

## Introduction

ABB has great experience in offering Crane and Hoist duty motors both for DOL operation as well as for VFD applications.

They conform to IS : 325 for Three-phase Induction Motors and IS : 4722 for Rotating Electrical Machines .The size of the motor is governed by the mechanical effects of starting and braking fuctions, the type of control and the number of switching per hour. The rated output, the number of starts/hour and the inertia (i.e load GD2 +rotor GD2) are interdependent.

With drive , its become utmost important that the motors are selected suitably considering the load details. The selection of motors is done through dedicated ABB software **Drive Size**™ which takes care of all the proper margins required as per application . Thus ensuring motors can be used for longer period of time with optimum performance levels.

### Scope:-

Crane duty Motors suitable for DOL & VFD applications.

### DOL

Frame- 71-200

KW rating:-0.37KW to 30KW

Pole:-4, 6 & 8 pole

CDF:- 25%, 40%, 60%, 100%

Starts-Stops/hr:-60, 150 , 300

### VFD

Frame- 71-400

KW rating:- 0.25KW to 560KW

Pole:-4, 6 & 8 pole

CDF:- 25%, 40%, 60%, 100%

Starts-Stops/hr:-60, 150 , 300

## Standard Operating conditions

Voltage 415V+/-10%

Frequency 50Hz+/-5%

Combined Voltage & Frequency variation +/-10% ( absolute sum )

Ambient temperature:- 50 deg /45 deg

Altitude:-1000m

### Standards:-

The motors manufactured under crane duty area comply to the following standards:-

IS:325

IS:4722

IS:1231

IS:2223

IS:3177

IEC:60034-1

IS:4137

### Deration Factors for ambient temp:-

Permissible Output	100%	95%	90%
Amb. Temp.	50°	55°	60°

### Motor Selection Procedure:-

#### FOR DOL :-

The motors are selected from the chart after matching the required starts stops per hour & corresponding CDF .

#### FOR VFD :-

The motors are selected from the chart based on the given mechanical KW .The final motor KW is selected based on the starts stops per hour , CDF & deration on account of Drive. Depending upon the type of crane employed , user has to take applicable service factor as per IS 2231& IS4137 & correct the mechanical KW accordingly. The permissible temperature rise i.e, Class B will be corresponding to the given mechanical KW .

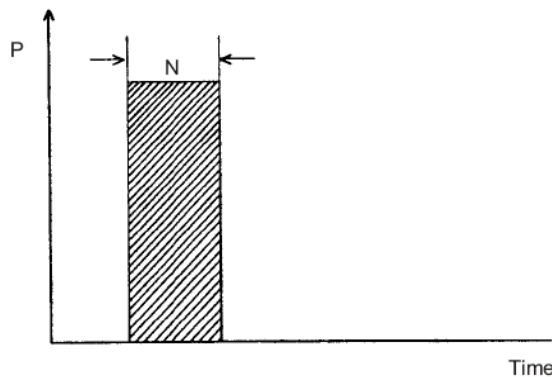
Any deration required on account of higher ambient temperature should be considered separately based on the above table applicable for both DOL & VFD operation.

### Duty Cycle:-

The duty types are indicated by the symbols S1 ... S9 according to IS:12824-1989. The outputs given in the tables are based on continuous running duty. S1 with rated output.

#### S2 Short-time duty

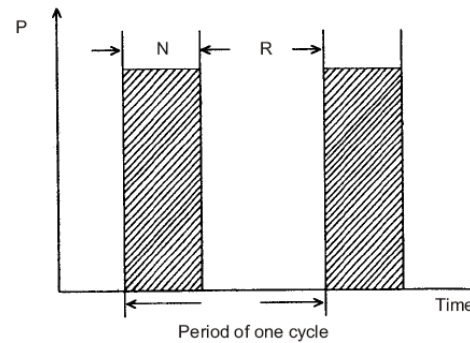
Operation at constant load during a given time, less than required to reach thermal equilibrium, followed by a rest and de-energised period of sufficient duration to re-establish motor temperatures equal to the ambient or the coolant temperature. The values 10, 30, 60 and 90 minutes are recommended for the rated duration of the duty cycle. Designation e.g. S2 60 min.



