Product Data

09AZ091-182
Air-Cooled Condensers
125 to 229 Nominal Tons

Features/Benefits

A family of ruggedly built condensers ideal for clinics, motels, schools, apartment and office buildings, and factories.

Air-Cooled Condensers for Remote Application with 30HX chillers. A wide range of sizes to choose from with:

- Low profile design
- Proven performance in every building application
- Efficient direct-drive fans
- Cabinet designs in vertical airflow configurations
- A choice of factory-installed options that allow application customizing
- High-efficiency performance for commercial and industrial projects

Design flexibility

Carrier remote condensers provide the design flexibility required in replacement, renovation, and new construction. Units are available in 13 sizes, from 90 to 200 tons. These condensers meet the needs for cooling large industrial and commercial applications.

Flexibility in meeting job requirements is ensured with unit design and available factory options. The compact footprint saves valuable space and allows installation in tight locations. Matching condensers to existing indoor units is easy with a selection of coil circuiting. Units are available with factory-mounted control options.

Easy installation and maintenance

Units are completely pre-piped and wired at the factory to ensure time and money-saving installation and service. Access panels are easily removed to provide speedy inspection and service of internal components. Factory-installed electrical junction box provides space for control connections. With factory-installed control options such as head pressure control, the unit arrives at the jobsite ready for installation. This reduces field labor. Mounting legs, shipped with the unit, are provided for all sizes. Precision engineered parts translate to a quality built, reliable design that will operate efficiently, minimize service calls, and provide years of reliable operation.

Quieter, more efficient operation

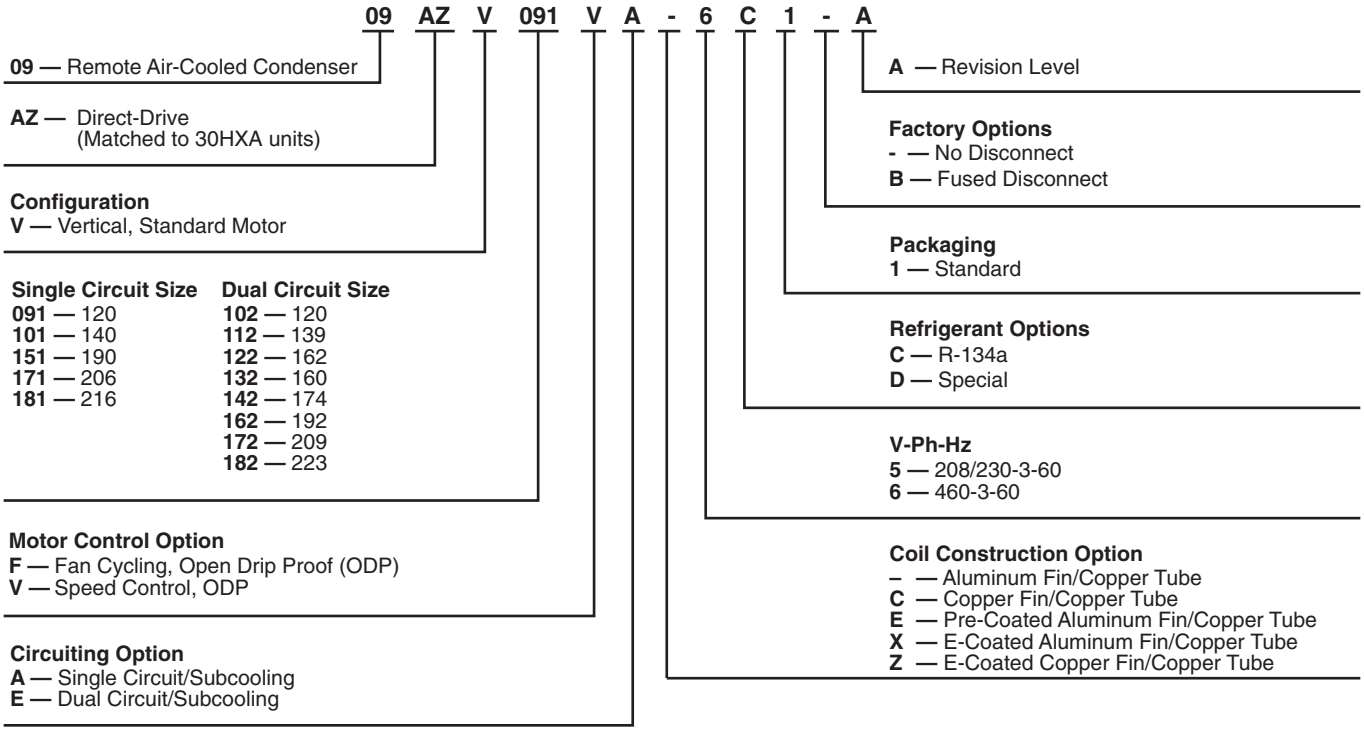
High-efficiency direct-drive condenser fans with bell-mouthed orifices provide large quantities of condenser air at low sound levels.

