

COMPRESSOR DEFINITION

Designation	FMF T411L
Nominal Voltage/Frequency	230 V 53-150 Hz
Engineering Number	513805017

A - APPLICATION / LIMIT WORKING CONDITIONS

1 Type	Hermetic reciprocating compressor		
2 Refrigerant	HFO		
3 Nominal voltage and frequency	230 / 53-150	[V / Hz]	
4 Application type	Low-Medium Back Pressure (Light Commercial - Curves until T.Evap -4		
4.1 Evaporating temperature range	-40°C to 0°C	(-40°F to 32°F)	
5 Motor type	BPM		
6 Starting torque	LST/HST - Low/Hight starting sorque		
7 Expantion device	Capillary tube or Expansion valve		
8 Compressor cooling		Operating voltage range	
		50 Hz	60 Hz
8.1 LBP (32°C Ambient temperature)	-	-	-
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	15.72	[kgf/cm ²] (224 psig)	/ °C - °F
9.2 Peak	19.82	[kgf/cm ²] (282 psig)	/ °C - °F
10 Maximum winding temperature	130	[°C]	

B - MECHANICAL DATA

1 Commercial designation	1	[hp]
2 Displacement	10.85	[cm ³] (0.662 cu.in)
2.1 Bore [mm]	24.000	
2.2 Stroke [mm]	24.000	
3 Lubricant charge	430	[ml] (14.54 fl.oz.)
3.1 Lubricants approved		
3.2 Lubricants type/viscosity	ESTER / ISO10	
4 Weight (with oil charge)	10.87	[kg] (23.96 lb.)
5 Nitrogen charge	0.2 to 0.3	[kgf/cm ²] (2.84 to 4.27 psig)

C - ELETRICAL DATA

1 Nominal Voltage/Frequency/Number of Phases	230 V 53-150 Hz 3 ~ (Three phase)	
2 Starting device type	Inverter	
2.1 Starting device	CF10B01 N 0.1 X	
3 Start capacitor	-	[µF(VAC minimum)]
4 Run capacitor	-	[µF(VAC minimum)]
5 Motor protection	CF10B01 N 0.1 XX A Y	
6 Start winding resistance	4.30	[Ω at 25°C (77°F)] +/- 8%
7 Run winding resistance	4.30	[Ω at 25°C (77°F)] +/- 8%
8 LRA - Locked rotor amperage (50/60 Hz)	6.50/6.50	[A] - Measured according to UL 984
9 FLA - Full load amperage L/MBP (50/60 Hz)	2.00	[A] - Measured according to UL 984
10 FLA - Full Load Amperage HBP (50/60 Hz)	-	[A] - Measured according to UL 984
11 Approval boards certification	UL - VDE	

D - PERFORMANCE - CHECK POINT DATA

TEST CONDITIONS: @220V1600RPM			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]
689	174	202	107	0.84	4.77	6.42	1.62	1.88

TEST CONDITIONS: @220V2400RPM			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]
1025	258	300	161	1.22	7.10	6.36	1.60	1.86

TEST CONDITIONS: @220V3000RPM			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]
1258	317	369	202	1.47	8.71	6.23	1.57	1.83

TEST CONDITIONS: @220V3600RPM			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]
1483	374	435	246	1.76	10.27	6.04	1.52	1.77

TEST CONDITIONS: @220V4500RPM			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]
1780	449	522	316	2.25	12.33	5.63	1.42	1.65

E - PERFORMANCE - CURVES

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 35°C (+95°F))					
@220V1600RPM		Fan								
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]
-40	(-40)	312	79	91	59	0.54	0.00	5.28	1.33	1.55
-35	(-31)	416	105	122	69	0.65	0.00	6.01	1.51	1.76
-30	(-22)	544	137	159	80	0.74	0.00	6.82	1.72	2.00
-25	(-13)	701	177	205	91	0.81	0.00	7.72	1.95	2.26
-20	(- 4)	890	224	261	102	0.87	0.00	8.76	2.21	2.57
-15	(+ 5)	1116	281	327	112	0.93	0.00	9.95	2.51	2.91
-10	(+14)	1382	348	405	123	0.99	0.00	11.32	2.85	3.32
-5	(+23)	1692	426	496	132	1.04	0.00	12.89	3.25	3.78
0	(+32)	2050	517	601	139	1.10	0.00	14.70	3.70	4.31

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@220V1600RPM		Fan								
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]
-40	(-40)	288	73	84	61	0.58	0.00	4.72	1.19	1.38
-35	(-31)	389	98	114	72	0.68	0.00	5.39	1.36	1.58
-30	(-22)	515	130	151	85	0.77	0.00	6.09	1.53	1.78
-25	(-13)	670	169	196	98	0.85	0.00	6.84	1.72	2.01
-20	(- 4)	856	216	251	111	0.92	0.00	7.69	1.94	2.25
-15	(+ 5)	1079	272	316	124	1.00	0.00	8.65	2.18	2.53
-10	(+14)	1341	338	393	137	1.08	0.00	9.74	2.46	2.85
-5	(+23)	1648	415	483	150	1.16	0.00	11.01	2.77	3.22
0	(+32)	2002	505	587	161	1.25	0.00	12.46	3.14	3.65