#### S3 Intermittent duty

A sequence of identical cycles, each including a period of operation at constant

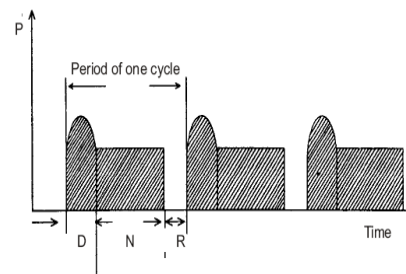
load & a rest & de-energised period. The period is



too short for thermal equilibrium to be obtained. The starting current does not significantly affect the temperature rise. Recommended values for the cyclic duration factor are 15, 25, 40 and 60%. The duration of the duty cycle is 10 min. Designation e.g. S3 25%

#### S4 Intermittent duty with starting

A sequence of identical duty cycles, each cycle including a significant period of starting, a period of operation at constant load and rest and de-energised period. The period



P = Output power  
D = Starting  
N = Operation under rated condition  
F = Electrical braking  
V = Operation of no load  
R = At rest and de-energised

is too short for thermal equilibrium to be obtained. In this duty type the motor is brought to rest by the load or by mechanical braking, where the motor is not thermally loaded. After the duty type the following factors must be indicated; the cyclic duration factor; the number of

duty cycles per hour (c/h); the factor of inertia FI; the moment of inertia, J, of the motor rotor; and the permissible Maverage moment of resistance, T, during the change of the Vspeed given with the rated load torque. The factor inertia FI is the ratio of the total moment of inertia, to the moment of inertia of the motor rotor. 2Designation e.g. S4 - 25% - 129 c/h - FI.2 - J= 0,1 kgm - T = M V0,5 T.V

### S5

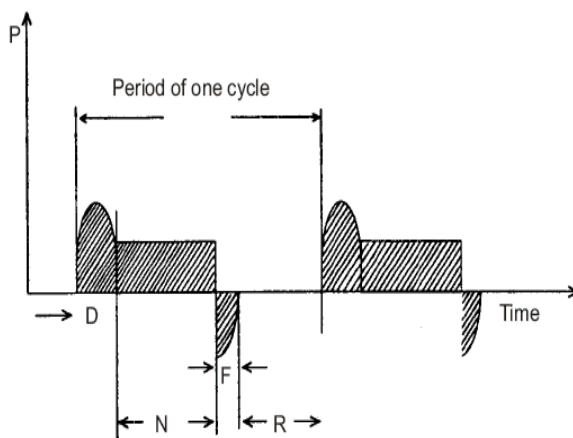
#### Intermittent duty with starting and electrical braking .

A sequence of identical duty cycles, each cycle consisting of a significant period of starting, a period of operation at constant load, a period of rapid electric braking and a rest and de-energised period. The period is too short for thermal equilibrium to be obtained. After the duty type the following factors must be indicated: the cyclic duration factor; the number of duty types per hour (c/h); the factor of inertia FI; the moment of inertia J, of the motor, and the Mpermissible moment of resistance T (see duty type S4.) V2Designation e.g. S5-40% -120 c/h- FI.3 - J= 1,3 kgm - T = 0,3 T.

### Enquiries :

The following information should be included during enquiry stage: -

- a)Application.
- b)Voltage and frequency variations.
- c)Ambient temperature, and type of protection
- d)Mechanical KW with service factor as applicable according to crane employed
- e)No. of starts/stops per hour with duty and CDF.
- f)Type of starting
- g)Load GD2 at motor speed.
- h)Load torque ; or Torque/Speed curve of driven equipment.
- i) Duty cycle diagram, if other than those described earlier.



