

ANT130LZS Series

Single-Axis Z Low-Profile Direct-Drive Nanopositioning Stages

Nanometer performance in a large travel format
(35 mm to 160 mm)

Dual-counterbalance, low-profile design

High-dynamic, noncontact direct-drive

Anti-creep crossed-roller bearings

Flexible tabletop and mounting patterns

High-resolution (2 nm), repeatability (75 nm),
and accuracy (275 nm)

In-position stability of <2 nm

Aerotech's ANT series stages are the world's first nanometer-level positioning systems with greater than 25 mm travel. Designed for vertical axis applications, the ANT130LZS series crossed-roller stages are the best-in-class in combining speed, resolution, accuracy, repeatability, reliability, and size, and are offered in two accuracy grades.

The ANT130LZS stages use a nearly frictionless dual-counterbalance mechanism to maintain performance levels while minimizing motor heating. The counterbalance is user adjustable from 0 to 14 kg. The dual-counterbalance design minimizes overall stage height and prevents off-axis moments that are applied by the counterbalance design that adversely affect straightness and angular errors. The result is positioning and geometric performance nearly equivalent to a non-counterbalanced ANT stage.

Noncontact Direct-Drive

Only noncontact direct-drive technology offers the robust, accurate, and high-speed positioning necessary for mass production of precision devices. ANT130LZS stages utilize advanced direct-drive technology pioneered by Aerotech to



The ANT130LZS features a dual-counterbalance, low-profile design.

achieve the highest level of performance for high-precision positioning, disk-drive fabrication, fiber alignment, optical delay element actuation, sensor testing, and scanning processes that demand smooth and precise motion.

Flexible System Design

The ANT130LZS family has universal mounting and tabletop patterns that allow for easy system integration. Two, three, or more axes can be easily combined for flexible system designs and multi-axis configurations.

System Characteristics

Outstanding accuracy, position repeatability, and in-position stability require small minimum incremental motion (mechanical resolution). The ANT130LZS stage's industry-leading 2 nm minimum incremental step size enables this high level of performance. Excellent in-position stability is assisted by high-quality, anti-creep, crossed-roller bearings. The stage offers virtually maintenance-free operation over the life of the product. Aerotech's direct-drive technology has no hysteresis or backlash, enabling accurate and repeatable nanometer-scale motion.

ANT130LZS Series SPECIFICATIONS

| Mechanical Specifications | | ANT130LZS-035 | ANT130LZS-060 |
|--|----------|-------------------------------------|---------------|
| Travel | | 35 mm | 60 mm |
| Accuracy ⁽¹⁾ | BASE | ±2.5 µm | ±2.5 µm |
| | PLUS | ±275 nm | ±275 nm |
| Resolution (Minimum Incremental Motion) | | (2 nm) | |
| Repeatability (Bidirectional) ⁽¹⁾ | BASE | ±100 nm | ±100 nm |
| | PLUS | ±75 nm | ±75 nm |
| Repeatability (Unidirectional) | | ±35 nm | |
| Straightness ⁽¹⁾ | | ±1.5 µm | |
| Flatness ⁽¹⁾ | | ±1.5 µm | |
| Pitch | | 10 arc sec | |
| Roll | | 10 arc sec | |
| Yaw | | 5 arc sec | |
| Maximum Speed ⁽²⁾ | | 200 mm/s | |
| Maximum Acceleration ⁽²⁾ | | 1 g (No Load) | |
| In-Position Stability ⁽³⁾ | | <2 nm | |
| Maximum Force (Continuous) | | 23 N | |
| Load Capacity ⁽⁴⁾ | Vertical | 14 kg | |
| Moving Mass | | 1.3 kg | 1.5 kg |
| Stage Mass | | 2.5 kg | 2.9 kg |
| Material | | Aluminum Body/Black Hardcoat Finish | |
| MTBF (Mean Time Between Failure) | | 30,000 Hours | |

Notes:

1. Certified with each stage.
2. Requires the selection of an appropriate amplifier with sufficient voltage and current.
3. In-position jitter listing is 3 sigma value.
4. Axis orientation for on-axis loading is listed.
5. Air supply must be clean, dry to 0°F dew point and filtered to 0.25 µm or better; recommend nitrogen at 99.9% purity. Supply pressure is determined by the amount of payload carried by the stage.
6. Specifications are for single-axis systems measured 25 mm above the tabletop. Performance of combined multi-axis systems is payload and work-point dependent. Consult factory for multi-axis or non-standard applications.
7. -PLUS requires the use of an Aerotech controller.

