

# Air-Cooled Self-Contained Units



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## INTRODUCTION

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### Indoor packaged solutions for convenient floor-by-floor installation.

The D-Series Self-Contained Horizontal and Vertical Indoor Air-Conditioning packages from Johnson Controls offer a complete line of unit options for high-rise and single-story building applications.

Johnson Controls' compact, low profile indoor design protects against potential vandalism and weathering and eliminates the need for any unsightly exterior equipment. The compact dimensions allow for easy installation through doorways, hallways and elevators.

Floor-by-floor installation provides independent zone and temperature control, eliminating many of the complications encountered with rooftop equipment. Renovation and restoration projects are simplified where roof load, cooling tower, and construction restrictions can present installation problems.

The D-Series Air-Cooled Self-Contained design by Johnson Controls features high efficiency, quality engineering and dependable operation.

### Listings / Certifications



# PRODUCT OVERVIEW

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**Refrigerant**

R-410A

**Sizes**

2 – 20 Tons (7.03 – 70.3 kW)

**Models**

DSH (Horizontal) 2-10 Tons

DSV (Vertical) 3-20 Tons

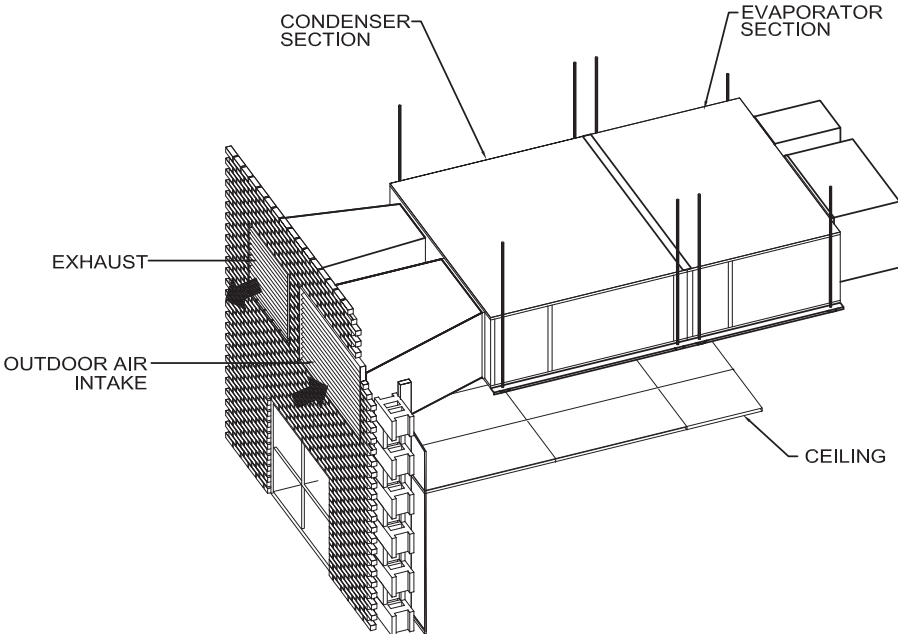
**Features**

- Ideal for the renovation/retrofit of interior spaces, in both high-rise and low-rise buildings
- Preserves aesthetics of building exterior; the necessity for unsightly exterior equipment is eliminated
- Equipment is protected from extreme weather conditions and vandalism
- Floor-by-floor, or zone-by-zone, installation allows independent metering / temperature control
- Convenient indoor access for all service needs
- Unit casings are constructed of heavy gauge galvanized steel. Cabinet interiors are lined with 1/2 inch thick, 2 lb. density, acoustic insulation
- Separate evaporator and condensing unit modules, allowing field separation if required for ease of ingress / handling in building corridors or elevators.
- Belt driven centrifugal blowers, with adjustable pulleys, are employed for both evaporator and condenser air movement; field adjustment of external static pressure capability to suit a wide range of installation requirements
- High efficiency Scroll compressors
- Each refrigerant circuit complete with schraeder access fittings, sight glass/moisture indicator, filter drier, and thermal expansion valve with external equalizer
- Refrigerant circuit isolation valves, with service ports, allow installation of units as a split evaporator / condensing unit system (DSH models only)
- Dual independent compressor circuits on 8, 10, 12, 15, and 20 ton models
- Electronic compressor protection / diagnostic module; includes phase protection on 3-phase units

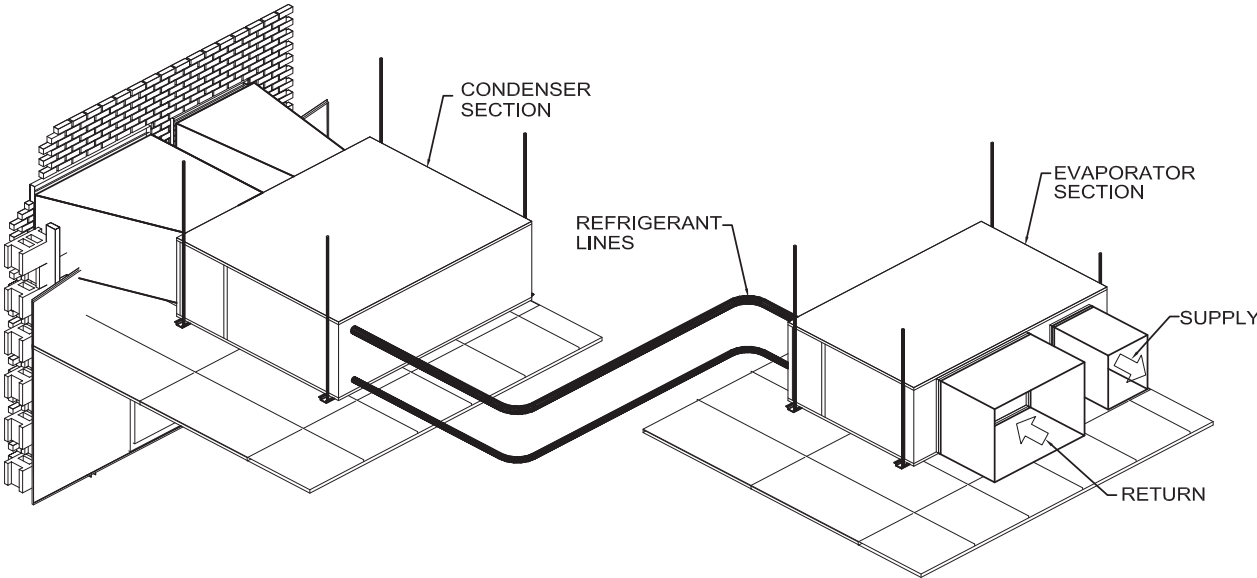


# HORIZONTAL APPLICATION & INSTALLATION

Ductable Ceiling Air Conditioner  
Packaged Installation



Ductable Ceiling Air Conditioner  
Split Installation



# DSH PHYSICAL DATA

## HORIZONTAL AIR COOLED — DSH SERIES R-410A

Model	DSH024	DSH036	DSH048	DSH060	DSH096	DSH120	
Nominal Cooling (Tons)	2	3	4	5	8	10	
Refrigerant	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	
<b>Cooling Performance</b>							
Gross Cooling Capacity(Btu/h) <sup>(1)</sup>	25,200	36,600	49,500	62,000	94,900	119,700	
Design CFM	800	1,200	1,600	2,000	3,200	4,000	
Net Cooling Capacity	24,700 <sup>(2)</sup>	35,600 <sup>(2)</sup>	48,500 <sup>(2)</sup>	60,800 <sup>(2)</sup>	92,000 <sup>(3)</sup>	114,000 <sup>(3)</sup>	
Net Cooling CFM	800	1,200	1,600	2,000	3,200	3,600	
SEER <sup>(2)</sup>	13.5	13.2	13.8	13.3	N/A	N/A	
EER <sup>(3)</sup>	N/A	N/A	N/A	N/A	11.5	11.2	
Compressor-Qty/Type	1/Scroll	1/Scroll	1/Scroll	1/Scroll	2/Scroll	2/Scroll	
Evaporator Coil-Type	Enhanced Copper Tubes, Enhanced Aluminum Fins						
Dimension- Height x Width (in)	20X34	20X34	22X36	23X38	31X52.5	31x52.5	
Face Area (sq ft)	4.72	4.72	6.07	6.07	11.3	11.3	
Rows/FPI	2/10	3/12	4/12	4/12	4/14	4/14	
Filters- Quantity/Size(in)	2 - 20x14x2	2-20x14x2	2-25x16x2	2-25x16x2	4-16X20X2	4-16X20X2	
Condenser Coil-Type	Enhanced Copper Tubes, Enhanced Aluminum Fins						
Dimension- Height x Width (in)	20X42	20X42	32X36	23X45	31X59	31x59	
Face Area (sq ft)	5.83	5.83	7.19	7.19	12.48	12.48	
Rows/FPI	4/16	4/16	4/16	4/16	4/14	5/14	
Evaporator Fan-Type	Centrifugal, Forward Curved						
Qty.-Diameter x Width(in)	1-9x7	1-10x8	1-12x9	1-12x9	1-15X15	1-15x15	
Drive	Adjustable Belt						
Motor HP (Standard)	1/4	1/3	3/4	1	1 1/2	2	
Condenser Fan-Type	Centrifugal, Forward Curved						
Qty.-Diameter x Width(in)	1-10x10	1-10x10	1-12x11	1-12x11	1-18X13	1-18x13	
Drive	Adjustable Belt						
Motor HP (Standard)	1/2	3/4	1	1 1/2	2	3	
Dimensions	Height (in)	22	22	25	25	32	32
	Width (in)	56	56	64	64	80	80
	Depth (in)	78	78	86	86	112	112
Weight	Operating (lbs)	565	595	740	860	1470	1560
	Shipping (lbs)	600	630	895	920	1560	1620

(1) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F web bulb and CFM listed. Gross capacity does not include the effect of fan motor heat.

(2) Rated in accordance with ANSI/AHRI Standard 210/240

(3) Rated in accordance with ANSI/AHRI Standard 340/360

# DSH PERFORMANCE DATA

Model	CFM	EDB	Ambient Condenser Air Temperature																							
			85°F						95°F						105°F						115°F					
			62°F EWB		67°F EWB		72°F EWB		62°F EWB		67°F EWB		72°F EWB		62°F EWB		67°F EWB		72°F EWB		62°F EWB		67°F EWB		72°F EWB	
			TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC
DSH024	700	75°F	23.3	17.6	25.1	14.7	26.8	11.5	22.2	17.1	23.9	14.0	25.2	11.6	21.1	16.5	22.7	13.4	24.4	10.2	19.9	16.1	21.6	12.9	23.3	10.5
		80°F	23.4	21.0	25.2	17.7	27.1	14.2	22.3	20.2	24.1	16.9	25.9	13.9	21.2	19.9	22.8	16.4	24.6	13.1	20.1	19.4	21.9	16.0	23.5	12.8
		85°F	23.4	23.4	25.4	20.7	27.4	17.1	22.4	22.4	24.3	20.0	26.1	16.9	21.3	21.3	23.0	19.5	24.6	16.2	20.8	20.8	22.0	19.1	23.8	15.9
	800	75°F	23.7	18.4	25.5	15.2	27.4	11.5	22.7	18.0	24.3	14.5	25.8	11.9	21.3	17.4	23.1	13.8	24.5	11.3	20.1	16.8	22.0	13.3	23.4	10.5
		80°F	23.9	22.2	25.8	18.3	27.5	14.7	22.7	21.7	24.7	18.1	26.7	14.3	22.0	21.2	23.5	17.3	24.8	14.3	20.5	20.5	22.0	16.8	24.0	13.2
		85°F	24.0	24.0	26.0	21.7	27.9	18.4	22.8	22.8	24.8	21.3	26.9	17.8	22.6	22.6	23.7	20.7	25.5	17.4	21.5	21.5	22.1	20.1	24.1	16.6
	900	75°F	24.2	19.5	26.1	15.2	27.5	12.7	22.9	18.8	24.6	14.6	26.6	12.3	22.0	18.3	23.7	14.6	25.1	11.5	20.4	17.8	22.4	14.0	23.7	10.7
		80°F	24.3	23.1	26.1	19.4	28.1	15.3	23.1	22.8	24.9	18.5	26.9	14.9	22.1	22.1	23.9	18.0	25.7	14.3	20.8	20.8	22.5	17.4	24.3	13.8
		85°F	25.0	25.0	26.4	23.0	28.3	18.9	24.1	24.1	25.2	22.3	27.1	18.2	23.2	23.2	24.1	21.9	25.8	18.1	22.1	22.1	22.7	21.3	24.4	17.0
DSH036	1000	75°F	33.3	25.6	36.2	20.5	38.6	16.4	31.6	24.6	34.6	19.6	37.0	16.1	30.4	23.9	32.9	18.7	35.1	14.6	26.1	22.2	30.7	18.1	33.0	14.1
		80°F	33.5	29.8	36.5	25.1	39.4	20.3	31.9	29.1	34.8	24.3	37.6	19.1	30.5	28.7	33.1	23.5	35.6	18.8	26.3	26.3	31.4	22.9	33.9	18.2
		85°F	33.7	33.7	36.6	29.6	39.7	24.5	32.7	32.7	34.9	28.9	37.9	23.9	31.5	31.5	33.3	28.3	36.1	23.4	30.5	30.5	31.4	27.7	34.2	22.5
	1200	75°F	34.4	27.2	37.3	21.5	39.9	16.1	32.2	26.8	35.6	20.9	37.2	16.2	31.1	25.8	33.8	20.1	35.8	14.9	27.3	24.6	31.9	19.5	33.8	14.4
		80°F	34.2	33.2	37.5	27.0	40.4	21.3	32.8	32.0	35.8	26.1	38.7	20.3	31.1	31.1	34.3	25.7	36.7	20.0	29.2	29.2	31.9	24.9	34.6	19.4
		85°F	36.0	36.0	37.5	32.6	40.9	26.5	34.4	34.4	35.8	32.0	38.9	26.0	32.9	32.9	33.8	31.2	37.1	25.1	31.2	31.2	31.9	30.1	35.0	24.4
	1400	75°F	35.1	29.2	38.0	22.8	40.4	17.2	33.5	28.4	36.2	22.0	38.5	16.4	31.7	27.7	34.4	21.6	36.8	15.6	29.9	27.3	32.4	20.4	34.5	14.4
		80°F	36.0	35.7	38.2	28.6	41.3	22.6	33.7	33.7	36.5	28.2	39.3	21.9	31.7	31.7	34.6	27.4	37.3	20.8	31.0	31.0	32.5	26.7	35.2	20.3
		85°F	37.2	37.2	38.2	35.2	41.6	28.3	35.6	35.6	36.7	33.7	39.7	27.7	34.3	34.3	34.7	33.0	37.7	26.7	33.6	33.6	32.5	32.5	35.3	26.1
DSH048	1450	75°F	45.6	35.7	49.8	27.9	53.1	22.3	43.5	34.4	47.4	27.0	50.5	22.2	41.3	33.1	45.1	26.1	48.1	20.2	38.8	32.1	42.8	25.2	45.2	19.9
		80°F	46.3	42.6	49.9	34.9	54.2	27.7	43.7	41.0	47.7	33.8	51.7	26.4	41.7	40.5	45.2	33.0	49.2	25.6	38.8	38.8	43.0	31.8	46.2	24.5
		85°F	48.0	48.0	50.5	41.8	54.2	34.1	45.4	45.4	48.0	40.7	51.7	33.1	43.4	43.4	45.5	40.0	49.0	32.4	41.4	41.4	43.0	39.0	46.2	31.4
	1600	75°F	46.8	37.0	50.6	28.8	53.1	22.3	44.5	35.7	48.1	28.0	51.3	21.0	41.9	34.8	45.7	27.0	48.8	21.0	39.3	33.4	43.0	25.8	46.1	19.4
		80°F	47.2	44.9	51.0	36.2	55.2	28.7	44.4	43.5	48.2	35.7	52.6	27.3	42.1	42.1	45.7	34.3	49.9	26.4	39.5	39.5	43.1	33.6	46.1	25.4
		85°F	48.7	48.7	51.0	43.8	55.4	36.0	46.7	46.7	48.5	43.2	52.8	34.8	45.2	45.2	46.0	42.4	50.2	34.1	42.5	42.5	43.6	40.9	46.4	33.0
	1800	75°F	47.4	39.3	51.1	30.2	54.2	22.8	45.3	38.1	49.0	29.4	52.6	21.0	42.7	36.7	46.8	28.5	49.7	19.4	40.1	35.7	43.6	27.0	47.1	19.3
		80°F	47.6	47.6	52.0	39.0	55.9	29.6	45.2	45.2	49.5	38.2	53.0	28.6	43.9	43.9	46.2	36.5	50.5	27.8	41.4	41.4	43.8	35.5	47.4	26.6
		85°F	50.5	50.5	51.9	46.7	55.9	37.5	48.3	48.3	49.5	45.9	53.1	36.7	46.7	46.7	46.6	45.3	50.8	35.7	44.0	44.0	44.1	44.1	47.4	34.6
DSH060	1800	75°F	57.7	43.8	62.9	35.3	67.3	27.6	54.9	42.2	59.4	33.3	63.1	27.8	52.1	41.7	57.1	32.5	60.7	25.5	49.1	39.8	54.0	31.3	57.8	24.2
		80°F	58.1	52.3	63.1	42.9	68.4	34.1	55.2	50.8	60.1	41.4	64.5	32.9	52.9	49.7	57.1	40.6	62.1	31.6	50.3	48.7	54.1	39.5	58.3	30.9
		85°F	58.2	58.2	63.2	51.8	68.7	42.5	56.8	56.8	60.1	49.9	64.9	40.9	55.0	55.0	57.5	49.4	62.2	39.8	51.9	51.9	54.3	47.8	58.2	38.4
	2000	75°F	58.7	45.3	64.2	36.6	68.6	27.4	56.0	44.2	60.4	35.0	64.1	26.3	53.3	43.2	57.9	33.6	60.9	26.2	50.1	41.5	54.4	32.8	58.4	23.9
		80°F	59.1	55.0	64.1	44.9	69.5	35.5	56.0	53.7	60.8	43.7	65.5	34.0	53.4	52.3	57.9	42.2	62.8	32.6	50.2	50.2	54.6	41.0	59.1	31.3
		85°F	61.0	61.0	64.3	54.0	69.6	44.5	58.7	58.7	60.8	52.9	65.9	42.8	56.2	56.2	58.1	52.3	62.8	42.1	53.5	53.5	55.1	50.7	59.3	40.9
	2200	75°F	59.4	47.5	64.4	37.6	68.9	28.3	56.6	45.9	61.0	36.0	64.8	28.6	53.2	45.2	58.4	35.0	62.1	24.8	50.7	44.1	54.9	33.5	59.3	23.7
		80°F	59.4	57.7	64.4	46.3	69.7	36.2	56.7	56.2	61.6	45.0	66.1	35.0	54.7	54.7	58.8	44.1	63.7	34.4	51.3	51.3	54.2	43.1	59.4	32.7
		85°F	62.4	62.4	64.5	56.8	69.8	46.1	59.9	59.9	61.6	55.5	66.2	44.4	58.1	58.1	59.1	54.4	64.0	43.6	55.5	55.5	55.9	53.1	60.0	42.6
DSH096	3000	75°F	90.5	72.1	97.4	58.4	100.4	50.2	86.3	70.3	92.9	56.5	96.2	47.7	81.7	68.2	87.7	54.2	91.0	45.6	76.9	65.9	82.7	52.0	85.7	45.3
		80°F	91.3	86.0	98.7	71.4	105.1	58.3	87.1	84.1	94.0	69.3	99.9	56.0	82.4	82.1	88.9	67.3	94.8	54.0	77.5	77.5	83.7	65.2	89.5	51.0
		85°F	94.6	94.6	99.4	85.0	106.8	69.6	91.1	91.1	94.7	82.9	101.9	68.0	87.2	87.2	89.7	81.2	96.3	66.0	83.1	83.1	84.5	79.1	90.8	63.8
	3200	75°F	91.5	74.5	98.4	60.8	101.7	51.3	87.2	72.4	93.9	57.7	96.4	50.8	82.5	70.5	88.7	55.5	91.9	48.3	77.7	68.4	83.6	53.2	86.9	43.3
		80°F	92.3	89.1	99.6	74.0	106.1	61.7	87.9	87.3	94.9	71.6	101.6	56.6	83.2	83.2	89.7	69.4	95.9	54.7	79.8	79.8	84.4	67.2	90.6	52.3
		85°F	96.6	96.6	100.5	88.0	107.7	72.7	93.0	93.0	95.6	86.1	102.8	70.1	88.8	88.8	90.4	84.3	97.2	68.1	84.6	84.6	85.2	82.0	91.6	66.1
	3400	75°F	92.7	77.0	99.6	61.1	102.9	53.0	88.0	74.6	94.7	59.0	98.0	50.2	83.2	72.7	89.5	56.8	92.7	46.6	78.3	70.7	84.2	54.3	87.3	46.1
		80°F	93.3	92.2	100.5	75.8	107.4	60.7	88.7	88.7	95.6	74.0	102.4	57.7	83.8	83.8	90.4	71.6	96.7	55.7	81.2	81.2	85.1	69.4	91.2	53.4
		85°F	98.5	98.5	101.4	91.1	108.7	74.2	94.6	94.6	96.5	89.3	103.5	72.2	90.4	90.4	91.1	87.1	97.9	70.2	86.0	86.0	85.8	85.1	92.2	68.2
DSH120	3600	75°F	113.2	88.3	121.3	73.6	125.7	60.1	108.4	86.3	116.0	71.1	119.7	63.2	102.3	83.5	110.1	67.1	113.9	57.1	95.9	80.5	103.0	64.1	105.9	58.6
		80°F	113.9	104.8	123.3	87.3	130.8	72.5	109.0	102.6	117.6	85.0	125.3	72.0	103.2	100.0	111.5	82.3	118.6	68.1	96.7	96.7	104.3	79.4	111.4	64.2
		85°F	116.8	116.8	124.1	103.5	133.4	85.6	113.0	113.0	118.6	101.2	127.4	83.1	108.4	108.4	112.1	98.7	120.5	80.6	102.8	102.8	105.3	95.9	113.3	77.9
	4000	75°F	115.2	87.6	123.9	74.9	127.8	67.0	110.0	90.6	118.3	72.2	122.8	62.1	103.9	88.0	111.7	69.6	116.2	60.9	97.2	85.2	104.6	66.5	107.7	58.0
		80°F	116.																							

