



3D MARINE DUTY MOTORS



BEVI®

Excellence in Electric Drives and Power Generation

Construction

3D 80-400 marine duty motors have stator house and end-shields in cast iron, HT200, and top mounted terminal boxes. The motors are produced according to IEC60034, IEC60072 and IEC60092 standards and are marked with CE. In addition the motors also comply with the rules and technical specifications of marine class authorities such as ABS, BV, CCS, DNV, GL, KR, LRS, NK, RINA and RR.

Voltage and Frequency

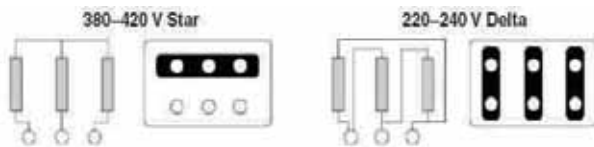
Motors are available for frequencies of 50 and 60 Hz, at all standard voltages, see motor plate for actual voltage. All motors are wide range wound. The voltage can vary by up to +/- 5%, without derating.

Maintenance

In normal use maintenance is limited to greasing of the bearings. All motors in sizes 160 and larger are fitted with grease nipples as standard. The bearings are lubricated with lithium based grease class 11. Smaller motors have closed bearing housings and sealed bearings, and can be considered maintenance free. For severe operating conditions special bearings can be supplied - for example, for high ambient temperature and increased speed.

Voltage

Three phase single speed motors can normally be connected for two different voltage ranges (connection in star – higher voltage, or delta – lower voltage) with a ratio of $\sqrt{3}$. This gives a wide application range and simplified management of ordering and stockholding.



The above connection diagrams are applicable to range wound motors for supplies of 220-240 V (Delta connection) and 380-420 V (Star connection).

Examples:

- 220-240 V Delta/380-420 V Star – may be labelled 230/400 V (Standard for motors 3 kW and smaller). Suitable for direct on line starting on 380-420 V supplies.
- 380-420V Delta/660-720V Star – may be labelled 400 V Delta (Standard for motors 4 kW and larger). Suitable for Star/Delta starting on 380-420 volt supplies or direct on line starting on 660-720 V supplies.

Frequency

Motors wound for 50 Hz supplies can also be used on 60 Hz. Rated data can be calculated from the table below.

Voltage at 50Hz	Voltage at 60Hz	60Hz data as % of 50Hz data			
		Power P	Torque M	Starting torque Mst	Speed n
230	230	100	83	69	120
230	255	111	92	85	120
400	400	100	83	69	120
400	440	110	92	84	120
400	460	115	96	92	120
400	480	120	100	100	120
525	525	100	83	69	120
525	575	115	96	92	120

Enclosure (Degree of Protection)

Motors are produced in degree of protection IP55 as standard, but are also available to other standards.

Insulation Class

All motors are wound with Class F material, but calculated with temperature rise according to class B at 50Hz.

Balancing

Motors are balanced with a half key. Special degrees of balancing are available on request.

Standards

Motor construction, outputs, and fixing dimensions comply with Chinese, Swedish and International standards.



Thermistors

Protection is provided by thermistors fitted in the frame 160 and up motor windings, together with a sensing relay. Thermistors are temperature sensitive resistors that at a certain temperature have a wide change of resistance. The sensing relay can, in turn, be used to e.g. cut off the supply to the main contactor coil.

Cooling

As standard, the fan and cowl is fitted at the non-drive end (cooling form IC 411). Other cooling methods can be supplied e.g. separately driven cooling fan (often used with inverter drives).

Heaters

Motors used in conditions of wide temperature variation or extreme climatic conditions can be damaged by condensation and dampness in the windings. In motors fitted with heaters, the windings are heated to a few degrees above ambient, which is enough to prevent condensation. Heaters must not be energised when the motor is running. Smaller motors can be heated by supplying a low voltage via the motor leads, using a supply of 5-10% of the rated voltage between two phases. BEVI can fit heaters to all motor sizes.

Ambient Temperature

The motors can operate at ambient 45 °C for marine use. The motor can also run at higher temperature if derating.

Duty

Continuous duty S1. The motor can also run at S2-S9 duty.

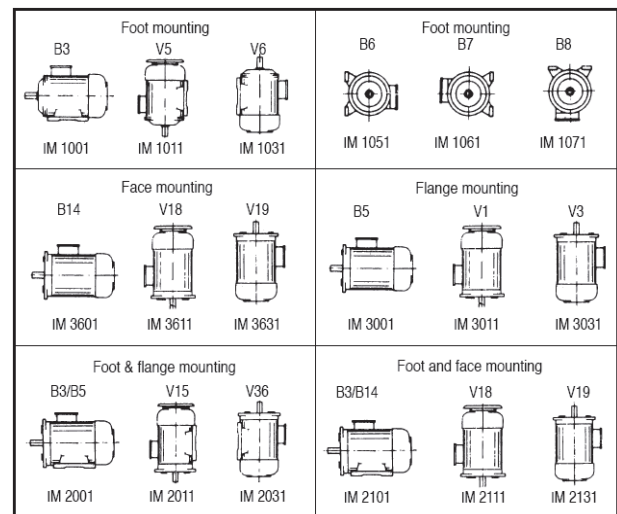
Vibration Speed

The vibration speed complies with Class N of IEC60034-14 as standard. Class R and S can also be met if required by customer.

Noise Level

The noise level complies with IEC60034-9 as standard.

