

### COMPRESSOR DEFINITION

Designation	VES A5C
Nominal Voltage/Frequency	230 V 40-150 Hz
Engineering Number	513907018

### 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-Medium Back Pressure		
4.1 Evaporating temperature range	-35°C to -5°C	(-31°F to 23°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	5.19	[cm <sup>3</sup> ] (0.317 cu.in)
2.1 Bore [mm]	21.000	
2.2 Stroke [mm]	15.000	
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)	5.99	[kg] (13.21 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)	56	14	16	13	0.12	0.17	4.53	1.14	1.33	
-30 (-22)	92	23	27	15	0.14	0.29	6.12	1.54	1.79	
-25 (-13)	127	32	37	17	0.17	0.40	7.35	1.85	2.15	
-20 (- 4)	164	41	48	19	0.18	0.52	8.45	2.13	2.48	
-15 (+ 5)	209	53	61	22	0.20	0.66	9.68	2.44	2.84	
-10 (+14)	267	67	78	24	0.21	0.84	11.28	2.84	3.30	
-5 (+23)	343	86	101	25	0.22	1.08	13.50	3.40	3.96	

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)	52	13	15	12	0.12	0.16	4.07	1.03	1.19	
-30 (-22)	85	21	25	15	0.15	0.27	5.45	1.37	1.60	
-25 (-13)	116	29	34	18	0.17	0.37	6.41	1.62	1.88	
-20 (- 4)	151	38	44	21	0.19	0.48	7.20	1.82	2.11	
-15 (+ 5)	194	49	57	24	0.21	0.61	8.08	2.04	2.37	
-10 (+14)	250	63	73	27	0.23	0.79	9.28	2.34	2.72	
-5 (+23)	325	82	95	29	0.25	1.03	11.06	2.79	3.24	

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)	38	9	11	12	0.12	0.12	3.23	0.81	0.95	
-30 (-22)	69	17	20	15	0.14	0.22	4.59	1.16	1.34	
-25 (-13)	100	25	29	18	0.17	0.31	5.48	1.38	1.61	
-20 (- 4)	134	34	39	22	0.20	0.42	6.16	1.55	1.80	
-15 (+ 5)	177	44	52	26	0.24	0.56	6.88	1.73	2.02	
-10 (+14)	233	59	68	29	0.28	0.74	7.88	1.99	2.31	
-5 (+23)	308	78	90	33	0.33	0.97	9.41	2.37	2.76	

### E - PERFORMANCE - CURVES

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)	78	20	23	16	0.15	0.24	5.01	1.26	1.47	
-30 (-22)	114	29	33	18	0.17	0.36	6.22	1.57	1.82	
-25 (-13)	156	39	46	21	0.19	0.49	7.40	1.87	2.17	
-20 (- 4)	206	52	60	24	0.21	0.65	8.64	2.18	2.53	
-15 (+ 5)	265	67	78	26	0.23	0.83	10.02	2.53	2.94	
-10 (+14)	337	85	99	29	0.25	1.06	11.66	2.94	3.42	
-5 (+23)	423	107	124	31	0.26	1.34	13.64	3.44	4.00	

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)	64	16	19	15	0.14	0.20	4.23	1.07	1.24	
-30 (-22)	100	25	29	18	0.17	0.31	5.39	1.36	1.58	
-25 (-13)	141	35	41	22	0.19	0.44	6.43	1.62	1.88	
-20 (- 4)	189	48	55	25	0.22	0.59	7.43	1.87	2.18	
-15 (+ 5)	247	62	72	29	0.25	0.78	8.50	2.14	2.49	
-10 (+14)	318	80	93	33	0.27	1.00	9.74	2.45	2.85	
-5 (+23)	403	101	118	36	0.30	1.27	11.23	2.83	3.29	

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)	51	13	15	15	0.14	0.16	3.46	0.87	1.01	
-30 (-22)	86	22	25	18	0.17	0.27	4.68	1.18	1.37	
-25 (-13)	126	32	37	22	0.20	0.40	5.68	1.43	1.66	
-20 (- 4)	174	44	51	27	0.23	0.55	6.56	1.65	1.92	
-15 (+ 5)	231	58	68	31	0.27	0.73	7.43	1.87	2.18	
-10 (+14)	301	76	88	36	0.30	0.95	8.37	2.11	2.45	
-5 (+23)	385	97	113	41	0.35	1.22	9.48	2.39	2.78	

### E - PERFORMANCE - CURVES

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)	103	26	30	20	0.18	0.32	5.27	1.33	1.54	
-30 (-22)	145	37	43	23	0.20	0.46	6.32	1.59	1.85	
-25 (-13)	197	50	58	27	0.23	0.62	7.42	1.87	2.17	
-20 (- 4)	260	66	76	30	0.26	0.82	8.62	2.17	2.53	
-15 (+ 5)	335	84	98	33	0.28	1.05	10.01	2.52	2.93	
-10 (+14)	425	107	124	36	0.30	1.34	11.66	2.94	3.42	
-5 (+23)	530	133	155	39	0.32	1.67	13.65	3.44	4.00	

