

### COMPRESSOR DEFINITION

Designation	<b>FMF T415U</b>
Nominal Voltage/Frequency	<b>230 V 53-167 Hz</b>
Engineering Number	<b>513805029</b>

### A - APPLICATION / LIMIT WORKING CONDITIONS

1 Type	Hermetic reciprocating compressor		
2 Refrigerant	R-290		
3 Nominal voltage and frequency	230 / 53-167	[ V / Hz ]	
4 Application type	Low-Medium Back Pressure (Light Commercial - Curves until T.Evap -		
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/High starting torque		
7 Expansion 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	18.4	[kgf/cm <sup>2</sup> ] (262 psig)	/ °C - °F
9.2 Peak	20.6	[kgf/cm <sup>2</sup> ] (293 psig)	/ °C - °F
10 Maximum winding temperature	130	[ °C ]	

### B - MECHANICAL DATA

1 Commercial designation	1 1/4	[hp]
2 Displacement	14.77	[cm <sup>3</sup> ] (0.901 cu.in)
2.1 Bore [mm]	28.000	
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 / ISO22	
4 Weight (with oil charge)	10.87	[kg] (23.96 lb.)
5 Nitrogen charge	0.2 to 0.3	[kgf/cm <sup>2</sup> ] (2.84 to 4.27 psig)

### C - ELECTRICAL DATA

1 Nominal Voltage/Frequency/Number of Phases	230 V 53-167Hz 3 ~ (Three phase)	
2 Starting device type	Inverter	
2.1 Starting device	CF10C01 M 0.1 X	
3 Start capacitor	-	[µF(VAC minimum)]
4 Run capacitor	-	[µF(VAC minimum)]
5 Motor protection	CF10C01 M 0.1 XX A Y	
6 Start winding resistance	3.79	[Ω at 25°C (77°F)] +/- 8%
7 Run winding resistance	3.79	[Ω at 25°C (77°F)] +/- 8%
8 LRA - Locked rotor amperage (50/60 Hz)	7.00/7.00	[A] - Measured according to UL 984
9 FLA - Full load amperage L/MBP (50/60 Hz)	-	[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	CCC - CE - UKCA - VDE	

### D - PERFORMANCE - CHECK POINT DATA

TEST CONDITIONS: <b>@220V1600RPM</b>			<b>ASHRAELBP32</b> <b>Fan</b>		Evaporating temperature (Condensing temperature)		<b>-23.3°C (-9.94°F)</b> <b>54.4°C (129.92°F)</b>	
Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
1600	403	469	264	1.19	4.76	6.07	1.53	1.78

TEST CONDITIONS: <b>@220V2400RPM</b>			<b>ASHRAELBP32</b> <b>Fan</b>		Evaporating temperature (Condensing temperature)		<b>-23.3°C (-9.94°F)</b> <b>54.4°C (129.92°F)</b>	
Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
2230	562	653	367	1.71	6.64	6.08	1.53	1.78

TEST CONDITIONS: <b>@220V3000RPM</b>			<b>ASHRAELBP32</b> <b>Fan</b>		Evaporating temperature (Condensing temperature)		<b>-23.3°C (-9.94°F)</b> <b>54.4°C (129.92°F)</b>	
Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
2758	695	808	450	2.13	8.21	6.13	1.54	1.80

TEST CONDITIONS: <b>@220V3600RPM</b>			<b>ASHRAELBP32</b> <b>Fan</b>		Evaporating temperature (Condensing temperature)		<b>-23.3°C (-9.94°F)</b> <b>54.4°C (129.92°F)</b>	
Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
3260	822	955	533	2.61	9.70	6.11	1.54	1.79

TEST CONDITIONS: <b>@220V5000RPM</b>			<b>ASHRAELBP32</b> <b>Fan</b>		Evaporating temperature (Condensing temperature)		<b>-23.3°C (-9.94°F)</b> <b>54.4°C (129.92°F)</b>	
Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
4270	1076	1251	781	3.58	12.71	5.47	1.38	1.60

