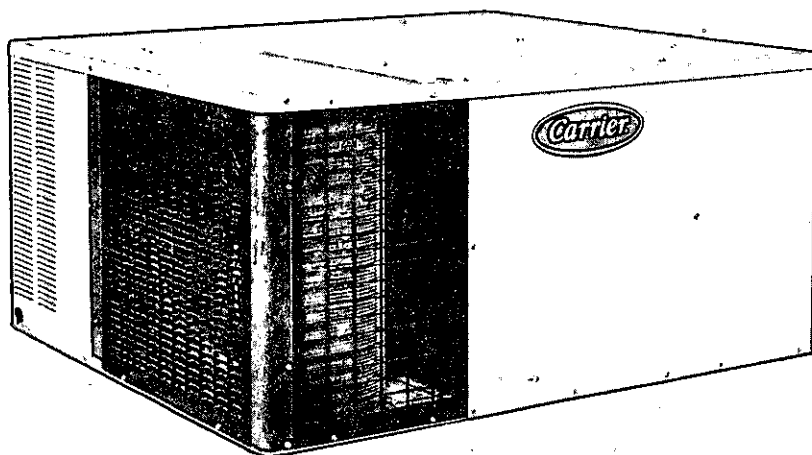
Land Use Officer



Product Data

48SS Single-Package Gas Heating/Electric Cooling Units

1-1/2 to 5 Nominal Tons



Single-Package Rooftop Products
with Energy-Saving Features

- direct spark ignition
- low sound levels
- 81% AFUE on most units
- 10 SEER

Features/Benefits

One-piece heating and cooling units with low installation costs, dependable performance, and easy maintenance

Easy installation

Factory-assembled package is a compact, fully self-contained, combination gas heating/electric cooling unit that is prewired, prepped, and pre-charged for minimum installation expense.

These 48SS units are available in a variety of standard and optional heating/cooling size combinations with voltage options to meet residential and light commercial requirements. Units are lightweight and install easily on a rooftop or a ground-level pad.

Convertible duct configuration

Unit is designed for easy use in either downflow or horizontal applications.

Efficient operation

High-efficiency design with SEERs (Seasonal Energy Efficiency Ratios) of 10.0 and AFUE (Annual Fuel Utilization Efficiency) ratings as high as 81.0%. All units have a minimum CSE (California Seasonal Efficiency) rating of 76%.

Energy-saving, direct-spark ignition saves gas by operating only when the room thermostat calls for heating. Standard units are furnished with natural gas controls. A low-cost, field-installed kit for propane conversion is available for all units.

Model 48SS units meet the California maximum oxides of nitrogen (NO_x) emission requirements.

Durable, dependable components

Compressors are designed for high efficiency. Each compressor is hermetically sealed against contamination to help promote longer life and dependable operation. Each compressor also has vibration isolation to provide quiet operation. All compressors have internal high-pressure and overcurrent protection. Rotary compressors are standard on unit size 018. Reciprocating compressors are standard on unit sizes 024-042. Scroll compressors are standard on unit sizes 048 and 060.

Monoport inshot burners produce precise air-to-gas mixture which provides for clean and efficient combustion. The large monoport on the inshot (or injection type) burners seldom, if ever, needs cleaning. All gas furnace components are accessible in one compartment.

Turbo-tubular™ heat exchangers are constructed of aluminized steel for corrosion resistance and optimum heat transfer for improved efficiency. The tubular design permits hot gases to make multiple passes across the path of the supply air. In addition, dimples located on the heat exchanger walls force the hot gases to stay in close contact with the walls, improving heat transfer.

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

Direct-drive, PSC condenser-fan motors are designed to help reduce energy consumption and provide for cooling operation down to 40 F outdoor temperature.

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

Evaporator and condenser coils are computer-designed for optimum heat transfer and cooling efficiency. Condenser coil is fabricated of copper tube and aluminum fins and is located inside the unit for protection against damage for long life and reliable operation. The condenser coil is internally mounted and protected by a composite grille. Copper fin coils are also available from the factory by special order. These coils are recommended in applications where aluminum fins are likely to be damaged due to corrosion and are ideal for sea-coast applications.

Low sound ratings ensure a quiet indoor and outdoor environment with sound ratings as low as 7.4 bels.

Easy to service cabinets provide easy accessibility to serviceable components during maintenance and installation. Rounded corners are an important safety feature, and a high quality finish ensures an attractive appearance.

Optional base rails provide holes for rigging and handling as well as an elevated mounting frame that provides structural support for horizontal installations.

Downflow option unit is converted for downflow at the factory to allow vertical ductwork connections. Unit is equipped with base rail.

Low and high voltage electrical entries allow low and high voltage to be brought in through either the front duct panel or rear flue panel.

Integrated gas control board provides safe and efficient control of heating and simplifies troubleshooting through its built-in diagnostic function.

Weatherized cabinets are constructed of heavy-duty, phosphated, zinc-coated prepainted steel capable of withstanding 500 hours in salt spray. Interior surfaces of the evaporator/heat exchanger compartment are insulated to help keep the conditioned air from being affected by the outdoor ambient temperature and to provide improved air quality. (Conforms to American Society of Heating, Refrigeration and Air Conditioning Engineers [ASHRAE] No. 62P.) Sloped condensate pan permits an external drain.

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	48SS	024	060	3	1	1	AA
Model No.							
48SS — Single Package Gas Heating/ Electric Cooling							
Nominal Cooling Capacity							
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							
Heat Level							
040 — 40,000 Btuh 100 — 100,000 Btuh							
060 — 60,000 Btuh 120 — 120,000 Btuh							
080 — 80,000 Btuh 140 — 140,000 Btuh							
	Options						
	AA — Base Rail						
	AB — Downflow With Base Rail						
	Packaging						
	Series						
	V-Ph-Hz						
	3 — 208/230-1-60						
	5 — 208/230-3-60						
	6 — 460-3-60						

ARI* capacities

COOLING CAPACITIES AND EFFICIENCIES

UNIT 48SS	NOMINAL TONS	STANDARD CFM	NET COOLING† CAPACITIES	SEER†	SOUND RATINGS** (Bels)
018040	1½	600	17,000	10.0	7.4
024040 024060	2	800	24,000	10.0	7.6
030040 030060 030080	2½	1000	29,200	10.0	8.0
036060 036080 036100 036120	3	1200	36,000	10.0	8.0
042060 042080 042100 042120	3½	1400	42,500	10.0	8.2
048080 048100 048120 048140	4	1600	47,000	10.0	8.2
060080 060100 060120 060140	5	1995	59,500	10.0	8.2

LEGEND

Bels — Sound Levels (1 bel = 10 decibels)
db — Dry Bulb
SEER — Seasonal Energy Efficiency Ratio
wb — Wet Bulb

*Air-Conditioning & Refrigeration Institute.

†Rated in accordance with U.S. Government DOE (Department of Energy) test procedures and/or ARI Standard 210/240-89.

**Rated in accordance with ARI Standard 270-84.

NOTES:

1. 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 outdoor entering-air temperature.

2. Before purchasing this appliance, read important energy cost and efficiency information available from your retailer.



ARI capacities (cont)



OUTDOOR SOUND: ONE-THIRD OCTAVE BAND DATA — DECIBELS

MODEL NO.	48SS						
Frequency (Hz)	018	024	030	036	042	048	060
63	49.8	38.1	45.7	47.8	45.5	56.0	54.3
125	56.5	55.0	58.1	59.3	61.2	65.6	65.1
250	60.3	65.3	68.7	67.4	70.4	71.5	71.5
500	59.8	67.2	64.7	68.8	69.9	71.4	72.7
1000	64.1	68.9	73.0	73.1	76.5	74.2	73.9
2000	64.1	65.5	70.2	69.5	71.3	73.3	73.4
4000	65.2	63.8	68.8	68.2	73.7	69.6	71.7
8000	56.0	60.3	66.6	65.8	65.5	67.1	66.3

Bels — Sound Levels (1 bel = 10 decibels)

HEATING CAPACITIES AND EFFICIENCIES

UNIT 48SS	HEATING INPUT (Btuh)	OUTPUT CAPACITY (Btuh)	TEMPERATURE RISE RANGE (°F)	AFUE (%)	CSE (%)
018040	40,000	32,800	20-50	81	76.5
024040			20-50	81	76.5
030040			20-50	81	76.5
024060	60,000	48,600	25-55	81	77.5
030060			25-55	81	77.5
036060			25-55	81	77.5
042060			25-55	81	77.5
030080	80,000	64,800	40-70	81	77.5
036080			40-70	81	77.5
042080			40-70	81	77.5
048080			40-70	81	77.5
060080			40-70	81	77.5
036100	100,000	81,000	50-80	81	78.0
042100			50-80	81	78.0
048100			50-80	81	78.0
060100			50-80	81	78.0
036120	120,000	97,200	60-90	80	77.5
042120			60-90	80	77.5
048120			60-90	80	77.5
060120			60-90	80	77.5
048140	140,000	113,000	50-80	80	77.5
060140			50-80	80	77.5

LEGEND

AFUE — Annual Fuel Utilization Efficiency

CSE — California Seasonal Efficiency

NOTE: Before purchasing this appliance, read important energy cost and efficiency information available from your retailer.



Physical data



SERIES 311, 511, AND 611

UNIT SIZE 48SS	018040	024040	024060	030040	030060	030080	036060	036080	036100	036120
NOMINAL CAPACITY (ton)	1½	2	2	2½	2½	2½	3	3	3	3
OPERATING WEIGHT (lb) Without Base Rail With Optional Base Rail	272 296	303 327	315 339	320 344	324 356	324 356	336 360	336 360	348 372	348 372
COMPRESSORS Quantity	Rotary 1	Reciprocating 1								
REFRIGERANT (R-22) Charge (lb)	2.60	2.75	2.75	3.40	3.40	3.40	4.30	4.30	4.30	4.30
REFRIGERANT METERING DEVICE Orifice ID (in.)	.030	.030	.030	.030	.030	.030	.032	.032	.032	.032
CONDENSER COIL Rows...Fins/in. Face Area (sq ft)	1...17 5.95	1...17 5.95	1...17 5.95	2...17 5.95	2...17 5.95	2...17 5.95	2...17 5.95	2...17 5.95	2...17 5.95	2...17 5.95
CONDENSER FAN Nominal Cfm Diameter (in.) Motor Hp (Rpm)	1700 18 ½ (850)	1700 18 ½ (850)	1700 18 ½ (850)	1900 18 ½ (850)	1900 18 ½ (850)	1900 18 ½ (850)	1900 18 ¼ (1050)	1900 18 ¼ (1050)	1900 18 ¼ (1050)	1900 18 ¼ (1050)
EVAPORATOR COIL Rows...Fins/in. Face Area (sq ft)	3...15 1.83	3...15 2.29	3...15 2.29	3...15 2.29	3...15 2.29	3...15 2.29	3...15 3.06	3...15 3.06	3...15 3.06	3...15 3.06
EVAPORATOR FAN Nominal Airflow (Cfm) Size (in.)	600 10 x 10	800 10 x 10	800 10 x 10	1000 10 x 10	1000 10 x 10	1000 10 x 10	1200 10 x 10	1200 10 x 10	1200 10 x 10	1200 10 x 10
FURNACE SECTION* Burner Orifice No. (Qty...drill size) Natural Gas Burner Orifice No. (Qty...drill size) Propane Gas	1...32 1...41	1...32 1...41	2...38 2...46	1...32 1...41	2...38 2...46	2...32 2...42	2...38 2...46	2...32 2...42	3...36 3...44	3...32 3...42
RETURN-AIR FILTERS (in.)† Throwaway	20 x 20	20 x 20	20 x 20	20 x 24	20 x 24	20 x 24	20 x 24	20 x 24	20 x 24	20 x 24

