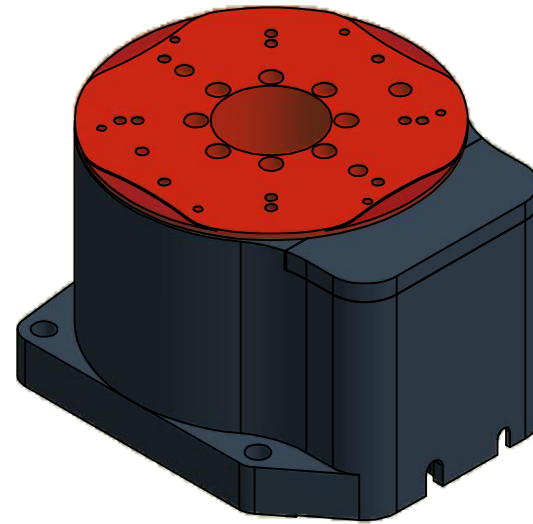
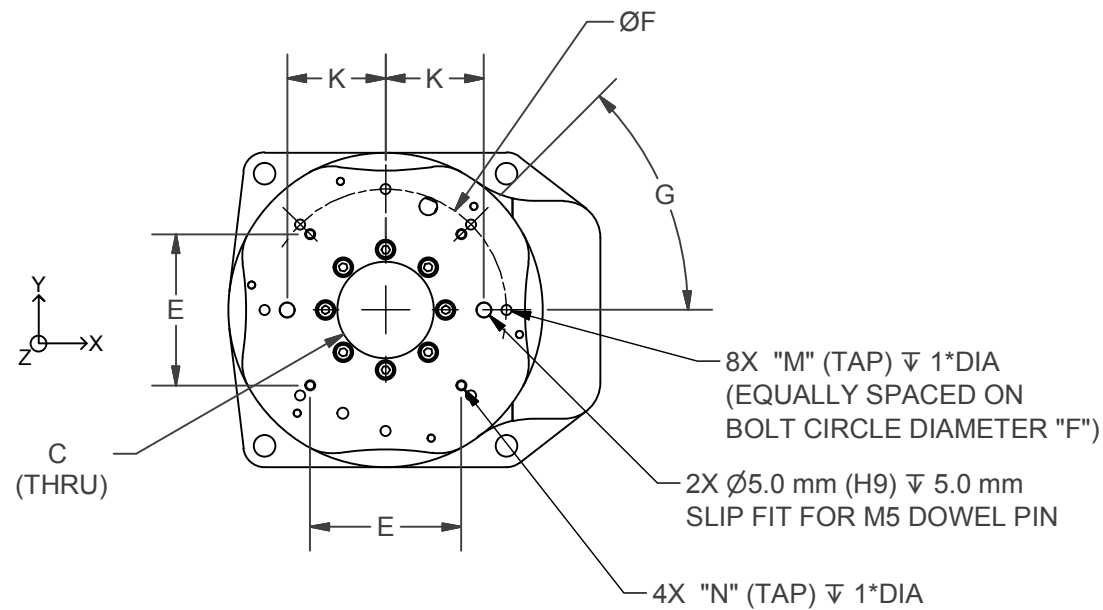
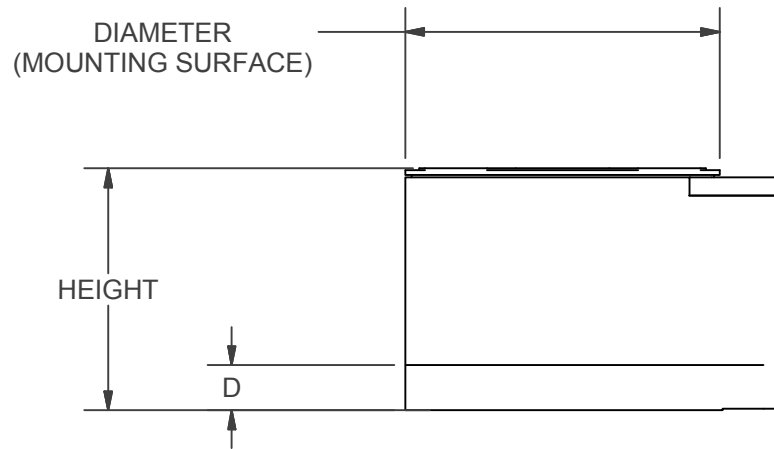




