

### COMPRESSOR DEFINITION

Designation	VES D9C
Nominal Voltage/Frequency	230 V 40-150 Hz
Engineering Number	513907012

### 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 187 V	255 to 255 V
8.2 LBP (43°C Ambient temperature)	Static	187 to 187 V	255 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	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	190	[ml] (6.42 fl.oz.)
3.1 Lubricants approved		
3.2 Lubricants type/viscosity	ALQUILB / ISO5	
4 Weight (with oil charge)	6.77	[kg] (14.93 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	PFC CF02D01 M	
3 Start capacitor	-	[µF(VAC minimum)]
4 Run capacitor	-	[µF(VAC minimum)]
5 Motor protection	SP(PFC CF02D01M)	
6 Start winding resistance	9.60	[Ω at 25°C (77°F)] +/- 8%
7 Run winding resistance	9.60	[Ω at 25°C (77°F)] +/- 8%
8 LRA - Locked rotor amperage (40/150 Hz)	-	[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		

### 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]
226	57	66	36	0.28	0.71	6.35	1.60	1.86

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	43	0.32	0.89	6.57	1.66	1.93

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]
365	92	107	55	0.42	1.15	6.62	1.67	1.94

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]
555	140	163	85	0.63	1.74	6.53	1.65	1.91

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]
783	197	229	128	0.88	2.46	6.11	1.54	1.79

### 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]
-35	(-31)	138	35	40	22	0.17	0.43	6.23	1.57	1.83
-30	(-22)	184	46	54	25	0.22	0.58	7.20	1.81	2.11
-25	(-13)	240	61	70	29	0.25	0.75	8.25	2.08	2.42
-20	(- 4)	310	78	91	33	0.27	0.97	9.43	2.38	2.76
-15	(+ 5)	393	99	115	37	0.29	1.24	10.77	2.71	3.15
-10	(+14)	491	124	144	40	0.31	1.55	12.30	3.10	3.60

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]
-35	(-31)	121	31	36	22	0.20	0.38	5.50	1.39	1.61
-30	(-22)	168	42	49	27	0.23	0.53	6.27	1.58	1.84
-25	(-13)	227	57	66	32	0.25	0.71	7.09	1.79	2.08
-20	(- 4)	298	75	87	37	0.28	0.94	8.01	2.02	2.35
-15	(+ 5)	384	97	113	42	0.31	1.21	9.05	2.28	2.65
-10	(+14)	486	123	142	47	0.36	1.53	10.25	2.58	3.00

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]
-35	(-31)	106	27	31	23	0.18	0.33	4.53	1.14	1.33
-30	(-22)	148	37	43	28	0.21	0.46	5.27	1.33	1.54
-25	(-13)	203	51	59	34	0.25	0.64	6.03	1.52	1.77
-20	(- 4)	271	68	80	40	0.30	0.85	6.84	1.72	2.01
-15	(+ 5)	355	89	104	46	0.38	1.12	7.75	1.95	2.27
-10	(+14)	455	115	133	52	0.48	1.44	8.79	2.22	2.58

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]
-35	(-31)	173	44	51	27	0.22	0.54	6.32	1.59	1.85
-30	(-22)	230	58	68	32	0.27	0.72	7.18	1.81	2.11
-25	(-13)	299	75	88	37	0.30	0.94	8.17	2.06	2.40
-20	(- 4)	383	96	112	41	0.33	1.20	9.32	2.35	2.73
-15	(+ 5)	484	122	142	46	0.36	1.52	10.64	2.68	3.12
-10	(+14)	607	153	178	50	0.39	1.91	12.19	3.07	3.57

### 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)	152	38	45	28	0.23	0.48	5.62	1.42	1.65
-30	(-22)	213	54	62	33	0.27	0.67	6.38	1.61	1.87
-25	(-13)	285	72	84	39	0.30	0.89	7.20	1.81	2.11
-20	(- 4)	373	94	109	46	0.34	1.17	8.12	2.05	2.38
-15	(+ 5)	479	121	140	52	0.38	1.51	9.16	2.31	2.68
-10	(+14)	607	153	178	58	0.44	1.91	10.37	2.61	3.04

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)	136	34	40	28	0.22	0.43	4.72	1.19	1.38
-30	(-22)	189	48	55	34	0.26	0.59	5.48	1.38	1.61
-25	(-13)	254	64	74	41	0.31	0.80	6.25	1.57	1.83
-20	(- 4)	334	84	98	48	0.36	1.05	7.05	1.78	2.06
-15	(+ 5)	434	109	127	55	0.44	1.37	7.92	1.99	2.32
-10	(+14)	557	140	163	63	0.52	1.76	8.89	2.24	2.60

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)	215	54	63	34	0.27	0.67	6.25	1.57	1.83
-30	(-22)	289	73	85	40	0.31	0.91	7.16	1.81	2.10
-25	(-13)	378	95	111	46	0.36	1.19	8.15	2.05	2.39
-20	(- 4)	486	122	142	53	0.41	1.53	9.25	2.33	2.71
-15	(+ 5)	615	155	180	59	0.45	1.93	10.51	2.65	3.08
-10	(+14)	767	193	225	64	0.50	2.42	11.98	3.02	3.51

