



Remote Air-Cooled Condenser Service Manual

09AW/AZ001-020
1 to 20 Nominal Tons

09AZV091-182
90-200 Nominal Tons

This document is not intended for general distribution. It is to be used by Carrier Distributor Service or Carrier Commercial Service personnel only, and may not be distributed to individuals not employed within these organizations. This document is intended as a guide only. There is no guarantee of the accuracy of the information contained within.

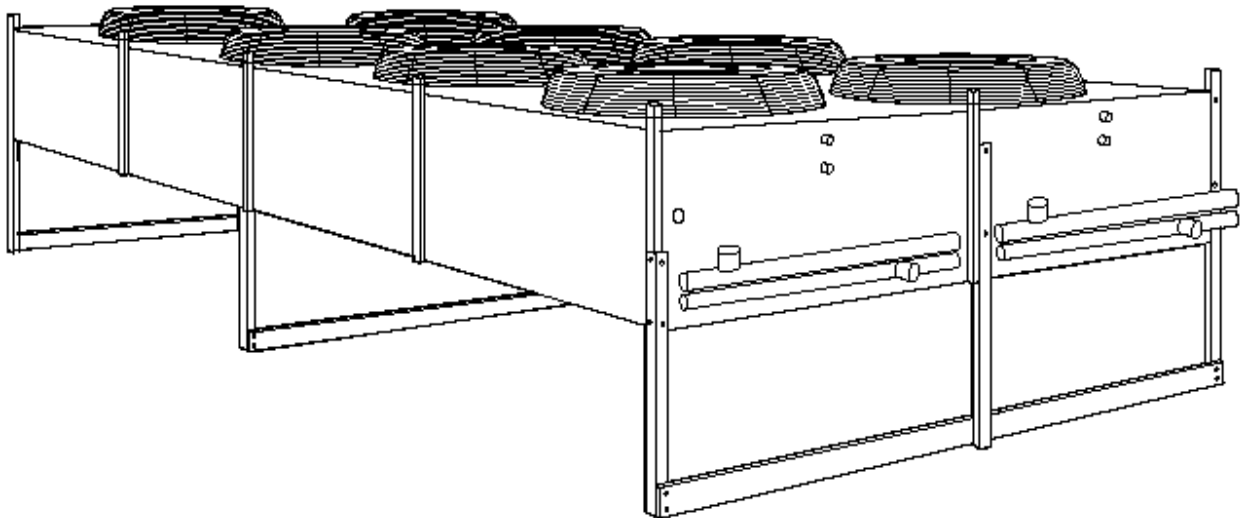


Table of Contents

Safety Considerations	3
Introduction	3
09AW/AZ001-024 Model Number Significance	6
09AW/AZ001-024 Factory Installed Options	8
09AZV091-182 Model Number Significance	8
09AZV091-182 Factory Installed Options	9
Serial Number Significance	10
Application.....	10
Head Pressure Control	10
Fan Cycling	11
Variable Speed Fan Control	11
Mounting Information	11
09AW,AZ001-020.....	11
09AZV091-182	11
Leg Extension Kits	11
09AZV091-182	11
Refrigerant Circuit Information	12
Literature	13
Service	14
Condenser Fan System, 09AZV091-182	14
Condenser Fan Blades	15
Condenser Fan/Motor	15
Head Pressure Control.....	16

Not for Distribution

SAFETY CONSIDERATIONS

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components, and equipment location (roof, elevated structures, etc.). Only trained, qualified installers and service mechanics should install, start-up, and service this equipment.

When working on this equipment, observe precautions in the literature, and on tags, stickers, and labels attached to the equipment and any other safety precautions that apply. Follow all safety codes. Wear safety glasses and work gloves. Use care in handling, rigging, and setting this equipment, and in handling all electrical components.

WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation and service. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is complete.

WARNING

DO NOT VENT refrigerant valves within a building. Outlet from relief valves must be vented outdoors in accordance with the latest edition of ANSI/ASHRAE (American National Standards Institute/American Society of Heating, Refrigeration and Air Conditioning Engineers) 15 (Safety Code for Mechanical Refrigeration). The accumulation of refrigerant in an enclosed space can displace oxygen and cause asphyxiation. Provide adequate ventilation in enclosed or low overhead areas. Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness or death. Misuse can be fatal. Vapor is heavier than air and reduces the amount of oxygen available for breathing. Product causes eye and skin irritation. Decomposition products are hazardous.

