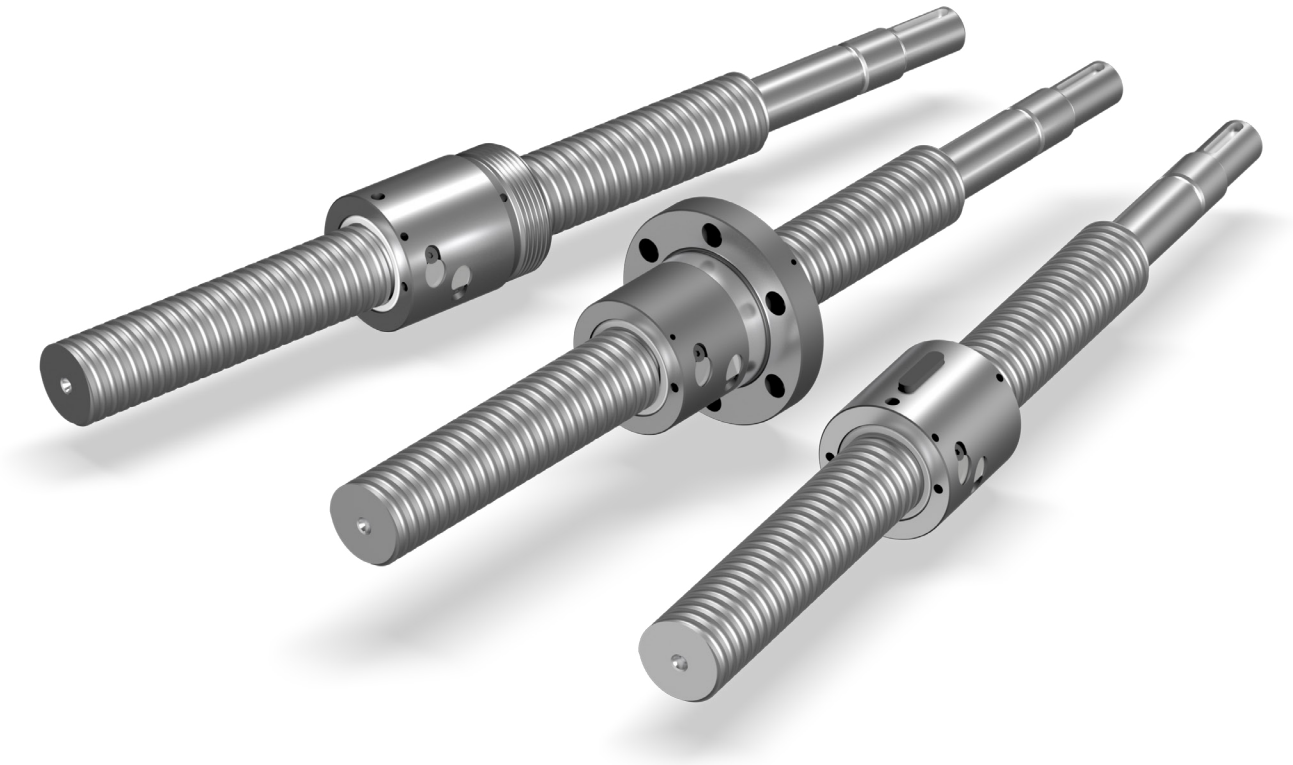
EWELLIX

MAKERS IN MOTION

SP SERIES

Ewellix precision ball screws

High precision and low noise ball screws for machine tool, automation and high duty applications