## DSH FAN PERFORMANCE DATA

### EVAPORATOR FAN PERFORMANCE

MODEL #	SUPPLY CFM	EXTERNAL STATIC PRESSURE - Inches W.C.															
		0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
DSH024A	700	593	0.06	755	0.10	915	0.13	1048	0.17	1175	0.23	-	-	-	-	-	-
	800	629	0.08	777	0.12	914	0.16	1169	0.20	1178	0.25	-	-	-	-	-	-
	900	668	0.11	804	0.15	930	0.19	1170	0.24	-	-	-	-	-	-	-	-
DSH036A	1000	598	0.11	722	0.16	835	0.19	930	0.25	1141	0.32	-	-	-	-	-	-
	1200	727	0.20	831	0.25	929	0.31	972	0.33	-	-	-	-	-	-	-	-
	1400	747	0.26	844	0.32	-	-	-	-	-	-	-	-	-	-	-	-
DSH048A	1450	595	0.22	661	0.27	745	0.31	836	0.38	909	0.45	982	0.52	1046	0.61	-	-
	1600	601	0.26	691	0.33	773	0.39	847	0.44	921	0.51	987	0.61	1056	0.67	-	-
	1800	652	0.35	735	0.42	812	0.50	883	0.57	948	0.64	1018	0.72	-	-	-	-
DSH060A	1800	583	0.30	674	0.37	755	0.44	830	0.52	900	0.59	966	0.69	1037	0.75	-	-
	2000	688	0.45	767	0.53	839	0.61	907	0.69	971	0.77	1029	0.85	1086	0.92	-	-
	2200	772	0.61	844	0.70	911	0.79	974	0.88	1034	0.97	-	-	-	-	-	-
DSH096A	3000	583	0.61	651	0.74	714	0.87	771	1.00	830	1.19	886	1.36	941	1.46	992	1.68
	3200	613	0.72	677	0.85	739	1.00	795	1.16	850	1.34	905	1.46	950	1.65	1005	1.82
	3400	643	0.84	704	0.99	763	1.14	816	1.30	871	1.46	920	1.65	970	1.82	1019	1.97
DSH120A	3600	688	1.02	746	1.17	801	1.33	850	1.49	900	1.67	950	1.85	1000	2.00	1046	2.25
	4000	752	1.36	805	1.53	855	1.70	904	1.88	950	2.07	995	2.26	1038	2.50	1076	2.70
	4400	817	1.77	865	1.95	912	2.14	957	2.34	1002	2.54	1042	2.75	1085	2.94	-	-

#### NOTE:

1. At high evaporator air flows, and wet bulb conditions, condensate carry-over may occur. Adjust airflow downward as necessary.
2. Values include pressure drop from wet coil and clean filters.
3. Shaded cells indicate oversized motors.

### CONDENSER FAN PERFORMANCE

MODEL #	OUTDOOR CFM	EXTERNAL STATIC PRESSURE - Inches W.C.											
		0.2		0.4		0.6		0.8		1.0		1.2	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
DSH024A	1600	750	0.29	852	0.35	948	0.42	996	0.46	-	-	-	-
DSH036A	1950	864	0.47	949	0.55	1032	0.63	1112	0.72	-	-	-	-
DSH048A	2500	645	0.53	749	0.63	812	0.74	872	0.86	945	0.98	-	-
DSH060A	2900	723	0.79	800	0.94	871	1.07	935	1.20	996	1.35	1057	1.47
DSH096A	4000	530	0.94	584	1.10	634	1.25	682	1.42	724	1.58	770	1.75
DSH120A	5000	658	1.81	702	2.01	743	2.20	783	2.40	822	2.60	860	2.81



# DSH ELECTRICAL DATA

## DSH ELECTRICAL DATA-STANDARD MOTOR

MODEL #	VOLTAGE	COMPRESSOR			EVAPORATOR FAN		CONDENSER FAN		MIN. CCT. AMPACITY	MAX FUSE / CCT. BKR. AMP	
		QTY	RLA	LRA	HP	FLA	HP	FLA			
DSH024A1	208-230/1/60	1	@	13.5	58.3	0.25	2.6	0.50	4.5	23.98	35
DSH024A2	208-230/3/60	1	@	8.6	55.0	0.25	1.4	0.50	2.2	14.35	20
DSH036A1	208-230/1/60	1	@	14.1	77.0	0.33	3.3	0.75	5.5	26.43	40
DSH036A2	208-230/3/60	1	@	9.0	71.0	0.33	1.6	0.75	2.6	15.45	20
DSH036A4	460/3/60	1	@	5.6	38.0	0.33	0.8	0.75	1.3	9.10	15
DSH036A5	575/3/60	1	@	3.8	36.5	0.50	0.9	0.75	1.0	6.65	15
DSH048A1	208-230/1/60	1	@	19.9	109.0	0.75	5.5	1.00	6.3	36.68	50
DSH048A2	208-230/3/60	1	@	13.1	83.1	0.75	2.6	1.00	3.3	22.28	35
DSH048A4	460/3/60	1	@	6.1	41.0	0.75	1.3	1.00	1.5	10.43	15
DSH048A5	575/3/60	1	@	5.0	34.0	0.75	1.0	1.00	1.1	8.35	15
DSH060A2	208-230/3/60	1	@	16.0	110.0	1.00	3.3	1.50	4.6	27.90	40
DSH060A4	460/3/60	1	@	7.8	52.0	1.00	1.5	1.50	2.1	13.35	20
DSH060A5	575/3/60	1	@	5.7	38.9	1.00	1.1	1.50	1.7	9.93	15
DSH096A2	208-230/3/60	2	@	13.1	83.1	1.50	4.6	2.00	6.0	39.99	50
DSH096A4	460/3/60	2	@	6.1	41.0	1.50	2.1	2.00	2.8	18.57	20
DSH096A5	575/3/60	2	@	4.4	33.0	1.50	1.7	2.00	2.1	13.70	15
DSH120A2	208-230/3/60	2	@	16.0	110.0	2.00	6.0	3.00	8.5	50.45	60
DSH120A4	460/3/60	2	@	7.1	52.0	2.00	2.8	3.00	4.0	22.73	25
DSH120A5	575/3/60	2	@	5.1	39.5	2.00	2.1	3.00	3.1	16.68	20

## DSH ELECTRICAL DATA-OVERSIZED MOTOR

MODEL #	VOLTAGE	COMPRESSOR			EVAPORATOR FAN		CONDENSER FAN		MIN. CCT. AMPACITY	MAX FUSE / CCT. BKR. AMP	
		QTY	RLA	LRA	HP	FLA	HP	FLA			
DSH096A2	208-230/3/60	2	@	13.1	83.1	2.00	6.0	2.00	6.0	41.38	50
DSH096A4	460/3/60	2	@	6.1	41.0	2.00	2.8	2.00	2.8	19.23	25
DSH096A5	575/3/60	2	@	4.4	33.0	2.00	2.1	2.00	2.1	14.10	15
DSH120A2	208-230/3/60	2	@	16.0	110.0	3.00	8.5	3.00	8.5	53.00	60
DSH120A4	460/3/60	2	@	7.1	52.0	3.00	4.0	3.00	4.0	23.98	30
DSH120A5	575/3/60	2	@	5.1	39.5	3.00	3.1	3.00	3.1	17.68	20

**NOTE: Data shown for packaged unit installation, with single point power supply.**

\*\*For split installation with separate evaporator motor power supply, calculate MCA and MFS as follows -

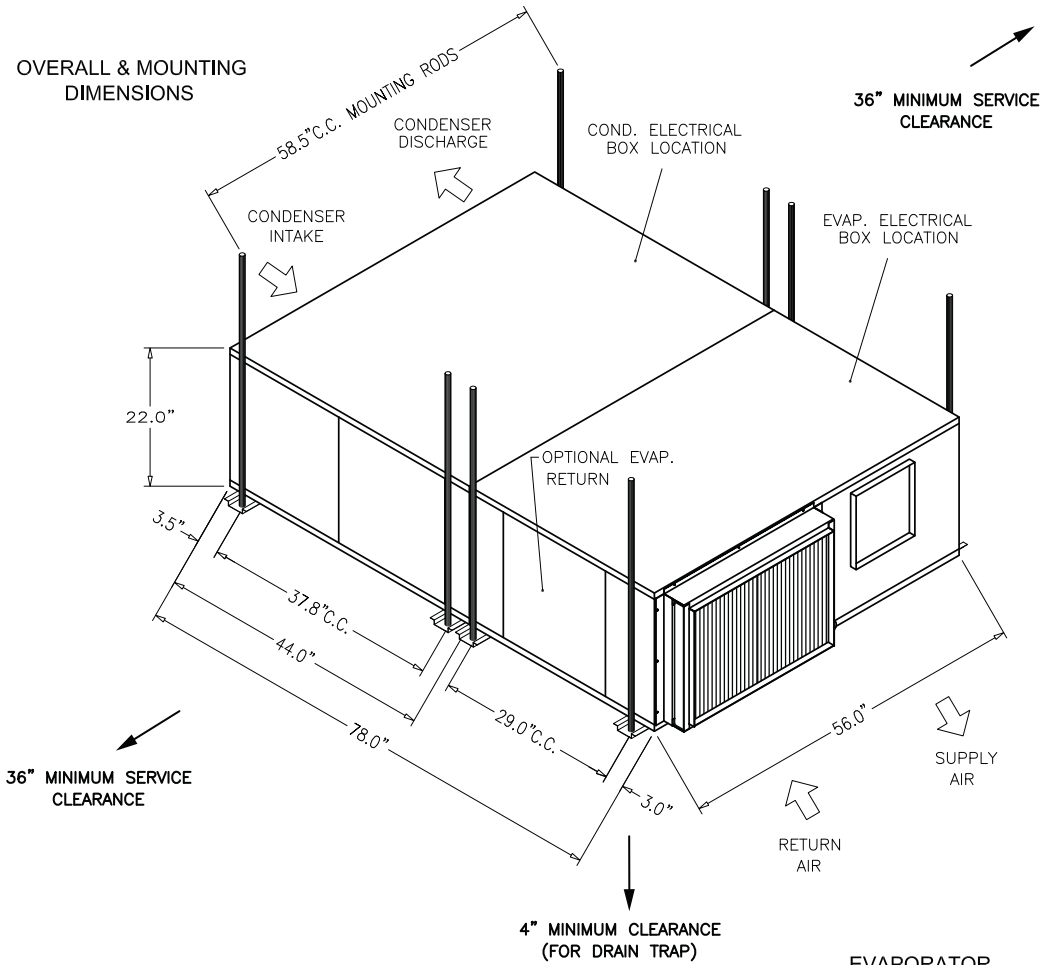
Min. Circuit Ampacity ( MCA ) = 1.25 X Largest motor amps (FLA or RLA) + sum of the remaining motor amps

Max Fuse / Cct. Bkr Size ( MFS ) = 2.25 X Largest motor amps + sum of the remaining motor amps

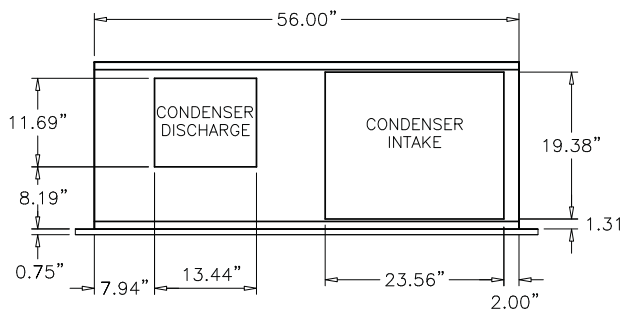
Select next smallest NEC listed fuse size from calculated value

