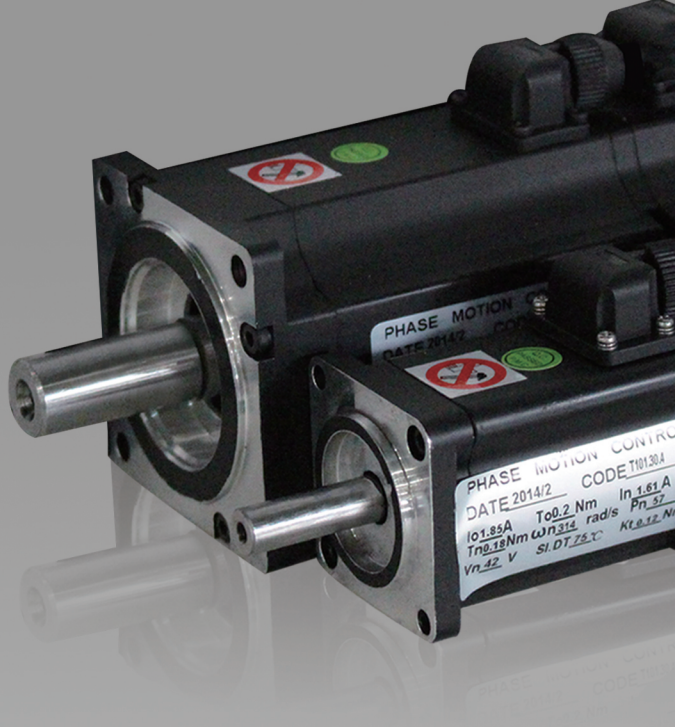
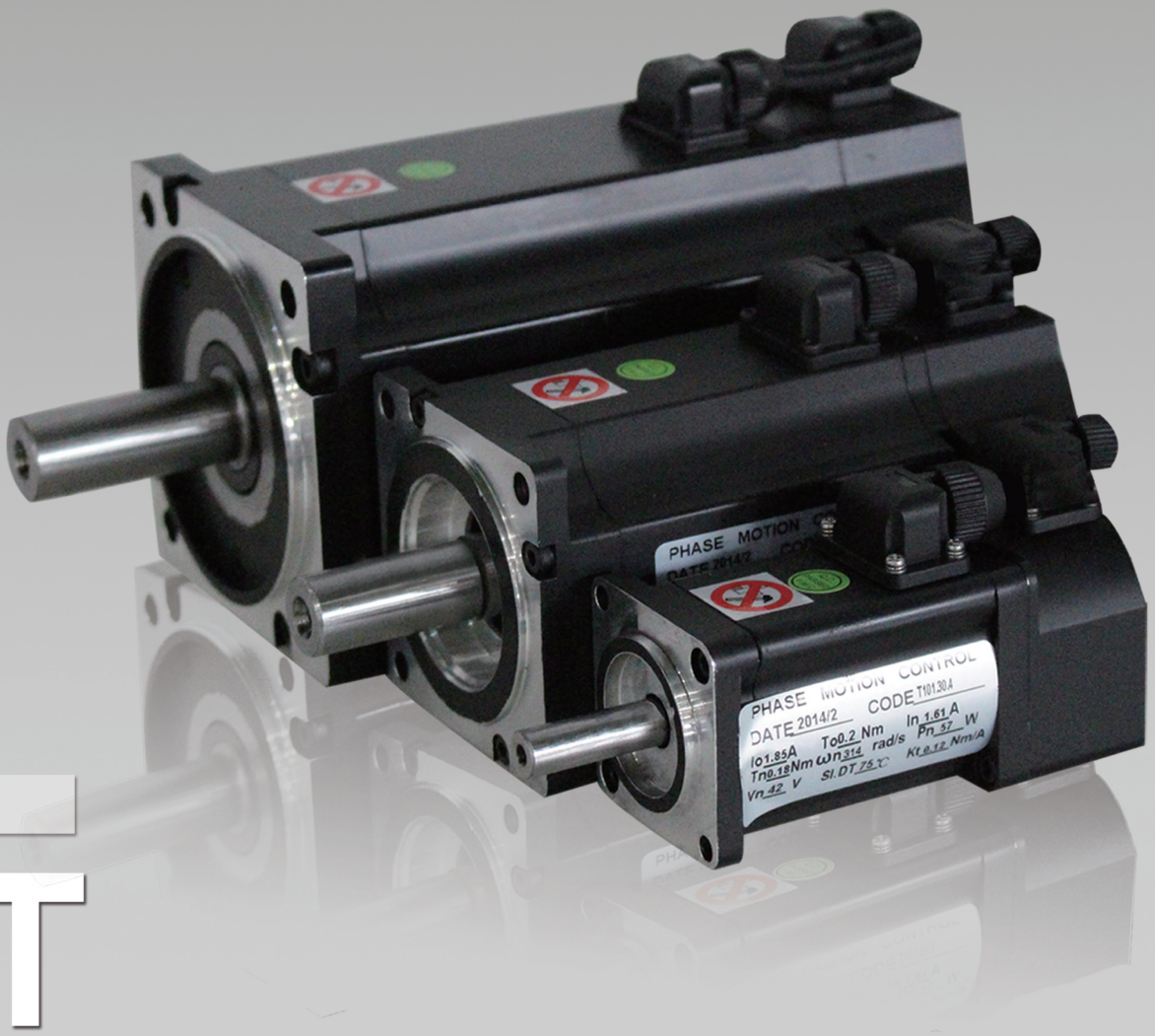
PHASE
MOTION CONTROL





