

## High-Load Linear Actuator

Dynamic, High-Resolution Precision Drive with DC Motor and Direct Position Measuring



### M-238

- Optional: Linear encoder for direct position measuring
- High load capacity to 400 N
- Travel range 50 mm
- Resolution to 0.1  $\mu\text{m}$
- Velocity to 30 mm/s

#### Reference-class linear drive

High-resolution, high-load linear actuator. Highly dynamic, closed-loop DC motors for high velocities.

#### High-quality components

Recirculating ball screw provides high velocity and long lifetime. Low-friction output shaft bearing can handle lateral forces to 100N. Nonrotating end piece for uniform motion prevents wobble, torque, and wear at the point of contact. Includes flat and spherical end piece for decoupling of lateral and tilt forces. Noncontact limit switches protect the mechanical system. A direction-sensing reference point switch supports automation applications

#### Highly accurate position measuring with incremental encoder

Noncontact optical encoders measure the position directly at the platform with the greatest accuracy. Nonlinearity, mechanical play or elastic deformation have no influence on the measurement.

#### Application fields

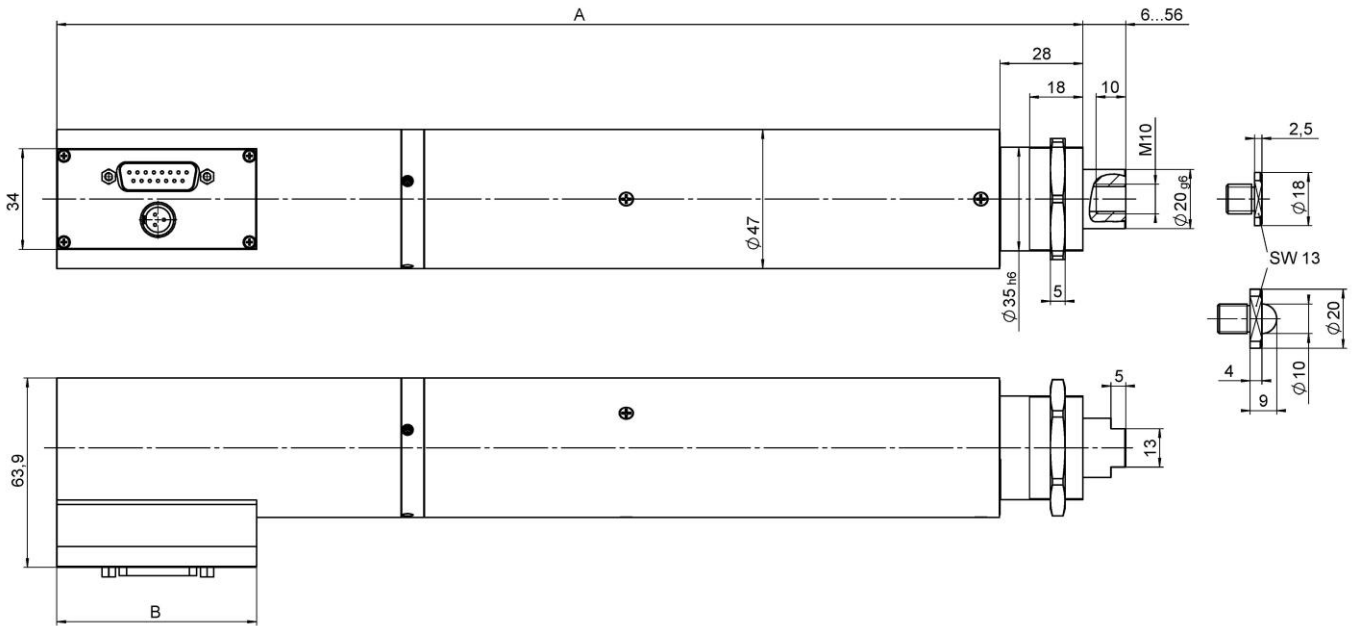
Precision alignment, external drive element for guided systems.

