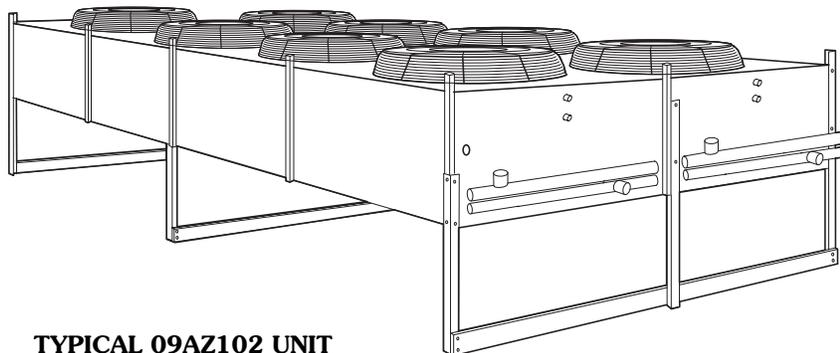




Product Data

09AZ091-182 Air-Cooled Condensers

90 to 200 Nominal Tons



TYPICAL 09AZ102 UNIT

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

Features/Benefits

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

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 in all popular three phase voltages and 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 and transformer, the unit arrives at the job-site 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 galvanized steel and are capable of withstanding Federal

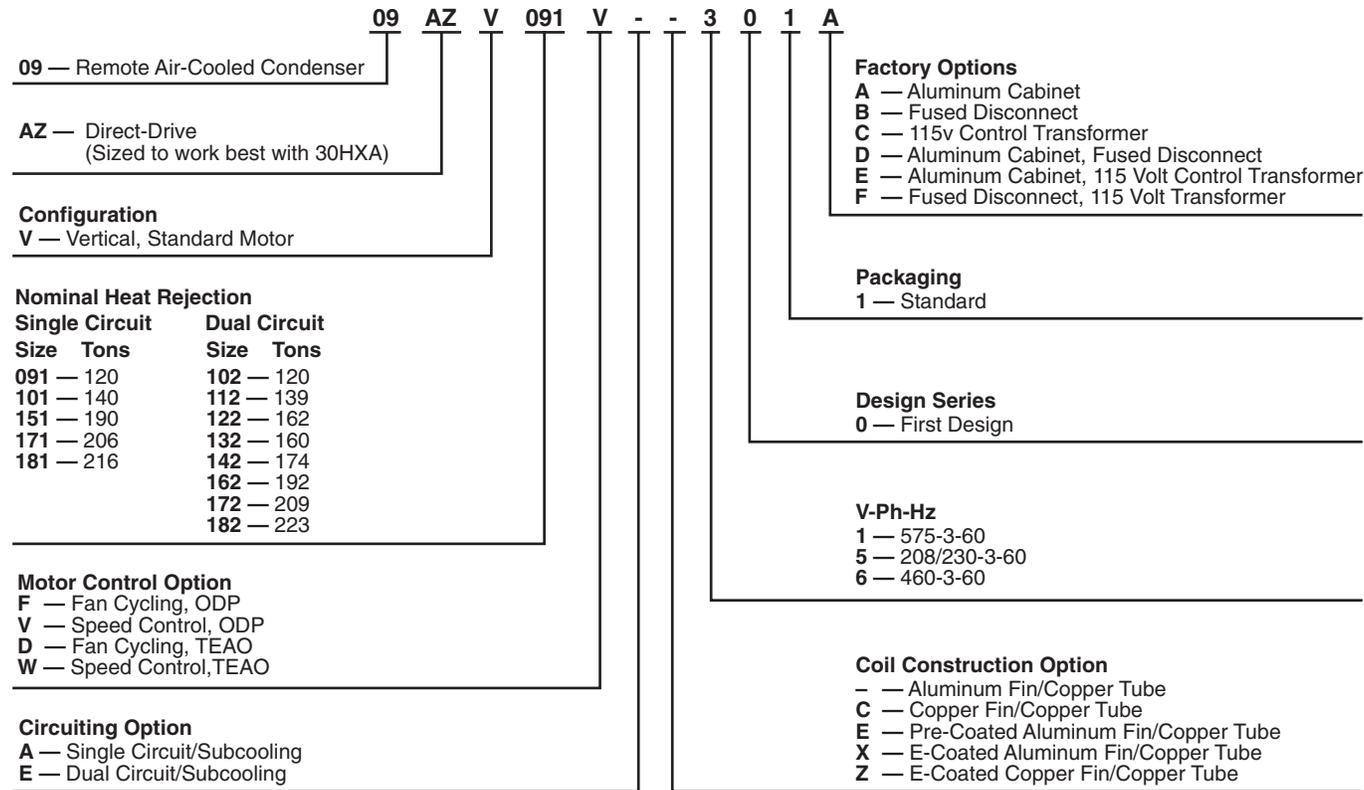
test method Standard No. 141 (Method 6061) 500-hour salt spray test.

