TECHNICAL CATALOG | MARCH 2023

Low voltage
High Dynamic Performance motors

With expertise, and a comprehensive portfolio of products and life-cycle services, we help value-minded industrial customers improve their energy efficiency and productivity.

Low voltage
High Dynamic Performance motors

Ordering information

Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M3FT	355A	3GFT 352 711 - ·UB		002, etc.
		1 2 3 4 5 6 7 8 9 10 11 12 13 14		

Positions 1 to 4	
3GET:	High Dynamic Performance IP55 motors
3GFT:	High Dynamic Performance IP23 motors
3GLT:	High Dynamic Performance IP55 liquid-cooled motors

Positions 5 and 6 - IEC size	
08:	80
10:	100
13:	132
16:	160
18:	180
20:	200
22:	225
25:	250
28:	280
31:	315
35:	355
40:	400

Position 7 - Pole pairs	
2:	4 poles

Position 8	
7:	For all motors

Position 9 - Stator package lenght	
1:	A
2:	B
3:	C
4:	D
5:	E
6:	F

Position 10 - Nominal speed (r/min)	
0:	500
1:	1000
2:	1500
3:	1750
4:	2000
5:	2500
6:	3000
7:	3500
8:	4000

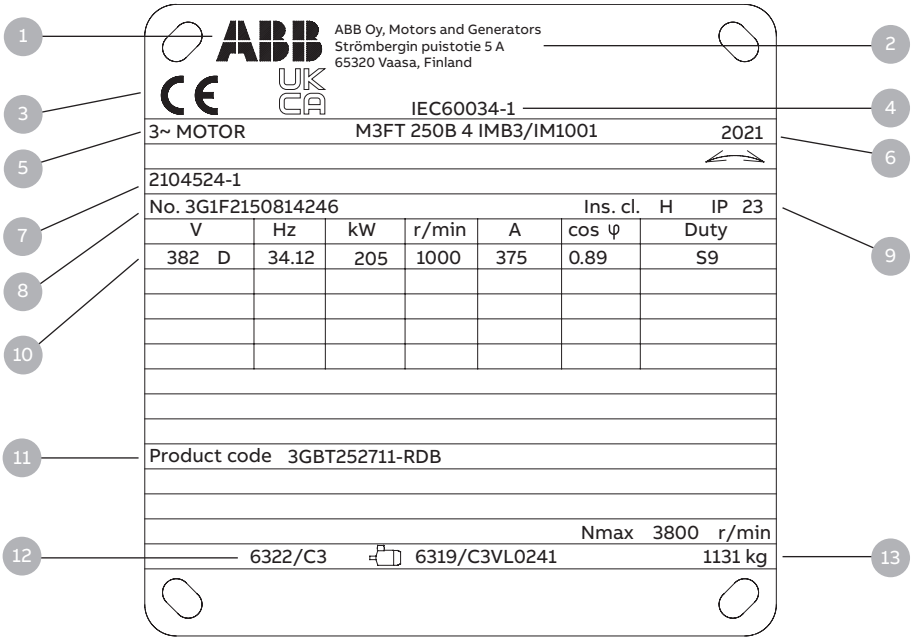
Position 11
-(dash)

Position 12 - Mounting arrangement (marked with black dot in data tables)	
A:	Foot-mounted, top-mounted terminal box
H:	Foot/flange mounted, terminal box top mounted
S:	Foot/flange mounted, terminal box RHS seen from D-end
R:	Foot mounted, terminal box RHS seen from D-end

Position 13 - Voltage and frequency (marked with black dot in data tables)	
D:	400 VΔ 50 Hz
C:	460 VΔ 60 Hz
P:	460 VY 60 Hz
U:	690 VΔ 50 Hz
Y:	690 VY 60 Hz

Position 14 - Design code
A, B, C, D...Q = Design code must be, if needed, followed by variant codes

Rating plates



1 ABB logo

2 Manufacturing place

3 CE mark on Ecodesign approved motors UKCA mark on UK approved motors

4 Manufacturing standard

5 Product description

6 Manufacturing year

7 Factory order reference number

8 Serial number

9 Insulation class, IP protection class

10 Voltage, Frequency, output, speed, current, power factory, duty

11 Product code

12 Bearing type

13 Weight

Mechanical design
Motor frame

The motor frame, end shields and main terminal box are made of cast iron. Feet are integrated with the frame, except for sizes 160-250 with side mounted terminal box, which have detachable feet.

Motors can be supplied for foot mounting, flange mounting, and combinations of these.

Lifting lugs

The motors are provided as standard with lifting lugs according to the table below. For improved lifting possibilities can variant code 305 be added, please refer to the variant code section for information about availability.

Motor size	Type of lugs	Horisontal mounting B3, B35		Size
		pcs, D-end	pcs, N-end	
80	lifting eye	1	1	M6
100	lifting eye	1	1	M8
132	lifting eye	1	1	M10
160	lifting eye	1	1	M16
180	lifting eye	1	1	M16
200	lifting eye	1	1	M20
225	lifting eye	1	1	M20
250	lifting eye	1	1	M20
280	lifting eye	1	1	M24
315	lifting eye	1	1	M30
355	lifting eye	1	1	M30
400	lifting eye	1	1	M36

Mechanical design
Bearings

Standard and alternative designs

Motor size	Standard design		Alternative design
	Deep groove ball bearings		Roller bearing (VC037)
	D-end	N-end	D-end
80	6305-2Z/C3	6305-2Z/C3	NU305ECP/C3
100	6308-2Z/C3	6308-2Z/C3	NU308ECP/C3
132	6310-2Z/C3	6310-2Z/C3	NU310ECP/C3
160	6312-2Z/C3	6312-2Z/C3	NU312ECP/C3
180	6314-2Z/C3	6314-2Z/C3	NU314ECP/C3
200	6315/C3	6314/C3VL0241	NU315ECP/C3
225	6319/C3	6316/C3VL0241	NU319ECP/C3
250	6322/C3	6319/C3VL0241	NU322ECP/C3
280	6322/C3	6316/C3VL0241	N/A
315	6326M/C3	6322/C3VL0241	N/A
355	6326M/C3	6322/C3VL0241	N/A
400	6330M/C3	6326M/C4VL0241	N/A

The variant codes for ordering angular-contact ball bearings at D-end are 058 and 060

Bearing life

The nominal life L_{10h} of a bearing is defined according to ISO 281 as the number of operating hours achieved or exceeded by 90 % of identical bearings in a large test series under specified conditions. 50 % of bearings achieve at least five times this lifetime.

The calculated bearing life L_{10h} for power transmission by means of coupling is for horizontally mounted motors in sizes up to 315 ≥ 100,000 hours.

Lubrication

On delivery, motors in frame size 200 and above are prelubricated with high-quality grease. Before the first start-up, read the instructions for relubrication and recommended grease in the manual delivered together with the motor, or see the lubrication plate on the motor.

Transport locking

Motors with roller bearings or an angular-contact ball bearing are fitted with a transport lock before dispatch to prevent damage to the bearings during transport. A warning sign is attached to motors when transport locking is used.

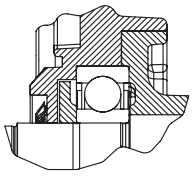
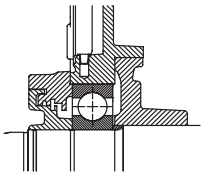
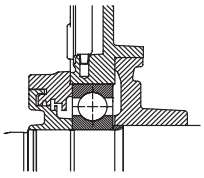
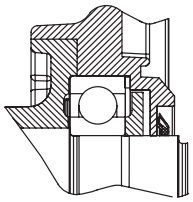
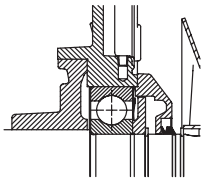
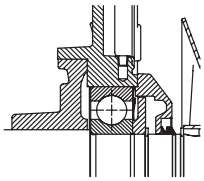
Locking may also be fitted in other cases if severe transport conditions are expected.

Bearings seals

Standard bearing seals

Motor size	Standard design	
	Deep groove ball bearings	
	D-end	N-end
80	Gamma Seal	Gamma Seal
90	Gamma Seal	Gamma Seal
100	Gamma Seal	Gamma Seal
112	Gamma Seal	Gamma Seal
132	Gamma Seal	Gamma Seal
160	Gamma Seal	Gamma Seal
180	Gamma Seal	Gamma Seal
200	Labyrinth seal	Labyrinth seal
225	Labyrinth seal	Labyrinth seal
250	Labyrinth seal	Labyrinth seal
280	Labyrinth seal	Labyrinth seal
315	Labyrinth seal	Labyrinth seal
355	Labyrinth seal	Labyrinth seal
400	Labyrinth seal	Labyrinth seal

Standard design

Motor sizes	80-180	200-250	280-400
D-end			
Seal type	Gamma ring	Labyrinth seal	Labyrinth seal
N-end			
Seal type	Gamma ring	Labyrinth seal	Labyrinth seal

Mechanical design
Radial and axial forces

The following tables show permissible radial and axial forces on the shaft in Newtons, assuming zero axial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20 000 and 40 000 hours per motor size.

These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft affects permissible forces.

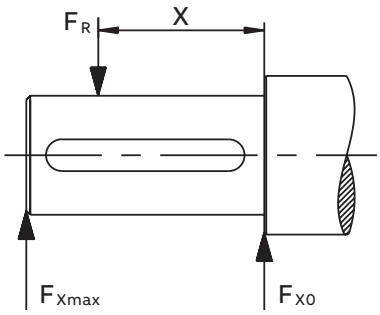
Permissible loads of simultaneous radial and axial forces can be supplied on request.

If the radial force is applied between points X0 and Xmax, the permissible force FR can be calculated with the following formula:

$$F_R = F_{X0} - \frac{X}{E}(F_{X0} - F_{Xmax})$$

Where

E	length of the shaft extension in the standard version



Radial and axial forces for M3FT motors with ball bearings

Radial and axial forces for M3FT100

		Max Radial Force (N)				Max Axial Force (N)			
Motor type		20000 h		40000 h		20000 h		40000 h	
M3FT100	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	3403	2741	2691	2167	2475	3427	1705	2657
B	1000	3388	2729	2676	2155	2468	3420	1698	2650
C	1000	3414	2809	2694	2216	2463	3415	1693	2645
D	1000	3431	2872	2705	2264	2457	3408	1687	2639
E	1000	3443	2653	2711	2303	2451	3403	1681	2633
A	1500	2967	2389	2345	1888	1982	2992	1372	2324
B	1500	2952	2377	2330	1876	1975	2927	1366	2318
C	1500	2973	2446	2344	1928	1970	2922	1361	2313
D	1500	2986	2499	2351	1968	1963	2915	1355	2307
E	1500	2995	2544	2355	2001	1957	2909	1350	2302
A	2000	2691	2167	2126	1712	1705	2657	1168	2120
B	2000	2676	2155	2111	1700	1698	2650	1162	2114
C	2000	2694	2216	2123	1746	1693	2645	1157	2109
D	2000	2705	2264	2128	1781	1687	2639	1152	2104
E	2000	2711	2303	2130	1809	1681	2633	1146	2098
A	3000	2345	1888	1851	1491	1372	2324	918	1870
B	3000	2330	1876	1836	1479	1366	2318	912	1864
C	3000	2344	1928	1845	1517	1361	2313	907	1859
D	3000	2351	1968	1847	1546	1355	2307	901	1853
E	3000	2355	2001	1848	1570	1350	2302	896	1848

Radial and axial forces for M3FT132

		Max Radial Force (N)				Max Axial Force (N)			
Motor type		20000 h		40000 h		20000 h		40000 h	
M3FT132	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	5212	4048	4116	3196	3961	4969	2787	3795
B	1000	5190	4030	4093	3178	3951	4958	2777	3785
C	1000	5213	4082	4107	3250	3942	4950	2768	3776
D	1000	5240	4028	4120	3361	3924	4932	2751	3759
E	1000	5249	3956	4119	3440	3906	4914	2734	3742
A	1500	4540	3526	3583	2782	3202	4209	2285	3293
B	1500	4518	3508	3560	2764	3191	4199	2275	3283
C	1500	4535	3589	3569	2825	3182	4190	2267	3275
D	1500	4553	3715	3575	2917	3165	4173	2251	3259
E	1500	4557	3806	3569	2981	3147	4155	2234	3242
A	2000	4116	3196	3246	2520	2787	3795	1976	2984
B	2000	4093	3178	3223	2503	2777	3785	1967	2975
C	2000	4107	3250	3230	2556	2768	3776	1959	2967
D	2000	4120	3361	3231	2636	2751	3759	1942	2950
E	2000	4119	3440	3222	2691	2734	3742	1926	2934
A	3000	3583	2782	2822	2192	2285	3293	1595	2603
B	3000	3560	2764	2799	2174	2275	3283	1586	2594
C	3000	3569	2825	2803	2218	2267	3275	1578	2586
D	3000	3575	2917	2799	2284	2251	3259	1562	2570
E	3000	3569	2981	2786	2327	2234	3242	1547	2555

Radial and axial forces for M3FT160

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT160	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	6723	5462	5289	4297	5338	6250	3799	4711
B	1000	6745	5570	5299	4376	5321	6233	3783	4695
C	1000	6761	5610	5299	4462	5297	6209	3760	4672
D	1000	6762	5550	5288	4524	5273	6184	3737	4648
A	1500	5844	4748	4591	3730	4337	5248	3146	4058
B	1500	5859	4838	4595	3795	4320	5231	3131	4043
C	1500	5865	4939	4588	3864	4296	5207	3108	4020
D	1500	5858	5012	4571	3911	4272	5183	3085	3997
A	2000	5289	4297	4151	3372	3799	4711	2743	3655
B	2000	5299	4376	4150	3428	3783	4695	2728	3640
C	2000	5299	4462	4139	3486	3760	4672	2705	3617
D	2000	5288	4524	4118	3523	3737	4648	2683	3595
A	3000	4591	3730	3597	2923	3146	4058	2246	3158
B	3000	4595	3795	3592	2966	3131	4043	2231	3143
C	3000	4588	3864	3575	3010	3108	4020	2209	3121
D	3000	4571	3911	3549	3037	3085	3997	2188	3100

Radial and axial forces for M3FT180

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT180	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	8423	6443	6599	5458	5991	8637	4032	6678
B	1000	8436	6343	6591	5553	5954	8600	3996	6642
C	1000	8428	6270	6566	5618	5916	8562	3960	6606
A	1500	7306	6042	5712	4724	4711	8637	3203	6678
B	1500	7305	6155	5694	4798	4674	7357	3168	5849
C	1500	7287	6234	5661	4843	4637	7320	3133	5814
A	2000	6599	5458	5152	4260	4032	7283	2691	5779
B	2000	6591	5553	5127	4320	3996	6678	2657	5337
C	2000	6566	5618	5089	4354	3960	6642	2622	5303
A	3000	5712	4724	4448	3678	3203	6606	2060	5268
B	3000	5694	4798	4415	3720	3168	5849	2027	4706
C	3000	5661	4843	4370	3739	3133	5814	1993	4673

