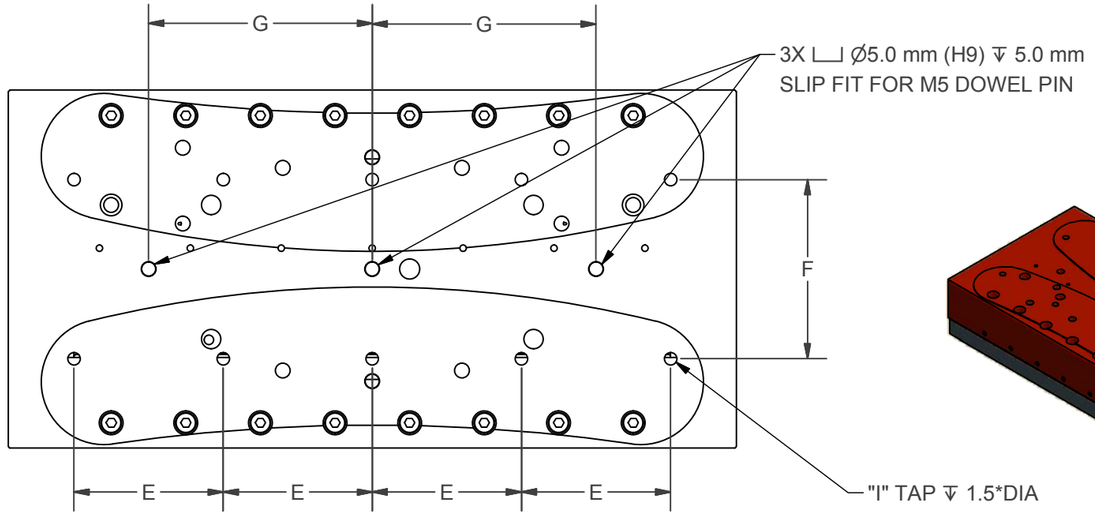
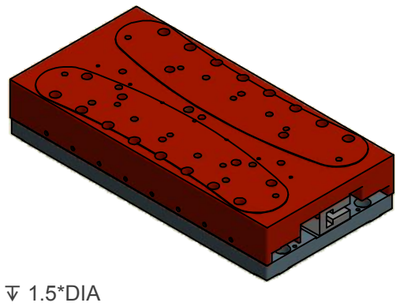
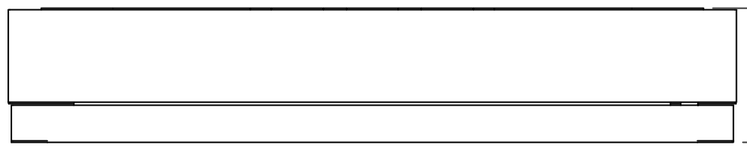
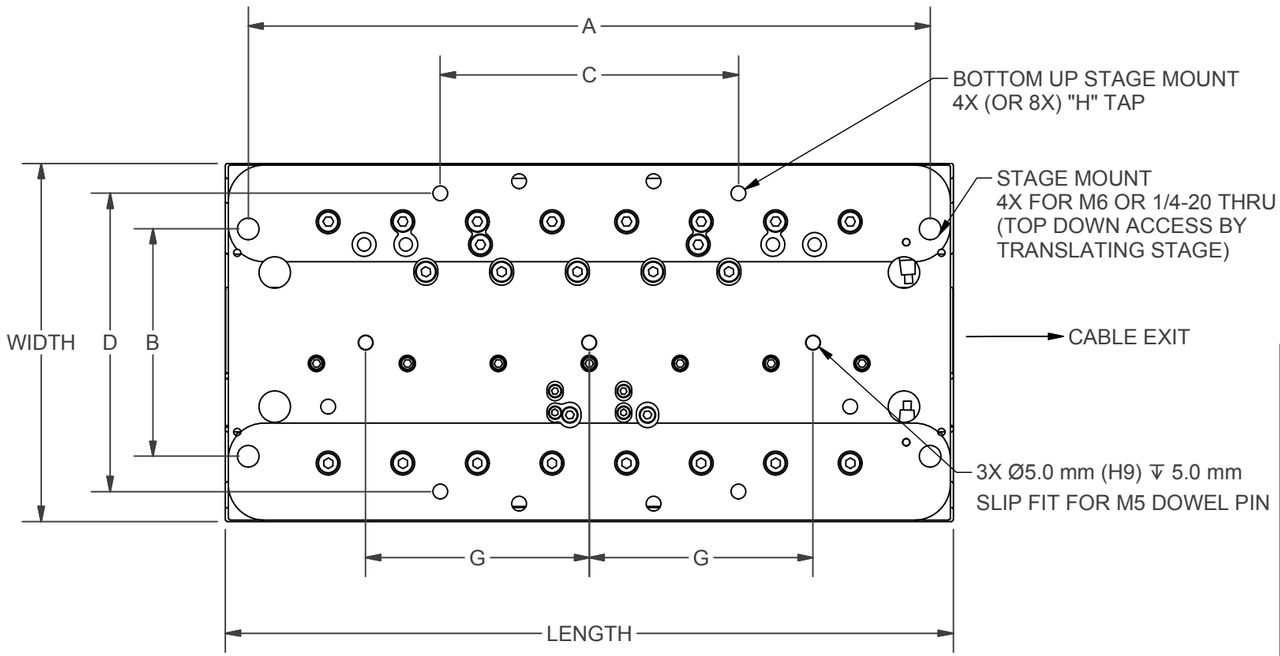