- 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.

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Model number nomenclature



TEAO — Totally Enclosed Air Over

Physical data



SINGLE CIRCUIT

09AZV SIZE	091	101	151	171	181
WEIGHT (lbs)					
Operating Weight	2300	2590	3081	3730	3770
Shipping Weight	2510	2800	3450	4040	4090
REFRIGERANT					
Type	134a				
FAN					
Type	Direct Drive, Vertical Discharge				
Quantity	8	8	10	12	12
Diameter (in.)	26	26	26	26	26
No. of Blades	4	4	4	4	4
Max Rpm	1140	1140	1140	1140	1140
Total Airflow (Cfm)	124,000	124,000	155,000	186,000	186,000
Motor Hp	1½	1½	1½	1½	1½
COIL					
Arrangement	Horizontal, Aluminum Fin, Copper Tube				
Rows (per circuit)	3	4	4	4	4
Fins per inch	14	14	14	10	12
Total Coil Face Area (sq ft)	120.6	120.6	150.6	180.6	180.6
No. of Refrigerant Circuits	1	1	1	1	1
Subcooler Circuit	Standard				
CONNECTIONS (in.)					
Discharge Gas In	3⅛	3⅛	3⅛	3⅛	3⅛
Liquid Out	2⅝	2⅝	2⅝	2⅝	2⅝

DUAL CIRCUIT

09AZV SIZE	102	112	122	132	142	162	172	182
WEIGHT (lbs)								
Operating Weight	2495	3164	2590	4032	3110	3081	3730	3820
Shipping Weight	2705	3374	2800	4242	3370	3450	4040	4130
REFRIGERANT								
Type	134a							
FAN								
Type	Direct Drive, Vertical Discharge							
Quantity	8	10	8	10	10	12	12	12
Diameter (in.)	26	26	26	26	26	26	26	26
No. of Blades	4	4	4	4	4	4	4	4
Max Rpm	1140	1140	1140	1140	1140	1140	1140	1140
Total Airflow (Cfm)	124,000	155,000	124,000	155,000	155,000	186,000	186,000	186,000
Motor Hp	1½	1½	1½	1½	1½	1½	1½	1½
COIL								
Arrangement	Horizontal, Aluminum Fin, Copper Tube							
Rows (per circuit A/B)	4/3	3/3	4/4	4/3	4/4	4/3	4/4	4/4
Fins per inch	14	14	14	14	10	12	10	14
Total Coil Face Area (sq ft)	120.6	150.6	120.6	150.6	150.6	180.6	180.6	180.6
No. of Refrigerant Circuits	2	2	2	2	2	2	2	2
Subcooler Circuit	Standard							
CONNECTIONS (in.)								
Discharge Gas In	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝
Liquid Out	2⅛	2⅛	2⅛	2⅛	2⅛	2⅛	2⅛	2⅛

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.

Motor option

Totally Enclosed, Air Over design motors may be used when required for harsh environments.

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 $100 \pm 10^\circ \text{F}$ ($38 \pm 6^\circ \text{C}$).

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.

Control transformer

Line voltage to control transformer is factory-mounted for control of condenser and indoor unit.

Aluminum cabinet

Cabinet can be fabricated with embossed aluminum for a more attractive, corrosion-resistant cabinet finish.

