

EASY SERVOMOTOR

HIGH PERFORMANCE ESM SERIES SERVOMOTOR



YOUR BEST CHOICE FOR AC SERVO MOTORS

HPB Technology Co., LTD.

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HIGH PERFORMANCE **ESM SERIES SERVOMOTOR**



The ESM series brushless servomotors are designed for industrial applications that require high performance and high accuracy at a very competitive price. The motors are made with the latest Neodymium Iron Boron high-energy magnets and low loss silicon steel. High accuracy encoder and connectors (some optional) provide OEM's with a very cost competitive automation solution.

- HIGH POWER DENSITY
- 3X OVERLOAD CAPABILITY
- SINUSOIDAL B.E.M.F.
- WIDE VARIETY OF OPTIONS
- SPECIAL DESIGN OPTIONS FOR OEM'S

ESM60, 85, 125(I), 145(I) & 190(I) Winding Data
ESM125(II), ESM145(II) & ESM190(II) Winding Data
ESM60 & 85 Mechanical Dimensions
ESM125, 145 & 190 Mechanical Dimensions
ESM Connection Data
ESM60 & 85 Speed Torque Curves
ESM125 & 145 Speed Torque Curves
ESM190 Speed Torque Curves

**SPECIFICATIONS SUBJECT TO
CHANGE WITHOUT PRIOR NOTICE**

GENERAL SPECIFICATIONS

- INSULATION CLASS: F
- INSULATION VOLTAGE: 1500 rms min
- INSULATION RESISTANCE: ABOVE 500VDC 10M Ω
- PROTECTION LEVEL: IP55
- OPERATING AMBIENT ENVIRONMENT:
0~40°C · 90%RH · NON-CONDENSING
- STORAGE AMBIENT ENVIRONMENT:
-20°C ~ 60°C · 90%RH · NON-CONDENSING
- VIBRATION CLASS: V5
- MOUNTING: B5 (FLANGE MOUNTING)
- FEEDBACK SYSTEM: ENCODER
+5V · LINE DRIVER · 2500PPR WITH U.V.W
COMMUTATION SIGNALS
- CONNECTOR & CABLE:
FRAME 60 · 85: FLYING LEADS
FRAME 125 / 145: CONNECTOR
FRAME190: MOTOR (TERMINAL BOX)
ENCODER (CONNECTOR)
- OVER TEMPERATURE PROTECTION: THERMO-SWITCH

OPTIONS:

- HOLDING BRAKE
- RESOLVER
- IP65 PROTECTION
- OIL SEAL
- SPECIAL Ke - Kt
- SPECIAL FLANGE, SHAFT
- MOTOR/ENCODER CABLES
- CONNECTOR FOR 60 & 85 FRAME MOTORS
- GEARBOX

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ESM SERIES SERVOMOTOR



TECHNICAL – DATA (I)

FRAME NO:	ESM60 A	ESM85 A	ESM85 B	ESM85 C	ESM85 D	ESM125 A	ESM125 B	ESM125 C	ESM125 D	ESM125 E	ESM125 F
RATED POWER (KW)	.4	.4	.6	.75	1	.75	1	1.5	2.2	3	4
RATED TORQUE (NM)	1.274	1.9	2.84	3.53	4.8	3.6	4.8	7.2	10.5	14.3	19
PEAK TORQUE (NM)	3.822	5.7	8.52	10.6	14.4	10.8	14.4	21.6	31.5	42.9	57
RATED SPEED (RPM)	3000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
MAX SPEED (RPM)	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
RATED CURRENT (A)	2.4	2.5	3.2	4	5.2	3.2	5	7.2	10.6	14.5	19.5
PEAK CURRENT (A)	7.2	7.5	9	12	15.6	9.6	15	21.6	31.5	43.5	58.5
Kt (NM/A)	.53	.76	.89	.88	.92	1.13	.96	1	.99	.986	.974
Ke Vrms/1000RPM	19.796	45	44	48	48	60	60	60	60	60	60
WINDING RESISTANT (Ω)	5.15	5.4	3.58	2.5	1.8	6.6	3.5	2	1.2	.9	.73
WINDING INDUCTANCE (mH)	17.5	10	7.6	5.8	4.3	18.5	11.2	6.8	4.8	4.3	2.6
POLE	8	8	8	8	8	8	8	8	8	8	8
ROTOR INERTIA J (Kg-cm ²)	.4	2.44	3.34	4.2	5.1	6.66	10.1	14.4	20.35	27.25	35.9
INSULATION	F	F	F	F	F	F	F	F	F	F	F
COOLING	IC0041	IC0041	IC0041	IC0041	IC0041	IC0041	IC0041	IC0041	IC0041	IC0041	IC0041
PROTECTION	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55
FEEDBACK SYSTEM ENCODER	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
OVER TEMPERATURE PROTECTION	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW
WEIGHT (Kg)	2	3	4	5	6	5.3	6.36	8.7	12	15	19