(FOR DOL ONLY)

Series Name-KHX  
Enclosure-TEFC  
Protection/Cooling-IP55 / IC411  
Insulation class-F  
Temperature rise Class-B

Pole-4

415V±10%  
50Hz±5%  
Ambient -45 deg  
Duty -S4 & S5 (equivalent)

Frame	60 Starts				150 Starts				300 Starts				Motor GD Sq. Kgm.sq	Weight Kg
	25% OR 40 % CDF		60 % CDF		25% OR 40 % CDF		60 % CDF		25% OR 40 % CDF		60 % CDF			
	Kw	In (A)	Kw	In (A)	Kw	In (A)	Kw	In (A)	Kw	In (A)	Kw	In (A)		
KHX71C4	0.55	1.6	0.55	1.6	0.55	1.6	0.55	1.6	0.55	1.6	0.55	1.6	0.0035	13.5
KHX80D4	0.75	2.0	0.75	2.0	0.75	2.0	0.75	2.0	0.75	2.0	0.75	2.0	0.007	15
KHX80D4	1.1	3.1	1.1	3.1	1.1	3.1	1.1	3.1	1.1	3.1	1.1	3.1	0.007	15
KHX90SLE4	1.5	3.4	1.5	3.4	1.5	3.4	1.5	3.4	1.5	3.4	1.5	3.4	0.017	27
KHX90SLE4	2.2	5.2	2.2	5.2	2.2	5.2	2.2	5.2	2.2	5.2	2.2	5.2	0.017	27
KHX100LC4	3.7	7.9	3.7	7.9	3.7	7.9	3.7	7.9	3.7	7.9	3.7	7.9	0.028	39.5
KHX112MC4	5.5	11.3	5.5	11.3	5.5	11.3	5.5	11.3	5.5	11.3	5.5	11.3	0.062	49
KHX132SME4	7.5	14.5	7.5	14.5	7.5	14.5	7.5	14.5	7.5	14.5	7.5	14.5	0.112	80
KHX132SME4	9.3	18.7	9.3	18.7	9.3	18.7	9.3	18.7	9.3	18.7	9.3	18.7	0.112	80
KHX160MLD4	11	21	11	21	11	21	11	21	11	21	11	21	0.252	145
KHX160MLE4	15	28	15	28	15	28	15	28	15	28	15	28	0.302	160
KHX160MLE4	18.5	35.6	18.5	35.6	18.5	35.6	18.5	35.6	18.5	35.6	18.5	35.6	0.302	160
KHX180MLC4	22	40.5	22	40.5	22	40.5	22	40.5	22	40.5	22	40.5	0.54	185
KHX200MLD4	30	53.3	30	53.3	30	53.3	30	53.3	26	46	26	46	1.344	265

Series Name-KHX

Enclosure-TEFC

Protection/Cooling-IP55 / IC411

Insulation class-F

Temperature rise Class-B

**(FOR DOL ONLY )  
Pole-6**

415V±10%

50Hz±5%

Ambient -45 deg

Duty -S4 & S5 (equivalent)

Frame	60 Starts				150 Starts				300 Starts				Motor GD Sq. Kgm.sq	Weight Kg
	25% OR 40 % CDF		60 % CDF		25% OR 40 % CDF		60 % CDF		25% OR 40 % CDF		60 % CDF			
	Kw	In (A)	Kw	In (A)	Kw	In (A)	Kw	In (A)	Kw	In (A)	Kw	In (A)		
KHX80B6	0.37	1.2	0.37	1.2	0.37	1.2	0.37	1.2	0.37	1.2	0.37	1.2	0.006	13
KHX80D6	0.55	1.6	0.55	1.6	0.55	1.6	0.55	1.6	0.55	1.6	0.55	1.6	0.008	15
KHX80D6	0.75	2.3	0.75	2.3	0.75	2.3	0.75	2.3	0.75	2.3	0.75	2.3	0.008	15
KHX90SLE6	1.1	2.9	1.1	2.9	1.1	2.9	1.1	2.9	1.1	2.9	1.1	2.9	0.017	28
KHX90SLE6	1.5	4.1	1.5	4.1	1.5	4.1	1.5	4.1	1.5	4.1	1.5	4.1	0.017	28
KHX100LB6	2.2	5.9	2.2	5.9	2.2	5.9	2.2	5.9	2.2	5.9	2.2	5.9	0.017	28
KHX112MC6	3.7	10.5	3.7	10.5	3.7	10.5	3.7	10.5	3.7	10.5	3.7	10.5	0.62	48
KHX132SME6	5.5	12.5	5.5	12.5	5.5	12.5	5.5	12.5	5.5	12.5	5.5	12.5	0.12	80
KHX132SME6	7.5	18.2	7.5	18.2	7.5	18.2	7.5	18.2	7.5	18.2	7.5	18.2	0.12	80
KHX160MLD6	9.3	19	9.3	19	9.3	19	9.3	19	9.3	19	9.3	19	0.372	155
KHX160MLE6	11	23	11	23	11	23	11	23	11	23	11	23	0.446	170
KHX160MLE6	15	34.7	15	34.7	15	34.7	15	34.7	15	34.7	15	34.7	0.446	170
KHX200MLC6	18.5	36	18.5	36	18.5	36	18.5	36	17	33	17	33	1.8	300
KHX200MLC6	22	42	22	42	22	42	22	42	18.5	36	18.5	36	1.8	300