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

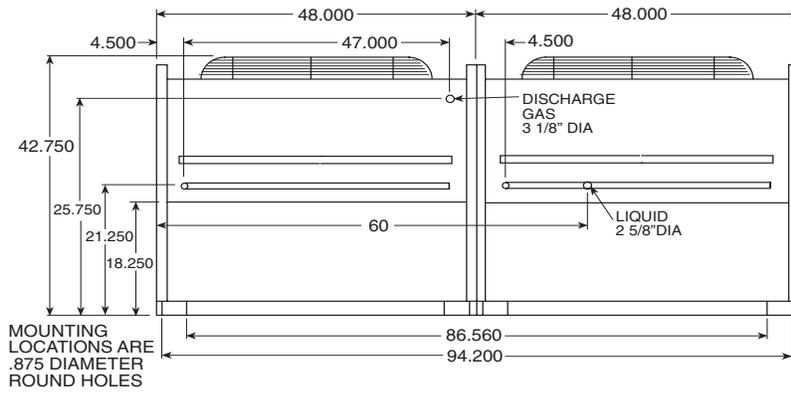
AL — Aluminum
CU — Copper

*See "Environmental Corrosion Protection" for more information (Publications 810-217 and 811-019).

Base unit dimensions

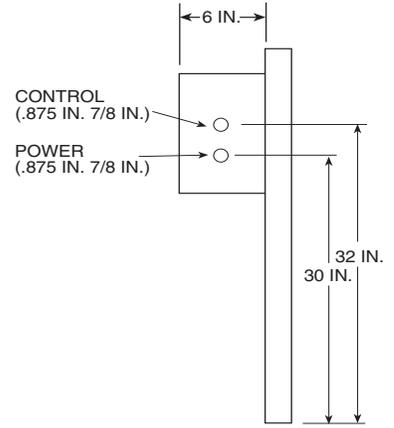


09AZV---1-A SINGLE CIRCUIT



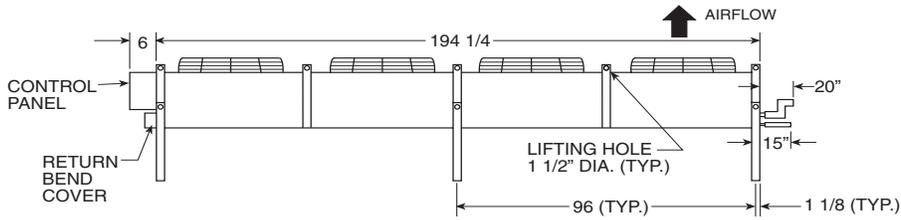
NOTES:

