



iselGermany
engineering to the point.

Ball screw spindles

Indispensable drive elements



Automation sales team



Steffan Gärth

Technical sales

Tel.: +49 (0) 6659 / 981-773

Fax: +49 (0) 6659 / 981-776

steffan.gaerth@isel.com



Katja Henkel

Technical sales

Tel.: +49 (0) 6659 / 981-744

Fax: +49 (0) 6659 / 981-776

katja.henkel@isel.com



Jessica Gatterdam

Team Assistant Sales

Tel.: +49 (0) 6659 / 981-751

Fax: +49 (0) 6659 / 981-776

jessica.gatterdam@isel.com

General Terms of Delivery and
terms of payment



www.isel.com/agb-aeb

Stand: April 2025



Content

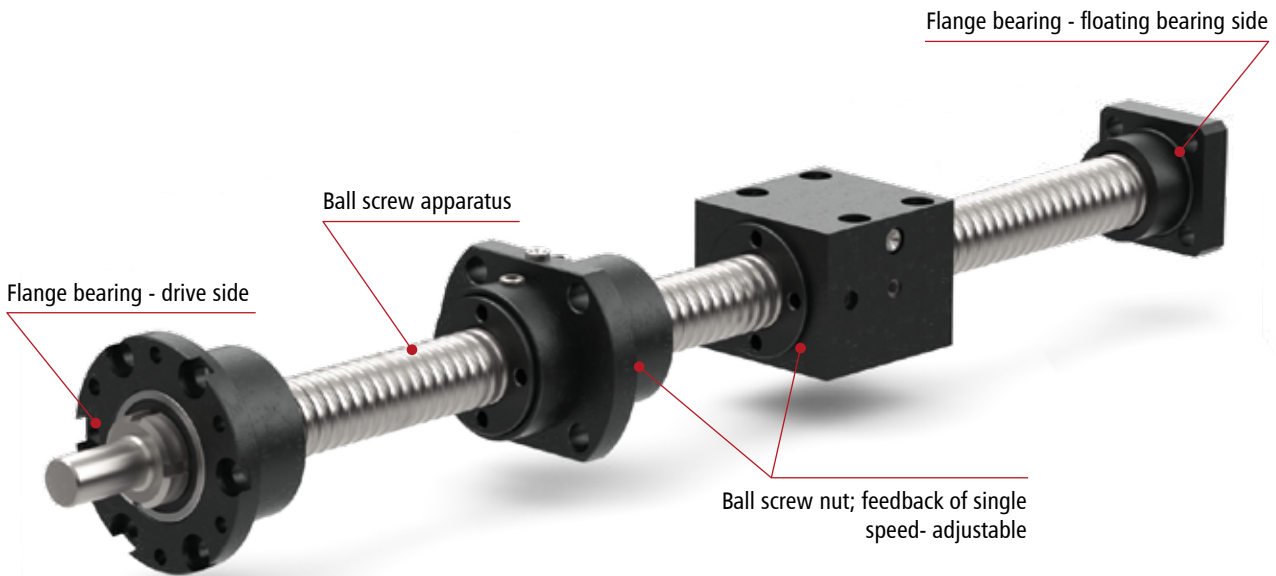
Ball screw spindles Ø 12, 16, 20, 25 mm	6
Flange bearing	7
Ball screw nuts equipped with single thread return	8
Structure of linear actuators	10
Shaft couplings	10
Bearing blocks	11



Precision is our drive

Our technically sophisticated ball screw drives are high-precision mechanical drive elements for many areas of technology and mechanical engineering, which have proven themselves successfully in demanding industrial practice for decades. The principle of the ball screw drive is very simple. And yet the requirements and designs of the drive solution are so diverse in their practical applications.

With our product range, we offer you a suitable drive solution for practically every movement task - regardless of the requirements for pitch, speed, rigidity, precision, service life and reliability. We specialize in providing you with an adequate solution for your application.



Information

The ball screw nuts of the **company isel Germany GmbH** are of high quality, precise and wear-resistant (hardened and ground). Together with the ball screw spindles, they convert rotary movements into linear movements by producing an extremely low friction-level.