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TECHNICAL – DATA (I)

FRAME NO:	ESM145 A	ESM145 B	ESM145 C	ESM145 D	ESM190 A	ESM190 B	ESM190 C	ESM190 D	ESM190 E
RATED POWER (KW)	3	4	5.6	7.5	4.5	6	7.5	11	15
RATED TORQUE (NM)	14.3	19	26.7	35.8	29	39	48	71.5	95
PEAK TORQUE (NM)	42.9	57	80.1	103.2	87	117	144	214.5	285
RATED SPEED (RPM)	2000	2000	2000	2000	1500	1500	1500	1500	1500
MAX SPEED (RPM)	4000	4000	4000	4000	4000	4000	4000	4000	4000
RATED CURRENT (A)	15	19.5	25.6	34.4	29.5	35	48	66	80
PEAK CURRENT (A)	45	58.5	80.1	107.4	88.5	105	144	198	240
Kt (NM/A)	.953	.97	1.04	1.04	.98	1.11	1	1.08	1.19
Ke Vrms/1000RPM	60	60	60	60	62	61	60	60	57
WINDING RESISTANT (Ω)	.5	.3	.26	.2	.2	.13	.5	.09	.1
WINDING INDUCTANCE (mH)	2.9	2.1	1.4	1.1	.96	.66	.1	.46	.58
POLE	8	8	8	8	8	8	8	8	8
ROTOR INERTIA J (Kg-cm ²)	51.06	66.48	91.15	120.45	87	102.7	139.8	177.4	214.5
INSULATION	F	F	F	F	F	F	F	F	F
COOLING	IC0041	IC0041	IC0041	IC0041	IC0416	IC0416	IC0416	IC0416	IC0416
PROTECTION	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55
FEEDBACK SYSTEM ENCODER	2500	2500	2500	2500	2500	2500	2500	2500	2500
OVER TEMPERATURE PROTECTION	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW
WEIGHT (Kg)	17.7	22	28.5	36.7	28	33	42	50	65

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TECHNICAL – DATA (II)

FRAME NO:	ESM125 B	ESM125 C	ESM125 D	ESM125 E	ESM125 F	ESM145 A	ESM145 B	ESM145 C	ESM145 D
RATED POWER (KW)	1	1.5	2.2	3	4	3	4	5.6	7.5
RATED TORQUE (NM)	4.8	7.2	10.5	14.3	19	14.3	19	26.7	35.8
PEAK TORQUE (NM)	14.4	21.6	31.5	42.9	57	42.9	57	80.1	103.2
RATED SPEED (RPM)	2000	2000	2000	2000	2000	2000	2000	2000	2000
MAX SPEED (RPM)	4000	4000	4000	4000	4000	4000	4000	4000	4000
RATED CURRENT (A)	2.3	3.4	4.9	6.7	8.7	6.6	8.8	12.3	16.3
PEAK CURRENT (A)	6.9	10.2	14.7	20.1	26.1	19.8	26.4	36.9	48.9
Kt (NM/A)	2.08	2.12	2.14	2.13	2.18	2.17	2.16	2.17	2.2
Ke Vrms/1000RPM	125	125	125	125	125	125	125	125	125
WINDING RESISTANT (Ω)	13.2	8.5	5.1	3.7	3.1	2.4	1.6	1.03	.19
WINDING INDUCTANCE (mH)	40.5	28.4	19.5	17.4	11.5	11.2	8.1	5.5	.98
POLE	8	8	8	8	8	8	8	8	8
ROTOR INERTIA J (Kg-cm ²)	10.1	14.4	20.35	27.25	35.9	51.06	66.48	91.15	120.45
INSULATION	F	F	F	F	F	F	F	F	F
COOLING	IC0041	IC0041	IC0041	IC0041	IC0041	IC0041	IC0041	IC0041	IC0041
PROTECTION	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55
FEEDBACK SYSTEM ENCODER	2500	2500	2500	2500	2500	2500	2500	2500	2500
OVER TEMPERATURE PROTECTION	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW
WEIGHT (Kg)	6.36	8.7	12	15	19	17.7	22	28.5	36.7

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ESM60

TECHNICAL – DATA (II)

