

### COMPRESSOR DEFINITION

Designation	VES D13C
Nominal Voltage/Frequency	230 V 43-150 Hz
Engineering Number	513907257

### A - APPLICATION / LIMIT WORKING CONDITIONS

1 Type	Hermetic reciprocating compressor		
2 Refrigerant	R-600a		
3 Nominal voltage and frequency	230 / 43-150	[ 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	103 to 140 V	103 to 140 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	1/4	[hp]
2 Displacement	13.27	[cm <sup>3</sup> ] (0.810 cu.in)
2.1 Bore [mm]	26.000	
2.2 Stroke [mm]	25.000	
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)	6.75	[kg] (14.88 lb.)
5 Nitrogen charge	-	[kgf/cm <sup>2</sup> ]

### C - ELETRICAL DATA

1 Nominal Voltage/Frequency/Number of Phases	230V 43-150 Hz 3~ (Three phase)	
2 Starting device type	Inverter	
2.1 Starting device	CF02B11 L XX XX/CF02B11 M XX XX/VCC31156UXXX	
3 Start capacitor	-	[µF(VAC minimum)]
4 Run capacitor	-	[µF(VAC minimum)]
5 Motor protection	INVERTER VCC3 1156 U	
6 Start winding resistance	7.29	[Ω at 25°C (77°F)] +/- 8%
7 Run winding resistance	7.29	[Ω at 25°C (77°F)] +/- 8%
8 LRA - Locked rotor amperage (40/150 Hz)	2.90	[A] - Measured according to UL 984
9 FLA - Full load amperage L/MBP (40/150 Hz)	-	[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	UL	

### D - PERFORMANCE - CHECK POINT DATA

TEST CONDITIONS: @115V1300RPM			ASHRAELBP32 Static		Evaporating temperature (Condensing temperature)		-23.3°C (-9.94°F) 54.4°C (129.92°F)		
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]	
353	89	103	54	0.79	1.11	6.50	1.64	1.90	

TEST CONDITIONS: @115V2000RPM			ASHRAELBP32 Static		Evaporating temperature (Condensing temperature)		-23.3°C (-9.94°F) 54.4°C (129.92°F)		
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]	
540	136	158	82	1.14	1.70	6.57	1.66	1.93	

TEST CONDITIONS: @115V3000RPM			ASHRAELBP32 Static		Evaporating temperature (Condensing temperature)		-23.3°C (-9.94°F) 54.4°C (129.92°F)		
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]	
797	201	234	127	1.58	2.50	6.29	1.59	1.84	

TEST CONDITIONS: @115V4500RPM			ASHRAELBP32 Static		Evaporating temperature (Condensing temperature)		-23.3°C (-9.94°F) 54.4°C (129.92°F)		
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]	
1023	258	300	182	2.33	3.21	5.64	1.42	1.65	

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @115V2000RPM		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)	325	82	95	51	0.48	1.02	6.39	1.61	1.87
-30	(-22)	431	108	126	60	0.56	1.35	7.12	1.80	2.09
-25	(-13)	558	141	164	70	0.64	1.75	7.98	2.01	2.34
-20	(- 4)	713	180	209	80	0.73	2.24	8.94	2.25	2.62
-15	(+ 5)	899	227	263	90	0.82	2.83	10.01	2.52	2.93
-10	(+14)	1121	283	329	100	0.91	3.54	11.17	2.81	3.27

### E - PERFORMANCE - CURVES

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@115V2000RPM		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)	299	75	88	53	0.49	0.94	5.69	1.43	1.67	
-30 (-22)	400	101	117	63	0.58	1.25	6.34	1.60	1.86	
-25 (-13)	524	132	154	74	0.68	1.64	7.09	1.79	2.08	
-20 (- 4)	677	171	198	85	0.77	2.13	7.92	2.00	2.32	
-15 (+ 5)	863	217	253	98	0.88	2.72	8.82	2.22	2.59	
-10 (+14)	1087	274	318	111	0.99	3.43	9.79	2.47	2.87	