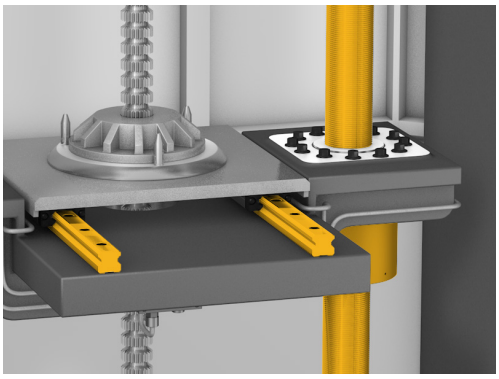


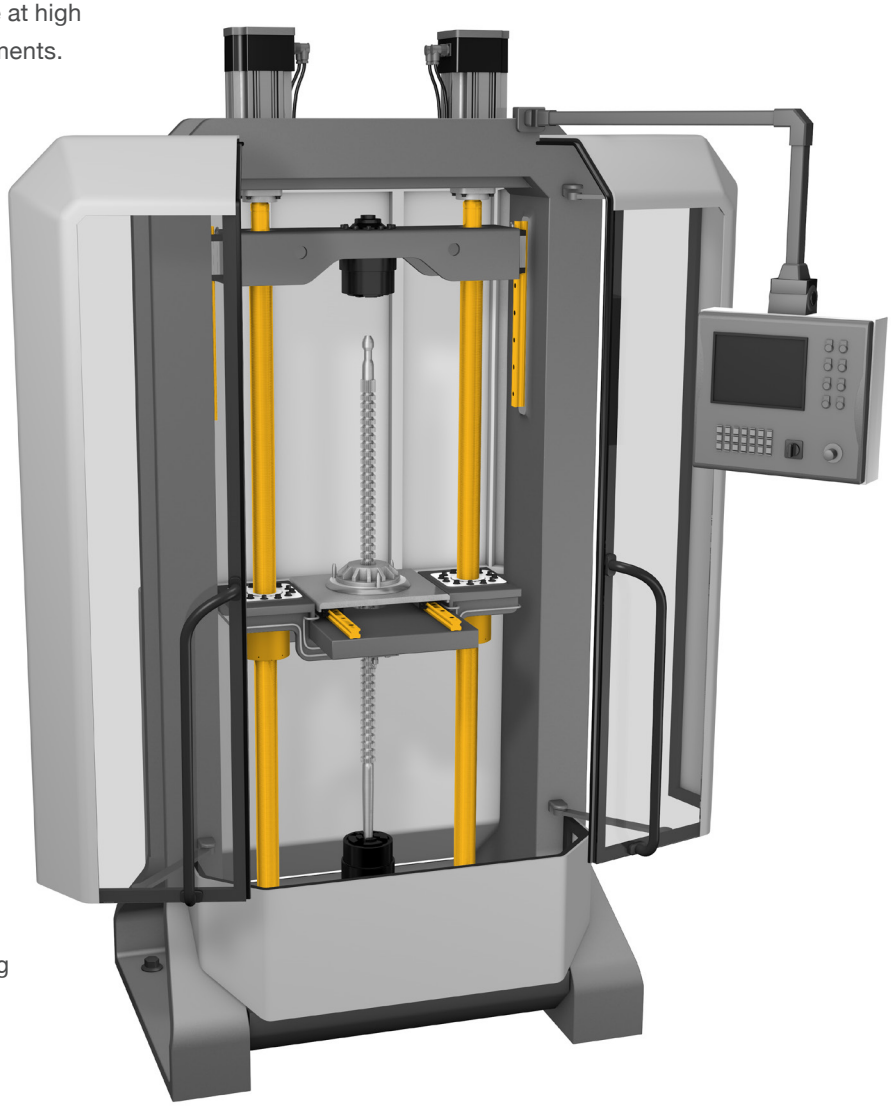
Ewellix high performance precision ball screws – SP Series

Made in the USA

High precision and low noise ball screws for machine tool, automation and high duty applications

Today's automated equipment manufacturers need components and systems that offer high reliability, precision and repeatability with low noise. The new Ewellix high performance precision ball screws do this while giving manufacturers a wide range of design flexibility. Enabling precise positioning for demanding applications, these quiet-running ball screws operate at high speeds with low friction and minimal service requirements. Robust and capable of handling high thrust loads, the screws are supplied in a standard range of nut types and available as customized solutions to meet any application requirement.

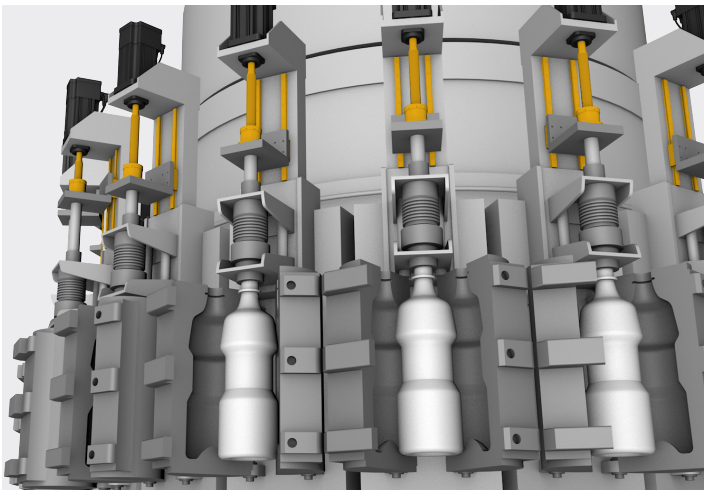




Broaching machine

Optimized design features for your application

Ewellix high performance precision ball screws open up new design and performance options for equipment manufacturers. Designers can extend machine reliability, increase speed and output, and reduce noise for a wide range of applications.



Improved nut design

Balls are picked up smoothly for a new highly optimized ball recirculation path resulting in optimal performance.

- Reduces tangential efforts on the recirculating balls
- Enables up to 25% higher speed limits (ndo < 100,000)
- Reduces noise levels
- Enables smoother running
- Provides much longer service life
- High positioning accuracy

External interface

The SP Series assortment offers easy mounting with:

SP – cylindrical design

- Machined outside diameter
- Includes machined key

SPF – integral flange design

- Machined outside diameter and flange face
- Six bolt holes for mounting

SPT – universal, threaded-nose design

- Interchangeable with most existing standard solutions
- Same attachment as existing SX series

Typical applications

- Gantry milling machine
- Precision grinding machine
- Honing machine
- Servo presses
- Oil and gas
- Material handling

Lead precision

Manufacturing precision

Generally speaking, the precision indicated defines the lead precision that complies with ISO standards, e.g. G3, G5, etc. (↳ **table 1**).

