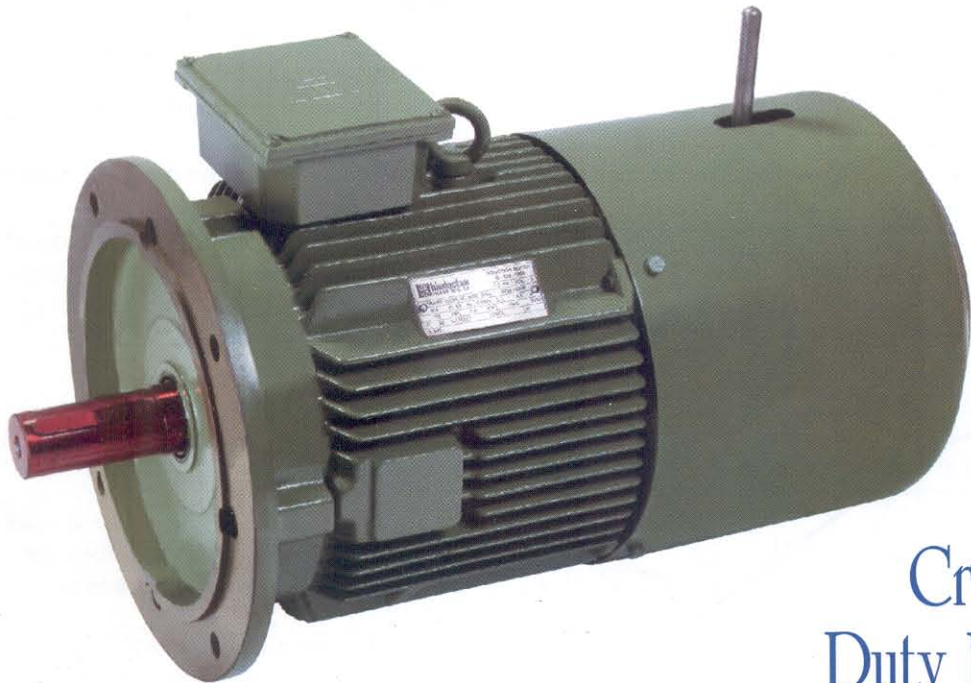


**hindustan**  
ELECTRIC MOTORS



Crane  
Duty Motors

Motoring  
the Wheels  
of Success

CE

ISO 9001:2000



A12311

# INTRODUCTION

## APPLICATION:

"HINDUSTAN" brand crane duty motors are specially designed for frequent starts/stops & reversing required in cranes & lifts of all types. They can also be used in applications such as material handling, weirs & sluices, auxiliary motors in rolling mills or wherever intermittent drives are required.

## RANGE:

KW	: 0.18 to 30.0 kW
RPM	: 1500, 1000, 750
Mounting	: Foot (B3), flange (B5), face (B14) & combinations
Frame	: 71 to 200L
Voltage	: 415V $\pm$ 10% or as required
Frequency	: 50Hz $\pm$ 5% or as required
Ambient	: 40°C. For motors other than this, a deration factor is applied as per Fig. 1
Altitude	: upto 1000m above m. s. l.
Rotor Type	: Squirrel cage aluminium die cast
Enclosure	: Totally enclosed fan cooled (TEFC)
Protection	: IP55
Insulation class	: Class F insulation with temp. rise limited to class B
Duty cycle	: S3 - S5
Standards	: IS:325, IS:1231, IS:2223 & IS:4722

