

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

Enclosures: (Material & T-Box location)

Frame Sizes	Enclosure Materials	Terminal Box Location	
		Standard	Option Available
71-80	Aluminum	Top	---
90S-132M	Cast Iron	RHS	LHS
			TOP

Construction

A Brake motor is an integral combination of an A.C induction motor and a disc type, fail safe, electromagnetic Brake unit. It consists of following:

- I) A.C. induction motor.
- II) Encapsulated brake coil housed in the non driving side end-cover.
- 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 energized 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-energized. 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 interruption can be used.

However for application 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.
- c) Special brake liner is used, which ensures that, the braking torque value remains quite stable throughout the use. Compensation for liner wear is 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 size than other Brake motors which are surface cooled. Therefore, these motor are more compact and economical for a given application.
- e) For Crane and Hoist duty application Brake motors are offered with special rotors to suit their respective duties. These rotors are specially suited for S3 and S4 duty normally encountered in Crane and Hoist application.
- f) Mechanical manual release of the brake as an optional feature is available from 90 to 132 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.



Bearing Details

Frame Size	Bearing Nos. C3 Clearance	
	DE	NDE
71	6202 2Z	6203 2Z
80	6004 2Z	6204 2Z
90S, 90L	6205 2Z	6305 2Z
100L	6206 2Z	6307 2Z
112M	6206 2Z	6308 2Z
132S, 132M	6208 2Z	6308 2Z

Applications

Brake Motors are used for numerous applications.

A few of them are listed below:

- Textile Machinery
- Machine Tools
- Printing Machine
- Crane 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^2 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:

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

Where

T = Braking torque in kgm

GD^2 = load GD^2 + rotor GD^2

N = Speed of rotation in r.p.m.

t_{app} = brake application time





Voltage	: 415V ± 10%	Ambient	: 50°C	Ins. Class	: F
Frequency	: 50Hz ± 5%	Duty	: S1	Temp. Rise	: B
Combined Variation	: ± 10%	Protection			: IP55

Performance Table - For Brake Part

Frame Size	Outputs (kW)				*Brake release time (ms)	**Brake Application time (ms)		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
	1.1	0.75	0.55	-	55	225	45	1.0
90S	1.5	1.1	0.75	0.37	100	260	50	2.0
90L	2.2	1.5	1.1	0.55	100	260	50	2.0
100L	3.7	2.2	1.5	0.75	135	270	50	4.0
	-	-	-	1.1	135	270	50	4.0
112M	-	3.7	2.2	1.5	145	290	60	5.0
132M	5.5,7.5	5.5	3.7	2.2	145	270	60	5.0
132M	9.3	7.5	5.5	-	145	270	60	5.0

1. Other Braking torque values up to 40% higher can be given for special applications.
2. Other output can be offered on request where feasible.

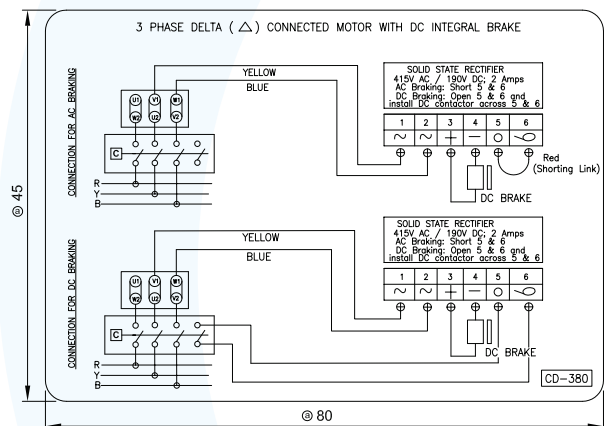
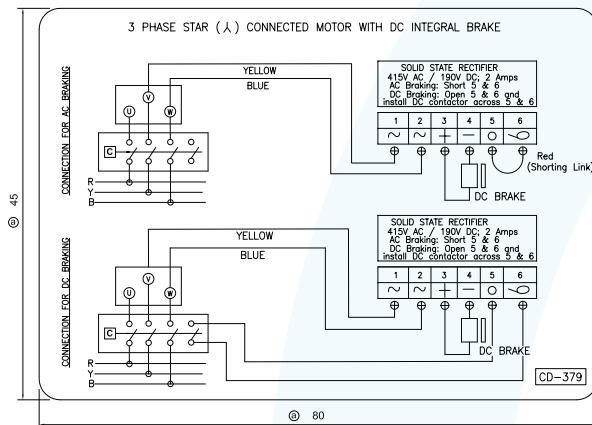
*Brake release time: The time interval between the instant the supply to the brake coil is switched on, to the instant the brake is released.

