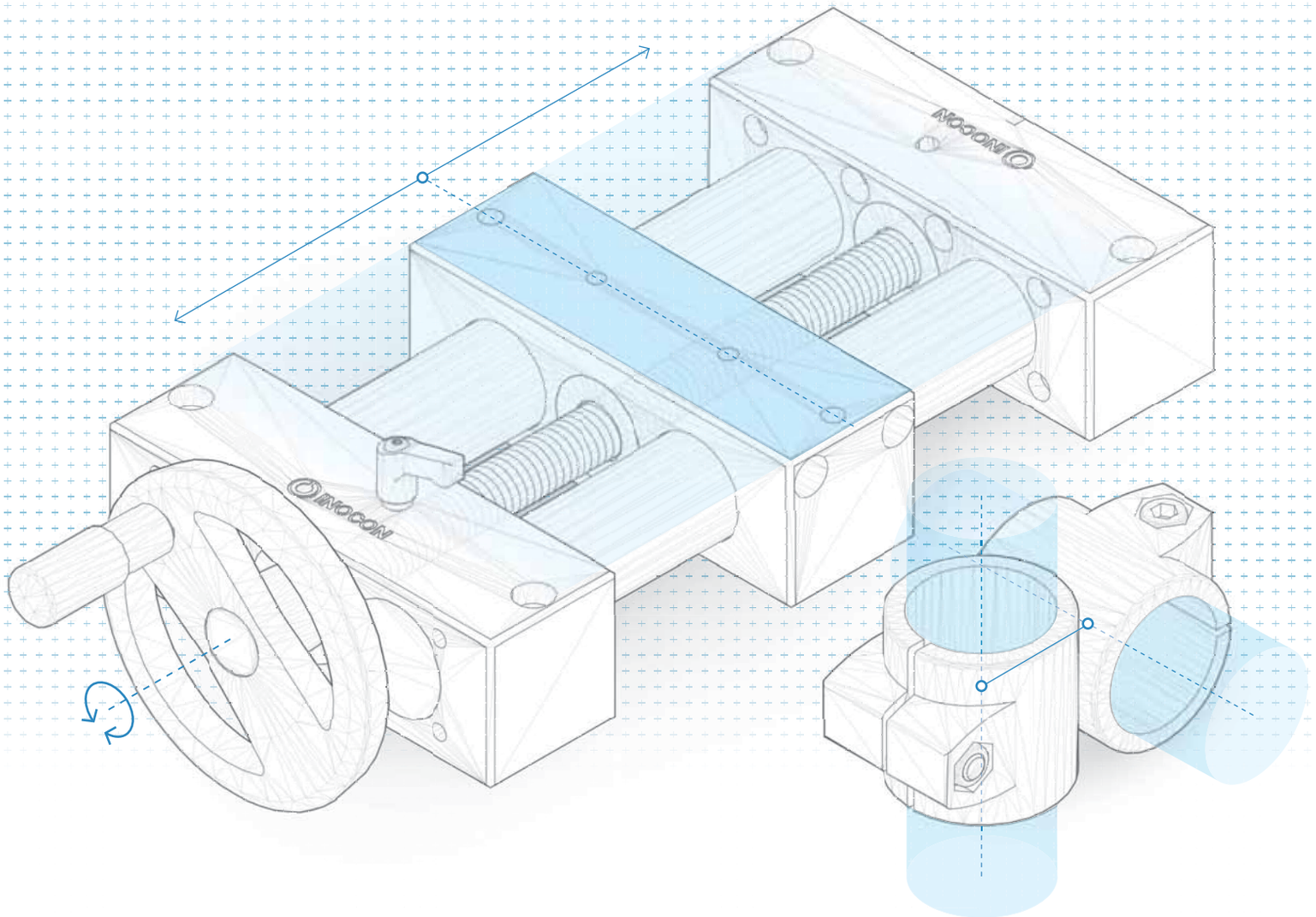
INOCON



Connecting and Positioning

Tube clamp assembly systems
Linear units
Precision linear units

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Connecting

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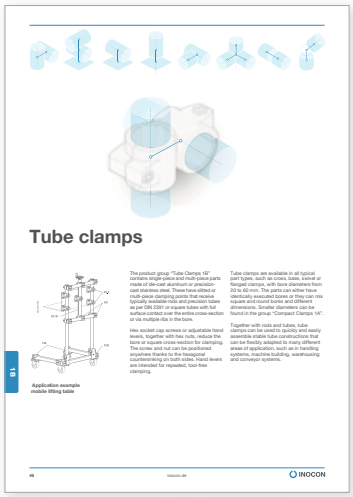
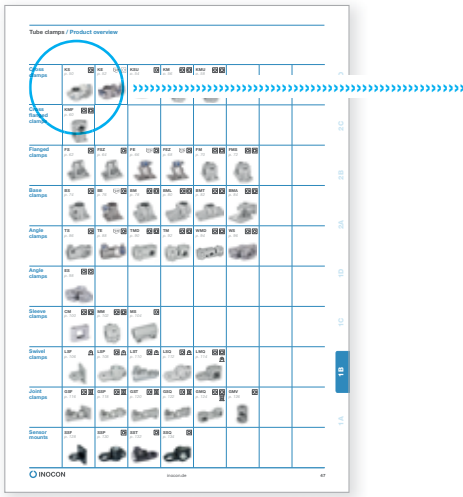
How to purchase

The table of contents at the start of the catalog contains an overview of all product groups.

The product introduction at the start of each section explains any special aspects that apply.



A compact overview of all products of the product group can be found on the following pages.



Product-Icons

Stainless steel
Parts of stainless steel

Clamping point, slitted, round (one-piece clamp)
Clamp with round, slitted clamping points machined by cutting methods. For clamping, a screw thread is used to reduce the slit height and thereby the bore cross-section.

Clamping point, split, round (multi-piece clamp)
Clamps with round, split clamping points partially machined by cutting methods. For clamping, two screw threads are used to reduce the slit height and thereby the bore cross-section.

Clamping point, split, square (multi-piece clamp)
Clamp with round clamping points machined by cutting methods, without clamping slit. Grub screws act radially on the bore cross-section to exert the clamping action.

Clamping point, round (one-piece clamp)
Clamp with round clamping points machined by cutting methods, without clamping slit. Grub screws act radially on the bore cross-section to exert the clamping action.

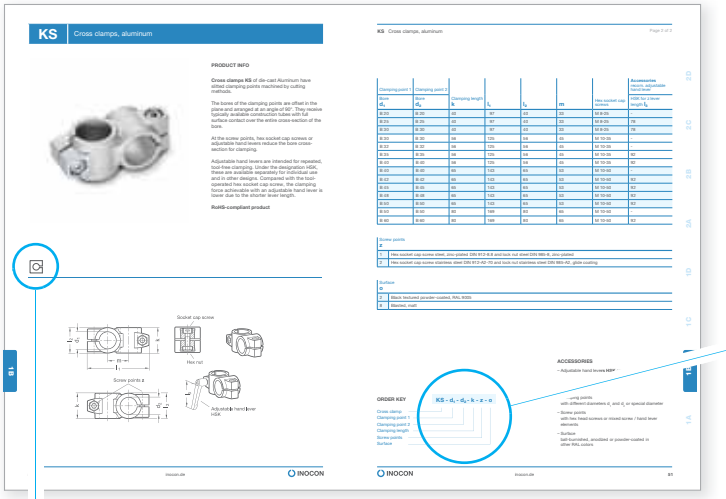
Fastening lugs
Parts can be fastened to the fastening lugs of swivel clamps, or flat elements can rest on them. By combining two swivel clamps, it is possible to assemble a joint clamp.

Joint clamps
Joint clamps consist of two swivel clamps combined together. These can be swiveled by ± 90 degrees at the clamping joint and can be fastened with the screw thread of the joint axis.

Parts with normal precision
Parts for applications in which shape, orientation, movement and position tolerances of up to 0.2 mm are generally required by the system setup.

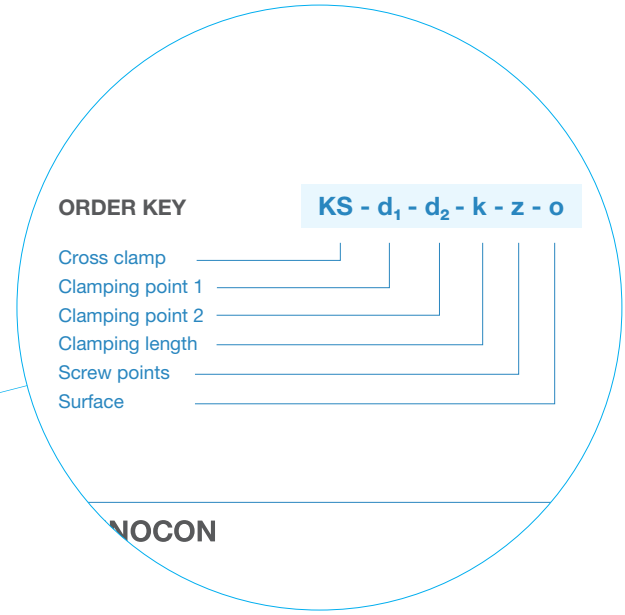
Parts with high precision
Parts for applications in which shape, orientation, movement and position tolerances of no more than 0.05 mm are generally required by the system setup.

The standard sheet contains detailed information about the product.



Icons provide quick and easy visual indication of the most important properties of the parts on each standard sheet.

The order key shows you how to assemble your individual order number from the various table values.



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Our website offers everything you need to quickly place an order.

In addition to all product information, you will also find free CAD files for all products and additional information about Inocon.

A convenient online configurator is available for linear units.

Our headquarters in Rheinbach

About us

INOCON – Solutions that connect

It all began in 1997 in a small office in the heart of Rheinbach. Today, INOCON is one of the leading providers of assembly components such as tube clamps and linear units.

New production methods, maximum quality, customer-specific special solutions, short delivery times and solid technical advice make INOCON a reliable and competent partner. INOCON is the first choice for anything having to do with positioning systems, multi-axis systems or mechanisms in plant construction.

The selection is continually expanding according to the special needs of customers in a wide range of industries, from labelling technology and food production to research and development systems.

After all, the individually developed solutions often find their way into the standard portfolio, especially if they would benefit all customers. INOCON thinks in practical terms.

That was already the case back when Walter-Franz Marxen founded the company. As an engineer and head of a design office for special machinery, he knew there was always a lack of universal standard elements.
The company has a particular interest in tube clamps and linear units, in other words elements that have always been indispensable in plant construction. INOCON develops its own products with the goal of offering better solutions than typical providers on the market.

With the move to the Rheinbach industrial region in 2005, the company began expanding its own production line to respond more quickly and flexibly to highly individual customer needs – even at small part volumes.

Our logistics center

CNC machining, powder coating, quality control, special solutions

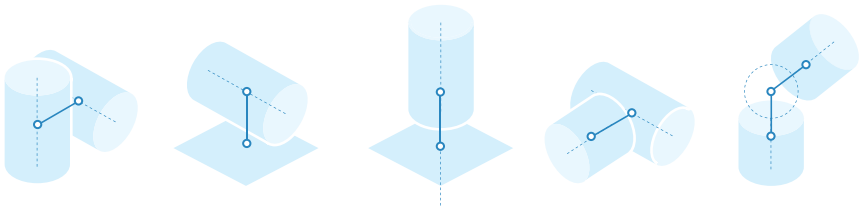
The capabilities were continually upgraded, including installation of a powder-coating plant and other CNC machines. In the meantime, INOCON now has multiple production buildings. All this means that INOCON is able to deliver within 48 hours of receiving an order – and overnight express is available for especially urgent orders.

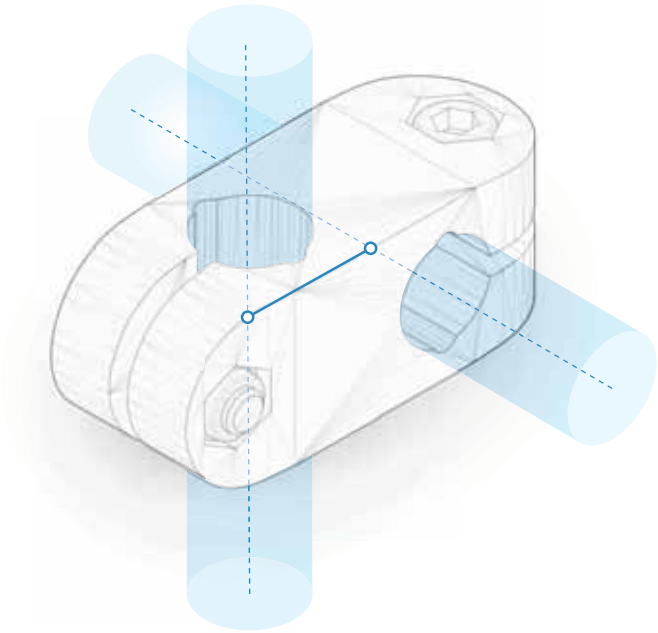
INOCON optimizes more than its production, shipping and portfolio as the company is also focused on sustainability. Since 2020, operations have been entirely powered by completely renewable sources, including the rooftop photovoltaic system.

In this way, INOCON brings innovative thinking, an application focus and continuous optimization to everything it does.

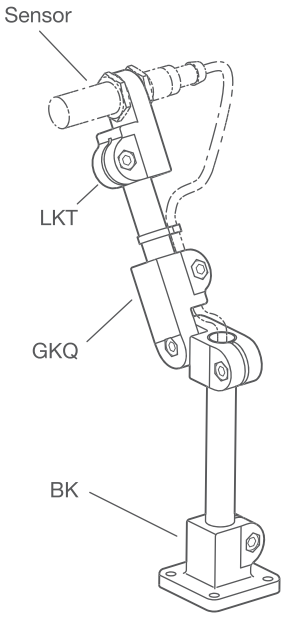
What you get from INOCON

+ **Short delivery times thanks to high stock levels**
+ **Implementation of individual customer requirements**
+ **Special solutions even at small part volumes**
+ **Support in the design, planning and implementation of complex projects**
+ **Free sample service**
+ **Free CAD data available for all products**
+ **Inhouse production**
+ **Maximum quality thanks to stable processes**
+ **Overnight express for urgent projects**





Compact clamps



Application example
Sensor mount

The product group “Compact Clamps 1A” contains single-piece parts made of die-cast aluminum or precision-cast stainless steel. These have slitted clamping points machined by cutting methods that receive typically available rods and precision tubes as per DIN 2391 with full surface contact over the entire cross-section of the bore.

Hex socket cap screws or adjustable hand levers, together with hex nuts, reduce the bore cross-section for clamping. The screw and nut can be positioned anywhere thanks to the hexagonal countersinking on both sides. Hand levers are intended for repeated, tool-free clamping..

Compact clamps are available in all typical part types, such as cross, base or flanged clamps, with bore diameters from 10 to 20 mm. Larger diameters can be found in the group “Tube Clamps 1B”.

Together with rods and tubes, compact clamps can be used to quickly and easily assemble stable tube constructions that can be flexibly adapted to many different areas of application, such as in automation and machine building.

Cross clamps	**KK** *p. 10* 							
Flanged clamps	**FK** *p. 12* 							
Base clamps	**BK** *p. 14* 	**BKZ** *p. 16* 	**BKG** *p. 18* 					
Angle clamps	**TK** *p. 20* 							
Swivel clamps	**LKF** *p. 22* 	**LKP** *p. 24* 	**LKT** *p. 26* 	**LKQ** *p. 28* 				
Joint clamps	**GKF** *p. 30* 	**GKP** *p. 32* 	**GKT** *p. 34* 	**GKQ** *p. 36* 				
Sensor mounts	**SKF** *p. 38* 	**SKP** *p. 40* 	**SKT** *p. 42* 	**SKQ** *p. 44* 				

KK Cross clamps, aluminum / stainless steel

PRODUCT INFO

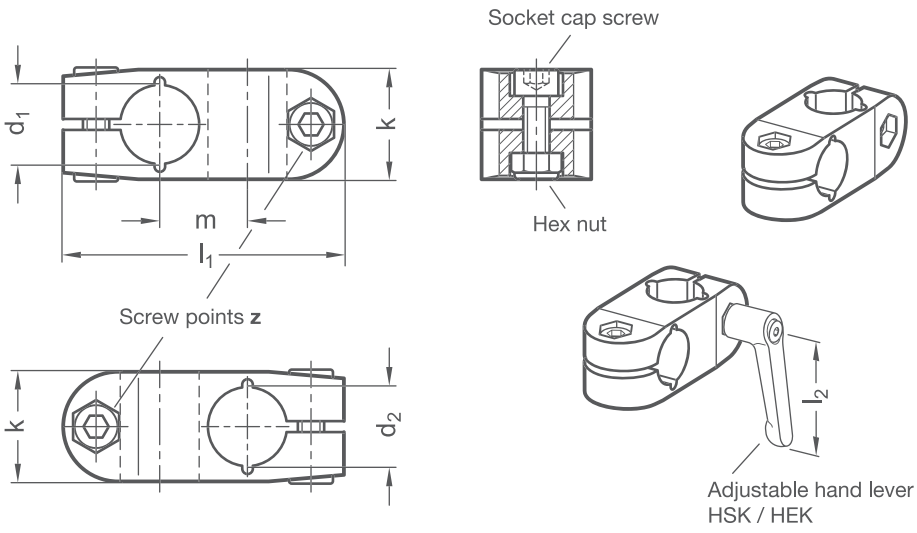
Cross clamps KK of die-cast aluminum or precision-cast stainless steel have slitted clamping points machined by cutting methods.

The bores of the clamping points are offset in the plane and arranged at an angle of 90°. They receive typically available rods and tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs.
Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1		Clamping point 2						**Accessories** recom. hand lever for z	
Bore **d_1**		Bore **d_2**		Clamping length **k**	**l_1**	**m**	Hex socket cap screws	HSK for aluminum clamp lever length **l_2**	HEK for stainless steel clamp lever length **l_2**
Aluminum	Stainless steel	Aluminum	Stainless steel						
B 10	-	B 10	-	25	64	20	M 6-20	63	-
B 12	B 12	B 12	B 12	25	64	20	M 6-20	63	-
B 14	B 14	B 14	B 14	25	64	20	M 6-20	63	-
B 15	B 15	B 15	B 15	25	64	20	M 6-20	63	-
B 16	B 16	B 16	B 16	25	64	20	M 6-20	63	-
B 18	B 18	B 18	B 18	25	64	20	M 6-20	63	63
-	B 20	-	B 20	25	64	20	M 6-20	-	63

Screw points **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamp)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material **o**	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

KK - d_1 - d_2 - z - o

- Cross clamp
- Clamping point 1
- Clamping point 2
- Screw points
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

FK Flanged clamps, with two fastening bores, aluminum / stainless steel

PRODUCT INFO

Flanged clamps FK of die-cast aluminum or precision-cast stainless steel have a slitted clamping point machined by cutting methods.

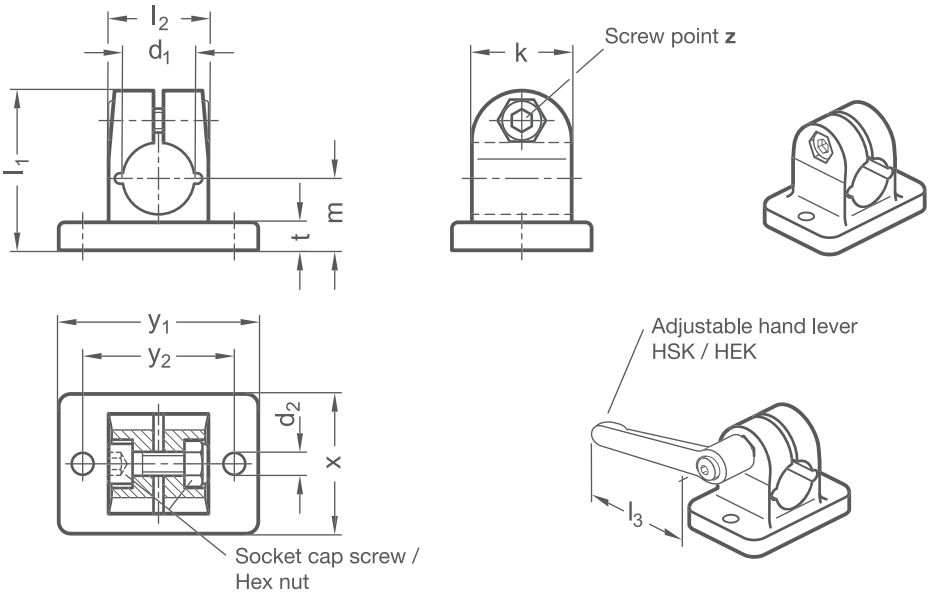
The flange with two bores serves as an interface or for fastening the clamp to the place of use.

The bore at the clamping point is arranged in the plane parallel to the face of the flange. It receives typically available rods and tubes with full surface contact over the entire cross-section of the bore.

At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point												**Accessories** recom. hand lever for z	
Bore d_1		d_2	Clamping length k	l_1	l_2	m	t	x	y_1	y_2	Hex socket cap screw	HSK for aluminum clamp lever length l_3	HEK for stainless steel clamp lever length l_3
Aluminum	Stainless steel												
B 10	-	5,5	25	40	25	18	7	35	50	38	M 6-20	-	-
B 12	B 12	5,5	25	40	25	18	7	35	50	38	M 6-20	63	-
B 14	B 14	5,5	25	40	25	18	7	35	50	38	M 6-20	63	-
B 15	B 15	5,5	25	40	25	18	7	35	50	38	M 6-20	63	-
B 16	B 16	5,5	25	40	25	18	7	35	50	38	M 6-20	63	-
B 18	B 18	5,5	25	40	25	18	7	35	50	38	M 6-20	63	63
-	B 20	5,5	25	40	25	18	7	35	50	38	M 6-20	-	63

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material o	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

FK - d_1 - z - o

- Flanged clamp
- Clamping point
- Screw point
- Surface / material

ACCESSORIES

– Adjustable hand lever **HSK** *see page 168*
– Stainless steel adjustable hand lever **HEK** *see page 170*

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

BK Base clamps, with four fastening bores, aluminum / stainless steel

PRODUCT INFO

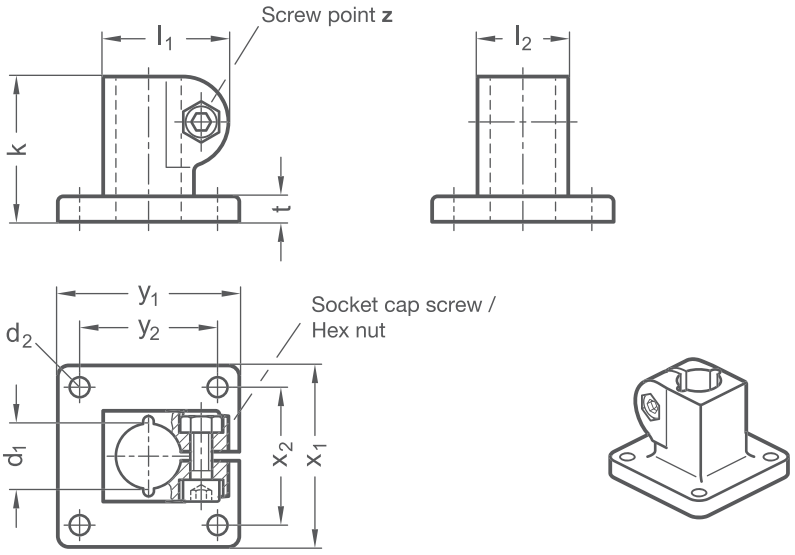
Base clamps BK of die-cast aluminum or precision-cast stainless steel have a slitted clamping point machined by cutting methods.

The base flange with four bores serves as an interface or for fastening the clamp to the place of use.

The bore at the clamping point is arranged perpendicular to the face of the flange. It receives typically available rods and tubes with full surface contact over the entire cross-section of the bore.

At the screw point, a hex socket cap screw reduces the bore cross-section for clamping.

RoHS-compliant product



Clamping point											
Bore d_1		d_2	Clamping length k	l_1	l_2	t	x_1	x_2	y_1	y_2	Hex socket cap screw
Aluminum	Stainless steel										
B 10	-	5,5	40	34,5	25	7	50	38	50	38	M 6-20
B 12	B 12	5,5	40	34,5	25	7	50	38	50	38	M 6-20
B 14	B 14	5,5	40	34,5	25	7	50	38	50	38	M 6-20
B 15	B 15	5,5	40	34,5	25	7	50	38	50	38	M 6-20
B 16	B 16	5,5	40	34,5	25	7	50	38	50	38	M 6-20
B 18	B 18	5,5	40	34,5	25	7	50	38	50	38	M 6-20
-	B 20	5,5	40	34,5	25	7	50	38	50	38	M 6-20

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material o	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

BK - d_1 - z - o

Base clamp
Clamping point
Screw point
Surface / material

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

BKZ Base clamps, with two fastening bores, aluminum / stainless steel

PRODUCT INFO

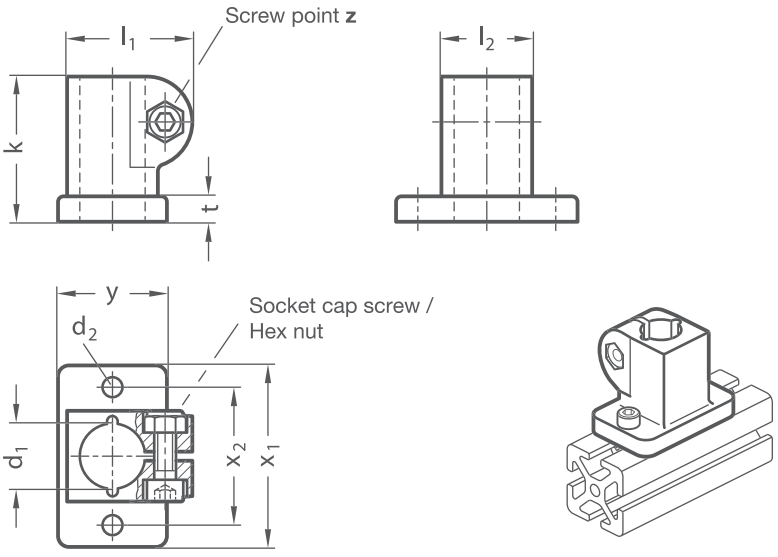
Base clamps BKZ of die-cast aluminum or precision-cast stainless steel have a slitted clamping point machined by cutting methods.

The base flange with two bores serves as an interface or for fastening the clamp to the place of use.

The bore at the clamping point is arranged perpendicular to the face of the flange. It receives typically available rods and tubes with full surface contact over the entire cross-section of the bore.

At the screw point, a hex socket cap screw reduces the bore cross-section for clamping.

RoHS-compliant product



Clamping point										
Bore d_1		d_2	Clamping length k	l_1	l_2	t	x_1	x_2	y	Hex socket cap screw
Aluminum	Stainless steel									
B 10	-	5,5	40	34,5	25	7	50	38	30	M 6-20
B 12	B 12	5,5	40	34,5	25	7	50	38	30	M 6-20
B 14	B 14	5,5	40	34,5	25	7	50	38	30	M 6-20
B 15	B 15	5,5	40	34,5	25	7	50	38	30	M 6-20
B 16	B 16	5,5	40	34,5	25	7	50	38	30	M 6-20
B 18	B 18	5,5	40	34,5	25	7	50	38	30	M 6-20
-	B 20	5,5	40	34,5	25	7	50	38	30	M 6-20

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material o	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

BKZ - d_1 - z - o

Base clamp
Clamping point
Screw point
Surface / material

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screws

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

BKG Base clamps, with grub screw, aluminum

PRODUCT INFO

Base clamps BKG of die-cast aluminum have a clamping point machined with cutting methods without a clamping slit.

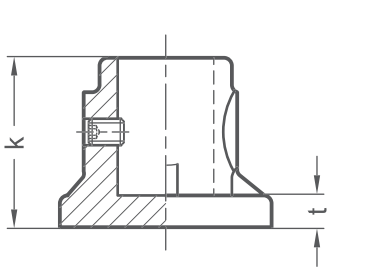
The base flange with four bores serves as an interface or for fastening the clamp to the place of use.

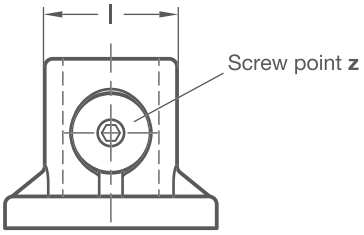
The bore at the clamping point is arranged perpendicular to the face of the flange. It receives typically available construction tubes with full surface contact over the entire cross-section of the bore.

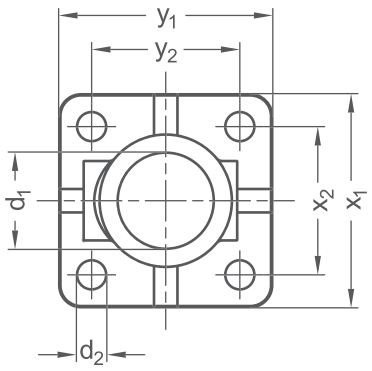
A grub screw with a cup point acts radially at the screw point to reduce the cross-section of the bore. The bushing into which the grub screw is inserted is made of red brass.

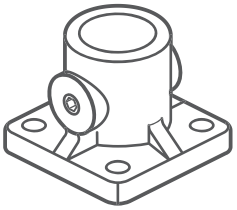
A centering bore on the clamped tube prevents pressure points and enables precise positioning.

RoHS-compliant product









1A

Clamping point Bore d_1	d_2	Clamping length k	l	t	x_1	x_2	y_1	y_2	Grub screw
B 10	5,5	32	25	6	40	28	40	28	M 6-6
B 12	5,5	32	25	6	40	28	40	28	M 6-6
B 14	5,5	32	25	6	40	28	40	28	M 6-6
B 15	5,5	32	25	6	40	28	40	28	M 6-6
B 16	5,5	32	25	6	40	28	40	28	M 6-6
B 18	5,5	32	25	6	40	28	40	28	M 6-6

Screw point z	
B	Grub screw with zinc-plated hex socket (DIN 913)
D	Grub screw with stainless steel hex socket (DIN 913)

Surface o	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt

ORDER KEY

BKG - d_1 - z - o

- Base clamp
- Clamping point
- Screw point
- Surface

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screw, hex socket cap screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

TK T-clamps, aluminum / stainless steel

PRODUCT INFO

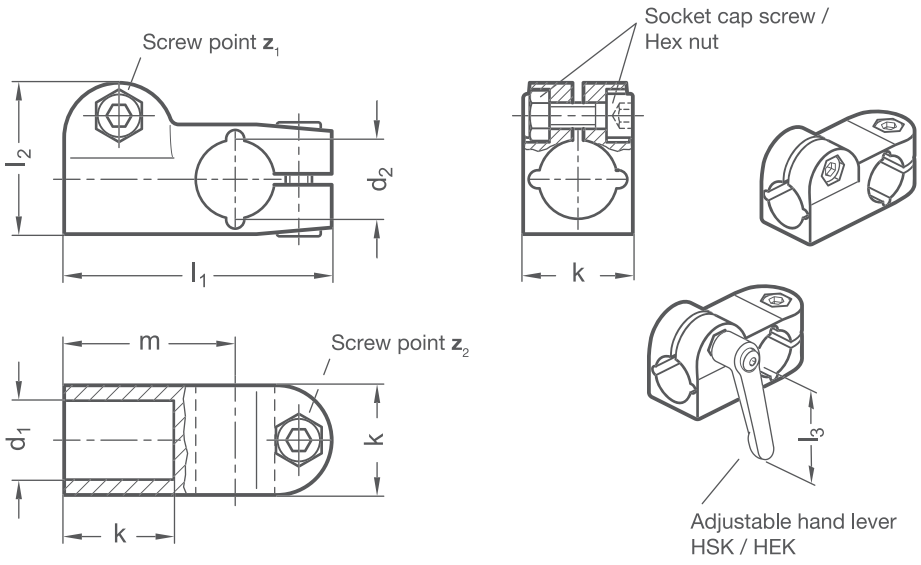
T-clamps TK of die-cast aluminum or precision-cast stainless steel have slitted clamping points machined by cutting methods.

The bores at the clamping points are situated in a plane and arranged in a T-shape. They receive typically available rods and tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1A

Clamping point 1		Clamping point 2		Clamping length				Hex socket cap screws	**Accessories** recom. hand lever			
Bore d_1		Bore d_2							HSK for aluminum clamp		HEK for stainless steel clamp	
Aluminum	Stainless steel	Aluminum	Stainless steel	k	l_1	l_2	m	z_1 / z_2	for z_1 l_3	for z_2 l_3	for z_1 l_3	for z_2 l_3
B 10	-	B 10	-	25	61	34,5	39	M 6-20	-	63	-	-
B 12	B 12	B 12	B 12	25	61	34,5	39	M 6-20	-	63	63	63
B 14	B 14	B 14	B 14	25	61	34,5	39	M 6-20	-	63	63	63
B 15	B 15	B 15	B 15	25	61	34,5	39	M 6-20	-	63	63	63
B 16	B 16	B 16	B 16	25	61	34,5	39	M 6-20	-	63	63	63
B 18	B 18	B 18	B 18	25	61	34,5	39	M 6-20	-	63	63	63
-	B 20	-	B 20	25	61	34,5	39	M 6-20	-	-	63	63

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material o	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

TK - d_1 - d_2 - z - o

- T-clamp
- Clamping point 1
- Clamping point 2
- Screw points
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2
or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

LKF Swivel clamps, aluminum / stainless steel

PRODUCT INFO

Swivel clamps LKF of die-cast aluminum or precision-cast stainless steel have a smooth fastening lug.

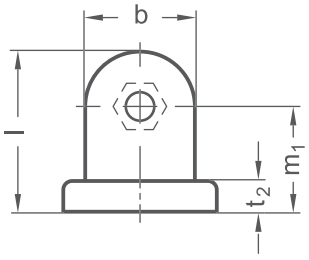
The fastening lug is centered and situated at an angle of 90° to the flange face.

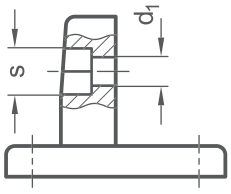
The flange with two bores serves as an interface or for fastening the clamp to the place of use.

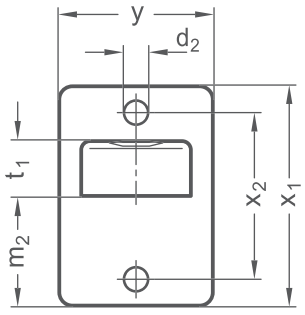
The screw point receives a hex head or hex socket cap screw or a lock nut for fastening any additional parts.

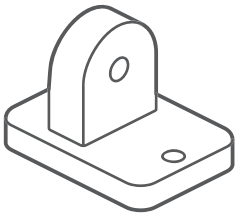
By combining swivel clamps with identical screw points, it is possible to assemble any type of joint clamp.

RoHS-compliant product









1A

Lug width **b**	d_1	d_2	l	m_1	m_2	t_1	t_2	s	x_1	x_2	y
25	6,5	5,5	36,5	24	25	12,5	7	10	50	38	35

Surface / material **o**	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY **LKF - b - o**

Swivel clamp
Lug width
Surface / material

ON REQUEST

– Surface ball-burnished, anodized or powder-coated in other RAL colors

LKP Swivel clamps, aluminum / stainless steel

PRODUCT INFO

Swivel clamps LKP of die-cast aluminum or precision-cast stainless steel have a slitted clamping point machined by cutting methods and a smooth fastening lug.

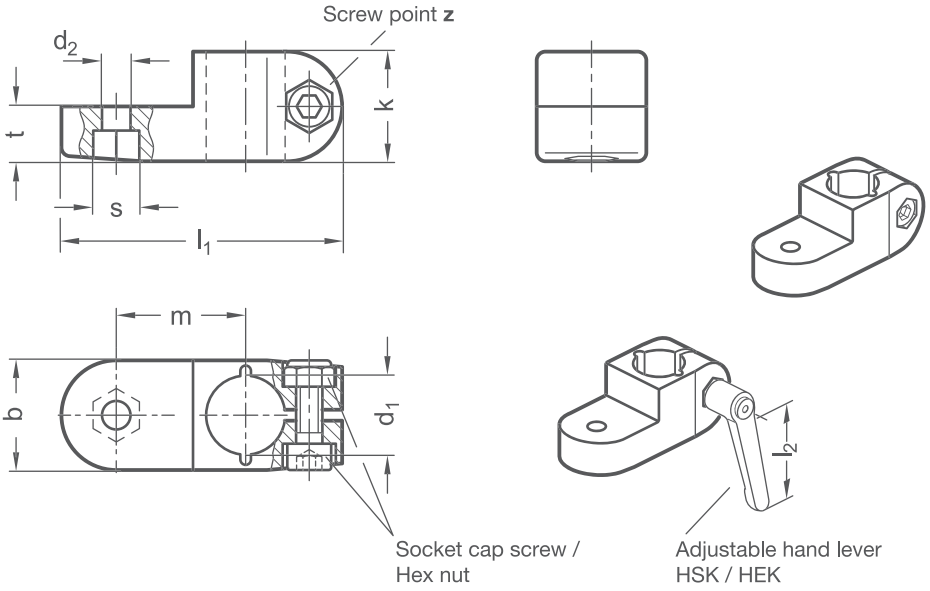
The fastening lug is centered and situated at an angle of 90° to the clamping point bore, which receives typically available rods and tubes with full contact over the entire cross-section.

The screw point of the fastening lug receives a hex head or hex socket cap screw or a lock nut for fastening any additional parts. At the clamping point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

By combining swivel clamps with identical screw points, it is possible to assemble any type of joint clamp.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point										**Accessories** recom. hand lever for z	
Bore d_1		Lug width									
Aluminum	Stainless steel	b	d_2	k	l_1	m	s	t	Hex socket cap screw	HSK for aluminum clamp lever length l_2	HEK for stainless steel clamp lever length l_2
B 12	B 12	25	6,5	25	64	29,5	10	12,5	M 6-20	63	-
B 14	B 14	25	6,5	25	64	29,5	10	12,5	M 6-20	63	-
B 15	B 15	25	6,5	25	64	29,5	10	12,5	M 6-20	63	-
B 16	B 16	25	6,5	25	64	29,5	10	12,5	M 6-20	63	-
B 18	B 18	25	6,5	25	64	29,5	10	12,5	M 6-20	63	63
-	B 20	25	6,5	25	64	29,5	10	12,5	M 6-20	-	63

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material o	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

LKP - d_1 - z - o

- Swivel clamp
- Clamping point
- Screw point
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screws

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

LKT Swivel clamps, aluminum / stainless steel

PRODUCT INFO

Swivel clamps LKT of die-cast aluminum or precision-cast stainless steel have a slitted clamping point machined by cutting methods and a smooth fastening lug.

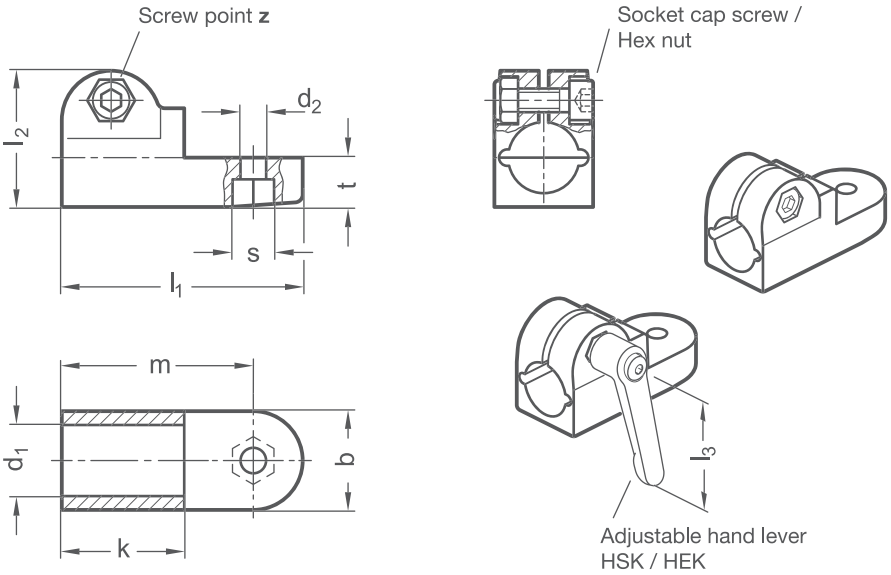
The fastening lug is centered and forms a T-shape relative to the axis of the bore, which receives typically available rods and tubes with full contact over the entire cross-section.

The screw point of the fastening lug receives hex head or hex socket cap screws or a lock nut for fastening any additional parts. At the clamping point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

By combining swivel clamps with identical screw points, it is possible to assemble any type of joint clamp.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lowerdue to the shorter lever length.

RoHS-compliant product



Clamping point											**Accessories** recom. hand lever for z	
Bore d_1		Lug width		Clamp-ing length							HSK for aluminum clamp lever length l_3	HEK for stainless steel clamp lever length l_3
Aluminum	Stainless steel	**b**	d_2	**k**	l_1	l_2	**m**	**s**	**t**	Hex socket cap screw		
B 12	B 12	25	6,5	31,5	61	34,5	48,5	10	12,5	M 6-20	63	-
B 14	B 14	25	6,5	31,5	61	34,5	48,5	10	12,5	M 6-20	63	-
B 15	B 15	25	6,5	31,5	61	34,5	48,5	10	12,5	M 6-20	63	-
B 16	B 16	25	6,5	31,5	61	34,5	48,5	10	12,5	M 6-20	63	-
B 18	B 18	25	6,5	31,5	61	34,5	48,5	10	12,5	M 6-20	63	63
-	B 20	25	6,5	31,5	61	34,5	48,5	10	12,5	M 6-20	-	63

Screw point **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material **o**	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

LKT - d_1 - z - o

- Swivel clamp
- Clamping point
- Screw point
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

LKQ Swivel clamps, aluminum / stainless steel

PRODUCT INFO

Swivel clamps LKQ of die-cast aluminum or precision-cast stainless steel have a slitted clamping point machined by cutting methods and a smooth fastening lug.

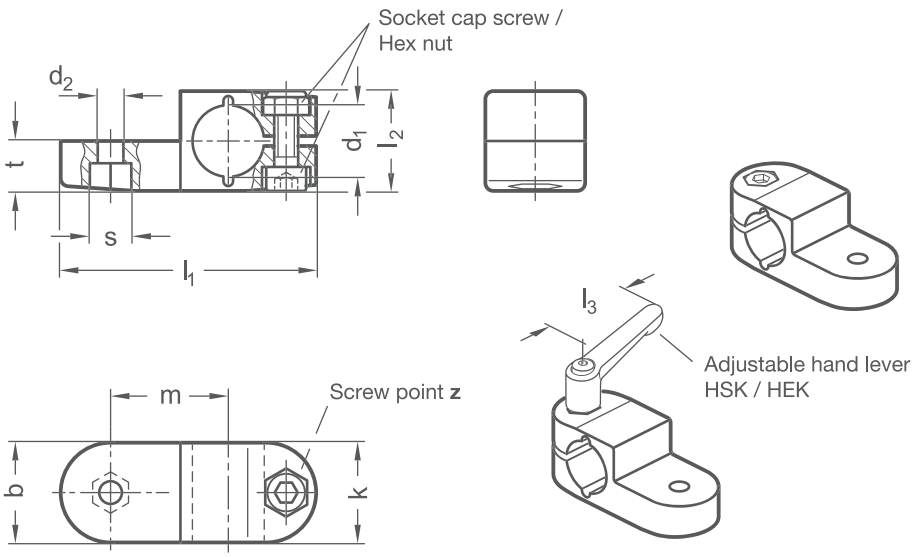
The fastening lug is centered and perpendicular to the axis of the bore, which receives typically available rods and tubes with full contact over the entire cross-section.

The screw point of the fastening lug receives hex head or hex socket cap screws or a lock nut for fastening any additional parts. At the clamping point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

By combining swivel clamps with identical screw points, it is possible to assemble any type of joint clamp.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point											**Accessories** recom. hand lever for z	
Bore d_1		Lug width									HSK for aluminum clamp lever length l_3	HEK for stainless steel clamp lever length l_3
Aluminum	Stainless steel	**b**	d_2	**k**	l_1	l_2	**m**	**s**	**t**	Hex socket cap screw		
B 12	B 12	25	6,5	25	64	25	29,5	10	12,5	M 6-20	63	-
B 14	B 14	25	6,5	25	64	25	29,5	10	12,5	M 6-20	63	-
B 15	B 15	25	6,5	25	64	25	29,5	10	12,5	M 6-20	63	-
B 16	B 16	25	6,5	25	64	25	29,5	10	12,5	M 6-20	63	63
B 18	B 18	25	6,5	25	64	25	29,5	10	12,5	M 6-20	63	63
-	B 20	25	6,5	25	64	25	29,5	10	12,5	M 6-20	-	63

Screw point
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material
o

2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

LKQ - d_1 - z - o

- Swivel clamp
- Clamping point
- Screw point
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*
– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

GKF Joint clamps, aluminum / stainless steel

PRODUCT INFO

Joint clamps GKF of die-cast aluminum or precision-cast stainless steel have a slitted clamping point machined by cutting methods. They are comprised of swivel clamps LKF and LKT.

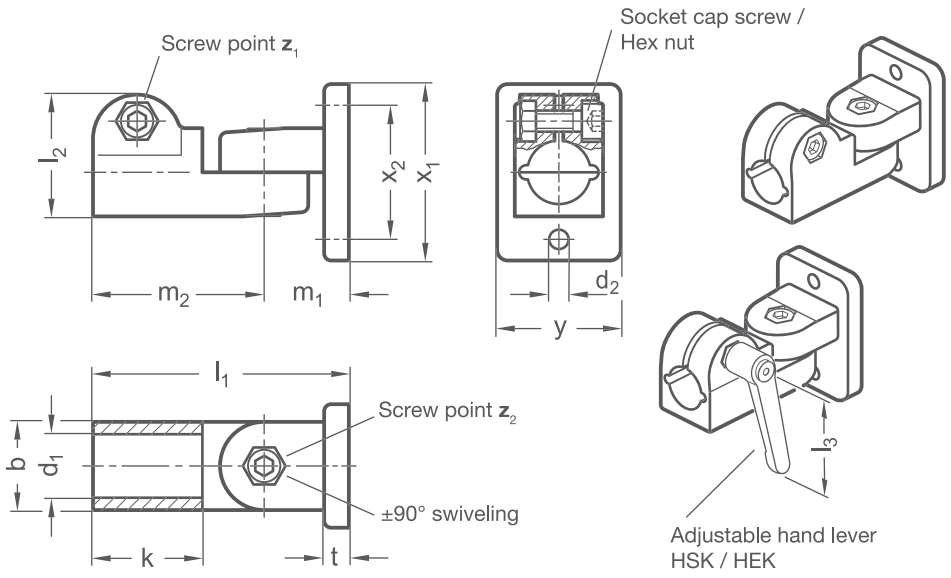
The clamping point bore is centered in the plane and can be rotated by ± 90° perpendicular to the flange face. It receives typically available rods and tubes with full surface contact over the entire cross-section of the bore.

At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

A hex socket cap screw or an adjustable hand lever at the clamping joint serves for locking the joint axis. The flange with two bores serves as an interface or for fastening the clamp to the place of use.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1A

Clamping point														**Accessories** recom. hand lever			
Bore d_1													Hex socket cap screws	HSK for aluminum clamp		HEK for stainless steel clamp	
Aluminum	Stainless steel	b	d_2	k	l_1	l_2	m_1	m_2	t	x_1	x_2	y	z_1 / z_2	for z_1 l_3	for z_2 l_3	for z_1 l_3	for z_2 l_3
B 12	B 12	25	5,5	31,5	72,5	34,5	24	48,5	7	50	38	35	M 6-20	63	63	-	63
B 14	B 14	25	5,5	31,5	72,5	34,5	24	48,5	7	50	38	35	M 6-20	63	63	-	63
B 15	B 15	25	5,5	31,5	72,5	34,5	24	48,5	7	50	38	35	M 6-20	63	63	-	63
B 16	B 16	25	5,5	31,5	72,5	34,5	24	48,5	7	50	38	35	M 6-20	63	63	-	63
B 18	B 18	25	5,5	31,5	72,5	34,5	24	48,5	7	50	38	35	M 6-20	63	63	63	63
-	B 20	25	5,5	31,5	72,5	34,5	24	48,5	7	50	38	35	M 6-20	63	63	-	63

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material
o

2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

GKF - d_1 - z - o

- Joint clamp
- Clamping point
- Screw points
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*
– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

GKP Joint clamps, aluminum / stainless steel

PRODUCT INFO

Joint clamps GKP of die-cast aluminum or precision-cast stainless steel have slitted clamping points machined by cutting methods. They are comprised of swivel clamps LKT and LKP.

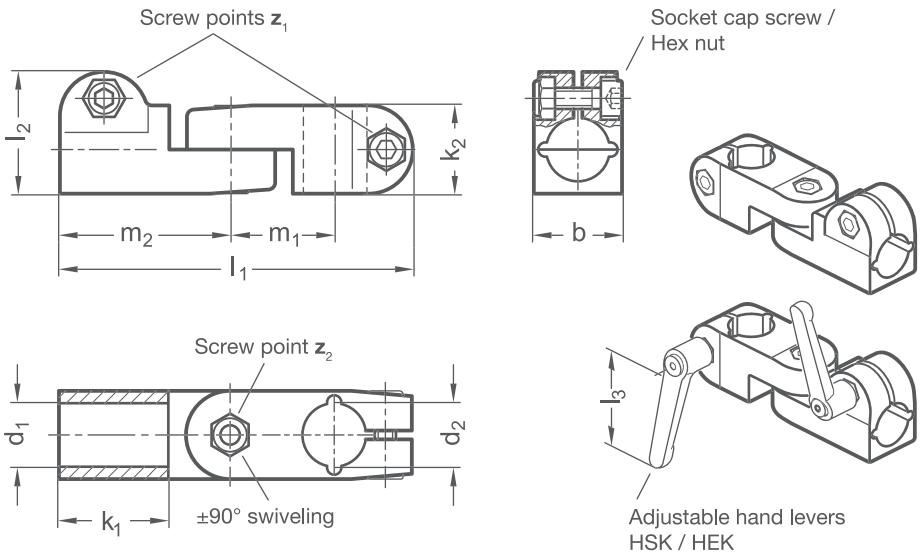
The clamping point bores are arranged at an angle of 90° and connected by the clamping joint to swivel by ± 90°. They receive typically available rods and tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

A hex socket cap screw or an adjustable hand lever at the clamping joint serves for locking the joint axis.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Aluminum														**Accessories** recom. hand lever	
Clamping point 1 Bore d_1	Clamping point 2 Bore d_2					b	k_1	k_2	l_1	l_2	m_1	m_2	Hex socket cap screws z_1 / z_2	HSK for aluminum clamp for z_1 l_3	for z_2 l_3
B12	B12	B14	B15	B16	B18	25	31,5	25	100	34,5	29,5	48,5	M 6-20	63	63
B14	B12	B14	B15	B16	B18	25	31,5	25	100	34,5	29,5	48,5	M 6-20	63	63
B15	B12	B14	B15	B16	B18	25	31,5	25	100	34,5	29,5	48,5	M 6-20	63	63
B16	B12	B14	B15	B16	B18	25	31,5	25	100	34,5	29,5	48,5	M 6-20	63	63
B18	B12	B14	B15	B16	B18	25	31,5	25	100	34,5	29,5	48,5	M 6-20	63	63

Stainless steel														**Accessories** recom. hand lever	
Clamping point 1 Bore d_1	Clamping point 2 Bore d_2						b	k_1	k_2	l_1	l_2	m_1	m_2	Hex socket cap screws z_1 / z_2	HEK for stainless steel clamp for z_1 l_3	for z_2 l_3
B12	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	29,5	48,5	M 6-20	-	63
B14	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	29,5	48,5	M 6-20	-	63
B15	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	29,5	48,5	M 6-20	-	63
B16	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	29,5	48,5	M 6-20	-	63
B18	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	29,5	48,5	M 6-20	63	63
B20	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	29,5	48,5	M 6-20	63	63

Screw points **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material **o**	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

GKP - d_1 - d_2 - z - o

- Joint clamp
- Clamping point 1
- Clamping point 2
- Screw points
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*
– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

GKT Joint clamps, aluminum / stainless steel

PRODUCT INFO

Joint clamps GKT of die-cast aluminum or precision-cast stainless steel have slitted clamping points machined by cutting methods. They are comprised of two swivel clamps LKT.

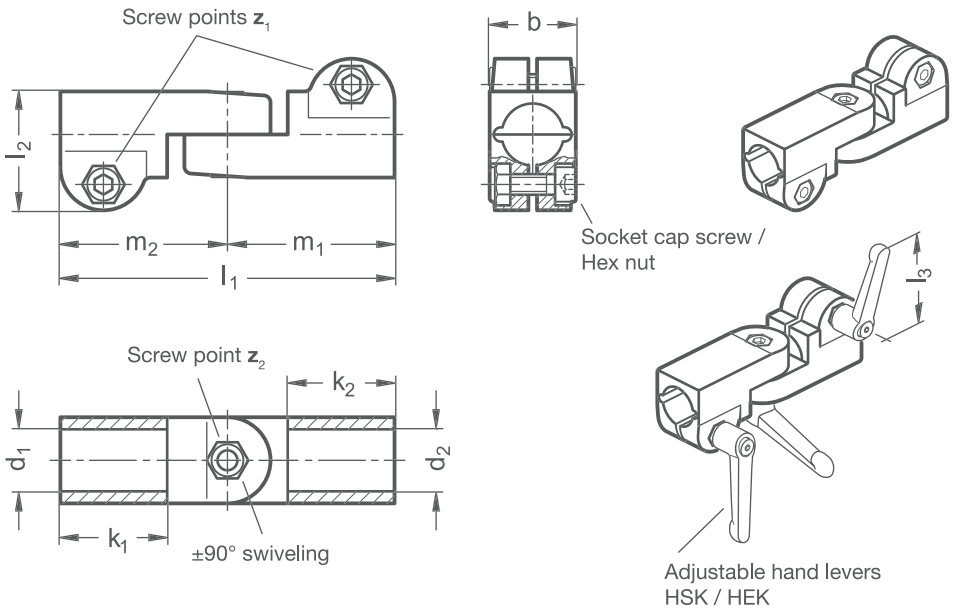
The clamping point bores are situated in a plane and are connected by the clamping joint to swivel by ± 90°, from aligned orientation to perpendicular. They receive typically available rods and tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

A hex socket cap screw or an adjustable hand lever at the clamping joint serves for locking the joint axis.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1A

Aluminum													**Accessories** recom. hand lever	
Clamping point 1 Bore d_1	Clamping point 2 Bore d_2					b	k_1	k_2	l_1	l_2	m_1	m_2	Hex socket cap screws z_1 / z_2	HSK for aluminum clamp for z_1 l_3	for z_2 l_3
B12	B12	B14	B15	B16	B18	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	63	63
B14	B12	B14	B15	B16	B18	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	63	63
B15	B12	B14	B15	B16	B18	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	63	63
B16	B12	B14	B15	B16	B18	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	63	63
B18	B12	B14	B15	B16	B18	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	63	63

Stainless steel														**Accessories** recom. hand lever	
Clamping point 1 Bore d_1	Clamping point 2 Bore d_2						b	k_1	k_2	l_1	l_2	m_1	m_2	Hex socket cap screws z_1 / z_2	HEK for stainless steel clamp for z_1 l_3	for z_2 l_3
B12	B12	B14	B15	B16	B18	B20	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	-	63
B14	B12	B14	B15	B16	B18	B20	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	-	63
B15	B12	B14	B15	B16	B18	B20	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	-	63
B16	B12	B14	B15	B16	B18	B20	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	-	63
B18	B12	B14	B15	B16	B18	B20	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	63	63
B20	B12	B14	B15	B16	B18	B20	25	31,5	31,5	97	34,5	48,5	48,5	M 6-20	63	63

Screw points **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material **o**	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

GKT - d_1 - d_2 - z - o

- Joint clamp
- Clamping point 1
- Clamping point 2
- Screw points
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

GKQ Joint clamps, aluminum / stainless steel

PRODUCT INFO

Joint clamps GKQ of die-cast aluminum or precision-cast stainless steel have slitted clamping points machined by cutting methods. They are comprised of swivel clamps LKT and LKQ.

