

ZERO COGGING | HIGHLY EFFICIENT ARCHITECTURE | OPTIMIZED ROTOR INERTIA SPACE HERITAGE | LIGHTWEIGHT COMPOSITE STATOR | SCALABLE SIZE AND POWER

Data Sheet Model Number:

TGR 79-26

ThinGap's TGR Series includes numerous high performance brushless permanent magnet motors. The TGR Series targets reaction wheel applications where a high efficiency, weight optimized solution with dynamic response capabilities is desired.



Motor Parameter Table

Continuous Torque @ Max Speed N-m 0.664 0.114 Max Continuous Speed RPM 16000 16000 Max Continuous Speed RPM 16000 16000 Max Continuous Power W 1112 192 Required Motor Voltage @ Max Speed V _{pkH} 74.1 70.0 Max Continuous Phase Current @ Max Speed A _{RMS} 13.4 2.3 Peak Parameters@Max Speed Units Atmosphere Vacuum Peak Parameters@Max Speed N-m 1.85 1.74 Peak Phase Current (1 sec) A _{RMS} 37.5 35.1 Peak Phase Current (3 sec)* N-m 1.20 1.01 Peak Power (3 sec)* W 3100 2915 Peak Power (3 sec)* W 3100 1692 Motor Constants Units Common Value Voltage Constant (I-I) V _{pkH} /rad/s 0.041 Voltage Constant (I-I) V _{pkH} /rad/s 0.041 Voltage Constant (I-I) V _{pkH} /rad/s 0.050 Motor Resistance @ 20°C	Motor Parameter Table			
Max Continuous Speed RPM 16000 16000 Max Continuous Power W 1112 192 Required Motor Voltage @ Max Speed V _{pil-1} 74.1 70.0 Max Continuous Phase Current @ Max Speed V _{pil-1} 74.1 70.0 Max Continuous Phase Current @ Max Speed A _{RMS} 13.4 2.3 Peak Parameters@Max Speed Units Atmosphere Vacuum Peak Prower (1 sec)* N-m 1.85 1.74 Peak Phase Current (1 sec) A _{RMS} 37.5 35.1 Peak Power (1 sec)* N-m 1.20 1.01 Peak Power (3 sec)* N-m 1.20 1.01 Peak Phase Current (3 sec) A _{RMS} 24.2 20.3 Peak Power (3 sec)* W 3100 1692 Motor Constant Units Common Value Voltage Constant (I-I) V _{pis.} /rad/s 0.041 V _{pis.} /rad/s 0.041 Voltage Constant (I-I) V _{pis.} /rad/s 0.041 V _{pis.} /rad/s 0.041 Voltage Constant (I-I)	Continuous Parameters	Units	Atmosphere	Vacuum
Max Continuous Power W 1112 192 Required Motor Voltage @ Max Speed V _{pl64} 74.1 70.0 Max Continuous Phase Current @ Max Speed A _{RMS} 13.4 2.3 Peak Parameters@Max Speed Units Atmosphere Vacuum Peak Torque (1 sec)* N-m 1.85 1.74 Peak Phase Current (1 sec) A _{RMS} 37.5 35.1 Peak Power (1 sec)* N-m 1.20 1.01 Peak Power (3 sec)* N-m 1.20 1.01 Peak Phase Current (3 sec) A _{RMS} 24.2 20.3 Peak Power (3 sec)* W 3100 2915 Peak Power (3 sec)* W 3100 1692 Motor Constant Units Common Value Voltage Constant (I-I) V _{pl64} /rad/s 0.041 Voltage Constant (I-I) V _{pl64} /rad/s 0.050 Motor Constant N-m/VA 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Q 0.450 <th>Continuous Torque @ Max Speed</th> <th>N-m</th> <th>0.664</th> <th>0.114</th>	Continuous Torque @ Max Speed	N-m	0.664	0.114
Required Motor Voltage @ Max Speed V _{pM-1} 74.1 70.0 Max Continuous Phase Current @ Max Speed A _{RMS} 13.4 2.3 Peak Parameters@Max Speed Units Atmosphere Vacuum Peak Torque (1 sec)* N-m 1.85 1.74 Peak Phase Current (2 sec) A _{RMS} 37.5 35.1 Peak Power (1 sec)* W 3100 2915 Peak Power (3 sec)* N-m 1.20 1.01 Peak Phase Current (3 sec) A _{RMS} 24.2 20.3 Peak Power (3 sec)* W 3100 1692 Motor Constants Units Common Value Voltage Constant (I-I) V _{pM-I} /rad/s 0.041 Voltage Constant (I-I) V _{pM-I} /rad/s 0.050 Motor Constant N-m/A _{RMS} 0.050 Motor Constant N-m/A _{RMS} 0.050 Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance µH 12.4 ± 20% Number of Mag	Max Continuous Speed	RPM	16000	16000
Max Continuous Phase Current @ Max Speed A _{RMS} 13.4 2.3 Peak Parameters@Max Speed Units Atmosphere Vacuum Peak Torque (1 sec)* N-m 1.85 1.74 Peak Phase Current (1 sec) A _{RMS} 37.5 35.1 Peak Power (1 sec)* W 3100 2915 Peak Power (3 sec)* N-m 1.20 1.01 Peak Power (3 sec)* W 3100 1692 Motor Constants Units Common Value Voltage Constant (I-I) V _{Pbt-I} /rad/s 0.041 Voltage Constant (I-I) V _{Pbt-I} /rad/s 0.050 Motor Constant N-m/A _{RMS} 0.050 Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.350 Inductance µH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz Common Value Motor Incritia Mg-m² 2.34E-04 Outer Diameter mm 55	Max Continuous Power	W	1112	192