Radial and axial forces for M3FT200

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT200	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	8890	7600	7040	6020	9790	5990	7840	4040
B	1000	9010	7790	7140	6170	9790	5990	7830	4030
C	1000	9110	7960	7220	6300	9780	5980	7830	4030
A	1500	7760	6630	6140	5250	8570	4770	6940	3140
B	1500	7860	6800	6220	5380	8570	4770	6940	3140
C	1500	7950	6940	6290	5490	8560	4760	6930	3130
A	2000	7040	6020	5580	4760	7840	4040	6380	2580
B	2000	7140	6170	5650	4880	7830	4030	6380	2580
C	2000	7220	6300	5710	4980	7830	4030	6380	2580
A	3000	6140	5250	4640	3960	6940	3140	5700	1900
B	3000	6220	5380	4700	4060	6940	3140	5690	1890
C	3000	6290	5490	4750	4140	6930	3130	5690	1890

Radial and axial forces for M3FT225

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT225	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	11530	10000	9130	7920	11430	8510	8990	6070
B	1000	11710	10290	9270	8150	11430	8510	8980	6060
C	1000	11870	10540	9390	8340	11420	8500	8970	6050
A	1500	10060	8730	7970	6910	9920	7000	7850	4930
B	1500	10220	8980	8090	7100	9910	6990	7840	4920
C	1500	10350	9190	8190	7270	9900	6980	7830	4910
A	2000	9130	7920	7230	6270	8990	6070	7140	4220
B	2000	9270	8150	7340	6450	8980	6060	7130	4210
C	2000	9390	8340	7430	6600	8970	6050	7130	4210

Radial and axial forces for M3FT250

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT250	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	15380	13080	12180	10360	10150	15350	7030	12230
B	1000	15650	13560	12390	10740	10130	15330	7020	12220
C	1000	15800	13850	12510	10960	10130	15330	7010	12210
A	1500	13420	11410	10630	9030	8220	13420	5560	10760
B	1500	13650	11830	10810	9360	8210	13410	5550	10750
C	1500	13780	12080	10900	9550	8200	13400	5540	10740
A	1750	12740	10830	10090	8580	7570	12770	5060	10260
B	1750	12960	11230	10260	8890	7550	12750	5050	10250
C	1750	13080	11460	10350	9070	7540	12740	5040	10240
A	2000	12180	10360	9650	8200	7030	12230	4660	9860
B	2000	12390	10740	9800	8500	7020	12220	4640	9840
C	2000	12510	10960	9890	8670	7010	12210	4640	9840

Radial and axial forces for M3FT280

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT280	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
C	500	13770	11770	10870	9300	12640	7510	10020	4890
A	1000	13560	11350	10730	8980	12790	7700	10150	5060
B	1000	13650	11530	10790	9110	12740	7640	10110	5010
C	1000	13770	11770	10870	9300	12640	7510	10020	4890
A	1500	13560	11350	10730	8980	12790	7700	10150	5060
B	1500	13650	11530	10790	9110	12740	7640	10110	5010
C	1500	13770	11770	10870	9300	12640	7510	10020	4890
A	1750	12870	10780	10180	8520	12140	7050	9660	4570
B	1750	12960	10940	10240	8650	12090	6990	9610	4510
C	1750	13070	11170	10310	8820	11990	6870	9520	4400
A	2000	12310	10300	9730	8140	11610	6520	9260	4170
B	2000	12380	10460	9770	8260	11560	6460	9210	4110
C	2000	12490	10680	9850	8420	11460	6340	9120	3990

Radial and axial forces for M3FT315

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT315	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	500	16430	14040	12980	11090	14820	8800	11740	5720
B	500	16550	14300	13050	11280	14680	8680	11600	5610
C	500	16680	14610	13110	11490	14470	8510	11400	5450
D	500	16750	14840	13130	11630	14260	8340	11200	5280
A	1000	16430	14040	12980	11090	14820	8800	11740	5720
B	1000	16550	14300	13050	11280	14680	8680	11600	5610
C	1000	16680	14610	13110	11490	14470	8510	11400	5450
D	1000	16750	14840	13130	11630	14260	8340	11200	5280
A	1500	16430	14040	12980	11090	14820	8800	11740	5720
B	1500	16550	14300	13050	11280	14680	8680	11600	5610
C	1500	16680	14610	13110	11490	14470	8510	11400	5450
D	1500	16750	14840	13130	11630	14260	8340	11200	5280
A	1750	15590	13330	12310	10520	14060	8040	11160	5150
B	1750	15700	13570	12370	10690	13920	7920	11030	5040
C	1750	15810	13850	12420	10880	13710	7750	10830	4880
D	1750	15870	14070	12420	11010	13500	7580	10630	4710

Radial and axial forces for M3FT355

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT355	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	500	16400	14380	12890	11300	14500	8430	11440	5360
B	500	16440	14500	12900	11370	14390	8330	11330	5270
C	500	16480	14640	12890	11450	14220	8190	11170	5140
A	1000	16400	14380	12890	11300	14500	8430	11440	5360
B	1000	16440	14500	12900	11370	14390	8330	11330	5270
C	1000	16480	14640	12890	11450	14220	8190	11170	5140
A	1500	16400	14380	12890	11300	14500	8430	11440	5360
B	1500	16440	14500	12900	11370	14390	8330	11330	5270
C	1500	16480	14640	12890	11450	14220	8190	11170	5140
A	1750	15550	13640	12210	10710	13740	7670	10870	4790
B	1750	15580	13740	12210	10770	13630	7570	10760	4700
C	1750	15610	13870	12190	10830	13470	7430	10610	4570

Radial and axial forces for M3FT400

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT400	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
B	500	19800	17330	15460	13540	17790	8420	14200	4830
C	500	19790	17450	15400	13570	17570	8240	14000	4660
D	500	19670	17500	15170	13490	17170	7900	13620	4350
B	1000	19800	17330	15460	13540	17790	8420	14200	4830
C	1000	19790	17450	15400	13570	17570	8240	14000	4660
D	1000	19670	17500	15170	13490	17170	7900	13620	4350
B	1500	19800	17330	15460	13540	17790	8420	14200	4830
C	1500	19790	17450	15400	13570	17570	8240	14000	4660
D	1500	19670	17500	15170	13490	17170	7900	13620	4350
B	1750	18750	16420	14620	12800	16900	7530	13540	4170
C	1750	18730	16510	14540	12810	16680	7350	13340	4010

Radial and axial forces for M3ET motors with ball bearings

Radial and axial forces for M3ET80

		Max Radial Force (N)				Max Axial Force (N)			
HDP		20000 h		40000 h		20000 h		40000 h	
M3ET80	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1500	1467	1085	1160	962	975	1523	666	1214
B	1500	1475	1081	1166	977	973	1521	664	1212
C	1500	1493	1073	1178	1007	971	1519	662	1210
A	2000	1331	1086	1052	873	834	1382	562	1110
B	2000	1338	1082	1057	886	833	1381	561	1109
C	2000	1353	1074	1068	912	830	1378	558	1106
A	3000	1160	962	916	760	666	1214	435	983
B	3000	1166	977	920	771	664	1212	433	981
C	3000	1178	1007	929	794	662	1210	431	979

Radial and axial forces for M3ET100

		Max Radial Force (N)				Max Axial Force (N)			
HDP		20000 h		40000 h		20000 h		40000 h	
M3ET100	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	3403	2741	2691	2167	2475	3427	1705	2657
B	1000	3388	2729	2676	2155	2468	3420	1698	2650
C	1000	3414	2809	2694	2216	2463	3415	1693	2645
D	1000	3431	2872	2705	2264	2457	3408	1687	2639
E	1000	3443	2670	2711	2303	2451	3403	1681	2633
A	1500	2967	2389	2345	1888	1982	2992	1372	2324
B	1500	2952	2377	2330	1876	1975	2927	1366	2318
C	1500	2973	2446	2344	1928	1970	2922	1361	2313
D	1500	2986	2499	2351	1968	1963	2915	1355	2307
E	1500	2995	2544	2355	2001	1957	2909	1350	2302
A	2000	2691	2167	2126	1712	1705	2657	1168	2120
B	2000	2676	2155	2111	1700	1698	2650	1162	2114
C	2000	2694	2216	2123	1746	1693	2645	1157	2109
D	2000	2705	2264	2128	1781	1687	2639	1152	2104
E	2000	2711	2303	2130	1809	1681	2633	1146	2098
A	3000	2345	1888	1851	1491	1372	2324	918	1870
B	3000	2330	1876	1836	1479	1366	2318	912	1864
C	3000	2344	1928	1845	1517	1361	2313	907	1859
D	3000	2351	1968	1847	1546	1355	2307	901	1853
E	3000	2355	2001	1848	1570	1350	2302	896	1848

Radial and axial forces for M3ET132

		Max Radial Force (N)				Max Axial Force (N)			
HDP		20000 h		40000 h		20000 h		40000 h	
M3ET132	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	5212	4048	4116	3196	3961	4969	2787	3795
B	1000	5190	4030	4093	3178	3951	4958	2777	3785
C	1000	5213	4120	4107	3250	3942	4950	2768	3776
D	1000	5240	4088	4120	3361	3924	4932	2751	3759
E	1000	5249	4050	4119	3440	3906	4914	2734	3742
A	1500	4540	3526	3583	2782	3202	4209	2285	3293
B	1500	4518	3508	3560	2764	3191	4199	2275	3283
C	1500	4535	3589	3569	2825	3182	4190	2267	3275
D	1500	4553	3715	3575	2917	3165	4173	2251	3259
E	1500	4557	3806	3569	2981	3147	4155	2234	3242
A	2000	4116	3196	3246	2520	2787	3795	1976	2984
B	2000	4093	3178	3223	2503	2777	3785	1967	2975
C	2000	4107	3250	3230	2556	2768	3776	1959	2967
D	2000	4120	3361	3231	2636	2751	3759	1942	2950
E	2000	4119	3440	3222	2691	2734	3742	1926	2934
A	3000	3583	2782	2822	2192	2285	3293	1595	2603
B	3000	3560	2764	2799	2174	2275	3283	1586	2594
C	3000	3569	2825	2803	2218	2267	3275	1578	2586
D	3000	3575	2917	2799	2284	2251	3259	1562	2570
E	3000	3569	2981	2786	2327	2234	3242	1547	2555

Radial and axial forces for M3ET160

		Max Radial Force (N)				Max Axial Force (N)			
HDP		20000 h		40000 h		20000 h		40000 h	
M3ET160	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	6723	5462	5289	4297	5338	6250	3799	4711
B	1000	6745	5570	5299	4376	5321	6233	3783	4695
C	1000	6761	5693	5299	4462	5297	6209	3760	4672
D	1000	6762	5666	5288	4524	5273	6184	3737	4648
A	1500	5844	4748	4591	3730	4337	5248	3146	4058
B	1500	5859	4838	4595	3795	4320	5231	3131	4043
C	1500	5865	4939	4588	3864	4296	5207	3108	4020
D	1500	5858	5012	4571	3911	4272	5183	3085	3997
A	2000	5289	4297	4151	3372	3799	4711	2743	3655
B	2000	5299	4376	4150	3428	3783	4695	2728	3640
C	2000	5299	4462	4139	3486	3760	4672	2705	3617
D	2000	5288	4524	4118	3523	3737	4648	2683	3595
A	3000	4591	3730	3597	2923	3146	4058	2246	3158
B	3000	4595	3795	3592	2966	3131	4043	2231	3143
C	3000	4588	3864	3575	3010	3108	4020	2209	3121
D	3000	4571	3911	3549	3037	3085	3997	2188	3100

Radial and axial forces for M3ET180

		Max Radial Force (N)				Max Axial Force (N)			
HDP		20000 h		40000 h		20000 h		40000 h	
M3ET180	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	8423	6515	6599	5458	5991	8637	4032	6678
B	1000	8436	6489	6591	5553	5954	8600	3996	6642
C	1000	8428	6461	6566	5618	5916	8562	3960	6606
A	1500	7306	6042	5712	4724	4711	7357	3203	5849
B	1500	7305	6155	5694	4798	4674	7320	3168	5814
C	1500	7287	6234	5661	4843	4637	7283	3133	5779
A	2000	6599	5458	5152	4260	4032	6678	2691	5337
B	2000	6591	5553	5127	4320	3996	6642	2657	5303
C	2000	6566	5618	5089	4354	3960	6606	2622	5268
A	3000	5712	4724	4448	3678	3203	5849	2060	4706
B	3000	5694	4798	4415	3720	3168	5814	2027	4673
C	3000	5661	4843	4370	3739	3133	5779	1993	4639

Radial and axial forces for M3ET200

		Max Radial Force (N)				Max Axial Force (N)			
HDP		20000 h		40000 h		20000 h		40000 h	
M3ET200	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	8750	7380	6930	5850	9790	5990	7840	4040
B	1000	8890	7600	7040	6020	9790	5990	7830	4030
C	1000	9010	7790	7130	6170	9780	5980	7830	4030
A	1500	7630	6440	6040	5100	8570	4770	6940	3140
B	1500	7760	6630	6140	5250	8570	4770	6940	3140
C	1500	7860	6800	6220	5380	8570	4770	6930	3130
A	2000	6930	5850	5490	4630	7840	4040	6380	2580
B	2000	7040	6020	5570	4760	7830	4030	6380	2580
C	2000	7130	6170	5640	4880	7830	4030	6380	2580
A	3000	6040	5100	4560	3850	6940	3140	5700	1900
B	3000	6140	5250	4640	3960	6940	3140	5690	1890
C	3000	6220	5380	4690	4060	6930	3130	5690	1890

Radial and axial forces for M3ET225

		Max Radial Force (N)				Max Axial Force (N)			
HDP		20000 h		40000 h		20000 h		40000 h	
M3ET225	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	11380	9790	9020	7750	11430	8510	8990	6070
B	1000	11590	10110	9180	8000	11430	8510	8980	6060
C	1000	11770	10390	9310	8220	11420	8500	8970	6050
A	1500	9930	8540	7870	6760	9920	7000	7850	4930
B	1500	10110	8820	8010	6980	9910	6990	7840	4920
C	1500	10260	9060	8120	7170	9900	6980	7830	4910
A	2000	9020	7750	7140	6140	8990	6070	7140	4220
B	2000	9180	8000	7260	6330	8980	6060	7130	4210
C	2000	9310	8220	7370	6500	8970	6050	7130	4210

Radial and axial forces for M3LT motors with ball bearings

Radial and axial forces for M3LT80

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3LT80	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1500	1467	1084	1160	962	975	1523	666	1214
B	1500	1475	1078	1166	977	973	1521	664	1212
C	1500	1493	1067	1178	1007	971	1519	662	1210
A	2000	1331	1084	1052	873	834	1382	562	1110
B	2000	1338	1078	1057	886	833	1381	561	1109
C	2000	1353	1068	1068	912	830	1378	558	1106
A	3000	1160	962	916	760	666	1214	435	983
B	3000	1166	977	920	771	664	1212	433	981
C	3000	1178	1007	929	794	662	1210	431	979

