



## LS SERIES FRAMELESS MOTOR KIT

HIGH TORQUE-TO-WEIGHT RATIO | LIGHT-WEIGHT AND LOW-INERTIA | HIGHLY EFFICIENT  
RING ARCHITECTURE | ZERO COGGING FOR PRECISION MOVEMENT | SCALABLE IN SIZE AND POWER

### Data Sheet Model Number:

### LSI 130-23

ThinGap's LS Line includes numerous high performance brushless permanent magnet motors. The LS line targets lower speed, high precision applications such as gimbals, optics, and precision robotics. The highest torque density with high power capability and low thermal resistance.



ThinGap's LS Line of Brushless Motors  
For low speed, high precision applications such as gimbals, optics, and precision robotics. Highest torque density with high power capability.  
Available in sizes 25mm to 267mm.

#### Winding Independent Parameter Table

Continuous Parameters	Units	Value
Continuous Torque @ Max Speed	N-m	2.25
Max Continuous Speed	RPM	1,530
Max Continuous Power	W	360
Peak Parameters @ Max Speed	Units	Value
Peak Torque (1 sec)	N-m	12.1
Peak Power (1 sec)	W	1,939
Peak Torque (3 sec)	N-m	7.3
Peak Power (3 sec)	W	1,170
Mechanical Parameters	Units	Value
Number of Magnetic Poles	ea	26
Outer Diameter	mm	130
Through Hole Diameter	mm	95
Axial Height	mm	23
Rotor Inertia	kg-m <sup>2</sup>	1.52E-03
Rotor Mass	kg	0.528
Stator Mass	kg	0.309
Part Set Mass	kg	0.837
Temperature Parameters	Units	Value
Max Stator Temperature	°C	130
Max Rotor Temperature	°C	85
Thermal Resistance	°C/W	2.006

#### Torque and Mechanical Speed

Continuous rated torque of up to 2.25 N-m and a rated speed of up to 1530 RPM.

#### Motor Controller Recommendation

Standard 3-Phase Controller  
High Frequency PWM power input

#### Resources for Integration

Space-claim CAD files at:  
[www.thingap.com](http://www.thingap.com)

Complete Mechanical drawings available upon request

#### Winding dependent Parameter Table

		WYE SERIES	WYE PARALLEL*	DELTA PARALLEL*
Electrical Parameters	Units	Value	Value	Value
Required Motor Voltage @ Max Speed	V <sub>pkl-l</sub>	80.9	40.5	23.4
Max Continuous Phase Current	A <sub>RMS</sub>	4.4	8.8	15.2
Peak Phase Current (1 sec)	A <sub>RMS</sub>	22.0	44.0	76.2
Peak Phase Current (3 sec)	A <sub>RMS</sub>	13.2	26.4	45.7
Motor Resistance @ 20°C	Ω	1.35	0.34	0.11
Motor Resistance @ Max Temperature	Ω	1.89	0.47	0.16
Terminal Inductance	μH	46.9 ± 20%	11.7 ± 20%	3.9 ± 20%
Electrical Frequency @ Max Speed	Hz	332	332	332
Motor Constants	Units	Value	Value	Value
Voltage Constant (l-l)	V <sub>pkl-l</sub> /rad/s	0.460	0.230	0.133
Voltage Constant (l-l)	V <sub>pkl-l</sub> /kRPM	48.2	24.1	13.9
Torque Constant	N-m/A <sub>RMS</sub>	0.563	0.282	0.163
Motor Constant	N-m/√W	0.396	0.396	0.396

\*WYE Parallel and Delta Parallel winding option not available off-the-shelf; may be ordered as a special configuration.