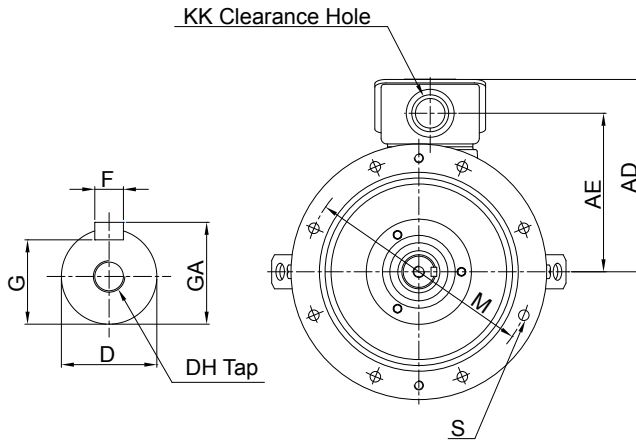
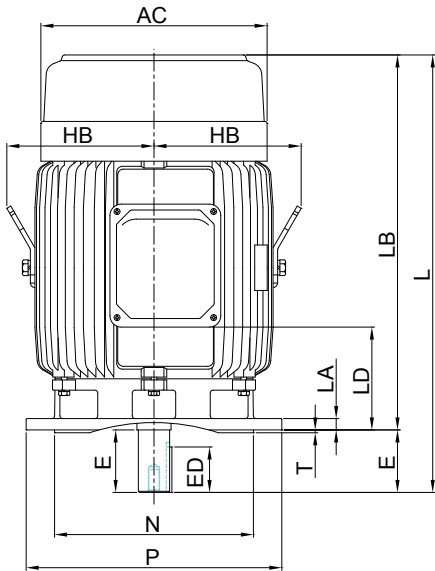


# ENGINEERING INFORMATION

## MODEL : IEC

標準馬達 Standard Motor



材質 Material : 鑄鐵 Cast Iron

極數 Pole	馬力 HP	重量 (kg) Weight
4P	1/4	10
	1/2	12
	1	19
	2	26
	3	35
	5	47
	7 1/2	71
	10	81
	15	116
	20	133
6P	25	163
	30	190
	40	275
	50	300
	1/8	-
	1/4	12
	1/2	19
	1/8	26
	2	35
	3	47
5	71	
7 1/2	81	
10	116	
15	133	
20	163	
25	190	
30	275	
40	300	

