

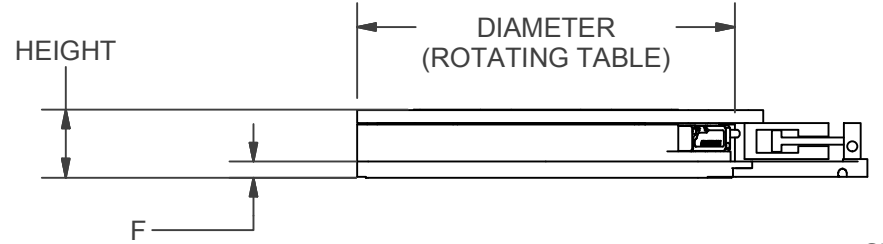
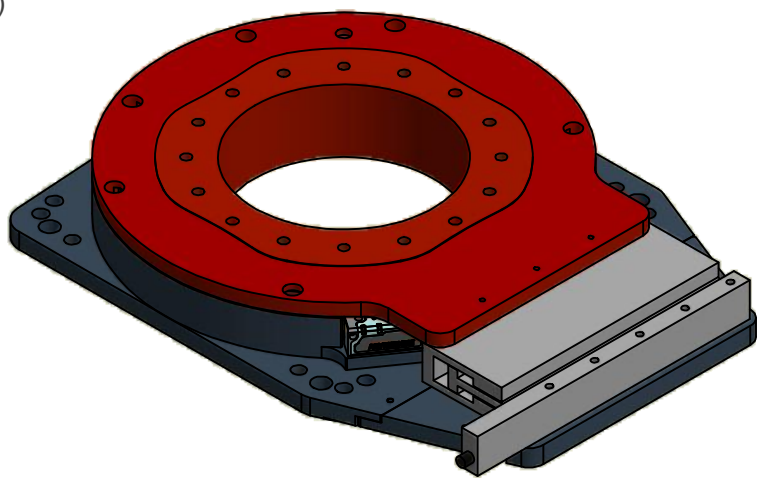
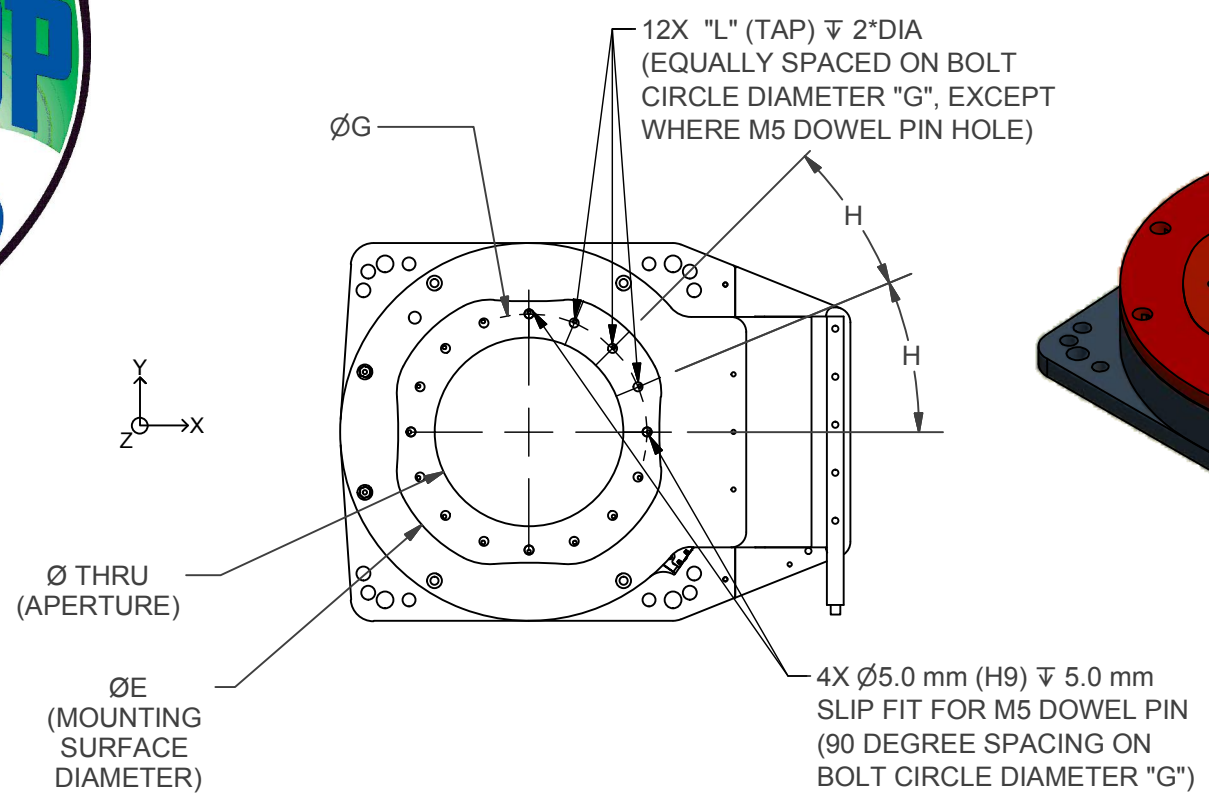
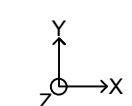