WARNING

DO NOT attempt to unbrazed factory joints when servicing this equipment. Compressor oil is flammable and there is no way to detect how much oil may be in any of the refrigerant lines. Cut lines with a tubing cutter as required when performing service. Use a pan to catch any oil that may come out of the lines and as a gage for how much oil to add to the system. DO NOT re-use compressor oil. DO NOT leave refrigerant system open to air any longer than necessary. Seal circuits being serviced and charge with dry nitrogen to prevent oil contamination when timely repairs cannot be completed.

INTRODUCTION

This information should be used with the Installation Instructions for these machines. Follow all safety precautions and procedures.

The 09AW/AZ001-020 condensers were introduced in March 1999, replacing the 9AB product offering obsoleted in December 1998. The 09AZ006-016 models are specifically designed to mate with Carrier's 50BZ VPAC product shown in the table below.

VPAC	Condenser
50BZN006	09AZ*006
50BZN008	09AZ*008
50BZN012	09AZ*012
50BZN014	09AZ*014
50BZN016	09AZ*016

Note: "*" denotes a variable character, H, L, V, or W.

The 09AW/AZ001-020 condensers are special condensers produced by Carrier Heat Transfer Products. Below is a cross-reference chart of units produced between March 1999 and December 2001:

Carrier Part Number	Carrier HTP Part Number	Carrier Part Number	Carrier HTP Part Number
09AWL001	CDL-001	09AZH006	CDS-005 (14 fpi)
09AWL002	CDL-002	09AZH008	CDS-010 (12 fpi)
09AWL003	CDL-003	09AZH012	RCS-015 (8 fpi)
09AWL004	CDL-004	09AZH014	RCS-016 (10 fpi)
09AWL006	CDL-006	09AZH016	RCS-016 (14 fpi)
09AWL008	CDL-008	09AZL006	CDL-006 (10 fpi)
09AWL012	CDL-009	09AZL008	CDL-008 (14 fpi)
09AWL014	RCL-013	09AZL012	RCL-014 (10 fpi)
09AWL016	RCL-014	09AZL014	RCL-017 (8 fpi)
09AWL018	RCL-017	09AZL016	RCL-018 (12 fpi)
09AWL020	RCL-018	09AZV012	RCS-015 (8 fpi)
09AWW014	RCL-013	09AZV014	RCS-016 (10 fpi)
09AWW016	RCL-014	09AZV016	RCS-016 (14 fpi)
09AWW018	RCL-017	09AZW012	RCL-014 (10 fpi)
09AWW020	RCL-018	09AZW014	RCL-017 (8 fpi)
		09AZW016	RCL-018 (12 fpi)

Below is a cross-reference chart of units produced after January 2002:

Carrier Part Number	Carrier HTP Part Number	Carrier Part Number	Carrier HTP Part Number
09AWL001	CDL-001	09AZH006	CDS-005 (14 fpi)
09AWL002	CDL-002	09AZH008	CDS-010 (12 fpi)
09AWL003	CDL-003	09AZH012	RCS-015 (8 fpi)
09AWL004	CDL-004	09AZH014	RCS-016 (10 fpi)

09AWL006	CDL-006	09AZH016	RCS-016 (14 fpi)
09AWL008	CDL-008	09AZL006	CDL-006 (10 fpi)
09AWL012	CDL-009	09AZL008	CDL-008 (14 fpi)
09AWL014	WCS-013	09AZL012	WCS-014 (10 fpi)
09AWL016	WCS-014	09AZL014	WCS-017 (8 fpi)
09AWL018	WCS-017	09AZL016	WCS-018 (12 fpi)
09AWL020	WCS-018	09AZV012	RCS-015 (8 fpi)
09AWW014	WCS-013	09AZV014	RCS-016 (10 fpi)
09AWW016	WCS-014	09AZV016	RCS-016 (14 fpi)
09AWW018	WCS-017	09AZW012	WCS-014 (10 fpi)
09AWW020	WCS-018	09AZW014	WCS-017 (8 fpi)
		09AZW016	WCS-018 (12 fpi)

The 09AZV091-182 machines introduced in December 1999 and were designed specifically to mate with the Carrier 30HXA Condenserless Screw Chillers as shown in the table below:

