

LTX Translation Stage

UHV Linear Sample Transporter (Rigid)

AML ultra high vacuum compatible rigid linear translation stages provide translation for loads of up to several tens of kilograms. They are generally similar to the AML LTV series, but use crossed-roller guides. They have very high rigidity, which is necessary where several transporters are stacked for compound motion or where offset loads are present. They are manufactured with UHV compatible material and construction methods and utilise AML UHV stepper motors.



FEATURES

- Travel ranges 25 to 85 mm
- Resolution to 1 μm per step
- Negligible backlash
- Low profile construction
- Load capacity to 50 kg
- Directly stackable for XYZ
- Suitable for use below 1×10^{-10} mBar
- Bakeable to 200°C
- Cross-roller bearing motion
- Diamond corrected leadscrew and matched nut
- Gamma radiation hard to 1×10^6 Gy versions available
- Limit switch or optical encoder options available
- May be customised

SPECIFICATIONS

| Specification | Unit | LTXL | LTXH |
|--|---------|--|--------|
| Travel | mm | 25 / 55 / 85 | |
| Resolution in full steps | µm | 5 | 1 |
| Maximum speed | mm/s | 15 | 4 |
| Recommended loaded speed in UHV | mm/s | 2 | 0.8 |
| Repeatability | µm | 1 | 0.2 |
| Centred Load Capacity (Normal) | kg | 50 | |
| Load moment | Nm | <20 | |
| Axial load force @ 500Hz, 1A phase current | kg | 3 | 10 |
| Backlash | µm | Negligible | |
| Roll, Pitch & Yaw (Unloaded) | µrad | <25 | |
| Roll Compliance | µrad/Nm | 5 | |
| Pitch & Yaw Compliance | µrad/Nm | 2 | |
| Straightness of Travel | µm | <1.3 µm / 100 mm | |
| Stepper Motor | | D35.1 | |
| Vacuum | mBar | 1 x 10 ⁻¹⁰ | |
| Maximum temperature | °C | 200 (reduces to 120 when an optical encoder is fitted) | |
| MTBF (5 kg load and 30% duty cycle) | hrs | 15,000 | 10,000 |

NOTES

BACKLASH: Backlash in the gearbox of LTXH is controlled by special gearing and is negligible. Backlash between the nut and leadscrew, and axial float in the bearings is controlled by a constant force spring and is much less than the resolution. If the transporter is used for motion with a significant vertical component (>30°), the load provided by the carriage weight is sufficient to eliminate backlash and the spring can be removed. In these cases, mount with the motor at the top. Since speeds are low, acceleration forces are negligible.

ROLL COMPLIANCE: Multiple-axis mechanisms can produce varying roll moments about the bottom transporter. The LTX carriage will deflect about the roll axis at 5µradian per Nm. To achieve this performance the transporter must be fixed to an extremely rigid, flat baseplate, using all of the base fixings.

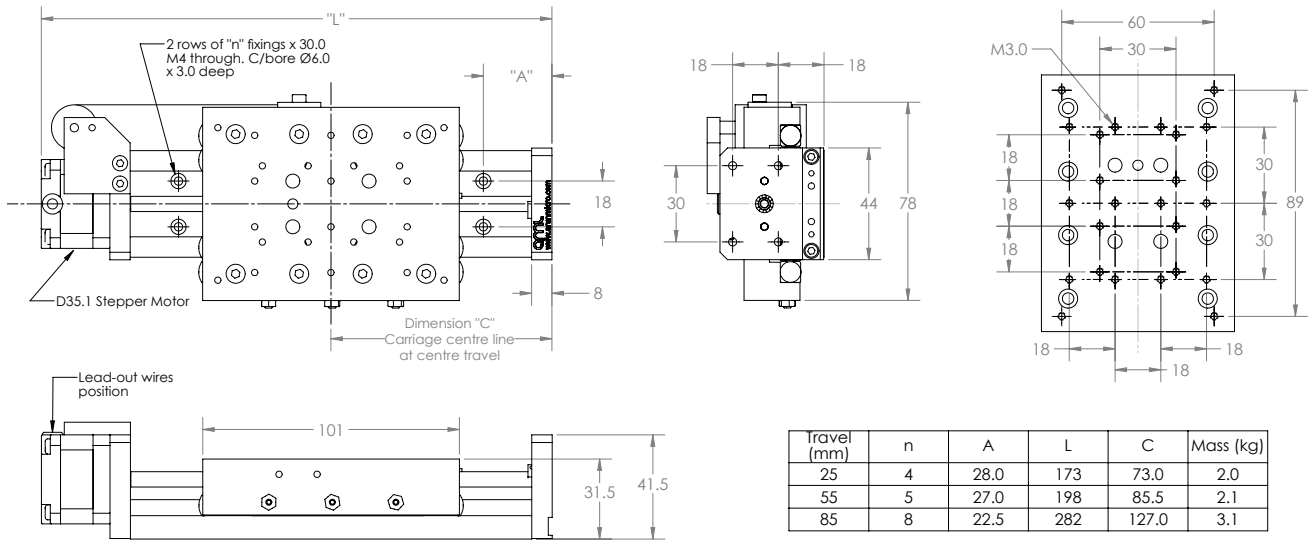
LUBRICATION: Running surfaces are dissimilar materials or dry lubricated with molybdenum disulfide. Leadscrews are lubricated with Nyetorr® 6300 UHV grease. Dry lubrication can be specified.