ANT130LZS Series DIMENSIONS

| Mechanical Specifications | | ANT130LZS-110 | ANT130LZS-160 |
|--|----------|-------------------------------------|---------------|
| Travel | | 110 mm | 160 mm |
| Accuracy ⁽¹⁾ | BASE | ±3 µm | ±4 µm |
| | PLUS | ±325 nm | ±325 nm |
| Resolution (Minimum Incremental Motion) | | 2 nm | |
| Repeatability (Bidirectional) ⁽¹⁾ | BASE | ±100 nm | ±100 nm |
| | PLUS | ±75 nm | ±75 nm |
| Repeatability (Unidirectional) | | ±35 nm | |
| Straightness ⁽¹⁾ | | ±1.5 µm | ±2 µm |
| Flatness ⁽¹⁾ | | ±1.5 µm | ±2 µm |
| Pitch | | 10 arc sec | |
| Roll | | 10 arc sec | |
| Yaw | | 5 arc sec | |
| Maximum Speed ⁽²⁾ | | 200 mm/s | |
| Maximum Acceleration ⁽²⁾ | | 1 g (No Load) | |
| In-Position Stability ⁽³⁾ | | <2 nm | |
| Maximum Force (Continuous) | | 23 N | |
| Load Capacity ⁽⁴⁾ | Vertical | 14 kg | |
| Moving Mass | | 2.1 kg | 2.5 kg |
| Stage Mass | | 3.9 kg | 4.6 kg |
| Material | | Aluminum Body/Black Hardcoat Finish | |
| MTBF (Mean Time Between Failure) | | 30,000 Hours | |