Mounting arrangements



BEARINGS AND CABLE GLANDS

FRAME SIZE	POLES	BEARING SIZE		CABLE GLAND	CABLE GLAND FOR PTC
		DE	NDE		
80	2,4,6,8	6204-2Z/C3	6204-2Z/C3	1×20×1.5	
90S	2,4,6,8	6205-2Z/C3	6205-2Z/C3	1×20×1.5	
90L	2,4,6,8	6205-2Z/C3	6205-2Z/C3	1×20×1.5	
100L	2,4,6,8	6206-2Z/C3	6206-2Z/C3	1×20×1.5	
112M	2,4,6,8	6206-2Z/C3	6206-2Z/C3	2×25×1.5	
132S	2,4,6,8	6208-2Z/C3	6208-2Z/C3	2×25×1.5	
132M	2,4,6,8	6208-2Z/C3	6208-2Z/C3	2×25×1.5	
160M	2,4,6,8	6309/C3	6309/C3	2×40×1.5	M16×1.5
160L	2,4,6,8	6309/C3	6309/C3	2×40×1.5	M16×1.5
180M	2,4,6,8	6311/C3	6311/C3	2×40×1.5	M16×1.5
180L	2,4,6,8	6311/C3	6311/C3	2×40×1.5	M16×1.5
200L	2,4,6,8	6312/C3	6312/C3	2×50×1.5	M16×1.5
225S	4,6,8	6313/C3	6313/C3	2×50×1.5	M16×1.5
225M	2	6312/C3	6312/C3	2×50×1.5	M16×1.5
225M	4,6,8	6313/C3	6313/C3	2×50×1.5	M16×1.5
250M	2	6314/C3	6314/C3	2×63×1.5	M20×1.5
250M	4,6,8	6314/C3	6314/C3	2×63×1.5	M20×1.5
280S	2	6316/C3	6316/C3	2×63×1.5	M20×1.5
280S	4,6,8	6316/C3	6316/C3	2×63×1.5	M20×1.5
280M	2	6316/C3	6316/C3	2×63×1.5	M20×1.5
280M	4,6,8	6316/C3	6316/C3	2×63×1.5	M20×1.5
315S	2	6316/C3	6316/C3	2×63×1.5	M20×1.5
315S	4,6,8	6319/C3	6319/C3	2×63×1.5	M20×1.5
315M	2	6316/C3	6316/C3	2×63×1.5	M20×1.5
315M	4,6,8	6319/C3	6319/C3	2×63×1.5	M20×1.5
315L	2	6316/C3	6316/C3	2×63×1.5	M20×1.5
315L	4,6,8	6319/C3	6319/C3	2×63×1.5	M20×1.5
355M	2	6319/C3	6319/C3	2×63×1.5	M20×1.5
355M	4,6,8	6322/C3	6319/C3	2×63×1.5	M20×1.5
355L	2	6319/C3	6319/C3	2×63×1.5	M20×1.5
355L	4,6,8	6322/C3	6319/C3	2×63×1.5	M20×1.5
OPTION BEARINGS AT V1-MOUNTING (standard bearings as above also at V1-mounting)					
250-V1	2,4,6,8	7314BEP	6314/C3	2×63×1.5	M20×1.5
280-V1	2,4,6,8	7316BEP	6316/C3	2×63×1.5	M20×1.5
315-V1	2	7316BEP	6316/C3	2×63×1.5	M20×1.5
315-V1	4,6,8	7319BEP	6319/C3	2×63×1.5	M20×1.5
355-V1	2	7319BEP	6319/C3	2×63×1.5	M20×1.5
355-V1	4,6,8	7322BEP	6319/C3	2×63×1.5	M20×1.5

Warning: Please refer to the nameplate data when replacing bearing.

TECHNICAL DATA

Number of poles 2 3000 r/m	Power kW 50Hz	Full load speed rpm 50Hz	Full load current (A) 50Hz		Power kW 60Hz	Full load speed rpm 60Hz	Full load current (A) 440-480V 460V 60Hz	Efficiency %	Power factor cos ϕ	Starting current ratio Ia/I _n	Starting torque ratio Ma/Mn	Pull out torque ratio Mmax/Mn	Moment of inertia (J) kgm ²	Mass (B3) kg
			220-240V 230V	380-420V 400V	525V									
3D 801-2	0.75	2845	3.01	1.74	1.33	0.9	3414	1.82	0.83	6.1	2.2	2.3	0.0008	12
3D 802-2	1.1	2840	4.30	2.48	1.89	1.32	3408	2.59	0.84	7.0	2.2	2.3	0.0010	14
3D 90 S-2	1.5	2840	5.68	3.28	2.50	1.8	3408	3.42	0.84	7.0	2.2	2.3	0.0015	18
3D 90 L-2	2.2	2840	7.98	4.61	3.51	2.64	3408	4.81	0.85	7.0	2.2	2.3	0.0021	24
3D 100 L-2	3	2860	10.44	6.03	4.59	3.6	3432	6.29	0.87	7.5	2.2	2.3	0.0031	30
3D 112 M1-2	4	2880	13.5	7.8	5.9	4.8	3456	8.1	0.88	7.5	2.2	2.3	0.0058	40
3D 112 M2-2	5.5	2900	18.2	10.5	8.0	6.6	3480	11.0	0.88	7.5	2.2	2.3	0.0113	54
3D 132 S1-2	5.5	2900	18.2	10.5	8.0	6.6	3480	11.0	0.88	7.5	2.2	2.3	0.0113	56
3D 132 S2-2	7.5	2900	24.4	14.1	10.7	9	3480	14.7	0.88	7.5	2.2	2.3	0.0133	60
3D 132 M-2	11	2930	35.0	20.2	15.4	13.2	3516	21.1	0.89	7.5	2.2	2.3	0.0443	90
3D 160 M1-2	11	2930	35.0	20.2	15.4	13.2	3516	21.1	0.89	7.5	2.2	2.3	0.0443	102
3D 160 M2-2	15	2930	47.1	27.2	20.7	18	3516	28.4	0.89	7.5	2.2	2.3	0.0549	114
3D 160 L-2	18.5	2930	57.2	33.0	25.1	22.2	3516	34.4	0.90	7.5	2.2	2.3	0.0620	128
3D 180 M-2	22	2940	67.5	39.0	29.7	26.4	3528	40.7	0.90	7.5	2.0	2.3	0.0853	166
3D 200 L1-2	30	2950	91.1	52.6	40.1	36	3540	54.9	0.90	7.5	2.0	2.3	0.1530	230
3D 200 L2-2	37	2950	111.7	64.5	49.1	44.4	3540	67.3	0.90	7.5	2.0	2.3	0.1780	244
3D 225 M-2	45	2960	135.1	78.0	59.4	54	3552	81.4	0.90	7.5	2.0	2.3	0.2770	286
3D 250 M1-2	55	2965	164.2	94.8	72.2	66	3558	98.9	0.90	7.5	2.0	2.3	0.3880	382
3D 250 M2-2	75	2970	222.6	128.5	97.9	90	3564	134.1	0.90	7.5	2.0	2.3	0.5740	410
3D 280 S-2	75	2970	222.6	128.5	97.9	90	3564	134.1	0.90	7.5	2.0	2.3	0.5740	508
3D 280 M1-2	90	2970	263.3	152.0	115.8	108	3564	158.6	0.91	7.5	2.0	2.3	0.6770	544
3D 280 M2-2	110	2980	321.5	185.6	141.4	132	3576	193.7	0.91	7.1	1.8	2.2	1.4000	730
3D 315 S-2	110	2980	321.5	185.6	141.4	132	3576	193.7	0.91	7.1	1.8	2.2	1.4000	868
3D 315 M-2	132	2980	383.8	221.6	168.8	158.4	3576	231.2	0.91	7.1	1.8	2.2	1.5700	908
3D 315 L1-2	160	2980	459.7	265.4	202.2	192	3576	276.9	0.92	7.1	1.8	2.2	1.7600	1014
3D 315 L2-2	200	2980	573.3	331.0	252.2	240	3576	345.4	0.92	7.1	1.8	2.2	2.3500	1162
3D 355 M-2	250	2980	713.6	412.0	313.9	300	3576	429.9	0.92	7.1	1.6	2.2	3.2500	1616
3D 355 L1-2	315	2980	897.2	518.0	394.7	378	3576	540.5	0.92	7.1	1.6	2.2	3.9300	1806
3D 355 L2-2	355	2982	1034	597	455	426	3578	623.0	0.90	7.5	1.6	2.4	7.4500	2240
3D 400 M1-2	355	2982	1034	597	455	426	3578	623.0	0.90	7.5	1.55	2.4	7.4500	2450
3D 400 M2-2	400	2982	1138	657	501	480	3578	685.6	0.92	5.80	1.23	2.80	12.520	2604
3D 400 L1-2	450	2982	1276	737	562	540	3578	769.0	0.92	7.11	1.64	2.7	13.260	3035
3D 400 L2-2	500	2982	1410	814	620	600	3578	849.4	0.92	6.42	1.47	2.8	14.210	3122
3D 400 L3-2	560	2982	1573	908	692	672	3578	947.5	0.92	5.74	1.31	2.7	14.950	3588
3D 400 L4-2	630	2982	1765	1019	776	756	3578	1063.3	0.93	7.27	1.83	2.8	15.670	3987