T

SERVO MOTORS

超短型交流永磁伺服电机

LEADING THE INNOVATION

in High Dynamic and position control for automation

T ServoMotors

LEADING THE INNOVATION

in High Dynamic and position control for automation

INTRODUCTION

The T series of high performance servo motors, produced in the new Phase Motion Control Plant specialized in high performance servo motors, is based on the last generation of rare earth magnets and embodies the patented Phase surface magnet assembly technology, which endows the motors with the highest torque density.

High Power Density Series

Design Features for T series motors:

Small size motor

Motors' flange: 40mm, 60mm, 80mm;

Peak torque up to 23Nm, max speed can reach 5000rpm, which will decrease response time and positioning time.

Small space for installation.

Encoder 2500ppr incremental encoder (Standard) and 18Bits single-turn or multi-turns (Standard) absolute encoder are available according different application.

Winding Insulation Class H; Motor Insulation Class F; Protection class IP55 (Not including shaft).

Safety brake All motors have an internal cavity where the PM safety brake can be mounted. The brakes are all rare earth permanent magnet type. This new high power density brake operates without brake pads. As a consequence, the problem of pollution of motor cavity when the brake is operated incorrectly is avoided.

Low cost High quality All motor's winding wire by machine automatically which will increase production efficiency and keep human cost down. It will decrease total motor's cost but keep quality through import key parts.

Main application Now Phase T series motors are widely used in following application:

- ✧ Robot
- ✧ PCB drilling machine
- ✧ Chip mounters
- ✧ Bending machine
- ✧ Conveyors
- ✧ Package machine

AVAILABLE OPTIONS

Protection	
Sensor	**D11: Heidenhain R35i digital incremental encoder, 2500ppr.** **D12: Tamagawa TS6214N336 digital incremental encoder, 2500ppr. (T1 NA)**
Safety brake	**B: Holding torque ⩾ Tn**
Keyway on shaft	**K: Not recommended**

MOTOR CODING

T □ □□ □□ □ □□ □ □

Size Identify	Stall Torque Identify	Speed Identify	Rated Voltage Identify	Encoder Identify	Option	Option
1: ⍁40mm 2: ⍁60mm 4: ⍁80mm	**Nm*0.1 for size T1,T2** **Nm for T4**	Nominal speed identifier, rad/s*100	2: 220Vac 3: 380Vac 4: 48Vac	D11: Digital incremental encoder 2500ppr	B: Brake	K: Key

ORDER CODE EXAMPLE

T 1 01 30 2 D11 B

Motor type T 1 , Stall torque 0.1Nm, nominal speed 3000rpm, 220Vac, Digital incremental encoder 2500ppr, with safety brake.