FRAME NO:	ESM190 A	ESM190 B	ESM190 C	ESM190 D	ESM190 E
ATED POWER (KW)	4.5	6	7.5	11	15
RATED TORQUE (NM)	29	39	48	71.5	95
EAK TORQUE (NM)	87	117	144	214.5	285
RATED SPEED (RPM)	1500	1500	1500	1500	1500
MAX SPEED (RPM)	4000	4000	4000	4000	4000
RATED CURRENT (A)	17	20	24	38	57
PEAK CURRENT (A)	51	60	72	114	171
Kt (NM/A)	1.7	1.95	2	1.88	1.67
Ke Vrms/1000RPM	109	108	119	104	98
WINDING RESISTANT (Ω)	.59	.43	.41	.28	.18
WINDING INDUCTANCE (mH)	3.4	2.1	2.2	1.6	.99
POLE	8	8	8	8	8
ROTOR INERTIA J (Kg-cm ²)	87	102.7	139.8	177.4	214.5
INSULATION	F	F	F	F	F
COOLING	IC416	IC416	IC416	IC416	IC416
PROTECTION	IP55	IP55	IP55	IP55	IP55
FEEDBACK SYSTEM ENCODER	2500	2500	2500	2500	2500
OVER TEMPERATURE PROTECTION	TH-SW	TH-SW	TH-SW	TH-SW	TH-SW
WEIGHT (Kg)	28	33	42	50	65



ESM85



ESM125



ESM145



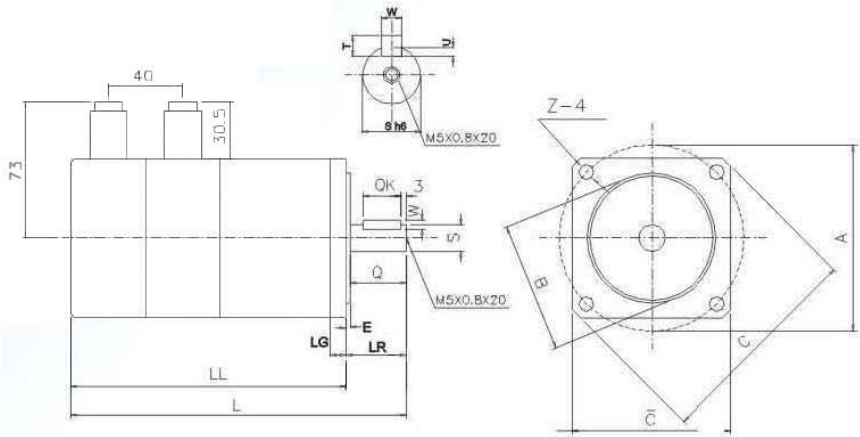
ESM190

HIGH PERFORMANCE
ESM SERIES SERVOMOTOR



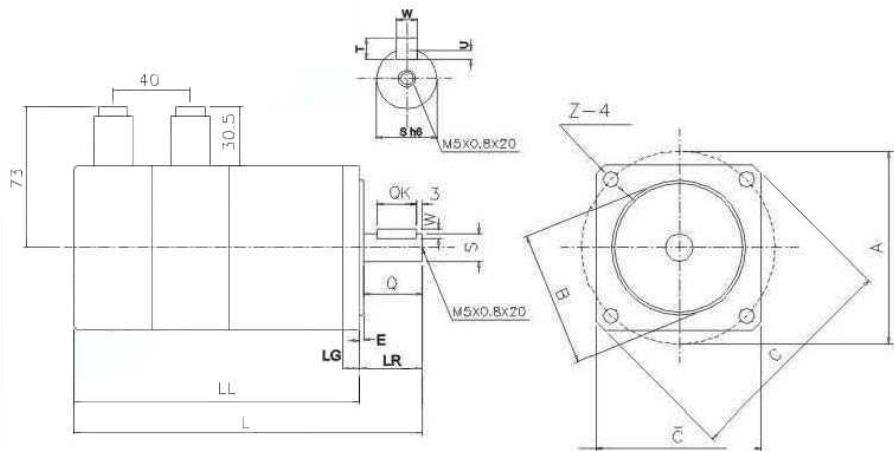
DIMENSION DRAWING

ESM60



FRAME	L	LL	E	LR	A	\bar{C}	B	Q	QK	S	T	U	W	Z
ESM60A	155	125	3	30	70	60	50	25	20	14	5	3	5	4.5

ESM85



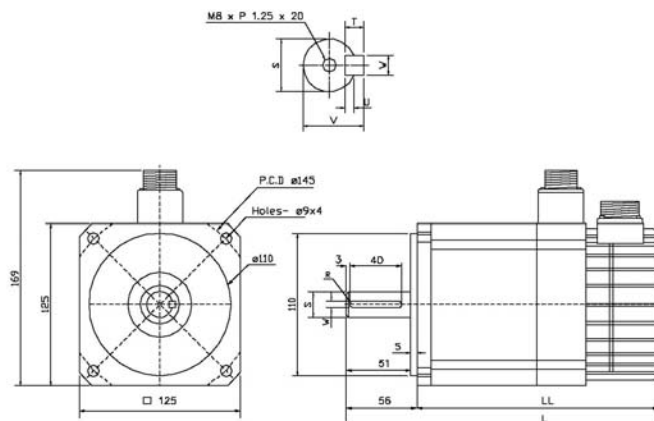
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ESM85A	172.5	145	2.5	33.5	70	100	85	30	20	14	5	2.5	5	7
ESM85B	192.5	165	2.5	33.5	70	100	85	30	20	16	5	2.5	5	7
ESM85C	212.5	185	2.5	33.5	70	100	85	30	20	16	5	2.5	5	7
ESM85D	232.5	205	2.5	33.5	70	100	85	30	20	16	5	2.5	5	7

