

### COMPRESSOR DEFINITION

Designation	VES A11C
Nominal Voltage/Frequency	230 V 40-150 Hz
Engineering Number	513907309

### 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 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	11.14	[cm <sup>3</sup> ] (0.680 cu.in)
2.1 Bore [mm]	26.000	
2.2 Stroke [mm]	21.000	
3 Lubricant charge	190	[ml] (6.42 fl.oz.)
3.1 Lubricants approved		
3.2 Lubricants type/viscosity	ALQUILB / ISO5	
4 Weight (with oil charge)	4.9	[kg] (10.80 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	VCC3 1156 XXXXX/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	13.40	[Ω at 25°C (77°F)] +/- 8%
7 Run winding resistance	13.40	[Ω at 25°C (77°F)] +/- 8%
8 LRA - Locked rotor amperage (46/133 Hz)	2.10/2.10	[A] - Measured according to UL 984
9 FLA - Full load amperage L/MBP (46/133 Hz)	2.10/2.10	[A] - Measured according to UL 984
10 FLA - Full Load Amperage HBP (46/133 Hz)	-	[A] - Measured according to UL 984
11 Approval boards certification	CCC - VDE	

### 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]
294	74	86	46	0.34	0.92	6.45	1.63	1.89

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]
366	92	107	56	0.41	1.15	6.51	1.64	1.91

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]
467	118	137	71	0.51	1.47	6.57	1.66	1.93

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]
707	178	207	110	0.78	2.22	6.41	1.62	1.88

TEST CONDITIONS: <b>@220V3900RPM</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]
763	192	224	130	1.00	2.40	5.87	1.48	1.72

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]
942	237	276	157	1.13	2.96	6.00	1.51	1.76

### 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)	177	45	52	28	0.22	0.56	6.29	1.59	1.84
-30	(-22)	237	60	69	33	0.26	0.74	7.14	1.80	2.09
-25	(-13)	309	78	90	38	0.29	0.97	8.06	2.03	2.36
-20	(- 4)	396	100	116	44	0.33	1.24	9.10	2.29	2.67
-15	(+ 5)	499	126	146	49	0.36	1.57	10.31	2.60	3.02
-10	(+14)	621	156	182	53	0.39	1.96	11.75	2.96	3.44

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)	163	41	48	29	0.23	0.51	5.58	1.41	1.64
-30	(-22)	220	56	65	35	0.27	0.69	6.33	1.60	1.85
-25	(-13)	291	73	85	41	0.32	0.91	7.09	1.79	2.08
-20	(- 4)	377	95	110	48	0.36	1.18	7.90	1.99	2.32
-15	(+ 5)	479	121	140	54	0.40	1.51	8.83	2.23	2.59
-10	(+14)	600	151	176	60	0.44	1.89	9.92	2.50	2.91

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)	145	36	42	30	0.23	0.45	4.80	1.21	1.41
-30	(-22)	199	50	58	36	0.27	0.62	5.50	1.39	1.61
-25	(-13)	266	67	78	43	0.32	0.84	6.16	1.55	1.80
-20	(- 4)	349	88	102	51	0.37	1.10	6.81	1.72	2.00
-15	(+ 5)	449	113	131	60	0.43	1.41	7.52	1.90	2.20
-10	(+14)	567	143	166	68	0.48	1.79	8.33	2.10	2.44

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)	215	54	63	35	0.27	0.67	6.24	1.57	1.83
-30	(-22)	289	73	85	41	0.31	0.91	7.08	1.78	2.07
-25	(-13)	381	96	112	47	0.36	1.20	8.01	2.02	2.35
-20	(- 4)	491	124	144	54	0.40	1.54	9.06	2.28	2.65
-15	(+ 5)	622	157	182	61	0.44	1.96	10.27	2.59	3.01
-10	(+14)	776	196	227	67	0.48	2.45	11.70	2.95	3.43

### 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)	204	51	60	36	0.29	0.64	5.62	1.42	1.65
-30	(-22)	273	69	80	43	0.33	0.86	6.32	1.59	1.85
-25	(-13)	359	91	105	51	0.38	1.13	7.05	1.78	2.07
-20	(- 4)	465	117	136	59	0.43	1.46	7.86	1.98	2.30
-15	(+ 5)	593	149	174	67	0.48	1.87	8.79	2.21	2.57
-10	(+14)	743	187	218	75	0.53	2.34	9.87	2.49	2.89

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)	185	47	54	37	0.29	0.58	4.95	1.25	1.45
-30	(-22)	249	63	73	45	0.34	0.78	5.61	1.41	1.64
-25	(-13)	332	84	97	53	0.39	1.04	6.24	1.57	1.83
-20	(- 4)	435	110	127	63	0.46	1.37	6.91	1.74	2.02
-15	(+ 5)	560	141	164	73	0.52	1.76	7.64	1.93	2.24
-10	(+14)	710	179	208	84	0.59	2.24	8.48	2.14	2.48