Special features for outstanding performance

- Space saver slab type condenser coils use Carrier's advanced heat transfer technology and provide peak heat transfer efficiency with large coil face area. Fins are mechanically bonded to nonferrous seamless tubing for efficient leak-free operation.
- Quiet fan performance efficiently moves large volumes of outdoor air. Specially designed discharge and fan sections provide superior air handling capability with high efficiency and low sound.
- Convenient access electrical control center contains all factory pre-wired control devices.
- The weather-resistant cabinets are constructed of painted steel and are capable of withstanding Federal test method Standard No. 141 (Method 6061) 500-hour salt spray test.
- A choice of motor controls provides the flexibility to meet most application requirements.
- All motors are protected against thermal overload, and 3-phase motors are protected against single-phasing conditions.
- The 09AZ units are specifically customized with options required for use with the 30HX chiller units. This includes appropriate circuiting with subcooling, condenser-fan contactors and optimized coil surface.

Table of contents

Model number nomenclature



Physical data

SINGLE CIRCUIT

09AZV SIZE	091	101	151	171	181
30HXA SIZE*	206 to 271	206	246	261	271
30HXA CIRCUIT*	B	A	A	A	A
WEIGHT (lbs)					
Operating Weight	3025	3050	3800	4550	4950
Shipping Weight	3700	3725	4600	5500	6000
REFRIGERANT					
Type	R-134a				
FAN					
Type	Direct Drive, Vertical Discharge				
Quantity	8	8	10	12	12
Diameter (in.)	30	30	30	30	30
No. of Blades	3	3	3	3	3
Max Rpm	1140	1140	1140	1140	1140
Total Airflow (Cfm)	86,400	81,300	101,600	129,400	122,300
Motor Hp	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
COIL					
Arrangement	Flat Horizontal, Aluminum Fin, Copper Tube				
Rows (per circuit)	3	4	4	4	4
Fins per inch	14	14	14	10	14
Total Coil Face Area (sq ft)	120.9	120.9	150.9	180.9	180.9
No. of Refrigerant Circuits	1	1	1	1	1
Circuit Volume (ft^3)	2.59	3.45	7.97	9.48	9.48
Subcooler Circuit	Standard	Standard	Standard	Standard	Standard
CONNECTIONS (in.)					
Discharge Gas In	(2) 1 5/8	(2) 1 5/8	(2) 2 1/8	(2) 2 1/8	(2) 2 1/8
Liquid Out	(2) 1 3/8	(2) 1 3/8	(2) 1 5/8	(2) 1 5/8	(2) 1 5/8
MANIFOLD CONN. (in.)†					
Discharge Gas In	2 1/8	2 1/8	3 1/8	3 1/8	3 1/8
Liquid Out	1 5/8	1 5/8	2 1/8	2 1/8	2 1/8

DUAL CIRCUIT

09AZV SIZE	102	112	122	132	142	162	172	182
30HXA SIZE*	106	116	126	136	146	161	171	186
WEIGHT (lbs)								
Operating Weight	3025	3125	3250	3775	3800	4750	4650	4850
Shipping Weight	3700	3800	3900	4600	4600	5700	5600	5900
REFRIGERANT								
Type	R-134a							
FAN								
Type	Direct Drive, Vertical Discharge							
Quantity	8	8	8	10	10	12	12	12
Diameter (in.)	30	30	30	30	30	30	30	30
No. of Blades	3	3	3	3	3	3	3	3
Max Rpm	1140	1140	1140	1140	1140	1140	1140	1140
Total Airflow (Cfm)	85,100	84,300	81,300	106,800	107,500	127,200	125,500	121,800
Motor Hp	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
COIL								
Arrangement	Horizontal, Aluminum Fin, Copper Tube							
Rows (per circuit A/B)	4/3	4/3	4/4	4/3	4/4	4/4	4/4	4/4
Fins per inch (circuit A/B)	14/8	14/10	14/14	14/8	10/10	14/8	12/12	14/14
Circuit Split (A/B)	64/36	64/36	60/40	59/41	50/50	59/41	50/50	50/50
Total Coil Face Area (sq ft)	120.9	120.9	120.9	150.9	150.9	180.9	180.9	180.9
No. of Refrigerant Circuits	2	2	2	2	2	2	2	2
Circuit Volume (ft^3) (A/B)	3.23/1.29	3.23/1.29	3.23/3.23	3.98/2.99	3.99/3.99	4.74/4.74	4.74/4.74	4.74/4.74
Subcooler Circuit	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
CONNECTIONS (in.)								
Discharge Gas In	(2) 1 5/8	(2) 1 5/8	(2) 1 5/8	(2) 2 1/8	(2) 2 1/8	(2) 2 1/8	(2) 2 1/8	(2) 2 1/8
Liquid Out	(2) 1 3/8	(2) 1 3/8	(2) 1 3/8	(2) 1 5/8	(2) 1 5/8	(2) 1 5/8	(2) 1 5/8	(2) 1 5/8

* 30HXA sizes are provided as reference only. All data presented in this chart relate to the 09AZ condenser.