Radial and axial forces for M3LT100

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3LT100	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	3403	2741	2691	2167	2475	3427	1705	2657
B	1000	3388	2729	2676	2155	2468	3420	1698	2650
C	1000	3414	2809	2694	2216	2463	3415	1693	2645
D	1000	3431	2872	2705	2264	2457	3408	1687	2639
E	1000	3443	2653	2711	2303	2451	3403	1681	2633
A	1500	2967	2389	2345	1888	1982	2992	1372	2324
B	1500	2952	2377	2330	1876	1975	2927	1366	2318
C	1500	2973	2446	2344	1928	1970	2922	1361	2313
D	1500	2986	2499	2351	1968	1963	2915	1355	2307
E	1500	2995	2544	2355	2001	1957	2909	1350	2302
A	2000	2691	2167	2126	1712	1705	2657	1168	2120
B	2000	2676	2155	2111	1700	1698	2650	1162	2114
C	2000	2694	2216	2123	1746	1693	2645	1157	2109
D	2000	2705	2264	2128	1781	1687	2639	1152	2104
E	2000	2711	2303	2130	1809	1681	2633	1146	2098
A	3000	2345	1888	1851	1491	1372	2324	918	1870
B	3000	2330	1876	1836	1479	1366	2318	912	1864
C	3000	2344	1928	1845	1517	1361	2313	907	1859
D	3000	2351	1968	1847	1546	1355	2307	901	1853
E	3000	2355	2001	1848	1570	1350	2302	896	1848

Radial and axial forces for M3LT132

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3LT132	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	5212	4048	4116	3196	3961	4969	2787	3795
B	1000	5190	4030	4093	3178	3951	4958	2777	3785
C	1000	5213	4105	4107	3250	3942	4950	2768	3776
D	1000	5240	4063	4120	3361	3924	4932	2751	3759
E	1000	5249	4016	4119	3440	3906	4914	2734	3742
A	1500	4540	3526	3583	2782	3202	4209	2285	3293
B	1500	4518	3508	3560	2764	3191	4199	2275	3283
C	1500	4535	3589	3569	2825	3182	4190	2267	3275
D	1500	4553	3715	3575	2917	3165	4173	2251	3259
E	1500	4557	3806	3569	2981	3147	4155	2234	3242
A	2000	4116	3196	3246	2520	2787	3795	1976	2984
B	2000	4093	3178	3223	2503	2777	3785	1967	2975
C	2000	4107	3250	3230	2556	2768	3776	1959	2967
D	2000	4120	3361	3231	2636	2751	3759	1942	2950
E	2000	4119	3440	3222	2691	2734	3742	1926	2934
A	3000	3583	2782	2822	2192	2285	3293	1595	2603
B	3000	3560	2764	2799	2174	2275	3283	1586	2594
C	3000	3569	2825	2803	2218	2267	3275	1578	2586
D	3000	3575	2917	2799	2284	2251	3259	1562	2570
E	3000	3569	2981	2786	2327	2234	3242	1547	2555

Radial and axial forces for M3LT160

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3LT160	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	6723	5462	5289	4297	5338	6250	3799	4711
B	1000	6745	5570	5299	4376	5321	6233	3783	4695
C	1000	6761	5610	5299	4462	5297	6209	3760	4672
D	1000	6762	5550	5288	4524	5273	6184	3737	4648
A	1500	5844	4748	4591	3730	4337	5248	3146	4058
B	1500	5859	4838	4595	3795	4320	5231	3131	4043
C	1500	5865	4939	4588	3864	4296	5207	3108	4020
D	1500	5858	5012	4571	3911	4272	5183	3085	3997
A	2000	5289	4297	4151	3372	3799	4711	2743	3655
B	2000	5299	4376	4150	3428	3783	4695	2728	3640
C	2000	5299	4462	4139	3486	3760	4672	2705	3617
D	2000	5288	4524	4118	3523	3737	4648	2683	3595
A	3000	4591	3730	3597	2923	3146	4058	2246	3158
B	3000	4595	3795	3592	2966	3131	4043	2231	3143
C	3000	4588	3864	3575	3010	3108	4020	2209	3121
D	3000	4571	3911	3549	3037	3085	3997	2188	3100

Radial and axial forces for M3LT180

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3LT180	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	8423	6491	6599	5458	5991	8637	4032	6678
B	1000	8436	6446	6591	5553	5954	8600	3996	6642
C	1000	8428	6400	6566	5618	5916	8562	3960	6606
A	1500	7306	6042	5712	4724	4711	7357	3203	5849
B	1500	7305	6155	5694	4798	4674	7320	3168	5814
C	1500	7287	6234	5661	4843	4637	7283	3133	5779
A	2000	6599	5458	5152	4260	4032	6678	2691	5337
B	2000	6591	5553	5127	4320	3996	6642	2657	5303
C	2000	6566	5618	5089	4354	3960	6606	2622	5268
A	3000	5712	4724	4448	3678	3203	5849	2060	4706
B	3000	5694	4798	4415	3720	3168	5814	2027	4673
C	3000	5661	4843	4370	3739	3133	5779	1993	4639

Radial and axial forces for M3FT motors roller bearings

Radial and axial forces for M3FT100

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT100	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	7877	2937	6242	2937	N/A	N/A	N/A	N/A
B	1000	7862	3091	6227	3091	N/A	N/A	N/A	N/A
C	1000	7939	3088	6285	3088	N/A	N/A	N/A	N/A
D	1000	7996	3011	6328	3011	N/A	N/A	N/A	N/A
E	1000	8041	2653	6361	2653	N/A	N/A	N/A	N/A
A	1500	6875	2937	5447	2937	N/A	N/A	N/A	N/A
B	1500	6860	3091	5432	3091	N/A	N/A	N/A	N/A
C	1500	6925	3088	5481	3088	N/A	N/A	N/A	N/A
D	1500	6974	3012	5516	3012	N/A	N/A	N/A	N/A
E	1500	7011	2655	5543	2655	N/A	N/A	N/A	N/A
A	2000	6242	2937	4944	2937	N/A	N/A	N/A	N/A
B	2000	6227	3091	4929	3091	N/A	N/A	N/A	N/A
C	2000	6285	3092	4973	3092	N/A	N/A	N/A	N/A
D	2000	6328	3014	5003	3014	N/A	N/A	N/A	N/A
E	2000	6361	2656	5027	2656	N/A	N/A	N/A	N/A
A	3000	5447	2939	4313	2939	N/A	N/A	N/A	N/A
B	3000	5432	3094	4298	3094	N/A	N/A	N/A	N/A
C	3000	5481	3095	4334	3095	N/A	N/A	N/A	N/A
D	3000	5516	3018	4359	3018	N/A	N/A	N/A	N/A
E	3000	5543	2660	4378	2660	N/A	N/A	N/A	N/A

Radial and axial forces for M3FT132

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT132	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	7060	4125	7060	4125	N/A	N/A	N/A	N/A
B	1000	7060	4113	7060	4113	N/A	N/A	N/A	N/A
C	1000	7060	4081	7060	4081	N/A	N/A	N/A	N/A
D	1000	7060	4028	7060	4028	N/A	N/A	N/A	N/A
E	1000	7060	3956	7060	3956	N/A	N/A	N/A	N/A
A	1500	7060	4123	6435	4123	N/A	N/A	N/A	N/A
B	1500	7060	4113	6412	4113	N/A	N/A	N/A	N/A
C	1500	7060	4081	6446	4081	N/A	N/A	N/A	N/A
D	1500	7060	4023	6488	4023	N/A	N/A	N/A	N/A
E	1500	7060	3961	6510	3961	N/A	N/A	N/A	N/A
A	2000	7060	4127	5837	4127	N/A	N/A	N/A	N/A
B	2000	7060	4115	5815	4115	N/A	N/A	N/A	N/A
C	2000	7060	4084	5843	4084	N/A	N/A	N/A	N/A
D	2000	7060	4025	5878	4025	N/A	N/A	N/A	N/A
E	2000	7060	3964	5893	3964	N/A	N/A	N/A	N/A
A	3000	6435	4130	5086	3950	N/A	N/A	N/A	N/A
B	3000	6412	4121	5064	3932	N/A	N/A	N/A	N/A
C	3000	6446	4094	5086	4024	N/A	N/A	N/A	N/A
D	3000	6488	4046	5111	4046	N/A	N/A	N/A	N/A
E	3000	6510	4002	5119	4002	N/A	N/A	N/A	N/A

Radial and axial forces for M3FT160

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT160	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	11529	5720	9992	5720	N/A	N/A	N/A	N/A
B	1000	11529	5668	10044	5668	N/A	N/A	N/A	N/A
C	1000	11529	5610	10094	5610	N/A	N/A	N/A	N/A
D	1000	11529	5550	10122	5550	N/A	N/A	N/A	N/A
A	1500	11021	5721	8700	5721	N/A	N/A	N/A	N/A
B	1500	11082	5672	8741	5672	N/A	N/A	N/A	N/A
C	1500	11143	5616	8777	5616	N/A	N/A	N/A	N/A
D	1500	11179	5559	8794	5559	N/A	N/A	N/A	N/A
A	2000	9992	5735	7884	5735	N/A	N/A	N/A	N/A
B	2000	10044	5692	7917	5692	N/A	N/A	N/A	N/A
C	2000	10094	5635	7945	5635	N/A	N/A	N/A	N/A
D	2000	10122	5575	7955	5575	N/A	N/A	N/A	N/A
A	3000	8700	5753	6858	5572	N/A	N/A	N/A	N/A
B	3000	8741	5722	6882	5683	N/A	N/A	N/A	N/A
C	3000	8777	5684	6899	5684	N/A	N/A	N/A	N/A
D	3000	8794	5644	6901	5644	N/A	N/A	N/A	N/A

Radial and axial forces for M3FT180

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT180	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	11390	6443	11390	6443	N/A	N/A	N/A	N/A
B	1000	11390	6343	11390	6343	N/A	N/A	N/A	N/A
C	1000	11390	6270	11390	6270	N/A	N/A	N/A	N/A
A	1500	11390	6443	11390	6443	N/A	N/A	N/A	N/A
B	1500	11390	6374	11390	6374	N/A	N/A	N/A	N/A
C	1500	11390	6292	11390	6292	N/A	N/A	N/A	N/A
A	2000	11390	6468	11390	6468	N/A	N/A	N/A	N/A
B	2000	11390	6405	11390	6405	N/A	N/A	N/A	N/A
C	2000	11390	6333	11390	6333	N/A	N/A	N/A	N/A
A	3000	11390	6493	10622	6493	N/A	N/A	N/A	N/A
B	3000	11390	6457	10660	6457	N/A	N/A	N/A	N/A
C	3000	11390	6413	10672	6413	N/A	N/A	N/A	N/A

Radial and axial forces for M3FT200

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT200	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	8890	7600	7040	6020	9790	5990	7840	4040
B	1000	9010	7790	7140	6170	9790	5990	7830	4030
C	1000	9110	7960	7220	6300	9780	5980	7830	4030
A	1500	7760	6630	6140	5250	8570	4770	6940	3140
B	1500	7860	6800	6220	5380	8570	4770	6940	3140
C	1500	7950	6940	6290	5490	8560	4760	6930	3130
A	2000	7040	6020	5580	4760	7840	4040	6380	2580
B	2000	7140	6170	5650	4880	7830	4030	6380	2580
C	2000	7220	6300	5710	4980	7830	4030	6380	2580
A	3000	6140	5250	4640	3960	6940	3140	5700	1900
B	3000	6220	5380	4700	4060	6940	3140	5690	1890
C	3000	6290	5490	4750	4140	6930	3130	5690	1890

Radial and axial forces for M3FT225

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT225	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	11530	10000	9130	7920	11430	8510	8990	6070
B	1000	11710	10290	9270	8150	11430	8510	8980	6060
C	1000	11870	10540	9390	8340	11420	8500	8970	6050
A	1500	10060	8730	7970	6910	9920	7000	7850	4930
B	1500	10220	8980	8090	7100	9910	6990	7840	4920
C	1500	10350	9190	8190	7270	9900	6980	7830	4910
A	2000	9130	7920	7230	6270	8990	6070	7140	4220
B	2000	9270	8150	7340	6450	8980	6060	7130	4210
C	2000	9390	8340	7430	6600	8970	6050	7130	4210

Radial and axial forces for M3FT/ET 250

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT250	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	15380	13080	12180	10360	10150	15350	7030	12230
B	1000	15650	13560	12390	10740	10130	15330	7020	12220
C	1000	15800	13850	12510	10960	10130	15330	7010	12210
A	1500	13420	11410	10630	9030	8220	13420	5560	10760
B	1500	13650	11830	10810	9360	8210	13410	5550	10750
C	1500	13780	12080	10900	9550	8200	13400	5540	10740
A	1750	12740	10830	10090	8580	7570	12770	5060	10260
B	1750	12960	11230	10260	8890	7550	12750	5050	10250
C	1750	13080	11460	10350	9070	7540	12740	5040	10240
A	2000	12180	10360	9650	8200	7030	12230	4660	9860
B	2000	12390	10740	9800	8500	7020	12220	4640	9840
C	2000	12510	10960	9890	8670	7010	12210	4640	9840

Radial and axial forces for M3FT/ET 280

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT280	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
C	500	13770	11770	10870	9300	12640	7510	10020	4890
A	1000	13560	11350	10730	8980	12790	7700	10150	5060
B	1000	13650	11530	10790	9110	12740	7640	10110	5010
C	1000	13770	11770	10870	9300	12640	7510	10020	4890
A	1500	13560	11350	10730	8980	12790	7700	10150	5060
B	1500	13650	11530	10790	9110	12740	7640	10110	5010
C	1500	13770	11770	10870	9300	12640	7510	10020	4890
A	1750	12870	10780	10180	8520	12140	7050	9660	4570
B	1750	12960	10940	10240	8650	12090	6990	9610	4510
C	1750	13070	11170	10310	8820	11990	6870	9520	4400
A	2000	12310	10300	9730	8140	11610	6520	9260	4170
B	2000	12380	10460	9770	8260	11560	6460	9210	4110
C	2000	12490	10680	9850	8420	11460	6340	9120	3990

Radial and axial forces for M3FT/ET 315

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT315	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	500	16430	14040	12980	11090	14820	8800	11740	5720
B	500	16550	14300	13050	11280	14680	8680	11600	5610
C	500	16680	14610	13110	11490	14470	8510	11400	5450
D	500	16750	14840	13130	11630	14260	8340	11200	5280
A	1000	16430	14040	12980	11090	14820	8800	11740	5720
B	1000	16550	14300	13050	11280	14680	8680	11600	5610
C	1000	16680	14610	13110	11490	14470	8510	11400	5450
D	1000	16750	14840	13130	11630	14260	8340	11200	5280
A	1500	16430	14040	12980	11090	14820	8800	11740	5720
B	1500	16550	14300	13050	11280	14680	8680	11600	5610
C	1500	16680	14610	13110	11490	14470	8510	11400	5450
D	1500	16750	14840	13130	11630	14260	8340	11200	5280
A	1750	15590	13330	12310	10520	14060	8040	11160	5150
B	1750	15700	13570	12370	10690	13920	7920	11030	5040
C	1750	15810	13850	12420	10880	13710	7750	10830	4880
D	1750	15870	14070	12420	11010	13500	7580	10630	4710