Series Name-KHX  
Enclosure-TEFC  
Protection/Cooling-IP55 / IC411  
Insulation class-F  
Temperature rise Class-B

**(FOR DOL ONLY )**

**Pole-8**

415V±10%  
50Hz±5%  
Ambient -45 deg  
Duty -S4 & S5 (equivalent)

Frame	60 Starts				150 Starts				300 Starts				Motor GD Sq. Kgm.sq	Weight Kg
	25% OR 40 % CDF		60 % CDF		25% OR 40 % CDF		60 % CDF		25% OR 40 % CDF		60 % CDF			
	Kw	In (A)	Kw	In (A)	Kw	In (A)	Kw	In (A)	Kw	In (A)	Kw	In (A)		
KHX90SLA8	0.37	1.4	0.37	1.4	0.37	1.4	0.37	1.4	0.37	1.4	0.37	1.4	0.012	22
KHX90SLD8	0.55	1.9	0.55	1.9	0.55	1.9	0.55	1.9	0.55	1.9	0.55	1.9	0.015	25
KHX90SLD8	0.75	2.7	0.75	2.7	0.75	2.7	0.75	2.7	0.75	2.7	0.75	2.7	0.015	25
KHX100LB8	1.1	3.9	1.1	3.9	1.1	3.9	1.1	3.9	1.1	3.9	1.1	3.9	0.026	35
KHX100LB8	1.5	6	1.5	6	1.5	6	1.5	6	1.5	6	1.5	6	0.026	35
KHX112MB8	2.2	7.8	2.2	7.8	2.2	7.8	2.2	7.8	2.2	7.8	2.2	7.8	0.048	48
KHX132SMC8	3.7	10.5	3.7	10.5	3.7	10.5	3.7	10.5	3.7	10.5	3.7	10.5	0.08	65
KHX160MLD8	5.5	12	5.5	12	5.5	12	5.5	12	5.5	12	5.5	12	0.372	155
KHX160MLE8	7.5	16	7.5	16	7.5	16	7.5	16	7.5	16	7.5	16	0.446	170
KHX160MLE8	9.3	19.8	9.3	19.8	9.3	19.8	9.3	19.8	9.3	19.8	9.3	19.8	0.446	170
KHX180MLB8	11	23.5	11	23.5	11	23.5	11	23.5	11	23.5	10	22	0.72	200
KHX200MLC8	15	28	15	28	15	28	15	28	15	28	11	24	2.21	250

- Note:** 1..All crane duty motors are suitable for VFD supply subject to proper selection using ABB Drive Size Software considering required BKW, speed range and constant torque appln.  
2. All crane duty motors shall be offered as MI motors  
3. Load GD Sq value should not be more than motor GD sq value.  
4. Motors for frame size 225 and higher can be offered against enquiry  
5)For class H insulation & temperature rise limited to Class F , 15% higher KW can be considered.

