

General technical data

WIESEL™ POWERLine®, DYNALine®, VARIOLine™, WO, SLT

Linear speeds

The linear speed achieved by a linear drive unit depends on the lead of the mechanical drive element and on the input rotational speed. The various linear speeds which can be achieved by the individual sizes are listed in the following table:

Drive element	Lead [mm]	n_{max} [rpm]	v_{max} [m/s]
TGT ¹⁾	4	1500	0.1
	8	1500	0.2
	12	1500	0.3
	16	1500	0.4
KGT ²⁾	4	3000	0.2
	5	3000	0.25
	10	3000	0.5
	20	3000	1
	40	3000	2
	50	3000	2.5
VARIOLine™		3000	1.5
ZRT ³⁾ 20ATL5	120	1250	2.5
ZRT ³⁾ 25ATL10	170	882	2.5

1) TGT: Trapezoidal screw drive

2) KGT: Ball screw drive

3) ZRT: Toothed belt drive

Installed position

The linear drive units can be installed in almost any position, provided that all the forces and moments occurring remain below the maximum values for the axis concerned.

Security advice

The ball screw drives in all three sizes are generally *not self-locking*. It is therefore advisable to install suitable motors with holding brake, particularly if the linear drive unit is installed vertically. If the toothed belt breaks, the load is released. Therefore safety precautions have to be taken for applications which are critical with regard to security.

Maximum forces

All maximum forces and moments provided refer to the center/top of the power bridge. Load overlay at several coordinates: If compound loads occur, with force and moment components in more than one direction, the maximum permissible loads must be reduced to 60% of the specified maximum values. When forces and moments are overlaid in two or three coordinates, it is necessary to reduce the maximum permissible load to 60% of the maximum value.

Load ratings

See page 96

Duty cycle

In practice, the following values have been proven.

Drive element:

For a trapezoidal screw the upper limit should be $\leq 30\%$ per hour, linear ball guides allow duty cycles up to 100%. Extremely high loads in combination with high duty cycles can reduce the life.

Guidance element:

For a sliding guide the upper limit should be $\leq 30\%$ per hour, linear ball guides allow duty cycles up to 100%.

Temperature

All series are designed for continuous operation at ambient temperatures up to 80°C (176°F). Temperatures up to 100°C (212°F) are also permitted for brief periods. The linear drive units are not suitable for operation at subzero temperatures.

Idle torques

The given values are means from a series of measurements. The effective values may differ in individual cases.

Straightness/torsion

The aluminum profiles are extruded sections which may display deviations in straightness and torsion due to their manufacturing process. The tolerance of these deviations is defined in DIN 17 615. The deviations found in Precision Technology USA, Inc. linear drive units corresponding to these limits are worst case, but are normally well below. In order to obtain the required guide accuracy, the linear drive unit must be aligned with the aid of leveling plates or clamped from a mounting surface machined with sufficient accuracy. This ensures that tolerances of at least 0.1 mm/1000 mm are achieved.

Cover strip

for WIESEL™ POWERLine®

WIESEL™ DYNALine®

WIESEL™ VARIOLine™

WIESEL™ SLT 10/15

Material: Polyamide 12

Characteristics:

- Resistant to alkaline solutions
- Conditionally resistant to acids
- Tough/rigid
- Abrasion-proof
- Little absorption of humidity
- Light resistant

Guide tube

All the components of a linear drive unit except the mechanical drive element are accommodated in a guide tube which is mounted either to the bottom of a driven WIESEL™ or is installed parallel to a driven WIESEL™. It takes higher loads and load

moments. All WIESEL™ models are also available as guide tube (except WIESEL™ DYNALine®, VARIOLine™).

Stroke length

The stroke length specified in the order code represents the maximum possible linear displacement. Acceleration and deceleration paths must be taken into account when designing the system, together with any overrun required. Entering the safety zone leads to mechanical collisions and must be prevented with suitable safety measures (safety limit switch, software queries, etc.)

