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Find the *Newport M-UMR12.80* at our website: *Click HERE*

# High Load, Double Row, Ball Bearing Steel Linear Stages

UMR Series Double-Row Ball Bearing Linear Stages feature a robust steel construction and double-row ball bearings that provide excellent, smooth, linear travel while also capable of carrying high loads. The moving carriage is preloaded by two springs, ensuring constant contact with the micrometer and backlash-free motion. All micrometers sold separately.



- Linear, single axis, double row ball-bearing stages
- Widest selection of sizes and travel ranges
- Low-profile steel construction for high stability and rigidity
- Centered load capacities up to 200 lb
- Offered with & without thread mounted micrometers and <200 µrad deviation

**See All Features**

| Compare | Model | Maximum Stage Travel | Load Capacity | Thread Type | Availability | Price |
|---|---|---|---|---|---|---|
|  | **M-UMR12.40** Linear Stage, Single-Row Ball Bearing, 40 mm Travel, M5 and M6 | 40 mm | 400 N | M5 and M6 | In Stock | $615 |
|  | **M-UMR12.63** Linear Stage, Single-Row Ball Bearing, 63 mm Travel, M5 and M6 | 63 mm | 400 N | M5 and M6 | In Stock | $830 |
|  | **M-UMR12.80** Linear Stage, Single-Row Ball Bearing, 80 mm Travel, M5 and M6 | 80 mm | 400 N | M5 and M6 | In Stock | $952 |
|  | **M-UMR3.5** Linear Stage, Double-Row Ball Bearing, 5 mm Travel, M4 | 5 mm | 600 N | M4 | In Stock | $260 |
|  | **M-UMR5.16** Linear Stage, Double-Row Ball Bearing, 16 mm Travel, M3, M4 and M6 | 16 mm | 600 N | M3, M4 and M6 | In Stock | $264 |
|  | **M-UMR5.25** Linear Stage, Double-Row Ball Bearing, 25 mm Travel, M3, M4 and M6 | 25 mm | 600 N | M3, M4 and M6 | In Stock | $363 |
|  | **M-UMR5.5** Linear Stage, Double-Row Ball Bearing, 5 mm Travel, M3, M4 and M6 | 5 mm | 600 N | M3, M4 and M6 | In Stock | $363 |
|  | **M-UMR8.25** Linear Stage, Double-Row Ball Bearing, 25 mm Travel, M4 and M6 | 25 mm | 900 N | M4 and M6 | In Stock | $341 |
|  | **M-UMR8.4** Linear Stage, Double-Row Ball Bearing, 4 mm Travel, M4 and M6 | 4 mm | 900 N | M4 and M6 | In Stock | $341 |

**Notes:**

Actuators are not included. Please see specifications for recommended actuators. We also offer Aperture Versions.

## Specifications








| Models | UMR3.5 | UMR5.5 | UMR5.16 | UMR5.25 | UMR8.4 |
|---|---|---|---|---|---|
| Maximum Stage Travel | 5 mm | 5 mm | 16 mm | 25 mm | 4 mm |
| Load Capacity | 600 N | 600 N | 600 N | 600 N | 900 N |
| Vertical Load Capacity | 40 N | 40 N | 40 N | 40 N | 100 N |
| Thread Type [1] | 8-32 | 4-40, 8-32 and 1/4-20 | 4-40, 8-32 and 1/4-20 | 4-40, 8-32 and 1/4-20 | 8-32 and 1/4-20 |
| Platform Size | 29 x 38.5 mm | 50 x 58 mm | 50 x 58 mm | 50 x 68 mm | 80 x 92 mm |
| Angular Deviation | <100 µrad | <100 µrad | <200 µrad | <200 µrad | <200 µrad |
| Compliance in Roll | 0.7 mrad/Nm | 0.1 mrad/Nm | 0.1 mrad/Nm | 0.1 mrad/Nm | 0.05 mrad/Nm |
| Compliance in Pitch | 0.3 mrad/Nm | 0.2 mrad/Nm | 0.2 mrad/Nm | 0.2 mrad/Nm | 0.05 mrad/Nm |
| Compliance in Yaw | 0.5 mrad/Nm | 0.2 mrad/Nm | 0.2 mrad/Nm | 0.2 mrad/Nm | 0.05 mrad/Nm |



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| Models | UMR3.5 | UMR5.5 | UMR5.16 | UMR5.25 | UMR8.4 |
|---|---|---|---|---|---|
| Material | Steel | Steel | Steel | Steel | Steel |
| Bearings | Double-Row Ball Bearings | Double-Row Ball Bearings | Double-Row Ball Bearings | Double-Row Ball Bearings | Double-Row Ball Bearings |
| Drive Location | Center drive | Center drive | Center drive | Center drive | Center drive |
| Recommended BM Micrometer | BM11.5 | BM11.5 | BM11.16 | BM11.25 | BM17.04N |
| Recommended DM Differential Micrometer | DM11-5 | DM11-5 | DM11-16 | DM11-25 | |

**Notes:**

-M versions and Aperture Versions have the same specifications as the imperial versions shown.