Radial and axial forces for M3FT/ET 355

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT355	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	500	16400	14380	12890	11300	14500	8430	11440	5360
B	500	16440	14500	12900	11370	14390	8330	11330	5270
C	500	16480	14640	12890	11450	14220	8190	11170	5140
A	1000	16400	14380	12890	11300	14500	8430	11440	5360
B	1000	16440	14500	12900	11370	14390	8330	11330	5270
C	1000	16480	14640	12890	11450	14220	8190	11170	5140
A	1500	16400	14380	12890	11300	14500	8430	11440	5360
B	1500	16440	14500	12900	11370	14390	8330	11330	5270
C	1500	16480	14640	12890	11450	14220	8190	11170	5140
A	1750	15550	13640	12210	10710	13740	7670	10870	4790
B	1750	15580	13740	12210	10770	13630	7570	10760	4700
C	1750	15610	13870	12190	10830	13470	7430	10610	4570

Radial and axial forces for M3FT400

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3FT400	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
B	500	19800	17330	15460	13540	17790	8420	14200	4830
C	500	19790	17450	15400	13570	17570	8240	14000	4660
D	500	19670	17500	15170	13490	17170	7900	13620	4350
B	1000	19800	17330	15460	13540	17790	8420	14200	4830
C	1000	19790	17450	15400	13570	17570	8240	14000	4660
D	1000	19670	17500	15170	13490	17170	7900	13620	4350
B	1500	19800	17330	15460	13540	17790	8420	14200	4830
C	1500	19790	17450	15400	13570	17570	8240	14000	4660
D	1500	19670	17500	15170	13490	17170	7900	13620	4350
B	1750	18750	16420	14620	12800	16900	7530	13540	4170
C	1750	18730	16510	14540	12810	16680	7350	13340	4010

Radial and axial forces for M3ET motors with roller bearings

Radial and axial forces for M3ET80

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3ET80	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1500	2924	1085	2645	1085	N/A	N/A	N/A	N/A
B	1500	2912	1081	2663	1081	N/A	N/A	N/A	N/A
C	1500	2890	1072	2698	1072	N/A	N/A	N/A	N/A
A	2000	2925	1085	2401	1085	N/A	N/A	N/A	N/A
B	2000	2914	1081	2417	1081	N/A	N/A	N/A	N/A
C	2000	2892	1073	2448	1073	N/A	N/A	N/A	N/A
A	3000	2645	1086	2094	1086	N/A	N/A	N/A	N/A
B	3000	2663	1082	2108	1082	N/A	N/A	N/A	N/A
C	3000	2698	1075	2135	1075	N/A	N/A	N/A	N/A

Radial and axial forces for M3ET100

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3ET100	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	7877	2942	6242	2942	N/A	N/A	N/A	N/A
B	1000	7862	3101	6227	3101	N/A	N/A	N/A	N/A
C	1000	7939	3104	6285	3104	N/A	N/A	N/A	N/A
D	1000	7996	3023	6328	3023	N/A	N/A	N/A	N/A
E	1000	8041	2670	6361	2670	N/A	N/A	N/A	N/A
A	1500	6875	2943	5447	2943	N/A	N/A	N/A	N/A
B	1500	6860	3102	5432	3102	N/A	N/A	N/A	N/A
C	1500	6925	3106	5481	3106	N/A	N/A	N/A	N/A
D	1500	6974	3024	5516	3024	N/A	N/A	N/A	N/A
E	1500	7011	2671	5543	2671	N/A	N/A	N/A	N/A
A	2000	6242	2943	4944	2943	N/A	N/A	N/A	N/A
B	2000	6227	3102	4929	3102	N/A	N/A	N/A	N/A
C	2000	6285	3108	4973	3108	N/A	N/A	N/A	N/A
D	2000	6328	3025	5003	3025	N/A	N/A	N/A	N/A
E	2000	6361	2672	5027	2672	N/A	N/A	N/A	N/A
A	3000	5447	2944	4313	2944	N/A	N/A	N/A	N/A
B	3000	5432	3103	4298	3103	N/A	N/A	N/A	N/A
C	3000	5481	3110	4334	3110	N/A	N/A	N/A	N/A
D	3000	5516	3028	4359	3028	N/A	N/A	N/A	N/A
E	3000	5543	2675	4378	2675	N/A	N/A	N/A	N/A

Radial and axial forces for M3ET132

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3ET132	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	7060	4141	7060	4141	N/A	N/A	N/A	N/A
B	1000	7060	4136	7060	4136	N/A	N/A	N/A	N/A
C	1000	7060	4119	7060	4119	N/A	N/A	N/A	N/A
D	1000	7060	4088	7060	4088	N/A	N/A	N/A	N/A
E	1000	7060	4050	7060	4050	N/A	N/A	N/A	N/A
A	1500	7060	4142	6435	4142	N/A	N/A	N/A	N/A
B	1500	7060	4139	6412	4139	N/A	N/A	N/A	N/A
C	1500	7060	4120	6446	4120	N/A	N/A	N/A	N/A
D	1500	7060	4089	6488	4089	N/A	N/A	N/A	N/A
E	1500	7060	4060	6510	4060	N/A	N/A	N/A	N/A
A	2000	7060	4142	5837	4142	N/A	N/A	N/A	N/A
B	2000	7060	4139	5815	4139	N/A	N/A	N/A	N/A
C	2000	7060	4121	5843	4121	N/A	N/A	N/A	N/A
D	2000	7060	4092	5878	4092	N/A	N/A	N/A	N/A
E	2000	7060	4060	5893	4060	N/A	N/A	N/A	N/A
A	3000	6435	4143	5086	3950	N/A	N/A	N/A	N/A
B	3000	6412	4142	5064	3932	N/A	N/A	N/A	N/A
C	3000	6446	4126	5086	4024	N/A	N/A	N/A	N/A
D	3000	6488	4100	5111	4100	N/A	N/A	N/A	N/A
E	3000	6510	4075	5119	4075	N/A	N/A	N/A	N/A

Radial and axial forces for M3ET160

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3ET160	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	11529	5768	9992	5768	N/A	N/A	N/A	N/A
B	1000	11529	5740	10044	5740	N/A	N/A	N/A	N/A
C	1000	11529	5708	10094	5708	N/A	N/A	N/A	N/A
D	1000	11529	5666	10122	5666	N/A	N/A	N/A	N/A
A	1500	11021	5774	8700	5774	N/A	N/A	N/A	N/A
B	1500	11082	5748	8741	5748	N/A	N/A	N/A	N/A
C	1500	11143	5708	8777	5708	N/A	N/A	N/A	N/A
D	1500	11179	5683	8794	5683	N/A	N/A	N/A	N/A
A	2000	9992	5778	7884	5778	N/A	N/A	N/A	N/A
B	2000	10044	5754	7917	5754	N/A	N/A	N/A	N/A
C	2000	10094	5723	7945	5723	N/A	N/A	N/A	N/A
D	2000	10122	5696	7955	5696	N/A	N/A	N/A	N/A
A	3000	8700	5787	6858	5572	N/A	N/A	N/A	N/A
B	3000	8741	5766	6882	5683	N/A	N/A	N/A	N/A
C	3000	8777	5741	6899	5741	N/A	N/A	N/A	N/A
D	3000	8794	5722	6901	5722	N/A	N/A	N/A	N/A

Radial and axial forces for M3ET180

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3ET180	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	11390	6515	11390	6515	N/A	N/A	N/A	N/A
B	1000	11390	6489	11390	6489	N/A	N/A	N/A	N/A
C	1000	11390	6461	11390	6461	N/A	N/A	N/A	N/A
A	1500	11390	6521	11390	6521	N/A	N/A	N/A	N/A
B	1500	11390	6492	11390	6492	N/A	N/A	N/A	N/A
C	1500	11390	6467	11390	6467	N/A	N/A	N/A	N/A
A	2000	11390	6530	11390	6530	N/A	N/A	N/A	N/A
B	2000	11390	6503	11390	6503	N/A	N/A	N/A	N/A
C	2000	11390	6483	11390	6483	N/A	N/A	N/A	N/A
A	3000	11390	6537	10622	6537	N/A	N/A	N/A	N/A
B	3000	11390	6517	10660	6517	N/A	N/A	N/A	N/A
C	3000	11390	6502	10672	6502	N/A	N/A	N/A	N/A

Radial and axial forces for M3ET200

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3ET200	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	8750	7380	6930	5850	9790	5990	7840	4040
B	1000	8890	7600	7040	6020	9790	5990	7830	4030
C	1000	9010	7790	7130	6170	9780	5980	7830	4030
A	1500	7630	6440	6040	5100	8570	4770	6940	3140
B	1500	7760	6630	6140	5250	8570	4770	6940	3140
C	1500	7860	6800	6220	5380	8570	4770	6930	3130
A	2000	6930	5850	5490	4630	7840	4040	6380	2580
B	2000	7040	6020	5570	4760	7830	4030	6380	2580
C	2000	7130	6170	5640	4880	7830	4030	6380	2580
A	3000	6040	5100	4560	3850	6940	3140	5700	1900
B	3000	6140	5250	4640	3960	6940	3140	5690	1890
C	3000	6220	5380	4690	4060	6930	3130	5690	1890

Radial and axial forces for M3ET225

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3ET225	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	11380	9790	9020	7750	11430	8510	8990	6070
B	1000	11590	10110	9180	8000	11430	8510	8980	6060
C	1000	11770	10390	9310	8220	11420	8500	8970	6050
A	1500	9930	8540	7870	6760	9920	7000	7850	4930
B	1500	10110	8820	8010	6980	9910	6990	7840	4920
C	1500	10260	9060	8120	7170	9900	6980	7830	4910
A	2000	9020	7750	7140	6140	8990	6070	7140	4220
B	2000	9180	8000	7260	6330	8980	6060	7130	4210
C	2000	9310	8220	7370	6500	8970	6050	7130	4210

Radial and axial forces for M3LT motors with roller bearings

Radial and axial forces for M3LT80

		Max Radial Force (N)				Max Axial Force (N)			
Motor type		20000 h		40000 h		20000 h		40000 h	
M3LT80	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B	1000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C	1000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	1500	2919	1083	2645	1083	N/A	N/A	N/A	N/A
B	1500	2904	1078	2663	1078	N/A	N/A	N/A	N/A
C	1500	2874	1066	2698	1066	N/A	N/A	N/A	N/A
A	2000	2921	1084	2401	1084	N/A	N/A	N/A	N/A
B	2000	2904	1078	2417	1078	N/A	N/A	N/A	N/A
C	2000	2878	1068	2448	1068	N/A	N/A	N/A	N/A
A	3000	2645	1085	2094	1085	N/A	N/A	N/A	N/A
B	3000	2663	1080	2108	1080	N/A	N/A	N/A	N/A
C	3000	2698	1071	2135	1071	N/A	N/A	N/A	N/A

Radial and axial forces for M3LT100

		Max Radial Force (N)				Max Axial Force (N)			
HDP		20000 h		40000 h		20000 h		40000 h	
M3LT100	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	7877	2939	6242	2939	N/A	N/A	N/A	N/A
B	1000	7862	3094	6227	3094	N/A	N/A	N/A	N/A
C	1000	7939	3092	6285	3092	N/A	N/A	N/A	N/A
D	1000	7996	3011	6328	3011	N/A	N/A	N/A	N/A
E	1000	8041	2653	6361	2653	N/A	N/A	N/A	N/A
A	1500	6875	2938	5447	2938	N/A	N/A	N/A	N/A
B	1500	6860	3093	5432	3093	N/A	N/A	N/A	N/A
C	1500	6925	3093	5481	3093	N/A	N/A	N/A	N/A
D	1500	6974	3015	5516	3015	N/A	N/A	N/A	N/A
E	1500	7011	2658	5543	2658	N/A	N/A	N/A	N/A
A	2000	6242	2938	4944	2938	N/A	N/A	N/A	N/A
B	2000	6227	3093	4929	3093	N/A	N/A	N/A	N/A
C	2000	6285	3096	4973	3096	N/A	N/A	N/A	N/A
D	2000	6328	3017	5003	3017	N/A	N/A	N/A	N/A
E	2000	6361	2661	5027	2661	N/A	N/A	N/A	N/A
A	3000	5447	2940	4313	2940	N/A	N/A	N/A	N/A
B	3000	5432	3097	4298	3097	N/A	N/A	N/A	N/A
C	3000	5481	3100	4334	3100	N/A	N/A	N/A	N/A
D	3000	5516	3020	4359	3020	N/A	N/A	N/A	N/A
E	3000	5543	2665	4378	2665	N/A	N/A	N/A	N/A

Radial and axial forces for M3LT132

		Max Radial Force (N)				Max Axial Force (N)			
Motor type		20000 h		40000 h		20000 h		40000 h	
M3LT132	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	7060	4134	7060	4134	N/A	N/A	N/A	N/A
B	1000	7060	4128	7060	4128	N/A	N/A	N/A	N/A
C	1000	7060	4105	7060	4105	N/A	N/A	N/A	N/A
D	1000	7060	4063	7060	4063	N/A	N/A	N/A	N/A
E	1000	7060	4015	7060	4015	N/A	N/A	N/A	N/A
A	1500	7060	4136	6435	4136	N/A	N/A	N/A	N/A
B	1500	7060	4133	6412	4133	N/A	N/A	N/A	N/A
C	1500	7060	4112	6446	4112	N/A	N/A	N/A	N/A
D	1500	7060	4072	6488	4072	N/A	N/A	N/A	N/A
E	1500	7060	4036	6510	4036	N/A	N/A	N/A	N/A

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3LT132	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	2000	7060	4137	5837	4137	N/A	N/A	N/A	N/A
B	2000	7060	4132	5815	4132	N/A	N/A	N/A	N/A
C	2000	7060	4113	5843	4113	N/A	N/A	N/A	N/A
D	2000	7060	4077	5878	4077	N/A	N/A	N/A	N/A
E	2000	7060	4042	5893	4042	N/A	N/A	N/A	N/A
A	3000	6435	4140	5086	3950	N/A	N/A	N/A	N/A
B	3000	6412	4137	5064	3932	N/A	N/A	N/A	N/A
C	3000	6446	4120	5086	4024	N/A	N/A	N/A	N/A
D	3000	6488	4090	5111	4090	N/A	N/A	N/A	N/A
E	3000	6510	4060	5119	4060	N/A	N/A	N/A	N/A

Radial and axial forces for M3LT160

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3LT160	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	11529	5720	9992	5720	N/A	N/A	N/A	N/A
B	1000	11529	5668	10044	5668	N/A	N/A	N/A	N/A
C	1000	11529	5610	10094	5610	N/A	N/A	N/A	N/A
D	1000	11529	5550	10122	5550	N/A	N/A	N/A	N/A
A	1500	11021	5721	8700	5721	N/A	N/A	N/A	N/A
B	1500	11082	5672	8741	5672	N/A	N/A	N/A	N/A
C	1500	11143	5616	8777	5616	N/A	N/A	N/A	N/A
D	1500	11179	5559	8794	5559	N/A	N/A	N/A	N/A
A	2000	9992	5735	7884	5735	N/A	N/A	N/A	N/A
B	2000	10044	5692	7917	5692	N/A	N/A	N/A	N/A
C	2000	10094	5635	7945	5635	N/A	N/A	N/A	N/A
D	2000	10122	5575	7955	5575	N/A	N/A	N/A	N/A
A	3000	8700	5753	6858	5572	N/A	N/A	N/A	N/A
B	3000	8741	5722	6882	5683	N/A	N/A	N/A	N/A
C	3000	8777	5684	6899	5684	N/A	N/A	N/A	N/A
D	3000	8794	5644	6901	5644	N/A	N/A	N/A	N/A

Radial and axial forces for M3LT180

Motor type		Max Radial Force (N)				Max Axial Force (N)			
		20000 h		40000 h		20000 h		40000 h	
M3LT180	RPM	F_{X0}	F_{Xmax}	F_{X0}	F_{Xmax}	F_{AD}	F_{AZ}	F_{AD}	F_{AZ}
A	1000	11390	6491	11390	6491	N/A	N/A	N/A	N/A
B	1000	11390	6446	11390	6446	N/A	N/A	N/A	N/A
C	1000	11390	6400	11390	6400	N/A	N/A	N/A	N/A
A	1500	11390	6495	11390	6495	N/A	N/A	N/A	N/A
B	1500	11390	6451	11390	6451	N/A	N/A	N/A	N/A
C	1500	11390	6406	11390	6406	N/A	N/A	N/A	N/A
A	2000	11390	6509	11390	6509	N/A	N/A	N/A	N/A
B	2000	11390	6469	11390	6469	N/A	N/A	N/A	N/A
C	2000	11390	6436	11390	6436	N/A	N/A	N/A	N/A
A	3000	11390	6525	10622	6525	N/A	N/A	N/A	N/A
B	3000	11390	6497	10660	6497	N/A	N/A	N/A	N/A
C	3000	11390	6475	10672	6475	N/A	N/A	N/A	N/A

Mechanical design
Terminal box

Standard terminal box

Degree of protection and mounting options

The degree of protection for the standard terminal box is IP 55. The terminal box default position can be on the top or the right depending on the type and the frame size. On request it can be mounted in all the other positions, top, left and right.