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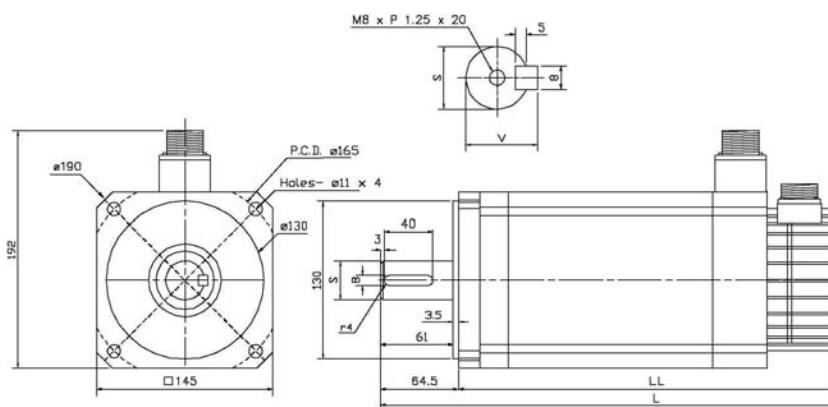
DIMENSION DRAWING

ESM125



FRAME	L	LL	E	LR	B	A	C̄	Q	QK	S	W	U	T	Z
ESM125A	209	153	5	56	110	145	125	51	40	19	5	3	5	9
ESM125B	229	173	5	56	110	145	125	51	40	22	7	4	7	9
ESM125C	254	198	5	56	110	145	125	51	40	24	7	4	7	9
ESM125D	289	233	5	56	110	145	125	51	40	24	7	4	7	9
ESM125E	329	273	5	56	110	145	125	51	40	28	8	5	8	9
ESM125F	379	323	5	56	110	145	125	51	40	28	8	5	8	9

ESM145



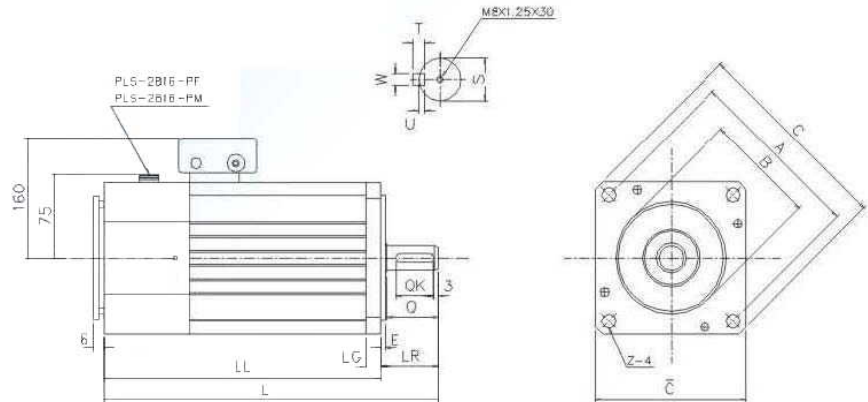
FRAME	L	LL	E	LR	B	A	C̄	Q	QK	S	W	U	T	Z
ESM145A	320	256	3.5	65	130	165	145	61	40	32	8	5	8	11
ESM145B	360	296	3.5	65	130	165	145	61	40	32	8	5	8	11
ESM145C	425	360	3.5	65	130	165	145	61	40	32	8	5	8	11
ESM145D	500	436	3.5	65	130	165	145	61	40	32	8	5	8	11

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DIMENSION DRAWING

ESM190



FRAME	L	LL	E	LR	B	A	C̄	Q	QK	S	W	U	T	Z
ESM190A	459	380	5	79	180	215	190	76	60	28	8	4	8	13
ESM190B	479	400	5	79	180	215	190	76	60	38	10	4	8	13
ESM190C	529	450	5	79	180	215	190	76	60	38	10	4	8	13
ESM190D	579	500	5	79	180	215	190	76	60	42	12	5	10	13
ESM190E	629	550	5	79	180	215	190	76	60	42	12	5	10	13



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CONNECTION

ESM60 ESM85

WITH FLYING LEADS

	MOTOR			THERMO-SWITCH		BRAKE	
Cable Color	RED	WHITE	BLACK	YELLOW	YELLOW	BLACK	BLACK
Description	U	V	W	H1	H2	B1	B2

ESM60, ESM85 ENCODER															
Cable Color	RED	PINK	OLIVE	BLUE	YELLOW	ORANGE	BEIGE	BROWN	GREEN	GRAY	LIGHT BLUE	VIOLET	WHITE	BLACK	SHIELD
Description	A	\bar{A}	B	\bar{B}	Z	\bar{Z}	U	\bar{U}	V	\bar{V}	W	\bar{W}	+5V	0V	SHIELD