30HXA	Chiller Circuit Split A/B	Matching Condenser	
		Circuit A	Circuit B
106	64/36	09AZV102	
116	60/40	09AZV112	
126	55/45	09AZV122	
136	59/41	09AZV132	
146	55/45	09AZV142	
161	59/41	09AZV162	
171	47/53	09AZV172	
186	50/50	09AZV182	
206	54/46	09AZV101	09AZV091
246	61/39	09AZV151	09AZV091
261	63/37	09AZV171	09AZV091
271	64/36	09AZV181	09AZV091

The 09AZV091-182 condensers are special condensers produced by Carrier Heat Transfer Products. Below is a cross-reference chart:

Carrier Model Number	Carrier Heat Transfer Products Model Number	
	Circuit A	Circuit B
09AZV091	WCS-121	-
09AZV101	WCS-140	-
09AZV102	WCS-069	WCS-053
09AZV112	WCS-077	WCS-077
09AZV122	WCS-140	
09AZV132	WCS-088	WCS-077
09AZV142	WCS-162	

09AZV151	WCS-177	-
09AZV162	WCS-098	WCS-096
09AZV171	WCS-193	-
09AZV172	WCS-193	
09AZV181	WCS-200	-
09AZV182	WCS-212	

09AW/AZ001-024 Model Number Significance

The following chart is a model number breakdown for the 09AW/AZ001-024.

Not for Distribution

09AW,AZ Air-Cooled Condenser

Position	1,2	3,4	5	6-8	9	10	11	12	13	14	15
Description	09	AZ	H	012	V	E	-	6	0	1	A
Remote Air-Cooled Condenser											
Direct Drive											
AW – Direct Drive AZ – Direct Drive (designed for 50BZ)											
Condenser Air Discharge											
H – Horizontal, Standard Motor L – Horizontal, Low Noise Motor V – Vertical, Standard Motor W – Vertical, Low Noise Motor											
Nominal Heat Rejection											
001 – 1 ton 002 – 2 tons 003 – 3 tons 004 – 4 tons 006 – 5 tons 008 – 7.5 tons 012 – 10 tons 014 – 12 tons 016 – 15 tons 018 – 17 tons 020 – 20 tons											
Fan Motor/Control Option											
- – ODP, No Control C – ODP, Contactors D – TEAO, Fan Cycling E – TEAO, Contactors F – ODP, Fan Cycling T – TEAO, No Control V – ODP, Speed Control ‡ W – TEAO, Speed Control ‡											
Circuiting Options											
- – Single Circuit, No Sub-cooler A – Single Circuit with Sub-cooler D – Dual Circuit, No Sub-cooler E – Dual Circuit with Sub-cooler											
Coil Construction											
- – Al Fin/Cu Tube C – Cu Fin/Cu Tube E – Pre-Coat Al Fin/Cu Tube X – E-coat Al Fin/Cu Tube Z – E-coat Cu fin/Cu Tube											
Electrical											
1 – 575-1-60 or 575-3-60 3 – 208/230-1-60 5 – 208/230-3-60 6 – 460-3-60											
Design Series											
Packaging											
1 – Standard											
Factory Options											
See 09AZV091-182 Factory Installed											
Options below											

Note: † - Fan motor terms

ODP – Open Drop-proof

TEAO – Totally Enclosed Air Over

‡ - Speed Control is not available on 575-3-60 machines.

09AW/AZ001-024 Factory Installed Options

Factory installed options are determined by Position 15 of the model number and are based on the following options:

Option Description	FIOP Code						
	A	B	C	D	E	F	G
<u>Aluminum Cabinet</u> Fabricated cabinet with embossed aluminum for a corrosion-resistant finish	X			X	X		X
<u>Fused Disconnect</u> A power circuit fused disconnect switch		X		X		X	X
<u>24-volt Control Transformer</u> Line to control voltage transformer.			X		X	X	X

09AZV091-182 Model Number Significance

The following chart is a model number breakdown for the 09AZV091-182.

