

### COMPRESSOR DEFINITION

Designation	VES D9C+
Nominal Voltage/Frequency	230 V 40-150 Hz
Engineering Number	513907093

### 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	-	-
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	1/5	[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	CCC - VDE	

### D - PERFORMANCE - CHECK POINT DATA

TEST CONDITIONS: <b>@100V1300RPM</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]
223	56	65	35	0.58	0.70	6.43	1.62	1.88

TEST CONDITIONS: <b>@100V1600RPM</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]
279	70	82	42	0.70	0.88	6.58	1.66	1.93

TEST CONDITIONS: <b>@100V2000RPM</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]
354	89	104	54	0.86	1.11	6.62	1.67	1.94

TEST CONDITIONS: <b>@100V3000RPM</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]
545	137	160	84	1.30	1.71	6.50	1.64	1.90

### E - PERFORMANCE - CURVES

TEST CONDITIONS: <b>@100V1300RPM</b>		<b>ASHRAE32</b> <b>Static</b>				(Condensing temperature <b>35°C (+95°F)</b> )				
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)	139	35	41	21	0.19	0.44	6.47	1.63	1.90
-30	(-22)	186	47	54	25	0.22	0.58	7.32	1.84	2.14
-25	(-13)	243	61	71	29	0.24	0.76	8.33	2.10	2.44
-20	(- 4)	313	79	92	33	0.26	0.98	9.53	2.40	2.79
-15	(+ 5)	397	100	116	36	0.29	1.25	10.95	2.76	3.21
-10	(+14)	496	125	145	39	0.32	1.57	12.64	3.18	3.70

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @100V1300RPM		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)	126	32	37	22	0.19	0.39	5.75	1.45	1.68
-30	(-22)	172	43	50	26	0.22	0.54	6.49	1.63	1.90
-25	(-13)	228	57	67	31	0.25	0.71	7.30	1.84	2.14
-20	(- 4)	296	75	87	36	0.29	0.93	8.21	2.07	2.41
-15	(+ 5)	378	95	111	41	0.32	1.19	9.26	2.33	2.71
-10	(+14)	475	120	139	45	0.36	1.50	10.49	2.64	3.07

TEST CONDITIONS: @100V1300RPM		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)	108	27	32	22	0.19	0.34	4.89	1.23	1.43
-30	(-22)	153	39	45	27	0.23	0.48	5.65	1.42	1.66
-25	(-13)	208	52	61	33	0.27	0.65	6.40	1.61	1.87
-20	(- 4)	275	69	81	38	0.31	0.86	7.16	1.80	2.10
-15	(+ 5)	355	90	104	45	0.36	1.12	7.97	2.01	2.34
-10	(+14)	450	113	132	51	0.41	1.42	8.87	2.24	2.60

TEST CONDITIONS: @100V1600RPM		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)	166	42	49	26	0.22	0.52	6.35	1.60	1.86
-30	(-22)	228	57	67	31	0.26	0.71	7.34	1.85	2.15
-25	(-13)	301	76	88	36	0.30	0.94	8.38	2.11	2.45
-20	(- 4)	387	98	114	41	0.34	1.22	9.52	2.40	2.79
-15	(+ 5)	489	123	143	45	0.37	1.54	10.85	2.73	3.18
-10	(+14)	609	153	178	49	0.40	1.92	12.42	3.13	3.64

TEST CONDITIONS: @100V1600RPM		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)	156	39	46	27	0.23	0.49	5.77	1.45	1.69
-30	(-22)	213	54	62	33	0.27	0.67	6.54	1.65	1.92
-25	(-13)	282	71	83	39	0.32	0.89	7.32	1.84	2.14
-20	(- 4)	366	92	107	45	0.36	1.15	8.18	2.06	2.40
-15	(+ 5)	467	118	137	51	0.41	1.47	9.19	2.32	2.69
-10	(+14)	587	148	172	56	0.45	1.85	10.42	2.63	3.05

### E - PERFORMANCE - CURVES

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 55°C (+131°F))					
@100V1600RPM		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)	136	34	40	27	0.23	0.42	5.05	1.27	1.48	
-30 (-22)	189	48	55	33	0.28	0.59	5.78	1.46	1.69	
-25 (-13)	257	65	75	40	0.33	0.81	6.50	1.64	1.90	
-20 (- 4)	340	86	100	47	0.38	1.07	7.26	1.83	2.13	
-15 (+ 5)	441	111	129	54	0.43	1.39	8.16	2.06	2.39	
-10 (+14)	562	142	165	61	0.48	1.77	9.24	2.33	2.71	

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 35°C (+95°F))					
@100V2000RPM		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)	200	50	59	32	0.26	0.63	6.18	1.56	1.81	
-30 (-22)	279	70	82	39	0.31	0.87	7.18	1.81	2.10	
-25 (-13)	373	94	109	45	0.36	1.17	8.21	2.07	2.41	
-20 (- 4)	484	122	142	52	0.41	1.52	9.34	2.35	2.74	
-15 (+ 5)	614	155	180	58	0.46	1.93	10.62	2.68	3.11	
-10 (+14)	765	193	224	64	0.50	2.41	12.10	3.05	3.54	