# DSH DIMENSIONAL DATA

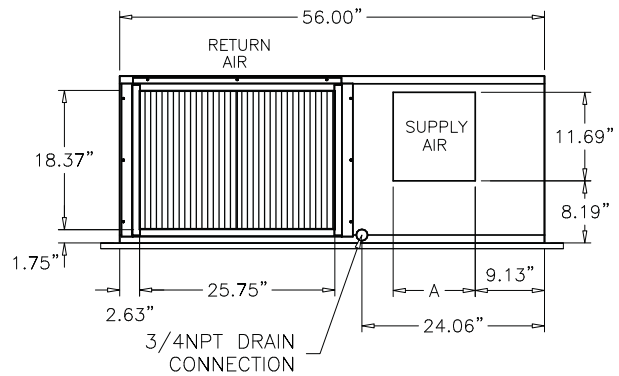
## DSH024 & DSH036 HORIZONTAL UNIT



**CONDENSER OPENINGS**



**EVAPORATOR OPENINGS**



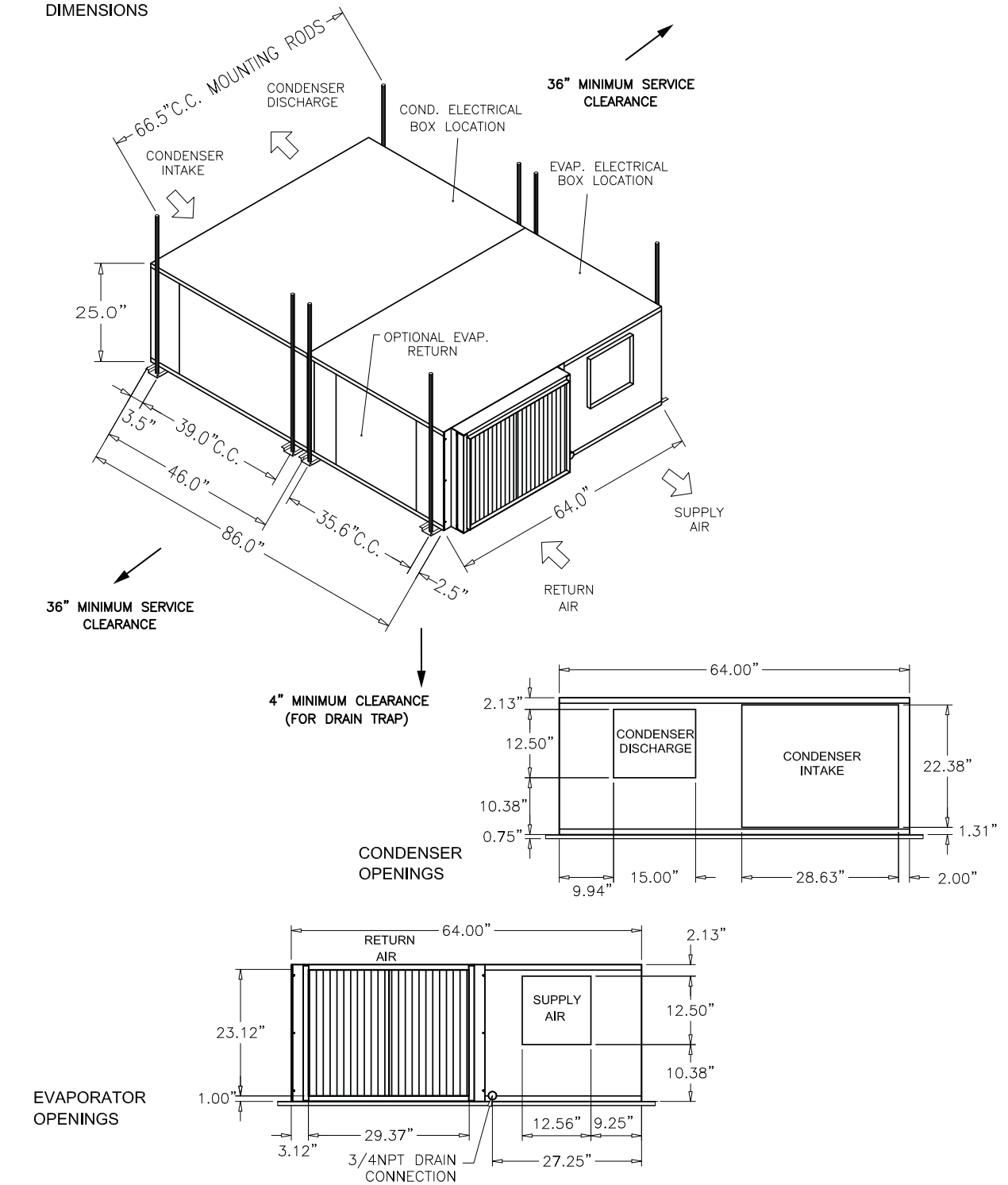
	A
2 TON	9.57
3 TON	10.88

Johnson Controls maintains a continuous product improvement policy, therefore specifications are subject to change without notice.

# DSH DIMENSIONAL DATA

## DSH048 & DSH060 HORIZONTAL UNIT

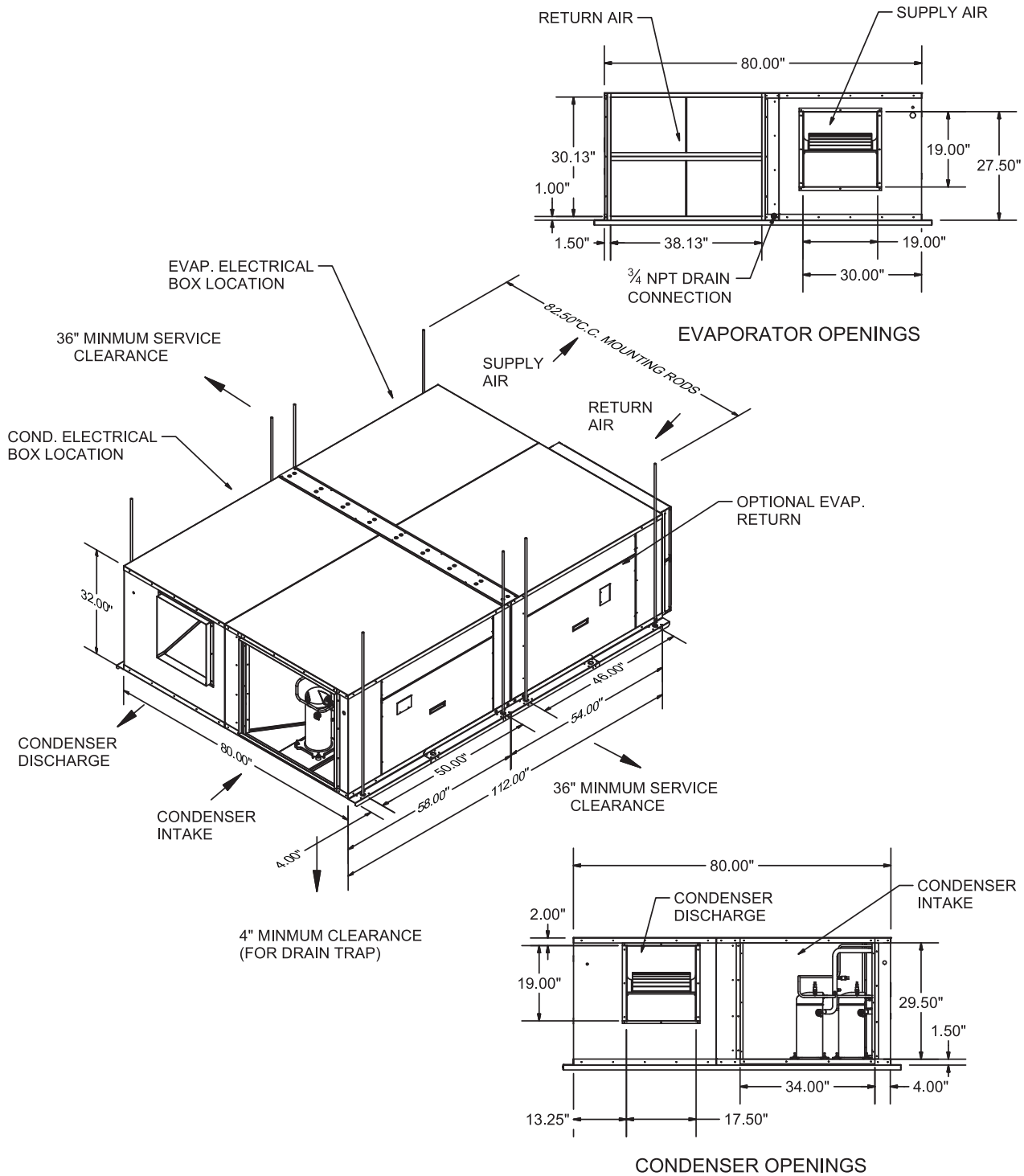
### OVERALL & MOUNTING DIMENSIONS



Johnson Controls maintains a continuous product improvement policy, therefore specifications are subject to change without notice.

# DSH DIMENSIONAL DATA

## DSH096A & 120A HORIZONTAL UNIT



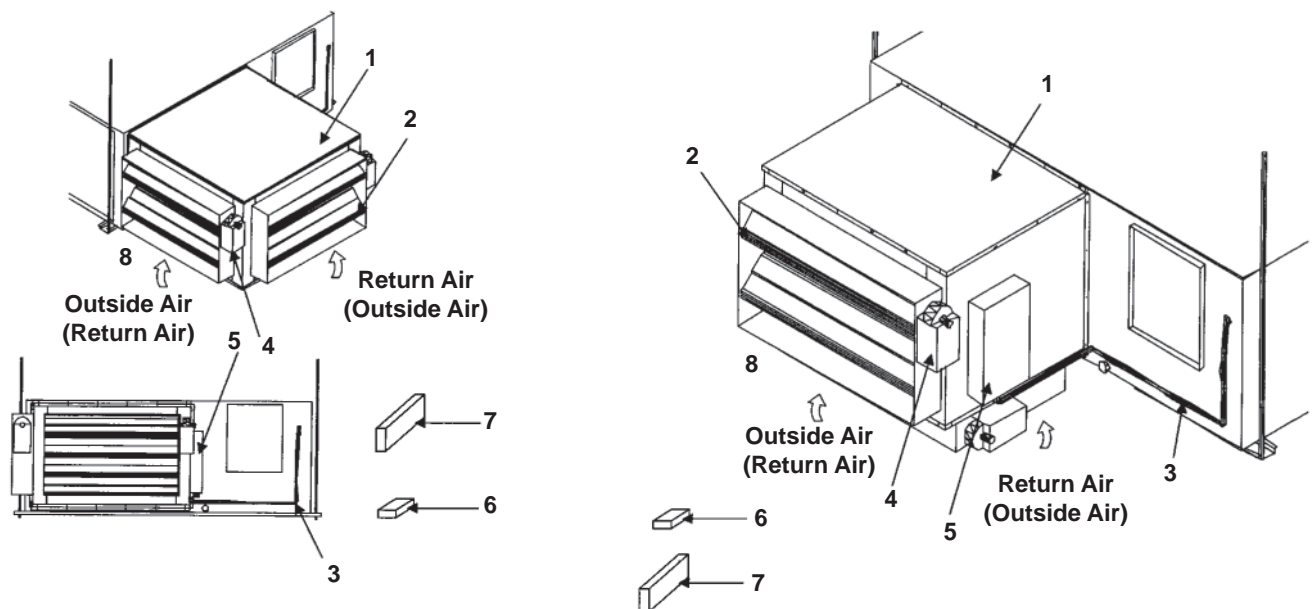
Johnson Controls maintains a continuous product improvement policy, therefore specifications are subject to change without notice.

## DSH AIRSIDE ECONOMIZER

Airside economizers are designed to meet current building and legislated codes for indoor ventilation. In addition to improving indoor air quality, economizers provide substantial energy savings by utilizing cool outside air instead of mechanical cooling whenever outside conditions permit.

The outlet or discharge of the airside economizer is fitted to the return air inlet of the packaged air conditioning unit. The two inlets to the economizer are fitted to the return air and outside air ductwork. Opposed blade dampers located in each inlet modulate the incoming air streams as they enter the mixing box. The outside air damper can be maintained at a predetermined position. In this way the buildings ventilation requirements can be met at all times.

### HORIZONTAL DSH ECONOMIZER



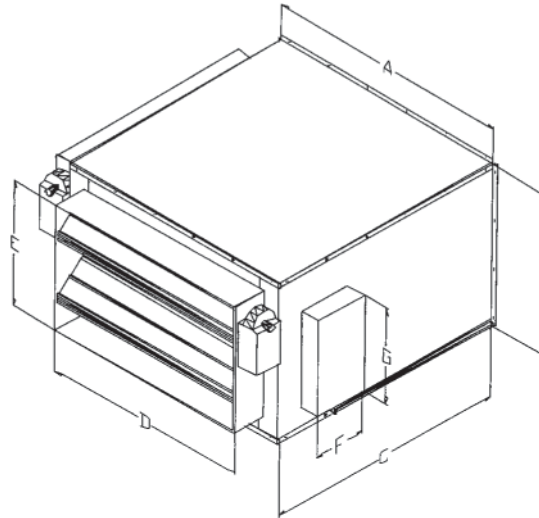
ALL ECONOMIZERS ARE SHIPPED COMPLETE WITH:

- 1- Heavy gauge galvanized cabinet, fully insulated.
- 2- Opposed blade, low leakage damper sections.
- 3- One step jack/plug wiring assembly.
- 4- Johnson Controls M9200 series spring return damper actuators.
- 5- Honeywell W7215 logic module with protective cabinet.
- 6- Enthalpy sensor.
- 7- Discharge sensor.
- 8- Return air / outside configuration is field convertible

NOTE: Additional field support required.

# DSH AIRSIDE ECONOMIZER

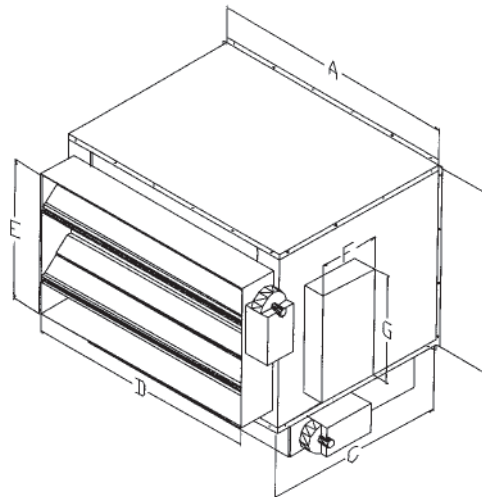
## HORIZONTAL DSH ECONOMIZER STANDARD SIDE & FRONT DAMPER ARRANGEMENT



Horizontal Unit Model Number	Economizer Model Number	MIXING BOX DIM'N			DAMPER DIM'N	
		A	B	C	D	E
DSH024/036	HASE-036H-BF	26.06	18.56	23.44	17.00	14.00
DSH048/060	HASE-060H-BF	29.68	23.44	30.44	24.00	14.00
DSH096/120	HASE-120H-BF	33.63	25.25	33.63	28.00	19.50

CONTROL MODULE	
F	G
8.00	15.00
8.00	15.00
8.00	15.00

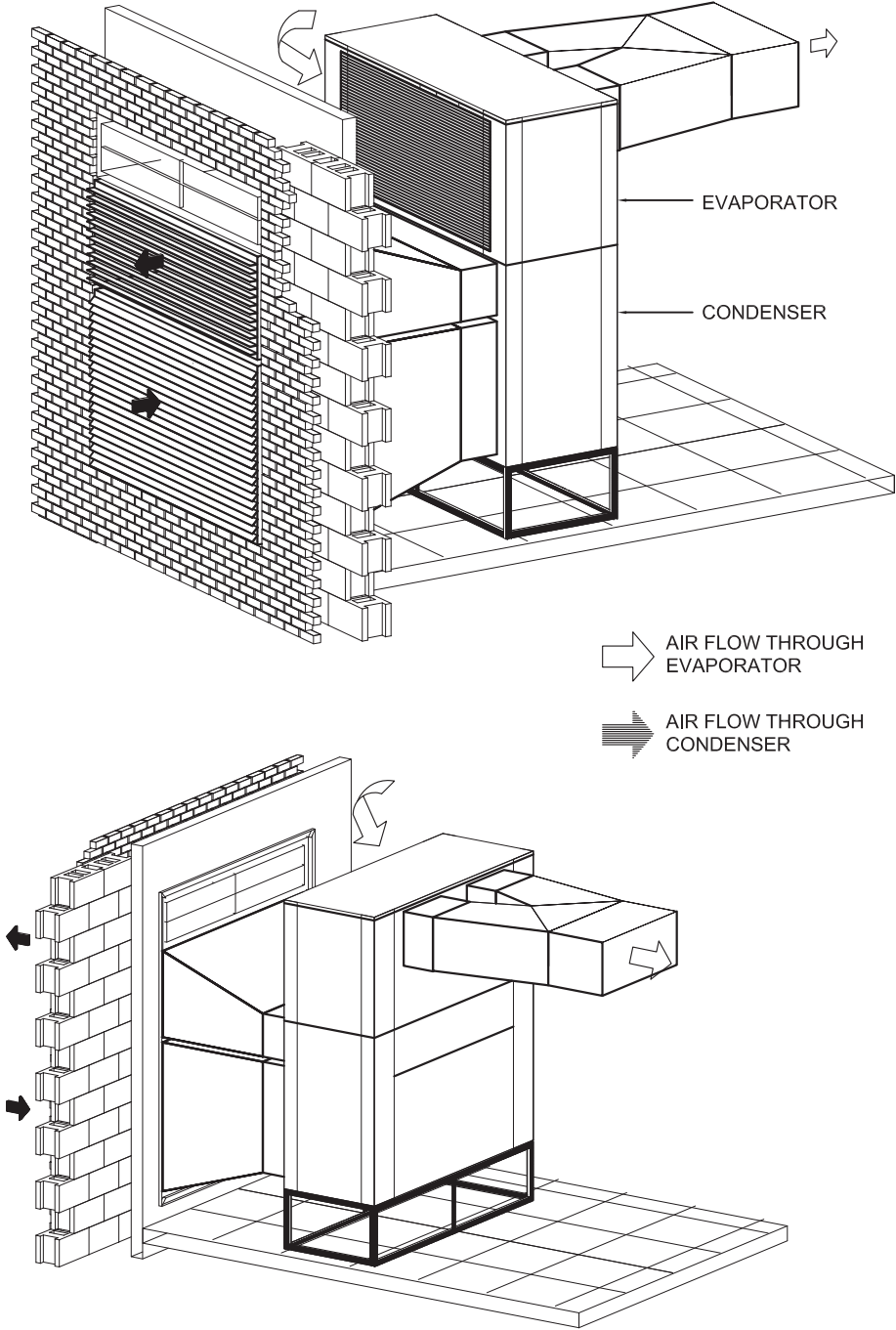
## OPTIONAL BOTTOM & FRONT DAMPER ARRANGEMENT



