

### COMPRESSOR DEFINITION

Designation	VES A9C
Nominal Voltage/Frequency	230 V 40-150 Hz
Engineering Number	513907160

### 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)	-	-	-
8.3 HBP (32°C Ambient temperature)	-	-	-
8.4 HBP (43°C Ambient temperature)	-	-	-
9 Maximum condensing temperature			
9.1 Operating	6.9	[kgf/cm <sup>2</sup> ] (98 psig)	/ °C - °F
9.2 Peak	7.8	[kgf/cm <sup>2</sup> ] (111 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)	6.8	[kg] (14.99 lb.)
5 Nitrogen charge	0.2 to 0.3	[kgf/cm <sup>2</sup> ] (2.84 to 4.27 psig)

### 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)	2.10/2.10	[A] - Measured according to UL 984
9 FLA - Full load amperage L/MBP (40/150 Hz)	2.10/2.10	[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		

### D - PERFORMANCE - CHECK POINT DATA

TEST CONDITIONS: <b>@220V1300RPM</b>			<b>ASHRAELBP32</b> <b>Static</b>		Evaporating temperature (Condensing temperature)		<b>-23.3°C (-9.94°F)</b> <b>54.4°C (129.92°F)</b>	
Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
227	57	67	39	0.32	0.71	5.90	1.49	1.73

TEST CONDITIONS: <b>@220V1600RPM</b>			<b>ASHRAELBP32</b> <b>Static</b>		Evaporating temperature (Condensing temperature)		<b>-23.3°C (-9.94°F)</b> <b>54.4°C (129.92°F)</b>	
Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
282	71	83	45	0.37	0.89	6.25	1.58	1.83

TEST CONDITIONS: <b>@220V2000RPM</b>			<b>ASHRAELBP32</b> <b>Static</b>		Evaporating temperature (Condensing temperature)		<b>-23.3°C (-9.94°F)</b> <b>54.4°C (129.92°F)</b>	
Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
356	90	104	56	0.45	1.12	6.35	1.60	1.86

TEST CONDITIONS: <b>@220V3000RPM</b>			<b>ASHRAELBP32</b> <b>Static</b>		Evaporating temperature (Condensing temperature)		<b>-23.3°C (-9.94°F)</b> <b>54.4°C (129.92°F)</b>	
Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
542	137	159	86	0.66	1.70	6.33	1.60	1.85

TEST CONDITIONS: <b>@220V4500RPM</b>			<b>ASHRAELBP32</b> <b>Static</b>		Evaporating temperature (Condensing temperature)		<b>-23.3°C (-9.94°F)</b> <b>54.4°C (129.92°F)</b>	
Cooling capacity +/- 5%			Power consumption +/- 5%	Current consumption +/- 5%	Gas flow rate +/- 5%	EFFICIENCY RATE +/- 7%		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
762	192	223	131	1.00	2.39	5.84	1.47	1.71

### 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]
-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]
-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]
-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]
-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: @220V1600RPM		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)	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: @220V1600RPM		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)	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: @220V2000RPM		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)	205	52	60	35	0.30	0.64	5.89	1.48	1.72
-30	(-22)	282	71	83	41	0.34	0.88	6.77	1.71	1.98
-25	(-13)	374	94	109	48	0.38	1.17	7.71	1.94	2.26
-20	(- 4)	482	121	141	55	0.43	1.51	8.74	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: @220V2000RPM		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)	193	49	56	36	0.29	0.60	5.37	1.35	1.57
-30	(-22)	265	67	78	43	0.35	0.83	6.11	1.54	1.79
-25	(-13)	353	89	103	51	0.41	1.11	6.86	1.73	2.01
-20	(- 4)	459	116	134	60	0.47	1.44	7.65	1.93	2.24
-15	(+ 5)	586	148	172	68	0.54	1.84	8.54	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	4.81	1.21	1.41	
-30 (-22)	238	60	70	44	0.36	0.75	5.47	1.38	1.60	
-25 (-13)	321	81	94	53	0.43	1.01	6.09	1.54	1.79	
-20 (- 4)	423	107	124	63	0.50	1.33	6.73	1.70	1.97	
-15 (+ 5)	548	138	161	74	0.58	1.72	7.41	1.87	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]
-35	(-31)	474	119	139	87	0.67	1.48	5.47	1.38	1.60
-30	(-22)	618	156	181	100	0.74	1.94	6.16	1.55	1.81
-25	(-13)	793	200	232	115	0.85	2.49	6.87	1.73	2.01
-20	(- 4)	1007	254	295	132	0.99	3.16	7.63	1.92	2.24
-15	(+ 5)	1268	320	372	150	1.14	3.99	8.45	2.13	2.48
-10	(+14)	1586	400	465	170	1.28	5.00	9.36	2.36	2.74

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]
-35	(-31)	444	112	130	89	0.69	1.39	4.96	1.25	1.45
-30	(-22)	582	147	170	105	0.79	1.82	5.55	1.40	1.63
-25	(-13)	750	189	220	122	0.93	2.35	6.18	1.56	1.81
-20	(- 4)	957	241	280	140	1.07	3.01	6.86	1.73	2.01
-15	(+ 5)	1212	305	355	160	1.21	3.82	7.61	1.92	2.23
-10	(+14)	1525	384	447	180	1.33	4.81	8.46	2.13	2.48

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]
-35	(-31)	385	97	113	86	0.67	1.21	4.47	1.13	1.31
-30	(-22)	525	132	154	104	0.80	1.65	5.01	1.26	1.47
-25	(-13)	695	175	204	124	0.95	2.18	5.60	1.41	1.64
-20	(- 4)	905	228	265	145	1.10	2.84	6.25	1.58	1.83
-15	(+ 5)	1164	293	341	167	1.22	3.66	6.98	1.76	2.05
-10	(+14)	1480	373	434	189	1.32	4.67	7.81	1.97	2.29

### F - EXTERNAL CHARACTERISTICS

1 Base plate	European Standard VES		
2 Tray holder	No		
3 Connectors			
3.1 SUCTION	6.2 +0.05/+0.05	[mm]	(0.244" +0.002"/+0.002")
3.1.1 Material	Copper		
3.1.2 Shape	Slanted 45° up + 49° to Back		
3.2 DISCHARGE	4.2 +0.10/-0.05	[mm]	(0.165" +0.004"/-0.002")
3.2.1 Material	Copper		
3.2.2 Shape	Slanted 47° up + 24° to Back		
3.3 PROCESS	6.2 +0.05/+0.05	[mm]	(0.244" +0.002"/+0.002")
3.3.1 Material	Copper		
3.3.2 Shape	Slanted 47° up + 59° to Back		
3.4 Oil cooler (Copper)	No	[mm]	
3.5 Connector sealing	Rubber Plugs		