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

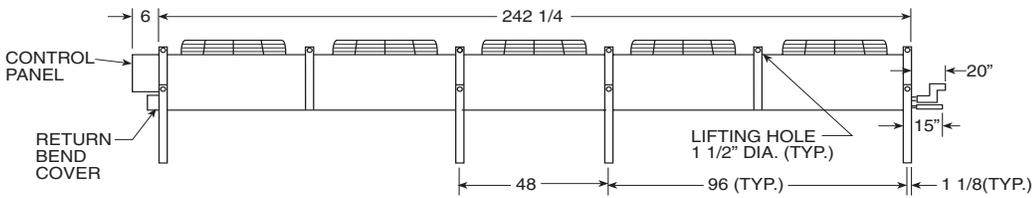


CONTROL PANEL DETAIL

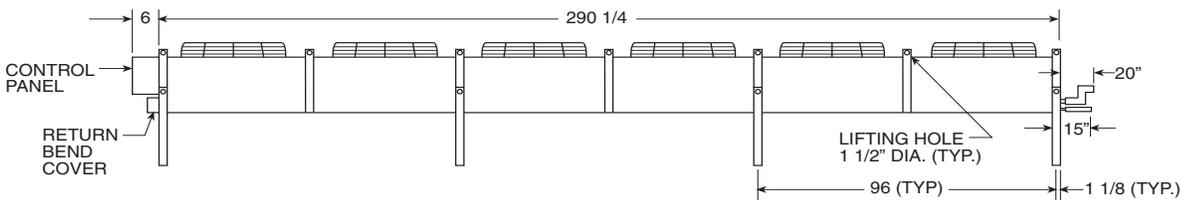
09AZV SIDE VIEW



09AZV091,101

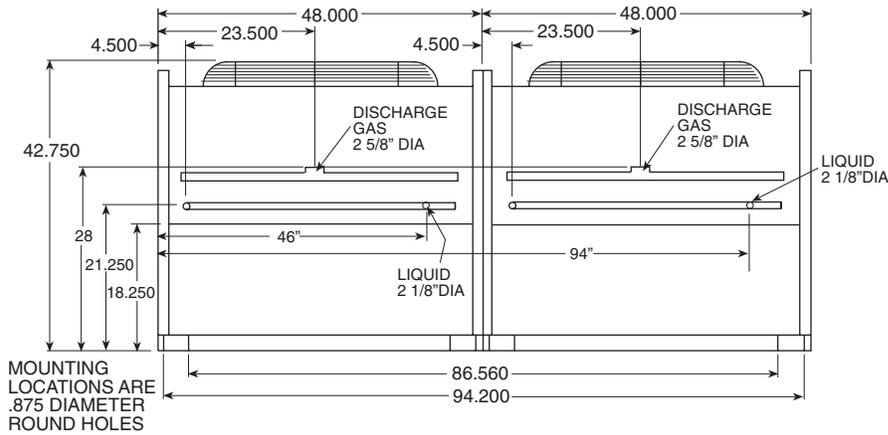


09AZV151

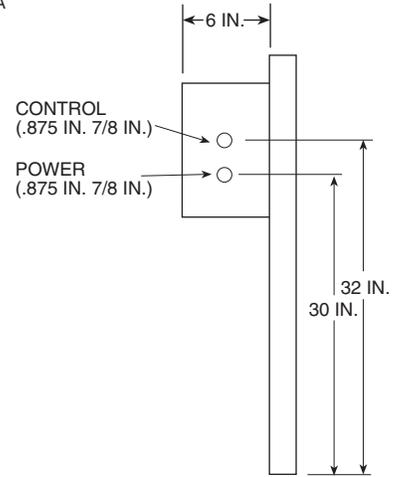


09AZV171,181

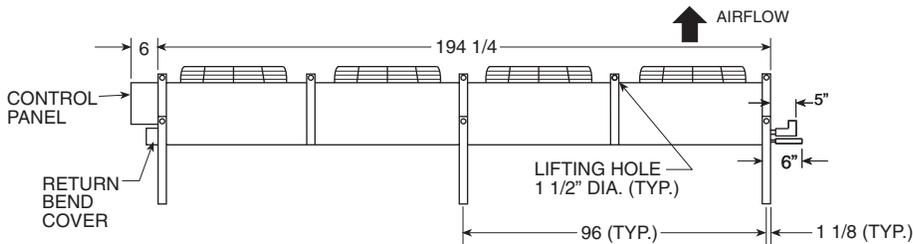
09AZV--2-E DUAL CIRCUIT



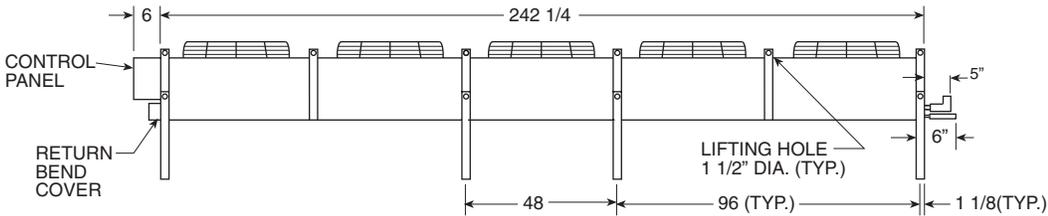
NOTE: Service clearances must be at least 48 in. on all sides.