4 | 3 | 2 | 1

B

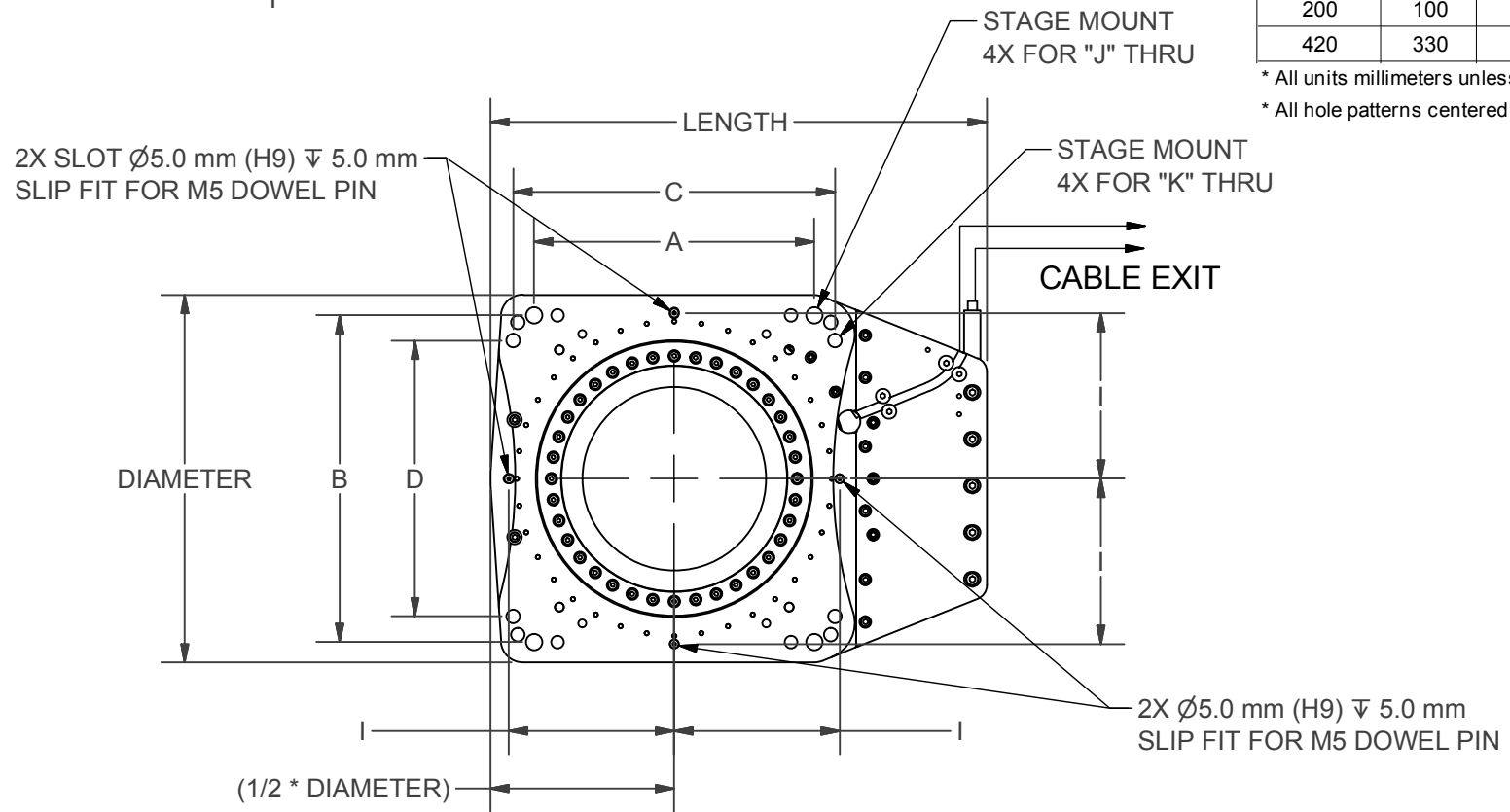
A

A



DIAMETER	THRU	HEIGHT	LENGTH	A (inch)	B (inch)	C	D	E	F	G	H (degrees)	I	J	K	L
200	100	36	270	6	7	175	150	150	8.5	125	22.5	90	M8 or 5/16-18	M6 or 1/4-20	M6
420	330	40	490	12	13	325	325	362.5	8.5	345	22.5	205	M6 or 1/4-20	M6 or 1/4-20	M6

* All units millimeters unless otherwise noted.
* All hole patterns centered on thru hole at center of stage diameter.



STANDARD FEATURES	
Stage	Rotary Stage
Travel	~ +/- 5 degrees
Motor	Tangential Direct Drive Ironless Core Linear Motor
Feedback	Non-Contact Incremental Optical Rotary Encoder Optional: Non-Contact Absolute Optical Rotary Encoder
Scale	20um Pitch Gold Tape Scale Optional: Absolute Stainless Steel Scale
Resolution	1Vp-p Sin-Cos Analog Output Digital AQB and Absolute options available
Sensors	Integrated Optical Latching Home Index and End of Travel Magnetic NPN Limits
Bearings	High Precision Angular Contact (Duplex Pair)
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
Oreintation	Horizontal or Vertical or Inverted
Structure	Black Anodized Aluminum 6061-T6
Environment	Standard Optional: Clean Room and Vacuum (10^{-6} Torr)
Temperature	Operating: 0°C to 50°C (performance not guaranteed throughout entire range) Storage/Transport: -20°C to 70°C
Humidity	10% to 80% Non-Condensing
Precision	6-D Nano Precision™ Test Methods

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



DRAWN	QWOLF	2020-12-18
CHECKED		
Tolerances:	Surface Roughness:	
x.x ± 0.5 mm	RMS MAX.	
x.xx ± 0.13 mm		
x.xxx ± 0.05 mm		
ANGLES ± 0.5°		
MATERIAL		
FINISH	SEE NOTES	