UNIT SIZE 48SS	042060	042080	042100	042120	048080	048100	048120	048140	060080	060100	060120	060140
NOMINAL CAPACITY (ton)	3½	3½	3½	3½	4	4	4	4	5	5	5	5
OPERATING WEIGHT (lb) Without Base Rail With Optional Base Rail	375 399	375 399	387 411	387 411	414 438	426 450	426 450	426 450	453 477	465 489	465 489	465 489
COMPRESSORS Quantity	Reciprocating 1				Hermetic Scroll 1							
REFRIGERANT (R-22) Charge (lb)	5.20	5.20	5.20	5.20	6.50	6.50	6.50	6.50	7.00	7.00	7.00	7.00
REFRIGERANT METERING DEVICE Orifice ID (in.)	.034	.034	.034	.034	.030	.030	.030	.030	.030	.030	.030	.030
CONDENSER COIL Rows...Fins/in. Face Area (sq ft)	2...17 7.04	2...17 7.04	2...17 7.04	2...17 7.04	2...17 8.67	2...17 8.67	2...17 8.67	2...17 8.67	2...17 8.67	2...17 8.67	2...17 8.67	2...17 8.67
CONDENSER FAN Nominal Cfm Diameter (in.) Motor Hp (Rpm)	1900 18 ¼ (1050)	1900 18 ¼ (1050)	1900 18 ¼ (1050)	1900 18 ¼ (1050)	2400 20 ½ (1050)	2400 20 ½ (1050)	2400 20 ½ (1050)	2400 20 ½ (1050)	2400 20 ½ (1050)	2400 20 ½ (1050)	2400 20 ½ (1050)	2400 20 ½ (1050)
EVAPORATOR COIL Rows...Fins/in. Face Area (sq ft)	3...15 3.33	3...15 3.33	3...15 3.33	3...15 3.33	3...15 4.44	3...15 4.44	3...15 4.44	3...15 4.44	4...15 4.44	4...15 4.44	4...15 4.44	4...15 4.44
EVAPORATOR FAN Nominal Airflow (Cfm) Size (in.)	1400 10 x 10	1400 10 x 10	1400 10 x 10	1400 10 x 10	1600 10 x 10	1600 10 x 10	1600 10 x 10	1600 10 x 10	1995 10 x 10	1995 10 x 10	1995 10 x 10	1995 10 x 10
FURNACE SECTION* Burner Orifice No. (Qty...drill size) Natural Gas Burner Orifice No. (Qty...drill size) Propane Gas	2...38 2...46	2...32 2...42	3...36 3...44	3...32 3...42	2...32 2...42	3...36 3...44	3...32 3...42	3...30 3...40	2...32 3...42	3...36 3...44	3...32 3...42	3...30 3...40
RETURN-AIR FILTERS (in.)† Throwaway	24 x 24	24 x 24	24 x 24	24 x 24	24 x 30	24 x 30	24 x 30	816**	24 x 30	24 x 30	24 x 30	960**

*Based on altitude of 0-2000 feet.

†Required filter sizes shown are based on the larger of the ARI (Air Conditioning & Refrigeration Institute) rated cooling airflow or the heating airflow at a velocity of 300 ft/min for throwaway type or 450 ft/min for high-capacity type. Air filter pressure drop for non-standard filters must not exceed 0.08 in. wg.

**Sq inch. Filter is mounted external to unit.

Options and accessories



Factory-installed options

Unit with base rail provides holes for rigging and handling as well as an elevated mounting frame that gives additional structural support for horizontal installations.

Downflow option unit is shipped from factory configured for vertical ductwork connection. Unit is equipped with base rail.

Field-installed accessories

Factory-assembled roof 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.

Modulating economizers are available for downflow or horizontal discharge applications.

The 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.

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. Modulating economizers also have an adjustable, motor-mounted, minimum-position potentiometer and a compressor lockout switch. The motor operates through the unit 24-v low-voltage control circuit.

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

Manual outdoor-air damper provides for minimum outdoor air and is manually adjustable. This device closes automatically whenever the evaporator fan is not operating.

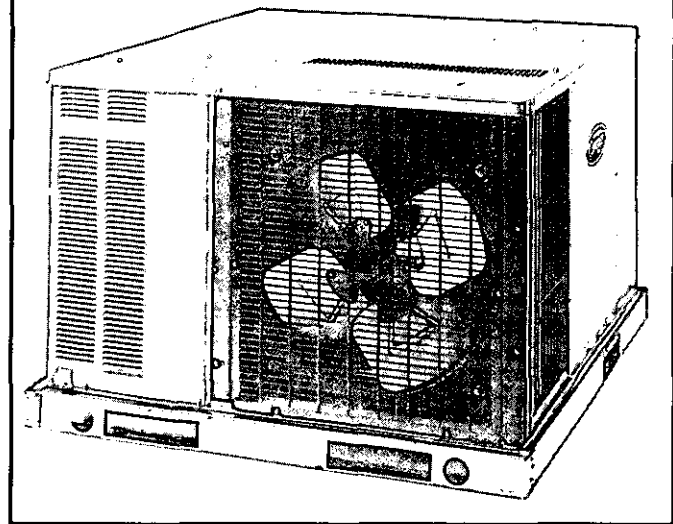
Two-position damper allows outside air to enter the building when the indoor fan is energized. When enthalpy control detects that outside air is suitable for cooling, outdoor-air damper opens fully and indoor-air damper closes, allowing outside air to enter building.

Thermostat and subbase provide heating and cooling unit control. The subbase provides system and fan switching at the thermostat location.

Carrier electronic programmable thermostats provide 2-stage heating and 2-stage cooling control with remote communication ability.

Low-ambient kit (Motormaster® II device) allows the use of mechanical cooling down to outdoor ambient temperatures as low as 0° F.

UNIT WITH OPTIONAL BASE RAIL



Solid-state Time Guard® device protects compressor by preventing short cycling.

Crankcase heater warms crankcase oil to reduce refrigerant migration and ensure proper compressor lubrication. (Recommended on 208/230-v single-phase units in sizes 024-042 only).

High- and low-pressure switches provide additional safety features and protect the unit from running at unsuitable pressures.

Filter rack features easy installation, serviceability, and high filtering performance.

Lifting bracket kit provides attachment points for rigging straps. The kit is not required when unit is equipped with an optional base rail or downflow application.

The natural-to-propane conversion kit allows for conversion from natural gas to liquid propane.

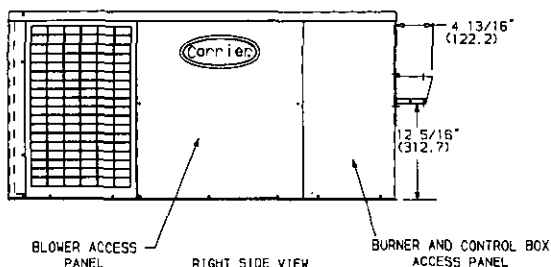
Flexible duct kit consists of 2 flexible UL-listed (Underwriters' Laboratories) ducts. The duct construction includes vapor barrier and 1-in. fiberglass insulation. The 'K' factor is 0.23. Each duct has a square-to-round snap adapter for attachment to the accessory roof curb on one end, and a round clamp collar for attachment to the accessory concentric diffuser box on the other end.

Concentric diffuser box is aerodynamically 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 with the diffuser box to provide even 4-way air distribution.

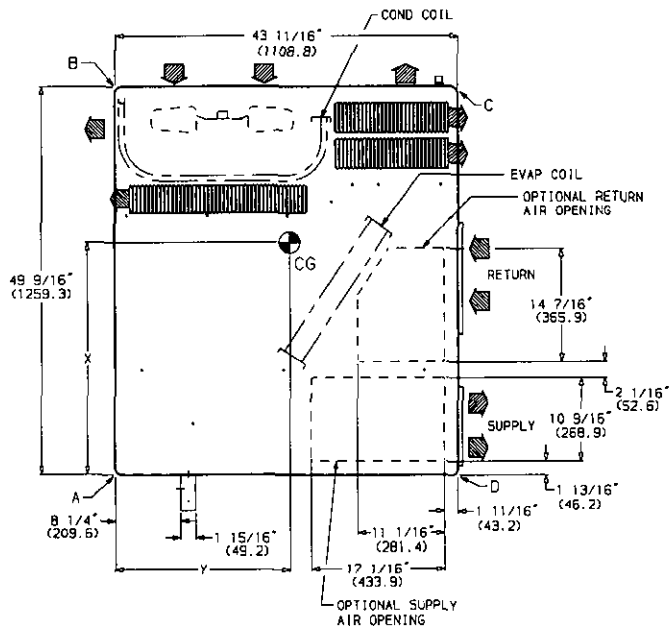
Base unit dimensions



48SS018-042 WITHOUT BASE RAIL



RIGHT SIDE VIEW



REQ'D CLEARANCES FOR SERVICING, in. (mm)

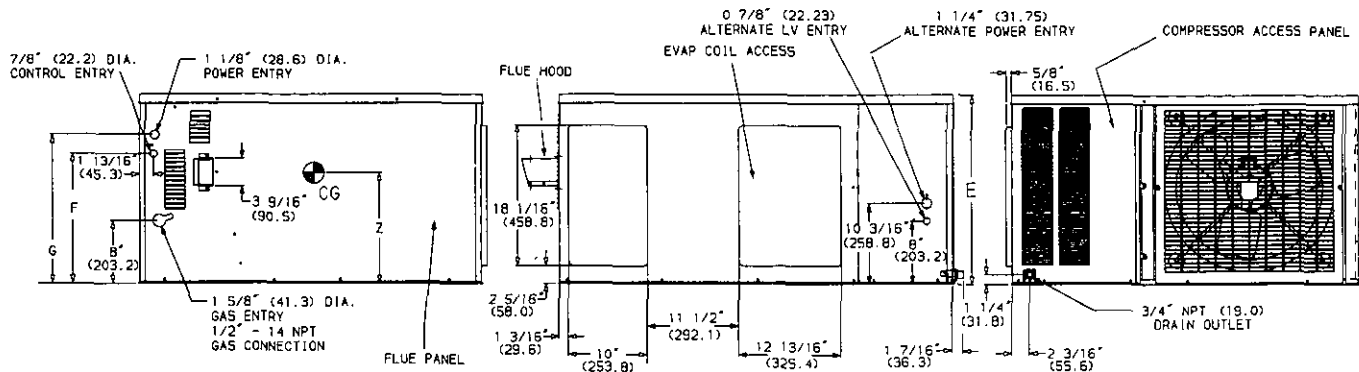
Duct panel	0
Unit top	36 (914)
Side opposite ducts	36 (914)
Compressor access	36 (914)
(Except for NEC requirements)	

REQ'D CLEARANCES TO COMBUSTIBLE MATL, in. (mm)

Maximum extension of overhangs	48 (1219)
Unit top	14 (356)
Duct side of unit	0
Side opposite ducts	9 (229)
Bottom of unit	0
Flue panel	30 (762)

NEC REQ'D CLEARANCES, in. (mm)

Between units, control box side	42 (1067)
Unit and ungrounded surfaces, control box side	36 (914)
Unit and block or concrete walls and other grounded surfaces, control box side	42 (1067)



REAR VIEW

LEFT SIDE VIEW

FRONT VIEW

UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (lb/kg)				UNIT HEIGHT (in./mm)
		lb	kg	A	B	C	D	
48SS180040	208/230-1-60	272	123	81/37	62/28	76/35	53/24	24.1/613
48SS024040	208/230-1-60	303	138	97/44	43/20	123/56	40/18	24.1/613
48SS024060	208/230-1-60	315	143	100/45	46/21	126/57	43/20	24.1/613
48SS030040	208/230-1-60, 208/230-3-60	320	145	100/45	47/21	126/57	47/21	24.1/613
48SS030060/080	208/230-1-60, 208/230-3-60	324	147	94/43	63/29	115/52	52/24	24.1/613
48SS036060/080	208/230-1-60, 208/230-3-60, 460-3-60	336	153	86/39	76/35	111/50	63/29	24.1/613
48SS036100/120	208/230-1-60, 208/230-3-60, 460-3-60	348	158	89/40	79/36	114/52	66/30	24.1/613
48SS042060/080	208/230-1-60, 208/230-3-60, 460-3-60	375	170	95/43	86/39	119/54	75/34	28.1/714
48SS042100/120	208/230-1-60, 208/230-3-60, 460-3-60	387	176	98/45	89/40	122/55	78/35	28.1/714

UNIT	F in./mm	G in./mm	CENTER OF GRAVITY in./mm		
			X	Y	Z
48SS018040	16 1/4/420.7	18 1/4/481.0	25.07/637	20.59/523	10.85/276
48SS024040			27.07/688	23.35/593	
48SS024060			26.98/685	23.27/591	
48SS030040			26.71/678	23.46/596	
48SS030060/080			27.15/689	22.36/568	
48SS036060/080			27.50/698	22.48/571	
48SS036100/120	20 9/16/522.3	22 1/4/568.6	27.40/696	22.44/570	12.7/321
48SS042060/080			27.01/686	22.44/570	
48SS042100/120			26.94/684	22.44/570	

LEGEND

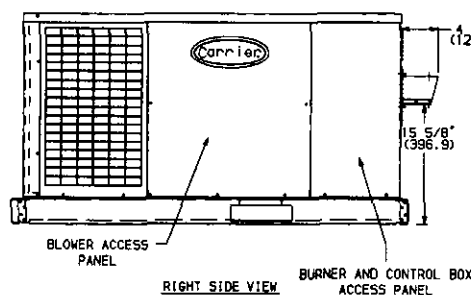
CG	Center of Gravity	MAT'L	Material
COND	Condenser	NEC	National Electrical Code
LV	Low Voltage	REQ'D	Required

NOTE: Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.