Parameters other than lead precision correspond in standard to class 5 of ISO 3408–3:2006. If the application requires special tolerances, ISO class 3 or ISO class 1, please specify these requirements in the inquiry.

Lead precision

Ewellix offers a variety of high precision solutions to meet the requirements of a growing market. Using equipment at the cutting edge of today's machining capability allows for the precise control of the thread machining. Ewellix positioning ball screws offer the accuracy and performance level of a G5 positioning screw as defined by ISO 3408-3. Standard lead precision is G5, with G3 or G1 lead precision available on request.

Screw lead precision class is primarily defined by the maximum permitted travel variation V300p over a threaded length of 300 mm (↳ **table 2**). Lead precision is measured at 20 °C on the useful stroke l_u. At Ewellix l_u is the threaded length of the shaft minus twice the length l_e equal to the screw nominal diameter (↳ **table 2** and **fig. 1**).

Some customer applications require a travel compensation c to account for the effect of operating temperature on the lead precision:

- Standard case with c = 0 (↳ **fig. 2**)
- Case with specific value of c (↳ **fig. 3**)

Table 1

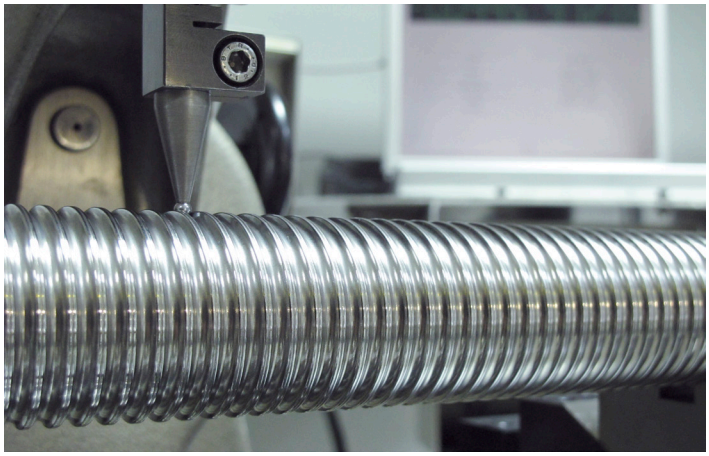
Maximum permitted travel variation over 300 mm

G1	G3	G5
V_{300p} µm	V_{300p}	V_{300p}
6	12	23

Table 2

Travel deviation and maximum permitted travel variation over the useful travel l_u

		G1		G3		G5	
l_u over	incl.	e_p	v_{up}	e_p	v_{up}	e_p	v_{up}
mm		µm					
0	**315**	6	6	12	12	23	23
315	**400**	7	6	13	12	25	25
400	**500**	8	7	15	13	27	26
500	**630**	9	7	16	14	32	29
630	**800**	10	8	18	16	36	31
800	**1 000**	11	9	21	17	40	34
1 000	**1 250**	13	10	24	19	47	39
1 250	**1 600**	15	11	29	22	55	44
1 600	**2 000**	18	13	35	25	65	51
2 000	**2 500**	22	15	41	29	78	59
2 500	**3 150**	26	17	50	34	96	69
3 150	**4 000**	32	21	62	41	115	82
4 000	**5 000**			76	49	140	99
5 000	**6 300**					170	119



Lead precision measurement

Symbols used in figs. 1 to **3**

l_u = useful travel

l_e = excess travel (no lead precision required)

l_0 = nominal travel

l_s = specified travel

c = travel compensation (difference between l_s and l_0 to be defined by the customer)

e_p = tolerance over the specified travel

V = travel variation (or permissible band width)