## Specifications

|                                      | M-238.5PG                       | M-238.5PL                             | Unit | Tolerance |
|--------------------------------------|---------------------------------|---------------------------------------|------|-----------|
|                                      | Rotary encoder on motor shaft   | Highest precision with linear encoder |      |           |
| <b>Motion and positioning</b>        |                                 |                                       |      |           |
| Travel range                         | 50                              | 50                                    | mm   |           |
| Integrated sensor                    | Rotary encoder                  | Linear encoder                        |      |           |
| Sensor resolution                    | 4000 cts/rev                    | 0.1 μm                                |      |           |
| Design resolution                    | 0.13                            | 0.1                                   | μm   | typ.      |
| Minimum incremental motion           | 0.5                             | 0.3                                   | μm   | typ.      |
| Backlash                             | 3                               | 1                                     | μm   | typ.      |
| Unidirectional repeatability         | ±1                              | ±0.3                                  | μm   | typ.      |
| Velocity                             | 30                              | 30                                    | mm/s | max.      |
| Reference point switch repeatability | 1                               | 1                                     | μm   | typ.      |
| <b>Mechanical properties</b>         |                                 |                                       |      |           |
| Drive screw pitch                    | 2                               | 2                                     | mm   |           |
| Gear ratio                           | 3.71:1                          | 3.71:1                                |      |           |
| Push/pull force                      | 400                             | 400                                   | N    | max.      |
| Permissible lateral force            | 100                             | 100                                   | N    | max.      |
| <b>Drive properties</b>              |                                 |                                       |      |           |
| Motor type                           | DC motor, ActiveDrive           | DC motor, ActiveDrive                 |      |           |
| Motor voltage                        | 24 V                            | 24 V                                  | V    |           |
| Motor power                          | 80                              | 80                                    | W    | nominal   |
| <b>Miscellaneous</b>                 |                                 |                                       |      |           |
| Operating temperature range          | -10 to 50                       | -10 to 50                             | °C   |           |
| Material                             | Aluminum anodized, chrome steel | Aluminum anodized, chrome steel       |      |           |
| Mass                                 | 2.4                             | 2.4                                   | kg   | ±5 %      |
| Cable length                         | 3                               | 3                                     | m    | ±10 mm    |
| Connector                            | Sub-D 15                        | Sub-D 15                              |      |           |
| Recommended controllers/drivers      | C-863<br>C-884                  | C-863<br>C-884                        |      |           |

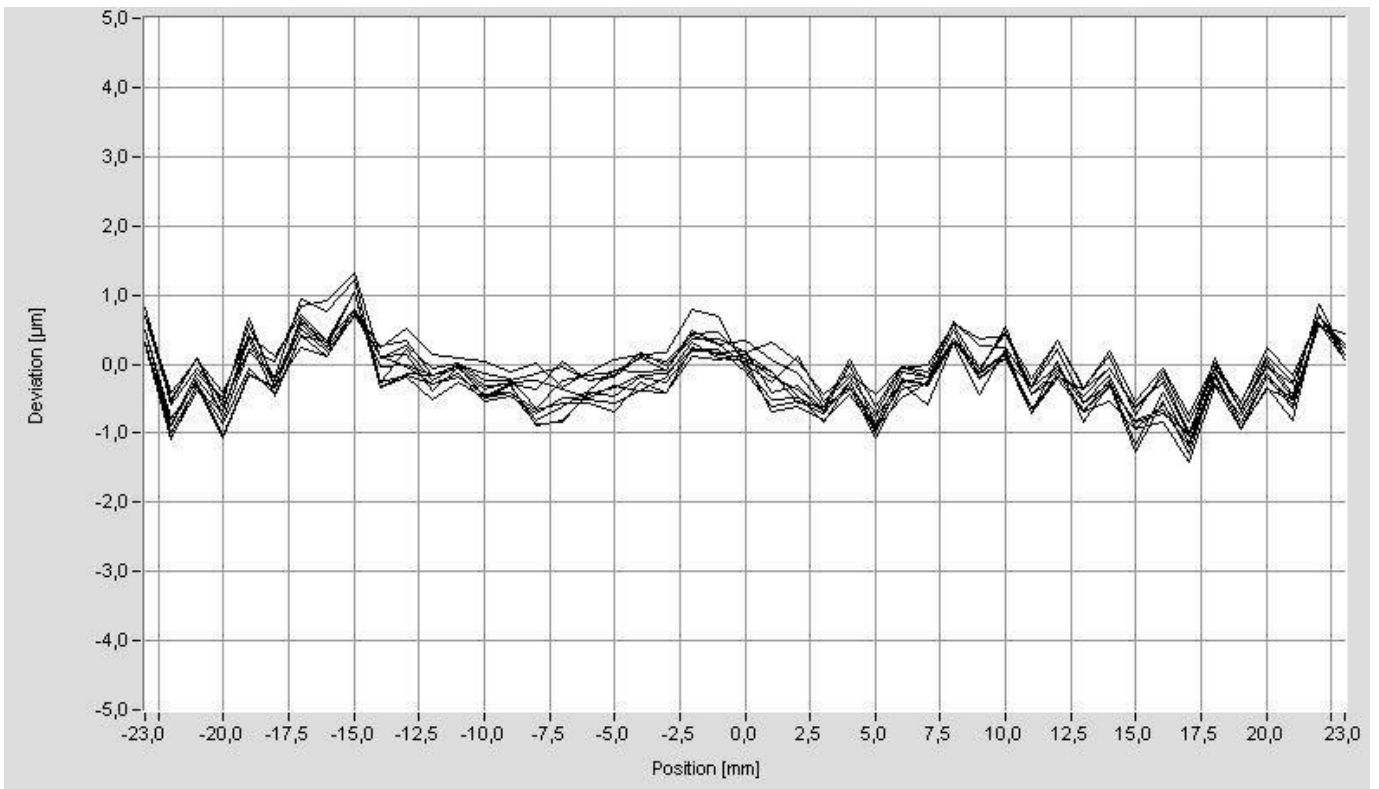
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## Drawings / Images