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)	272	69	80	45	0.33	0.85	6.11	1.54	1.79
-30	(-22)	363	91	106	52	0.38	1.14	6.95	1.75	2.04
-25	(-13)	476	120	140	60	0.44	1.49	7.87	1.98	2.31
-20	(- 4)	614	155	180	69	0.50	1.93	8.89	2.24	2.60
-15	(+ 5)	778	196	228	78	0.55	2.45	10.05	2.53	2.94
-10	(+14)	968	244	284	85	0.60	3.05	11.38	2.87	3.34

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)	254	64	74	46	0.34	0.80	5.53	1.39	1.62
-30	(-22)	341	86	100	55	0.40	1.07	6.27	1.58	1.84
-25	(-13)	452	114	132	64	0.47	1.42	7.03	1.77	2.06
-20	(- 4)	587	148	172	75	0.54	1.84	7.85	1.98	2.30
-15	(+ 5)	747	188	219	85	0.61	2.35	8.77	2.21	2.57
-10	(+14)	935	236	274	95	0.67	2.95	9.83	2.48	2.88

### 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)	229	58	67	47	0.35	0.72	4.90	1.23	1.43	
-30 (-22)	314	79	92	56	0.41	0.99	5.60	1.41	1.64	
-25 (-13)	423	107	124	67	0.49	1.33	6.29	1.59	1.84	
-20 (- 4)	557	140	163	80	0.57	1.75	7.00	1.76	2.05	
-15 (+ 5)	716	180	210	92	0.65	2.25	7.76	1.95	2.27	
-10 (+14)	903	227	265	105	0.73	2.85	8.61	2.17	2.52	

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)	414	104	121	70	0.52	1.30	5.94	1.50	1.74	
-30 (-22)	551	139	161	82	0.59	1.73	6.75	1.70	1.98	
-25 (-13)	720	181	211	95	0.68	2.26	7.58	1.91	2.22	
-20 (- 4)	925	233	271	109	0.78	2.91	8.45	2.13	2.48	
-15 (+ 5)	1168	294	342	125	0.87	3.67	9.36	2.36	2.74	
-10 (+14)	1451	366	425	140	0.97	4.58	10.33	2.60	3.03	

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)	379	96	111	71	0.52	1.19	5.33	1.34	1.56	
-30 (-22)	515	130	151	85	0.61	1.61	6.05	1.53	1.77	
-25 (-13)	682	172	200	100	0.71	2.14	6.79	1.71	1.99	
-20 (- 4)	883	223	259	117	0.82	2.78	7.55	1.90	2.21	
-15 (+ 5)	1121	282	328	134	0.94	3.53	8.34	2.10	2.44	
-10 (+14)	1397	352	409	152	1.05	4.41	9.19	2.31	2.69	

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)	340	86	100	70	0.52	1.06	4.83	1.22	1.42	
-30 (-22)	475	120	139	87	0.62	1.49	5.49	1.38	1.61	
-25 (-13)	641	161	188	104	0.74	2.01	6.15	1.55	1.80	
-20 (- 4)	838	211	246	123	0.86	2.63	6.82	1.72	2.00	
-15 (+ 5)	1071	270	314	143	0.99	3.37	7.52	1.89	2.20	
-10 (+14)	1340	338	393	163	1.12	4.23	8.25	2.08	2.42	

### 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)	567	143	166	105	0.74	1.78	5.39	1.36	1.58	
-30 (-22)	743	187	218	121	0.81	2.33	6.08	1.53	1.78	
-25 (-13)	938	236	275	137	0.91	2.94	6.81	1.72	1.99	
-20 (- 4)	1182	298	346	156	1.02	3.71	7.60	1.92	2.23	
-15 (+ 5)	1507	380	442	177	1.11	4.74	8.52	2.15	2.50	
-10 (+14)	1945	490	570	202	1.18	6.13	9.59	2.42	2.81	

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)	537	135	157	108	0.77	1.68	4.98	1.25	1.46	
-30 (-22)	707	178	207	126	0.85	2.22	5.60	1.41	1.64	
-25 (-13)	899	227	263	144	0.96	2.82	6.24	1.57	1.83	
-20 (- 4)	1144	288	335	165	1.07	3.59	6.94	1.75	2.03	
-15 (+ 5)	1473	371	432	190	1.17	4.64	7.75	1.95	2.27	
-10 (+14)	1917	483	562	219	1.23	6.05	8.71	2.19	2.55	

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)	514	130	151	111	0.78	1.61	4.60	1.16	1.35	
-30 (-22)	677	171	199	130	0.88	2.12	5.16	1.30	1.51	
-25 (-13)	865	218	254	151	1.00	2.72	5.73	1.44	1.68	
-20 (- 4)	1109	280	325	176	1.11	3.49	6.35	1.60	1.86	
-15 (+ 5)	1440	363	422	204	1.21	4.53	7.07	1.78	2.07	
-10 (+14)	1889	476	554	238	1.26	5.96	7.92	2.00	2.32	

### F - EXTERNAL CHARACTERISTICS

1 Base plate	Universal VES		
2 Tray holder	No		
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 5° out + 63° up		
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 10° 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		