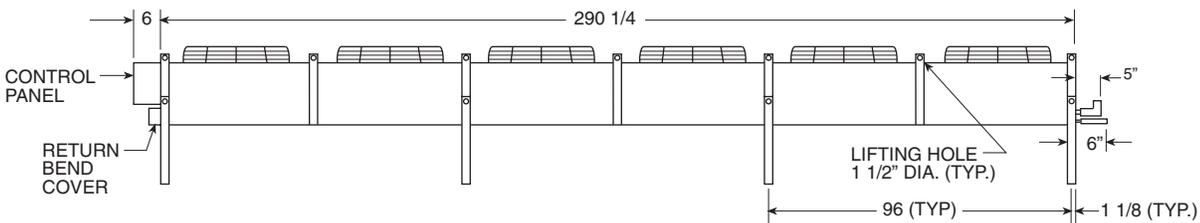
09AZV SIDE VIEW



09AZV102,122



09AZV112,132,142



09AZV162,172,182

Selection procedure



Contact your local Carrier representative for selection procedure and guidelines.

Performance data

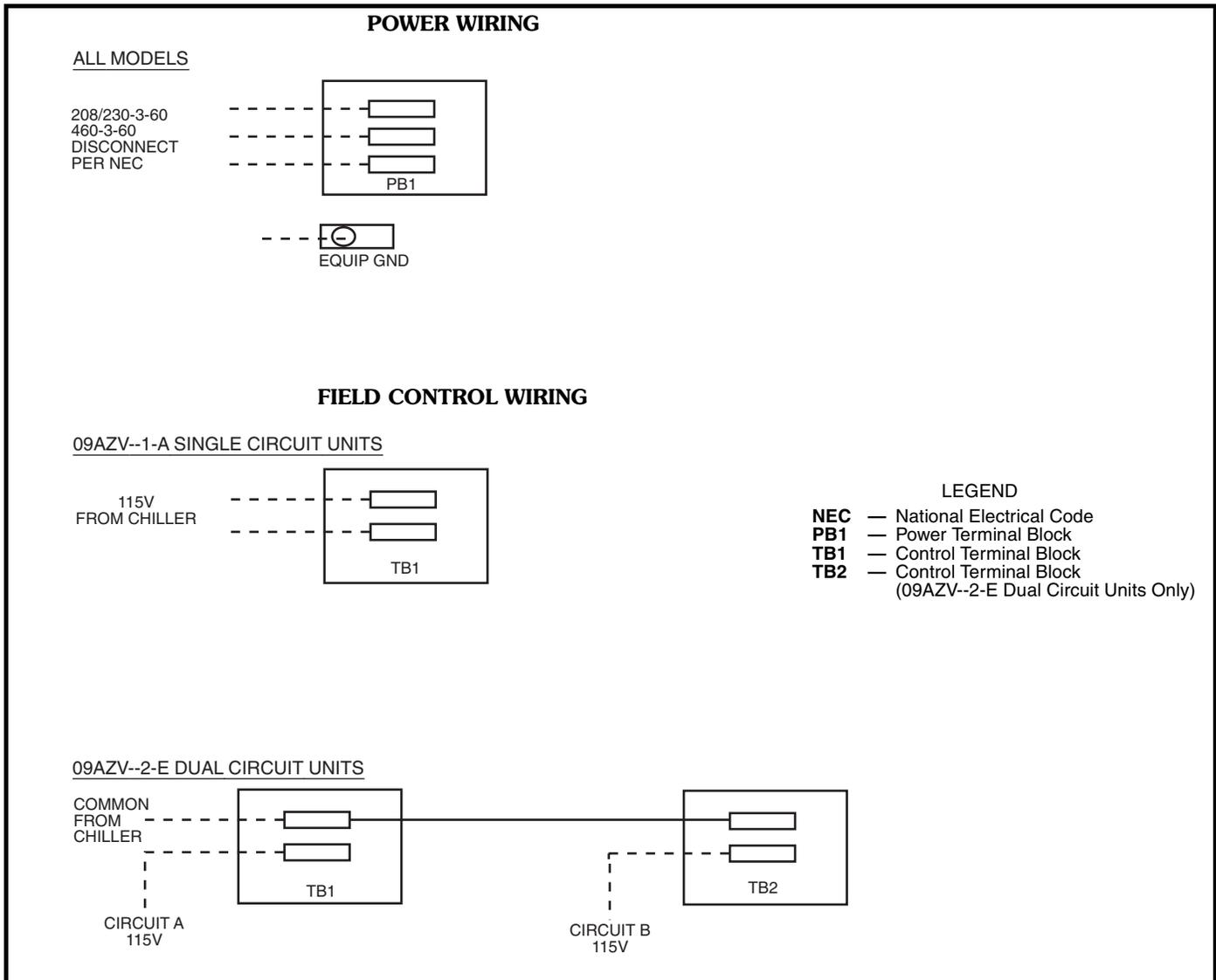
Contact your Carrier representative for 09AZ/30HXA performance ratings.