unit: mm

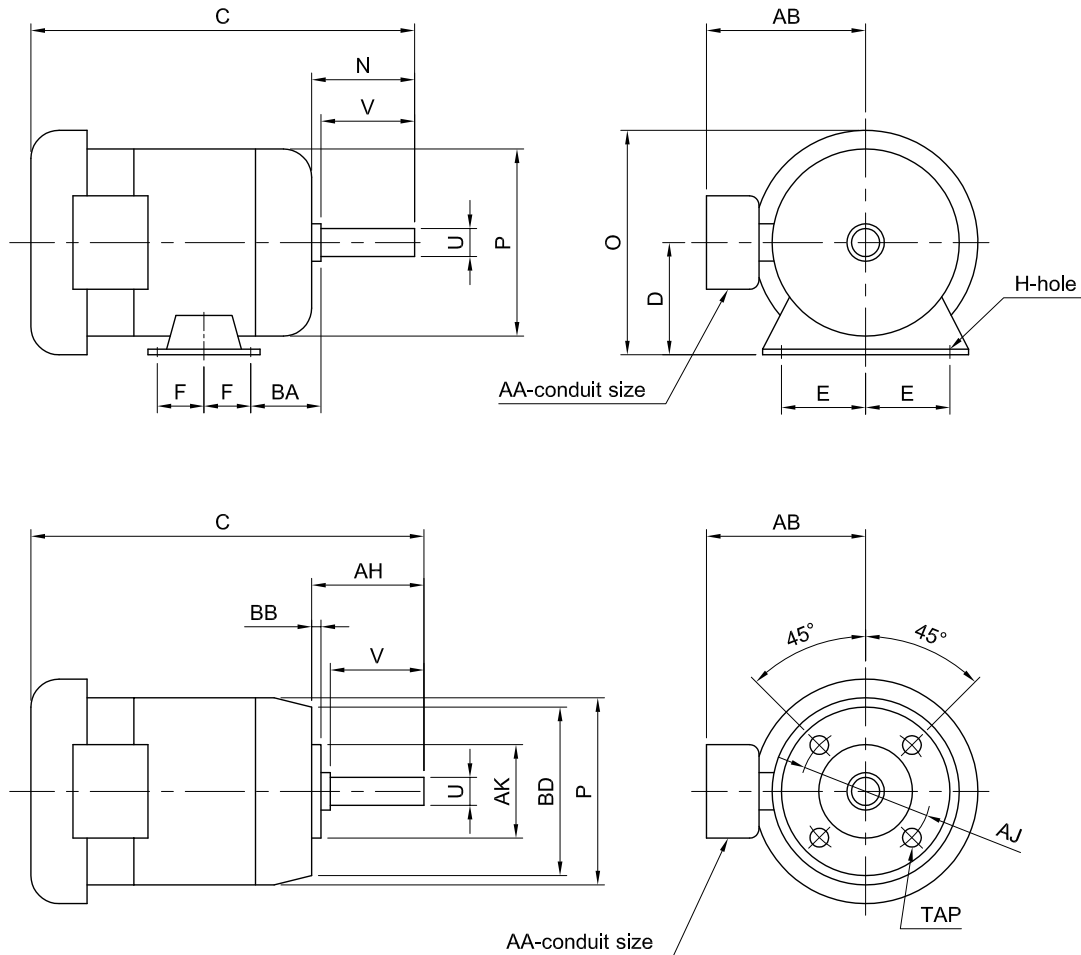
輸出 (HP) Output				框號 IEC Frame	AC	AD	AE	HB	KK	L	LA	LB	LD	M	N	P	S	T	軸端 End of Shaft							
2P	4P	6P	8P																D	E	ED	F	G	GA	DH	
1/4	1/4	---	---	63	144	123	93	---	22	248	12	225	74	130	110	160	4-Ø10	3.5	11	23	10	4	8.5	12.5	M4X8	
1/2	1/2	1/4	---	71	162	133	103	---	22	277.5	12	247.5	82	130	110	160	4-Ø10	3.5	14	30	14	5	11	16	M5X10	
1	1	1/2	1/4	80	177	144	112	---	22	282	12	242	60	165	130	200	4-Ø12	3.5	19	40	25	6	15.5	21.5	M6X12	
2、3	2	1	1/2	90L	200	157	125	---	22	371.5	12	321.5	113	165	130	200	4-Ø12	3.5	24	50	32	8	20	27	M8X16	
---	3	2	1	100L	219	180	145	140	28	374.5	16	314.5	88	215	180	250	4-Ø14.5	4.0	28	60	40	8	24	31	M10X20	
5	5	3	2	112M	235	189	154	150	28	431	16	371	135	215	180	250	4-Ø14.5	4.0	28	60	40	8	24	31	M10X20	
7.5、10	7.5	5	3	132S	273	224	180	169	35	454	20	374	97	265	230	300	4-Ø14.5	4.0	38	80	64	10	33	41	M12X24	
---	10	7.5	5	132M	273	224	180	169	35	492	20	412	116	265	230	300	4-Ø14.5	4.0	38	80	64	10	33	41	M12X24	
15、20	15	10	7.5	160M	334	263	218	217	35	608	20	498	139	300	250	350	4-Ø18.5	5.0	42	110	80	12	37	45	M16X32	
25	20	15	10	160L	334	263	218	217	35	652	20	542	161	300	250	350	4-Ø18.5	5.0	42	110	80	12	37	45	M16X32	
30	---	---	---	180MA	382	305	250	241	52	672	20	562	158	350	300	400	4-Ø18.5	5.0	48	110	80	14	42.5	51.5	M16X32	
---	25	20	15	180MC	382	305	250	241	52	672	20	562	158	350	300	400	4-Ø18.5	5.0	48	110	80	14	42.5	51.5	M16X32	
---	30	20	15	180MC	382	305	250	241	52	672	20	562	158	350	300	400	4-Ø18.5	5.0	48	110	80	14	42.5	51.5	M16X32	
40	---	---	---	180LA	382	305	250	241	52	710	20	600	177	350	300	400	4-Ø18.5	5.0	55	110	80	16	49	59	M20X40	
---	40	25	20	180LC	382	305	250	241	52	710	20	600	177	350	300	400	4-Ø18.5	5.0	55	110	80	16	49	59	M20X40	
---	40	30	20	180LC	382	305	250	241	52	710	20	600	177	350	300	400	4-Ø18.5	5.0	55	110	80	16	49	59	M20X40	
50、60	---	---	---	200LA	420	341	274	260	65	770	20	660	178	400	350	450	8-Ø18.5	5.0	55	110	80	16	49	59	M20X40	
---	50	40	25	200LC	420	341	274	260	65	800	20	660	178	400	350	450	8-Ø18.5	5.0	60	140	110	18	53	64	M20X40	
---	60	50	30	200LC	420	341	274	260	65	800	20	660	178	400	350	450	8-Ø18.5	5.0	60	140	110	18	53	64	M20X40	
75	---	---	---	225SA	458	386	312	286	90	786	22	676	175	500	450	550	8-Ø18.5	5.0	55	110	80	16	49	59	M20X40	
---	75	60	40	225SC	458	386	312	286	92	816	22	676	175	500	450	550	8-Ø18.5	5.0	65	140	110	18	58	69	M20X40	
100	---	---	---	A250SA	510	479	364	312	92	890.5	22	780.5	201.5	500	450	550	8-Ø18.5	5.0	55	110	80	16	49.5	59	M20X40	
---	100	75	50	A250SC	510	479	364	312	92	920.5	22	780.5	201.5	500	450	550	8-Ø18.5	5.0	75	140	110	20	67.5	79.5	M20X40	
125	---	---	---	A250MA	510	479	364	312	92	947.5	22	837.5	230	500	450	550	8-Ø18.5	5.0	55	110	80	16	49	59	M20X40	
---	125	100	60	A250MC	510	479	364	312	92	977.5	22	837.5	230	500	450	550	8-Ø18.5	5.0	75	140	110	20	67.5	79.5	M20X40	
100	---	---	---	A250SA	510	479	364	312	92	890.5	22	780.5	201.5	500	450	550	8-Ø18.5	5.0	55	110	80	16	49.5	59	M20X40	
---	100	75	50	A250SC	510	479	364	312	92	920.5	22	780.5	201.5	500	450	550	8-Ø18.5	5.0	75	140	110	20	67.5	79.5	M20X40	
125	---	---	---	A250MA	510	479	364	312	92	947.5	22	837.5	230	500	450	550	8-Ø18.5	5.0	55	110	80	16	49	59	M20X40	
---	125	100	60	A250MC	510	479	364	312	92	977.5	22	837.5	230	500	450	550	8-Ø18.5	5.0	75	140	110	20	67.5	79.5	M20X40	