TECHNICAL DATA

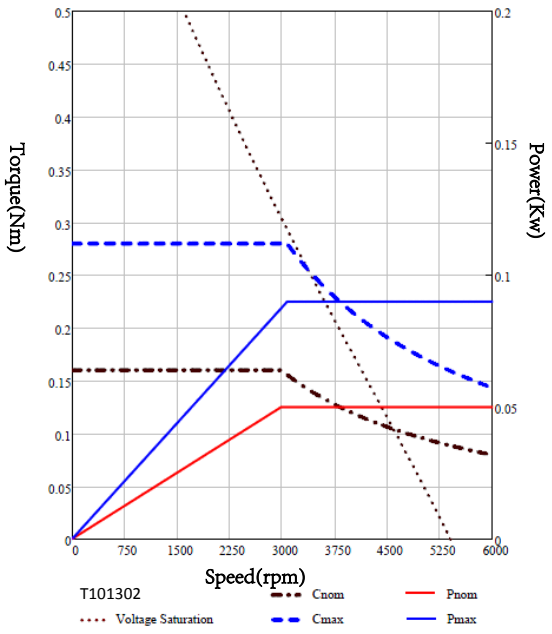
Technical Data Summary For T1

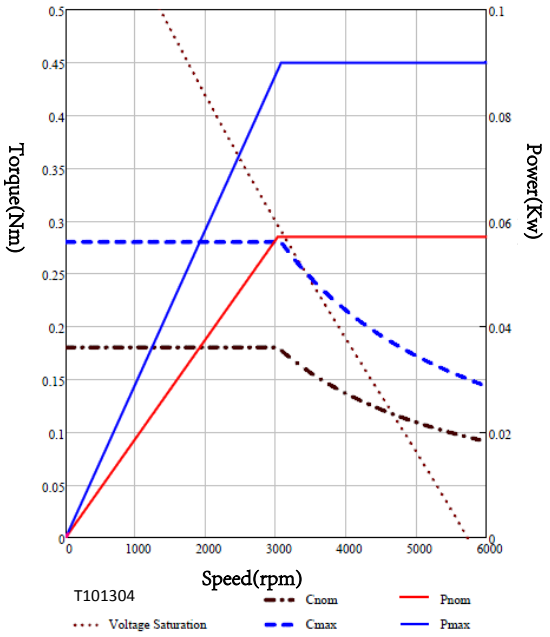
Motor Type		Unit	T101302	T102302	T101304	T102304
Base Data						
Voltage		Vac	200	200	48	48
Nominal Torque	Tn	Nm	0.16	0.3	0.18	0.27
Stall Torque	T0	Nm	0.2	0.36	0.2	0.32
Peak Torque	Tpk	Nm	1	2	1	2
Nominal Speed	Wn	rpm	3000	3000	3000	3000
Max Speed	wmax	rpm	5705	5905	6051	5345
Nominal Power	Pn	Kw	0.05	0.1	0.05	0.1
Poles			8	8	8	8
Physical Data						
Inertia	Jm	$mkgm^2$	0.0025	0.0045	0.0025	0.0045
Acceleration at Peak Torque	apk	rad/s^2	400000	444000	400000	222000
Mass	M	Kg	0.425	0.561	0.425	0.561
Insulation			Winding : Class H ; Motor : Class F			
Cooling			Convection(IC0041)			
Protection			IP55			
Electrical Data						
Back EMF	Ke	Vs	37.1	35.8	7.4	8.4
Torque Constant	Kt	Nm/A	0.613	0.592	0.123	0.139
Winding Resistance	Rw	Ohm	120.595	50.836	5.647	3.479
Winding Inductance	Lw	mH	84.83	39.58	3.39	2.17
Nominal Voltage	Vn	V	145.12	134.63	30.66	32.19
Nominal Current	In	A	0.3	0.57	1.61	2.19
Stall Current	I0	A	0.36	0.67	1.85	2.56
Peak Current	Ipk	A	2	4	8	13
Frequency	fn	Hz	200	200	200	200
Efficiency at Rated Power	n		55.5%	61.4%	52.5%	59.3%

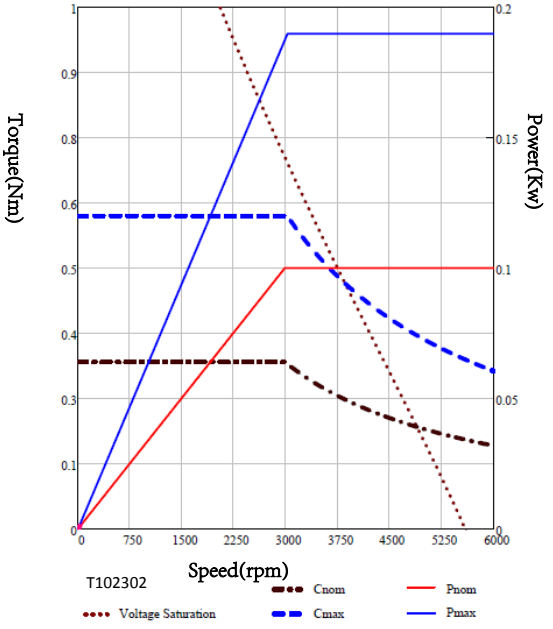
Test Condition:

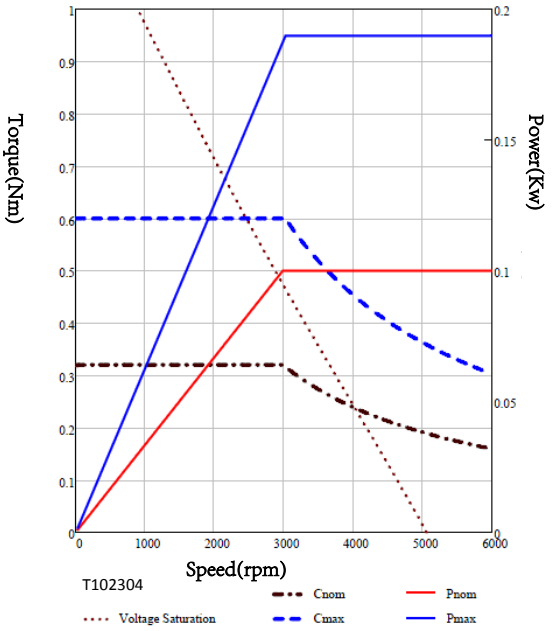
1) Motor tested in Horizontal position in free air, ambient temperature 25℃;
2) Motor flanged
3) Typical data tolerance±10%;
4) Chopper frequency 8KHz;