Base unit dimensions (cont)



48SS018-A042 WITH OPTIONAL BASE RAIL



REQ'D CLEARANCES FOR SERVICING, in. (mm)

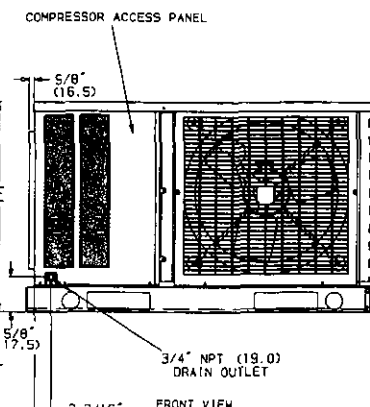
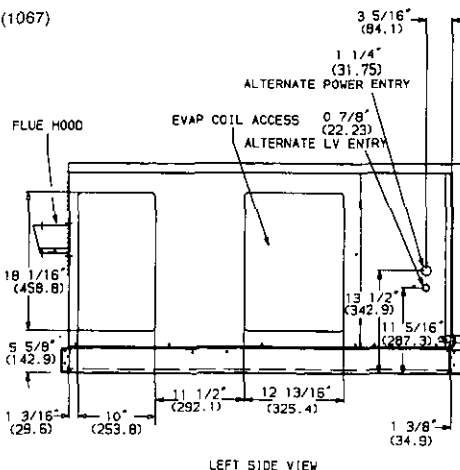
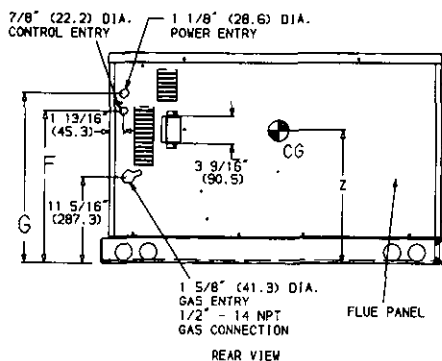
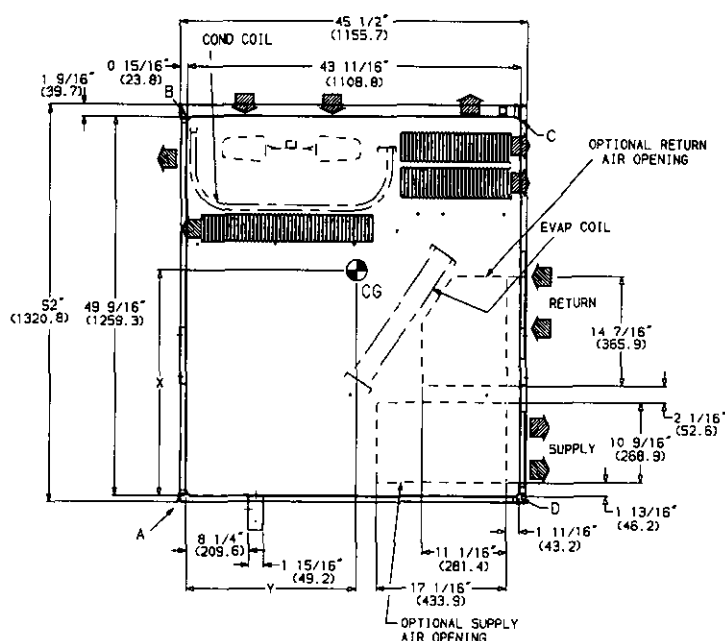
Duct panel	0
Unit top	36 (914)
Side opposite ducts	36 (914)
Compressor access	36 (914)
(Except for NEC requirements)	

REQ'D CLEARANCES TO COMBUSTIBLE MATL, in. (mm)

Maximum extension of overhangs	48 (1219)
Unit top	14 (356)
Duct side of unit	0
Side opposite ducts	9 (229)
Bottom of unit	0
Flue panel	30 (762)

NEC REQ'D CLEARANCES, in. (mm)

Between units, control box side	42 (1067)
Unit and ungrounded surfaces, control box side	36 (914)
Unit and block or concrete walls and other grounded surfaces, control box side	42 (1067)



UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (lb/kg)				UNIT HEIGHT (in./mm)
		lb	kg	A	B	C	D	
48SS018040	208/230-1-60	296	135	87/40	68/31	82/37	59/27	27.4/697
48SS024040	208/230-1-60	327	149	103/47	49/22	129/59	46/21	27.4/697
48SS024060	208/230-1-60	339	155	106/48	52/24	132/60	49/22	27.4/697
48SS030040	208/230-1-60, 208/230-3-60	344	157	106/48	53/24	132/60	53/24	27.4/697
48SS030060/080	208/230-1-60, 208/230-3-60	356	162	102/46	71/32	123/56	60/27	27.4/697
48SS036060/080	208/230-1-60, 208/230-3-60, 460-3-60	360	164	92/42	82/37	117/53	69/31	27.4/697
48SS036100/120	208/230-1-60, 208/230-3-60, 460-3-60	372	169	95/43	85/39	120/55	72/33	27.4/697
48SS042060/080	208/230-1-60, 208/230-3-60, 460-3-60	399	181	101/46	92/42	125/57	81/37	31.4/798
48SS042100/120	208/230-1-60, 208/230-3-60, 460-3-60	411	187	104/47	95/43	128/58	84/38	31.4/798

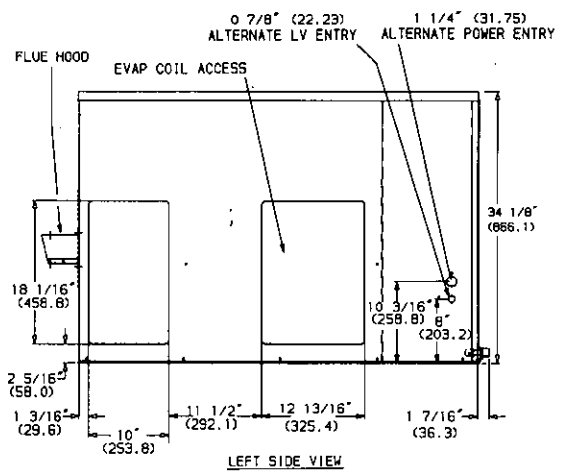
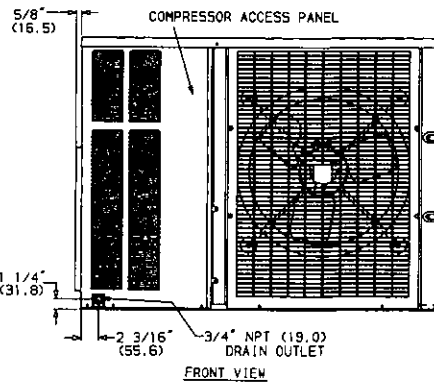
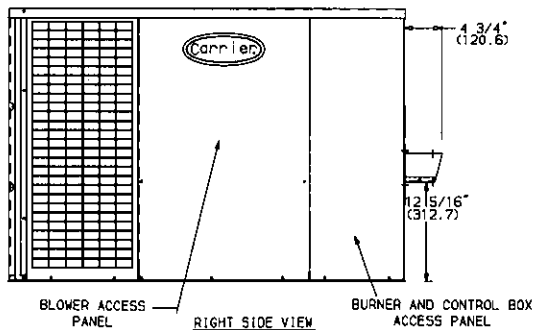
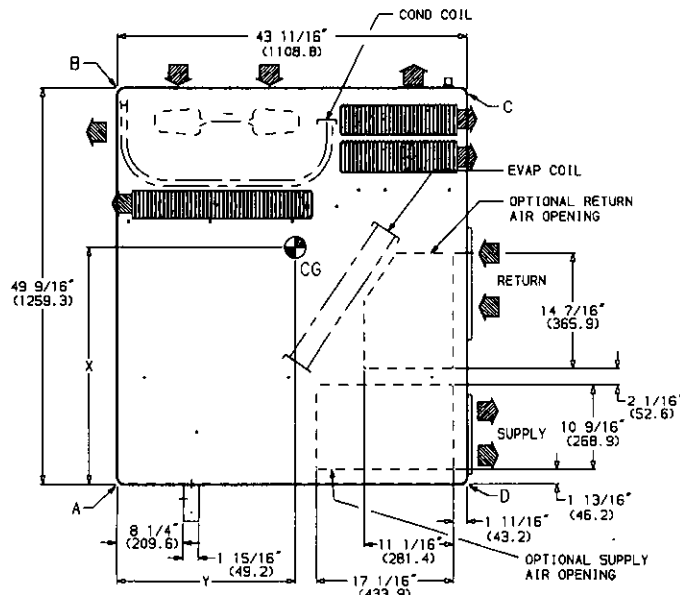
UNIT	F in./mm	G in./mm	CENTER OF GRAVITY in./mm		
			X	Y	Z
48SS018040	19 7/8/504.8	22 1/4/565.4	25.04/636	22.72/577	13.16/334.3
48SS024040			26.90/683.3	20.17/512.3	
48SS024060			26.82/681.2	20.22/513.6	
48SS030040			26.57/674.9	20.1/509.3	
48SS030060/080			26.93/684	21.1/535.4	
48SS036100/120			27.31/693.7	21.0/532.6	
48SS042060/080	23 7/8/606.4	26 1/4/666.8	27.23/691.6	21.0/533.1	14.96/380
48SS042100/120			26.87/682.5	21.0/533.1	
48SS042100/120			26.81/681	21.0/533.7	

LEGEND

CG	Center of Gravity	MAT'L	Material
COND	Condenser	NEC	National Electrical Code
LV	Low Voltage	REQ'D	Required

NOTE: Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.