1. 以上數值僅供參考。  
2. 實際尺寸依製造商規格為準。

1.The above information is for reference only.  
2.Certified dimension drawings from the motor manufacturer.

MODEL : NEMA

標準馬達 Standard Motor



unit: mm

Nema Frame	D	E	F	H	MIN. N	D	P	U	MIN. V	AA	AB	AH	AJ	AK	BA	BB	BD	TAP
48	3	2-1/8	1-3/8	11/32 SLOT	1-7/8	5-7/8	5-11/16	1/2	1-1/2	1/2	4-3/8	1-11/16	3-3/4	3	2-1/2	5/32	5-5/8	1/2-20
56	3-1/2	2-7/16	1-1/2	11/32 SLOT	2-1/4	6-7/8	6-5/8	5/8	1-7/8	1/2	5	2-1/16	5-7/8	4-1/2	2-3/4	5/32	6-1/2	3/8-16
143T 145T	3-1/2	2-3/4	2 2-1/2	11/32	2	6-7/8	6-5/8	7/8	2	3/4	5-1/4	2-1/8	5-7/8	4-1/2	2-1/4	5/32	6-1/2	3/8-16
182 184 182T 184T	4-1/4	3-3/4	2-1/4 2-3/4 2-1/4 23/4	13/32	2 2-3/4	8-11/16	7-7/8	7/8 1-1/8	2 2-3/4	3/4	5-7/8	2-1/8 2-7/8	5-7/8 7-1/4	4-1/2 8-1/2	2-3/4	5/32 1/4	6-1/2 9	3/8-16 1/2-13
213 215 213T 215T	5-1/4	4-1/4	2-3/4 3-1/2 2-3/4 3-1/2	13/32	3-3/8	10-1/4	9-9/16	1-1/8 1-3/8	3-3/4 3-3/8	3/4	7-3/8	3 3-3/8	5-7/8 7-1/4	8-1/2	3-1/2	1/4	9	1/2-13
254U 256U 254T 256T	6-1/4	5	4-1/8 5 4-1/8 5	17/32	4-1/4	13	13-1/2	1-3/8 1-5/8	3-1/2 4	1	9-5/8	3-3/4 4	7-1/4	8-1/2	4-1/4	1/4	10	1/2-13

