TORQUEMASTER
BRUSH SERVO MOTORS

2600 SERIES

MTI-Torque Systems specializes in the design of high performance brush servo motors that provide efficiency, flexibility of application, and a long and trouble-free service life. Our TORQUEMASTER® 2600 series is no exception, when integrated with high performance brush amplifiers, TORQUE-MASTER 2600 Series brush servo motors provide effective and highly efficient motion control solutions for a wide range of applications including factory automation, packaging, robotics, machine tools, medical instrumentation and more.

Performance Benefits:

• Delivers smooth and superior low speed performanceand maximum power ratings with low thermal resistance for high speed performance.

• Maximum torque in a smaller package

• Rugged industrial construction

• Continuous torque ratings up to 90 oz.-in with speeds up to 6500 RPM *(no load)*

• Peak torque ratings up to 450 oz.-in.

• High torque-to-inertia ratio delivers maximum torque per frame size

• Numerous custom options available

Design Features:

• Latest in high performance permanent magnet technology, and are available in eight standard windings as well as custom windings

• Motors can be customized to fit your exact application with tachometers, encoders, brakes and other options.

• Specialized machinery designs can install or retrofit servomotor with little or no restrictions

• Multiple configurations accommodate flexible design considerations

• Performance enhancement and feature convenience that allows Torque Systems motors to be incorporated into a broader range of applications

Montevideo Technology, Inc. (MTI)®
A Motor And Control Company
TORQUE SYSTEMS

BRUSH SERVO MOTOR CHARACTERISTICS

	SYMBOL		UNITS	2605	2610	2615	2620	2630	2640
	T_C	Cont. Torque	Oz-In	17	29	42	52	70	90
	T_P	Peak Torque	Oz-In	75	150	200	300	350	450
	T_F	Static Friction	Oz-In	4.5	4.5	4.5	4.5	4.5	4.5
	F_i	Viscous Friction	Oz-In/KRPM	0.2	0.2	0.3	0.4	0.5	0.6
	T_R	Cogging Torque	Oz-In	0.2	0.3	0.5	0.7	1	1.5
	J_M	Inertia	Oz-In-sec^2	0.0018	0.0031	0.0044	0.0057	0.0083	0.0115
	R_{TH}	Thermal Res	Deg C/watt	5.9	5	4.5	4	3.5	3
	T_{TH}	Thermal Time	Minute	10	15	15	20	20	25
	t_m	Mech Time	Millisec	8.6	5.9	4.9	4.8	4.6	4.6
	t_e	Elect Time	Millisec	1.6	1.9	2.1	2.1	2.2	2.2
	F_C	Commutation	Watts x Oz In / Amps	890	1300	1750	2100	2870	3780
	Wt	Weight	Lbs	2	2.6	3.1	3.6	4.7	5.7

Note: All values at 25°C Ambient.

