thin gap

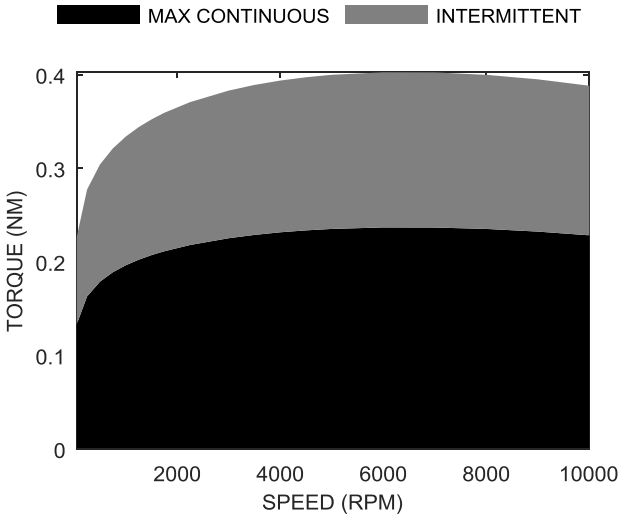
INNOVATION IN MOTORS™

# TG305X

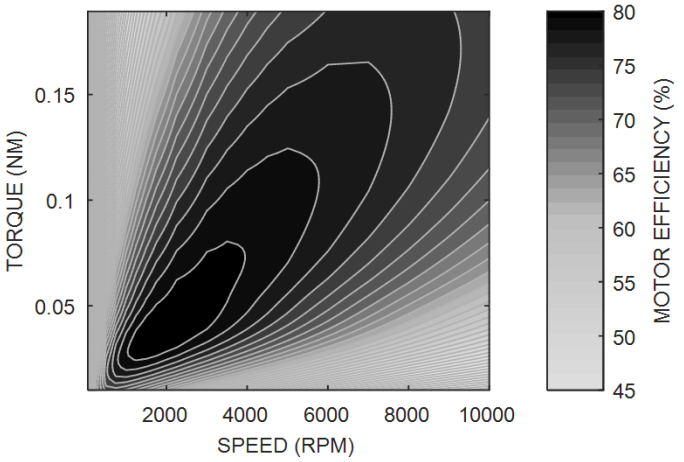
## BRUSHLESS PERMANENT MAGNET MACHINE

| PERFORMANCE | | |
|---|---|---|
| Max continuous torque | Nm | 0.21 |
| Max permissible speed | RPM | 17900 |
| Max continuous shaft power | W | 151 |
| Max efficiency | % | 82% |
| Max stator temperature | C | 100 |
| Peak Torque - 1s (3s) | Nm | 0.62 (0.37) |

## REGION OF OPERATION




## EFFICIENCY MAP




| MODEL SPECIFICATIONS | | TG3050 | TG3051 | TG3052 | TG3053 | SYM |
|---|---|---|---|---|---|---|
| Winding configuration | | Series Y | Series Δ | Parallel Y | Parallel Δ | |
| Max continuous current | Arms | 3.1 | 4.6 | 6.2 | 9.2 | I |
| Voltage constant | Vpkl-l/(rad/s) | 0.060 | 0.035 | 0.030 | 0.017 | Ke |
| Voltage constant | Vpkl-l/kRPM | 6.3 | 3.7 | 3.2 | 1.8 | Ke |
| Torque constant | Nm/Arms | 0.074 | 0.049 | 0.037 | 0.025 | Kt |
| Motor Constant | Nm/√W | 0.042 | 0.042 | 0.042 | 0.042 | Km |
| Terminal resistance | Ω | 2.027 | 0.676 | 0.507 | 0.169 | R |
| Terminal inductance | µH | 34.8 | 11.6 | 8.7 | 2.9 | L |
| Motor drive voltage | Vbus | (RPM*Kv*π/30+Torque/Kt*R)*1.2 | | | | |
| Generator terminal voltage | Vrms | (RPM*Kv*π/30-Torque/Kt*R)/Sqrt(2) | | | | |

## NOTES

- All ThinGap machines can operate as a motor or generator
- When operated as a motor best performance is obtained with high frequency sinusoidal drives
- 70µH per phase of external inductance is recommended when operated with conventional drives
- Consult ThinGap engineering for drive compatibility and applications engineering