† In single-circuit applications, refrigerant connections are made between the 30HXA unit and the 09AZ manifold.

Factory-installed options

Condenser coil options (Enviro-Shield™)

Several options are available to match coil construction to the site conditions for the best durability. Consult your Carrier representative for further information.

Speed head pressure control (low ambient kit)

This option contains a fan speed-control device activated by a pressure sensor. With the speed control, the condenser-fan motor speed is controlled in response to the saturated condensing pressure. This factory-installed option maintains the condensing temperature at 100 ± 10°F (38 ± 6°C).

The speed control consists of a solid-state circuit on a printed circuit board, sensor, transformer, and single phase compatible condenser-fan motor.

NOTE: The fan cycling head pressure control is included on all units with speed control.

Fused disconnect

Power circuit fused disconnect switch can be factory-mounted on 3-phase units.

CONDENSER COIL CORROSION PROTECTION OPTIONS

ENVIRO-SHIELD OPTION*	ENVIRONMENT					
	Standard	Mild Coastal	Moderate Coastal	Severe Coastal	Industrial	Combined Industrial/Coastal
AL Fins (Standard Coils)	X					
CU Fins			X			
AL Fins, E-coat					X	X
CU Fins, E-coat				X		
AL Fins, Pre-coated		X				

LEGEND

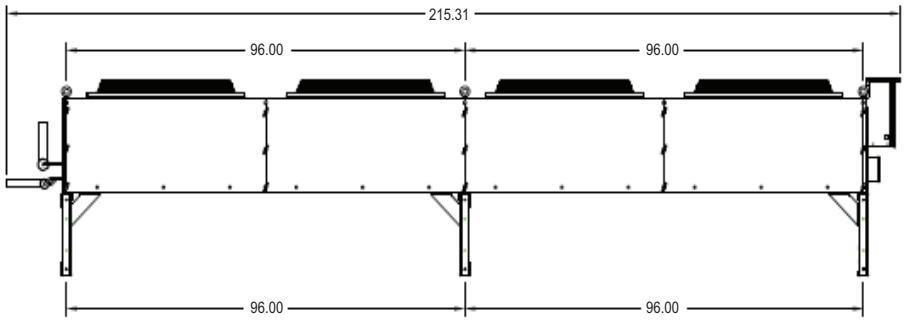
AL — Aluminum
CU — Copper

* See “Environmental Corrosion Protection” for more information (Publication 04-581061-01).