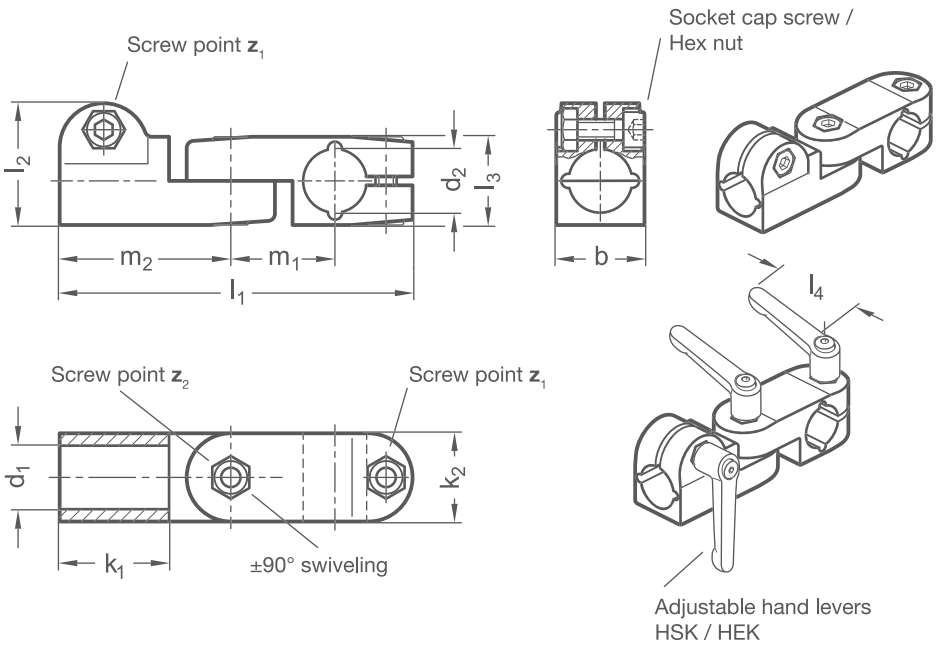
The clamping point bores are situated in a plane and are connected by the clamping joint to swivel by ± 90°, from perpendicular to parallel. They receive typically available rods and tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

A hex socket cap screw or an adjustable hand lever at the clamping joint serves for locking the joint axis.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1A

Aluminum															Accessories recom. hand lever	
Clamping point 1 Bore d_1	Clamping point 2 Bore d_2					b	k_1	k_2	l_1	l_2	l_3	m_1	m_2	Hex socket cap screws z_1 / z_2	HSK for aluminum clamp for z_1 l_4	for z_2 l_4
B12	B12	B14	B15	B16	B18	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	63	63
B14	B12	B14	B15	B16	B18	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	63	63
B15	B12	B14	B15	B16	B18	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	63	63
B16	B12	B14	B15	B16	B18	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	63	63
B18	B12	B14	B15	B16	B18	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	63	63

Stainless steel															Accessories recom. hand lever	
Clamping point 1 Bore d_1	Clamping point 2 Bore d_2						b	k_1	k_2	l_1	l_2	l_3	m_1	m_2	Hex socket cap screws z_1 / z_2	HEK for stainless steel clamp for z_1 l_4	for z_2 l_4
B12	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	-	63
B14	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	-	63
B15	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	-	63
B16	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	63	63
B18	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	63	63
B20	B12	B14	B15	B16	B18	B20	25	31,5	25	100	34,5	25	29,5	48,5	M 6-20	63	63

Screw points **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum clamps)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material **o**	
2	Aluminum, textured powder-coated, Black RAL 9005
8	Aluminum, blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

GKQ - d_1 - d_2 - z - o

- Joint clamp
- Clamping point 1
- Clamping point 2
- Screw points
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

SKF Sensor mounts, aluminum

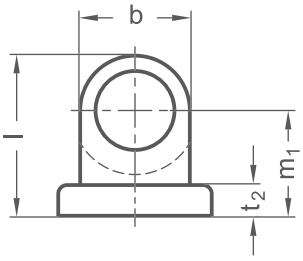
PRODUCT INFO

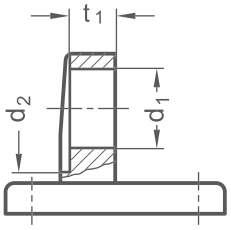
Sensor mounts SKF of die-cast aluminum have a sensor bore machined by cutting methods.

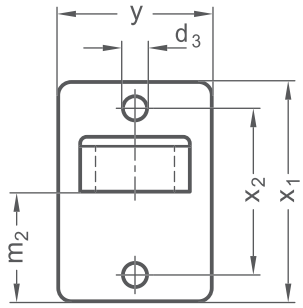
The sensor bore is centered and parallel to the flange face. It can be used for attaching a sensor with male thread.

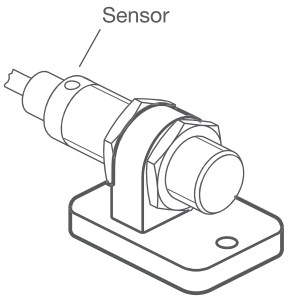
The flange with two bores serves as an interface or for fastening the sensor mount to the place of use.

RoHS-compliant product









Sensor bore d_1	Lug width b	d_2	d_3	l	m_1	m_2	t_1	t_2	x_1	x_2	y
B12	25	30	5,5	36,5	24	25	11,5	7	50	38	35
B18	25	30	5,5	36,5	24	25	11,5	7	50	38	35

Surface o	
2	Aluminum, textured powder-coated, Black RAL 9005

ORDER KEY

SKF - d_1 - b - o

- Sensor mount
- Bore
- Lug width
- Surface

ON REQUEST

– Stainless steel version

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

– Sensor bore
with special diameter

SKP Sensor mounts, aluminum

PRODUCT INFO

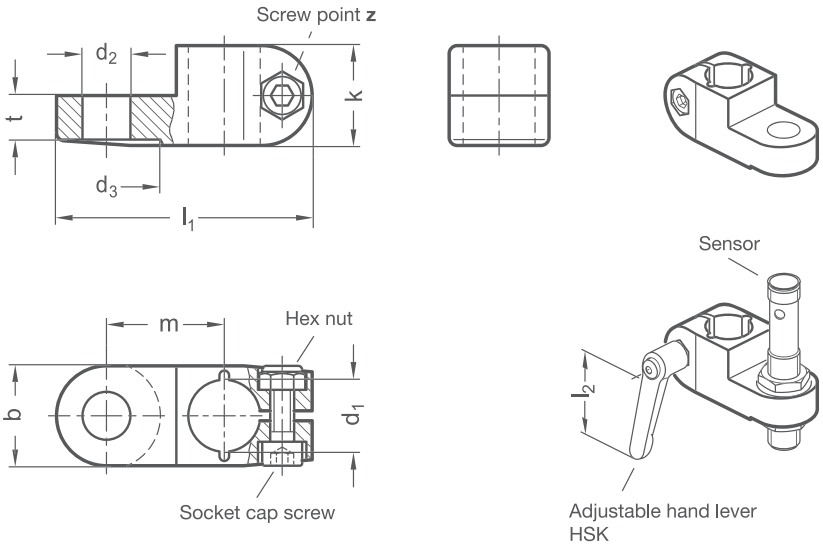
Sensor mounts SKP of die-cast aluminum have a slitted clamping point and a sensor bore, both machined by cutting methods.

The sensor bore allows attachment of a sensor with male thread. It lies within a plane and parallel to the clamping point bore, which receives typically available rods and tubes with full contact over the entire cross-section.

At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point	Sensor bore									**Accessories** recom. hand lever
Bore d_1	d_2		Lug width b	d_3	k	l_1	m	t	Hex socket cap screw	HSK for z lever length l_2
B 12	B 12	B 18	25	27	25	64	29,5	11	M 6-20	63
B 14	B 12	B 18	25	27	25	64	29,5	11	M 6-20	63
B 15	B 12	B 18	25	27	25	64	29,5	11	M 6-20	63
B 16	B 12	B 18	25	27	25	64	29,5	11	M 6-20	63
B 18	B 12	B 18	25	27	25	64	29,5	11	M 6-20	63

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	Aluminum, textured powder-coated, Black RAL 9005

ORDER KEY **SKP - d_1 - d_2 - z - o**

- Sensor mount
- Clamping point
- Sensor bore
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Stainless steel version

– Clamping points / Sensor bore with special diameter

– Screw point with hex head screws

– Surface ball-burnished, anodized or powder-coated in other RAL colors

SKT Sensor mounts, aluminum

PRODUCT INFO

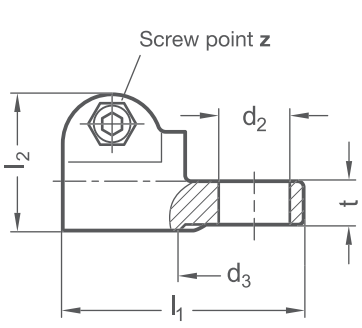
Sensor mounts SKT of die-cast aluminum have a slitted clamping point and a sensor bore, both machined by cutting methods.

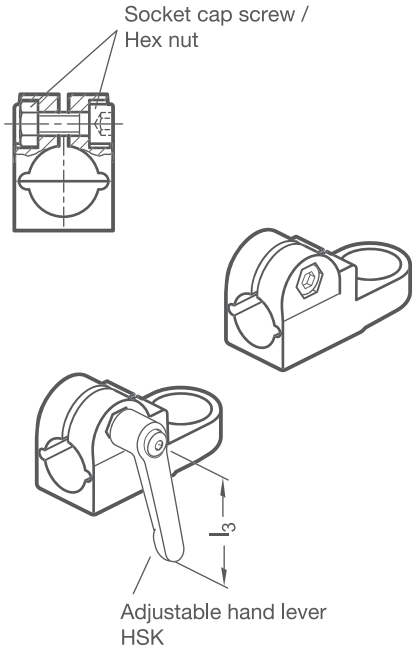
The sensor bore allows attachment of a sensor with male thread. It is centered and forms a T-shape relative to the clamping point bore, which receives typically available rods and tubes with full contact over the entire cross-section.

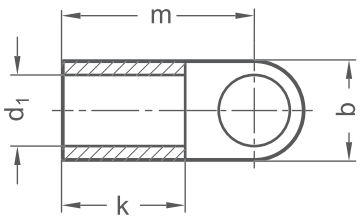
At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product







1A

Clamping point	Sensor bore										**Accessories** recom. hand lever
Bore d_1	d_2		Lug width b	d_3	k	l_1	l_2	m	t	Hex socket cap screw	HSK for z lever length l_3
B 12	B 12	B 18	25	27	31,5	61	34,5	48,5	11	M 6-20	63
B 14	B 12	B 18	25	27	31,5	61	34,5	48,5	11	M 6-20	63
B 15	B 12	B 18	25	27	31,5	61	34,5	48,5	11	M 6-20	63
B 16	B 12	B 18	25	27	31,5	61	34,5	48,5	11	M 6-20	63
B 18	B 12	B 18	25	27	31,5	61	34,5	48,5	11	M 6-20	63

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	Aluminum, textured powder-coated, Black RAL 9005

ORDER KEY **SKT - d_1 - d_2 - z - o**

- Sensor mount
- Clamping point
- Sensor bore
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Stainless steel version

– Clamping point / Sensor bore
with special diameter

– Screw point
with hex head screws

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

SKQ Sensor mounts, aluminum

PRODUCT INFO

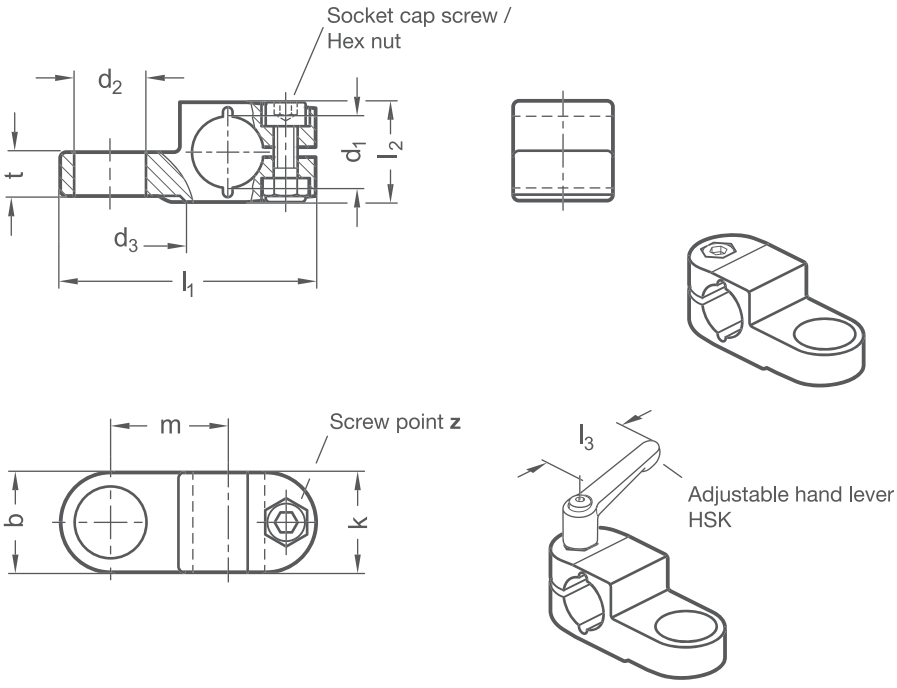
Sensor mounts SKQ of die-cast aluminum have a slitted clamping point and a sensor bore, both machined by cutting methods.

The sensor bore allows attachment of a sensor with male thread. It is offset in the plane and situated at an angle of 90° to the clamping point bore, which receives typically available rods and tubes with full contact over the entire cross-section.

At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1A

Clamping point	Sensor bore										**Accessories** recom. hand lever
Bore d_1	d_2		Lug width b	d_3	k	l_1	l_2	m	t	Hex socket cap screw	HSK for z lever length l_3
B 12	B 12	B 18	25	27	25	64	25	29,5	11	M 6-20	63
B 14	B 12	B 18	25	27	25	64	25	29,5	11	M 6-20	63
B 15	B 12	B 18	25	27	25	64	25	29,5	11	M 6-20	63
B 16	B 12	B 18	25	27	25	64	25	29,5	11	M 6-20	63
B 18	B 12	B 18	25	27	25	64	25	29,5	11	M 6-20	63

Screw point
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	Aluminum, textured powder-coated, Black RAL 9005

ORDER KEY

SKQ - d_1 - d_2 - z - o

- Sensor mount
- Clamping point
- Sensor bore
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

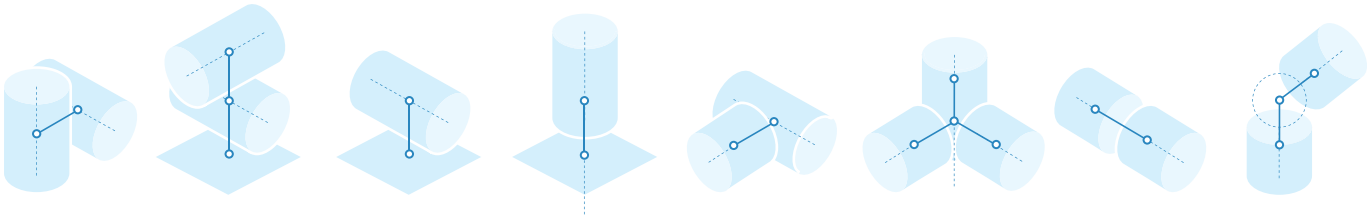
ON REQUEST

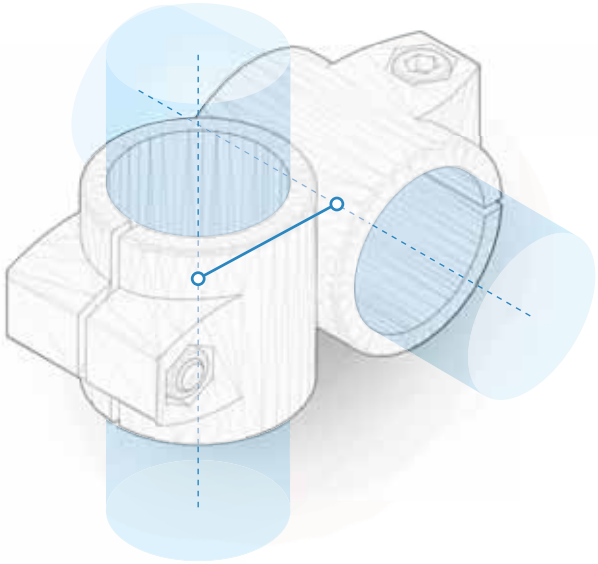
– Stainless steel version

– Clamping point / Sensor bore
with special diameter

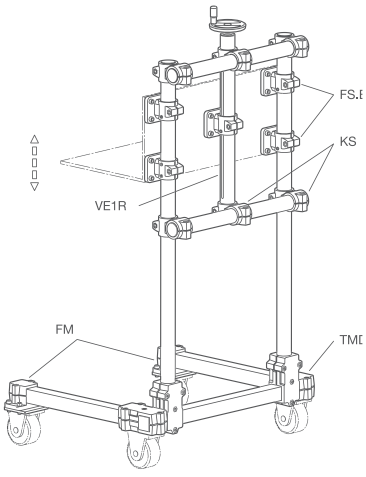
– Screw point
with hex head screws

– Surface
ball-burnished, anodized or powder-coated in other RAL colors





Tube clamps



Application example mobile lifting table

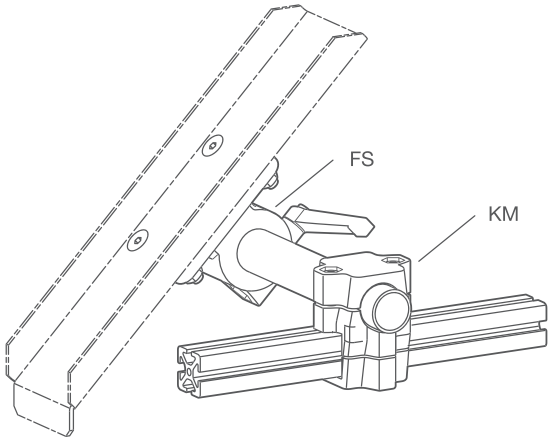
The product group “Tube Clamps 1B” contains single-piece and multi-piece parts made of die-cast aluminum or precision-cast stainless steel. These have slitted or multi-piece clamping points that receive typically available rods and precision tubes as per DIN 2391 or square tubes with full surface contact over the entire cross-section or via multiple ribs in the bore.

Hex socket cap screws or adjustable hand levers, together with hex nuts, reduce the bore or square cross-section for clamping. The screw and nut can be positioned anywhere thanks to the hexagonal countersinking on both sides. Hand levers are intended for repeated, tool-free clamping.

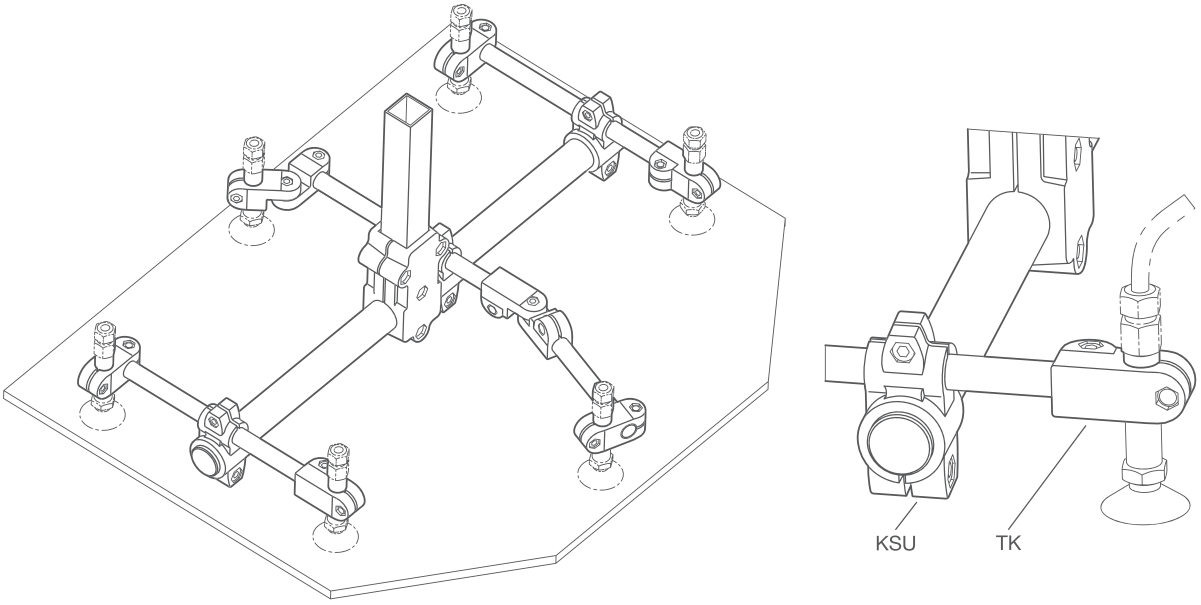
Tube clamps are available in all typical part types, such as cross, base, swivel or flanged clamps, with bore diameters from 20 to 60 mm. The parts can either have identically executed bores or they can mix square and round bores and different dimensions. Smaller diameters can be found in the group “Compact Clamps 1A”.

Together with rods and tubes, tube clamps can be used to quickly and easily assemble stable tube constructions that can be flexibly adapted to many different areas of application, such as in handling systems, machine building, warehousing and conveyor systems.

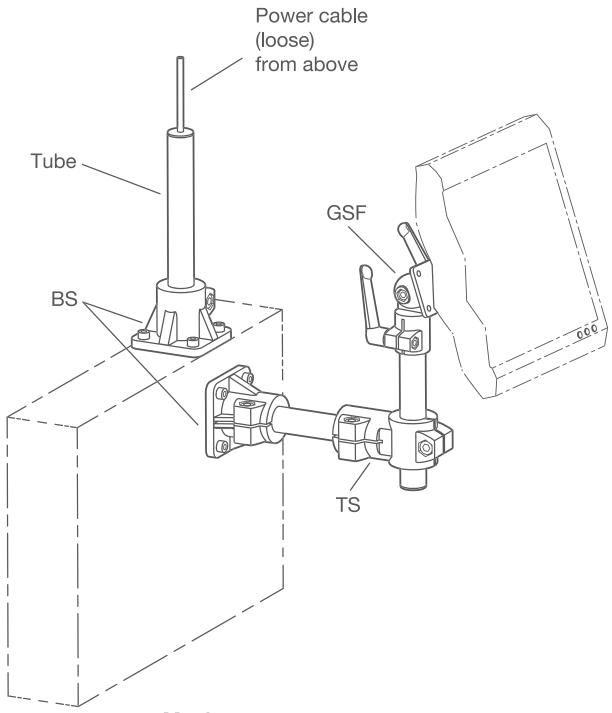
Cross clamps	**KS** *p. 50* 	**KE** *p. 52* 	**KSU** *p. 54* 	**KM** *p. 56* 	**KMU** *p. 58* 			
Cross flanged clamps	**KMF** *p. 60* 							
Flanged clamps	**FS** *p. 62* 	**FSZ** *p. 64* 	**FE** *p. 66* 	**FEZ** *p. 68* 	**FM** *p. 70* 	**FMS** *p. 72* 		
Base clamps	**BS** *p. 74* 	**BE** *p. 76* 	**BM** *p. 78* 	**BML** *p. 80* 	**BMT** *p. 82* 	**BMA** *p. 84* 		
Angle clamps	**TS** *p. 86* 	**TE** *p. 88* 	**TMD** *p. 90* 	**TM** *p. 92* 	**WMD** *p. 94* 	**WS** *p. 96* 		
Angle clamps	**ES** *p. 98* 							
Sleeve clamps	**CM** *p. 100* 	**MM** *p. 102* 	**MS** *p. 104* 					
Swivel clamps	**LSF** *p. 106* 	**LSP** *p. 108* 	**LST** *p. 110* 	**LSQ** *p. 112* 	**LMQ** *p. 114* 			
Joint clamps	**GSF** *p. 116* 	**GSP** *p. 118* 	**GST** *p. 120* 	**GSQ** *p. 122* 	**GMQ** *p. 124* 	**GMV** *p. 126* 		
Sensor mounts	**SSF** *p. 128* 	**SSP** *p. 130* 	**SST** *p. 132* 	**SSQ** *p. 134* 				



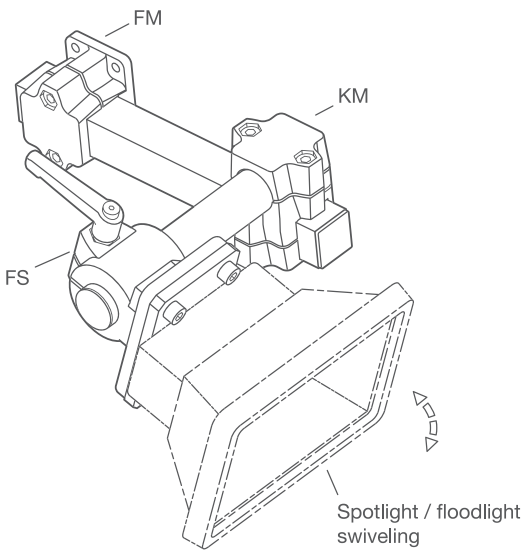
Workpiece slide
Transition to aluminum profile system



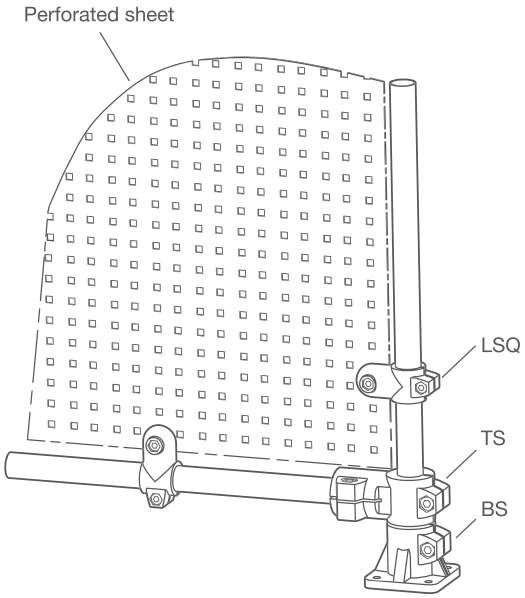
Suction gripper for panels



Monitor mount



Mount for spotlight



Safety fence

KS Cross clamps, aluminum

PRODUCT INFO

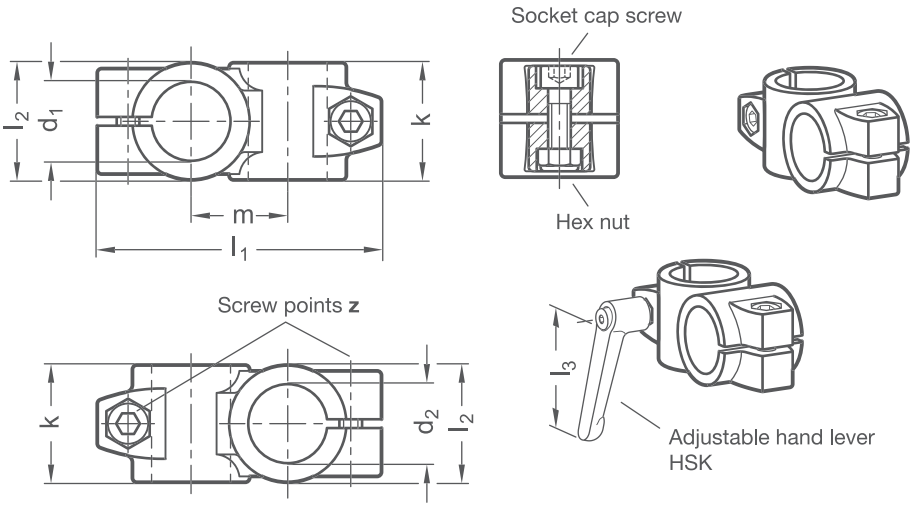
Cross clamps KS of die-cast Aluminum have slitted clamping points machined by cutting methods.

The bores of the clamping points are offset in the plane and arranged at an angle of 90°. They receive typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1	Clamping point 2						**Accessories** recom. adjustable hand lever
Bore d_1	Bore d_2	Clamping length k	l_1	l_2	m	Hex socket cap screws	HSK for z lever length l_3
B 20	B 20	40	97	40	33	M 8-25	-
B 25	B 25	40	97	40	33	M 8-25	78
B 30	B 30	40	97	40	33	M 8-25	78
B 30	B 30	56	125	56	45	M 10-35	-
B 32	B 32	56	125	56	45	M 10-35	-
B 35	B 35	56	125	56	45	M 10-35	92
B 40	B 40	56	125	56	45	M 10-35	92
B 40	B 40	65	143	65	53	M 10-50	-
B 42	B 42	65	143	65	53	M 10-50	92
B 45	B 45	65	143	65	53	M 10-50	92
B 48	B 48	65	143	65	53	M 10-50	92
B 50	B 50	65	143	65	53	M 10-50	92
B 50	B 50	80	169	80	65	M 10-50	-
B 60	B 60	80	169	80	65	M 10-50	92

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	Black textured powder-coated, RAL 9005
8	Blasted, matt

ORDER KEY

KS - d_1 - d_2 - k - z - o

- Cross clamp
- Clamping point 1
- Clamping point 2
- Clamping length
- Screw points
- Surface

ACCESSORIES

– Adjustable hand lever**s HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

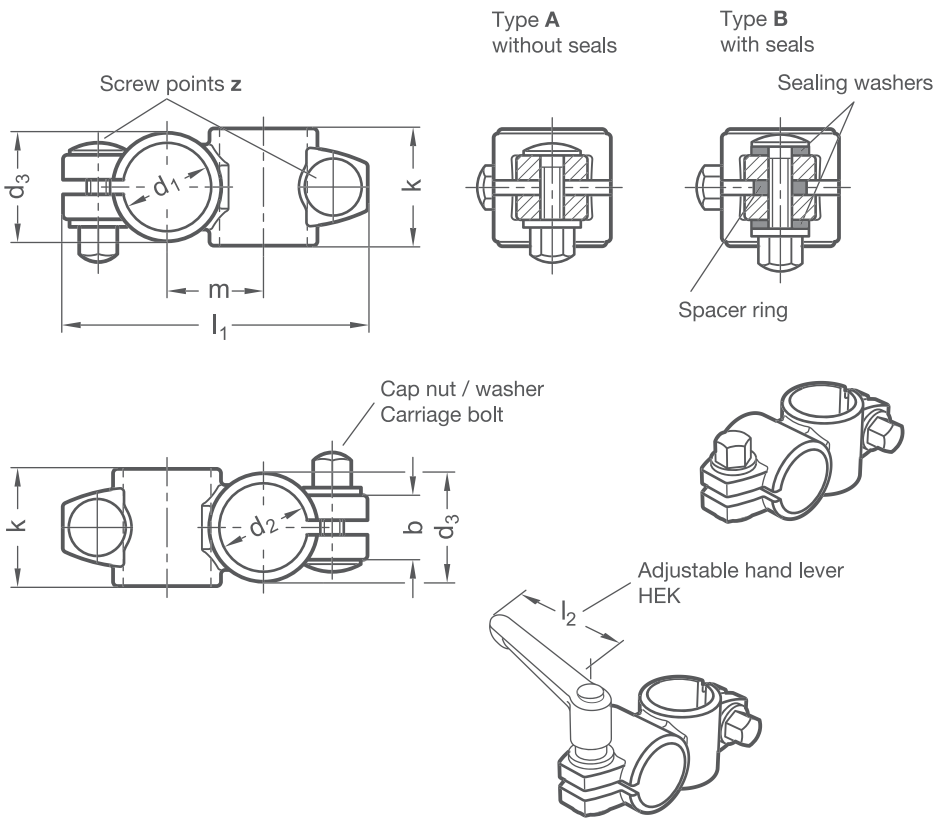
Cross clamps KE of matt blasted precision-cast stainless steel have a slitted clamping point machined by cutting methods.

The bores of the clamping points are offset in the plane and arranged at an angle of 90°. They receive typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw points, carriage bolts together with cap nuts or adjustable hand levers reduce the bore cross-section for clamping. Type B is equipped with seals at the screw points.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1	Clamping point 2							**Accessories** recom. hand lever
Bore d_1	Bore d_2	b	d_3	Clamping length k	l_1	m	Cap nut	HEK for z lever length l_2
B 30	B 30	22	37	40	104	33	M 8	78
B 40	B 40	28	50,2	56	133	45	M 10	92
B 50	B 50	30	60	65	150	53	M 10	92

Type t	
A	Without seals
B	With seals (sealing washer polyacetal POM, blue, spacer ring silicone 40 ... 60 Shore A, blue)

Screw points z	
4	Cap nut stainless steel DIN 917-A2 and carriage bolt stainless steel DIN 603-A2

ORDER KEY

KE - d_1 - d_2 - t - z

- Cross clamp
- Clamping point 1
- Clamping point 2
- Type
- Screw points

ACCESSORIES

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping points
with special diameter

– Screw points
with hex head screws or mixed screw /
adjustable hand lever elements

KSU Cross clamps, unequal bore dimensions, aluminum

PRODUCT INFO

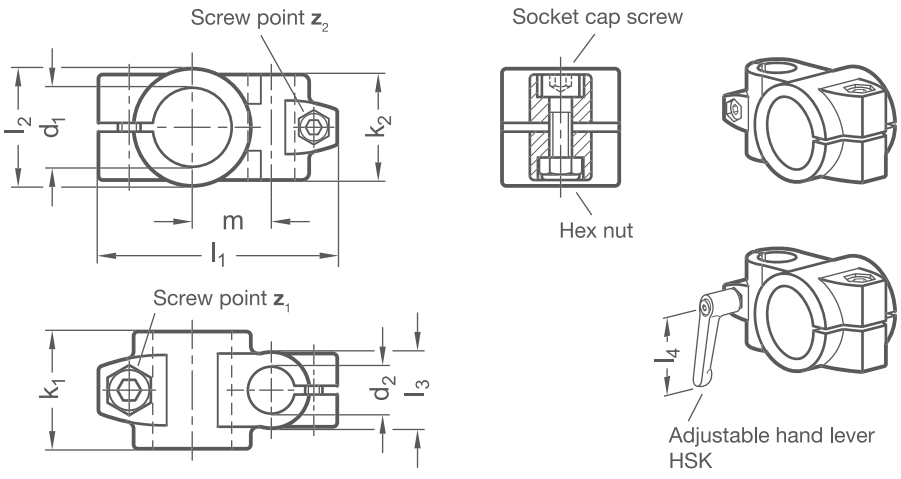
Cross clamps KSU of die-cast aluminum have slitted clamping points with different cross-sections that were machined by cutting methods.

The bores of the clamping points are offset in the plane and arranged at an angle of 90°. They receive typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1	Clamping point 2													Accessories recom. hand lever	
Bore d_1	Bore d_2						k_1	k_2	l_1	l_2	l_3	m	Hex socket cap screw z_1	Hex socket cap screw z_2	for z_1 l_4	for z_2 l_4
B 20	B 10	B 12	B 14	B 15	B 16	B 18	40	36	81,5	40	26	27	M 8-25	M 6-20	-	63
B 25	B 10	B 12	B 14	B 15	B 16	B 18	40	36	81,5	40	26	27	M 8-25	M 6-20	78	63
B 30	B 10	B 12	B 14	B 15	B 16	B 18	40	36	81,5	40	26	27	M 8-25	M 6-20	78	63
B 40	B 20	B 25	B 30	-	-	-	65	59	122	65	40	45	M 10-50	M 8-25	-	78
B 42	B 20	B 25	B 30	-	-	-	65	59	122	65	40	45	M 10-50	M 8-25	92	78
B 45	B 20	B 25	B 30	-	-	-	65	59	122	65	40	45	M 10-50	M 8-25	92	78
B 48	B 20	B 25	B 30	-	-	-	65	59	122	65	40	45	M 10-50	M 8-25	92	78
B 50	B 20	B 25	B 30	-	-	-	65	59	122	65	40	45	M 10-50	M 8-25	92	78

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

KSU - d_1 - d_2 - z - o

- Cross clamp
- Clamping point 1
- Clamping point 2
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

KM Cross clamps, multi-piece, aluminum

PRODUCT INFO

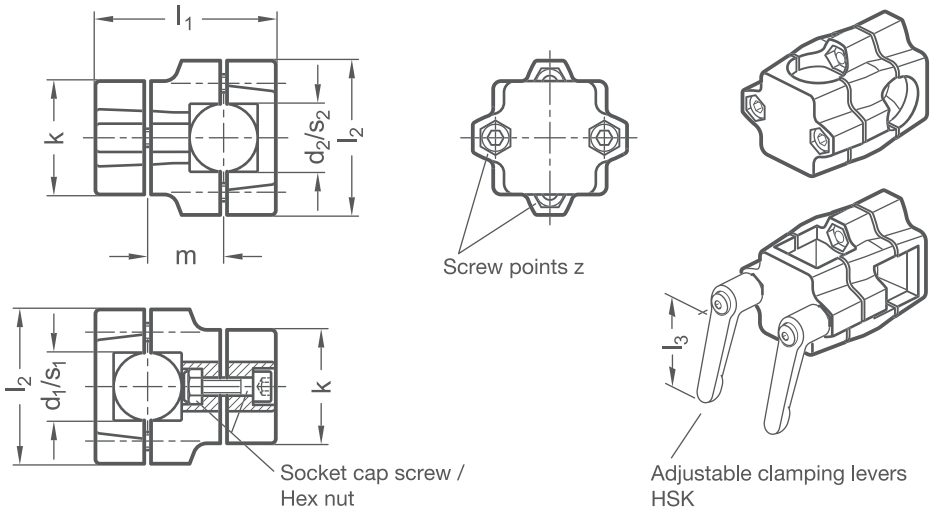
Cross clamps KM of die-cast aluminum have split clamping points with identical round or square cross-section that have been partially machined by cutting methods.

The bores of the clamping points are offset in the plane and arranged at an angle of 90°. They receive typically available construction tubes via multiple ribs in the cross-section of the bores.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point 1 - Clamping point 2			Clamping length				Accessories recom. hand lever	
Bore - Bore d_1 - d_2	Bore - Square d_1 - s_2	Square - Square s_1 - s_2	k	l_1	l_2	m	Hex socket cap screws	HSK for z lever length l_3
B 20 - B 20	B 20 - V 20	V 20 - V 20	50	79,5	68	33,5	M 8-30	63
B 25 - B 25	B 25 - V 25	V 25 - V 25	50	79,5	68	33,5	M 8-30	63
B 30 - B 30	B 30 - V 30	V 30 - V 30	50	79,5	68	33,5	M 8-30	63
B 30 - B 30	B 30 - V 30	V 30 - V 30	60	109	79	50	M 8-50	63
B 32 - B 32	-	-	60	109	79	50	M 8-50	63
B 35 - B 35	B 35 - V 35	V 35 - V 35	60	109	79	50	M 8-50	63
B 40 - B 40	B 40 - V 40	V 40 - V 40	60	109	79	50	M 8-50	63
B 40 - B 40	B 40 - V 40	V 40 - V 40	76	125	98	55	M 10-50	78
B 42 - B 42	-	-	76	125	98	55	M 10-50	78
B 45 - B 45	B 45 - V 45	V 45 - V 45	76	125	98	55	M 10-50	78
B 48 - B 48	-	-	76	125	98	55	M 10-50	78
B 50 - B 50	B 50 - V 50	V 50 - V 50	76	125	98	55	M 10-50	78

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

KM - d_1-d_2 (d_1-s_2 / s_1-s_2) - k - z - o

- Cross clamp
- Clamping point 1 - Clamping point 2
- Clamping length
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1, d_2, s_1 and s_2 or special diameters

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

KMU Cross clamps, multi-piece, unequal bore dimensions, aluminum

PRODUCT INFO

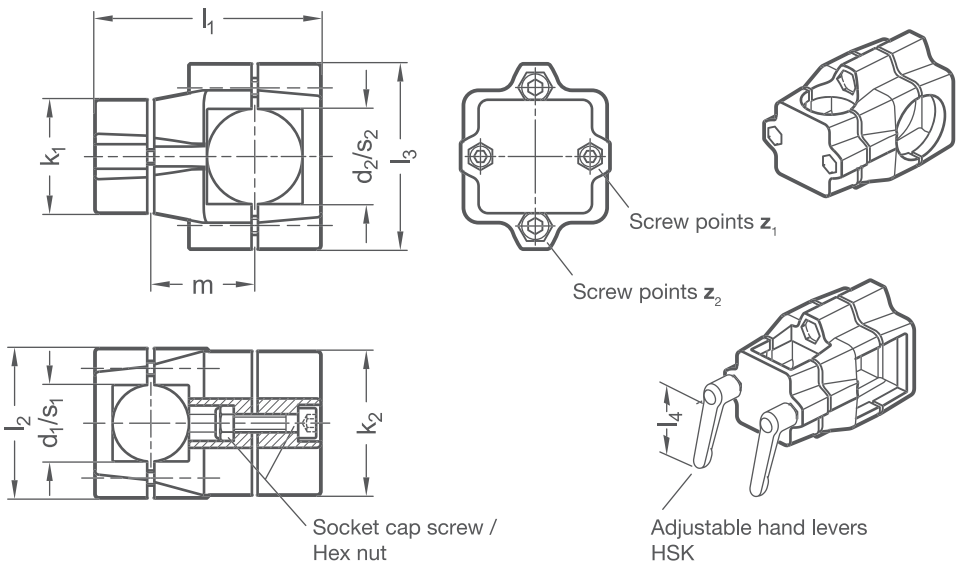
Cross clamps KMU of die-cast aluminum have split clamping points with different round or square cross-section that have been partially machined by cutting methods.

The bores of the clamping points are offset in the plane and arranged at an angle of 90°. They receive typically available construction tubes via multiple ribs in the cross-section of the bores.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point 1		Clamping point 2		Clamping length	Clamping length							**Accessories** recom. hand lever	
Bore d_1	Square s_1	Bore d_2	Square s_2	k_1	k_2	l_1	l_2	l_3	m	z_1	z_2	HSK for z_1 lever length l_4	HSK for z_2 lever length l_4
B30	V30	B40	V40	60	76	120	79	98	55	M 8-50	M 10-50	78	92
B30	V30	B50	V50	60	76	120	79	98	55	M 8-50	M 10-50	78	92
B40	V40	B50	V50	60	76	120	79	98	55	M 8-50	M 10-50	78	92

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

KMU - d_1/s_1 - d_2/s_2 - k_1 - z - o

- Cross clamp
- Clamping point 1
- Clamping point 2
- Clamping length
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1, d_2, s_1 and s_2 or special diameters

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

KMF Cross flanged clamps, multi-piece, aluminum

PRODUCT INFO

Cross flanged clamps KMF of die-cast aluminum have split clamping points with identical round or square cross-section that have been partially machined by cutting methods.

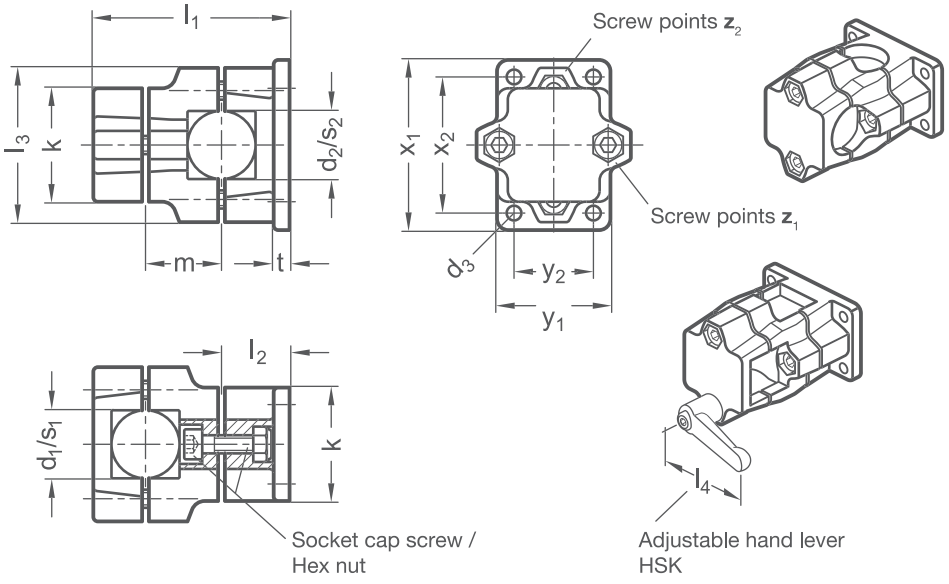
The flange with four bores serves as an interface or for fastening the clamp to the place of use.

The bores of the clamping points are offset in the plane and arranged at an angle of 90°. They receive typically available construction tubes via multiple ribs in the cross-section of the bores.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point 1		Clamping point 2															**Accessories** recom. hand lever
Bore d_1	Square s_1	Bore d_2	Square s_2	d_3	k	l_1	l_2	l_3	m	t	x_1	x_2	y_1	y_2	z_1	z_2	HSK for z_1 lever length l_4
B 20	V 20	B 20	V 20	6,5	50	86	30	68	33,5	7	75	60	50	35	M 8-30	M 8-35	63
B 25	V 25	B 25	V 25	6,5	50	86	30	68	33,5	7	75	60	50	35	M 8-30	M 8-35	63
B 30	V 30	B 30	V 30	6,5	50	86	30	68	33,5	7	75	60	50	35	M 8-30	M 8-35	63
B 40	V 40	B 40	V 40	11	76	136	46	98	55	14	115	90	76	50	M 10-50	M 10-55	78
B 42	-	B 42	-	11	76	136	46	98	55	14	115	90	76	50	M 10-50	M 10-55	78
B 45	V 45	B 45	V 45	11	76	136	46	98	55	14	115	90	76	50	M 10-50	M 10-55	78
B 48	-	B 48	-	11	76	136	46	98	55	14	115	90	76	50	M 10-50	M 10-55	78
B 50	V 50	B 50	V 50	11	76	136	46	98	55	14	115	90	76	50	M 10-50	M 10-55	78

Screw points **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface **o**	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

KMF - d_1/s_1 - d_2/s_2 - z - o

- Cross clamp
- Clamping point 1
- Clamping point 2
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1, d_2, s_1 and s_2 or special diameters

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

FS Flanged clamps, with four fastening bores, aluminum

PRODUCT INFO

Flanged clamps FS of die-cast aluminum have a slitted clamping point machined by cutting methods.

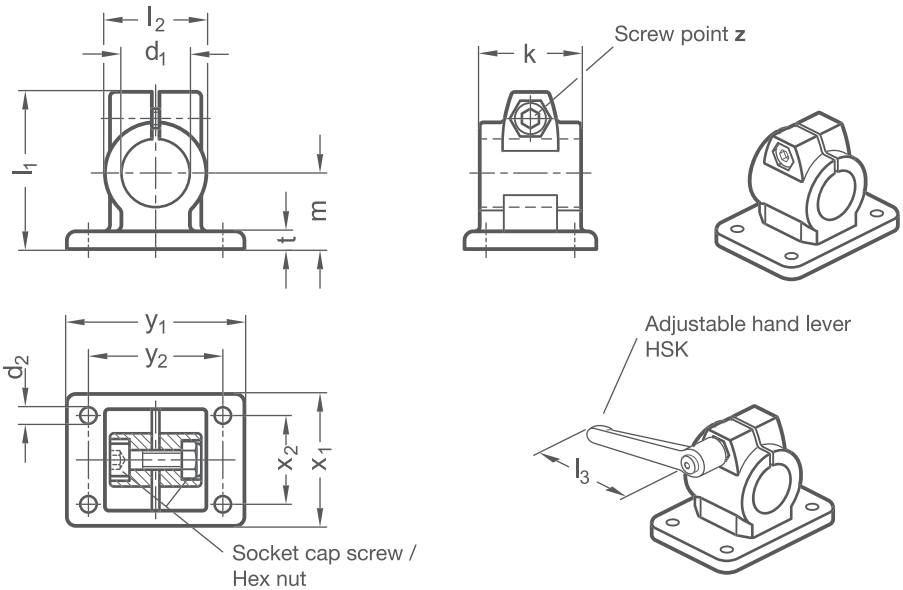
The flange with four bores serves as an interface or for fastening the clamp to the place of use.

The bore at the clamping point is arranged in the plane parallel to the face of the flange. It receives typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point Bore d_1	Clamping length k	d_2	l_1	l_2	m	t	x_1	x_2	y_1	y_2	Hex socket cap screw	**Zubehör** recom. hand lever HSK for z lever length l_3
B 20	40	6,5	62	40	30	7	52	35	70	53	M 8-25	-
B 25	40	6,5	62	40	30	7	52	35	70	53	M 8-25	78
B 30	40	6,5	62	40	30	7	52	35	70	53	M 8-25	78
B 30	56	8,5	83	56	42	10	78	52	108	82	M 10-35	-
B 32	56	8,5	83	56	42	10	78	52	108	82	M 10-35	-
B 35	56	8,5	83	56	42	10	78	52	108	82	M 10-35	92
B 40	56	8,5	83	56	42	10	78	52	108	82	M 10-35	92
B 40	65	11	95	65	50	14	92	62	128	98	M 10-50	-
B 42	65	11	95	65	50	14	92	62	128	98	M 10-50	-
B 45	65	11	95	65	50	14	92	62	128	98	M 10-50	92
B 48	65	11	95	65	50	14	92	62	128	98	M 10-50	92
B 50	65	11	95	65	50	14	92	62	128	98	M 10-50	92
B 50	80	11	112	80	60	14	110	74	154	118	M 10-50	-
B 60	80	11	112	80	60	14	110	74	154	118	M 10-50	92

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

FS - d_1 - k - z - o

- Flanged clamp
- Clamping point
- Clamping length
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameters

– Screw point
with hex head screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

FSZ Flanged clamps, with two fastening bores, aluminum

PRODUCT INFO

Flanged clamps FSZ of die-cast aluminum have a slitted clamping point machined with cutting methods.

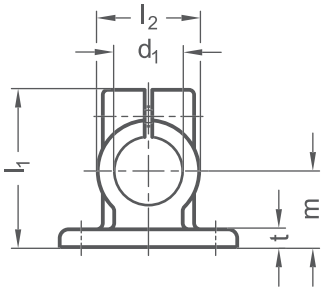
The flange with two bores serves as an interface or for fastening the clamp to the place of use.

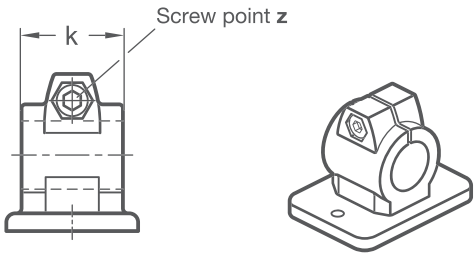
The bore at the clamping point is arranged in the plane parallel to the face of the flange. It receives typically available construction tubes with full surface contact over the entire cross-section of the bore.

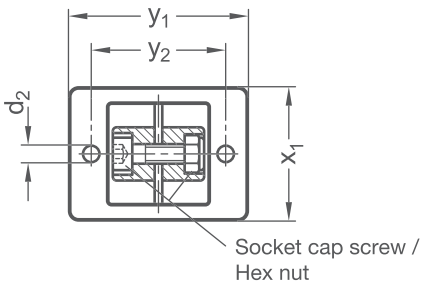
At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

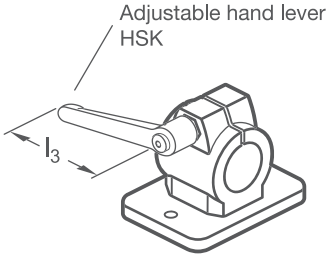
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product









Clamping point Bore d_1	Clamping length k	d_2	l_1	l_2	m	t	x_1	y_1	y_2	Hex socket cap screw	**Accessories** recom. hand lever HSK for z lever length l_3
B 20	40	6,5	62	40	30	7	52	70	53	M 8-25	-
B 25	40	6,5	62	40	30	7	52	70	53	M 8-25	78
B 30	40	6,5	62	40	30	7	52	70	53	M 8-25	78
B 30	56	8,5	83	56	42	10	78	108	82	M 10-35	-
B 32	56	8,5	83	56	42	10	78	108	82	M 10-35	-
B 35	56	8,5	83	56	42	10	78	108	82	M 10-35	92
B 40	56	8,5	83	56	42	10	78	108	82	M 10-35	92

Screw point **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface **o**	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

FSZ - d_1 - k - z - o

- Flanged clamp
- Clamping point
- Clamping length
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

FE Flanged clamps, with four fastening bores, stainless steel

PRODUCT INFO

Flanged clamps FE of matt blasted precision-cast stainless steel have a slitted clamping point machined by cutting methods.

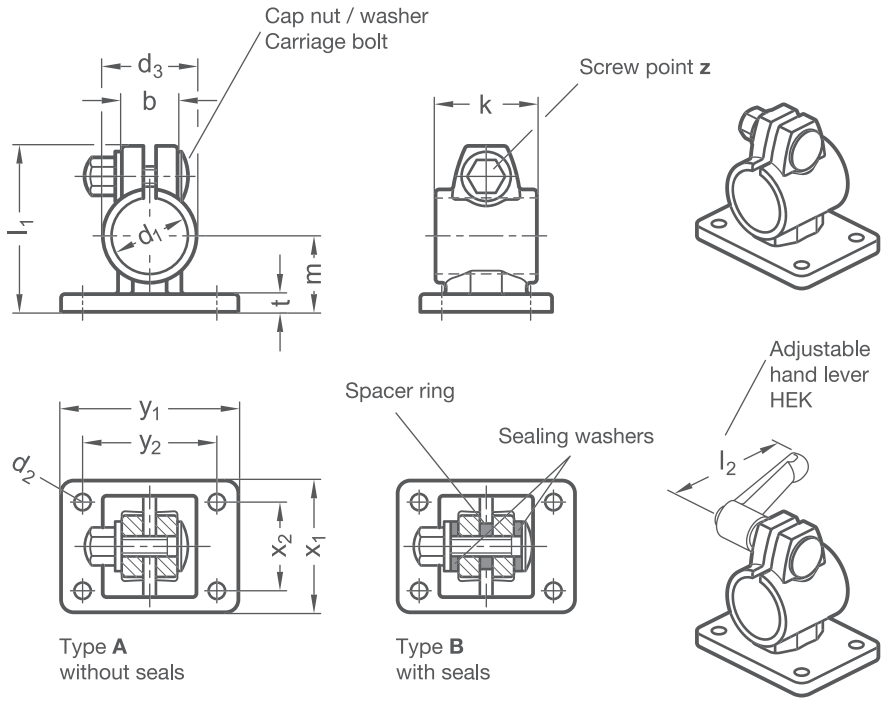
The flange with four bores serves as an interface or for fastening the clamp to the place of use.

The bore at the clamping point is arranged in the plane parallel to the face of the flange. It receives typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw point, a carriage bolt and a cap nut or an adjustable hand lever reduces the bore cross-section for clamping. Type B is equipped with seals at the screw point.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point Bore d_1	b	d_2	d_3	Clamping length k	l_1	m	t	x_1	x_2	y_1	y_2	Cap nut	**Accessories** recom. hand lever HEK for z lever length l_2
B 30	22	6,5	37	40	66	30	7	52	35	70	53	M 8	78
B 40	28	8,5	50,2	56	86	42	7,63	78	52	108	82	M 10	92
B 50	30	10,7	60	65	98,5	50	9	92	62	128	98	M 10	92

Type t	
A	Without seals
B	With seals (sealing washer polyacetal POM, blue, spacer ring silicone 40 ... 60 Shore A, blue)

Screw point z	
4	Cap nut stainless steel DIN 917-A2 and carriage bolt stainless steel DIN 603-A2

ORDER KEY

FE - d_1 - t - z

- Flanged clamp
- Clamping point
- Type
- Screw point

ACCESSORIES

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping point with special diameter

– Screw point with hex head screw

FEZ Flanged clamps, with two fastening bores, stainless steel

PRODUCT INFO

Flanged clamps FEZ of matt blasted precision-cast stainless steel have a slitted clamping point machined by cutting methods.

