

### COMPRESSOR DEFINITION

Designation	EM 20HHR
Nominal Voltage/Frequency	220-240 V 50-60 Hz
Engineering Number	513307411

### A - APPLICATION / LIMIT WORKING CONDITIONS

1 Type	Hermetic reciprocating compressor		
2 Refrigerant	R-134a		
3 Nominal voltage and frequency	220-240 / 50-60	[ V / Hz ]	
4 Application type	Low-Medium-High Back Pressure		
4.1 Evaporating temperature range	-35°C to 15°C	(-31°F to 59°F)	
5 Motor type	RSIR/CSIR		
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 255 V	187 to 242 V
8.2 LBP (43°C Ambient temperature)	Static	187 to 255 V	187 to 242 V
8.3 HBP (32°C Ambient temperature)	Fan	187 to 255 V	187 to 242 V
8.4 HBP (43°C Ambient temperature)	Fan	187 to 255 V	187 to 242 V
9 Maximum condensing temperature			
9.1 Operating	14.2	[kgf/cm <sup>2</sup> ] (202 psig)	/ °C - °F
9.2 Peak	15.9	[kgf/cm <sup>2</sup> ] (226 psig)	/ °C - °F
10 Maximum winding temperature	130	[ °C ]	

### B - MECHANICAL DATA

1 Commercial designation	1/12	[hp]
2 Displacement	2.27	[cm <sup>3</sup> ] (0.139 cu.in)
2.1 Bore [mm]	19.000	
2.2 Stroke [mm]	8.000	
3 Lubricant charge	160	[ml] (5.41 fl.oz.)
3.1 Lubricants approved		
3.2 Lubricants type/viscosity	ESTER / ISO22	
4 Weight (with oil charge)	6.81	[kg] (15.01 lb.)
5 Nitrogen charge	0.2 to 0.3	[kgf/cm <sup>2</sup> ] (2.84 to 4.27 psig)

### C - ELETRICAL DATA

1 Nominal Voltage/Frequency/Number of Phases	220-240 V 50-60 Hz 1 ~ (Single phase)	
2 Starting device type	Current Relay	
2.1 Starting device	213514032/213515225	
3 Start capacitor	72-88(150)	[µF(VAC minimum)]
4 Run capacitor	-	[µF(VAC minimum)]
5 Motor protection	4TM189NFBYY-53	
6 Start winding resistance	50.30	[Ω at 25°C (77°F)] +/- 8%
7 Run winding resistance	31.80	[Ω at 25°C (77°F)] +/- 8%
8 LRA - Locked rotor amperage (50/60 Hz)	6.50/6.00	[A] - Measured according to UL 984
9 FLA - Full load amperage L/MBP (50/60 Hz)	0.65/0.60	[A] - Measured according to UL 984
10 FLA - Full Load Amperage HBP (50/60 Hz)	0.75/0.70	[A] - Measured according to UL 984
11 Approval boards certification	CCC - CE - IRAM - ISI - TUV - UKCA - VDE	

### D - PERFORMANCE - CHECK POINT DATA

TEST CONDITIONS: @220V50Hz			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]
840	212	246	98	0.62		8.57	2.16	2.51

TEST CONDITIONS: @220V60Hz			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]
998	251	292	118	0.66		8.46	2.13	2.48

TEST CONDITIONS: @220V60Hz			ASHRAEHBP32 Fan		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]
998	251	292	118	0.66		8.46	2.13	2.48

TEST CONDITIONS: @220V50Hz			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]
172	43	50	59	0.50	0.98	2.92	0.74	0.86

TEST CONDITIONS: @220V60Hz			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]
200	50	59	66	0.65	1.14	3.03	0.76	0.89

TEST CONDITIONS: @220V60Hz			ASHRAELBP32 Fan		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]
200	50	59	66	0.65	1.14	3.03	0.76	0.89

### E - PERFORMANCE - CURVES

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@220V50Hz		Static								
Evaporating temperature		Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE		
		+/- 5%			+/- 5%	+/- 5%	+/- 5%	+/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35	(-31)	78	20	23	48	0.48	0.44	1.66	0.42	0.49
-30	(-22)	126	32	37	51	0.49	0.72	2.45	0.62	0.72
-25	(-13)	182	46	53	56	0.50	1.04	3.20	0.81	0.94
-20	(- 4)	248	62	73	62	0.51	1.41	3.94	0.99	1.16
-15	(+ 5)	326	82	95	68	0.53	1.86	4.74	1.19	1.39
-10	(+14)	417	105	122	74	0.54	2.39	5.63	1.42	1.65
-5	(+23)	524	132	154	79	0.56	3.01	6.68	1.68	1.96
0	(+32)	650	164	190	83	0.57	3.76	7.92	2.00	2.32
+5	(+41)	795	200	233	86	0.58	4.63	9.42	2.37	2.76
+10	(+50)	963	243	282	87	0.60	5.64	11.22	2.83	3.29
+15	(+59)	1154	291	338	86	0.61	6.82	13.37	3.37	3.92