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 55°C (+131°F))					
@115V2000RPM		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)	284	72	83	54	0.51	0.89	5.26	1.32	1.54	
-30 (-22)	377	95	111	65	0.61	1.18	5.83	1.47	1.71	
-25 (-13)	496	125	145	77	0.71	1.56	6.46	1.63	1.89	
-20 (- 4)	645	162	189	90	0.83	2.03	7.16	1.80	2.10	
-15 (+ 5)	828	209	243	105	0.95	2.61	7.90	1.99	2.31	
-10 (+14)	1051	265	308	121	1.08	3.32	8.68	2.19	2.54	

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 35°C (+95°F))					
@115V3000RPM		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)	481	121	141	79	0.73	1.50	6.10	1.54	1.79	
-30 (-22)	627	158	184	93	0.85	1.96	6.72	1.69	1.97	
-25 (-13)	802	202	235	108	0.98	2.51	7.42	1.87	2.18	
-20 (- 4)	1013	255	297	124	1.11	3.18	8.17	2.06	2.40	
-15 (+ 5)	1270	320	372	141	1.25	4.00	8.95	2.26	2.62	
-10 (+14)	1578	398	462	162	1.42	4.98	9.75	2.46	2.86	

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@115V3000RPM		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)	439	111	129	81	0.74	1.38	5.47	1.38	1.60	
-30 (-22)	593	149	174	98	0.89	1.86	6.06	1.53	1.77	
-25 (-13)	772	194	226	115	1.03	2.42	6.71	1.69	1.97	
-20 (- 4)	984	248	288	133	1.18	3.09	7.40	1.86	2.17	
-15 (+ 5)	1237	312	362	152	1.34	3.89	8.12	2.05	2.38	
-10 (+14)	1538	388	451	174	1.52	4.85	8.84	2.23	2.59	

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @115V3000RPM		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)	409	103	120	80	0.74	1.28	5.08	1.28	1.49
-30	(-22)	564	142	165	100	0.91	1.77	5.61	1.41	1.64
-25	(-13)	742	187	217	120	1.07	2.33	6.20	1.56	1.82
-20	(- 4)	948	239	278	139	1.24	2.98	6.82	1.72	2.00
-15	(+ 5)	1193	301	349	160	1.41	3.75	7.47	1.88	2.19
-10	(+14)	1482	373	434	183	1.60	4.68	8.11	2.04	2.38

TEST CONDITIONS: @115V4500RPM		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)	605	153	177	115	0.93	1.89	5.27	1.33	1.54
-30	(-22)	776	196	227	132	1.02	2.43	5.92	1.49	1.73
-25	(-13)	1039	262	305	161	1.25	3.26	6.44	1.62	1.89
-20	(- 4)	1363	343	399	196	1.56	4.28	6.95	1.75	2.04
-15	(+ 5)	1714	432	502	227	1.86	5.39	7.55	1.90	2.21
-10	(+14)	2061	519	604	248	2.08	6.50	8.35	2.10	2.45

TEST CONDITIONS: @115V4500RPM		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)	575	145	169	118	0.98	1.80	4.86	1.22	1.42
-30	(-22)	750	189	220	138	1.10	2.35	5.48	1.38	1.61
-25	(-13)	1007	254	295	168	1.34	3.16	6.01	1.51	1.76
-20	(- 4)	1315	331	385	201	1.63	4.13	6.54	1.65	1.92
-15	(+ 5)	1640	413	481	229	1.89	5.16	7.18	1.81	2.10
-10	(+14)	1951	492	572	245	2.04	6.15	8.03	2.02	2.35

TEST CONDITIONS: @115V4500RPM		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)	508	128	149	113	0.92	1.59	4.51	1.14	1.32
-30	(-22)	692	174	203	139	1.09	2.17	5.03	1.27	1.48
-25	(-13)	947	239	278	173	1.37	2.97	5.48	1.38	1.60
-20	(- 4)	1243	313	364	208	1.66	3.91	5.94	1.50	1.74
-15	(+ 5)	1546	390	453	235	1.91	4.87	6.54	1.65	1.92
-10	(+14)	1826	460	535	248	2.02	5.76	7.38	1.86	2.16

### 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 0° 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		