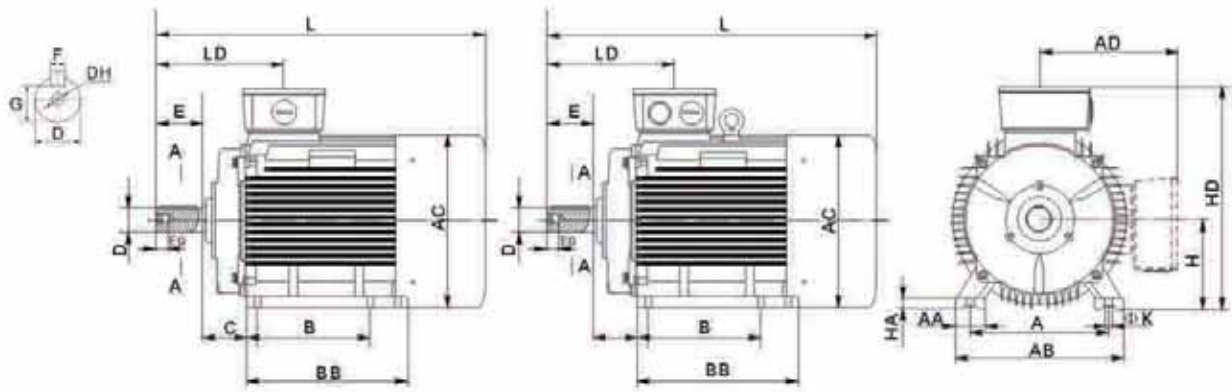
TEC NICAL DATA

Number of poles 4 1500 r/m	Power kW 50Hz	Full load speed rpm 50Hz	Full load current (A)			Power kW 60Hz	Full load speed rpm 60Hz	Full load current (A)		Efficiency %	Power factor cos φ	Starting current ratio Ia/I _n	Starting torque ratio Ma/M _n	Pull out torque ratio Mmax/M _n	Moment of inertia (J) kgm ²	Mass (B3) kg
			220-240V 230V	380-420V 400V	50Hz 525V			440-480V 460V 60Hz								
3D 80 L-4	0.55	1390	2.58	1.49	1.14	0.66	1668	1.55	71.0	0.75	5.2	2.4	2.3	0.0013	14	
3D 80 2-4	0.75	1380	3.38	1.95	1.49	0.9	1656	2.03	73.0	0.76	6.0	2.3	2.3	0.0017	16	
3D 90 S-4	1.1	1390	4.69	2.71	2.06	1.32	1668	2.83	76.2	0.77	6.0	2.3	2.3	0.0026	18	
3D 90 L-4	1.5	1390	6.04	3.49	2.66	1.8	1668	3.64	78.5	0.79	6.0	2.3	2.3	0.0035	22	
3D 100 L1-4	2.2	1410	8.38	4.84	3.69	2.64	1692	5.05	81.0	0.81	7.0	2.3	2.3	0.0065	30	
3D 100 L2-4	3	1410	11.07	6.39	4.87	3.6	1692	6.67	82.6	0.82	7.0	2.3	2.3	0.0088	32	
3D 112 M 1-4	4	1435	14.48	8.36	6.37	4.8	1722	8.72	84.2	0.82	7.0	2.3	2.3	0.0098	42	
3D 112 M 2-4	5.5	1440	19.4	11.2	8.5	6.6	1728	11.7	85.7	0.83	7.0	2.3	2.3	0.0254	55	
3D 132 S-4	5.5	1440	19.4	11.2	8.5	6.6	1728	11.7	85.7	0.83	7.0	2.3	2.3	0.0254	56	
3D 132 M1-4	7.5	1440	25.6	14.8	11.3	9	1728	15.4	87.0	0.84	7.0	2.3	2.3	0.0351	70	
3D 132 M2-4	11	1460	37.1	21.4	16.3	13.2	1752	22.3	88.4	0.84	7.0	2.2	2.3	0.0798	87	
3D 160 M-4	11	1460	37.1	21.4	16.3	13.2	1752	22.3	88.4	0.84	7.0	2.2	2.3	0.0798	106	
3D 160 L-4	15	1460	49.4	28.5	21.7	18	1752	29.7	89.4	0.85	7.5	2.2	2.3	0.1060	130	
3D 180 M-4	18.5	1470	59.8	34.5	26.3	22.2	1764	36.0	90.0	0.86	7.5	2.2	2.3	0.1470	162	
3D 180 L-4	22	1470	70.7	40.8	31.1	26.4	1764	42.6	90.5	0.86	7.5	2.2	2.3	0.1640	180	
3D 200 L-4	30	1470	95.4	55.1	42.0	36	1764	57.5	91.4	0.86	7.2	2.2	2.3	0.2680	234	
3D 225 S-4	37	1475	115.5	66.7	50.8	44.4	1770	69.6	92.0	0.87	7.2	2.2	2.3	0.4580	278	
3D 225 M-4	45	1475	139.8	80.7	61.5	54	1770	84.2	92.5	0.87	7.2	2.2	2.3	0.5600	314	
3D 250 M1-4	55	1480	169.9	98.1	74.7	66	1776	102.4	93.0	0.87	7.2	2.2	2.3	0.7730	406	
3D 250 M2-4	75	1480	230.4	133.0	101.3	90	1776	138.8	93.6	0.87	7.2	2.2	2.3	1.2300	477	
3D 280 S-4	75	1480	230.4	133.0	101.3	90	1776	138.8	93.6	0.87	7.2	2.2	2.3	1.2300	512	
3D 280 M1-4	90	1480	275.4	159.0	121.1	108	1776	165.9	93.9	0.87	7.2	2.2	2.3	1.5400	606	
3D 280 M2-4	110	1480	330.6	190.9	145.4	132	1776	199.2	94.5	0.88	6.9	2.1	2.2	2.9700	731	
3D 315 S-4	110	1480	330.6	190.9	145.4	132	1776	199.2	94.5	0.88	6.9	2.1	2.2	2.9700	898	
3D 315 M-4	132	1480	395.6	228.4	174.0	158.4	1776	238.3	94.8	0.88	6.9	2.1	2.2	3.3400	956	
3D 315 L1-4	160	1480	473.5	273.4	208.3	192	1776	285.3	94.9	0.89	6.9	2.1	2.2	4.0300	1064	
3D 315 L2-4	200	1480	592.0	341.8	260.4	240	1776	366.7	94.9	0.89	6.9	2.1	2.2	4.8800	1212	
3D 355 M-4	250	1490	729.5	421.2	320.9	300	1788	439.5	95.2	0.90	6.9	2.1	2.2	8.3300	1643	
3D 355 L1-4	315	1490	919.2	530.7	404.3	378	1788	553.8	95.2	0.90	6.9	2.1	2.2	10.510	1818	
3D 355 L2-4	355	1490	1044.4	603	459.4	426	1788	629.2	95.7	0.90	7.5	2.3	2.4	11.200	2000	
3D 400 M1-4	400	1492	1153.5	666	507.4	480	1790	695.0	96.0	0.90	6.61	1.92	2.75	14.950	2786	
3D 400 M2-4	450	1492	1299.0	750	571.4	540	1790	782.6	96.1	0.90	6.84	2.03	2.81	15.630	3122	
3D 400 L1-4	500	1492	1439.3	831	633.1	600	1790	867.1	96.4	0.90	6.19	1.83	2.52	18.410	3132	
3D 400 L2-4	560	1492	1600.4	924	704.0	672	1790	964.2	96.4	0.90	6.64	2.02	2.67	19.620	3548	
3D 400 L3-4	630	1492	1806.5	1043	794.7	756	1790	1088.3	96.4	0.91	5.81	1.75	2.34	21.330	3589	