WINDING									
A	K_T	Torq. Sens.	Oz-In/Amp	3.1	5.3	7.5	9.5	13.6	18
	R_A	Arm. Resis.	Ohms	0.29	0.38	0.47	0.56	0.74	0.92
	K_V	Back E.M.F	Volts/KRPM	2.3	3.9	5.5	7.0	10.1	13.3
	F_C/K_T	P_b	Watts	287	245	233	221	211	210
B	K_T	Torq. Sens.	Oz-In/Amp	3.7	6.4	9	11.5	16.4	21.7
	R_A	Arm. Resis.	Ohms	0.44	0.58	0.63	0.79	1.06	1.34
	K_V	Back E.M.F	Volts/KRPM	2.7	4.7	6.7	8.5	12.1	16.0
	F_C/K_T	P_b	Watts	241	203	194	183	175	174
C	K_T	Torq. Sens.	Oz-In/Amp	4.7	8	11.4	14.5	20.8	27.4
	R_A	Arm. Resis.	Ohms	0.7	0.87	1.02	1.4	1.7	2.14
	K_V	Back E.M.F	Volts/KRPM	3.5	5.9	8.4	10.7	15.4	20.2
	F_C/K_T	P_b	Watts	189	163	154	145	138	138
D	K_T	Torq. Sens.	Oz-In/Amp	6	10.2	14.5	18.5	26.5	35
	R_A	Arm. Resis.	Ohms	1.13	1.4	1.65	2.0	2.9	3.5
	K_V	Back E.M.F	Volts/KRPM	4.4	7.5	10.7	13.7	19.6	25.9
	F_C/K_T	P_b	Watts	148	127	121	114	108	108
E	K_T	Torq. Sens.	Oz-In/Amp	7.4	12.7	18	23	33	43.5
	R_A	Arm. Resis.	Ohms	1.8	2.2	2.5	3.15	4.3	5.4
	K_V	Back E.M.F	Volts/KRPM	5.5	9.4	13.3	17.0	24.4	32.1
	F_C/K_T	P_b	Watts	120	102	97	91	87	87
F	K_T	Torq. Sens.	Oz-In/Amp	9.2	15.8	22.3	28.5	41	53.9
	R_A	Arm. Resis.	Ohms	2.8	3.4	3.9	4.8	6.6	8.3
	K_V	Back E.M.F	Volts/KRPM	6.8	11.7	16.5	21.1	30.3	39.8
	F_C/K_T	P_b	Watts	97	82	78	74	70	70
G	K_T	Torq. Sens.	Oz-In/Amp	11.5	19.6	27.8	35.5	51	67.1
	R_A	Arm. Resis.	Ohms	4.3	5.2	6.0	7.5	10.2	12.9
	K_V	Back E.M.F	Volts/KRPM	8.5	14.5	20.5	26.2	37.7	49.6
	F_C/K_T	P_b	Watts	77	66	63	59	56	56
H	K_T	Torq. Sens.	Oz-In/Amp	14.2	24.3	34.5	44	63	83.2
	R_A	Arm. Resis.	Ohms	6.84	8	9.3	11.5	15.6	19.8
	K_V	Back E.M.F	Volts/KRPM	10.5	18.0	25.5	32.5	46.6	61.5
	F_C/K_T	P_b	Watts	63	53	51	48	46	45

Note: Continuous torque specifications obtained with motor mounted to an 10" x 10" x 0.25" alum. plate at 25 C° ambient. Typical values are within ±10% of rating.

For custom designs please consult factory.

All specifications subject to change without notice.

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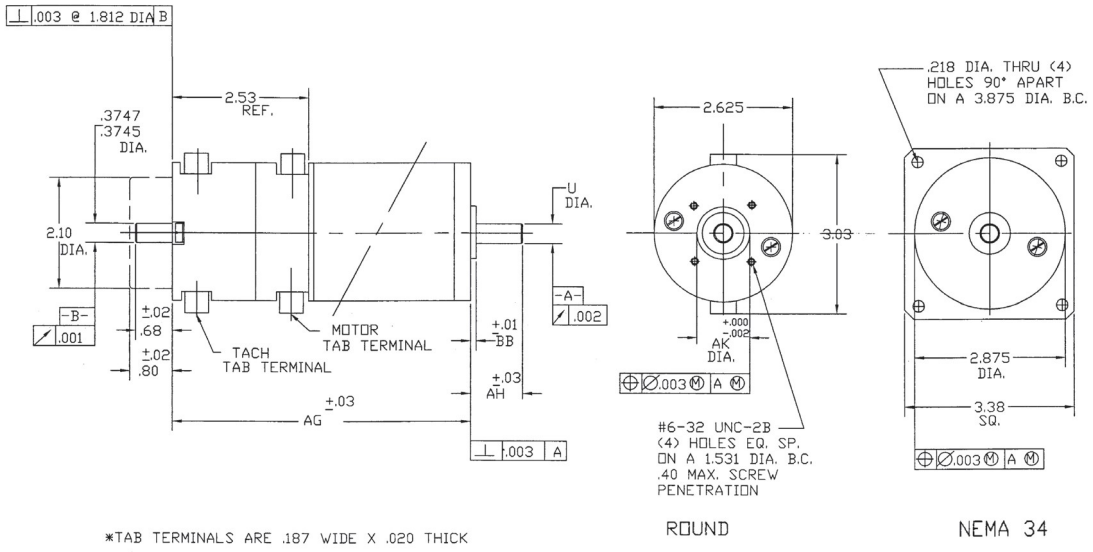
MECHANICAL SPECIFICATIONS*



