Brake Motors are offered for various applications requiring almost instantaneous stopping of driven load. These motors are offered in frame sizes 71 to 132M. Their operation is of 'fail safe' type, i.e., the brake is applied when, power to the motor is switched off, or, if power failure occurs.

Construction

A Brake Motor is an integral combination of an A.C. induction motor and a disc type, fail safe, electromagnetic brake unit. it consist of following:

i) A.C. induction motor.
ii) Encapsulated brake coil housed in the non-driving end End-shield.
iii) Brake liner attached to the armature disc at its interface with the cooling fan.
iv) Cooling fan.
v) The rectifier unit is provided inside the Terminal Box. it converts A.C. supply into D.C. supply for the Brake coil.

Operation

Under no power condition Brake springs keep the Brake Liner pressed against the cooling fan. This prevents rotor shaft rotation, because, the fan is keyed to it. When power is switched on, the Brake coil gets energised through the Rectifier unit. It instantly attracts the armature disc by overcoming the spring force. This action results in releasing of the fan allowing the rotor to rotate freely.

When the power fails or when it is switched off, the brake coil gets de-energised. This results in the springs pressing the brake liner against cooling fan, i.e. returning armature disc to its original position. This causes almost instantaneous braking of rotor. Fail safe condition is thus ensured.

For applications, where total load stopping time is not very critical, A.C. side interuption can be used.

However for applications where faster braking is required D.C. side interruption should be used. An additional contactor interlocked with main contactor should be used.

Special Features

a) Being simple and rugged - in construction., these motors need very little maintenance.

b) No separate DC supply is necessary for brake coil energisation, because a rectifier unit is provided. The rectifier is open type and fixed between the two terminals inside the terminal box. Being open type, it ensures good heat dissipation and is very easy to replace. Varistor is provided across the DC terminals to protect the brake coil and rectifier against line and switching surges.

c. Special brake liner is used, which ensures that, the braking torque value remains quite stable throughout the use. Compensation for liner wear is easily done by advancing the position of the fan by tightening the castle nut at the non-drive end. The design of brake motor facilitates a very easy replacement of armature disc and brake liner assembly.

d) Since the fan serves as a braking surface (unlike some other designs), it also serves to cool the Brake coil and the motor. These Brake Motors being fan-cooled are available in smaller frame sizes than other brake motors which are surface cooled. Therefore, these motors are more compact and economical for a given application.

e) For crane and hoist duty application Brake Motors are offered with special rotors. These rotors are specially suited for S_3 and S_4 duty normally encountered in hoist and crane applications.

f) Mechanical manual release of the brake as an optional feature is available from 90S to 132M frames. In case of power failure, the brake can be released manually with a lever.

g) The working of the rectifier unit has been successfully type tested for one million operations.

Applications

Brake Motors are used for numerous applications. A few of them are listed below :

— Textile Machinery
— Machine Tools
— Printing Machine
— Cranes and Hoists
— Material Handling Equipments
— Leather Processing Machines
— Geared Motors
— Cable Reeling Drums
— Rolling Mills

Enquiry Details :

When placing an enquiry kindly furnish the following information.

1. Application details
2. Output and speed
3. Duty cycle with number of starts/stops per hour.
4. Ambient temperature and special environmental factors likely to affect the motor, if any.
5. Method of mounting.
6. Load GD referred to motor shaft*
7. Braking torque required*
8. Maximum permissible stopping time.
9. Any other special features required.

*These are inter-related parameters and related by following formula

$$\text{Total Stopping time } Ts = \frac{GD^2 \times N}{375 \times T} + t_{app}$$

where
T = braking torque in kgm
GD^2 = load GD^2 + rotor GD^2
N = speed of rotation in r.p.m.
tapp = brake application time
(to be obtained from Table 1)

DC Brake Motors :

Frames 71 to 132 M, B3 Construction, Class 'F' insulation, suitable 415V ± 10%, 50 Hz± 5%, Combined Variation, ± 10%, for Ambient temperature 50^0 C, Degree of Protection IP 55. All motors Conform to IS 325.