Not for Distribution

09AW,AZ Air-Cooled Condenser

Position	1,2	3,4	5	6-8	9	10	11	12	13	14	15
Description	09	AZ	V	091	V	A	-	3	0	1	A
Remote Air-Cooled Condenser											
Direct Drive											
Vertical Discharge											
Nominal Heat Rejection											
Single Circuit 091 – 120 tons 101 – 140 tons 151 – 190 tons 171 – 206 tons 181 – 216 tons											
Dual Circuit 102 – 120 tons 112 – 139 tons 122 – 162 tons 132 – 160 tons 142 – 174 tons 162 – 192 tons 172 – 209 tons 182 – 223 tons											
Fan Motor/Control Option D – TEAO/Fan Cycling F – ODP/Fan Cycling V – ODP/Speed Control † W – TEAO/Speed Control ‡											
Circuiting Options A – Single Circuit and Sub-cooler E – Dual Circuit and Sub-cooler											
Coil Construction - – Al Fin/Cu Tube C – Cu Fin/Cu Tube E – Pre-Coat Al Fin/Cu Tube X – E-coat Al Fin/Cu Tube Z – E-coat Cu fin/Cu Tube											
Electrical 1 – 575-3-60 5 – 208/230-3-60 6 – 460-3-60											
Design Series											
Packaging 1 – Standard											
Factory Options See 09AZV091-182 Factory Installed											
Options below											

Note: † - Fan motor terms

ODP – Open Drop-proof

TEAO – Totally Enclosed Air Over

‡ - Speed Control is not available on 575-3-60 machines.

09AZV091-182 Factory Installed Options

Factory installed options are determined by Position 15 of the model number and are based on the following options:

Option Description	FIOF Code						
	A	B	C	D	E	F	G
<u>Aluminum Cabinet</u> Fabricated cabinet with embossed aluminum for a corrosion-resistant finish	X			X	X		X
<u>Fused Disconnect</u> A power circuit fused disconnect switch		X		X		X	X
<u>115-volt Control Transformer</u> Line to control voltage transformer. No longer offered.			X		X	X	X

Options and FIOF Codes in gray are no longer offered. See Bulletin,.

Product Bulletins pertaining to this information:

- 111-01-100 – Discontinued: Control Transformer, 09AZV091-182, dated 10/12/01.
The 115-volt Control Transformer Option was removed from the offering shortly after the product was introduced.
- 111-04-69 – 09AZV091-182 Price Page Clarification, dated: 12/02/04.
This bulletin clarified the model number for the 09AZV091-182 machines.

Serial Number Significance

The following chart is the serial number breakdown for the 09AZV

	Position				
	1-7	8-9	10-11	12	13-14
	123456-	01	01	A	00
Sales Order Number (This number always precedes the “-”, and is a numeric counter.)					
Item Number Identifies Unit by Item Number on the sales order.					
Unit Number Identifies the Unit as a subset of the sales order					
Month Code A = January E = May I = September B = February F = June J = October C = March G = July K = November D = April H = August L = December					
Year Code 00 = 2000, 01 = 2001, etc.					

APPLICATION

Head Pressure Control

Two types of head pressure controls are offered, fan cycling or variable speed fan control.

Fan Cycling

This option relies on temperature and pressure switches to control the number of fans that are energized. This is the preferred control when using floodback control.

Variable Speed Fan Control

This option uses the fan cycling controls listed above in combination with a variable speed controller for the lead fans.

Variable Speed Fan Control is not available on 575-3-60 machines. There is no motor qualified for this application.

Mounting Information

09AW,AZ001-020

All 09AW001-012 and 09AZ006-008 units are furnished with a mounting stand for either a horizontal or vertical condenser air discharge.

The 09AWH/AWL014-020, and the 09AZH/AZL012-016 are shipped with a leg kit that must be field installed.

The 09AZV/AZW012-016 can be converted from vertical discharge to horizontal discharge by completing the following steps:

1. The unit should be oriented such that the liquid tube is on the bottom of the coil. The discharge header inlet is currently in the middle of the coil. When the unit is rotated to horizontal discharge, the discharge gas line will need to be looped up and over the top of the coil to prevent liquid refrigerant from running back out of the inlet while the machine is off.
2. The electrical box will need to be rotated also, so that the top of the control box in the vertical configuration is on top when the unit is reconfigured for horizontal discharge.
3. The leg orientation will need to change and a "foot" will need to be constructed. Make the stand similar to the 09AZH.

09AZV091-182

Mounting holes are provided at each outside leg of the machine. The mounting hole is 0.875" (22.2 mm).

This machine can be point mounted at the legs of the machine. No mounting rail is required between the legs.

Leg Extension Kits

09AZV091-182

The standard units provide 18" (457 mm) of clearance under the unit. Three accessory packages are offered to raise the level of the condenser.