# Crane Duty Motors Chart

(For VVVF Drive Only)

Series Name-KHX+  
Enclosure-TEFC  
Protection/Cooling-IP55 / IC411  
Insulation class-F  
Temperature rise Class-B

**Pole-6**

415V±10%  
50Hz±5%  
Ambient -50 deg  
Duty -S4 & S5 (equivalent)

FRAME	MOTOR RATING	Current	Maximum Permissible Mechanical KW												Motor GD <sup>2</sup>	Weight
			150 STARTS STOPS PER HOUR						300 STARTS STOPS PER HOUR							
			KW	A	25 OR 40 % CDF	In(A)	60% CDF	In(A)	100% CDF	In(A)	25 OR 40 % CDF	In(A)	60 % CDF	In(A)		
KHX+80D6	0.37	1.2	0.3	1.0	0.30	1.0	0.26	0.9	0.3	1.0	0.3	1.0	0.25	0.8	0.008	15
KHX+90SLD6	0.55	1.6	0.45	1.4	0.45	1.4	0.4	1.3	0.45	1.4	0.45	1.4	0.4	1.2	0.015	25
KHX+90SLE6	0.75	2.3	0.6	1.9	0.6	1.9	0.5	1.8	0.6	1.9	0.6	1.9	0.5	1.6	0.008	15
KHX90SLE6	1.1	2.9	0.9	2.5	0.9	2.5	0.8	2.4	0.9	2.5	0.9	2.5	0.8	2.1	0.017	28
KHX+100LB6	1.5	4.1	1.2	3.3	1.2	3.3	1.1	3.1	1.2	3.3	1.2	3.3	1.0	2.8	0.026	35
KHX+112MB6	2.2	5.9	1.7	4.6	1.7	4.6	1.5	4.3	1.7	4.6	1.7	4.6	1.4	3.9	0.05	46
KHX+132SMC6	3.7	8.3	2.9	6.6	2.9	6.6	2.6	6.2	2.9	6.6	2.9	6.6	2.5	5.6	0.088	70
KHX+132SME6	5.5	12.5	4.3	10	4.3	10	3.9	9.5	4.3	10	4.3	10	3.7	8.4	0.12	80
KHX+160MLC6	7.5	15.5	5.8	12.2	5.8	12.2	5.2	11.5	5.8	12.2	5.8	12.2	4.9	10.3	0.326	145
KHX+160MLD6	9.3	19	7.2	14.8	7.2	14.8	6.5	14.0	7.2	14.8	7.2	14.8	6.1	12.5	0.372	155
KHX+160MLE6	11	23	7.6	16	7.6	16	6.8	15.1	7.6	16	7.6	16	6.5	13.5	0.446	170
KHX+180MLC6	15	30	11.7	24	11.7	24	10.5	22.7	11.7	24	11.7	24	9.9	20.2	0.68	185
KHX+200MLB6	18.5	36	14.2	28	14.2	28	12.8	26.5	14.2	28	14.2	28	12.1	23.6	1.6	230
KHX+200MLC6	22	42	16.8	33	16.8	33	15.1	31.2	16.8	33	16.8	33	14.3	27.8	1.8	300

- Note:-**
- 1)Maximum permissible Mechanical KW has been calculated based on VVVF supply & duty cycles
  - 2)Separate derations are required for different service factors for different cranes & ambient temperature
  - 3)Speed range 10-100%
  - 4)Load GD square is assumed to be equal to motor GD
  - 5)For class H insulation & temperature rise limited to Class F , 15% higher mechanical KW can be considered.

