

| Specifications | Model: | AI-CM-3000-XY | AI-CM-6000-XY | AI-CM-10000-XY | AI-CM-15000-XY | AI-CM-20000-XY |
|-----------------------------------------------------------|--------------------------------|--------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Travel | | 30 x 30 mm | 60 x 60 mm | 100 x 100 mm | 150 x 150 mm | 200 x 200 mm |
| Performance Spec's ⁽¹⁾: Precision Grade | | (Std.) ULTRA NANO | (Std.) ULTRA NANO | (Std.) ULTRA NANO | (Std.) ULTRA NANO | (Std.) ULTRA NANO |
| Linear Displacement Accuracy | | ± 3.0 µm ± 0.5 µm ± 0.2 µm | ± 3.0 µm ± 0.7 µm ± 0.2 µm | ± 3.0 µm ± 1.0 µm ± 0.2 µm | ± 3.0 µm ± 1.0 µm ± 0.3 µm | ± 4.0 µm ± 1.0 µm ± 0.3 µm |
| Straightness | | ± 2.0 µm ± 0.5 µm ± 0.2 µm | ± 2.0 µm ± 0.7 µm ± 0.2 µm | ± 2.0 µm ± 1.0 µm ± 0.2 µm | ± 3.0 µm ± 1.0 µm ± 0.3 µm | ± 3.0 µm ± 1.0 µm ± 0.3 µm |
| Flatness ⁽²⁾ | | ± 2.0 µm | ± 2.0 µm | ± 2.0 µm | ± 3.0 µm | ± 3.0 µm |
| Bi-Directional Linear Repeatability | | ± 30 nm | ± 30 nm | ± 30 nm | ± 30 nm | ± 30 nm |
| Resolution | | 5 nm (Standard; Options avail.) | 5 nm (Standard; Options avail.) | 5 nm (Standard; Options avail.) | 5 nm (Standard; Options avail.) | 5 nm (Standard; Options avail.) |
| Feedback | | Non-Contact Linear Encoder | Non-Contact Linear Encoder | Non-Contact Linear Encoder | Non-Contact Linear Encoder | Non-Contact Linear Encoder |
| Pitch (all +/-) | | 12 arc-sec | 12 arc-sec | 12 arc-sec | 15 arc-sec | 15 arc-sec |
| Yaw (all +/-) | | 12 arc-sec | 12 arc-sec | 12 arc-sec | 15 arc-sec | 15 arc-sec |
| Roll (all +/-) | | 12 arc-sec | 12 arc-sec | 12 arc-sec | 15 arc-sec | 15 arc-sec |
| Orthogonality | | 20 arc-sec 5 arc-sec 1 arc-sec | 20 arc-sec 5 arc-sec 1 arc-sec | 20 arc-sec 5 arc-sec 1 arc-sec | 20 arc-sec 5 arc-sec 1 arc-sec | 20 arc-sec 5 arc-sec 1 arc-sec |
| Motion Profile Specifications | | Motion Profile Specifications | | | | |
| Max Velocity ⁽³⁾ | | 0.2 m/sec | 0.3 m/sec | 0.4 m/sec | 0.4 m/sec | 0.5 m/sec |
| Max Acceleration ⁽³⁾ | | 0.3 G | 0.3 G | 0.3 G | 0.2 G | 0.2 G |
| Max Payload Capability | | 8 kg | 10 kg | 12 kg | 12 kg | 15 kg |
| Assembly Mass | | 1.6 kg | 2.9 kg | 5.8 kg | 8.5 kg | 12 kg |
| Moving Mass (X-Axis) | | 1.3 kg | 2.1 kg | 4.4 kg | 6.5 kg | 8.8 kg |
| Moving Mass (Y-Axis) | | 0.6 kg | 0.9 kg | 2.1 kg | 2.7 kg | 3.7 kg |
| Motor Information | | Motor Information | | | | |
| Drive Type | | Ironless, Brushless Servomotor | Ironless, Brushless Servomotor | Ironless, Brushless Servomotor | Ironless, Brushless Servomotor | Ironless, Brushless Servomotor |
| Motor Model | | C12-1 | C12-1 | C12-1 | C12-1 | C12-2 |
| Magnetic Pitch (N-N) | | 30.48 mm | 30.48 mm | 30.48 mm | 30.48 mm | 30.48 mm |
| Maximum line to line Voltage ⁽⁴⁾ | | 500 VDC | 500 VDC | 500 VDC | 500 VDC | 500 VDC |
| Electrical Time Constant | | 0.20 msec | 0.20 msec | 0.20 msec | 0.20 msec | 0.20 msec |
| Maximum Motor Temp | | 130 °C | 130 °C | 130 °C | 130 °C | 130 °C |
| Force Constant | | 3.5 N/Apk | 3.5 N/Apk | 3.5 N/Apk | 3.5 N/Apk | 7.1 N/Apk |
| Phase Resistance (@ 25 °C) ⁽⁵⁾ | | 2.9 Ω | 2.9 Ω | 2.9 Ω | 2.9 Ω | 5.8 Ω |
| Phase Resistance (@ 130 °C) ⁽⁵⁾ | | 4.2 Ω | 4.2 Ω | 4.2 Ω | 4.2 Ω | 8.3 Ω |
| Inductance | | 0.6 mH | 0.6 mH | 0.6 mH | 0.6 mH | 1.2 mH |
| Continuous Force ⁽⁶⁾ | Motor Connection: Delta | 10 N | 10 N | 10 N | 10 N | 19.8 N |
| Continuous Current ⁽⁶⁾ | Motor Connection: Delta | Up to 2.80 A | Up to 2.80 A | Up to 2.80 A | Up to 2.80 A | Up to 2.80 A |
| Peak Force ⁽⁷⁾ | Motor Connection: Delta | 21 N | 21 N | 21 N | 21 N | 42 N |
| Peak Current ⁽⁷⁾ | Motor Connection: Delta | 6.0 A | 6.0 A | 6.0 A | 6.0 A | 6.0 A |
| Back EMF Constant | | 3.5 V/m/sec | 3.5 V/m/sec | 3.5 V/m/sec | 3.5 V/m/sec | 7.1 V/m/sec |
| Corresponding ALIO Drawing # | | 001-08013-001 | 001-08013-001 | 001-08013-001 | 001-08013-001 | 001-08013-001 |
| Mean Time Between Failure | | 100,000 Hrs | 100,000 Hrs | 100,000 Hrs | 100,000 Hrs | 100,000 Hrs |

Notes:

- (1) Specifications measured on stage centerline, 50mm above mounting surface. ALIO provides NIST traceable proof for all options/spec per quote.
- (2) Flatness specifications dependent on system base. Contact ALIO for more information.
- (3) Stage limitation at no load. Does not account for drive or resolution limitations.
- (4) Back EMF plus IR drop must not exceed maximum line to line bus voltage.
- (5) Resistance values do not include cable resistance. Cable resistance adds 0.146 ohm/m for Delta connection and 0.44 ohm/m for Wye Connection.
- (6) Continuous operating limits are based on continuous operation at maximum temperature with aluminum heat sink (300mm x 12.5mm x motor length).
- (7) Maximum on time at peak operating limits is 10 seconds.
- (8) All electrical specifications may vary by 12% from listed values.
- (9) Additional motor and travel options are available for each stage for optimized performance as necessary per customer requirements.
- (10) Lack of mounting surface quality and environmental control may force stages out of these specifications.

