COMPRESSOR DEFINITION

Designation	**VES A4H**
Nominal Voltage/Frequency	**230 V 46-133 Hz**
Engineering Number	**513907089**

A - APPLICATION / LIMIT WORKING CONDITIONS

1 Type	Hermetic reciprocating compressor		
2 Refrigerant	R-134a		
3 Nominal voltage and frequency	230 / 46-133	[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 Expantion device	Capillary tube		
8 Compressor cooling		Operating voltage range	
		50 Hz	60 Hz
8.1 LBP (32ºC Ambient temperature)	Static	103 to 140 V	103 to 140 V
8.2 LBP (43ºC Ambient temperature)	Static	103 to 140 V	103 to 140 V
8.3 HBP (32ºC Ambient temperature)	-	-	-
8.4 HBP (43ºC Ambient temperature)	-	-	-
9 Maximum condensing temperature			
9.1 Operating	14.2	[kgf/cm²] (202 psig)	/ ºC - ºF
9.2 Peak	15.9	[kgf/cm²] (226 psig)	/ ºC - ºF
10 Maximum winding temperature	130	[°C]	

B - MECHANICAL DATA

1 Commercial designation		[hp]
2 Displacement	4.25	[cm³] (0.259 cu.in)
2.1 Bore [mm]	19.000	
2.2 Stroke [mm]	15.000	
3 Lubricant charge	190	[ml] (6.42 fl.oz.)
3.1 Lubricants approved		
3.2 Lubricants type/viscosity	ESTER / ISO10	
4 Weight (with oil charge)	6.6	[kg] (14.55 lb.)
5 Nitrogen charge	-	[kgf/cm²]

C - ELETRICAL DATA

1 Nominal Voltage/Frequency/Number of Phases	230 V 46-133 Hz 3~ (Three phase)	
2 Starting device type	Inverter	
2.1 Starting device	VCC3 1156 XXXXX	
3 Start capacitor	-	[µF(VAC minimum)]
4 Run capacitor	-	[µF(VAC minimum)]
5 Motor protection	VCC31156XXXXX	
6 Start winding resistance	11.50	[Ω at 25ºC (77ºF)] +/- 8%
7 Run winding resistance	11.50	[Ω at 25ºC (77ºF)] +/- 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 - UL	

D - PERFORMANCE - CHECK POINT DATA

TEST CONDITIONS: **@115V1600RPM**			**ASHRAEHBP32** **Static**		Evaporating temperature (Condensing temperature		**7.2°C (44.96°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]
192	48	56	35	0.60		5.57	1.40	1.63

TEST CONDITIONS: **@115V1400RPM**			**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]
177	45	52	32	0.50	1.01	5.53	1.39	1.62

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]
250	63	73	44	0.80	1.42	5.68	1.43	1.66

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]
378	95	111	68	1.10	2.15	5.58	1.41	1.64

TEST CONDITIONS: **@115V4000RPM**			**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]
477	120	140	89	1.34	2.71	5.38	1.36	1.58

E - PERFORMANCE - CURVES

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **35ºC (+95ºF))**
@115V1400RPM **Static**

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)**	90	23	26	16	0.27	0.51	5.35	1.35	1.57
-30	**(-22)**	135	34	40	21	0.33	0.77	6.32	1.59	1.85
-25	**(-13)**	183	46	54	25	0.38	1.04	7.31	1.84	2.14
-20	**(- 4)**	240	61	70	29	0.44	1.37	8.39	2.11	2.46
-15	**(+ 5)**	311	78	91	32	0.49	1.78	9.60	2.42	2.81
-10	**(+14)**	402	101	118	36	0.54	2.30	10.98	2.77	3.22

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **45ºC (+113ºF))**
@115V1400RPM **Static**

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)**	77	19	23	19	0.26	0.43	4.45	1.12	1.30
-30	**(-22)**	132	33	39	25	0.34	0.75	5.38	1.36	1.58
-25	**(-13)**	191	48	56	30	0.42	1.08	6.28	1.58	1.84
-20	**(- 4)**	258	65	76	35	0.50	1.47	7.20	1.81	2.11
-15	**(+ 5)**	341	86	100	41	0.58	1.95	8.17	2.06	2.40
-10	**(+14)**	445	112	130	47	0.67	2.55	9.27	2.34	2.72

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **55ºC (+131ºF))**
@115V1400RPM **Static**