NOTE:MODEL AI-LM-10000 SHOWN.

STANDARD FEATURES	
Stage	Linear Stage
Travel	60mm to 300mm
Motor	Direct Drive Ironless Core Linear Motor
Feedback	Non-Contact Incremental Optical Linear Encoder Optional: Non-Contact Absolute Optical Linear Encoder
Scale	20um Pitch Gold Tape Scale Optional: 20um Pitch Near Zero CTE ZeroMet Scale Optional: Absolute Stainless Steel or Near Zero CTE ZeroMet Scale
Resolution	1Vp-p Sin-Cos Analog Output (~4.88nm with 4096 Interpolation) Digital AQB options available between 1nm and 5um (reduced speeds may apply) Absolute options available between 1nm and 100nm
Sensors	Integrated Optical Latching Home Index and End-of-Travel Magnetic NPN Limits
Bearings	High Precision Crossed Roller Bearings
Cables	High Flex, 10M Cycle, 3m Length from Component (Standard) (some length consumed inside stage), ~5mm OD, 20mm Dynamic Bend Radius (Motor and Encoder)
Hard Stops	Integrated End-of-Travel Hard Stops
Orientation	Horizontal Only; Can be Mounted on Horizontal or Vertical Surface; Inverted Ok
Structure	Black Anodized Aluminum 6061-T6
Maintenance	Stages are Grease for Life in Normal Environment; No Maintenance
Environment	Standard Optional: Clean Room or Vacuum (10^-6 Torr)
Temperature	Operating: 0°C to 50°C (precision not guaranteed throughout entire range) Stoarge/Transport: -20°C to 70°C
Humidity	10% to 80% Non-Condensing
Precision	6-D Nano Precision ™ Test Methods

TRAVEL	LENGTH	WIDTH	HEIGHT	A (inch)	B (inch)	C	D	E	F	G	H	I
60	168	120	40	6	3	100	100	50	60	60	M6 (4X)	M5 (6X)
100	244	120	45	9	3	100	100	50	60	75	M6 (4X)	M5 (8X)
150	275	120	45	10	3	100	100	50	60	75	M6 (4X)	M5 (10X)
200	340	154	46	13	3	80	100	50	75	100	M6 (8X)	M6 (10X)
250	404	154	55	13	3	80	100	50	75	100	M6 (8X)	M6 (10X)
300	506	178	55	15	3	100	100	50	75	100	M6 (8X)	M6 (14X)

* All units millimeters unless otherwise noted.
* All hole patterns centered on M5 dowel pin hole at center of stage.
* Custom and intermediate sizes available.
* Compact sized with minimal performance impact available
* All dimensions and visual representations reflect stage at mid-stroke or home position.