# Crane Duty Motors Chart

(For VVVF Drive Only)

Series Name-KHX+ & M2BA  
 Enclosure-TEFC  
 Protection/Cooling-IP55 / IC411  
 Insulation class-F  
 Temperature rise Class-B

**Pole-6**

415V±10%  
 50Hz±5%  
 Ambient -50 deg  
 Duty -S4 & S5 (equivalent)

FRAME	MOTOR RATING	Current	Maximum Permissible Mechanical KW												Motor GD <sup>2</sup>	Weight
			150 STARTS STOPS PER HOUR						300 STARTS STOPS PER HOUR							
			KW	A	25 OR 40 % CDF	In(A)	60% CDF	In(A)	100% CDF	In(A)	25 OR 40 % CDF	In(A)	60 % CDF	In(A)		
<b>KHX+225SMC6</b>	30	55.5	25	50	23	45	20	40	21	40	20	40	19	36	2.98	320
<b>KHX+250MB6</b>	37	66	30	55	27	50	25	46	27	50	26	48	24	45	4.8	420
<b>KHX+280SMB6</b>	45	79.5	35	65	33	60	30	55	31	58	29	55	28	54	7.2	590
<b>KHX+280SMC6</b>	55	97	42	68	39	65	36	60	36	60	35	57	34	55	8.1	600
<b>M2BA315SMA6</b>	75	132	55	110	53	100	49	92	47	90	46	85	45	83	14.2	860
<b>M2BA315SMB6</b>	90	158	75	135	69	125	62	118	68	128	65	122	60	115	16.7	930
<b>M2BA315SMC6</b>	110	193	88	165	83	160	75	150	77	155	75	150	71	145	20	1005
<b>M2BA315MLC6</b>	132	228	96	180	92	175	86	165	83	164	82	160	79	155	28.2	1240
<b>M2BA355SMA6</b>	160	275	110	200	107	195	101	185	92	180	90	178	88	175	42	1595
<b>M2BA355SMB6</b>	200	343	136	260	133	255	125	240	114	220	110	215	108	212	50.5	1800
<b>M2BA355MLA6</b>	250	428	185	340	177	325	164	305	160	300	158	295	152	285	55	1940
<b>M2BA355MLB6</b>	315	550	240	450	227	425	210	395	210	395	205	390	195	375	60.2	2040
<b>M2BA400LA6</b>	355	640	252	500	243	485	205	410	212	420	210	415	185	400	66	3000
<b>M2BA400LB6</b>	400	740	270	610	260	590	245	560	237	550	230	540	210	500	77	3100

- Note:-**
- 1)Maximum permissible Mechanical KW has been calculated based on VVVF supply & duty cycles
  - 2)Separate derations are required for different service factors for different cranes & ambient temperature
  - 3)Speed range 10-100%
  - 4)Load GD square is assumed to be equal to motor GD square
  - 5)For class H insulation & temperature rise limited to Class F , 15% higher mechanical KW can be considered.



# Crane Duty Motors Chart

(For VVVF Drive Only)

Series Name-KHX+  
Enclosure-TEFC  
Protection/Cooling-IP55 / IC411  
Insulation class-F  
Temperature rise Class-B

**Pole-8**

415V±10%  
50Hz±5%  
Ambient -50 deg  
Duty -S4 & S5 (equivalent)

FRAME	MOTOR RATING	Current	Maximum Permissible Mechanical KW												Motor GD <sup>2</sup>	Weight
			150 STARTS STOPS PER HOUR						300 STARTS STOPS PER HOUR							
			KW	A	25 OR 40 % CDF	In(A)	60% CDF	In(A)	100% CDF	In(A)	25 OR 40 % CDF	In(A)	60 % CDF	In(A)		
KHX+90SLA8	0.37	1.4	0.29	1.1	0.29	1.1	0.26	1.0	0.29	1.1	0.29	1.1	0.2	1.0	0.012	22
KHX+90SLD8	0.55	1.9	0.44	1.6	0.44	1.6	0.40	1.5	0.44	1.6	0.44	1.6	0.4	1.4	0.015	25
KHX+100LA8	0.75	3.1	0.58	2.5	0.58	2.5	0.52	2.4	0.58	2.5	0.58	2.5	0.5	2.2	0.02	35
KHX+100LB8	1.1	3.9	0.85	3.3	0.85	3.3	0.77	3.1	0.85	3.3	0.85	3.3	0.7	2.9	0.026	35
KHX+112MA8	1.5	4.8	1.2	3.8	1.2	3.8	1.1	3.6	1.2	3.8	1.2	3.8	1.0	3.4	0.044	45
KHX+132SMB8	2.2	6.3	1.7	6.0	1.7	6.0	1.5	5.7	1.7	6.0	1.7	6.0	1.4	5.4	0.06	60
KHX+160MLB8	3.7	8	2.8	6.6	2.8	6.6	2.5	6.2	2.8	6.6	2.8	6.6	2.4	5.9	0.288	125
KHX+160MLD8	5.5	12	4.3	10	4.3	10	3.9	9.5	4.3	10	4.3	10	3.7	8.9	0.372	155
KHX+160MLE8	7.5	16	5.9	14	5.9	14	5.3	13.2	5.9	14	5.9	14	5.0	12.5	0.446	170
KHX+180MLA8	9.3	20	7.2	16	7.2	16	6.5	15.1	7.2	16	7.2	16	6.1	14.3	0.64	160
KHX+180MLB8	11	23.5	8.6	18	8.6	18	7.7	17.0	8.6	18	7.8	16.6	6.6	14.8	0.72	170
KHX+200MLC8	15	31.5	11.6	25	11.6	25	10.4	23.6	11.6	25	8.6	25	7.3	22.3	1.98	240

