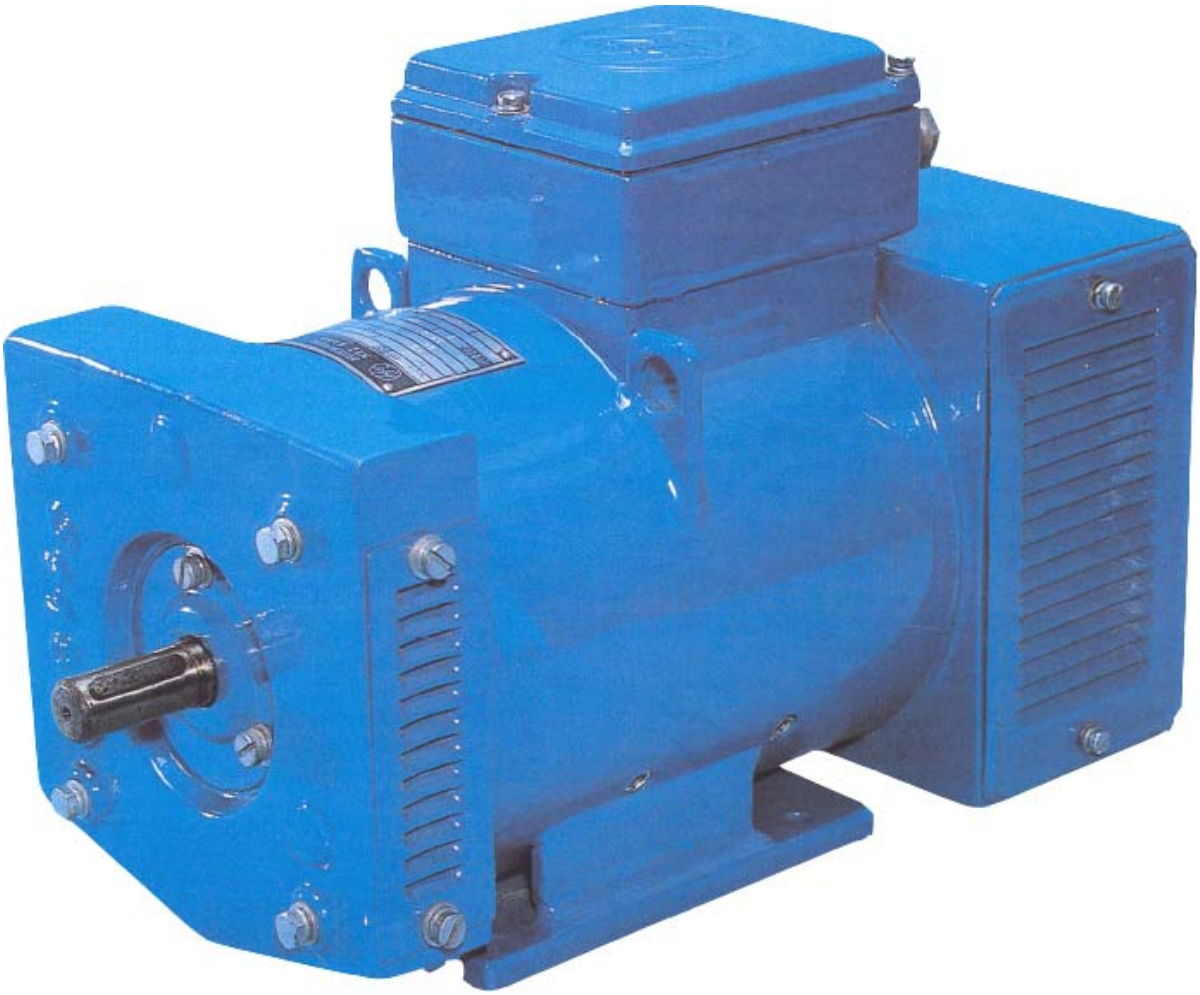
EM Brno Ltd.

DC MOTORS FOR GENERAL PURPOSE OF
M Series



DC MOTORS FOR GENERAL PURPOSE OF M SERIES

USE:
Motors of this series are designed for use in industrial drives and in engines, where is requested an easy and continual speed regulation.

GENERALLY:
This series is produced in four axial heights - 90, 112, 132 and 160 mm. Machines have four poles, only M90 has two poles. Structural design enables high amount of alternatives. Dynamically balanced rotors are placed on radial ball bearings with permanent grease filling. Class F of temperature resistance. Magnitude of vibrations A.

TECHNICAL DATA:
Armature voltage – 110,160,220,270,330,400,440 V.
Excitation voltage – 110,190,220,330,440 V
Max. speed can't override allowed mechanical speed 4 500 min^{-1}.
Speed regulation: at machines with separate excitation there is possible to control the speed by armature voltage from nominal to minimum speed at constant torque, as it is shown in the table. It is also possible to control by field weakening above nominal speed, in the range 1 : 1,5 at constant nominal output, 1 : 2 at output reduced by 10%.
Motors are also produced with parallel, series and compound field winding.
Degree of protection IP23, IP44, if agreed then IP55.
Cooling system is in detail described in the table.
Mounting – IM1001, IM2001, IM3001, IM3011, IM3031, IM1002, IM2002, IM3002, IM3012, IM 3032.