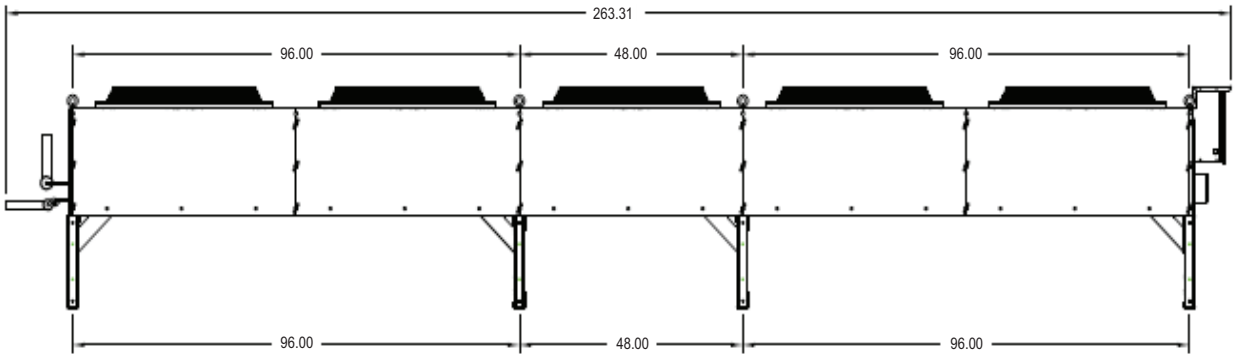
Dimensions

09AZV--1-A SINGLE CIRCUIT SIDE VIEWS

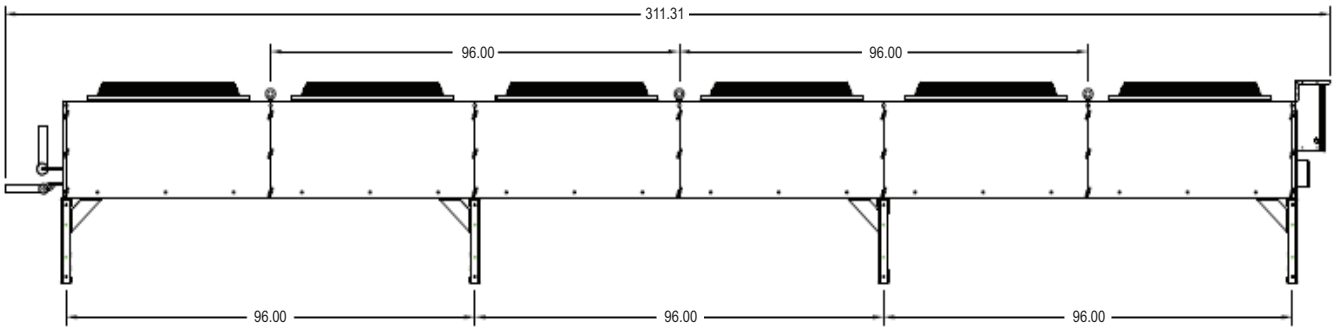
NOTES:
1. Service clearances must be at least 48 in. on all sides.
2. Field assembly of discharge/liquid headers required.



09AZV91,101



09AZV151

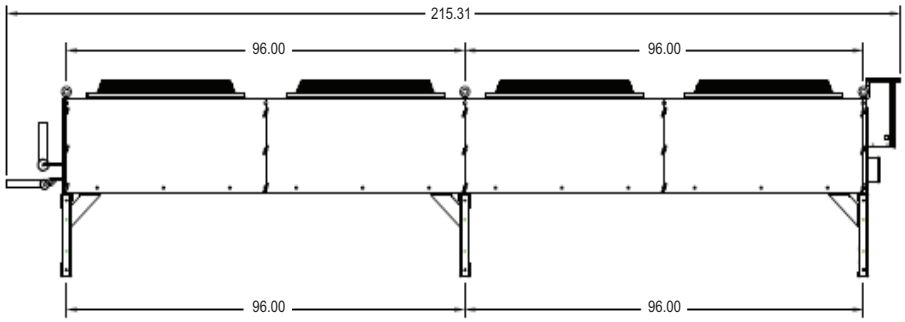


09AZV171,181

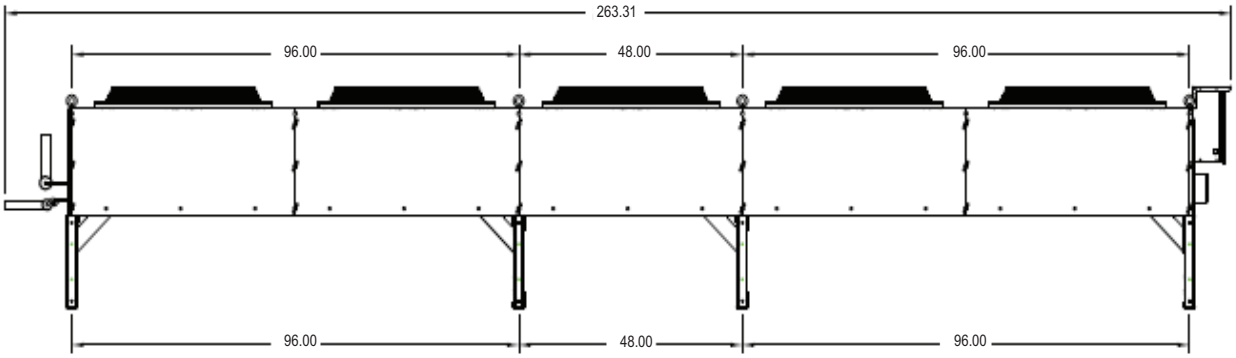
Dimensions (cont)

09AZV--2-E DUAL CIRCUIT SIDE VIEWS

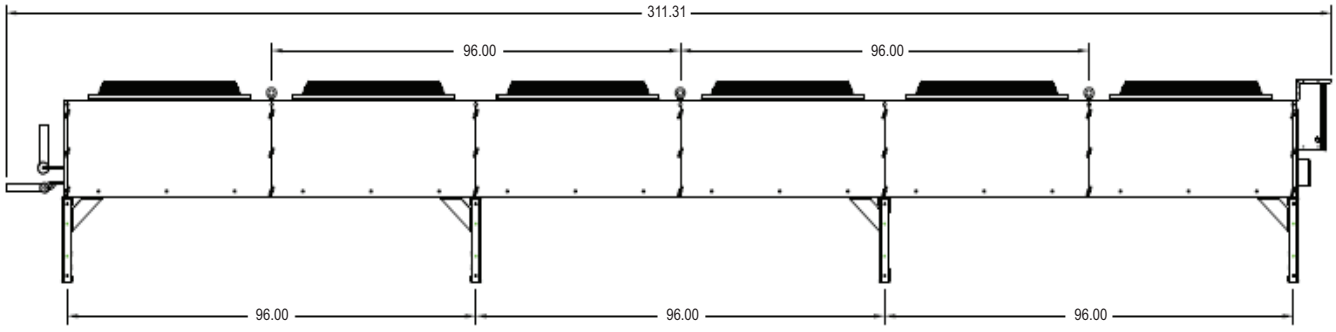
NOTE: Service clearances must be at least 48 in. on all sides.



