

STANDARD FEATURES	
Stage	Vertical Stage
Travel	6mm
Motor	Direct Drive Voice Coil Motor (VC)
Feedback	Non-Contact Incremental Optical Linear Encoder
Scale	20um Pitch Gold Tape Scale Optional: 20um Pitch 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)
Sensors	Integrated Optical Latching Home Index and End of Travel Magnetic NPN Limits
Bearings	High Precision Crossed Roller Bearings
Counterbalance	User-Swappable Spring
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	Vertical Axis; Mounted on Front/Back or Top/Bottom; Cannot be Inverted
Structure	Black Anodized Aluminum 6061-T6
Maintenance	Stges are Greased for Life in Normal Environment; No Maintenance
Environment	Standard Optional: Clean Room and Vacuum (10 <sup>-6</sup> Torr)
Temperature	Operating: 0°C to 50°C (performance not guaranteed throughout entire temp range) Storage/Transport: -20°C to 70°C
Humidity	10% to 80% Non-Condensing
Precision	6-D Nano Precision™ Test Methods

MOTOR	TRAVEL	LENGTH	WIDTH	HEIGHT	A	B	C	D	E	F	G	H	I	J	K
VC	6	80	60	70	30	59.9	60	46	46	25	30	35	M4	M4	M3

- \* All units millimeters unless otherwise noted.
- \* Motor type is voice coil (VC) designator in model number.
- \* All hole patterns centered on M5 dowel pin hole at center of stage (if not otherwise indicated).
- \* Custom and intermediate sizes 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  
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DRAWN	QWOLF	2022-08-04
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-(MOTOR)-(TRAVEL)00-Z-SCB		
SIZE	DWG NO	REV
B	0010-08034	002
SCALE	0090-07999-016 ALIO STD TEMPLATE	SHEET 1 OF 2

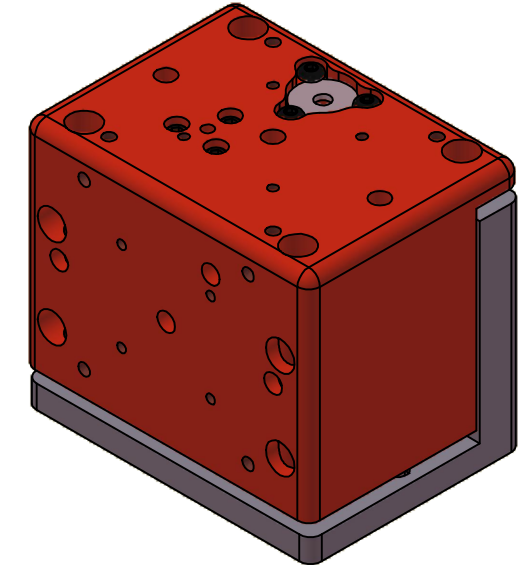
NOTE: MODEL AI-VC-600-Z-SCB SHOWN.



# ALIO STAGE AND MOTOR SPECIFICATIONS

MODEL	UNITS	AI-VC-600-Z-SCB
NOMINAL TRAVEL FROM HOME INDEX	mm	+/- 3
MAGNETIC LIMIT LOCATIONS (+0.25/-2.5mm)	mm	+/- 3
HARD STOP LOCATIONS (+/- 0.25mm)	mm	+/- 3.6
PERFORMANCE SPECIFICATIONS [1]		(STD)   ULTRA   NANO
HOME INDEX BIDIRECTIONAL REPEATABILITY	-	< +/- 1 encoder count
LINEAR DISPLACEMENT ACCURACY	um	CONTACT ALIO INDUSTRIES
BIDIRECTIONAL LINEAR REPEATABILITY	nanometers	
STRAIGHTNESS IN X	um	
STRAIGHTNESS IN Y [2]	um	
PITCH ABOUT X [2]	arc-sec	
PITCH ABOUT Y	arc-sec	
PITCH ABOUT Z	arc-sec	
MOTION PROFILE SPECIFICATIONS		
MAX VELOCITY [3]	m/s	0.3
MAX PEAK ACCELERATION [3]	G	4.0
MAX PAYLOAD CAPABILITY	kg	2.5
ASSEMBLY MASS	kg	0.9
MOVING MASS	kg	0.2
MOTOR INFORMATION		
MOTOR TYPE	-	VOICE COIL
MOTOR MODEL	-	AI-VC-144AAA
MAX VOLTAGE (LINE TO LINE) [4]	V	17.0
ELECTRICAL TIME CONSTANT (@ 25°C)	msec	0.304
MAX MOTOR TEMP	°C	155
MOTOR THERMISTOR		NONE
MOTOR CONSTANT	N/sqrt(W)	4.386
FORCE CONSTANT	N/Apk	7.34
PHASE RESISTANCE (@ 25°C) [5]	Ohm	2.8
INDUCTANCE @ 1kHz	mH	0.850
CONTINUOUS FORCE [6] [8]	N	15.57
CONTINUOUS CURRENT [6]	Apk	2.1
PEAK FORCE [7] [8]	N	44.48
PEAK CURRENT [7]	Apk	6.06
BACK EMF CONSTANT	V/m/s	7.35

- Notes:
- Specifications measured on stage centerline at nominal 20°C, 50mm above mounting surface with no payload. For up to 150mm cantilever payloads.
  - Flatness and Pitch specifications dependent on system base. Contact ALIO for more information.
  - Stage limitation at no load. Based on 100% S-curve. Does not account for limitations due to arm.
  - Back EMF plus IR drop must not exceed maximum line to line bus voltage.
  - Resistance values do not include cable resistance. Cable resistance adds 0.117 ohm/m for vc.
  - Continuous operating limits are based on continuous operation at maximum temperature with a.
  - Maximum on time at peak operating limits is 10 seconds.
  - Voice Coil (VC only) forces are reduced by 25% at ends of travel.
  - All electrical specifications may vary by 12% from listed values.
  - Additional motor and travel options are available for each stage for optimized performance as



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CHECKED					
			TITLE		
Tolerances: x.x ± 0.5 mm x.xx ± 0.13 mm x.xxx ± 0.05 mm ANGLES ± 0.5°			AI-(MOTOR)-(TRAVEL)00-Z-SCB		
Surface Roughness:  RMS MAX.			SIZE	DWG NO	REV
MATERIAL			B	0010-08034	002
FINISH SEE NOTES			SCALE	0090-07999-016 ALIO STD TEMPLATE	SHEET 2 OF 2