Accessory Part Number	Description	Used on	Clearance under unit, in (mm)
09AZ-900---101	30 inch Extended Leg Package	09AZV091,101,102,122	30 (762)
09AZ-900---102		09AZV112,132,142,151	
09AZ-900---103		09AZV162,171,172,181,182	
09AZ-900---104	48 inch Extended Leg Package	09AZV091,101,102,122	48 (1219)
09AZ-900---105		09AZV112,132,142,151	
09AZ-900---106		09AZV162,171,172,181,182	
09AZ-900---107	72 inch Extended Leg Package	09AZV091,101,102,122	72 (1829)
09AZ-900---108		09AZV112,132,142,151	
09AV-900---109		09AZV162,171,172,181,182	

Refrigerant Circuit Information

All coils are horizontal with an integral subcooler as standard.

09AZV	091	101	102	112
No. of Refrigerant Circuits	1	1	2	2
Rows (Circuit A/B)	3/-	4/-	4/3	3/3
Fins/Inch (Circuit A/B)	14/-	14/-	14/10	14/14
Total Face Area (ft ²)	120.9	120.9	121.0	151.0
Circuit Split (Circuit A/B)	100/-	100/-	56/44	50/50
Circuit Volume (ft ³) (Circuit A/B)	2.48/-	3.31/-	1.65/1.24	2.84/2.84

09AZV	122	132	142	151
No. of Refrigerant Circuits	2	2	2	1
Rows (Circuit A/B)	4/4	4/3	4/4	4/-
Fins/Inch (Circuit A/B)	14/14	14/14	10/10	10/-
Total Face Area (ft ²)	120.9	151.0	150.9	150.9
Circuit Split (Circuit A/B)	50/50	53/47	50/50	100/-
Circuit Volume (ft ³) (Circuit A/B)	1.65/1.65	3.79/2.84	3.79/3.79	7.58/-

09AZV	162	171	172	181
No. of Refrigerant Circuits	2	1	2	1
Rows (Circuit A/B)	4/4	4/-	4/4	4/-
Fins/Inch (Circuit A/B)	12/10	10/-	10/10	12/-
Total Face Area (ft ²)	181.0	180.9	180.9	180.9
Circuit Split (Circuit A/B)	51/49	100/-	50/50	100/-
Circuit Volume (ft ³) (Circuit A/B)	4.54/4.54	9.08/-	4.54/4.54	9.08/-

09AZV	182
No. of Refrigerant Circuits	2
Rows (Circuit A/B)	4/4
Fins/Inch (Circuit A/B)	14/14
Total Face Area (ft ²)	180.9
Circuit Split (Circuit A/B)	50/50
Circuit Volume (ft ³) (Circuit A/B)	4.54/4.54

LITERATURE

Below is a list of literature for the 09AZ Air-Cooled Condenser machines. Shaded literature is obsolete literature.

Form Number	Catalog Number	Title	Print Date	Reprint Date	Superceded By
Product Data					
09AW,AZ-1PD	520-911	09AW,AZ001-020 Air-Cooled Condensers	2/99		09AW,AZ-2PD
09AW,AZ-2PD	520-921	09AW,AZ001-020 Air-Cooled Condensers	4/02		
09AZ-1PD	520-925	09AZ091-182 Air-Cooled Condensers	2/01		
Application Information					
Product Bulletin					
111-99-12		50BZ/09AZ Combination Ratings	03/19/99		
111-99-12		1 to 20 ton 09AW & 09AZ Direct Drive Air Cooled Condensers	03/26/99		
111-99-79		NEW! Large Air Cooled Condensers for 30HXA Chillers	12/10/99		
111-00-40		Master Price Page Correction: 09AZV091-182 Motor Options	05/19/00		
111-00-77		Master Price Page Correction: 09AZV181 Coil Coating Option	09/15/00		
111-01-24		09AZV091-182 Product Data	03/23/01		
111-01-100		Discontinued: Control Transformer, 09AZV091-182	10/12/01		
111-04-69		09AZV091-182 Price Page Clarification	12/02/04		
Submittal Bulletin					
09AW-1SB	510-902	09AWH,AWL001-004 Air-Cooled Condenser	1/99		09AW-8SB
09AW-2SB	510-903	09AWH,AWL006-012 Air-Cooled Condenser	1/99		09AW-5SB
09AW-3SB	510-904	09AWH,AWL014-020 Air-Cooled Condenser	1/99		09AW-6SB
09AW-4SB	510-905	09AWV,AWV014-020 Air-Cooled Condenser	1/99		09AW-7SB
09AW-5SB	510-913	09AWH,AWL006-012 Air-Cooled Condenser	12/00		
09AW-6SB	510-914	09AWH,AWL014-020 Air-Cooled Condenser	1/02		
09AW-7SB	510-933	09AWV,AWV014-020 Air-Cooled Condenser	1/02		
09AW-8SB	510-936	09AWH,AWL001-004 Air-Cooled Condenser	12/00		
09AZ-1SB	510-906	09AZH006 Air-Cooled Condenser	1/99		09AZ-8SB