48SS048,060 WITHOUT BASE RAIL



REQ'D CLEARANCES FOR SERVICING, in. (mm)

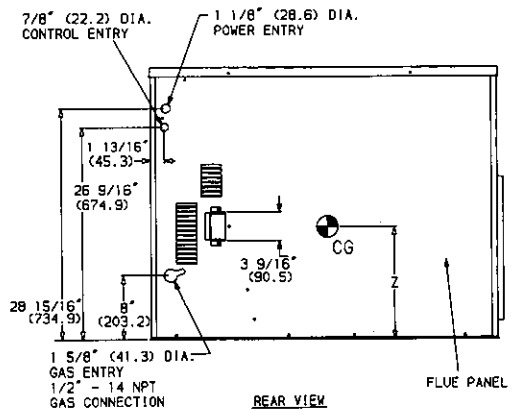
Duct panel	0
Unit top	36 (914)
Side opposite ducts	36 (914)
Compressor access	36 (914)
(Except for NEC requirements)	

REQ'D CLEARANCES TO COMBUSTIBLE MATL, in. (mm)

Maximum extension of overhangs	48 (1219)
Unit top	14 (356)
Duct side of unit	0
Side opposite ducts	9 (229)
Bottom of unit	0
Flue panel	30 (762)

NEC REQ'D CLEARANCES, in. (mm)

Between units, control box side	42 (1067)
Unit and ungrounded surfaces, control box side	36 (914)
Unit and block or concrete walls and other grounded surfaces, control box side	42 (1067)



UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (lb/kg)			
		lb	kg	A	B	C	D
48SS048080	208/230-1-60, 208/230-3-60, 460-3-60	414	188	107/49	83/38	158/72	66/30
48SS048100/120/140	208/230-1-60, 208/230-3-60, 460-3-60	426	193	110/50	86/39	159/72	71/32
48SS060080	208/230-1-60, 208/230-3-60, 460-3-60	453	206	117/53	93/42	167/76	76/35
48SS060100/120/140	208/230-1-60, 208/230-3-60, 460-3-60	465	211	120/55	96/44	167/76	82/37

UNIT	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
48SS048080	28.76/731	23.46/596	15.35/390
48SS048100/120/140	28.42/722	23.42/595	15.35/390
48SS060080	28.36/720	23.27/591	15.35/390
48SS060100/120/140	27.95/710	23.23/590	15.35/390

LEGEND

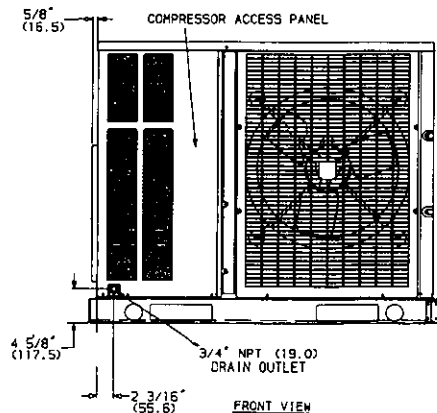
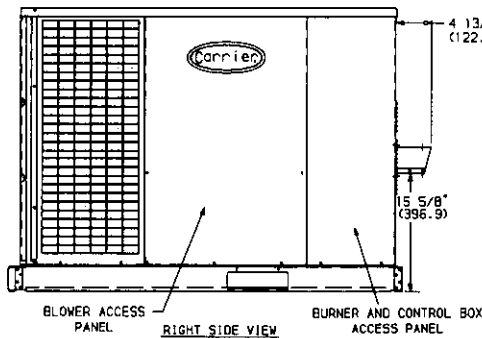
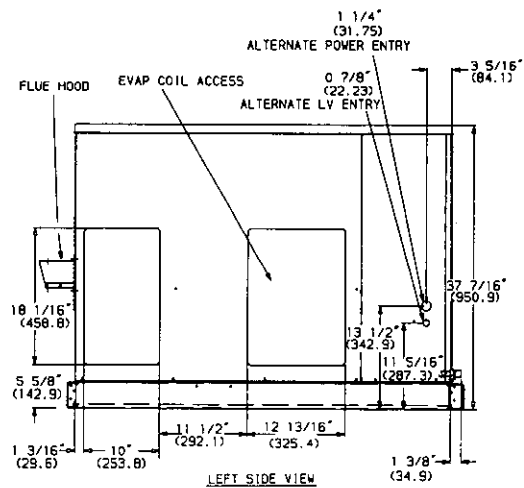
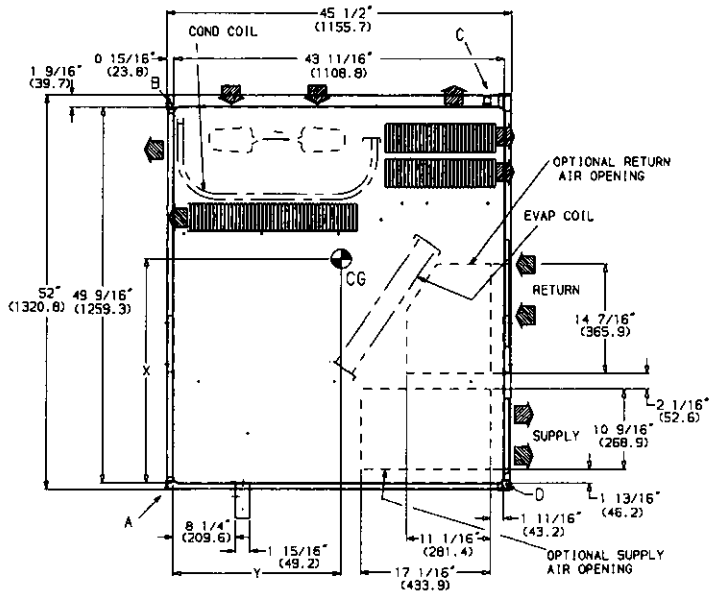
CG	Center of Gravity	MAT'L	Material
COND	Condenser	NEC	National Electrical Code
LV	Low Voltage	REQ'D	Required

NOTE: Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.

Base unit dimensions (cont)



48SS048,060 WITH OPTIONAL BASE RAIL



REQ'D CLEARANCES FOR SERVICING, in. (mm)

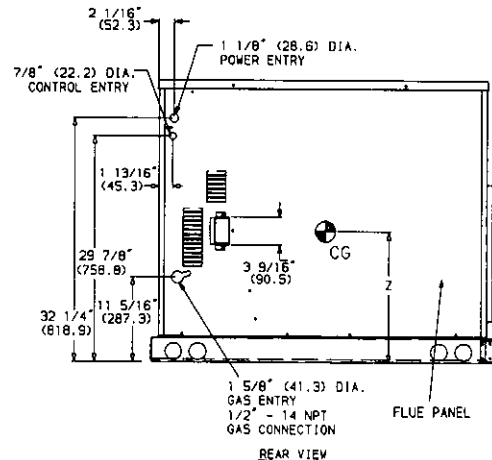
Duct panel	0
Unit top	36 (914)
Side opposite ducts	36 (914)
Compressor access	36 (914)
(Except for NEC requirements)	

REQ'D CLEARANCES TO COMBUSTIBLE MATL, in. (mm)

Maximum extension of overhangs	48 (1219)
Unit top	14 (356)
Duct side of unit	0
Side opposite ducts	9 (229)
Bottom of unit	0
Flue panel	30 (762)

NEC REQ'D CLEARANCES, in. (mm)

Between units, control box side	42 (1067)
Unit and ungrounded surfaces, control box side	36 (914)
Unit and block or concrete walls and other grounded surfaces, control box side	42 (1067)



UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (lb/kg)			
		lb	kg	A	B	C	D
48SS048080	208/230-1-60, 208/230-3-60, 460-3-60	438	199	113/51	89/40	164/75	72/33
48SS048100/120/140	208/230-1-60, 208/230-3-60, 460-3-60	450	205	116/53	92/42	165/75	77/35
48SS060080	208/230-1-60, 208/230-3-60, 460-3-60	477	217	123/56	99/45	173/79	82/37
48SS060100/120/140	208/230-1-60, 208/230-3-60, 460-3-60	489	222	126/57	102/46	173/79	88/40

UNIT	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
48SS048080	28.54/724.9	20.00/508	17.66/448.6
48SS048100/120/140	28.22/716.8	20.05/509.3	17.66/448.6
48SS060080	28.18/715.6	20.19/512.8	17.66/448.6
48SS060100/120/140	27.79/705.9	20.23/513.8	17.66/448.6

LEGEND

CG	— Center of Gravity	MAT'L	— Material
COND	— Condenser	NEC	— National Electrical Code
LV	— Low Voltage	REQ'D	— Required

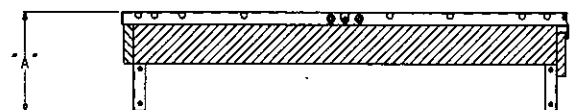
NOTE: Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.

Accessory dimensions

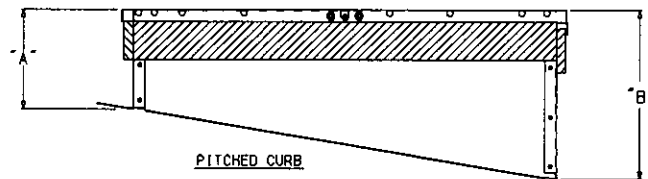


ROOF CURB DIMENSIONS

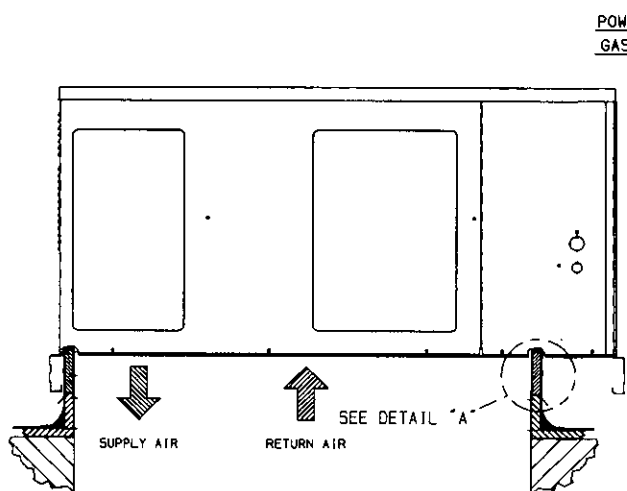
	PART NUMBER	"A"	"B"	PITCH
FLAT	50SS900015	8" [203]	—	—
	50SS900016	11" [279]	—	—
	50SS900017	14" [356]	—	—
PITCHED	50SS900019	8" [203]	10 7/8" [276]	1:12
	50SS900020	8" [203]	13 9/16" [344]	2:12
	50SS900021	8" [203]	16 3/8" [416]	3:12
	50SS900022	8" [203]	19 1/4" [489]	4:12
	50SS900023	8" [203]	22 5/8" [568]	5:12
	50SS900024	8" [203]	25 5/8" [651]	6:12



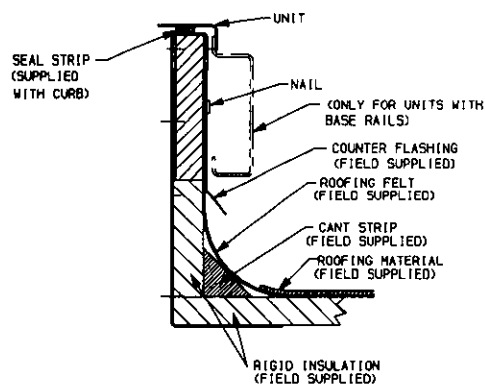
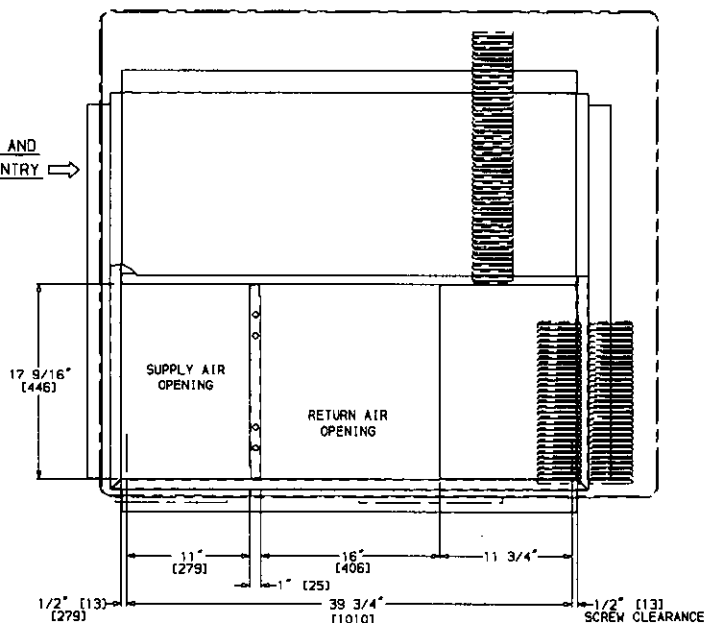
FLAT CURB