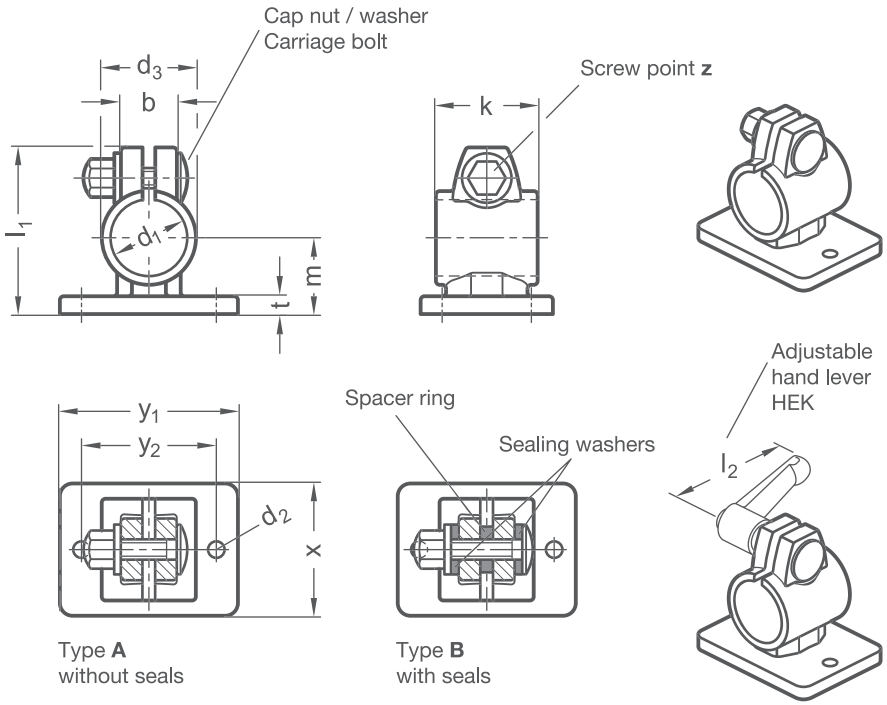
The flange with two bores serves as an interface or for fastening the clamp to the place of use.

The bore at the clamping point is arranged in the plane parallel to the face of the flange. It receives typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw point, a carriage bolt and a cap nut or an adjustable hand lever reduces the bore cross-section for clamping. Type B is equipped with seals at the screw point.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point Bore d_1	b	d_2	d_3	Clamping length k	l_1	m	t	x	y_1	y_2	Cap nut	**Accessories** recom. hand lever HEK for z lever length l_2
B 30	22	6,5	37	40	66	30	7	52	70	53	M 8	78

Type t	
A	Without seals
B	With seals (sealing washer polyacetal POM, blue, spacer ring silicone 40 ... 60 Shore A, blue)

Screw point z	
4	Cap nut stainless steel DIN 917-A2 and carriage bolt stainless steel DIN 603-A2

ORDER KEY

FEZ - d_1 - t - z

- Flanged clamp
- Clamping point
- Type
- Screw point

ACCESSORIES

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping point with special diameter

– Screw point with hex head screw

FM Flanged clamps, multi-piece, aluminum

PRODUCT INFO

Flanged clamps FM of die-cast aluminum have a split clamping point with round or square cross-section that has been partially machined by cutting methods.

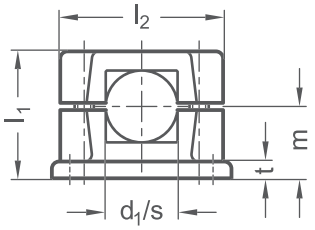
The flange with four bores serves as an interface or for fastening the clamp to the place of use.

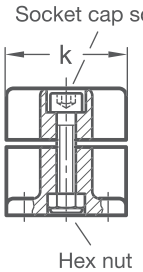
The bore at the clamping point is arranged in the plane parallel to the face of the flange. It receives typically available construction tubes via multiple ribs in the cross-section of the bore.

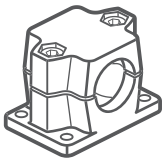
At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

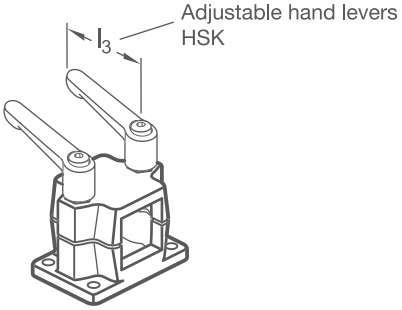
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

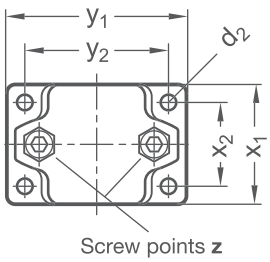
RoHS-compliant product











1B

Clamping point													Accessories recom. hand lever
Bore d_1	Square s	d_2	Clamping length k	l_1	l_2	m	t	x_1	x_2	y_1	y_2	Hex socket cap screws	HSK for z lever length l_3
B 20	V 20	6,5	50	53	68	30	7	50	35	75	60	M 8-35	78
B 25	V 25	6,5	50	53	68	30	7	50	35	75	60	M 8-35	78
B 30	V 30	6,5	50	53	68	30	7	50	35	75	60	M 8-35	78
B 40	V 40	11	76	81,5	98	46,5	14	76	50	115	90	M 10-60	92
B 42	-	11	76	81,5	98	46,5	14	76	50	115	90	M 10-60	92
B 45	V 45	11	76	81,5	98	46,5	14	76	50	115	90	M 10-60	92
B 48	-	11	76	81,5	98	46,5	14	76	50	115	90	M 10-60	92
B 50	V 50	11	76	81,5	98	46,5	14	76	50	115	90	M 10-60	92

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

FM - d_1 / s - z - o

- Flanged clamp
- Clamping point
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

FMS Flanged clamps, multi-piece, with six fastening bores, aluminum

PRODUCT INFO

Flanged clamps FMS of die-cast aluminum have a split clamping point with round or square cross-section that has been partially machined by cutting methods.

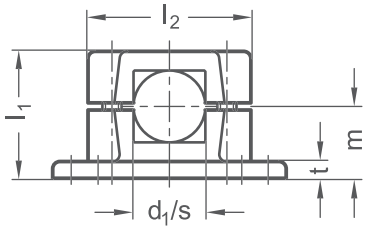
The flange with six bores serves as an interface or for fastening the clamp to the place of use.

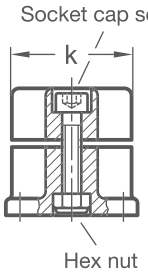
The bore at the clamping point is arranged in the plane parallel to the face of the flange. It receives typically available construction tubes with full surface contact via multiple ribs in the cross-section of the bore.

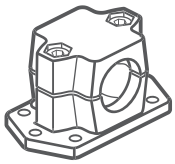
At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

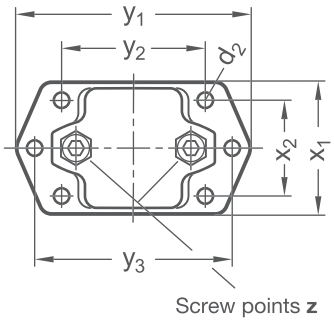
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

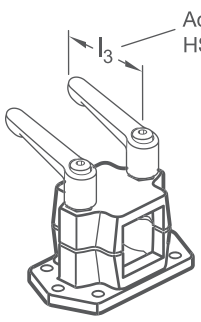
RoHS-compliant product











Clamping point														**Accessories** recom. hand lever
Bore d_1	Square s	d_2	Clamping length k	l_1	l_2	m	t	x_1	x_2	y_1	y_2	y_3	Hex socket cap screws	HSK for z lever length l_3
B 20	V 20	6,5	50	53	68	30	7	50	40	97,5	60	82,5	M 8-35	78
B 25	V 25	6,5	50	53	68	30	7	50	40	97,5	60	82,5	M 8-35	78
B 30	V 30	6,5	50	53	68	30	7	50	40	97,5	60	82,5	M 8-35	78

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

FMS - d_1 / s - z - o

- Flanged clamp
- Clamping point
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

BS Base clamps, aluminum

PRODUCT INFO

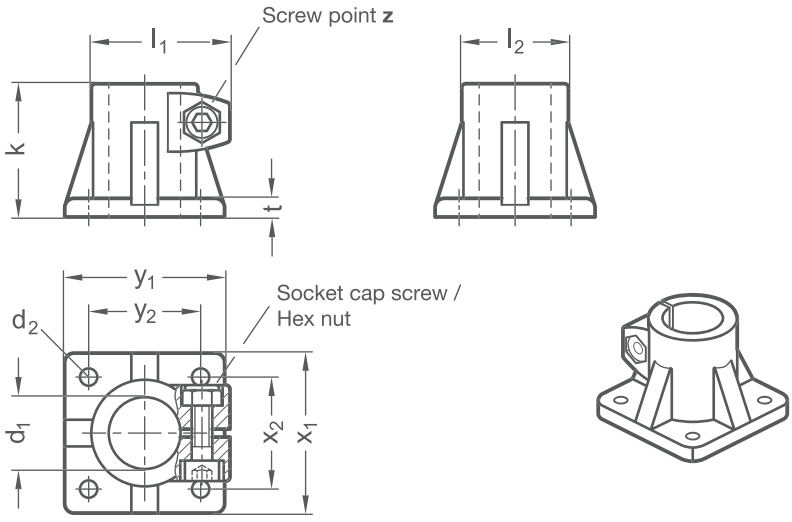
Base clamps BS of die-cast aluminum have a slitted clamping point machined by cutting methods.

The base flange with four bores serves as an interface or for fastening the clamp to the place of use.

The bore at the clamping point is arranged perpendicular to the face of the flange. It receives typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw point, a hex socket cap screw reduces the bore cross-section for clamping.

RoHS-compliant product



Clamping point Bore d_1	Clamping length k	d_2	l_1	l_2	t	x_1	x_2	y_1	y_2	Hex socket cap screw
B 20	50	6,5	52	40	7	60	42	60	42	M 8-25
B 25	50	6,5	52	40	7	60	42	60	42	M 8-25
B 30	50	6,5	52	40	7	60	42	60	42	M 8-25
B 30	70	8,5	68	56	10	90	64	90	64	M 10-35
B 32	70	8,5	68	56	10	90	64	90	64	M 10-35
B 35	70	8,5	68	56	10	90	64	90	64	M 10-35
B 40	70	8,5	68	56	10	90	64	90	64	M 10-35
B 40	85	11	77,5	65	14	105	74	105	74	M 10-50
B 42	85	11	77,5	65	14	105	74	105	74	M 10-50
B 45	85	11	77,5	65	14	105	74	105	74	M 10-50
B 48	85	11	77,5	65	14	105	74	105	74	M 10-50
B 50	85	11	77,5	65	14	105	74	105	74	M 10-50
B 60	100	11	92	80	14	125	89	125	89	M 10-50

Screw point z	
1	Hex socket cap screw (DIN 912-8.8 and lock nut DIN 985-8, zinc-plated)
2	Hex socket cap screw stainless steel (DIN 912-A2-70 and lock nut DIN 985-A2, glide coating)

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

BS - d_1 - k - z - o

- Base clamp
- Clamping point
- Clamping length
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

BE Base clamps, stainless steel

PRODUCT INFO

Base clamps BE of precision-cast stainless steel have a slitted clamping point machined by cutting methods.

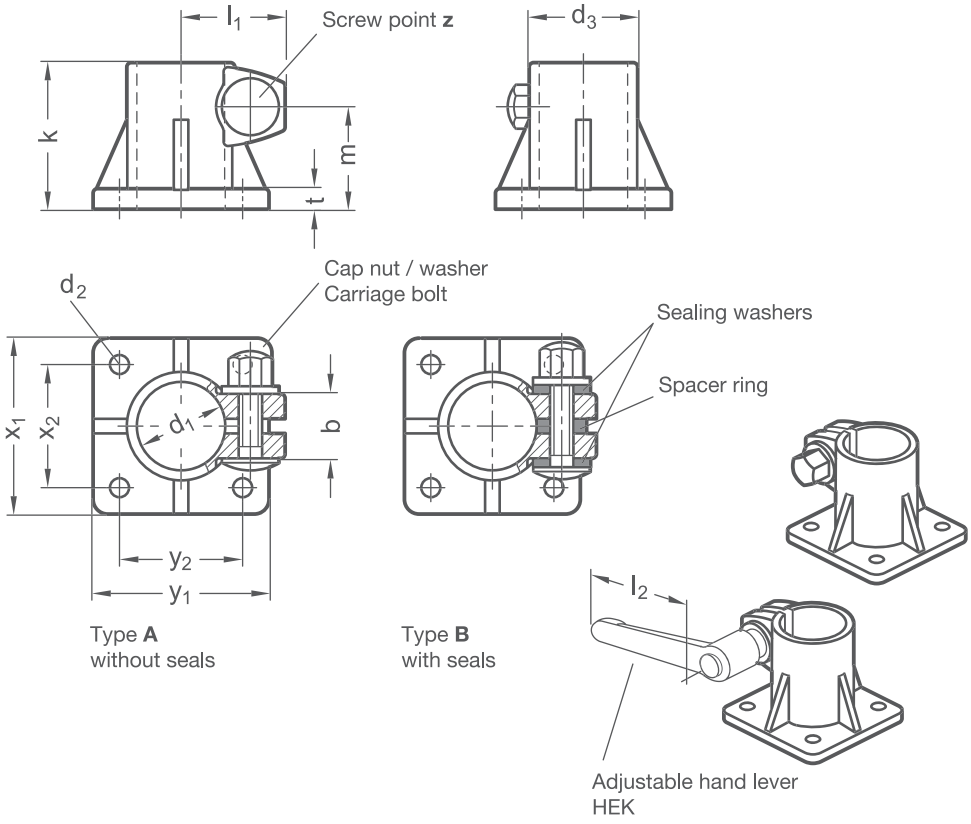
The base flange with four bores serves as an interface or for fastening the clamp to the place of use.

The bore at the clamping point is arranged perpendicular to the face of the flange. It receives typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw point, a carriage bolt and a cap nut or an adjustable hand lever reduces the bore cross-section for clamping. Type B features seals at the screw point.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point Bore d_1	b	d_2	d_3	Clamping length k	l_1	m	t	x_1	x_2	y_1	y_2	Cap nut	**Accessories** recom. hand lever HEK for z lever length l_2
B 30	22	6,5	37	50	36	35	6,5	60	42	60	42	M 8	78
B 50	30	10,7	60	85	48,5	60	9	105	74	105	74	M 10	92

Type t	
A	Without seals
B	With seals (sealing washer polyacetal POM, blue, spacer ring silicone 40 ... 60 Shore A, blue)

Screw point z	
4	Cap nut stainless steel DIN 917-A2 and carriage bolt stainless steel DIN 603-A2

ORDER KEY

BE - d_1 - t - z

- Base clamp
- Clamping point
- Type
- Screw point

ACCESSORIES

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Clamping point with special diameter

– Screw point with hex head screw

BM Base clamps, multi-piece, aluminum

PRODUCT INFO

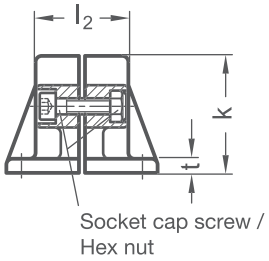
Base clamps BM of die-cast aluminum have a split clamping point with a round or square cross-section that has been partially machined by cutting methods.

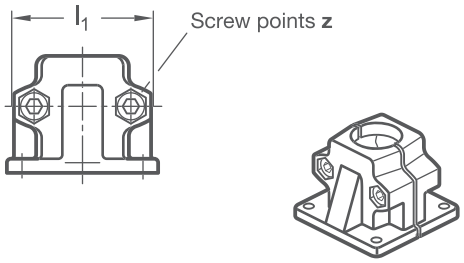
The bore at the clamping point is arranged perpendicular to the face of the flange. It receives typically available construction tubes via multiple ribs in the cross-section of the bore.

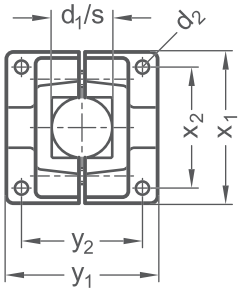
At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

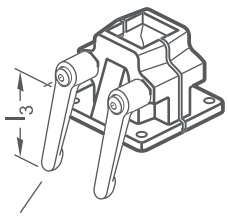
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product









1B

Clamping point												Accessories recom. hand lever
Bore d_1	Square s	d_2	Clamping length k	l_1	l_2	t	x_1	x_2	y_1	y_2	Hex socket cap screws	HSK for z lever length l_3
B 20	V 20	7	58	69	46	7	75	60	75	60	M 8-35	78
B 25	V 25	7	58	69	46	7	75	60	75	60	M 8-35	78
B 30	V 30	7	58	69	46	7	75	60	75	60	M 8-35	78
B 40	V 40	11	91	98	70	14	115	90	119	90	M 10-60	92
B 42	-	11	91	98	70	14	115	90	119	90	M 10-60	92
B 45	V 45	11	91	98	70	14	115	90	119	90	M 10-60	92
B 48	-	11	91	98	70	14	115	90	119	90	M 10-60	92
B 50	V 50	11	91	98	70	14	115	90	119	90	M 10-60	92

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

BM - d_1 / s - z - o

- Base clamp
- Clamping point
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

BML Base clamps, multi-piece, aluminum

PRODUCT INFO

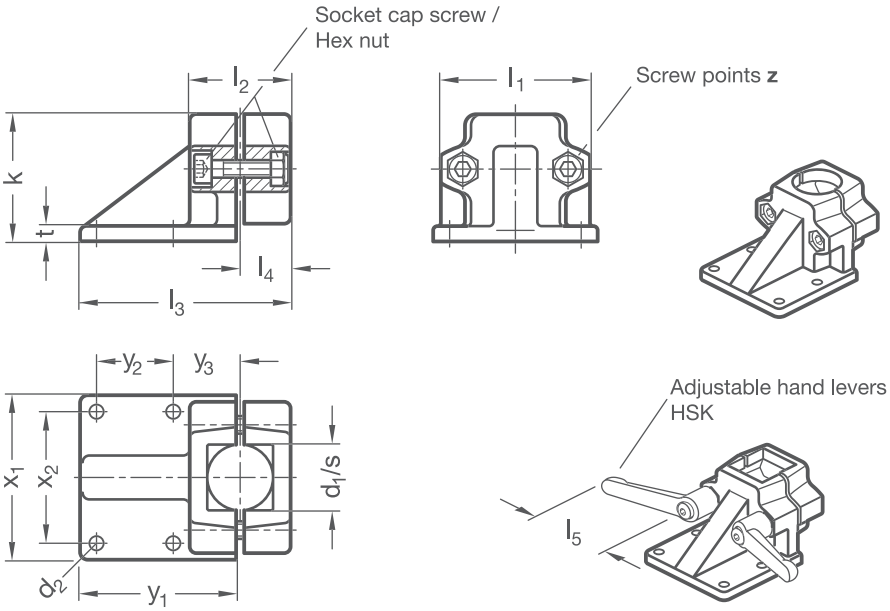
Base clamps BML of die-cast aluminum have a split clamping point with round or square cross-section that has been partially machined by cutting methods.

The bore at the clamping point is arranged perpendicular to the face of the flange. It receives typically available construction tubes via multiple ribs in the cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point															Accessories recom. hand lever
Bore d_1	Square s	d_2	Clamping length k	l_1	l_2	l_3	l_4	t	x_1	x_2	y_1	y_2	y_3	Hex socket cap screws	HSK for z lever length l_5
B 20	V 20	7	58	69	46	96	23	7	75	60	72	35	30	M 8-35	78
B 25	V 25	7	58	69	46	96	23	7	75	60	72	35	30	M 8-35	78
B 30	V 30	7	58	69	46	96	23	7	75	60	72	35	30	M 8-35	78
B 40	V 40	11	91	98	70	145	35	14	115	90	108	50	45	M 10-60	92
B 42	-	11	91	98	70	145	35	14	115	90	108	50	45	M 10-60	92
B 45	V 45	11	91	98	70	145	35	14	115	90	108	50	45	M 10-60	92
B 48	-	11	91	98	70	145	35	14	115	90	108	50	45	M 10-60	92
B 50	V 50	11	91	98	70	145	35	14	115	90	108	50	45	M 10-60	92

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

BML - d_1 / s - z - o

Base clamp
Clamping point
Screw points
Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

BMT Base clamps, multi-piece, aluminum

PRODUCT INFO

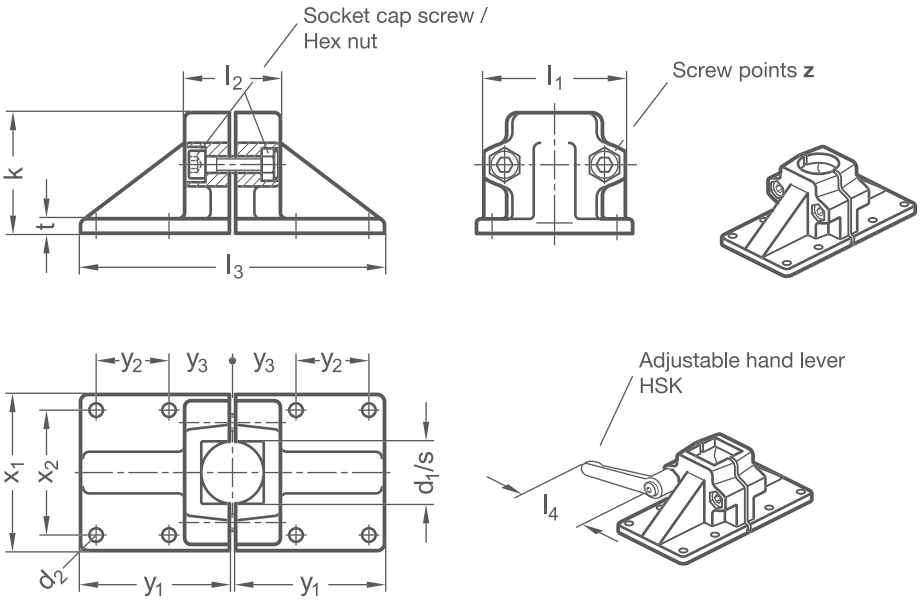
Base clamps BMT of die-cast aluminum have a split clamping point with round or square cross-section that has been partially machined by cutting methods.

The bore at the clamping point is arranged perpendicular to the faces of the flanges. It receives typically available construction tubes via multiple ribs in the cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point														Accessories recom. hand lever
Bore d_1	Square s	d_2	Clamping length k	l_1	l_2	l_3	t	x_1	x_2	y_1	y_2	y_3	Hex socket cap screws	HSK for z lever length l_4
B 20	V 20	7	58	69	46	146	7	75	60	72	35	30	M 8-35	78
B 25	V 25	7	58	69	46	146	7	75	60	72	35	30	M 8-35	78
B 30	V 30	7	58	69	46	146	7	75	60	72	35	30	M 8-35	78
B 40	V 40	11	91	98	70	219	14	115	90	108	50	45	M 10-60	92
B 42	-	11	91	98	70	219	14	115	90	108	50	45	M 10-60	92
B 45	V 45	11	91	98	70	219	14	115	90	108	50	45	M 10-60	92
B 48	-	11	91	98	70	219	14	115	90	108	50	45	M 10-60	92
B 50	V 50	11	91	98	70	219	14	115	90	108	50	45	M 10-60	92

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

BMT - d_1 / s - z - o

- Base clamp
- Clamping point
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

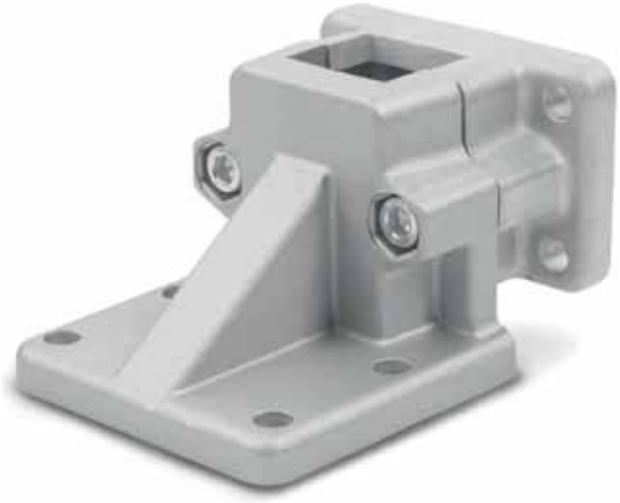
ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

BMA Base flanged clamps, multi-piece, aluminum



PRODUCT INFO

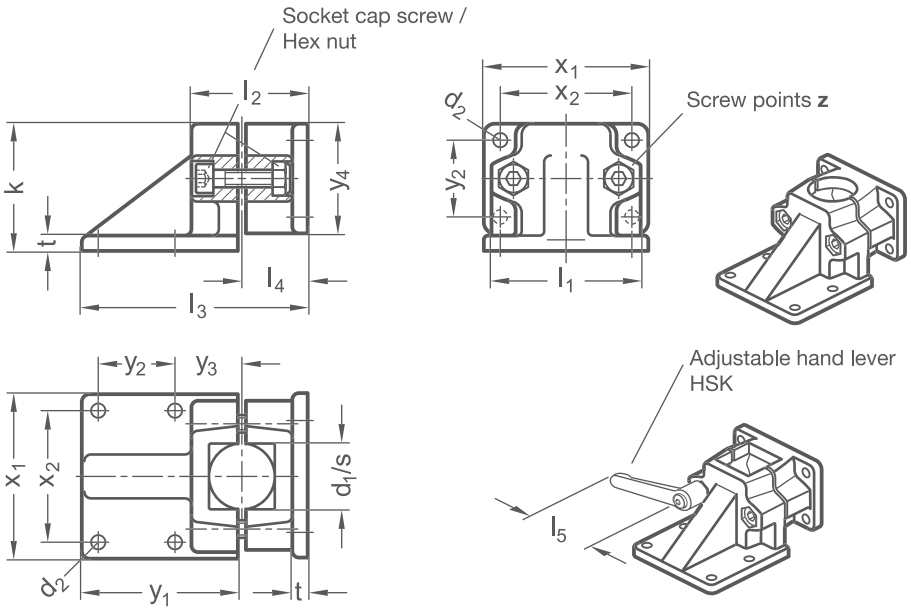
Base flanged clamps BMA of die-cast aluminum have a split clamping point with round or square cross-section that has been partially machined by cutting methods.

The bore at the clamping point is arranged perpendicular to the faces of the flanges. It receives typically available construction tubes via multiple ribs in the cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point																Accessories recom. hand lever
Bore d_1	Square s	d_2	Clamping length k	l_1	l_2	l_3	l_4	t	x_1	x_2	y_1	y_2	y_3	y_4	Hex socket cap screws	HSK for z lever length l_5
B 20	V 20	7	58	69	53	103	30	7	75	60	72	35	30	50	M 8-35	78
B 25	V 25	7	58	69	53	103	30	7	75	60	72	35	30	50	M 8-35	78
B 30	V 30	7	58	69	53	103	30	7	75	60	72	35	30	50	M 8-35	78
B 40	V 40	11	91	98	82	156	47	14	115	90	108	50	45	76	M 10-60	92
B 42	-	11	91	98	82	156	47	14	115	90	108	50	45	76	M 10-60	92
B 45	V 45	11	91	98	82	156	47	14	115	90	108	50	45	76	M 10-60	92
B 48	-	11	91	98	82	156	47	14	115	90	108	50	45	76	M 10-60	92
B 50	V 50	11	91	98	82	156	47	14	115	90	108	50	45	76	M 10-60	92

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

BMA - d_1 / s - z - o

- Base flanged clamp
- Clamping point
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

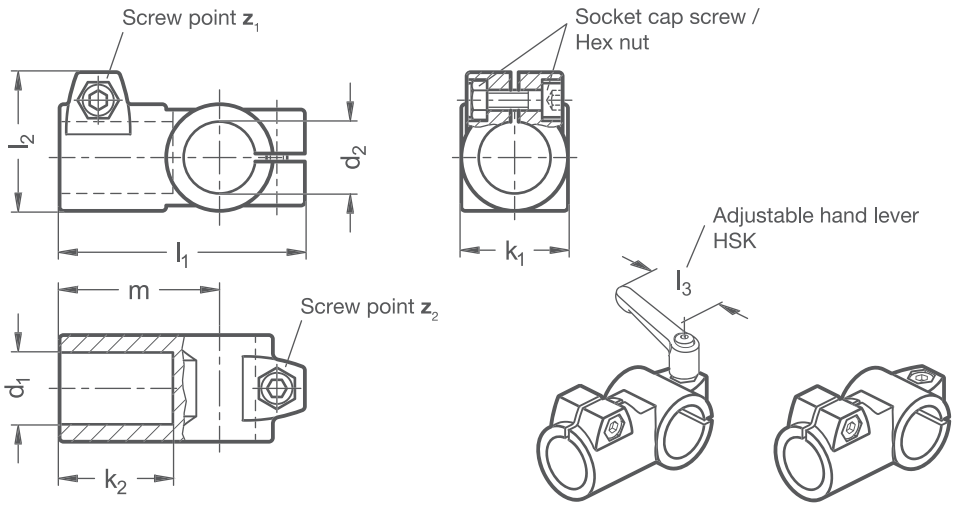
T-clamps TS of die-cast aluminum have slitted clamping points machined by cutting methods.

The bores at the clamping points are situated in a plane and arranged in a T-shape. They receive typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1	Clamping point 2								Accessories recom. hand lever	
Bore d_1	Bore d_2	Clamping length k_1	Clamping length k_2	l_1	l_2	m	Hex socket cap screws z_1	Hex socket cap screws z_2	HSK for z_1 l_3	for z_2 l_3
B 20	B 20	40	42,5	92	52	60	M 8-25	M 8-25	-	
B 25	B 25	40	42,5	92	52	60	M 8-25	M 8-25	78	78
B 30	B 30	40	42,5	92	52	60	M 8-25	M 8-25	78	78
B 30	B 30	56	62	130	68	90	M 10-35	M 10-35	-	-
B 32	B 32	56	62	130	68	90	M 10-35	M 10-35	-	-
B 35	B 35	56	62	130	68	90	M 10-35	M 10-35	92	-
B 40	B 40	56	62	130	68	90	M 10-35	M 10-35	92	92
B 40	B 40	65	75	148	77,5	103	M 10-50	M 10-50	92	-
B 42	B 42	65	75	148	77,5	103	M 10-50	M 10-50	92	-
B 45	B 45	65	75	148	77,5	103	M 10-50	M 10-50	92	-
B 48	B 48	65	75	148	77,5	103	M 10-50	M 10-50	92	92
B 50	B 50	65	75	148	77,5	103	M 10-50	M 10-50	92	92
B 50	B 50	80	80	177	92	125	M 10-50	M 10-50	-	-
B 60	B 60	80	80	177	92	125	M 10-50	M 10-50	92	-

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

TS - d_1 - d_2 - k_1 - z - o

- T-clamp
- Clamping point 1
- Clamping point 2
- Clamping length
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

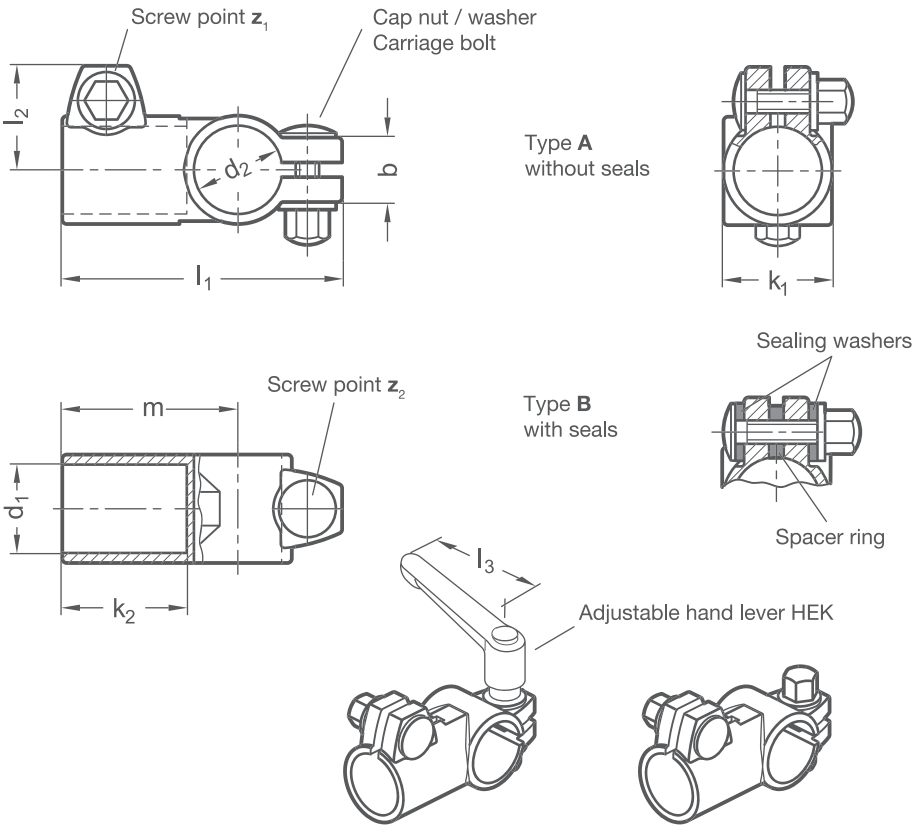
Cross clamps TE of matt blasted precision-cast stainless steel have a slitted clamping point machined by cutting methods.

The bores at the clamping points are situated in a plane and arranged in a T-shape. They receive typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw points, carriage bolts together with cap nuts or adjustable hand levers reduce the bore cross-section for clamping. Type B is equipped with seals at the screw points.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1	Clamping point 2								Accessories recom. hand lever	
Bore d_1	Bore d_2	b	Clamping length k_1	k_2	l_1	l_2	m	Cap nut	HEK for z_1 l_3	for z_2 l_3
B 30	B 30	22	37	42	96	35	60	M 8	78	78
B 50	B 50	30	65	75	151,5	48,5	103	M 10	92	92

Type t	
A	Without seals
B	With seals (sealing washer polyacetal POM, blue, spacer ring silicone 40 ... 60 Shore A, blue)

Screw points z	
4	Cap nut stainless steel DIN 917-A2 and carriage bolt stainless steel DIN 603-A2

ORDER KEY

TE - d_1 - d_2 - t - z

- T-clamp
- Clamping point 1
- Clamping point 2
- Type
- Screw points

ACCESSORIES

– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

TM T-clamps, multi-piece, aluminum

PRODUCT INFO

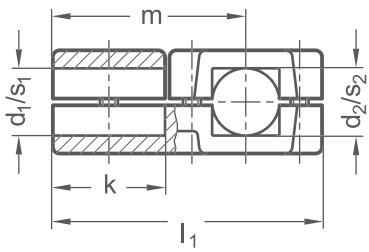
T-clamps TM of die-cast aluminum have split clamping points with identical round or square cross-section that have been partially machined by cutting methods.

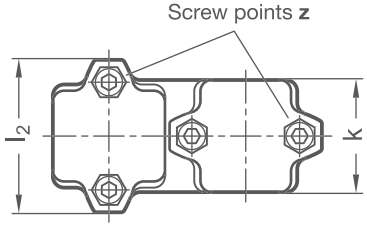
The bores at the clamping points are situated in a plane and arranged in a T-shape. They receive typically available construction tubes via multiple ribs in the cross-section of the bores.

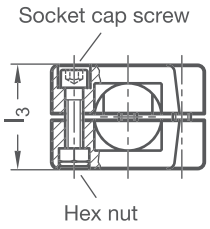
At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

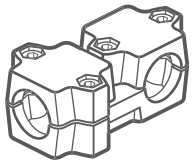
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

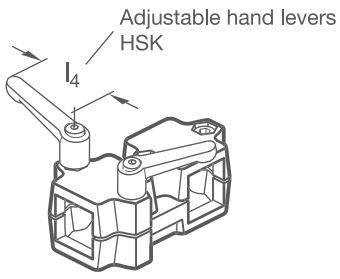
RoHS-compliant product











1B

Clamping point 1		Clamping point 2		Clamping length						**Accessories** recom. hand lever
Bore d_1	Square s_1	Bore d_2	Square s_2	k	l_1	l_2	l_3	m	Hex socket cap screws	HSK for z lever length l_4
B 20	V 20	B 20	V 20	50	120	68	46	86	M 8-35	78
B 25	V 25	B 25	V 25	50	120	68	46	86	M 8-35	78
B 30	V 30	B 30	V 30	50	120	68	46	86	M 8-35	78
B 30	V 30	B 30	V 30	60	141	79	59	101,5	M 8-50	78
B 32	-	B 32	-	60	141	79	59	101,5	M 8-50	78
B 35	V 35	B 35	V 35	60	141	79	59	101,5	M 8-50	78
B 40	V 40	B 40	V 40	60	141	79	59	101,5	M 8-50	78
B 40	V 40	B 40	V 40	76	176	98	70	127	M 10-60	92
B 42	-	B 42	-	76	176	98	70	127	M 10-60	92
B 45	V 45	B 45	V 45	76	176	98	70	127	M 10-60	92
B 48	-	B 48	-	76	176	98	70	127	M 10-60	92
B 50	V 50	B 50	V 50	76	176	98	70	127	M 10-60	92

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

TM - d_1/s_1 - d_2/s_2 - k - z - o

- T-clamp
- Clamping point 1
- Clamping point 2
- Clamping length
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1, d_2, s_1 and s_2 or special diameters

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

TMD T-clamps, multi-piece, aluminum

PRODUCT INFO

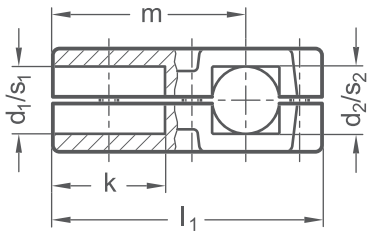
T-clamps TMD of die-cast aluminum have split clamping points with identical round or square cross-section that have been partially machined by cutting methods.

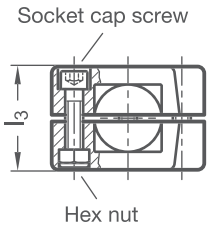
The bores at the clamping points are situated in a plane and arranged in a T-shape. They receive typically available construction tubes via multiple ribs in the cross-section of the bores.

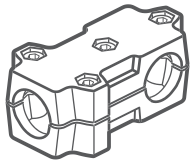
At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping. The clamping points are clamped simultaneously.

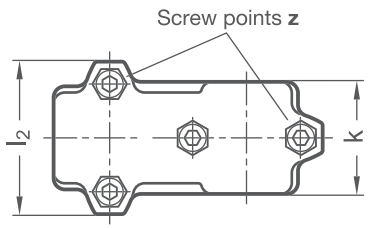
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

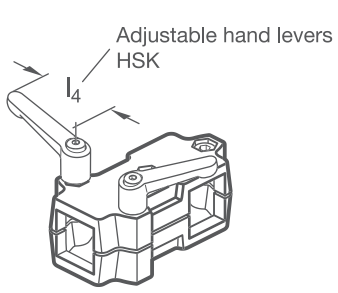
RoHS-compliant product











Clamping point 1		Clamping point 2		Clamping length						**Accessories** recom. hand lever
Bore d_1	Square s_1	Bore d_2	Square s_2	k	l_1	l_2	l_3	m	Hex socket cap screws	HSK for z lever length l_4
B 20	V 20	B 20	V 20	50	120	68	46	86	M 8-35	78
B 25	V 25	B 25	V 25	50	120	68	46	86	M 8-35	78
B 30	V 30	B 30	V 30	50	120	68	46	86	M 8-35	78
B 30	V 30	B 30	V 30	60	141	79	59	101,5	M 8-50	78
B 32	-	B 32	-	60	141	79	59	101,5	M 8-50	78
B 35	V 35	B 35	V 35	60	141	79	59	101,5	M 8-50	78
B 40	V 40	B 40	V 40	60	141	79	59	101,5	M 8-50	78
B 40	V 40	B 40	V 40	76	176	98	70	127	M 10-60	92
B 42	-	B 42	-	76	176	98	70	127	M 10-60	92
B 45	V 45	B 45	V 45	76	176	98	70	127	M 10-60	92
B 48	-	B 48	-	76	176	98	70	127	M 10-60	92
B 50	V 50	B 50	V 50	76	176	98	70	127	M 10-60	92

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

TMD - d_1/s_1 - d_2/s_2 - k - z - o

- T-clamp
- Clamping point 1
- Clamping point 2
- Clamping length
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1, d_2, s_1 and s_2 or special diameters

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

WMD Angle clamps, multi-piece, aluminum

PRODUCT INFO

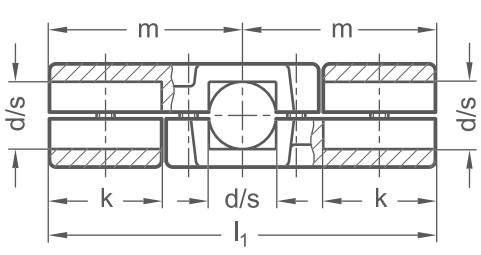
Angle clamps WMD of die-cast aluminum have split clamping points with identical round or square cross-section that have been partially machined by cutting methods.

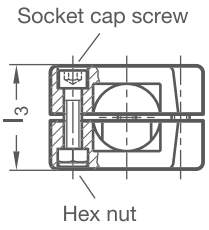
The bores at the clamping points are situated in a plane and arranged in a double T-shape. They receive typically available construction tubes via multiple ribs in the cross-section of the bores.

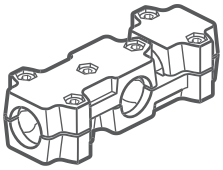
At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

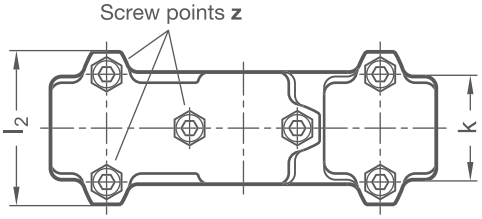
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

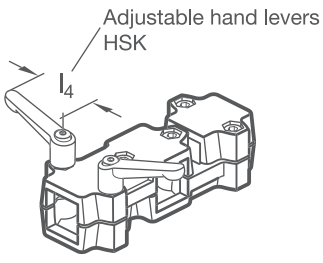
RoHS-compliant product











1B

Clamping points		Clamping length					Hex socket cap screws	**Accessories** recom. hand lever
Bore **d**	Square **s**	**k**	l_1	l_2	l_3	**m**		HSK for z lever length l_4
B 20	V 20	50	172	68	46	86	M 8-35	78
B 25	V 25	50	172	68	46	86	M 8-35	78
B 30	V 30	50	172	68	46	86	M 8-35	78
B 30	V 30	60	203	79	59	101,5	M 8-50	78
B 32	-	60	203	79	59	101,5	M 8-50	78
B 35	V 35	60	203	79	59	101,5	M 8-50	78
B 40	V 40	60	203	79	59	101,5	M 8-50	78
B 40	V 40	76	254	98	70	127	M 10-60	92
B 42	-	76	254	98	70	127	M 10-60	92
B 45	V 45	76	254	98	70	127	M 10-60	92
B 48	-	76	254	98	70	127	M 10-60	92
B 50	V 50	76	254	98	70	127	M 10-60	92

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

WMD - d / s - k - z - o

- Angle clamp
- Clamping points
- Clamping length
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

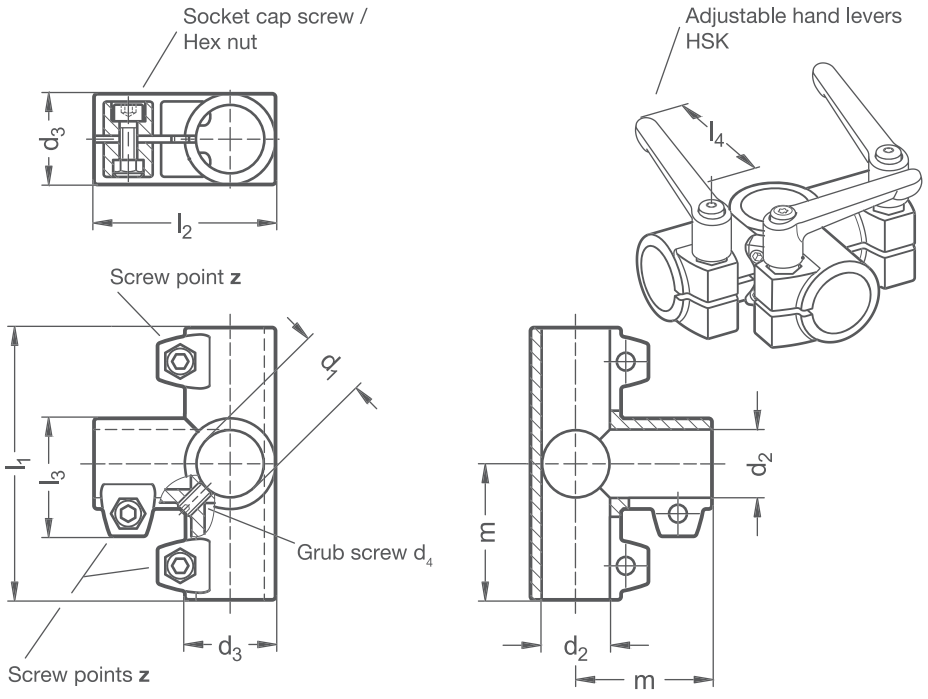
Angle clamps WS of die-cast aluminum have cylindrical clamping points machined by cutting methods. Three clamping points have a slitted cross-section and one has no clamping slit.

All bores of the clamping points are arranged at an angle of 90° to each other. The slitted bores lie in a plane, while the bore cross-section without clamping slit is perpendicular to this plane. All bores receive typically available construction tubes with full surface contact over the entire cross-section.

At the screw points, hex socket cap screws or adjustable hand levers reduce the slitted bore cross-section. Grub screws with cup points act radially on the cross-section of the bore for clamping without a clamping slit.
Centering bores on the clamped tube prevent pressure points and enable precise positioning.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1	Clamping points 2								Accessories recom. hand lever
Bore d_1	Bore d_2	d_3	d_4	l_1	l_2	l_3	m	Hex socket cap screws	HSK for z lever length l_4
B 20	B 20	40	M 8	120	80	52	60	M 8-25	-
B 25	B 25	40	M 8	120	80	52	60	M 8-25	78
B 30	B 30	40	M 8	120	80	52	60	M 8-25	78
B 40	B 40	65	M 10	206	135,5	77,5	103	M 10-50	-
B 42	B 42	65	M 10	206	135,5	77,5	103	M 10-50	-
B 45	B 45	65	M 10	206	135,5	77,5	103	M 10-50	92
B 48	B 48	65	M 10	206	135,5	77,5	103	M 10-50	92
B 50	B 50	65	M 10	206	135,5	77,5	103	M 10-50	92

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated / grub screw DIN 914 steel, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating / Grub screw Stainless steel

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

WS - d_1 - d_2 - z - o

- Angle clamp
- Clamping point 1
- Clamping points 2
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

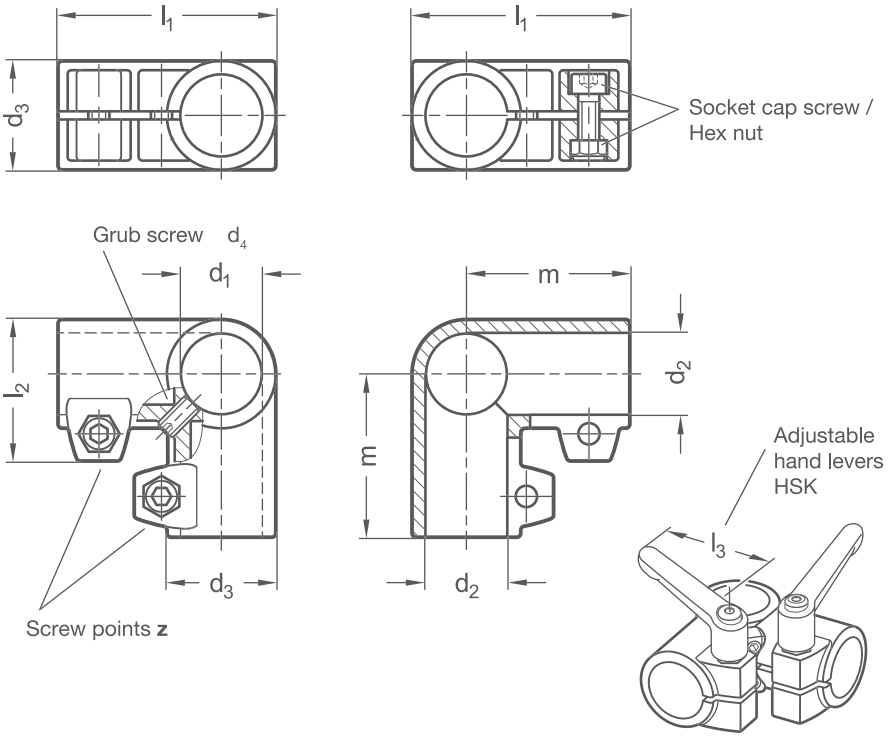
Angle clamps ES of die-cast aluminum have cylindrical clamping points machined by cutting methods. Two clamping points have a slitted cross-section and one has no clamping slit.

All bores of the clamping points are arranged at an angle of 90° to each other. The slitted bores lie in a plane, while the bore cross-section without clamping slit is perpendicular to this plane. All bores receive typically available construction tubes with full surface contact over the entire cross-section.

At the screw points, hex socket cap screws or adjustable hand levers reduce the slitted bore cross-section. Grub screws with cup points act radially on the cross-section of the bore for clamping without a clamping slit.
Centering bores on the clamped tube prevent pressure points and enable precise positioning.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1	Clamping points 2							**Accessories** recom. hand lever
Bore d_1	Bore d_2	d_3	d_4	l_1	l_2	m	Hex socket cap screws	HSK for z lever length l_3
B 20	B 20	40	M 8	80	52	60	M 8-25	-
B 25	B 25	40	M 8	80	52	60	M 8-25	78
B 30	B 30	40	M 8	80	52	60	M 8-25	78
B 40	B 40	65	M 10	135,5	77,5	103	M 10-50	-
B 42	B 42	65	M 10	135,5	77,5	103	M 10-50	-
B 45	B 45	65	M 10	135,5	77,5	103	M 10-50	92
B 48	B 48	65	M 10	135,5	77,5	103	M 10-50	92
B 50	B 50	65	M 10	135,5	77,5	103	M 10-50	92

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated / grub screw DIN 914 steel, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating / grub screw stainless steel

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

ES - d_1 - d_2 - z - o

- Angle clamp
- Clamping point 1
- Clamping points 2
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

CM Tube supports, multi-piece, aluminum

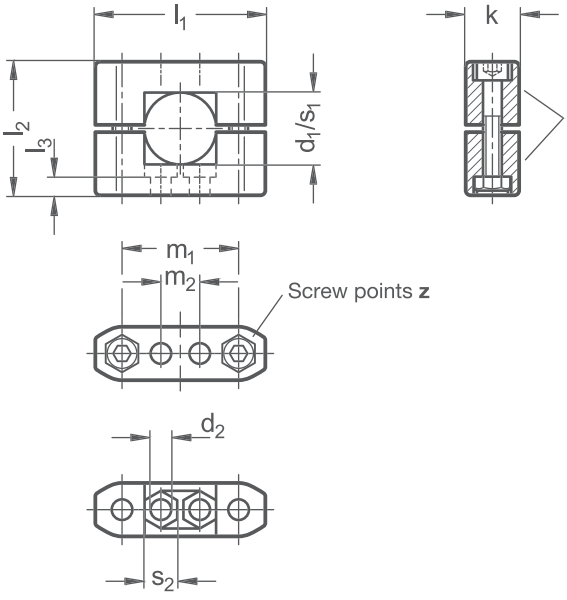
PRODUCT INFO

Tube supports CM of die-cast aluminum have a split clamping point with round or square cross-section that has been partially machined by cutting methods.

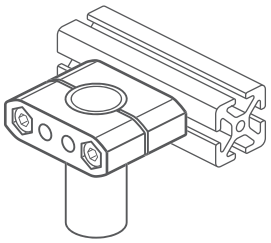
The bore at the clamping point is arranged in the plane parallel to the flange faces of the tube support halves. It receives typically available construction tubes with full surface contact via two ribs in the cross-section of the bore.

At the screw points, hex socket cap screws reduce the bore cross-section for clamping.

RoHS-compliant product



Application example:
Tube support mounted on aluminum profile



Clamping point								d_2	Clamping length k	l_1	l_2	l_3	m_1	m_2	s_2	Hex socket cap screws
Bore d_1				Square s_1												
B 8	B 10	B 12	B 14	V 8	V 10	V 12	V 14	6,2	17	52	38	3,5	36	10,5	10	M 6-30
B 15	B 16	B 18	-	V 15	V 16	V 18	-	6,2	17	52	38	3,5	36	10,5	10	M 6-30
B 20	B 25	B 30	-	V 20	V 25	V 30	-	8,5	22	70	55	4	48	16	13	M 8-45
B 40	B 42	B 45	B 48	V 40	V 45	V 50	-	10,5	27	100	80	5	73	30	17	M 10-65
B 50	-	-	-	-	-	-	-	10,5	27	100	80	5	73	30	17	M 10-65
B 60	-	-	-	V 60	-	-	-	10,5	27	100	90	5	78	30	17	M 10-75

Screw points **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface **o**	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

CM - d_1 / s_1 - z - o

- Tube support
- Clamping point
- Screw points
- Surface

ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

MM Sleeve clamps, multi-piece, aluminum

PRODUCT INFO

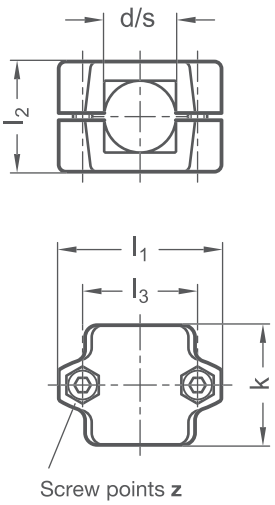
Sleeve clamps MM of die-cast aluminum have a split clamping point with round or square cross-section that has been partially machined by cutting methods.

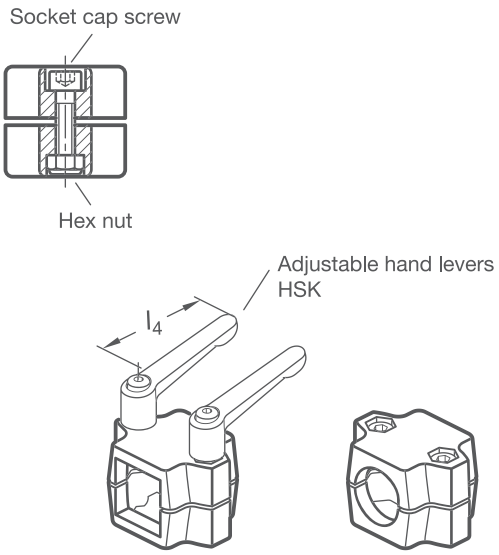
The bore at the clamping point is arranged in the plane parallel to the outer surfaces of the sleeve halves. It receives typically available construction tubes via multiple ribs in the cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product





1B

Clamping point						Clamping length					Accessories recom. hand lever
Bore d			Square s			k	l_1	l_2	l_3	Hex socket cap screws	Klemmhebel HSK lever length l_4
B 20	B 25	B 30	V 20	V 25	V 30	50	68	46	48	M 8-35	78
B 30	B 32	B 35	V 30	V 35	V 40	60	79	59	58	M 8-50	78
B 40	-	-	-	-	-	60	79	59	58	M 8-50	78
B 40	B 42	B 45	V 40	V 45	V 50	76	98	70	73	M 10-60	92
B 48	B 50	-	-	-	-	76	98	70	73	M 10-60	92

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

MM - d / s - k - z - o

- Sleeve clamp
- Clamping point
- Clamping length
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

MS Sleeve clamps, aluminum

PRODUCT INFO

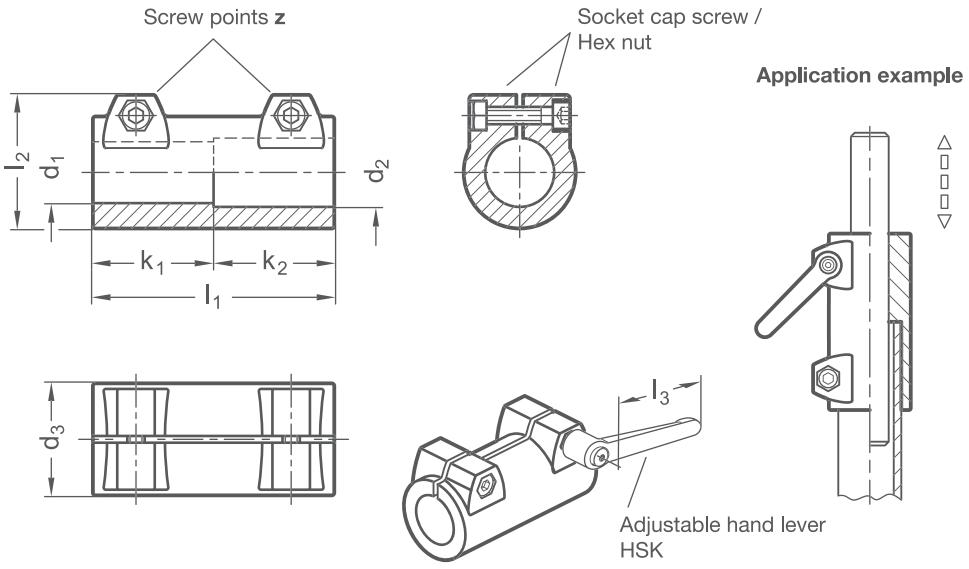
Sleeve clamps MS of die-cast aluminum have slitted clamping points machined by cutting methods.

