

### COMPRESSOR DEFINITION

Designation	VES A9C
Nominal Voltage/Frequency	230 V 40-150 Hz
Engineering Number	513907036

### A - APPLICATION / LIMIT WORKING CONDITIONS

1 Type	Hermetic reciprocating compressor		
2 Refrigerant	R-600a		
3 Nominal voltage and frequency	230 / 40-150	[ V / Hz ]	
4 Application type	Low Back Pressure		
4.1 Evaporating temperature range	-35°C to -10°C	(-31°F to 14°F)	
5 Motor type	BPM		
6 Starting torque	LST - Low Starting Torque		
7 Expansion device	Capillary tube		
8 Compressor cooling		Operating voltage range	
		50 Hz	60 Hz
8.1 LBP (32°C Ambient temperature)	Static	187 to 255 V	187 to 255 V
8.2 LBP (43°C Ambient temperature)	Static	187 to 255 V	187 to 255 V
8.3 HBP (32°C Ambient temperature)	-	-	-
8.4 HBP (43°C Ambient temperature)	-	-	-
9 Maximum condensing pressures/temperature			
9.1 Operating (gauge)	7.7	[kgf/cm <sup>2</sup> ] (109 psig)	/ °C - °F
9.2 Peak (gauge)	9.8	[kgf/cm <sup>2</sup> ] (139 psig)	/ °C - °F
10 Maximum winding temperature	130	[ °C ]	

### B - MECHANICAL DATA

1 Commercial designation	1/5	[hp]
2 Displacement	9.04	[cm <sup>3</sup> ] (0.552 cu.in)
2.1 Bore [mm]	24.000	
2.2 Stroke [mm]	20.000	
3 Lubricant charge	200	[ml] (6.76 fl.oz.)
3.1 Lubricants approved		
3.2 Lubricants type/viscosity	ALQUILB / ISO5	
4 Weight (with oil charge)	6.11	[kg] (13.47 lb.)
5 Nitrogen charge	-	[kgf/cm <sup>2</sup> ]

### C - ELETRICAL DATA

1 Nominal Voltage/Frequency/Number of Phases	230 V 40-150 Hz 3 ~ (Three phase)	
2 Starting device type	Inverter	
2.1 Starting device	VES 2456 XX X X	
3 Start capacitor	-	[µF(VAC minimum)]
4 Run capacitor	-	[µF(VAC minimum)]
5 Motor protection	INVERTER VES 2456X	
6 Start winding resistance	11.50	[Ω at 25°C (77°F)] +/- 8%
7 Run winding resistance	11.50	[Ω at 25°C (77°F)] +/- 8%
8 LRA - Locked rotor amperage (40/150 Hz)	2.10	[A] - Measured according to UL 984
9 FLA - Full load amperage L/MBP (40/150 Hz)	2.10	[A] - Measured according to UL 984
10 FLA - Full Load Amperage HBP (40/150 Hz)	-	[A] - Measured according to UL 984
11 Approval boards certification	CCC - VDE	

### D - PERFORMANCE - CHECK POINT DATA

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V1300RPM		ASHRAE32 Static			(Condensing temperature 35°C (+95°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	137	35	40	24	0.21	0.43	5.79	1.46	1.70	
-30 (-22)	182	46	53	27	0.24	0.57	6.68	1.68	1.96	
-25 (-13)	237	60	70	31	0.28	0.74	7.53	1.90	2.21	
-20 (- 4)	306	77	90	36	0.32	0.96	8.45	2.13	2.48	
-15 (+ 5)	389	98	114	41	0.35	1.23	9.55	2.41	2.80	
-10 (+14)	489	123	143	45	0.38	1.54	10.93	2.75	3.20	

TEST CONDITIONS: @220V1300RPM		ASHRAE32 Static			(Condensing temperature 45°C (+113°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	122	31	36	23	0.21	0.38	5.31	1.34	1.55	
-30 (-22)	169	43	50	28	0.25	0.53	5.98	1.51	1.75	
-25 (-13)	228	57	67	35	0.29	0.72	6.57	1.65	1.92	
-20 (- 4)	299	75	88	41	0.34	0.94	7.18	1.81	2.10	
-15 (+ 5)	385	97	113	48	0.39	1.21	7.92	2.00	2.32	
-10 (+14)	486	122	142	54	0.44	1.53	8.90	2.24	2.61	

TEST CONDITIONS: @220V1300RPM		ASHRAE32 Static			(Condensing temperature 55°C (+131°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	110	28	32	24	0.21	0.35	4.53	1.14	1.33	
-30 (-22)	152	38	45	29	0.25	0.48	5.18	1.30	1.52	
-25 (-13)	205	52	60	36	0.30	0.64	5.69	1.43	1.67	
-20 (- 4)	270	68	79	44	0.37	0.85	6.19	1.56	1.81	
-15 (+ 5)	349	88	102	52	0.44	1.10	6.77	1.71	1.98	
-10 (+14)	443	112	130	59	0.52	1.40	7.54	1.90	2.21	