Horizontal Unit Model Number	Economizer Model Number	MIXING BOX DIM'N			DAMPER DIM'N	
		A	B	C	D	E
DSH024/036	HASE-036H-SF	26.06	18.56	23.44	17.00	14.00
DSH048/060	HASE-060H-SF	29.68	23.44	30.44	24.00	14.00
DSH096/120	HASE-120H-SF	33.63	25.25	33.63	28.00	19.50

CONTROL MODULE	
F	G
8.00	15.00
8.00	15.00
8.00	15.00

# VERTICAL APPLICATION & INSTALLATION



# DSV PHYSICAL DATA

## VERTICAL AIR COOLED — DSV SERIES R-410A

Model	DSV036	DSV048	DSV060	DSV096	DSV120	DSV144	DSV180	DSV240	
Nominal Cooling (Tons)	3	4	5	8	10	12	15	20	
Refrigerant	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	
<b>Cooling Performance</b>									
Gross Cooling Capacity(Btu/h) <sup>(1)</sup>	37,800	50,100	62,900	99,500	124,200	145,900	177,900	252,400	
Design CFM	1,200	1,600	2,000	3,200	4,000	4,800	6,000	8,000	
Net Cooling Capacity	37,000 <sup>(2)</sup>	49,000 <sup>(2)</sup>	61,000 <sup>(2)</sup>	98,000 <sup>(3)</sup>	118,000 <sup>(3)</sup>	142,000 <sup>(3)</sup>	168,000 <sup>(3)</sup>	240,000 <sup>(3)</sup>	
Net Cooling CFM	1,200	1,600	2,000	3,200	3,600	4,800	5,000	7,200	
SEER <sup>(2)</sup>	13.0	13.0	13.0	N/A	N/A	N/A	N/A	N/A	
EER <sup>(3)</sup>	N/A	N/A	N/A	11.7	11.2	11.3	11.0	10.2	
Compressor-Qty/Type	1/Scroll	1/Scroll	1/Scroll	2/Scroll	2/Scroll	2/Scroll	2/Scroll	2/Scroll	
Evaporator Coil-Type	Enhanced Copper Tubes, Enhanced Aluminum Fins								
Dimension- Height x Width (in)	22X34	22X36	22X36	28X52	28x52	34X67	34x67	38x77	
Face Area (sq ft)	5.16	5.46	5.46	10.11	10.11	15.82	15.82	20.32	
Rows/FPI	3/12	3/12	3/12	3/12	4/12	3/14	4/14	4/14	
Filters- Quantity/Size(in)	2-18x24x2	2-20x24x2	2-20x24x2	3-20x14x2 3-20x16x2	3-20x14x2 3-20x16x2	2-25x20x2 2-25x14x2 1-20x14x2 1-20x20x2	2-25x20x2 2-25x14x2 1-20x14x2 1-20x20x2	8-20x20x2	
Condenser Coil-Type	Enhanced Copper Tubes, Enhanced Aluminum Fins								
Dimension- Height x Width (in)	30X34	32X36	32X36	34X56	34X56	40X67	40X67	44x77	
Face Area (sq ft)	7.03	7.94	7.94	13.22	13.22	18.61	18.61	23.53	
Rows/FPI	3/12	4/14	4/14	4/14	4/14	4/14	4/14	4/14	
Evaporator Fan-Type	Centrifugal, Forward Curved								
Qty.-Diameter x Width(in)	1-10x8	1-10x10	1-10x10	1-15X15	1-15X15	2-15X11	2-15X11	2-15x15	
Drive	Adjustable Belt								
Motor HP (Standard)	1/3	1/2	1	1.0	1.5	2	3	5	
Condenser Fan-Type	Centrifugal, Forward Curved								
Qty.-Diameter x Width(in)	1-12x12	1-12x15	1-12x15	2-15X9	2-15X9	2-18X9	2-18X9	2-18x13	
Drive	Adjustable Belt								
Motor HP (Standard)	1	1	1 1/2	1 1/2	2	3	5	7 1/2	
Dimensions	Height (in)	66.5	68.5	68.5	78.0	78.0	91.5	91.5	101.0
	Width (in)	40.0	42.0	42.0	64.0	64.0	78.0	78.0	88.0
	Depth (in)	29.0	29.0	29.0	32.5	32.5	34.0	34.0	34.0
Weight	Operating (lbs)	610	670	720	1055	1110	1415	1480	1610
	Shipping (lbs)	650	715	765	1105	1170	1500	1565	1695

(1) Cooling performance is rated at 95°F ambient, 80°F entering dry bulb, 67°F web bulb and CFM listed. Gross capacity does not include the effect of fan motor heat.

(2) Rated in accordance with ANSI/AHRI Standard 210/240

(3) Rated in accordance with ANSI/AHRI Standard 340/360



# DSV PERFORMANCE DATA

Model	CFM	EDB	Ambient Condenser Air Temperature																							
			85°F						95°F						105°F						115°F					
			62°F EWB		67°F EWB		72°F EWB		62°F EWB		67°F EWB		72°F EWB		62°F EWB		67°F EWB		72°F EWB		62°F EWB		67°F EWB		72°F EWB	
			TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC
DSV036	1000	75°F	34.7	26.4	37.4	21.4	38.8	15.5	32.6	25.5	35.8	20.4	37.8	16.6	30.8	24.5	33.5	19.5	35.6	15.6	29.3	23.9	31.8	18.5	33.7	14.5
		80°F	34.7	31.3	37.8	26.1	40.7	21.2	33.0	30.4	36.2	25.3	38.5	20.1	31.0	29.4	33.7	24.2	36.6	19.4	29.4	28.8	32.0	23.7	34.8	18.4
		85°F	35.2	35.2	38.0	31.2	40.9	25.8	33.9	33.9	36.5	30.3	38.9	24.8	32.5	32.5	34.9	29.7	36.7	23.8	30.9	30.9	32.1	28.6	34.7	23.2
	1200	75°F	35.6	28.5	37.4	22.4	40.0	15.6	33.9	27.9	36.4	21.9	39.0	17.1	31.6	26.9	34.4	20.7	36.8	15.8	30.0	26.3	32.7	20.0	34.6	15.5
		80°F	35.7	34.2	38.9	28.4	41.8	22.2	33.9	33.5	37.1	27.5	40.0	21.2	31.7	31.7	34.6	26.6	37.6	20.7	30.8	30.8	32.7	26.1	35.7	19.7
		85°F	37.3	37.3	39.2	34.0	42.3	27.9	35.9	35.9	37.1	33.4	40.3	26.9	34.0	34.0	35.0	32.5	38.2	26.3	32.6	32.6	32.9	31.6	35.5	25.6
	1400	75°F	36.6	30.8	39.7	23.7	41.6	18.3	34.5	30.1	37.6	22.9	39.6	18.2	32.1	29.3	35.1	21.8	37.7	16.9	30.4	27.9	32.9	20.8	35.1	15.1
		80°F	36.7	36.7	39.9	30.3	42.9	23.1	35.0	35.0	38.1	29.8	40.7	22.5	33.3	33.3	35.4	28.7	38.2	21.4	31.7	31.7	32.9	27.6	35.8	20.8
		85°F	39.4	39.4	40.2	37.3	43.4	30.0	37.8	37.8	38.0	36.4	41.0	29.1	35.4	35.4	35.3	35.3	38.0	28.5	33.6	33.6	33.1	33.1	35.8	27.2
DSV048	1450	75°F	46.9	36.3	50.8	28.6	53.0	24.6	44.6	35.0	48.4	27.7	50.9	22.6	42.2	34.4	45.8	26.7	48.8	20.7	39.6	33.1	43.0	25.5	45.7	20.3
		80°F	46.8	43.3	51.1	36.0	55.3	27.8	45.0	42.6	48.7	34.8	52.7	27.0	42.5	41.4	45.8	34.1	49.9	26.1	40.0	39.8	43.3	32.7	46.9	25.0
		85°F	48.5	48.5	51.0	43.1	55.6	34.7	46.3	46.3	48.9	41.8	53.0	34.1	44.7	44.7	46.2	40.9	50.2	33.4	41.7	41.7	43.3	40.1	47.1	32.3
	1600	75°F	47.6	37.8	51.5	29.5	54.4	24.1	45.3	36.9	49.0	28.6	51.9	23.0	42.8	35.7	46.3	27.5	49.4	20.4	40.2	34.4	43.5	26.3	46.2	19.6
		80°F	47.6	46.0	51.9	37.6	56.1	29.3	45.5	44.4	49.4	36.3	53.3	27.9	43.0	43.0	46.6	35.7	50.5	26.9	40.3	40.3	43.8	34.0	47.4	25.7
		85°F	49.9	49.9	52.1	45.1	56.4	36.9	47.9	47.9	49.6	44.0	53.7	35.6	46.0	46.0	46.8	43.4	50.5	35.1	43.6	43.6	44.0	42.0	47.7	33.6
	1800	75°F	48.4	39.9	52.3	31.1	55.6	24.1	46.0	38.9	49.8	30.0	53.2	22.5	43.3	37.8	47.0	28.8	50.1	21.2	40.8	36.5	44.0	27.4	46.7	19.8
		80°F	48.5	48.4	52.7	39.2	56.8	30.4	46.2	46.2	50.2	38.4	54.1	29.3	43.6	43.6	47.1	37.4	51.2	28.3	40.9	40.9	44.4	36.2	48.0	27.0
		85°F	51.5	51.5	52.9	47.9	57.2	38.6	49.5	49.5	50.4	47.2	54.4	37.8	47.3	47.3	47.6	45.6	51.5	36.2	44.9	44.9	44.5	44.5	48.3	35.5
DSV060	1800	75°F	58.2	43.6	62.9	35.2	65.7	30.2	55.4	42.6	59.7	34.1	63.5	27.3	52.0	41.1	56.6	32.8	60.0	25.8	49.2	39.8	53.1	31.4	56.6	22.6
		80°F	58.5	52.6	63.2	43.6	68.0	34.7	55.5	51.1	60.2	42.1	64.6	33.6	52.5	49.5	56.9	40.9	61.4	31.9	49.4	48.4	53.5	39.6	57.7	30.6
		85°F	58.8	58.8	63.5	52.0	67.8	42.8	55.9	55.9	60.4	50.7	65.3	41.8	54.9	54.9	57.2	49.2	61.9	40.2	52.3	52.3	53.7	47.9	57.8	38.7
	2000	75°F	59.1	46.1	63.8	36.3	67.3	28.9	56.2	44.4	60.6	35.2	64.2	27.0	53.0	43.0	57.4	33.9	61.1	25.0	49.7	41.3	53.8	32.3	57.0	25.0
		80°F	59.3	54.5	64.0	45.5	69.0	35.8	56.4	53.5	61.7	44.4	65.7	34.2	53.4	52.3	57.2	42.9	62.2	33.0	50.1	50.1	54.2	41.2	58.5	31.6
		85°F	59.4	59.4	64.4	54.1	69.5	44.5	59.1	59.1	61.4	53.4	66.2	43.7	56.3	56.3	58.0	51.6	62.7	42.0	53.5	53.5	54.4	50.5	58.5	40.9
	2200	75°F	59.8	47.9	64.4	37.3	68.4	28.7	56.9	46.1	61.4	36.2	65.4	26.8	53.5	45.0	58.0	34.8	61.9	25.4	50.2	43.2	54.5	33.3	57.4	25.8
		80°F	60.1	57.1	64.8	46.7	69.8	37.0	57.3	56.1	61.8	45.7	66.4	35.8	53.9	53.9	58.4	44.4	62.9	34.0	50.6	50.6	54.8	42.7	59.1	32.5
		85°F	62.8	62.8	65.2	56.7	70.4	46.5	60.6	60.6	62.1	55.8	66.9	44.8	57.8	57.8	58.6	53.9	63.3	43.6	54.8	54.8	54.9	52.7	59.6	42.3
DSV096	3000	75°F	95.2	74.9	101.2	61.3	105.4	51.6	91.1	72.4	97.0	58.6	100.9	48.9	85.8	70.2	91.9	55.7	96.1	46.7	80.9	67.7	86.5	52.7	89.9	43.8
		80°F	96.2	88.5	103.3	73.4	109.1	61.1	91.7	86.2	98.4	71.3	104.5	58.0	86.7	83.8	93.0	68.9	98.9	55.0	81.6	81.4	87.7	66.4	93.3	51.8
		85°F	99.1	99.1	104.0	83.3	111.5	72.0	95.3	95.3	98.7	84.9	106.3	70.6	90.9	90.9	93.5	82.6	100.6	66.4	86.5	86.5	88.2	80.4	94.5	65.0
	3200	75°F	96.6	76.8	102.9	61.9	107.5	49.1	91.9	74.7	97.9	58.8	103.0	47.4	87.0	72.0	92.7	56.3	95.8	44.9	81.7	69.7	87.4	54.0	90.7	47.7
		80°F	96.9	91.0	104.3	75.7	110.9	61.3	92.6	89.1	99.5	73.1	105.7	58.2	87.3	86.6	93.9	70.9	100.0	55.8	82.3	82.3	88.5	88.5	94.5	52.8
		85°F	100.9	100.9	105.1	90.1	112.5	73.8	97.0	97.0	99.9	88.0	107.4	71.2	92.5	92.5	94.5	85.4	101.1	69.3	88.1	88.1	89.0	83.2	95.4	67.6
	3400	75°F	97.6	78.8	104.3	62.6	108.7	52.5	92.9	76.4	99.2	59.8	102.6	52.6	87.5	74.2	93.5	57.5	97.8	44.3	82.4	71.6	88.2	55.3	90.7	48.0
		80°F	98.1	94.4	105.3	77.5	111.8	62.1	93.5	92.1	100.4	75.1	106.4	58.8	88.1	88.1	94.8	73.0	101.2	56.2	82.8	82.8	88.7	69.6	95.1	53.9
		85°F	102.9	102.9	105.9	93.0	113.8	74.7	98.7	98.7	100.8	90.8	108.2	72.6	94.0	94.0	95.2	88.5	102.2	70.6	89.5	89.5	89.7	86.0	96.1	68.8
DSV120	3600	75°F	118.6	92.0	128.3	73.8	132.3	63.2	113.2	89.5	122.1	69.9	122.1	61.8	107.2	88.2	116.2	69.3	123.9	55.5	101.0	85.3	109.4	66.5	112.7	56.6
		80°F	118.9	108.7	128.2	90.5	138.4	71.8	113.4	106.1	122.5	87.8	131.3	69.8	108.0	105.4	116.3	86.6	125.7	68.7	101.8	101.8	109.8	83.7	118.7	63.8
		85°F	121.9	121.9	128.8	106.9	138.5	88.5	118.6	118.6	123.4	106.3	133.2	87.4	113.3	113.3	116.9	103.4	126.1	84.6	107.9	107.9	110.2	100.8	118.7	81.9
	4000	75°F	120.5	96.4	129.9	76.3	135.0	65.8	114.7	93.8	123.7	73.6	129.4	62.4	108.0	90.9	116.9	70.6	122.9	56.7	101.9	88.0	109.9	69.1	115.7	53.6
		80°F	120.7	114.6	130.3	94.7	140.1	76.1	115.0	112.0	124.2	92.1	132.8	73.0	108.8	108.8	117.3	89.3	125.6	71.0	101.9	101.9	110.4	86.4	119.2	64.5
		85°F	125.7	125.7	130.7	112.8	140.7	92.6	120.8	120.8	124.4	110.2	134.0	90.1	115.4	115.4	117.8	107.4	126.8	87.2	109.9	109.9	110.5	104.5	119.4	84.5
	4400	75°F	122.8	103.2	132.9	80.6	139.2	68.2	117.4	100.5	126.1	77.8	132.6	61.3	110.6	97.7	119.3	74.5	125.4	59.6	104.2	94.7	112.6	71.4	118.8	53.5
		80°F	123.8	123.8	133.5	101.3	144.1	78.1	117.7	117.7	126.7	98.7	136.9	75.3	114.0	114.0	119.7	95.9	129.4	73.0	108.2	108.2	112.7	92.9	121.2	69.6
		85°F	131.2	131.2	133.9	121.8	144.1	98.9	125.9	125.9	127.6	119.2	136.9	96.4	120.1	120.1	120.5	116.3	129.6	93.6	114.1	114.1	113.0	113.0	121.6	90.9