Max Continuous Phase Current @ Max Speed A _{RMS} 13.4 2.3 Peak Parameters@Max Speed Units Atmosphere Vacuum Peak Torque (1 sec)* N-m 1.85 1.74 Peak Phase Current (1 sec) A _{RMS} 37.5 35.1 Peak Power (1 sec)* W 3100 2915 Peak Power (3 sec)* N-m 1.20 1.01 Peak Power (3 sec)* W 3100 1692 Motor Constants Units Common Value Voltage Constant (I-I) V _{Pbt-I} /rad/s 0.041 Voltage Constant (I-I) V _{Pbt-I} /rad/s 0.050 Motor Constant N-m/A _{RMS} 0.050 Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.350 Inductance µH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz Common Value Motor Incritia Mg-m² 2.34E-04 Outer Diameter mm 55	Required Motor Voltage @ Max Speed	V_{pkl-l}	74.1	70.0
Peak Torque (1 sec)* N-m 1.85 1.74 Peak Phase Current (1 sec) A _{RMS} 37.5 35.1 Peak Power (1 sec)* W 3100 2915 Peak Torque (3 sec)* N-m 1.20 1.01 Peak Phase Current (3 sec) A _{RMS} 24.2 20.3 Peak Power (3 sec)* W 3100 1692 Motor Constants Units Common Value Voltage Constant (I-I) V _{pk1} /rad/s 0.041 Voltage Constant (I-I) V _{pk2} //RPPM 4.300 Torque Constant N-m/A _{RMS} 0.050 Motor Rosistance @ 20°C Ω 0.321 Motor Resistance @ 40°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance µH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diamet	Max Continuous Phase Current @ Max Speed		13.4	2.3
Peak Phase Current (1 sec) A _{RMS} 37.5 35.1 Peak Power (1 sec)* W 3100 2915 Peak Torque (3 sec)* N-m 1.20 1.01 Peak Phase Current (3 sec) A _{RMS} 24.2 20.3 Peak Power (3 sec)* W 3100 1692 Motor Constants Units Common Value Voltage Constant (I-I) V _{pk-I} /rad/s 0.041 Voltage Constant (I-I) V _{pk-I} /kRPM 4.300 Torque Constant N-m/A _{RMS} 0.050 Motor Constant N-m/VW 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance µH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter	Peak Parameters@Max Speed	Units	Atmosphere	Vacuum
Peak Power (1 sec)* W 3100 2915 Peak Torque (3 sec)* N-m 1.20 1.01 Peak Phase Current (3 sec) ARMS 24.2 20.3 Peak Power (3 sec)* W 3100 1692 Motor Constants Units Common Value Voltage Constant (I-I) Vpkii/real/s 0.041 Voltage Constant (I-I) Vpkii/real/s 0.050 Motor Constant N-m/ARMS 0.050 Motor Constant N-m/VW 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance µH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 26.3	Peak Torque (1 sec)*	N-m	1.85	1.74
Peak Torque (3 sec)* N-m 1.20 1.01 Peak Phase Current (3 sec) A _{RMS} 24.2 20.3 Peak Power (3 sec)* W 3100 1692 Motor Constants Units Common Value Voltage Constant (I-I) V _{pki-I} /rad/s 0.041 Voltage Constant (I-I) V _{pki-I} /rad/s 0.050 Motor Constant N-m/A _{RMS} 0.050 Motor Constant N-m/VW 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance µH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 26.3 Axial Height mm 26.3	Peak Phase Current (1 sec)	A _{RMS}	37.5	35.1
Peak Phase Current (3 sec) A _{RMS} 24.2 20.3 Peak Power (3 sec)* W 3100 1692 Motor Constants Units Common Value Voltage Constant (I-I) V _{pkt-I} /kRPM 4.300 Vorque Constant N-m/A _{RMS} 0.050 Motor Constant N-m/A _{RMS} 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance µH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.255 Part Set Mass Units	Peak Power (1 sec)*	W	3100	2915
Peak Power (3 sec)* W 3100 1692 Motor Constants Units Common Value Voltage Constant (I-I) V _{pkt-I} /rad/s 0.041 Voltage Constant (I-I) V _{pkt-I} /kRPM 4.300 Torque Constant N-m/A _{RMS} 0.050 Motor Constant N-m/VW 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance µH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass Vnits Common Value	Peak Torque (3 sec)*	N-m	1.20	1.01
Motor Constants Units Common Value Voltage Constant (I-I) V _{pk1-I} /rad/s 0.041 Voltage Constant (I-I) V _{pk1-I} /kRPM 4.300 Torque Constant N-m/A _{RMS} 0.050 Motor Constant N-m/VW 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance μH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130 <th>Peak Phase Current (3 sec)</th> <th>A_{RMS}</th> <th>24.2</th> <th>20.3</th>	Peak Phase Current (3 sec)	A _{RMS}	24.2	20.3