Repeatability

The repeatability is defined as the capability of a linear drive unit to repeatedly reach an actual position it has reached before under the same conditions. It refers to the average position variation according to VDI/DGQ 3441. The repeatability is influenced, among other things, by:

- Load
- Speed
- Deceleration/acceleration
- Direction of travel
- Temperature

Aggressive working environments

The mechanical drive and the guidance of the WIESEL™ are well protected against dirt by means of the patented cover strip. In cases of heavy dirt and dust particles, an additional bellow is recommended. Available upon request.

Maintenance

The mechanical components (ball screw drive and linear ball bearing guide) must be lubricated via the grease nipple on the power bridge with the aid of a grease gun after 400 hours of operation or at least every three months. On the WM40, one lubrication nipple is used to lubricate the linear guideway, while the second lubrication point supplies the ball screw drive with grease. The cover strip should also be lubricated at the same time in order to prevent premature wear. Grease: rolling bearing grease (original grease Fuchs Lubritec URETHYN E/M1).

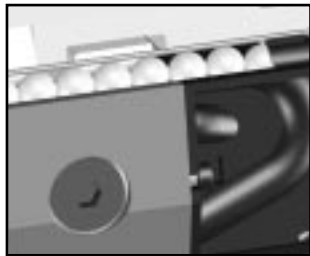
Tensioning of the toothed belt

The tensioning of the toothed belt can be adjusted with the aid of the tensioning screws on the guide casing which are intended for this. The linear units are delivered with optimal tension values in order to guarantee security and functionality. Changes in this adjustment must be carried out in service cases and by Precision Technology USA, Inc. service engineers.

New: WIESEL™ VARIOLine™

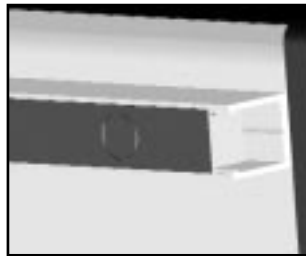
Here's how to get to grips with things

The new WIESEL™ VARIOLine™ really makes your decision for a handling unit with increased lateral forces easy. Precision Technology USA, Inc. has already integrated many functions perfectly in this ready-to-install solution. Ideal for changing workpieces, gripping or inserting – for all of these uses, the high screw leads now make it possible to combine high speed and high precision. This not only saves you in-house design effort, it also saves valuable space. So if you are looking for a particularly efficient way of feeding workpieces into a workspace, here is your chance.



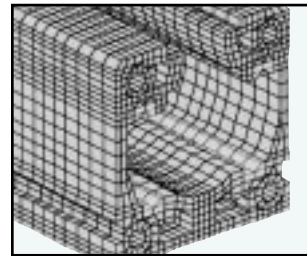
Integrated guidance system

The integrated Precision Technology USA, Inc. linear ball bearing guidance system in the tubular section and the robust ball sleeve on the piston rod absorb high forces and moments.



Integrated design

Adjustable limit switches are already installed.