ESM85 / 125 / 145

WITH CONNECTOR

POWER CONNECTION

MOTOR	CONNECTOR
ESM85	MS3102A22-23P
ESM125	MS3102A20-15P
ESM145 A & B	MS3102A22-23P
ESM145 C & D	MS3102B24-10S

ENCODER CONNECTION PLS-2816-RM

CONNECTOR PIN	FUNCTION
A	MOTOR U PHASE
B	MOTOR V PHASE
C	MOTOR W PHASE
D	GROUND
E	THERMO-SWITCH
F	THERMO-SWITCH

1 → A	9 → V
2 → \bar{A}	10 → \bar{V}
3 → B	11 → W
4 → \bar{B}	12 → \bar{W}
5 → Z	13 → +VCC
6 → \bar{Z}	14 → 0V
7 → U	15 → Shield
8 → \bar{U}	

BRAKE CONNECTION PLT-163P/R

ESM190

WITH TERMINAL BOX AND CONNECTOR

POWER CONNECTION

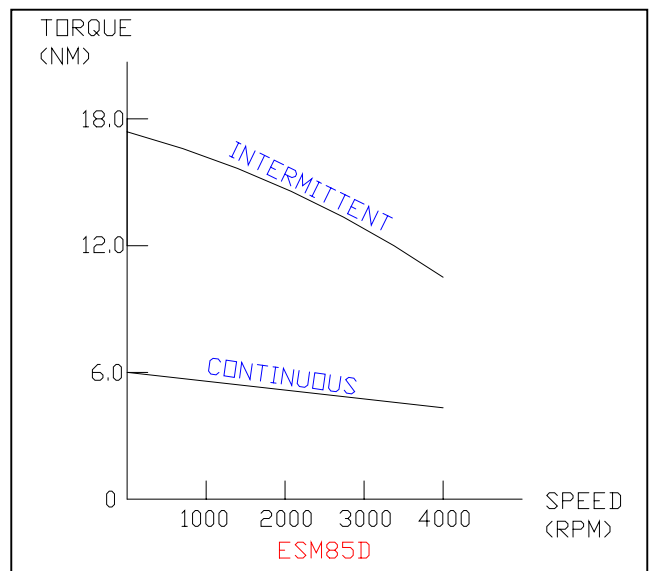
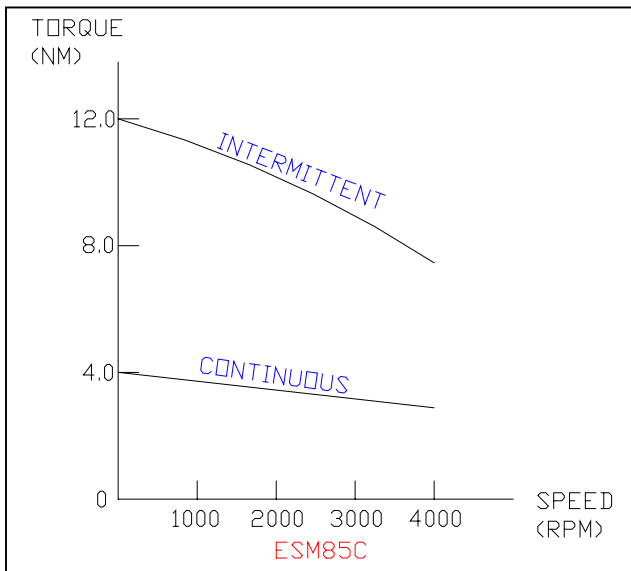
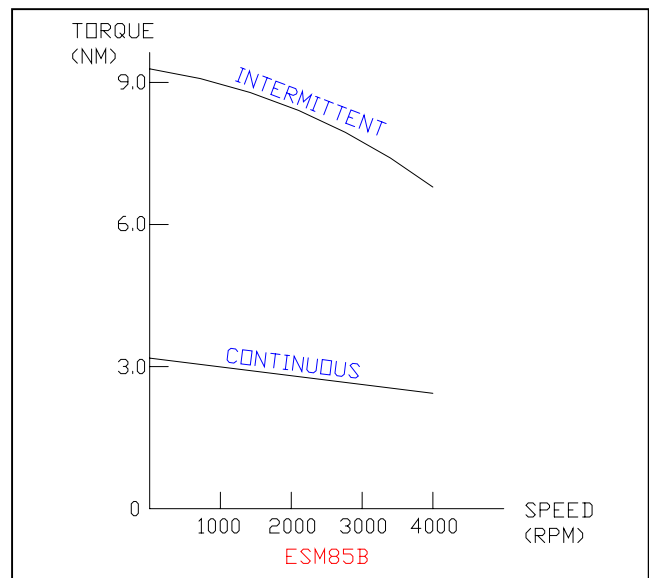
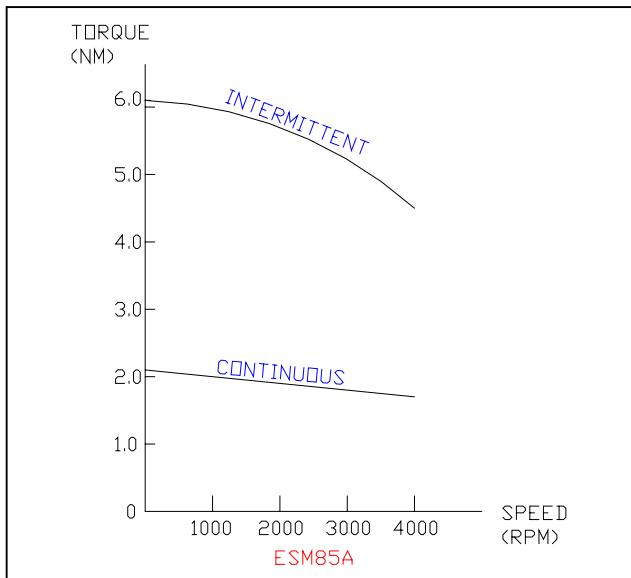
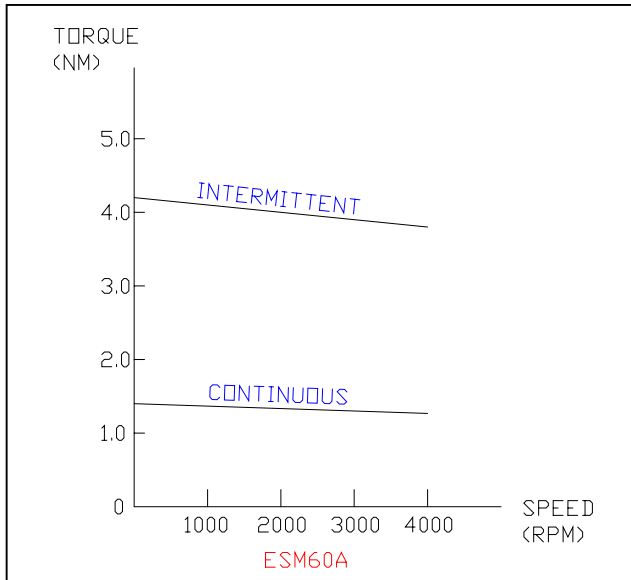
ENCODER CONNECTION PLS-2816-RM