*TAB TERMINALS ARE .187 WIDE X .020 THICK

ROUND

NEMA 34

DIMENSION CHART*

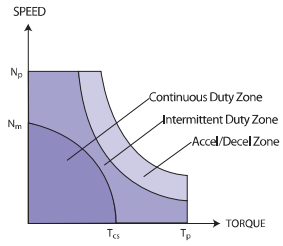
MOTOR	AG	AG	U DIA.		AH		AK	AF	BB	
	Motor Only Inches (Metric)	Motor Tach Inches (Metric)	STD	NEMA	STD	NEMA	STD	NEMA	STD	NEMA
2605	3.13 (79.50)	4.72 (119.8)	.3750/.3745	.3750/.3745	1.00	1.19	1.000	2.875	0.10	0.06
2610	3.63 (92.20)	5.22 (132.6)	.3750/.3745	.3750/.3745	1.00	1.19	1.000	2.875	0.10	0.06
2615	4.13 (104.90)	5.72 (145.3)	.3750/.3745	.3750/.3745	1.00	1.19	1.000	2.875	0.10	0.06
2620	4.63 (117.60)	6.22 (158.0)	.3750/.3745	.3750/.3745	1.00	1.19	1.000	2.875	0.10	0.06
2630	5.63 (143.01)	7.22 (183.4)	.3750/.3745	.3750/.3745	1.00	1.19	1.000	2.875	0.10	0.06
2640	6.63 (168.40)	8.22 (209.0)	.3750/.3745	.3750/.3745	1.00	1.19	1.000	2.875	0.10	0.06

METRIC (mm): DIMENSIONS ALL FRAME SIZES

SHAFT:	DIA	8j6	**MOUNTING:**	PILOT	25.0
	LENGTH	25.0		B.C.	38.89
				HOLE SIZE	M4

*All specifications are for reference only. Please consult the factory for certified dimension drawings. Standard Direction of Rotation: CCW rotation viewed from shaft end with red motor terminal positive with respect to black motor terminal.

TORQUE PERFORMANCE CURVES



NOTE: Continuous torque specifications obtained with motor mounted to an 10"x10"x.25" aluminum plate at 25 C° ambient. Typical values are within ±10% of rating.

STANDARD WINDING SPEED/TORQUE CURVE DATA FOR SIZING A SERVO MOTOR

Nm = Maximum speed, continuous operation

Np = Peak speed, acceleration/deceleration and intermittent duty

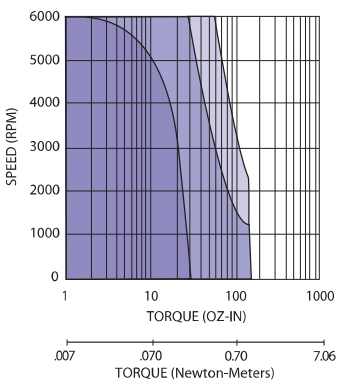
Tcs = Continuous stall torque

Tp = Peak torque

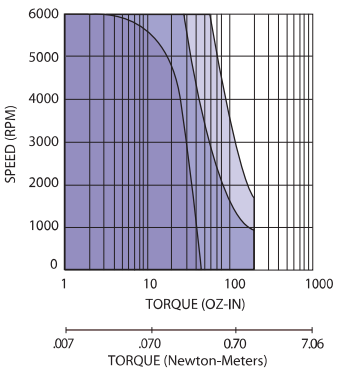
All specifications subject to change without notice.

TORQUE PERFORMANCE CURVES

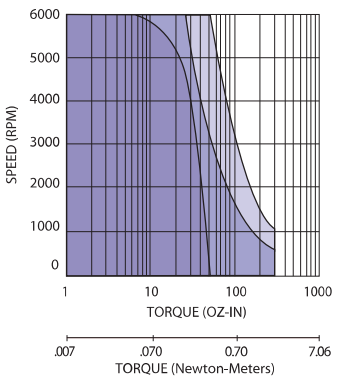
Motor MH2610 - WINDING: B



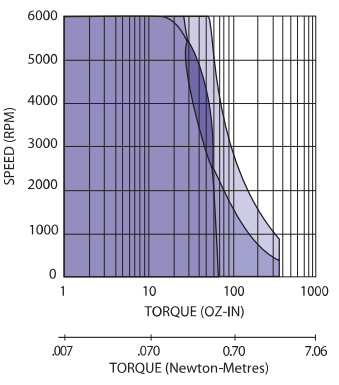
Motor MH2615 - WINDING: D



Motor MH2620 - WINDING: D



Motor MH2630 - WINDING: D



Torque Speed Curves of other windings available, consult factory.