1. M-UMR stages have M4 threads. M-UMR5 stages have M3, M4 & M6 threads. M-UMR8 stages have M4 & M6 threads.







| Models | UMR8.25 [1] | UMR8.51 [2] | UMR12.40 [3] | UMR12.63 [4] | UMR12.80 |
|---|---|---|---|---|---|
| Maximum Stage Travel | 25 mm | 50 mm | 40 mm | 63 mm | 80 mm |
| Load Capacity | 900 N | 900 N | 400 N | 400 N | 400 N |
| Vertical Load Capacity | 100 N | 100 N | 440 N | 440 N | 440 N |
| Thread Type | 8-32 and 1/4-20 | 8-32 and 1/4-20 | 10-24 and 1/4-20 | 10-24 and 1/4-20 | 10-24 and 1/4-20 |
| Platform Size | 80 x 92 mm | 80 x 118 mm | 120 x 142.5 mm | 120 x 166.5 mm | 120 x 210.5 mm |
| Angular Deviation | <200 µrad | 150 µrad | <200 µrad | <200 µrad | <200 µrad |
| Compliance in Roll | 0.05 mrad/Nm | 0.05 mrad/Nm | 0.02 mrad/Nm | 0.02 mrad/Nm | 0.02 mrad/Nm |
| Compliance in Pitch | 0.05 mrad/Nm | 0.05 mrad/Nm | 0.02 mrad/Nm | 0.02 mrad/Nm | 0.02 mrad/Nm |
| Compliance in Yaw | 0.05 mrad/Nm | 0.05 mrad/Nm | 0.02 mrad/Nm | 0.02 mrad/Nm | 0.02 mrad/Nm |
| Material | Steel | Steel | Alloy Steel | Alloy Steel | Alloy Steel |
| Bearings | Double-Row Ball Bearings | Double-Row Ball Bearings | Single-Row Ball Bearings | Double-Row Ball Bearings | Double-Row Ball Bearings |
| Drive Location | Center drive | Center drive | Center drive | Center drive | Center drive |
| Recommended BM Micrometer | BM17.25 | BM17.51 | BM25.40 | BM25.63 | BM32.80 |
| Recommended DM Differential Micrometer | DM17-25 | | | | |
| Recommended LTA Motorized Actuator | LTA-HL | LTA-HS | LTA-HS | LTA-HS | |

**Notes:**

-M versions and Aperture Versions have the same specifications as the imperial versions shown.

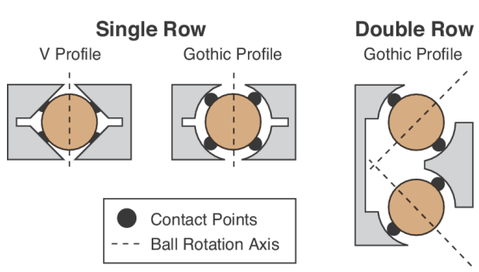
1. Can also be fitted with TRA25 or TRB25 motorized actuators when using the ADAPT-TRA25 adapter.
2. Requires ADAPT-BM17-375 adapter when used with LTA-HS actuator.
3. Travel limited to 40 mm and additional adapter is required when used with LTA-HS actuator.
4. Travel limited to 50 mm and additional adapter is required when used with LTA-HS actuator.

# Features

### Low Profile and a Wide Variety of Sizes

These UMR Linear Stages are offered with translation from 0.2 in (5 mm) all the way to 3.15 in (80 mm). Stages can be sold separately or with thread mounted micrometers of either 1 or 0.1 µm sensitivity to fit your particular need. Stages are also available with a center aperture for applications needing optical access.






The type of bearing way, ball

### Double-Row Ball Bearings for Smooth Travel & Heavier Loads

Ball bearing slides provide smoother translation from a rolling motion. Ball bearings are captured in guide ways by means of hardened steel rods with a gothic profile. This creates only two points of contact for minimal friction, and

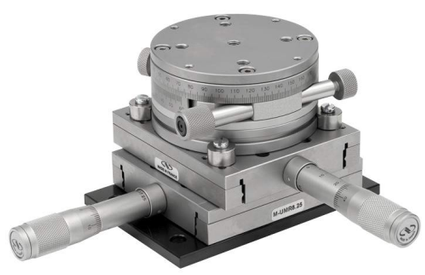

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The type of bearing way, ball diameter, and number of balls affect the load capacity of a stage.