**Brake application time: The time interval between the instant the 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.

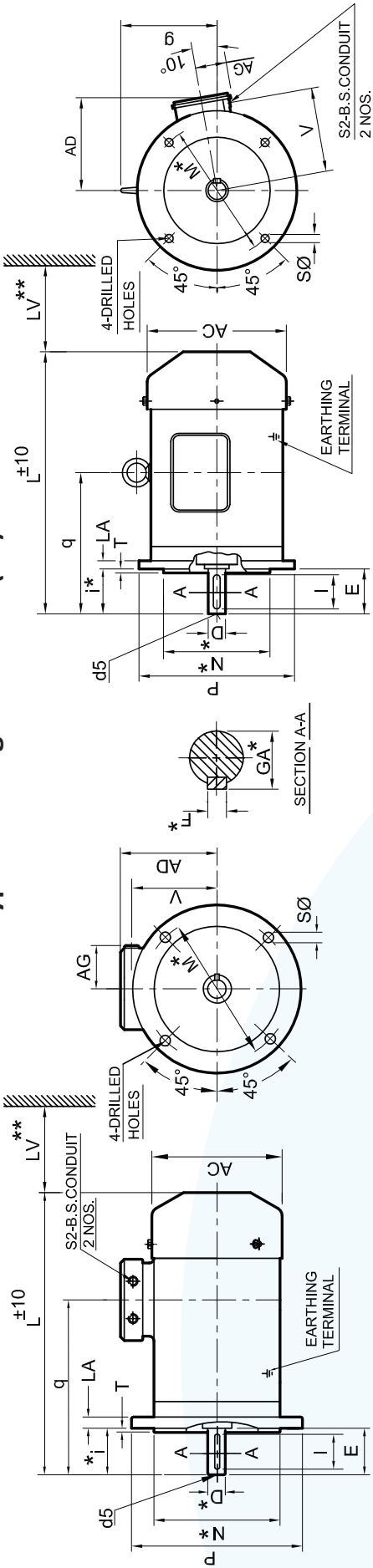
For performance details of motor parts, please refer Industrial Motor section of this catalogue.

Brake Coil Connections



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

Dimensional Details: Brake Motors Type MB Flange Mounted (B5) TEFC Series Frame 71-132M



FRAME SIZE 71 TO 80

FRAME SIZE 90S TO 132M

IEC Fr. size	Pole	FIXING						GENERAL						TERMINAL BOX						SHAFT			
		P	N*	M*	i*	S	T	LA	AD	AC	L	g	LV**	V	q	AG	S2	B.S.C.	D*	E	F*	GA*	I
71	2,4 & 6	160	110	130	30	10	3.5	9	145	140	306	—	30	104	168	53	3/4"	14	30	5	16	25	M5
80	2,4 & 6	200	130	165	40	12	3.5	10	155	157	331	—	30	114	170	53	3/4"	19	40	6	21.5	35	M6
90S	2,4,6 & 8	200	130	165	50	12	3.5	10	172	174	355	①	35	124	156	53	3/4"	24	50	8	27	45	M8
90L	2,4,6 & 8	250	180	215	60	15	4	11	198	195	439	135	40	143	193	60	1"	28	60	8	31	55	M10
100L	2,4,6 & 8	250	180	215	60	15	4	11	211	220	456	148	45	156	200	60	1"	28	60	8	31	55	M10
112M	4,6 & 8	300	230	265	80	15	4	12	232	260	512	176	50	178	239	60	1"	38	80	10	41	70	M12
132S	2,4,6 & 8	300	230	265	80	15	4	12	232	260	550	176	50	178	239	60	1"	38	80	10	41	70	M12
132M	2,4,6 & 8	300	230	265	80	15	4	12	232	260	550	176	50	178	239	60	1"	38	80	10	41	70	M12

TABLE A

Dimension	Tolerance	Specification
N	j6	IS : 2223
M	±0.3	IS : 2223
I	±1	IS : 2223

* Refer TABLE A for tolerances

Dimension	Tolerance	Specification
D	j6	IS : 1231
GA,F	k6	IS : 1231
d5(centering)		IS : 2048
		IS : 2540