1. 以上數值僅供參考。  
2. 實際尺寸依製造商規格為準。

1.The above information is for reference only.  
2.Certified dimension drawings from the motor manufacturer.

# ENGINEERING INFORMATION

減速比 Ratio	入力轉速 Input R.P.M.	出力軸轉速表 Output R.P.M.				
	1800	1500	1200	900	600	
5	360	300	240	180	120	
10	180	150	120	90	60	
20	90	75	60	45	30	
30	60	50	40	30	20	
40	45	37.5	30	22.5	15	
50	36	30	24	18	12	
60	30	25	20	15	10	
80	22.5	18.75	15	11.25	7.5	
100	18	15	12	9	6	
120	15	12.5	10	7.5	5	
150	12	10	8	6	4	
180	10	8.33	6.67	5	3.33	
200	9	7.5	6	4.5	3	
300	6	5	4	3	2	
500	3.6	3	2.4	1.8	1.2	
1000	1.8	1.5	1.2	0.9	0.6	
2000	0.9	0.75	0.6	0.45	0.3	

## 馬達 kW 選定表扭力曲線圖 Motor kW Selection Table Torque Curve Drawing

1. 本選定表係針對標準馬達 (低壓三相全密式感應電動機, E 級絕緣) 使用而言, 對於啟動頻繁、變動負載或衝擊負載等特殊負載條件者, 不在此限。

2. 馬達所需 kW 以  $\frac{\text{必要負載轉矩}}{\text{減速部效率}}$  計算所得決定之

●減速機效率 2 段減速時為 95%, 3 段減速時為 92%。

●必要負載轉矩, 如為變動負載以其等值轉矩表示之, 如負載變動循環不明時, 以最大轉矩使用。

●一般對啟動轉矩不予考慮。

$$\frac{\text{負載轉矩}}{\text{效率}} = \frac{35.1}{0.95} = 36.9\text{Kg-m}$$

負載轉矩 36.9kg.m 之橫線與 58RPM 之垂直線之交點可得知馬達使用 2.2kW 計算值

2.19kW, 可選用 3HP 馬達

$$\text{減速比} = \frac{\text{出力轉速}}{\text{馬達轉速}} = \frac{58}{1750} = \frac{1}{30}$$

1.This selection table is for standard motor (low voltage 3-phase fully-enclosed induction motor, E class insulation). But it is exclusive for the conditions of frequent starting, variable loading or impact loading etc.

2.kW required by the motor shall be decided from the calculation of Necessary loading torque.

Reducing efficiency  
The reducing efficiency of 2-stage reducer is 95%, and the reducing efficiency of 3-stage reduce is 92%.

Necessary loading torque, if the change loading is indicated by its equivalent value or if loading change cycle is unclear, please use the maximum torque  
In general, start torque won't be considered.