Performance Curve

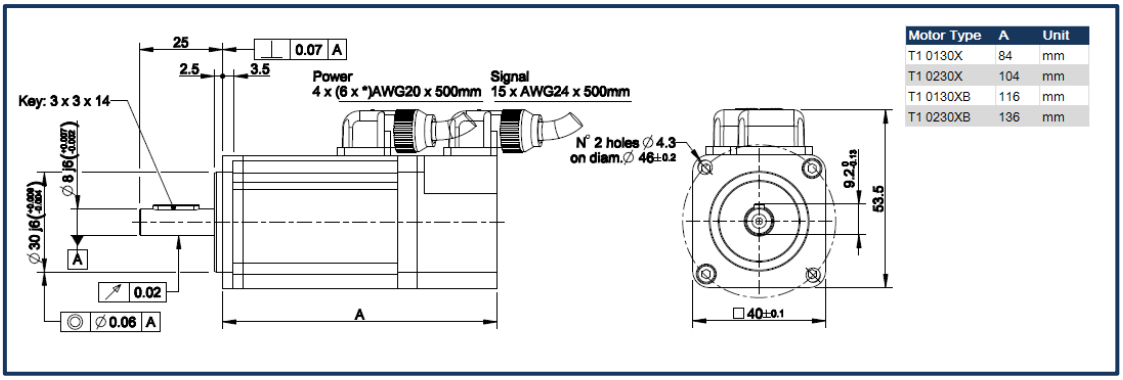








Dimension



Motor Type	A	Unit
T1 0130X	84	mm
T1 0230X	104	mm
T1 0130XB	116	mm
T1 0230XB	136	mm

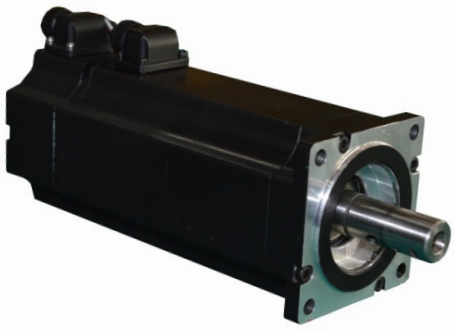
TECHNICAL DATA

Technical Data Summary For T2

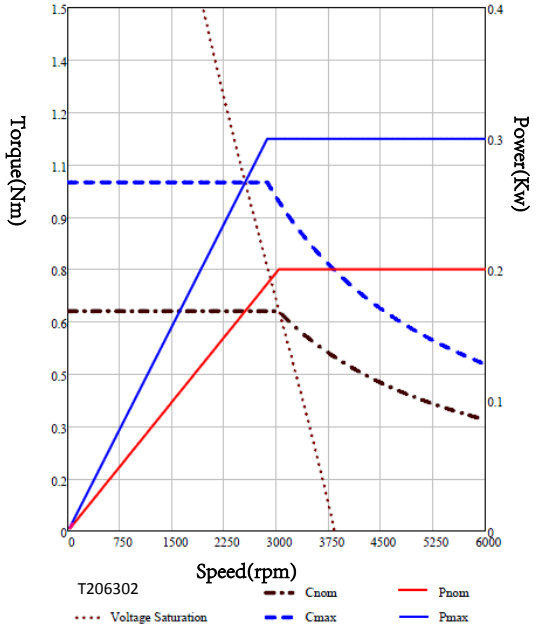
Motor Type		Unit	T206302	T212302	T206304	T212304
Base Data						
Voltage		Vac	200	200	48	48
Nominal Torque	Tn	Nm	0.72	1.26	0.69	1.24
Stall Torque	T0	Nm	0.77	1.35	0.75	1.34
Peak Torque	Tpk	Nm	4	9	4	9
Nominal Speed	Wn	rpm	3000	3000	3000	3000
Max Speed	wmax	rpm	4048	4086	4294	4078
Nominal Power	Pn	Kw	0.2	0.4	0.2	0.4
Poles			8	8	8	8
Physical Data						
Inertia	Jm	$mkgm^2$	0.037	0.071	0.037	0.071
Acceleration at Peak Torque	apk	rad/s^2	108000	126000	108000	126000
Mass	M	Kg	1.159	1.739	1.159	1.739
Insulation			Winding : Class H ; Motor : Class F			
Cooling			Convection(IC0041)			
Protection			IP55			
Electrical Data						
Back EMF	Ke	Vs	52.2	51.4	10.4	10.9
Torque Constant	Kt	Nm/A	0.86	0.85	0.17	0.18
Winding Resistance	Rw	Ohm	34.135	14.569	1.361	0.674
Winding Inductance	Lw	mH	51.44	29.26	2.06	1.32
Nominal Voltage	Vn	V	189.3	180.72	37.55	38.42
Nominal Current	In	A	0.88	1.55	4.24	7.21
Stall Current	I0	A	0.94	1.67	4.58	7.77
Peak Current	Ipk	A	6	14	32	64
Frequency	fn	Hz	200	200	200	200
Efficiency at Rated Power	n		72.9%	77.3%	73.5%	77.2%