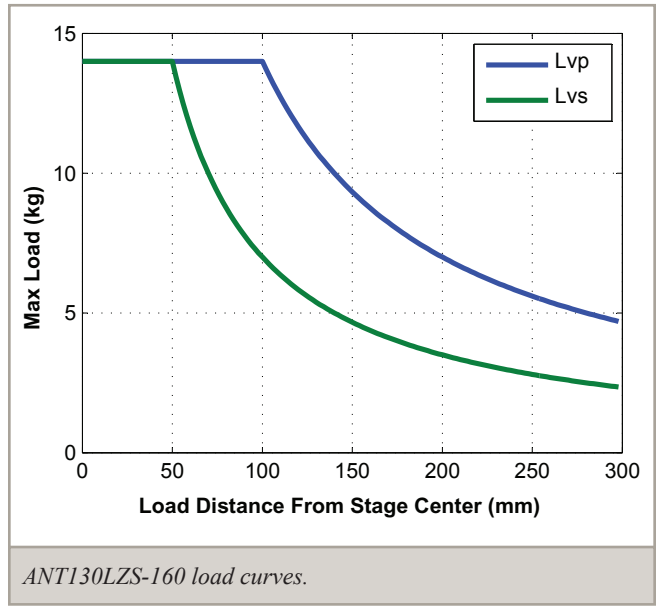
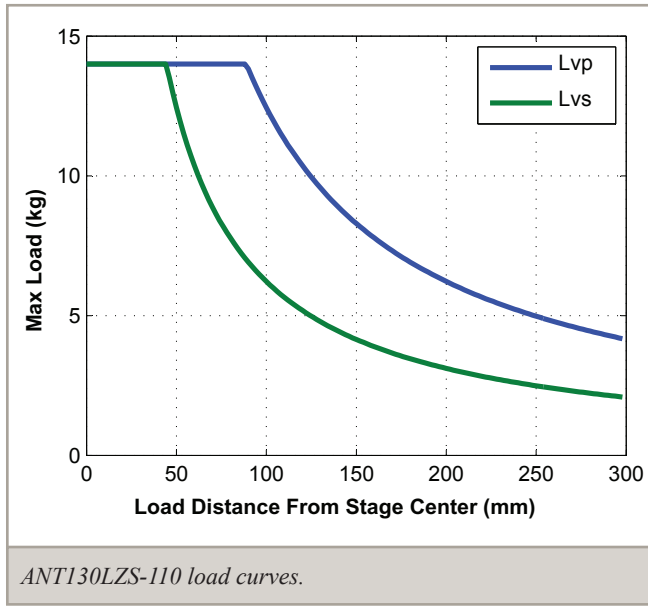
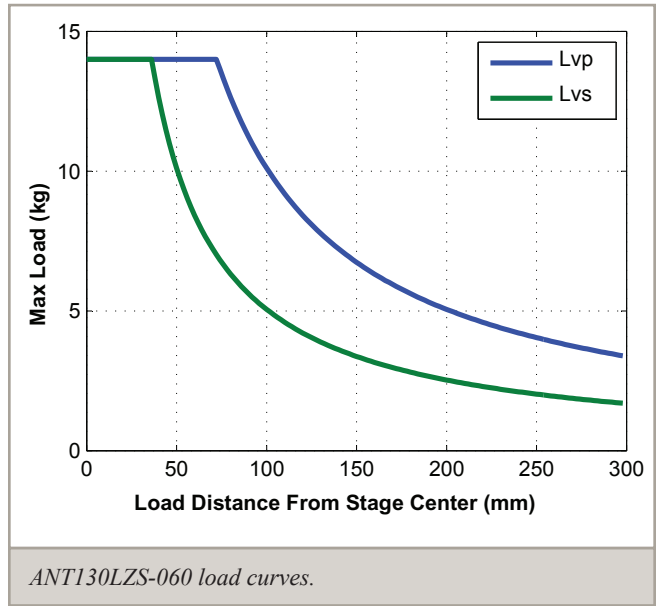
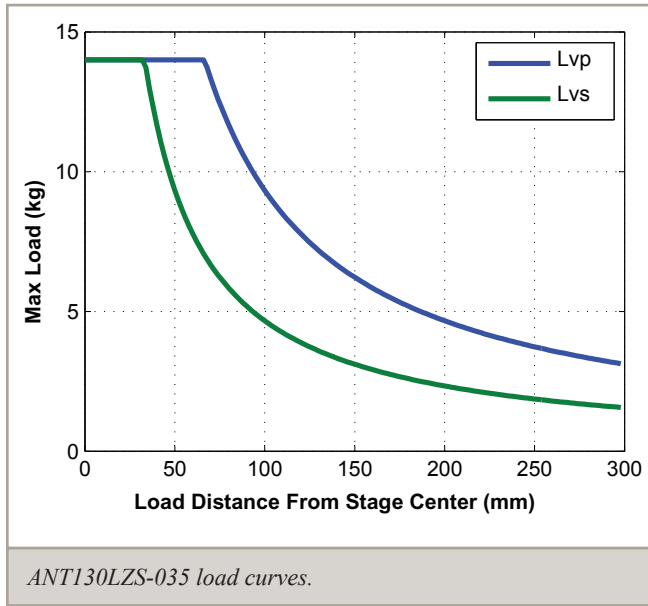
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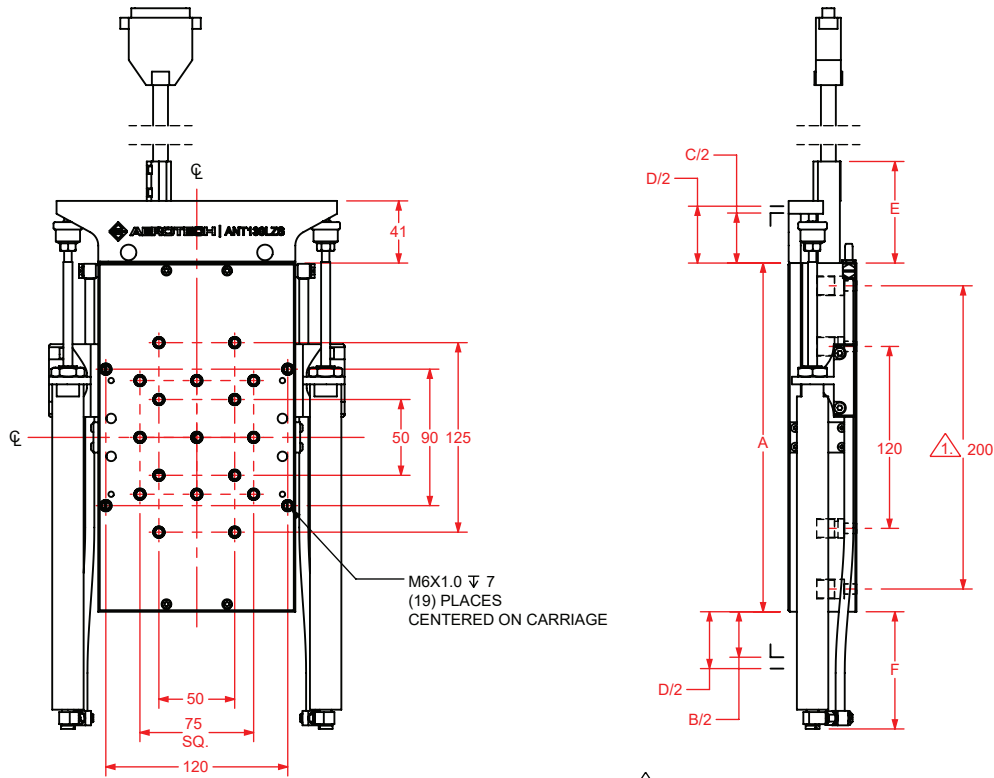
| Electrical Specifications | |
|---------------------------|-----------------------------|
| Drive System | Brushless Linear Servomotor |
| Feedback | Noncontact Linear Encoder |
| Maximum Bus Voltage | -CN1: 80 VDC, -CN2: 160 VDC |
| Limit Switches | 5 V, Normally Closed |
| Home Switch | Near Center |

