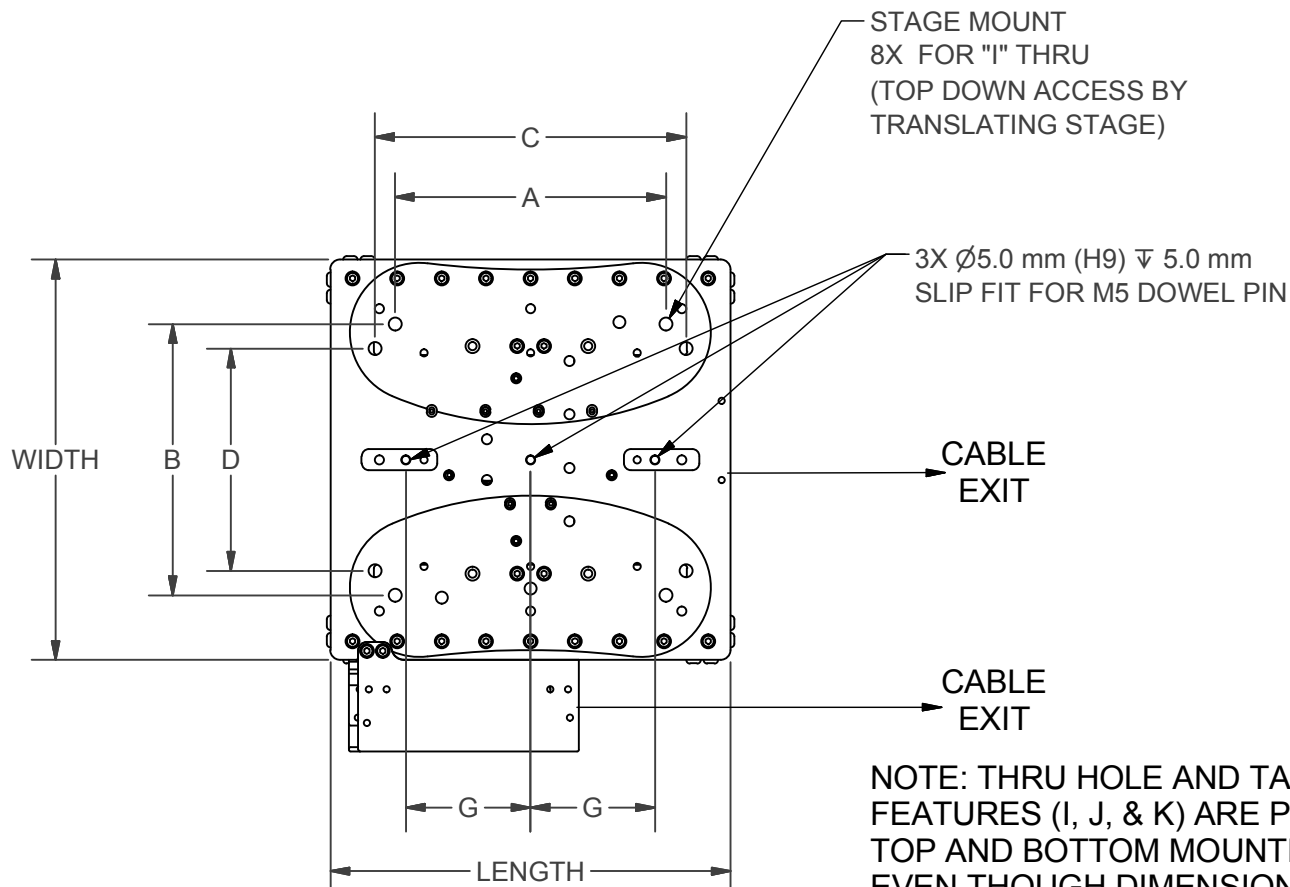


STANDARD FEATURES	
Stage	Monolithic XY Stage
Travel	30mm to 300mm
Motor	Direct Drive Ironless Core Linear Motor
Feedback	Non-Contact Incremental Optical Linear Encoder Optional: Non-Contact Absolute Optical Linear Encoder (for Travel >=100mm)
Scale	20um Pitch Gold Tape Scale Optional: 20um Pitch Near 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)
Cable Routing	Integrated Top Axis Cable Routing (for Travel >= 100mm) Customer Cable Routing Integrated Upon Request
Hard Stops	Integrated End-of-Travel Hard Stops
Orientation	Horizontal Only; Inverted Ok
Structure	Black Anodized Aluminum 6061-T6
Maintenance	Stages are Greased 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) Storage/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	J	K
30	112	112	50	n/a	n/a	80	42	46	60	35	n/a	M4	M4 (4X)	M5 (4X)
60	125	125	60	4	3	100	75	46	60	35	n/a	M6 or 1/4-20	M4 (4X)	M5 (4X)
100	184	184	60	6	4	125	100	46	120	70	52	M6 or 1/4-20	M4 (4X)	M5 (6X)
150	225	225	60	6	6	175	125	120	170	70	52	M6 or 1/4-20	M5	M6
200	275	275	60	6	6	175	125	120	170	70	62	M6 or 1/4-20	M5	M6
250	400	400	100	12	8	350	250	170 & 225	275	100	96	M8 or 5/16-18	M6	M8 (6X)
300	500	500	100	12	8	350	250	170 & 225	275	100	96	M8 or 5/16-18	M6	M8 (6X)

- * 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 sizes with minimal performance impact available.
- * All dimensions and visual representations reflect stage at mid-stroke or home position.