TEST CONDITIONS: @220V1600RPM		ASHRAE32 Static			(Condensing temperature 35°C (+95°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	161	41	47	28	0.24	0.50	5.87	1.48	1.72	
-30 (-22)	217	55	64	33	0.28	0.68	6.68	1.68	1.96	
-25 (-13)	287	72	84	38	0.32	0.90	7.57	1.91	2.22	
-20 (- 4)	373	94	109	43	0.36	1.17	8.59	2.17	2.52	
-15 (+ 5)	478	120	140	49	0.40	1.50	9.80	2.47	2.87	
-10 (+14)	603	152	177	54	0.44	1.90	11.24	2.83	3.29	

### E - PERFORMANCE - CURVES

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@220V1600RPM		Static								
Evaporating temperature	Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE			
	+/- 5%						+/- 7%			
°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]	
-35 (-31)	160	40	47	29	0.27	0.50	5.47	1.38	1.60	
-30 (-22)	212	53	62	35	0.31	0.67	6.13	1.55	1.80	
-25 (-13)	278	70	81	41	0.35	0.87	6.79	1.71	1.99	
-20 (- 4)	359	90	105	48	0.40	1.13	7.49	1.89	2.20	
-15 (+ 5)	458	115	134	55	0.44	1.44	8.30	2.09	2.43	
-10 (+14)	575	145	169	62	0.49	1.82	9.26	2.33	2.71	

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 55°C (+131°F))					
@220V1600RPM		Static								
Evaporating temperature	Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE			
	+/- 5%						+/- 7%			
°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]	
-35 (-31)	133	34	39	29	0.25	0.42	4.65	1.17	1.36	
-30 (-22)	187	47	55	35	0.29	0.59	5.37	1.35	1.57	
-25 (-13)	254	64	74	42	0.35	0.80	6.00	1.51	1.76	
-20 (- 4)	335	84	98	51	0.41	1.05	6.60	1.66	1.93	
-15 (+ 5)	432	109	127	60	0.48	1.36	7.22	1.82	2.11	
-10 (+14)	548	138	161	69	0.55	1.73	7.90	1.99	2.32	

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 35°C (+95°F))					
@220V2000RPM		Static								
Evaporating temperature	Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE			
	+/- 5%						+/- 7%			
°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]	
-35 (-31)	205	52	60	35	0.30	0.64	5.90	1.49	1.73	
-30 (-22)	282	71	83	42	0.34	0.88	6.76	1.70	1.98	
-25 (-13)	374	94	109	48	0.38	1.17	7.69	1.94	2.25	
-20 (- 4)	482	121	141	55	0.43	1.51	8.73	2.20	2.56	
-15 (+ 5)	609	154	178	62	0.49	1.92	9.90	2.49	2.90	
-10 (+14)	758	191	222	68	0.54	2.39	11.22	2.83	3.29	

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@220V2000RPM		Static								
Evaporating temperature	Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE			
	+/- 5%						+/- 7%			
°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]	
-35 (-31)	193	49	56	35	0.29	0.60	5.50	1.38	1.61	
-30 (-22)	265	67	78	43	0.35	0.83	6.18	1.56	1.81	
-25 (-13)	353	89	103	51	0.41	1.11	6.90	1.74	2.02	
-20 (- 4)	459	116	134	60	0.47	1.44	7.68	1.93	2.25	
-15 (+ 5)	586	148	172	68	0.54	1.84	8.55	2.15	2.50	
-10 (+14)	736	186	216	77	0.61	2.32	9.53	2.40	2.79	

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V2000RPM		ASHRAE32 Static			(Condensing temperature 55°C (+131°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	173	44	51	36	0.29	0.54	4.82	1.22	1.41	
-30 (-22)	238	60	70	44	0.36	0.75	5.45	1.37	1.60	
-25 (-13)	321	81	94	53	0.43	1.01	6.07	1.53	1.78	
-20 (- 4)	423	107	124	63	0.50	1.33	6.71	1.69	1.97	
-15 (+ 5)	548	138	161	74	0.58	1.72	7.40	1.86	2.17	
-10 (+14)	697	176	204	85	0.66	2.20	8.16	2.06	2.39	