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 55°C (+131°F))					
@220V50Hz		Static								
Evaporating temperature		Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE		
		+/- 5%			+/- 5%	+/- 5%	+/- 5%	+/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35	(-31)	56	14	16	44	0.48	0.32	1.34	0.34	0.39
-30	(-22)	94	24	28	49	0.49	0.54	2.00	0.50	0.59
-25	(-13)	141	36	41	55	0.50	0.81	2.60	0.66	0.76
-20	(- 4)	199	50	58	62	0.52	1.13	3.19	0.80	0.94
-15	(+ 5)	269	68	79	69	0.53	1.53	3.82	0.96	1.12
-10	(+14)	354	89	104	76	0.55	2.02	4.54	1.14	1.33
-5	(+23)	456	115	133	83	0.57	2.62	5.40	1.36	1.58
0	(+32)	576	145	169	89	0.59	3.33	6.46	1.63	1.89
+5	(+41)	717	181	210	93	0.61	4.18	7.75	1.95	2.27
+10	(+50)	882	222	258	95	0.63	5.17	9.34	2.35	2.74
+15	(+59)	1071	270	314	95	0.66	6.32	11.26	2.84	3.30

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 65°C (+149°F))					
@220V50Hz		Static								
Evaporating temperature		Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE		
		+/- 5%			+/- 5%	+/- 5%	+/- 5%	+/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35	(-31)	34	9	10	43	0.48	0.19	0.73	0.18	0.21
-30	(-22)	63	16	19	48	0.49	0.36	1.37	0.35	0.40
-25	(-13)	102	26	30	55	0.50	0.58	1.95	0.49	0.57
-20	(- 4)	152	38	44	62	0.51	0.86	2.50	0.63	0.73
-15	(+ 5)	215	54	63	70	0.53	1.23	3.09	0.78	0.91
-10	(+14)	294	74	86	78	0.55	1.68	3.75	0.95	1.10
-5	(+23)	391	98	114	85	0.57	2.24	4.55	1.15	1.33
0	(+32)	507	128	148	91	0.59	2.93	5.53	1.39	1.62
+5	(+41)	645	162	189	96	0.62	3.75	6.74	1.70	1.97
+10	(+50)	806	203	236	99	0.64	4.72	8.23	2.07	2.41
+15	(+59)	994	250	291	99	0.67	5.87	10.06	2.53	2.95

### E - PERFORMANCE - CURVES

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@220V60Hz		Static								
Evaporating temperature		Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE		
		+/- 5%			+/- 5%	+/- 5%	+/- 5%	+/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35	(-31)	95	24	28	50	0.42	0.54	1.98	0.50	0.58
-30	(-22)	157	40	46	58	0.44	0.89	2.63	0.66	0.77
-25	(-13)	221	56	65	65	0.46	1.26	3.30	0.83	0.97
-20	(- 4)	293	74	86	72	0.48	1.67	4.03	1.02	1.18
-15	(+ 5)	377	95	110	78	0.50	2.15	4.83	1.22	1.42
-10	(+14)	476	120	139	84	0.51	2.72	5.74	1.45	1.68
-5	(+23)	596	150	175	89	0.53	3.42	6.79	1.71	1.99
0	(+32)	741	187	217	94	0.54	4.28	7.99	2.01	2.34
+5	(+41)	915	230	268	98	0.56	5.32	9.37	2.36	2.75
+10	(+50)	1122	283	329	102	0.57	6.58	10.96	2.76	3.21
+15	(+59)	1367	345	401	106	0.59	8.07	12.80	3.22	3.75

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 55°C (+131°F))					
@220V60Hz		Static								
Evaporating temperature		Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE		
		+/- 5%			+/- 5%	+/- 5%	+/- 5%	+/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35	(-31)	51	13	15	47	0.41	0.28	1.19	0.30	0.35
-30	(-22)	114	29	33	55	0.43	0.65	1.96	0.49	0.57
-25	(-13)	178	45	52	63	0.45	1.02	2.68	0.68	0.79
-20	(- 4)	250	63	73	71	0.47	1.42	3.40	0.86	1.00
-15	(+ 5)	332	84	97	79	0.50	1.89	4.12	1.04	1.21
-10	(+14)	429	108	126	87	0.52	2.45	4.89	1.23	1.43
-5	(+23)	546	138	160	95	0.55	3.14	5.72	1.44	1.67
0	(+32)	687	173	201	103	0.58	3.97	6.64	1.67	1.94
+5	(+41)	856	216	251	111	0.62	4.98	7.67	1.93	2.25
+10	(+50)	1058	267	310	120	0.66	6.20	8.86	2.23	2.59
+15	(+59)	1297	327	380	129	0.70	7.66	10.21	2.57	2.99

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 65°C (+149°F))					
@220V60Hz		Static								
Evaporating temperature		Cooling capacity			Power consumption	Current consumption	Gas flow rate	EFFICIENCY RATE		
		+/- 5%			+/- 5%	+/- 5%	+/- 5%	+/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-35	(-31)	18	5	5	44	0.41	0.10	0.44	0.11	0.13
-30	(-22)	76	19	22	52	0.43	0.43	1.36	0.34	0.40
-25	(-13)	135	34	39	60	0.45	0.77	2.17	0.55	0.64
-20	(- 4)	199	50	58	69	0.47	1.14	2.90	0.73	0.85
-15	(+ 5)	274	69	80	78	0.50	1.56	3.58	0.90	1.05
-10	(+14)	362	91	106	88	0.53	2.07	4.23	1.06	1.24
-5	(+23)	470	118	138	98	0.57	2.70	4.87	1.23	1.43
0	(+32)	601	151	176	109	0.62	3.47	5.54	1.40	1.62
+5	(+41)	760	191	223	121	0.67	4.42	6.26	1.58	1.84
+10	(+50)	950	239	278	133	0.72	5.57	7.06	1.78	2.07
+15	(+59)	1177	297	345	147	0.79	6.95	7.97	2.01	2.33

### F - EXTERNAL CHARACTERISTICS

1 Base plate	Universal EG/F/AMEM version 2		
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	Slanted		
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		