Spindle Drive

Ball screw

105 N

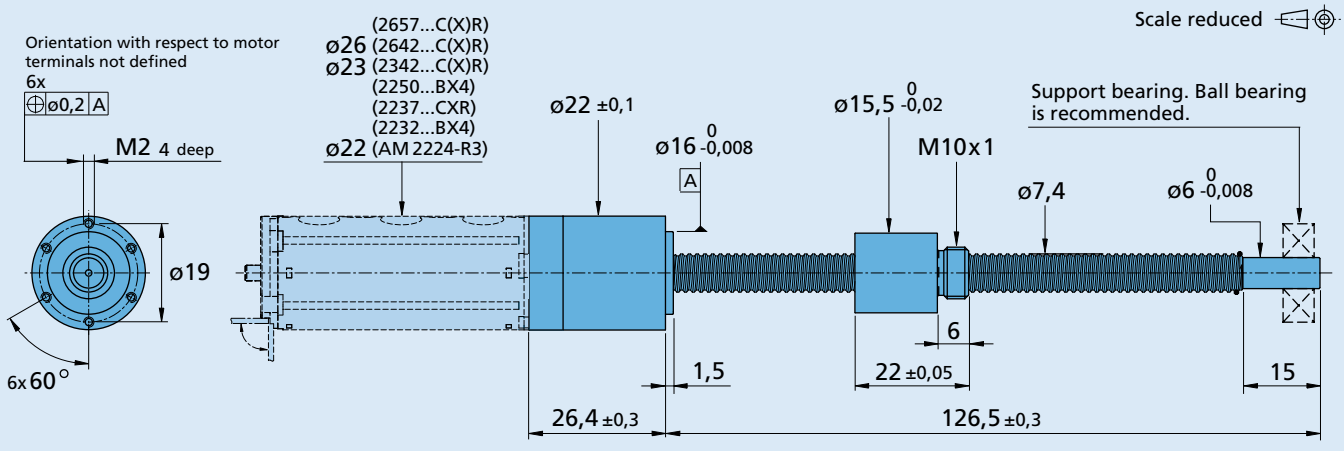
For combination with
DC-Micromotors
Brushless DC-Servomotors
Stepper Motors

Series BS22-1.5

			BS22-1.5	
Screw length, standard			126,5	mm
Stroke, standard			94	mm
Pitch	P_h		1,5	mm
Mean actual travel deviation e_{0a}:				
– maximum permissible	e_p		5 (According to accuracy class 1)	µm
Tolerance of travel variation	v_{up}		5 (According to accuracy class 1)	µm
Efficiency, max.	$\eta_{max.}$		89	%
Operating temperature range		–35 ... +100		°C
Bearing		ball bearings, preloaded		
Axial load capacity:				
– dynamic	C_{am}	≤ 519		N
– static	C_{oa}	≤ 475		N
Shaft load, max.:				
– radial (50 mm from mounting face)	$F_{max\ rad}$	≤ 43		N
Screw nut:				
– axial play		≤ 5		µm
– radial runout		≤ 12		µm
Screw nut load, max.:				
– radial	$F_{max\ rad}$	≤ 23		N
Material				
– screw		stainless steel		
– nut		stainless steel		
– balls		stainless steel		
Direction of rotation		right hand thread		

Recommended values - mathematically independent of each other				
Continous axial load, max.	$F_{m\ max.}$		105	N
Intermittent axial load, max.	$F_{p\ max.}$		470	N
Rotational speed, max.			5 000	rpm
Linear speed, max.			125	mm/s

Note: Specifications are valid over the whole entire travel according to ISO 3408.
A clean and contamination/dust free operating environment is required for performance as specified in the datasheet.
Do not remove the nut from the screw! No relubrication allowed.



