



thin gap

LS SERIES DIRECT DRIVE ASSEMBLY

PERFECT FOR APPLICATIONS IN PHOTONICS, SEMICONDUCTOR, METROLOGY, MEDICAL IMAGING, AND SURGERY WHERE LARGE THROUGH HOLE AND SMOOTH OPERATION IS PARAMOUNT.

Data Sheet Model Number:

H-LSI 75-12

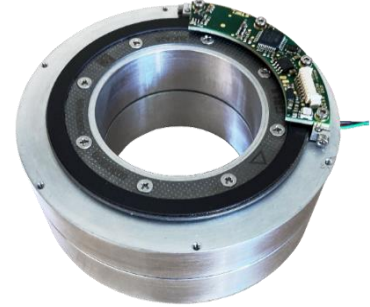
ThinGap's H-LSI 75-12 Direct Drive Motor Assembly is a Technology Demonstrator featuring its LS series of slotless motors. This model is intended to make sure that the time and cost of engineering a direct drive assembly is not lost on program managers and developers who value an already available, fully-engineered solution.

Motor Parameter Table

Continuous Parameters	Units	Value
Continuous Torque @ Max Speed	N-m	0.32
Max Continuous Speed	RPM	2500
Max Continuous Power	W	85.3
Required Motor Voltage @ Max Speed	V_{pk-l}	55
Max Continuous Phase Current @ Max Speed	A_{RMS}	1.55
Peak Parameters@Max Speed	Units	Value
Peak Torque (1 sec)*	N-m	1.36
Peak Phase Current (1 sec)	A_{RMS}	6.49
Peak Power (1 sec)*	W	357
Motor Constants	Units	Value
Voltage Constant (I-I)	$V_{pk-l}/rad/s$	0.171
Voltage Constant (I-I)	$V_{pk-l}/kRPM$	17.9
Torque Constant	$N-m/A_{RMS}$	0.209
Motor Constant	$N-m/\sqrt{W}$	0.072
Electrical Parameters	Units	Value
Terminal Resistance @ 20°C	Ω	5.877
Terminal Resistance @ Max Temperature	Ω	7.951
Terminal Inductance	μH	147 \pm 20%
Number of Magnetic Poles	ea	26
Electrical Frequency @ Max Speed	Hz	542
Mechanical Parameters	Units	Value
Rotor Inertia	$kg-m^2$	1.380E-04
Outer Diameter	mm	99
Through Hole Diameter	mm	50.8
Axial Height	mm	49.6
Part Set Mass	kg	0.720
Temperature Parameters	Units	Value
Max Stator Temperature	°C	130
Max Rotor Temperature	°C	85
Thermal Resistance	°C/W	3.84

All torque values should be considered nominal and are calculated based off of the additional heat being pulled from the stator by the housing.

All motor parameters calculated assuming 20° C ambient temperature.



ThinGap's Direct Drive Motor. 75mm high-performance cogless motor, a precision bearing set, and a 20-bit absolute encoder in a turnkey housed assembly.

Torque and Mechanical Speed:

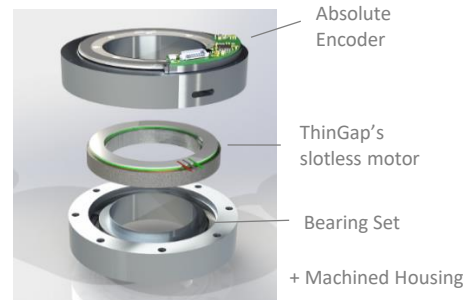
Continuous rated torque of up to 0.324 N-m and rated speed of up to 2500 RPM.