Form Number	Catalog Number	Title	Print Date	Reprint Date	Superseded By
09AZ-2SB	510-907	09AZH008, 09AZL006,008 Air-Cooled Condenser	1/99		09AZ-9SB
09AZ-3SB	510-908	09AZH,AZL012-016 Air-Cooled Condenser	1/99		09AZ-7SB
09AZ-4SB	510-909	09AZV,AZW012-016 Air-Cooled Condenser	1/99		09AZ-5SB
09AZ-5SB	510-911	09AZV,AZW012-016 Air-Cooled Condenser	1/02		
09AZ-6SB	510-912	09AZV091-182 Air-Cooled Condenser	11/00		
09AZ-7SB	510-908	09AZH,AZL012-016 Air-Cooled Condenser	1/02		
09AZ-8SB	510-937	09AZH006 Air-Cooled Condenser	1/02		
09AZ-9SB	510-938	09AZH008, 09AZL006,008 Air-Cooled Condenser	1/02		
Installation Instructions					
09AW,AZ-1SI	530-904	09AW,AZ001-020 Air-Cooled Condensers, 1 to 20 Tons	2/99		09AW,AZ-2SI
09AW,AZ-2SI	530-919	09AW,AZ001-020 Air-Cooled Condensers, 1 to 20 Tons	1/02		
09AZ-1SI	530-921	09AZ091-182 Air-Cooled Condensers, 90 to 200 Tons	2/01		
Accessory Installation Instructions					
Wiring Diagrams					
09AW,AZ-1W	530-905	09AW,AZ001-024 Remote Air-Cooled Condenser	2/99		

SERVICE

Condenser Fan System, 09AZV091-182

The condenser fan system is a direct drive, vertical discharge system.

09AZV	091		101		102		112	
Fan Option (Position 9)	D or F	V or W	D or F	V or W	D or F	V or W	D or F	V or W
Qty...Fan Diameter (in.)	8...30	2...26 6...30	8...30	2...26 6...30	8...30	2...26 6...30	10...30	2...26 8...30
No. of Blades	4							
Maximum RPM	1140							
Total Airflow, CFM	87,600		82,800		86,300		109,500	
Cir. Airflow, CFM (Cir. A/B)	-/-		-/-		41,400/44,900		54,750/54,750	
Motor Hp	1-1/2							

09AZV	122		132		142		151	
Fan Option (Position 9)	D or F	V or W	D or F	V or W	D or F	V or W	D or F	V or W
Qty...Fan Diameter (in.)	8...30	2...26 6...30	10...30	2...26 8...30	10...30	2...26 8...30	10...30	2...26 8...30
No. of Blades	4							
Maximum RPM	1140							
Total Airflow, CFM	82,800		106,500		108,700		103,500	
Cir. Airflow, CFM (Cir. A/B)	41,400/41,400		51,750/54,750		54,350/54,350		-/-	
Motor Hp	1-1/2							

09AZV	162		171		172		181	
Fan Option (Position 9)	D or F	V or W	D or F	V or W	D or F	V or W	D or F	V or W
Qty...Fan Diameter (in.)	12...30	2...26 10...30	12...30	2...26 10...30	12...30	2...26 10...30	12...30	2...26 10...30
No. of Blades	4							
Maximum RPM	1140							
Total Airflow, CFM	130,450		132,700		132,700		128,200	
Cir. Airflow, CFM (Cir. A/B)	64,100/66,350		-/-		66,350/66,350		-/-	
Motor Hp	1-1/2							

09AZV	182	
Fan Option (Position 9)	D or F	V or W
Qty...Fan Diameter (in.)	12...30	2...26 10...30
No. of Blades	4	
Maximum RPM	1140	
Total Airflow, CFM	124,200	
Cir. Airflow, CFM (Cir. A/B)	62,100/62,100	
Motor Hp	1-1/2	

Condenser Fan Blades

The condenser fan changes based on the head pressure control used, temperature control or variable speed.