TECHNICAL DATA

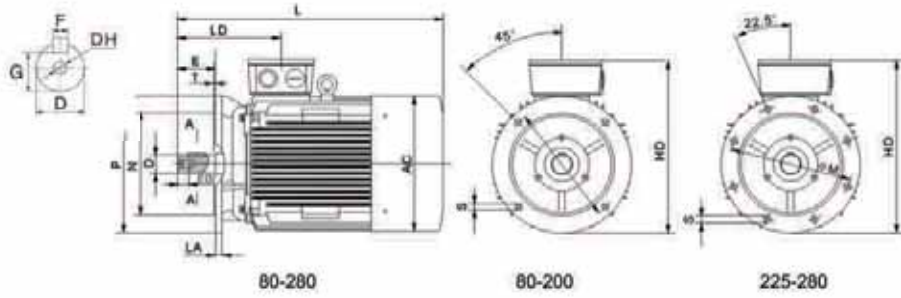
Number of poles 6 1000 r/m	Power kW 50Hz	Full load speed rpm 50Hz	Full load current (A) 50Hz			Power kW 60Hz	Full load speed rpm 60Hz	Full load current (A) 440-480V 460V 60Hz	Efficiency %	Power factor cos φ	Starting current ratio Ia/In	Starting torque ratio Ma/Mn	Pull out torque ratio Mmax/Mn	Moment of inertia (J) kgm ²	Mass (B3) kg
			220-240V 230V	380-420V 400V	525V										
3D 80 L-6	0.37	885	2.13	1.23	0.94	0.44	1062	1.28	62.0	0.70	4.7	1.9	2.0	0.0017	15
3D 80 2-6	0.55	885	2.94	1.70	1.30	0.66	1062	1.77	65.0	0.72	4.7	1.9	2.1	0.0022	16
3D 90 S-6	0.75	910	3.78	2.18	1.66	0.9	1092	2.27	69.0	0.72	5.5	2.0	2.1	0.0033	20
3D 90 L-6	1.1	910	5.23	3.02	2.30	1.32	1092	3.15	72.0	0.73	5.5	2.0	2.1	0.0045	22
3D 100 L-6	1.5	920	6.58	3.80	2.90	1.8	1104	3.97	76.0	0.75	5.5	2.0	2.1	0.0081	28
3D 112 M-6	2.2	935	9.18	5.30	4.04	2.64	1122	5.53	79.0	0.76	6.5	2.0	2.1	0.0150	38
3D 132 S-6	3	960	12.18	7.03	5.36	3.6	1152	7.34	81.0	0.76	6.5	2.1	2.1	0.0290	58
3D 132 M1-6	4	960	16.1	9.3	7.1	4.8	1152	9.7	82.0	0.76	6.5	2.1	2.1	0.0390	68
3D 132 M2-6	5.5	960	21.3	12.3	9.4	6.6	1152	12.8	84.0	0.77	6.5	2.1	2.1	0.0530	76
3D 160 M-6	7.5	970	28.2	16.3	12.4	9	1164	17.0	86.0	0.77	6.5	2.0	2.1	0.0897	106
3D 160 L-6	11	970	40.4	23.3	17.8	13.2	1164	24.3	87.5	0.78	6.5	2.0	2.1	0.1270	130
3D 180 L-6	15	970	52.0	30.0	22.9	18	1164	31.3	89.0	0.81	7.0	2.0	2.1	0.2140	176
3D 200 L1-6	18.5	980	63.4	36.6	27.9	22.2	1176	38.2	90.0	0.81	7.0	2.1	2.1	0.3190	216
3D 200 L2-6	22	980	73.6	42.5	32.4	26.4	1176	44.3	90.0	0.83	7.0	2.1	2.1	0.3690	226
3D 225 M-6	30	980	97.5	56.3	42.9	36	1176	58.7	91.5	0.84	7.0	2.0	2.1	0.5860	292
3D 250 M-6	37	980	116.9	67.5	51.4	44.4	1176	70.4	92.0	0.86	7.0	2.1	2.1	0.9400	364
3D 280 S-6	45	980	141.3	81.6	62.2	54	1176	85.1	92.5	0.86	7.0	2.1	2.0	1.7100	472
3D 280 M-6	55	980	172.3	99.5	75.8	66	1176	103.8	92.8	0.86	7.0	2.1	2.0	2.1500	512
3D 315 S-6	75	980	233.1	134.6	102.6	90	1176	140.5	93.5	0.86	7.0	2.0	2.0	3.4500	806
3D 315 M-6	90	980	278.9	161.0	122.7	108	1176	168.0	93.8	0.86	7.0	2.0	2.0	4.0800	958
3D 315 L1-6	110	980	340.2	196.4	149.6	132	1176	204.9	94.0	0.86	6.7	2.0	2.0	5.0600	990
3D 315 L2-6	132	980	402.7	232.5	177.1	158.4	1176	242.6	94.2	0.87	6.7	2.0	2.0	5.8400	1050
3D 355 M1-6	160	990	479.8	277.0	211.0	192	1188	289.0	94.5	0.88	6.7	1.9	2.0	9.5300	1634
3D 355 M2-6	200	990	601.0	347.0	264.4	240	1188	362.1	94.5	0.88	6.7	1.9	2.0	11.800	1772
3D 355 L-6	250	990	750.0	433.0	329.9	300	1188	451.8	94.5	0.88	6.7	1.9	2.0	14.800	1784
3D 400 M1-6	315	994	956.1	552	420.6	378	1193	576.0	95.8	0.86	5.91	1.83	2.3	18.210	3003
3D 400 M2-6	355	994	1080.8	624	475.4	426	1193	651.1	95.9	0.86	5.89	1.86	2.3	19.320	3410
3D 400 L1-6	400	994	1214.1	701	534.1	480	1193	731.5	95.9	0.86	6.38	2.08	2.5	21.860	3558
3D 400 L2-6	450	994	1356.2	783	596.6	540	1193	817.0	95.9	0.86	6.31	2.07	2.4	22.310	3841
3D 400 L3-6	500	994	1508.6	871	663.6	600	1193	908.9	96.1	0.86	5.72	1.86	2.2	23.520	3866
3D 400 L4-6	560	994	1659.3	958	729.9	672	1193	999.7	96.1	0.86	5.88	1.95	2.2	24.460	4140