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V1600RPM		ASHRAE32 Fan			(Condensing temperature 35°C (+95°F))					
Evaporating temperature	Cooling capacity (Qe)			Input power (We)	Electric current	Mass flow rate	Efficiency EER & COP			
	+/- 5%						+/- 5%	+/- 5%	+/- 7%	
°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]	
-40 (-40)	760	192	223	135	0.69	2.24	5.62	1.42	1.65	
-35 (-31)	998	251	292	160	0.84	2.95	6.22	1.57	1.82	
-30 (-22)	1257	317	368	183	0.97	3.73	6.88	1.73	2.02	
-25 (-13)	1550	391	454	203	1.08	4.61	7.64	1.93	2.24	
-20 (- 4)	1889	476	554	223	1.18	5.64	8.52	2.15	2.50	
-15 (+ 5)	2287	576	670	240	1.27	6.85	9.54	2.40	2.79	
-10 (+14)	2757	695	808	257	1.35	8.30	10.72	2.70	3.14	
-5 (+23)	3311	834	970	274	1.43	10.02	12.09	3.05	3.54	
0 (+32)	3961	998	1161	289	1.51	12.04	13.68	3.45	4.01	

TEST CONDITIONS: @220V1600RPM		ASHRAE32 Fan			(Condensing temperature 45°C (+113°F))					
Evaporating temperature	Cooling capacity (Qe)			Input power (We)	Electric current	Mass flow rate	Efficiency EER & COP			
	+/- 5%						+/- 5%	+/- 5%	+/- 7%	
°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]	
-40 (-40)	702	177	206	140	0.78	2.07	5.06	1.28	1.48	
-35 (-31)	947	239	277	170	0.93	2.80	5.56	1.40	1.63	
-30 (-22)	1208	304	354	198	1.06	3.58	6.07	1.53	1.78	
-25 (-13)	1497	377	439	225	1.18	4.45	6.63	1.67	1.94	
-20 (- 4)	1827	460	535	252	1.30	5.45	7.25	1.83	2.12	
-15 (+ 5)	2211	557	648	277	1.41	6.62	7.96	2.01	2.33	
-10 (+14)	2661	671	780	302	1.53	8.01	8.79	2.21	2.57	
-5 (+23)	3190	804	935	327	1.66	9.65	9.75	2.46	2.86	
0 (+32)	3810	960	1116	351	1.79	11.58	10.88	2.74	3.19	

TEST CONDITIONS: @220V1600RPM		ASHRAE32 Fan			(Condensing temperature 55°C (+131°F))					
Evaporating temperature	Cooling capacity (Qe)			Input power (We)	Electric current	Mass flow rate	Efficiency EER & COP			
	+/- 5%						+/- 5%	+/- 5%	+/- 7%	
°C (°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]	
-40 (-40)	660	166	193	146	0.80	1.95	4.52	1.14	1.33	
-35 (-31)	916	231	269	182	0.95	2.71	5.00	1.26	1.47	
-30 (-22)	1184	298	347	217	1.10	3.51	5.45	1.37	1.60	
-25 (-13)	1474	371	432	251	1.24	4.38	5.89	1.48	1.73	
-20 (- 4)	1800	454	527	285	1.39	5.37	6.35	1.60	1.86	
-15 (+ 5)	2174	548	637	319	1.55	6.51	6.84	1.72	2.00	
-10 (+14)	2609	658	765	353	1.72	7.85	7.40	1.86	2.17	
-5 (+23)	3118	786	914	387	1.90	9.43	8.05	2.03	2.36	
0 (+32)	3712	935	1088	421	2.10	11.28	8.81	2.22	2.58	

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V3000RPM		ASHRAE32 Fan			(Condensing temperature 35°C (+95°F))					
Evaporating temperature		Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-40	(-40)	1354	341	397	255	1.25	4.00	5.31	1.34	1.56
-35	(-31)	1737	438	509	293	1.46	5.14	5.92	1.49	1.73
-30	(-22)	2184	550	640	333	1.66	6.48	6.57	1.66	1.93
-25	(-13)	2709	683	794	373	1.84	8.06	7.28	1.84	2.13
-20	(- 4)	3326	838	975	413	2.02	9.92	8.06	2.03	2.36
-15	(+ 5)	4049	1020	1187	454	2.20	12.13	8.93	2.25	2.62
-10	(+14)	4892	1233	1433	494	2.38	14.72	9.90	2.50	2.90
-5	(+23)	5868	1479	1720	534	2.58	17.75	10.99	2.77	3.22
0	(+32)	6992	1762	2049	573	2.80	21.26	12.21	3.08	3.58