CORRESPONDING CHILLER AND CONDENSER SIZES

30HXC CHILLER SIZE	09AZV CONDENSER SIZE	30HXC CHILLER SIZE	09AZV CONDENSER SIZE
106	102	206 Circuit A*	101
116	112	206 Circuit B*	091
126	122	246 Circuit A*	151
136	132	246 Circuit B*	091
146	142	261 Circuit A*	171
161	162	261 Circuit B*	091
171	172	271 Circuit A*	181
186	182	271 Circuit B*	091

*Indicates duplex units.

Typical wiring schematic



Electrical data (fan motor)



SINGLE-CIRCUIT UNITS

09AZV SIZE	208/230-3-60				460-3-60				575-3-60				CONTROL CIRCUIT (V-Ph-Hz)
	FLA	MCA	MOCP	Min/Max (Volts)	FLA	MCA	MOCP	Min/Max (Volts)	FLA	MCA	MOCP	Min/Max (Volts)	
091	6.5	53.6	60	187/253	3.3	27.2	30	414/506	2.4	19.8	20	518/632	115-1-60
101	6.5	53.6	60	187/253	3.3	27.2	30	414/506	2.2	19.8	20	518/632	115-1-60
151	6.5	66.0	70	187/253	3.3	33.8	35	414/506	2.2	24.6	25	518/632	115-1-60
171	6.5	79.6	80	187/253	3.3	40.5	45	414/506	2.2	29.4	30	518/632	115-1-60
181	6.5	79.6	80	187/253	3.3	40.5	45	414/506	2.2	29.4	30	518/632	115-1-60

DUAL-CIRCUIT UNITS

09AZV SIZE	208/230-3-60				460-3-60				575-3-60				CONTROL CIRCUIT (V-Ph-Hz)
	FLA	MCA	MOCP	Min/Max (Volts)	FLA	MCA	MOCP	Min/Max (Volts)	FLA	MCA	MOCP	Min/Max (Volts)	
102	6.5	53.6	60	187/253	3.3	27.2	30	414/506	2.4	19.8	20	518/632	115-1-60
112	6.5	66.0	70	187/253	3.3	33.8	35	414/506	2.4	24.6	25	518/632	115-1-60
122	6.5	56.3	60	187/253	3.3	27.2	30	414/506	2.4	19.8	20	518/632	115-1-60
132	6.5	66.0	70	187/253	3.3	33.8	35	414/506	2.4	24.6	25	518/632	115-1-60
142	6.5	66.0	70	187/253	3.3	33.8	35	414/506	2.4	24.6	25	518/632	115-1-60
162	6.5	79.6	80	187/253	3.3	40.5	45	414/506	2.4	29.4	30	518/632	115-1-60
172	6.5	79.6	80	187/253	3.3	40.5	45	414/506	2.4	29.4	30	518/632	115-1-60
182	6.5	79.6	80	187/253	3.3	40.5	45	414/506	2.4	29.4	30	518/632	115-1-60