The ball screw nut is inserted into the respective clamping block and positioned and fastened by means of a stud bolt. The ball screw nuts have multiple ball circuits equipped with an internal ball return.

A set screw on the clamping block allows the run of the ball screw spindle to be adjusted without any clearance.

The repetition accuracy is less than 0.01 mm over a length of 300 mm. A lubricating nipple is attached to the clamping block for the lubrication of the linear drive.

The ball screw spindles are manufactured on modern machines in a rolled design, and then hardened and polished.

Our linear drives are technically mature and have proven themselves in their practical application for more than 25 years.



Process know-how and vertical integration

Our ball screw spindles are technically mature, powerful and extensively proven through use in automation systems: With ball screw drives, isel Germany GmbH has created a core competence with a lot of know-how in design and production.

With modern production facilities, we carry out all workprocesses (rolling, hardening and polishing) as well as the individual end-processing effectively and customer-specifically in order to offer you the optimal solution for your design task.

Just give us a call to discuss your individual application and possible solutions with us. Our experienced team is always at your disposal for details and questions.

Our design department checks all the technical requirements and coordinates with the production engineers so that your order can be quickly and flexibly integrated into the production process.

We have been manufacturing ball screw spindles on modern CNC-controlled production machines and with robotsupport for more than 25 years. Certified processes, permanent monitoring and



optimization of production processes as well as the most modern 3D measuring machines guarantee consistent quality to meet customer requirements.

Our long-standing customers include companies from the following branches:

- Mechanical and apparatus engineering
- Medical technology
- Electronics industry
- Semiconductor industry
- Wood processing
- Training • and many more...





Ball screw spindles Ø 12, 16, 20, 25 mm

- rolled, hardened, and polished
- Material CF 53, hardened by induction (HRC 60±2)
- Available in lengths of up to 3052 mm (inside the grid of 100 mm, special lengths are available upon request!)
- End processing according to the isel standard or based on customer specifications
- Standard tolerance class according to ISO 7



Order key

211 1XX XXXX

Diameter
 2 = 12 mm
 3 = 16 mm
 4 = 25 mm
 5 = 20 mm

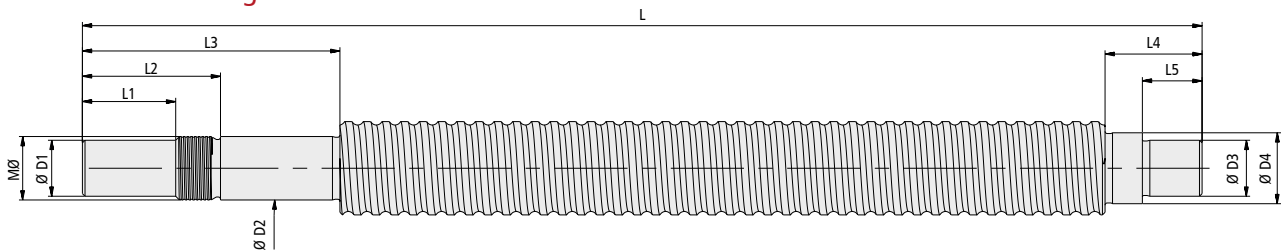
Spindle gradient
 2 = 2.5 mm (only for Ø 12, 16 mm)
 3 = 4 mm (only for Ø 16 mm)
 4 = 5 mm
 5 = 10 mm (not with Ø 12 mm)
 6 = 20 mm (not with Ø 12 mm)

End machining
 0 = unprocessed
 1 = one-sided processing
 2 = two-sided processing (only for Ø 12, 25 mm)
 5 = two-sided processing (only for Ø 16, 20 mm) suitable for all feeds (aluminum profile length +78 mm)

Lengths
 e.g. 045 = 452 mm
 086 = 868 mm
 305 = 3052 mm (shortened by the last digit)

See "Available lengths" for permissible combinations.