Turnability

The standard terminal box for all sizes can be turned 4*90°. But note, The terminal block is not possible to turn easily after ordering.

Cable entries

The terminal box is provided with tapped holes for cable glands. No cable glands are included as standard, the entry holes are closed with blanking plugs made of plastic..

Different types of cable glands are available as an option. Please refer to the terminal box alternatives section for more details.

Cable type and terminations If no cable type is specified in the order, it will be a PVC-insulated non-armored cable, and its termination parts are determined as shown in the following table.

Terminations are suitable for copper and aluminum cables. Cables are connected to terminals by cable lugs, which are not included in the delivery.

Ordering

To ensure the delivery of desired terminations for the motor, state the cable type, quantity, size,and outer diameter when ordering. Non-standard designs of terminal boxes, such as non-standard size or higher degree of protection, are available as options.

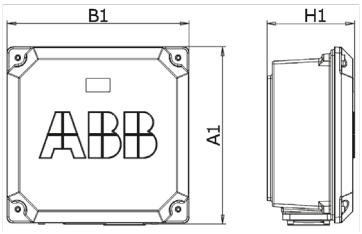
See section Variant codes for all available options.

Terminal box dimensions

For motor sizes 80–132 the terminal box is integrated in motor frame and the dimensions for terminal boxes can be found in the motor dimension drawings in ABB Library.

To match the correct terminal box with motor sizes 160–400, find the motor type and correspondent terminal box type on the previous page. The box types and heir dimensions are presented on this page.

—
01 Terminal box types 32, 184 and 446
—
02 Terminal box types 210 and 370
—
03 Terminal box type 750 + adapter
—
04 Terminal box type 1200 + adapter



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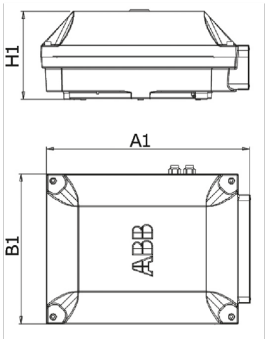

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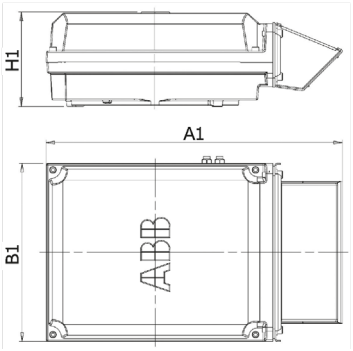

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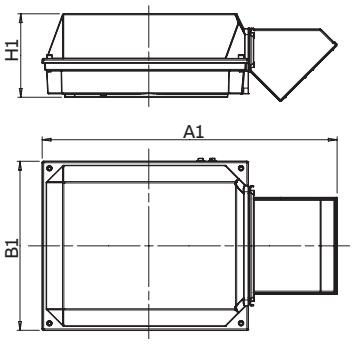
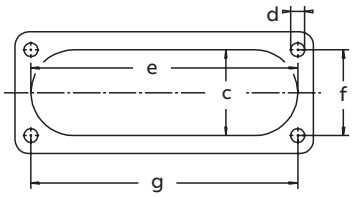


04

Terminal box types	A1	B1	H1	Gland plate opening
32	100	100	52	B
184	170	170	84	C
446	230	230	165	C
210	416	306	177	C
370	451	347	200	D
750 with E-D adapter	686	413	219	D
750 without E-D	523	413	219	E
750 with E-2D adapter	826	413	219	2xD
1200 with E-2D adapter	1000	578	285	2xD
1200 without E-2D adapter	697	578	285	E
1200 with E-2E adapter	1195	578	285	2xE
1200 with E-3D adapter	1250	578	285	3xD

Dimensions for terminal box inlets

Corresponds to motor sizes 160 and above



Flange opening	c mm	e mm	f mm	g mm	d thread type
B	31	120	30	120	M6
C *)	71	194	62	193	M6
C **)	67	193	62	193	M8
D	100	300	80	292	M10
E	115	370	100	360	M12

*) for frame sizes 200–225.
**) for frame size 280.

Note! The C flange is different depending on frame size

Cable glands

The motors are delivered as standard with plugged cable entries or cable sealing units as described in the previous section. There is available a broad selection of different type of cable glands, which are suitable for different types of cable and outer diameter ranges.

Size of threaded opening for cable gland	Cable gland(s) nickel plated brass, variant code 230 or 731	EMC Cable gland(s) nickelplated brass, variant code 704	Cable gland(s) plastic, variant code 375 or 376
	Cable outer diameter, mm	Cable outer diameter, mm	Cable outer diameter, mm
M16 x 1.5	4–12	4–8	4–12
M20 x 1.5	4–12	4–12	4–12
M25 x 1.5	10–18	10–18	10–18
M32 x 1.5	14–24	14–24	14–24
M40 x 1.5	22–32	22–32	22–32
M50 x 1.5	26–35	26–35	26–35
M63 x 1.5 *)	35–45	35–45	35–45
M75 x 1.5	46–62	46–62	not available

Threaded openings for cable glands with NPT thread (variant code 730)

The standard delivery for the motors are provided with openings for cable glands with metric threads as listed in the section describing the standard terminal box. If NPT threads will be needed, the variant code 730 is to be ordered. If nothing else is stated on the order, the sizes in tables below will be delivered.

Motor frame size	Main cable entries	NPT plug
80–100	1 x ¾”	–
132	2 x ¾”	1 x ¾”
160–180	2 x 1 ¼”	1 x 1 ¼”
200–250	2 x 1 ½”	1 x 1 ½”
280	2 x 2”	1 x 2”
315–400	2 x 3”	1 x 3”

Motor frame size	Cable entries for auxiliaries	NPT plug
80–100	2 x ¾”	2 x ¾”
132	1 x ¾”	1 x ¾”
160–400	2 x ¾”	2 x ¾”

Gland plates with threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands is not suitable then nonstandard size openings are also available, either by fitting the reducers to make the openings smaller or by increasing the amount or size of holes. The maximum possible size and amount for each gland plate size is listed below. Threaded openings of non-standard size can be ordered by using variant codes 554 and 727.

Gland plate size	Maximum amount and size of threaded holes
B	2 x M40
C	2 x M63
D	2 x M90 or 3 x M75
E	2 x M90 or 4 x M75

Terminal box types

Terminal boxes for M3FT motors

Motors size	Pole number	Terminal box type	Size of gland plate opening on terminal box	45° angle adaper	Amount and size of threaded plugged holes or cable sealing end unit	Max. Connectable core cross section mm²/phase	Number and size of terminal bolts
80	4	32	-	-	-	2 x 2.5	3 x M5
100	4	184	B	-	-	2 x 35	3 x M8
132	4	184	B	-	-	2 x 35	3 x M8
160	4	446	C	-	-	2 x 70	3 x M12
180	4	446	C	-	-	2 x 70	3 x M12
200	4	370	D	-	-	2 x 240	6 x M12
225	4	750	E	-	-	4 x 240	6 x M12
250	4	750	E	-	-	4 x 240	6 x M12
280	4	750	E	-	-	4 x 240	6 x M12
315	4	750	E	-	-	4 x 240	6 x M12
355	4	1200	E	-	-	6 x 240	6 x M12
400	4	1200	E	-	-	6 x 240	6 x M12
Auxilary cable entries							
280-400	4				2 x M20 x 1,5		

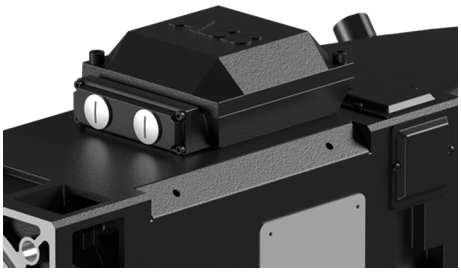
Terminal boxes for M3ET motors

Motor size	Pole number	Terminal box type	Size of gland plate opening on terminal box	45° angle adaper	Amount and size of threaded plugged holes or cable sealing end unit	Max. Connectable core cross section mm²/phase	Number and size of terminal bolts
IE2 and IE3 motors							
80	4	32	-	-	-	2 x 2.5	3 x M5
100	4	184	B	-	-	2 x 35	3 x M8
132	4	184	B	-	-	2 x 35	3 x M8
160	4	446	C	-	-	2 x 70	3 x M12
180	4	446	C	-	-	2 x 70	3 x M12
200	4	210	C	-	-	2 x 150	6 x M12
225	4	370	D	-	-	2 x 240	6 x M12
250	4	370	D	-	-	2 x 240	6 x M12
280	4	750	E	-	-	4 x 240	6 x M12
315	4	750	E	-	-	4 x 240	6 x M12
355	4	1200	E	-	-	6 x 240	6 x M12
400	4	1200	E	-	-	6 x 240	6 x M12
Auxilary cable entries							
200-225	4				2 x M20 x 1,5		
280-400	4				2 x M20 x 1,5		

Terminal boxes for M3LT motors

Motor size	Pole number	Terminal box type	Size of gland plate opening on terminal box	45° angle adaper	Amount and size of threaded plugged holes or cable sealing end unit	Max. Connectable core cross section mm²/phase	Number and size of terminal bolts
IE2 and IE3 motors							
80	4	32	-	-	-	2 x 2.5	3 x M5
100	4	184	B	-	-	2 x 35	3 x M8
132	4	184	B	-	-	2 x 35	3 x M8
160	4	446	C	-	-	2 x 70	3 x M12
180	4	446	C	-	-	2 x 70	3 x M12

Terminal boxes



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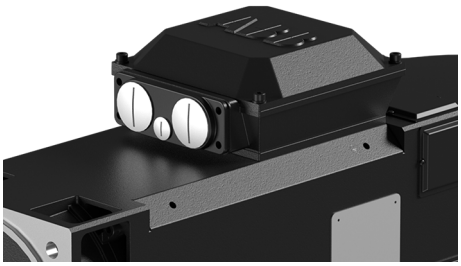

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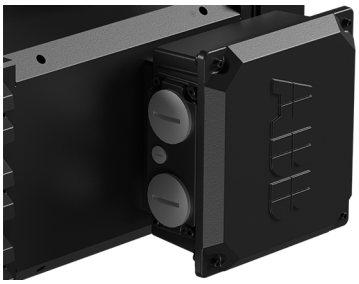

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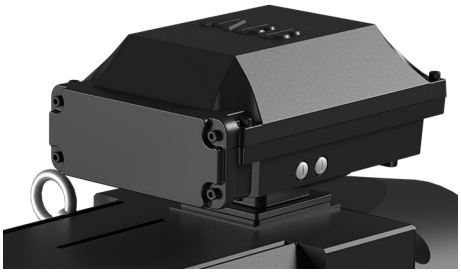

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05 Terminal box type 32. Connection flanges with tapped cable entries
—
06 Terminal box type 184. Connection flanges with tapped cable entries
—
07 Terminal box type 446. Connection flanges with tapped cable entries
—
08 Terminal box type 210
—
09 Terminal box type 370
—
10 Terminal box type 750
—
11 Terminal box type 1200

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12 Main terminal boxes for HDP 160 frame motors (motor types from left: M3ET, M3FT, M3LT)

Terminal box alternatives

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12

Adapters

There is a broad selection of cable termination accessories available to allow termination of one or several cables. The most common ones are explained below.

How to order

- Check first that the teminal box itself allows mounting of the desired cable and cores (refer to motor type and terminal box type cross reference on previous page)
- If very large cables are used it might be necessary to use a larger terminal box than standard. Select the right cable gland(s) or cable sealing end unit(s) that match outer diamater of the cable(s)
- Select appropriate adapter or flange
- Note that turning the terminal box to a non-standard position might limit the use of some adapters.

Ordering example

Motor Cables	2 pieces, outer diameter 58 mm, single core cross section 185 mm^2, clamping device needed, cables coming from below
Motor type	195 kW, 400 V & 50 Hz, M3FT 200A B3, 4 poles
Adapter	D-D - variant code 293
Cable sealing end unit	Variant code 278
Clamping	Variant code 231
Auxiliaries	Variant codes 380, 567, 568

—
13 Adapters, Flange with glands; cable sealing end units

—
13

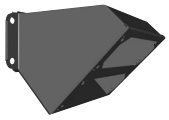
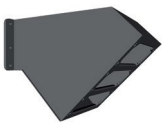
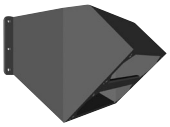
Main terminal box and maximum single core cross-section

You can select one size larger than standard terminal box if a larger single cross-section is needed. The standard sizes of the main terminal box are listed in the following table. The terminal box is named according to its current-carrying capacity, from 120 to 1200. Check also the capacity of the cable entry to make sure that the cables fit. A larger terminal box can be ordered with variant code 019.

Standard terminal box	Large terminal box	Size of opening, large box	Max single cross-section mm² /phase
120	210	B	1 x 70
210	370	C	2 x 240
370	750	D	2 x 300
750	1200	E	4 x 500
1200	–	–	–

Optional adapters

To allow easy termination of cables entering the terminal box from above or below, an angle adapter is recommended. These are available for motor sizes 280 and above and can also be used to allow the mounting of several cable sealing end units or gland plates. For exact suitability on a certain motor size, refer to the ‘terminal box opening’ column in section Standard terminal box.