4 | 3 | 2 | 1

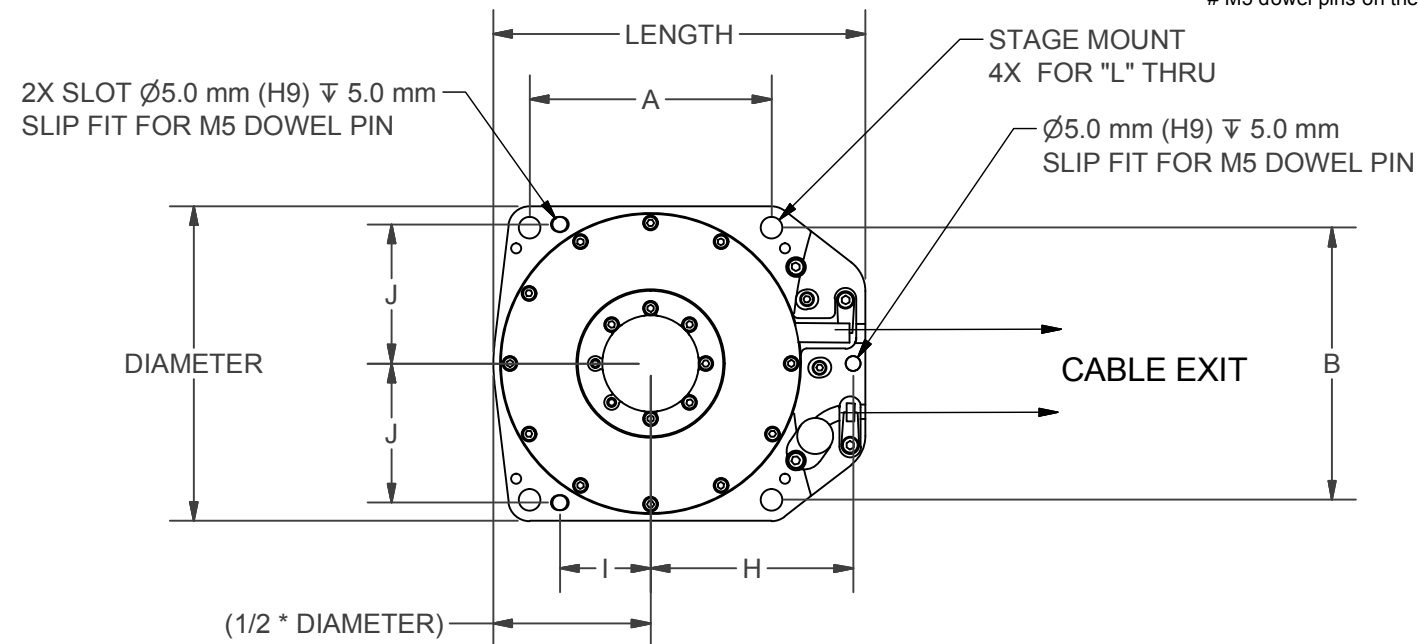


STANDARD FEATURES	
Stage	Rotary Stage
Travel	360 Degrees Continuous
Motor	Direct Drive Frameless Torque Motor
Feedback	Non-Contact Incremental Optical Rotary Encoder Optional: Non-Contact Absolute Optical Rotary Encoder
Scale	20um Pitch Stainless Steel Ring Optional: Stainless Steel Absolute Ring
Resolution	1Vp-p Sin-Cos Analog Output Digital AQB options available (reduced speeds may apply)
Sensors	Integrated Optical Latching Home Index
Bearings	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	Not Standard, but Available Upon Request Only
Orientation	Vertical or Horizontal or Inverted
Structure	Black Anodized Aluminum 6061-T6
Maintenance	Stages are Greased for Life in Normal Environment; No Maintenance
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



DIAMETER	HEIGHT	LENGTH	A	B	C	D	E	F	G (degrees)	H	I	J	K	L	M	N
56	62	72	46	46	8	10	n/a	30	45	30	17	25	22.5#	M4	M3	n/a
80	60	96	70	70	6	17.5	50	35	45	50	28	35	25	M4	M4	M4
104	80	123	80	90	32	15	50	80	45	67	30	46	32.5	M6 or 1/4-20	M4	M4

* All units millimeters unless otherwise noted.
 * All hole patterns centered on thru hole at center of stage diameter.
 * All dimensions and visual representations reflect the stage at home position.
 # M5 dowel pins on the AI-TM-56R are rotated 90 degrees relative to dowel pins shown on this datasheet.



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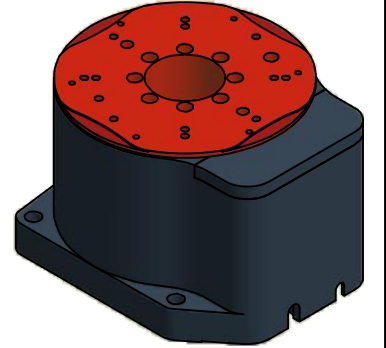
DRAWN QWOLF 2020-12-18				
CHECKED				
	TITLE AI-TM-(DIAMETER)R			
Tolerances: $x.x \pm 0.5$ mm $x.xx \pm 0.13$ mm $x.xxx \pm 0.05$ mm ANGLES $\pm 0.5^\circ$ MATERIAL	Surface Roughness: RMS MAX.	SIZE B	DWG NO 0010-08010	REV 004
FINISH SEE NOTES	SCALE	0090-07999-016 ALIO STD TEMPLATE	SHEET 1 OF 2	