① Without Eye bolt

□ Also suitable for V19 & v18 mounting as per IS 2253

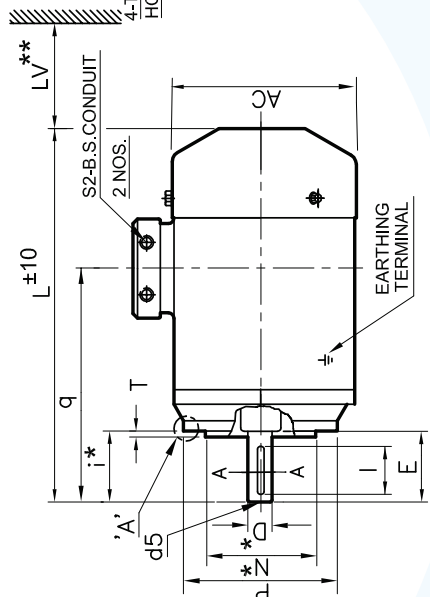
□ Key / key way fit : h9 / N9

** Minimum distance for efficient cooling of motor to be maintained by user

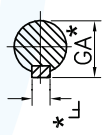
All Dimensions are in mm unless otherwise specified.

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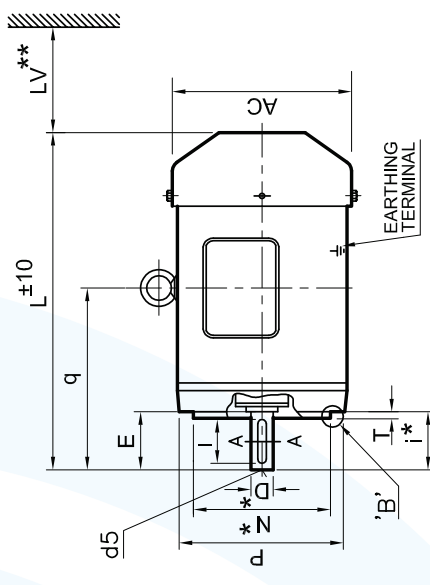
Dimensional Details: Brake Motors Type MB Face Mounted (B14) TEFC Series Frame 71-132M



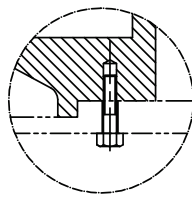
FRAME SIZE 71 TO 80



SECTION A-A

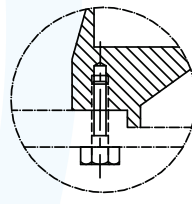


FRAME SIZE 90S TO 132M



ENLARGEMENT OF CIRCLE 'B'

IEC Fr. size	Pole	FIXING			GENERAL				TERMINAL BOX			SHAFT									
		P	N	M	S	T	AD	AC	L	g	LV	V	q	AG	S2 B.S.C.	D	E	F*	GA*	I	d5
71	2,4 & 6	105	70	85	30	2.5	145	140	279	—	30	104	143	53	3/4"	14	30	5	16	25	M5
80	2,4 & 6	120	80	100	40	3	155	157	331	—	30	114	170	53	3/4"	19	40	6	21.5	35	M6
90S	2,4,6 & 8	140	95	115	50	3	172	174	355	①	35	124	156	53	3/4"	24	50	8	27	45	M8
90L	2,4,6 & 8	140	95	115	50	3	172	174	380	—	35	124	169	53	3/4"	24	50	8	27	45	M8
100L	2,4,6 & 8	160	110	130	60	3.5	198	195	439	—	40	143	193	60	1"	28	60	8	31	55	M10
112M	4,6 & 8	160	110	130	60	3.5	211	220	456	—	45	156	200	60	1"	28	60	8	31	55	M10
132S	2,4,6 & 8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
132M	2,4,6 & 8	250	180	215	80	4	232	260	550	—	50	178	239	60	1"	38	80	10	41	70	M12



ENLARGEMENT OF CIRCLE 'A'

TABLE A

Dimension	Tolerance	Specification
N	j6	IS : 2223
M	±0.3	IS : 2223
i	±1	IS : 2223

* Refer TABLE A for tolerances

Dimension	Tolerance	Specification
D	j6	IS : 1231
	k6	IS : 1231
GA,F		IS : 2048
d5(centering)		IS : 2540

- ① Without Eye bolt
- Also suitable for V19 & v18 mounting as per IS 2253
- Key / key way fit : h9 / N9
- ** Minimum distance for efficient cooling of motor to be maintained by user

All Dimensions are in mm unless otherwise specified.

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