TEST CONDITIONS: @220V3000RPM		ASHRAE32 Fan			(Condensing temperature 45°C (+113°F))					
Evaporating temperature		Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-40	(-40)	1245	314	365	257	1.36	3.67	4.87	1.23	1.43
-35	(-31)	1643	414	482	303	1.58	4.86	5.42	1.37	1.59
-30	(-22)	2100	529	615	350	1.79	6.23	5.98	1.51	1.75
-25	(-13)	2630	663	771	399	1.99	7.82	6.59	1.66	1.93
-20	(- 4)	3246	818	951	448	2.19	9.68	7.24	1.82	2.12
-15	(+ 5)	3962	998	1161	497	2.39	11.87	7.95	2.00	2.33
-10	(+14)	4791	1207	1404	547	2.60	14.42	8.75	2.20	2.56
-5	(+23)	5749	1449	1685	596	2.83	17.39	9.63	2.43	2.82
0	(+32)	6848	1726	2007	645	3.07	20.82	10.63	2.68	3.12

TEST CONDITIONS: @220V3000RPM		ASHRAE32 Fan			(Condensing temperature 55°C (+131°F))					
Evaporating temperature		Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-40	(-40)	1174	296	344	265	1.35	3.47	4.44	1.12	1.30
-35	(-31)	1573	396	461	318	1.61	4.65	4.93	1.24	1.44
-30	(-22)	2024	510	593	373	1.86	6.00	5.42	1.37	1.59
-25	(-13)	2542	641	745	430	2.10	7.56	5.93	1.49	1.74
-20	(- 4)	3141	792	920	488	2.34	9.37	6.46	1.63	1.89
-15	(+ 5)	3834	966	1123	546	2.58	11.48	7.03	1.77	2.06
-10	(+14)	4635	1168	1358	605	2.84	13.94	7.66	1.93	2.25
-5	(+23)	5558	1401	1629	664	3.12	16.81	8.36	2.11	2.45
0	(+32)	6617	1667	1939	723	3.41	20.11	9.15	2.31	2.68

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V3600RPM		ASHRAE32 Fan			(Condensing temperature 35°C (+95°F))					
Evaporating temperature	Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%			
	°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]
-40	(-40)	1619	408	474	306	1.49	4.78	5.27	1.33	1.54
-35	(-31)	2045	515	599	342	1.73	6.05	5.92	1.49	1.73
-30	(-22)	2572	648	754	394	1.97	7.63	6.50	1.64	1.90
-25	(-13)	3206	808	939	456	2.21	9.53	7.05	1.78	2.07
-20	(- 4)	3954	996	1159	522	2.46	11.80	7.63	1.92	2.24
-15	(+ 5)	4823	1215	1413	587	2.71	14.45	8.30	2.09	2.43
-10	(+14)	5819	1466	1705	645	2.97	17.52	9.10	2.29	2.67
-5	(+23)	6950	1751	2036	691	3.24	21.02	10.09	2.54	2.96
0	(+32)	8221	2072	2409	719	3.52	25.00	11.32	2.85	3.32

TEST CONDITIONS: @220V3600RPM		ASHRAE32 Fan			(Condensing temperature 45°C (+113°F))					
Evaporating temperature	Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%			
	°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]
-40	(-40)	1503	379	440	321	1.63	4.44	4.73	1.19	1.39
-35	(-31)	1944	490	570	370	1.89	5.75	5.28	1.33	1.55
-30	(-22)	2480	625	727	435	2.15	7.35	5.75	1.45	1.68
-25	(-13)	3117	785	913	509	2.41	9.27	6.18	1.56	1.81
-20	(- 4)	3862	973	1132	587	2.67	11.52	6.63	1.67	1.94
-15	(+ 5)	4722	1190	1384	664	2.94	14.14	7.16	1.81	2.10
-10	(+14)	5703	1437	1671	734	3.21	17.16	7.82	1.97	2.29
-5	(+23)	6813	1717	1996	791	3.49	20.60	8.66	2.18	2.54
0	(+32)	8058	2031	2361	830	3.78	24.49	9.74	2.45	2.85