Motor Controller Recommendation:

Standard 3-Phase Controller
High frequency PWM recommended
Contact ThinGap for Recommendations

Custom Variants Available Upon Request:

Alternative winding design options
Higher speed options
High temperature option
Two Phase Winding





Motor Data Sheet Model Number: H-LSI 75-12

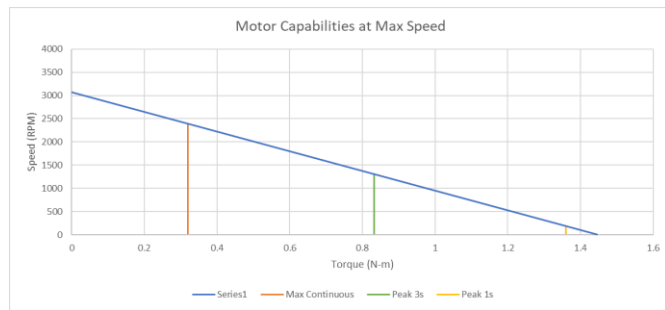
ThinGap technology incorporates the latest electro-magnetic components where torque limits, both continuous and peak, are determined by available cooling. The charts presented develop these limits based on natural convection from the lamination stack surface with forced convection on the coil surface due to rotation of the rotor. Mounting of the laminations stack to a heat sink will further improve maximum continuous torque capacity. Contact ThinGap for application-specific requirements.

ThinGap's frameless motor part set allows it to be completely integrated resulting in the highest ratio of torque-to-volume. In this configuration, the motor's rotor and stator can be housed within the customer's assembly utilizing a common shaft and bearing system, resulting in increased coupling efficiencies, smaller system size and lower weight. **Note:** stator and rotor assembly requires tooling due the high magnetic strength of ThinGap's rotor designs.

Similar Frame Sizes Available:

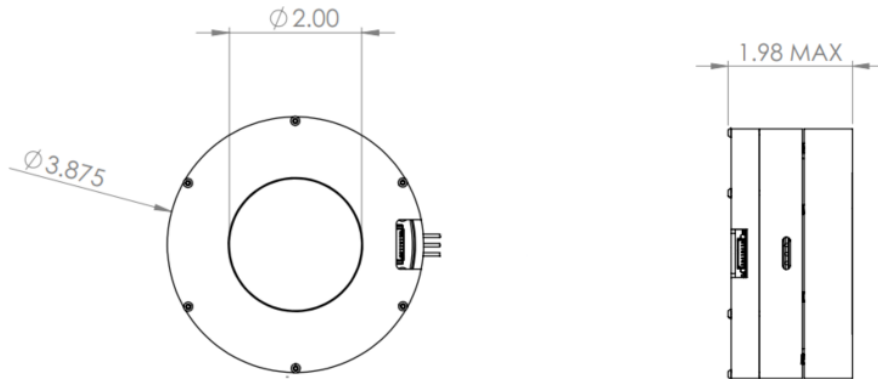
Motor Model (mm)	Continuous Torque (N-m)
LSI 51-13	0.14
LSI 51-25	0.35
LSI 59-13	0.18
LSI 59-22	0.38
LSI 75-20	0.66
LSI 75-30	1.04
LSI 105-33	1.9
LSI 130-23	2.25
LSI 130-40	4.24

(Custom sizes also available.)



Example of Typical Use Speed-Torque Curve
Higher speeds possible and is dependent on the applied voltage. Top speed may be limited mechanically. Please consult factory if higher speeds are required.

H-LSI 75-12 Mechanical Information



General Mechanical Specifications
All values should be considered nominal. Please consult factory for up-to-date mechanical drawing and ICD.

ThinGap is a leading designer and producer of US-made standard and custom motors and generators. In addition to the LS Line (presented above) for lower speed, high precision applications, the TG Line offers the highest power density motor design with high torque and inherent high-speed capability in sizes 25mm to 1 meter, and powers from mW to MW. ThinGap also develops custom and application-specific motors, such as carbon fiber-based designs and large clean output starter generators. ThinGap's high performance, zero cogging motors and generators are widely used in aerospace propulsion, hybrid power, space, medical and high-end industrial applications.