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DRAWN	QWOLF	2021-02-03
CHECKED		
Tolerances: Surface Roughness: x.x ± 0.5 mm x.xx ± 0.13 mm x.xxx ± 0.05 mm ANGLES ± 0.5° MATERIAL FINISH SEE NOTES		

TITLE		
AI-CM-(TRAVEL)00-XY		
SIZE	DWG NO	REV
B	0010-08013	005
SCALE	0090-07999-016 ALIO STD TEMPLATE SHEET 1 OF 2	

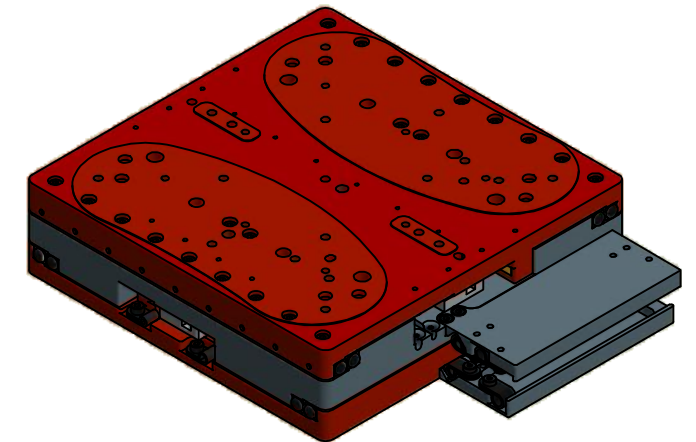
NOTE: MODEL AI-CM-15000-XY SHOWN.

NOTE: THRU HOLE AND TAP MOUNTING FEATURES (I, J, & K) ARE PRESENT ON TOP AND BOTTOM MOUNTING SURFACES EVEN THOUGH DIMENSIONS ARE ONLY SHOWN ON ONE SURFACE.