| Recommended Controller | | |
|------------------------|----------|--------------------------------------|
| Multi-Axis | A3200 | Npaq MXR/Npaq MR-MXH/Ndrive ML-MXH |
| | Ensemble | Epaq MXH/Epaq MR-MXH/Ensemble ML-MXH |
| Single Axis | Soloist | Soloist ML-MXH |

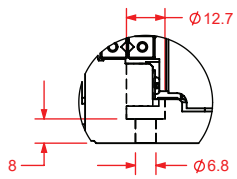
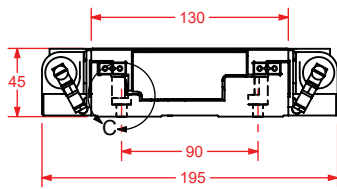
ANT130LZS Series SPECIFICATIONS



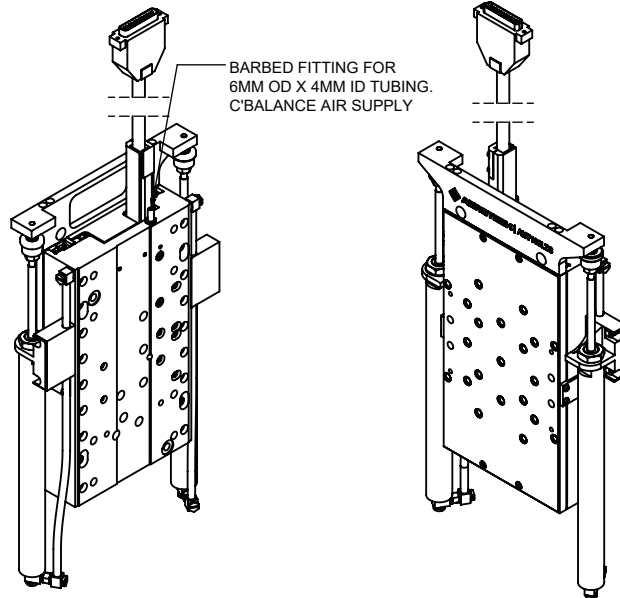
ANT130LZS Series DIMENSIONS



△ ANT130LZS-110 AND ANT130LZS-160 ONLY



DETAIL C
SCALE 2 : 5
MOUNTING HOLES TYP.



| TRAVEL OPTION | A = STAGE LENGTH | B = NOMINAL TRAVEL | C = LIMIT TRAVEL | D = HARDSTOP TRAVEL | E | F |
|---------------|------------------|--------------------|------------------|---------------------|----|----|
| -035 | 155 | 35 | 41 | 50 | 17 | 35 |
| -060 | 180 | 60 | 66 | 75 | 42 | 42 |
| -110 | 230 | 110 | 116 | 125 | 67 | 78 |
| -160 | 280 | 160 | 166 | 175 | 92 | 93 |

DIMENSIONS: MILLIMETERS

ANT130LZS Series ORDERING INFORMATION**Linear Stage Travel (Required)**

| | |
|------|---------------|
| -035 | 35 mm travel |
| -060 | 60 mm travel |
| -110 | 110 mm travel |
| -160 | 160 mm travel |

Connectors (Required)

| | |
|------|--|
| -CN1 | Single 25-pin D connector, 25DU |
| -CN2 | Two connectors, 4-pin HPD and 25-pin D, 4DU-25DU |

Note: -CN1 option not valid for systems using bus voltages greater than 80 V

Mounting Plate (Optional)

| | |
|-----|----------------|
| -MP | Mounting plate |
|-----|----------------|

Performance Grade (Required)

| | |
|------|---------------------------------|
| -PL1 | Base performance |
| -PL2 | High-accuracy performance, PLUS |

Integration (Required)

Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire custom integration support with your system.

| | |
|------|---|
| -TAS | Integration - Test as system Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration. |
| TAC | Integration - Test as components Testing and integration of individual items as discrete components. This is typically used for spare parts, replacement parts, or items that will not be used or shipped together (ex: stage only). These components may or may not be part of a larger system. |