The clamping point bores are situated concentrically on an axis. They receive typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point 1	Clamping point 2								**Accessories** recom. hand lever
Bore d_1	Bore d_2		d_3	Clamping length k_1	Clamping length k_2	l_1	l_2	Hex socket cap screws	HSK for z lever length l_3
B 20	B 20	B 25	40	45	45	90	52	M 8-25	-
B 25	B 25	B 30	40	45	45	90	52	M 8-25	78
B 30	B 30	-	40	45	45	90	52	M 8-35	78
B 40	B 40	B 50	65	70	70	140	77,5	M 10-50	-
B 42	B 42	-	65	70	70	140	77,5	M 10-50	-
B 45	B 45	-	65	70	70	140	77,5	M 10-50	92
B 48	B 48	-	65	70	70	140	77,5	M 10-50	92
B 50	B 50	-	65	70	70	140	77,5	M 10-50	92

Screw points **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface **o**	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

MS - d_1 - d_2 - z - o

- Sleeve clamp
- Clamping point 1
- Clamping point 2
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

LSF Swivel clamps, aluminum

PRODUCT INFO

Swivel clamps LSF of die-cast aluminum have a fastening lug that is either smooth or features a centering ring. The centering ring can also have outer or inner crown toothing.

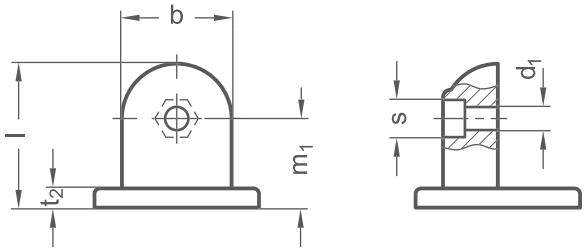
The fastening lug is centered and situated at an angle of 90° to the flange face.

The flange with four bores serves as an interface or for fastening the clamp to the place of use.

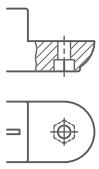
The screw point of the fastening lug receives a hex head or hex socket cap screw or a lock nut for fastening any additional parts.

By combining swivel clamps that have identical fastening lugs and corresponding centering ring toothing, it is possible to assemble any type of joint clamp.

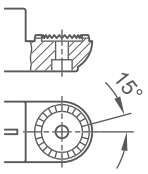
RoHS-compliant product

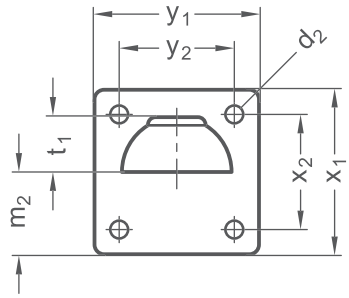


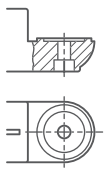
Type **OZ**



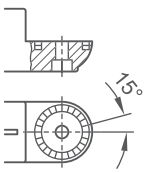
Type **AV**







Type **MZ**



Type **IV**

Lug width **b**	d_1	d_2	l	m_1	m_2	t_1	t_2	s	x_1	x_2	y_1	y_2
40	8,5	5,5	52,5	32,5	30	20	7	13	60	42	60	42
65	10,2	11	84,5	52	52,5	32,5	14	17	105	74	105	74

Type
t

OZ	Without centering step (smooth)
MZ	With centering step
AV	With external serration
IV	With internal serration

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY **LSF - b - t - o**

Swivel clamp
Lug width
Type
Surface

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

LSP Swivel clamps, aluminum

PRODUCT INFO

Swivel clamps LSP of die-cast aluminum have a slitted clamping point machined with cutting methods. The fastening lug is smooth, has a centering ring or has crown toothing that may be countersunk or raised.

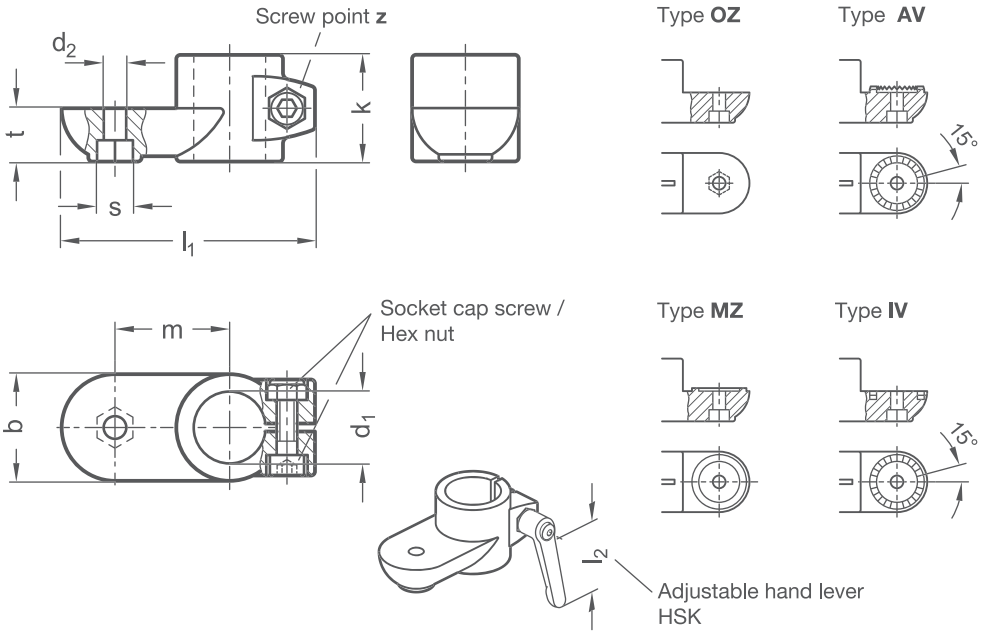
The fastening lug is centered and situated at an angle of 90° to the clamping point bore, which receives typically available construction tubes with full contact over the entire cross-section.

The screw point of the fastening lug receives a hex head or hex socket cap screw or a lock nut for fastening any additional parts. At the clamping point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

By combining swivel clamps that have identical fastening lugs and corresponding centering ring serration, it is possible to assemble any type of joint clamp.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point									Accessories recom. hand lever
Bore d_1	Lug width b	d_2	k	l_1	m	s	t	Hex socket cap screw	HSK for z lever length l_2
B 20	40	8,5	40	95	43	13	20	M 8-25	-
B 25	40	8,5	40	95	43	13	20	M 8-25	78
B 30	40	8,5	40	95	43	13	20	M 8-25	78
B 40	65	10,5	65	148	70	17	32,5	M 10-50	-
B 42	65	10,5	65	148	70	17	32,5	M 10-50	-
B 45	65	10,5	65	148	70	17	32,5	M 10-50	92
B 48	65	10,5	65	148	70	17	32,5	M 10-50	92
B 50	65	10,5	65	148	70	17	32,5	M 10-50	92

Type
t

OZ	Without centering step (smooth)
MZ	With centering step
AV	With external serration
IV	With internal serration

Screw point
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

LSP - d_1 - t - z - o

- Swivel clamp
- Clamping point
- Type
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

Swivel clamps LST of die-cast aluminum have a slitted clamping point machined with cutting methods. The fastening lug is smooth, has a centering ring or has crown serration that may be countersunk or raised.

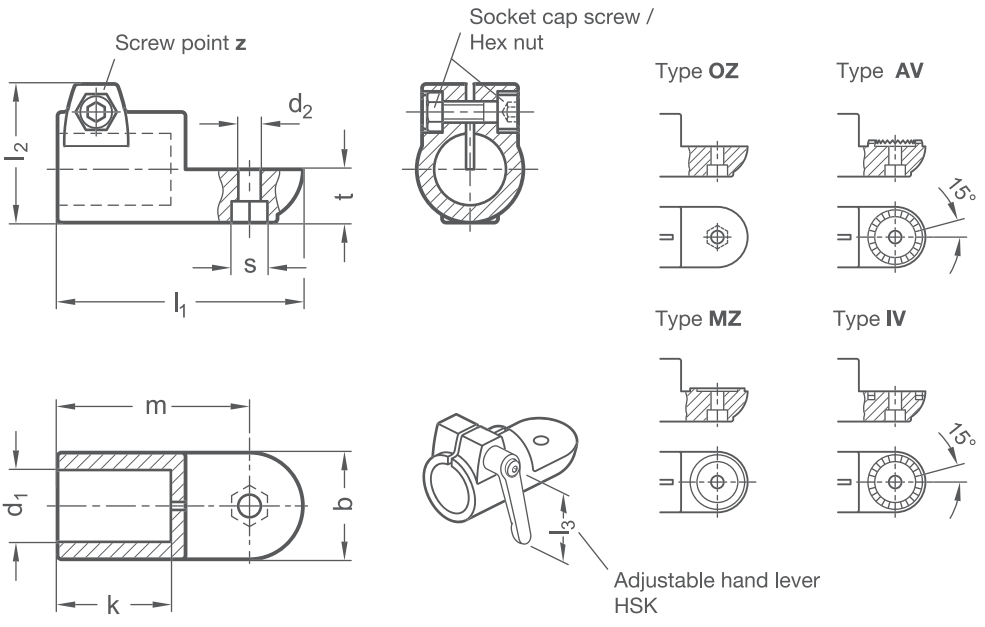
The fastening lug is centered and forms a T-shape relative to the axis of the bore, which receives typically available construction tubes with full contact over the entire cross-section.

The screw point of the fastening lug receives a hex head or hex socket cap screw or a lock nut for fastening any additional parts. At the clamping point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

By combining swivel clamps that have identical fastening lugs and corresponding centering ring serration, it is possible to assemble any type of joint clamp.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point Bore d_1	Lug width b	d_2	k	l_1	l_2	m	s	t	Hex socket cap screw	**Accessories** recom. hand lever HSK for z lever length l_3
B 20	40	8,5	42,5	92	52	72	13	20	M 8-25	-
B 25	40	8,5	42,5	92	52	72	13	20	M 8-25	78
B 30	40	8,5	42,5	92	52	72	13	20	M 8-25	78
B 40	65	10,5	74	148	77,5	115	17	32,5	M 10-50	-
B 42	65	10,5	74	148	77,5	115	17	32,5	M 10-50	-
B 45	65	10,5	74	148	77,5	115	17	32,5	M 10-50	92
B 48	65	10,5	74	148	77,5	115	17	32,5	M 10-50	92
B 50	65	10,5	74	148	77,5	115	17	32,5	M 10-50	92

Type
t

OZ	Without centering step (smooth)
MZ	With centering step
AV	With external serration
IV	With internal serration

Screw point
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

LST - d_1 - t - z - o

- Swivel clamp
- Clamping point
- Type
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

LSQ Swivel clamps, aluminum

PRODUCT INFO

Swivel clamps LSQ of die-cast aluminum have a slitted clamping point machined with cutting methods. The fastening lug is smooth, has a centering ring or has crown serration that may be countersunk or raised.

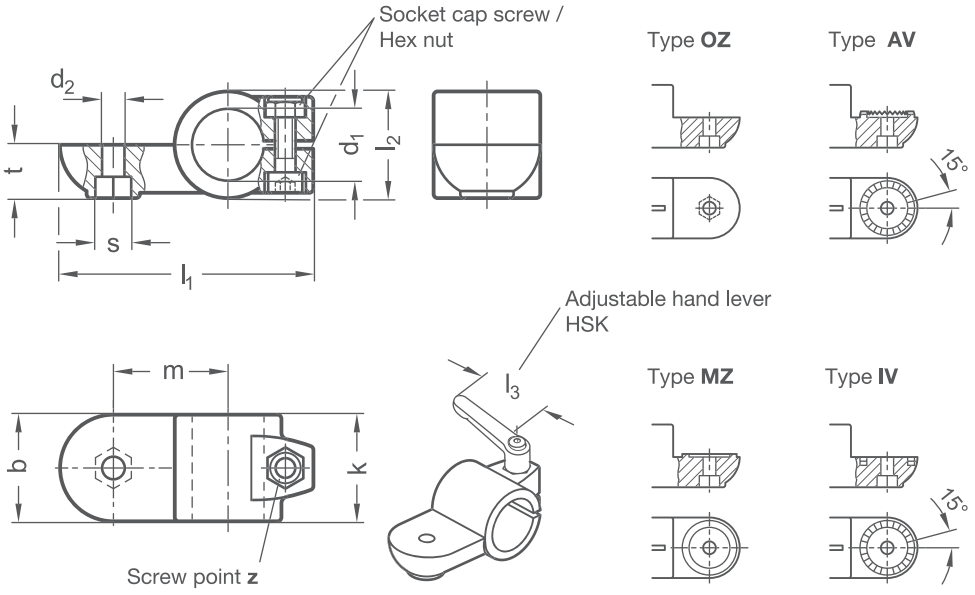
The fastening lug is centered and perpendicular to the axis of the bore, which receives typically available construction tubes with full contact over the entire cross-section.

The screw point of the fastening lug receives a hex head or hex socket cap screw or a lock nut for fastening any additional parts. At the clamping point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

By combining swivel clamps that have identical fastening lugs and corresponding centering ring serration, it is possible to assemble any type of joint clamp.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point										Accessories recom. hand lever
Bore d_1	Lug width b	d_2	k	l_1	l_2	m	s	t	Hex socket cap screw	HSK for z lever length l_3
B 20	40	8,5	40	95	40	43	13	20	M 8-25	-
B 25	40	8,5	40	95	40	43	13	20	M 8-25	78
B 30	40	8,5	40	95	40	43	13	20	M 8-25	78
B 40	65	10,5	65	148	65	70	17	32,5	M 10-50	92
B 42	65	10,5	65	148	65	70	17	32,5	M 10-50	92
B 45	65	10,5	65	148	65	70	17	32,5	M 10-50	92
B 48	65	10,5	65	148	65	70	17	32,5	M 10-50	92
B 50	65	10,5	65	148	65	70	17	32,5	M 10-50	92

Type
t

OZ	Without centering step (smooth)
MZ	With centering step
AV	With external serration
IV	With internal serration

Screw point
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

LSQ - d_1 - t - z - o

- Swivel clamp
- Clamping point
- Type
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screw

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

LMQ Swivel clamps, multi-piece, aluminum

PRODUCT INFO

Swivel clamps LMQ of die-cast aluminum have a split clamping point with round or square cross-section that has been partially machined by cutting methods. The fastening lug has a smooth surface.

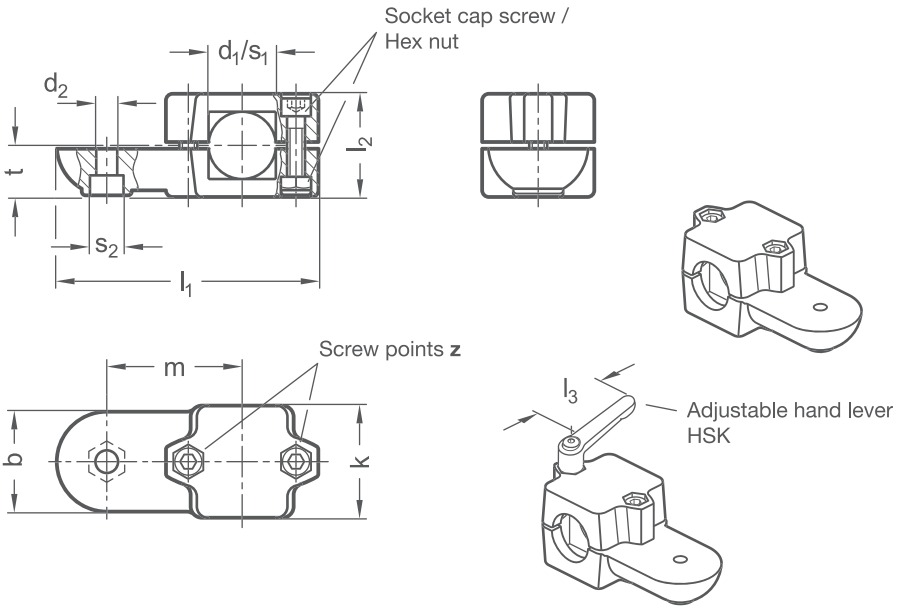
The fastening lug is centered and perpendicular to the axis of the bore, which receives typically available construction tubes via multiple ribs in the cross-section.

The screw point of the fastening lug receives a hex head or hex socket cap screw or a lock nut for fastening any additional parts. At the clamping point, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

By combining swivel clamps that have identical fastening lugs, it is possible to assemble any type of joint clamp.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point		Lug width		Clamping length							Accessories recom. hand lever
Bore d_1	Square s_1	b	d_2	k	l_1	l_2	m	s_2	t	Hex socket cap screws	HSK for z lever length l_3
B 40	V 40	65	10,5	76	166,5	70	85	17	35	M 10-60	92
B 42	-	65	10,5	76	166,5	70	85	17	35	M 10-60	92
B 45	V 45	65	10,5	76	166,5	70	85	17	35	M 10-60	92
B 48	-	65	10,5	76	166,5	70	85	17	35	M 10-60	92
B 50	V 50	65	10,5	76	166,5	70	85	17	35	M 10-60	92

Type
t

OZ	Without centering step (smooth)

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Oberfläche
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

LMQ - d_1 / s_1 - t - z - o

- Swivel clamp
- Clamping point
- Type
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

Joint clamps GSF of die-cast aluminum have a slitted clamping point machined with cutting methods. They are comprised of swivel clamps LSF and LST.

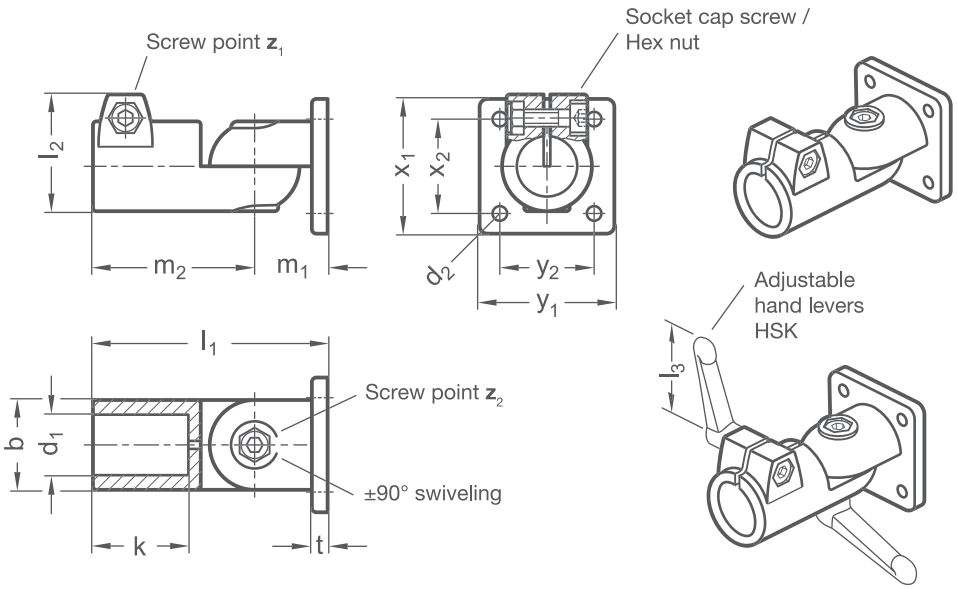
The clamping point bore is centered in the plane and can be rotated by ± 90° perpendicular to the flange face. It receives typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping. A hex socket cap screw or an adjustable hand lever at the clamping joint serves for locking the joint axis. The clamping joint can be adjusted either steplessly or based on the serration pattern.

The flange with four bores serves as an interface or for fastening the clamp to the place of use.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point Bore d_1	Lug width b	d_2	k	l_1	l_2	m_1	m_2	t	x_1	x_2	y_1	y_2	Hex socket cap screw z_1	Hex socket cap screw z_2	**Accessories** recom. hand lever HSK for z_1 l_3	HSK for z_2 l_3
B 20	40	6,5	42,5	104,5	52	32,5	72	7	60	42	60	42	M 8-25	M 8-30	-	78
B 25	40	6,5	42,5	104,5	52	32,5	72	7	60	42	60	42	M 8-25	M 8-30	78	78
B 30	40	6,5	42,5	104,5	52	32,5	72	7	60	42	60	42	M 8-25	M 8-30	78	78
B 40	65	11	74	167	77,5	52	115	14	105	74	105	74	M 10-50	M 10-55	-	92
B 42	65	11	74	167	77,5	52	115	14	105	74	105	74	M 10-50	M 10-55	-	92
B 45	65	11	74	167	77,5	52	115	14	105	74	105	74	M 10-50	M 10-55	92	92
B 48	65	11	74	167	77,5	52	115	14	105	74	105	74	M 10-50	M 10-55	92	92
B 50	65	11	74	167	77,5	52	115	14	105	74	105	74	M 10-50	M 10-55	92	92

Type
t

S	Stepless adjustment
T	Adjustment with 15° division (serration)

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

GSF - d_1 - t - z - o

- Joint clamp
- Clamping point
- Type
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

GSP Joint clamps, aluminum

PRODUCT INFO

Joint clamps GSP of die-cast aluminum have slitted clamping points machined by cutting methods. They are comprised of swivel clamps LST and LSP.

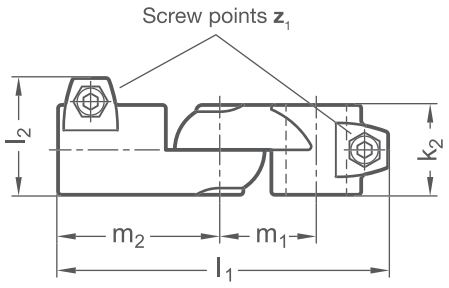
The clamping point bores are arranged at an angle of 90° and connected by the clamping joint to swivel by ± 90°. They receive typically available construction tubes with full surface contact over the entire cross-section of the bore.

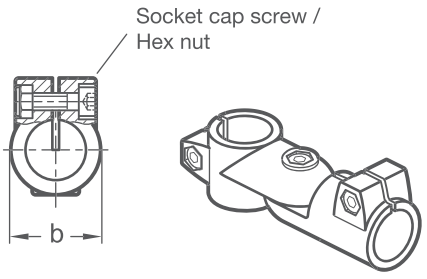
At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

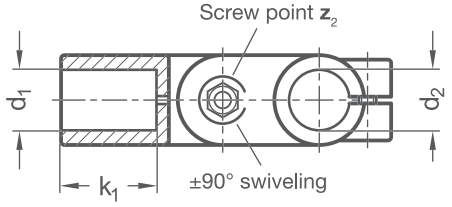
A hex socket cap screw or an adjustable hand lever at the clamping joint acts axially on the joint axis. The clamping joint can be adjusted either steplessly or based on the serration pattern.

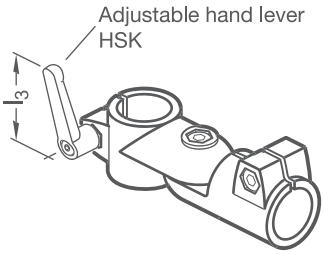
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product









1B

Clamping point 1	Clamping point 2										Accessories recom. hand lever	
Bore d_1	Bore d_2	Lug width b	k_1	k_2	l_1	l_2	m_1	m_2	Hex socket cap screw z_1	Hex socket cap screw z_2	HSK for z_1 l_3	HSK for z_2 l_3
B 20	B 20	40	42,5	40	147	52	43	72	M 8-25	M 8-30	-	78
B 25	B 25	40	42,5	40	147	52	43	72	M 8-25	M 8-30	78	78
B 30	B 30	40	42,5	40	147	52	43	72	M 8-25	M 8-30	78	78
B 40	B 40	65	74	65	230	77,5	70	115	M 10-50	M 10-55	-	92
B 42	B 42	65	74	65	230	77,5	70	115	M 10-50	M 10-55	-	92
B 45	B 45	65	74	65	230	77,5	70	115	M 10-50	M 10-55	92	92
B 48	B 48	65	74	65	230	77,5	70	115	M 10-50	M 10-55	92	92
B 50	B 50	65	74	65	230	77,5	70	115	M 10-50	M 10-55	92	92

Type
t

S	Stepless adjustment
T	Adjustment with 15° division (serration)

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

GSP - d_1 - d_2 - t - z - o

- Joint clamp
- Clamping point 1
- Clamping point 2
- Type
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

GST Joint clamps, aluminum

PRODUCT INFO

Joint clamps GST of die-cast aluminum have slitted clamping points machined by cutting methods. They are comprised of two swivel clamps LST.

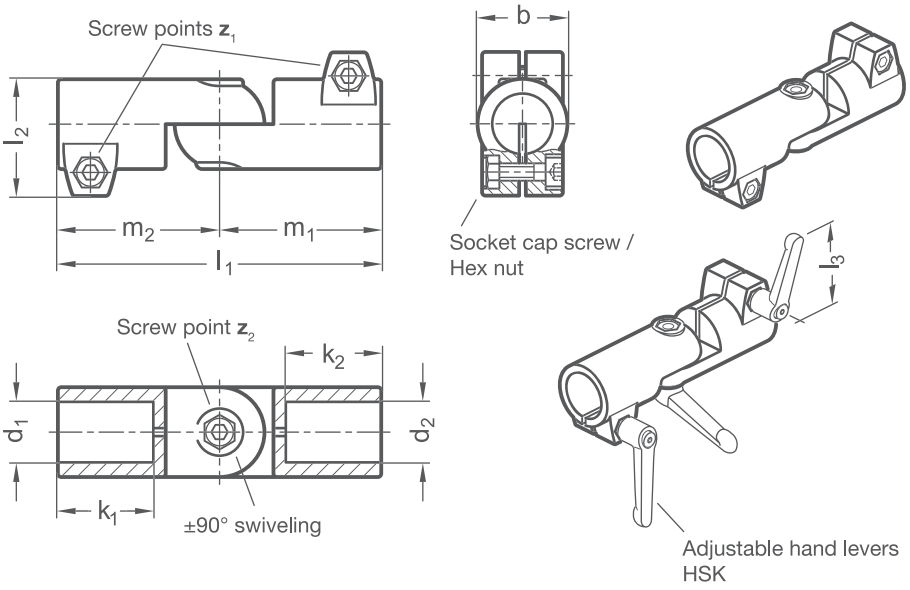
The clamping point bores are situated in a plane and are connected by the clamping joint to swivel by ± 90°, from aligned orientation to perpendicular. They receive typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

A hex socket cap screw or an adjustable hand lever at the clamping joint serves for locking the joint axis. The clamping joint can be adjusted either steplessly or based on the serration pattern.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point 1	Clamping point 2					Lug width							Hex socket cap screw	Hex socket cap screw	**Accessories** recom. hand lever	
Bore d_1	Bore d_2					b	k_1	k_2	l_1	l_2	m_1	m_2	z_1	z_2	HSK for z_1 l_3	HSK for z_2 l_3
B 20	B 20	B 25	B 30	-	-	40	42,5	42,5	144	52	72	72	M 8-25	M 8-30	-	78
B 25	B 25	B 30	-	-	-	40	42,5	42,5	144	52	72	72	M 8-25	M 8-30	78	78
B 30	B 30	-	-	-	-	40	42,5	42,5	144	52	72	72	M 8-25	M 8-30	78	78
B 40	B 40	B 42	B 45	B 48	B 50	65	74	74	230	77,5	115	115	M 10-50	M 10-55	-	92
B 42	B 42	B 45	B 48	B 50	-	65	74	74	230	77,5	115	115	M 10-50	M 10-55	-	92
B 45	B 45	B 48	B 50	-	-	65	74	74	230	77,5	115	115	M 10-50	M 10-55	92	92
B 48	B 48	B 50	-	-	-	65	74	74	230	77,5	115	115	M 10-50	M 10-55	92	92
B 50	B 50	-	-	-	-	65	74	74	230	77,5	115	115	M 10-50	M 10-55	92	92

Type
t

S	Stepless adjustment
T	Adjustment with 15° division (serration)

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

GST - d_1 - d_2 - t - z - o

- Joint clamp
- Clamping point 1
- Clamping point 2
- Type
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

Joint clamps GSQ of die-cast aluminum have slitted clamping points machined by cutting methods. They are comprised of swivel clamps LST and LSQ.

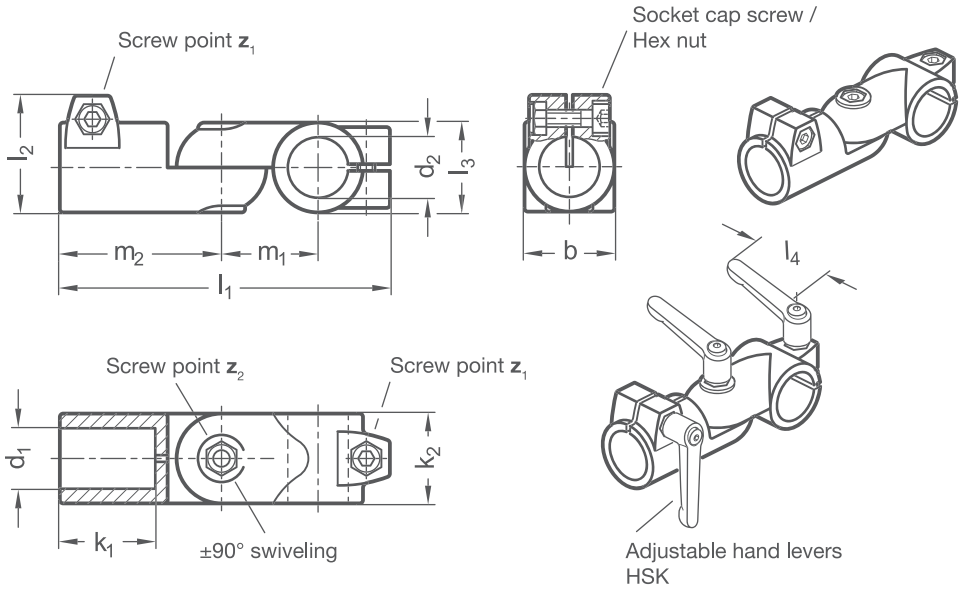
The clamping point bores are situated in a plane and are connected by the clamping joint to swivel by ± 90°, from perpendicular to parallel. They receive typically available construction tubes with full surface contact over the entire cross-section of the bore.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

A hex socket cap screw or an adjustable hand lever at the clamping joint serves for locking the joint axis. The clamping joint can be adjusted either steplessly or based on the serration pattern.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1	Clamping point 2											Accessories recom. hand lever	
Bore d_1	Bore d_2	Lug width b	k_1	k_2	l_1	l_2	l_3	m_1	m_2	Hex socket cap screw z_1	Hex socket cap screw z_2	HSK for z_1 l_4	HSK for z_2 l_4
B 20	B 20	40	42,5	40	147	52	40	43	72	M 8-25	M 8-30	-	78
B 25	B 25	40	42,5	40	147	52	40	43	72	M 8-25	M 8-30	78	78
B 30	B 30	40	42,5	40	147	52	40	43	72	M 8-25	M 8-30	78	78
B 40	B 40	65	74	65	230	77,5	65	70	115	M 10-50	M 10-55	-	92
B 42	B 42	65	74	65	230	77,5	65	70	115	M 10-50	M 10-55	-	92
B 45	B 45	65	74	65	230	77,5	65	70	115	M 10-50	M 10-55	92	92
B 48	B 48	65	74	65	230	77,5	65	70	115	M 10-50	M 10-55	92	92
B 50	B 50	65	74	65	230	77,5	65	70	115	M 10-50	M 10-55	92	92

Type
t

S	Stepless adjustment
T	Adjustment with 15° division (serration)

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

GSQ - d_1 - d_2 - t - z - o

- Joint clamp
- Clamping point 1
- Clamping point 2
- Type
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with different diameters d_1 and d_2 or special diameter

– Screw points
with hex head screws or mixed screw / adjustable hand lever elements

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

GMQ Joint clamps, multi-piece, aluminum

PRODUCT INFO

Joint clamps GMQ of die-cast aluminum have split clamping points with identical round or square cross-section that have been partially machined by cutting methods. They are comprised of two swivel clamps LMQ.

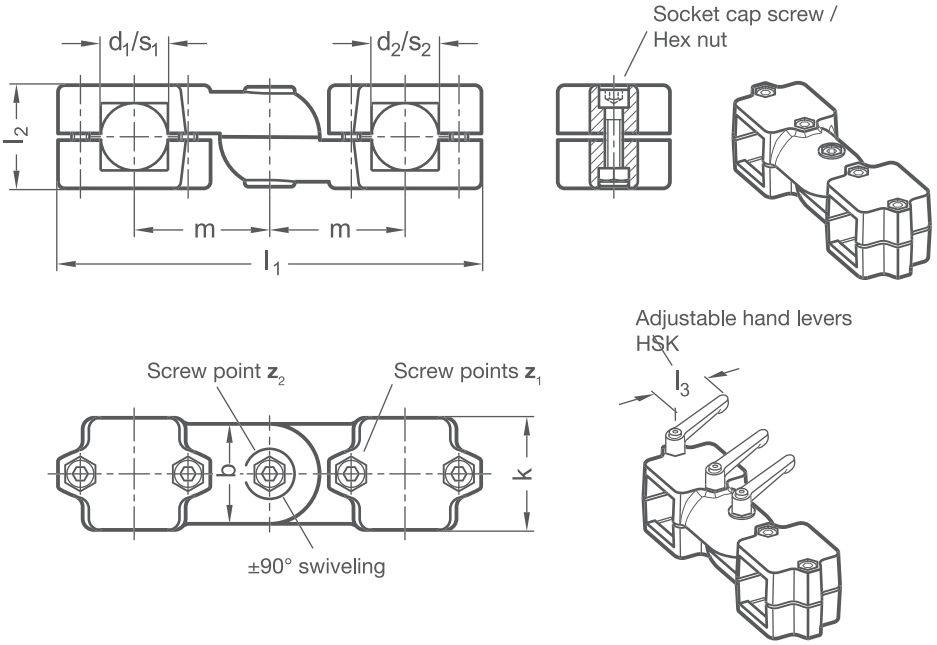
The clamping point bores are situated in a plane and are connected by the clamping joint to swivel by ± 90°, from parallel to perpendicular. They receive typically available construction tubes via multiple ribs in the cross-section of the bores.

At the screw points, hex socket cap screws or adjustable hand levers reduce the bore cross-section for clamping.

A hex socket cap screw or an adjustable hand lever at the clamping joint serves for locking the joint axis.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



1B

Clamping point 1 - Clamping point 2			Lug width							Accessories recom. hand lever	
Bore - Bore d_1 - d_2	Bore - Square d_1 - s_2	Square - Square s_1 - s_2	b	k	l_1	l_2	m	Hex socket cap screw z_1	Hex socket cap screw z_2	HSK for z_1 l_3	HSK for z_2 l_3
B40 - B40	B40 - V40	V40 - V40	65	76	268	70	85	M 10-60	M 10-55	92	92
B40 - B42	-	-	65	76	268	70	85	M 10-60	M 10-55	92	92
B40 - B45	B40 - V45	V40 - V45	65	76	268	70	85	M 10-60	M 10-55	92	92
B40 - B48	-	-	65	76	268	70	85	M 10-60	M 10-55	92	92
B40 - B50	B40 - V50	V40 - V50	65	76	268	70	85	M 10-60	M 10-55	92	92
-	B42 - V40	-	65	76	268	70	85	M 10-60	M 10-55	92	92
B42 - B42	-	-	65	76	268	70	85	M 10-60	M 10-55	92	92
B42 - B45	B42 - V45	-	65	76	268	70	85	M 10-60	M 10-55	92	92
B42 - B48	-	-	65	76	268	70	85	M 10-60	M 10-55	92	92
B42 - B50	B42 - V50	-	65	76	268	70	85	M 10-60	M 10-55	92	92
-	B45 - V40	-	65	76	268	70	85	M 10-60	M 10-55	92	92
B45 - B45	B45 - V45	V45 - V45	65	76	268	70	85	M 10-60	M 10-55	92	92
B45 - B48		-	65	76	268	70	85	M 10-60	M 10-55	92	92
B45 - B50	B45 - V50	V45 - V50	65	76	268	70	85	M 10-60	M 10-55	92	92
-	B48 - V40	-	65	76	268	70	85	M 10-60	M 10-55	92	92
-	B48 - V45	-	65	76	268	70	85	M 10-60	M 10-55	92	92
B48 - B48	-	-	65	76	268	70	85	M 10-60	M 10-55	92	92
B48 - B50	B48 - V50	-	65	76	268	70	85	M 10-60	M 10-55	92	92
-	B50 - V40	-	65	76	268	70	85	M 10-60	M 10-55	92	92
-	B50 - V45	-	65	76	268	70	85	M 10-60	M 10-55	92	92
B50 - B50	B50 - V50	V50 - V50	65	76	268	70	85	M 10-60	M 10-55	92	92

Type
t

S	Stepless adjustment

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

GMQ - d_1-d_2 (d_1-s_2 / s_1-s_2) - t - z - o

- Joint clamp
- Clamping point 1 - Clamping point 2
- Type
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points with different diameters d_1 and d_2 or special diameter

– Screw points with hex head screws or mixed screw / adjustable hand lever elements

– Surface ball-burnished, anodized or powder-coated in other RAL colors

GMV Joint clamps, swiveling, aluminum / stainless steel

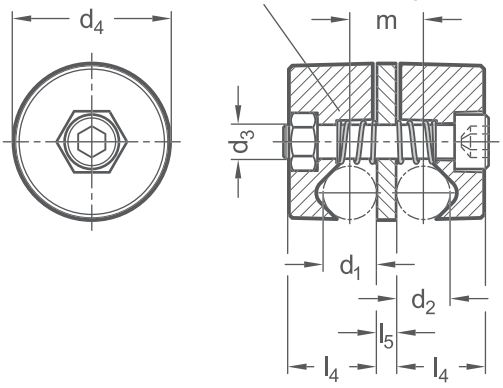
PRODUCT INFO

Swivel joint clamps GMV are made of forged or die-cast aluminum or precision-cast stainless steel.

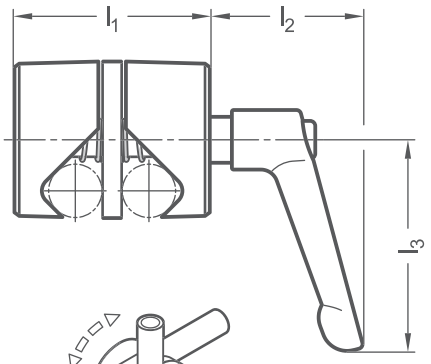
They clamp rods and tubes with a V-block arrangement and are capable of bridging a large diameter tolerance range. The compression spring keeps the clamp halves spaced out, simplifying both clamping and releasing.

RoHS-compliant product

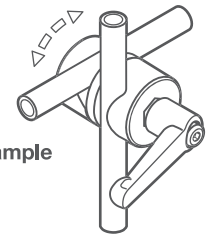
Type **A**



Type **B**



Application example



Clamping diameter d_1	Clamping diameter d_2	d_3	d_4	l_1	l_2	l_3	l_4	l_5	m
8	8	M 6	28	33	35	45	14	5	13
10	10	M 8	32	45	45	63	20	5	15
12	12	M 8	36	47	45	63	21	5	17
14	14	M 8	46	57	55	78	25,5	6	20
15	15	M 10	46	57	55	78	25,5	6	21
16	16	M 10	46	57	55	78	25,5	6	22
18	18	M 10	56	63	55	78	28,5	6	24
20	20	M 10	56	65	55	78	28,5	8	28

Type **t**	
2	Hex socket cap screw stainless steel (DIN 912-A2-70 and hex nut DIN 934-A2)
8	with adjustable hand lever, lever zinc-die-cast textured powder-coated, Silver RAL 9006 for surface 2 / G | Lever stainless steel precision-cast AISI CF-8, blasted, matt for surface ED, Threaded insert stainless steel AISI 303, screw A1 and hex nut DIN 934-A2

Surface **o**	
2	Aluminum, textured powder-coated, Black RAL 9005
G	Aluminum glide coating, matt
ED	Stainless steel, blasted, matt

ORDER KEY **GMV - d_1 - d_2 - t - o**

Joint clamp
Clamping diameter
Type
Surface

ON REQUEST

– Clamping point with special diameter
– Screw point with hex head screw
– Surface anodized in other colors
– Retaining magnet

SSF Sensor mounts, aluminum

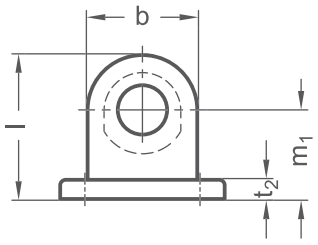
PRODUCT INFO

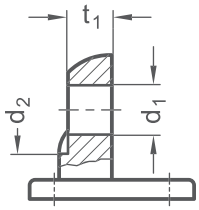
Sensor mounts SSF of die-cast aluminum have a sensor bore machined by cutting methods.

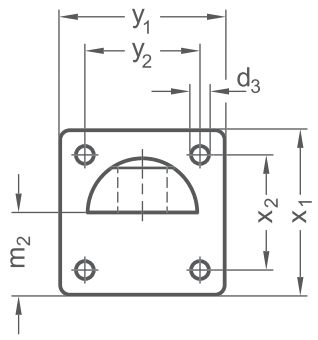
The sensor bore is centered and parallel to the flange face. It can be used for attaching a sensor with male thread.

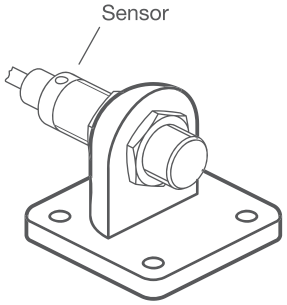
The flange with four bores serves as an interface or for fastening the sensor mount to the place of use.

RoHS-compliant product









Sensor bore d_1	Lug width b	d_2	d_3	l	m_1	m_2	t_1	t_2	x_1	x_2	y_1	y_2
B 18	40	50	6,5	52,5	32,5	30	10	7	60	42	60	42
B 30	40	50	6,5	52,5	32,5	30	10	7	60	42	60	42

Surface o	
2	textured powder-coated, Black RAL 9005

ORDER KEY

SSF - d_1 - b - o

- Sensor mount
- Bore
- Lug width
- Surface

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

– Sensor bore with special diameter

SSP Sensor mounts, aluminum

PRODUCT INFO

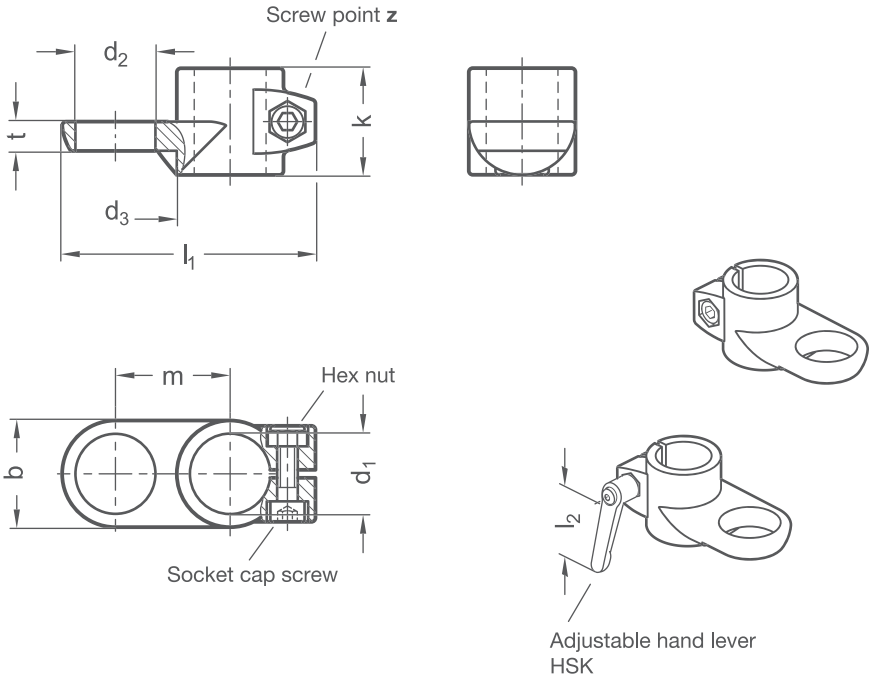
Sensor mounts SSP of die-cast aluminum have a slitted clamping point and a sensor bore, both machined by cutting methods.

The sensor bore allows attachment of sensors with male thread. It lies within a plane and parallel to the clamping point bore, which receives typically available construction tubes with full contact over the entire cross-section.

At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point	Sensor bore									**Accessories** recom. hand lever
Bore d_1	d_2		Lug width b	d_3	k	l_1	m	t	Hex socket cap screw	HSK for z lever length l_2
B 20	B 18	B 30	40	50	40	95	43	10	M 8-25	-
B 25	B 18	B 30	40	50	40	95	43	10	M 8-25	78
B 30	B 18	B 30	40	50	40	95	43	10	M 8-25	78

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	Aluminum, textured powder-coated, Black RAL 9005

ORDER KEY

SSP - d_1 - d_2 - z - o

- Sensor mount
- Clamping point
- Sensor bore
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping points
with special diameter

– Screw point
with hex head screws

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

SST Sensor mounts, aluminum

PRODUCT INFO

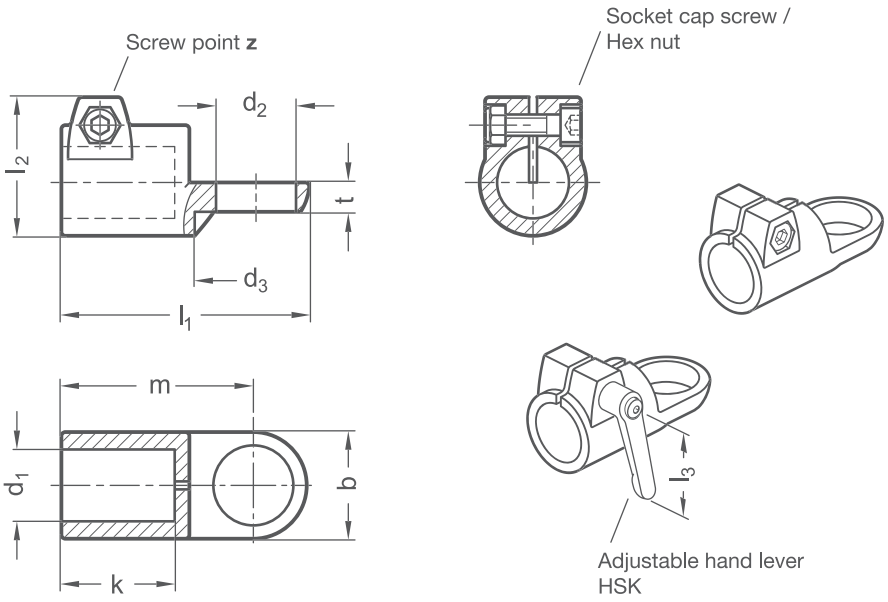
Sensor mounts SST of die-cast aluminum have a slitted clamping point and a sensor bore, both machined by cutting methods.

The sensor bore allows attachment of a sensor with male thread. It is centered and forms a T-shape relative to the clamping point bore, which receives typically available construction tubes with full contact over the entire cross-section.

At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point	Sensor bore										Accessories recom. hand lever
Bore d_1	d_2		Lug width b	d_3	k	l_1	l_2	m	t	Hex socket cap screw	HSK for z lever length l_3
B 20	B 18	B 30	40	50	42,5	92	52	72	10	M 8-25	-
B 25	B 18	B 30	40	50	42,5	92	52	72	10	M 8-25	78
B 30	B 18	B 30	40	50	42,5	92	52	72	10	M 8-25	78

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	Aluminum, textured powder-coated, Black RAL 9005

ORDER KEY

SST - d_1 - d_2 - z - o

- Sensor mount
- Clamping point
- Sensor bore
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Clamping point
with special diameter

– Screw point
with hex head screws

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

SSQ Sensor mounts, aluminum

PRODUCT INFO

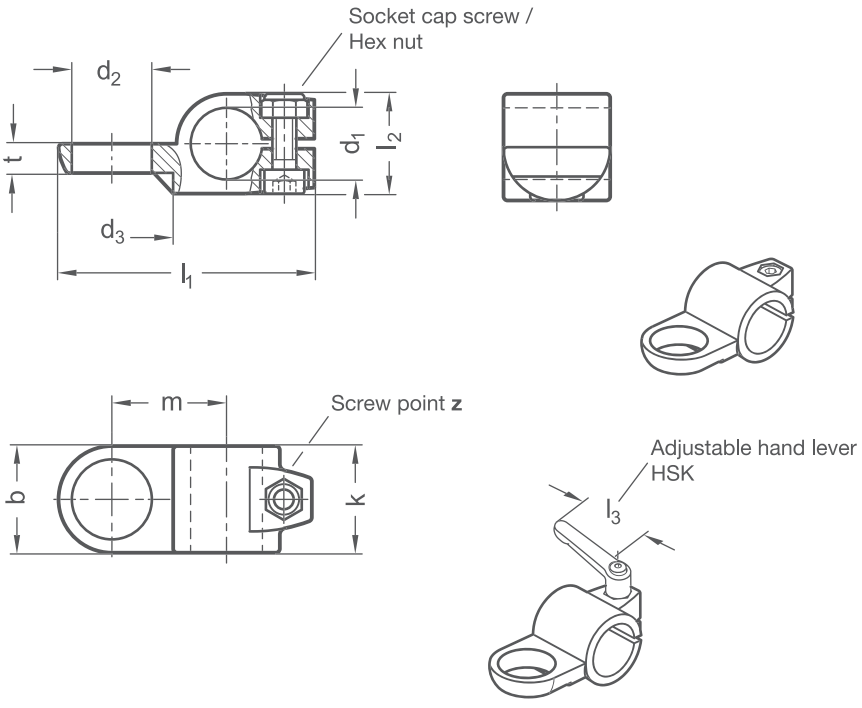
Sensor mounts SSQ of die-cast aluminum have a slitted clamping point and a sensor bore, both machined by cutting methods.

The sensor bore allows attachment of a sensor with male thread. It is offset in the plane and situated at an angle of 90° to the clamping point bore, which receives typically available construction tubes with full contact over the entire cross-section.

At the screw point, a hex socket cap screw or an adjustable hand lever reduces the bore cross-section for clamping.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point	Sensor bore										**Accessories** recom. hand lever
Bore d_1	d_2		Lug width b	d_3	k	l_1	l_2	m	t	Hex socket cap screw	HSK for z lever length l_3
B 20	B 18	B 30	40	50	40	95	40	43	10	M 8-25	-
B 25	B 18	B 30	40	50	40	95	40	43	10	M 8-25	78
B 30	B 18	B 30	40	50	40	95	40	43	10	M 8-25	78

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	Aluminum, textured powder-coated, Black RAL 9005

ORDER KEY

SSQ - d_1 - d_2 - z - o

- Sensor mount
- Clamping point
- Sensor bore
- Screw point
- Surface

ACCESSORIES

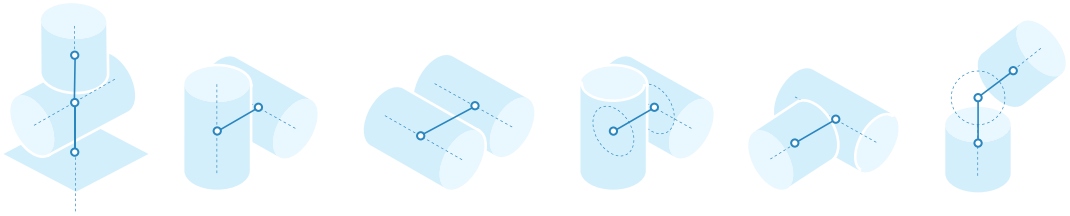
– Adjustable hand levers **HSK** *see page 168*

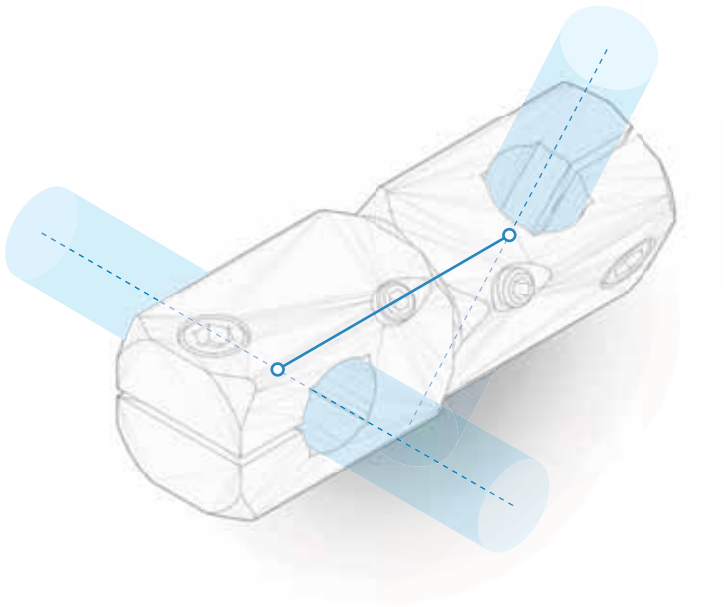
ON REQUEST

– Clamping points
with special diameter

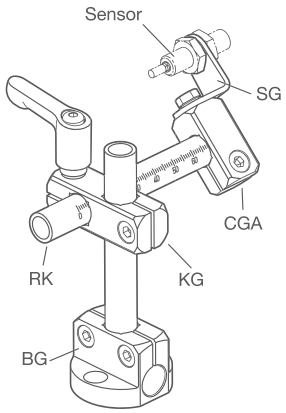
– Screw point
with hex head screws

– Surface
ball-burnished, anodized or powder-coated in other RAL colors





Clamp mountings



Application example
Sensor holder

The group “Clamp Mountings 1C” contains single-piece parts made from drawn aluminum profiles or plastic. The aluminum clamp mountings have slitted clamping points machined by cutting methods that receive rods and tubes with round or square cross-sections via the additionally incorporated square bore in some versions.

Hex socket cap screws or adjustable hand levers, together with the thread cut into the part, reduce the bore cross-section for clamping. Adjustable hand levers are intended for repeated, tool-free clamping.

Clamp mountings are available in all typical part types, such as cross, base or flanged clamps, with bore diameters from 8 to 20 mm. Larger diameters can be found in the group “Tube Clamps 1B”.

Together with rods and tubes, clamp mountings can be used to quickly and easily assemble stable tube constructions that can be flexibly adapted to many different areas of application, such as in automation, sensor systems, and jig and fixture construction.

Base clamp mountings	**BG** *p. 138* 							
Cross clamp mountings	**KG** *p. 140* 							
Parallel clamp mountings	**PG** *p. 142* 							
Swivel cross clamp mountings	**DGK** *p. 144* 							
T-clamp mountings	**TG** *p. 146* 							
Clamps	**CG** *p. 148* 							
Attachment clamp mountings	**CGA** *p. 150* 							
Swivel clamp mountings	**LG** *p. 152* 	**LGT** *p. 154* 	**LGA** *p. 156* 	**LGF** *p. 158* 				
Plastic clamp mountings	**KP** *p. 160* 	**BP** *p. 162* 	**SP** *p. 164* 					

PRODUCT INFO

Base clamp mountings BG Base are made of drawn round aluminum profiles and have slitted clamping points machined by cutting methods.

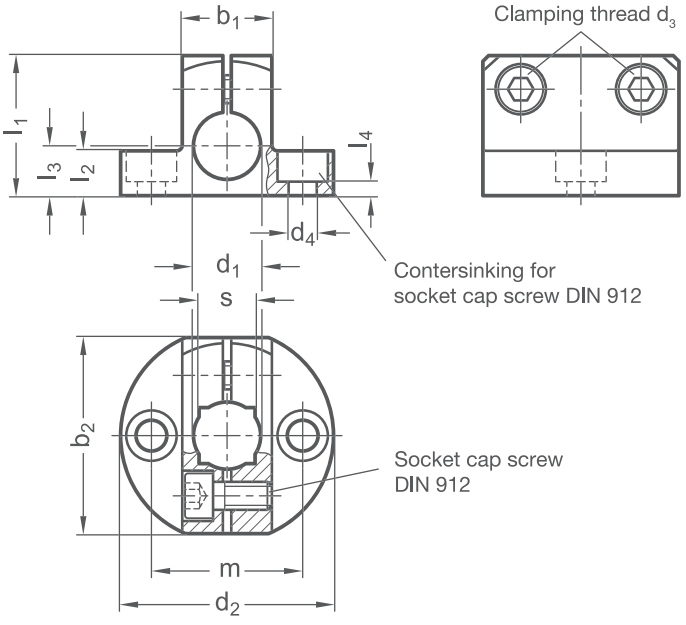
The base with two bores serves as an interface or for fastening the clamp mounting to the place of use.