Performance Table - MB Type

Frame Size	Outputs (kW)				*Brake release time (milisecs)	**Brake application time (milisecs)		Braking torque (kgm)
	2P	4P	6P	8P		AC side interruption	DC side interruption	
71	0.37	0.25	0.25	-	50	135	25	0.5
	0.55	0.37	-	-	50	135	25	0.5
80	0.75	0.55	0.37	-	55	225	45	1.0
	1.10	0.75	0.55	-	55	225	45	1.0
90S	1.50	1.10	0.75	0.37	100	260	50	2.0
90L	2.20	1.50	1.10	0.55	100	260	50	2.0
100L	3.70	2.20	1.50	0.75	135	270	50	4.0
	-	-	-	1.10	135	270	50	4.0
112M	-	3.70	2.20	1.50	145	290	60	5.0
132S	5.50, 7.5	5.50	3.70	2.20	145	270	60	5.0
132M	9.3	7.50	5.50	-	145	270	60	5.0

1. Other braking torque values upto 40% higher can be given for special applications.
2. Other outputs can be offered on request where feasible.

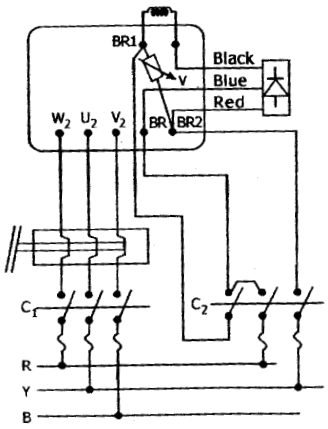
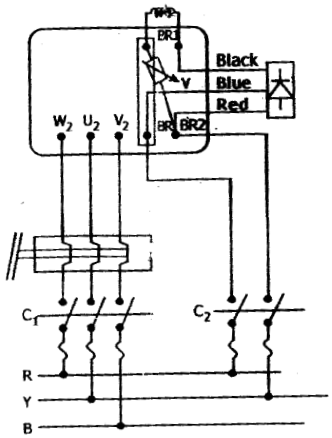
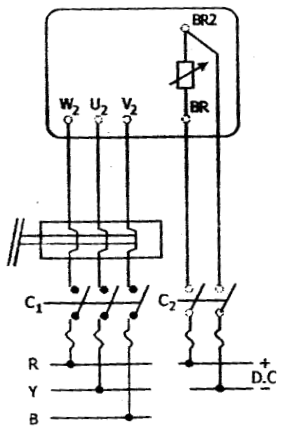
* Brake release time : The time interval between the instant supply to the brake coil is switched on, to the instant the brake is released.

** Brake application time : The time inteval between the instant supply to the brake coil is interrupted to the instant the brake is applied.

The value depends on whether the circuit is interrupted on AC side or DC side.

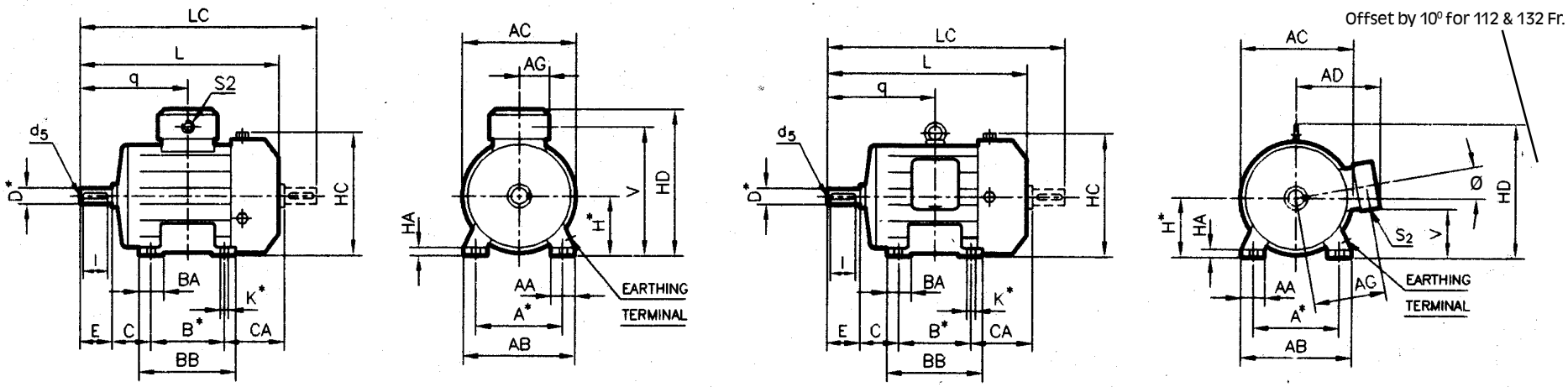
For performance details, please refer standard Motor Catalogue.