V_{300p} = maximum permitted travel variation over 300 mm

V_{up} = maximum permitted travel variation over the useful travel l_u

V_{300a} = measured travel variation over 300 mm

V_{ua} = measured travel variation over l_u

Fig. 1

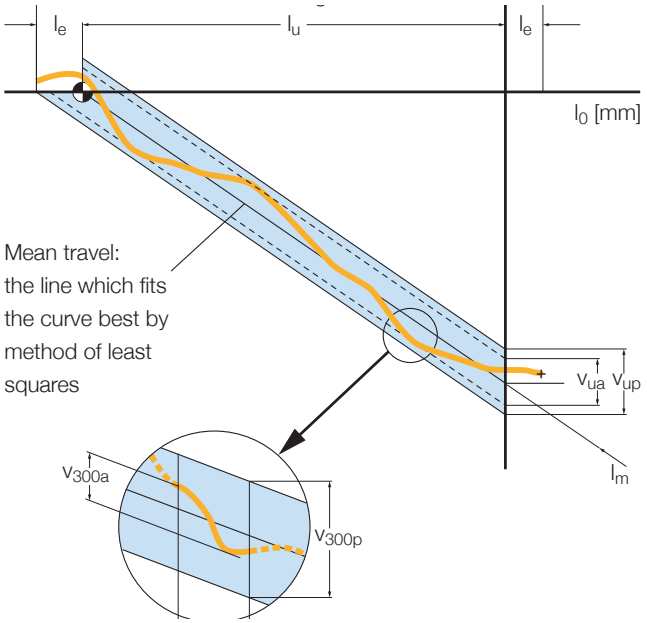


Fig. 2

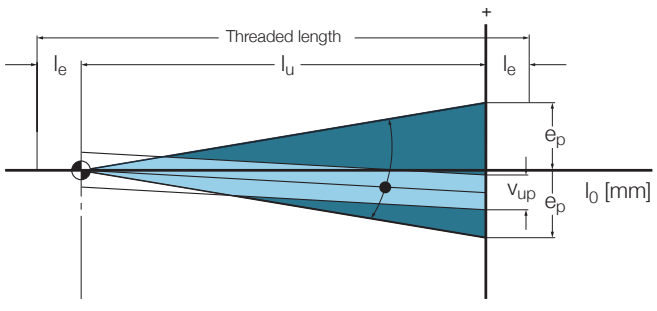
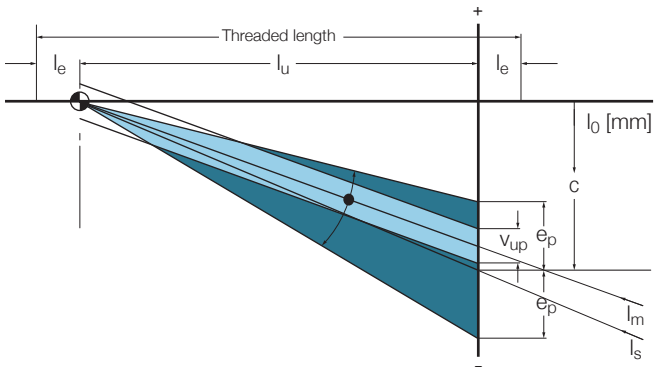
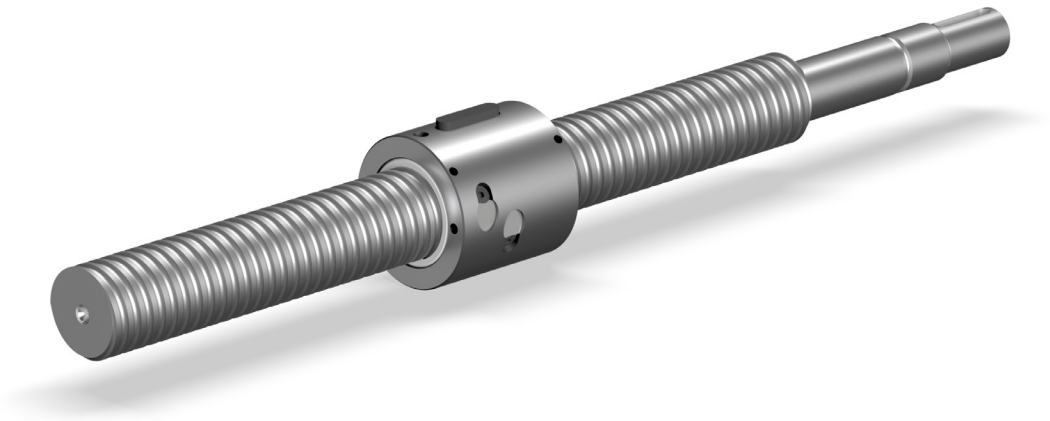