TITLE		
AI-LM-(DIAMETER)RA		
SIZE	DWG NO	REV
B	0010-08038	005
SCALE	0090-07999-016 ALIO STD TEMPLATE	SHEET 1 OF 2

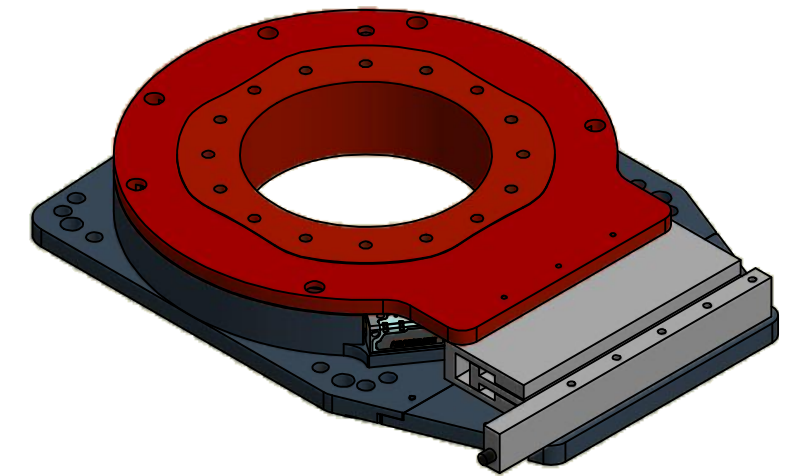
NOTE: MODEL AI-LM-200RA SHOWN

4 | 3 | 2 | 1



ALIO STAGE AND MOTOR SPECIFICATIONS

MODEL	UNITS	AI-LM-200RA			AI-LM-420RA		
NOMINAL TRAVEL FROM HOME INDEX	deg	+/- 7.5			+/- 5		
MAGNETIC LIMIT LOCATIONS (+1deg/-3deg)	deg	+/- 3			+/- 5.2		
HARD STOP LOCATIONS (+/- 1deg)	deg	+/- 8.4			+/- 7		
PERFORMANCE SPECIFICATIONS [1]		(STD)	ULTRA	NANO	(STD)	ULTRA	NANO
ANGULAR ACCURACY	arc-sec	N/A	+/- 1.0		N/A	+/- 1.0	
BIDIRECTIONAL ANGULAR REPEATABILITY	arc-sec	+/- 0.5	+/- 0.4	+/- 0.2	+/- 0.4	+/- 0.3	+/- 0.2
RESOLUTION (ANALOG - STANDARD)	arc-sec	0.01 arc-sec			0.005 arc-sec		
RESOLUTION (DIGITAL - OPTIONAL) [2]	arc-sec	0.003 - 10.0 arc-sec			0.002 - 5.0 arc-sec		
ENCODER SCALE LINES PER DEGREE	lines/deg	82.2055 lines/deg			177.7618 lines/deg		
AXIAL RUNOUT	um	+/- 2.0	N/A		+/- 1.5	N/A	
RADIAL RUNOUT	um	+/- 2.0	N/A		+/- 1.5	N/A	
WOBBLE	arc-sec	+/- 4.0	N/A		+/- 2.5	N/A	
MOTION PROFILE SPECIFICATIONS							
MAX VELOCITY [3]	deg/sec	1500			900		
MAX ACCELERATION [3]	deg/sec^2	2000000			800000		
ASSEMBLY MASS	kg	4.0			8.7		
MAX LOAD (AXIAL)	kg	40			40		
MAX LOAD (RADIAL)	kg	20			20		
MOVING MASS	kg	2.6			4.0		
ROTATING MASS MOMENT OF INERTIA	kg*mm^2	20000			143000		
MOTOR INFORMATION							
MOTOR TYPE	--	LINEAR BRUSHLESS SERVO MOTOR			LINEAR BRUSHLESS SERVO MOTOR		
MOTOR MODEL	--	AI-LM-144BSN-D-C			AI-LM-144BSN-D-C		
MAGNETIC PITCH (N-N)	deg	12.164			6.785		
MAX VOLTAGE (LINE TO LINE) [4]	VDC	500			500		
ELECTRICAL TIME CONSTANT	msec	0.22			0.22		
MAX MOTOR TEMP	°C	125			125		