Motors are designed for environment:

- Standard (ambient temperature -20 to +40°C)
- Tropic wet - TH32 in protection IP23 (ambient temperature -20 to+40°C)
- Tropic universal - T23 in protection IP23 (ambient temperature -20 to +45°C)

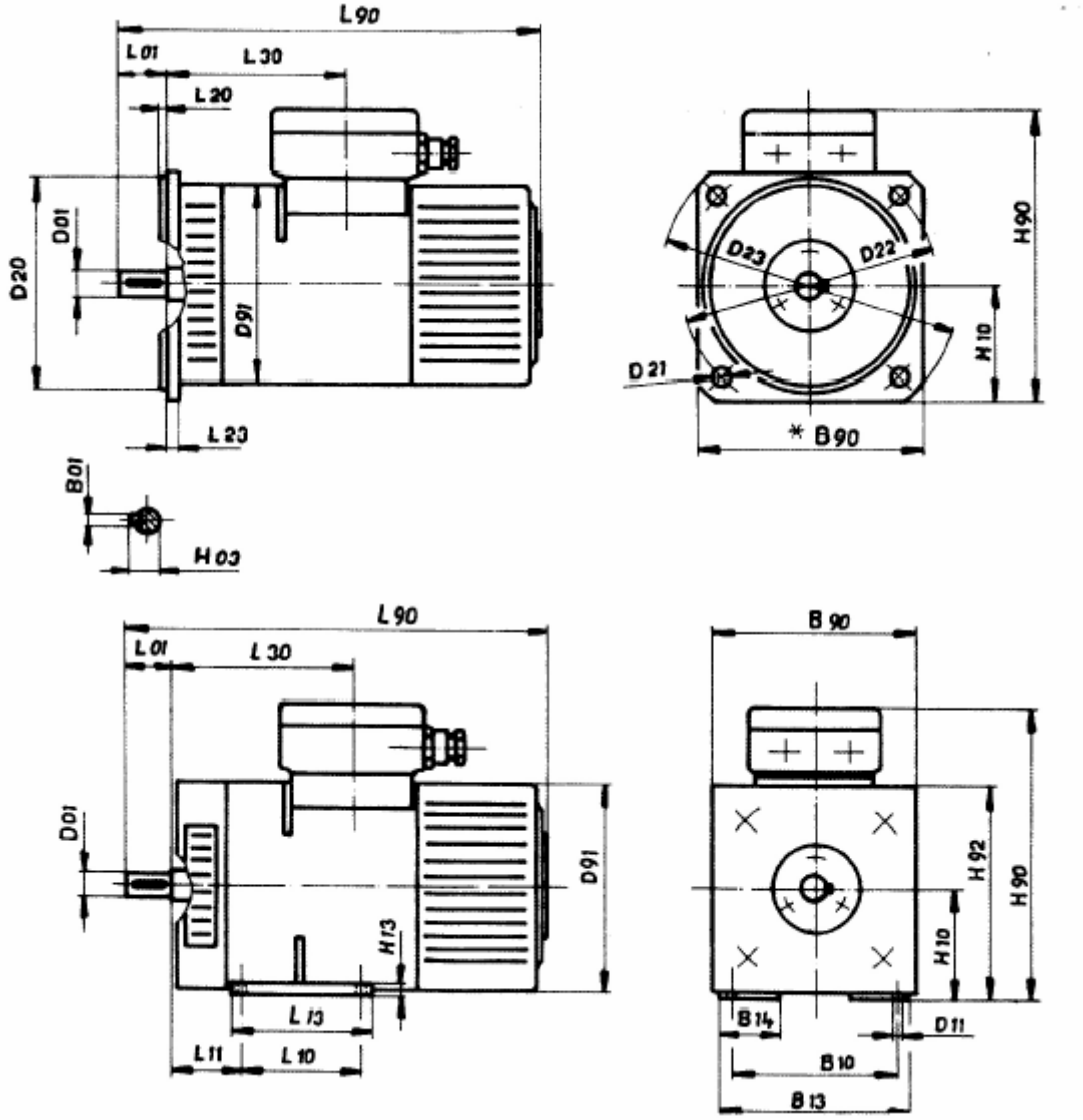
Elevation – max. 1000 m, above 1000 m it is necessary to reduce the output.
Direction of rotation – both.
Speed control: nominal speed theoretically varies from the lowest (stated in the table) up to the highest (app. 3500 1/min). Practically they are limited by a feasibility of each version of the armature. Outputs are calculated from torques (stated in the table) and from speed according to the equation

$$P = \frac{M \cdot n}{9550} \left[kW; Nm, min^{-1} \right]$$

Powering:
Stated values rely to the powering by a smooth supply current (to ripple 15 %). At ripple above 15 % the torque (power) is reduced by 15 %. Ripple above 45 % is not acceptable.