Fig. 3



SP cylindrical nut

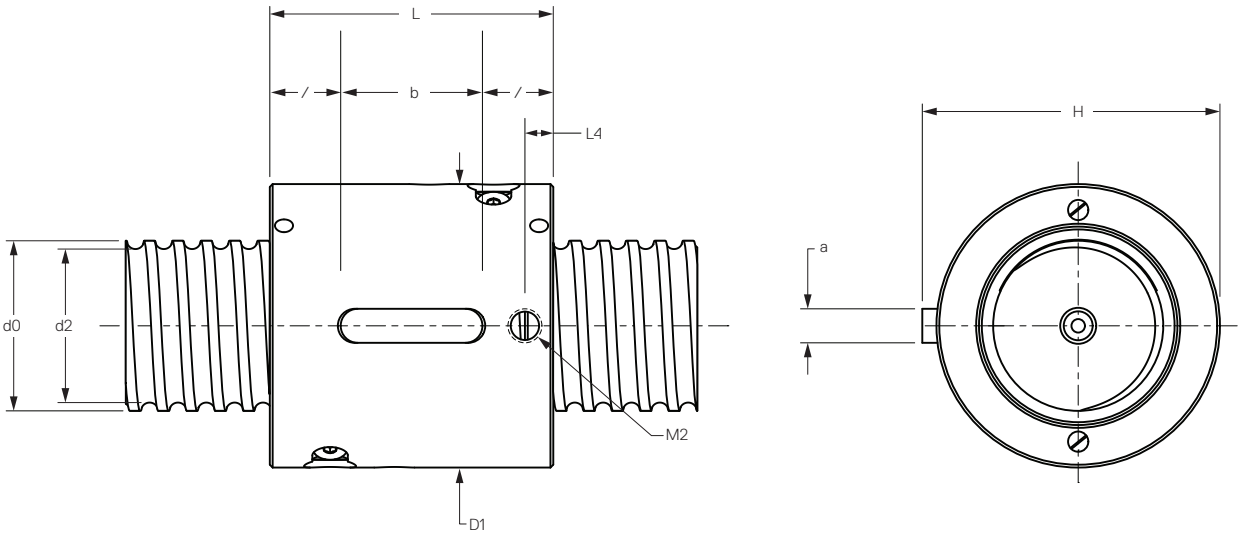
Precision ball screw



Technical data

Nom Ø	Lead (RH)	Nut									Screw	
d_0	Ph	C_a	C_{0a}	Circuits of balls	Std Play	Reduced Play	Preload Torque - Zero Play	Inertia	Grease	Mass	Mass	Inertia
mm	mm	kN		–	mm		Nm	kg*mm^2	cm^3	kg	kg/m	kg*mm^2/m
30	5	29	76	2X3	0.10	0.05	0.19	181.35	1.70	0.41	5.51	620.31
40	5	58	169	2X4	0.10	0.05	0.38	526.65	3.30	0.72	9.81	1 961.97
	10	98	219	2X3	0.12	0.08	0.83	1 949.36	10.80	1.96	9.69	1 938.05
50	5	64	215	2X4	0.10	0.05	0.53	885.54	4.20	0.86	15.36	4 799.37
	10	112	287	2X3	0.12	0.08	1.18	3 039.48	13.20	2.30	15.24	4 761.99
63	10	156	475	2X4	0.12	0.08	1.63	7 189.53	20.20	3.77	24.29	12 052.94

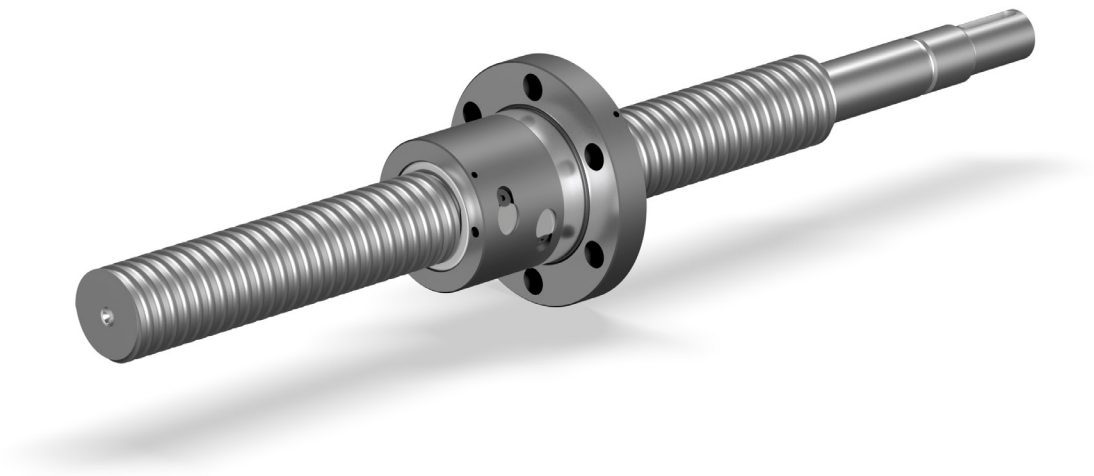
Notes:
– Lubrication hole is standard.
– Wipers available.
– Customized axial play and backlash elimination available.



Nut				Key			Screw
min D1	L	L4	M2	a	H	b	d2
mm							
50	50	5	M6X1	6	52.5	25	27.0
63	62	5	M6X1	6	65.5	32	36.2
76	97	10	M8X1	6	78.5	32	34.1
72	62	5	M6X1	6	74.5	32	46.2
86	97	10	M8X1	8	89.0	40	44.1
102	117	10	M8X1	8	105.0	40	57.1