PITCHED CURB



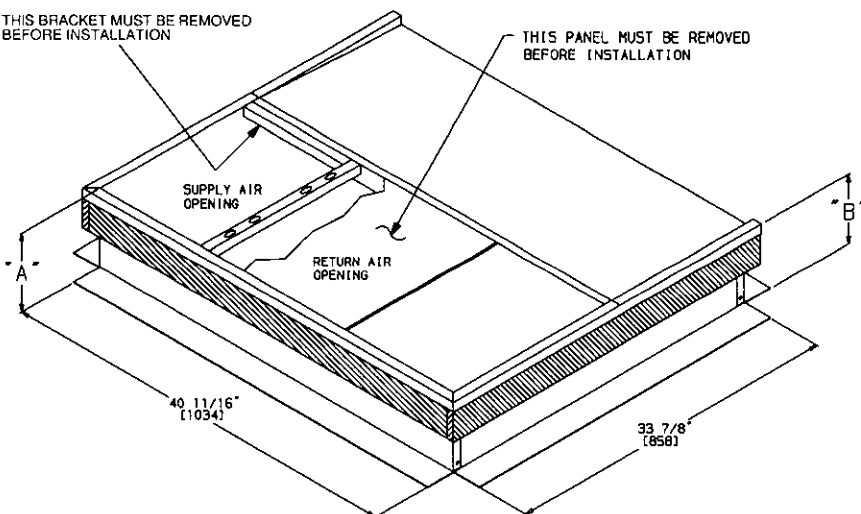
POWER AND
GAS ENTRY →



DETAIL "A"

THIS BRACKET MUST BE REMOVED
BEFORE INSTALLATION

THIS PANEL MUST BE REMOVED
BEFORE INSTALLATION



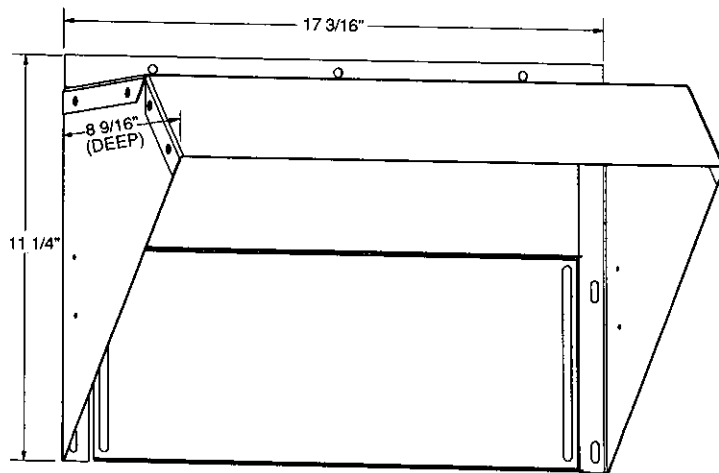
NOTES:

1. Roof curb must be set up for unit being installed.
2. Seal strip must be applied as required for unit being installed.
3. Dimensions in [] are in millimeters.
4. Roof curb is made of 16 gage steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance 4 ft on each side.
7. Direction of airflow.
8. Insulated panels: 1-in. thick fiberglass 1 lb density.

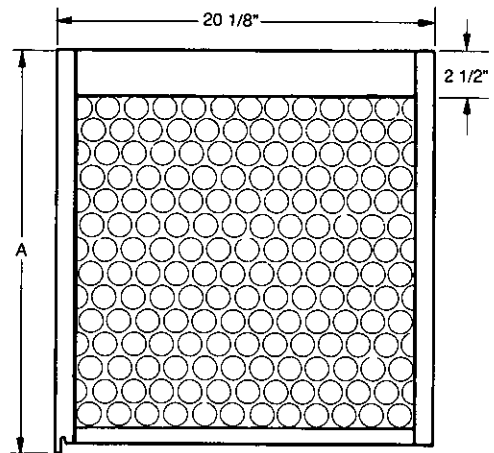
Accessory dimensions (cont)



MANUAL OUTDOOR AIR DAMPER

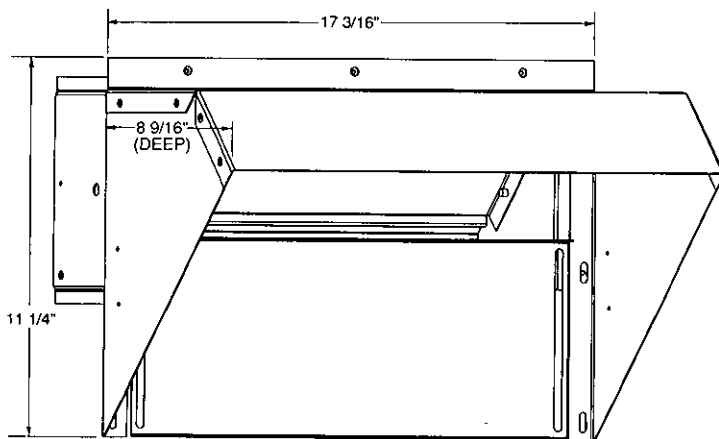


FILTER RACKS AND FILTERS



ACCESSORY	PART NUMBER	"A"
FILTER RACK	50SS500013	21 11/16"
	50SS500040	31 11/16"
	50SS500014	25 11/16"

TWO-POSITION DAMPER



Selection procedure (with example)



I Determine cooling and heating requirements at design conditions:

Given:

Required Cooling Capacity (TC) 34,000 Btuh
Sensible Heat Capacity (SHC) 24,000 Btuh
Required Heating Capacity 60,000 Btuh
Condenser Entering-Air Temperature 95 F
Indoor-Air Temperature 80 F edb, 67 F ewb
Evaporator-Air Quantity 1200 cfm
External Static Pressure 0.2 in. wg
Electrical Characteristics (V-Ph-Hz) 208-1-60

II Select unit based on required cooling capacity.

Enter Cooling Capacities table at condenser entering temperature of 95 F. Unit 48SS036 at 1200 cfm and 67 F ewb (entering wet bulb) will provide a total capacity of 36,000 Btuh and an SHC of 26,200 Btuh. Calculate SHC correction, if required, using Note 4 under Cooling Capacities tables.

III Select heating capacity of unit to provide design condition requirement.

In the Heating Capacities and Efficiencies table on page 4, note that unit 48SS036080 will provide 64,800 Btuh with an input of 80,000 Btuh.

IV Determine fan speed and power requirements at design conditions.

Before entering the air delivery tables, calculate the total static pressure required. From the given, the Wet Coil Pressure Drop table, and the Filter Pressure Drop table on page 18, find at 1200 cfm:

External static pressure	0.20 in. wg
Wet coil	0.088 in. wg
Filter	0.13 in. wg
Total static pressure	0.42 in. wg (rounded)

Enter the table for Dry Coil Air Delivery — Horizontal Discharge for 230 and 460 V on page 16. For 208 v operation, deduct 10% from value given. The fan will deliver 1233 cfm at 0.4 external static pressure (1370×0.9) at high speed and 852 cfm at 0.5 external static pressure (946×0.9) at low speed. The fan speed should be set at high to satisfy job requirements.

V Select unit that corresponds to power source available.

The Electrical Data table on page 23 shows that the unit is designed to operate at 208-1-60.

Performance data



COOLING CAPACITIES

48SS018										
TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		525/0.10			600/0.12			675/0.13		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	15.8	17.4	19.0	16.0	17.6	19.2	16.1	17.8	19.3
	SHC	13.6	11.2	8.7	14.4	11.8	9.0	15.1	12.4	9.2
	KW	1.76	1.80	1.85	1.81	1.86	1.90	1.86	1.91	1.95
95	TC	15.3	16.9	18.5	15.5	17.0	18.7	15.6	17.1	18.8
	SHC	13.4	11.1	8.6	14.2	11.6	8.9	14.9	12.2	9.1
	KW	1.90	1.95	2.00	1.95	2.00	2.05	2.01	2.05	2.10
105	TC	14.6	16.2	17.9	14.9	16.3	18.0	14.9	16.4	18.0
	SHC	13.2	10.9	8.4	14.0	11.4	8.6	14.6	12.0	8.8
	KW	2.05	2.10	2.15	2.10	2.15	2.20	2.15	2.20	2.25
115	TC	13.8	15.5	17.1	14.1	15.6	17.3	14.3	15.7	17.4
	SHC	12.8	10.6	8.1	13.6	11.2	8.4	14.2	11.7	8.7
	KW	2.20	2.26	2.31	2.25	2.31	2.37	2.31	2.36	2.42

48SS036										
TEMP (F) AIR ENT COND		EVAP AIR -- CFM/BF								
		1050/0.07			1200/0.08			1350/0.09		
		Evap Air -- Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	33.6	37.6	41.7	34.2	38.3	42.3	34.8	38.7	42.6
	SHC	30.5	25.4	19.9	32.5	27.1	20.7	34.2	28.5	21.4
	kW	3.72	3.86	3.99	3.81	3.95	4.08	3.90	4.03	4.15
95	TC	31.2	35.5	39.3	31.9	36.0	40.2	32.8	36.4	40.4
	SHC	29.4	24.7	19.1	31.4	26.2	20.1	32.8	27.7	20.8
	kW	3.90	4.05	4.18	3.99	4.14	4.29	4.09	4.22	4.36
105	TC	28.8	33.2	37.2	30.0	33.7	37.6	31.1	34.0	37.9
	SHC	28.2	23.8	18.4	30.0	25.4	19.2	31.0	26.8	20.0
	kW	4.08	4.23	4.39	4.17	4.32	4.48	4.29	4.41	4.56
115	TC	26.7	30.9	34.7	28.1	31.3	35.0	29.2	31.6	35.2
	SHC	26.7	22.9	17.5	28.1	24.5	18.3	29.2	25.9	19.0
	kW	4.26	4.41	4.57	4.37	4.50	4.66	4.48	4.58	4.73

48SS024										
TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		700/0.06			800/0.07			900/0.08		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	22.5	25.1	27.8	23.0	25.6	28.3	23.4	26.0	28.7
	SHC	19.8	16.6	13.2	21.2	17.6	13.7	22.3	18.6	14.2
	KW	2.51	2.60	2.69	2.56	2.65	2.75	2.62	2.71	2.80
95	TC	21.1	23.6	26.3	21.5	24.0	26.6	21.9	24.4	27.0
	SHC	19.3	16.1	12.7	20.5	17.1	13.1	21.5	18.1	13.7
	KW	2.63	2.73	2.84	2.69	2.82	2.89	2.75	2.85	2.95
105	TC	19.6	22.0	24.6	20.0	22.4	25.0	20.5	22.6	25.3
	SHC	18.5	15.5	12.1	19.7	16.5	12.7	20.5	17.4	13.2
	KW	2.74	2.86	2.97	2.81	2.92	3.03	2.88	2.97	3.09
115	TC	17.9	20.3	22.9	18.6	20.6	23.2	19.2	20.9	23.5
	SHC	17.6	14.9	11.6	18.5	15.9	12.2	19.2	16.9	12.7
	KW	2.85	2.97	3.10	2.93	3.03	3.16	3.01	3.09	3.21

48SS042										
TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		1225/0.11			1400/0.12			1575/0.14		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	40.3	44.2	47.9	41.1	44.9	48.5	41.8	45.4	49.0
	SHC	36.1	30.0	23.5	38.3	31.7	24.3	40.2	33.2	25.0
	kW	4.28	4.43	4.57	4.38	4.52	4.66	4.48	4.61	4.75
95	TC	38.0	41.8	45.3	38.8	42.5	45.9	39.4	43.0	46.4
	SHC	34.9	29.2	22.5	37.1	30.9	23.4	38.9	32.5	24.2
	kW	4.50	4.67	4.81	4.61	4.77	4.91	4.71	4.87	5.00
105	TC	35.7	39.3	43.0	36.4	39.9	43.3	37.2	40.4	43.7
	SHC	33.8	28.2	21.8	35.8	29.9	22.5	37.2	31.5	23.4
	kW	4.73	4.90	5.08	4.84	5.01	5.17	4.94	5.10	5.26
115	TC	33.3	36.7	40.1	34.1	37.2	40.4	35.0	37.6	40.8
	SHC	32.5	27.2	20.7	34.1	28.8	21.4	35.0	30.4	22.3
	kW	4.94	5.12	5.30	5.06	5.23	5.39	5.18	5.32	5.49

48SS030										
TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		875/0.08			1000/0.09			1125/0.10		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	27.5	30.7	33.7	28.0	31.1	34.0	28.4	31.3	34.5
	SHC	25.2	21.0	16.3	26.8	22.3	16.9	28.2	23.4	17.6
	KW	3.01	3.09	3.16	3.07	3.15	3.22	3.13	3.20	3.28
95	TC	25.8	28.8	31.7	26.3	29.2	32.3	26.9	29.4	32.4
	SHC	24.4	20.4	15.6	25.9	21.6	16.4	26.9	22.7	16.9
	KW	3.16	3.25	3.33	3.23	3.32	3.40	3.30	3.37	3.44
105	TC	23.9	26.9	29.9	24.6	27.2	30.1	25.3	27.5	30.5
	SHC	23.4	19.6	15.0	24.6	20.9	15.6	25.3	22.1	16.4
	KW	3.30	3.40	3.49	3.38	3.46	3.54	3.45	3.52	3.61
115	TC	21.9	24.8	27.6	22.9	25.0	28.0	23.6	25.2	28.1
	SHC	21.9	18.8	14.2	22.9	20.1	15.0	23.6	21.2	15.6
	KW	3.44	3.53	3.62	3.52	3.59	3.89	3.59	3.64	3.74

LEGEND

BF — Bypass Factor
Ewb — Entering Wet-Bulb
kW — Total Unit Power Input
SHC — Sensible Heat Capacity, 1000 Btuh
TC — Total Cooling Capacity, 1000 Btuh (net)

NOTES:

1. Ratings are net; they account for the effects of the indoor-fan motor power and heat.
2. Direct interpolation is permissible. Do not extrapolate.
3. The following formulas may be used:

$$t_{db} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

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

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

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

4. 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 = $1.10 \times (1 - BF) \times (edb - 80)$.