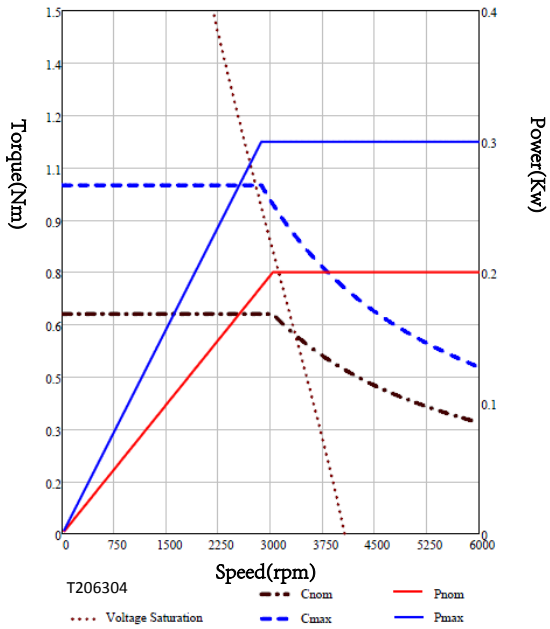
Test Condition:

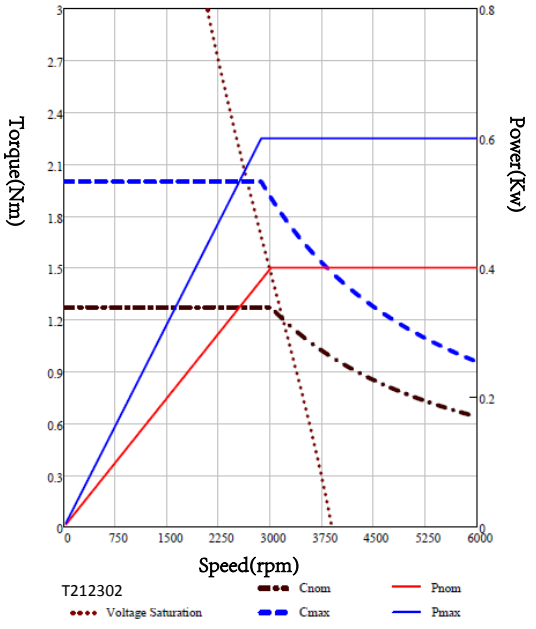
1) Motor tested in Horizontal position in free air, ambient temperature 25℃;
2) Motor flanged
3) Typical data tolerance±10%;
4) Chopper frequency 8KHz.