# DSV PERFORMANCE DATA

Model	CFM	EDB	Ambient Condenser Air Temperature																							
			85°F						95°F						105°F						115°F					
			62°F EWB		67°F EWB		72°F EWB		62°F EWB		67°F EWB		72°F EWB		62°F EWB		67°F EWB		72°F EWB		62°F EWB		67°F EWB		72°F EWB	
			TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC
DSV144	4300	75°F	138.9	106.1	149.2	85.6	154.2	76.6	132.1	102.7	139.7	86.4	144.7	73.9	124.7	99.1	133.5	78.2	139.5	68.4	116.8	95.6	125.5	77.5	130.8	65.4
		80°F	139.0	125.0	150.3	104.4	158.1	90.3	132.6	121.7	143.0	101.3	150.8	86.4	125.4	118.2	135.6	97.6	143.2	82.1	117.8	114.5	127.5	94.1	135.1	77.8
		85°F	139.8	139.8	151.1	123.3	162.8	102.4	136.4	136.4	143.2	120.0	155.1	99.2	130.4	130.4	136.4	116.6	146.8	96.0	124.1	124.1	127.9	113.2	138.3	92.2
	4800	75°F	141.5	111.2	150.2	91.9	156.6	76.6	134.5	107.9	144.0	88.4	149.0	76.3	126.6	104.5	136.0	83.1	142.0	68.9	119.0	100.6	127.8	79.3	134.1	64.3
		80°F	142.2	132.2	152.9	109.7	161.5	92.1	135.2	129.1	145.9	106.2	154.4	88.0	127.8	125.3	137.9	102.7	146.7	83.2	119.9	119.9	129.9	98.9	138.1	78.7
		85°F	147.2	147.2	154.0	130.3	165.6	107.5	141.1	141.1	146.6	127.1	157.8	104.3	134.8	134.8	138.5	123.8	149.6	100.4	128.1	128.1	130.3	120.2	140.7	96.6
	5300	75°F	143.2	116.6	153.5	93.4	161.3	74.7	136.5	112.9	146.3	89.5	153.1	72.9	129.0	109.1	138.2	85.7	144.9	67.7	120.8	105.3	129.7	81.4	135.6	64.9
		80°F	144.6	139.3	155.9	114.2	166.0	93.0	137.1	135.4	148.0	111.0	157.5	89.0	129.7	129.7	140.3	107.6	149.4	84.2	124.3	124.3	131.4	104.7	140.6	79.9
		85°F	151.5	151.5	156.6	137.2	168.1	112.1	145.3	145.3	148.7	133.9	161.0	108.0	138.7	138.7	140.7	130.6	151.5	105.2	131.7	131.7	132.2	126.9	142.2	101.7
DSV180	5400	75°F	169.9	132.5	182.5	109.5	188.1	95.9	162.0	129.6	174.1	102.7	179.5	91.5	153.3	124.1	165.1	99.1	173.8	85.2	144.7	121.5	156.0	96.7	162.0	81.0
		80°F	170.1	156.5	184.0	130.6	194.8	107.1	162.6	152.9	174.9	127.7	186.6	104.5	154.3	149.7	165.7	124.3	177.7	97.7	146.0	146.0	157.3	119.5	170.0	93.5
		85°F	174.4	174.4	184.1	154.6	197.8	128.6	168.1	168.1	175.4	150.9	188.3	124.3	161.5	161.5	166.7	148.3	178.7	121.5	154.1	154.1	157.5	143.3	170.4	117.6
	6000	75°F	172.9	140.1	186.1	111.7	193.4	96.7	164.5	136.6	177.2	108.1	184.2	93.9	156.3	132.9	167.8	104.1	174.9	87.5	147.2	129.5	158.9	100.1	167.4	72.0
		80°F	173.4	166.4	186.8	138.3	200.0	108.0	165.3	163.6	177.9	135.2	190.6	104.8	156.7	156.7	168.6	129.8	180.8	101.2	147.8	147.8	159.8	127.8	172.4	98.3
		85°F	180.7	180.7	187.1	164.6	200.9	134.6	173.8	173.8	178.7	160.9	191.6	132.2	165.9	165.9	169.5	157.7	181.5	127.1	158.6	158.6	160.0	153.6	173.4	124.9
	6600	75°F	175.1	145.4	188.1	114.7	196.7	96.4	167.3	143.9	179.5	111.3	188.0	90.3	158.6	139.6	170.1	108.9	179.3	84.3	149.4	135.9	160.8	104.5	170.9	80.3
		80°F	175.9	175.9	189.3	143.9	203.6	112.0	167.6	167.6	180.8	139.2	193.3	108.2	158.7	158.7	170.9	136.7	183.4	104.6	154.3	154.3	161.6	134.1	174.9	103.2
		85°F	185.7	185.7	190.4	173.2	203.9	140.7	178.9	178.9	181.3	170.4	194.0	137.7	171.0	171.0	171.5	166.4	184.0	134.3	163.7	163.7	162.2	162.2	175.2	131.4
DSV240	7200	75°F	240.0	184.1	255.7	152.6	265.1	140.9	229.6	179.5	245.3	145.2	254.3	132.2	218.1	174.5	232.3	145.2	242.3	127.2	206.0	169.2	220.2	137.4	229.7	119.5
		80°F	240.5	217.4	259.1	180.9	274.9	155.1	230.4	213.1	248.2	176.2	263.0	146.7	218.9	208.1	235.6	171.3	250.6	140.3	206.5	203.0	222.7	166.1	239.0	134.3
		85°F	241.9	241.9	261.1	214.4	280.5	176.7	237.9	237.9	249.7	209.7	267.9	172.2	228.2	228.2	236.7	205.0	254.5	167.7	218.0	218.0	224.0	199.8	243.0	163.3
	8000	75°F	244.4	193.5	260.2	158.7	271.8	140.3	233.7	188.8	248.1	154.6	260.8	128.8	221.6	183.5	236.0	151.3	247.9	122.7	208.2	178.0	223.5	140.8	234.1	118.0
		80°F	244.8	230.4	264.2	190.0	279.2	160.2	234.4	225.5	252.4	185.3	267.3	152.1	222.2	220.9	239.2	180.1	254.3	148.5	210.2	210.2	226.4	175.0	243.5	141.0
		85°F	255.1	255.1	265.9	226.3	285.3	185.2	245.7	245.7	253.4	222.2	272.1	180.9	235.2	235.2	240.6	217.5	258.2	176.1	224.6	224.6	227.9	212.2	246.5	172.3
	8800	75°F	247.0	202.3	264.6	164.3	278.2	134.1	235.7	197.5	252.4	158.5	266.8	126.2	223.6	192.5	239.4	151.1	252.4	122.9	211.1	187.0	226.5	149.2	238.4	121.1
		80°F	248.7	242.9	267.6	198.8	284.6	163.1	237.6	237.6	256.0	193.8	271.7	158.1	225.7	225.7	242.5	188.9	258.1	151.8	218.2	218.2	228.8	183.5	246.2	147.5
		85°F	262.0	262.0	268.8	238.7	289.0	193.9	252.1	252.1	256.6	234.3	276.0	189.6	241.6	241.6	244.0	229.3	261.3	184.7	231.1	231.1	231.0	224.6	249.7	180.5

# DSV FAN PERFORMANCE DATA

## EVAPORATOR FAN PERFORMANCE

MODEL #	SUPPLY CFM	EXTERNAL STATIC PRESSURE - Inches W.C.																			
		0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
DSV036A	1000	605	0.11	732	0.16	839	0.19	941	0.26	1051	0.31	-	-	-	-	-	-	-	-	-	-
	1200	675	0.17	788	0.23	890	0.29	988	0.34	-	-	-	-	-	-	-	-	-	-	-	-
	1400	749	0.26	849	0.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSV480A	1450	735	0.24	845	0.30	950	0.38	1037	0.45	1134	0.52	-	-	-	-	-	-	-	-	-	-
	1600	788	0.31	889	0.38	987	0.46	1076	0.55	-	-	-	-	-	-	-	-	-	-	-	-
	1800	870	0.43	962	0.51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DSV060A	1800	860	0.41	945	0.50	1039	0.58	1130	0.67	1208	0.76	1280	0.83	1359	0.85	1435	0.96	-	-	-	-
	2000	926	0.55	1010	0.63	1098	0.72	1178	0.81	1250	0.90	1325	0.99	-	-	-	-	-	-	-	-
	2200	1007	0.72	1085	0.80	1160	0.90	1230	0.99	-	-	-	-	-	-	-	-	-	-	-	-
DSV096A	3000	486	0.45	563	0.57	632	0.70	697	0.83	757	0.97	817	1.14	872	1.30	926	1.44	-	-	-	-
	3200	508	0.53	581	0.66	648	0.79	710	0.93	768	1.09	827	1.25	876	1.39	-	-	-	-	-	-
	3400	530	0.62	601	0.75	665	0.89	725	1.04	783	1.20	837	1.38	884	1.50	-	-	-	-	-	-
DSV120A	3600	552	0.72	620	0.86	683	1.01	740	1.16	796	1.32	845	1.46	900	1.65	947	1.83	993	1.97	1052	2.09
	4000	598	0.95	662	1.11	720	1.26	774	1.43	826	1.60	876	1.78	924	1.96	970	2.08	-	-	-	-
	4400	645	1.22	704	1.39	759	1.57	810	1.75	859	1.93	-	-	-	-	-	-	-	-	-	-
DSV144A	4300	540	0.74	613	0.92	679	1.10	740	1.28	802	1.48	858	1.73	910	1.98	963	2.23	1110	2.56	1058	2.78
	4800	588	0.99	655	1.18	717	1.39	775	1.58	825	1.80	880	2.03	930	2.26	978	2.50	1025	2.76	1077	3.00
	5300	639	1.29	701	1.51	759	1.73	813	1.96	868	2.22	912	2.44	964	2.67	1005	2.93	1050	3.16	-	-
DSV180A	5400	646	1.35	708	1.57	765	1.80	819	2.03	872	2.29	915	2.55	964	2.82	1014	3.05	1165	3.30	1110	3.60
	6000	715	1.84	771	2.09	824	2.34	874	2.59	921	2.84	965	3.10	1012	3.38	1051	3.65	1095	3.94	1136	4.24
	6600	781	2.42	832	2.69	881	2.96	928	3.24	973	3.52	1015	3.79	1057	4.08	1096	4.38	1130	4.70	1175	5.04
DSV240A	7200	683	2.01	741	2.32	796	2.64	845	2.90	901	3.36	942	3.60	995	4.02	1040	4.41	1083	4.80	1128	5.20
	8000	745	2.68	798	3.01	848	3.35	898	3.72	945	4.07	990	4.50	1038	4.89	1081	5.28	1123	5.67	1167	6.09
	8800	808	3.48	857	3.85	903	4.21	949	4.60	994	5.01	1033	5.46	1081	5.86	1122	6.29	1161	6.80	1202	7.23

### NOTE:

1. At high evaporator air flows, and wet bulb conditions, condensate carry-over may occur. Adjust airflow downward as necessary.
2. Values include pressure drop from wet coil and clean filters.
3. Shaded cells indicate oversized motors.

## CONDENSER FAN PERFORMANCE

MODEL #	OUTDOOR CFM	EXTERNAL STATIC PRESSURE - Inches W.C.													
		0.2		0.4		0.6		0.8		1.0		1.2		1.4	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
DSV036A	2200	622	0.39	720	0.50	802	0.60	961	0.69	953	0.79	-	-	-	-
DSV048A	2600	719	0.61	800	0.71	870	0.85	940	0.98	-	-	-	-	-	-
DSV060A	3000	886	0.87	838	0.99	920	1.12	1002	1.29	1055	1.47	-	-	-	-
DSV096A	4400	616	1.02	681	1.21	739	1.47	800	1.63	854	1.86	911	2.09	-	-
DSV120A	5500	730	1.83	785	2.07	837	2.30	888	2.55	938	2.83	982	3.00	-	-
DSV144A	5800	576	1.61	627	1.85	676	2.10	720	2.38	764	2.67	811	2.97	-	-
DSV180A	7000	673	2.68	717	2.97	759	3.27	800	3.57	840	3.88	881	4.12	-	-
DSV240A	10000	654	3.59	698	3.98	740	4.37	780	4.77	819	5.17	857	5.59	893	5.99

# DSV ELECTRICAL DATA

## DSV ELECTRICAL DATA-STANDARD MOTOR

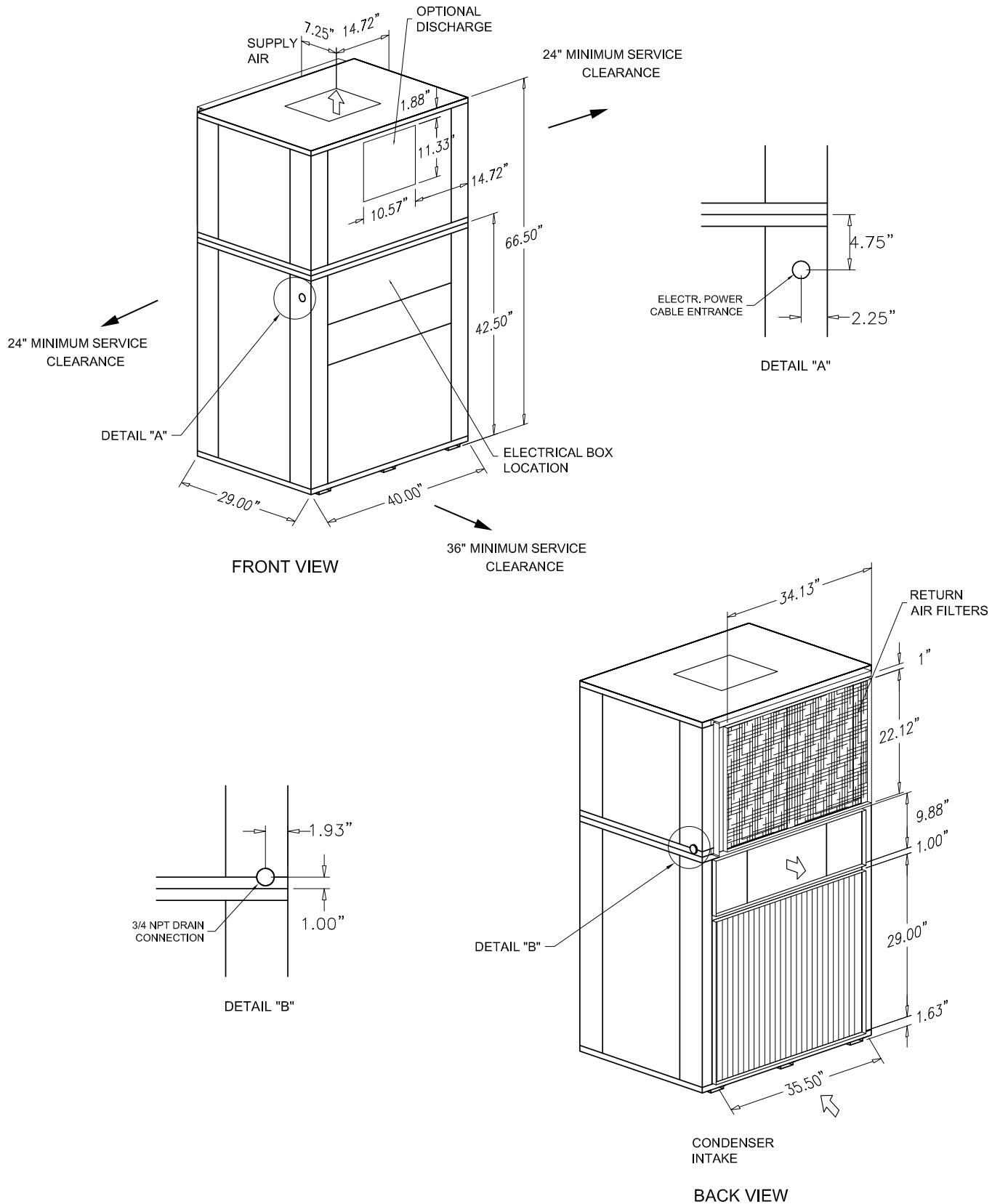
MODEL #	VOLTAGE	COMPRESSOR			EVAPORATOR FAN		CONDENSER FAN		MIN. CCT. AMPACITY	MAX FUSE / CCT. BKR. AMP	
		QTY	RLA	LRA	HP	FLA	HP	FLA			
DSV036A1	208-230/1/60	1	@	14.1	77.0	0.33	3.2	1.00	6.7	27.53	40
DSV036A2	208-230/3/60	1	@	9.0	71.0	0.33	1.8	1.00	3.0	16.05	25
DSV036A4	460/3/60	1	@	5.6	38.0	0.33	0.8	1.00	1.4	9.20	15
DSV036A5	575/3/60	1	@	3.8	36.5	0.33	0.6	1.00	1.1	6.45	15
DSV048A1	208-230/1/60	1	@	19.9	109.0	0.50	4.4	1.00	6.7	35.98	50
DSV048A2	208-230/3/60	1	@	13.1	83.1	0.50	2.1	1.00	3.0	21.48	30
DSV048A4	460/3/60	1	@	6.1	41.0	0.50	1.0	1.00	1.4	10.03	15
DSV048A5	575/3/60	1	@	5.0	34.0	0.50	0.8	1.00	1.1	8.15	15
DSV060A2	208-230/3/60	1	@	16.0	110.0	1.00	3.2	1.50	4.3	27.50	40
DSV060A4	460/3/60	1	@	7.8	52.0	1.00	1.5	1.50	2.1	13.35	20
DSV060A5	575/3/60	1	@	5.7	38.9	1.00	1.2	1.50	1.7	10.03	15
DSV096A2	208-230/3/60	2	@	15.3	83.0	1.00	3.2	2.00	6.0	43.58	50
DSV096A4	460/3/60	2	@	6.2	41.0	1.00	1.5	2.00	2.8	18.20	20
DSV096A5	575/3/60	2	@	4.8	33.0	1.00	1.2	2.00	2.1	14.10	15
DSV120A2	208-230/3/60	2	@	16.0	110.0	1.50	4.6	3.00	8.5	49.06	60
DSV120A4	460/3/60	2	@	7.8	52.0	1.50	2.1	3.00	4.0	23.64	30
DSV120A5	575/3/60	2	@	5.7	38.9	1.50	1.7	3.00	3.1	17.63	20
DSV144A2	208-230/3/60	2	@	19.0	123.0	2.00	6.0	3.00	8.5	57.20	70
DSV144A4	460/3/60	2	@	9.7	62.0	2.00	2.8	3.00	4.0	28.58	35
DSV144A5	575/3/60	2	@	7.4	50.0	2.00	2.1	3.00	3.1	21.85	25
DSV180A2	208-230/3/60	2	@	23.2	164.0	3.00	8.5	5.00	13.8	74.50	90
DSV180A4	460/3/60	2	@	11.2	75.0	3.00	4.0	5.00	6.6	35.80	45
DSV180A5	575/3/60	2	@	7.9	54.0	3.00	3.1	5.00	5.2	26.08	30
DSV240A2	208-230/3/60	2	@	30.1	225.0	5.00	13.8	7.50	21.0	102.53	125
DSV240A4	460/3/60	2	@	16.7	114.0	5.00	6.6	7.50	9.6	53.78	70
DSV240A5	575/3/60	2	@	12.2	80.0	5.00	5.2	7.50	7.6	40.25	50