Dimensional drawings



	Gradient	L [max.]	L1	L2	L3	L4	L5	M	D1	D2	D3	D4
Ø 12	2.5 / 5	1552	10	20	40	19	-	M8 x 1	6,35 h7	8 h6	-	7 h6
Ø 16	2.5 / 4 / 5 / 10 / 20	3068	18	31	52	28	-	M10 x 0.75	8 h7	10 h6	-	12 h6
Ø 20	5 / 10 / 20	3952	20	32	55	27.5	-	M12 x 1	10 h7	12 h6	-	12/14 h6
Ø 25	5 / 10 / 20	3000	25	37	69	26	16	M17 x 1	15 h7	17 h6	15 j6	19 h11

Available lengths

End processing in 100 mm grid	Ø 12 mm	Ø 16 mm	Ø 20 mm	Ø 25 mm
without	252 - 1552 mm	352 - 3052 mm	252 - 3052 mm	300 - 3000 mm
one-sided	252 - 552 mm	352 - 1052 mm	252 - 1052 mm	352 - 1052 mm
two-sided	252 - 1552 mm	368 - 3068 mm	252 - 3052 mm	295 - 2995 mm



Flange bearing

Flange bearing - drive side



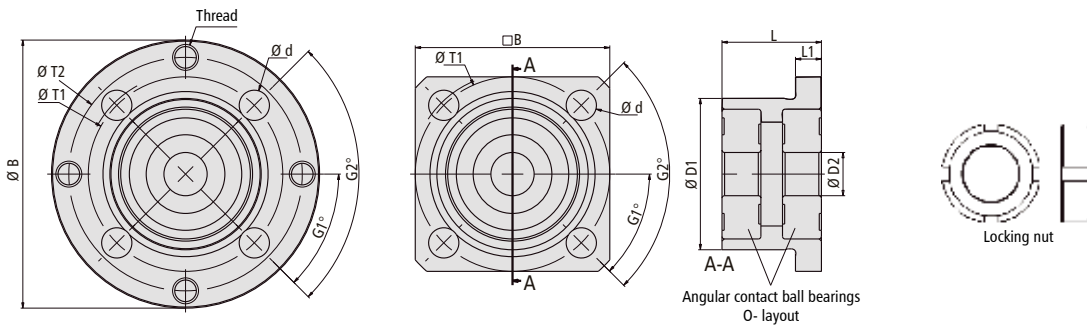
Flange bearing - floating bearing side



- Bearing of the ball screw spindle (fixed-loose bearing)
- **Flange bearing, drive side (fixed bearing):** bearing bush equipped with two pressed-in angular ball bearings in an O arrangement
- **Flange bearing opposite bearing side (floating bearing):** bearing bush equipped with a pressed-in needle bearing

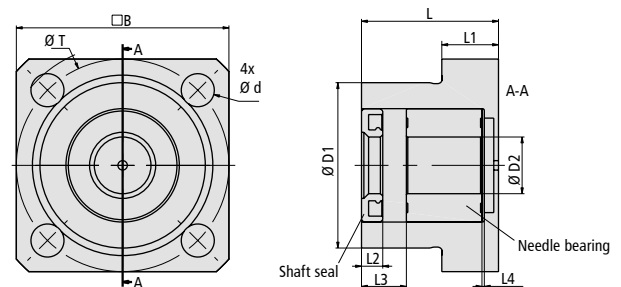
drive side and lock nut

	Construction	B	L	L1	D1	D2	T1	T2	G1	G2	d	Thread	Item number
Ø 12	rectangular	36	19.5	-	-	8	38.2	-	45°	90°	4 x Ø 4.5	-	216504 0030
Ø 16	rectangular	45	23	6	35	10	45	-	45°	90°	4 x Ø12 4U / Ø7	-	216504 0001
Ø 16	round	62	23	6	35	10	45	54	45°	90°	4 x Ø12 4U / Ø7	4 X M6	216504 0003
Ø 20	round	64	23	8	39.5	12	50	54	45°	90°	4 x Ø12 4U / Ø7	4 X M6	216504 0031
Ø 25	round	72	34	8	53	17	62	62	30°	60°	4 x Ø12 4U / Ø7	6 x M6	216504 0006