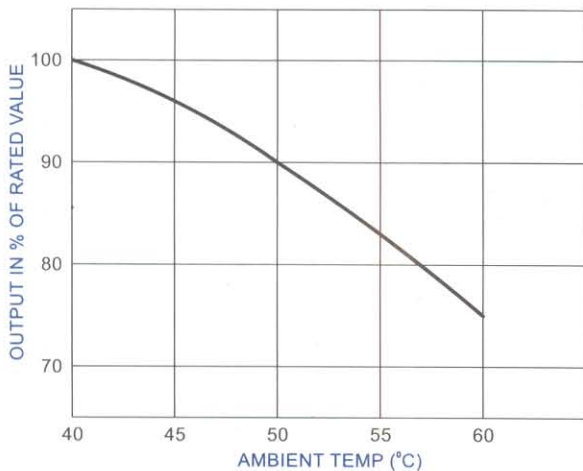


Fig.1: Deration factor

Ambient temp.	Deration factor
45°C	0.96
50°C	0.90
55°C	0.83
60°C	0.75

## CONSTRUCTION:

**Castings:** "Hindustan" crane duty motors' housings & endshields are made from high quality castings as per IS: 210. All components are machined to correct accuracy & alignment.

**Stampings:** The stampings are made from low loss high permeability steel.

**Terminal Box:** Standard location of terminal box is on top. However the terminal box on right or left side can be provided on request. The terminal box can be rotated in steps of 90° in each position.

## MOTORS WITH INTEGRAL BRAKES:

These motors can be supplied with integral electromagnetic DC fail safe brakes with built in rectifiers.

## FLAMEPROOF MOTORS:

"Hindustan" crane duty motors are also available with flameproof enclosures.

## ENQUIRY DETAILS:

When placing an enquiry, please furnish the following details;

- Application details
- Motor power & speed
- Voltage & frequency variations
- Mounting
- No. of start/stops per hour with duty & CDF
- Load GD<sup>2</sup> at motor speed
- Load torque or torque/speed curve of driven equipment
- Duty cycle diagram if other than those described here in

## DEFINITIONS:

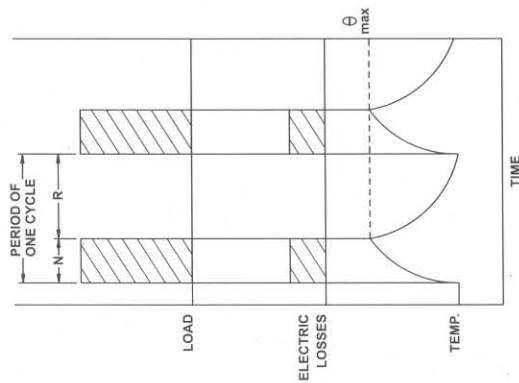
The terms frequently used in the intermittent duty drives are as follows;

1. **Duty:** Operation of the motor at load including no load & de-energised period to which the motor is subjected including the sequence & duration.
2. **Cyclic Duration Factor (CDF):** The ratio between the period of loading including starting & electric braking and the duration of the duty cycle expressed as percentage.
3. **Starting:** The process of energizing a motor to bring it upto its rated speed from rest.
4. **Electric Braking:** A system in which a braking action is applied to an electric motor by causing it to act as a generator.
5. **Regenerative Braking:** A system of electric braking in which energy is returned to the supply system.
6. **D C Injection Braking:** A form of braking of an induction motor in which a separate DC supply is used to magnetise the motor.
7. **Plugging:** A form of braking of an induction motor obtained by reversing the phase sequence of its any twolines.

## DUTY TYPES:

**Intermittent Periodic Duty (Duty Type S3):** A sequence of identical duty cycle, each consisting of a period of operation at constant load & a rest period. These periods being too short to attain thermal equilibrium during one duty cycle. In this duty type, the starting current does not significantly affect the temperature rise. (Fig. 3)

Unless otherwise specified, the duration of the cycle is 10 min. The recommended values for the load factor are 15, 25, 40 & 60 percent.