09AZV102,112,122



09AZV132,142

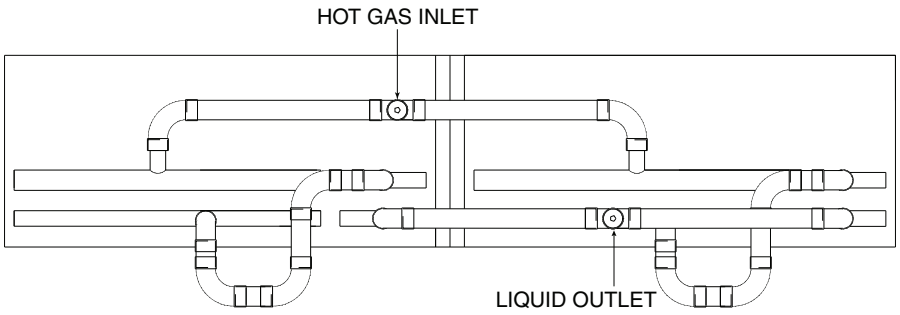


09AZV162,172,182

Dimensions (cont)

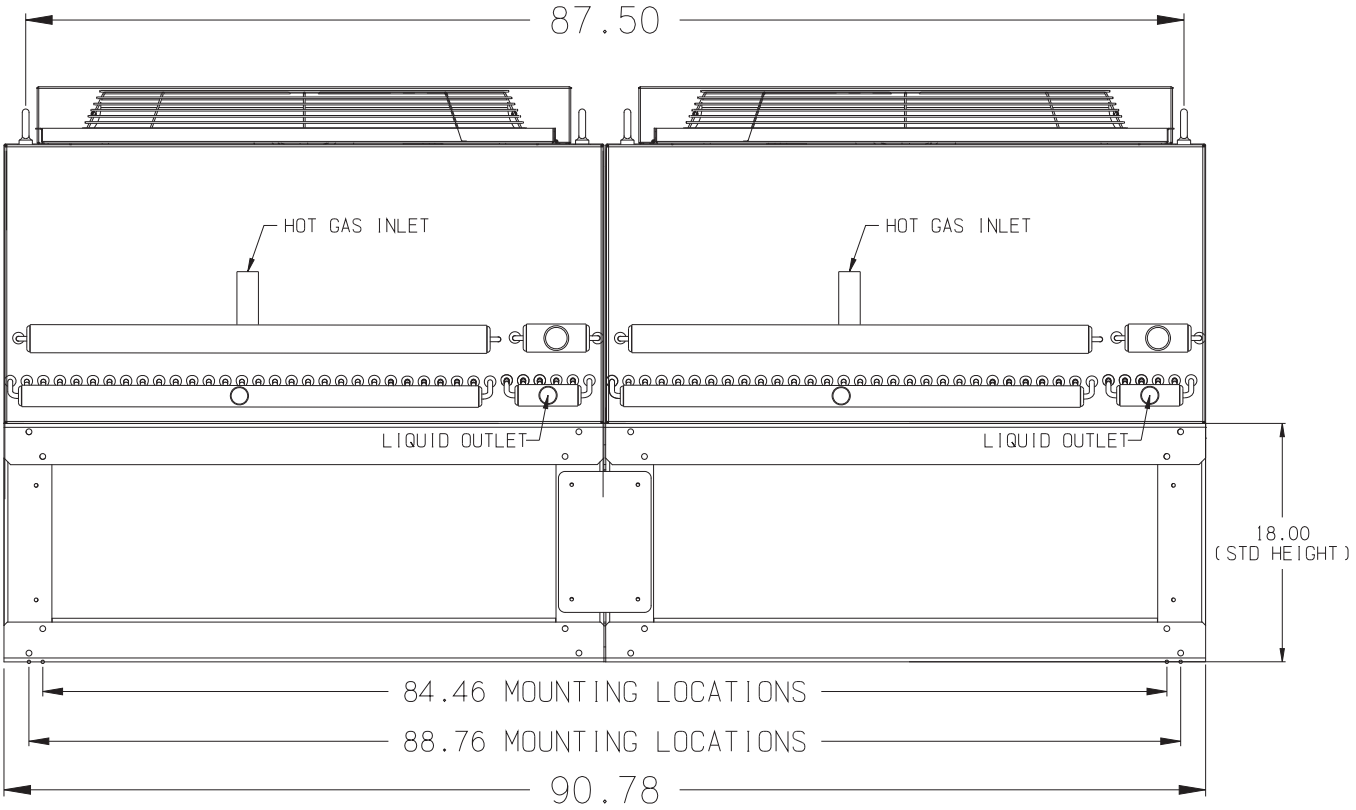
REFRIGERANT CONNECTION END VIEW

SINGLE-CIRCUIT CONDENSER REFRIGERANT CONNECTIONS



NOTE: Field installation of a refrigerant manifold (shipped loose from the manufacturer) is required on single-circuit condensers. This diagram depicts the overall look after the manifold is assembled and installed.

DUAL-CIRCUIT CONDENSER REFRIGERANT CONNECTIONS



NOTE: Dimensions are in inches.

Selection procedure

Contact your local Carrier representative for selection procedure and guidelines.

Performance data

Contact your Carrier representative for 09AZ/30HXA performance ratings.

CORRESPONDING CHILLER AND CONDENSER SIZES

30HXA CHILLER SIZE	09AZV CONDENSER SIZE
106	102
116	112
126	122
136	132
146	142
161	162
171	172
186	182

30HXA CHILLER SIZE	09AZV CONDENSER SIZE
206 Circuit A*	101
206 Circuit B*	091
246 Circuit A*	151
246 Circuit B*	091
261 Circuit A*	171
261 Circuit B*	091
271 Circuit A*	181
271 Circuit B*	091

* Indicates the 30HXA circuit being piped to the single circuit 09AZ condenser.