The bore distance m is the same for all clamp mountings and the available accessories with fastening options to ensure simple replacement and combination.

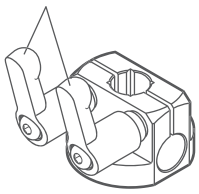
The bores at the clamping points are situated in a plane and arranged in a T-shape, parallel / perpendicular to the fastening plane. They receive rods and tubes with round or square cross-sections via the additionally incorporated square bore.

For clamping, stainless steel socket cap screws DIN 912-A2-70 combine with the clamping thread to reduce the bore cross-section. For regular tool-free clamping, adjustable hand lever sets are available as accessories under the designation HK.

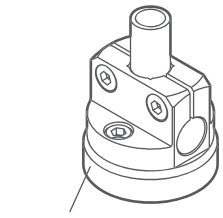
RoHS-compliant product



Adjustable hand lever set HK



Application example



Retaining magnet
available as accessory

Clamping point Bore d_1	b_1	b_2	d_2	Clamping thread d_3	Pass-through bore d_4 for	l_1	l_2	l_3	l_4	m	Square s	**Accessories** Hand lever set HK for d_3
B 8	14	29	31,5	M 4	M 4	20	7	7	3	22	-	M 4-14
B 10	16	35	38	M 5	M 5	24	8	8	2,5	27	8	M 5-16
B 12	16	35	38	M 5	M 5	25	8	8	2,5	27	10	M 5-16
B 15	20	41	45	M 6	M 6	30	10	10	4	32	12	M 6-20
B 16	20	41	45	M 6	M 6	31	10	10	4	32	-	M 6-20
B 20	25	44	50	M 6	M 6	35	12,5	12,5	6,5	36	16	M 6-25

Surface o	
G	Tumbled, matt
S	Anodized black

ORDER KEY

BG - d_1 - o

- Base clamp mounting
- Clamping point
- Surface

ACCESSORIES

– Adjustable hand lever set **HK** *see page 172*

ON REQUEST

– Clamping point with special diameter

– Screw points with hex head screws

– Surface anodized in colors

– Retaining magnet

KG Cross clamp mountings, aluminum

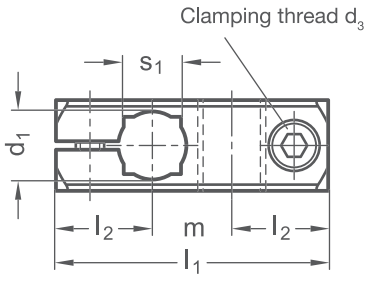
PRODUCT INFO

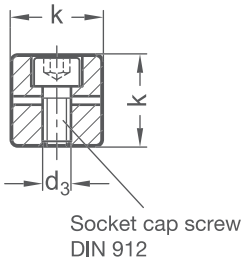
Cross clamp mountings KG are made of drawn aluminum profiles and have slitted clamping points machined by cutting methods.

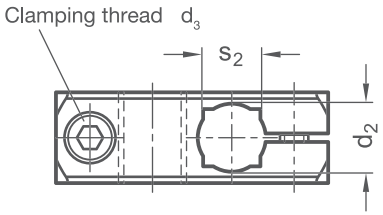
The bores of the clamping points are offset in the plane and arranged at an angle of 90°. They receive rods and tubes with round or square cross-sections via the additionally incorporated square bore.

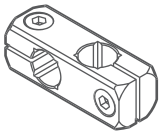
For clamping, stainless steel socket cap screws DIN 912-A2-70 combine with the clamping thread to reduce the bore cross-section. For regular tool-free clamping, adjustable hand lever sets are available as accessories under the designation HK.

RoHS-compliant product









Clamping point 1	Clamping point 2	Clamping thread							Accessories
Bore d_1	Bore d_2	d_3	k	l_1	l_2	m	Square s_1	Square s_2	Hand lever set HK for d_3
B 8	B 8	M 4	14	37	13,5	10	-	-	M 4-14
B 10	B 8	M 5	16	46	17	12	8	-	M 5-16
B 10	B 10	M 5	16	46	17	12	8	8	M 5-16
B 12	B 8	M 5	16	48	17	14	10	-	M 5-16
B 12	B 12	M 5	16	48	17	14	10	10	M 5-16
B 15	B 10	M 6	20	58	20,5	17	12	8	M 6-20
B 15	B 12	M 6	20	58	20,5	17	12	10	M 6-20
B 15	B 15	M 6	20	58	20,5	17	12	12	M 6-20
B 16	B 12	M 6	20	59	20,5	18	-	10	M 6-20
B 16	B 16	M 6	20	59	20,5	18	-	-	M 6-20
B 20	B 15	M 6	25	65	21,5	22	16	12	M 6-25
B 20	B 16	M 6	25	65	21,5	22	16	-	M 6-25
B 20	B 20	M 6	25	65	21,5	22	16	16	M 6-25

Surface o	
G	Tumbled, matt
S	Anodized black

ORDER KEY

KG - d_1 - d_2 - o

- Cross clamp mounting
- Clamping point 1
- Clamping point 2
- Surface

ACCESSORIES

– Adjustable hand lever set **HK** *see page 172*

ON REQUEST

– Clamping points with special diameter

– Screw points with hex head screws

– Surface anodized in colors

PG Parallel clamp mountings, aluminum

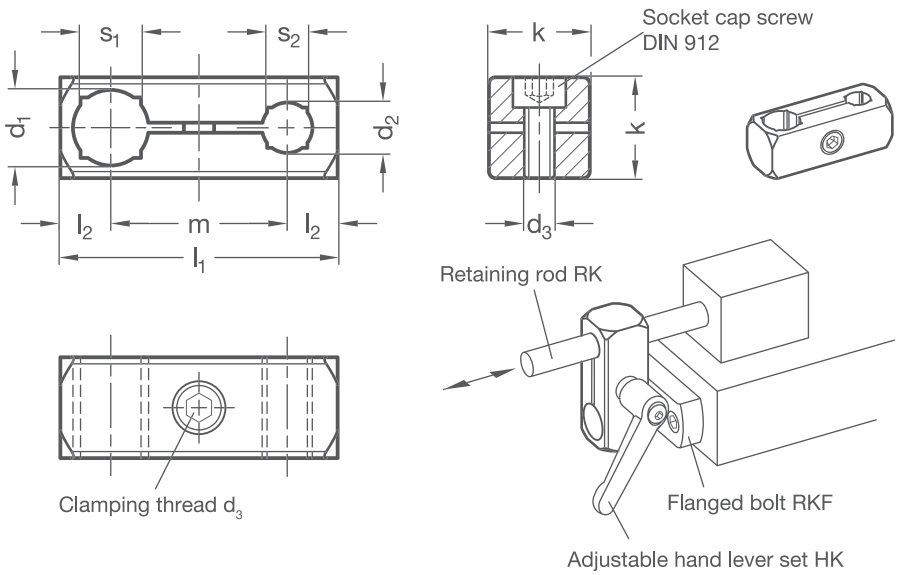
PRODUCT INFO

Parallel clamp mountings PG are made of drawn aluminum profiles and have slitted clamping points machined by cutting methods.

The bores at the clamping points are situated in a plane and are parallel to each other. They receive rods and tubes with round or square cross-sections via the additionally incorporated square bore.

For clamping, a stainless steel socket cap screw DIN 912-A2-70 combines with the clamping thread to reduce the bore cross-section. For regular tool-free clamping, adjustable hand lever sets are available as accessories under the designation HK.

RoHS-compliant product



1C

Clamping point 1	Clamping point 2	Clamping thread							Accessories
Bore d_1	Bore d_2	d_3	k	l_1	l_2	m	Square s_1	Square s_2	Hand lever set HK for d_3
B 8	B 8	M 4	14	38	7	24	-	-	M 4-14
B 10	B 8	M 5	16	44	8	28	8	-	M 5-16
B 10	B 10	M 5	16	44	8	28	8	8	M 5-16
B 12	B 8	M 5	16	45	8	29	10	-	M 5-16
B 12	B 10	M 5	16	45	8	29	10	8	M 5-16
B 12	B 12	M 5	16	45	8	29	10	10	M 5-16
B 15	B 10	M 6	20	55	10	35	12	8	M 6-20
B 15	B 12	M 6	20	55	10	35	12	10	M 6-20
B 15	B 15	M 6	20	55	10	35	12	12	M 6-20
B 16	B 10	M 6	20	55	10	35	-	8	M 6-20
B 16	B 12	M 6	20	55	10	35	-	10	M 6-20
B 16	B 15	M 6	20	55	10	35	-	12	M 6-20
B 16	B 16	M 6	20	55	10	35	-	-	M 6-20
B 20	B 12	M 6	25	66	12,5	41	16	10	M 6-25
B 20	B 15	M 6	25	66	12,5	41	16	12	M 6-25
B 20	B 16	M 6	25	66	12,5	41	16	-	M 6-25
B 20	B 20	M 6	25	66	12,5	41	16	16	M 6-25

Surface o	
G	Tumbled, matt
S	Anodized black

ORDER KEY

PG - d_1 - d_2 - o

- Parallel clamp mounting
- Clamping point 1
- Clamping point 2
- Surface

ACCESSORIES

– Adjustable hand lever set **HK** *see page 172*

ON REQUEST

– Clamping points with special diameter

– Screw point with hex head screw

– Surface anodized in colors

DGK Swivel cross clamp mountings, aluminum

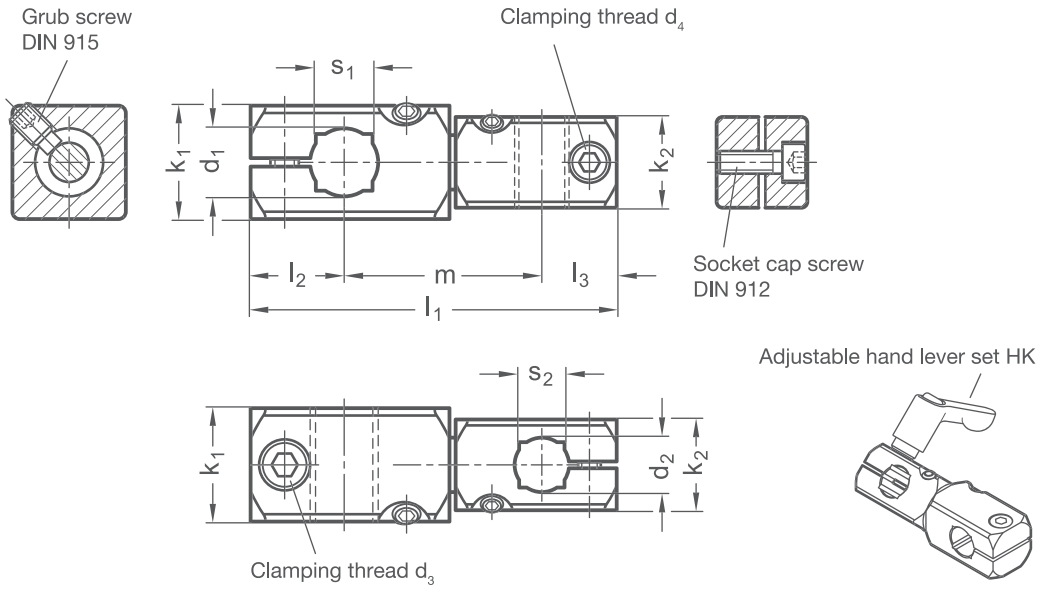
PRODUCT INFO

Swivel cross clamp mountings DGK are made of drawn aluminum profiles and have slitted clamping points machined by cutting methods.

The clamping point bores are arranged offset in the plane and can be clamped at any angle to a centered connecting bolt using a grub screw. They receive rods and tubes with round or square cross-sections via the additionally incorporated square bore.

For clamping, stainless steel socket cap screws DIN 912-A2-70 combine with the clamping thread to reduce the bore cross-section of the clamping points. For regular tool-free clamping, adjustable hand lever sets are available as accessories under the designation HK.

RoHS-compliant product



Clamping point 1	Clamping point 2											Accessories	
Bore d_1	Bore d_2	Clamping thread d_3	Clamping thread d_4	k_1	k_2	l_1	l_2	l_3	m	Square s_1	Square s_2	Hand lever set HK for d_3	Hand lever set HK for d_4
B 8	B 8	M 4	M 4	16	16	52,5	13	13	26,5	-	-	M 4-16	M 4-16
B 10	B 8	M 5	M 5	20	16	58	15,5	13	29,5	8	-	M 5-20	M 4-16
B 10	B 10	M 5	M 5	20	20	63,5	15,5	15,5	32,5	8	8	M 5-20	M 5-20
B 12	B 8	M 5	M 5	20	16	62	16,5	13	32,5	10	-	M 5-20	M 4-16
B 12	B 12	M 5	M 5	20	20	71,5	16,5	16,5	38,5	10	10	M 5-20	M 5-20
B 15	B 10	M 6	M 6	25	16	75,5	20	15,5	40	12	8	M 5-25	M 5-20
B 15	B 12	M 6	M 6	25	20	79,5	20	16,5	43	12	10	M 6-25	M 6-20
B 15	B 15	M 6	M 6	25	25	87,5	20	20	47,5	12	12	M 6-25	M 6-25
B 16	B 12	M 6	M 6	25	20	81	20	16,5	44,5	-	10	M 6-25	M 6-20
B 16	B 16	M 6	M 6	25	25	90,5	20	20	50,5	-	-	M 6-25	M 6-25
B 20	B 15	M 6	M 6	30	25	95	22	20	53	16	12	M 6-30	M 6-25
B 20	B 16	M 6	M 6	30	25	96,5	22	20	54,5	16	-	M 6-30	M 6-25
B 20	B 20	M 6	M 6	30	30	102,5	22	22	58,5	16	16	M 6-30	M 6-30

Surface o	
G	Tumbled, matt
S	Anodized black

ORDER KEY

DGK - d_1 - d_2 - o

- Swivel cross clamp mounting
- Clamping point 1
- Clamping point 2
- Surface

ACCESSORIES

– Adjustable hand lever set **HK** *see page 172*

ON REQUEST

– Clamping points with special diameter

– Screw points with hex head screws

– Surface anodized in colors

PRODUCT INFO

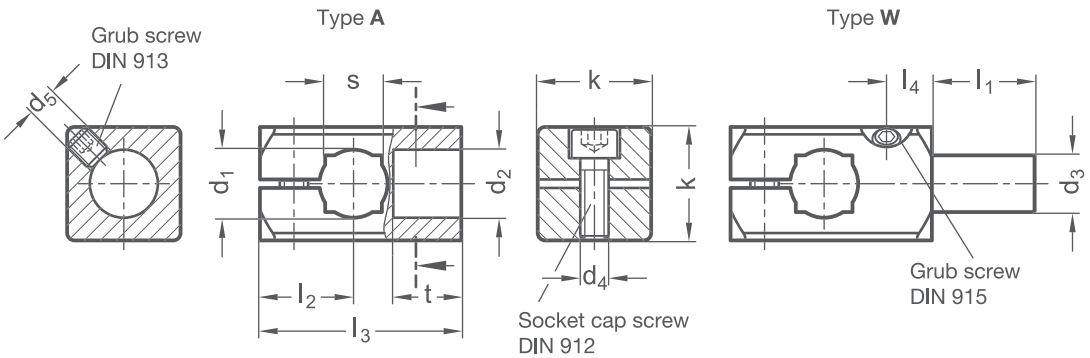
T-clamp mountings TG are made of drawn aluminum profiles and have a slitted clamping point machined by cutting methods.

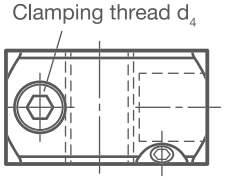
The clamping point bore is T-shaped relative to the bolt and to the bore on the opposite side. It receives rods and tubes with round or square cross-sections via the additionally incorporated square bore.

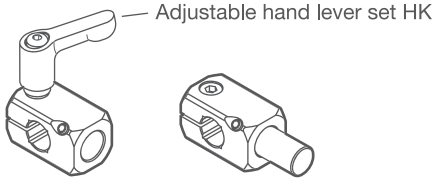
T-clamp mountings of type W are suitable alternatives to swivel cross clamp mountings DGK if higher retaining torques are required.

For clamping, a stainless steel socket cap screw DIN 912-A2-70 combines with the clamping thread to reduce the cross-section of the clamping point bore. For regular tool-free clamping, adjustable hand lever sets are available as accessories under the designation HK.

RoHS-compliant product







Clamping point Bore d_1	Type A d_2	Type W d_3	Clamping thread d_4	k	d_5	l_1	l_2	l_3	l_4	Square s	t	Accessories Hand lever set HK for d_4
B 8	B 8	8	M 4	16	M 4	16	13	26	5,5	-	8	M 4-16
B 10	B 10	10	M 5	20	M 5	17	15,5	31,5	7	8	10	M 5-20
B 12	B 12	12	M 5	20	M 5	19	16,5	35,5	8	10	12	M 5-20
B 15	B 15	15	M 6	25	M 6	21	20	43,5	10	12	15	M 6-25
B 16	B 16	16	M 6	25	M 6	24	20	45	11	-	16	M 6-25
B 20	B 20	20	M 6	30	M 6	26	22	51	12	16	18	M 6-30

Type t	
A	With bore
W	With bolt (stainless steel, AISI 303)

Surface o	
G	Tumbled, matt
S	Anodized black

ORDER KEY

TG - d_1 - d_2 / d_3 - t - o

- T-clamp mounting
- Clamping point
- Diameter bore / bolt
- Type
- Surface

ACCESSORIES

– Adjustable hand lever set **HK** *see page 172*

ON REQUEST

– Clamping point with special diameter

– Screw point with hex head screw

– Surface anodized in colors

PRODUCT INFO

Clamp mountings CG are made of drawn aluminum profiles and have a slitted clamping point machined by cutting methods.

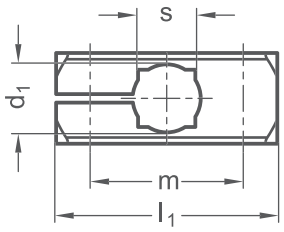
The fastening surface with two bores serves as an interface or for fastening the clamp mounting to the place of use.

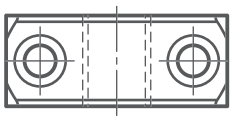
The bore distance m is the same for all clamp mountings and the available accessories with fastening options to ensure simple replacement and combination.

The bore at the clamping point is arranged in the plane parallel to the fastening surface. It receives rods and tubes with round or square cross-sections via the additionally incorporated square bore.

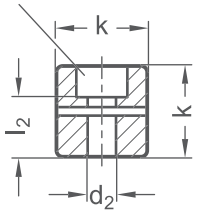
Clamp mountings CG do not have their own thread. For clamping, socket cap screws together with clamping threads at the place of use reduce the bore cross-section. For regular tool-free clamping, adjustable hand lever sets are available as accessories under the designation HK.

RoHS-compliant product

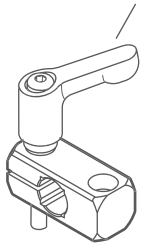




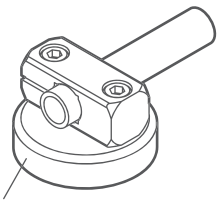
Contersinking for
socket cap screw DIN 912



Adjustable hand lever set HK



Application example



Retaining magnet
available as accessory

Clamping point							Accessories
Bore d_1	Pass-through bore d_2 for	k	l_1	l_2	m	Square s	Hand lever set HK for d_2
B 8	M 4	14	31,5	10	22	-	M 4-20
B 10	M 5	16	38	10,5	27	8	M 5-25
B 12	M 5	16	38	10,5	27	10	M 5-25
B 15	M 6	20	45	14	32	12	M 6-25
B 16	M 6	20	45	14	32	-	M 6-25
B 20	M 6	25	50	19	36	16	M 6-32

Surface o	
G	Tumbled, matt
S	Anodized black

ORDER KEY

CG - d_1 - o

Clamp mounting
Clamping point
Surface

ACCESSORIES

– Adjustable hand lever set **HK** *see page 172*

ON REQUEST

– Clamping point with special diameter

– Screw points with hex head screws

– Surface anodized in colors

– Retaining magnet

CGA Attachment clamp mountings, aluminum

PRODUCT INFO

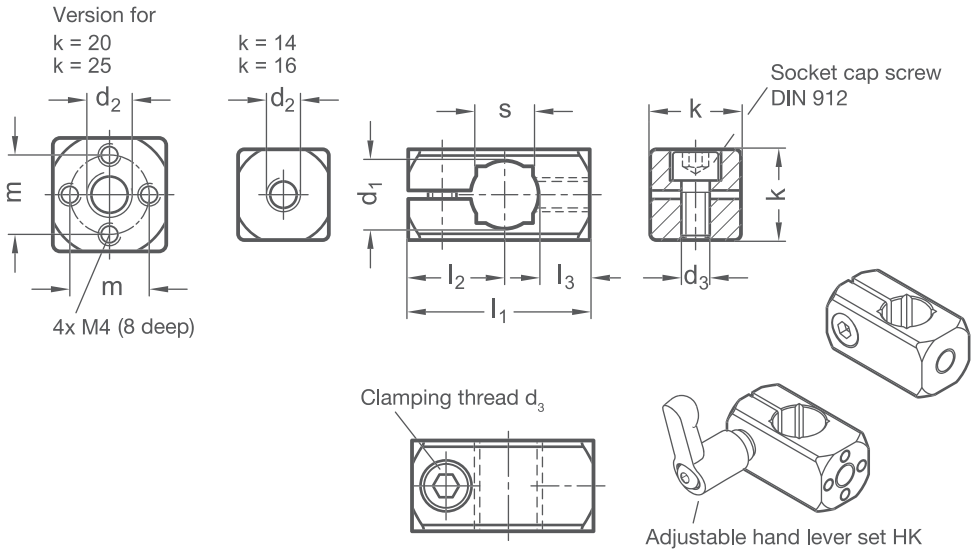
Attachment clamp mountings CGA are made of drawn aluminum profiles and have a slitted clamping point machined by cutting methods.

The clamping point bore is T-shaped relative to the attachment side. It receives rods and tubes with round or square cross-sections via the additionally incorporated square bore.

Attachment clamp mountings are intended for attaching sensor mounts SG and retaining plates SGU. on the attachment side, they have a central thread and, as of bore size d_1 = B15, also an additional bore pattern of 4 x M4.

For clamping, a stainless steel socket cap screw DIN 912-A2-70 combines with the clamping thread to reduce the bore cross-section. For regular tool-free clamping, adjustable hand lever sets are available as accessories under the designation HK.

RoHS-compliant product



Clamping point Bore d_1	d_2			Clamping thread d_3	k	l_1	l_2	l_3	m	Square s	**Accessories** Hand lever set HK for d_3
B 8	M 5	-	-	M 4	14	25	13,5	7,5	-	-	M 4-14
B 10	M 5	M 6	M 8	M 5	16	30	17	8	-	8	M 5-16
B 12	M 5	M 6	M 8	M 5	16	32	17	9	-	10	M 5-16
B 15	M 6	M 8	-	M 6	20	40	20,5	12	14	12	M 6-20
B 16	M 6	M 8	-	M 6	20	40	20,5	11,5	14	-	M 6-20
B 20	M 8	M 10	-	M 6	25	45	21,5	12	17	16	M 6-25

Surface o	
G	Tumbled, matt
S	Anodized black

ORDER KEY

CGA - d_1 - d_2 - o

- Attachment clamp mounting
- Clamping point
- Thread
- Surface

ACCESSORIES

– Adjustable hand lever set **HK** *see page 172*

ON REQUEST

– Clamping point with special diameter

– Screw point with hex head screw

– Surface anodized in colors

LG Swivel clamp mountings, aluminum

PRODUCT INFO

Swivel clamp mountings LG are made of drawn aluminum profiles and have a slitted clamping point and a smooth clamping lug, both machined by cutting methods.

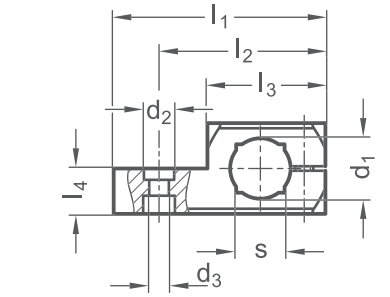
The lug is arranged perpendicular or parallel to the bore of the clamping point, which receives rods and tubes with round cross-sections or also square cross-sections via the optionally incorporated square bore.

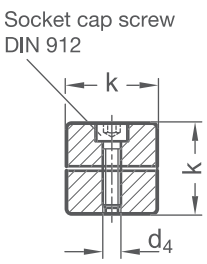
For clamping, a socket cap screw DIN 912-A2-70 combines with the clamping thread to reduce the bore cross-section. For regular tool-free clamping, adjustable hand lever sets are available as accessories under the designation HK.

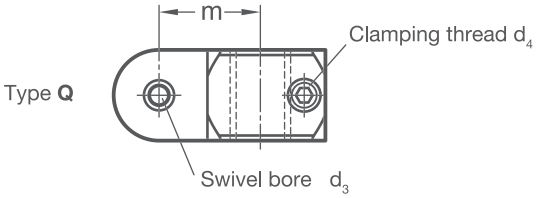
Swivel clamp mountings LG can be combined with other swivel clamp mountings with identical k dimensions to create any kind of joint clamp mounting. Clamping kits HM are available, type S with a screw and type K with an adjustable hand lever.

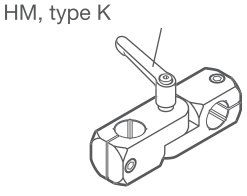
The relevant dimensions for ordering the clamping kits are found in the dimensions table.

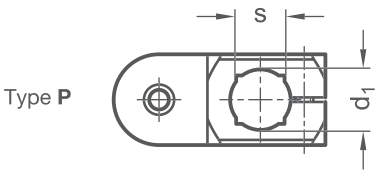
RoHS-compliant product

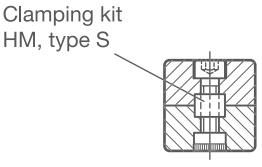












Clamping point Bore d_1	k	d_2	Swivel bore d_3	Clamping thread d_4	l_1	l_2	l_3	l_4	m	Square s	Accessories Clamping kit HM for d_3	Accessories Hand lever set HK for d_4
B 8	16	7	4,5	M 4	40	32	23	18,5	8	-	M 4-16	M 4-16
B 10	20	8,5	5,5	M 5	50	40	29	23	10	8	M 5-20	M 5-20
B 12	20	8,5	5,5	M 5	50	40	29	23	10	10	M 5-20	M 5-20
B 15	25	10	6,5	M 6	62	49,5	36	29	12,5	12	M 6-25	M 6-25
B 16	25	10	6,5	M 6	62	49,5	36	29	12,5	-	M 6-25	M 6-25
B 20	30	10	6,5	M 6	70	55	39	33,5	15	16	M 6-30	M 6-30

Type
t

Q	Clamping bore perpendicular to the lug axis
P	Clamping bore parallel to the lug axis

Surface
o

G	Tumbled, matt
S	Anodized black

ORDER KEY

LG - d_1 - k - t - o

- Swivel clamp mounting
- Clamping point
- Clamping length
- Type
- Surface

ACCESSORIES

– Clamping kit **HM** *see page 174*

– Adjustable hand lever set **HK** *see page 172*

ON REQUEST

– Clamping point with special diameter

– Screw point with hex head screw

– Surface anodized in colors

LGT T-Swivel clamp mountings, aluminum

PRODUCT INFO

T-Swivel clamp mountings LGT are made of drawn aluminum profiles and have a smooth clamping lug machined by cutting methods.

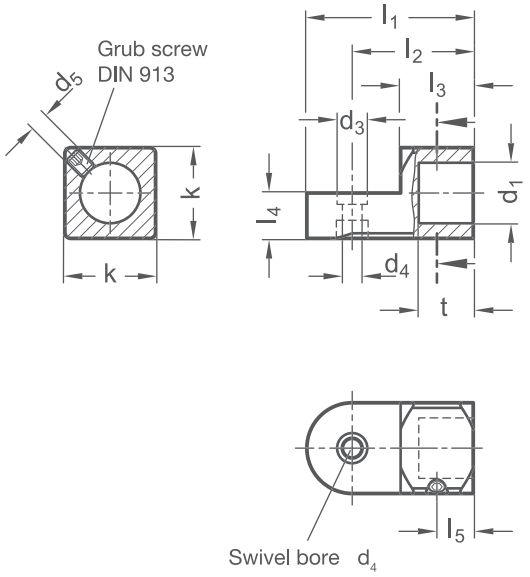
The lug is T-shaped relative to the bolt and to the bore on the opposite side.

T-Swivel clamp mountings LGT can be combined with other swivel clamp mountings with identical k dimensions to create clamp mountings. Clamping kits HM are available, type S with a screw and type K with an adjustable hand lever.

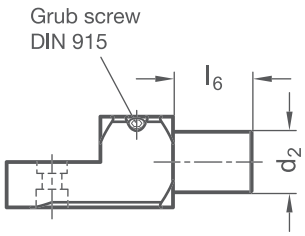
The relevant dimensions for ordering the clamping kits are found in the dimensions table.

RoHS-compliant product

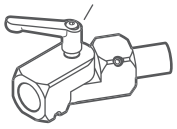
Type **A**



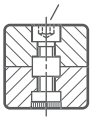
Type **W**



Joint clamp mounting with clamping kit HM, type K



Clamping kit HM, type S



Type A d_1	Type W d_2	k	d_3	Swivel bore d_4	d_5	l_1	l_2	l_3	l_4	l_5	l_6	t	Accessories Clamping kit HM for d_4
B 8	8	16	7	4,5	M 4	30	22	13	8	5,5	16	8	M 4-16
B 10	10	20	8,5	5,5	M 5	38	28	17	10	7	17	10	M 5-20
B 12	12	20	8,5	5,5	M 5	38	28	17	10	8	19	12	M 5-20
B 15	15	25	10	6,5	M 6	46	33,5	20	12,5	10	21	15	M 6-25
B 16	16	25	10	6,5	M 6	46	33,5	20	12,5	11	24	16	M 6-25
B 20	20	30	10	6,5	M 6	55	40	24	15	12	26	18	M 6-30

Type **t**	
A	With bore
W	With bolt (stainless steel, AISI 303)

Surface **o**	
G	Tumbled, matt
S	Anodized black

ORDER KEY

LGT - d_1 / d_2 - k - t - o

- T-Swivel clamp
- Clamping point
- Part size
- Type
- Surface

ACCESSORIES

– Clamping kit **HM** *see page 174*

ON REQUEST

– Surface
anodized in colors

LGA Attachment swivel clamp mountings, aluminum

PRODUCT INFO

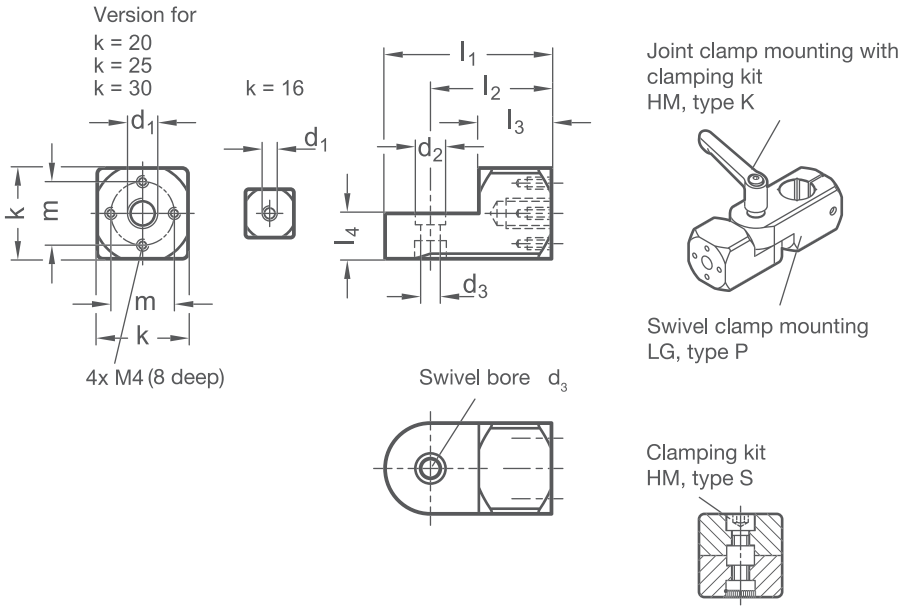
Attachment swivel clamp mountings LGA are made of drawn aluminum profiles and have a smooth clamping lug machined by cutting methods.

The lug is centered and situated at an angle of 90° to the attachment side, where it has a central thread and, as of dimension k = 20, an additional bore pattern of 4 x M4. Attachment clamp mountings are intended for attaching sensor mounts SG and retaining plates SGU.

Swivel clamp mountings LG can be combined with other swivel clamp mountings with identical k dimensions to create any kind of joint clamp mounting. Clamping kits HM are available, type S with a screw and type K with an adjustable hand lever.

The relevant dimensions for ordering the clamping kits are found in the dimensions table.

RoHS-compliant product



d_1			k	d_2	Swivel bore d_3	l_1	l_2	l_3	l_4	m	Accessories Clamping kit HM for d_3
M 5	M 6	M 8	16	7	4,5	30	22	13	8	-	M 4-16
M 6	M 8	-	20	8,5	5,5	38	28	17	10	14	M 5-20
M 8	M 10	-	25	10	6,5	46	33,5	20	12,5	17	M 6-25
M 8	M 10	M 12	30	10	6,5	55	40	24	15	20	M 6-30

Surface o	
G	Tumbled, matt
S	Anodized black

ORDER KEY

LGA - d_1 - k - o

- Attachment swivel clamps
- Thread
- Part size
- Surface

ACCESSORIES

– Clamping kit **HM** *see page 174*

ON REQUEST

– Clamping point with special diameter

– Screw point with hex head screw

– Surface anodized in colors

LGF Base swivel clamp mountings, aluminum

PRODUCT INFO

Base swivel clamp mountings LGF are made of cast aluminum round profiles and have a smooth clamping lug machined by cutting methods.

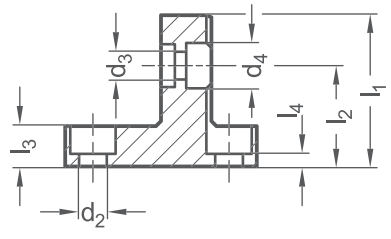
The lug is centered and situated at an angle of 90° to the flange face. The base with two bores serves as an interface or for fastening the clamp mounting to the place of use.

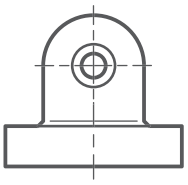
The bore distance m is the same for all clamp mountings and the available accessories with fastening options to ensure simple replacement and combination.

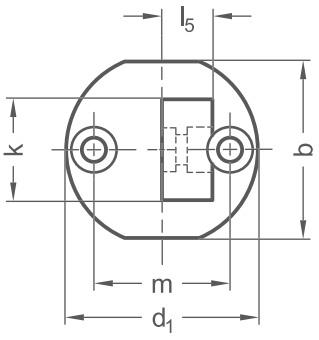
Base swivel clamp mountings LGF can be combined with other swivel clamp mountings with identical k dimensions to create joint clamp mountings. Clamping kits HM are available, type S with a screw and type K with an adjustable hand lever.

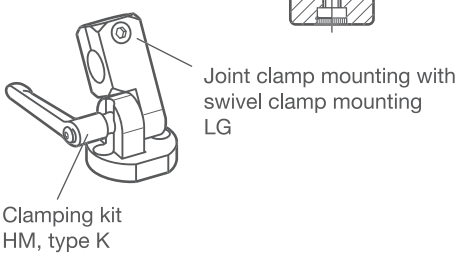
The relevant dimensions for ordering the clamping kits are found in the dimensions table.

RoHS-compliant product









k	b	d_1	Pass-through bore d_2 for	Swivel bore d_3	d_4	l_1	l_2	l_3	l_4	l_5	m	Accessories Clamping kit HM for d_3
16	29	31,5	M 4	4,5	7,5	25	17	7	3	8	22	M 4-16
20	35	38	M 5	5,5	9	30	20	8	2,5	10	27	M 5-20
25	41	45	M 6	6,5	10,5	37	24,5	10	4	12,5	32	M 6-25
30	44	50	M 6	6,5	10,5	44,5	29,5	12,5	6,5	15	36	M 6-30

Surface o	
G	Tumbled, matt
S	Anodized black

ACCESSORIES

– Clamping kit **HM** *see page 174*

ORDER KEY

LGF - k - o

Base swivel clamp
Part size
Surface

ON REQUEST

– Surface anodized in colors
– Retaining magnet

KP Cross clamp mountings, plastic

PRODUCT INFO

Cross clamp mountings KP are made of polyamide by injection molding and have slitted clamping points.

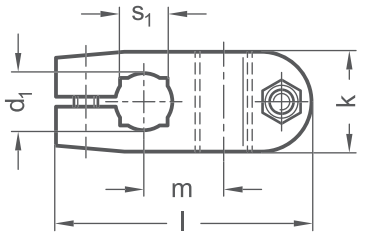
The bores of the clamping points are offset in the plane and arranged at an angle of 90°. They receive rods and tubes with round or square cross-sections via the additional cast square bore.

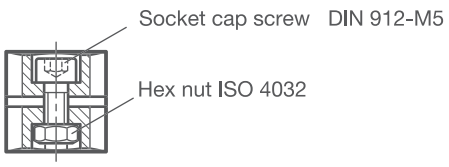
Stainless steel screws and nuts reduce the bore cross-section for clamping.

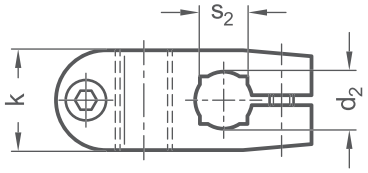
The exceptionally lightweight plastic elements are well-suited for use in corrosive environments.

RoHS-compliant product

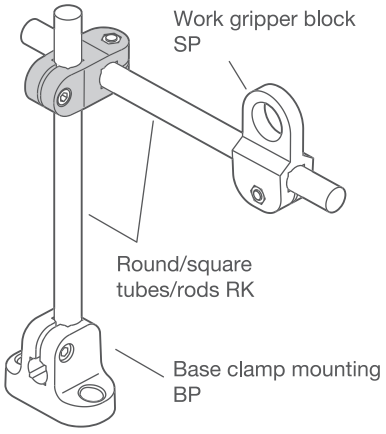
elesa
Original design MSX.







Application example



Clamping point 1	Clamping point 2					
Bore d_1	Bore d_2	k	Length l	m	Square s_1	Square s_2
B 10	B 10	21	52	17	V 8	V 8
B 12	B 12	21	52	17	V 10	V 10
B 14	B 14	21	52	17	V 12	V 12

ORDER KEY **KP - d_1 - d_2**

Cross clamp mounting
Clamping point 1
Clamping point 2

BP Base clamp mountings, plastic

PRODUCT INFO

Base clamp mountings BP are made of polyamide by injection molding and have slitted clamping points.

The base with two bores serves as an interface or for fastening the clamp mounting to the place of use.

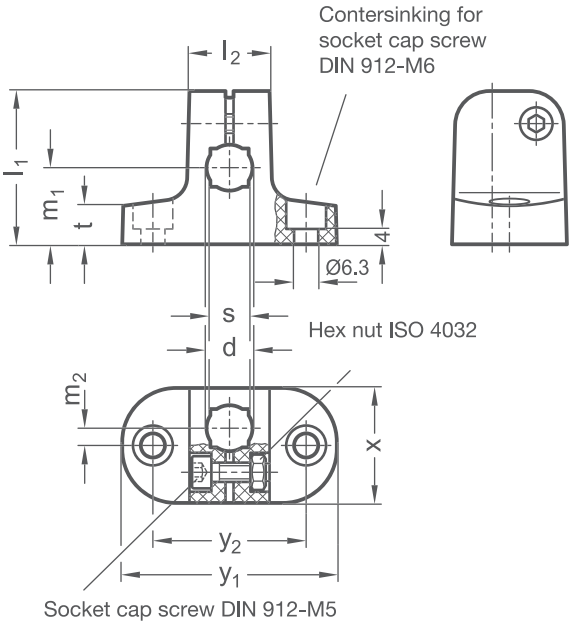
The bores at the clamping points are situated in a plane and arranged in a T-shape, parallel / perpendicular to the fastening plane. They receive rods and tubes with round or square cross-sections via the additionally incorporated square bore.

Stainless steel screws and nuts reduce the bore cross-section for clamping.

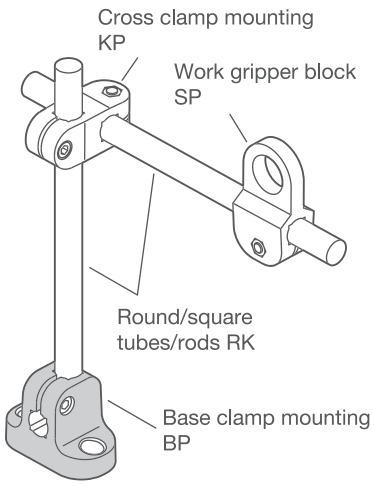
The exceptionally lightweight plastic elements are well-suited for use in corrosive environments.

RoHS-compliant product

elesa
Original design MSX.



Application example



Clamping points Bore **d**	**l_1**	**l_2**	**m_1**	**m_2**	Square **s**	**t ≈**	**x**	**y_1**	**y_2**
B 10	40	21	20	4,5	V 8	10	30	56	40
B 12	40	21	20	4,5	V 10	10	30	56	40
B 14	40	21	20	4,5	V 12	10	30	56	40

ORDER KEY **BP - d**

Base clamp mounting
Clamping points

SP Fastening lugs for sensors and reflectors, plastic

PRODUCT INFO

Fastening lugs SP are made of polyamide by injection molding and have a slitted clamping point.

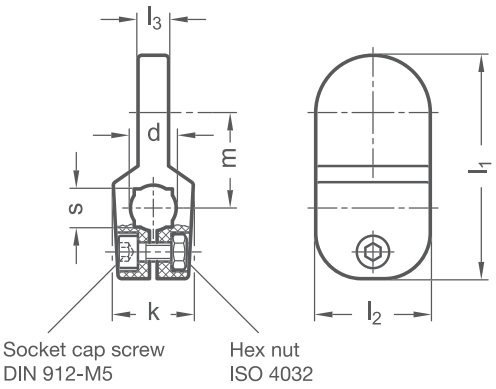
The lug is situated in a plane with and parallel to the clamping point bore, which receives rods and tubes with round cross-sections or also square cross-sections via the additionally incorporated square bore. A variety of types make fastening lugs suitable for all manner of uses.

Stainless steel screws and nuts reduce the bore cross-section for clamping.

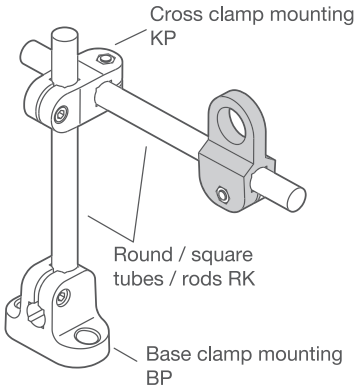
The exceptionally lightweight plastic elements are well-suited for use in corrosive environments.

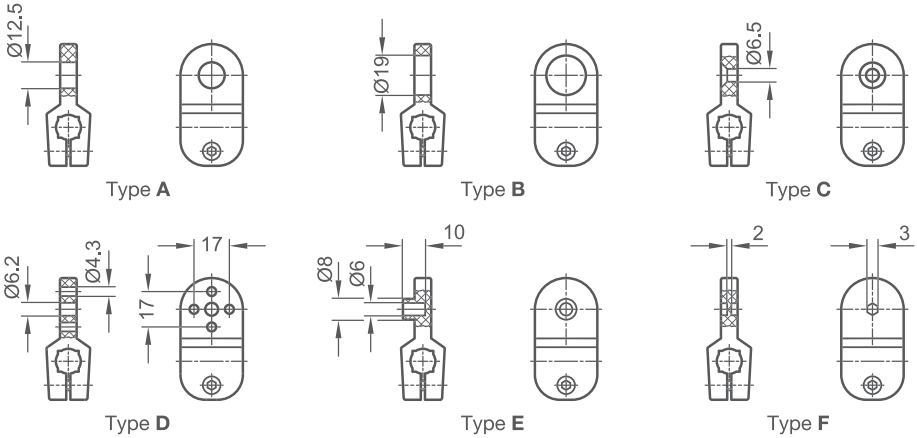
RoHS-compliant product

elesa
Original design MSX.



Application example



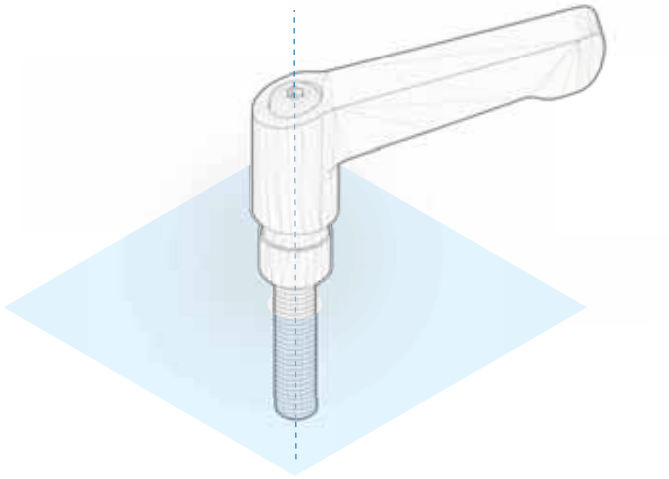


Clamping point Bore **d**	**k**	**l_1**	**l_2**	**l_3**	**m**	Square **s**
B 10	21	58,5	30	8	25	V 8
B 12	21	58,5	30	8	25	V 10
B 14	21	58,5	30	8	25	V 12

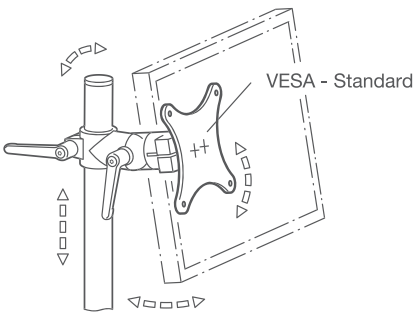
Type **t**	
A	For sensor mounting
B	For sensor mounting
C	With bore for countersunk screw M6
D	For reflector mounting
E	For reflector mounting
F	For inserting specific bores

ORDER KEY **SP - d - t**

Fastening lug
Clamping point
Type



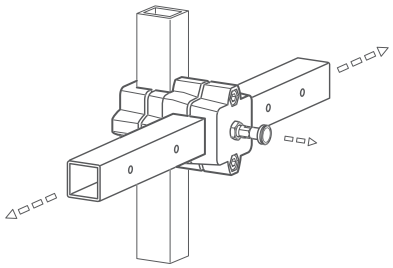
Connecting accessories



Application example monitor mount

The group “Connecting accessories 1D” contains parts intended for extending or improving the usability of clamps and guide elements.

For example, this includes adjustable hand levers for tool-free clamping and construction tubes, including tube end plugs. Parts such as locking guide elements, VESA monitor mounts and sensor mounts round out this group of accessories.



Application example Locking slide unit

Adjustable hand levers	**HSK** *p. 168* 	**HEK** *p. 170* 	**HK** *p. 172* 	**HM** *p. 174* 				
Construction tubes	**RS** *p. 176* 	**RK** *p. 178* 	**RR** *p. 180* 					
Locking slide units for construction tubes with locking bores RR	**KM.R** *p. 182* 	**FM.R** *p. 184* 						
Tube end plugs for construction tubes	**AS** *p. 186* 							
Monitor mounts	**VS** *p. 188* 							
Flanged bolts for clamp mountings / profile systems	**RKF** *p. 190* 							
Sensor holders	**SG** *p. 192* 							
Retaining plates	**SGU** *p. 194* 							

HSK Adjustable hand levers for tube clamps

PRODUCT INFO

Adjustable hand levers HSK are made of powder-coated zinc die-cast. The screw inserts installed here are made of turned stainless steel and have a rolled thread.

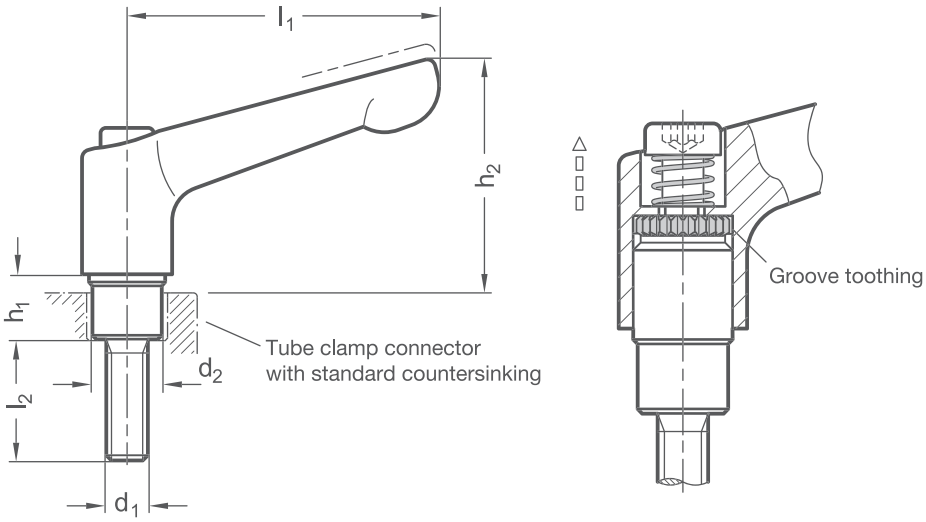
Adjustable hand levers HSK are specially designed as accessories for use at the screw points of clamps. They replace the hex socket cap screws DIN 912 and are used where repeated tool-free clamping is required.

The threaded insert is connected to the handle by groove toothing such that it can be disengaged. Lifting the lever releases the engagement, and the hand lever can be swiveled to a favorable position.

The clamping force achievable with an adjustable hand lever is lower than with tool-operated hex socket cap screws due to the shorter lever length.

The tables for the respective clamps contain the appropriate and recommended hand lever sizes for each thread dimension.

RoHS-compliant product



l_1	d_1	l_2				d_2	h_1	$h_2 \approx$
45	M 6	20	-	-	-	10	9	34
63	M 6	20	-	-	-	10	12	44
63	M 8	25	30	35	50	13	12,5	42
78	M 8	25	30	35	50	13	15	52
78	M 10	35	50	55	60	16	16	50
92	M 10	35	50	55	60	16	16	60

Surface **o**	
2	Adjustable hand lever zinc die-cast, black texture powder-coated RAL 9005 / threaded insert stainless steel AISI 303 (A1)

ORDER KEY **HSK - l_1 - d_1 - l_2 - o**

- Adjustable hand lever
- Handle
- Thread diameter
- Thread length
- Surface

ON REQUEST

– Adjustable hand levers surface powder-coated in other RAL colors

– Threaded insert in zinc-plated steel

HEK Adjustable hand levers for tube clamps, stainless steel

PRODUCT INFO

Stainless steel adjustable hand levers HEK are made of precision-cast stainless steel. The screw and nut inserts installed here are made of turned stainless steel and have a rolled or shaped thread.

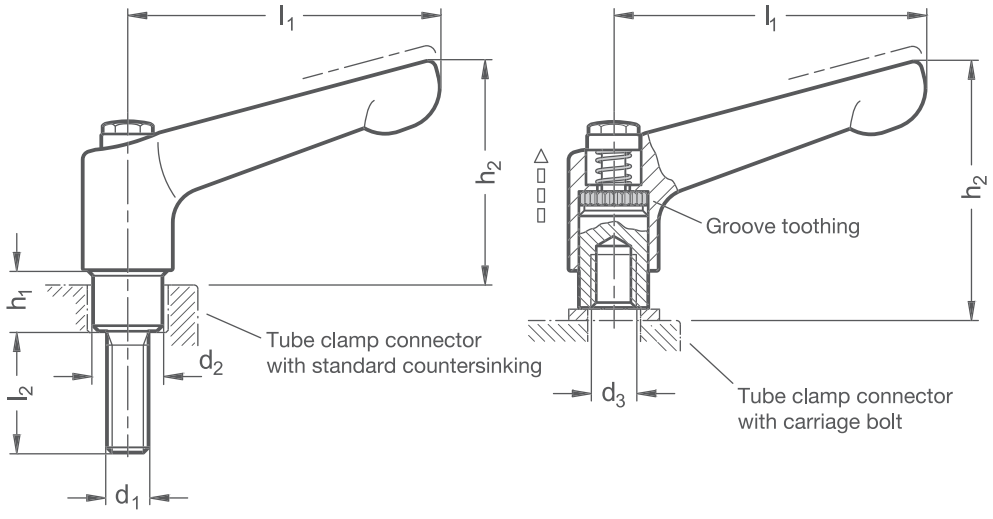
Stainless steel adjustable hand levers HEK are specially designed as accessories for use at the screw points of clamps. They replace the hex socket cap screws DIN 912 and cap nuts DIN 917 and are used where repeated tool-free clamping is required.

The threaded insert is connected to the handle by groove toothing such that it can be disengaged. Lifting the lever releases the engagement, and the hand lever can be swiveled to a favorable position.

The clamping force achievable with an adjustable hand lever is lower than with tool-operated hex socket cap screws due to the shorter adjustable hand lever length.

The tables for the respective clamps contain the appropriate and recommended hand lever sizes for each thread dimension.

RoHS-compliant product



Adjustable hand levers with male thread

l_1	d_1	l_2	d_2	h_1	$h_2 \approx$
45	M 6	20	10	9	34
63	M 6	20	10	12	44

Adjustable hand levers with female thread

l_1	d_3	$h_2 \approx$
63	M 8	45
78	M 8	54
78	M 10	54
92	M 10	64

Surface

o

ED	Adjustable hand lever precision-cast stainless steel AISI CF-8 (A2), matt blasted / threaded insert stainless steel AISI 303 (A1)

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

Stainless steel adjustable hand levers with male thread

ORDER KEY **HEK - l_1 - d_1 - l_2 - o**

Hand lever
Handle
Thread diameter
Thread length
Surface

Stainless steel adjustable hand levers with female thread

ORDER KEY **HEK - l_1 - d_3 - o**

Hand lever
Handle
Thread diameter
Surface

HK Adjustable hand lever set, for clamp mountings

PRODUCT INFO

Adjustable hand lever sets HK are comprised of silver powder-coated zinc die-cast handles containing installed screw inserts with a rolled thread. The screw inserts and the spacing and threaded bushes are made of turned stainless steel.

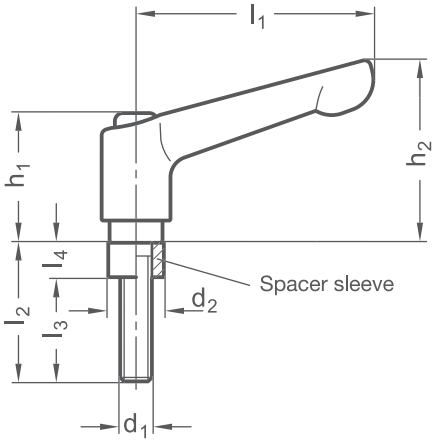
The screw inserts are connected to the handle by groove toothing such that they can be disengaged. Lifting the lever releases the engagement, and the adjustable hand lever can be swiveled to a favorable position.

Adjustable hand lever sets HK are specially designed as accessories for use with clamping threads of clamps. They replace the hex socket cap screws DIN 912 and are used where repeated tool-free clamping is required.

The clamping force achievable with an adjustable hand lever is lower than with tool-operated hex socket cap screws due to the shorter lever length.

The tables for the respective clamp mountings contain the appropriate and recommended hand lever sizes for each thread dimension.