VERNIER STOP: These transporters may be driven to the vernier stops at the limits of their travel and stalled without damage.

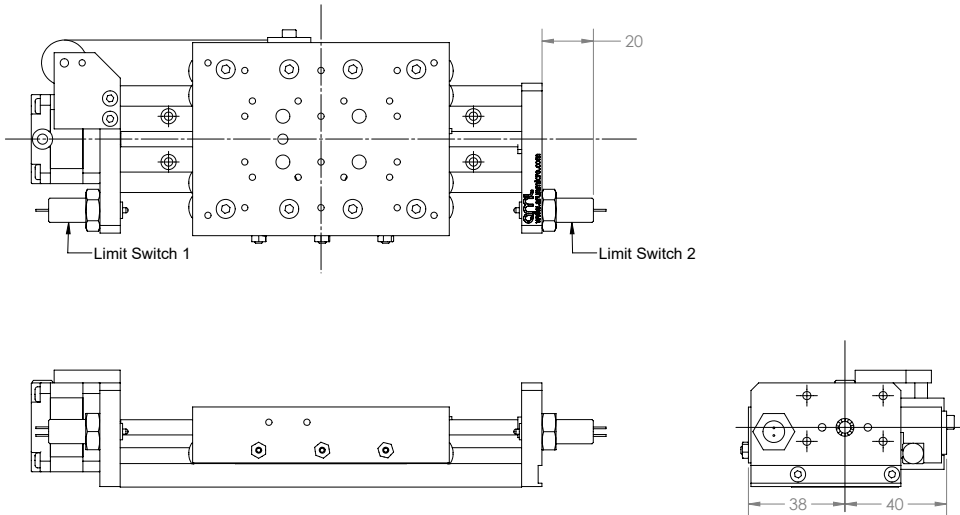
STACKED MECHANISMS: For 3-axis motion mount the stage moving the load vertically on top of the others to avoid adding their weight to its load.