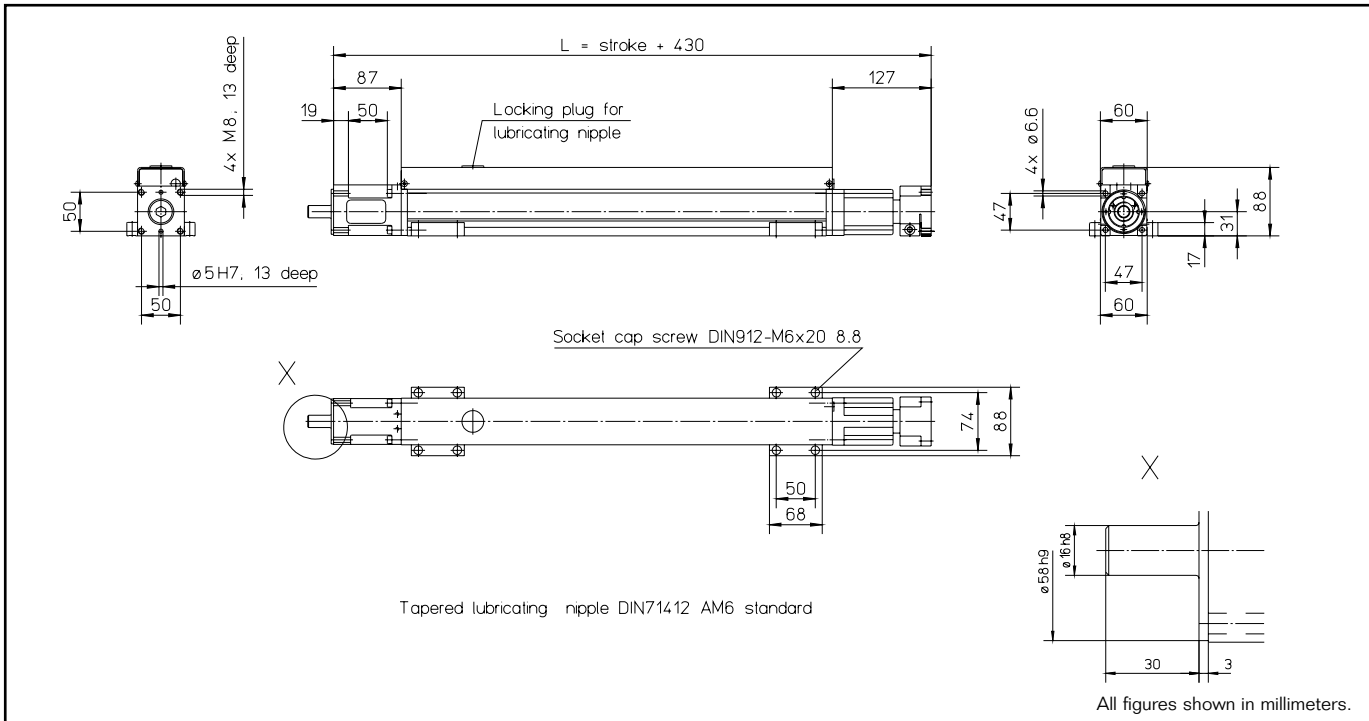
FEM optimized design

Maximum power density through FEM optimized design.



WIESEL™ VARIOLine™ WZ60

with ball screw drive and integrated linear ball bearing drive



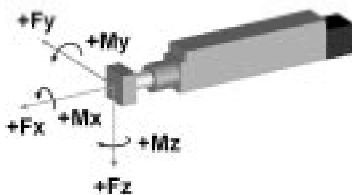
Technical data

- Linear speed:max. 1.5 m/s
- Repeatability:± 0.02 mm
- Acceleration:max. 20 m/s²
- Rotational speed:3000 rpm
- Drive element:ball screw with backlash free
single nut
- Diameter:20 mm
- Lead:5, 20, 50 mm
- Stroke length:max 400 mm
- Geometrical moment of inertia:ly 5.8 x 10⁵ mm⁴
lz 5.9 x 10⁵ mm⁴

Weights

- Basic unit with zero stroke:4.5 kg
- 100 mm stroke:0.77 kg
- Mass to be moved without stroke:1.8 kg
- Mass to be moved per 100 mm stroke:0.26 kg
- Provided:4 pieces KAO mounting brackets

Loads and load moments



Load	dynam. [N]
Fx drive	2800
Fy	see diagram
±Fz	see diagram
Load moment	dynam. [Nm]
Mx	50

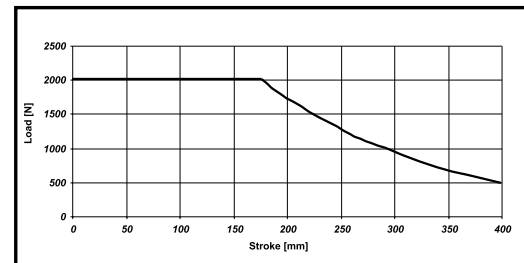
Unit conversions

- Length:** 1 m=1000 mm=39.37 inches
1 inch=25.4 mm
- Force:** 1 N=0.225 lbf
1 lbf=4.45 N
- Moment of Force:** 1 Nm=0.738 lb · ft=8.85 lb · inches
1 lb · ft=1.36 Nm