RoHS-compliant product



d_1	l_2	d_2	l_1	l_3	l_4	h_1	h_2
M 4	14	7,5	22	9,5	4,5	18,5	23
M 4	16	7,5	22	11,5	4,5	18,5	23
M 4	20	7,5	22	15,5	4,5	18,5	23
M 5	16	9	30	10	6	24,5	30,5
M 5	20	9	30	14	6	24,5	30,5
M 5	25	9	30	19	6	24,5	30,5
M 6	20	10,5	45	13,5	6,5	24,5	35
M 6	25	10,5	45	18,5	6,5	24,5	35
M 6	30	10,5	45	25,5	6,5	24,5	35
M 6	32	10,5	45	25,5	6,5	24,5	35

ORDER KEY

HK - d_1 - l_2

Adjustable hand lever set
Thread
Length

ON REQUEST

– Adjustable hand lever surface in other RAL colors

– Threaded insert in zinc-plated steel

PRODUCT INFO

Clamping kits HM of type K are comprised of silver powder-coated zinc die-cast adlustable hand levers containing installed screw inserts with a rolled thread. The screw inserts and the centering, spacing, and threaded bushes are made of turned stainless steel.

The screw inserts are connected to the handle by groove toothing such that they can be disengaged. Lifting the lever releases the engagement, and the adjustable hand lever can be swiveled to a favorable position.

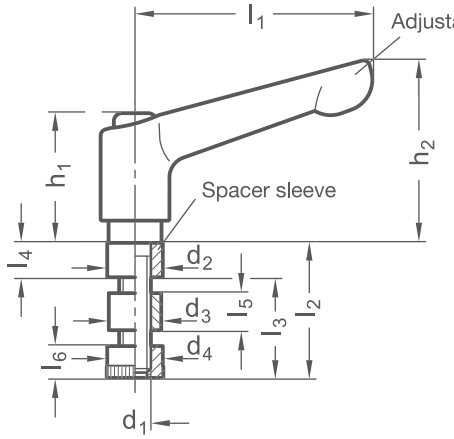
Clamping kits HM of type K are delivered with a stainless steel hex socket cap screw DIN 912 instead of the tool-free adjustable hand lever.

Clamping kits HM are specially designed as accessories for use with swivel clamp mountings. They can be used to combine swivel clamp mountings with identical k dimensions to create joint clamp mountings.

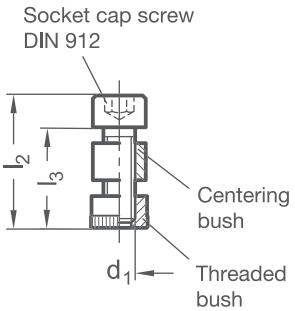
The tables for the respective swivel clamp mountings contain the appropriate clamping kits HM for each thread dimension.

RoHS-compliant product

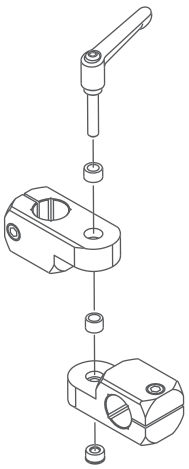
Type **K**



Type **S**



Mounting example



d_1	l_2	d_2	d_3	d_4	l_1	l_3	l_4	l_5	l_6	h_1	h_2	Swivel clamp mounting k dimension
M 4	16	7,5	6,9	7,5	22	11,5	4,5	4	4	18,5	23	16
M 5	20	9	8,4	9	30	14	6	5	5	24,5	30,5	20
M 6	25	10,5	9,9	10,5	45	18,5	6,5	7	6	24,5	35	25
M 6	30	10,5	9,9	10,5	45	23,5	6,5	7	6	24,5	35	30

Typ **t**	
K	Adjustable hand lever zinc die-cast / stainless steel (lever in silver texture powder-coated, screw, spacer sleeve, centering bush and threaded bush A1)
S	Hex socket cap screw stainless steel (DIN 912-A2-70, centering bush and threaded bush A1)

ORDER KEY **HM - d_1 - l_2 - t**

Clamping kit
Thread
Length
Type

ON REQUEST

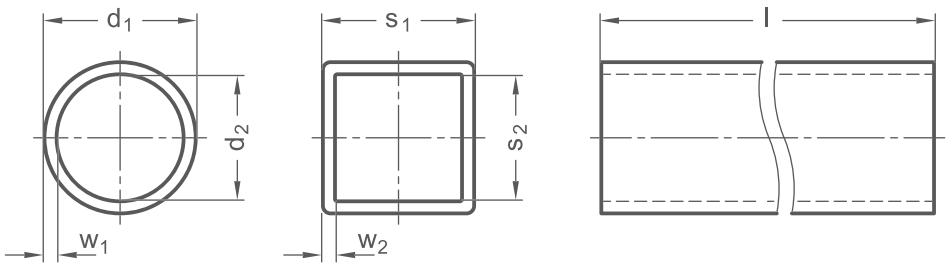
– Adjustable hand lever surface in other RAL colors

PRODUCT INFO

Construction tubes RS are intended for assembly using clamps and can be combined with these to build tube constructions of all types.

The tubes are available from stock in the standard lengths indicated in the table. On request, individual lengths up to 6000 mm are possible, including single part orders. The tolerances of the outer dimension are selected to ensure secure clamping of the tube clamp.

RoHS-compliant product



Diameter d_1				Square s_1				w_1	w_2	Length l ±0,5				d_2	s_2
AB	AL	ST	ED	AB	AL	ST	ED								
D10	D10	D10	D10	-	-	-	-	1,5	-	200	500	1000	2000	7	-
D12	D12	D12	D12	-	-	-	-	1,5	-	200	500	1000	2000	9	-
D14	D14	D14	D14	-	-	-	-	1,5	-	200	500	1000	2000	11	-
D15	D15	D15	D15	-	-	-	-	1,5	-	200	500	1000	2000	12	-
D16	D16	D16	D16	-	-	-	-	1,5	-	200	500	1000	2000	13	-
D18	D18	D18	D18	-	-	-	-	1,5	-	200	500	1000	2000	15	-
D20	D20	D20	D20	V20	V20	V20	V20	2,0	2,0	200	500	1000	2000	16	16
D25	D25	D25	D25	V25	V25	V25	V25	2,0	2,0	200	500	1000	2000	21	21
D30	D30	D30	D30	V30	V30	V30	V30	2,0	2,0	200	500	1000	2000	26	26
D32	D32	D32	D32	-	-	-	-	2,0	-	200	500	1000	2000	28	-
D35	D35	D35	D35	V35	V35	V35	V35	2,0	2,0	200	500	1000	2000	31	31
D40	D40	D40	D40	V40	V40	V40	V40	3,0	3,0	200	500	1000	2000	34	34
D42	D42	D42	-	-	-	-	-	3,0	-	200	500	1000	2000	36	-
D45	D45	D45	-	V45	V45	V45	V45	3,0	3,0	200	500	1000	2000	39	39
D48	D48	D48	-	-	-	-	-	3,0	-	200	500	1000	2000	42	-
D50	D50	D50	D50	V50	V50	V50	V50	3,0	3,0	200	500	1000	2000	44	44
-	-	D50	D50	-	-	-	-	4,0	-	200	500	1000	2000	42	-
D60	D60	D60	D60	-	-	-	-	5,0	-	200	500	1000	2000	50	-

On request, individual lengths up to 6000 mm are possible, including single part orders.

Surface o	
AB	Aluminum • Plate finish
AL	Aluminum • Anodized, natural colors
ST	Steel • Zinc-plated
ED	Stainless steel

ORDER KEY

RS - d_1/s_1 - w_1 - o - l

- Construction tube
- Diameter / Square
- Wall thickness
- Surface
- Length

ON REQUEST

- Individual lengths up to 6000 mm

RK Retaining rods / retaining tubes, for clamp mountings

PRODUCT INFO

Retaining rods and retaining tubes RK are turned and chamfered starting from round stainless steel solid profiles for diameters 8 and 10 mm and from welded and polished stainless steel round tubes for diameters 12 to 20 mm.

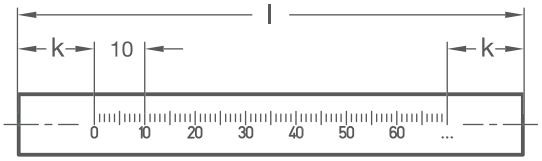
The square versions are made from drawn and anodized aluminum square tubes by sawing.

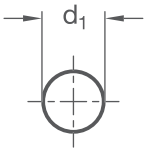
Retaining rods and retaining tubes are intended as accessories for use with clamp mountings, and the outer dimensions are matched accordingly.

Retaining rods and retaining tubes are only available in the lengths indicated in the table.
A laser-engraved length scale (type LS) is also possible as an option.

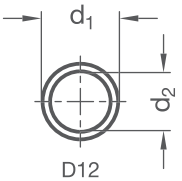
Retaining tubes can additionally be used as cable pass-throughs.

RoHS-compliant product

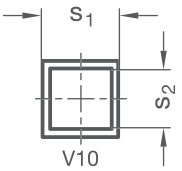




D 8
D10



D12
D15
D16
D20



V10
V12
V16

Round d_1 stainless steel	Square s_1 aluminum	Length l							d_2	k	s_2
D 8	-	100	150	200	250	300	350	400	-	15	-
D 10	V 10	100	150	200	250	300	350	400	-	15	7
D 12	V 12	100	150	200	250	300	350	400	9	15	9
D 15	-	100	150	200	250	300	350	400	12	20	-
D 16	V 16	100	150	200	250	300	350	400	13	20	13
D 20	-	100	150	200	250	300	350	400	16	25	-

Surface / material
o

ED	Round retaining rods / tubes, stainless steel AISI 304 polished
AL	Square retaining tubes, aluminum anodized in natural colors

Type
t

OS	Without scale
LS	With length scale (mm divisions)

ORDER KEY **RK - d_1 / s_1 - l - o - t**

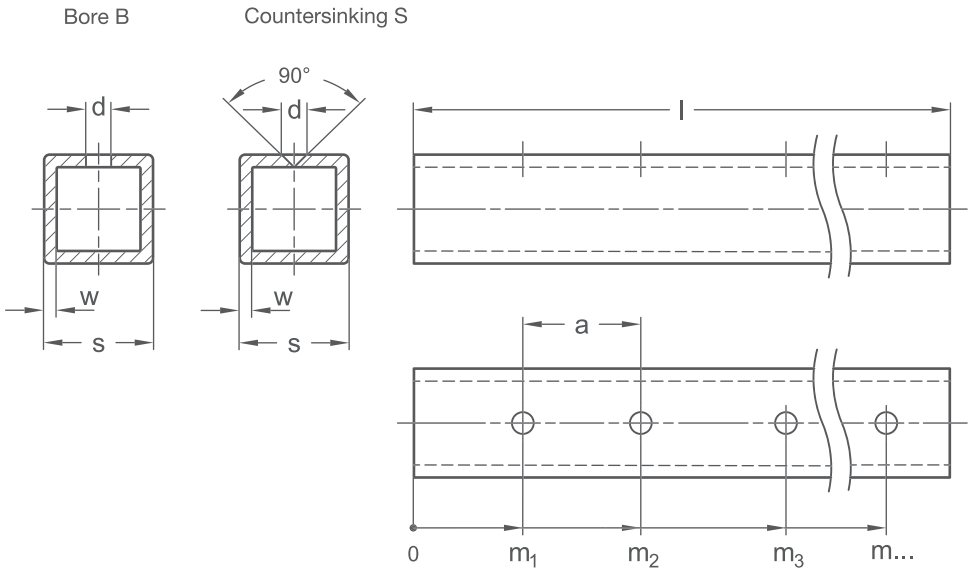
Retaining rod / retaining tube
Clamping point
Length
Surface
Type

PRODUCT INFO

Construction tubes RR are used together with locking slide units FM.R and KM.R for fast, easy, and frequent movement to previously defined positions along a square construction tube. Depending on the locking slide unit used, the tubes can be ordered with bores B or countersinking S.

Each bore position can be individually selected and indicated as an absolute dimension in the order key. The number of dimensional values (m_1, m_2, ...) corresponds to the number of bores. The minimum edge distance or hole distance is indicated in the table.

RoHS-compliant product



Bore positions

Material
ws

AL	Aluminum
ED	Stainless steel • AISI 304

Square **s**	Length **l** ±0.5	**d** ±0.3 Bore B (for indexing plungers)	Countersunk S (for spring plungers)	Minimum hole distance **a**	Minimum edge distance m_1	**w**
V 25	available in all lengths from 100 to 2000 mm (in 1 mm steps)	B 5	S 2,5	10	25	2
V 30		B 5	S 2,5	10	25	2
V 40		B 8	S 4,5	16	38	3
V 50		B 8	S 4,5	16	38	3

Surface
o

EL	(only for aluminum) • Anodized, natural colors
BL	(only for stainless steel) • Plain, untreated

Construction tube

ORDER KEY **RR - ws - s - l - o**

Construction tube
Material
Square
Length
Surface

Hole pattern

ORDER KEY **RR - d - m_1 - m_2 - m_3 - ...**

Hole pattern
Bore / countersinking
Bore position 1
Bore position 2
Bore position 3
...

PRODUCT INFO

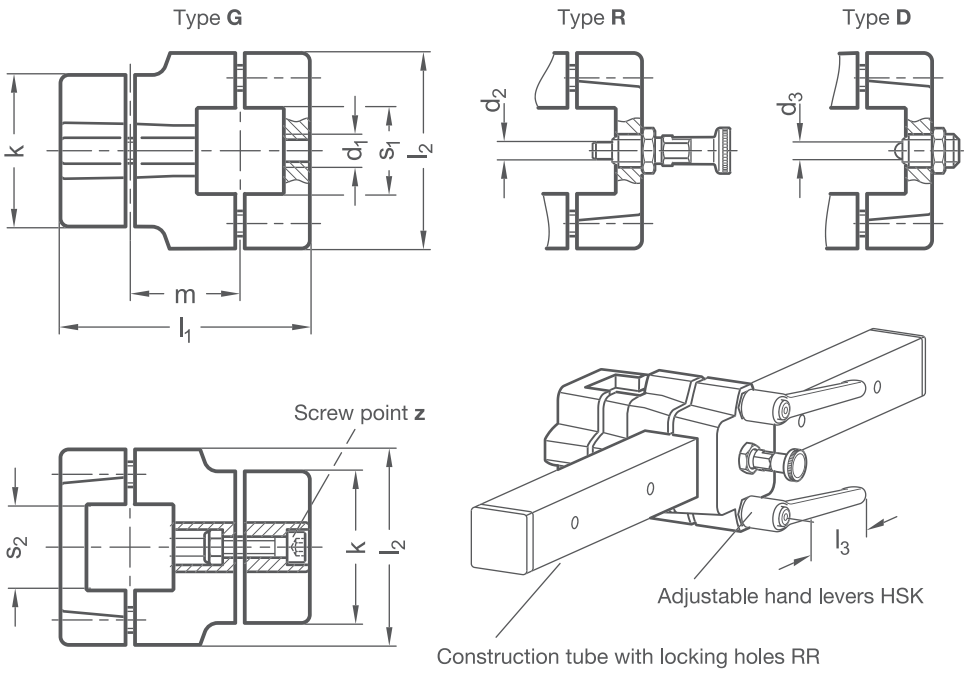
Cross locking slide units KM.R of die-cast aluminum have split clamping points and slide unit bores machined by cutting methods.
The bores are offset in the plane and arranged at an angle of 90°.

Together with the guide tube, the slide unit bore forms a solid square guide mechanism that can be adjusted and clamped for low play. With the indexing plungers or spring plungers in the top part, it is possible to repeatedly move quickly and easily to positions along a square construction tube defined by bores.

Depending on the design, the part to be moved is fastened to the slide unit or the slide unit itself is installed at the place of use such that the entire locking unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the slide unit bore or clamping point size.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1 Square s_1	Clamping point 2 Square s_2	d_1	Pin –0,05 Bore $^{+0,03}_{+0,08}$ d_2	Ball Ø d_3	Clamping length k	l_1	l_2	m	Hex socket cap screws	**Accessories** recom. hand lever HSK for z lever length l_3
V 25	V 25	M 8	5	3,5	50	79,5	68	33,5	M 8-30	78
V 30	V 30	M 8	5	3,5	50	79,5	68	33,5	M 8-30	78
V 40	V 40	M 12	8	6,5	76	125	98	55	M 10-50	92
V 50	V 50	M 12	8	6,5	76	125	98	55	M 10-50	92

Type
t

G	With thread
R	With indexing plunger
D	With spring plunger

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

KM.R - s_1 - s_2 - t - o

- Cross locking slide unit
- Clamping point 1
- Clamping point 2
- Type
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

Flanged locking slide units FM.R of die-cast aluminum have a split slide unit bore machined by cutting methods. This is arranged in the plane parallel to the face of the flange.

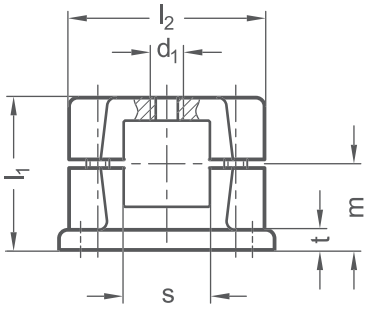
Together with the guide tube, the slide unit bore forms a solid square guide mechanism that can be adjusted and clamped for low play. With the indexing plungers or spring plungers in the top part, it is possible to repeatedly move quickly and easily to positions along a square construction tube defined by bores.

Depending on the design, the part to be moved is fastened to the slide unit or the slide unit itself is installed at the place of use such that the entire locking unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the slide unit bore size.

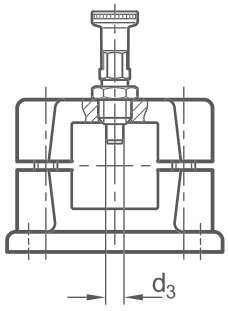
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product

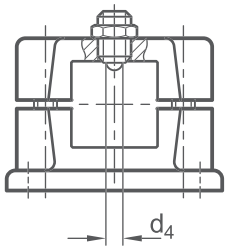
Type **G**



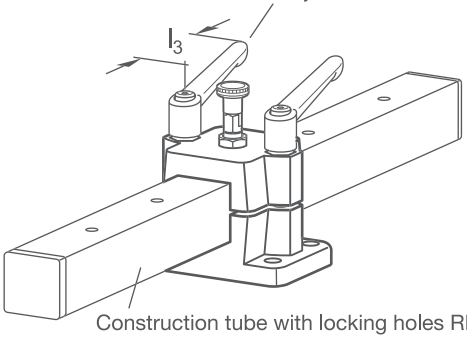
Type **R**

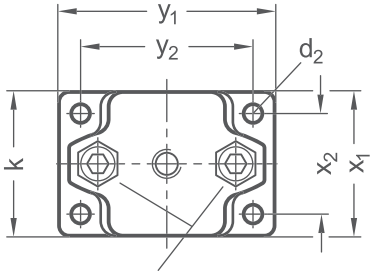


Type **D**



Adjustable hand levers HSK





Screw points **z**

Construction tube with locking holes RR

Clamping point Square **s**	**d_1**	**d_2**	Pin –0,05 Bore $^{+0,03}_{+0,08}$ **d_3**	Ball Ø **d_4**	Clamping length **k**	**l_1**	**l_2**	**m**	**t**	**x_1**	**x_2**	**y_1**	**y_2**	Hex socket cap screws	**Accessories** recom. hand lever HSK for z lever length **l_3**
V 25	M 8	6,5	5	3,5	50	53	68	30	7	50	35	75	60	M 8-35	78
V 30	M 8	6,5	5	3,5	50	53	68	30	7	50	35	75	60	M 8-35	78
V 40	M 12	11	8	6,5	76	81,5	98	46,5	14	76	50	115	90	M 10-60	92
V 50	M 12	11	8	6,5	76	81,5	98	46,5	14	76	50	115	90	M 10-60	92

Type
t

G	With thread
R	With indexing plunger
D	With spring plunger

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

FM.R - s - t - o

- Flanged locking slide unit
- Clamping point
- Type
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

AS Tube end plugs, round and square

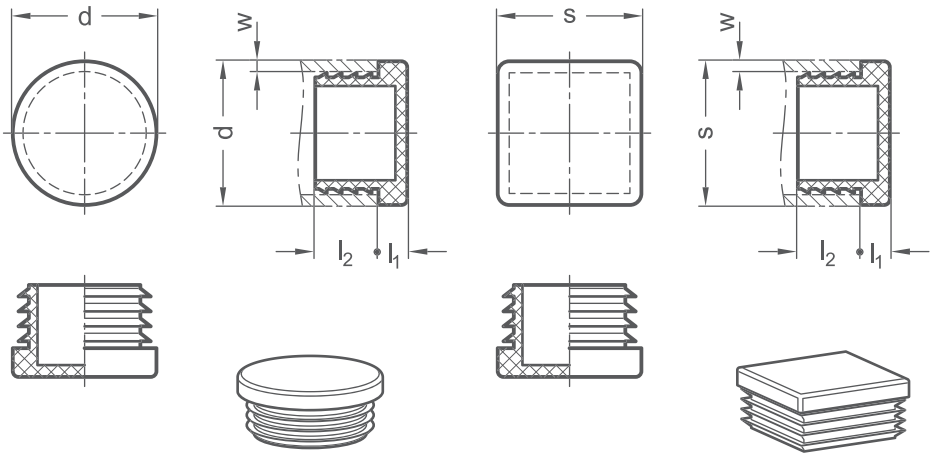
PRODUCT INFO

Tube end plugs AS close off the front of deburred construction tubes to create a visually appealing termination and to protect against injuries.

The plastic tube end plugs are made of polyethylene.

RoHS-compliant product

elesa
Original design NIL.T



d	w	l_1	l_2	for tube
D 10	1 ... 2	3,5	11	RS
D 12	1 ... 2	3,5	11	RS
D 13	1 ... 2	4	11	1/4“
D 14	1 ... 2	5	11,5	RS
D 15	1 ... 2	3	11,5	RS
D 16	1 ... 2	5	11	RS
D 18	1 ... 2	5	11,5	RS
D 20	1 ... 2,5	5	11,5	RS
D 22	1 ... 2	5	11,5	-
D 25	1 ... 2	5	11,5	RS
D 26	1 ... 2	5	11,5	-
D 27	1 ... 2	5	11,5	3/4“
D 28	1 ... 2	5	11,5	-
D 30	1 ... 2,5	5	11,5	RS
D 32	1 ... 2	5	12	RS
D 34	1 ... 2	5	11,5	1“

d	w	l_1	l_2	for tube
D 35	1 ... 3	5	11,5	RS
D 36	1 ... 3	5	11,5	-
D 38	1 ... 3,5	5	11,5	-
D 40	1 ... 3	5	11,5	RS
D 42	1 ... 3	5	11,5	RS
D 45	1 ... 3	5	11	RS
D 48	1,2 ... 3,6	5	11,5	RS
D 50	2,5 ... 4,5	5	11,5	RS
D 55	3 ... 5	5	14,5	RS
D 60	3 ... 5	5	17,5	RS
D 70	1,5 ... 3,5	5	21	-
D 76	1,6 ... 4	6	21,5	2 1/2“
D 80	1,5 ... 3	5	22	-
D 88	1,5 ... 4	6	21,5	3“
D 90	1,5 ... 5	6	21	-
D 100	2 ... 4,5	6	28,5	-

s	w	l_1	l_2	for tube
V 10	0,8 ... 2,5	4	12	-
V 12	1 ... 2	4	12	-
V 15	1 ... 2	3	11,5	-
V 16	1 ... 2,5	5	11,5	-
V 18	1,5 ... 3	5	11,5	-
V 20	1 ... 3	5	11,5	RS
V 22	1 ... 3,5	5	12	-
V 25	1 ... 3	5	11,5	RS
V 30	1 ... 3	5	11,5	RS
V 34	1 ... 3	5	14,5	-
V 35	1 ... 3	5	11,5	RS
V 40	1 ... 3	5	14,5	RS
V 45	1 ... 3	5	14,5	RS
V 50	2,6 ... 4	5,5	24	RS
V 55	2 ... 4,5	5	14,5	-
V 60	1,5 ... 3,5	5	15	-
V 70	2 ... 5	5	22	-
V 80	1,5 ... 4	6	21	-
V 90	3 ... 5	6	21	-
V 100	1 ... 4	7	21	-

Surface **o**	
2	Black, RAL 9005, matt
4	Gray, RAL 7042, matt

ORDER KEY **AS - d / s - o**

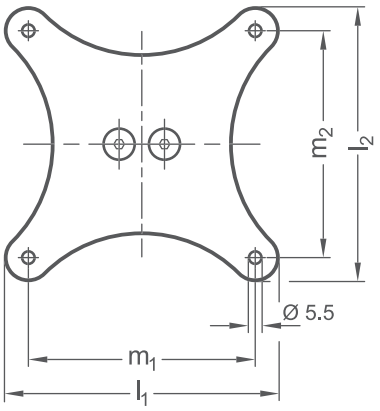
Tube end plug
Round / square
Surface

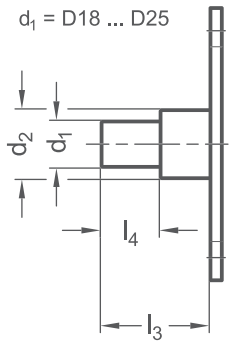
PRODUCT INFO

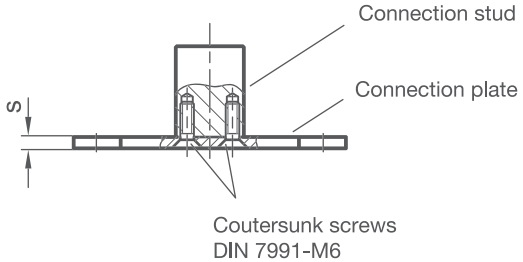
Monitor mounts VS can be ordered with bore patterns 75x75 or 100x100 and comply with the VESA standard.

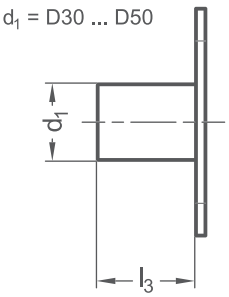
The connection studs can be combined with various parts in the tube clamp product range to implement various fastening variants, degrees of freedom, and adjustment options for monitors.

RoHS-compliant product









d_1	m_1	m_2	d_2	l_1	l_2	l_3	l_4	s
D 18	75	75	30	95	95	46	24	5
D 20	75	75	30	95	95	48	26	5
D 25	75	75	30	95	95	54	32	5
D 30	75	75	-	95	95	40	-	5
D 40	75	75	-	95	95	52	-	5
D 50	75	75	-	95	95	65	-	5

d_1	m_1	m_2	d_2	l_1	l_2	l_3	l_4	s
D 18	100	100	30	120	120	46	24	5
D 20	100	100	30	120	120	48	26	5
D 25	100	100	30	120	120	54	32	5
D 30	100	100	-	120	120	40	-	5
D 40	100	100	-	120	120	52	-	5
D 50	100	100	-	120	120	65	-	5

Type
t

A	With connection stud

Surface
o

8	Tumbled, matt (connection stud plain, turned)

ORDER KEY **VS - d_1 - m_1 - m_2 - t - o**

Monitor Mounts
Connection stud diameter
Hole distance
Hole distance
Type
Surface

RKF Flanged mounting bolts, for clamp mountings / profile systems

PRODUCT INFO

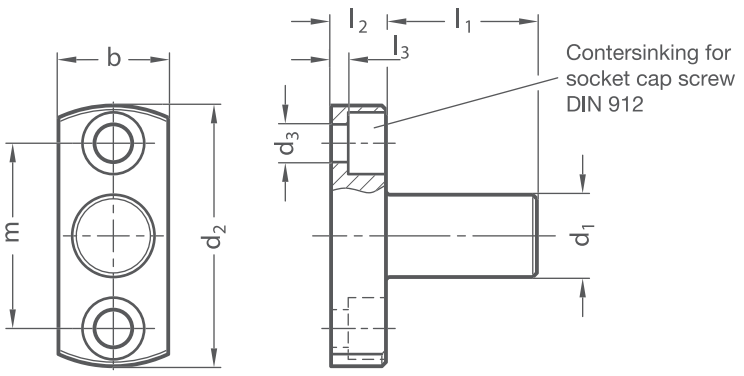
Flanged mounting bolts RKF are turned from round steel profiles and are zinc-plated.

The base with two bores serves as an interface or for fastening the flanged mounting bolt to the place of use.

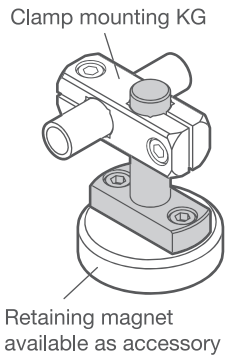
The bore distance m within a nominal size is the same on all clamp mountings with fastening options to ensure easy replacement and combination.

Flanged mounting bolts RKF are suitable alternatives to base clamp mountings BG when especially low assembly heights are required.

RoHS-compliant product



Application example



d_1	l_1		b	d_2	Pass-through bore d_3 for	l_2	l_3	m
8	18	32	14	31,5	M 4	6	2	22
10	21	37	16	38	M 5	8	2,5	27
12	22	39	16	38	M 5	8	2,5	27
15	27,5	47,5	20	45	M 6	10	4	32
16	28	49	20	45	M 6	10	4	32
20	35	60	25	50	M 6	10	4	36

ORDER KEY **RKF - d_1 - l_1**

Flanged mounting bolt
Bolt diameter
Bolt length

ON REQUEST

– Retaining magnet

SG Sensor holders for attachment clamps CGA / LGA, stainless steel

PRODUCT INFO

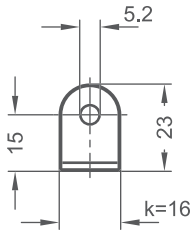
Stainless steel sensor holders SG are made from laser-cut and bent stainless steel sheets.

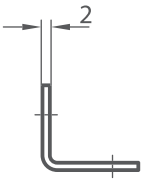
They hold sensors with male thread, which are fastened with two lock nuts. The fastening bore is adapted to the central thread of the attachment clamps CGA and the attachment swivel clamp mountings LGA.

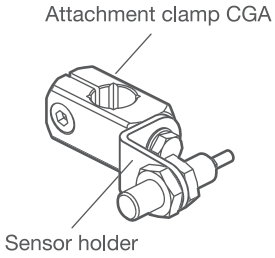
For the dimension k=30, the cross-shaped slots offer additional adjustment options and allow the use of two fastening screws. However, these are not included.

RoHS-compliant product

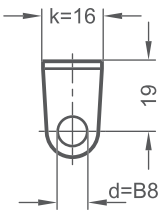
Lug width k=16

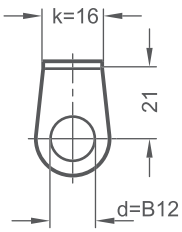


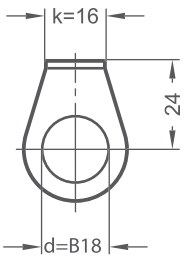




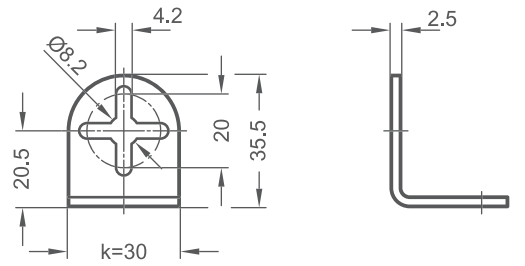
Top views for different bore Ø d

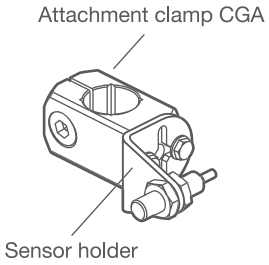




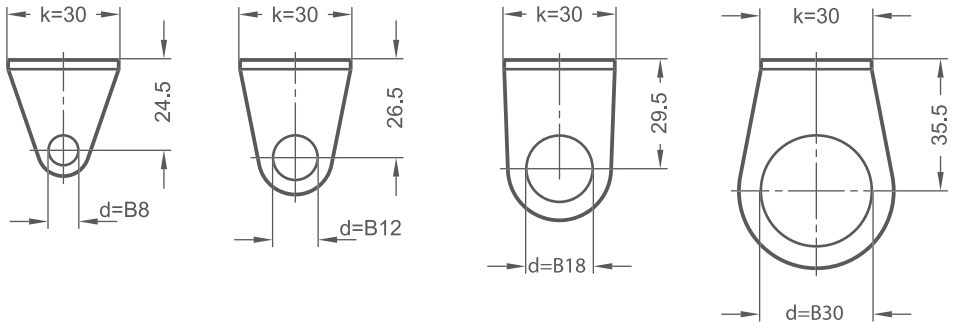


Lug width k=30





Top views for different bore Ø d



d	k
B 8	16
B 8	30
B 12	16
B 12	30
B 18	16
B 18	30
B 30	30

ORDER KEY **SG - d - k**

Sensor holder
Bore
Lug width

SGU Retaining plates for attachment clamps CGA / LGA, stainless steel

PRODUCT INFO

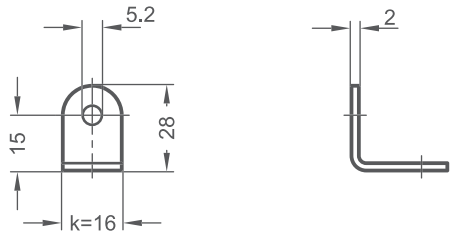
Stainless steel retaining plates SGU are made from laser-cut and bent stainless steel sheets.

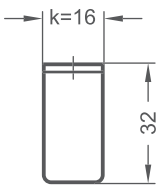
They serve as universal assembly elements, such as for incorporating specific bore patterns. The fastening bore is adapted to the central thread of the attachment clamps CGA and the attachment swivel clamp mountings LGA.

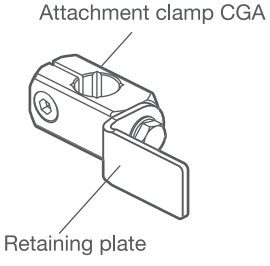
For the dimension k=30, the cross-shaped slots offer additional adjustment options and allow the use of two fastening screws. However, these are not included.

RoHS-compliant product

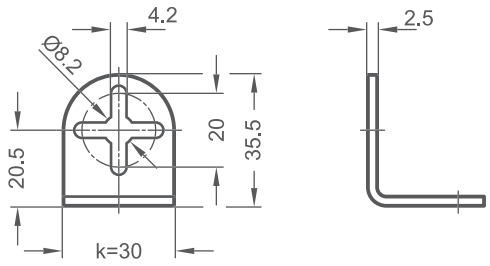
Lug width k=16

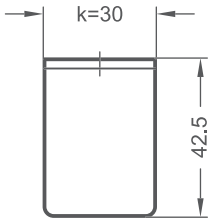


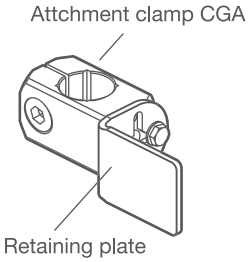




Lug width k=30



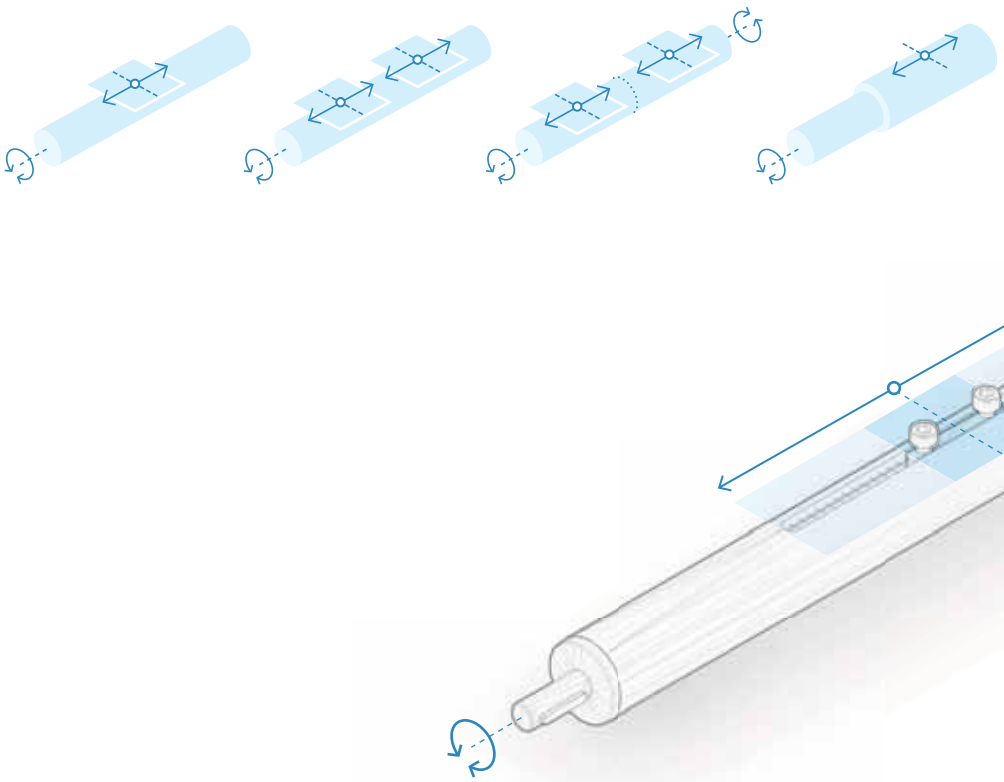




k
16
30

ORDER KEY **SGU - k**

Retaining plate
Lug width



Single tube linear units

The group “Single Tube Linear Units 2A” contains linear units made of chrome-plated steel or bright stainless steel precision tubes. Together with linear unit connectors, these form a solid linear round or square guide. The spindle drive in the guide tube transmits the linear movement to a linear unit connector.

The linear units are freely configurable and are entirely manufactured by Inocon.

Single tube linear units can be divided into four types:

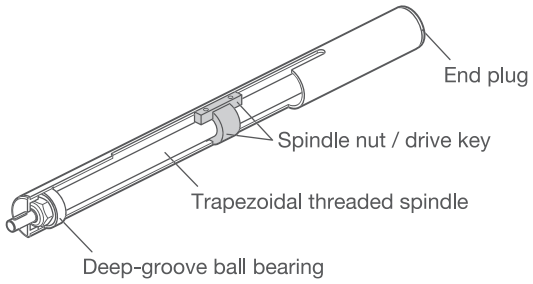
- **Linear units with one guide element:** the linear unit connector is moved along the guide tube by the spindle thread.
- **Linear units with two opposing guide elements:** two linear unit connectors move symmetrically along the guide tube due to different thread directions.
- **Linear units with two independent guide elements:** two linear unit connectors move independently along the guide tube due to separate spindles.
- **Telescope linear units:** an outer tube forms the linear unit connector, which is moved along the inner guide tube by the spindle thread. This increases or decreases the total length of the linear units.

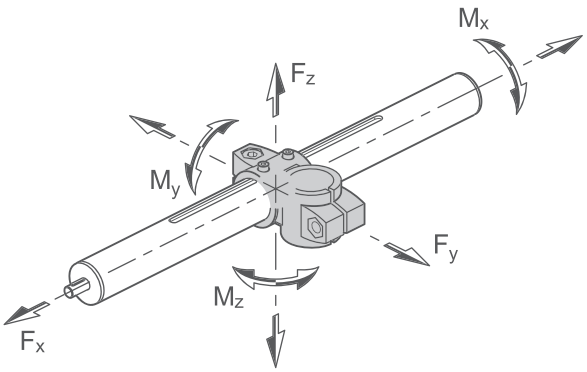
Possible accessories for the single tube linear units offered in group 2D include handwheels in various designs, position indicators and spacer plates for spindle clamping. The accessories are matched to the nominal diameters of the linear units. The matching linear unit connectors are available in group 2B in all typical part types, such as cross, base or flanged linear unit connectors.

Together with the linear unit connectors, single tube linear units can be used to quickly and easily assemble solid linear guides that can be flexibly adapted to many different areas of application, such as for format adjustment and machine building.

An operating manual with instructions for assembly can be downloaded from our website at inocon.de/en/service.

Single tube linear units with one guide element, standard lengths	**VES** *p. 202* 		
Single tube linear units with one guide element	**VE1R** *p. 204* 	**VE1V** *p. 208* 	
Single tube linear units with two opposing guide element	**VE2R** *p. 212* 	**VE2V** *p. 216* 	
Single tube linear units with two independent guide elements	**VE3R** *p. 220* 	**VE3V** *p. 224* 	
Telescope linear units	**VT1S** *p. 228* 	**VT1W** *p. 232* 	

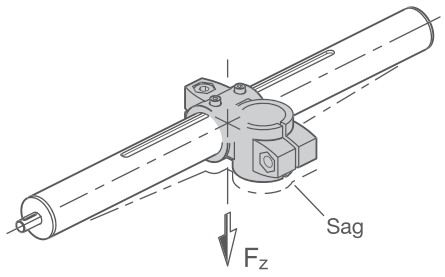




Linear unit nominal diameter	**Fx** in N	**Fy** in N			**Fz** in N			**Mx** in Nm	**My** in Nm	**Mz** in Nm
	l = 500	l = 500	l = 1000	l = 1500	l = 500	l = 1000	l = 1500			
18	400	80	15	-	65	10	-	1,5	4,5	4,5
30	850	500	70	15	550	55	10	6,5	15	15
40	1100	2150	250	65	1900	150	50	15	42	42
50	1750	3100	650	150	3100	650	150	29	69	69
60	2600	4550	1500	400	4550	1400	350	45	125	125

Sag / elastic deformation

The maximum permissible forces and tightening torques listed in the table will result in elastic deformation of the linear unit. For the listed values, this amounts to approximately 0.4 mm. This deformation is shown here using the force Fz as an example.



Positioning precision

The positioning precision indicates the deviation with which a position can be reached. The table shown here lists the maximum arising deviation.

	Trapoidal thread lead screw	Fine thread lead screw
Max. deviation	±0,1 mm / 300 mm stroke	±0,1 mm / 300 mm stroke

Repeatable precision

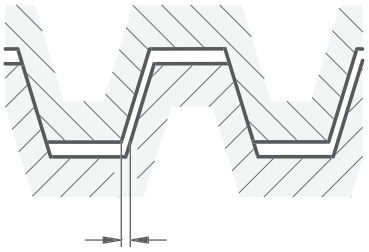
The repeatable precision indicates how precisely a position can be approached multiple times under the same conditions. In most cases, the repeatable precision is higher than the positioning precision because manufacturing tolerances have no influence on the repeatable precision. The trapezoidal and fine thread lead screws have a repeatable precision of ±0.05 mm.

Guide precision

The precision guide tubes of the linear units of steel are manufactured as per DIN EN 10305-4 and also chrome-plated. In the stainless steel version, steel precision guide tubes as per EN10216-5 are used.

Backlash on reversal

Due to the play between the thread flanks of the spindle and spindle nut, backlash (lost motion) occurs when the direction of the drive movement is changed. This backlash must be overcome before the guide element moves in the opposite direction. The backlash on reversal is required to prevent the spindle nut from seizing on the spindle. For linear units with trapezoidal and fine thread spindle, the value is 0.2 mm.



Self-braking

Because trapezoidal and fine thread spindles have pitch angles lower than the angle of friction, they are often self-braking. It is not possible to slide the guide element. In addition, the spindle can be secured against movement with an external spindle clamp. The clamping plates listed as accessories may be used for this.

Lifespan

The lifespan of linear units depends on the expected ambient conditions of the specific application. The following factors come into play here:

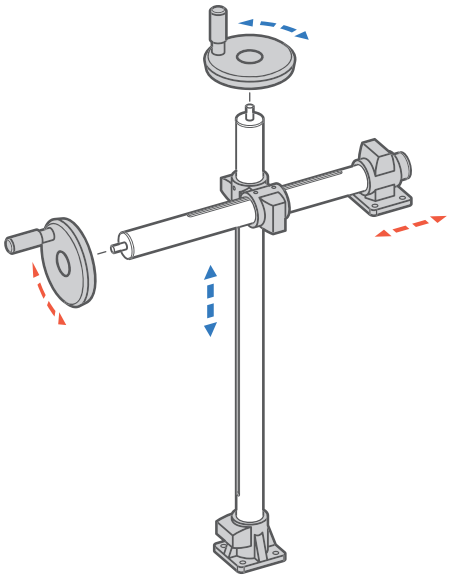
- The installation orientation
- The load to be moved
- The movement speed
- The movement frequency
- Ambient temperature
- External influences
- Compliance with the maintenance intervals

Ambient conditions

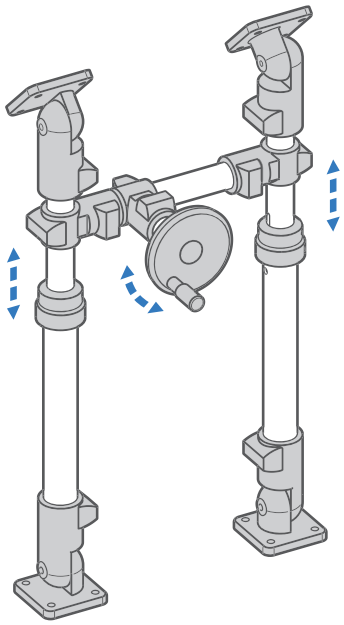
The linear units are designed for ambient temperatures from -20°C to +100°C. Large temperature fluctuations and condensing humidity should also be avoided.

Safety device for vertical linear units

It is possible to install an additional spindle nut that is carried along as a safety nut. This holds the linear unit in position in the event of damage (such as due to overloading or wear) and prevents the guide element from falling when used in a vertical orientation.

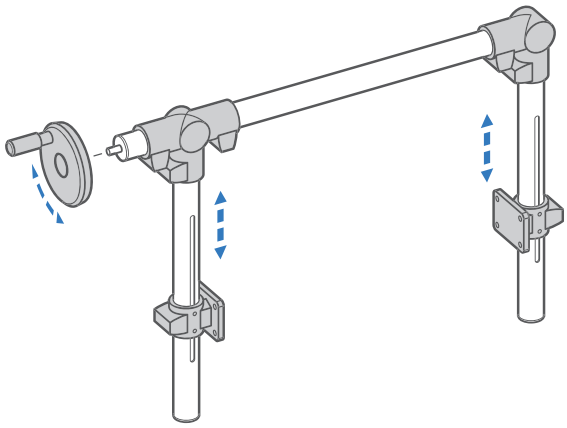


Single tube linear units combination with adjustment in the X / Z direction

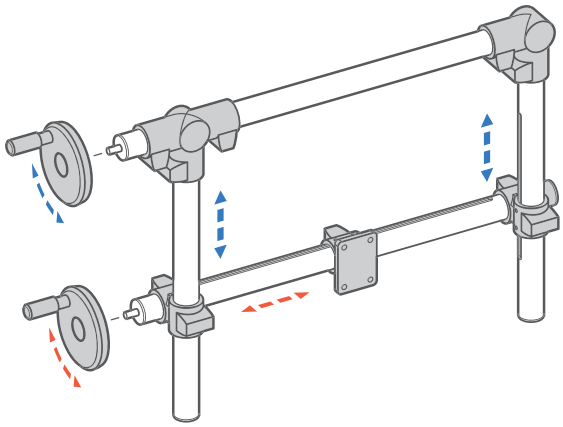


Height adjustment by two telescope linear units

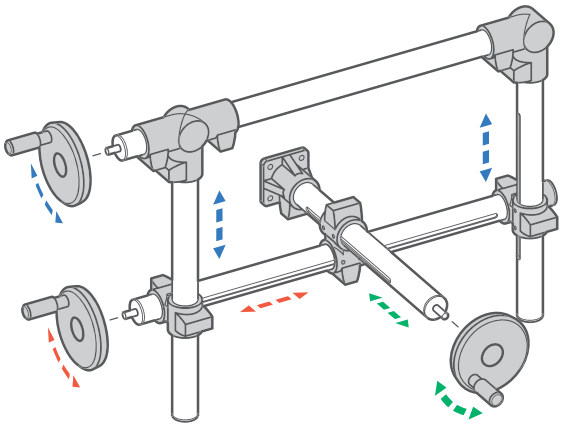
Multi-axis systems are assemblies comprised of multiple linear units. The use of angle gears and transfer units allows multiple linear units to move synchronously. To ensure smooth, even and low-wear movement of the linear units, they must be oriented exactly perpendicular or parallel to each other.



Multi-axis system with adjustment in Z direction



Multi-axis system with adjustment in Z / X direction



Multi-axis system with adjustment in Z / X / Y direction

PRODUCT INFO

Linear units VES are made from chrome-plated steel and can be ordered from stock in the standard lengths given in the table for short delivery times. Configurable linear units in individual lengths are available under VE1R.

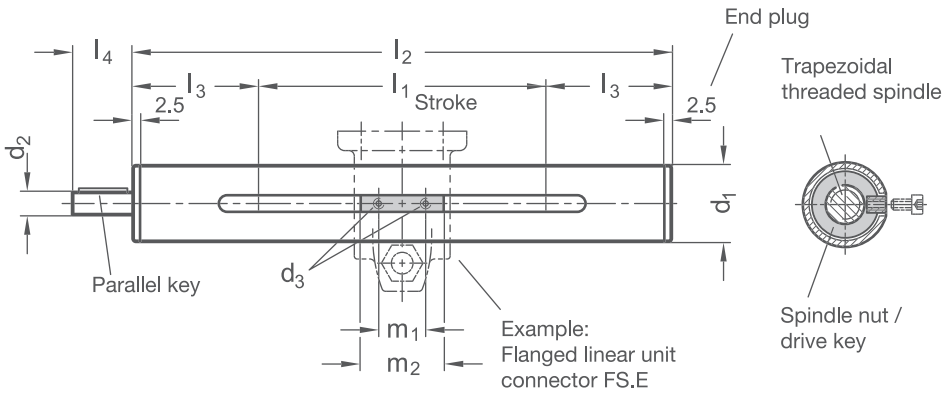
A continuous spindle with ball bearings on each side is installed in the guide tube. The spindle nut transmits the linear movements to a linear unit connector via a drive key along the guide groove.

The guide element bore forms a solid linear round guide together with the guide tube. Multiple connector types are available for selection and can be adjusted or clamped for low play using the slitted bore. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

The journal length is designed for attachment of a handwheel. The handwheel and the linear unit connectors are not included with the linear unit and must be ordered separately.

Adjustable hand levers are intended for repeated, tool-free clamping of the guide elements. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



d_1	l_1 Stroke (standard lengths)					max. Stroke	Threaded spindle	d_2	d_3	l_2	l_3	l_4	m_1	m_2	Parallel key DIN 6885
18	65	165	265	-	-	350	TR 10x3	6	M 3	l_1+140	70	16	17	24	A2x2x12
30	100	150	200	300	-	1250	TR 14x4	8	M 4	l_1+205	102,5	16	23	38	A2x2x12
40	70	170	220	270	320	1570	TR 20x4	12	M 5	l_1+235	117,5	17	42	54	A4x4x12
50	65	115	215	265	315	1565	TR 20x4	12	M 6	l_1+240	120	18	42	54	A4x4x12
60	220	720	-	-	-	1520	TR 24x5	14	M 8	l_1+285	142,5	19	58	70	A5x5x16

Type
t

R1	• Right-hand thread • Shaft journal on one side

Material
w

ST	Steel • Guide tube, DIN EN 10305-4: Steel, chrome-plated • Trapezoidal thread spindle: Steel, with ball bearing • Spindle nut: Red brass / end plug: Plastic

ACCESSORIES

– Handwheels **VZH** → *see page 356*
– Angle gears **YLS / YTS** → *see page 374 / 376*
– Transfer units **VA** → *see page 370*

ORDER KEY

VES - d_1 - l_1 - t - w

Single tube linear units
Outer diameter
Stroke
Type
Material

LINEAR UNIT CONNECTORS

The single tube linear unit VES only becomes a functional axis after attachment of a linear unit connector. Linear unit connectors are available in a variety of designs for different applications. To simplify the selection process, an overview is provided on page 238.






VE1R | Single tube linear units, round, for one guide element

PRODUCT INFO

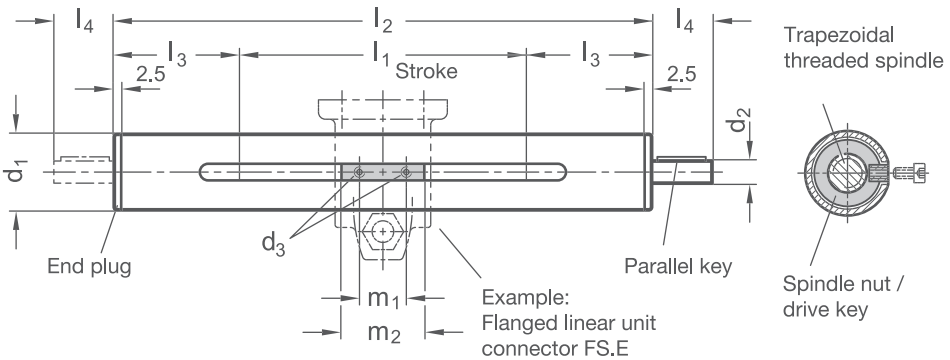
The guide tubes of the **linear units VE1R** are made of chrome-plated steel or bright stainless steel precision tubes. A continuous spindle with ball bearings on each side is installed in the guide tube. The spindle nut transmits the linear movements to a linear unit connector via a drive key along the guide groove.

The guide element bore forms a solid linear round guide together with the guide tube. Multiple connector types are available for selection and can be adjusted or clamped for low play using the slitted bore. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The linear unit connectors and the accessories are not included with the linear units and must be ordered separately.

Adjustable hand levers are intended for repeated, tool-free clamping of the guide elements. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



d_1	Stroke max. l_1	Edge distance 1 min. k_1	Edge distance 2 min. k_2	d_3	Total length max. ($k_1 + l_1 + k_2$) l_2	m_1	m_2
18	350	40	40	M 3	490	17	24
30	1250	57	57	M 4	1455	23	38
40	1570	70	70	M 5	1805	42	54
50	1565	75	75	M 6	1805	42	54
60	1520	88	88	M 8	1805	58	70

Material
w

ST	Steel • Guide tube, DIN EN 10305-4: Steel, chrome-plated • Trapezoidal / fine thread spindle: Steel, with ball bearing • Spindle nut: Red brass / end plug: Plastic
ED	Stainless steel • Guide tubes, EN 10216-5: Stainless steel AISI 304 • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing • Spindle nut: Red brass / end plug: Plastic

Spindle thread direction
r

RH	Right-hand thread
LH	Left-hand thread

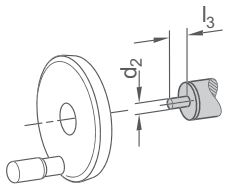
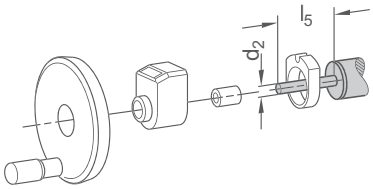
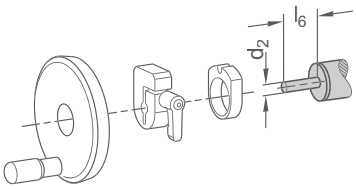
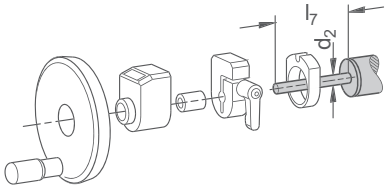
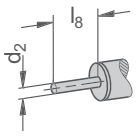
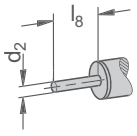
d_1	Spindle Ø	Spindle pitch **p**		Journal diameter d_2	Journal length B l_3	Journal length C l_4	Journal length D l_5	Journal length E l_6	Journal length F l_7	Individual journal length l_8
		Trapezoidal thread	Fine thread, metric							
18	10	3	1	6	16	28	44	-	-	16...65
30	14	4	1	8	16	36	52	31	67	16...67
40	20	4	1	12	17	42	59	32	74	17...74
50	20	4	1	12	18	42	60	33	75	18...75
60	24	5	1,5	14	19	42	61	34	76	19...76

Accessories:

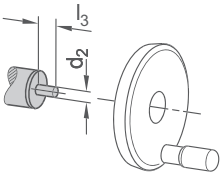
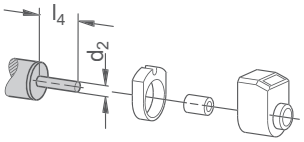
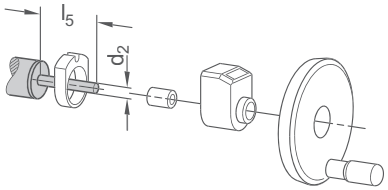
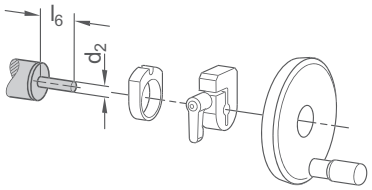
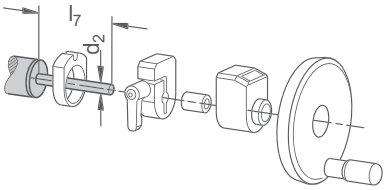
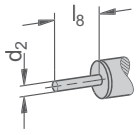
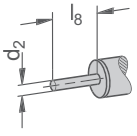
d_1	Torque support	Clamping plate	Position indicator		Handwheel
18	VZDR	-	VZPM	-	VZH
30	VZDR	VZK	VZPM *	VZPE	VZH
40	VZDR	VZK	VZPM	VZPE	VZH
50	VZDR	VZK	VZPM	VZPE	VZH
60	VZDR	VZK	VZPM (only trapezoidal thread)	VZPE	VZH

* only for stroke ≤ 1000 mm

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_3		 Journal length l_5		 Journal length l_6	
F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)	Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator
		 Journal length l_3		 Journal length l_4	
D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)	F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)
 Journal length l_5		 Journal length l_6		 Journal length l_7	
Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)		
 Journal length l_8		 Journal length l_8			

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDR** → *see page 364*
- Angle gears **YLS / YTS** → *see page 374* / 376
- Transfer units **VA** → *see page 370*

ORDER KEY

Name key | Supplemental key

VE1R - d_1 - w - l_1 - k_1 - k_2 - r - p - z_1 - z_2

- Single tube linear unit
- Outer diameter
- Material
- Stroke
- Edge distance 1
- Edge distance 2
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

LINEAR UNIT CONNECTORS

The single tube linear unit VE1R only becomes a functional axis after attachment of a linear unit connector. Linear unit connectors are available in a variety of designs for different applications. To simplify the selection process, an overview is provided on page 238.