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@100V2000RPM		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)	189	48	56	34	0.28	0.59	5.52	1.39	1.62	
-30 (-22)	262	66	77	41	0.33	0.82	6.40	1.61	1.88	
-25 (-13)	352	89	103	48	0.39	1.10	7.27	1.83	2.13	
-20 (- 4)	460	116	135	56	0.44	1.45	8.18	2.06	2.40	
-15 (+ 5)	589	148	172	64	0.50	1.85	9.20	2.32	2.69	
-10 (+14)	739	186	217	71	0.56	2.33	10.37	2.61	3.04	

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 55°C (+131°F))					
@100V2000RPM		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)	171	43	50	34	0.28	0.54	4.95	1.25	1.45	
-30 (-22)	238	60	70	41	0.33	0.75	5.77	1.45	1.69	
-25 (-13)	324	82	95	50	0.39	1.02	6.53	1.65	1.91	
-20 (- 4)	429	108	126	59	0.46	1.35	7.29	1.84	2.14	
-15 (+ 5)	556	140	163	69	0.54	1.75	8.10	2.04	2.37	
-10 (+14)	706	178	207	78	0.61	2.23	9.02	2.27	2.64	

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @100V3000RPM		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)	300	76	88	51	0.40	0.94	5.93	1.49	1.74
-30	(-22)	423	107	124	61	0.48	1.33	6.86	1.73	2.01
-25	(-13)	565	142	166	72	0.56	1.77	7.81	1.97	2.29
-20	(- 4)	731	184	214	83	0.65	2.30	8.81	2.22	2.58
-15	(+ 5)	923	233	271	94	0.74	2.90	9.87	2.49	2.89
-10	(+14)	1147	289	336	104	0.82	3.62	11.01	2.77	3.23

TEST CONDITIONS: @100V3000RPM		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)	275	69	81	51	0.41	0.86	5.36	1.35	1.57
-30	(-22)	390	98	114	63	0.49	1.22	6.16	1.55	1.80
-25	(-13)	527	133	155	75	0.59	1.65	6.98	1.76	2.05
-20	(- 4)	690	174	202	88	0.69	2.17	7.85	1.98	2.30
-15	(+ 5)	883	222	259	101	0.79	2.78	8.77	2.21	2.57
-10	(+14)	1109	279	325	114	0.89	3.50	9.77	2.46	2.86

TEST CONDITIONS: @100V3000RPM		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)	249	63	73	51	0.40	0.78	4.85	1.22	1.42
-30	(-22)	353	89	103	64	0.49	1.11	5.54	1.39	1.62
-25	(-13)	481	121	141	77	0.60	1.51	6.24	1.57	1.83
-20	(- 4)	638	161	187	91	0.72	2.01	6.98	1.76	2.05
-15	(+ 5)	827	208	242	106	0.83	2.60	7.78	1.96	2.28
-10	(+14)	1052	265	308	122	0.94	3.32	8.64	2.18	2.53

TEST CONDITIONS: @100V4300RPM		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)	435	110	128	79	0.61	1.36	5.49	1.38	1.61
-30	(-22)	568	143	167	90	0.70	1.78	6.28	1.58	1.84
-25	(-13)	712	179	209	101	0.77	2.23	7.08	1.78	2.07
-20	(- 4)	877	221	257	111	0.85	2.76	7.89	1.99	2.31
-15	(+ 5)	1075	271	315	123	0.93	3.38	8.72	2.20	2.55
-10	(+14)	1316	332	386	138	1.03	4.15	9.55	2.41	2.80

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @100V4300RPM		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)	415	105	122	83	0.64	1.30	5.00	1.26	1.47
-30	(-22)	548	138	161	95	0.74	1.72	5.74	1.45	1.68
-25	(-13)	692	174	203	106	0.82	2.17	6.52	1.64	1.91
-20	(- 4)	858	216	251	117	0.89	2.70	7.35	1.85	2.15
-15	(+ 5)	1058	267	310	129	0.97	3.33	8.22	2.07	2.41
-10	(+14)	1302	328	381	142	1.07	4.11	9.13	2.30	2.68

TEST CONDITIONS: @100V4300RPM		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)	374	94	110	82	0.64	1.17	4.57	1.15	1.34
-30	(-22)	505	127	148	97	0.76	1.58	5.15	1.30	1.51
-25	(-13)	647	163	190	111	0.86	2.03	5.81	1.46	1.70
-20	(- 4)	812	205	238	124	0.95	2.55	6.55	1.65	1.92
-15	(+ 5)	1012	255	296	137	1.05	3.19	7.36	1.86	2.16
-10	(+14)	1256	317	368	152	1.16	3.96	8.25	2.08	2.42

### 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		