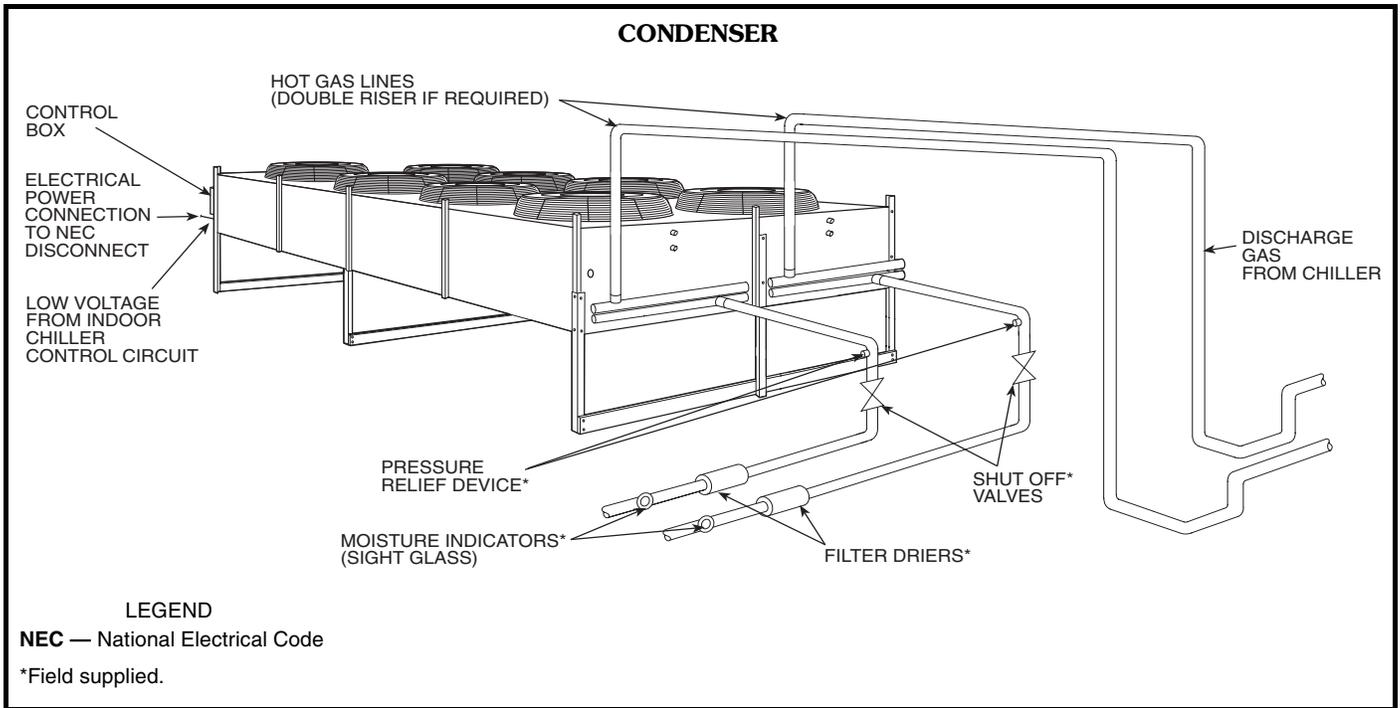
LEGEND

- 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. Canadian units may be fuse or circuit breaker.
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



09AZ controls

The 09AZV091-182 units are designed to operate specifically with 30HXA chillers, using R134a 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.

Guide specifications — 09AZV091-182

Air-Cooled Condensers

HVAC Guide Specifications

Size Range: **90 to 200 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 corrosion resistant zinc coated 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.
5. Unit shall be factory arranged for horizontal airflow. Headers shall have proper arrangement and connection locations correct refrigerant and oil return for the required airflow.

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.

Guide specifications — 09AZV091-182 (cont)



E. Motors:

Motors shall be weatherproof and inherently protected to operate at the specified electrical characteristics. Motors shall have permanently lubricated ball bearings. Optional TEAO (Totally Enclosed, Air Over) motors shall be used when required by environmental conditions. Motors shall be factory wired to weatherproof NEMA 3R 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. Embossed Aluminum cabinet will be provided for enhanced appearance and corrosion protection.
2. Fan Motor 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 discharge head pressure. Fan cycling control and contactors provided wired with controls. Control shall include all components of fan cycling control and contactors and a single phase motor qualified for use with speed control and speed controller.
3. Totally Enclosed, Air Over (TEAO) condenser fan motors shall be furnished for protection in harsh environments.
4. 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.
5. Fused disconnect for 3 phase units.
6. Control transformer with 115 v output to operate condenser and/or compressor and evaporator.