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 55°C (+131°F))					
@220V1600RPM		Fan								
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]
-40	(-40)	258	65	76	60	0.59	0.00	4.25	1.07	1.25
-35	(-31)	356	90	104	73	0.68	0.00	4.89	1.23	1.43
-30	(-22)	478	121	140	87	0.77	0.00	5.52	1.39	1.62
-25	(-13)	629	159	184	102	0.86	0.00	6.17	1.56	1.81
-20	(- 4)	812	205	238	118	0.95	0.00	6.87	1.73	2.01
-15	(+ 5)	1030	260	302	135	1.04	0.00	7.64	1.93	2.24
-10	(+14)	1288	325	377	151	1.14	0.00	8.51	2.14	2.49
-5	(+23)	1590	401	466	167	1.26	0.00	9.51	2.40	2.79
0	(+32)	1940	489	568	182	1.39	0.00	10.65	2.68	3.12

E - PERFORMANCE - CURVES

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 35°C (+95°F))					
@220V3000RPM		Fan								
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]
-40	(-40)	538	136	158	109	0.92	0.00	4.94	1.25	1.45
-35	(-31)	732	185	215	129	1.06	0.00	5.67	1.43	1.66
-30	(-22)	970	245	284	149	1.21	0.00	6.49	1.64	1.90
-25	(-13)	1261	318	369	171	1.35	0.00	7.36	1.86	2.16
-20	(- 4)	1611	406	472	195	1.51	0.00	8.24	2.08	2.41
-15	(+ 5)	2028	511	594	223	1.67	0.00	9.08	2.29	2.66
-10	(+14)	2521	635	739	256	1.85	0.00	9.86	2.48	2.89
-5	(+23)	3096	780	907	295	2.04	0.00	10.52	2.65	3.08
0	(+32)	3763	948	1103	341	2.25	0.00	11.04	2.78	3.23

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@220V3000RPM		Fan								
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]
-40	(-40)	508	128	149	113	0.95	0.00	4.50	1.13	1.32
-35	(-31)	694	175	203	136	1.08	0.00	5.09	1.28	1.49
-30	(-22)	924	233	271	159	1.22	0.00	5.83	1.47	1.71
-25	(-13)	1204	304	353	181	1.37	0.00	6.65	1.68	1.95
-20	(- 4)	1544	389	453	205	1.52	0.00	7.54	1.90	2.21
-15	(+ 5)	1951	492	572	232	1.69	0.00	8.43	2.13	2.47
-10	(+14)	2432	613	713	261	1.87	0.00	9.31	2.35	2.73
-5	(+23)	2996	755	878	296	2.07	0.00	10.12	2.55	2.97
0	(+32)	3650	920	1069	337	2.28	0.00	10.83	2.73	3.17

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 55°C (+131°F))					
@220V3000RPM		Fan								
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]
-40	(-40)	455	115	133	104	0.95	0.00	4.40	1.11	1.29
-35	(-31)	641	162	188	136	1.10	0.00	4.73	1.19	1.39
-30	(-22)	870	219	255	166	1.26	0.00	5.25	1.32	1.54
-25	(-13)	1150	290	337	194	1.42	0.00	5.90	1.49	1.73
-20	(- 4)	1488	375	436	223	1.60	0.00	6.67	1.68	1.95
-15	(+ 5)	1892	477	554	252	1.79	0.00	7.49	1.89	2.19
-10	(+14)	2370	597	694	284	1.99	0.00	8.34	2.10	2.44
-5	(+23)	2929	738	858	320	2.21	0.00	9.17	2.31	2.69
0	(+32)	3578	902	1048	360	2.45	0.00	9.95	2.51	2.92

E - PERFORMANCE - CURVES

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 35°C (+95°F))					
@220V3600RPM		Fan								
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]
-40	(-40)	618	156	181	130	1.04	0.00	4.75	1.20	1.39
-35	(-31)	856	216	251	156	1.24	0.00	5.47	1.38	1.60
-30	(-22)	1142	288	335	184	1.44	0.00	6.20	1.56	1.82
-25	(-13)	1484	374	435	213	1.62	0.00	6.96	1.75	2.04
-20	(- 4)	1890	476	554	244	1.81	0.00	7.74	1.95	2.27
-15	(+ 5)	2369	597	694	278	2.01	0.00	8.53	2.15	2.50
-10	(+14)	2929	738	858	313	2.22	0.00	9.34	2.35	2.74
-5	(+23)	3578	902	1048	352	2.45	0.00	10.15	2.56	2.97
0	(+32)	4325	1090	1267	394	2.72	0.00	10.97	2.76	3.21