Floating bearing side

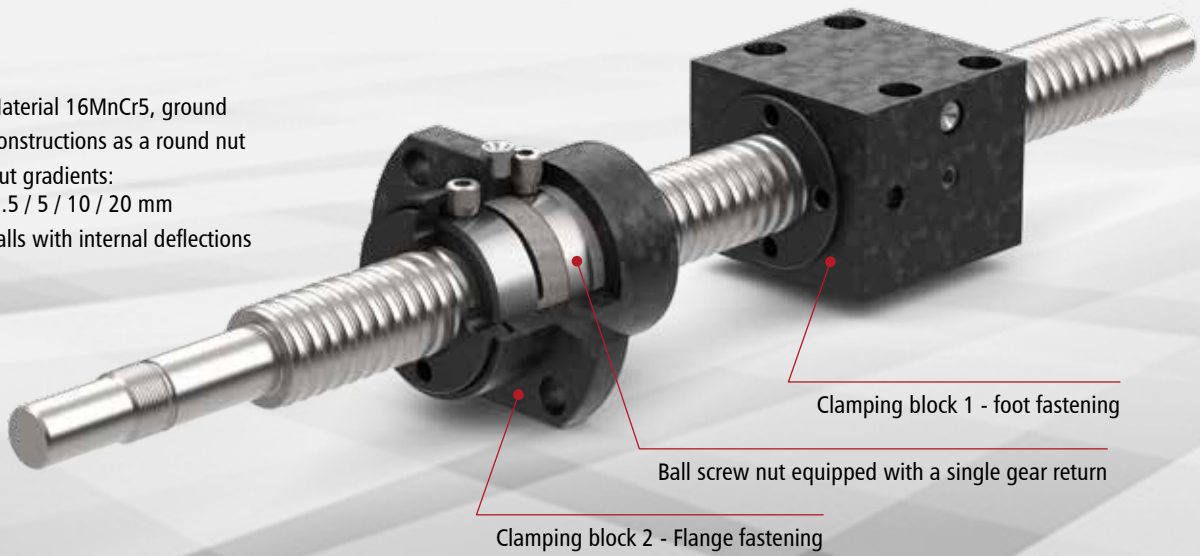
	B	L	L1	L2	L3	L4	D1	D2	T	d	Item number
Ø 12	35	20	8	6	6.5	0.5	28	7	38.2	Ø7.5 x 4U / Ø4.5	216504 0032
Ø 16	45	29	12	4.5	9.5	0.5	35	12	45	Ø 12 x 4U / Ø 7	216504 0002
Ø 20	50	29.5	12	4.5	5	1.5	35	12	50	Ø 12 x 4U / Ø 7	216504 0033
Ø 25	45	29	12	8	10	0	35	15	45	Ø 12 x 4U / Ø 7	216504 0005





Ball screw nuts equipped with single thread return

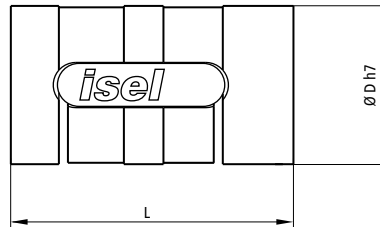
- Material 16MnCr5, ground
- Constructions as a round nut
- Nut gradients: 2.5 / 5 / 10 / 20 mm
- Balls with internal deflections



Scraper

- Constructions for ball screw nuts
Ø 12, 16, 20, 25 mm (PU = 2 pieces)

- Ø 12 mm Part No.: 213500 0003
- Ø 16 mm Part No.: 213500 0001
- Ø 20 mm Part No.: 213500 0002
- Ø 25 mm Part No.: 213700 9000



drive side and lock nut

	Gradient	D	L	dyn. load rating [N]	stat. load rating [N]	Item number
Ø 12	2.5	24	37.5	1900	3000	213412 0003
	5			1300	2,000	213412 0005
Ø 16	2.5	28	50	3,500	5500	213503
	4			4600	7200	213514
	5			4600	7200	213505
	10			4200	6500	213510
Ø 20	20	33	50	1900	2,500	213520
	5			5000	9000	213420 0005
	10			4,500	8,000	213420 0010
Ø 25	5	38	50	5,100	12,600	213700 0005
	10			5,100	12,600	213700 0010
	20			3,570	8,800	213700 0020