ALIO INDUSTRIES PROPRIETARY DOCUMENT
5335 XENON ST, ARVADA, CO 80002 USA
(Tel) 303.339.7500 - WWW.ALIOINDUSTRIES.COM

DRAWN QWOLF 2021-02-01
CHECKED
Tolerances: x.x ± 0.5 mm, x.xx ± 0.13 mm, x.xxx ± 0.05 mm, ANGLES ± 0.5°
Surface Roughness: RMS MAX.
MATERIAL
FINISH SEE NOTES

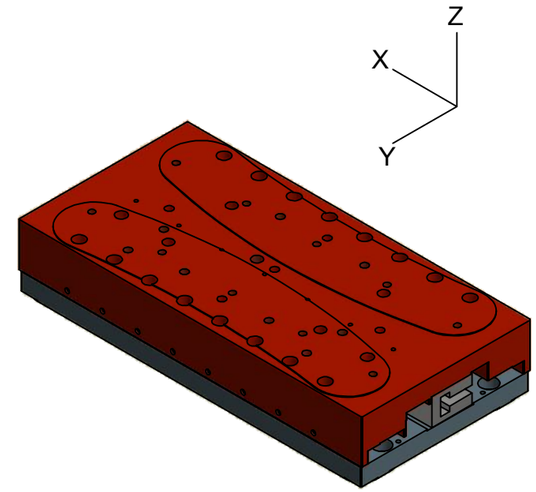
ALIO 6-D

TITLE
AI-LM-(TRAVEL)00

SIZE B | DWG NO 0010-08002 | REV 006
SCALE | 0090-07999-016 ALIO STD TEMPLATE | SHEET 1 OF 2

ALIO STAGE AND MOTOR SPECIFICATIONS

MODEL	UNITS	AI-LM-6000			AI-LM-10000			AI-LM-15000			AI-LM-20000			AI-LM-25000			AI-LM-30000		
NOMINAL TRAVEL FROM HOME INDEX	mm	+/- 30			+/- 50			+/- 75			+/- 100			+ /-125			+/- 150		
MAGNETIC LIMIT LOCATIONS (+1/-3mm)	mm	+/- 29			+/- 51			+/- 75			+/- 101			+/- 126			+/- 151		
HARD STOP LOCATIONS (+/- 1mm)	mm	+/- 32			+/- 53			+/- 77			+/- 103			+/- 128			+/- 153		
PERFORMANCE SPECIFICATIONS [1]		(STD)	ULTRA	NANO	(STD)	ULTRA	NANO	(STD)	ULTRA	NANO	(STD)	ULTRA	NANO	(STD)	ULTRA	NANO	(STD)	ULTRA	NANO
LINEAR DISPLACEMENT ACCURACY	um	+/- 3.0	+/- 0.5	+/- 0.2	+/- 3.0	+/- 0.7	+/- 0.3	+/- 3.0	+/- 0.7	+/- 0.4	+/- 3.0	+/- 1.0	+/- 0.4	+/- 5.0	+/- 1.0	+/- 0.5	+/- 5.0	+/- 1.0	+/- 0.6
BIDIRECTIONAL LINEAR REPEATABILITY	nanometers	+/- 30																	
HOME INDEX BIDIRECTIONAL REPEATABILITY		< +/- 1 encoder count																	
RESOLUTION	nanometers	Standard: ~4.88nm after 4096 Interpolation (Digital AQB options available between 1nm and 5um) (Absolute options available between 1nm and 100nm)																	
STRAIGHTNESS IN Y	um	+/- 2.5	+/- 1.5	+/- 1.0	+/- 2.5	+/- 1.5	+/- 1.0	+/- 2.5	+/- 1.5	+/- 1.2	+/- 3.0	+/- 2.0	+/- 1.5	+/- 4.0	+/- 3.0	+/- 2.0	+/- 6.0	+/- 4.5	+/- 3.0
STRAIGHTNESS IN Z [2]	um	+/- 2.0	+/- 1.0		+/- 2.0	+/- 1.0		+/- 3.0	+/- 1.5		+/- 3.0	+/- 1.5		+/- 5.0	+/- 2.0		+/- 5.0	+/- 2.0	
PITCH ABOUT Y [2]	arc-sec	+/- 10.0			+/- 10.0			+/- 15.0			+/- 15.0			+/- 18.0			+/- 18.0		
PITCH ABOUT Z	arc-sec	+/- 10.0			+/- 10.0			+/- 15.0			+/- 15.0			+/- 18.0			+/- 18.0		
PITCH ABOUT X	arc-sec	+/- 6.0			+/- 6.0			+/- 8.0			+/- 8.0			+/- 10.0			+/- 10.0		
MOTION PROFILE SPECIFICATIONS																			
MAX VELOCITY [3]	m/s	1.2			1.8			2.1			2.4			2.5			2.4		
MAX ACCELERATION [3]	G	5.0			7.0			6.0			6.0			5.0			4.0		
MAX PAYLOAD CAPABILITY	kg	20			25			25			30			40			50		
ASSEMBLY MASS	kg	2.2			4.0			4.4			7.8			9.4			15.2		
MOVING MASS	kg	1.4			2.4			2.7			4.7			5.5			9.0		
MOTOR INFORMATION																			
MOTOR TYPE	--	LINEAR BRUSHLESS SERVO MOTOR																	
