

### 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: @220V1300RPM			CECOMAFLBP Static		Evaporating temperature (Condensing temperature		-25°C (-13°F) 55°C (131°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]
167	42	49	34	0.25	0.64	4.97	1.25	1.46

TEST CONDITIONS: @220V1600RPM			CECOMAFLBP Static		Evaporating temperature (Condensing temperature		-25°C (-13°F) 55°C (131°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]
209	53	61	41	0.31	0.80	5.15	1.30	1.51

TEST CONDITIONS: @220V2000RPM			CECOMAFLBP Static		Evaporating temperature (Condensing temperature		-25°C (-13°F) 55°C (131°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]
272	69	80	52	0.40	1.04	5.21	1.31	1.53

TEST CONDITIONS: @220V3000RPM			CECOMAFLBP Static		Evaporating temperature (Condensing temperature		-25°C (-13°F) 55°C (131°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]
413	104	121	81	0.60	1.57	5.13	1.29	1.50

TEST CONDITIONS: @220V4500RPM			CECOMAFLBP Static		Evaporating temperature (Condensing temperature		-25°C (-13°F) 55°C (131°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]
595	150	174	123	0.85	2.27	4.82	1.21	1.41

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V1300RPM		CECOMAF 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)	135	34	39	22	0.17	0.43	6.10	1.54	1.79
-30	(-22)	179	45	53	25	0.22	0.58	7.03	1.77	2.06
-25	(-13)	235	59	69	29	0.25	0.75	8.06	2.03	2.36
-20	(- 4)	303	76	89	33	0.27	0.97	9.22	2.32	2.70
-15	(+ 5)	384	97	113	37	0.29	1.24	10.53	2.65	3.08
-10	(+14)	480	121	141	40	0.31	1.55	12.03	3.03	3.52

TEST CONDITIONS: @220V1300RPM		CECOMAF 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)	109	28	32	22	0.20	0.38	4.97	1.25	1.45
-30	(-22)	152	38	44	27	0.23	0.53	5.65	1.42	1.66
-25	(-13)	205	52	60	32	0.25	0.71	6.39	1.61	1.87
-20	(- 4)	269	68	79	37	0.28	0.94	7.21	1.82	2.11
-15	(+ 5)	346	87	101	42	0.31	1.21	8.15	2.05	2.39
-10	(+14)	438	110	128	47	0.36	1.53	9.24	2.33	2.71

TEST CONDITIONS: @220V1300RPM		CECOMAF 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)	87	22	26	23	0.18	0.33	3.73	0.94	1.09
-30	(-22)	122	31	36	28	0.21	0.46	4.34	1.09	1.27
-25	(-13)	167	42	49	34	0.25	0.64	4.97	1.25	1.46
-20	(- 4)	223	56	65	40	0.30	0.85	5.64	1.42	1.65
-15	(+ 5)	292	73	85	46	0.38	1.12	6.38	1.61	1.87
-10	(+14)	374	94	110	52	0.48	1.44	7.23	1.82	2.12

TEST CONDITIONS: @220V1600RPM		CECOMAF 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)	169	43	50	27	0.22	0.54	6.17	1.56	1.81
-30	(-22)	225	57	66	32	0.27	0.72	7.02	1.77	2.06
-25	(-13)	292	74	86	37	0.30	0.94	7.99	2.01	2.34
-20	(- 4)	374	94	110	41	0.33	1.20	9.11	2.30	2.67
-15	(+ 5)	473	119	139	46	0.36	1.52	10.41	2.62	3.05
-10	(+14)	593	149	174	50	0.39	1.91	11.92	3.00	3.49

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V1600RPM		CECOMAF 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	28	0.23	0.48	5.07	1.28	1.49
-30	(-22)	192	48	56	33	0.27	0.67	5.75	1.45	1.69
-25	(-13)	257	65	75	39	0.30	0.89	6.49	1.63	1.90
-20	(- 4)	336	85	98	46	0.34	1.17	7.31	1.84	2.14
-15	(+ 5)	431	109	126	52	0.38	1.51	8.25	2.08	2.42
-10	(+14)	546	138	160	58	0.44	1.91	9.34	2.35	2.74

TEST CONDITIONS: @220V1600RPM		CECOMAF 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)	112	28	33	28	0.22	0.43	3.88	0.98	1.14
-30	(-22)	156	39	46	34	0.26	0.59	4.52	1.14	1.33
-25	(-13)	209	53	61	41	0.31	0.80	5.15	1.30	1.51
-20	(- 4)	275	69	81	48	0.36	1.05	5.80	1.46	1.70
-15	(+ 5)	357	90	105	55	0.44	1.37	6.51	1.64	1.91
-10	(+14)	457	115	134	63	0.52	1.76	7.30	1.84	2.14

TEST CONDITIONS: @220V2000RPM		CECOMAF 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)	210	53	62	34	0.27	0.67	6.11	1.54	1.79
-30	(-22)	282	71	83	40	0.31	0.91	7.00	1.76	2.05
-25	(-13)	370	93	108	46	0.36	1.19	7.97	2.01	2.33
-20	(- 4)	475	120	139	53	0.41	1.53	9.04	2.28	2.65
-15	(+ 5)	601	151	176	59	0.45	1.93	10.28	2.59	3.01
-10	(+14)	750	189	220	64	0.50	2.42	11.71	2.95	3.43