In 2001 the 30" fan blade was changed from Lau to Hessaire fan blade. In August 2003 (Serial Numbers ending with H03) a revised Hessaire fan was implemented with a higher efficiency.

Condenser Fan Motor

Standard fan motors are 3-phase motors. Fan motors connected to the speed control device are single-phase motors.

A known problem with the condenser fan motor overloads was experienced by Witt production with serial numbers ending with K02 through H03.

Troubleshooting:

If the motor overload is tripping, check the following items:

- Check the fan placement in the orifice.
- Check for the proper fan blade.
- Check for a voltage/current imbalance.
- Consider replacing the fan motor due to a faulty condenser fan motor overload.

Head Pressure Control

There are several control schemes offered for the 09AZ091-182 condensers.

Temperature & Pressure Switch Control

The standard control is for temperature and pressure switches to control various fans.

The fans at the header end are uncontrolled. They will start when control power is applied to the machine. See the fan staging diagram shown below for fan numbering.

A temperature switch controls the opposite the header end. See the fan staging diagram shown below for fan numbering. The switch is adjustable and should be field set for the following:

Cut-In Temperature (± 3 °F)	70 °F
Cut-Out Temperature (± 3 °F)	60 °F

A pressure switch controls the remaining fans. See the fan staging diagram shown below for fan numbering. The switch is adjustable and should be field set for the following:

Cut-In Pressure (± 10 psi)	175 psi
Cut-Out Pressure (± 10 psi)	145 psi

Variable Speed Head Pressure Control

Machines selected with the variable speed option, utilize the temperature and pressure switch control scheme outlined above. However, a variable speed device controls the uncontrolled fans located at the header end in the scheme above.

On all machines, the variable head pressure control device is a Johnson P66AAB-4C controller. This device controls the lead fans located at the header end of the machine.

The device requires 24 vac control power to function.

Part Number	P66AAB-4C
Operating Range, psig (kPa) [Factory Setting]	135-165 (931-1138)
Effective Throttling Range, psig (kPa) [Fixed]	30 (207)
Pressure Range, psig (kPa) [Adjustable]	80-200 (551-1379)
Maximum Operating Pressure, psig (kPa)	450 (3103)
Control Voltage, V-Ph-Hz	24-1-60
Power Consumption, VA	1
Capillary Length, in. (mm)	60 (1,524)

Early production of these machines incorrectly called for the R-22 controller, P66AAB-1. The pressure settings were too high for the device to control, causing the 30HXA machines to trip on high head pressure.

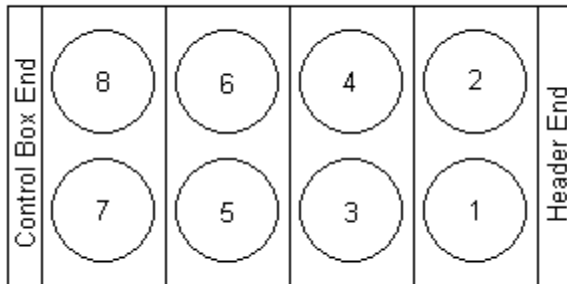
For field modification of the Fan Cycling to Variable Speed Head Pressure Control, the following parts are needed.

Description	Part Number (by Voltage)		09AZV	
	208/230-3-60	460-3-60	091, 101, 151, 171, 181	102, 112, 122, 132, 142, 162, 172, 182
Speed Controller	08219437		1	2
1/4" Shut-off Valve	08396559		1	2
Transformer	08218258	08218259	2	2
Fan Blade, 26"	08221047		2	2
Fan Guard	08397010		2	2
Fan Venturi	08517407		2	2
Fan Motor	08216098		2	2
Capacitor	08352555		2	2

There are no instructions available for this change. It is a Factory Installed Option only.