Number of poles 8 750 r/m	Power kW 50Hz	Full load speed rpm 50Hz	Full load current (A) 50Hz			Power kW 60Hz	Full load speed rpm 60Hz	Full load current (A) 440-480V 460V 60Hz	Efficiency %	Power factor cos φ	Starting current ratio Ia/In	Starting torque ratio Ma/Mn	Pull out torque ratio Mmax/Mn	Moment of inertia (J) kgm ²	Mass (B3) kg
			220-240V 230V	380-420V 400V	525V										
3D 80 L-8	0.18	645	1.45	0.84	0.64	0.21	774	0.88	51.0	0.61	3.3	1.8	1.9	0.0020	16
3D 80 2-8	0.25	645	1.91	1.10	0.84	0.3	774	1.15	54.0	0.61	3.3	1.8	1.9	0.0024	18
3D 90 S-8	0.37	670	2.44	1.41	1.07	0.44	804	1.47	62.0	0.61	4.0	1.8	1.9	0.0039	26
3D 90 L-8	0.55	670	3.59	2.07	1.58	0.66	804	2.16	63.0	0.61	4.0	1.8	2.0	0.0048	28
3D 100 L1-8	0.75	680	3.95	2.28	1.74	0.9	816	2.38	71.0	0.67	4.0	1.8	2.0	0.0072	30
3D 100 L2-8	1.1	680	5.46	3.15	2.40	1.32	816	3.29	73.0	0.69	5.0	1.8	2.0	0.0081	32
3D 112 M-8	1.5	690	7.24	4.18	3.18	1.8	828	4.36	75.0	0.69	5.0	1.8	2.0	0.0140	40
3D 132 S-8	2.2	705	9.92	5.73	4.37	2.64	846	5.98	78.0	0.71	6.0	1.8	2.0	0.0320	58
3D 132 M-8	3	705	13.0	7.5	5.7	3.6	846	7.8	79.0	0.73	6.0	1.8	2.0	0.0392	68
3D 160 M1-8	4	720	16.9	9.76	7.4	4.8	864	10.2	81.0	0.73	6.0	1.9	2.0	0.0635	98
3D 160 M2-8	5.5	720	22.3	12.9	9.8	6.6	864	13.5	83.0	0.74	6.0	2.0	2.0	0.0897	110
3D 160 L-8	7.5	720	29.3	16.9	12.9	9	864	17.6	85.5	0.75	6.0	2.0	2.0	0.1270	132
3D 180 L-8	11	730	41.4	23.9	18.2	13.2	876	24.9	87.5	0.76	6.6	2.0	2.0	0.2140	176
3D 200 L-8	15	730	56.1	32.4	24.7	18	876	33.8	88.0	0.76	6.6	2.0	2.0	0.3490	232
3D 225 S-8	18.5	730	67.5	39.0	29.7	22.2	876	40.7	90.0	0.76	6.6	1.9	2.0	0.5200	268
3D 225 M-8	22	730	77.9	45.0	34.3	26.4	876	47.0	90.5	0.78	6.6	1.9	2.0	0.6200	288
3D 250 M-8	30	735	104.3	60.2	45.9	36	882	62.8	91.0	0.79	6.6	1.9	2.0	0.8900	372
3D 280 S-8	37	735	128.0	73.9	56.3	44.4	882	77.1	91.5	0.79	6.6	1.9	2.0	1.7100	472
3D 280 M-8	45	735	154.8	89.4	68.1	54	882	93.3	92.0	0.79	6.6	1.9	2.0	2.1500	530
3D 315 S-8	55	735	182.9	105.6	80.5	66	882	110.2	92.8	0.81	6.6	1.8	2.0	3.7900	804
3D 315 M-8	75	735	248.9	143.7	109.5	90	882	149.9	93.0	0.81	6.6	1.8	2.0	5.2000	1000
3D 315 L1-8	90	735	292.5	168.9	128.7	108	882	176.2	93.8	0.82	6.6	1.8	2.0	6.1900	1018
3D 315 L2-8	110	735	356.8	206.0	157.0	132	882	215.0	94.0	0.82	6.4	1.8	2.0	7.2600	1118
3D 355 M1-8	132	740	429.5	248.0	189.0	158.4	888	258.8	93.7	0.82	6.4	1.8	2.0	11.850	1584
3D 355 M2-8	160	740	517.9	299.0	227.8	192	888	312.0	94.2	0.82	6.4	1.8	2.0	14.500	1734
3D 355 L-8	200	740	637.4	368.0	280.4	240	888	384.0	94.5	0.83	6.4	1.8	2.0	18.120	1850
3D 400 M1-8	250	745	788.1	455.0	346.7	300	894	474.8	95.3	0.84	6.29	1.85	2.48	25.630	2914
3D 400 M2-8	280	745	871.2	503.0	383.2	336	894	524.9	95.3	0.84	5.90	1.71	2.31	26.520	3070
3D 400 L1-8	315	745	980.3	566.0	431.2	378	894	590.6	95.5	0.85	6.13	1.81	2.38	27.860	3392
3D 400 L2-8	355	745	1110.2	641.0	488.4	426	894	668.9	95.6	0.85	5.84	1.72	2.25	29.760	3592
3D 400 L3-8	400	740	1252.2	723.0	550.9	480	888	754.4	95.6	0.85	6.39	1.96	2.44	31.340	3949