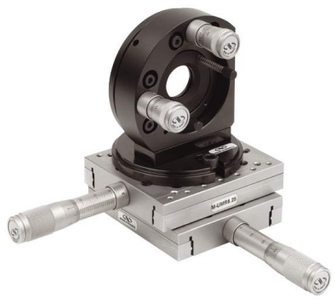
provides extremely smooth travel for even the smallest of incremental movements. Fewer points of contact also mean less differential slip and provide higher load capacities compared to the 4-point contact of other ball-bearing designs. The lower differential slip keeps friction and wear minimal, adding to the durability and lifetime of these stages.

### Easy Configuration

Abundant tapped hole patterns on these stages are included to provide the most options for mounting components on the stage mounting surface. Two stages can be easily stacked to provide X-Y translation as well as secure mounting to a table or breadboard with an optional M-PBN Mounting Base (not needed for UMR8 and UMR12). Vertical stage configurations can be easily assembled also using our EQ Series Angle Brackets. Additionally, UMR Stages are compatible with UTR and URM Rotation Stages and BGM Goniometers, which provide countless configuration possibilities to fit the needs of both smaller and larger scale optical systems.



Two UMR5.25 stages with a UTR rotation stage.



Two UMR stages with an SL optical mount.

### Optical Mount Application

Low profile UMR stages work great for XY positioning of optical mounts in optical systems.

### Compatible Bases and Brackets

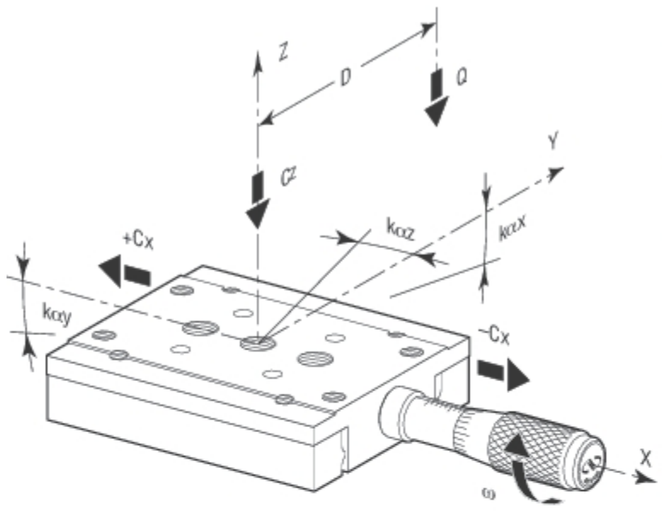
Brackets and bases are available for creating multiaxis configurations of UMR stages. PBN Series steel base plates are used to connect stages with bottom-surface mounting holes to support structures that are inaccessible from below, such as breadboards and optical tables. EQ Series Angle Brackets are made with an open-corner design to allow more mounting space and easier access to adjustments. These right-angle brackets are available in either an exterior (-E) or interior (-I) model, for a building X-Z and X-Y-Z motion control in a wider variety of configurations.



| UMR Stages | Base Plates | Angle Brackets |
|---|---|---|
| UMR3.5 | M-PBN3 | 339232, 339233 |
| UMR5.16(A) | M-PBN5 | EQ50-E, EQ50-I |
| UMR5.25(A) | | |
| UMR8.4 | M-PBN8 | EQ80-E, EQ80-I |
| UMR8.25(A) | | |
| UMR8.51 | | |
| UMR12.40(A) | M-PBN12 | EQ120-E, EQ120-I |
| UMR12.63 | | |
| UMR12.80 | | |


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## UMR Stage Load Characteristics




| | |
|---|---|
| Cz, | Normal centered load capacity |
| -Cx, | Axial load capacity in the direction toward the actuator |
| +Cx, | Axial load capacity in the direction away from the actuator |
| Kαx, | Compliance in roll |
| Kαy, | Compliance in pitch |
| Kαz, | Compliance in yaw |
| ω, | Drive torque for +Cx = 10 N |
| Q, | Off-center load (N) $Q \leq Cz \div (1 + D/a)$ |
| | Where D = Cantilever distance (mm) |
| | a = Construction parameter (mm) |

