

TG714X

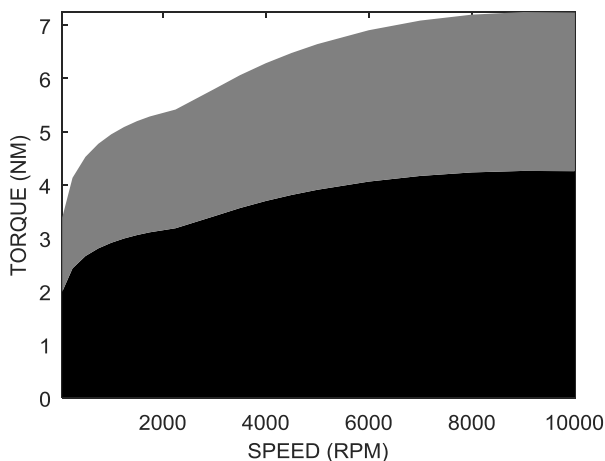
BRUSHLESS PERMANENT MAGNET MACHINE

PERFORMANCE

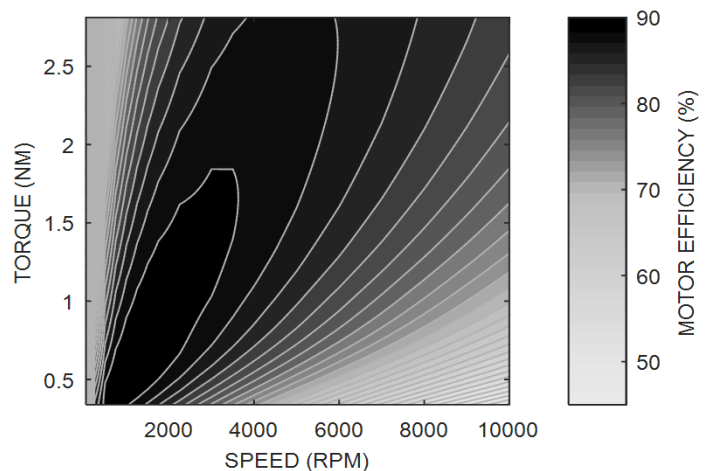
| | | |
|----------------------------|-----|--------------|
| Max continuous torque | Nm | 4.26 |
| Max permissible speed | RPM | 10800 |
| Max continuous shaft power | kW | 3.57 |
| Max efficiency | % | 91% |
| Max stator temperature | C | 120 |
| Peak Torque - 1s (3s) | Nm | 17.47 (10.5) |

REGION OF OPERATION

MAX CONTINUOUS
 INTERMITTENT



EFFICIENCY MAP



MODEL SPECIFICATIONS

| | | TG7140 | TG7141 | TG7142 | TG7143 | SYM |
|----------------------------|--------------|-----------------------------------|----------|------------|------------|-----|
| Winding configuration | | Series Y | Series Δ | Parallel Y | Parallel Δ | I |
| Max continuous current | Arms | 24.2 | 36.2 | 48.3 | 72.5 | I |
| Voltage constant | Vpkl/(rad/s) | 0.160 | 0.092 | 0.080 | 0.046 | Ke |
| Voltage constant | Vpkl-/kRPM | 16.8 | 9.7 | 8.4 | 4.8 | Ke |
| Torque constant | Nm/Arms | 0.196 | 0.131 | 0.098 | 0.065 | Kt |
| Motor Constant | Nm/√W | 0.330 | 0.330 | 0.330 | 0.330 | Km |
| Terminal resistance | Ω | 0.236 | 0.079 | 0.059 | 0.020 | R |
| Terminal inductance | μH | 20.5 | 6.8 | 5.1 | 1.7 | 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 and can be purchased with or without frame
- 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 <40kHz drives
- Contact ThinGap for drive compatibility and applications engineering

MODEL NUMBER

| | TG71 | X | X | - X010 | EXAMPLE: TG7142 - P010 |
|--|------|---|---|--------|------------------------|
| Machine series | ↑ | | | | |
| Rotor configuration | | ↑ | | | |
| Winding configuration | | | ↑ | | |
| Mounting option (M-Framed, P-Frameless Part Set) | | | | ↑ | |