NOMINAL HEAT REJECTION CHART*

SINGLE CIRCUIT	
SIZE	NOMINAL TONS
091	125
101	142
151	192
171	202
181	221

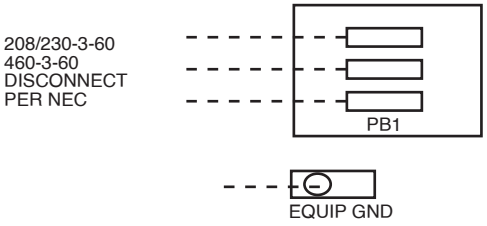
DUAL CIRCUIT	
SIZE	NOMINAL TONS
102	126
112	135
122	151
132	164
142	176
162	192
172	213
182	229

* Based on 95°F ambient, 120°F condensing, 25°F temperature difference.

Typical wiring schematic

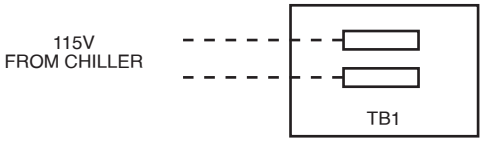
POWER WIRING

ALL MODELS



FIELD CONTROL WIRING

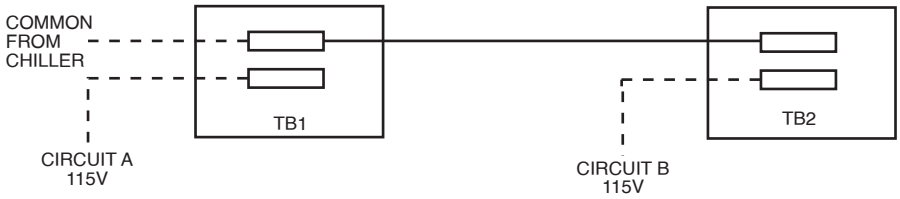
09AZV--1-A SINGLE CIRCUIT UNITS



LEGEND

NEC — National Electrical Code
PB1 — Power Terminal Block
TB1 — Control Terminal Block
TB2 — Control Terminal Block (09AZV--2-E Dual Circuit Units Only)

09AZV--2-E DUAL CIRCUIT UNITS



Electrical data (fan motor)

SINGLE-CIRCUIT UNITS

09AZV SIZE	208/230-3-60				460-3-60				CONTROL CIRCUIT (V-Ph-Hz)
	FLA	MCA	MOCP	Min/Max (Volts)	FLA	MCA	MOCP	Min/Max (Volts)	
091	52	53.6	60	187/253	26.4	27.2	30	414/506	115-1-60
101	52	53.6	60	187/253	26.4	27.2	30	414/506	115-1-60
151	65	66.6	70	187/253	33	35.1	40	414/506	115-1-60
171	78	80.1	90	187/253	39.6	40.4	45	414/506	115-1-60
181	78	80.1	90	187/253	39.6	40.4	45	414/506	115-1-60