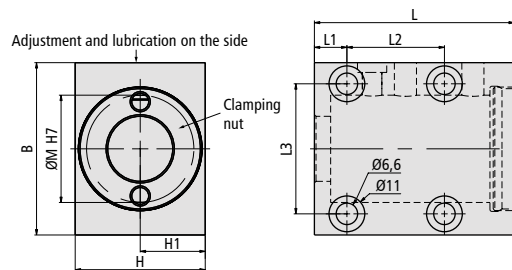
... and matching clamping blocks



- Clamping blocks for foot and flange fastening
- Material steel, blued
- Constructions for ball screw spindles
Ø 12, 16, 20, 25 mm

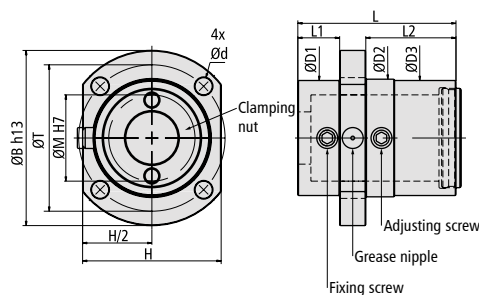
Foot fastening

	M	L	B	C	H1	L1	L2	L3	Clamping nut	Part No.
Ø 12	24	37.5	44	29	14.5	7	20	31	-	213400
Ø 16	28	54	47	33	16.5	14.5	25	35	-	213500
Ø 20	33	61.5	53	40	20	10	30	40	1x	213600
Ø 25 - gradient 5/10	38	60	60	49.5	25	10	30	46	1x	213700 9001
Ø 25 - gradient 20	38	80	60	50	25	10	50	46	1x	213700 9002



Flange fastening

	M	L	B	C	d	T	D1	D2	D3	L1	L2	Clamping nut	Part No.
Ø 12	24	37.5	53	42	4.5	45	35	37 g6	35	3	24.5	-	213401
Ø 16	28	50	62	48	6.6	51	39	40 g6	39	11.6	28.4	-	213501
Ø 20	33	60.5	67	53	6.6	56	44	45 g6	44	16	34.5	1x	213601
Ø 25 - gradient 5/10	38	60	80	62	9	65	49	50 f9	50f9	32.25	17.75	1x	213700 9003
Ø 25 - gradient 20	38	80	80	62	9	65	49	50 f9	50f9	52.25	17.75	1x	213700 9004





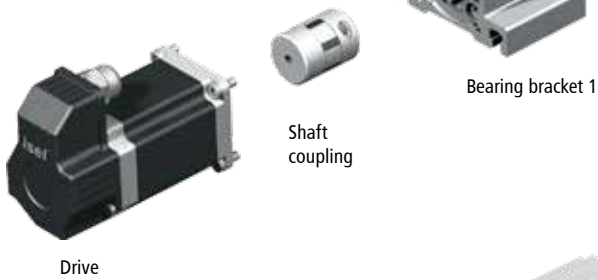
Structure of linear actuators

The most frequently encountered variant when using linear actuators is the spindle driven directly or via toothed belts.