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)**	63	16	19	18	0.26	0.36	3.29	0.83	0.96
-30	**(-22)**	102	26	30	23	0.33	0.58	4.26	1.07	1.25
-25	**(-13)**	145	37	42	29	0.41	0.82	5.12	1.29	1.50
-20	**(- 4)**	198	50	58	34	0.49	1.13	5.94	1.50	1.74
-15	**(+ 5)**	268	67	78	40	0.58	1.53	6.76	1.70	1.98
-10	**(+14)**	359	90	105	47	0.68	2.05	7.62	1.92	2.23

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **35ºC (+95ºF))**
@115V1600RPM **Static**

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)**	117	30	34	23	0.31	0.66	5.26	1.32	1.54
-30	**(-22)**	172	43	50	25	0.37	0.98	6.61	1.67	1.94
-25	**(-13)**	233	59	68	30	0.44	1.32	7.60	1.92	2.23
-20	**(- 4)**	303	76	89	36	0.51	1.72	8.48	2.14	2.48
-15	**(+ 5)**	384	97	113	41	0.57	2.19	9.50	2.39	2.78
-10	**(+14)**	480	121	141	45	0.63	2.75	10.91	2.75	3.20

E - PERFORMANCE - CURVES

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **45ºC (+113ºF))**
@115V1600RPM **Static**

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)**	81	20	24	18	0.30	0.46	4.44	1.12	1.30
-30	**(-22)**	137	35	40	24	0.37	0.78	5.60	1.41	1.64
-25	**(-13)**	201	51	59	31	0.46	1.14	6.38	1.61	1.87
-20	**(- 4)**	274	69	80	39	0.54	1.56	7.03	1.77	2.06
-15	**(+ 5)**	361	91	106	47	0.63	2.06	7.80	1.97	2.29
-10	**(+14)**	463	117	136	52	0.71	2.65	8.95	2.25	2.62

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **55ºC (+131ºF))**
@115V1600RPM **Static**

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)**	68	17	20	19	0.28	0.38	3.45	0.87	1.01
-30	**(-22)**	116	29	34	26	0.36	0.66	4.45	1.12	1.30
-25	**(-13)**	172	43	50	35	0.45	0.98	5.06	1.27	1.48
-20	**(- 4)**	240	60	70	45	0.55	1.36	5.51	1.39	1.61
-15	**(+ 5)**	321	81	94	54	0.66	1.83	6.07	1.53	1.78
-10	**(+14)**	419	106	123	60	0.76	2.40	6.97	1.76	2.04

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **35ºC (+95ºF))**
@115V2000RPM **Static**

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)**	161	41	47	29	0.40	0.91	5.60	1.41	1.64
-30	**(-22)**	221	56	65	34	0.47	1.25	6.50	1.64	1.91
-25	**(-13)**	293	74	86	39	0.54	1.66	7.47	1.88	2.19
-20	**(- 4)**	382	96	112	45	0.62	2.17	8.55	2.15	2.50
-15	**(+ 5)**	491	124	144	50	0.70	2.80	9.81	2.47	2.88
-10	**(+14)**	626	158	183	55	0.77	3.58	11.33	2.86	3.32

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **45ºC (+113ºF))**
@115V2000RPM **Static**

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)**	132	33	39	27	0.39	0.74	4.82	1.21	1.41
-30	**(-22)**	194	49	57	34	0.48	1.10	5.67	1.43	1.66
-25	**(-13)**	266	67	78	41	0.57	1.51	6.49	1.64	1.90
-20	**(- 4)**	353	89	103	48	0.67	2.01	7.34	1.85	2.15
-15	**(+ 5)**	459	116	134	55	0.77	2.62	8.28	2.09	2.43
-10	**(+14)**	587	148	172	62	0.86	3.36	9.37	2.36	2.75

E - PERFORMANCE - CURVES

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **55ºC (+131ºF))**
@115V2000RPM **Static**

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)**	85	21	25	23	0.35	0.48	3.70	0.93	1.08
-30	**(-22)**	149	38	44	31	0.46	0.84	4.66	1.18	1.37
-25	**(-13)**	221	56	65	40	0.57	1.26	5.50	1.39	1.61
-20	**(- 4)**	307	77	90	49	0.69	1.74	6.27	1.58	1.84
-15	**(+ 5)**	408	103	120	58	0.82	2.33	7.05	1.78	2.06
-10	**(+14)**	530	134	155	67	0.93	3.04	7.88	1.99	2.31