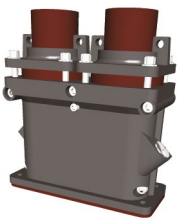
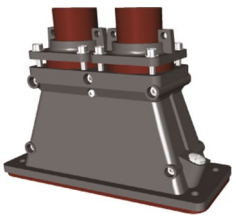
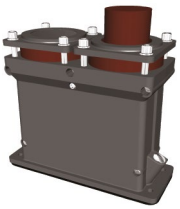
Adapter						
Variant code	292	293	294	295	296	444
Opening to terminal box	C	D	E	E	E	E
Flange or opening for end unit	C	D	D	2 x D	3 x D	2 x E
Material	Cast iron	Cast iron	Cast iron	Steel	Steel	Steel
Notes					Only possible on type 1200 terminal box.	Only possible on type 1200 terminal box.

Cable sealing end units

As an alternative to flanges and cable glands, cable sealing end units can be used. These allow more space for spreading the cores for easy termination.

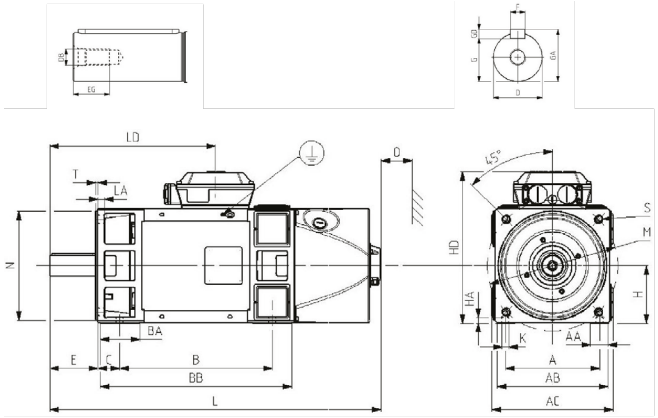
Cable sealing end units have rubber-sealed entries for one of two main cables. In addition, there are two plugged M20 holes for auxiliary cables.

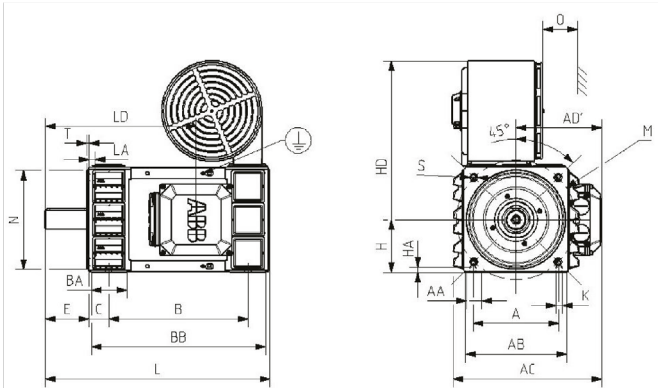
Please note that the table below is only for guidance. Due to the large amount of combinations possible between terminal box sizes , end units and adapters, not all possible combinations can be described. Please contact your ABB sales office for more detailed information.

	Small	**Medium**	**Large**
End unit			
Variant code	277	278	279
Opening to terminal box or to adapter	C	D	D
Cable outer diameter	1–2 cables, 48–60 mm	1–2 cables, 48–60 mm	1–2 cables, 60–80 mm
Cable entry for auxiliary cable	2 x M20 plugged holes	2 x M20 plugged holes	2 x M20 plugged holes
Additional optional variants	EMC cable gland (704)	EMC cable gland (704)	EMC cable gland (704)

Dimension drawings

High Dynamic Performance motors, sizes 80-180





Motor size	Poles	Foot-mounted: IM B3 (IM 1001)																							
		A	AA	AB	AC	AD	B	BA	BB	C	D	DB	GD	E	EG	F	G	GA	H	HA	HD	HD'	K	L	LA	LD
M3ET 80 A	4	125	26	147	173	87	197	56	259	38	24	M8	7	50	19	8	20	27	80	9	210		10	511	13	205
M3ET 80 B	4	125	26	147	173	87	212	56	274	38	24	M8	7	50	19	8	20	27	80	9	210		10	526	13	220
M3ET 80 C	4	125	26	147	173	87	247	56	309	38	24	M8	7	50	19	8	20	27	80	9	210		10	561	13	255
M3LT 80 A	4	125	27	147	166	87	197	57	259	38	24	M8	7	50	19	8	20	27	80	9	210		10	327	13	205
M3LT 80 B	4	125	27	147	166	87	212	57	274	38	24	M8	7	50	19	8	20	27	80	9	210		10	342	13	220
M3LT 80 C	4	125	27	147	166	87	247	57	309	38	24	M8	7	50	19	8	20	27	80	9	210		10	377	13	255
M3FT 100 A	4	160	30	188	305	183	282	68.5	363	40	38	M12	8	80	36	10	33	41	100	8.5	462		12	446	12.25	275
M3FT 100 B	4	160	30	188	305	183	282	68.5	363	40	38	M12	8	80	36	10	33	41	100	8.5	462		12	446	12.25	275
M3FT 100 C	4	160	30	188	305	183	322	68.5	403	40	38	M12	8	80	36	10	33	41	100	8.5	462		12	486	12.25	315
M3FT 100 D	4	160	30	188	305	183	362	68.5	443	40	38	M12	8	80	36	10	33	41	100	8.5	462		12	526	12.25	355
M3FT 100 E	4	160	30	188	305	183	402	68.5	483	40	38	M12	8	80	36	10	33	41	100	8.5	462		12	566	12.25	395
M3ET 100 A	4	160	30	188	209	104.5	282	68.5	363	40	38	M12	8	80	36	10	33	41	100	8.5	283		12	630	12.25	275
M3ET 100 B	4	160	30	188	209	104.5	282	68.5	363	40	38	M12	8	80	36	10	33	41	100	8.5	283		12	630	12.25	275
M3ET 100 C	4	160	30	188	209	104.5	322	68.5	403	40	38	M12	8	80	36	10	33	41	100	8.5	283		12	670	12.25	315
M3ET 100 D	4	160	30	188	209	104.5	362	68.5	443	40	38	M12	8	80	36	10	33	41	100	8.5	283		12	710	12.25	355
M3ET 100 E	4	160	30	188	209	104.5	402	68.5	483	40	38	M12	8	80	36	10	33	41	100	8.5	283		12	750	12.25	395
M3LT 100 A	4	160	30	188	198	99	282	68.5	363	40	38	M12	8	80	36	10	33	41	100	8.5	283		12	446	12.25	275
M3LT 100 B	4	160	30	188	198	99	282	68.5	363	40	38	M12	8	80	36	10	33	41	100	8.5	283		12	446	12.25	275
M3LT 100 C	4	160	30	188	198	99	322	68.5	403	40	38	M12	8	80	36	10	33	41	100	8.5	283		12	486	12.25	315
M3LT 100 D	4	160	30	188	198	99	362	68.5	443	40	38	M12	8	80	36	10	33	41	100	8.5	283		12	526	12.25	355
M3LT 100 E	4	160	30	188	198	99	402	68.5	483	40	38	M12	8	80	36	10	33	41	100	8.5	283		12	566	12.25	395
M3FT 132 A	4	216	40	254	374	215	316	90	404	50	48	M16	9	110	36	14	42.5	51.5	132	13	532		16	531	15.5	345
M3FT 132 B	4	216	40	254	374	215	316	90	404	50	48	M16	9	110	36	14	42.5	51.5	132	13	532		16	531	15.5	345
M3FT 132 C	4	216	40	254	374	215	351	90	439	50	48	M16	9	110	36	14	42.5	51.5	132	13	532		16	566	15.5	380
M3FT 132 D	4	216	40	254	374	215	421	90	509	50	48	M16	9	110	36	14	42.5	51.5	132	13	532		16	636	15.5	450
M3FT 132 E	4	216	40	254	374	215	491	90	579	50	48	M16	9	110	36	14	42.5	51.5	132	13	532		16	706	15.5	520
M3ET 132 A	4	216	40	254	278	139	316	90	404	50	48	M16	9	110	36	14	42.5	51.5	132	13.5	347		16	724	15.5	345
M3ET 132 B	4	216	40	254	278	139	316	90	404	50	48	M16	9	110	36	14	42.5	51.5	132	13.5	347		16	724	15.5	345
M3ET 132 C	4	216	40	254	278	139	351	90	439	50	48	M16	9	110	36	14	42.5	51.5	132	13.5	347		16	759	15.5	380
M3ET 132 D	4	216	40	254	278	139	421	90	509	50	48	M16	9	110	36	14	42.5	51.5	132	13.5	347		16	829	15.5	450
M3ET 132 E	4	216	40	254	278	139	491	90	579	50	48	M16	9	110	36	14	42.5	51.5	132	13.5	347		16	899	15.5	520
M3LT 132 A	4	216	40	254	262	131	316	90	404	50	48	M16	9	110	36	14	42.5	51.5	132	13	347		16	531	15.5	345
M3LT 132 B	4	216	40	254	262	131	316	90	404	50	48	M16	9	110	36	14	42.5	51.5	132	13	347		16	531	15.5	345
M3LT 132 C	4	216	40	254	262	131	351	90	439	50	48	M16	9	110	36	14	42.5	51.5	132	13	347		16	566	15.5	380
M3FT 132 D	4	216	40	254	262	131	421	90	509	50	48	M16	9	110	36	14	42.5	51.5	132	13	347		16	639	15.5	450

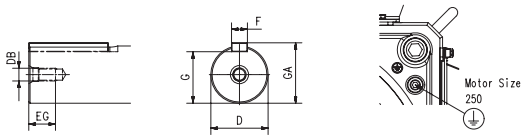
Motor size	Poles	Foot-mounted: IM B3 (IM 1001)																							
		A	AA	AB	AC	AD	B	BA	BB	C	D	DB	GD	E	EG	F	G	GA	H	HA	HD	HD'	K	L	LA	LD
M3FT 132 E	4	216	40	254	262	131	491	90	579	50	48	M16	9	110	36	14	42.5	51.5	132	13	347		16	706	15.5	520
M3FT 160 A	4	254	50	300	514	323	393	100	493	64	55	M16	10	110	36	16	49	59	160	16	702		18	636	17.5	418
M3FT 160 B	4	254	50	300	514	323	438	100	538	64	55	M16	10	110	36	16	49	59	160	16	702		18	681	17.5	463
M3FT 160 C	4	254	50	300	514	323	503	100	603	64	55	M16	10	110	36	16	49	59	160	16	702		18	746	17.5	528
M3FT 160 D	4	254	50	300	514	323	568	100	668	64	55	M16	10	110	36	16	49	59	160	16	702		18	811	17.5	593
M3ET 160 A	4	254	50	300	332	166	393	100	493	64	55	M16	10	110	36	16	49	59	160	16	483		18	829	17.5	420
M3ET 160 B	4	254	50	300	332	166	438	100	538	64	55	M16	10	110	36	16	49	59	160	16	483		18	874	17.5	465
M3ET 160 C	4	254	50	300	332	166	503	100	603	64	55	M16	10	110	36	16	49	59	160	16	483		18	939	17.5	530
M3ET 160 D	4	254	50	300	332	166	568	100	668	64	55	M16	10	110	36	16	49	59	160	16	483		18	1004	17.5	595
M3LT 160 A	4	254	50	300	316	158	393	100	493	64	55	M16	10	110	36	16	49	59	160	16	483		18	636	17.5	420
M3LT 160 B	4	254	50	300	316	158	438	100	538	64	55	M16	10	110	36	16	49	59	160	16	483		18	681	17.5	465
M3LT 160 C	4	254	50	300	316	158	503	100	603	64	55	M16	10	110	36	16	49	59	160	16	483		18	746	17.5	530
M3LT 160 D	4	254	50	300	316	158	568	100	668	64	55	M16	10	110	36	16	49	59	160	16	483		18	811	17.5	595
M3FT 180 A	4	279	100	336	552	342	492	155	703	121	65	M20	11	140	42	18	59	70	180	16.5	767		19	877	24.5	604
M3FT 180 B	4	279	100	336	552	342	572	155	783	121	65	M20	11	140	42	18	59	70	180	16.5	767		19	957	24.5	684
M3FT 180 C	4	279	100	336	552	342	652	155	863	121	65	M20	11	140	42	18	59	70	180	16.5	767		19	1037	24.5	764
M3ET 180 A	4	279	100	336	370	185	492	155	703	121	65	M20	11	140	42	18	59	70	180	16.5	522		19	1102	24.5	606
M3ET 180 B	4	279	100	336	370	185	572	155	783	121	65	M20	11	140	42	18	59	70	180	16.5	522		19	1182	24.5	686
M3ET 180 C	4	279	100	336	370	185	652	155	863	121	65	M20	11	140	42	18	59	70	180	16.5	522		19	1262	24.5	766
M3LT 180 A	4	279	100	336	354	177	492	155	703	121	65	M20	11	140	42	18	59	70	180	16.5	522		19	879	24.5	606
M3LT 180 B	4	279	100	336	354	177	572	155	783	121	65	M20	11	140	42	18	59	70	180	16.5	522		19	959	24.5	686
M3LT 180 C	4	279	100	336	354	177	652	155	863	121	65	M20	11	140	42	18	59	70	180	16.5	522		19	1039	24.5	766