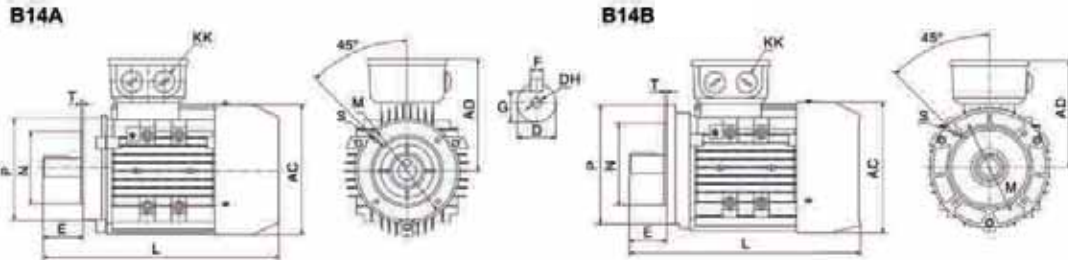
B3

Frame Size	Poles	A	B	C	D	E	G	D			AB	AC	AD	D	L	
80	2,4,6,8	125	100	50	19	40	6	15.5	M6	80	10	165	165	165	245	295
90S	2,4,6,8	140	100	56	24	50	8	20	M8	90	10	180	180	175	265	315
90L	2,4,6,8	140	125	56	24	50	8	20	M8	90	10	180	180	175	265	340
100L	2,4,6,8	160	140	63	28	60	8	24	M10	100	12	205	205	200	290	385
112M	2,4,6,8	190	140	70	28	60	8	24	M10	112	12	230	240	220	325	400
132S	2,4,6,8	216	140	89	38	80	10	33	M12	132	12	270	275	240	365	470
132M	2,4,6,8	216	178	89	38	80	10	33	M12	132	12	270	275	240	365	510
160M	2,4,6,8	254	210	108	42	110	12	37	M16	160	15	320	320	285	440	620
160L	2,4,6,8	254	254	108	42	110	12	37	M16	160	15	320	320	285	440	675
180M	2,4,6,8	279	241	121	48	110	14	42.5	M16	180	15	355	380	310	470	700
180L	2,4,6,8	279	279	121	48	110	14	42.5	M16	180	15	355	380	310	470	740
200L	2,4,6,8	318	305	133	55	110	16	49	M20	200	19	395	410	335	525	775
225S	4,6,8	356	286	149	60	140	18	53	M20	225	19	435	470	370	580	820
225M	2	356	311	149	55	110	16	49	M20	225	19	435	470	370	580	815
	4,6,8	356	311	149	60	140	18	53	M20	225	19	435	470	370	580	845
250M	2	406	349	168	60	140	18	53	M20	250	24	490	490	380	635	930
	4,6,8	406	349	168	65	140	18	58	M20	250	24	490	490	380	635	930
280S	2	457	368	190	65	140	18	58	M20	280	24	550	580	410	698	981
	4,6,8	457	368	190	75	140	20	67.5	M20	280	24	550	580	410	698	981
280M	2	457	419	190	65	140	18	58	M20	280	24	550	580	410	698	1032
	4,6,8	457	419	190	75	140	20	67.5	M20	280	24	550	580	410	698	1032
315S	2	508	406	216	65	140	18	58	M20	315	28	630	645	535	885	1185
	4,6,8,10	508	406	216	80	170	22	71	M20	315	28	630	645	535	885	1215
315M	2	508	457	216	65	140	18	58	M20	315	28	630	645	535	885	1295
	4,6,8,10	508	457	216	80	170	22	71	M20	315	28	630	645	535	885	1325
315L	2	508	508	216	65	140	18	58	M20	315	28	630	645	535	885	1295
	4,6,8,10	508	508	216	80	170	22	71	M20	315	28	630	645	535	885	1325
355M	2	610	560	254	75	140	20	67.5	M20	355	28	730	720	650	1065	1495
	4,6,8,10	610	560	254	95	170	25	86	M24	355	28	730	720	650	1065	1525
355L	2	610	630	254	75	140	20	67.5	M20	355	28	730	720	650	1065	1495
	4,6,8,10	610	630	254	95	170	25	86	M24	355	28	730	720	650	1065	1525
400	2	686	710	280	85	170	22	76	M24	400	36	806	860	-	1075	1820
	4,6,8	686	710	280	120	210	28	100	M24	400	36	806	860	-	1075	1881



B5

Frame Size	Poles	D	E	F	G	DH	H	M	N	P	S	T	AC	AD	L
80	2,4,6,8	19	40	6	15.5	M6	80	165	130	200	12	3.5	165	165	295
90S	2,4,6,8	24	50	8	20	M8	90	165	130	200	12	3.5	180	175	315
90L	2,4,6,8	24	50	8	20	M8	90	165	130	200	12	3.5	180	175	340
100L	2,4,6,8	28	60	8	24	M10	100	215	180	250	15	4	205	200	385
112M	2,4,6,8	28	60	8	24	M10	112	215	180	250	15	4	240	220	400
132S	2,4,6,8	38	80	10	33	M12	132	265	230	300	15	4	275	240	470
132M	2,4,6,8	38	80	10	33	M12	132	265	230	300	15	4	275	240	510
160M	2,4,6,8	42	110	12	37	M16	160	300	250	350	19	5	320	285	620
160L	2,4,6,8	42	110	12	37	M16	160	300	250	350	19	5	320	285	675
180M	2,4,6,8	48	110	14	42.5	M16	180	300	250	350	19	5	380	310	700
180L	2,4,6,8	48	110	14	42.5	M16	180	300	250	350	19	5	380	310	740
200L	2,4,6,8	55	110	16	49	M20	200	350	300	400	19	5	410	335	775
225S	4,6,8	60	140	18	53	M20	225	400	350	450	19	5	470	370	820
225M	2	55	110	16	49	M20	225	400	350	450	19	5	470	370	815
	4,6,8	60	140	18	53	M20	225	400	350	450	19	5	470	370	845
250M	2	60	140	18	53	M20	250	500	450	550	19	5	490	380	930
	4,6,8	65	140	18	58	M20	250	500	450	550	19	5	490	380	930
280S	2	65	140	18	58	M20	280	500	450	550	19	5	580	410	981
	4,6,8	75	140	20	67.5	M20	280	500	450	550	19	5	580	410	981
280M	2	65	140	18	58	M20	280	500	450	550	19	5	580	410	1032
	4,6,8	75	140	20	67.5	M20	280	500	450	550	19	5	580	410	1032

