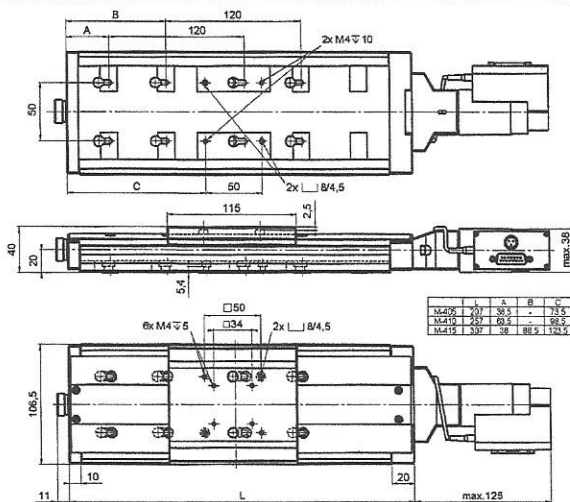
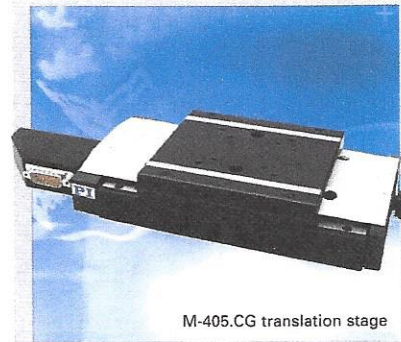




M-405.DG, M-410.DG, M-415.DG, M-405.PD, M-410.PD and M-415.PD  
dimensions in mm, cable length 3 m, Sub-D connector 15-pin



M-405.CG translation stage

## Technical Data

| Model                         | M-405.CG /<br>M-410.CG /<br>M-415.CG                     | M-405.DG /<br>M-410.DG /<br>M-415.DG *                   | M-405.PD /<br>M-410.PD /<br>M-415.PD                                          | M-405.2S /<br>M-410.2S /<br>M-415.2S | Units      |
|-------------------------------|----------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------|------------|
| <b>Motion and positioning</b> |                                                          |                                                          |                                                                               |                                      |            |
| Travel range                  | 50 / 100 / 150                                           | 50 / 100 / 150                                           | 50 / 100 / 150                                                                | 50 / 100 / 150                       | mm         |
| Integrated sensor             | Rotary encoder                                           | Rotary encoder                                           | Rotary encoder                                                                | –                                    |            |
| Sensor resolution             | 2048                                                     | 2000                                                     | 4000                                                                          |                                      | cts./rev.  |
| <b>Encoder bandwidth</b>      |                                                          |                                                          |                                                                               |                                      |            |
| Design resolution             | 0.0035                                                   | 0.0085                                                   | 0.125                                                                         | 0.0781                               | μm         |
| Min. incremental motion       | 0.1                                                      | 0.1                                                      | 0.25                                                                          | 0.1                                  | μm         |
| Unidirectional repeatability  | 0.2                                                      | 0.2                                                      | 0.2                                                                           | 0.2                                  | μm         |
| Bidirectional repeatability   | 2                                                        | 2                                                        | 2                                                                             | 2                                    | μm         |
| Pitch, yaw                    | ±25 / ±50 / ±75                                          | ±25 / ±50 / ±75                                          | ±25 / ±50 / ±75                                                               | ±25 / ±50 / ±75                      | μrad       |
| Max. velocity                 | 0.7                                                      | 1.5                                                      | 15                                                                            | 3.5                                  | mm/s       |
| <b>Mechanical properties</b>  |                                                          |                                                          |                                                                               |                                      |            |
| Spindle pitch                 | 0.5                                                      | 0.5                                                      | 0.5                                                                           | 0.5                                  | mm         |
| Gear ratio                    | 69.12:1                                                  | (28/12)*1 ≈ 29.6:1                                       |                                                                               |                                      |            |
| Motor resolution              | –                                                        | –                                                        | –                                                                             | 6400*                                | steps/rev. |
| Max. load                     | 200                                                      | 200                                                      | 200                                                                           | 200                                  | N          |
| Max. push / pull force        | 40 / 40                                                  | 50 / 50                                                  | 50 / 50                                                                       | 50 / 50                              | N          |
| Max. lateral force            | 150                                                      | 150                                                      | 150                                                                           | 150                                  | N          |
| <b>Drive properties</b>       |                                                          |                                                          |                                                                               |                                      |            |
| Motor type                    | DC-motor,<br>gearhead                                    | DC-motor,<br>gearhead                                    | ActiveDrive™<br>DC Motor                                                      | 2-phase<br>stepper motor*            |            |
| Operating voltage             | 0 to ±12                                                 | 0 to ±12                                                 | 0 to ±24                                                                      | 24                                   | V          |
| Electrical power              | 2                                                        | 3                                                        | 30                                                                            | –                                    | W          |
| Limit and reference switches  | Hall-effect                                              | Hall-effect                                              | Hall-effect                                                                   | Hall-effect                          |            |
| <b>Miscellaneous</b>          |                                                          |                                                          |                                                                               |                                      |            |
| Operating temperature range   | -20 to +65                                               | -20 to +65                                               | -20 to +65                                                                    | -20 to +65                           | °C         |
| Material                      | Aluminum, steel                                          | Aluminum, steel                                          | Aluminum, steel                                                               | Aluminum, steel                      |            |
| Mass                          | 2                                                        | 2.1                                                      | 2.1                                                                           | 2.1                                  | kg         |
| Recommended controller/driver | C-863 (single-axis)<br>C-843 PCI board<br>(up to 4 axes) | C-863 (single-axis)<br>C-843 PCI board<br>(up to 4 axes) | C-863 (single-axis, p. 4-114)<br>C-843 PCI board (p. 4-120)<br>(up to 4 axes) | C-663 (single-axis)<br>(p. 4-112)    |            |

\*2-phase stepper motor, 24 V chopper voltage, max. 0.8 A/phase, 400 full steps/rev., motor resolution with C-663 stepper motor controller

## Linear Actuators & Motors

## Nanopositioning / Piezoelectrics

## Nanometrology

## Micropositioning

## Hexapod 6-Axis Systems / Parallel Kinematics

## Linear Stages

### Translation (X)

Vertical (Y)

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Single-Channel

Hybrid

Multi-Channel

## Micropositioning Fundamentals

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