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@220V3600RPM		Fan								
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]
-40	(-40)	577	145	169	132	1.07	0.00	4.37	1.10	1.28
-35	(-31)	808	204	237	161	1.26	0.00	5.02	1.26	1.47
-30	(-22)	1087	274	319	191	1.45	0.00	5.69	1.43	1.67
-25	(-13)	1424	359	417	223	1.64	0.00	6.39	1.61	1.87
-20	(- 4)	1826	460	535	258	1.83	0.00	7.10	1.79	2.08
-15	(+ 5)	2302	580	675	294	2.05	0.00	7.83	1.97	2.29
-10	(+14)	2861	721	838	334	2.28	0.00	8.57	2.16	2.51
-5	(+23)	3511	885	1029	377	2.55	0.00	9.32	2.35	2.73
0	(+32)	4260	1074	1248	423	2.85	0.00	10.07	2.54	2.95

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 55°C (+131°F))					
@220V3600RPM		Fan								
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]
-40	(-40)	516	130	151	132	1.10	0.00	3.92	0.99	1.15
-35	(-31)	741	187	217	164	1.29	0.00	4.52	1.14	1.32
-30	(-22)	1017	256	298	198	1.49	0.00	5.14	1.30	1.51
-25	(-13)	1351	340	396	233	1.69	0.00	5.79	1.46	1.70
-20	(- 4)	1752	442	513	272	1.92	0.00	6.45	1.63	1.89
-15	(+ 5)	2229	562	653	313	2.16	0.00	7.13	1.80	2.09
-10	(+14)	2789	703	817	357	2.44	0.00	7.82	1.97	2.29
-5	(+23)	3442	867	1009	404	2.76	0.00	8.52	2.15	2.50
0	(+32)	4196	1057	1229	455	3.12	0.00	9.22	2.32	2.70

E - PERFORMANCE - CURVES

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 35°C (+95°F))					
@220V4500RPM		Fan								
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]
-40	(-40)	717	181	210	157	1.23	0.00	4.58	1.15	1.34
-35	(-31)	999	252	293	198	1.48	0.00	5.05	1.27	1.48
-30	(-22)	1347	339	395	238	1.72	0.00	5.66	1.43	1.66
-25	(-13)	1767	445	518	276	1.97	0.00	6.40	1.61	1.88
-20	(- 4)	2264	570	663	311	2.22	0.00	7.28	1.84	2.13
-15	(+ 5)	2843	717	833	343	2.50	0.00	8.29	2.09	2.43
-10	(+14)	3511	885	1029	373	2.80	0.00	9.42	2.37	2.76
-5	(+23)	4272	1077	1252	401	3.12	0.00	10.68	2.69	3.13
0	(+32)	5132	1293	1504	425	3.49	0.00	12.05	3.04	3.53

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 45°C (+113°F))					
@220V4500RPM		Fan								
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]
-40	(-40)	673	170	197	157	1.27	0.00	4.29	1.08	1.26
-35	(-31)	950	239	278	203	1.54	0.00	4.68	1.18	1.37
-30	(-22)	1293	326	379	251	1.80	0.00	5.15	1.30	1.51
-25	(-13)	1707	430	500	300	2.07	0.00	5.67	1.43	1.66
-20	(- 4)	2198	554	644	349	2.35	0.00	6.26	1.58	1.83
-15	(+ 5)	2771	698	812	399	2.65	0.00	6.91	1.74	2.02
-10	(+14)	3431	865	1005	449	2.98	0.00	7.61	1.92	2.23
-5	(+23)	4185	1055	1226	500	3.34	0.00	8.37	2.11	2.45
0	(+32)	5037	1269	1476	551	3.74	0.00	9.17	2.31	2.69

TEST CONDITIONS:		ASHRAE32			(Condensing temperature 55°C (+131°F))					
@220V4500RPM		Fan								
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]
-40	(-40)	594	150	174	163	1.29	0.00	3.64	0.92	1.07
-35	(-31)	868	219	254	204	1.57	0.00	4.25	1.07	1.25
-30	(-22)	1208	304	354	248	1.86	0.00	4.86	1.22	1.42
-25	(-13)	1618	408	474	297	2.15	0.00	5.46	1.38	1.60
-20	(- 4)	2105	530	617	349	2.45	0.00	6.05	1.52	1.77
-15	(+ 5)	2673	674	783	405	2.78	0.00	6.63	1.67	1.94
-10	(+14)	3328	839	975	464	3.13	0.00	7.20	1.81	2.11
-5	(+23)	4076	1027	1194	527	3.52	0.00	7.74	1.95	2.27
0	(+32)	4922	1240	1442	593	3.95	0.00	8.27	2.08	2.42

F - EXTERNAL CHARACTERISTICS

1 Base plate	Universal EG/F/AMEM version 2		
2 Tray holder	No		
3 Connectors			
3.1 SUCTION	8.2 +0.12/-0.08	[mm]	(0.323" +0.005"/-0.003")
3.1.1 Material	Copper		
3.1.2 Shape	Straight		
3.2 DISCHARGE	6.5 +0.12/-0.08	[mm]	(0.256" +0.005"/-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		