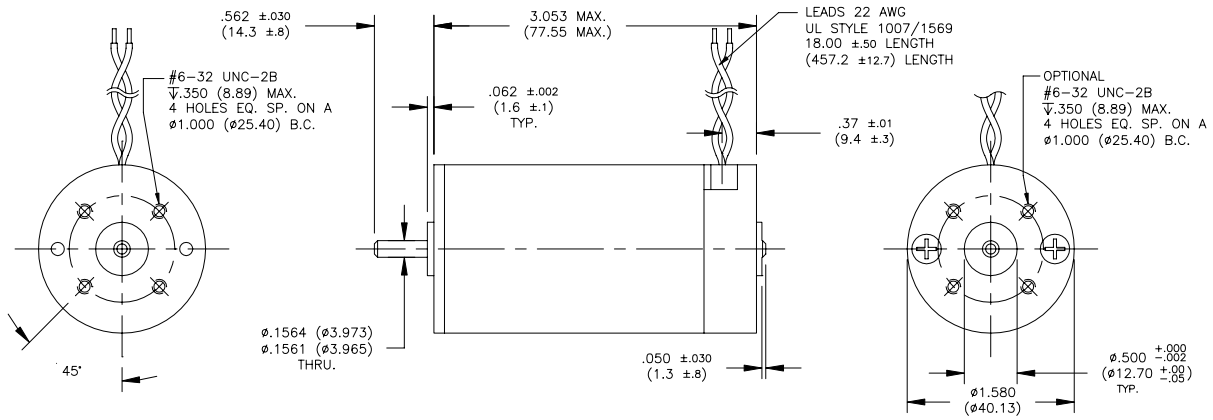
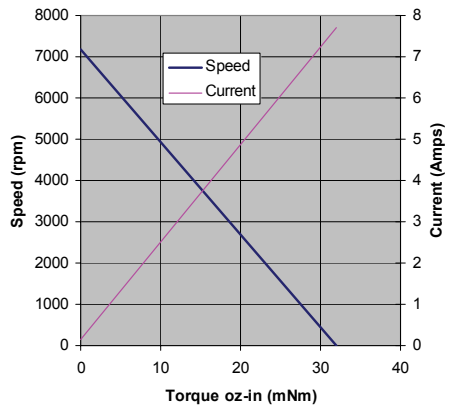
# 9236 SERIES DC SERVO MOTOR