SPF flanged nut

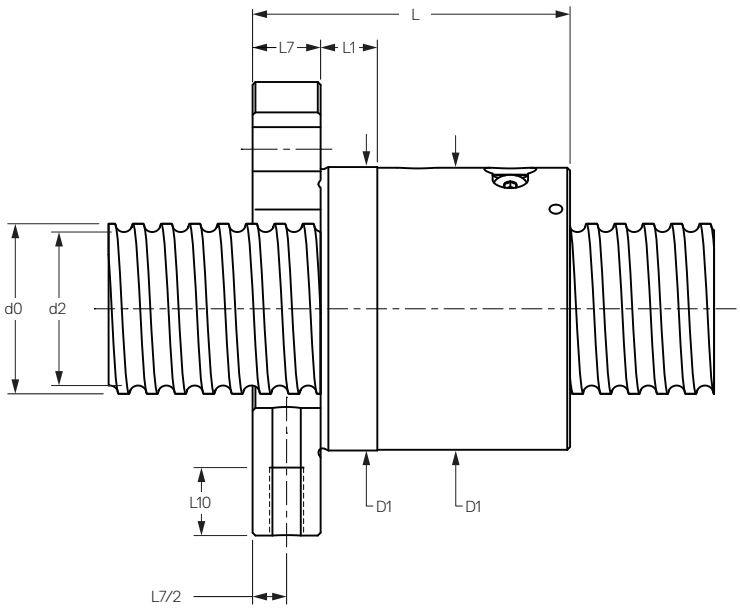
Precision ball screw

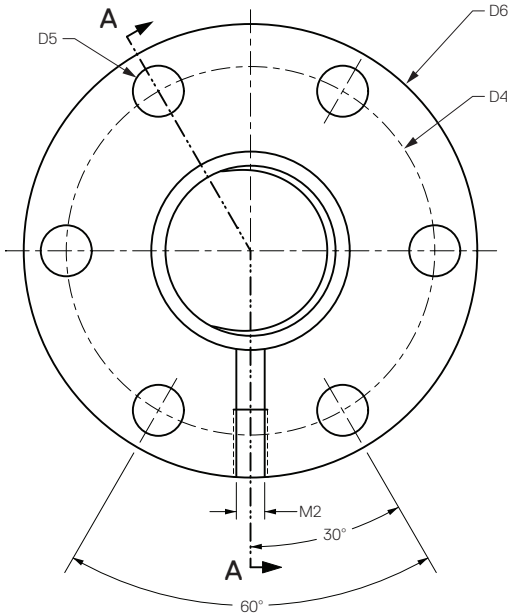


Technical data

Nom Ø	Lead (RH)	Nut									Screw	
d_0	Ph	C_a	C_{0a}	Circuits of balls	Std Play	Reduced Play	Preload Torque - Zero Play	Inertia	Grease	Mass	Mass	Inertia
mm	mm	kN		–	mm		Nm	kg*mm^2	cm^3	kg	kg/m	kg*mm^2/m
30	5	21	50	1X4	0.10	0.05	0.19	481.93	1.50	0.71	5.51	620.31
40	5	32	85	1X4	0.10	0.05	0.38	1 046.28	2.50	0.99	9.81	1 961.97
	10	69	146	1X4	0.12	0.08	0.83	3 068.70	6.60	2.37	9.69	1 938.05
50	5	50	161	2X3	0.10	0.05	0.53	1 987.35	3.80	1.35	15.36	4 799.37
	10	79	191	1X4	0.12	0.08	1.18	4 907.00	8.00	2.84	15.24	4 761.99
63	10	122	356	2X3	0.12	0.08	1.63	10 024.43	15.80	4.51	24.29	12 052.94

Notes:
– Lubrication hole is standard.
– Wipers available.
– Customized axial play and backlash elimination available.

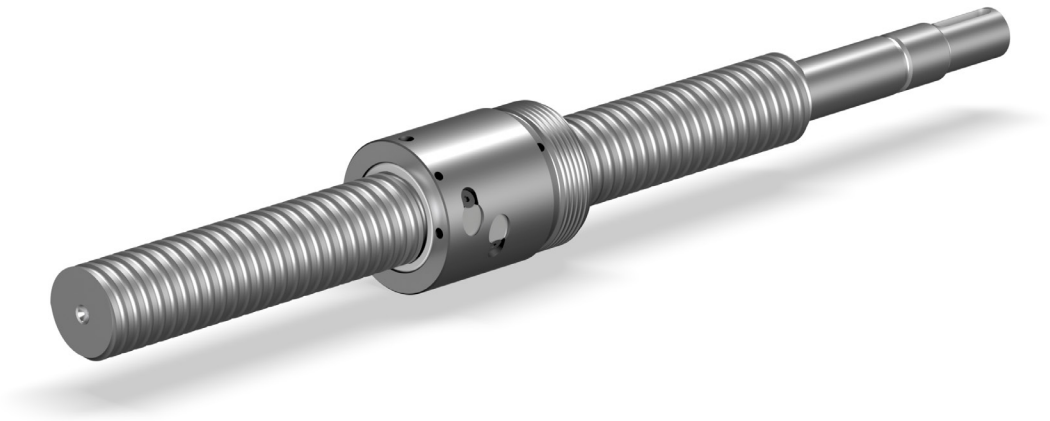




Nut										Screw
min D1	D4	D5	D6	L	L1	L7	L10	M1	M2	d2
mm										
50	65	9	80	56.0	10	12	12	N/A	M6X1	27.0
63	78	9	93	58.5	10	14	12	N/A	M6X1	36.2
76	94	9	110	87.0	20	16	12	N/A	M8X1	34.1
72	90	11	110	68.5	10	14	12	N/A	M6X1	46.2
86	106	11	125	87.0	20	16	12	N/A	M8X1	44.1
102	120	11	137	114.0	20	18	12	N/A	M8X1	57.1