COOLING CAPACITIES (cont)

48SS048

TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		1400/0.08			1600/0.10			1800/0.11		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	43.8	48.3	52.9	44.5	49.1	53.7	45.1	49.6	53.9
	SHC	39.4	32.7	25.6	41.9	34.6	26.4	44.1	36.4	27.1
	KW	4.76	4.85	4.95	4.87	4.97	5.07	4.99	5.08	5.17
95	TC	41.9	46.4	50.9	42.6	47.0	51.7	43.3	47.5	52.2
	SHC	38.6	32.1	24.8	41.1	33.9	25.9	43.1	35.9	26.8
	KW	5.17	5.28	5.38	5.29	5.40	5.50	5.41	5.51	5.61
105	TC	39.3	44.2	48.8	40.1	44.7	49.2	41.2	45.2	49.6
	SHC	37.3	31.2	24.1	39.7	33.1	25.1	41.2	35.1	26.0
	KW	5.61	5.73	5.83	5.74	5.85	5.95	5.87	5.96	6.06
115	TC	36.6	41.5	46.4	37.7	42.4	47.0	39.0	42.8	47.4
	SHC	35.9	30.2	23.4	37.6	32.4	24.3	39.0	34.2	25.4
	KW	6.08	6.22	6.34	6.22	6.34	6.45	6.36	6.46	6.57

48SS060

TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		1750/0.03			2000/0.04			2250/0.05		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	55.0	62.0	69.4	56.3	63.1	70.5	58.2	63.9	71.3
	SHC	52.4	43.7	34.2	56.1	46.7	35.8	58.1	49.5	37.4
	KW	6.14	6.33	6.53	6.32	6.50	6.70	6.52	6.67	6.88
95	TC	51.8	58.8	66.2	53.6	59.6	67.3	55.6	60.2	68.1
	SHC	51.0	42.4	33.2	53.5	45.3	34.8	55.6	48.2	36.3
	KW	6.62	6.82	7.05	6.83	7.00	7.22	7.03	7.17	7.39
105	TC	48.7	55.1	62.9	51.0	56.0	63.9	53.0	56.7	64.5
	SHC	48.7	41.1	32.1	50.9	44.0	33.7	52.8	46.9	35.3
	KW	7.17	7.37	7.60	7.39	7.54	7.78	7.59	7.71	7.95
115	TC	45.8	52.0	59.5	48.5	52.8	60.5	50.4	53.4	60.8
	SHC	45.8	40.0	30.9	48.4	42.8	32.6	50.3	45.6	34.1
	KW	7.77	7.94	8.19	7.98	8.12	8.36	8.18	8.29	8.43

LEGEND

BF — Bypass Factor
Ewb — Entering Wet-Bulb
kW — Total Unit Power Input
SHC — Sensible Heat Capacity, 1000 Btuh
TC — Total Cooling Capacity, 1000 Btuh (net)

NOTES:

1. Ratings are net; they account for the effects of the indoor-fan motor power and heat.
2. Direct interpolation is permissible. Do not extrapolate.
3. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

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

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

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

4. 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 = $1.10 \times (1 - BF) \times (edb - 80)$.

Performance data (cont)



DRY COIL AIR DELIVERY* — HORIZONTAL DISCHARGE (Deduct 10% for 208 v)

UNIT SIZE 48SS	MOTOR SPEED		230 AND 460 VOLT HORIZONTAL DISCHARGE										
			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	Watts	230	225	220	210	195	170	—	—	—	—	—
		Cfm	760	745	725	695	640	540	—	—	—	—	—
	High	Watts	—	—	—	—	270	235	200	—	—	—	—
		Cfm	—	—	—	—	850	700	450	—	—	—	—
024, 030	Low	Watts	275	275	273	269	260	257	249	—	—	—	—
		Cfm	857	835	802	782	745	717	663	—	—	—	—
	Med	Watts	371	368	360	349	345	326	319	304	293	—	—
		Cfm	1079	1063	1027	996	978	919	865	783	726	—	—
	High	Watts	514	493	476	460	443	425	401	378	344	—	—
		Cfm	1409	1383	1324	1282	1223	1156	1068	984	857	—	—
036	Low	Watts	473	447	427	418	395	367	346	337	323	—	—
		Cfm	1253	1253	1172	1130	1047	946	865	829	768	—	—
	Med	Watts	519	500	478	459	439	410	377	357	340	—	—
		Cfm	1414	1366	1287	1234	1162	1074	920	829	743	—	—
	High	Watts	667	634	609	593	564	541	506	469	436	422	—
		Cfm	1734	1639	1563	1461	1370	1292	1157	960	829	743	—
042	Low	Watts	678	635	604	580	550	520	493	455	430	—	—
		Cfm	1540	1515	1475	1430	1375	1280	1225	1128	1020	—	—
	High	Watts	—	820	785	750	700	680	649	612	570	—	—
		Cfm	—	1825	1750	1685	1610	1525	1485	1335	1215	—	—
048	Low	Watts	—	—	854	786	744	706	641	606	557	511	—
		Cfm	—	—	2026	1905	1830	1752	1603	1513	1367	1228	—
	High	Watts	—	—	—	905	846	824	804	748	683	637	—
		Cfm	—	—	—	2025	1905	1830	1752	1603	1398	1228	—
060	Low	Watts	1000	991	970	925	904	875	849	830	819	—	—
		Cfm	2125	2110	2085	2046	2009	1960	1900	1845	1775	—	—
	Med	Watts	1355	1315	1265	1212	1158	1103	987	925	880	—	—
		Cfm	2480	2440	2388	2336	2266	2198	2050	1968	1890	—	—
	High	Watts	—	—	1435	1375	1310	1265	1175	1108	1010	915	—
		Cfm	—	—	2509	2450	2380	2310	2235	2160	2083	1888	—

*Air delivery values are based on operating voltage of 230 v or 460 v, dry coil, without filter.
Deduct wet coil and filter pressure drops to obtain external static pressure available for ducting.

NOTES:

1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator coil frosting may occur at airflows below this point.
2. Dashes indicate portions of table that are beyond the blower motor capacity or are not recommended.



DRY COIL AIR DELIVERY* – VERTICAL DISCHARGE
(Deduct 10% for 208 v)

UNIT SIZE 48SS	MOTOR SPEED		230 AND 460 VOLT VERTICAL DISCHARGE										
			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	Watts	—	295	251	223	201	176	149	124	—	—	—
		Cfm	—	821	817	753	665	536	343	164	—	—	—
	High	Watts	401	376	346	322	294	272	250	229	219	—	—
		Cfm	1334	1253	1128	996	816	658	461	246	167	—	—
024, 030	Low	Watts	—	285	284	282	278	274	270	261	251	244	230
		Cfm	—	798	761	727	682	634	581	525	450	371	304
	Med	Watts	—	378	371	368	362	357	343	332	315	301	283
		Cfm	—	1011	982	948	906	858	771	703	597	492	387
	High	Watts	—	520	511	487	472	451	431	411	385	362	341
		Cfm	—	1342	1289	1237	1181	1106	1007	892	745	610	471
	Low	Watts	—	460	439	423	898	379	349	322	297	270	246
		Cfm	—	1191	1136	1081	1005	907	795	687	579	471	349
036	Med	Watts	—	511	492	470	450	420	392	364	332	308	275
		Cfm	—	1316	1244	1178	1104	1005	891	784	657	535	389
	High	Watts	—	655	631	603	584	552	522	492	459	433	398
		Cfm	—	1541	1458	1367	1292	1178	1053	920	806	662	509
042	Low	Watts	—	637	612	587	560	536	493	455	—	—	—
		Cfm	—	1500	1450	1405	1350	1290	1200	1105	—	—	—
	High	Watts	—	790	750	700	699	639	608	574	547	—	—
		Cfm	—	1750	1625	1604	1509	1421	1323	1221	1094	—	—
048	Low	Watts	—	847	784	746	708	646	609	563	516	—	—
		Cfm	—	1995	1901	1822	1730	1580	1477	1319	1178	—	—
	High	Watts	—	—	909	852	820	801	751	687	639	—	—
		Cfm	—	—	2018	1896	1814	1729	1582	1380	1220	—	—
060	Low	Watts	—	970	952	928	905	880	847	804	760	—	—
		Cfm	—	2075	2054	2024	1994	1945	1890	1830	1762	—	—
	Med	Watts	—	—	1291	1247	1195	1076	1025	970	921	833	810
		Cfm	—	—	2395	2348	2291	2164	2099	2022	1950	1827	1804
	High	Watts	—	1490	1400	1312	1270	1219	1161	1104	1045	985	930
		Cfm	—	2530	2475	2420	2355	2289	2223	2150	2079	2008	1932

*Air delivery values are based on operating voltage of 230 v or 460 v, dry coil, without filter.
Deduct wet coil and filter pressure drops to obtain external static pressure available for ducting.

NOTES:

1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator coil frosting may occur at airflows below this point.
2. Dashes indicate portions of table that are beyond the blower motor capacity or are not recommended.