TEST CONDITIONS: @220V3600RPM		ASHRAE32 Fan			(Condensing temperature 55°C (+131°F))					
Evaporating temperature	Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%			
	°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]
-40	(-40)	1389	350	407	308	1.56	4.10	4.49	1.13	1.32
-35	(-31)	1835	462	538	364	1.87	5.43	5.01	1.26	1.47
-30	(-22)	2370	597	695	436	2.17	7.03	5.43	1.37	1.59
-25	(-13)	3001	756	879	517	2.48	8.92	5.82	1.47	1.70
-20	(- 4)	3733	941	1094	602	2.78	11.14	6.21	1.57	1.82
-15	(+ 5)	4575	1153	1341	685	3.09	13.70	6.68	1.68	1.96
-10	(+14)	5532	1394	1621	760	3.41	16.64	7.27	1.83	2.13
-5	(+23)	6611	1666	1937	823	3.73	19.99	8.03	2.02	2.35
0	(+32)	7820	1971	2291	867	4.06	23.77	9.01	2.27	2.64

### E - PERFORMANCE - CURVES

TEST CONDITIONS: @220V5000RPM		ASHRAE32 Fan			(Condensing temperature 35°C (+95°F) )					
Evaporating temperature		Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-40	(-40)	2004	505	587	431	1.94	5.92	4.69	1.18	1.38
-35	(-31)	2735	689	801	486	2.45	8.09	5.58	1.41	1.64
-30	(-22)	3536	891	1036	571	2.90	10.48	6.13	1.55	1.80
-25	(-13)	4386	1105	1285	670	3.27	13.04	6.51	1.64	1.91
-20	(- 4)	5265	1327	1543	765	3.58	15.71	6.85	1.73	2.01
-15	(+ 5)	6151	1550	1802	841	3.81	18.43	7.31	1.84	2.14
-10	(+14)	7025	1770	2058	880	3.96	21.14	8.05	2.03	2.36
-5	(+23)	7864	1982	2304	866	4.04	23.78	9.21	2.32	2.70
0	(+32)	8649	2180	2534	784	4.04	26.30	10.94	2.76	3.21

TEST CONDITIONS: @220V5000RPM		ASHRAE32 Fan			(Condensing temperature 45°C (+113°F) )					
Evaporating temperature		Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-40	(-40)	2012	507	590	448	2.13	5.94	4.48	1.13	1.31
-35	(-31)	2702	681	792	510	2.63	7.99	5.31	1.34	1.55
-30	(-22)	3461	872	1014	602	3.07	10.26	5.78	1.46	1.70
-25	(-13)	4269	1076	1251	706	3.43	12.70	6.07	1.53	1.78
-20	(- 4)	5106	1287	1496	806	3.73	15.24	6.31	1.59	1.85
-15	(+ 5)	5950	1499	1743	886	3.95	17.83	6.67	1.68	1.95
-10	(+14)	6781	1709	1987	929	4.10	20.40	7.28	1.84	2.13
-5	(+23)	7578	1910	2221	918	4.18	22.91	8.31	2.09	2.44
0	(+32)	8320	2097	2438	838	4.17	25.29	9.90	2.50	2.90

TEST CONDITIONS: @220V5000RPM		ASHRAE32 Fan			(Condensing temperature 55°C (+131°F) )					
Evaporating temperature		Cooling capacity (Qe) +/- 5%			Input power (We) +/- 5%	Electric current +/- 5%	Mass flow rate +/- 5%	Efficiency EER & COP +/- 7%		
°C	(°F)	[Btu/h]	[kcal/h]	[W]	[W]	[A]	[kg/h]	[Btu/Wh]	[kcal/Wh]	[W/W]
-40	(-40)	1886	475	553	459	2.12	5.57	4.05	1.02	1.19
-35	(-31)	2510	633	736	529	2.61	7.42	4.81	1.21	1.41
-30	(-22)	3205	808	939	627	3.03	9.50	5.23	1.32	1.53
-25	(-13)	3948	995	1157	737	3.39	11.74	5.43	1.37	1.59
-20	(- 4)	4720	1189	1383	842	3.68	14.08	5.59	1.41	1.64
-15	(+ 5)	5499	1386	1611	926	3.89	16.47	5.84	1.47	1.71
-10	(+14)	6264	1579	1836	972	4.04	18.84	6.34	1.60	1.86
-5	(+23)	6996	1763	2050	964	4.11	21.15	7.24	1.82	2.12
0	(+32)	7672	1933	2248	886	4.10	23.32	8.70	2.19	2.55

### 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		