## DSV ELECTRICAL DATA-OVERSIZED MOTOR

MODEL #	VOLTAGE	COMPRESSOR			EVAPORATOR FAN		CONDENSER FAN		MIN. CCT. AMPACITY	MAX FUSE / CCT. BKR. AMP	
		QTY	RLA	LRA	HP	FLA	HP	FLA			
DSV096A2	208-230/3/60	2	@	15.3	83.0	1.50	4.6	2.00	6.0	44.94	60
DSV096A4	460/3/60	2	@	6.2	41.0	1.50	2.1	2.00	2.8	18.79	20
DSV096A5	575/3/60	2	@	4.8	33.0	1.50	1.7	2.00	2.1	14.60	15
DSV120A2	208-230/3/60	2	@	16.0	110.0	2.00	6.0	3.00	8.5	50.45	60
DSV120A4	460/3/60	2	@	7.8	52.0	2.00	2.8	3.00	4.0	24.30	30
DSV120A5	575/3/60	2	@	5.7	38.9	2.00	2.1	3.00	3.1	18.03	20
DSV144A2	208-230/3/60	2	@	19.0	123.0	3.00	8.5	3.00	8.5	59.75	70
DSV144A4	460/3/60	2	@	9.7	62.0	3.00	4.0	3.00	4.0	29.83	35
DSV144A5	575/3/60	2	@	7.4	50.0	3.00	3.1	3.00	3.1	22.85	30
DSV180A2	208-230/3/60	2	@	23.2	164.0	5.00	13.8	5.00	13.8	79.80	100
DSV180A4	460/3/60	2	@	11.2	75.0	5.00	6.6	5.00	6.6	38.40	45
DSV180A5	575/3/60	2	@	7.9	54.0	5.00	5.2	5.00	5.2	28.18	35
DSV240A2	208-230/3/60	2	@	30.1	225.0	7.50	21.0	7.50	21.0	109.73	125
DSV240A4	460/3/60	2	@	16.7	114.0	7.50	9.6	7.50	9.6	56.78	70
DSV240A5	575/3/60	2	@	12.2	80.0	7.50	7.6	7.50	7.6	42.65	50

# DSV DIMENSIONAL DATA

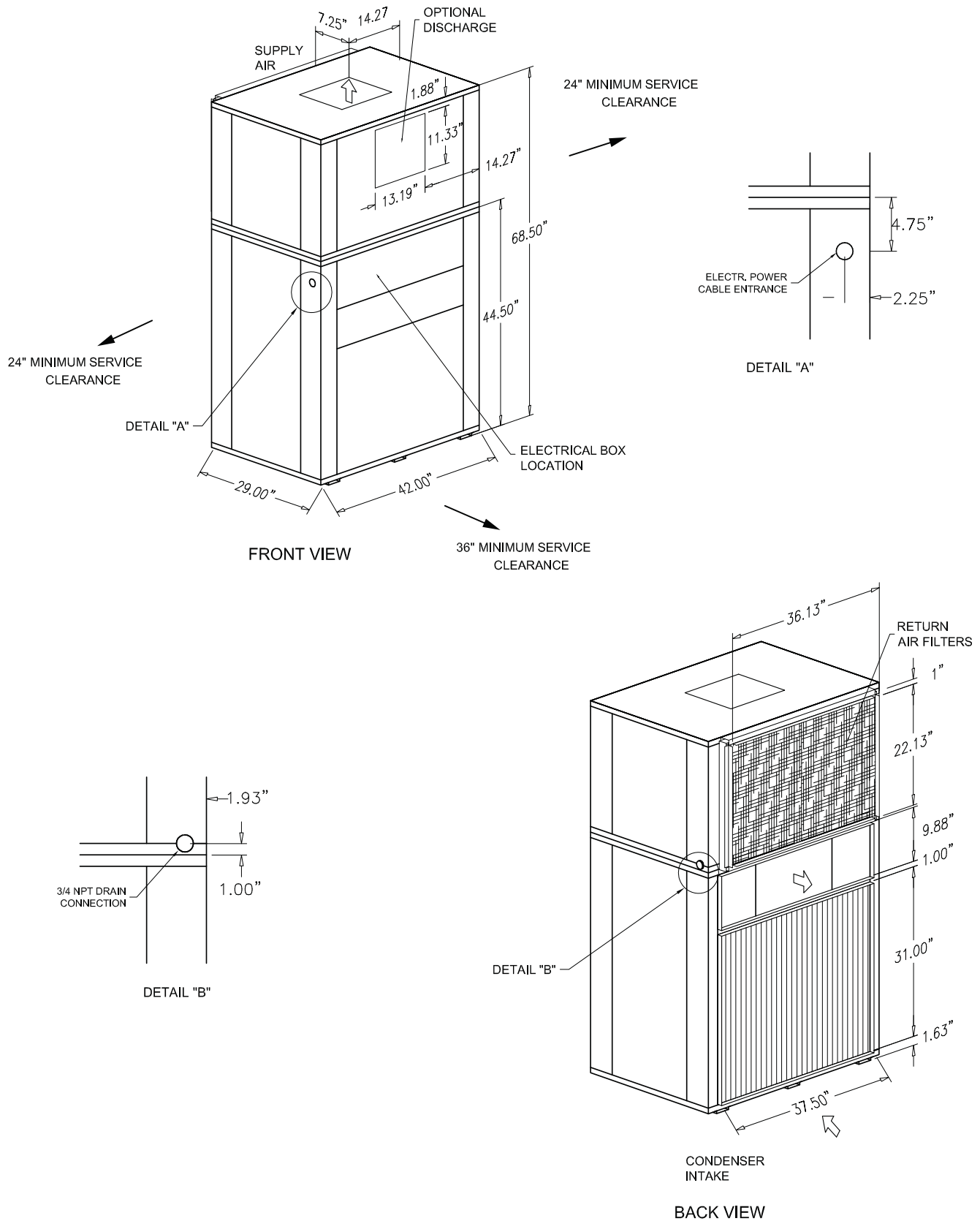
## DSV036 VERTICAL AIR-COOLED UNIT



Johnson Controls maintains a continuous product improvement policy, therefore specifications are subject to change without notice.

# DSV DIMENSIONAL DATA

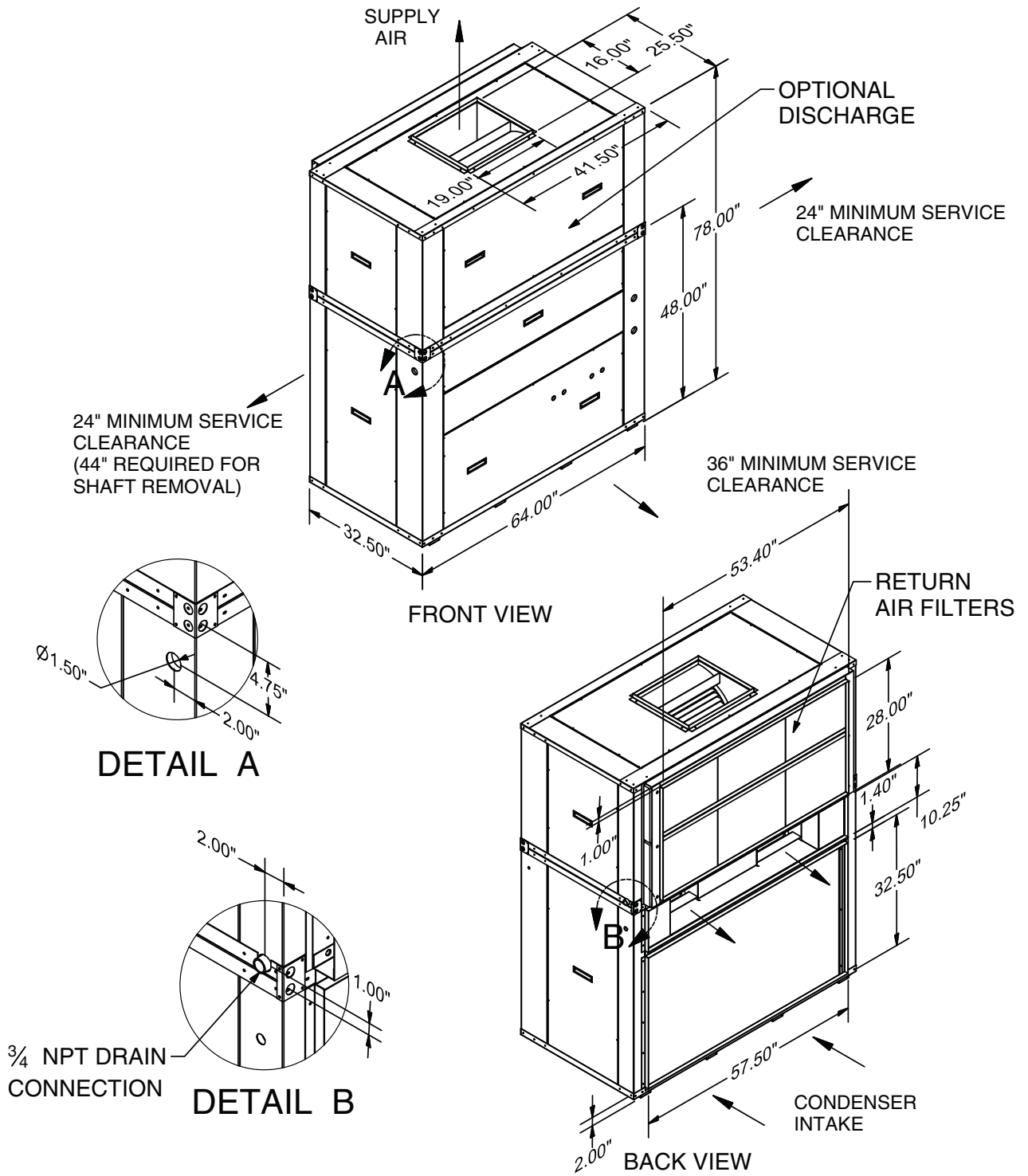
## DSV048/060 VERTICAL AIR-COOLED UNIT



Johnson Controls maintains a continuous product improvement policy, therefore specifications are subject to change without notice.

# DSV DIMENSIONAL DATA

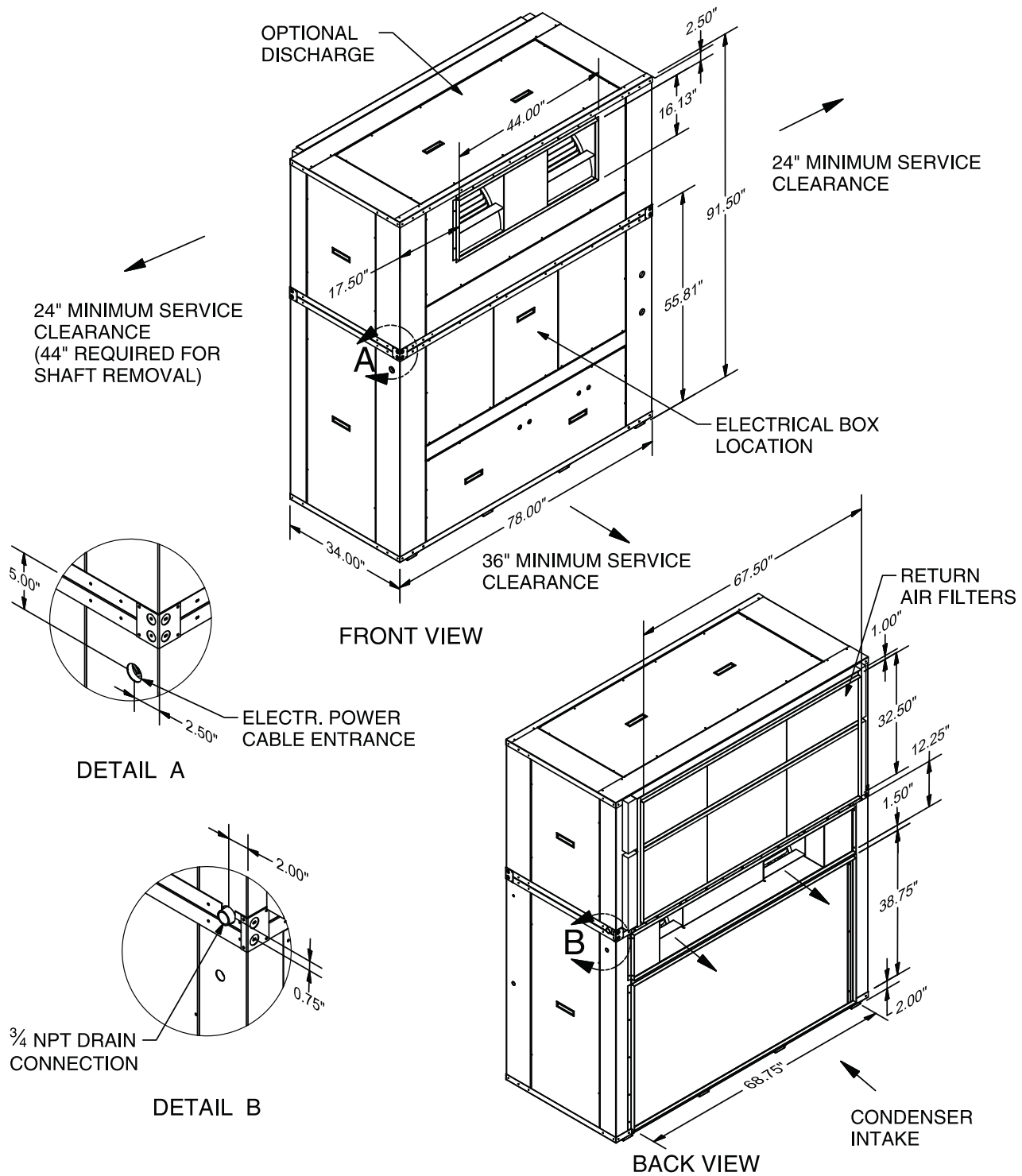
## DSV096/120 VERTICAL AIR-COOLED UNIT



Johnson Controls maintains a continuous product improvement policy, therefore specifications are subject to change without notice.