ALIO STAGE AND MOTOR SPECIFICATIONS

MODEL	UNITS	AI-CM-3000-XY	AI-CM-6000-XY	AI-CM-10000-XY	AI-CM-15000-XY	AI-CM-20000-XY	AI-CM-25000-XY	AI-CM-30000-XY
NOMINAL XY TRAVEL FROM HOME INDEX	mm	+/- 15	+/- 30	+/- 50	+/- 75	+/- 100	+/- 125	+/- 150
MAGNETIC LIMIT LOCATIONS (+1/-3mm)	mm	+/- 14	+/- 30	+/- 50	+/- 75	+/- 100	+/- 127	+/- 152
HARD STOP LOCATIONS (+/- 1mm)	mm	+/- 16	+/- 32	+/- 52	+/- 77	+/- 102	+/- 128	+/- 153
PERFORMANCE SPECIFICATIONS [1]		(STD) ULTRA NANO	(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 +/- 1.0 +/- 0.3	+/- 3.0 +/- 1.0 +/- 0.4	+/- 4.0 +/- 1.0 +/- 0.4	+/- 5.0 +/- 1.0 +/- 0.5	+/- 6.0 +/- 1.0 +/- 0.6
BIDIRECTIONAL LINEAR REPEATABILITY	nanometers	+/- 30						
HOME INDEX BIDIRECTIONAL REPEATABILITY		< +/- 1 encoder count						
RESOLUTION	--	Standard: ~4.88nm after 4096 Interpolation (Digital AQB options available between 1nm and 5um) (Absolute options available between 1nm and 100nm)						
STRAIGHTNESS	um	+/- 1.0 +/- 0.5 +/- 0.2	+/- 2.0 +/- 0.7 +/- 0.3	+/- 2.0 +/- 1.0 +/- 0.3	+/- 3.0 +/- 1.0 +/- 0.4	+/- 4.0 +/- 1.0 +/- 0.4	+/- 6.0 +/- 2.0 +/- 1.0	+/- 10.0 +/- 2.0 +/- 1.0
FLATNESS [2]	um	+/- 2.0 +/- 1.0 +/- 2.5	+/- 1.5 +/- 1.5 +/- 3.0	+/- 1.5 +/- 1.5 +/- 4.0	+/- 2.0 +/- 1.5 +/- 4.0	+/- 3.0 +/- 1.5 +/- 6.0	+/- 4.0 +/- 1.5 +/- 8.0	+/- 5.0 +/- 1.5 +/- 10.0
PITCH [2]	arc-sec	+/- 12.0	+/- 12.0	+/- 12.0	+/- 15.0	+/- 15.0	+/- 18.0	+/- 18.0
YAW	arc-sec	+/- 12.0	+/- 12.0	+/- 12.0	+/- 15.0	+/- 15.0	+/- 18.0	+/- 18.0
ROLL	arc-sec	+/- 12.0	+/- 12.0	+/- 12.0	+/- 15.0	+/- 15.0	+/- 18.0	+/- 18.0
ORTHOGONALITY	arc-sec	+/- 20.0 +/- 5.0 +/- 1.0	+/- 20.0 +/- 5.0 +/- 1.0	+/- 20.0 +/- 5.0 +/- 1.0	+/- 20.0 +/- 5.0 +/- 1.0	+/- 20.0 +/- 5.0 +/- 1.0	+/- 20.0 +/- 5.0 +/- 1.0	+/- 20.0 +/- 5.0 +/- 1.0
MOTION PROFILE SPECIFICATIONS								
TOP AXIS MAX VELOCITY [3]	m/s	0.7	0.9	0.7	0.8	1.0	0.8	0.7
BOT AXIS MAX VELOCITY [3]	m/s	0.5	0.6	0.5	0.5	0.6	0.5	0.3
TOP AXIS MAX PEAK ACCELERATION [3]	G	4.0	3.0	1.2	1.0	1.0	0.6	0.4
BOT AXIS MAX PEAK ACCELERATION [3]	G	2.0	1.2	0.6	0.4	0.4	0.2	0.1
MAX PAYLOAD CAPABILITY	kg	8	10	12	12	15	25	35
ASSEMBLY MASS	kg	1.6	2.9	5.8	8.5	12	48	69
BOT AXIS MOVING MASS	kg	1.3	2.1	4.4	6.5	8.8	33	48
TOP AXIS MOVING MASS	kg	0.6	0.9	2.1	2.7	3.7	15	23
MOTOR INFORMATION								
MOTOR TYPE	--	LINEAR BRUSHLESS SERVO MOTOR						
MOTOR MODEL	--	AI-CM-144AEP-D	AI-CM-144AEP-D	AI-CM-144AEP-D	AI-CM-144AEP-D	AI-CM-144BEP-D	AI-CM-256CEP-D	AI-CM-256CEP-D
MAGNETIC PITCH (N-N)	mm	30.48						
MAX VOLTAGE (LINE TO LINE) [4]	V	250						
ELECTRICAL TIME CONSTANT (@ 25°C)	msec	0.2	0.2	0.2	0.2	0.2	0.12	0.12
MAX MOTOR TEMP	°C	130						
MOTOR THERMISTOR (options available)		POSITIVE COEFFICIENT PTC THERMISTOR						
MOTOR CONNECTION	--	DELTA						
MOTOR CONSTANT	N/sqrt(W)	1.4	1.4	1.4	1.4	2.0	3.73	3.73
FORCE CONSTANT	N/Apk	3.4	3.4	3.4	3.4	6.8	17.8	17.8
PHASE RESISTANCE (@ 25°C) [5]	Ohm	2.8	2.8	2.8	2.8	5.65	8.27	8.27
PHASE RESISTANCE (@ 130°C) [5]	Ohm	4.0	4.0	4.0	4.0	8.1	11.86	11.86
INDUCTANCE @ 1kHz	mH	0.6	0.6	0.6	0.6	1.1	1.0	1.0
CONTINUOUS FORCE [6]	N	10.2	10.2	10.2	10.2	20.5	53.5	53.5
CONTINUOUS CURRENT [6]	Apk	3.00	3.00	3.00	3.00	3.00	3.00	3.00
PEAK FORCE [7]	N	30	30	30	30	41	107	107
PEAK CURRENT [7]	Apk	6.00	6.00	6.00	6.00	6.00	6.00	6.00
BACK EMF CONSTANT	V/m/s	3.4	3.4	3.4	3.4	6.82	17.8	17.8



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- Notes:
- 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.
 - Flatness and Pitch specifications dependent on system base. Contact ALIO for more information.
 - Axis limitation at no payload. Based on 100% S-curve. 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 0.43 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.
 - Additional motor and travel options are available for each stage for optimized performance as necessary per customer requirements.

DRAWN	2021-02-03		
CHECKED			
		TITLE	
Tolerances: x.x ± 0.5 mm x.xx ± 0.13 mm x.xxx ± 0.05 mm ANGLES ± 0.5° MATERIAL		AI-CM-(TRAVEL)00-XY	
FINISH		SIZE	REV
SEE NOTES		B	005
SCALE		DWG NO	
		0010-08013	
		0090-07999-016 ALIO STD TEMPLATE	SHEET 2 OF 2