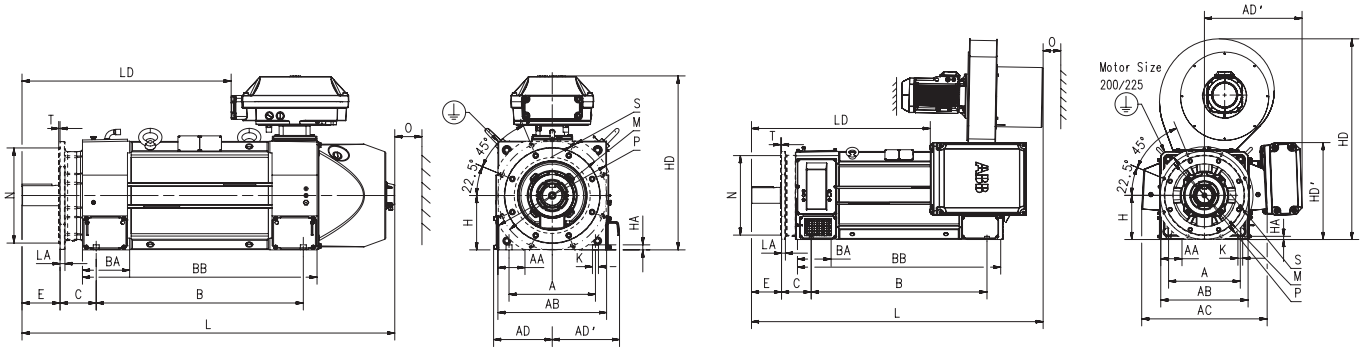
Motor size	Poles	Foot- and flande-mounted: IM B35 (IM 2001)					
		M	N	O	P	S	T
M3ET 80 A	4	165	130	100	N/A	12	3.5
M3ET 80 B	4	165	130	100	N/A	12	3.5
M3ET 80 C	4	165	130	100	N/A	12	3.5
M3LT 80 A	4	165	130	N/A	N/A	12	3.5
M3LT 80 B	4	165	130	N/A	N/A	12	3.5
M3LT 80 C	4	165	130	N/A	N/A	12	3.5
M3FT 100 A	4	215	180	100	N/A	14.5	4
M3FT 100 B	4	215	180	100	N/A	14.5	4
M3FT 100 C	4	215	180	100	N/A	14.5	4
M3FT 100 D	4	215	180	100	N/A	14.5	4
M3FT 100 E	4	215	180	100	N/A	14.5	4
M3ET 100 A	4	215	180	100	N/A	14.5	4
M3ET 100 B	4	215	180	100	N/A	14.5	4
M3ET 100 C	4	215	180	100	N/A	14.5	4
M3ET 100 D	4	215	180	100	N/A	14.5	4
M3ET 100 E	4	215	180	100	N/A	14.5	4
M3LT 100 A	4	215	180	N/A	N/A	14.5	4
M3LT 100 B	4	215	180	N/A	N/A	14.5	4
M3LT 100 C	4	215	180	N/A	N/A	14.5	4
M3LT 100 D	4	215	180	N/A	N/A	14.5	4
M3LT 100 E	4	215	180	N/A	N/A	14.5	4
M3FT 132 A	4	300	250	100	N/A	18.5	5
M3FT 132 B	4	300	250	100	N/A	18.5	5
M3FT 132 C	4	300	250	100	N/A	18.5	5
M3FT 132 D	4	300	250	100	N/A	18.5	5
M3FT 132 E	4	300	250	100	N/A	18.5	5
M3ET 132 A	4	300	250	100	N/A	18.5	5
M3ET 132 B	4	300	250	100	N/A	18.5	5
M3ET 132 C	4	300	250	100	N/A	18.5	5
M3ET 132 D	4	300	250	100	N/A	18.5	5
M3ET 132 E	4	300	250	100	N/A	18.5	5
M3LT 132 A	4	300	250	100	N/A	18.5	5
M3LT 132 B	4	300	250	100	N/A	18.5	5
M3LT 132 C	4	300	250	100	N/A	18.5	5
M3FT 132 D	4	300	250	100	N/A	18.5	5
M3FT 132 E	4	300	250	100	N/A	18.5	5
M3FT 160 A	4	350	300	100	N/A	18.5	5
M3FT 160 B	4	350	300	100	N/A	18.5	5
M3FT 160 C	4	350	300	100	N/A	18.5	5
M3FT 160 D	4	350	300	100	N/A	18.5	5
M3ET 160 A	4	350	300	100	N/A	18.5	5
M3ET 160 B	4	350	300	100	N/A	18.5	5
M3ET 160 C	4	350	300	100	N/A	18.5	5
M3ET 160 D	4	350	300	100	N/A	18.5	5
M3LT 160 A	4	350	300	100	N/A	18.5	5
M3LT 160 B	4	350	300	100	N/A	18.5	5
M3LT 160 C	4	350	300	100	N/A	18.5	5
M3LT 160 D	4	350	300	100	N/A	18.5	5
M3FT 180 A	4	350	300	100	N/A	18.5	5
M3FT 180 B	4	350	300	100	N/A	18.5	5
M3FT 180 C	4	350	300	100	N/A	18.5	5
M3ET 180 A	4	350	300	100	N/A	18.5	5
M3ET 180 B	4	350	300	100	N/A	18.5	5
M3ET 180 C	4	350	300	100	N/A	18.5	5
M3LT 180 A	4	350	300	100	N/A	18.5	5
M3LT 180 B	4	350	300	100	N/A	18.5	5
M3LT 180 C	4	350	300	100	N/A	18.5	5

Tolerances:	
A, B	± 0.8
D	ISO m6
F	ISO h9
H	+0 -1.0
N	ISO j6 (280)
	ISO js6 (315-400)
C	± 0.8

Dimension drawings

High Dynamic Performance motors, sizes 200-250





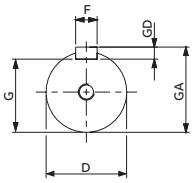
Motor size	Poles	Foot-mounted: IM B3 (IM 1001)																							
		A	AA	AB	AC	AD	B	BA	BB	C	D	DB	GD	E	EG	F	G	GA	H	HA	HD	HD'	K	L	LA	LD
M3FT 200 A	4	318	87	399	544	463	688	190	824	133	75	M20	NA	140	42	20	67.5	79.5	200	16	1038	448	22	1274	NA	657
M3FT 200 B	4	318	87	399	544	463	758	190	894	133	75	M20	NA	140	42	20	67.5	79.5	200	16	1038	448	22	1344	NA	727
M3FT 200 C	4	318	87	399	544	463	828	190	964	133	75	M20	NA	140	42	20	67.5	79.5	200	16	1038	448	22	1414	NA	797
M3ET200 A	4	318	100	400	216	248	622	174	723	133	75	M20	NA	140	42	20	67.5	79.5	200	18.5	640	NA	22	1232	NA	630
M3ET200 B	4	318	100	400	216	248	692	174	793	133	75	M20	NA	140	42	20	67.5	79.5	200	18.5	640	NA	22	1302	NA	700
M3ET200 C	4	318	100	400	216	248	762	174	863	133	75	M20	NA	140	42	20	67.5	79.5	200	18.5	640	NA	22	1372	NA	770
M3FT 225 A	4	356	125	439	575	497	761	220	899	149	75	M20	NA	140	42	20	67.5	79.5	225	21	1083	453	18.5	1344	NA	743
M3FT 225 B	4	356	125	439	575	497	856	220	994	149	75	M20	NA	140	42	20	67.5	79.5	225	21	1083	453	18.5	1439	NA	838
M3FT 225 C	4	356	125	439	575	497	956	220	1094	149	75	M20	NA	140	42	20	67.5	79.5	225	21	1073	453	18.5	1539	NA	938
M3ET 225 A	4	356	125	440	236	248	701	196	803	149	75	M20	NA	140	42	20	67.5	79.5	225	20	709	709	18.5	1356	22	692
M3ET 225 B	4	356	125	440	236	248	796	196	898	149	75	M20	NA	140	42	20	67.5	79.5	225	20	709	709	18.5	1451	22	787
M3ET 225 C	4	356	125	440	236	248	896	196	998	149	75	M20	NA	140	42	20	67.5	79.5	225	20	709	709	18.5	1551	22	887
M3FT/ET 250 A	4	406	116	496	905.5	552	755	190	910	168	90	M20	14	170	42	25	81	95	250	18	928	696	27	1316	22	761
M3FT/ET 250 B	4	406	116	496	905.5	552	895	190	1050	168	90	M20	14	170	42	25	81	95	250	18	928	696	27	1456	22	901
M3FT/ET 250 C	4	406	116	496	905.5	552	995	190	1150	168	90	M20	14	170	42	25	81	95	250	18	928	696	27	1556	22	1001

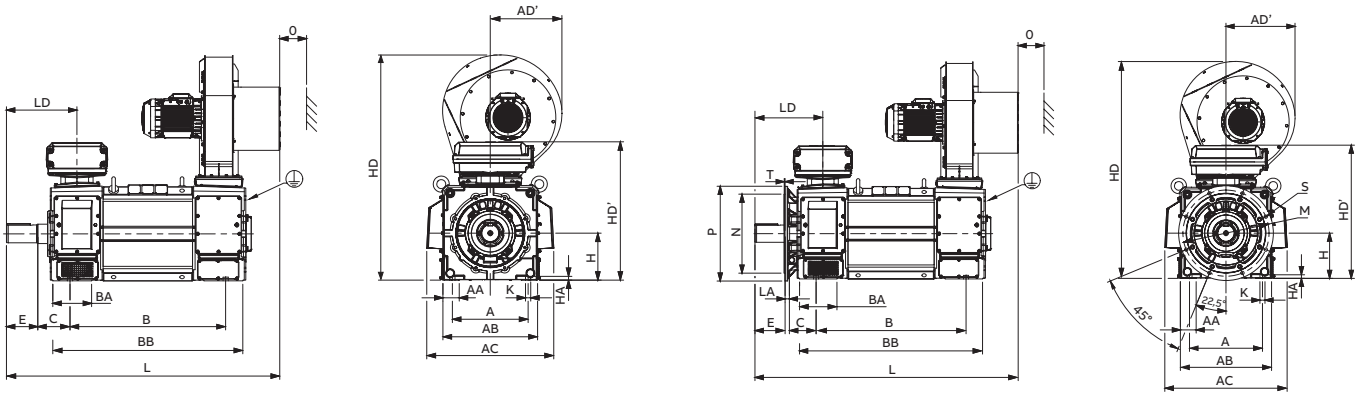
Motor size	Poles	Foot- and flande-mounted: IM B35 (IM 2001)					
		M	N	O	P	S	T
M3FT/ET 200 A	4	400	350	100	450	18.5	5
M3FT/ET 200 B	4	400	350	100	450	18.5	5
M3FT/ET 200 C	4	400	350	100	450	18.5	5
M3FT/ET 225 A	4	500	450	100	550	18.5	5
M3FT/ET 225 B	4	500	450	100	550	18.5	5
M3FT/ET 225 C	4	500	450	100	550	18.5	5
M3FT/ET 250 A	4	500	450	100	550	18.5	5
M3FT/ET 250 B	4	500	450	100	550	18.5	5
M3FT/ET 250 C	4	500	450	100	550	18.5	5

Tolerances:	
A, B	± 0.8
D	ISO m6
F	ISO h9
H	+0 -1.0
N	ISO j6 (280)
	ISO js6 (315-400)
C	± 0.8

Dimension drawings

High Dynamic Performance motors, sizes 280-400





Motor size	Poles	Foot-mounted: IM B3 (IM 1001)												Foot- and flande-mounted: IM B35 (IM 2001)					
		A	B	BB	C	D	E	F	GA	H	HD	HD'	K	L	M	N	O	P	S	T
M3ET/FT 280 A	4	457	834	1014	190	100	210	28	106	280	1445	863	28	1610	500	450	180	550	18	5
M3ET/FT 280 B	4	457	894	1074	190	100	210	28	106	280	1445	863	28	1670	500	450	180	550	18	5
M3ET/FT 280 C	4	457	994	1174	190	100	210	28	106	280	1445	863	28	1770	500	450	180	550	18	5
M3ET/FT 315 A	4	508	944	1174	216	120	210	32	127	315	1510	928	35	1733	600	550	180	660	23	6
M3ET/FT 315 B	4	508	1044	1274	216	120	210	32	127	315	1510	928	35	1833	600	550	180	660	23	6
M3ET/FT 315 C	4	508	1194	1424	216	120	210	32	127	315	1510	928	35	1983	600	550	180	660	23	6
M3ET/FT 315 D	4	508	1344	1574	216	120	210	32	127	315	1510	928	35	2133	600	550	180	660	23	6
M3ET/FT 355 A	4	610	1154	1414	254	120	210	32	127	355	1682	1085	35	1993	740	680	180	800	23	6
M3ET/FT 355 B	4	610	1224	1484	254	120	210	32	127	355	1682	1085	35	2063	740	680	180	800	23	6
M3ET/FT 355 C	4	610	1324	1584	254	120	210	32	127	355	1682	1085	35	2163	740	680	180	800	23	6
M3FT 400 B	4	686	1366	1684	280	140	250	36	148	400	1748	1187	42	2256	940	880	180	1000	28	6
M3FT 400 C	4	686	1466	1784	280	140	250	36	148	400	1748	1187	42	2356	940	880	180	1000	28	6
M3FT 400 D	4	686	1616	1934	280	140	250	36	148	400	1748	1187	42	2506	940	880	180	1000	28	6

Tolerances:	
A, B	± 0.8
D	ISO m6
F	ISO h9
H	+0 -1.0
N	ISO j6 (280)
	ISO js6 (315-400)
C	± 0.8

Motors in brief

High Dynamic Performance motors, IP55 (M3ET) series

Motor size		80	100	132	160	180	200	225	250	280	315	355
Stator	Material	Extruded aluminum frame					Electrical steel, steel					
	Paint colour shade	RAL 9005/ Jet black										
End-shields	Material	LPDC Aluminum				Cast iron						
	Paint colour shade	RAL 9005/ Jet black										
Feet		Integrated in end shields										
Bearings	D-end	6305-2Z/ C3	6308-2Z/ C3	6310-2Z/ C3	6312-2Z/ C3	6314-2Z/ C3	6315/ C3	6319/ C3	6322/ C3	6322/ C3	6326M/C3	
	N-end	6305-2Z/ C3	6308-2Z/ C3	6310-2Z/ C3	6312-2Z/ C3	6314-2Z/ C3	6314/ C3VL0241	6316/ C3VL0241	6319/ C3VL0241	6316/ C3VL0241	6322/C3VL0241	
Axially-locked bearings	Inner bearing cover	As standard, locked ad D-end. Floating N-end.										
Bearing seal	D-end	Gamma ring as standard					Labyrinth seal					
	N-end	Gamma ring as standard					Labyrinth seal					
Lubrication		2Z/ZZ permanently lubricated bearings					Regreasable bearings, regreasing nipples, M10x1					
Rating plate	Material	Stainless steel										
Terminal box	Frame material	Die cast aluminum				Cast iron						
	Cover material	Die cast aluminum			Cast iron							
	Cover screws material	Steel 8.8, zinc electroplated										
Connections	Cable-entries	Blind flange										
	Terminals	3 terminals for connection with cable lugs					6 terminals for connection with cable lugs					
Fan cover	Material	Steel										
	Paint colour shade	RAL 9005/ Jet black										
Stator winding	Material	Copper										
	Insulation	Insulation class H										
	Winding protection	3 PTC thermistors as standard 150 °C					3 PTC thermistors as standard 170 °C					
Rotor winding	Material	Presure die-cast aluminum										
Balancing		Half-key balancing as standard										
Key ways		Closed keyways					Open keyways					
Drain holes							B3 none and B35 STD					
External earthing bolt		M6	M8	M10	M16		M10x1			M10x25		
Enclosure		IP 55										
Cooling method		IC416							IC06			