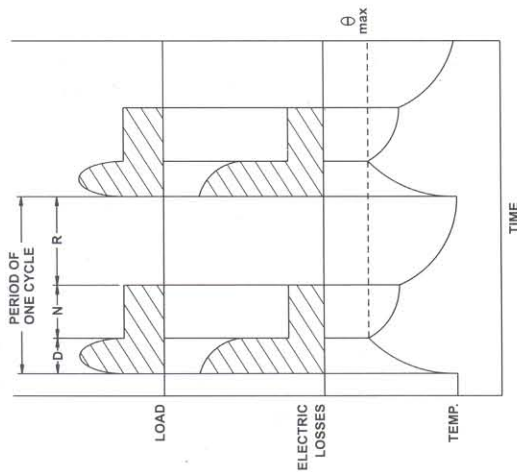


$$CDF = N/(N+R)$$

**Fig. 3: Intermittent Periodic Duty, Duty Type S3**

**Intermittent Periodic Duty with Starting (Duty Type S4):** A sequence of identical duty cycles each consisting of a period of starting, a period of operation at constant load & a rest period. The operating, rest & de-energised periods being too short to attain thermal equilibrium during one cycle. (Fig. 4)

In this duty the stopping of the motor is obtained either by natural deceleration after disconnection of the electric supply or by means of braking such as a mechanical brake which does not cause additional heating of the windings.

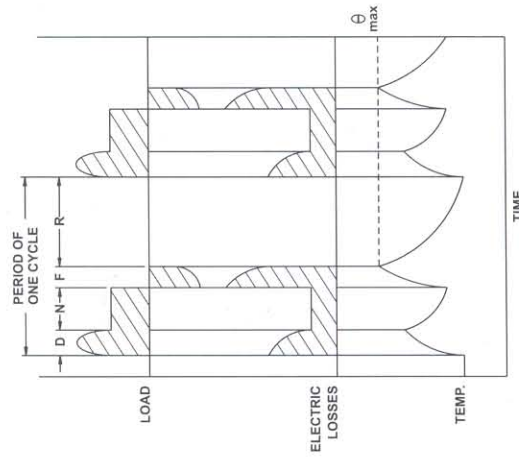


$$CDF = (D+N)/(D+N+R)$$

**Fig. 4: Intermittent Periodic Duty with Starting, Duty Type S4**

**Intermittent Periodic Duty with Starting & Braking (Duty Type S5):** A sequence of identical duty cycles each consisting of a period of starting, a period of operation at constant load, a period of braking & a rest period. The operating, rest & de-energised periods being too short to attain thermal equilibrium during one cycle. In this duty, braking is rapid & is carried out electrically. (Fig. 5)

Note: In all the above type of duties, the loading duration & the idling duration of the cycle are so short that the steady state temp. is not reached. While working on these identical cycles continuously, the motor temp. rise must not exceed the permissible values.