TEST CONDITIONS: @220V3000RPM		ASHRAE32 Static			(Condensing temperature 35°C (+95°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	319	80	93	54	0.42	1.00	5.95	1.50	1.74	
-30 (-22)	432	109	127	64	0.49	1.35	6.78	1.71	1.99	
-25 (-13)	569	143	167	75	0.57	1.79	7.62	1.92	2.23	
-20 (- 4)	733	185	215	86	0.66	2.30	8.51	2.14	2.49	
-15 (+ 5)	928	234	272	98	0.75	2.92	9.49	2.39	2.78	
-10 (+14)	1157	292	339	109	0.84	3.65	10.59	2.67	3.10	

TEST CONDITIONS: @220V3000RPM		ASHRAE32 Static			(Condensing temperature 45°C (+113°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	291	73	85	54	0.43	0.91	5.35	1.35	1.57	
-30 (-22)	399	100	117	66	0.51	1.25	6.06	1.53	1.77	
-25 (-13)	530	134	155	78	0.61	1.66	6.76	1.70	1.98	
-20 (- 4)	690	174	202	92	0.71	2.17	7.50	1.89	2.20	
-15 (+ 5)	882	222	258	106	0.81	2.78	8.31	2.09	2.43	
-10 (+14)	1109	280	325	120	0.92	3.50	9.22	2.32	2.70	

TEST CONDITIONS: @220V3000RPM		ASHRAE32 Static			(Condensing temperature 55°C (+131°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	265	67	78	55	0.43	0.83	4.84	1.22	1.42	
-30 (-22)	365	92	107	67	0.52	1.14	5.47	1.38	1.60	
-25 (-13)	491	124	144	81	0.62	1.54	6.08	1.53	1.78	
-20 (- 4)	645	163	189	96	0.74	2.03	6.71	1.69	1.97	
-15 (+ 5)	833	210	244	113	0.86	2.62	7.39	1.86	2.16	
-10 (+14)	1058	267	310	130	0.98	3.34	8.15	2.05	2.39	

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V4500RPM		ASHRAE32 Static			(Condensing temperature 35°C (+95°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	474	119	139	86	0.67	1.48	5.51	1.39	1.62	
-30 (-22)	618	156	181	102	0.74	1.94	6.08	1.53	1.78	
-25 (-13)	793	200	232	117	0.85	2.49	6.79	1.71	1.99	
-20 (- 4)	1007	254	295	132	0.99	3.16	7.61	1.92	2.23	
-15 (+ 5)	1268	320	372	149	1.14	3.99	8.50	2.14	2.49	
-10 (+14)	1586	400	465	168	1.28	5.00	9.43	2.38	2.76	

TEST CONDITIONS: @220V4500RPM		ASHRAE32 Static			(Condensing temperature 45°C (+113°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	444	112	130	90	0.69	1.39	4.94	1.25	1.45	
-30 (-22)	582	147	170	106	0.79	1.82	5.48	1.38	1.61	
-25 (-13)	750	189	220	122	0.93	2.35	6.15	1.55	1.80	
-20 (- 4)	957	241	280	139	1.07	3.01	6.91	1.74	2.02	
-15 (+ 5)	1212	305	355	157	1.21	3.82	7.72	1.94	2.26	
-10 (+14)	1525	384	447	178	1.33	4.81	8.54	2.15	2.50	

TEST CONDITIONS: @220V4500RPM		ASHRAE32 Static			(Condensing temperature 55°C (+131°F))					
Evaporating temperature	Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%			
	°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35 (-31)	385	97	113	87	0.67	1.21	4.44	1.12	1.30	
-30 (-22)	525	132	154	104	0.80	1.65	5.03	1.27	1.47	
-25 (-13)	695	175	204	121	0.95	2.18	5.72	1.44	1.67	
-20 (- 4)	905	228	265	140	1.10	2.84	6.48	1.63	1.90	
-15 (+ 5)	1164	293	341	160	1.22	3.66	7.27	1.83	2.13	
-10 (+14)	1480	373	434	183	1.32	4.67	8.07	2.03	2.36	

### F - EXTERNAL CHARACTERISTICS

1 Base plate	European Standard VES		
2 Tray holder	Yes		
3 Connectors			
3.1 SUCTION	6.1 +0.10/+0.00	[mm]	(0.240" +0.004"/+0.000")
3.1.1 Material	Copper		
3.1.2 Shape	Slanted 45° up + 15° to Back		
3.2 DISCHARGE	4.9 +0.10/-0.05	[mm]	(0.193" +0.004"/-0.002")
3.2.1 Material	Copper		
3.2.2 Shape	Slanted 0° up + 24° to Back		
3.3 PROCESS	6 +0.08/-0.08	[mm]	(0.236" +0.003"/-0.003")
3.3.1 Material	Copper(OD)		
3.3.2 Shape	Slanted 47° up + 59° to Back		
3.4 Oil cooler (Copper)	No	[mm]	
3.5 Connector sealing	Rubber Plugs		