CONNECTOR PIN	FUNCTION
1 → A	11 → W
2 → \bar{A}	12 → \bar{W}
3 → B	13 → +VCC
4 → \bar{B}	14 → 0V
5 → Z	15 → Shield
6 → \bar{Z}	
7 → U	
8 → \bar{U}	
9 → V	
10 → \bar{V}	

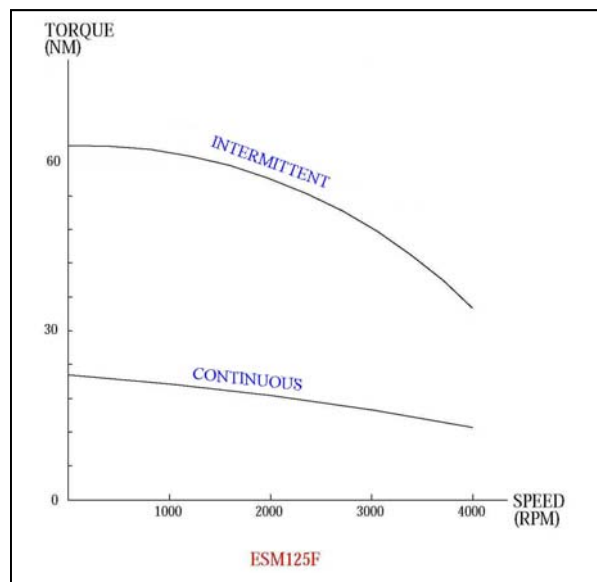