SPT nut with threaded nose

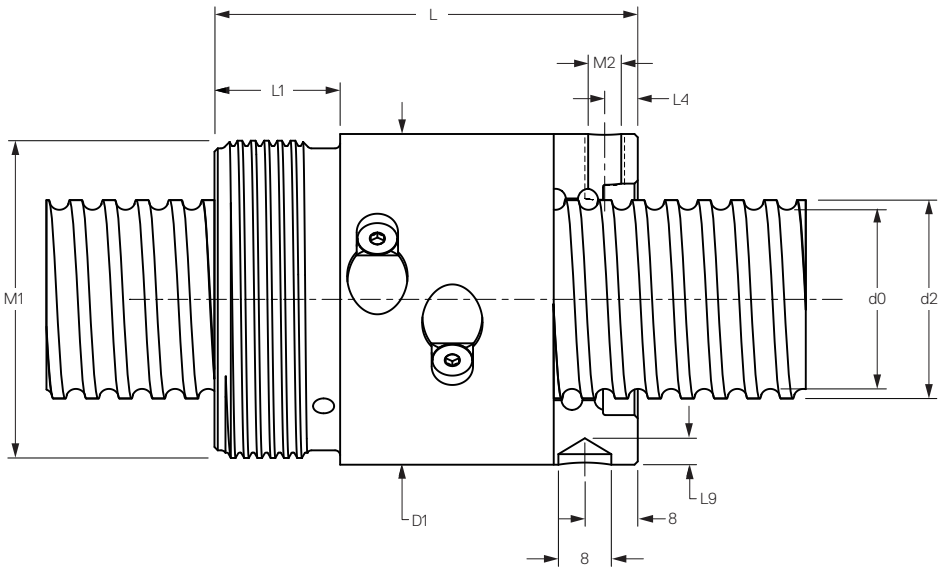
Precision ball screw

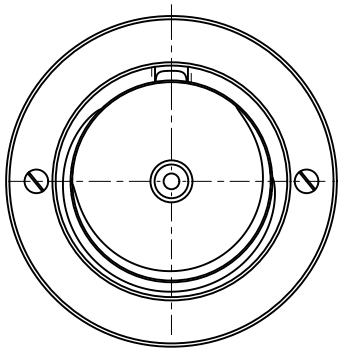


Technical data

Nom Ø	Lead (RH)	Nut									Screw	
d_0	Ph	C_a	C_{0a}	Circuits of balls	Std Play	Reduced Play	Preload Torque - Zero Play	Inertia	Grease	Mass	Mass	Inertia
mm	mm	kN		–	mm		Nm	kg*mm²	cm³	kg	kg/m	kg*mm²/m
30	5	29	76	2X3	0.10	0.05	0.19	212.76	1.70	0.48	5.51	620.31
40	5	58	169	2X4	0.10	0.05	0.38	581.59	3.30	0.79	9.81	1 961.97
	10	98	219	2X3	0.12	0.08	0.83	2 121.79	10.80	2.16	9.69	1 938.05
50	5	64	215	2X4	0.10	0.05	0.53	970.29	4.20	0.96	15.36	4 799.37
	10	112	287	2X3	0.12	0.08	1.18	3 358.04	13.20	2.57	15.24	4 761.99
63	10	156	475	2X4	0.12	0.08	1.63	7 715.60	20.20	4.11	24.29	12 052.94

Notes:
– Lubrication hole is standard.
– Wipers available.
– Customized axial play and backlash elimination available.





Nut								Screw
min D1	L	L1	L4	M1	M2	L9	Spanner	d2
mm								
50	64	19	5	M48X1	M6X1	4	HN7	27.0
63	81	24	5	M60X2	M6X1	4	HN9	36.2
76	114	24	10	M72X2	M8X1	5	HN11	34.1
72	81	24	5	M72X2	M6X1	4	HN11	46.2
86	119	29	10	M80X2	M8X1	5	HN14	44.1
102	139	29	10	M94X2	M8X1	5	HN16	57.1

Design calculation and inquiry form

Customer and project information

Company name .....

Address .....

Contact name ..... Phone number .....

Email ..... Website .....

Project name.....

Application type .....

Short description of application
(please attach a sketch if possible) .....

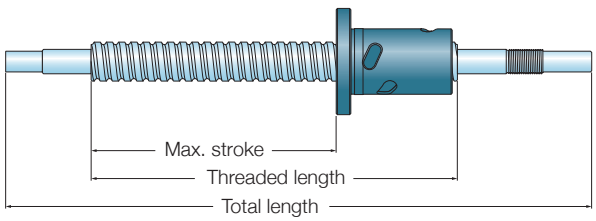
Annual ball screw requirements
and start of production date .....

Prototype requirements
and suitable delivery date .....

For existing or modified application,
type of ball screw already used .....

Ball screw data

Design parameter	Value
Maximum stroke [mm]	.....
Threaded length [mm]	.....
Total length [mm]	.....
Pre-selection of screw shaft nominal diameter d_0 [mm]	.....
Pre-selection of lead P_h [mm]	.....
Pre-selection of nut type	.....
Lead precision grade according to ISO 3408	.....
Pre-selection of axial play, backlash elimination or preload	.....
If axial play is selected, preferred min/max range [µm]	.....
Request for accessories (flanges, support bearings, etc.)	.....
Other pertinent information	.....



Operating conditions

Maximum loads

- Maximum static load or shock load [N] .....
- Maximum dynamic load in tension [N] .....
- Maximum dynamic load in compression [N] .....

- Average linear speed [m/min] .....
- Maximum linear speed [m/min] .....
- Maximum acceleration [m/s^2] .....