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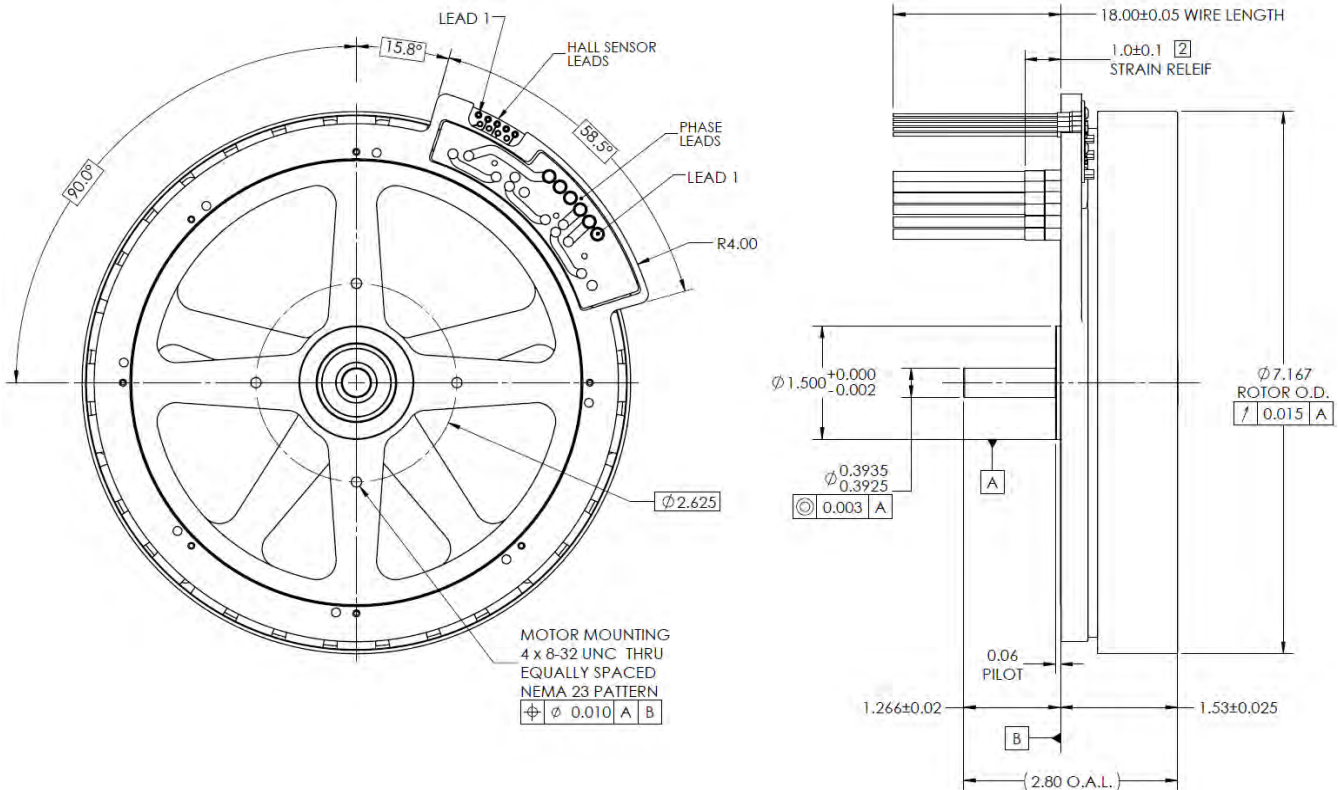
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MECHANICAL SPECIFICATIONS

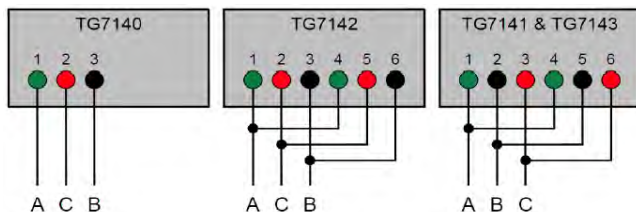
| | | |
|-------------------------------|--|-------------------|
| Max outer diameter | in (mm) | 7.169 (182) |
| Through hole diameter | in (mm) | 6.341 (161) |
| Total axial height | in (mm) | 1.539 (39) |
| Rotor mass | lbs (kg) | 1.159 (0.526) |
| Stator mass | lbs (kg) | 0.504 (0.228) |
| Partset mass (rotor & stator) | lbs (kg) | 1.663 (0.754) |
| Total motor assembly mass | lbs (kg) | 2.8 (1.27) |
| Rotor Inertia | lbm-ft ² (kg-m ²) | 9.41E-2 (3.97E-3) |

MACHINE ASSEMBLY DRAWING

SHOWN WITH M010 MOUNTING OPTION



POWER CONNECTION



MOTOR EXCITATION

Hall Sensor Lead Identification

| PHASE | EXCITATION STEP | | | | | | Lead # | Color | Description |
|-------|-----------------|---|---|---|---|---|--------|-------|-------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | | | |
| A | + | - | - | - | + | + | 1 | YEL | V+ |
| B | - | + | + | - | - | - | 2 | GRY | COM - |
| C | - | - | + | + | - | - | 3 | BRN | HALL A |
| | | | | | | | 4 | BLU | HALL B |
| | | | | | | | 5 | ORN | HALL C |