

TRAVEL	THRU	LENGTH	HEIGHT	A (inch)	B (inch)	C	D	E	F	G	H	I	J	K	L
30	30	140	45	n/a	n/a	40	20	100	125	40	30	84.5	n/a	M4	M4
50	50	179.5	45	3	1	100	25	154	164.5	60	40	102.5	n/a	M6 or 1/4-20	M5
100	100	229.5	52	5	3	150	75	204	214.5	120	70	127.5	52	M6 or 1/4-20	M6
150	150	282.5	52	7	5	200	100	258	267.5	170	100	153.5	52	M6 or 1/4-20	M6
200	200	332.5	65	11	7	250	150	308	317.5	225	125	178.5	62	M6 or 1/4-20	M6
250	250	468.5	80	11	7	300	150	427	455	275	150	255	96	M6 or 1/4-20	M6

* All units millimeters unless otherwise noted.
 * All hole patterns centered on aperture centerline.
 * All dimensions and visual representations reflect the stage at home or mid-stroke position.
 * Custom and intermediate sizes available.

STANDARD FEATURES

Stage	Open Center Monolithic XY Stage
Travel	30mm to 250mm
Motor	Direct Drive Ironless Core Linear Motor
Feedback	Non-Contact Incremental Optical Linear Encoder Optional: Non-Contact Absolute Optical Linear Encoder (for Travel >=50mm)
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 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

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



DRAWN	QWOLF	2021-02-04
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)00E-(THRU)-XY		
SIZE	DWG NO	REV
B	0010-08014	005
SCALE	0090-07999-016 ALIO STD TEMPLATE	SHEET 1 OF 2

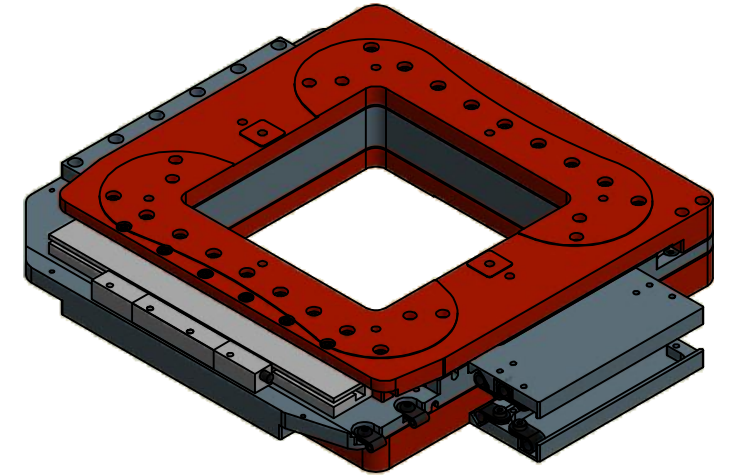
NOTE: MODEL AI-CM-15000E-150-XY SHOWN

NOTE: THRU HOLE AND TAP MOUNTING FEATURES (I & J) 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-3000-030-XY		AI-CM-5000-050-XY		AI-CM-10000-100-XY		AI-CM-15000-150-XY		AI-CM-20000-200-XY		AI-CM-25000-250-XY							
NOMINAL XY TRAVEL FROM HOME INDEX	mm	+/- 15		+/- 30		+/- 50		+/- 75		+/- 100		+/- 125							
MAGNETIC LIMIT LOCATIONS (+1/-3mm)	mm	+/- 15		+/- 25		+/- 50		+/- 75		+/- 100		+/- 125							
HARD STOP LOCATIONS (+/- 1mm)	mm	+/- 16		+/- 31		+/- 52		+/- 77		+/- 102		+/- 126.5							
PERFORMANCE SPECIFICATIONS [1]		(STD)	ULTRA	NANO	(STD)	ULTRA	NANO	(STD)	ULTRA	NANO	(STD)	ULTRA	NANO						
LINEAR DISPLACEMENT ACCURACY	um	+/- 3.0	+/- 0.5	+/- 0.3	+/- 3.0	+/- 0.7	+/- 0.4	+/- 4.0	+/- 1.0	+/- 0.5	+/- 4.0	+/- 1.0	+/- 0.5	+/- 5.0	+/- 1.2	+/- 0.7	+/- 5.0	+/- 1.2	+/- 0.7
BIDIRECTIONAL LINEAR REPEATABILITY	nanometers	+/- 50																	
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	um	+/- 2.0	+/- 0.5	+/- 0.3	+/- 3.0	+/- 0.7	+/- 0.4	+/- 3.0	+/- 1.0	+/- 0.5	+/- 4.0	+/- 1.0	+/- 0.5	+/- 4.0	+/- 1.2	+/- 0.7	+/- 4.0	+/- 1.2	+/- 0.7
FLATNESS [2]	um	+/- 2.0	+/- 1.0		+/- 2.5	+/- 1.5		+/- 3.0	+/- 1.5		+/- 5.0	+/- 2.0		+/- 4.0	+/- 3.0		+/- 4.0	+/- 3.0	
PITCH [2]	arc-sec	+/- 12.0		+/- 12.0		+/- 12.0		+/- 12.0		+/- 15.0		+/- 15.0		+/- 15.0		+/- 15.0		+/- 15.0	
YAW	arc-sec	+/- 12.0		+/- 12.0		+/- 12.0		+/- 12.0		+/- 15.0		+/- 15.0		+/- 15.0		+/- 15.0		+/- 15.0	
ROLL	arc-sec	+/- 12.0		+/- 12.0		+/- 12.0		+/- 12.0		+/- 15.0		+/- 15.0		+/- 15.0		+/- 15.0		+/- 15.0	
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
MOTION PROFILE SPECIFICATIONS																			
TOP AXIS MAX VELOCITY [3]	m/s	0.8		0.8		0.8		0.9		1.0		1.1							
BOT AXIS MAX VELOCITY [3]	m/s	0.5		0.5		0.5		0.5		0.6		0.6							
TOP AXIS MAX PEAK ACCELERATION [3]	G	5.0		3.0		1.6		1.2		1.0		1.0							
BOT AXIS MAX PEAK ACCELERATION [3]	G	1.8		1.0		0.6		0.4		0.4		0.3							
MAX PAYLOAD CAPABILITY	kg	8		10		12		12		15		25							
ASSEMBLY MASS	kg	1.9		3.2		5.6		7.4		11.4		33							
BOT AXIS MOVING MASS	kg	1.5		2.5		4.4		5.7		8.7		25							
TOP AXIS MOVING MASS	kg	0.5		0.9		1.8		2.2		3.4		8.8							
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							
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							
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							
FORCE CONSTANT	N/ Apk	3.4		3.4		3.4		3.4		6.8		17.8							
PHASE RESISTANCE (@ 25°C) [5]	Ohm	2.8		2.8		2.8		2.8		5.65		8.27							
PHASE RESISTANCE (@ 130°C) [5]	Ohm	4.0		4.0		4.0		4.0		8.1		11.86							
INDUCTANCE @ 1kHz	mH	0.6		0.6		0.6		0.6		1.1		1.0							
CONTINUOUS FORCE [6]	N	10.2		10.2		10.2		10.2		20.5		53.5							
CONTINUOUS CURRENT [6]	Apk	3.00		3.00		3.00		3.00		3.00		3.00							
PEAK FORCE [7]	N	30		30		30		30		41		107							
PEAK CURRENT [7]	Apk	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							



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

- 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	QWOLF	2021-02-04
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)00E-(THRU)-XY		
SIZE	DWG NO	REV
B	0010-08014	005
SCALE	0090-07999-016 ALIO STD TEMPLATE SHEET 2 OF 2	