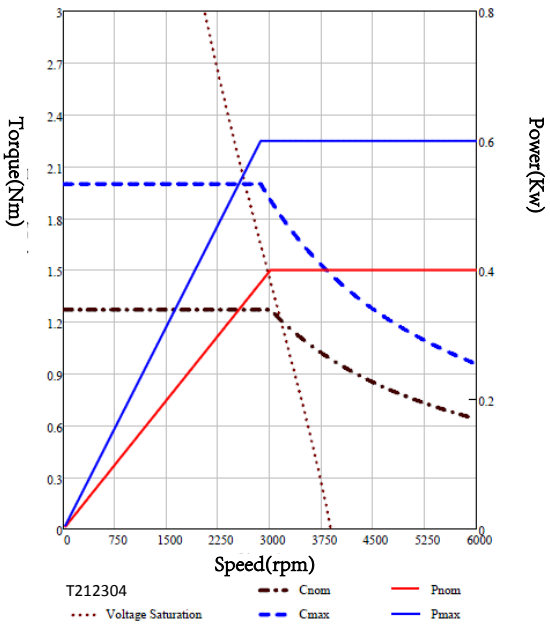


Performance Curve

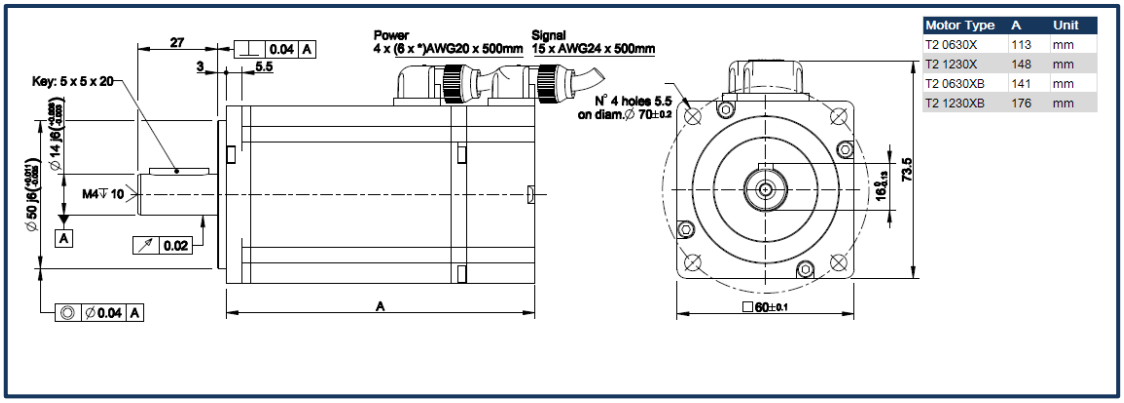








Dimension



Motor Type	A	Unit
T2 0630X	113	mm
T2 1230X	148	mm
T2 0630XB	141	mm
T2 1230XB	176	mm

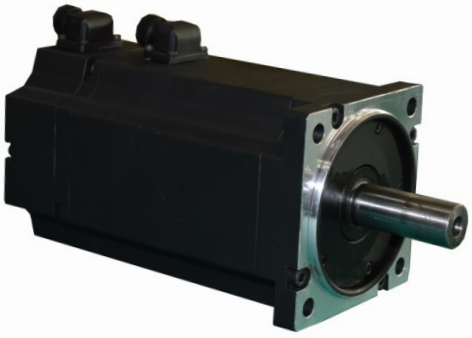
TECHNICAL DATA

Technical Data Summary For T4

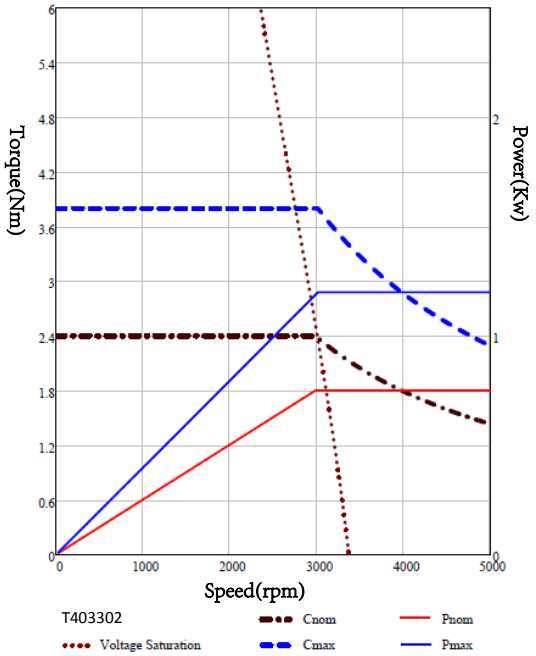
Motor Type		Unit	T403302	T404302	T403303	T404303
Base Data						
Voltage		Vac	200	200	380	380
Nominal Torque	Tn	Nm	2.46	3.96	2.45	3.83
Stall Torque	T0	Nm	2.86	4.49	2.89	4.47
Peak Torque	Tpk	Nm	15	23	15	23
Nominal Speed	Wn	rpm	3000	3000	3000	3000
Max Speed	wmax	rpm	3563	3563	3868	4128
Nominal Power	Pn	Kw	0.75	1.2	0.75	1.2
Poles			8	8	8	8
Physical Data						
Inertia	Jm	$mkgm^2$	0.131	0.168	0.131	0.168
Acceleration at Peak Torque	apk	rad/s^2	114000	136000	114000	136000
Mass	M	Kg	2.982	3.532	2.982	3.532
Insulation			Winding : Class H ; Motor : Class F			
Cooling			Convection(IC0041)			
Protection			IP55			
Electrical Data						
Back EMF	Ke	Vs	59.3	59.3	103.8	97.3
Torque Constant	Kt	Nm/A	0.981	0.981	1.718	1.61
Winding Resistance	Rw	Ohm	4.91	2.806	14.734	7.607
Winding Inductance	Lw	mH	13.45	8.41	41.19	22.61
Nominal Voltage	Vn	V	194.19	192.39	339.32	314.68
Nominal Current	In	A	2.79	4.27	1.59	2.52
Stall Current	I0	A	3.24	4.84	1.87	2.94
Peak Current	Ipk	A	19	30	11	18
Frequency	fn	Hz	200	200	200	200
Efficiency at Rated Power	n		82%	84.7%	81.9%	84.3%