Brake Coil Connections :

Type 1 BRAKE COIL SWITCHED OFF ON D.C. SIDE	**Type 2** BRAKE COIL SWITCHED OFF ON D.C. SIDE	**Type 3** BRAKE COIL SWITCHED OFF ON D.C. SIDE
		

THE MOTOR MUST NEVER BE SWITCHED ON UNLESS THE BRAKE IS ENERGISED AND THE BRAKE SHOULD NEVER BE DE-ENERGISED WHEN THE MOTOR IS ON THE INTERLOCKING OF TWO CONTACTORS IS ABSOLUTELY NECESSARY.

Dimensional Drawing : Foot Mounted (B3 Construction) TEFC Standard Brake Motors Frame 71-132M



Frame Size 71 & 80

Frame Size 90S to 132M

Dimensional Details : Foot Mounted (B3 Construction) TEFC Standard Brake Motors Frame 71-132M

		FIXING						GENERAL										TERMINAL BOX					SHAFT					
IEC Frame Size	Motor Type	A*	B*	B1*	C	H*	K*	AB	BB	AA	BA	BA1	HA	HC	HD	AD	L	AC	V	q	AG	S2 B.S.C	D*	E	F*	GA*	l	d
71	MB 071	112	90	-	45	71	7	138	110	30	29	-	7	143.5	214	-	277	139	163	120	40	3/4"	14	30	5	16	25	M5
80	MB 080	125	100	-	50	80	10	153	124	32	32	-	10	161	220	-	347	157	179	110	40	3/4"	19	40	6	21.5	35	M6
90S	MB 09S	140	100	-	56	90	10	180	135	50	40	-	13	181	①	162	355	172	58	156	117	3/4"	24	50	8	27	45	M8
90L	MB 09L	140	125	-	56	90	10	180	160	50	40	-	13	181	①	162	380	172	58	169	117	3/4"	24	50	8	27	45	M8
100L	MB 10L	160	140	-	63	100	12	200	176	54	50	-	14	201	235	177	439	196	68	193	131	1"	28	60	8	31	55	M10
112M	MB 11M	190	140	-	70	112	12	230	176	62	50	-	15	226	269	190	456	226	82	200	144	1"	28	60	8	31	55	M10
132S	MB 13S	216	140	-	89	132	12	256	180	64	50	-	17	266	308	217	501	266	99	239	166	1"	38	80	10	41	70	M12
132M	MB 13M	216	178	-	89	132	12	256	218	64	54	-	17	266	308	217	539	266	99	258	166	1"	38	80	10	41	70	M12

Dimensions for double shaft extension on request.

All Dimensions are in mm unless otherwise specified

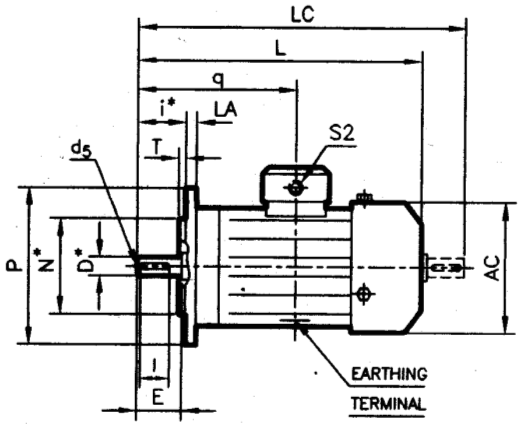
Tolerance on Dimensions with star

Dimension	Tolerance		Specification
A,B	±0.75	IS	IS : 1231
H	0.5	IS	IS : 1231
D	j6	11,14,19,24,28Ø	
	k6	38	
K	+0.360	10Ø	
	+0.430	12,15Ø,19Ø,24Ø	
GA,F			IS : 2048
d(centering)			IS : 2540