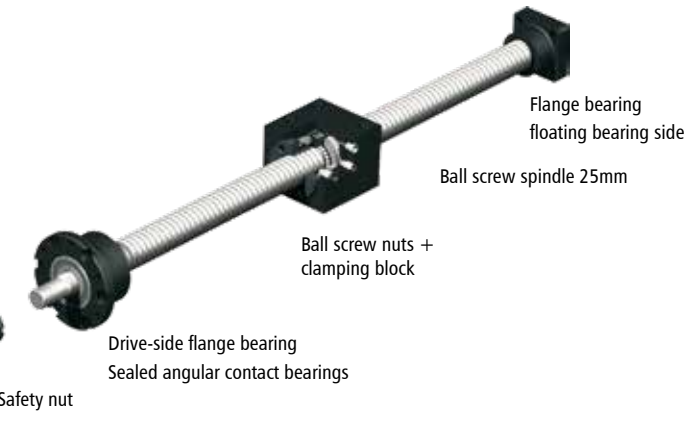
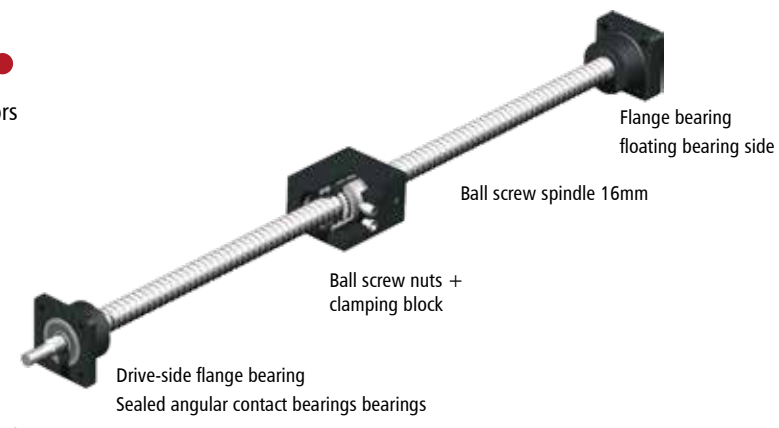
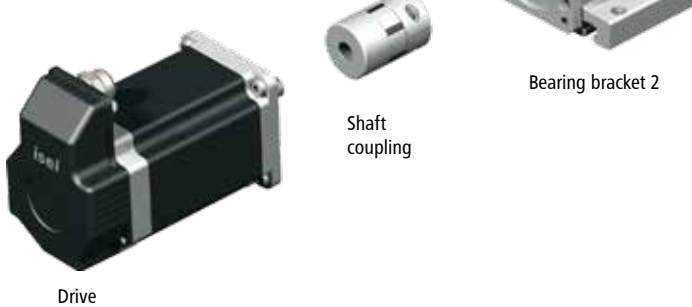
Features:

- precise
- low friction
- robust
- cost-effective

Spindle 16 mm



Spindle 25 mm



Shaft couplings



Set of two shaft coupling halves, three PUR sprockets (86 °, 92 ° and 98 ° Shore hardness) and corresponding clamping screws

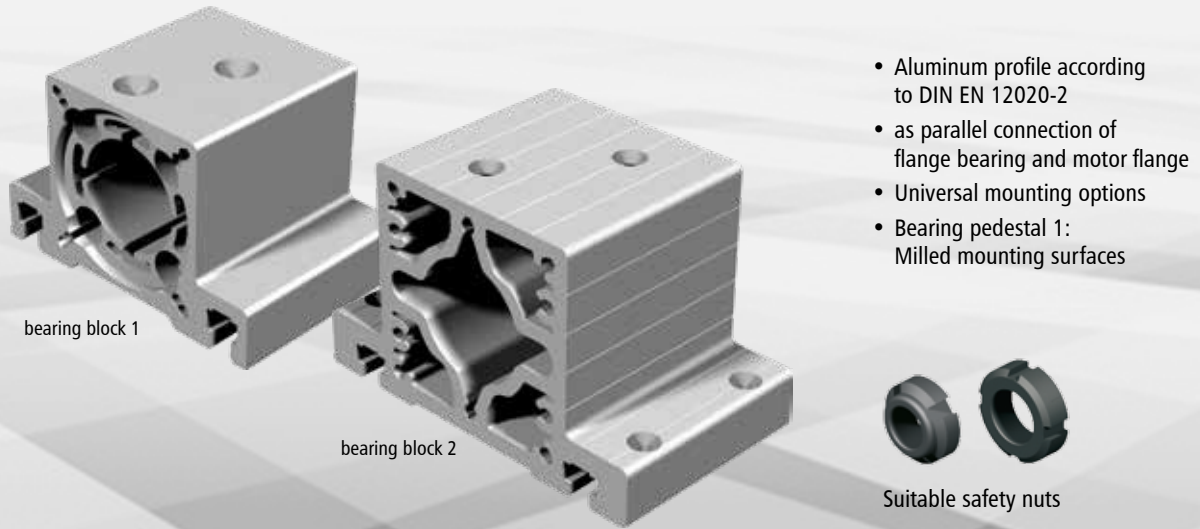
Order data

Clutch	d ₁	d ₂	Part no.:
20/30	5,0	6,0	218 001 5060
	von 4 bis 7 mm		218 001 9999
30/40	6,35	8,0	218 002 6380
	von 6 bis 13 mm		218 002 9999
40/60	9,52	8,0	218 003 9580
	von 8 bis 18 mm		218 003 9999

Other couplings on request.