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)	84	21	25	19	0.17	0.26	4.46	1.12	1.31	
-30 (-22)	128	32	37	23	0.20	0.40	5.53	1.39	1.62	
-25 (-13)	180	45	53	27	0.24	0.56	6.54	1.65	1.92	
-20 (- 4)	242	61	71	32	0.27	0.76	7.55	1.90	2.21	
-15 (+ 5)	316	80	93	37	0.31	1.00	8.63	2.17	2.53	
-10 (+14)	404	102	118	41	0.34	1.27	9.86	2.49	2.89	
-5 (+23)	506	127	148	45	0.36	1.60	11.32	2.85	3.32	

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)	66	17	19	19	0.17	0.21	3.51	0.89	1.03	
-30 (-22)	110	28	32	23	0.20	0.34	4.72	1.19	1.38	
-25 (-13)	161	41	47	28	0.24	0.51	5.74	1.45	1.68	
-20 (- 4)	222	56	65	34	0.28	0.70	6.66	1.68	1.95	
-15 (+ 5)	293	74	86	39	0.32	0.92	7.55	1.90	2.21	
-10 (+14)	377	95	111	45	0.36	1.19	8.47	2.13	2.48	
-5 (+23)	475	120	139	50	0.40	1.50	9.51	2.40	2.79	

### E - PERFORMANCE - CURVES

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)	156	39	46	30	0.25	0.49	5.22	1.32	1.53	
-30 (-22)	221	56	65	35	0.29	0.69	6.23	1.57	1.83	
-25 (-13)	302	76	89	41	0.34	0.95	7.29	1.84	2.14	
-20 (- 4)	401	101	117	48	0.38	1.26	8.44	2.13	2.47	
-15 (+ 5)	516	130	151	53	0.42	1.62	9.74	2.45	2.85	
-10 (+14)	649	164	190	58	0.46	2.05	11.22	2.83	3.29	
-5 (+23)	800	202	234	62	0.48	2.53	12.93	3.26	3.79	

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)	137	35	40	30	0.26	0.43	4.56	1.15	1.34	
-30 (-22)	198	50	58	36	0.30	0.62	5.51	1.39	1.61	
-25 (-13)	275	69	81	43	0.35	0.86	6.45	1.62	1.89	
-20 (- 4)	371	93	109	50	0.40	1.17	7.43	1.87	2.18	
-15 (+ 5)	485	122	142	57	0.45	1.53	8.50	2.14	2.49	
-10 (+14)	617	156	181	64	0.49	1.95	9.69	2.44	2.84	
-5 (+23)	768	194	225	70	0.53	2.43	11.06	2.79	3.24	

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)	115	29	34	30	0.26	0.36	3.82	0.96	1.12	
-30 (-22)	169	43	50	36	0.30	0.53	4.78	1.20	1.40	
-25 (-13)	242	61	71	43	0.35	0.76	5.67	1.43	1.66	
-20 (- 4)	334	84	98	51	0.41	1.05	6.55	1.65	1.92	
-15 (+ 5)	445	112	130	60	0.47	1.40	7.46	1.88	2.18	
-10 (+14)	576	145	169	68	0.53	1.82	8.44	2.13	2.47	
-5 (+23)	727	183	213	76	0.58	2.30	9.53	2.40	2.79	

### 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)	228	57	67	48	0.38	0.71	4.80	1.21	1.41	
-30 (-22)	319	80	93	56	0.44	1.00	5.68	1.43	1.67	
-25 (-13)	428	108	125	65	0.50	1.34	6.59	1.66	1.93	
-20 (- 4)	562	142	165	74	0.57	1.77	7.57	1.91	2.22	
-15 (+ 5)	727	183	213	83	0.64	2.29	8.70	2.19	2.55	
-10 (+14)	929	234	272	92	0.70	2.93	10.02	2.53	2.94	
-5 (+23)	1176	296	345	102	0.76	3.72	11.60	2.92	3.40	

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)	209	53	61	48	0.40	0.65	4.33	1.09	1.27	
-30 (-22)	298	75	87	58	0.46	0.93	5.20	1.31	1.52	
-25 (-13)	403	102	118	68	0.53	1.26	6.02	1.52	1.76	
-20 (- 4)	531	134	156	78	0.61	1.67	6.85	1.73	2.01	
-15 (+ 5)	687	173	201	89	0.68	2.16	7.76	1.95	2.27	
-10 (+14)	879	222	258	100	0.75	2.77	8.79	2.21	2.58	
-5 (+23)	1113	281	326	111	0.82	3.52	10.01	2.52	2.93	

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)	149	37	44	43	0.35	0.47	3.40	0.86	1.00	
-30 (-22)	245	62	72	55	0.44	0.77	4.41	1.11	1.29	
-25 (-13)	355	89	104	67	0.53	1.11	5.29	1.33	1.55	
-20 (- 4)	485	122	142	80	0.62	1.53	6.13	1.54	1.79	
-15 (+ 5)	643	162	188	93	0.71	2.02	6.96	1.75	2.04	
-10 (+14)	833	210	244	106	0.81	2.63	7.85	1.98	2.30	
-5 (+23)	1063	268	312	120	0.90	3.36	8.87	2.23	2.60	

### 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		