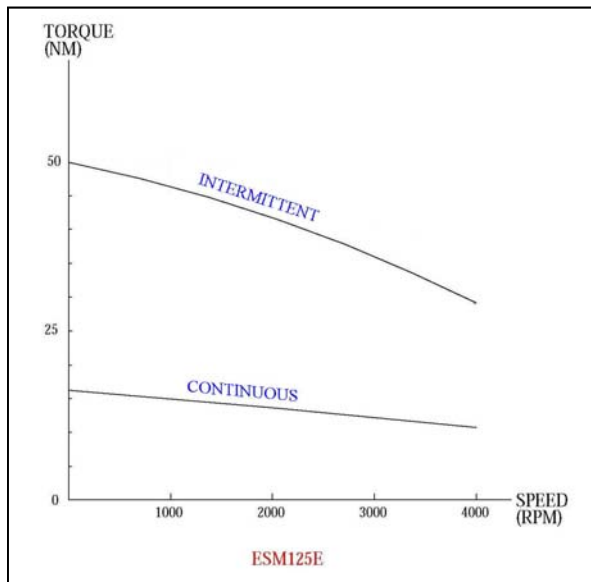
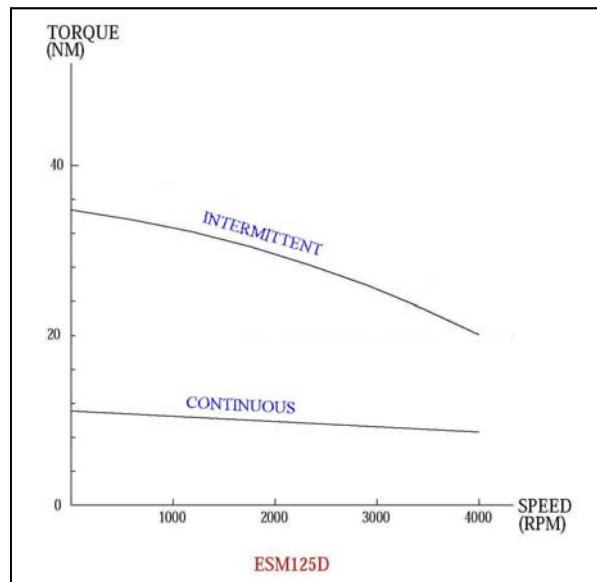
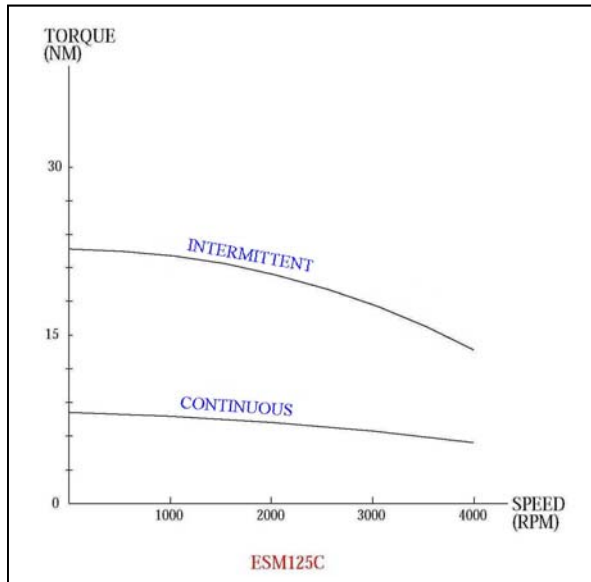
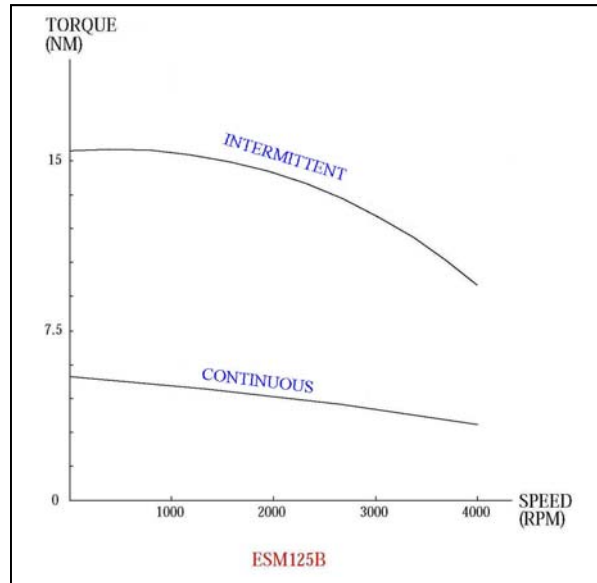
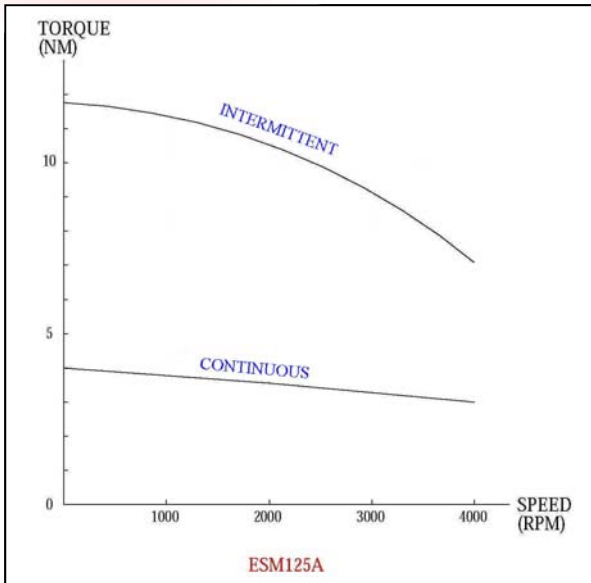
FAN CONNECTION PLT-163P/R