VE1V | Single tube linear units, square, for one guide element

PRODUCT INFO

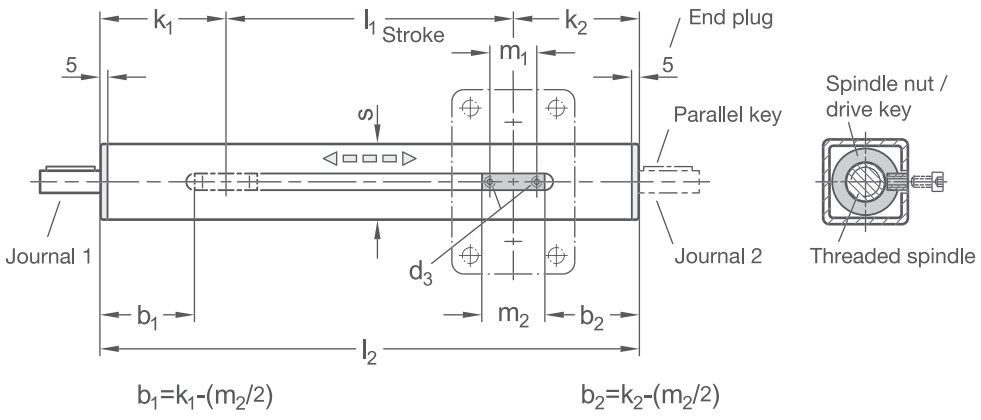
The guide tubes of the **linear units VE1V** are made of chrome-plated steel or bright stainless steel precision tubes. A continuous spindle with ball bearings on each side is installed in the guide tube. The spindle nut transmits the linear movements to a linear unit connector via a drive key along the guide groove.

Together with the guide tube, the guide element bore forms a solid linear square guide mechanism that can receive large torsional forces. Multiple connector types are available for selection and can be adjusted or clamped for low play using the split bore. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The linear unit connectors and the accessories are not included with the linear units and must be ordered separately.

Adjustable hand levers are intended for repeated, tool-free clamping of the guide elements. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



s	Stroke max. l_1	Edge distance 1 min. k_1	Edge distance 2 min. k_2	d_3	Total length max. ($k_1 + l_1 + k_2$) l_2	m_1	m_2
30	1250	59	59	M 4	1460	23	38
40	1570	72	72	M 5	1810	42	54
50	1565	77	77	M 6	1810	42	54

Material
w

ST	Steel • Guide tube, DIN EN 10305-4: Steel, chrome-plated • Trapezoidal / fine thread spindle: Steel, with ball bearing • Spindle nut: Red brass / end plug: Plastic
ED	Stainless steel • Guide tubes, EN 10216-5: Stainless steel AISI 304 • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing • Spindle nut: Red brass / end plug: Plastic

Spindle thread direction
r

RH	Right-hand thread
LH	Left-hand thread

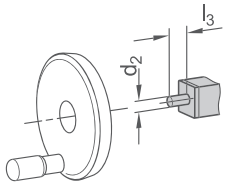
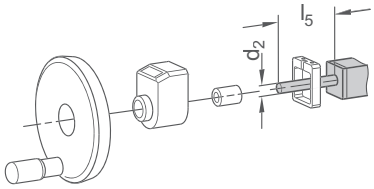
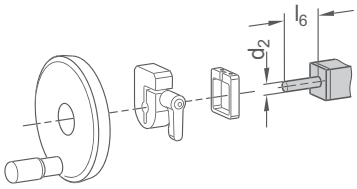
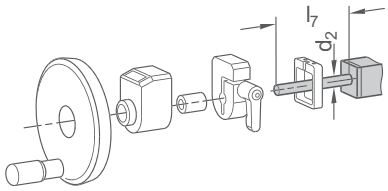
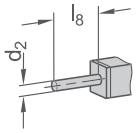
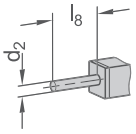
s	Spindle Ø	Spindle pitch p: Trapezoidal thread	Spindle pitch p: Fine thread, metric	Journal diameter d_2	Journal length B l_3	Journal length C l_4	Journal length D l_5	Journal length E l_6	Journal length F l_7	Individual journal length l_8
30	14	4	1	8	16	36	52	31	67	16...67
40	20	4	1	12	17	42	59	32	74	17...74
50	20	4	1	12	18	42	60	33	75	18...75

Accessories:

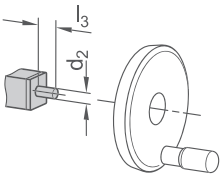
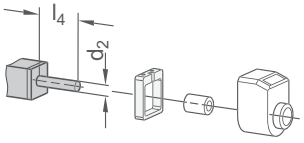
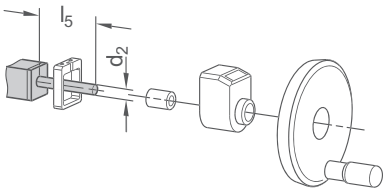
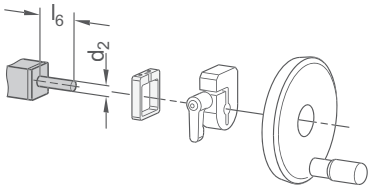
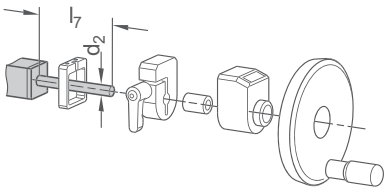
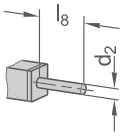
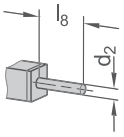
s	Torque support	Clamping plate	Position indicator		Handwheel
30	VZDV	VZK	VZPM *	VZPE	VZH
40	VZDV	VZK	VZPM	VZPE	VZH
50	VZDV	VZK	VZPM	VZPE	VZH

* only for stroke ≤ 1000 mm

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_3		 Journal length l_5		 Journal length l_6	
F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)	Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator
		 Journal length l_3		 Journal length l_4	
D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)	F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)
 Journal length l_5		 Journal length l_6		 Journal length l_7	
Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)		
 Journal length l_8		 Journal length l_8			

2A

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDV** → *see page 366*
- Angle gears → *on request*
- Transfer units **VA** → *see page 370*

ORDER KEY

Name key	Supplemental key
VE1V - s - w - l_1 - k_1 - k_2 - r - p - z_1 - z_2	

- Single tube linear unit
- Outer diameter
- Material
- Stroke
- Edge distance 1
- Edge distance 2
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

LINEAR UNIT CONNECTORS

The single tube linear unit VE1V only becomes a functional axis after attachment of a linear unit connector. Linear unit connectors are available in a variety of designs for different applications. To simplify the selection process, an overview is provided on page 238.

VE2R | Single tube linear units, round, for two opposing guide elements

PRODUCT INFO

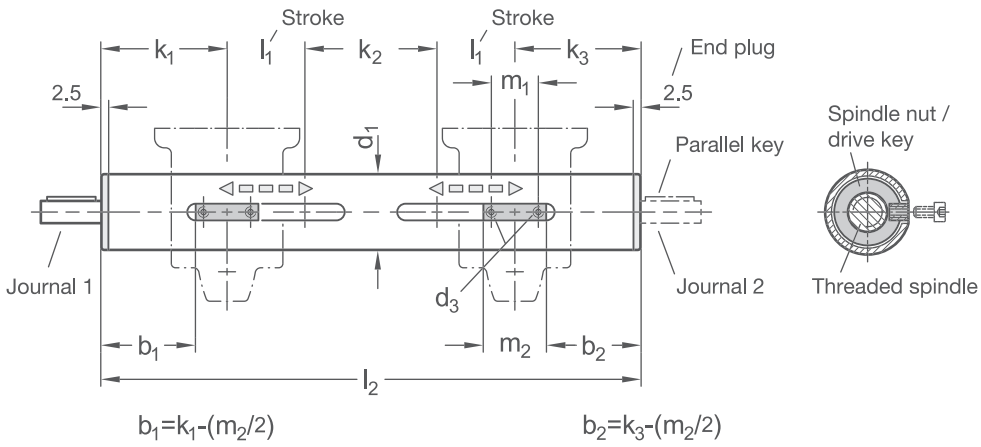
The guide tubes of the **linear units VE2R** are made of chrome-plated steel or bright stainless steel precision tubes. A spindle with ball bearings on both sides is installed in the guide tube. This is comprised of one part with left-hand thread and one with right-hand thread. The spindle nuts positioned on the left and right transmit the symmetrical and opposing linear movements to two linear unit connectors via two drive keys along the guide groove.

The guide element bores form solid linear round guides together with the guide tube. Multiple connector types are available for selection and can be adjusted or clamped for low play using the slitted bore. The parts to be moved are fastened to the guide element, such as for format adjustments, in which one side guide is symmetrically moved to various widths.

Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables.
This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The linear unit connectorss and the accessories are not included with the linear units and must be ordered separately.

Adjustable hand levers are intended for repeated, tool-free clamping of the guide elements. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



d_1	Stroke max. l_1	Edge distance 1 min. k_1	Spacing min. k_2	Edge distance 2 min. k_3	d_3	Total length max. (k_1+k_2+k_3+2x l_1) l_2	m_1	m_2
18	167	40	32	40	M 3	505	17	24
30	601	57	50	57	M 4	1455	23	38
40	753	70	66	70	M 5	1805	42	54
50	748	75	70	75	M 6	1805	42	54
60	715	93	90	93	M 8	1805	58	70

Material
w

ST	Steel • Guide tube, DIN EN 10305-4: Steel, chrome-plated • Trapezoidal / fine thread spindle: Steel, with ball bearing • Spindle nut: Red brass / end plug: Plastic
ED	Stainless steel • Guide tubes, EN 10216-5: Stainless steel AISI 304 • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing • Spindle nut: Red brass / end plug: Plastic

Spindle thread direction
r

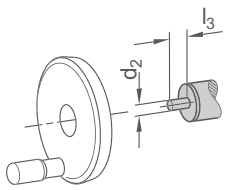
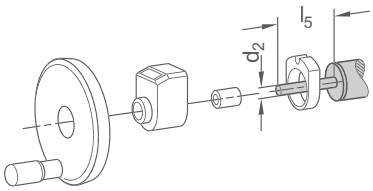
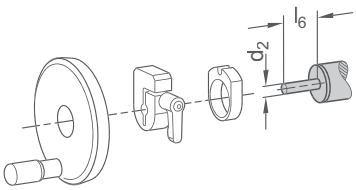
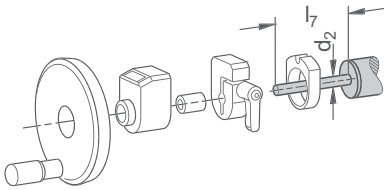
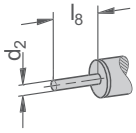
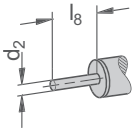
RH	Right-hand thread on journal z_1, Left-hand thread on journal z_2
LH	Left-hand thread on journal z_1, Right-hand thread on journal z_2

d_1	Spindle Ø	Spindle pitch **p**		Journal diameter d_2	Journal length B l_3	Journal length C l_4	Journal length D l_5	Journal length E l_6	Journal length F l_7	Individual journal length l_8
		Trapezoidal thread	Fine thread, metric							
18	10	3	1	6	16	28	44	-	-	16...65
30	14	4	1	8	16	36	52	31	67	16...67
40	20	4	1	12	17	42	59	32	74	17...74
50	20	4	1	12	18	42	60	33	75	18...75
60	24	5	1,5	14	19	42	61	34	76	19...76

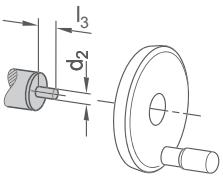
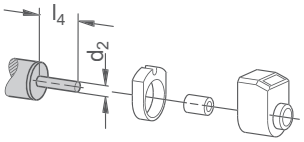
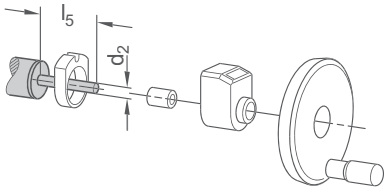
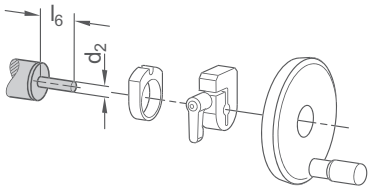
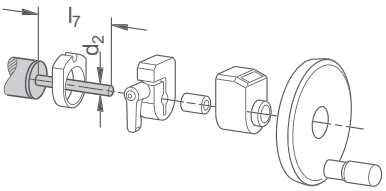
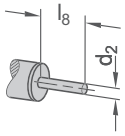
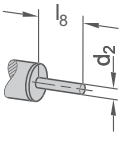
Accessories:

d_1	Torque support	Clamping plate	Position indicator		Handwheel
18	VZDR	-	VZPM	-	VZH
30	VZDR	VZK	VZPM	VZPE	VZH
40	VZDR	VZK	VZPM	VZPE	VZH
50	VZDR	VZK	VZPM	VZPE	VZH
60	VZDR	VZK	VZPM (only trapezoidal thread)	VZPE	VZH

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_3		 Journal length l_5		 Journal length l_6	
F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)	Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator
		 Journal length l_3		 Journal length l_4	
D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)	F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)
 Journal length l_5		 Journal length l_6		 Journal length l_7	
Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)		
 Journal length l_8		 Journal length l_8			

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDR** → *see page 364*
- Angle gears **YLS / YTS** → *see page 374 / 376*
- Transfer units **VA** → *see page 370*

ORDER KEY

Name key | Supplemental key

VE2R - d_1 - w - l_1 - k_1 - k_2 - k_3 - r - p - z_1 - z_2

- Single tube linear unit
- Outer diameter
- Material
- Stroke
- Edge distance 1
- Spacing
- Edge distance 2
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

LINEAR UNIT CONNECTORS

The single tube linear unit VE2R only becomes a functional axis after attachment of a linear unit connector. Linear unit connectors are available in a variety of designs for different applications. To simplify the selection process, an overview is provided on page 238.

VE2V

Single tube linear units, square, for two opposing guide elements

PRODUCT INFO

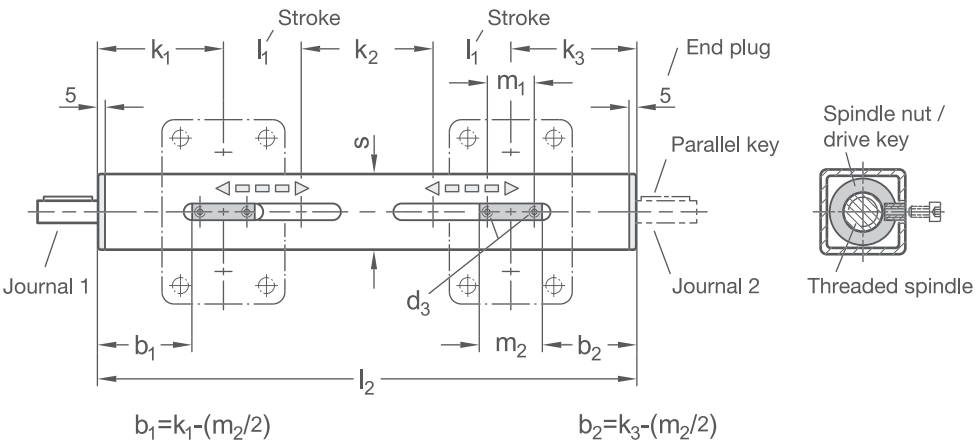
The guide tubes of the **linear units VE2V** are made of chrome-plated steel or bright stainless steel precision tubes. A spindle with ball bearings on both sides is installed in the guide tube. This is comprised of one part with left-hand thread and one with right-hand thread. The spindle nuts positioned on the left and right transmit the symmetrical and opposing linear movements to two linear unit connectors via two drive keys along the guide groove.

Together with the guide tube, the guide element bores form solid linear square guide mechanisms that can receive large torsional forces. Multiple connector types are available for selection and can be adjusted or clamped for low play using the split bore. The parts to be moved are fastened to the guide element, such as for format adjustments, in which one side guide is symmetrically moved to various widths.

Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The linear unit connectors and the accessories are not included with the linear units and must be ordered separately.

Adjustable hand levers are intended for repeated, tool-free clamping of the guide elements. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



s	Stroke max. l_1	Edge distance 1 min. k_1	Spacing min. k_2	Edge distance 2 min. k_3	d_3	Total length max. (k_1+k_2+k_3+2x l_1) l_2	m_1	m_2
30	601	59	50	59	M 4	1460	23	38
40	753	72	66	72	M 5	1810	42	54
50	748	77	70	77	M 6	1810	42	54

Material
w

ST	Steel • Guide tube, DIN EN 10305-4: Steel, chrome-plated • Trapezoidal / fine thread spindle: Steel, with ball bearing • Spindle nut: Red brass / end plug: Plastic
ED	Stainless steel • Guide tubes, EN 10216-5: Stainless steel AISI 304 • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing • Spindle nut: Red brass / end plug: Plastic

Spindle thread direction
r

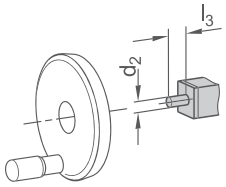
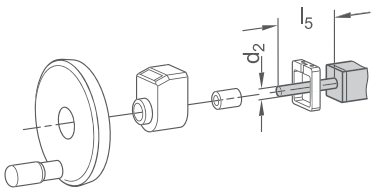
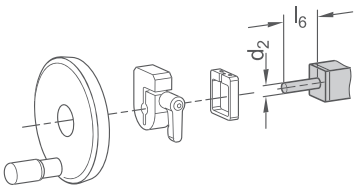
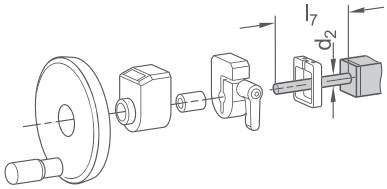
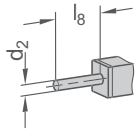
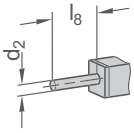
RH	Right-hand thread on journal z_1, Left-hand thread on journal z_2
LH	Left-hand thread on journal z_1, Right-hand thread on journal z_2

s	Spindle Ø	Spindle pitch p: Trapezoidal thread	Spindle pitch p: Fine thread, metric	Journal diameter d_2	Journal length B l_3	Journal length C l_4	Journal length D l_5	Journal length E l_6	Journal length F l_7	individual journal length l_8
30	14	4	1	8	16	36	52	31	67	16...67
40	20	4	1	12	17	42	59	32	74	17...74
50	20	4	1	12	18	42	60	33	75	18...75

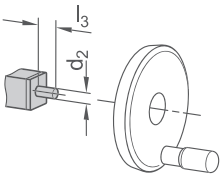
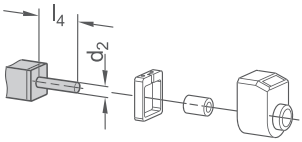
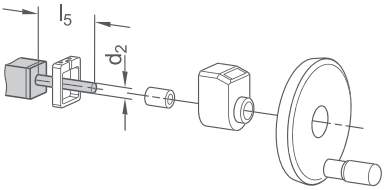
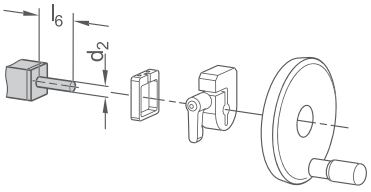
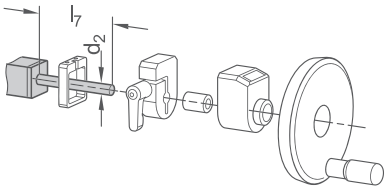
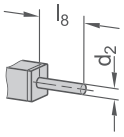
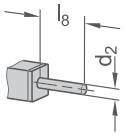
Accessories:

s	Torque support	Clamping plate	Position indicator		Handwheel
30	VZDV	VZK	VZPM	VZPE	VZH
40	VZDV	VZK	VZPM	VZPE	VZH
50	VZDV	VZK	VZPM	VZPE	VZH

Journal
Z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_3		 Journal length l_5		 Journal length l_6	
F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)	Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

Journal
Z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator
		 Journal length l_3		 Journal length l_4	
D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)	F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)
 Journal length l_5		 Journal length l_6		 Journal length l_7	
Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)		
 Journal length l_8		 Journal length l_8			

2A

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDV** → *see page 366*
- Angle gears → *on request*
- Transfer units **VA** → *see page 370*

ORDER KEY

Name key | Supplemental key

VE2V - s - w - l_1 - k_1 - k_2 - k_3- r - p - z_1 - z_2

- Single tube linear unit
- Outer diameter
- Material
- Stroke
- Edge distance 1
- Spacing
- Edge distance 2
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

LINEAR UNIT CONNECTORS

The single tube linear unit VE2V only becomes a functional axis after attachment of a linear unit connector. Linear unit connectors are available in a variety of designs for different applications. To simplify the selection process, an overview is provided on page 238.






VE3R | Single tube linear units, round, for two independent guide elements

PRODUCT INFO

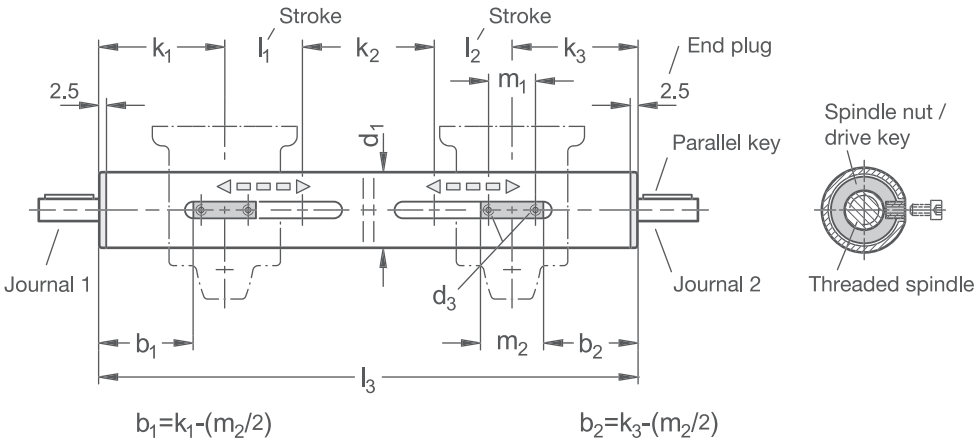
The guide tubes of the **linear units VE3R** are made of chrome-plated steel or bright stainless steel precision tubes. Two independent spindles with ball bearings on each side are installed in the guide tube. The thread direction of the spindles can be chosen as desired for each side. The spindle nuts positioned on each spindle transmit the linear movements to the linear unit connector via a drive key along the guide groove, independently of the opposite side.

The guide element bores form solid linear round guides together with the guide tube. Multiple connector types are available for selection and can be adjusted or clamped for low play using the slitted bore. The parts to be moved are fastened to the guide element, such as for format adjustments, in which one side guide is moved independently from the opposite side to various widths.

Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The linear unit connectors and the accessories are not included with the linear units and must be ordered separately.

Adjustable hand levers are intended for repeated, tool-free clamping of the guide elements. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



d_1	Stroke max. l_1	Stroke max. l_2	Edge distance 1 min. k_1	Spacing min. k_2	Edge distance 2 min. k_3	d_3	Total length max. (k_1+ k_2+ k_3 + l_1+ l_2) l_3	m_1	m_2
30	601	601	57	50	57	M 4	1455	23	38
40	753	753	76	66	76	M 5	1805	42	54
50	748	748	80	70	80	M 6	1805	42	54
60	715	715	98	90	98	M 8	1805	58	70

Material
w

ST	Steel • Guide tube, DIN EN 10305-4: Steel, chrome-plated • Trapezoidal / fine thread spindle: Steel, with ball bearing • Spindle nut: Red brass / end plug: Plastic
ED	Stainless steel • Guide tubes, EN 10216-5: Stainless steel AISI 304 • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing • Spindle nut: Red brass / end plug: Plastic

Spindle 1 thread direction (on journal z_1)
r_1

RH	Right-hand thread
LH	Left-hand thread

Spindle 2 thread direction (on journal z_2)
r_2

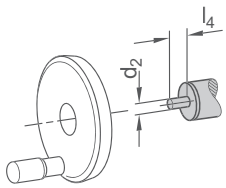
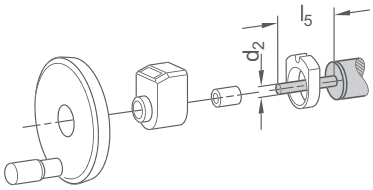
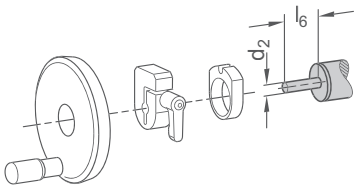
RH	Right-hand thread
LH	Left-hand thread

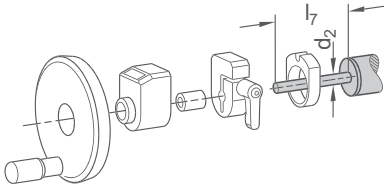
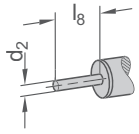
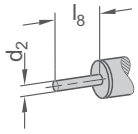
d_1	Spindle Ø	Spindle pitch spindle 1 p_1		Spindle pitch spindle 2 p_2		Journal diameter d_2	Journal length B l_4	Journal length D l_5	Journal length E l_6	Journal length F l_7	individual journal length l_8
		Trapezoidal thread	Fine thread, metric	Trapezoidal thread	Fine thread, metric						
30	14	4	1	4	1	8	16	52	31	67	16...67
40	20	4	1	4	1	12	17	59	32	74	17...74
50	20	4	1	4	1	12	18	60	33	75	18...75
60	24	5	1,5	5	1	14	19	61	34	76	19...76

Accessories:

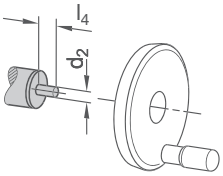
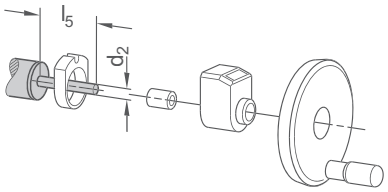
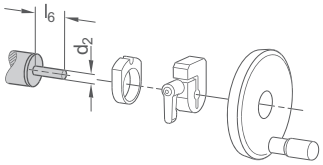
d_1	Torque support	Clamping plate	Position indicator		Handwheel
30	VZDR	VZK	VZPM	VZPE	VZH
40	VZDR	VZK	VZPM	VZPE	VZH
50	VZDR	VZK	VZPM	VZPE	VZH
60	VZDR	VZK	VZPM (only trapezoidal thread)	VZPE	VZH

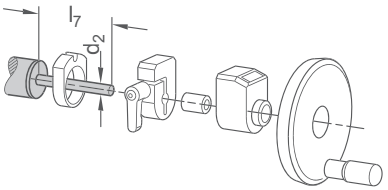
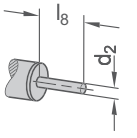
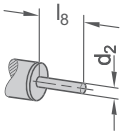
Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_4		 Journal length l_5		 Journal length l_6	

F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)	Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

Journal
z_2

B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_4		 Journal length l_5		 Journal length l_6	

F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)	Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDR** → *see page 364*
- Angle gears **YLS / YTS** → *see page 374 / 376*
- Transfer units **VA** → *see page 370*

ORDER KEY

Name key | Supplemental key

VE3R - d_1 - w - l_1 - l_2 - k_1 - k_2 - k_3 - r_1 - p_1 - z_1 - r_2 - p_2 - z_2

- Single tube linear unit
- Outer diameter
- Material
- Stroke 1
- Stroke 2
- Edge distance 1
- Spacing
- Edge distance 2
- Spindle 1 thread direction
- Spindle 1 thread pitch
- Journal z_1
- Spindle 2 thread direction
- Spindle 2 thread pitch
- Journal z_2

LINEAR UNIT CONNECTORS

The single tube linear unit VE3R only becomes a functional axis after attachment of a linear unit connector. Linear unit connectors are available in a variety of designs for different applications. To simplify the selection process, an overview is provided on page 238.






VE3V | Single tube linear units, square, for two independent guide elements

PRODUCT INFO

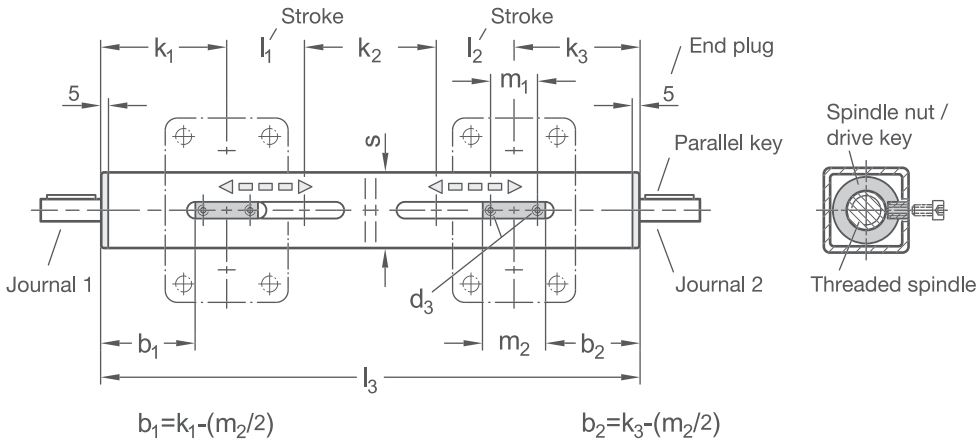
The guide tubes of the **linear units VE3V** are made of chrome-plated steel or bright stainless steel precision tubes. Two independent spindles with ball bearings on each side are installed in the guide tube. The thread direction of the spindles can be chosen as desired for each side. The spindle nuts positioned on each spindle transmit the linear movements to a linear unit connector via a drive key along the guide groove, independently of the opposite side.

Together with the guide tube, the guide element bores form solid linear square guide mechanisms that can receive large torsional forces. Multiple connector types are available for selection and can be adjusted or clamped for low play using the split bore. The parts to be moved are fastened to the guide element, such as for format adjustments, in which one side guide is moved independently from the opposite side to various widths.

Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The linear unit connectors and the accessories are not included with the linear units and must be ordered separately.

Adjustable hand levers are intended for repeated, tool-free clamping of the guide elements. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



s	Stroke max. l_1	Stroke max. l_2	Edge distance 1 min. k_1	Spacing min. k_2	Edge distance 2 min. k_3	d_3	Total length max. (k_1+ k_2+ k_3 + l_1+ l_2) l_3	m_1	m_2
30	601	601	59	50	59	M 4	1460	23	38
40	753	753	78	66	78	M 5	1810	42	54
50	748	748	82	70	82	M 6	1810	42	54

Material
w

ST	Steel • Guide tube, DIN EN 10305-4: Steel, chrome-plated • Trapezoidal / fine thread spindle: Steel, with ball bearing • Spindle nut: Red brass / end plug: Plastic
ED	Stainless steel • Guide tubes, EN 10216-5: Stainless steel AISI 304 • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing • Spindle nut: Red brass / end plug: Plastic

Spindle 1 thread direction (on journal z_1)
r_1

RH	Right-hand thread
LH	Left-hand thread

Spindle 2 thread direction (on journal z_2)
r_2

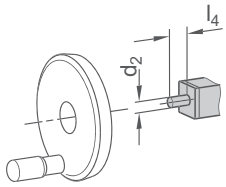
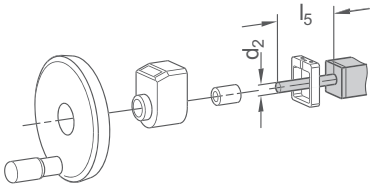
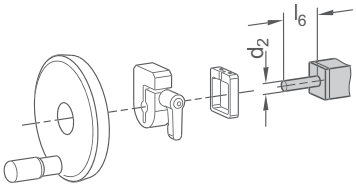
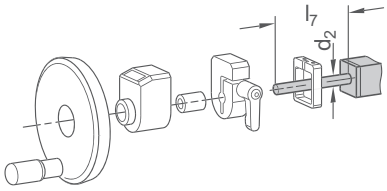
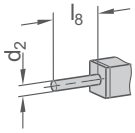
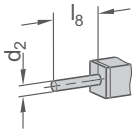
RH	Right-hand thread
LH	Left-hand thread

s	Spindle Ø	Spindle pitch spindle 1 p_1		Spindle pitch spindle 2 p_2		Journal diameter d_2	Journal length B l_4	Journal length D l_5	Journal length E l_6	Journal length F l_7	individual journal length l_8
		Trapezoidal thread	Fine thread, metric	Trapezoidal thread	Fine thread, metric						
30	14	4	1	4	1	8	16	52	31	67	16...67
40	20	4	1	4	1	12	17	59	32	74	17...74
50	20	4	1	4	1	12	18	60	33	75	18...75

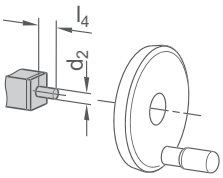
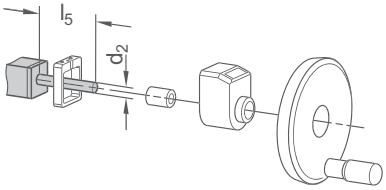
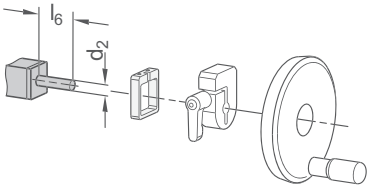
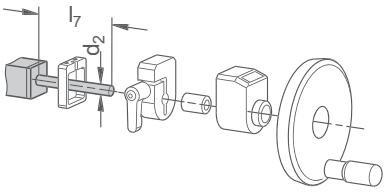
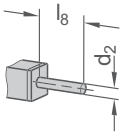
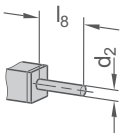
Accessories:

s	Torque support	Clamping plate	Position indicator		Handwheel
30	VZDV	VZK	VZPM	VZPE	VZH
40	VZDV	VZK	VZPM	VZPE	VZH
50	VZDV	VZK	VZPM	VZPE	VZH

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_4		 Journal length l_5		 Journal length l_6	
F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)	Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

Journal
z_2

B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_4		 Journal length l_5		 Journal length l_6	
F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)	Gxx	Individual length with keyway (for xx enter value from column l_8)	Hxx	Individual length without keyway (for xx enter value from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicator **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDV** → *see page 366*
- Angle gears → *on request*
- Transfer units **VA** → *see page 370*

ORDER KEY

Name key | Supplemental key

VE3V - s - w - l_1 - l_2 - k_1 - k_2 - k_3 - r_1 - p_1 - z_1 - r_2 - p_2 - z_2

- Single tube linear unit
- Outer diameter
- Material
- Stroke 1
- Stroke 2
- Edge distance 1
- Spacing
- Edge distance 2
- Spindle 1 thread direction
- Spindle 1 thread pitch
- Journal z_1
- Spindle 2 thread direction
- Spindle 2 thread pitch
- Journal z_2

LINEAR UNIT CONNECTORS

The single tube linear unit VE3V only becomes a functional axis after attachment of a linear unit connector. Linear unit connectors are available in a variety of designs for different applications. To simplify the selection process, an overview is provided on page 238.





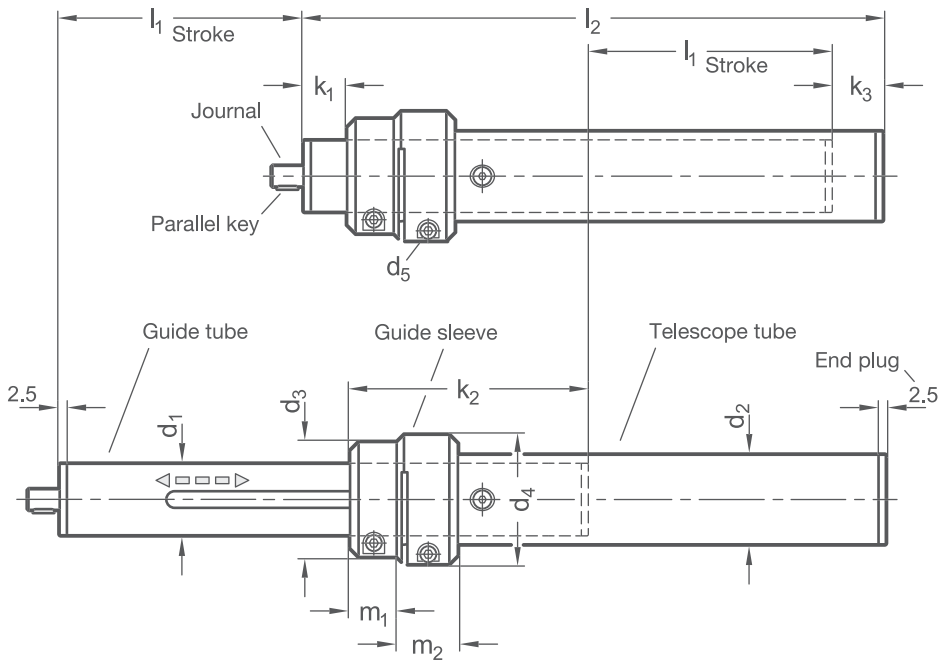

PRODUCT INFO

The tubes of **telescope linear units VT1S** are made of chrome-plated steel or bright, seamless stainless steel precision tubes. A continuous spindle with ball bearings on each side is installed in the guide tube. The attached spindle nut transmits the linear movements to the telescope tube, initiating an adjustment of the telescope linear unit travel distance.

The guide tube is fitted with sliding inserts and forms a solid linear round guide together with the telescope tube. The linear unit can be adjusted for low backlash or clamped in place via the slitted guide sleeve. The drive is situated on the end, allowing the telescope linear unit to be fastened from the side. Depending on the type of fastening, the drive of the linear unit remains at the fastening point or is carried along by the travel movement.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures that the length of the shaft journal z is correct for attaching the accessories, for example. The accessories are not included with the linear units and must be ordered separately.

RoHS-compliant product



d_1	Stroke max. l_1	Edge distance 1 min. k_1	Guide length min. k_2	Edge distance 2 min. k_3	d_2	d_3	d_4	d_5	Total length max. ($k_1 + k_2 + l_1 + k_3$) l_2	m_1	m_2
30	...400	70	73	12	35	49	54	M 5	1000	15	21
40	...600	90	94	12	50	64	72	M 6	1400	26	34

Material
w

ST	Steel • Guide tube, DIN EN 10305-4: Steel, chrome-plated • Trapezoidal / fine thread spindle: Steel, with ball bearing • Spindle nut: Red brass / end plug: Plastic / Guide sleeve: Aluminum
ED	Stainless steel • Guide tubes, EN 10216-5: Stainless steel AISI 304 • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing • Spindle nut: Red brass / end plug: Plastic / Guide sleeve: Aluminum

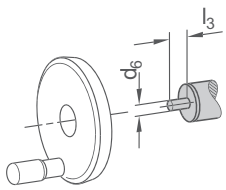
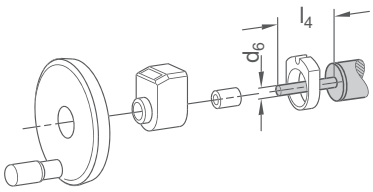
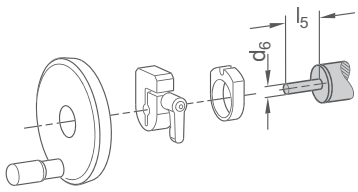
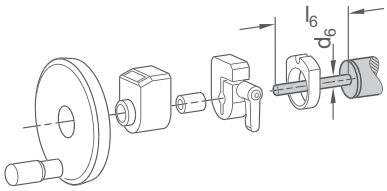
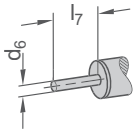
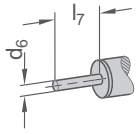
Spindle thread direction
r

RH	Right-hand thread
LH	Left-hand thread

d_1	Spindle Ø	Spindle pitch **p**		Journal diameter d_6	Journal length B l_3	Journal length D l_4	Journal length E l_5	Journal length F l_6	individual journal length l_7
		Trapezoidal thread	Fine thread, metric						
30	14	4	1	8	16	52	31	67	16...67
40	20	4	1	12	17	59	32	74	17...74

d_1	**Accessories:**				
	Torque support	Clamping plate	Position indicator		Handwheel
30	VZDR	VZK	VZPM	VZPE	VZH
40	VZDR	VZK	VZPM	VZPE	VZH

Journal
z

B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel
 Journal length l_3		 Journal length l_4		 Journal length l_5	
F	Journal for spacer plate, position indicator and handwheel	Gxx	Individual length with keyway (for xx enter value from column l_7)	Hxx	Individual length without keyway (for xx enter value from column l_7)
 Journal length l_6		 Journal length l_7		 Journal length l_7	

ACCESSORIES

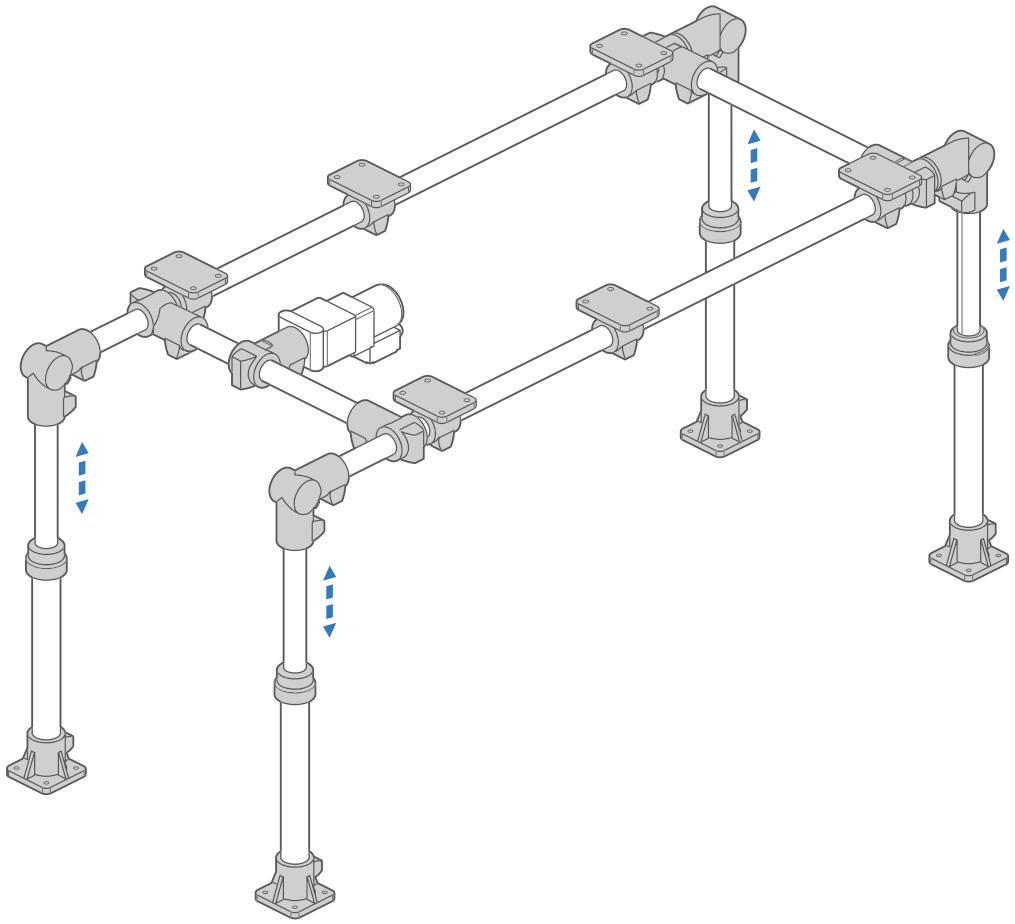
- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDR** → *see page 364*

ORDER KEY

Name key | Supplemental key

VT1S - d_1 - w - l_1 - k_1 - k_2 - k_3 - r - p - z

- Telescope linear unit
- Outer diameter
- Material
- Stroke
- Edge distance 1
- Guide length
- Edge distance 2
- Spindle thread direction
- Spindle pitch
- Journal z



VT1W Telescope linear units with side drive

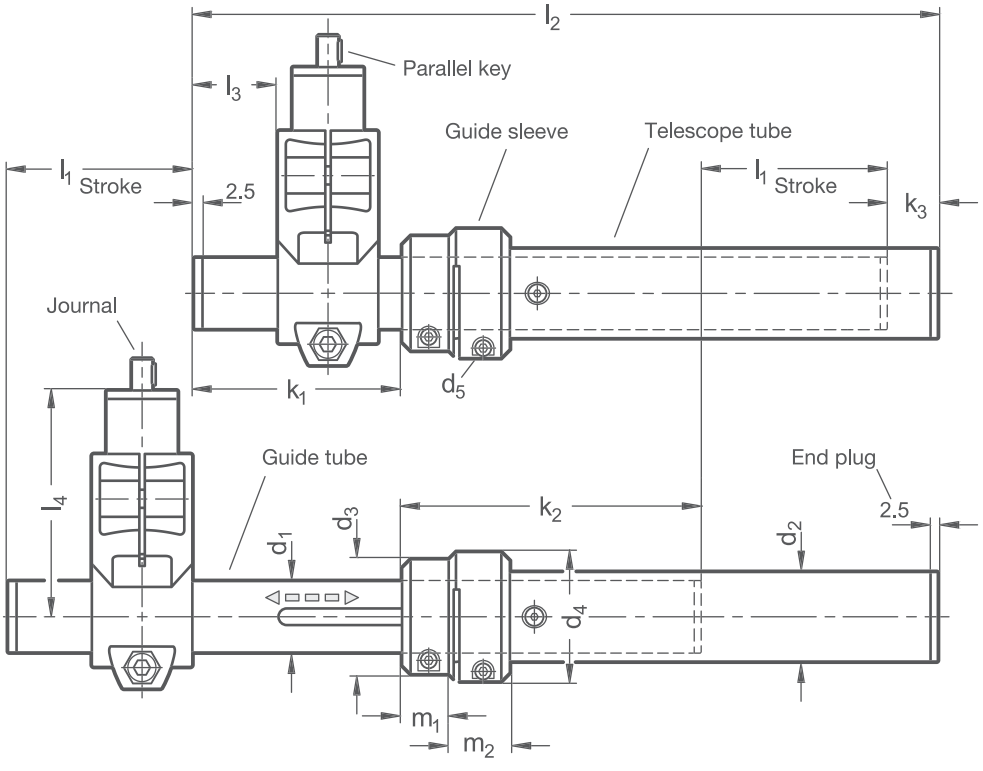
PRODUCT INFO

The tubes of the **telescope linear units VT1W** are made of chrome-plated steel or bright, seamless stainless steel precision tubes. A continuous spindle with ball bearings on each side is installed in the guide tube. The attached spindle nut transmits the linear movements to the telescope tube, initiating an adjustment of the telescope linear unit travel distance.

The guide tube is fitted with sliding inserts and forms a solid linear round guide together with the telescope tube. The linear unit can be adjusted for low backlash or clamped in place via the slitted guide sleeve. The drive is offset by 90 degrees by means of an angle gear, allowing the telescope linear unit to be fastened at the end. Depending on the type of fastening, the drive of the linear unit remains at the fastening point or is carried along by the travel movement.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures that the length of the shaft journal z is correct for attachment of the accessories, for example. The accessories are not included with the linear units and must be ordered separately.

RoHS-compliant product



d_1	Stroke max. l_1	Edge distance 1 min. k_1	Guide length min. k_2	Edge distance 2 min. k_3	d_2	d_3	d_4	d_5	Total length max. (retracted) ($k_1 + k_2 + l_1 + k_3$) l_2	l_3	l_4	m_1	m_2
30	...400	120	73	12	35	49	54	M 5	1000	70	86	15	21
40	...600	156	94	12	50	64	72	M 6	1400	90	125	26	34

Material
w

ST	Steel • Guide tube, DIN EN 10305-4: Steel, chrome-plated • Trapezoidal / fine thread spindle: Steel, with ball bearing • Spindle nut: Red brass / end plug: Plastic / Guide sleeve: Aluminum
ED	Stainless steel • Guide tubes, EN 10216-5: Stainless steel AISI 304 • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing • Spindle nut: Red brass / end plug: Plastic / Guide sleeve: Aluminum

Spindle thread direction
r

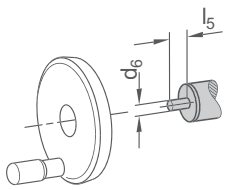
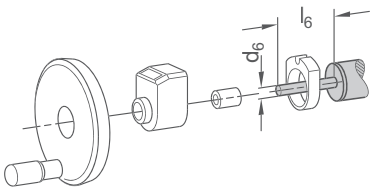
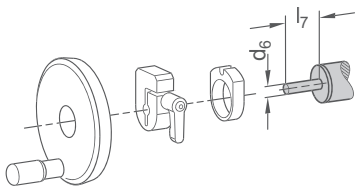
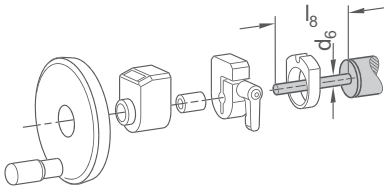
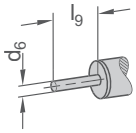
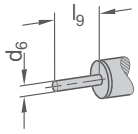
RH	Right-hand thread
LH	Left-hand thread

d_1	Spindle Ø	Spindle pitch **p**		Journal diameter d_6	Journal length B l_5	Journal length D l_6	Journal length E l_7	Journal length F l_8	individual journal length l_9
		Trapezoidal thread	Fine thread, metric						
30	14	4	1	8	16	52	31	67	16...67
40	20	4	1	12	17	59	32	74	17...74

Accessories:

d_1	Torque support	Clamping plate	Position indicator		Handwheel
30	VZDR	VZK	VZPM	VZPE	VZH
40	VZDR	VZK	VZPM	VZPE	VZH

Journal
z

B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for spacer plate and handwheel
 Journal length l_5		 Journal length l_6		 Journal length l_7	
F	Journal for spacer plate, position indicator and handwheel	Gxx	Individual length with keyway (for xx enter value from column l_9)	Hxx	Individual length without keyway (for xx enter value from column l_9)
 Journal length l_8		 Journal length l_9		 Journal length l_9	

2A

ACCESSORIES

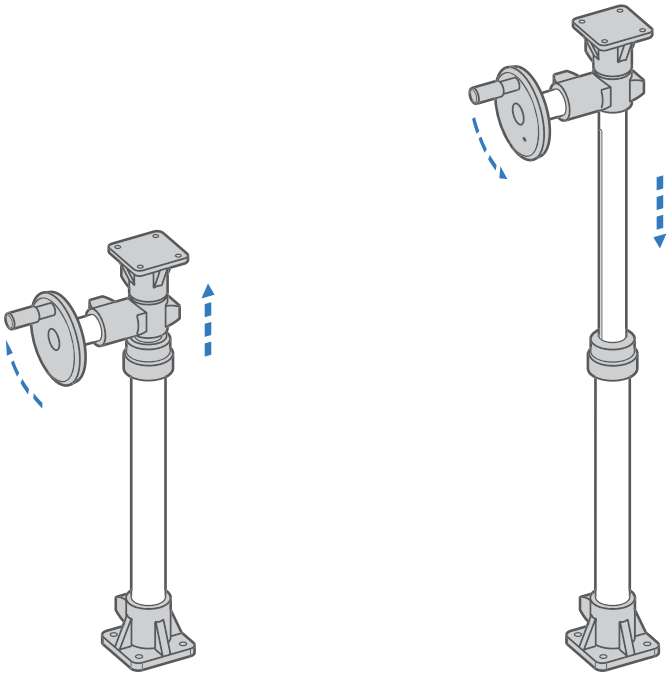
- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDR** → *see page 364*

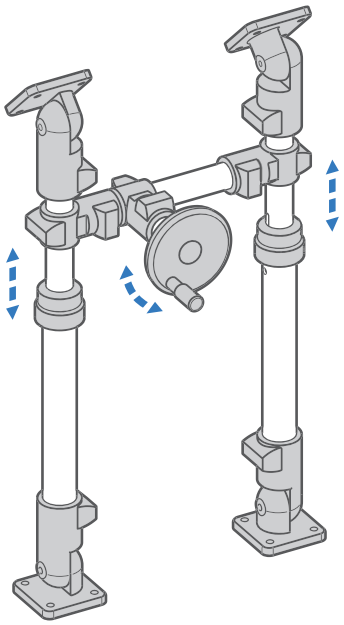
ORDER KEY

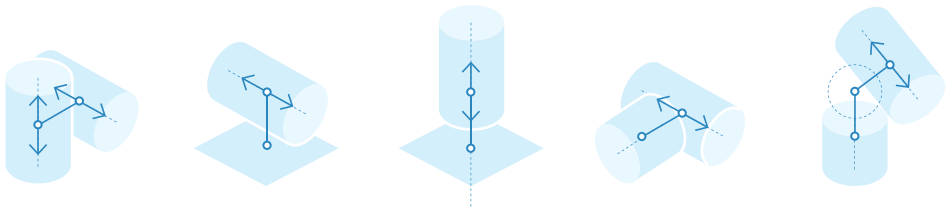
Name key | Supplemental key

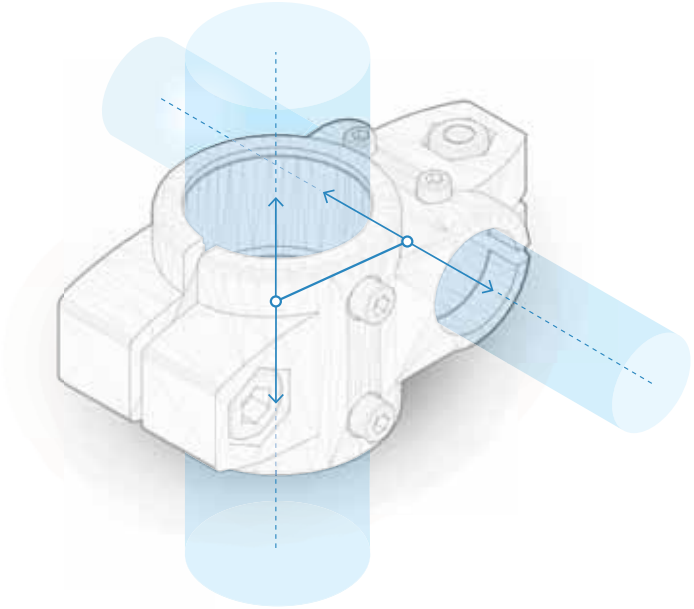
VT1W - d_1 - w - l_1 - k_1 - k_2 - k_3 - r - p - z

- Telescope linear unit
- Outer diameter
- Material
- Stroke
- Edge distance 1
- Guide length
- Edge distance 2
- Spindle thread direction
- Spindle pitch
- Journal z

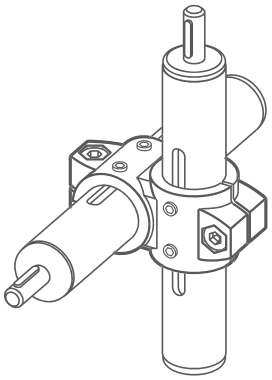








Linear unit connectors

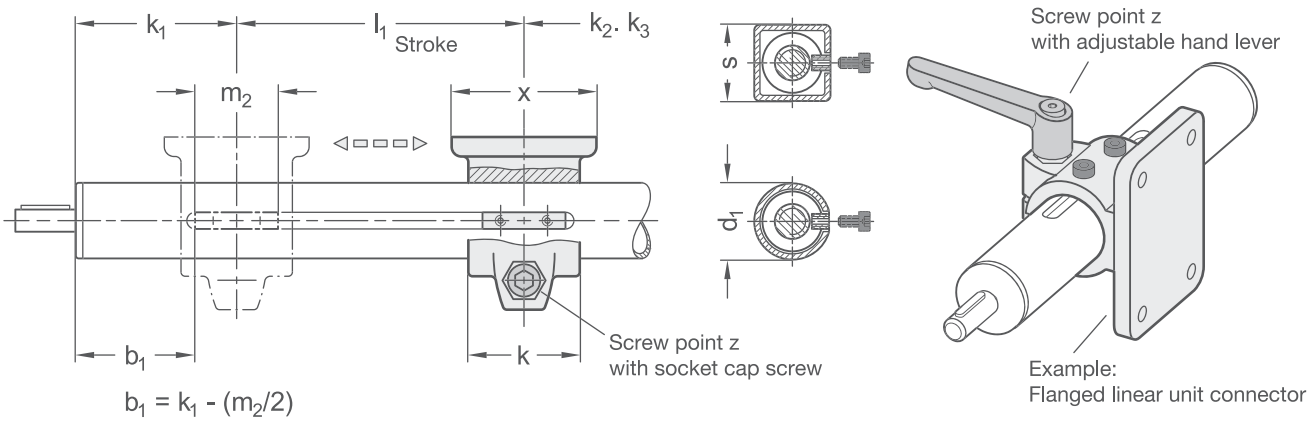


The group “Linear unit connectors 2B” contains single- and multi-piece linear unit connectors made of die-cast aluminum or precision-cast stainless steel. These have clamping points and guide element bores with or without a sliding insert. Together with single tube linear units, they form solid linear round or square guides. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Hex socket cap screws or adjustable hand levers, together with hex nuts, reduce the cross-section of the guide element bore, allowing it to be adjusted and clamped for low play. The screw and nut can be positioned anywhere thanks to the hexagonal countersinking on both sides. Adjustable hand levers are intended for repeated, tool-free clamping.