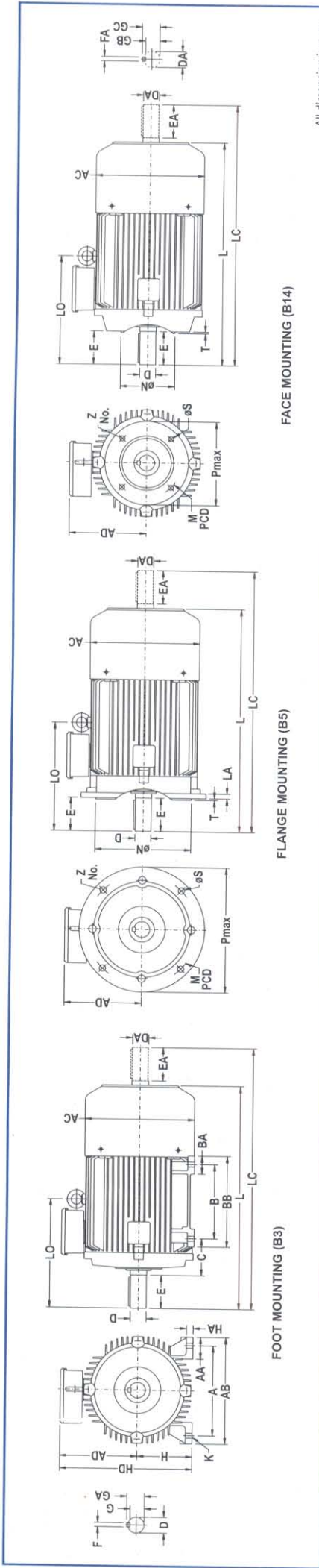


$$CDF = (D+N+F)/(D+N+F+R)$$

**Fig. 5: Intermittent Periodic Duty with Starting & Electric braking, Duty Type S5**

- D = Starting
- N = Operation under rated condition
- F = Electric braking
- R = At rest & de-energised
- $\theta_{max}$  = Max. temp. attained during the duty cycle