Performance data (cont)



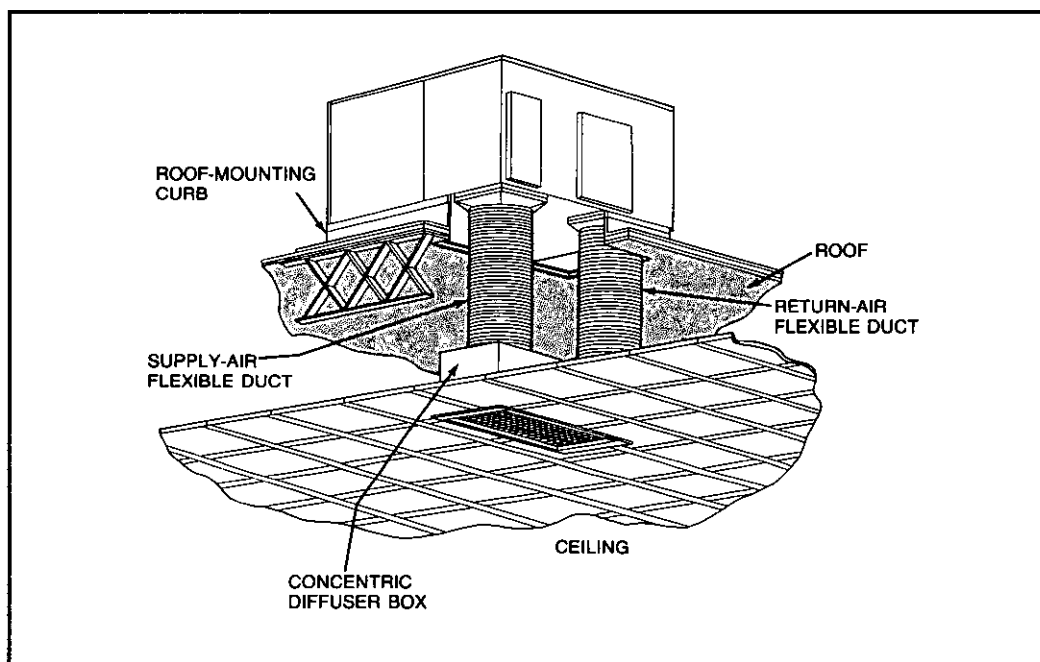
WET COIL PRESSURE DROP

UNIT SIZE	AIRFLOW (cfm)	PRESSURE DROP (in. wg)
018	600	0.069
	700	0.082
	800	0.102
	900	0.116
024	600	0.039
	700	0.058
	800	0.075
	900	0.088
030	900	0.088
	1000	0.095
	1200	0.123
036	1000	0.068
	1200	0.088
	1400	0.108
	1600	0.123
042	1000	0.048
	1200	0.069
	1400	0.088
	1600	0.102
048	1400	0.068
	1600	0.075
	1800	0.088
060	1700	0.082
	1900	0.095
	2100	0.108
	2300	0.123

FILTER PRESSURE DROP (in. wg)

UNIT SIZE	FILTER SIZE (in.)	CFM																		
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
018, 024	20 x 20	0.05	0.07	0.08	0.10	0.12	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—
030, 036	20 x 24	—	—	—	—	0.09	0.10	0.11	0.13	0.14	0.15	0.16	—	—	—	—	—	—	—	—
042	24 x 24	—	—	—	—	—	—	—	—	0.11	0.12	0.14	0.15	—	—	—	—	—	—	—
048, 060	24 x 30	—	—	—	—	—	—	—	—	—	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18

Typical installation



Application data

Condensate trap — A 2-in. condensate trap must be field supplied.

Ductwork — Secure downflow discharge ductwork to roof curb. For horizontal discharge applications, attach ductwork to unit with flanges.

To convert a unit to downflow discharge or horizontal discharge — Units are equipped with factory-installed duct covers on both the downflow and horizontal openings. Remove appropriate duct panel covers for intended discharge application. Units with downflow option do not require duct panel cover removal.

Thermostat — To achieve simultaneous economizer cooling and mechanical cooling, use of 2-stage cooling thermostat is recommended for all units equipped with an accessory economizer.

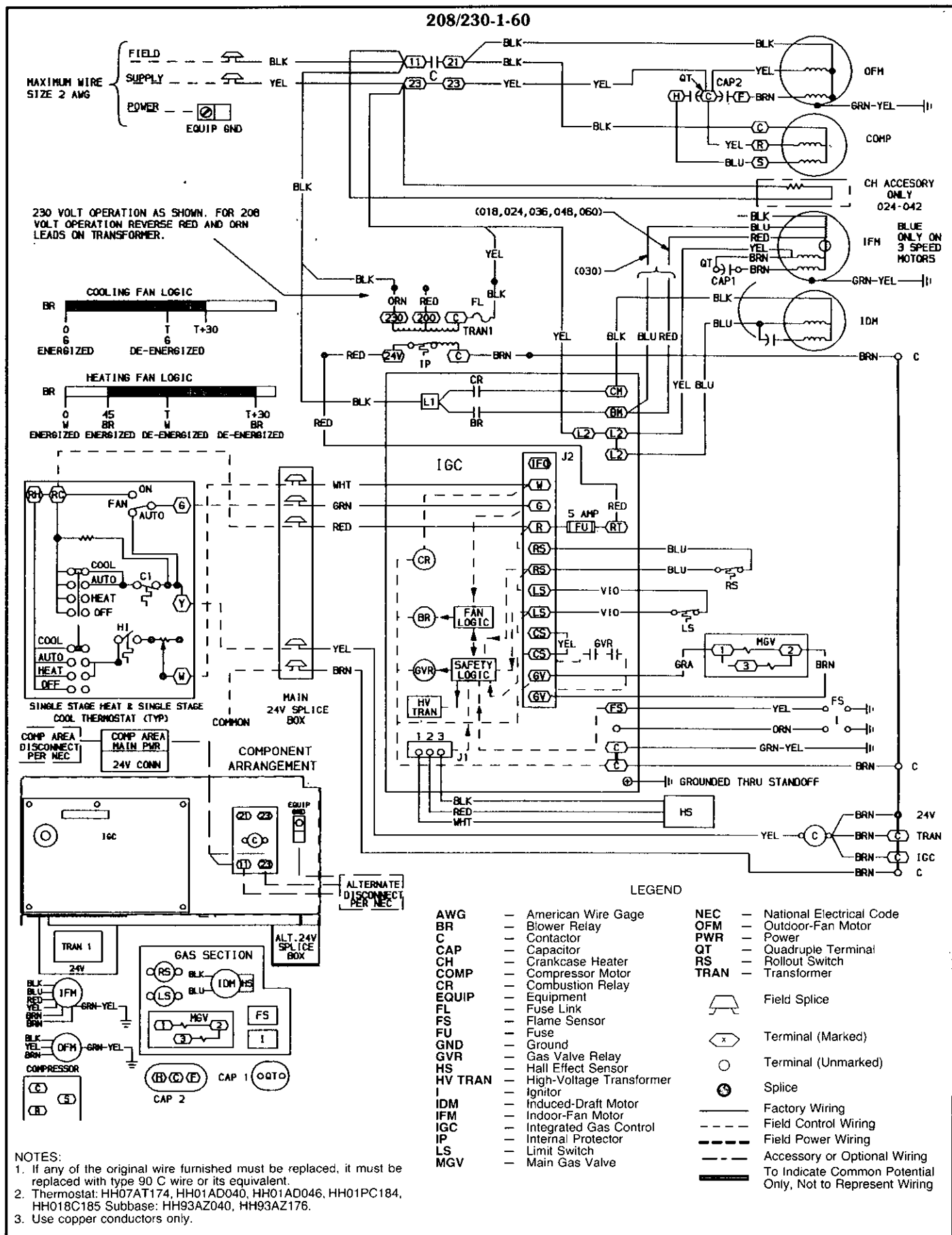
Airflow — Units are draw-thru on cooling and blow-thru on heating.

Maximum cooling airflow — To minimize the possibility of condensate blow-off from evaporator, airflow through units should not exceed 450 cfm/ton.

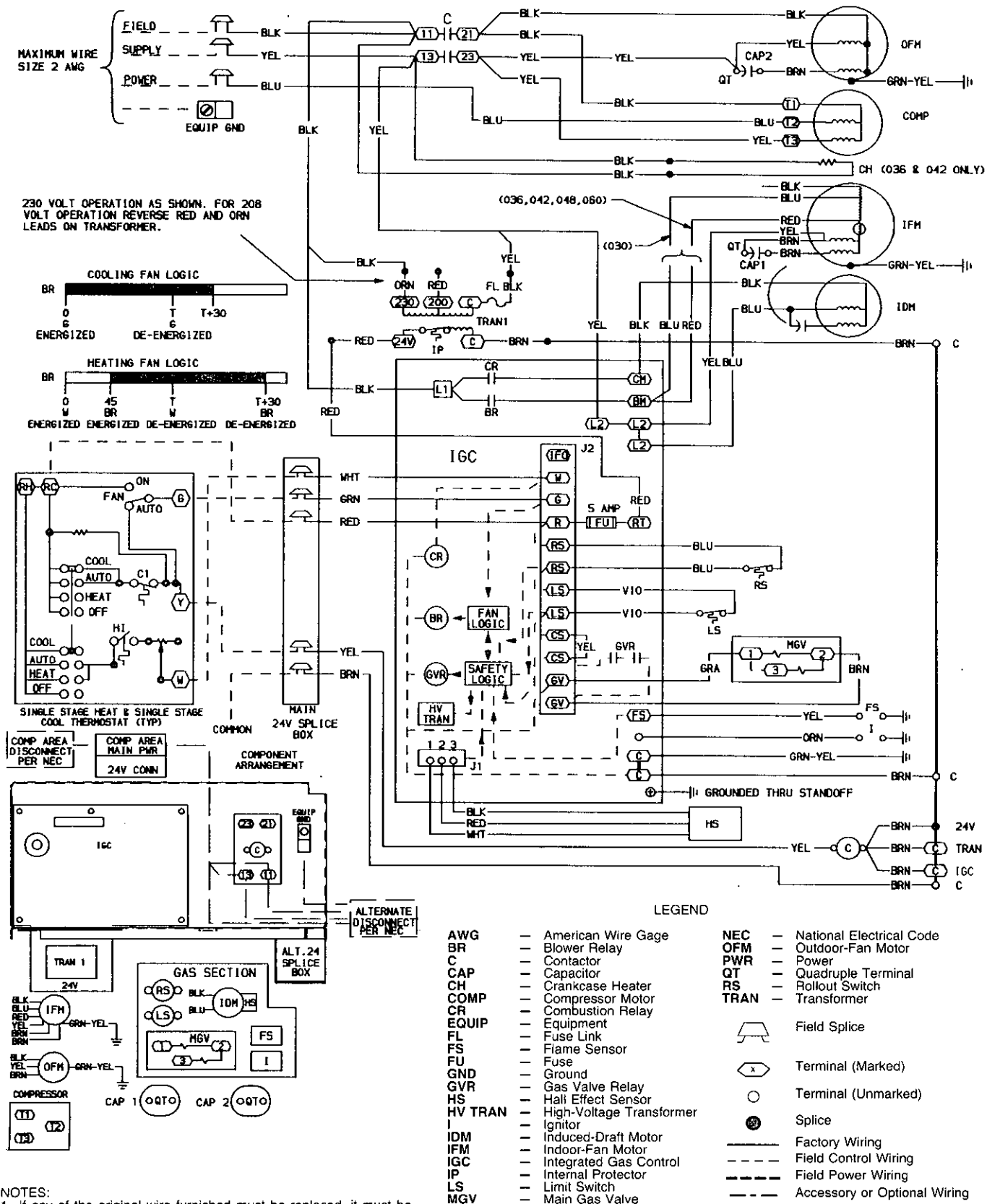
Minimum cooling airflow is 350 cfm/ton.

Minimum ambient operating temperature for all standard units is 40 F. With accessory low ambient temperature kit, units can operate at temperatures down to 0° F.