DUAL-CIRCUIT UNITS

09AZV SIZE	208/230-3-60				460-3-60				CONTROL CIRCUIT (V-Ph-Hz)
	FLA	MCA	MOCP	Min/Max (Volts)	FLA	MCA	MOCP	Min/Max (Volts)	
102	52	53.6	60	187/253	26.4	27.2	30	414/506	115-1-60
112	52	53.6	60	187/253	26.4	27.2	30	414/506	115-1-60
122	52	53.6	60	187/253	26.4	27.2	30	414/506	115-1-60
132	65	66.6	70	187/253	33	35.1	40	414/506	115-1-60
142	65	66.6	70	187/253	33	35.1	40	414/506	115-1-60
162	78	80.1	90	187/253	39.6	40.4	45	414/506	115-1-60
172	78	80.1	90	187/253	39.6	40.4	45	414/506	115-1-60
182	78	80.1	90	187/253	39.6	40.4	45	414/506	115-1-60

LEGEND

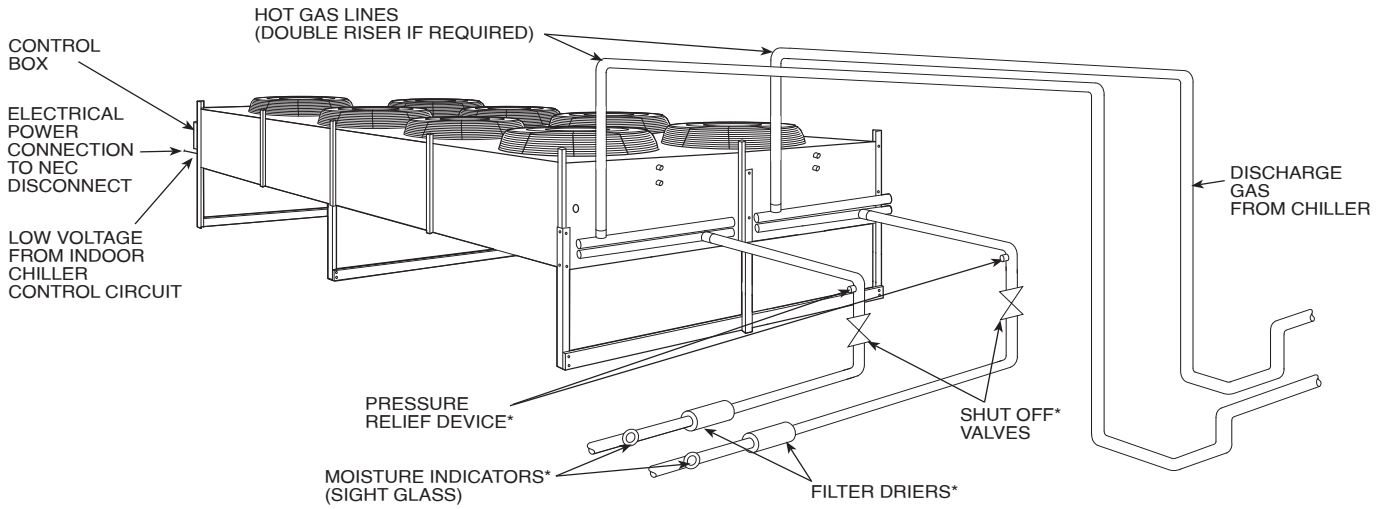
FLA — Full Load Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protective Device (see Note 1)
NEC — National Electric Code

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (NEC Articles 430 and 440), the overcurrent protective device for the unit shall be either circuit breaker (where available) or fuse.
2. Wire sizing amps (MCA) are a sum of 125% of the condenser-fan motor FLA.
3. Motors are protected against primary single phasing condition.
4. Three-phase voltage imbalance must not exceed 2%.

Typical piping and wiring

CONDENSER



LEGEND

NEC — National Electrical Code

*Field supplied.

Controls

09AZ controls

The 09AZV091-182 units are designed to operate specifically with 30HXA chillers, using R-134a refrigerant. Units with 8 fans have 2 direct controlled (applied to optional variable speed), 4 refrigerant pressure, and 2 ambient temperature controlled fans. Units with 10 fans have 2 direct controlled (applied to optional variable speed), 4 refrigerant pressure, and 4 ambient temperature controlled fans. Units with 12 fans have 2 direct controlled (applied to optional variable speed), 6 refrigerant pressure, and 4 ambient temperature controlled fans.

Operation sequence

All condenser fans are allowed to operate once a call for cooling comes from the chiller. Direct fans will operate while refrigerant pressure and ambient temperature control fans maintain refrigerant head pressure based on existing refrigerant pressure and ambient temperature conditions. Optional variable speed control will ramp direct fan motor speed for improved low ambient performance.