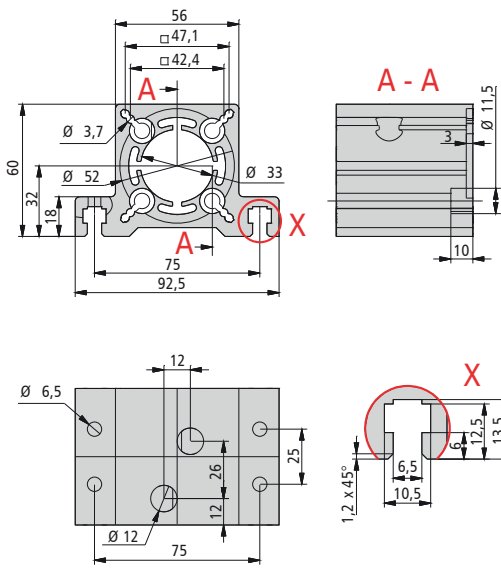


Bearing blocks

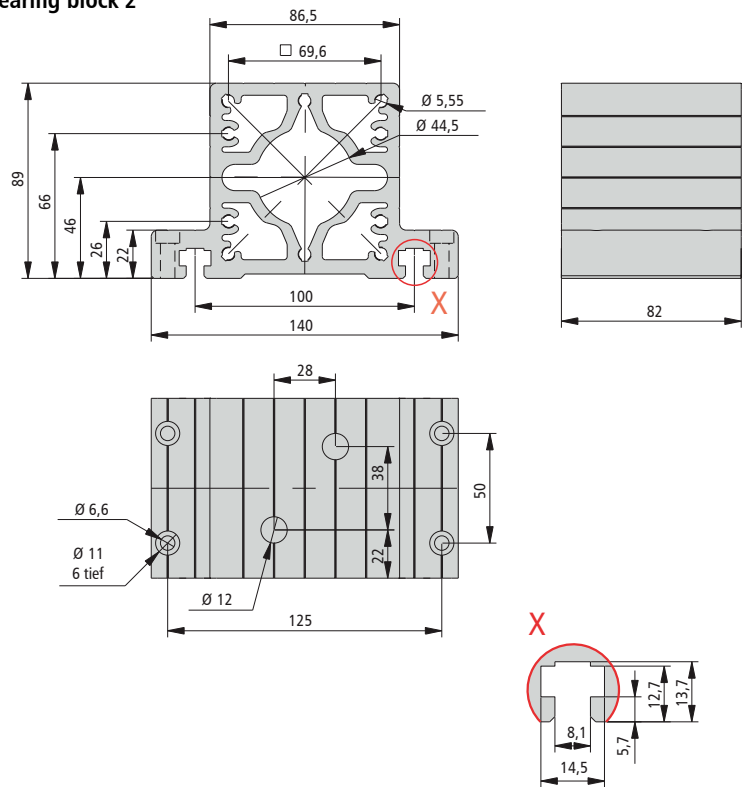


Dimensional drawings

Bearing block 1



Bearing block 2



Order data

	Execution	Part no.:
Bearing block 1	for ball screw $\varnothing 16$ mm	216504 0007
Bearing block 2	for ball screw $\varnothing 25$ mm	216504 0008
Safety nut	for ball screw $\varnothing 16$ mm, self-locking, M 10 x 0.75 mm	890257 0011
Safety nut	for ball screw $\varnothing 25$ mm, self-locking, M 17 x 1.0 mm	890259 0011



The future of drive technology.

Ball screw drives as indispensable drive elements!

<https://www.isel.com/automatisierung/antriebstechnik/kugelgewindespindeln>



Further publications

Media are available in our download area, software and regular updates are available.

www.isel.com/service/download



Optimally networked

Find out more about our branches and cooperation with selected partners.

www.isel.com/unternehmen/partner

isel Germany GmbH

Bürgermeister-Ebert-Straße 40

D-36124 Eichenzell

Tel: +49 (0) 66 59/981-700

E-Mail: info@isel.com

www.isel.com