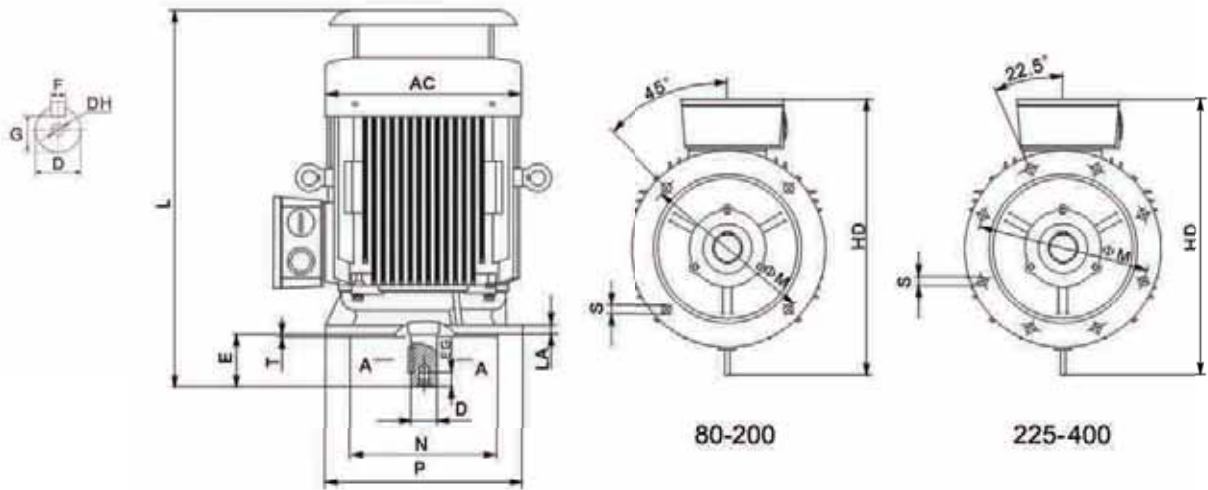


B14A

Frame Size	Poles	D	E	F	G	DH	H	M	N	P	S	T	AC	AD	L
80	2,4,6,8	19	40	6	15.5	M6	80	100	80	120	M6	3	165	165	295
90S	2,4,6,8	24	50	8	20	M8	90	115	95	140	M8	3	180	175	315
90L	2,4,6,8	24	50	8	20	M8	90	115	95	140	M8	3	180	175	340
100L	2,4,6,8	28	60	8	24	M10	100	130	110	160	M8	3.5	205	200	385
112M	2,4,6,8	28	60	8	24	M10	112	130	110	160	M8	3.5	240	220	400
132S	2,4,6,8	38	80	10	33	M12	132	165	130	200	M10	3.5	275	240	470
132M	2,4,6,8	38	80	10	33	M12	132	165	130	200	M10	3.5	275	240	510

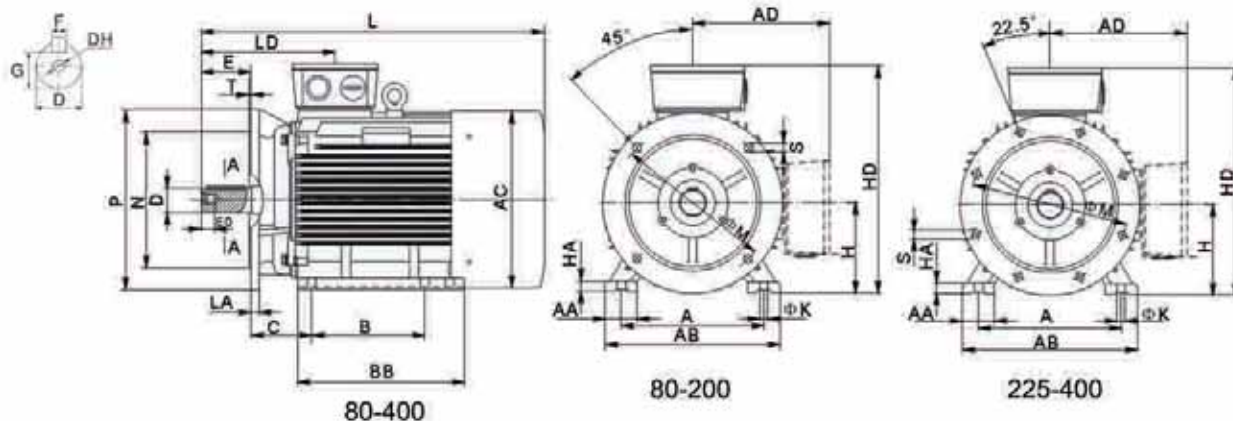
B14B

Frame Size	Poles	D	E	F	G	DH	H	M	N	P	S	T	AC	AD	L
80	2,4,6,8	19	40	6	15.5	M6	80	130	110	160	M8	3.5	165	165	295
90S	2,4,6,8	24	50	8	20	M8	90	130	110	160	M8	3.5	180	175	315
90L	2,4,6,8	24	50	8	20	M8	90	130	110	160	M8	3.5	180	175	340
100L	2,4,6,8	28	60	8	24	M10	100	165	130	200	M10	3.5	205	200	385
112M	2,4,6,8	28	60	8	24	M10	112	165	130	200	M10	3.5	240	220	400
132S	2,4,6,8	38	80	10	33	M12	132	215	180	250	M12	4	275	240	470
132M	2,4,6,8	38	80	10	33	M12	132	215	180	250	M12	4	275	240	510