- Note:-**
- 1)Maximum permissible Mechanical KW has been calculated based on VVVF supply & duty cycles
  - 2)Separate derations are required for different service factors for different cranes & ambient temperature
  - 3)Speed range 10-100%
  - 4)Load GD square is assumed to be equal to motor GD square
  - 5)For class H insulation & temperature rise limited to Class F , 15% higher mechanical KW can be considered.

# Crane Duty Motors Chart

(For VVVF Drive Only)

Series Name-KHX+ & M2BA  
 Enclosure-TEFC  
 Protection/Cooling-IP55 / IC411  
 Insulation class-F  
 Temperature rise Class-B

**Pole-8**

415V±10%  
 50Hz±5%  
 Ambient -50 deg  
 Duty -S4 & S5 (equivalent)

FRAME	MOTOR RATING	Current	Maximum Permissible Mechanical KW												Motor GD <sup>2</sup>	Weight
			150 STARTS STOPS PER HOUR						300 STARTS STOPS PER HOUR							
			KW	A	25 OR 40 % CDF	In(A)	60% CDF	In(A)	100% CDF	In(A)	25 OR 40 % CDF	In(A)	60 % CDF	In(A)		
KHX+225SMB8	18.5	38.5	15	34	14.5	33	13	30	14	32	13.5	31	12	28	3.32	320
KHX+225SMC8	22	45.5	19	42	17.5	39	15.5	35	17	38	16	36	15	35	3.5	340
KHX+250MB8	30	60	25.5	55	23.5	52	21	48	23	50	22.5	48	20.5	44	4.54	520
KHX+280SMB8	37	73.5	30	62	28	58	25	52	27	56	26	54	24	50	7.64	590
KHX+280SMC8	45	89	38	78	35	72	31	64	34	70	33	68	30	62	7.75	600
M2BA315SMA8	55	101	42.5	87	40	82	36	75	38	78	36	75	34	72	13	830
M2BA315SMB8	75	135	55	110	53	106	50	100	52	105	50	100	45	90	18.8	975
M2BA315SMC8	90	162	77	150	71	135	63	120	68	130	66	125	60	115	22	1055
M2BA315MLB8	110	197	87	165	82	155	75	142	78	150	76	146	70	135	23.6	1125
M2BA355SMA8	132	239	100	205	95	195	88	182	87	180	86	175	82	168	42	1590
M2BA355MLA8	160	289	120	240	114	230	105	215	104	210	103	208	98	200	55	1945
M2BA355MLB8	200	360	155	310	146	295	134	275	136	280	133	275	126	262	64.2	2090
M2BA355MLB8K	250	470	194	405	183	385	168	355	171	360	167	355	157	335	66	2100
M2BA400LA8	315	600	238	510	226	485	208	450	208	450	204	445	195	428	68.8	2800
M2BA400LB8	355	670	308	610	280	560	250	510	257	520	250	510	245	500	80	3100

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