TEST CONDITIONS: @220V2000RPM		CECOMAF 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)	179	45	52	36	0.28	0.62	5.03	1.27	1.47
-30	(-22)	244	62	72	42	0.33	0.85	5.75	1.45	1.68
-25	(-13)	323	81	95	50	0.38	1.12	6.49	1.64	1.90
-20	(- 4)	418	105	122	57	0.44	1.46	7.30	1.84	2.14
-15	(+ 5)	531	134	156	65	0.49	1.86	8.21	2.07	2.41
-10	(+14)	666	168	195	72	0.54	2.33	9.27	2.34	2.72

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V2000RPM		CECOMAF 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)	142	36	42	36	0.27	0.54	3.97	1.00	1.16	
-30 (-22)	201	51	59	44	0.34	0.76	4.61	1.16	1.35	
-25 (-13)	272	69	80	52	0.40	1.04	5.22	1.31	1.53	
-20 (- 4)	357	90	105	61	0.47	1.36	5.84	1.47	1.71	
-15 (+ 5)	458	116	134	70	0.53	1.76	6.52	1.64	1.91	
-10 (+14)	579	146	170	79	0.59	2.22	7.30	1.84	2.14	

TEST CONDITIONS: @220V3000RPM		CECOMAF 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)	312	79	91	53	0.40	1.00	5.84	1.47	1.71	
-30 (-22)	428	108	126	63	0.47	1.37	6.75	1.70	1.98	
-25 (-13)	565	142	166	74	0.55	1.81	7.68	1.94	2.25	
-20 (- 4)	726	183	213	84	0.62	2.33	8.66	2.18	2.54	
-15 (+ 5)	914	230	268	94	0.69	2.94	9.71	2.45	2.85	
-10 (+14)	1132	285	332	105	0.76	3.65	10.84	2.73	3.18	

TEST CONDITIONS: @220V3000RPM		CECOMAF 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)	259	65	76	54	0.41	0.90	4.82	1.21	1.41	
-30 (-22)	364	92	107	65	0.50	1.27	5.55	1.40	1.63	
-25 (-13)	489	123	143	77	0.58	1.70	6.30	1.59	1.85	
-20 (- 4)	637	160	187	90	0.66	2.22	7.09	1.79	2.08	
-15 (+ 5)	810	204	237	102	0.74	2.83	7.93	2.00	2.32	
-10 (+14)	1013	255	297	115	0.82	3.55	8.85	2.23	2.59	

TEST CONDITIONS: @220V3000RPM		CECOMAF 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)	213	54	62	54	0.40	0.81	3.93	0.99	1.15	
-30 (-22)	304	77	89	67	0.50	1.15	4.53	1.14	1.33	
-25 (-13)	413	104	121	80	0.60	1.57	5.13	1.29	1.50	
-20 (- 4)	543	137	159	94	0.70	2.08	5.76	1.45	1.69	
-15 (+ 5)	699	176	205	108	0.79	2.68	6.43	1.62	1.89	
-10 (+14)	882	222	259	123	0.89	3.39	7.17	1.81	2.10	

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V4500RPM		CECOMAF 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)	447	113	131	83	0.61	1.43	5.37	1.35	1.57	
-30 (-22)	590	149	173	97	0.69	1.90	6.11	1.54	1.79	
-25 (-13)	749	189	220	109	0.76	2.41	6.92	1.74	2.03	
-20 (- 4)	943	238	276	121	0.83	3.03	7.80	1.97	2.29	
-15 (+ 5)	1188	299	348	135	0.91	3.82	8.76	2.21	2.57	
-10 (+14)	1504	379	441	152	1.00	4.85	9.80	2.47	2.87	

TEST CONDITIONS: @220V4500RPM		CECOMAF 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)	401	101	118	86	0.64	1.39	4.63	1.17	1.36	
-30 (-22)	535	135	157	102	0.73	1.86	5.22	1.31	1.53	
-25 (-13)	677	171	198	116	0.82	2.36	5.86	1.48	1.72	
-20 (- 4)	847	213	248	130	0.89	2.95	6.56	1.65	1.92	
-15 (+ 5)	1061	267	311	145	0.97	3.71	7.33	1.85	2.15	
-10 (+14)	1338	337	392	163	1.06	4.69	8.18	2.06	2.40	

TEST CONDITIONS: @220V4500RPM		CECOMAF 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)	324	82	95	86	0.63	1.24	3.79	0.96	1.11	
-30 (-22)	458	115	134	105	0.75	1.73	4.28	1.08	1.25	
-25 (-13)	595	150	174	123	0.85	2.26	4.81	1.21	1.41	
-20 (- 4)	751	189	220	139	0.94	2.87	5.39	1.36	1.58	
-15 (+ 5)	945	238	277	157	1.03	3.63	6.03	1.52	1.77	
-10 (+14)	1195	301	350	177	1.12	4.60	6.75	1.70	1.98	

### 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		