V1

Frame Size	Poles	D	E	F	G	DH	H	M	N	P	S	T	AC	AD	L
80	2,4,6,8	19	40	6	15.5	M6	80	165	130	200	12	3.5	165	165	345
90S	2,4,6,8	24	50	8	20	M8	90	165	130	200	12	3.5	180	175	365
90L	2,4,6,8	24	50	8	20	M8	90	165	130	200	12	3.5	180	175	390
100L	2,4,6,8	28	60	8	24	M10	100	215	180	250	15	4	205	200	435
112M	2,4,6,8	28	60	8	24	M10	112	215	180	250	15	4	240	220	450
132S	2,4,6,8	38	80	10	33	M12	132	265	230	300	15	4	275	240	520
132M	2,4,6,8	38	80	10	33	M12	132	265	230	300	15	4	275	240	560
160M	2,4,6,8	42	110	12	37	M16	160	300	250	350	19	5	320	285	670
160L	2,4,6,8	42	110	12	37	M16	160	300	250	350	19	5	320	285	725
180M	2,4,6,8	48	110	14	42.5	M16	180	300	250	350	19	5	380	310	760
180L	2,4,6,8	48	110	14	42.5	M16	180	300	250	350	19	5	380	310	800
200L	2,4,6,8	55	110	16	49	M20	200	350	300	400	19	5	410	335	845
225S	4,6,8	60	140	18	53	M20	225	400	350	450	19	5	470	370	915
225M	2	55	110	16	49	M20	225	400	350	450	19	5	470	370	910
	4,6,8	60	140	18	53	M20	225	400	350	450	19	5	470	370	940
250M	2	60	140	18	53	M20	250	500	450	550	19	5	490	380	1035
	4,6,8	65	140	18	58	M20	250	500	450	550	19	5	490	380	1035
280S	2	65	140	18	58	M20	280	500	450	550	19	5	580	410	1115
	4,6,8	75	140	20	67.5	M20	280	500	450	550	19	5	580	410	1115
280M	2	65	140	18	58	M20	280	500	450	550	19	5	580	410	1157
	4,6,8	75	140	20	67.5	M20	280	500	450	550	19	5	580	410	1157
315S	2	65	140	18	58	M20	315	600	550	660	24	6	645	535	1310
	4,6,8,10	80	170	22	71	M20	315	600	550	660	24	6	645	535	1340
315M	2	65	140	18	58	M20	315	600	550	660	24	6	645	535	1425
	4,6,8,10	80	170	22	71	M20	315	600	550	660	24	6	645	535	1450
315L	2	65	140	18	58	M20	315	600	550	660	24	6	645	535	1425
	4,6,8,10	80	170	22	71	M20	315	600	550	660	24	6	645	535	1450
355M	2	75	140	20	67.5	M20	355	740	680	800	24	6	720	700	1640
	4,6,8,10	95	170	25	86	M24	355	740	680	800	24	6	720	700	1670
355L	2	75	140	20	67.5	M20	355	740	680	800	24	6	720	700	1640
	4,6,8,10	95	170	25	86	M24	355	740	680	800	24	6	720	700	1670
400	2	85	170	22	76	M24	400	940	880	1000	28	6	810	-	1980
	4,6,8	120	210	28	100	M24	400	940	880	1000	28	6	810	-	2040



B35

Frame Size	Poles	A	B	C	D	E	F	G	DH	H	K	M	N	P	S	T	AB	AC	AD	HD	L
80	2,4,6,8	125	100	50	19	40	6	15.5	M6	80	10	165	130	200	12	3.5	165	165	165	245	295
90S	2,4,6,8	140	100	56	24	50	8	20	M8	90	10	165	130	200	12	3.5	180	180	175	265	315
90L	2,4,6,8	140	125	56	24	50	8	20	M8	90	10	165	130	200	12	3.5	180	180	175	265	340
100L	2,4,6,8	160	140	63	28	60	8	24	M10	100	12	215	180	250	15	4	205	205	200	290	385
112M	2,4,6,8	190	140	70	28	60	8	24	M10	112	12	215	180	250	15	4	230	240	220	325	400
132S	2,4,6,8	216	140	89	38	80	10	33	M12	132	12	265	230	300	15	4	270	275	240	365	470
132M	2,4,6,8	216	178	89	38	80	10	33	M12	132	12	265	230	300	15	4	270	275	240	365	510
160M	2,4,6,8	254	210	108	42	110	12	37	M16	160	15	300	250	350	19	5	320	320	285	440	620
160L	2,4,6,8	254	254	108	42	110	12	37	M16	160	15	300	250	350	19	5	320	320	285	440	675
180M	2,4,6,8	279	241	121	48	110	14	42.5	M16	180	15	300	250	350	19	5	355	380	310	470	700
180L	2,4,6,8	279	279	121	48	110	14	42.5	M16	180	15	300	250	350	19	5	355	380	310	470	740
200L	2,4,6,8	318	305	133	55	110	16	49	M20	200	19	350	300	400	19	5	395	410	335	525	775
225S	4,6,8	356	286	149	60	140	18	53	M20	225	19	400	350	450	19	5	435	470	370	580	820
225M	2	356	311	149	55	110	16	49	M20	225	19	400	350	450	19	5	435	470	370	580	815
	4,6,8	356	311	149	60	140	18	53	M20	225	19	400	350	450	19	5	435	470	370	580	845
250M	2	406	349	168	60	140	18	53	M20	250	24	500	450	550	19	5	490	490	380	635	930
	4,6,8	406	349	168	65	140	18	58	M20	250	24	500	450	550	19	5	490	490	380	635	930
280S	2	457	368	190	65	140	18	58	M20	280	24	500	450	550	19	5	550	580	410	698	981
	4,6,8	457	368	190	75	140	20	67.5	M20	280	24	500	450	550	19	5	550	580	410	698	981
280M	2	457	419	190	65	140	18	58	M20	280	24	500	450	550	19	5	550	580	410	698	1032
	4,6,8	457	419	190	75	140	20	67.5	M20	280	24	500	450	550	19	5	550	580	410	698	1032
315S	2	508	406	216	65	140	18	58	M20	315	28	600	550	660	24	6	630	645	535	885	1185
	4,6,8,10	508	406	216	80	170	22	71	M20	315	28	600	550	660	24	6	630	645	535	885	1215
315M	2	508	457	216	65	140	18	58	M20	315	28	600	550	660	24	6	630	645	535	885	1295
	4,6,8,10	508	457	216	80	170	22	71	M20	315	28	600	550	660	24	6	630	645	535	885	1325
315L	2	508	508	216	65	140	18	58	M20	315	28	600	550	660	24	6	630	645	535	885	1295
	4,6,8,10	508	508	216	80	170	22	71	M20	315	28	600	550	660	24	6	630	645	535	885	1325
355M	2	610	560	254	75	140	20	67.5	M20	355	28	740	680	800	24	6	730	720	700	1065	1495
	4,6,8,10	610	560	254	95	170	25	86	M24	355	28	740	680	800	24	6	730	720	700	1065	1525
355L	2	610	630	254	75	140	20	67.5	M20	355	28	740	680	800	24	6	730	720	700	1065	1495
	4,6,8,10	610	630	254	95	170	25	86	M24	355	28	740	680	800	24	6	730	720	700	1065	1525
400	2	686	710	280	85	170	22	76	M24	400	36	940	880	1000	28	6	806	810	-	1075	1820
	4,6,8	686	710	280	120	210	28	100	M24	400	36	940	880	1000	28	6	806	810	-	1075	1881



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