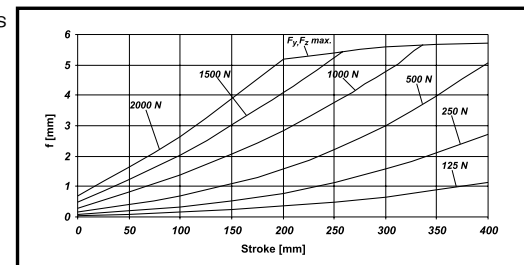
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Idle torques [Nm]

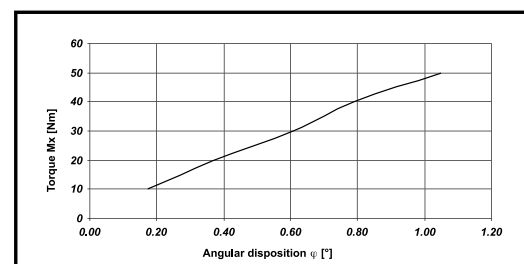
Rotational speed [rpm]	Lead P [mm]		
	5	20	50
150	0.5	0.9	1.2
1500	0.9	1.4	1.8
3000	1.3	1.6	2.0



Max side load Fy, Fz



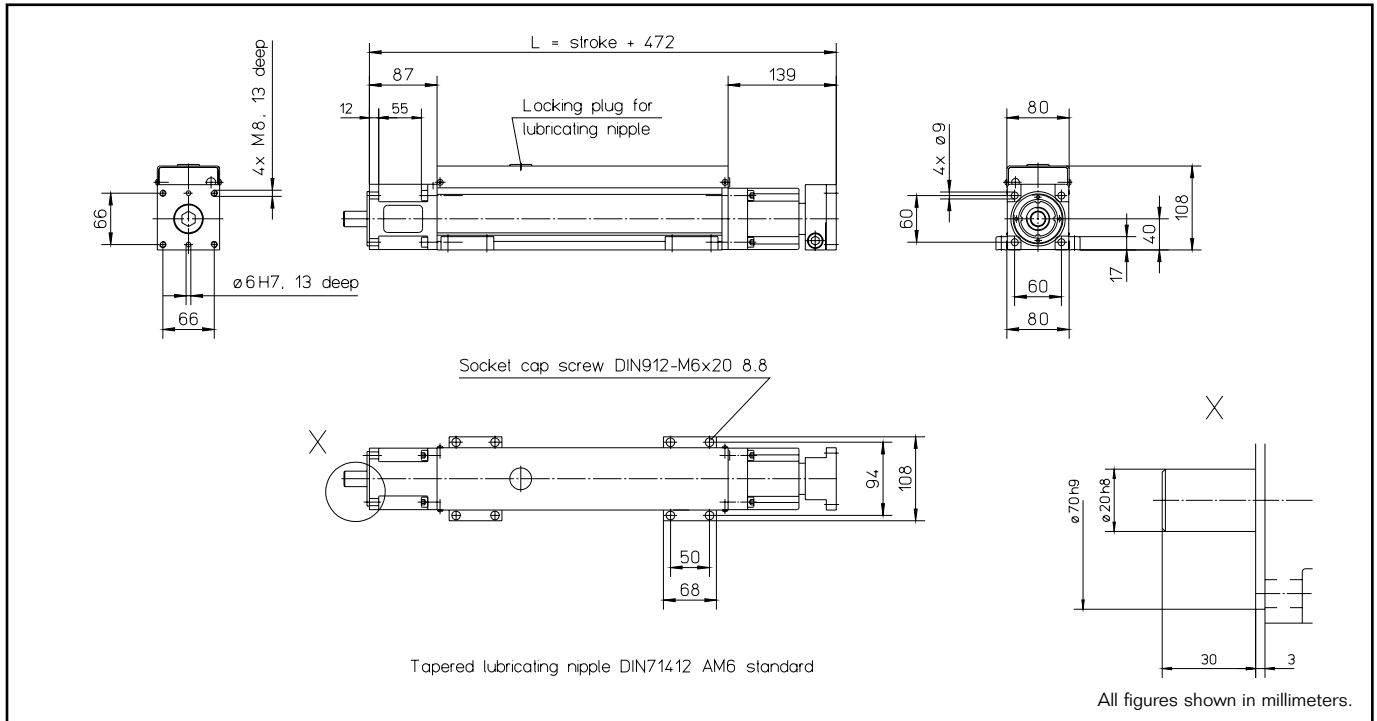
Deflection due to Fy, Fz



Torsion

WIESEL™ VARIOLine™ WZ80

with ball screw drive and integrated linear ball bearing drive



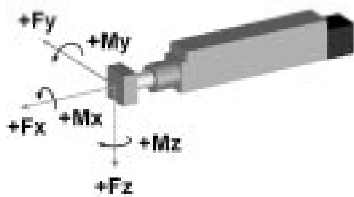
Technical data

Linear speed:max. 1.5 m/s
 Repeatability:± 0.02 mm
 Acceleration:max. 20 m/s²
 Rotational speed:3000 rpm
 Drive element:ball screw with backlash free
 single nut
 Diameter:25 mm
 Lead:5, 10, 20, 50 mm
 Stroke length:max 500 mm
 Geometrical moment of inertia:ly 1.9 x 10⁶ mm⁴
 lz 1.9 x 10⁶ mm⁴

Weights

Basic unit with zero stroke:7.5 kg