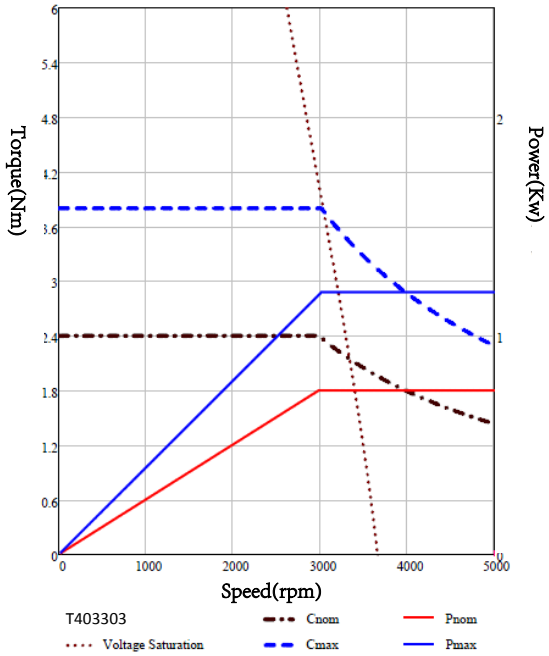
Test Condition:

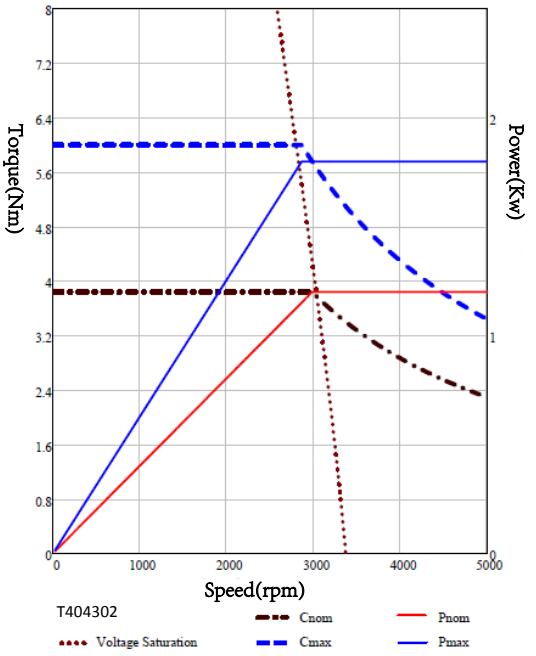
1) Motor tested in Horizontal position in free air, ambient temperature 2
2) Motor flanged;
3) Typical data tolerance±10%;
4) Chopper frequency 8KHz.

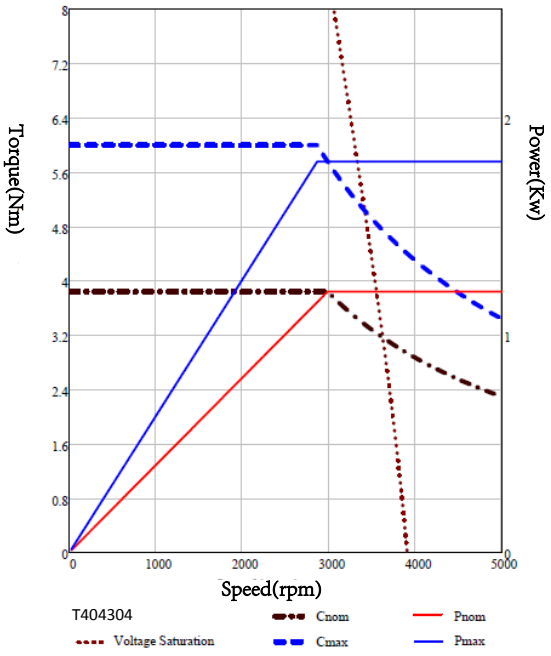


Performance Curve

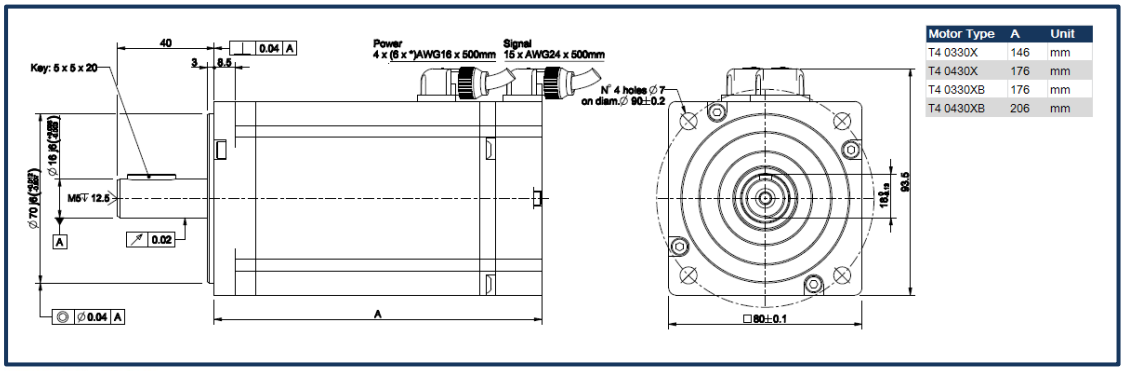








Dimension



Motor Type	A	Unit
T4 0330X	146	mm
T4 0430X	176	mm
T4 0330XB	176	mm
T4 0430XB	206	mm