Lubrication

- Brand name .....
- Type .....
- Viscosity at average operating temperature [cSt] .....

Operating temperature

- Minimum [°C] .....
- Average [°C] .....
- Maximum [°C] .....

Required service life

- Travel [m] .....
- Or revolutions [rev] .....
- Or duration [hours] .....

Duty cycle description

Step	Axial force [N]	Speed, either rotational speed [rpm] or linear speed [m/minute]	Travel [mm]
1	.....	.....	.....
2	.....	.....	.....
3	.....	.....	.....
4	.....	.....	.....
5	.....	.....	.....
Etc.	.....	.....	.....

Mounting conditions

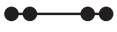
Position of the screw ☐ Vertical ☐ Horizontal

Rotating part ☐ Screw ☐ Nut

Screw end fixing conditions

N  (fixed, free)

N  (fixed, radial support)

N  (fixed, fixed)

Other pertinent information

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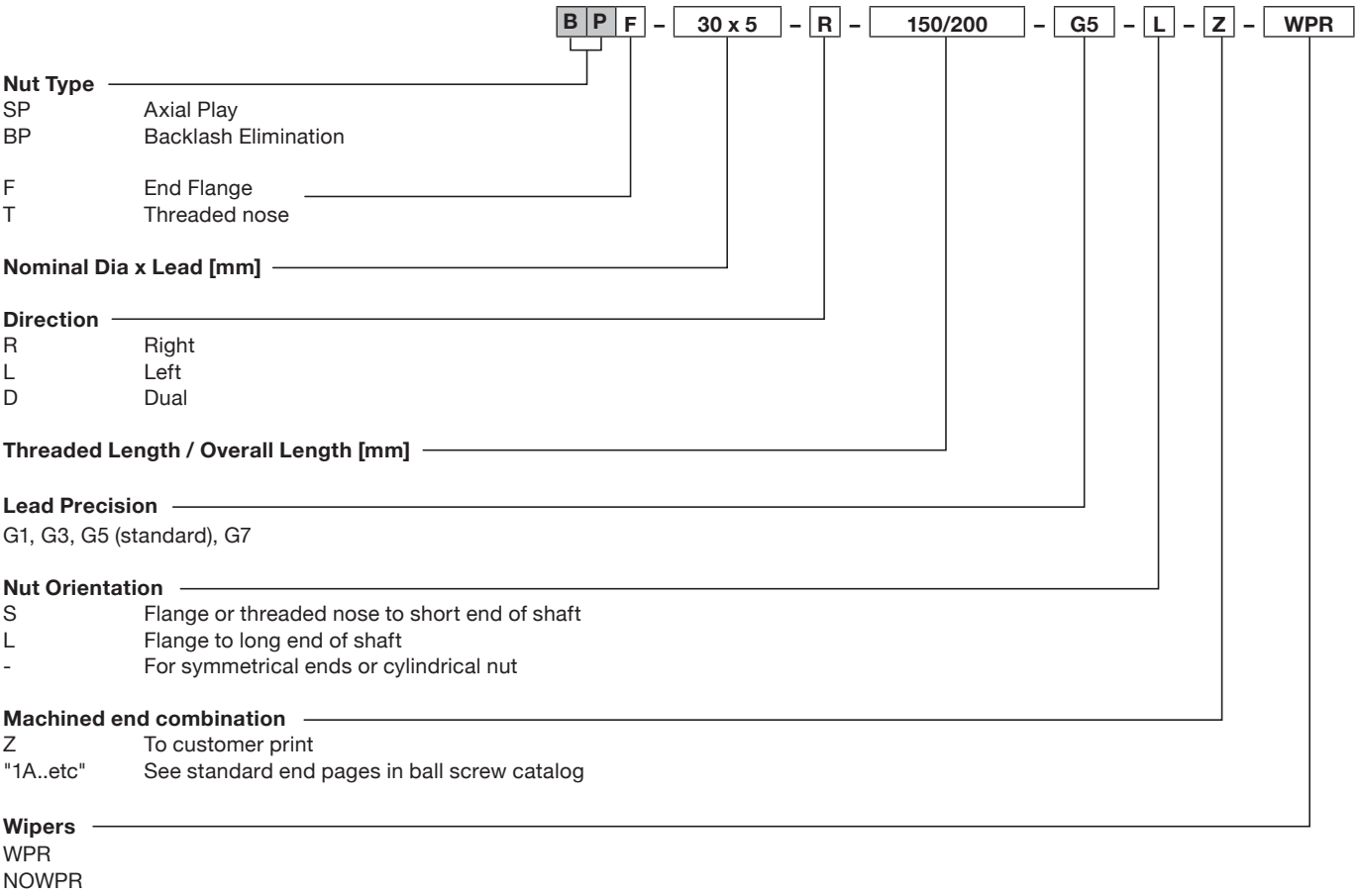
Ball screw catalogue, ball screw 2D prints and 3D models are available on **www.ewellix.com**
Please send inquiry form to your Ewellix sales office. For contact information, please visit **www.ewellix.com**

Ordering key



Made in the USA

Download

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