 100 mm stroke:1.35 kg
 Mass to be moved without stroke:3.0 kg
 Mass to be moved per 100 mm stroke:0.5 kg
 Provided:4 pieces KAO mounting brackets

Loads and load moments



Load	dynam. [N]
Fx drive	3500
Fy	see diagram
±Fz	see diagram
Load moment	dynam. [Nm]
Mx	150

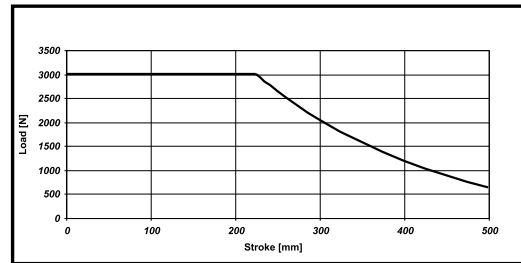
Unit conversions

Geometrical moment of inertia:	1 m ⁴ =10 ¹² mm ⁴ =2.4025 x 10 ⁶ in ⁴
Mass moment of inertia:	1 kg · m ² =10 ⁴ kg · cm ² =0.738 lb · ft · s ²
Mass:	1 kg=2.2 lb

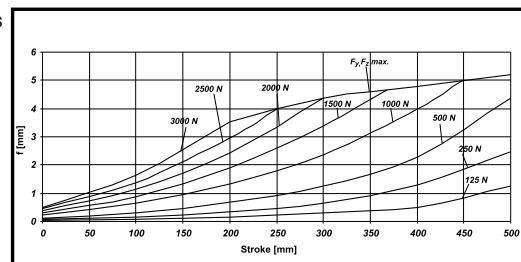
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Idle torques [INm]

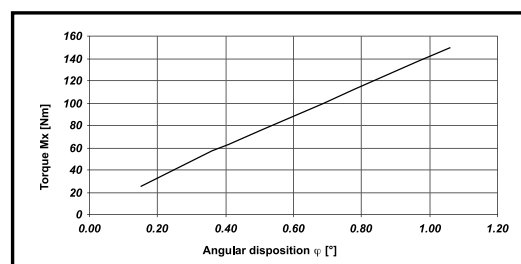
Rotational speed [rpm]	Lead P [mm]			
	5	10	20	50
150	0.6	1.1	1.3	1.8
1500	1.1	1.5	1.6	2.2
3000	1.4	1.8	1.8	2.7



Max side load Fy, Fz



Deflection due to Fy, Fz



Torsion