Application data

Contact your Carrier representative for information concerning 09AZ application data.

Air-Cooled Condensers

HVAC Guide Specifications

Size Range: **125 to 229 Tons**

Carrier Model Number: **09AZV**

Part 1 — General

1.01 SYSTEM DESCRIPTION

Outdoor mounted, packaged air-cooled remote condenser. Unit shall be equipped with vertical air discharge.

1.02 QUALITY ASSURANCE

A. Units shall be rated with 30HXA units of the same nominal size using R-134a refrigerant.

B. Units shall be designed to conform to ANSI/ASHRAE 15, latest revision of safety code, and UL Standard 1995. Units shall be listed under both American and Canadian Standards.

C. Coils shall be leak tested at 400 psig and unit operation shall be tested at the factory.

1.03 DELIVERY, STORAGE, AND HANDLING

Units shall be stored and handled according to manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

A. General:

Outdoor mounted, packaged air-cooled remote condenser. Factory assembled units shall consist of condenser coil, fans and motors, mounting legs, factory wiring, piping and controls, and a charge of dry nitrogen.

B. Unit Cabinet:

1. Cabinet shall be constructed of minimum 18 gage painted galvanized steel and is capable of withstanding Federal Method Standard No. 141 (Method 6061) 500-hour salt spray test. (Optional heavy gage embossed aluminum shall be available.)
2. Fan sections shall be divided by full width baffles to prevent air bypass and provide additional casing rigidity.
3. Unit shall be furnished with lifting eyes to aid in rigging.
4. Service panels shall be easily removable using a single wrench size.

C. Fans:

Fans shall be dynamically balanced, propeller type, direct driven by weatherproof motors. Discharge side shall be protected by anti-corrosion fan guards constructed of vinyl coated close-mesh steel wire. Fans shall have dual square head set screws spaced 90 degrees apart that seat onto one flat and one keyway on the motor shaft.

D. Coils:

Coils shall use copper tubing with aluminum fins (or optional copper tubing with copper fins and coated with polyester or E-coated fin treatment as required) and galvanized steel tube sheets. Fins shall be bonded to the tubes through mechanical expansion. Hot gas and liquid connections shall be made from the same end. Single coil circuit model numbers end with the number "1". Example: 09AZV091. Dual coil circuit model numbers end with the number "2". Example: 09AZV182. Final pass subcooling circuit shall be provided to allow additional cooling of refrigerant to compensate for long refrigerant line or applications with condenser below compressor.

E. Motors:

Motors shall be weatherproof and inherently protected to operate at the specified electrical characteristics. Motors shall have permanently lubricated ball bearings. Motors shall be factory wired to weatherproof NEMA rated control box on opposite header end of unit. Fan motors will be a rigid base type mounted to 12 gage galvanized steel rails. Low sound motors will be provided when required by specifications.

F. Operating Characteristics:

Unit shall be capable of rejecting the required heat at the required cfm and be capable of operating at moderate ambient temperatures with standard factory-supplied fan cycling and at reduced ambient temperatures with optional fan cycling or motor speed control.

G. Electrical Characteristics:

All electrical power wiring shall enter the unit cabinet at a single location. Fan motor contactors shall be provided and wired to condenser fans. Control circuit is 115 v and control wiring shall enter the unit control box at one connection only.

H. Controls:

Fan cycling shall include temperature actuated fan cycling switch, fan contactors, and low voltage terminal strip. Factory mounted control cycles one fan in response to entering air temperature to maintain head pressure.

I. Special Features:

Units will be furnished with optional factory mounted or field-installed special features (as required by application).

1. Fan variable speed control shall be provided to allow operation to –20°F. Factory mounted controller modulates the speed of the lead condenser fan on response to a 0-10Vdc signal. Fan cycling control and contactors provided wired with controls. Control shall include all components of fan cycling control and contactors.
2. Coil Options:
   a. Copper-fin coils shall be constructed of copper-fins mechanically bonded to copper-tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil

pan to minimize potential for galvanic corrosion between the coil and pan. All copper construction shall provide protection in moderate coastal environments.

b. E-Coated aluminum-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss requirements of 60° of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to a minimum of 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum-fins mechanically bonded to copper tubes.

c. E-Coated copper-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss requirements of 60° of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to a minimum of 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be copper-fins mechanically bonded to copper tubes with copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to maintain coating integrity and minimize corrosion potential between the coil and pan.

d. Pre-coated aluminum-fin coils shall have a polyester coating to provide protection in salty environments, such as those found at seacoast locations. Coating shall be baked into the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and the copper tube.

3. Fused disconnect for 3 phase units — optional in lieu of non-fused disconnect.

   Unit ships standard with a non-fused disconnect.

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Replaces: 09AZ-1PD