DIMENSIONS

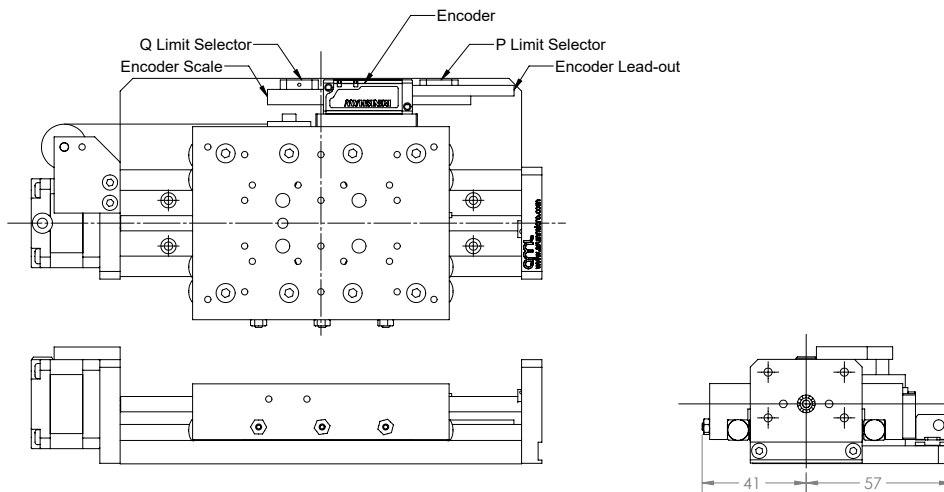
LTXL



LTXL-LS

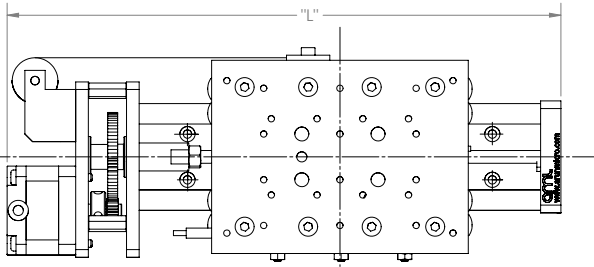


LTXL-E



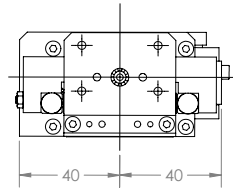
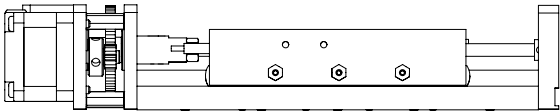
DIMENSIONS

LTXH

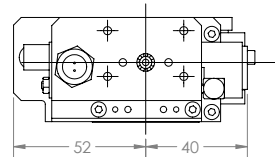
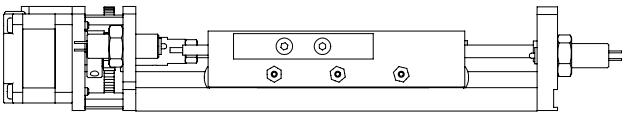
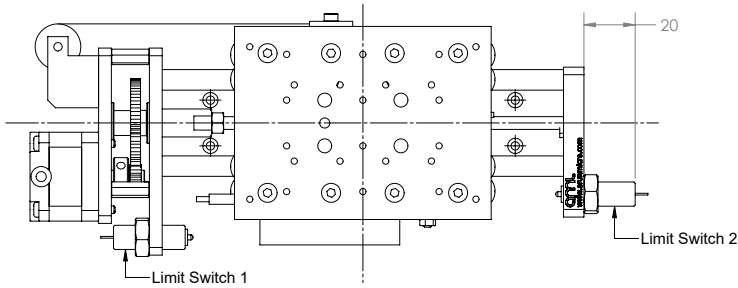


| Travel (mm) | L | C | Mass (kg) |
|-------------|-----|-------|-----------|
| 25 | 190 | 73.0 | 2.2 |
| 55 | 215 | 85.5 | 2.3 |
| 85 | 299 | 127.0 | 3.3 |

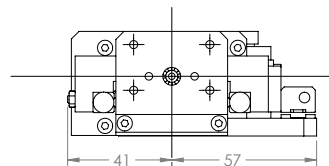
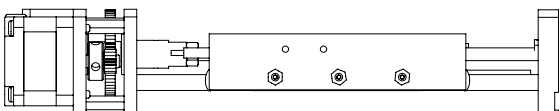
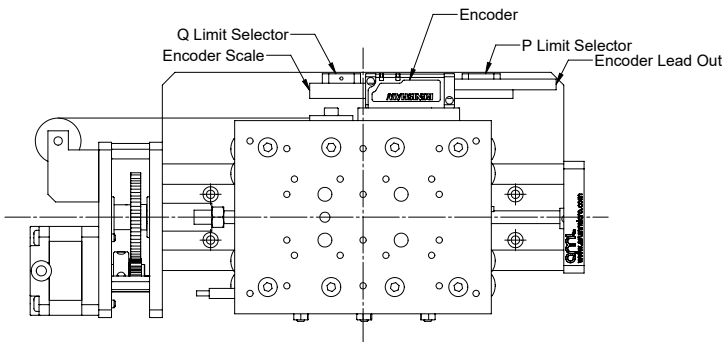
All other dimensions as LTXL



LTXH-LS



LTXH-E



ORDERING INFORMATION

| Order Code | |
|-------------|---|
| LTXL-xxx | Translation stage, 5 µm (xxx = travel in mm) |
| LTXL-xxx-LS | Translation stage, 5 µm with 2 x limit switches |
| LTXL-xxx-E | Translation stage, 5 µm with optical encoder |
| LTXH-xxx | Translation stage, 1 µm (xxx = travel in mm) |
| LTXH-xxx-LS | Translation stage, 1 µm with 2 x limit switches |
| LTXH-xxx-E | Translation stage, 1 µm with optical encoder |

Add suffix 'G' for Nyetorr® lubrication (at > 1 x 10⁹ mbar)

| Related Products | |
|------------------|--------------------------------|
| SMD210 | Stepper Motor Controller |
| SMD3 | Stepper Motor Drive |
| MLF18F | 18-way Electrical Feedthrough |
| MLF18NBL | 3 metre lead, SMD210 to MLF18F |



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AML pursues a policy of continuous improvement and reserves the right to make detail changes to specifications without consultation. E and OE.