Typical control wiring schematic



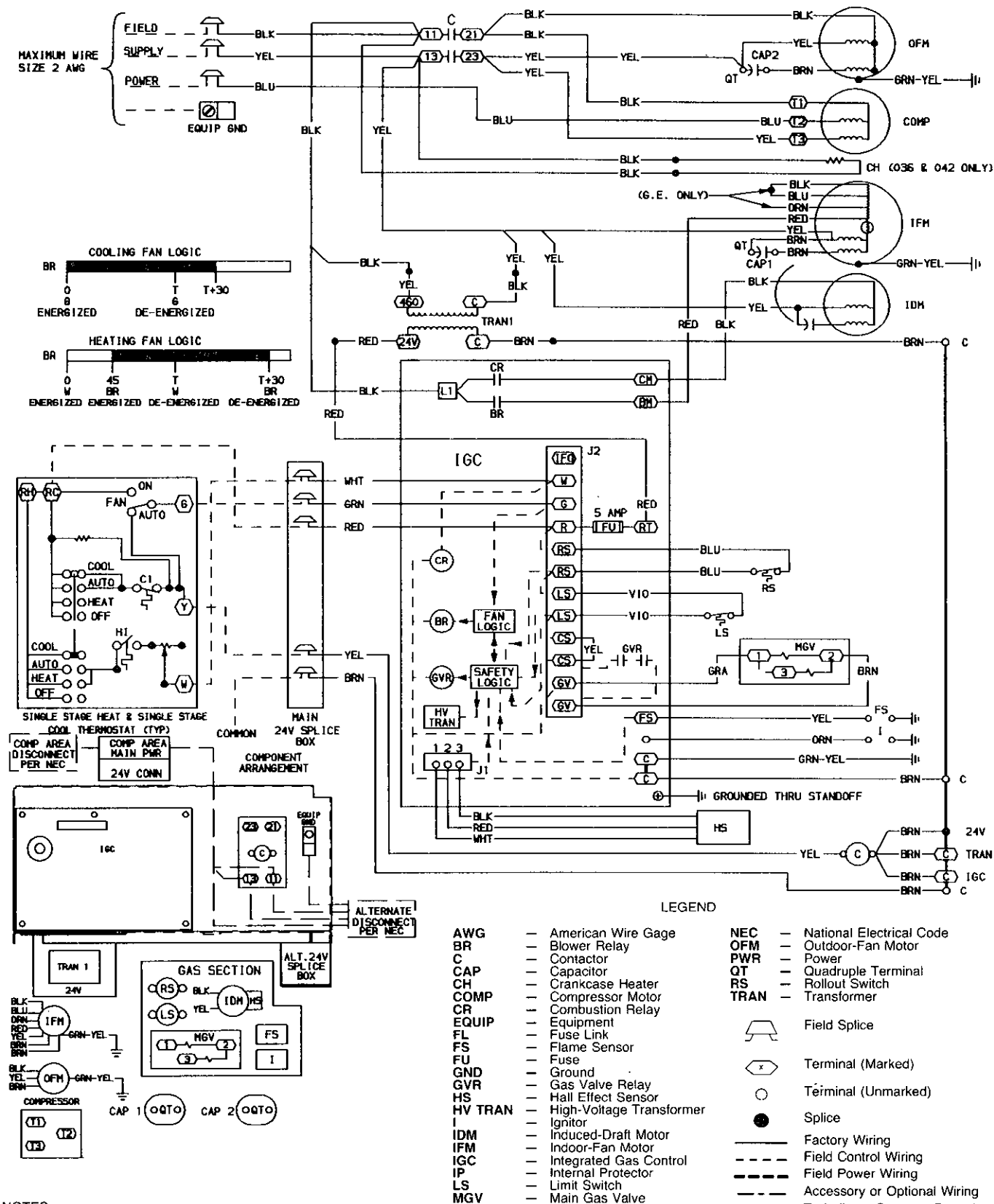
208/230-3-60



Typical control wiring schematic (cont)

Carrier

460-3-60



Electrical data



UNIT 48SS	V-PH-HZ	VOLTAGE RANGE		COMPRESSOR		COND. FAN MOTOR	INDOOR FAN FLA	POWER SUPPLY		AWG 60 C MIN WIRE SIZE†	MAX WIRE LENGTH (ft)
		Min	Max	RLA	LRA	FLA		MCA	MOCP*		
018	208/230-1-60	187	253	7.6	45	0.7	1.8	12.0	15	14	75
024				12.4	61	0.7	2.0	18.2	30	12	80
030				14.4	82	1.4	2.0	21.8	30	10	100
036				18.0	96	1.4	2.8	26.7	40	10	90
042				20.4	104	1.4	4.0	30.9	50	8	100
048				26.4	129	2.1	5.0	40.1	60	6	100
060				32.1	169	2.1	6.8	49.0	60	6	100
030	208/230-3-60	187	253	9.4	66	1.4	2.0	15.5	25	12	80
036				11.7	75	1.4	2.8	18.8	30	12	65
042				14.0	91	1.4	4.0	22.9	35	10	85
048				15.0	99	2.1	5.0	25.9	40	10	75
060				19.3	123	2.1	6.8	33.0	50	8	90
036	460-3-60	414	506	5.6	40	0.8	1.4	9.2	10	14	100
042				6.4	42	0.8	2.0	10.8	15	14	100
048				8.2	50	1.1	2.3	13.7	20	14	100
060				10.0	62	1.1	3.2	16.8	25	12	100

LEGEND

- AWG** — American Wire Gage
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
RLA — Rated Load Amps



*Fuse or HACR breaker.

†Minimum wire size is based on 60 C copper wire. If other than 60 C wire is used, determine size from NEC. Voltage drop of wire must be less than 2% of rated voltage.

NOTES:

- 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. The CSA units may be fuse or circuit 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 percent voltage imbalance.

% Voltage Imbalance

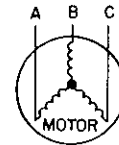
$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60

AB = 452 v

BC = 464 v

AC = 455 v



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

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

$$= 457$$

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 percent voltage imbalance.

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

$$= 1.53\%$$

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.

Sequence of operation



Heating

On a call for heating, terminal "W" of the thermostat is energized, starting the induced-draft motor. When the hall-effect sensor on the induced-draft motor senses that it has reached the required speed, the burner sequence begins. This function is performed by the integrated control board (IGC). The indoor-fan motor is energized 45 seconds after flame is established. When the thermostat is satisfied and "W" is deenergized, the indoor-fan motor stops after a 45-second time-off delay.

Cooling

With the room thermostat SYSTEM switch in the COOL position and the FAN switch in the AUTO. position, the cooling sequence of operation is as follows:

When the room temperature rises to a point that is slightly above the cooling control setting of the thermostat, the thermostat completes the circuit between thermostat terminal R to terminals Y and G. These completed circuits through the thermostat connect contactor coil (C) (through unit wire Y) and blower relay coil (BR) (through unit wire G) across the 24-v secondary of transformer (TRAN).

The normally-open contacts of energized contactor (C) close and complete the circuit through compressor motor (COMP) to condenser (outdoor) fan motor (OFM). Both motors start instantly.

The set of normally-open contacts of energized relay BR close and complete the circuit through evaporator blower (indoor) fan motor (IFM). The blower motor starts instantly.

NOTE: Once the compressor has started and then has stopped, it should not be started again until 5 minutes have elapsed.

The cooling cycle remains "on" until the room temperature drops to point that is slightly below the cooling control setting of the room thermostat. At this point, the thermostat "breaks" the circuit between thermostat terminal R to terminals Y and G. These open circuits deenergize contactor coil C and relay coil BR. The condenser and compressor motors stop. After a 30-second delay, the blower motor stops. The unit is in a "standby" condition, waiting for the next "call for cooling" from the room thermostat.

Packaged Heating/Cooling Units

Constant Volume Application

HVAC Guide Specifications

Size Range: **1½ to 5 Tons, Nominal Cooling**
40,000 to 140,000 Btuh,
Nominal Input Heating

Carrier Model Number: **48SS**

Part 1 — General

1.01 SYSTEM DESCRIPTION

- A. Outdoor rooftop mounted, gas heating/electric cooling unit utilizing a rotary, reciprocating, or scroll hermetic compressor for cooling duty. Unit shall discharge supply air downward or horizontally as shown on contract drawings. Outdoor fan/coil section shall have a blow-thru design for minimum sound levels.

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 564.
- C. Unit shall be UL listed and CSA certified as a total package for safety requirements.
- D. Roof curb shall be designed to conform to NRCA Standards.
- E. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
- F. Cabinet insulation shall meet ASHRE standard no. 62P.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Unit shall be stored and handled per manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory-assembled, single-piece heating and cooling unit. Contained within the enclosure shall be all factory wiring, piping, controls, refrigerant charge (R-22), and special features required prior to field start-up.

B. Unit Cabinet:

- 1. Unit cabinet shall be constructed of phosphated, zinc-coated prepainted steel, capable of withstanding 500 hours in salt spray.
- 2. Cabinet panels shall be easily removed for servicing.
- 3. Indoor blower compartment interior cabinet surfaces shall be insulated with a minimum ½-in. thick, flexible fiberglass insulation, coated on the air side. Aluminum foil-faced fiberglass insulation shall be used in the entire section.

C. Fans:

- 1. The indoor (evaporator) fan shall be 2- or 3-speed direct-drive, as shown on equipment drawings.
- 2. Fan wheel shall be made from steel, be double-inlet type with forward curved blades with corrosion resistant finish and be dynamically balanced.
- 3. Outdoor (condenser) fan shall be of the direct driven, propeller type with aluminum blades riveted to corrosion resistant steel spiders, be dynamically balanced, and discharge air vertically upwards and horizontally.

D. Compressor:

- 1. Fully hermetic compressor with factory-installed vibration isolation.
- 2. Rotary compressors shall be standard on unit size 018. Reciprocating compressors shall be standard on unit sizes 024-042. Scroll compressors shall be standard on unit sizes 048 and 060.

E. Coils:

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

F. Heating Section:

- 1. Induced-draft combustion type with energy saving direct spark ignition system and redundant main gas valve.
- 2. Induced-draft motors shall be provided with solid-state hall effects sensor to ensure adequate airflow for combustion.
- 3. The heat exchangers shall be constructed of aluminumized steel for corrosion resistance.
- 4. Burners shall be of the in-shot type constructed of aluminum coated steel.
- 5. Integrated gas control board shall provide control of heating and simplify troubleshooting through its built-in diagnostic function.
- 6. All gas piping and electric power shall enter the unit cabinet at a single location.

G. Refrigerant Components:

Refrigerant components shall be of the Acutrol™ feed system type.

H. Filter section shall consist of field-installed, throw-away, 1-in. thick fiberglass filters of commercially available sizes.

I. Controls and Safeties:

1. Unit Controls:

- a. Unit shall be complete with self-contained low-voltage control circuit.

2. Safeties:

Compressors shall incorporate a solid-state compressor protector which provides reset capability.

J. Operating Characteristics:

1. Unit shall be capable of starting and running at 125 F ambient outdoor temperature per maximum load criteria of ARI Standard 210/240-89.
2. Compressor with standard controls shall be capable of operation down to 40 F ambient outdoor temperature.
3. Unit provided with fan time delay to prevent cold air delivery before heat exchanger warms up.
4. Unit provided with fan time-delay after the thermostat is satisfied.

K. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single location.

L. 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. Condenser-fan motor shall be totally enclosed.

M. Special Features:

1. Economizer:

- a. Economizer controls capable of providing free cooling using outside air.
- b. Equipped with low-leakage dampers not to exceed 3% leakage, at 1.0 in. wg pressure differential.
- c. Spring-return motor shuts off outdoor damper on power failure.

2. Roof Curb:

Curb shall have seal strip and a wood nailer for flashing and shall be installed per manufacturer's instructions.

3. Manual Outdoor-Air Damper:

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

4. Two-Position Damper:

Damper allows outside air to enter the building when the indoor fan is energized.

5. Thermostat and Subbase:

To provide for one-stage heating and cooling in addition to manual or automatic changeover and fan control.

6. Electronic Programmable Thermostat:

Thermostat provides 2-stage heating and 2-stage cooling control with remote communication ability.

7. Natural-to-Propane Conversion Kit:

Kit shall have burner orifices.

8. Low Ambient Package:

Package shall consist of a solid-state control and condenser coil temperature sensor for controlling outdoor-fan motor operation, which shall allow unit to operate down to 0° F outdoor ambient temperature.

9. Time Guard® Device:

Solid-state control shall protect compressor by preventing short cycling.

10. Flexible Duct Kit:

Kit shall include 2 flexible UL-listed ducts. The duct is insulated with 1-in. fiberglass insulation and includes a vapor barrier.

11. Concentric Diffuser Box:

To provide even 4-way air distribution. Designed for use with accessory flexible ducts and roof curbs.

12. Lifting Bracket Kit:

Kit shall provide attachment points for rigging straps. (Not required with optional base rail or downflow option applications.)

13. High- and Low-Pressure Switch Kits:

Switches provide additional safety features and protect the unit from running at unsuitable pressures.

14. Filter Rack:

Rack provides mounting location for filters when unit is in downflow application.

15. Crankcase Heater:

Heater warms crankcase oil to reduce refrigerant migration (recommended on 208/230-v, single-phase units in sizes 024-042).

16. Base Rail:

Base rail provides holes for rigging and handling, and an elevated base for horizontal applications.

17. Downflow Option:

Option provides for vertical ductwork connections.



Carrier Corporation • Syracuse, New York 13221

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CARRIER**

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Form 48SS-2PD
Replaces: 48SS-1PD