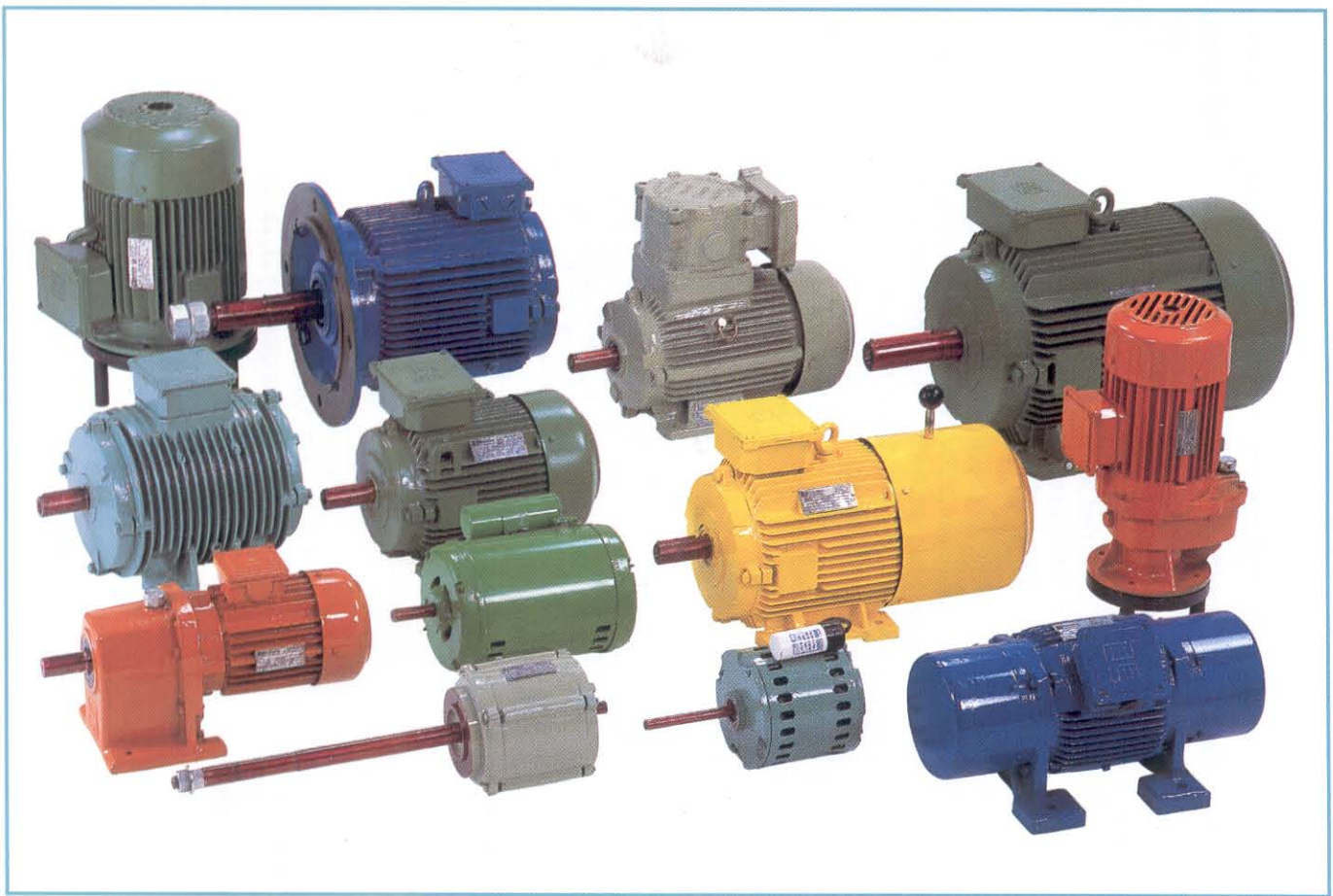
# MECHANICAL DIMENSIONS



All dimension in mm.

Frame Size	For foot mounted motors (B3)											For flange mounted motors (B5)					For face mounted motors (B14)																	
	L	LC	LO	AC	AD	D, DA	E, EA	F, FA	GA, GC	G, GB	A	B	C	H	K	AA	AB	BB	BA	HA	HD	P max	M PCD	øN	øS	Z No.	T							
56	180	204	-	110	80	9	20	3	10.2	7.2	90	71	36	56	6	25	110	91	-	6	136	140	115	95	10	4	3	9	80	65	50	M5	4	2.5
63	206	236	-	124	100	11	23	4	12.5	8.5	100	80	40	63	7	27	122	102	27	7	163	140	115	95	10	4	3	9	90	75	60	M5	4	2.5
71	240	276	-	140	105	14	30	5	16	11	112	90	45	71	7	31	134	112	31	8	176	160	130	110	10	4	3.5	9	105	85	70	M6	4	2.5
80	277	324	-	158	122	19	40	6	21.5	15.5	125	100	50	80	10	32	150	125	32	9	202	200	165	130	12	4	3.5	10	120	100	80	M6	4	3
90S	297	354	-	180	129	24	50	8	27	20	140	100	56	90	10	33	168	124	32	10	219	200	165	130	12	4	3.5	10	140	115	95	M8	4	3
90L	322	379	-	180	129	24	50	8	27	20	140	125	56	90	10	33	168	149	32	10	219	200	165	130	12	4	3.5	10	140	115	95	M8	4	3
100L	366	433	-	198	152	28	60	8	31	24	160	140	63	100	12	43	200	180	46	14	252	250	215	180	15	4	4	11	160	130	110	M8	4	3.5
112M	389	456	230	222	165	28	60	8	31	24	190	140	70	112	12	49	230	180	47	15	277	250	215	180	15	4	4	11	160	130	110	M8	4	3.5
132S	437	524	257	262	185	38	80	10	41	33	216	140	89	132	12	52	256	180	48	16	317	300	265	230	15	4	4	12	200	165	130	M12	4	3.5
132M	475	562	260	262	185	38	80	10	41	33	216	178	89	132	12	52	256	218	48	16	317	300	265	230	15	4	4	12	200	165	130	M12	4	3.5
160M	576	693	354	311	211	42	110	12	45	37	254	210	108	160	15	64	304	260	60	20	371	350	300	250	19	4	5	13	-	-	-	-	-	-
160L	620	737	354	311	211	42	110	12	45	37	254	254	108	160	15	64	304	304	60	20	371	350	300	250	19	4	5	13	-	-	-	-	-	-
180M	643	760	381	336	233	48	110	14	51.5	42.5	279	241	121	180	15	65	335	297	101	24	413	350	300	250	19	4	5	13	-	-	-	-	-	-
180L	681	798	381	336	233	48	110	14	51.5	42.5	279	279	121	180	15	65	335	335	101	24	413	350	300	250	19	4	5	13	-	-	-	-	-	-
200L	760	880	416	395	276	55	110	16	59	49	318	305	133	200	19	84	386	365	74	26	476	400	350	300	19	4	5	15	-	-	-	-	-	-





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