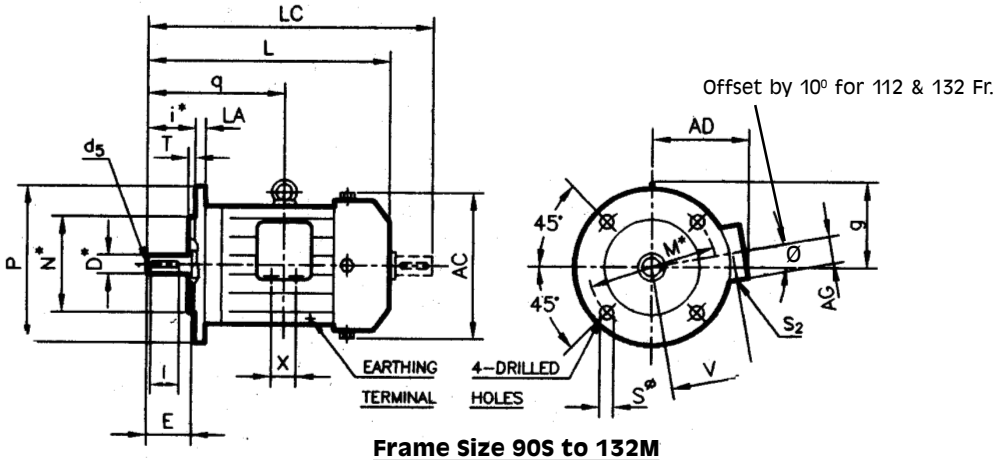
Note :

① Without Eye bolt.

Dimensional Drawing : Flange Mounted (B5 Construction) TEFC Standard Brake Motor Frames 71-132M



Frame Size 71 & 80



Frame Size 90S to 132M

Dimensional Details : Flange Mounted (B5 Construction) TEFC Standard Brake Motor Frames 71-132M

		FIXING					GENERAL						TERMINAL BOX				SHAFT					
IEC Frame	Motor Type Size	P	N*	M*	i*	S	T	LA	AD	AC	L	g	v	q	AG	S2	D* B.S.C	E	F*	GA*	i	d
71	MB 071	160	110	130	30	10	3.5	9	133	139	304		92	147	40	3/4"	14	30	5	16	25	M5
80	MB 080	200	130	165	40	12	3.5	10	140	157	347		99	110	40	3/4"	19	40	6	21.5	35	M6
90S	MB 09S	200	130	165	50	12	3.5	10	162	181	355	①	117	156	52	3/4"	24	50	8	27	45	M8
90L	MB 09L	200	130	165	50	12	3.5	10	162	181	380	①	117	169	52	3/4"	24	50	8	27	45	M8
100L	MB 10L	250	180	215	60	15	4	11	177	202	439	135	131	193	56	1"	28	60	8	31	55	M10
112M	MB 11M	250	180	215	60	15	4	11	190	227	456	157	144	200	56	1"	28	60	8	31	55	M10
132S	MB 13S	300	230	265	80	15	4	12	217	267	501	176	166	239	63	1"	38	80	10	41	70	M12
132M	MB 13M	300	230	265	80	15	4	12	217	267	539	176	166	258	63	1"	38	80	10	41	70	M12

Dimensions for double shaft extension on request.