Motors in brief

High Dynamic Performance motors, IP23 (M3FT) series

Motor size		100	132	160	180	200	225	250	280	315	355	400
Stator	Material	Extruded aluminum frame				Electrical steel, steel						
	Paint colour shade	RAL 9005/ Jet black										
End-shields	Material	LPDC Aluminum			Cast iron							
	Paint colour shade	RAL 9005/ Jet black										
Feet		Integrated in end shields										
Bearings	D-end	6308-2Z/ C3	6310-2Z/ C3	6312-2Z/ C3	6314-2Z/ C3	6315/ C3	6319/ C3	6322/ C3	6322/ C3	6326M/ C3		6330M/ C3
	N-end	6308-2Z/ C3	6310-2Z/ C3	6312-2Z/ C3	6314-2Z/ C3	6314/ C3VL0241	6316/ C3VL0241	6319/ C3VL0241	6316/ C3VL0241	6322/ C3VL0241		6326M/ C4VL0241
Axially-locked bearings	Inner bearing cover	As standard, locked ad D-end. Floating ND-end.										
Bearing seal	D-end	Gamma ring as standard				Labyrinth seal						
	N-end	Gamma ring as standard				Labyrinth seal						
Lubrication		2Z/ZZ permanently lubricated bearings				Regreasable bearings, regreasing nipples, M10x1						
Rating plate	Material	Stainless steel										
Terminal box	Frame material	Die cast aluminum			Cast iron							
	Cover material	Die cast aluminum		Cast iron								
	Cover screws material	Steel 8.8, zinc electroplated										
Connections	Cable-entries	Blind flange										
	Terminals	3 terminals for connection with cable lugs				6 terminals for connection with cable lugs						
Fan cover	Material	Steel										
	Paint colour shade	RAL 9005/ Jet black										
Stator winding	Material	Copper										
	Insulation	Insulation class H										
	Winding protection	3 PTC thermistors as standard 150 °C				3 PTC thermistors as standard 170 °C						
Rotor winding	Material	Presure die-cast aluminum										
Balancing		Half-key balancing as standard										
Key ways		Closed keyways				Open keyways						
Drain holes						B3 none and B35 STD						
External earthing bolt		M8	M10	M16	M16	M10x1			M10x25			
Enclosure		IP 23										
Cooling method		IC06										

Motors in brief

High Dynamic Performance motors, IP55 liquid-cooled (M3LT) series

Motor size		80	100	132	160	180
Stator	Material	Extruded aluminum frame				
	Paint colour shade	RAL 9005/ Jet black				
End-shields	Material	LPDC Aluminum				Cast iron
	Paint colour shade	RAL 9005/ Jet black				
Feet		Integrated in end shields				
Bearings	D-end	6305-2Z/C3	6308-2Z/C3	6310-2Z/C3	6312-2Z/C3	6314-2Z/C3
	N-end	6305-2Z/C3	6308-2Z/C3	6310-2Z/C3	6312-2Z/C3	6314-2Z/C3
Axially-locked bearings	Inner bearing cover	As standard, locked ad D-end. Floating ND-end.				
Bearing seal	D-end	Gamma ring as standard				
	N-end	Gamma ring as standard				
Lubrication		2Z/ZZ permanently lubricated bearings				
Rating plate	Material	Stainless steel				
Terminal box	Frame material	Die cast aluminum				Cast iron
	Cover material	Die cast aluminum			Cast iron	
	Cover screws material	Steel 8.8, zinc electroplated				
Connections	Cable-entries	Blind flange				
	Terminals	3 terminals for connection with cable lugs				
Stator winding	Material	Copper				
	Insulation	Insulation class H				
	Winding protection	3 PTC thermistors as standard 150 °C				
Rotor winding	Material	Presure die-cast aluminum				
Balancing		Half-key balancing as standard				
Key ways		Closed keyways				
Drain holes						
External earthing bolt		M6	M8	M10	M16	M16
Enclosure		IP 55				
Cooling method		IC71W				

Accessories
Holding brake

HDP motors can be equipped with an electrically driven brake that mechanically acts on the motor shaft. The motor's mechanical brake is intended to be used as a holding brake; whose mainfunction is to lock the motor shaft when the converter is discharged.

Upon request, HDP motors can be supplied with the standard brake or the improved brake. The motors equipped with a brake are subject to special speed limitations which are summarized below.

Motor type	Brake type	Torque, Nm	Power, W	Current, A	Voltage, V	Max.speed, rpm
IP55 fan-cooled						
M3ET 80	Standard	20	28	0.27	220	5000
	Improved	40	28	0.27	220	5000
M3ET 100 A-B-C-D	Standard	55	38	0.73	220	5000
	Improved	80	38	0.73	220	5000
M3ET 100 E	Standard	80	38	0.73	220	5000
	Improved	125	38	0.73	220	5000
M3ET 132 A-B-C	Standard	125	25	0.24	220	5000
	Improved	200	25	0.24	220	5000
M3ET 132 D-E	Standard	200	25	0.24	220	5000
	Improved	400	25	0.24	220	5000
M3ET 160 A-B	Standard	200	30	0.29	220	5000
	Improved	400	30	0.29	220	5000
M3ET 160 C-D	Standard	400	30	0.29	220	5000
	Improved	800	30	0.29	220	5000
M3ET 180	Standard	400	31	0.3	220	5000
	Improved	800	31	0.3	220	5000
M3ET 200	Standard	800	132	3	220	3000
	Improved	NA				
M3ET 225	Standard	800	132	3	220	3000
	Improved	NA				
M3ET 250	Standard	1200	230	3	400	2300
	Improved	NA				
M3ET 280	Standard	R				
	Improved	R				
M3ET 315	Standard	R				
	Improved	R				
IP23 blower cooled						
M3FT 100 A-B	Standard	55	38	0.73	220	5000
	Improved	80	38	0.73	220	5000
M3FT 100 C-D	Standard	80	38	0.73	220	5000
	Improved	125	38	0.73	220	5000
M3FT 100 E	Standard	125	38	0.73	220	5000
	Improved	NA				
M3FT 132 A	Standard	125	25	0.24	220	5000
	Improved	200	25	0.24	220	5000
M3FT 132 B-C	Standard	200	25	0.24	220	5000
	Improved	400	25	0.24	220	5000
M3FT 132 D-E	Standard	400	25	0.24	220	5000
	Improved	NA				
M3FT 160 A-B	Standard	400	30	0.29	220	5000
	Improved	800	30	0.29	220	5000
M3FT 160 C-D	Standard	800	30	0.29	220	5000
	Improved	NA				
M3FT 180	Standard	800	31	0.3	220	5000
	Improved	1000	31	0.3	220	5000
M3FT 200	Standard	800	132	3	220	3000
	Improved	NA				

Motor type	Brake type	Torque, Nm	Power, W	Current, A	Voltage, V	Max.speed, rpm
M3FT 225	Standard	800	132	3	220	3000
	Improved	NA				
M3FT 250	Standard	1200	230	3	400	2300
	Improved	NA				
M3FT 280	Standard	R				
	Improved	R				
M3FT 315	Standard	R				
	Improved	R				
M3FT 355	Standard	R				
	Improved	R				
M3FT 400	Standard	R				
	Improved	R				
IP55 water-cooled						
M3LT 80 A-B	Standard	20	28	0.27		5000
	Improved	40	28	0.27		5000
M3LT 80 C	Standard	40	28	0.27		5000
	Improved	NA				
M3LT 100 A-B	Standard	55	38	0.73		5000
	Improved	80	38	0.73		5000
M3LT 100 C-D	Standard	80	38	0.73		5000
	Improved	125	38	0.73		5000
M3LT 100 E	Standard	125	38	0.73		5000
	Improved	NA				
M3LT 132 A-B	Standard	125	25	0.24		5000
	Improved	200	25	0.24		5000
M3LT 132 C-D-E	Standard	200	25	0.24		5000
	Improved	400	25	0.24		5000
M3LT 160 A	Standard	200	30	0.29		5000
	Improved	400	30	0.29		5000
M3LT 160 B-C-D	Standard	400	30	0.29		5000
	Improved	800	30	0.29		5000
M3LT 180 A	Standard	400	31	0.3		5000
	Improved	800	31	0.3		5000
M3LT 180 B-C	Standard	800	31	0.3		5000
	Improved	1000	31	0.3		5000

M3_T 80-180: motors will be provided with a rectifier with input voltage of 220 VAC (Brake overexcitation voltage OEX 207 VDC and nominal voltage 103 VDC)

M3_T 200-225: motors will be provided with a rectifier with input voltage 220 VAC (Brake nominal voltage 205 VDC)

M3_T 250: motors will be provided with a rectifier with input voltage 400 VAC (Brake nominal voltage 360 VDC)

Accessories
Cooling fan

ABB HDP-motors are equipped with an external cooling fan as standard. IP55 versions have an axial cooling fan, IC416 except frame size 250 which have a radial cooling, IC06. IP23 versions have an radial cooling blower, IC06. HDP-motors can also be delivered without cooling fan if a separate cooling source will be used. Please check for required air flow/volume from ABB.

Motor type	Supply voltage	Power, W	Current, A	Certification
IP55 fan-cooled				
M3ET 80	230 V 50 Hz	46	0.32	UL
	230 V 60 Hz	42	0.25	UL
M3ET 100	400 V 50 Hz	45	0.13	UL *)
	460 V 60 Hz	43	0.09	UL *)
M3ET 132	400 V 50 Hz	100	0.18	UL
	460 V 60 Hz	150	0.22	UL
M3ET 160	400 V 50 Hz	100	0.18	UL
	460 V 60 Hz	150	0.22	UL
M3ET 180	400 V 50 Hz	210	0.36	UL.CCC
	460 V 60 Hz	340	0.51	UL.CCC
M3ET 200	400 V 50 Hz	210	0.36	UL.CCC
	460 V 60 Hz	340	0.51	UL.CCC
M3ET 225	400 V 50 Hz	230	0.4	CE/UL
	460 V 60 Hz	370	0.53	CE/UL
M3ET 250	400 V 50 Hz	3000	5.4	CE/UL
	460 V 60 Hz	N/A		
M3ET 280	400 V 50 Hz	7500	13.1	UL
	460 V 60 Hz	8600	13	UL
M3ET 315	400 V 50 Hz	7500	13.1	UL
	460 V 60 Hz	8600	13	UL
M3ET 355	400 V 50 Hz	15000	26.7	UL
	460 V 60 Hz	17000	26.3	UL
IP23 blower cooled				
M3FT 100	230 V 50 Hz	166	1.4	UL.CCC
	230 V 50 Hz	166	1.4	UL.CCC
M3FT 132	230 V 50 Hz	166	1.4	UL.CCC
	230 V 50 Hz	166	1.4	UL.CCC
M3FT 160	400 V 50 Hz	1180	1.8	UL.CCC
	460 V 60 Hz	1180	1.8	UL.CCC
M3FT 180	400 V 50 Hz	1180	1.8	UL.CCC
	460 V 60 Hz	1180	1.8	UL.CCC
M3FT 200	400 V 50 Hz	3000	5.4	CE/UL
	460 V 60 Hz	N/A		
M3FT 225	400 V 50 Hz	3000	5.4	CE/UL
	460 V 60 Hz	N/A		
M3FT 250	400 V 50 Hz	3000	5.4	CE/UL
	460 V 60 Hz	N/A		
M3FT 280	400 V 50 Hz	7500	13.1	UL
	460 V 60 Hz	8600	13	UL
M3FT 315	400 V 50 Hz	7500	13.1	UL
	460 V 60 Hz	8600	13	UL
M3FT 355	400 V 50 Hz	15000	26.7	UL
	460 V 60 Hz	17000	26.3	UL
M3FT 400	400 V 50 Hz	15000	26.7	UL
	460 V 60 Hz	17000	26.3	UL

*) CCC available with another fan, if CCC is selected there will be no UL

Accessories

Feedback devices and connectors

Feedback devices

ABB HDP-motors can be equipped with different feedback devices for positioning and/or speed control. The connector type is normally a 12 pin M23 intercontec male connector, IP67 protected. Different encoder types may require another number of pins. For more information, please contact ABB.

Incremental encoders

Programmable encoders withe following features:

- Any pulse number from 1...65536
- Voltage supply 4.75 - 30 VDC
- Output stages TTL/RS422 or HTL/push-pull
- Reference signal Zero pulse 90° or 180°
- Output signals A+A-, B+B-, Z+Z-
- Operating speed ≤6000 rpm
- Operating temperature -40...+100 °C

Absolute encoders (SSI, Endat, Hiperface)

Programmable encoders withe following features:

- Communication method
  1. SSI+Incremental
  2. SSI+Sin/Cos
  3. Hiperface (Note: Hiperface is digital protocol so other configuration options are disabled upon selection)
- Number of steps per revolution
  1. Selection from 256, 512, 1024, 2048, 4096, 8192, 16384, 32768
  2. Counting direction
  3. CCW (Encoder wire/pin inactive)
  4. CW (Encoder wire/pin inactive)
  5. Encoder wire/pin active, CW at HIGH (not connected). Note! This is default.
  6. Encoder wire/pin active, CCW at HIGH (not connected)

Connectors and cables

Signal connectors [1)]

- 400014148, loose signal connector 12 pin for encoder HTL-TTL-1Vpp
- 16491979, loose signal connector 17 pin for absolute encoder

[1)] To be ordered separately

Cables

Encoder cables with motor connector [1)]	Length [2)], m
HDP1255L0	5
HDP12510L	10
HDP12515L	15
HDP12520L	20
HDP12530L	30

[1)] To be ordered separately.
[2)] Other lenghts available on request.

Cable characteristics

- Multipolar cable with double shield for mobile application (Al/polyester and copper)
- 3 pairs AWG 26 and 3AWG 20 single
- PVC transparent external sheat (style UL 2095)
- Operating temperature +80 °C
- Working voltage 300 V
- Capacity: 120 pF/m between wires pairs 20 °C
- Number of cycles: minimum 3 millions
- Minimum bending radius: 65 mm
- Reference standard: UL 758
- Outside diameter: 7.5 ± 0.2 mm

Thermal protection

HDP-motors in frame size 80-180 are equipped with PTC thermistors 150°C in stator winding as standard. HDP-motors in frame sizes 200-400 are equipped with PTC thermistors, 170°C, in stator winding as standard.

Other available solutions which can be combined:

- PT100 (2- or 3-wire) in stator winding, one per phase
- Bimetal detectors, break type (NCC), (3 in series)

Total product offering

Motors and generators with a complete portfolio of services

IEC motors
- Low voltage motors
- High voltage induction and synchronous motors
- Marine motors
- Motors for explosive atmospheres
- Motors for food and beverage
- Motors for variable speed drives
- Permanent magnet motors
- Synchronous reluctance motors
- Traction motors

NEMA motors
- Low voltage motors
- High voltage induction and synchronous motors
- Marine motors
- Motors for explosive atmospheres
- Motors for variable speed drives
- Permanent magnet motors
- Servomotors
- Washdown motors

Generators
- Generators for wind turbines
- Generators for diesel and gas engine power plants
- Generators for steam and gas turbine power plants
- Generators for marine applications
- Generators for industrial applications
- Generators for traction applications
- Synchronous condensers for reactive power compensation

Life cycle services

ABB’s portfolio of drives

Optimal solution for you

Being able to rely on the continuous high performance and efficiency of your operations is something you want to take for granted. ABB variable-frequency drives are made with all this in mind, established upon more than 40 years of experience and backed by a broad range of life cycle services.

ABB drives help you to optimize your processes and systems with state-of-the-art motor control technology, resulting in increased energy efficiency, better product quality, and reduced operating costs with higher output, less downtime, and reduced need for maintenance. All ABB drives are designed for easy selection, ordering, installation and use, and they offer integrated safety features, giving you more time to focus on what matters for you and your business.

Our portfolio offers low-voltage AC and DC drives, medium-voltage AC drives, and motion control drives spanning the fractional-kilowatt to multi-megawatt power level. There is a drive available for essentially every industry and application and for all types of motors, in environments ranging from water utility facilities to clean electrical rooms, and to harsh coal mines and windy offshore platforms to food and beverage production. This wide product range allows you to select the best-fitting drive solution, providing maximum reliability and efficiency for every need.

Additional information
We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

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For more information and contact details:

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