| Model | Cz | -Cx | +Cx [BM] (1) | +Cx [DM] (2) | a | ω | Kαx | Kαy | Kαz |
|---|---|---|---|---|---|---|---|---|---|
| | (N) | | | | (mm) | (Nm) | (mrad/Nm) | | |
| **UMR3.5** | 600 | 10 | 40 | 30 | 20 | 0.04 | 0.7 | 0.3 | 0.5 |
| **UMR5.5** | 600 | 12 | 40 | 30 | 22 | 0.05 | 0.1 | 0.2 | 0.2 |
| **UMR5.16** | 600 | 15 | 40 | 30 | 22 | 0.05 | 0.1 | 0.2 | 0.2 |
| **UMR5.25** | 600 | 11 | 40 | 30 | 22 | 0.05 | 0.1 | 0.2 | 0.2 |
| **UMR8.4** | 900 | 18 | 100 | 50 | 40 | 0.07 | 0.05 | 0.05 | 0.05 |
| **UMR8.25** | 900 | 17 | 100 | 50 | 40 | 0.07 | 0.05 | 0.05 | 0.05 |
| **UMR8.51** | 900 | 11 | 100 | – | 40 | 0.07 | 0.05 | 0.05 | 0.05 |
| **UMR12.40** | 400 | 35 | 450 | – | 70 | 0.08 | 0.02 | 0.02 | 0.02 |
| **UMR12.63** | 400 | 25 | 450 | – | 70 | 0.08 | 0.02 | 0.02 | 0.02 |
| **UMR12.80** | 400 | 20 | 450 | – | 70 | 0.08 | 0.02 | 0.02 | 0.02 |

*1) With a BM micrometer head.* *2) With a DM differential micrometer head.*

# Accessories

### UMR Stage Accessories

| Compare | Description | Drawings, CAD & Specs | Avail. | Price |
|---|---|---|---|---|
|  | **M-PBN3** Base Plate, Used with UMR3.5 Linear Stage | | In Stock | $58 |
|  | **M-PBN5** Base Plate, Used with UMR5 Series, MVN50 & UTR46 Series | | In Stock | $68 |
|  | **M-PBN8** Base Plate, Used with UMR8 Series, MVN80 & UTR80 Series | | In Stock | $91 |
|  | **M-PBN12** Base Plate, Used with UMR12 Series, MVN120 & UTR120 Series | | In Stock | $114 |
|  | **FP22-80** Fixed Positioning Kit, UMR12.80 | | In Stock | $35 |
|  | **FP18-40** Fixed Positioning Kit, UMR12.40 | | 2 Weeks | $35 |
|  | **FP3-5** Fixed Positioning Kit, UMR3.5 | | In Stock | $55 |
|  | **ADAPT-TRA25** Actuator Adapter, TRA25, Opto-Mechanical Components | | In Stock | $66 |
|  | **ADAPT-BM17-375** Motorized Actuator Adapter, UMR8 to VP-25AA, LTA-HS, TRA or PZA12 | | In Stock | $55 |
|  | **ADAPT-BM25-375** Motorized Actuator Adapter, UMR12 to VP-25AA and PZA12 | | In Stock | $55 |

### Carriage Locks

Carriage locking kits includes a screw that mounts in the stage body opposite the actuator. Two carriage locks are required for fixed positioning.

| Compare | Description | Drawings, CAD & Specs | Avail. | Price |
|---|---|---|---|---|
|  | **CL12-25** Carriage Lock, UMR8.25, 2 Req. for Fixed Positioning | | In Stock | $35 |
|  | **CL18-63** Carriage Lock, UMR12.63 | | In Stock | $35 |
|  | **CL12-51** Carriage Lock, UMR8.51, 2 Req. for Fixed Positioning | | In Stock | $35 |

| Compare | Description | Drawings, CAD & Specs | Avail. | Price |
|---|---|---|---|---|
|  | **CL12-4** Carriage Lock, UMR8.4, 2 Req. for Fixed Positioning | | In Stock | $35 |
|  | **CL18-40** Carriage Lock, UMR12.40 or UMR12.40A | | In Stock | $35 |
|  | **CL3-5** Carriage Lock, UMR3.5 | | 2 Weeks | $46 |
|  | **CL6-5** Carriage Lock, UMR5.5, 2 Req. for Fixed Positioning | | In Stock | $35 |
|  | **CL22-80** Carriage Lock, UMR12.80 | | In Stock | $34 |
|  | **CL6-16** Carriage Lock, UMR5.16, 2 Req. for Fixed Positioning | | In Stock | $35 |
|  | **CL6-25** Carriage Lock, UMR5.25, 2 Req. for Fixed Positioning | | In Stock | $35 |

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