NOTE: MODEL AI-TM-104R SHOWN

4 | 3 | 2 | 1



ALIO STAGE AND MOTOR SPECIFICATIONS



BASE MODEL FAMILY	UNITS	AI-TM-56R			AI-TM-80R			AI-TM-104R		
TRAVEL	--	360 degrees continuous								
PERFORMANCE SPECIFICATIONS [1]		(STD)	ULTRA	NANO	(STD)	ULTRA	NANO	(STD)	ULTRA	NANO
ANGULAR ACCURACY	arc-sec	N/A	+/- 3.0		N/A	+/- 3.0		N/A	+/- 3.0	
BIDIRECTIONAL ANGULAR REPEATABILITY	arc-sec	+/- 0.7	+/- 0.6	+/- 0.4	+/- 0.7	+/- 0.6	+/- 0.4	+/- 0.6	+/- 0.5	+/- 0.3
HOME INDEX BIDIRECTIONAL REPEATABILITY		< +/- 1 encoder count								
RESOLUTION (ANALOG - STANDARD)	arc-sec	0.039 arc-sec			0.027 arc-sec			0.02 arc-sec		
RESOLUTION (DIGITAL - OPTIONAL) [2]	arc-sec	0.01 - 40.0 arc-sec			0.007 - 27.0 arc-sec			0.005 - 21.0 arc-sec		
RESOLUTION (ENCODER LINE COUNT)	lines/rev	8192			11840			15744		
AXIAL RUNOUT (STANDARD)	um	+/- 7.5	+/- 6.0	+/- 5.0	+/- 6.0	+/- 5.0	+/- 4.0	+/- 6.0	+/- 4.5	+/- 3.0
RADIAL RUNOUT (STANDARD)	um	+/- 7.5	+/- 6.0	+/- 5.0	+/- 6.0	+/- 5.0	+/- 4.0	+/- 6.0	+/- 4.5	+/- 3.0
WOBBLE	arc-sec	+/- 12.5	+/- 10.0	+/- 7.5	25	+/- 10.0	+/- 7.5	+/- 12.5	+/- 7.5	+/- 5.0
MOTION PROFILE SPECIFICATIONS										
MAX VELOCITY [3]	deg/sec	>3000			>6000			>8000		
MAX ACCELERATION [3]	deg/sec^2	60000			200000			400000		
ASSEMBLY MASS	kg	0.65			1.1			2.7		
MAX LOAD (AXIAL)	kg	2.5			2.5			12.0		
MAX LOAD (RADIAL)	kg	2.5			2.5			12.0		
MOVING MASS	kg	0.25			0.40			1.0		
ROTATING MASS MOMENT OF INERTIA	kg*mm^2	80			260			1000		
MOTOR INFORMATION										
MOTOR TYPE	--	FRAMELESS TORQUE MOTOR								
MOTOR MODEL	--	AI-TM-44AE-W			AI-TM-65BN-W			AI-TM-89B9-W		
MAGNETIC PITCH (N-N)	deg	120			90			60		
MAX VOLTAGE (LINE TO LINE) [4]	VDC	340			600			340		
MAX MOTOR TEMP	°C	155			100			155		
MOTOR THERMISTOR		NONE								
MOTOR CONNECTION	--	WYE								
MOTOR CONSTANT	Nm/sqrt(W)	0.04			0.08			0.35		
TORQUE CONSTANT	Nm/Arms	0.091			0.118			0.683		
PHASE RESISTANCE (@ 25°C) [5]	Ohm	4.5			0.799			3.9		
INDUCTANCE @ 1kHz	mH	3.2			1.62			8.9		
CONTINUOUS TORQUE [6]	Nm	0.21			0.66			2.59		
CONTINUOUS CURRENT [6]	Arms	2.31			5.61			3.79		
PEAK TORQUE [7]	Nm	0.66			1.31			8.23		
PEAK CURRENT [7]	Arms	7.31			13.84			11.98		
BACK EMF CONSTANT	Vrms/krpm	5.497			7.2			41.282		

Notes:

- Specifications measured on stage centerline at nominal 20°C, ~30mm above mounting surface. Standard describes typical values. Ultra and Nano 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 0.177 ohm/m.
- Continuous operating limits are based on continuous operation at maximum temperature with aluminum heat sink (300mm x 300mm x 25mm).
- Maximum on time at peak operating limits is 10 seconds.
- All electrical specifications may vary by 12% from listed values.
- Additional motor and travel options are available for each stage for optimized performance as necessary per customer requirements.

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DRAWN	QWOLF	2020-12-18			
CHECKED					
			TITLE		
Tolerances: Surface Roughness: x.x ± 0.5 mm x.xx ± 0.13 mm x.xxx ± 0.05 mm ANGLES ± 0.5°			AI-TM-(DIAMETER)R		
MATERIAL			SIZE	DWG NO	REV
FINISH SEE NOTES			B	0010-08010	004
SCALE			0090-07999-016 ALIO STD TEMPLATE SHEET 2 OF 2		