BRAKE CONNECTION PLT-163P/R

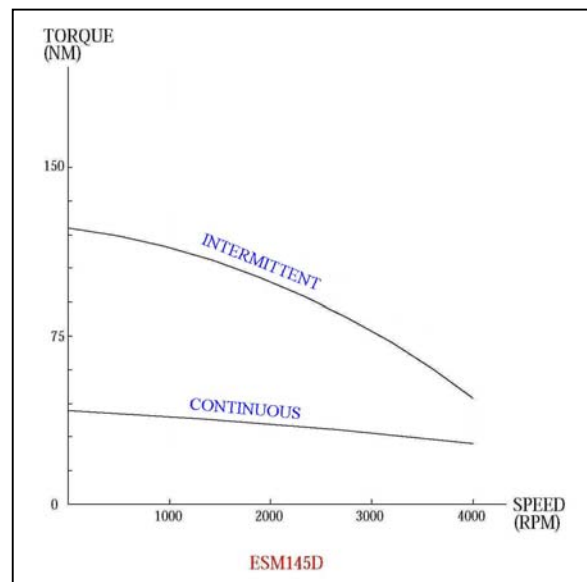
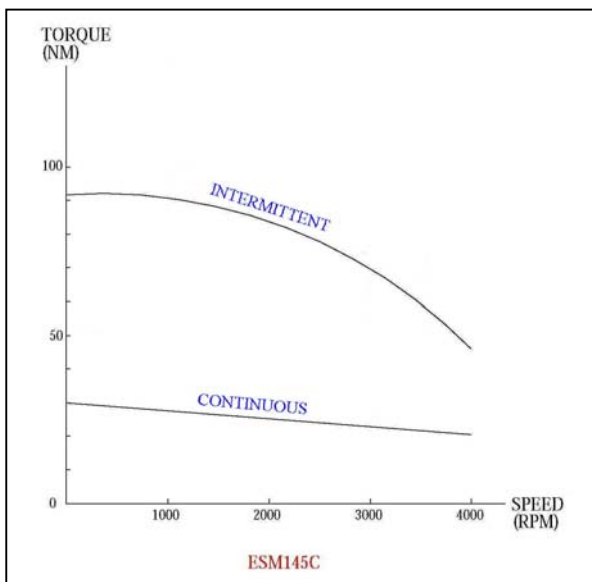
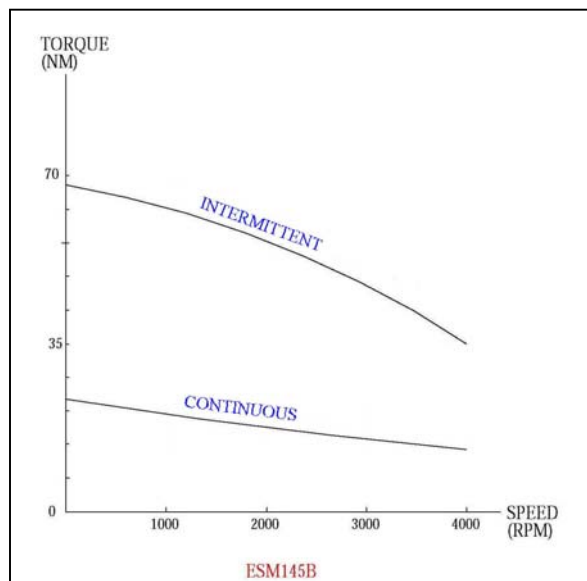
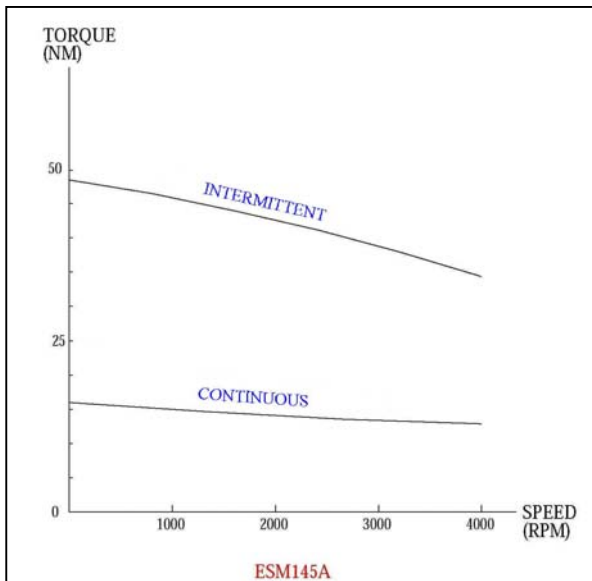
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