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)	198	50	58	36	0.28	0.62	5.57	1.40	1.63
-30	(-22)	271	68	79	42	0.33	0.85	6.38	1.61	1.87
-25	(-13)	358	90	105	50	0.38	1.12	7.20	1.82	2.11
-20	(- 4)	464	117	136	57	0.44	1.46	8.10	2.04	2.37
-15	(+ 5)	590	149	173	65	0.49	1.86	9.12	2.30	2.67
-10	(+14)	739	186	217	72	0.54	2.33	10.29	2.59	3.02

### 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	0.27	0.54	4.82	1.22	1.41	
-30 (-22)	244	61	72	44	0.34	0.76	5.58	1.41	1.64	
-25 (-13)	330	83	97	52	0.40	1.04	6.33	1.59	1.85	
-20 (- 4)	434	109	127	61	0.47	1.36	7.09	1.79	2.08	
-15 (+ 5)	558	141	163	70	0.53	1.76	7.93	2.00	2.32	
-10 (+14)	705	178	206	79	0.59	2.22	8.89	2.24	2.60	

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	94	53	0.40	1.00	5.97	1.51	1.75	
-30 (-22)	438	110	128	63	0.47	1.37	6.90	1.74	2.02	
-25 (-13)	578	146	169	74	0.55	1.81	7.85	1.98	2.30	
-20 (- 4)	743	187	218	84	0.62	2.33	8.86	2.23	2.60	
-15 (+ 5)	935	236	274	94	0.69	2.94	9.93	2.50	2.91	
-10 (+14)	1158	292	339	105	0.76	3.65	11.09	2.80	3.25	

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)	287	72	84	54	0.41	0.90	5.35	1.35	1.57	
-30 (-22)	404	102	118	65	0.50	1.27	6.16	1.55	1.80	
-25 (-13)	542	137	159	77	0.58	1.70	6.99	1.76	2.05	
-20 (- 4)	706	178	207	90	0.66	2.22	7.87	1.98	2.31	
-15 (+ 5)	900	227	264	102	0.74	2.83	8.81	2.22	2.58	
-10 (+14)	1125	284	330	115	0.82	3.55	9.82	2.48	2.88	

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)	258	65	76	54	0.40	0.81	4.77	1.20	1.40	
-30 (-22)	368	93	108	67	0.50	1.15	5.49	1.38	1.61	
-25 (-13)	501	126	147	80	0.60	1.57	6.23	1.57	1.82	
-20 (- 4)	660	166	194	94	0.70	2.08	7.00	1.76	2.05	
-15 (+ 5)	851	214	249	108	0.79	2.68	7.83	1.97	2.29	
-10 (+14)	1074	271	315	123	0.89	3.39	8.73	2.20	2.56	

### 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)	458	115	134	83	0.61	1.43	5.49	1.38	1.61	
-30 (-22)	605	152	177	97	0.69	1.90	6.25	1.58	1.83	
-25 (-13)	768	193	225	109	0.76	2.41	7.08	1.78	2.07	
-20 (- 4)	964	243	283	121	0.83	3.03	7.98	2.01	2.34	
-15 (+ 5)	1214	306	356	135	0.91	3.82	8.96	2.26	2.63	
-10 (+14)	1537	387	450	152	1.00	4.85	10.03	2.53	2.94	

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)	445	112	130	86	0.64	1.39	5.14	1.29	1.50	
-30 (-22)	592	149	174	102	0.73	1.86	5.78	1.46	1.69	
-25 (-13)	751	189	220	116	0.82	2.36	6.49	1.64	1.90	
-20 (- 4)	940	237	275	130	0.89	2.95	7.28	1.83	2.13	
-15 (+ 5)	1178	297	345	145	0.97	3.71	8.14	2.05	2.39	
-10 (+14)	1486	374	435	163	1.06	4.69	9.09	2.29	2.66	

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)	394	99	116	86	0.63	1.24	4.61	1.16	1.35	
-30 (-22)	553	139	162	105	0.75	1.73	5.19	1.31	1.52	
-25 (-13)	720	181	211	123	0.85	2.26	5.83	1.47	1.71	
-20 (- 4)	913	230	268	139	0.94	2.87	6.55	1.65	1.92	
-15 (+ 5)	1152	290	338	157	1.03	3.63	7.34	1.85	2.15	
-10 (+14)	1456	367	427	177	1.12	4.60	8.21	2.07	2.41	

### F - EXTERNAL CHARACTERISTICS

1 Base plate	Universal VES		
2 Tray holder	No		
3 Connectors			
3.1 SUCTION	6.5 +0.12/-0.08	[mm]	(0.256" +0.005"/-0.003")
3.1.1 Material	Copper		
3.1.2 Shape	Straight		
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	6.5 +0.12/-0.08	[mm]	(0.256" +0.005"/-0.003")
3.3.1 Material	Copper		
3.3.2 Shape	Slanted 0° up + 59° to Back		
3.4 Oil cooler (Copper)	No	[mm]	
3.5 Connector sealing	Rubber Plugs		