Voltage Constant (I-I) V _{pkl-I} /rad/s 0.041 Voltage Constant (I-I) V _{pkl-I} /kRPM 4.300 Torque Constant N-m/A _{RMS} 0.050 Motor Constant N-m/VW 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance μH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Peak Power (3 sec)*	W	3100	1692
Voltage Constant (I-I) V _{pkl-I} /kRPM 4.300 Torque Constant N-m/A _{RMS} 0.050 Motor Constant N-m/VW 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance μH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.259 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Motor Constants	Units	Common Value	
Torque Constant N-m/A _{RMS} 0.050 Motor Constant N-m/VW 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance µH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.259 Temperature Parameters Units Common Value Common Value 150 150 150 150 150 150 150 15	Voltage Constant (I-I)	V _{pkl-I} /rad/s	0.041	
Motor Constant N-m/VW 0.073 Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance μH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Voltage Constant (I-I)	V _{pkl-I} /kRPM	4.300	
Electrical Parameters Units Common Value Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance μH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Torque Constant	N-m/A _{RMS}	0.050	
Motor Resistance @ 20°C Ω 0.321 Motor Resistance @ Max Temperature Ω 0.450 Inductance μH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Motor Constant	N-m/√W	0.073	
Motor Resistance @ Max Temperature Ω 0.450 Inductance μH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Electrical Parameters	Units	Common Value	
Inductance μH 12.4 ± 20% Number of Magnetic Poles ea 12 Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Motor Resistance @ 20°C	Ω	0.321	
Number of Magnetic Poles Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.259 Temperature Parameters Units Common Value 130	Motor Resistance @ Max Temperature	Ω	0.450	
Electrical Frequency @ Max Speed Hz 1600 Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Inductance	μН	12.4 ± 20%	
Mechanical Parameters Units Common Value Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Number of Magnetic Poles	ea	12	
Rotor Inertia kg-m² 2.34E-04 Outer Diameter mm 79 Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Electrical Frequency @ Max Speed	Hz	1600	
Outer Diametermm79Through Hole Diametermm55Axial Heightmm26.3Rotor Masskg0.204Stator Masskg0.055Part Set Masskg0.259Temperature ParametersUnitsCommon ValueMax Stator Temperature°C130	Mechanical Parameters	Units	Common Value	
Through Hole Diameter mm 55 Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Rotor Inertia	kg-m ²	2.34E-04	
Axial Height mm 26.3 Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Outer Diameter	mm	79	
Rotor Mass kg 0.204 Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Through Hole Diameter	mm	55	
Stator Mass kg 0.055 Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Axial Height	mm	26.3	
Part Set Mass kg 0.259 Temperature Parameters Units Common Value Max Stator Temperature °C 130	Rotor Mass	kg	0.204	
Temperature Parameters Units Common Value Max Stator Temperature °C 130	Stator Mass	kg	0.055	
Max Stator Temperature °C 130	Part Set Mass	kg	0.259	
	Temperature Parameters	Units	Common Value	
Max Rotor Temperature °C 85	Max Stator Temperature	°C	130	
	Max Rotor Temperature	°C	85	

ThinGap's TGR Line of Brushless motor kits designed for use in reaction wheel applications; both in atmosphere and vacuum. These motor kits are available in sizes ranging from 29mm to 79 mm

Derated Specifications for Vacuum

Continuous torque of up to 0.114 N-m and a rated speed of up to 16000 RPM.

Motor Controller Recommendation

3-Phase Controller

High Frequency PWM power input



^{*} Current value takes into account temperature losses during operation.