



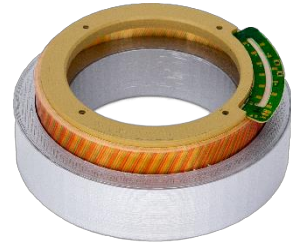
# thin gap | TGR SERIES MOTOR KIT

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

## Data Sheet Model Number:

**TGR 29-12**

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 Parameters	Units	Atmosphere	Vacuum
Continuous Torque @ Max Speed	N-m	0.0135	0.0028
Max Continuous Speed	RPM	16000	16000
Max Continuous Power	W	22.69	4.67
Required Motor Voltage @ Max Speed	$V_{pk-l}$	9.9	8.2
Max Continuous Phase Current @ Max Speed	$A_{RMS}$	2.51	0.59
Peak Parameters@Max Speed	Units	Atmosphere	Vacuum
Peak Torque (1 sec)*	N-m	0.036	0.034
Peak Phase Current (1 sec)	$A_{RMS}$	6.6	6.1
Peak Power (1 sec)*	W	23	21
Peak Torque (3 sec)*	N-m	0.024	0.019
Peak Phase Current (3 sec)	$A_{RMS}$	4.3	3.6
Peak Power (3 sec)*	W	14	12
Motor Constants	Units	Common Value	
Voltage Constant (I-I)	$V_{pk-l}/rad/s$	0.0046	
Voltage Constant (I-I)	$V_{pk-l}/kRPM$	0.4790	
Torque Constant	$N-m/A_{RMS}$	0.0056	
Motor Constant	$N-m/\sqrt{W}$	0.0054	
Electrical Parameters	Units	Common Value	
Motor Resistance @ 20°C	$\Omega$	0.726	
Motor Resistance @ Max Temperature	$\Omega$	1.019	
Inductance	$\mu H$	7.13 $\pm$ 20%	
Number of Magnetic Poles	ea	6	
Electrical Frequency @ Max Speed	Hz	300	
Mechanical Parameters	Units	Common Value	
Rotor Inertia	$kg-m^2$	3.27E-06	
Outer Diameter	mm	29	
Through Hole Diameter	mm	9	
Axial Height	mm	12.4	
Rotor Mass	kg	0.028	
Stator Mass	kg	0.004	
Part Set Mass	kg	0.031	
Temperature Parameters	Units	Common Value	
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 0.0028 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.

