

Technical drawing of a bellows assembly, showing side, front, and detail views with dimensions in mm.

**Side View (Top):**

- Total length = Stroke + 582 (732)<sup>a)</sup> + 2 x Block length of bellows
- Dimensions: 87+FB (81), 450 (600)<sup>a)</sup>, Stroke, 57+FB (51), 70.5, 40.5, 6.
- Block length: nx 160
- End block dimensions: 50, 20, 100, 30.2, 34.

**Front View (Bottom):**

- Dimensions: 120 (160)<sup>a)</sup>, 360 (510)<sup>a)</sup>, 120, 360 ± 0.02, 40.2, 120, 360.
- Internal features: 10 JS9,3,2 deep, M10 15 deep, M20 x15 12 deep.
- Left side detail: 3, 17, 4.6, 80F8, 24x7, 6885 8x7x25, 50, 20, 100, 30.2, 34.

**Detail View (Right):**

- Dimensions: 455, 79, 69.3, 50, 69.3, 400, 120, 41, 17, 26, 17.5, 6.
- Internal features: M10 20 deep, Ø 8, 8.5 deep.
- Stop angle.

**Notes:**

- a) Data in brackets refer to long carriage
- Outlet for internal screw holes for short strokes

**SSS**

|                              |          |
|------------------------------|----------|
| Basic length without stroke: | 65.20 kg |
| 100 mm stroke:               | 5.20 kg  |
| Entire carriage 450 mm:      | 26.20 kg |
| Entire carriage 600 mm:      | 33.80 kg |

Max. total length: 3000 mm

SSS

|                    |                     |
|--------------------|---------------------|
| Max. total speed:  | 2.00 m/s            |
| Max. acceleration: | 20 m/s <sup>2</sup> |
| Repeat accuracy:   | ± 0.03 mm (KGT)     |
| Idle torque:       | 2.50 Nm             |



Diagram illustrating the forces and moments acting on the 6-DOF piezoelectric actuator. The actuator is shown in a perspective view, with a central rectangular block and two sets of piezoelectric actuators (black blocks) on the top and bottom surfaces. The forces and moments are labeled as follows:

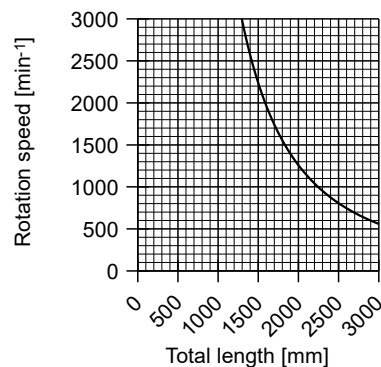
- $+F_x$  (Force along the x-axis)
- $+M_x$  (Moment about the x-axis)
- $+F_y$  (Force along the y-axis)
- $+M_y$  (Moment about the y-axis)
- $+F_z$  (Force along the z-axis)
- $+M_z$  (Moment about the z-axis)

|                       | SSS           |
|-----------------------|---------------|
| <b>Forces</b>         | Dynamic [N]   |
| <b>F<sub>x</sub></b>  | 18000         |
| <b>F<sub>y</sub></b>  | 14000         |
| <b>F<sub>z</sub></b>  | 120000        |
| <b>-F<sub>z</sub></b> | 80000         |
| <b>Moments</b>        | Dynamic [Nm]  |
| <b>M<sub>x</sub></b>  | 12000         |
| <b>M<sub>y</sub></b>  | 10000 (13000) |
| <b>M<sub>z</sub></b>  | 5000 (6000)   |

Data in brackets refer to long carriage (600)

**KG T**

|                      |                                             |
|----------------------|---------------------------------------------|
| Max. rotation speed: | 3000 min <sup>-1</sup>                      |
| Diameter:            | 40 mm                                       |
| Pitch:               | 5 / 10 / 20 / 40 mm                         |
| Moment of inertia:   | 1.34 · 10 <sup>-3</sup> kgm <sup>2</sup> /m |



**Example for stroke of 500 mm:**

Stroke / 52 = Number of pleats  
 Number of pleats · 3 – 2 = Block length of bellows (FB)

500 mm / 52 = 9.62 => **10** pleats (rounded up)  
**10** · 3 – 2 = **28** mm simple block length (FB)