## MODEL NUMBER

TG30 X X - X010 EXAMPLE: TG3052 - P010

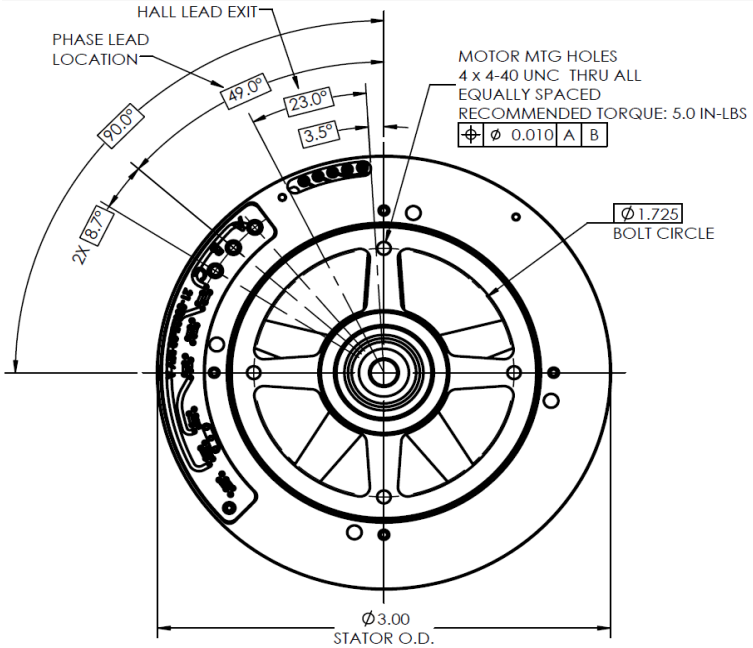
Machine series
Rotor configuration
Winding configuration
Mounting option (M-Framed, P-Frameless Part Set)

# TG305X

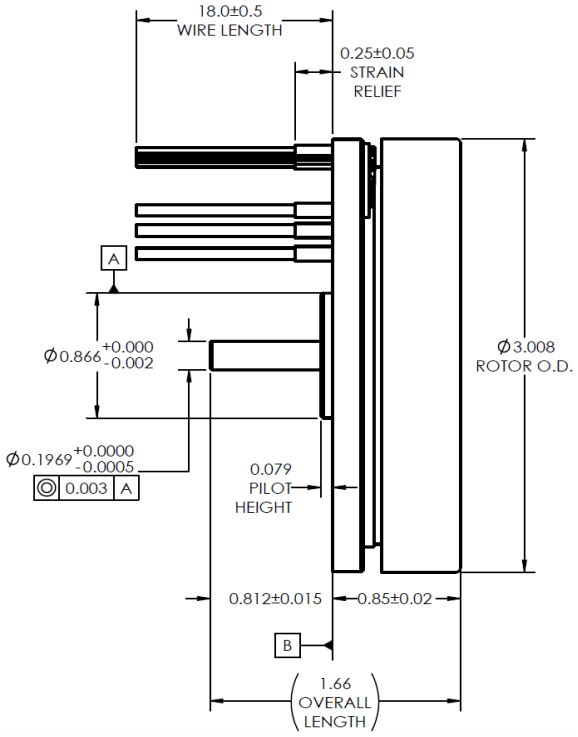
## BRUSHLESS PERMANENT MAGNET MACHINE

| MECHANICAL SPECIFICATIONS | | |
|---|---|---|
| Max outer diameter | in (mm) | 3.008 (76) |
| Through hole diameter | in (mm) | 2.404 (61) |
| Total axial height | in (mm) | 0.647 (16) |
| Rotor mass | lbs (g) | 0.201 (91) |
| Stator mass | lbs (g) | 0.139 (63) |
| Partset mass (rotor & stator) | lbs (g) | 0.34 (154) |
| Total motor assembly mass | lbs (g) | 0.46 (210) |
| Rotor Inertia | lbm-ft$^2$ (kg-m$^2$) | 2.56E-3 (1.08E-4) |

**MACHINE ASSEMBLY DRAWING**




**M1 MOUNT**




| Hall Sensor Lead Identification | | | TG305X Phase Lead Identification | | | Motor Excitation (Trapezoidal Commutation) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead # | Color | Description | Lead # | Color | Description | Phase | Excitation Step | | | | | | |
| | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 1 |
| 1 | YEL | V+ | 1 | GRN | PHASE A | A | + | | – | – | | + | + |
| 2 | GRY | COM - | | | | | | | | | | | |
| 3 | BRN | HALL 1 | 2 | BLK | PHASE B | B | | + | + | | – | – | |
| 4 | ORN | HALL 2 | | | | | | | | | | | |
| 5 | BLU | HALL 3 | 3 | RED | PHASE C | C | – | – | | + | + | | – |