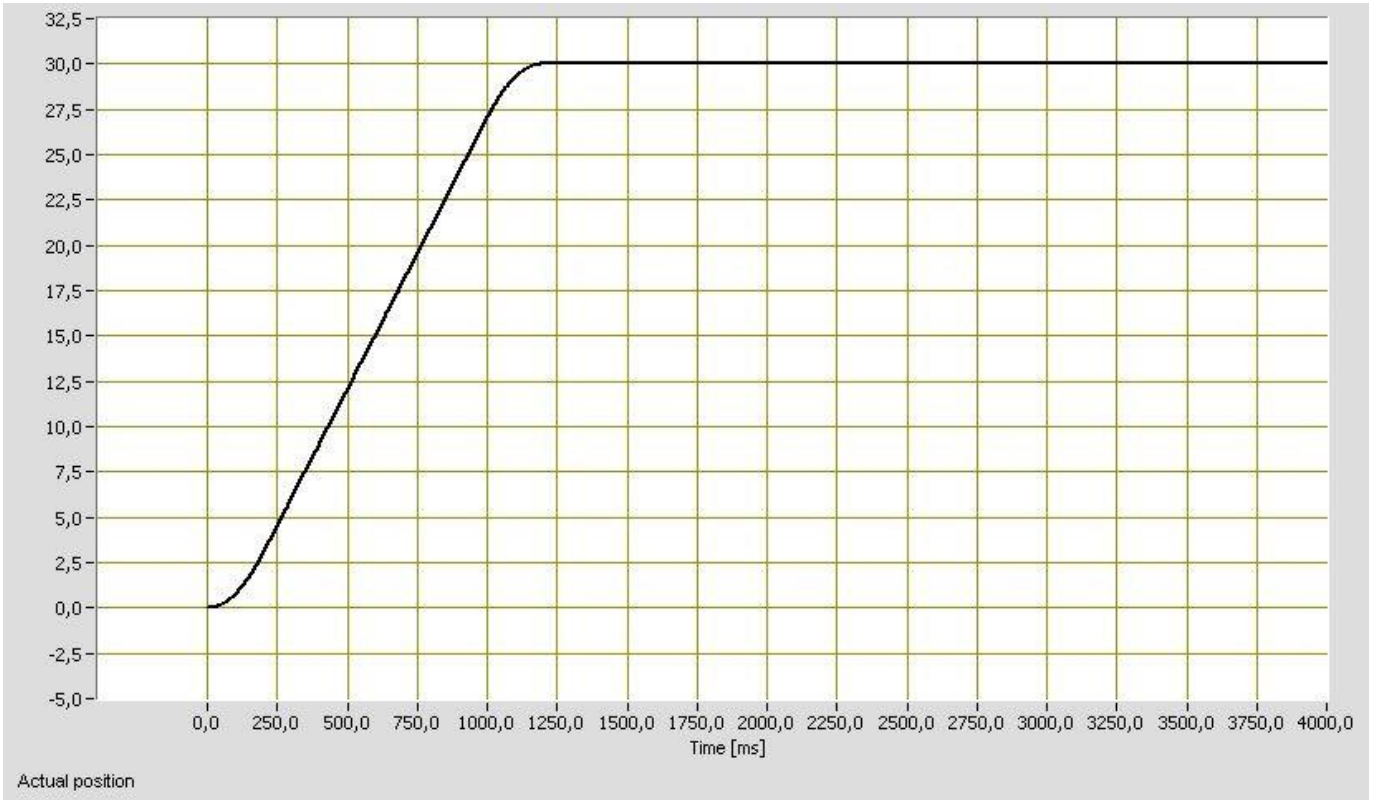


|           | A     | B    |
|-----------|-------|------|
| M-238.5PL | 336,2 | 90   |
| M-238.5PG | 347,2 | 67,6 |

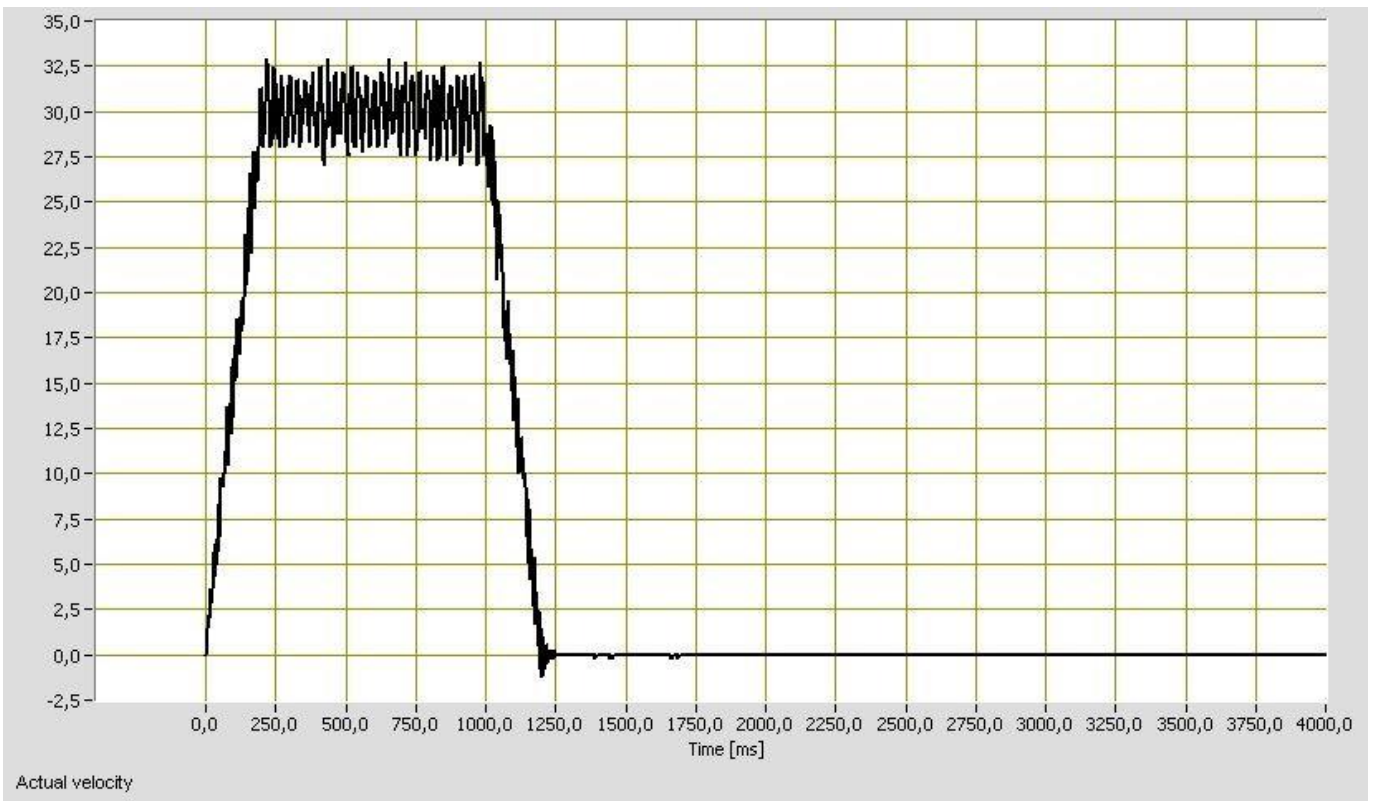
M-238, dimensions in mm



The repeatability of the M-238.5PL with linear encoder is less than 0.3 µm.



*The M-238 requires less than 1.5 seconds for a 30-mm step.*



*The velocity constancy of an M-238.5PL at 30 mm/s.*

## Ordering Information

### **M-238.5PG**

High-load linear actuator, 400 N, 50 mm, DC gear motor, ActiveDrive

### **M-238.5PL**

High-load linear actuator, 400 N, 50 mm, DC gear motor, ActiveDrive, direct position measuring