VOLTAGE EQUATION FOR MOTORS

$$\text{Volts} = \frac{K_T \times RPM}{1{,}350} + \frac{T \times R_A}{K_T} + V_B$$

Where:

K_T = torque constant, oz.-in. per amp
T = load torque plus motor friction torque-oz.-in.
R_A = armature resistance + brush resistance
V_B = brush voltage drop = 2 volts

Note: For armature resistance at maximum temperature rating, multiply catalog value of R by 1.5

MOTOR TORQUE RATING VS. SPEED

$$T_R = .94K_T \left[\frac{\frac{130}{R_{TH}} - \frac{RPM \times T_F}{1{,}350} - \frac{RPM^2 \times F_i}{1{,}350{,}000}}{1.5\,R_A} \right]^{1/2} - T_F - \left[\frac{RPM \times F_i}{1000} \right]$$

Where:

T_R = rated torque (25°C ambient)-oz.-in.
K_T = torque sensitivity-oz.-in./amp
R_A = armature resistance
RPM = revolutions per minute
T_F = static friction torque-oz.-in.
F_i = viscous friction-oz.-in.
R_{TH} = thermal resistance

To Find: Higher Torque Rating for Intermittent Duty

$$\text{Let A} = \frac{\text{total cycle time in seconds}}{\text{thermal time constant of motors in seconds}}$$

$$\text{Let B} = \frac{\text{"on" time in seconds per cycle}}{\text{thermal time constant of motor in seconds}}$$

then with T_R = Rated torque for 100% duty
and T_{MAX} = Rated torque for intermittent duty

$$T_{MAX} = T_R \times \left[\frac{1 - e^{-A}}{1 - e^{-B}} \right]^{1/2}$$

ORDERING INFORMATION (For Standard Options)

26 XX X XX XX XX X X X X X X

SERIES
26

LAM STACK
05
10
15
20
30
40

TACH
0 = None
T = Tach

COMMUTATION/MAGNET
00 = STD

ENCODER
00 = None
M0 = Mod. Enc Prep
QC = 500
QE = 1024
QD = 1000
QG = 2000
QH = 2048
QJ = 2500
QK = 5000
SX = Special

BRAKE
00 = No Brake
B1 = 7 lb-in, 24 VDC

SEALING
0 = No sealing

TERMINATION
T = Tab terminals (std)
S = Screw terminals (optional)
W = 3 foot long leads attached to tab terminals (optional)
Y = 3 foot long leads w/cord grip (optional)

SHAFT
A = 3/8" dia. x 1" lg.
B = A plus .02" x .80" lg. flat
E = 3/8" dia. x .1.19" lg. (NEMA34)
F = E plus .02" x .80" long flat
M= Metric, 8mm dia x 25mm long
S = Special

MTG PLATE
A = 2 5/8" Round
C = 3 1/4" Square (NEMA34)
M= Metric (66.8mm Round)
S= Special

WINDINGS MOTOR
A THRU H

WINDINGS TACH
(V/KRPM)
0 = None
E = 3
F = 7
G = 15

CUSTOMIZE THE 2600 SERIES TO YOUR EXACT REQUIREMENTS

To satisfy various applications with cost-effective solutions, 2600 Series motors are readily available with a wide range of standard capabilities. Final designs are often the result of cooperative efforts between the customer's engineering department and MTI-Torque Systems. For assistance, call your local distributor or Torque Systems direct. We look forward to meeting your custom requirements.

ASK ABOUT OTHER MOTION CONTROL SOLUTIONS & CAPABILITIES FROM TORQUE SYSTEMS

- Brushless TorqueMaster® Servo Motor
- Gearboxes/Brakes
- Expert application engineering
- Complete repair & refurbishing services

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02/16 1M TS963R1-2600