All Dimensions are in mm unless otherwise specified

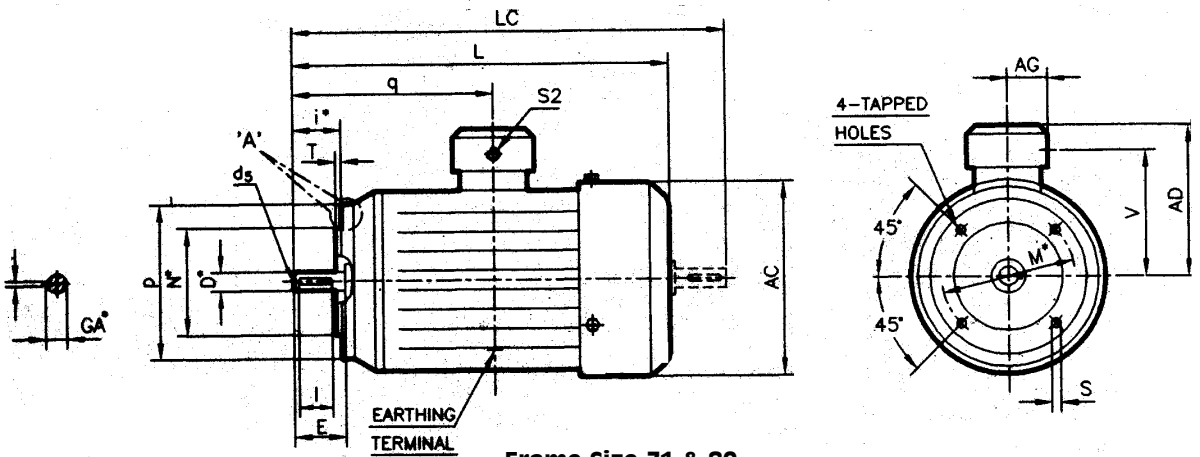
Tolerance on Dimensions with star

Dimension	Tolerance		Specification
N	j 6		IS : 2223
M	±0.3	UPTO 265	
	±0.5	OVER 265	
i	±1	UPTO 85	
	±1.5	OVER 85	
D	j6	11, 14, 19, 24, 28Ø	
	k6	38	
GA,F			IS : 2048
d(centering)			IS : 2540

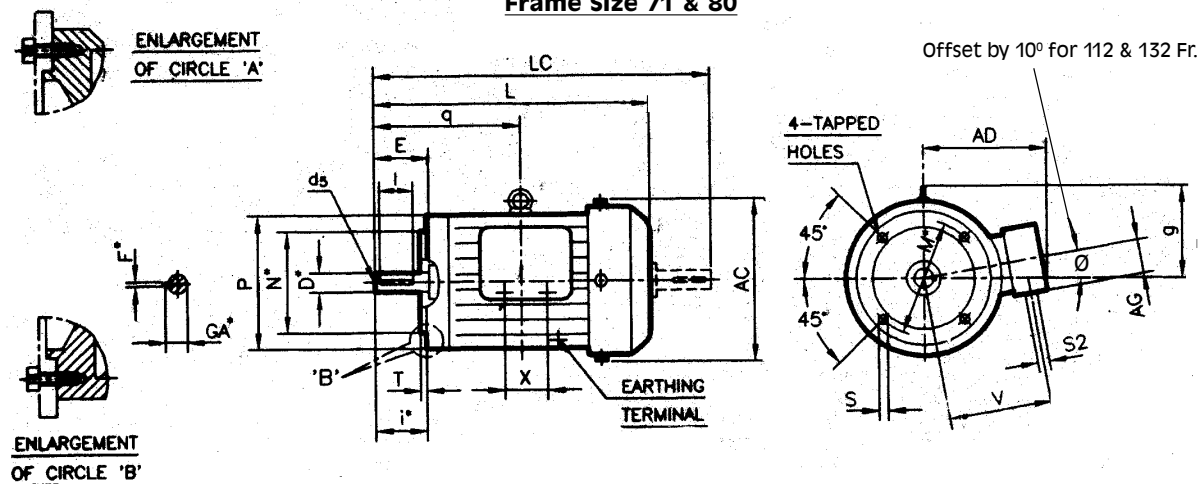
Note :

① Without Eye bolt.

