thin gap | TGR SERIES MOTOR KIT

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.

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 t0 79 mm

Motor Parameter Table

Continuous Parameters	Units	Atmosphere	Vacuum
Continuous Torque @ Max Speed	N-m	0.664	0.114
Max Continuous Speed	RPM	16000	16000
Max Continuous Power	W	1112	192
Required Motor Voltage @ Max Speed	V_{pkl-l}	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)*	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 (l-l)	V_{pkl-l}/rad/s	0.041	
Voltage Constant (l-l)	V_{pkl-l}/kRPM	4.300	
Torque Constant	N-m/A_{RMS}	0.050	
Motor Constant	N-m/√W	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-m^2	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	
Max Rotor Temperature	°C	85	

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.

thin gap