CONNECTOR SPECIFICATION

Signal connector pins	Color	Description
1	Yellow	A
2	Yellow/white	A-
3	blue	B
4	Blue/white	B-
5	Orange	Z
6	Orange/white	Z-
7	Green	S1
8	Green/white	S1-
9	Brown	S2
10	Brown/white	S2-
11	White	S3
12	Gray/white	S3-
13	Red	VCC
14	Black	GND
15	Gray	FGND
16		
17		

Power Connector	Color	Description	Note
1	Blue	U	
2	Red	V	
3	Yellow	W	
4	Green*	BR+*(DC24V)	Option
5	Brown*	BR-*	Option
6	Black	GND	

(*)Option Brake

BRAKE SPECIFICATION

We can supply safety brakes for all TL series motors to match special applications, for example, robot, laser cutting machine, textile machine, package machine and so on.

Brake Type	T1	T2	T4	Unit
Static Holding Torque	0.5	2.2	5	Nm
Dynamic Holding Torque	0.4	1.8	4	Nm
Operation Time	5	10	17	ms
Release Time	5	10	17	ms
Release Voltage	20±4	20±4	20±4	Vdc±10%
Release Current	0.16	0.28	0.42	A
Additional Mass	0.065	0.278	0.302	kg
Inertia	16.59	95.83	319.3	$mkgcm^2$

PHASE
MOTION CONTROL

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WORLDWIDE SUPPORT AND DISTRIBUTION NETWORK

WORLD WIDE SUPPORT AND DISTRIBUTION NETWORKS

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Phase Motion Control, U.S.A

Phase USA, Inc.
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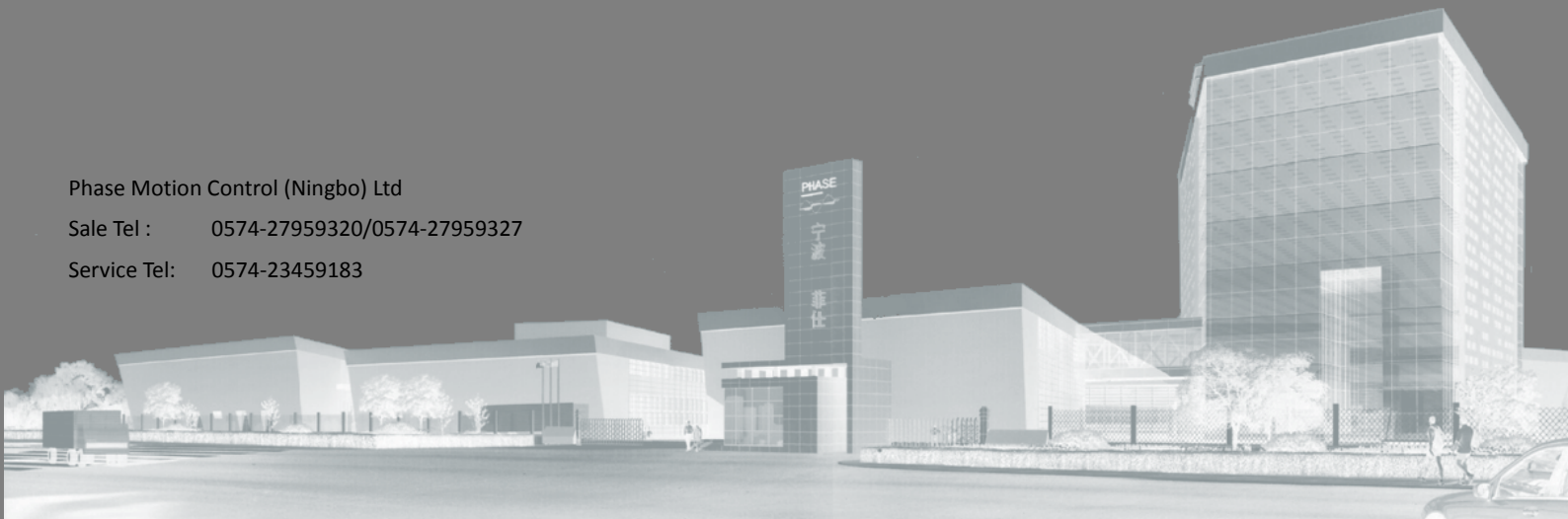

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