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **35ºC (+95ºF))**
@115V3000RPM **Static**

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)**	246	62	72	43	0.59	1.39	5.65	1.42	1.66
-30	**(-22)**	334	84	98	53	0.71	1.89	6.39	1.61	1.87
-25	**(-13)**	440	111	129	61	0.82	2.50	7.22	1.82	2.12
-20	**(- 4)**	573	144	168	70	0.93	3.26	8.19	2.06	2.40
-15	**(+ 5)**	736	186	216	79	1.04	4.20	9.32	2.35	2.73
-10	**(+14)**	937	236	275	87	1.16	5.37	10.67	2.69	3.13

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **45ºC (+113ºF))**
@115V3000RPM **Static**

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)**	193	49	57	42	0.57	1.09	4.63	1.17	1.36
-30	**(-22)**	288	72	84	53	0.71	1.63	5.47	1.38	1.60
-25	**(-13)**	398	100	117	64	0.85	2.26	6.29	1.59	1.84
-20	**(- 4)**	530	134	155	74	0.99	3.02	7.15	1.80	2.10
-15	**(+ 5)**	690	174	202	85	1.13	3.94	8.08	2.04	2.37
-10	**(+14)**	884	223	259	97	1.27	5.07	9.11	2.30	2.67

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **55ºC (+131ºF))**
@115V3000RPM **Static**

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)**	125	31	36	37	0.51	0.70	3.40	0.86	1.00
-30	**(-22)**	227	57	67	50	0.68	1.29	4.46	1.12	1.31
-25	**(-13)**	343	86	100	63	0.85	1.95	5.41	1.36	1.58
-20	**(- 4)**	477	120	140	76	1.02	2.71	6.28	1.58	1.84
-15	**(+ 5)**	636	160	186	90	1.19	3.63	7.12	1.79	2.09
-10	**(+14)**	825	208	242	104	1.36	4.73	7.97	2.01	2.34

E - PERFORMANCE - CURVES

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **35ºC (+95ºF))**
@115V4000RPM **Static**

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)**	268	67	78	56	0.79	1.51	4.84	1.22	1.42
-30	**(-22)**	389	98	114	67	0.93	2.20	5.81	1.47	1.70
-25	**(-13)**	538	136	158	79	1.08	3.06	6.74	1.70	1.98
-20	**(- 4)**	723	182	212	94	1.25	4.11	7.65	1.93	2.24
-15	**(+ 5)**	948	239	278	110	1.44	5.41	8.57	2.16	2.51
-10	**(+14)**	1218	307	357	128	1.65	6.98	9.51	2.40	2.79

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **45ºC (+113ºF))**
@115V4000RPM **Static**

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)**	231	58	68	56	0.76	1.31	4.11	1.04	1.20
-30	**(-22)**	351	88	103	70	0.95	1.99	5.05	1.27	1.48
-25	**(-13)**	496	125	145	85	1.13	2.81	5.92	1.49	1.74
-20	**(- 4)**	672	169	197	101	1.32	3.83	6.74	1.70	1.98
-15	**(+ 5)**	886	223	260	118	1.52	5.06	7.54	1.90	2.21
-10	**(+14)**	1142	288	335	137	1.74	6.55	8.33	2.10	2.44

TEST CONDITIONS: **ASHRAE32** (Condensing temperature **55ºC (+131ºF))**
@115V4000RPM **Static**

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)**	138	35	40	46	0.62	0.78	2.97	0.75	0.87
-30	**(-22)**	267	67	78	64	0.87	1.51	4.06	1.02	1.19
-25	**(-13)**	418	105	122	82	1.10	2.37	5.04	1.27	1.48
-20	**(- 4)**	597	150	175	101	1.32	3.40	5.95	1.50	1.74
-15	**(+ 5)**	810	204	237	120	1.54	4.63	6.81	1.72	1.99
-10	**(+14)**	1063	268	311	140	1.78	6.09	7.63	1.92	2.24

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	4.94 +0.08/-0.08	[mm]	(0.194" +0.003"/-0.003")
3.2.1 Material	Copper		
3.2.2 Shape	Straight		
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	Straight		
3.4 Oil cooler (Copper)	No	[mm]	
3.5 Connector sealing	Rubber Plugs		