BS22-1.5

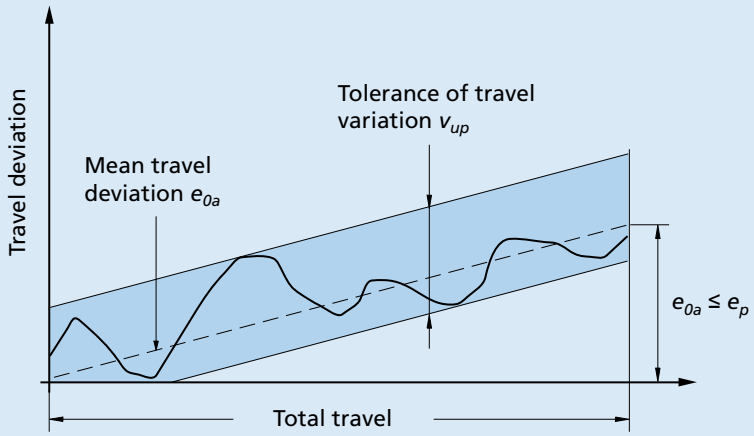
Typical pitch variation

Note:

The diagram indicates the travel deviation in relation to the entire travel for a given ambient temperature of 22°C.

The pitch deviation leads to a total mean travel deviation e_{0a} limited to the total travel by the e_p value. Addtional short bandwidth travel deviations can run parallel to the mean travel deviation.

This bandwidth is limited over the entire travel by the total travel tolerance value v_{up}.



Efficiency

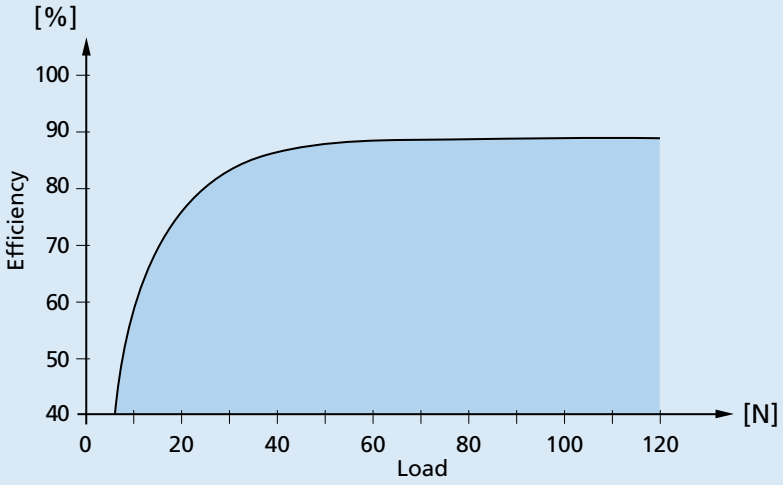
Note:

The diagram indicates the efficiency in relation to the load for a given ambient temperature of 22° C.

The specified efficiency $\eta_{max.}$ is the maximum value for the spindle/nut system. It decreases with reduced load as shown in the curve.

$$M_{mot} = \frac{F_m \cdot P_h}{2\pi \cdot \eta}$$

M_{mot} Required motor torque [mNm]
F_m Continous axial load [N]
P_h Pitch [mm]
η Efficiency [%]



Features

Ball screw calculations - gerneral formulas

The theoretical lifetime is generally defined by the total number of revolutions. The lifetime can also be expressed in hours or in total travel distance.

Life cycle calculation:

$$L_{rev} = \left(\frac{C_{am}}{F_m}\right)^3 \cdot 10^6 \qquad L_h = \frac{L_{rev}}{n_m \cdot 60} \qquad L_s = P_h \cdot \left(\frac{C_{am}}{F_m}\right)^3 \cdot 10^3$$

L_{rev} Lifetime in revolutions [rev]
L_h Lifetime in hours [h]
L_s Lifetime in meters [m]
C_{am} Dynamic axial load capacity [N]
F_m Continous axial load [N]
n_m Equivalent motor speed [min^{-1}]
P_h Pitch, lead [mm]

On request

Customer specific versions are available upon request to meet the requirements of the most areas of applications such as medical, automation, or aerospace. The possible modifications:

- Customer specific nuts, ball screw lengths and ball screw ends
- Modified pitch
- Modified load capacities
- Reduced (up to zero) backlash
- Customer specific surface treatment
- Ceramic balls
- Special lubrication for vacuum capability and extended temperature range

... and much more.

Please contact your local area sales engineer for more information and support.