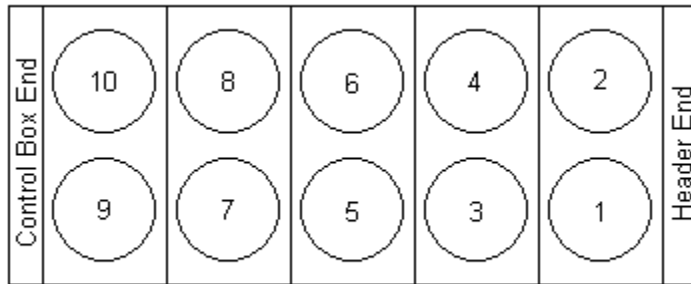
Fan Identification

09AZV091,101,102,122



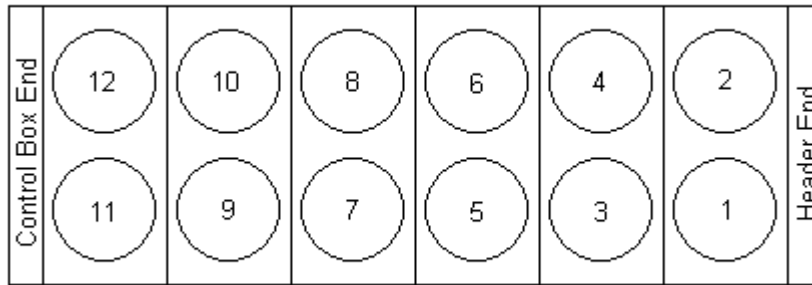
Machine	Fan Option (Position 9)	Circuit	Controlled By	Contactor	Fan Motor
09AZV091, 09AZV101	D or F	A	None	C1	1, 2
			Pressure Switch	C2, C3	3, 4, 5, 6
			Temperature Switch	C4	7, 8
	V or W	A	Variable Speed	C1	1, 2
			Pressure Switch	C2, C3	3, 4, 5, 6
			Temperature Switch	C4	7, 8
09AZV102, 09AZV122	D or F	A	None	C1	1
			Pressure Switch	C3, C5	3, 5
			Temperature Switch	C7	7
		B	None	C2	2
			Pressure Switch	C4, C6	4, 6
			Temperature Switch	C8	8
	V or W	A	Variable Speed	C1	1
			Pressure Switch	C3, C5	3, 5
			Temperature Switch	C7	7
		B	Variable Speed	C2	2
			Pressure Switch	C4, C6	4, 6
			Temperature Switch	C8	8

09AZV112,132,142,151



Machine	Fan Option (Position 9)	Circuit	Controlled By	Contactor	Fan Motor
09AZV112, 09AZV132, 09AZV142	D or F	A	None	C1	1
			Pressure Switch	C3, C5	3, 5
			Temperature Switch	C7, C9	7, 9
		B	None	C2	2
	Pressure Switch		C4, C6	4, 6	
	Temperature Switch		C8, C10	8, 10	
	V or W	A	Variable Speed	C1	1
			Pressure Switch	C3, C5	3, 5
			Temperature Switch	C7, C9	7, 9
		B	Variable Speed	C2	2
Pressure Switch			C4, C6	4, 6	
Temperature Switch			C8, C10	8, 10	
09AZV151	D or F	A	None	C1	1, 2
			Pressure Switch	C2, C3	3, 4, 5, 6
			Temperature Switch	C4, 5	7, 8, 9, 10
	V or W	A	Variable Speed	C1	1, 2
			Pressure Switch	C2, C3	3, 4, 5, 6
			Temperature Switch	C4, C5	7, 8, 9, 10

09AZV162,171,172,181,182



Machine	Fan Option (Position 9)	Circuit	Controlled By	Contactor	Fan Motor
09AZV162, 09AZV172, 09AZV182	D or F	A	None	C1	1
			Pressure Switch	C3, C5, C7	3, 5, 7
			Temperature Switch	C9, C11	9, 11
		B	None	C2	2
			Pressure Switch	C4, C6, C8	4, 6, 8
			Temperature Switch	C10, C12	10, 12
	V or W	A	Variable Speed	C1	1
			Pressure Switch	C3, C5, C7	3, 5, 7
		B	Variable Speed	C2	2
			Pressure Switch	C4, C6, C8	4, 6, 8
09AZV171, 09AZV181	D or F	A	None	C1	1, 2
			Pressure Switch	C2, C3, C4	3, 4, 5, 6, 7, 8
			Temperature Switch	C5, C6	9, 10, 11, 12
	V or W	A	Variable Speed	C1	1, 2
			Pressure Switch	C2, C3, C4	3, 4, 5, 6, 7, 8
			Temperature Switch	C5, C6	9, 10, 11, 12