MOTOR MODEL	--	AI-LM-144ASN-D			AI-LM-144BSN-D			AI-LM-144BSN-D			AI-LM-256BSN-D			AI-LM-256BSN-D			AI-LM-256CSN-D		
MAGNETIC PITCH (N-N)	mm	30.48																	
MAX VOLTAGE (LINE TO LINE) [4]	V	500																	
ELECTRICAL TIME CONSTANT	msec	0.22			0.22			0.22			0.20			0.20			0.20		
MAX MOTOR TEMP	°C	125			125			125			130			130			130		
MOTOR THERMISOTR (options available)		NEGATIVE COEFFICIENT THERMISTOR: GE TYPE AL03006-5818-97-K, MATERIAL: GE9.7A																	
MOTOR CONNECTION	--	DELTA																	
MOTOR CONSTANT	N/sqrt(W)	2.96			4.18			4.18			7.04			7.04			8.62		
FORCE CONSTANT	N/Apk	8.4			16.8			16.8			28.7			28.7			43.0		
PHASE RESISTANCE (@ 25°C) [5]	Ohm	5.79			11.60			11.60			11.74			11.74			17.60		
PHASE RESISTANCE (@ MAX°C) [5]	Ohm	8.04			16.07			16.07			16.59			16.59			24.89		
INDUCTANCE @ 1kHz	mH	1.3			2.5			2.5			2.3			2.3			3.5		
CONTINUOUS FORCE [6]	N	26.70			53.3			43.3			93.1			93.1			139.7		
CONTINUOUS CURRENT [6]	Apk	3.18			3.18			3.18			3.25			3.25			3.25		
PEAK FORCE [7]	N	84			169			169			295			295			442		
PEAK CURRENT [7]	Apk	10.06			10.06			10.06			10.27			10.27			10.27		
BACK EMF CONSTANT	V/m/s	8.40			16.8			16.8			28.7			28.7			43.0		



Notes:

1. Specifications measured on stage centerline at nominal 20°C, ~50mm above mounting surface with no payload.
   Standard describes typical values, Ultra and Nano are guaranteed. ALIO provides NIST traceable proof for all options/specs per quote.
2. Flatness and Pitch specifications dependent on system base. Contact ALIO for more information.
3. Axis limitation at no load. Based on 100% S-curve profile. Does not account for limitations due to amplifier, resolution, position error, or duty cycle.
4. Back EMF plus IR drop must not exceed maximum line to line bus voltage.
5. Resistance values do not include cable resistance. Cable resistance adds 0.146 ohm/m.
6. Continuous operating limits are based on continuous operation at maximum temperature with aluminum heat sink (300mm x 12.5mm x motor length).
7. Maximum on time at peak operating limits is 10 seconds.
8. All electrical specifications may vary by 12% from listed values.
9. Additional motor and travel options are available for each stage for optimized performance as necessary per customer requirements.

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DRAWN QWOLF 2021-02-01
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Surface Roughness: RMS MAX.
MATERIAL
FINISH SEE NOTES

ALIO 6-D

TITLE
AI-LM-(TRAVEL)00

SIZE		DWG NO	REV
B		0010-08002	006

SCALE | 0090-07999-016 ALIO STD TEMPLATE | SHEET 2 OF 2