# DSV DIMENSIONAL DATA

## DSV144/180 VERTICAL AIR-COOLED UNIT

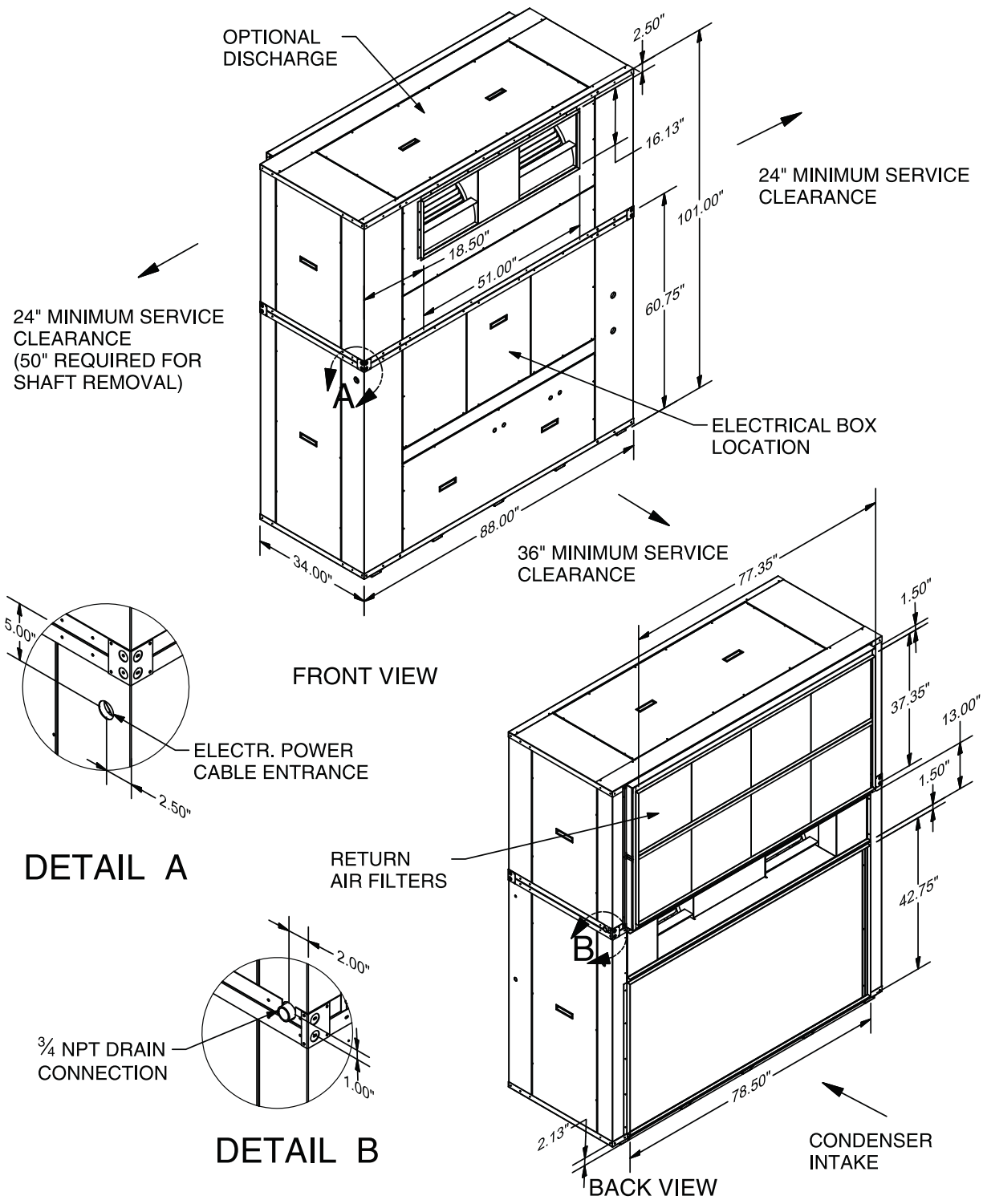


Johnson Controls maintains a continuous product improvement policy, therefore specifications are subject to change without notice.



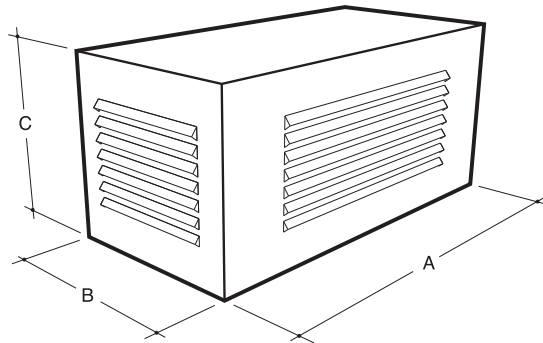
# DSV DIMENSIONAL DATA

## DSV240 VERTICAL AIR-COOLED UNIT



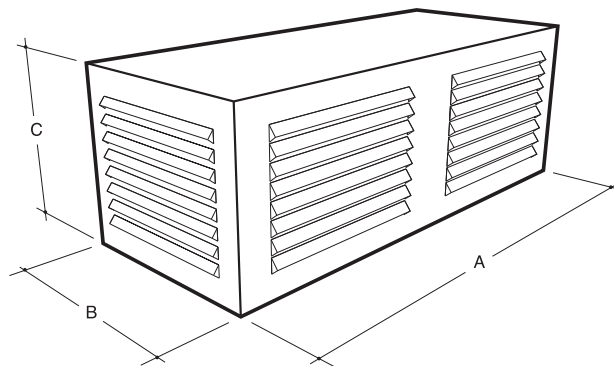
Johnson Controls maintains a continuous product improvement policy, therefore specifications are subject to change without notice.

# DSV DISCHARGE PLENUM



PLENUM DIMENSIONS (INCHES)

UNIT SIZE	DIMENSIONS			Side Grill	Front Grill
	A	B	C		
<b>3 Ton</b>	40	29	24	16x12 (2x)	32x12
<b>4/5 Ton</b>	42	29	24	16x12 (2x)	32x12
<b>8 Ton</b>	64	32.5	24	20x16 (2x)	48x16
<b>10 Ton</b>	64	32.5	24	20x16 (2x)	48x16



PLENUM DIMENSIONS (INCHES)

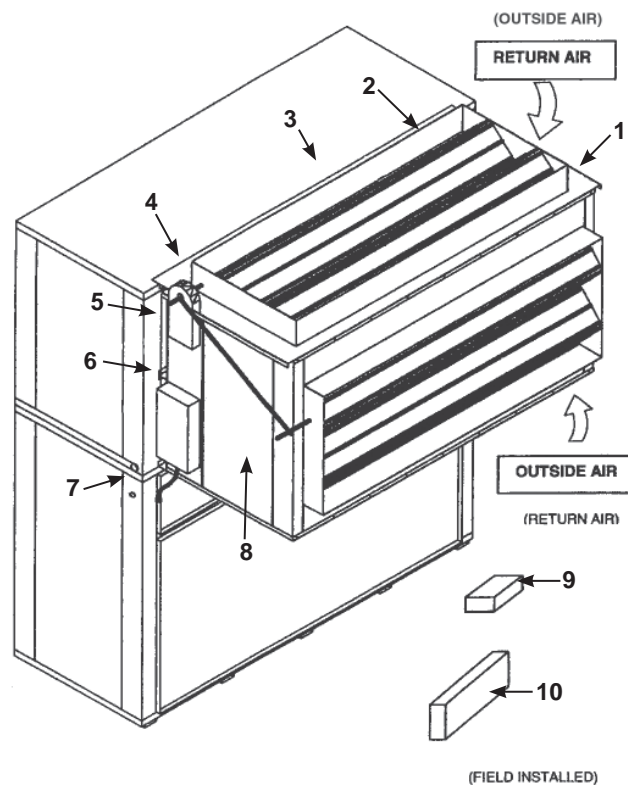
UNIT SIZE	DIMENSIONS			Side Grill	Front Grill
	A	B	C		
<b>12 Ton</b>	78	34	28	24x20 (2x)	28x20 (2x)
<b>15 Ton</b>	78	34	28	24x20 (2x)	28x20 (2x)
<b>20 Ton</b>	88	34	28	24x20 (2x)	32x20 (2x)

## DSV AIRSIDE ECONOMIZER

Airside economizers are designed to meet current building and legislated codes for indoor ventilation. In addition to improving indoor air quality, economizers provide substantial energy savings by utilizing cool outside air instead of mechanical cooling whenever outside conditions permit.

The outlet or discharge of the airside economizer is fitted to the return air inlet of the packaged air conditioning unit. The two inlets to the economizer are fitted to the return air and outside air ductwork. Opposed blade dampers located in each inlet modulate the incoming air streams as they enter the mixing box. The outside air damper can be maintained at a predetermined position. In this way the buildings ventilation requirements can be met at all times.

### VERTICAL DSV ECONOMIZER



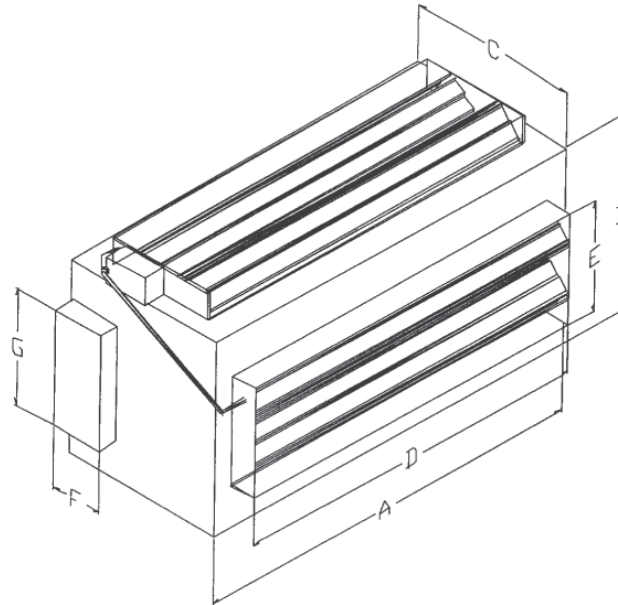
ALL ECONOMIZERS ARE SHIPPED COMPLETE WITH:

- 1- 18-gauge galvanized cabinet, fully insulated.
- 2- Opposed blade, low leakage damper sections.
- 3- Steel securing strip for unit support\*.
- 4- Johnson Controls M9200 Series return damper actuator.
- 5- Filters and access.
- 6- Honeywell W7215 logic module with protective cabinet.
- 7- One step jack/plug wiring assembly.
- 8- Access doors on both sides of cabinet.
- 9- Enthalpy sensor.
- 10- Discharge sensor.
- 11- Return air / outside configuration is field convertible

NOTE: Additional field support required.

# DSV AIRSIDE ECONOMIZER

## VERTICAL DSV ECONOMIZER

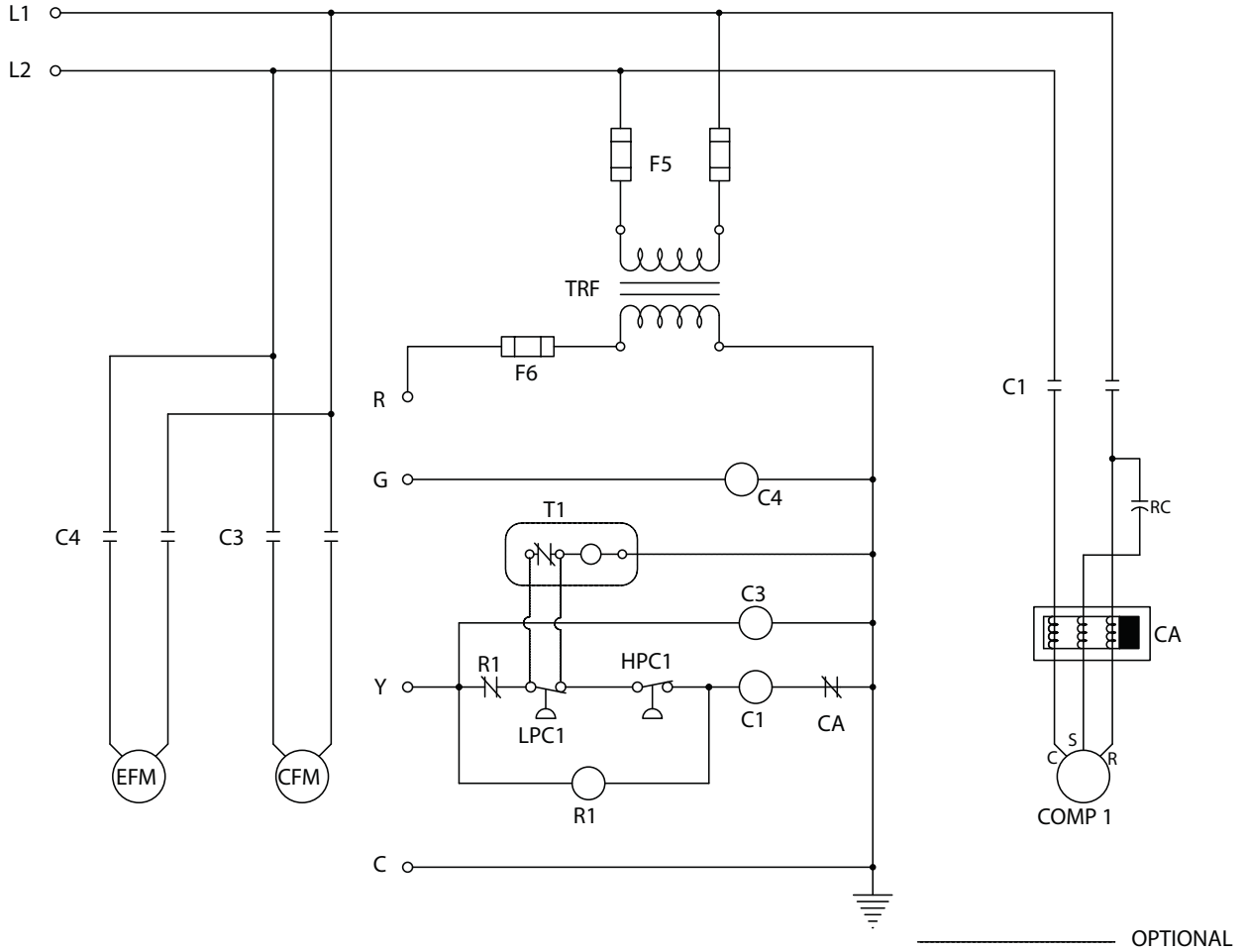


Vertical Unit Model Number	Economizer Model Number	MIXING BOX DIM'N			DAMPER DIM'N	
		A	B	C	D	E
DSV036	VASE-036H	36.00	24.00	24.00	31.00	14.00
DSV048-060	VASE-060H	38.00	24.00	24.00	31.00	14.00
DSV096/120	VASE-120H	55.25	29.75	26.50	44.00	19.50
DSV144/180	VASE-180H	69.25	35.00	26.50	64.00	19.50
DSV240	VASE-240H	79.25	39.00	32.00	69.00	25.00