| Motor Data | Symbol | Units | Winding Designation | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 9.55 V | 12.0 V | 15.2 V | 19.1 V | 24.0 V | 30.3 V | 38.2 V | 48.0 V |
| Supply Voltage (Reference) | $V_s$ | V | 9.55 | 12.0 | 15.2 | 19.1 | 24.0 | 30.3 | 38.2 | 48.0 |
| Continuous Torque | $T_c$ | oz-in | 9.50 | 9.50 | 9.50 | 9.50 | 9.50 | 9.50 | 9.50 | 9.50 |
| | | Nm | 0.0671 | 0.0671 | 0.0671 | 0.0671 | 0.0671 | 0.0671 | 0.0671 | 0.0671 |
| Speed @ Cont. Torque | $S_c$ | rpm | 3790 | 4080 | 4230 | 4280 | 4400 | 4420 | 4460 | 4430 |
| Current @ Cont. Torque | $I_c$ | A | 5.30 | 4.28 | 3.38 | 2.65 | 2.14 | 1.69 | 1.34 | 1.06 |
| Continuous Output Power | $P_{o,c}$ | W | 27 | 29 | 30 | 30 | 31 | 31 | 31 | 31 |
| Motor Constant | $K_M$ | oz-in/√W | 4.11 | 4.11 | 4.11 | 4.11 | 4.11 | 4.11 | 4.11 | 4.11 |
| | | Nm/√W | 0.0290 | 0.0290 | 0.0290 | 0.0290 | 0.0290 | 0.0290 | 0.0290 | 0.0290 |
| Torque Constant | $K_T$ | oz-in/A | 2.62 | 3.25 | 4.12 | 5.24 | 6.49 | 8.24 | 10.4 | 13.1 |
| | | Nm/A | 0.0185 | 0.0230 | 0.0291 | 0.0370 | 0.0458 | 0.0582 | 0.0732 | 0.0926 |
| Voltage Constant | $K_E$ | V/krpm | 1.94 | 2.40 | 3.05 | 3.88 | 4.80 | 6.09 | 7.66 | 9.69 |
| | | V s/rad | 0.0185 | 0.0230 | 0.0291 | 0.0370 | 0.0458 | 0.0582 | 0.0732 | 0.0926 |
| Terminal Resistance | $R_{mt}$ | Ω | 0.50 | 0.71 | 1.07 | 1.64 | 2.49 | 3.91 | 6.14 | 9.72 |
| Inductance | L | mH | 0.43 | 0.66 | 1.06 | 1.72 | 2.63 | 4.24 | 6.70 | 10.7 |
| No-Load Current | $I_{nl}$ | A | 0.40 | 0.33 | 0.26 | 0.20 | 0.16 | 0.13 | 0.10 | 0.080 |
| No-Load Speed | $S_{nl}$ | rpm | 4920 | 4920 | 4920 | 4920 | 4920 | 4920 | 4920 | 4920 |
| Peak Current (Stall) | $I_{pk}$ | A | 19.2 | 16.9 | 14.2 | 11.7 | 9.64 | 7.74 | 6.23 | 4.94 |
| Peak Torque (Stall) | $T_{pk}$ | oz-in | 61.8 | 61.8 | 61.8 | 61.8 | 61.8 | 61.8 | 61.8 | 61.8 |
| | | Nm | 0.436 | 0.436 | 0.436 | 0.436 | 0.436 | 0.436 | 0.436 | 0.436 |
| Coulomb Friction Torque | $T_f$ | oz-in | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| | | Nm | 0.0056 | 0.0056 | 0.0056 | 0.0056 | 0.0056 | 0.0056 | 0.0056 | 0.0056 |
| Viscous Damping Factor | D | oz-in/krpm | 0.0525 | 0.0525 | 0.0525 | 0.0525 | 0.0525 | 0.0525 | 0.0525 | 0.0525 |
| | | Nm s/rad | $3.5x10^{-6}$ | $3.5x10^{-6}$ | $3.5x10^{-6}$ | $3.5x10^{-6}$ | $3.5x10^{-6}$ | $3.5x10^{-6}$ | $3.5x10^{-6}$ | $3.5x10^{-6}$ |
| Electrical Time Constant | $\tau_e$ | ms | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| Mechanical Time Constant | $\tau_m$ | ms | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 |
| Thermal Time Constant | $\tau_{th}$ | min | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| Thermal Resistance | $R_{th}$ | °C/W | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Max. Winding Temperature | $\theta_{max}$ | °C | 155 | 155 | 155 | 155 | 155 | 155 | 155 | 155 |
| Rotor Inertia | $J_r$ | oz-in-sec$^2$ | $1.0x10^{-3}$ | $1.0x10^{-3}$ | $1.0x10^{-3}$ | $1.0x10^{-3}$ | $1.0x10^{-3}$ | $1.0x10^{-3}$ | $1.0x10^{-3}$ | $1.0x10^{-3}$ |
| | | kg m$^2$ | $7.1x10^{-6}$ | $7.1x10^{-6}$ | $7.1x10^{-6}$ | $7.1x10^{-6}$ | $7.1x10^{-6}$ | $7.1x10^{-6}$ | $7.1x10^{-6}$ | $7.1x10^{-6}$ |
| Motor Weight (Mass) | $w_M$ | oz | 13.8 | 13.8 | 13.8 | 13.8 | 13.8 | 13.8 | 13.8 | 13.8 |
| | | g | 391 | 391 | 391 | 391 | 391 | 391 | 391 | 391 |

## Performance (24 V Winding)




## Standard Features

- Sintered Bronze Bearings
- 2-pole Stator
- Ceramic Magnets
- 7-slot Armature
- Heavy-gauge Steel Housing
- Silicon Steel Laminations
- Copper-graphite Brushes
- Diamond-Turned Commutator

## Complementary Products

- G42A Planetary Gearbox
- G42B Planetary Gearbox
- G51A Spur Gearbox
- E22A Optical Encoder
- E30A Optical Encoder
- E30B Optical Encoder
- E35A Optical Encoder

Notes:

[1] All values specified at 25°C ambient temperature and without heat sink.

[2] Peak values are theoretical and supplied for reference only.



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