M90S	Designation	MF	MB					MG
	Protection/cooling	IP44/IC37, IP23/IC17	IP23/IC01					IP44/IC410
	Speed control	to 50 T*)	to 1500 T	to 750 T	to 300 T			to 50 T
	Torque [Nm]	4,8	4,8	3,6	2,9			2,65
M90L1	Designation	MF	MB					MG
	Protection/cooling	IP44/IC37, IP23/IC17	IP23/IC01					IP44/IC410
	Speed control	to 50 T	to 1500 T	to 750 T	to 300 T			to 50 T
	Torque [Nm]	7,0	7,0	5,25	4,2			3,85
M90L2	Designation	MF	MB					MG
	Protection/cooling	IP44/IC37, IP23/IC17	IP23/IC01					IP44/IC410
	Speed control	to 50 T	to 1500 T	to 750 T	to 300 T			to 50 T
	Torque [Nm]	9,6	9,6	7,2	5,75			5,3
M112S2	Designation	MF	MB			MO		MG
	Protection/cooling	IP44/IC37, IP23/IC05,17	IP23/IC01			IP44/IC411		IP44/IC410
	Speed control	to 50 T	to 1300 T	to 750 T	to 300 T	to 300 T		to 50 T
	Torque [Nm]	14	14	10,3	8,5	6,7		6,2
M112S	Designation	MF	MB			MO		MG
	Protection/cooling	IP44/IC37, IP23/IC05,17	IP23/IC01			IP44/IC411		IP44/IC410
	Speed control	to 50 T	to 1300 T	to 750 T	to 300 T	to 300 T		to 50 T
	Torque [Nm]	19,1	19,1	14,3	11,5	9,6		7,6
M112L	Designation	MF	MB			MO		MG
	Protection/cooling	IP44/IC37, IP23/IC05,17	IP23/IC01			IP44/IC411		IP44/IC410
	Speed control	to 50 T	to 1300 T	to 750 T	to 300 T	to 300 T		to 50 T
	Torque [Nm]	25,4	25,4	19	15,2	12,7		8,9
M132M	Designation	MF	MB			MO		MG
	Protection/cooling	IP44/IC37, IP23/IC05,17	IP23/IC01			IP44/IC411		IP44/IC410
	Speed control	to 50 T	to 1300 T	to 750 T	to 300 T	to 300 T		to 50 T
	Torque [Nm]	35	35	26,2	21	17,5		12,7
M132L	Designation	MF	MB			MO		MG
	Protection/cooling	IP44/IC37, IP23/IC05,17	IP23/IC01			IP44/IC411		IP44/IC410
	Speed control	to 50 T	to 1300 T	to 750 T	to 300 T	to 300 T		to 50 T
	Torque [Nm]	47,8	47,8	35,9	28,7	23,9		16,6
M160S	Designation	MF	MB			MO		
	Protection/cooling	IP44/IC37, IP23/IC05,17	IP23/IC01			IP44/IC411		
	Speed control	to 50 T	to 1500 T	to 750 T	to 300 T	to 1500 T	to 750 T	to 300 T
	Torque [Nm]	70	70	52,5	35	35	31,5	28
M160L1	Designation	MF	MB			MO		
	Protection/cooling	IP44/IC37, IP23/IC05,17	IP23/IC01			IP44/IC411		
	Speed control	to 50 T	to 1500 T	to 750 T	to 300 T	to 1500 T	to 750 T	to 300 T
	Torque [Nm]	96	96	72	48	48	43,2	38,4
M160L2	Designation	MF	MB			MO		
	Protection/cooling	IP44/IC37, IP23/IC05,17	IP23/IC01			IP44/IC411		
	Speed control	to 50 T	to 1500 T	to 750 T	to 300 T	to 1500 T	to 750 T	to 300 T
	Torque [Nm]	118	118	88,5	59	59	53,1	47,2

*) T means min^{-1}



TYPE	B01	B10	B13	B14	B90*	B90	D01 $_{K6}$	D11	D20 $_{j6}$	D21	D22	D23	D91	H03	H10 $_{-0,5}$	H13	H9	H92	L01	L10	L11	L13	L20	L23	L30	L90	m [kg]
MB90S	6	140	160	53	188x188	202	19	10	180	15	215	250	174	22	90	10	247	177	40	100	56	120	4	10	152	352	28
MB90L1																									182	382	33
MB90L2																				125		160			212	412	38
MB112S2	8	190	224	45	240x240	228	28	12	180	15	215	250	216	31	112	12	303	220	60	114	70	148	4	10	170	441	52
MB112S																									205	476	54
MB112L																				159		199			235	506	60
MB132M	10	216	250	45	260x260	270	38	12	230	15	265	300	260	41	132	14	346	261	80	178	89	212	4	12	224	535	82
MB132L																				203		243			264	575	91
MB160M	12	254	286	50	312x312	332	42	15	250	19	300	350	312	45	160	18	395	316	110	210	108	237	5	12	261	607	129
MB160L1																									306	652	152
MB160L2																				254		281			346	692	173

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All data in the catalogue are informative only, manufacturer reserves the right to any changes.