CONTROL MODULE	
F	G
8.00	15.00
8.00	15.00
8.00	15.00
8.00	15.00
8.00	15.00

# WIRING DIAGRAM

## 2-5 TON SINGLE PHASE AC WIRING SCHEMATIC



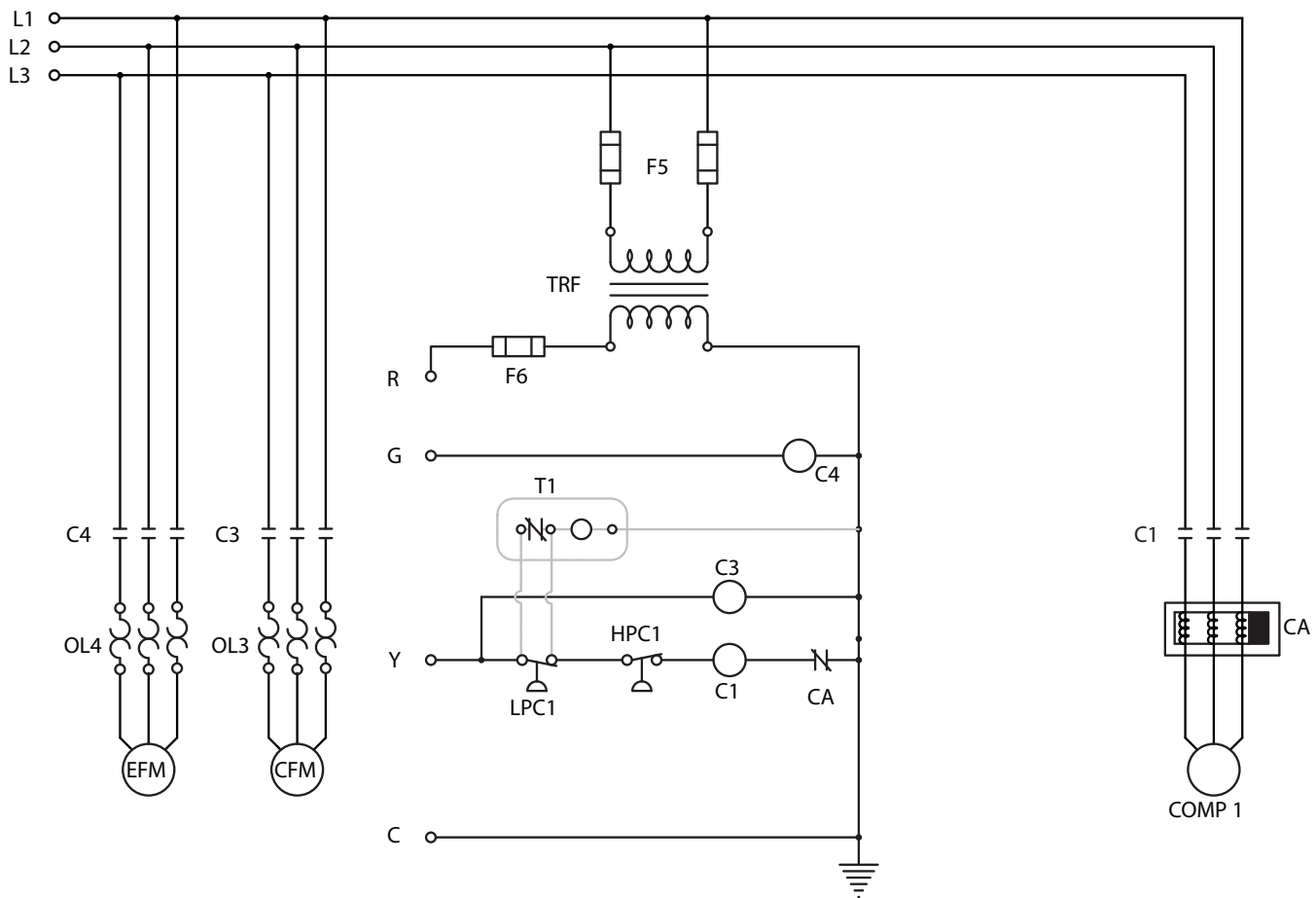
- TB1 - LINE VOLTAGE TERMINAL BLOCK
- TB2 - LOW VOLTAGE TERMINAL BLOCK
- TB3 - EVAP. LINE VOLTAGE TERMINAL BLOCK
- TB4E - EVAP. LOW VOLTAGE TERMINAL BLOCK
- TB4C - COND. LOW VOLTAGE TERMINAL BLOCK
- CFM - CONDENSER FAN MOTOR
- EFM - EVAPORATOR FAN MOTOR
- COMP 1 - COMPRESSOR ONE
- CA - COMFORT ALERT DIAGNOSTICS MODULE
- C1 - COMPRESSOR ONE CONTACTOR
- F5 - TRANSFORMER PRIMARY FUSE
- F6 - TRANSFORMER SECONDARY FUSE

- C3 - COND. FAN MOTOR CONTACTOR
- C4 - EVAP. FAN MOTOR CONTACTOR
- HPC1 - HIGH PRESSURE SWITCH (COMP 1)
- LPC1 - LOW PRESSURE SWITCH (COMP 1)
- TRF - TRANSFORMER
- GRD - GROUND
- T1 - BYPASS TIMER (LOW AMBIENT ONLY)
- R1 - LOCK OUT RELAY (COMPRESSOR ONE)
- RC - COMPRESSOR RUN CAPACITOR

OPTIONAL

# WIRING DIAGRAM

## 2-5 TONS 3 PHASE AC WIRING SCHEMATIC

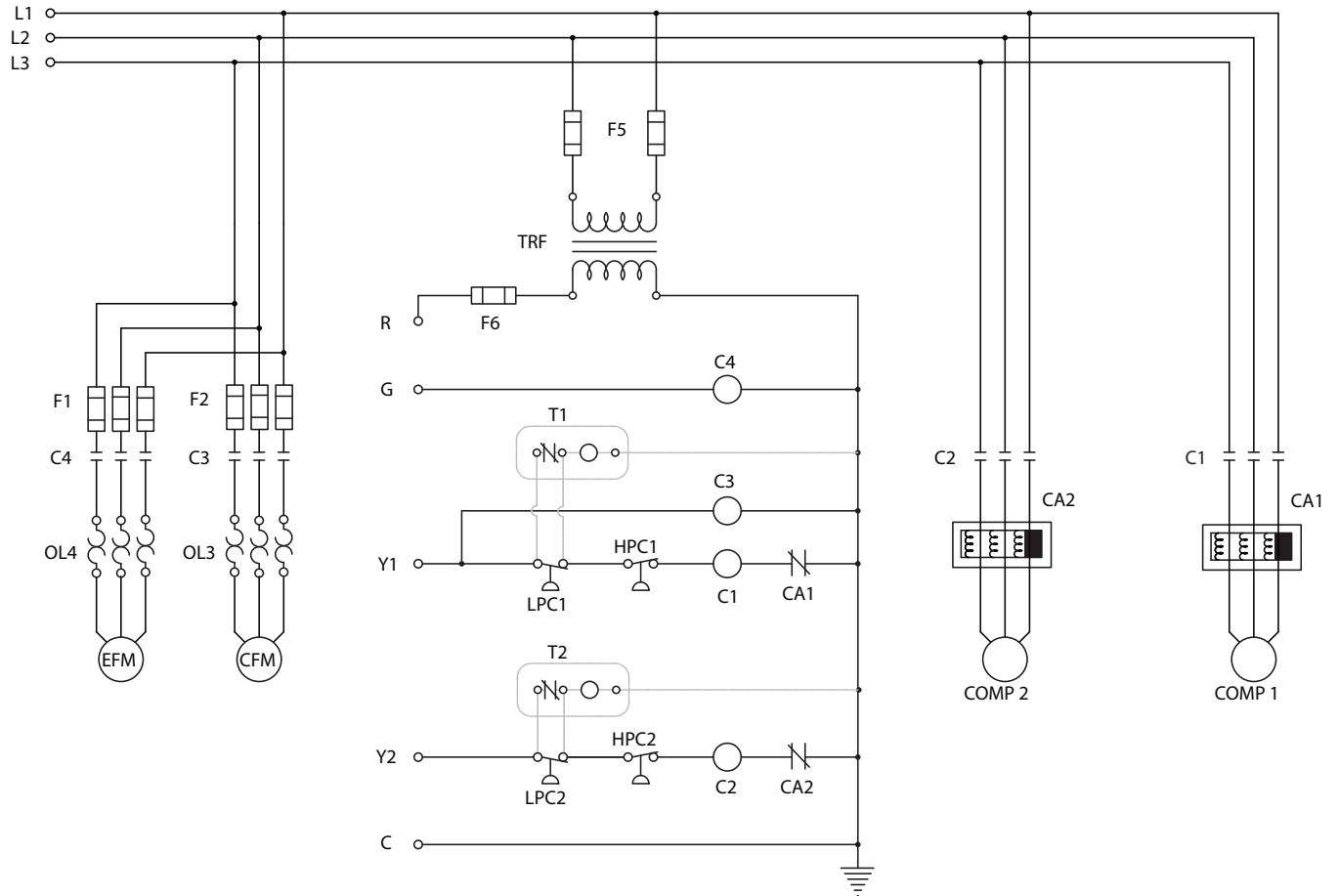


OPTIONAL

- |  |   |
|--|---|
| <p>TB1 - LINE VOLTAGE TERMINAL BLOCK</p> <p>TB2 - LOW VOLTAGE TERMINAL BLOCK</p> <p>CFM - CONDENSER FAN MOTOR</p> <p>EFM - EVAPORATOR FAN MOTOR</p> <p>COMP 1 - COMPRESSOR ONE</p> <p>F5 - TRANSFORMER PRIMARY FUSE</p> <p>F6 - TRANSFORMER SECONDARY FUSE</p> <p>C1 - COMPRESSOR ONE CONTACTOR</p> <p>CA - COMFORT ALERT DIAGNOSTICS MODULE</p> | <p>C3 - COND. FAN MOTOR CONTACTOR</p> <p>C4 - EVAP. FAN MOTOR CONTACTOR</p> <p>OL3 - COND. FAN MOTOR OVERLOAD</p> <p>OL4 - EVAP. FAN MOTOR OVERLOAD</p> <p>HPC1 - HIGH PRESSURE SWITCH (COMP 1)</p> <p>LPC1 - LOW PRESSURE SWITCH (COMP 1)</p> <p>TRF - TRANSFORMER</p> <p>GRD - GROUND</p> <p>T1 - BYPASS TIMER 1 (WITH LOW AMBIENT DAMPER ONLY)</p> |
|--|---|

# WIRING DIAGRAM

## 8-20 TONS 3 PHASE AC WIRING SCHEMATIC



OPTIONAL

- |        |                                      |      |   |
|--------|--------------------------------------|------|---|
| TB1    | - LINE VOLTAGE TERMINAL BLOCK        | C1   | - COMPRESSOR ONE CONTACTOR                      |
| TB2    | - LOW VOLTAGE TERMINAL BLOCK         | C2   | - COMPRESSOR TWO CONTACTOR                      |
| CFM    | - CONDENSER FAN MOTOR                | C3   | - COND. FAN MOTOR CONTACTOR                     |
| EFM    | - EVAPORATOR FAN MOTOR               | C4   | - EVAP. FAN MOTOR CONTACTOR                     |
| COMP 1 | - COMPRESSOR ONE                     | OL3  | - COND. FAN MOTOR OVERLOAD                      |
| COMP 2 | - COMPRESSOR TWO                     | OL4  | - EVAP. FAN MOTOR OVERLOAD                      |
| F1     | - EVAP. FAN MOTOR FUSE               | HPC1 | - HIGH PRESSURE SWITCH (COMP 1)                 |
| F2     | - COND. FAN MOTOR FUSE               | LPC1 | - LOW PRESSURE SWITCH (COMP 1)                  |
| F5     | - TRANSFORMER PRIMARY FUSE           | HPC2 | - HIGH PRESSURE SWITCH (COMP 2)                 |
| F6     | - TRANSFORMER SECONDARY FUSE         | LPC2 | - LOW PRESSURE SWITCH (COMP 2)                  |
| CA1    | - COMFORT ALERT DIAGNOSTICS MODULE 1 | T1   | - BYPASS TIMER 1 (WITH LOW AMBIENT DAMPER ONLY) |
| CA2    | - COMFORT ALERT DIAGNOSTICS MODULE 2 | T2   | - BYPASS TIMER 2 (WITH LOW AMBIENT DAMPER ONLY) |
| TRF    | - TRANSFORMER                        |      |   |
| GRD    | - GROUND                             |      |   |

# SPECIFICATIONS

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## GENERAL

All models 2-10 tons ship as a fully assembled, factory charged, packaged unit.

### Horizontal

All models are designed for suspended mounting via integral structural channels. These units include refrigerant line shut-off valves between the condenser and evaporator section, allowing the unit to be field split and installed as separate modules to suit on-site requirements.

### Vertical

All models are designed for free standing mounting on the floor, or on a field fabricated structural steel stand. The 12-20 ton models are shipped as separate condensing unit and evaporator section modules for field assembly into a single packaged unit. The 3-10 ton models are shipped with vertical evaporator fan discharge as standard. The 12-20 ton models are shipped horizontal discharge as standard.

## CABINET

All cabinets are completely constructed of heavy gauge galvanized corrosion-resistant steel. The entire unit interior (both evaporator and condensing section) is insulated with 1/2" thick, 2-lb density insulation. Service panels are equipped with lifting handles for ease of removal and handling. Duct flanges for condenser discharge, condenser intake, and evaporator discharges are provided with the unit for field installation. Duct flange on evaporator return is incorporated into the filter frame.

## COMPRESSORS

All models utilize high-efficiency "Scroll" type, R-410A, hermetic compressors. Compressors are mounted on rubber isolators to minimize vibration transmission. Internal motor overload protection is provided. External high pressure and low pressure cut-out switches are included in each compressor control circuit. Models 8 tons and larger have two individual scroll compressors.

## REFRIGERANT CIRCUITS

Models 5 tons and smaller have a single refrigeration circuit. Models 8 tons and larger feature two independent refrigeration circuits. Each refrigeration circuit is

thoroughly evacuated, and fully charged with R-410A refrigerant before shipment (12-20 ton models ship with a nitrogen holding charge only). Each refrigeration circuit includes an adjustable thermal expansion valve (with external equalizer), liquid line filter drier, sight glass/moisture indicator, a high refrigerant pressure safety switch, a low refrigerant pressure switch (for compressor protection), and service gauge ports.

## EVAPORATOR AND CONDENSER COILS

The evaporator and condenser coils are constructed of internally enhanced copper tubes mechanically bonded to enhanced-surface aluminum fins. Both coils are employed in a draw-thru configuration. Large evaporator coil face area minimizes potential for water blow-off.

## INDOOR/OUTDOOR FANS

Forward curved, double inlet and double width centrifugal blowers are used for both evaporator and condenser air movement. Blower wheels are fabricated of galvanized steel. Blowers employ solid steel shafts, supported in permanently lubricated ball bearings. All blowers are belt driven. Variable-pitch motor sheaves allow for field adjustment of blower rpm. Motor shall be 1750 RPM, open drip proof design. Three-phase motors are provided with external manual reset overload protection. Single-phase motors feature auto reset internal overloads.

## ELECTRICAL/CONTROLS

All units are completely factory wired with all necessary controls. Current overload protection is provided on both evaporator and condenser motors (Internal auto-reset overloads on single-phase units, external manual-reset overload on three-phase). All models come equipped with an electronic diagnostic compressor protection module. A flashing LED indicator is used to communicate alert codes. Phase protection and anti-short cycle time delay protection is provided on each compressor circuit. Compressor will be locked out for 3 minutes when thermostat opens, or there is a momentary power outage. All units feature an auto-reset soft lock-out, on each compressor control circuit in the event of a high/low cut-out, and a manual reset hard lock-out due to multiple high/low pressure cut-outs. A 24 volt control circuit, with oversize transformer, is provided for field connection.



# SPECIFICATIONS

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## FILTERS

All models are shipped with 2-inch thick medium-efficiency throwaway filters factory installed.

**Vertical** — Filter rack is external to the cabinet (shipped loose).

## FACTORY INSTALLED OPTIONS

### Oversized Evaporator Fan Motors

Increased horsepower motors and drive components are available for those applications where external static pressure requirements exceed the capability of the standard motor.

### Corrosion Resistant Coatings

Condenser and/or evaporator coils shall receive a 1-mil thickness of a cathodic epoxy type electro-deposition coating, applied in a multiple dip and bake process.

### Stainless Steel Drain Pan

Evaporator drain pan shall be fabricated of 304 stainless steel material. The 3/4 in. NPT drain connection fitting is also fabricated of 304 stainless steel.

### Condensate Overflow Switch

Condensate overflow switch shall be mounted in the evaporator drain pan and in the event of an alarm, shut off power to unit compressor(s).

### Hot Gas Bypass

Adjustable hot gas regulator and all necessary piping shall be installed on lead compressor circuit. The modulating regulator diverts hot discharge gas to evaporator inlet (For a DSH split unit installation, an interconnecting hot gas line is required between condensing and evaporator sections). Bypass capacity shall be minimum 50% of compressor capacity. The Bypass valve opens at a preset suction pressure to prevent coil freeze-up at light evaporator load, or low airflow conditions. The use of the field installed Low Ambient Control is strongly recommended when Hot Gas Bypass is installed.

## FIELD INSTALLED ACCESSORIES

### Low Ambient Damper Kit

Head pressure control damper kit will allow unit operation down to 0 F ambient. Damper assembly mounts on condenser air intake. The kit includes damper actuator and low pressure switch bypass timer(s).

### Discharge Plenum (Vertical Only)

Plenums shall mount on top of the evaporator section, with fans arranged for vertical discharge. Double deflection grills shall allow air discharge in multiple directions.

### Oversized Evaporator Fan Motor Kit

Increased horsepower motors and drive components are available for field installation.

## AIRSIDE ECONOMIZER

### General

Consisting of an integrated mixing box and control assembly, the economizer mates easily to all D-Series air handlers. A factory supplied wiring harness and jack plug assembly simplifies field wiring, reducing valuable installation time. No additional controls or transformers are necessary to complete the installation.

### Mixing Box

The mixing box is manufactured from heavy gauge steel and completely insulated with one half inch of insulation. The mixing box is complete with fully modulating opposed blade dampers and linkage.

### Low Leakage

Low leakage dampers meet the criteria of less than 10 cfm per square foot at 4" w.g. (0.5% at 2000 fpm). All damper blades are provided with neoprene seals providing a tight seal and quiet operation.

### Honeywell W7215 Economizer Control Module

The W7215 is a multi-functional controller capable of analyzing dry bulb, enthalpy and air quality inputs. An output from the economizer module will position the mixing box dampers to provide energy saving through the introduction of outside air for free cooling.

# NOTES

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**NOTES**

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