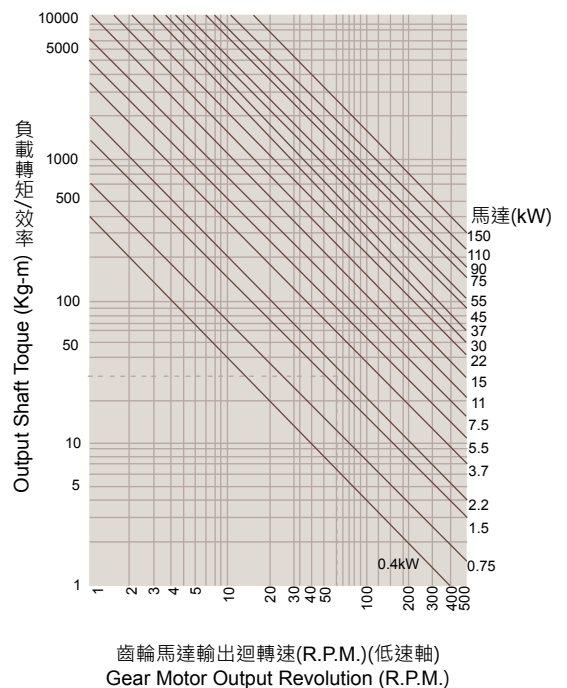
$$\frac{\text{Loading Torque}}{\text{Efficiency}} = \frac{35.1}{0.95} = 36.9\text{Kg-m}$$

From the cross point of the cross line of loading torque 6.3Kg-m and the vertical line of 60RPM. we know the motor applied is 0.4kW.

Calculation value :  
0.39kW can select to use of 1/2HP motor.

$$\text{Reducing ratio} = \frac{\text{Output Revolving speed}}{\text{Motor RPM}}$$

$$= \frac{58}{1750} = \frac{1}{30}$$



單位換算 Conversion Factors					
1kW	1HP	1kgf·m	1 Nm	1 Lb-in	1 Lb-ft
1.34 HP	0.746 kW	9.807 Nm	0.10197 Kgf·m	0.1129 Nm	1.356 Nm
1.36 PS	1.01 PS	7.233 Lb-ft	0.73756 Lb-ft	0.0115 Kgf·m	0.1383 Kgf·m
102.0 Kgf/m/s	76.07 kgf·m/s	86.796 Lb-in	8.85070 Lb-in	0.083 Lb-ft	12 Lb-in

電動機公式 Electrical Power Formula			
	直流 Direct Current	交流 Alternating Current	
		單相 Single Phase	三相 Three Phase
AMP=	$(HP \times 746) / (VOLT \times EFF)$ $(kW \times 1000) / VOLTS$	$(HP \times 746) / (VOLT \times EFF)$ $(kW \times 1000) / (VOL \times PF)$	$(HP \times 746) / (VOLT \times EFF \times PF \times 1.73)$ $(kW \times 1000) / (VOLT \times PF \times 1.73)$
kW=	$(AMP \times VOLT) / 1000$	$(AMP \times VOLT \times PF) / 1000$	$(AMP \times VOLT \times PF \times 1.73) / 1000$
HP=	$(AMP \times VOLT \times EFF) / 746$	$(AMP \times VOLT \times EFF \times PF) / 746$	$(AMP \times VOLT \times EFF \times PF \times 1.73) / 746$

PF= 功率因數約 80%  
EFF= 效率, 約 80~90%  
詳細資料請與馬達製造商聯絡

Power Factor (Usually Estimated at 80% )  
Efficiency (Usually 80~90%)  
Contact Motor Manufacturer for Complete Information.

## 公式集 Formula

欲知的條件 Item	代號 Symbol	公式 Formula	單位 Unit
扭力 Troque	T	$T=F \times R$	(kgf·m)
扭力 Troque	T	$T=(716 \times HP) / N$	(kgf·m)
扭力 Troque	T	$T=(974 \times kW) / N$	(kgf·m)
馬力 HP	HP	$HP=(T \times N) / 716$	(HP)
動力 kW	kW	$kW=(T \times N) / 974$	(kW)
馬力 HP	HP	$HP=(F \times V) / 75$	(HP)
動力 kW	kW	$kW=(F \times V) / 102$	(kW)
速度 Speed	V	$V=(\pi \times D \times N) / 60$	(m/sec)
減速比 Ratio	I	$i=N1 / N2$	
飛輪效應 Dynamic moment	GD <sup>2</sup>	$GD^2 = 364 \times (F \times V^2 / N^2)$	Kgm <sup>2</sup>

F: 重量 Mass (kg)  
N: 迴轉數 Return per minutes (R.P.M.)

D: 直徑 Diameter (M)  
R: 半徑 Radius (M)