MOTOR THERMISTOR (options available)	--	NEGATIVE COEFFICIENT THERMISTOR: GE TYPE AL03006-5818-97-K, MATERIAL: GE9.7A					
MOTOR CONNECTION	--	DELTA			DELTA		
MOTOR CONSTANT	Nm/sqrt(W)	0.46			1.00		
TORQUE CONSTANT	Nm/Apk	1.59			3.46		
PHASE RESISTANCE (@ 25°C) [5]	Ohm	11.60			11.60		
PHASE RESISTANCE (@ 130°C) [5]	Ohm	16.07			16.07		
INDUCTANCE @ 1kHz	mH	2.5			2.5		
CONTINUOUS TORQUE [6]	Nm	5.0			10.8		
CONTINUOUS CURRENT [6]	Arms	3.18			3.18		
PEAK TORQUE [7]	Nm	16.0			34.8		
PEAK CURRENT [7]	Arms	10.06			10.06		
BACK EMF CONSTANT	Vrms/krpm	241			437		



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- Notes:
- Specifications measured on stage centerline at nominal 20°C, ~30mm above mounting surface with no payload. Standard describes typical values. Nano and Ultra are guaranteed. ALIO provides NIST traceable proof for all options/spec per quote.
 - Reduced speeds may apply. Absolute options also available.
 - Stage limitation at no load. Does not account for limitations due to amplifier, resolution, position error, or duty cycle.
 - Back EMF plus IR drop must not exceed maximum line to line bus voltage.
 - Resistance values do not include cable resistance. Cable resistance adds 0.146 ohm/m.
 - Continuous operating limits are based on continuous operation at maximum temperature with aluminum heat sink (300mm x 12.5mm x motor length).
 - Maximum on time at peak operating limits is 10 seconds.
 - All electrical specifications may vary by 12% from listed values.

DRAWN	QWOLF	2020-12-18			
CHECKED					
			TITLE		
Tolerances: x.x ± 0.5 mm x.xx ± 0.13 mm x.xxx ± 0.05 mm ANGLES ± 0.5° MATERIAL			AI-LM-(DIAMETER)RA		
FINISH SEE NOTES			SIZE	DWG NO	REV
			B	0010-08038	005
SCALE			0090-07999-016 ALIO STD TEMPLATE SHEET 2 OF 2		