Dimensional Drawing: Face Mounted (B14 Construction) TEFC Standard Brake Motor Frame 71-132M



Frame Size 71 & 80



Frame Size 71 to 132m

Dimensional Details : Face Mounted (B14 Construction) TEFC Standard Brake Motor Frame 71-132M

		FIXING					GENERAL					TERMINAL BOX				SHAFT					
IEC Frame Size	Motor Type	P	N*	M*	I*	S	T	AD	AC	L	g	V	q	AG	S2 B.S.C	D*	E	F*	GA*	i	d*
71	MB 071	105	70	85	30	M6X13	2.5	133	139	277		92	120	40	3/4"	14	30	5	16	25	M5
80	MB 080	120	80	100	40	M6X13	3	140	157	347		99	110	40	3/4"	19	40	6	21.5	35	M6
90S	MB 09S	140	95	115	50	M8X12	3	162	172	355	①	117	156	52	3/4"	24	50	8	27	45	M8
90L	MB 09L	140	95	115	50	M8X12	3	162	172	380	①	117	169	52	3/4"	24	50	8	27	45	M8
100L	MB 10L	160	110	130	60	M8X12	3.5	177	196	439	135	131	193	56	1"	28	60	8	31	55	M10
112M	MB 11M	160	110	130	60	M8X12	3.5	190	227	456	157	144	200	56	1"	28	60	8	31	55	M10
132S	MB 13S	250	180	215	80	M12X12	4	217	267	501	176	166	239	63	1"	38	80	10	41	70	M12
132M	MB 13M	250	180	215	80	M12X12	4	217	267	539	176	166	258	63	1"	38	80	10	41	70	M12

Dimensions for double shaft extension on request.

All Dimensions are in mm unless otherwise specified

Tolerance on Encircled

Dimension	Tolerance	Specification
N	j6	IS : 2223
M	+ 0.3	
i	+ 1	
D	j6 Upto 28 k6 Over 28	
GA, F		IS : 2048
d (centering)		IS : 2540

Note :

① With Eyebolt

l Suitable for B14, V19 & V18 mounting as per IS 2223.

l Key/Key way fit : h9 / N9

Bharat Bijlee Limited

: Registered Office :

Electric Mansion, 6th Floor, Appasaheb Marathe Marg, Prabhadevi, Mumbai 400 025.
Tel.: 2430 6237, 2430 6375 Fax: 022-2437 0624

: Central Marketing Office & Works :

Post Box No. 100, Thane Belapur Road, Thane 400 601.
Tel : 2760 0401 / 2760 0411 Fax : 91-22-2760 0430

Offices

REGION	CITY	ADDRESS	PHONE	FAX
NORTH	NEW DELHI	Milap Niketan, 4th floor 8A, Bahadur Shah Zafar Marg, New Delhi 110 002.	2371 14 34 2331 96 94 /95/96	011-2331 9413
	LUDHIANA	7, Gian Market, Opp. Ramgarhia Gurudwara, G. T. Road, Miller Ganj, Ludhiana - 141 003.	2531 663 2542 131	0161-2533826
	INDORE	C/o. Tirupati Engineering, 128, 3rd Floor, Dawa Bazar, RNT Marg, Indore 452 001.	2704 474 2704 486	0731-2704390
EAST	KOLKATA	Flat No.8, 'Mansarowar', 2nd Floor, 3B Camac Street, Kolkata 700 016.	2217 23 82 2217 23 83/ 84	033-2217 2467
WEST	MUMBAI	Post Box No.100, Thane-Belapur Road, Thane 400 601.	2760 58 34 2760 58 35 / 36	022-2760 0430
	PUNE	9, Ketki Building, 2nd Floor, Next to Alka Theatre, Sadashiv Peth, Pune 411 630.	433 48 31 432 12 67	020-433 9210
	AHMEDABAD	202, Arth, 8-Rashmi Society, Behind A. K. Patel House, Mithakhali, Cross Road, Ahmedabad - 380 009.	2642 76 67 2643 08 98	079-2656 3581
SOUTH	BANGALORE	204-207, Ramanashree Chambers, 2nd Floor, No.37, Lady Curzon Road, Bangalore 560 001.	559 26 81 559 21 37 559 62 74	080-559 2823
	CHENNAI	C/o. Arpan Corporation, AVM Studios Compound, 38, Arcol Road, Vadapalani, Chennai 600 026.	2372 85 79 2472 67 34	044-2372 8579
	SECUNDERABAD	Krishna Mansion, 2nd Floor, Adjacent to Bible House, 134, Rashtrapati Road, Secunderabad 500 003.	2753 45 12	040-2753 1791