Together with rods and tubes, linear unit connectors with linear units can be used to easily build adjustable tube constructions that can be flexibly adapted to many different areas of application. Examples include handling systems, warehousing systems, and conveyor systems for format adjustment.

Cross linear unit connectors	**KK.E** *p. 240* 	**KK.Z** *p. 240* 	**KS.E** *p. 242* 	**KS.Z** *p. 242* 	**KE.E** *p. 244* 	**KE.Z** *p. 244* 	**KSU.E** *p. 246* 	**KSU.Z** *p. 246* 
	KM.E *p. 248* 	**KM.Z** *p. 248* 	**KMU.E** *p. 250* 					
Flanged linear unit connectors	**FK.E** *p. 252* 	**FS.E** *p. 254* 	**FSZ.E** *p. 256* 	**FE.E** *p. 258* 	**FEZ.E** *p. 260* 	**FM.E** *p. 262* 		
Base linear unit connectors	**BK.E** *p. 264* 	**BS.E** *p. 266* 	**BE.E** *p. 268* 	**BM.E** *p. 270* 				
T-linear unit connectors	**TK.E** *p. 272* 	**TS.E** *p. 274* 	**TE.E** *p. 276* 					
Swivel linear unit connectors	**LKP.E** *p. 278* 	**LSP.E** *p. 280* 	**LKQ.E** *p. 282* 	**LSQ.E** *p. 284* 				



Standard		Material		Cross-section		Interfering contours		Sliding inserts	Hand lever
		AL	ED	d_1	s	k Clamp. length	x Flange	available	available as accessory
KK.E **KK.Z** *p. 240*		×	×	18	-	25	-	yes	yes
KS.E **KS.Z** *p. 242*		×	-	30 40 50 60	-	40 56 65 80	-	yes	yes
KE.E **KE.Z** *p. 244*		-	×	30 50	-	40 65	-	yes	yes
KSU.E **KSU.Z** *p. 246*		×	-	18 30 50	-	40 65	-	yes	yes
KM.E **KM.Z** **KMU.E** *p. 248 / 250*		×	-	30 40 50	30 40 50	50 60 76	-	no	yes
FK.E *p. 252*		×	-	18	-	25	35	yes	yes
FS.E **FSZ.E** *p. 254 / 256*		×	-	30 40 50 60	-	40 56 65 80	52 78 92 110	yes	yes
FE.E **FEZ.E** *p. 258*		-	×	30 50	-	40 65	52 92	yes	yes

Standard		Material		Cross-section		Interfering contours		Sliding inserts	Hand lever
		AL	ED	d_1	s	k Clamp. length	x Flange	available	available as accessory
FM.E *p. 262*		×	-	-	30 40 50	50 76	50 76	no	yes
BK.E *p. 264*		-	×	18	-	40	-	yes	yes
BS.E *p. 266*		×	-	30 40 50 60	-	50 70 85 100	-	yes	no
BE.E *p. 268*		-	×	30 50	-	50 85	-	yes	yes
BM.E *p. 270*		×	-	-	30 40 50	58 91	-	no	yes
TK.E *p. 272*		×	×	18	-	25	-	yes	yes
TS.E *p. 274*		×	-	30 40 50 60	-	40 56 65 80	-	yes	yes
TE.E *p. 276*		-	×	30 50	-	37 65	-	yes	yes
LKP.E *p. 278*		×	-	18	-	25	-	yes	yes
LSP.E *p. 280*		×	-	30 40 50	-	40 65	-	yes	yes
LKQ.E *p. 282*		×	-	18	-	25	-	yes	yes
LSQ.E *p. 284*		×	-	30 40 50	-	40 65	-	yes	yes

KK.E / KK.Z

Cross linear unit connectors for one- and two-axis systems, aluminium / stainless steel

PRODUCT INFO

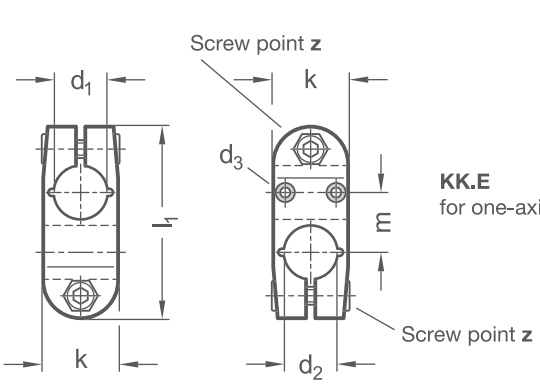
Cross linear unit connectors KK.E and KK.Z of die-cast aluminum or precision-cast stainless steel have slitted clamping points and guide element bores machined by cutting methods, with or without a sliding insert. The bores are offset in the plane and arranged at an angle of 90°.

Together with the guide tube of the linear unit, the guide element bores form a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

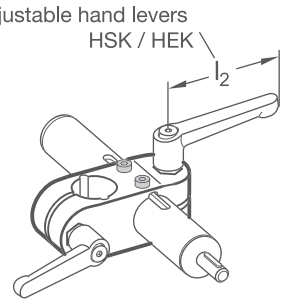
Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the guide element bore or clamping point size.

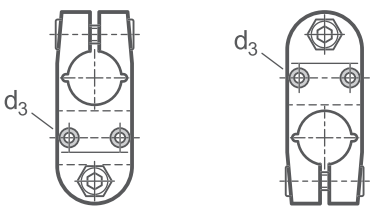
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product

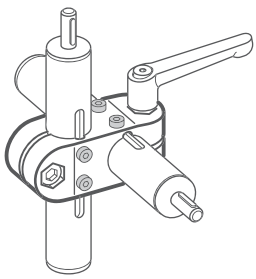


KK.E
for one-axis system





KK.Z
for two-axis system



KK.E for one-axis systems

Clamping point 1 - 2							**Accessories** recom. hand lever for z	
Bore d_1 - d_2		Mounting screws on the drive key d_3	Clamping length k	l_1	m	Hex socket cap screws	HSK for aluminum clamp lever length l_2	HEK for stainless steel clamp lever length l_2
Without sliding insert (alum. only)	With PTFE sliding insert							
B18 - B18	G18 - B18	M3	25	64	20	M 6-20	63	63

KK.Z for two-axis systems

Clamping point 1 - 2							**Accessories** recom. hand lever for z	
Bore d_1 - d_2		Mounting screws on the drive key d_3	Clamping length k	l_1	m	Hex socket cap screws	HSK for aluminum clamp lever length l_2	HEK for stainless steel clamp lever length l_2
Without sliding insert (alum. only)	With PTFE sliding insert							
B18 - B18	G18 - G18	M3	25	64	20	M 6-20	63	63

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum linear unit connector)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material o	
2	Aluminium textured powder-coated, Black RAL 9005
8	Aluminium blasted, matt
ED	Stainless steel, blasted, matt

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*
– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

One-axis system

ORDER KEY **KK.E - d_1 - d_2 - z - o**

Cross linear unit connector
Clamping point 1
Clamping point 2
Screw points
Surface / material

Two-axis system

ORDER KEY **KK.Z - d_1 - d_2 - z - o**

Cross linear unit connector
Clamping point 1
Clamping point 2
Screw points
Surface / material

KS.E / KS.Z

Cross linear unit connectors for one- and two-axis systems, aluminium

PRODUCT INFO

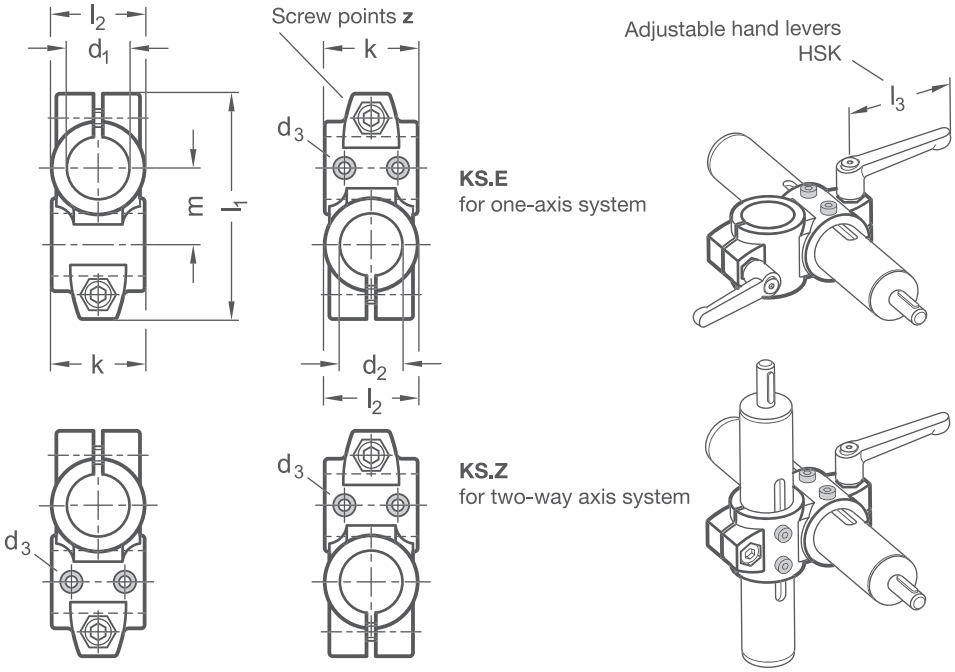
Cross linear unit connectors KS.E and KS.Z of die-cast aluminum have slitted clamping points and guide element bores machined by cutting methods, with or without a sliding insert. The bores are offset in the plane and arranged at an angle of 90°.

Together with the guide tube of the linear unit, the guide element bores form a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the guide element bore or clamping point size.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



KS.E for one-axis systems

Clamping point 1 - 2		Clamping length	Mounting screws on the drive key					**Accessories** recom. hand lever
d_1 - d_2								
Without sliding insert	With PTFE sliding insert	**k**	d_3	l_1	l_2	**m**	Hex socket cap screws	HSK for z lever length l_3
B30 - B30	G30 - B30	40	M 4	97	40	33	M 8-25	78
B30 - B30	G30 - B30	56	M 4	125	56	45	M 10-35	-
B40 - B40	G40 - B40	56	M 5	125	56	45	M 10-35	92
B40 - B40	G40 - B40	65	M 5	143	65	53	M 10-50	-
B50 - B50	G50 - B50	65	M 6	143	65	53	M 10-50	92
B60 - B60	G60 - B60	80	M 8	169	80	65	M 10-50	92

KS.Z for two-axis systems

Clamping point 1 - 2		Clamping length	Mounting screws on the drive key					**Accessories** recom. hand lever
d_1 - d_2								
Without sliding insert	With PTFE sliding insert	**k**	d_3	l_1	l_2	**m**	Hex socket cap screws	HSK for z lever length l_3
B30 - B30	G30 - G30	40	M 4	97	40	33	M 8-25	78
B30 - B30	G30 - G30	56	M 4	125	56	45	M 10-35	-
B40 - B40	G40 - G40	56	M 5	125	56	45	M 10-35	92
B40 - B40	G40 - G40	65	M 5	143	65	53	M 10-50	-
B50 - B50	G50 - G50	65	M 6	143	65	53	M 10-50	92
B60 - B60	G60 - G60	80	M 8	169	80	65	M 10-50	92

Screw point **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface **o**	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

One-axis system

ORDER KEY **KS.E - d_1 - d_2 - k - z - o**

Cross linear unit connector
Clamping point 1
Clamping point 2
Clamping length
Screw point
Surface

Two-axis system

ORDER KEY **KS.Z - d_1 - d_2 - k - z - o**

Cross linear unit connector
Clamping point 1
Clamping point 2
Clamping length
Screw point
Surface

KE.E / KE.Z

Cross linear unit connectors for one- and two-axis systems, stainless steel

PRODUCT INFO

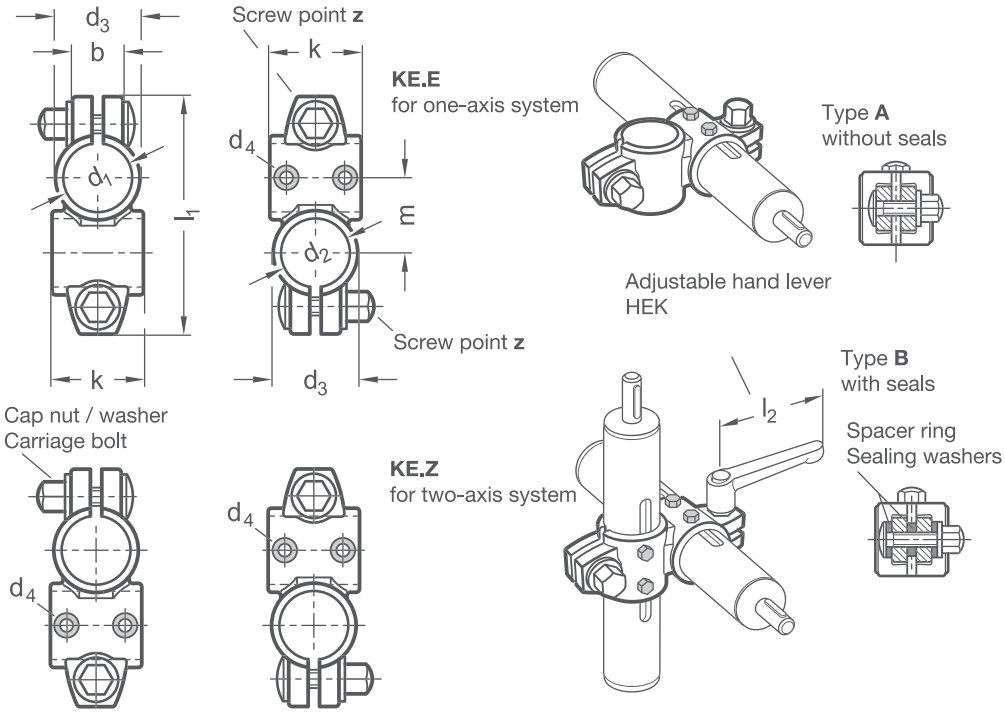
Cross linear unit connectors KE.E and KE.Z of precision-cast stainless steel have slitted clamping points and guide element bores machined by cutting methods and equipped with a sliding insert. The bores are offset in the plane and arranged at an angle of 90°.

Together with the guide tube of the linear unit, the guide element bores form a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, carriage bolts together with cap nuts or adjustable hand levers reduce the guide element bore or clamping point size. Type B is equipped with seals at the screw points.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



KE.E for one-axis systems

Clamping point 1 - 2 **d_1 - d_2** With PTFE sliding insert	**b**	**d_3**	Mounting screws on the drive key **d_4**	Clamping length **k**	**l_1**	**m**	Hex socket cap screws	**Accessories** recom. hand lever HEK for z lever length **l_2**
G30 - B30	22	37	M 4	40	104	33	M 8	78
G50 - B50	30	60	M 6	65	150	53	M 10	92

KE.Z for two-axis systems

Clamping point 1 - 2 **d_1 - d_2** With PTFE sliding insert	**b**	**d_3**	Mounting screws on the drive key **d_4**	Clamping length **k**	**l_1**	**m**	Hex socket cap screws	**Accessories** recom. hand lever HEK for z lever length **l_2**
G30 - G30	22	37	M 4	40	104	33	M 8	78
G50 - G50	30	60	M 6	65	150	53	M 10	92

Type **t**	
A	Without seals
B	With seals (sealing washer polyacetal POM, blue, spacer ring silicone 40 ... 60 Shore A, blue)

Screw point **z**	
4	Cap nut stainless steel DIN 917-A2 and carriage bolt stainless steel DIN 603-A2

ACCESSORIES

– Stainless steel adjustable hand levers **HEK** *see page 170*

One-axis system

ORDER KEY **KE.E - d_1 - d_2 - t - z**

Cross linear unit connector
Clamping point 1
Clamping point 2
Type
Screw point

Two-axis system

ORDER KEY **KE.Z - d_1 - d_2 - t - z**

Cross linear unit connector
Clamping point 1
Clamping point 2
Type
Screw point

KSU.E / KSU.Z

Cross linear unit connectors for one- and two-axis systems, unequal bore dimensions, aluminum

PRODUCT INFO

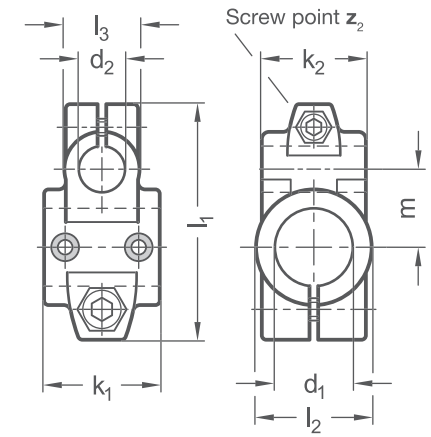
Cross linear unit connectors KSU.E and KSU.Z of die-cast aluminum have unequal slitted clamping points and guide element bores machined by cutting methods, with or without a sliding insert. The bores are offset in the plane and arranged at an angle of 90°.

Together with the guide tube of the linear unit, the guide element bores form a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

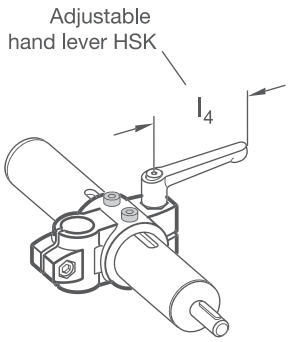
Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the guide element bore or clamping point size.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

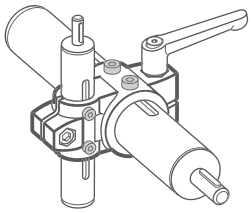
RoHS-compliant product



KSU.E
for one-axis system



KSU.Z
for two-axis system



KSU.E for one-axis systems

Clamping point 1 - 2 d_1 - d_2 Without sliding insert	With PTFE sliding insert	Mounting screws on the drive key d_3	k_1	k_2	l_1	l_2	l_3	m	Hex socket cap screws z_1	Hex socket cap screws z_2	**Accessories** recom. hand lever for z_1 lever length l_4	for z_2 lever length l_4
B30 - B18	G30 - B18	M 4	40	36	81,5	40	26	27	M 8-25	M 6-20	78	63
B50 - B30	G50 - B30	M 6	65	59	122	65	40	45	M 10-50	M 8-25	92	78

KSU.Z for two-axis systems

Clamping point 1 - 2 d_1 - d_2 Without sliding insert	With PTFE sliding insert	Mounting screws on the drive key d_3	d_4	k_1	k_2	l_1	l_2	l_3	m	Hex socket cap screws z_1	Hex socket cap screws z_2	**Accessories** recom. hand lever for z_1 lever length l_4	for z_2 lever length l_4
B30 - B18	G30 - G18	M 4	M 3	40	36	81,5	40	26	27	M 8-25	M 6-20	78	63
B50 - B30	G50 - G30	M 6	M 4	65	59	122	65	40	45	M 10-50	M 8-25	92	78

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

One-axis system

ORDER KEY **KSU.E - d_1 - d_2 - z - o**

Cross linear unit connector
Clamping point 1
Clamping point 2
Screw points
Surface

Two-axis system

ORDER KEY **KSU.Z - d_1 - d_2 - z - o**

Cross linear unit connector
Clamping point 1
Clamping point 2
Screw points
Surface

KM.E / KM.Z

Cross linear unit connectors for one- and two-axis systems, multi-piece, aluminum

PRODUCT INFO

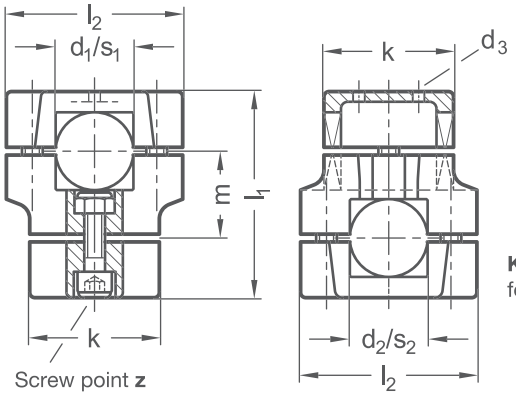
Cross linear unit connectors KM.E and KM.Z of die-cast aluminum have split clamping points and guide element bores that have been partially machined by cutting methods. The bores are offset in the plane and arranged at an angle of 90°.

Together with the guide tube of the linear unit, the guide element bores form a solid linear round or square guide mechanism that can be adjusted and clamped for low play. Centering bushes in the pass-through bores eliminate axial play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

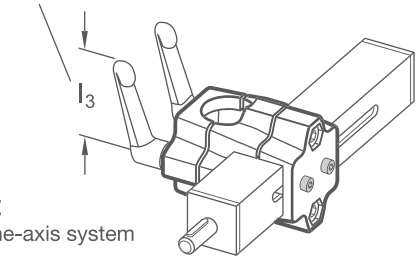
Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the guide element bore or clamping point size.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

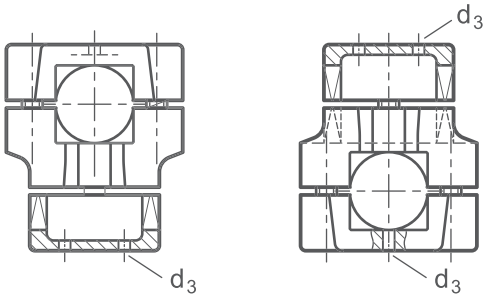
RoHS-compliant product



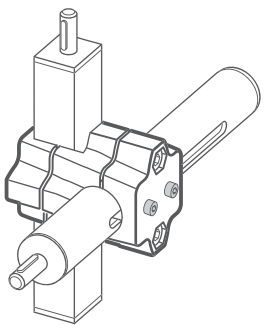
Adjustable hand levers
HSK



KM.E
for one-axis system



KM.Z
for two-axis system



KM.E for one-axis systems

Clamping point 1 - Clamping point 2			Clamping length	Mounting screws on the drive key				Hex socket cap screws	**Accessories** recom. hand lever
Bore - Bore d_1 - d_2	Bore - Square (d_1 with drive key) d_1 - s_2	Square - Square s_1 - s_2	k	d_3	l_1	l_2	m		HSK for z lever length l_3
B30 - B30	B30 - V30	V30 - V30	50	M 4	79,5	68	33,5	M 8-30	78
B30 - B30	B30 - V30	V30 - V30	60	M 4	109	79	50	M 8-50	78
B40 - B40	B40 - V40	V40 - V40	60	M 5	109	79	50	M 8-50	78
B40 - B40	B40 - V40	V40 - V40	76	M 5	125	98	55	M 10-50	92
B50 - B50	B50 - V50	V50 - V50	76	M 6	125	98	55	M 10-50	92

KM.Z for two-axis systems

Clamping point 1 - Clamping point 2			Clamping length	Mounting screws on the drive key				Hex socket cap screws	**Accessories** recom. hand lever
Bore - Bore d_1 - d_2	Bore - Square d_1 - s_2	Square - Square s_1 - s_2	k	d_3	l_1	l_2	m		HSK for z lever length l_3
B30 - B30	B30 - V30	V30 - V30	50	M 4	79,5	68	33,5	M 8-30	78
B30 - B30	B30 - V30	V30 - V30	60	M 4	109	79	50	M 8-50	78
B40 - B40	B40 - V40	V40 - V40	60	M 5	109	79	50	M 8-50	78
B40 - B40	B40 - V40	V40 - V40	76	M 5	125	98	55	M 10-50	92
B50 - B50	B50 - V50	V50 - V50	76	M 6	125	98	55	M 10-50	92

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

One-axis system

ORDER KEY **KM.E - d_1 - d_2 - k - z - o**

- Cross linear unit connector
- Clamping point 1
- Clamping point 2
- Clamping length
- Screw point
- Surface

Two-axis system

ORDER KEY **KM.Z - d_1 - d_2 - k - z - o**

- Cross linear unit connector
- Clamping point 1
- Clamping point 2
- Clamping length
- Screw point
- Surface

KMU.E

Cross linear unit connectors, multi-piece, unequal bore dimensions, aluminum

PRODUCT INFO

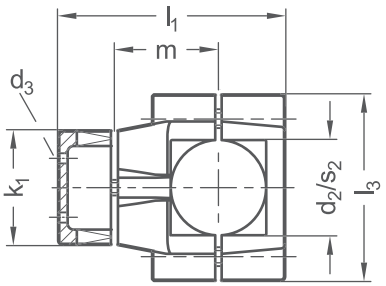
Cross linear unit connectors KMU.E of die-cast aluminum have split clamping points and guide element bores that have been partially machined by cutting methods. The bores are offset in the plane and arranged at an angle of 90°.

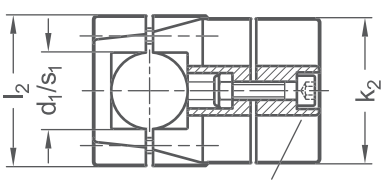
Together with the guide tube of the linear unit, the guide element bores form a solid linear round or square guide mechanism that can be adjusted and clamped for low play. Centering bushes in the pass-through bores eliminate axial play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the guide element bore or clamping point size.

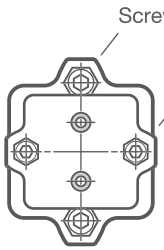
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

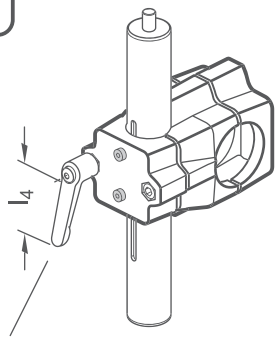
RoHS-compliant product





Socket cap screw /
Hex nut





Adjustable hand lever
HSK

Clamping point 1		Clamping point 2		Mounting screws on the drive key	Clamping length	Clamping length							**Accessories** recom. hand lever	
Bore d_1	Square s_1	Bore d_2	Square s_2	d_3	k_1	k_2	l_1	l_2	l_3	m	z_1	z_2	HSK for z_1 Lever length l_4	HSK for z_2 Lever length l_4
B 30	V 30	B 40	V 40	M 4	60	76	120	79	98	55	M 8-50	M 10-55	78	92
B 30	V 30	B 50	V 50	M 4	60	76	120	79	98	55	M 8-50	M 10-55	78	92
B 40	V 40	B 50	V 50	M 5	60	76	120	79	98	55	M 8-50	M 10-55	78	92

Screw points **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface **o**	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

KMU.E - d_1 - d_2 - z - o

- Cross linear unit connector
- Clamping point 1
- Clamping point 2
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

FK.E Flanged linear unit connectors, with two fastening bores, aluminium / stainless steel

PRODUCT INFO

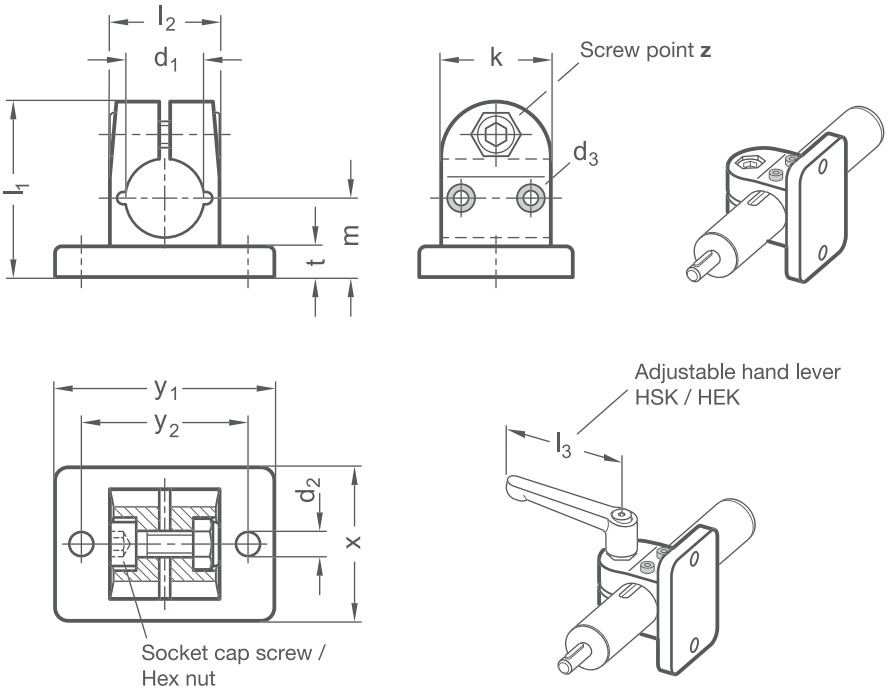
Flanged linear unit connectors FK.E of die-cast aluminum or precision-cast stainless steel have a slitted bore machined by cutting methods, with or without a sliding insert. This is arranged in the plane parallel to the face of the flange.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a hex socket cap screw or an adjustable hand lever reduces size of the guide element bore.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point													**Accessories** recom. hand lever for z	
Bore d_1														
Without sliding insert (only alum.)	With PTFE sliding insert	d_2	Mounting screws on the drive key d_3	Clamping length k	l_1	l_2	m	t	x	y_1	y_2	Hex socket cap screw	HSK for aluminum clamp lever length l_3	HEK for stainless steel clamp lever length l_3
B18	G18	5,5	M3	25	40	25	18	7	35	50	38	M 6-20	63	63

Screw point
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum linear unit connector)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material
o

2	Aluminium textured powder-coated, Black RAL 9005
8	Aluminium blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

FK.E - d_1 - z - o

- Flanged linear unit connector
- Clamping point
- Screw point
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*
– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

FS.E Flanged linear unit connectors, with four fastening bores, aluminum

PRODUCT INFO

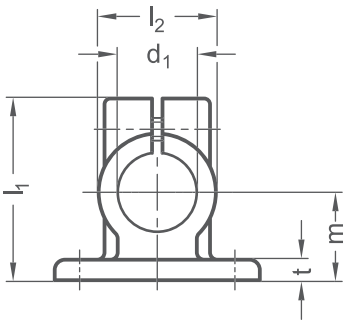
Flanged linear unit connectors FS.E of die-cast aluminum have a slitted bore machined by cutting methods, with or without a sliding insert. This is arranged in the plane parallel to the face of the flange.

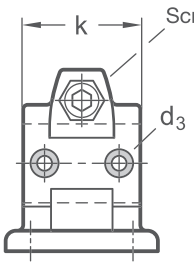
Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

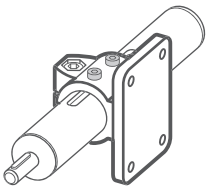
Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a hex socket cap screw or an adjustable hand lever reduces size of the guide element bore.

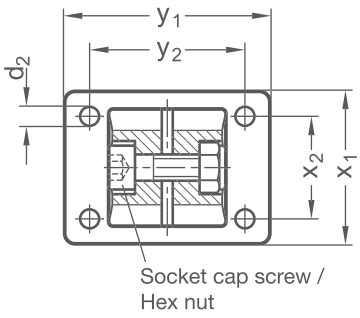
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

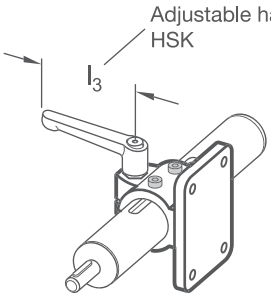
RoHS-compliant product











Clamping point														Accessories recom. hand lever
Bore d_1		Clamping length k	d_2	Fastening screws on the drive key d_3	l_1	l_2	m	t	x_1	x_2	y_1	y_2	Hex socket cap screw	HSK for z lever length l_3
Without sliding insert	With sliding insert													
B 30	G 30	40	6,5	M 4	62	40	30	7	52	35	70	53	M 8-25	78
B 30	G 30	56	8,5	M 4	83	56	42	10	78	52	108	82	M 10-35	-
B 40	G 40	56	8,5	M 5	83	56	42	10	78	52	108	82	M 10-35	92
B 40	G 40	65	11	M 5	95	65	50	14	92	62	128	98	M 10-50	-
B 50	G 50	65	11	M 6	95	65	50	14	92	62	128	98	M 10-50	92
B 60	G 60	80	11	M 8	112	80	60	14	110	74	154	118	M 10-50	92

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

FS.E - d_1 - k - z - o

- Flanged linear unit connector
- Clamping point
- Clamping length
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

FSZ.E | Flanged linear unit connectors, with two fastening bores, aluminum

PRODUCT INFO

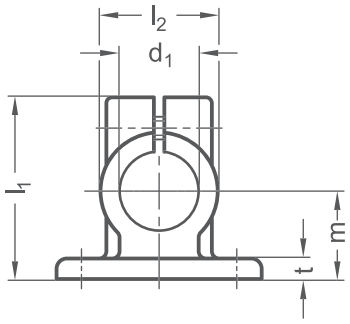
Flanged linear unit connectors FSZ.E of die-cast aluminum have a slitted bore machined by cutting methods, with or without a sliding insert. This is arranged in the plane parallel to the face of the flange.

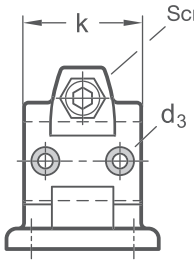
Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

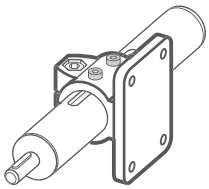
Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a hex socket cap screw or an adjustable hand lever reduces size of the guide element bore.

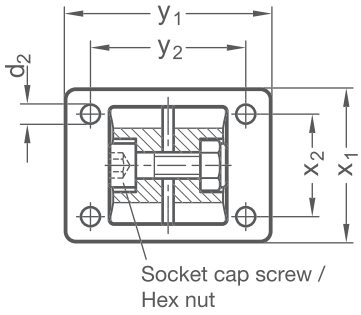
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

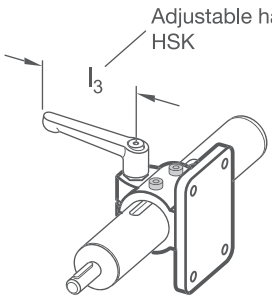
RoHS-compliant product











Clamping point													**Accessories** recom. hand lever
Bore d_1		Clamping length		Mounting screws on the drive key									
Without sliding insert	With sliding insert	**k**	d_2	d_3	l_1	l_2	**m**	**t**	**x**	y_1	y_2	Hex socket cap screw	HSK for z lever length l_3
B 30	G 30	40	6,5	M 4	62	40	30	7	52	70	53	M 8-25	78
B 30	G 30	56	8,5	M 4	83	56	42	10	78	108	82	M 10-35	-
B 40	G 40	56	8,5	M 5	83	56	42	10	78	108	82	M 10-35	92

Screw point **z**	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface **o**	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

FSZ.E - d_1 - k - z - o

- Flanged linear unit connector
- Clamping point
- Clamping length
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

FE.E Flanged linear unit connectors, with four fastening bores, stainless steel

PRODUCT INFO

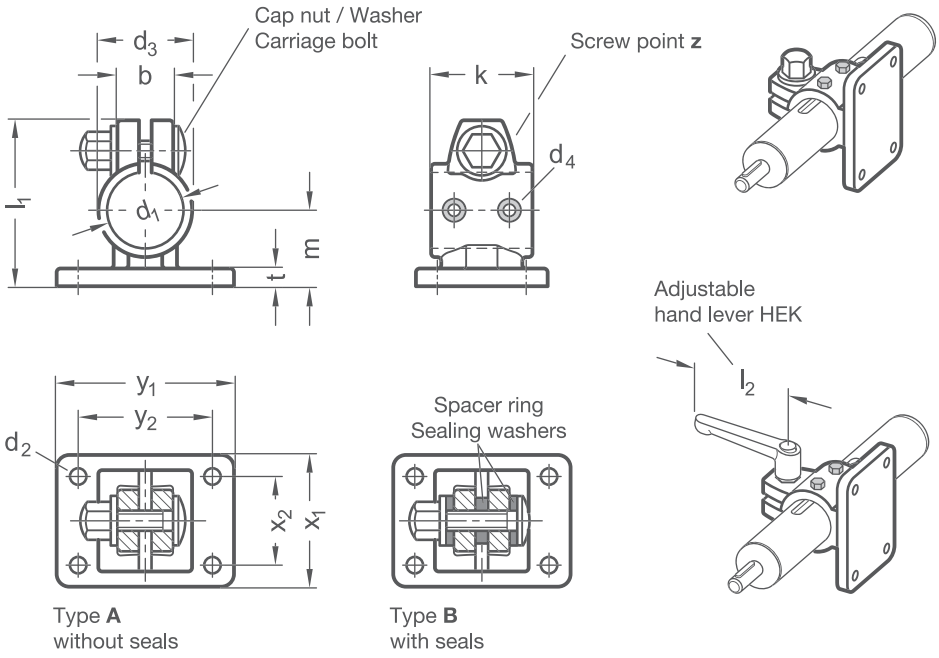
Flanged linear unit connectors FE.E of precision-cast stainless steel have a slitted bore machined by cutting methods and are fitted with a sliding insert. This is arranged in the plane parallel to the face of the flange.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a carriage bolt and a cap nut or an adjustable hand lever reduces the size of the guide element bore or clamping point. Type B is equipped with seals at the screw point.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point Bore d_1 With sliding insert	b	d_2	d_3	Mounting screws on the drive key d_4	Clamping length k	l_1	m	t	x_1	x_2	y_1	y_2	Cap nut	**Accessories** recom. hand lever HEK for z lever length l_2
G 30	22	6,5	37	M 4	40	66	30	7	52	35	70	53	M 8	78
G 50	30	10,7	60	M 6	65	98,5	50	9	92	62	128	98	M 10	92

Type t	
A	Without seals
B	With seals (sealing washer polyacetal POM, blue, spacer ring silicone 40 ... 60 Shore A, blue)

Screw point z	
4	Cap nut stainless steel DIN 917-A2 and carriage bolt stainless steel DIN 603-A2

ORDER KEY

FE.E - d_1 - t - z

- Flanged linear unit connector
- Clamping point
- Type
- Screw point

ACCESSORIES

– Stainless steel adjustable hand levers **HEK** *see page 170*

FEZ.E | Flanged linear unit connectors, with two fastening bores, stainless steel

PRODUCT INFO

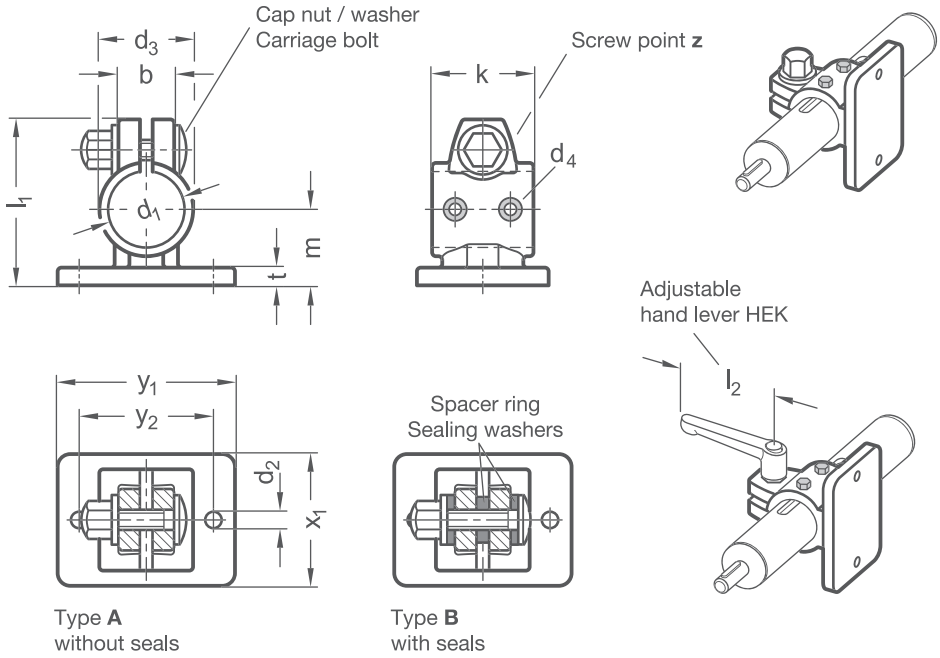
Flanged linear unit connectors FEZ.E of precision-cast stainless steel have a slitted bore machined by cutting methods and are fitted with a sliding insert. This is arranged in the plane parallel to the face of the flange.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a carriage bolt and a cap nut or an adjustable hand lever reduces the size of the guide element bore or clamping point. Type B is equipped with seals at the screw point.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point Bore d_1 With sliding insert	b	d_2	d_3	Mounting screws on the drive key d_4	Clamping length k	l_1	m	t	x	y_1	y_2	Cap nut	**Accessories** recom. hand lever HEK for z lever length l_2
G 30	22	6,5	37	M 4	40	66	30	7	52	70	53	M 8	78

Type t	
A	Without seals
B	With seals (sealing washer polyacetal POM, blue, spacer ring silicone 40 ... 60 Shore A, blue)

Screw point z	
4	Cap nut stainless steel DIN 917-A2 and carriage bolt stainless steel DIN 603-A2

ORDER KEY **FEZ.E - d_1 - t - z**

Flanged linear unit connector
Clamping point
Type
Screw point

ACCESSORIES

– Stainless steel adjustable hand levers **HEK** *see page 170*

FM.E Flanged linear unit connectors, multi-piece, aluminum

PRODUCT INFO

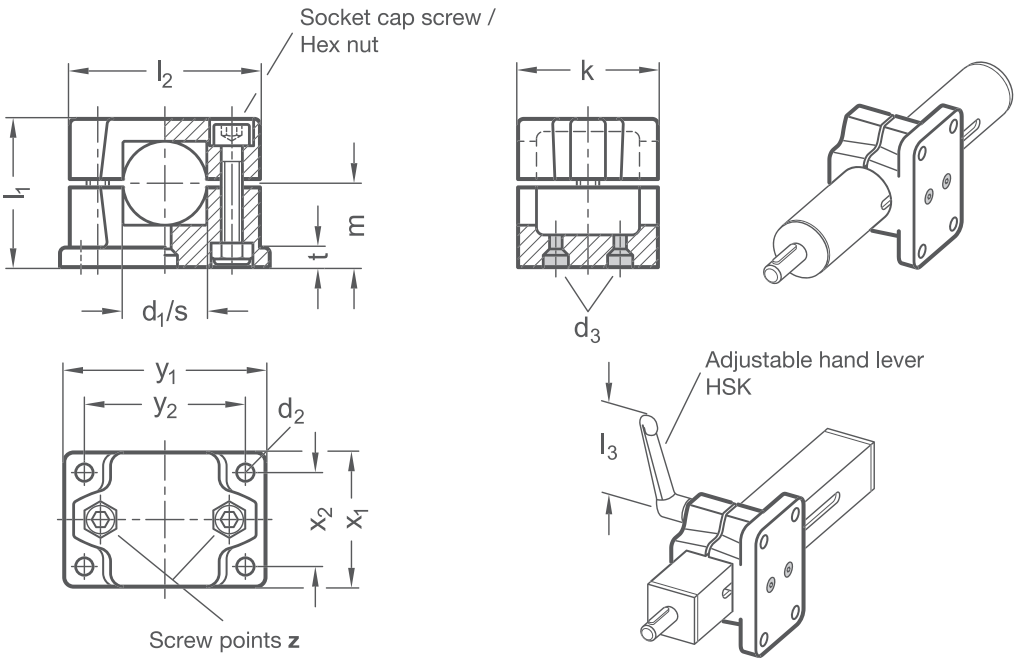
Flanged linear unit connectors FM.E of die-cast aluminum have a split guide element bore machined by cutting methods. This is arranged in the plane parallel to the face of the flange.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round or square guide mechanism that can be adjusted and clamped for low play. Centering bushes in the pass-through bores eliminate axial play. Drive keys transmit the linear movement of the linear unit to the guide element.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the guide element bore size.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point														Accessories recom. hand lever
Bore d_1	Square s	d_2	Mounting screws on the drive key d_3	Clamping length k	l_1	l_2	m	t	x_1	x_2	y_1	y_2	Hex socket cap screws	HSK for z lever length l_3
B 30	V 30	6,5	M 4	50	53	68	30	7	50	35	75	60	M 8-35	78
B 40	V 40	11	M 5	76	81,5	98	46,5	14	76	50	115	90	M 10-60	92
B 50	V 50	11	M 6	76	81,5	98	46,5	14	76	50	115	90	M 10-60	92

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

FM.E - d_1 / s - z - o

- Flanged linear unit connector
- Clamping point
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

BK.E Base linear unit connectors, with four fastening bores, aluminum / stainless steel

PRODUCT INFO

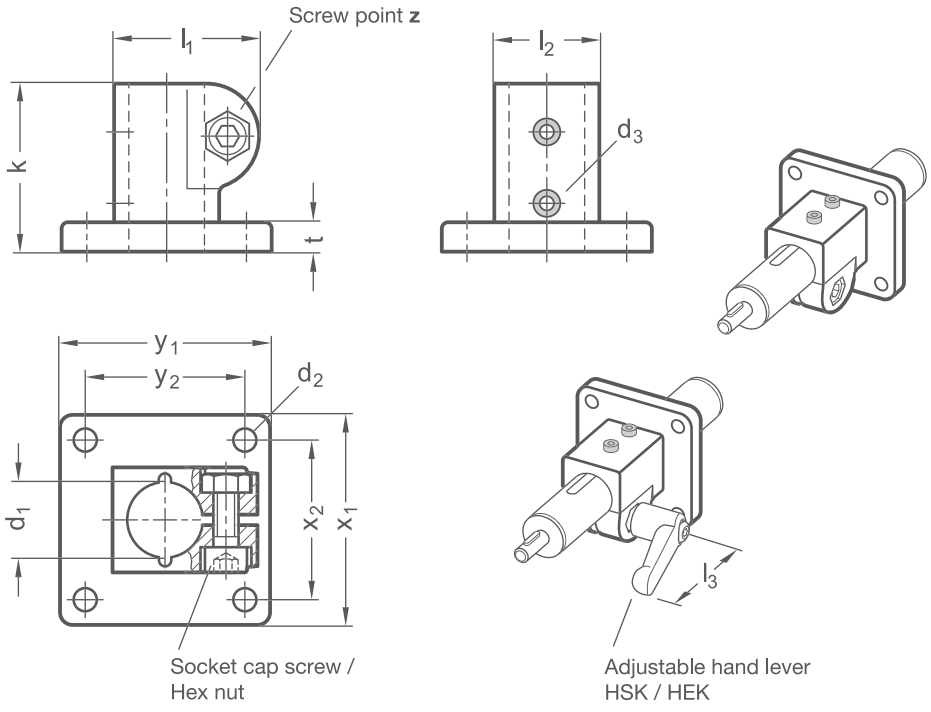
Base linear unit connectors BK.E of die-cast aluminum or precision-cast stainless steel have a slitted bore machined by cutting methods, with or without a sliding insert. This is arranged perpendicular to the face of the flange.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a hex socket cap screw or an adjustable hand lever reduces size of the guide element bore.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point													**Accessories** recom. hand lever for z	
Bore d_1														
Without sliding insert (only alum.)	With PTFE sliding insert	d_2	Mounting screws on the drive key d_3	Clamping length k	l_1	l_2	t	x_1	x_2	y_1	y_2	Hex socket cap screw	HSK for aluminum clamp lever length l_3	HEK for stainless steel clamp lever length l_3
B18	G18	5,5	M3	40	34,5	25	7	50	38	50	38	M 6-20	63	63

Screw point
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum linear unit connector)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material
o

2	Aluminium textured powder-coated, Black RAL 9005
8	Aluminium blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

BK.E - d_1 - z - o

- Base linear unit connector
- Clamping point
- Screw point
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*
– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

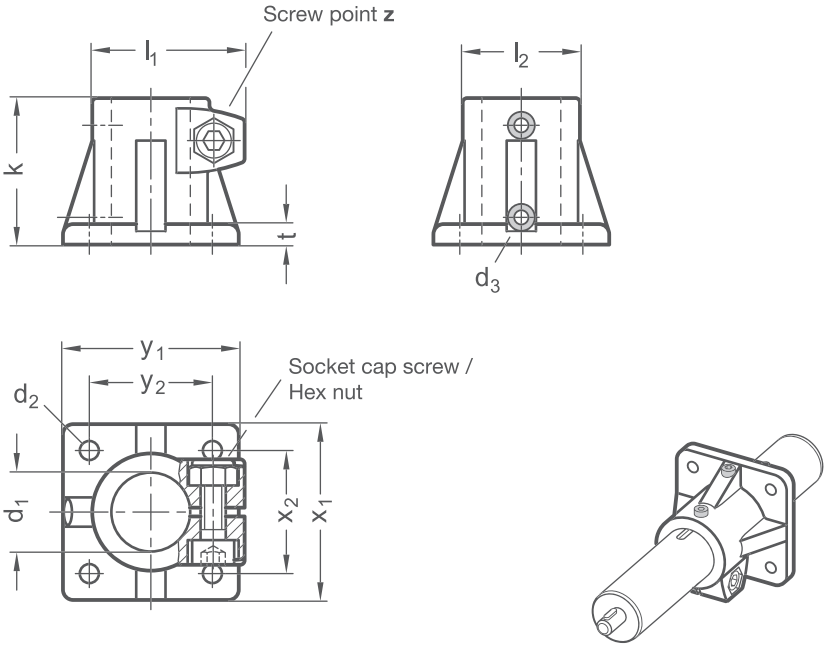
PRODUCT INFO

Base linear unit connectors BS.E of die-cast aluminum have a slitted bore machined by cutting methods, with or without a sliding insert. This is arranged perpendicular to the face of the flange.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a hex socket cap screw reduces the guide element bore size.

RoHS-compliant product



Clamping point		Clamping length		Mounting screws on the drive key								
Bore d_1												
Without sliding insert	With PTFE sliding insert	k	d_2	d_3	l_1	l_2	t	x_1	x_2	y_1	y_2	Hex socket cap screw
B 30	G 30	50	6,5	M 4	52	40	7	60	42	60	42	M 8-25
B 30	G 30	70	8,5	M 4	68	56	10	90	64	90	64	M 10-35
B 40	G 40	70	8,5	M 5	68	56	10	90	64	90	64	M 10-35
B 40	G 40	85	11	M 5	77,5	65	14	105	74	105	74	M 10-50
B 50	G 50	85	11	M 6	77,5	65	14	105	74	105	74	M 10-50
B 60	G 60	100	11	M 8	92	80	14	125	89	125	89	M 10-50

Screw point z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

BS.E - d_1 - k - z - o

- Base linear unit connector
- Clamping point
- Clamping length
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

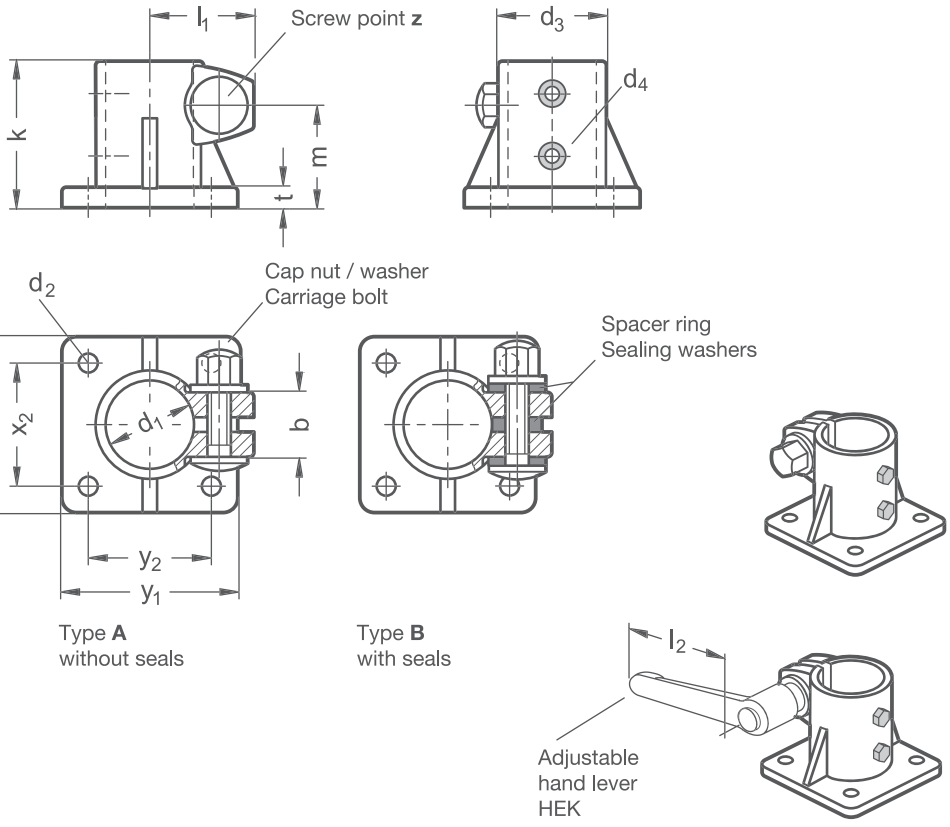
Base linear unit connectors BE.E of precision-cast stainless steel have a slitted bore machined by cutting methods and are fitted with a sliding insert. This is arranged perpendicular to the face of the flange.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a carriage bolt and a cap nut or an adjustable hand lever reduces the size of the guide element bore or clamping point. Type B is equipped with seals at the screw point.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point Bore d_1 With PTFE sliding insert	b	d_2	d_3	Mounting screws on the drive key d_4	Clamping length k	l_1	m	t	x_1	x_2	y_1	y_2	Cap nut	**Accessories** recom. hand lever HEK for z lever length l_2
G 30	22	6,5	37	M 4	50	36	35	6,5	60	42	60	42	M 8	78
G 50	30	10,7	60	M 6	85	48,5	60	9	105	74	105	74	M 10	92

Type t	
A	Without seals
B	With seals (sealing washer polyacetal POM, blue, spacer ring silicone 40 ... 60 Shore A, blue)

Screw point z	
4	Cap nut stainless steel DIN 917-A2 and carriage bolt stainless steel DIN 603-A2

ORDER KEY

BE.E - d_1 - t - z

- Base linear unit connector
- Clamping point
- Type
- Screw point

ACCESSORIES

– Stainless steel adjustable hand levers **HEK** *see page 170*

PRODUCT INFO

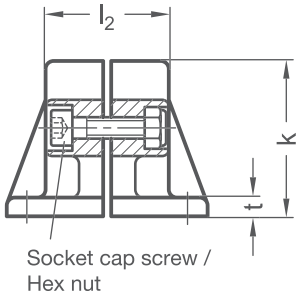
Base linear unit connectors BM.E of die-cast aluminum have a split guide element bore machined by cutting methods that is oriented perpendicular to the face of the flange.

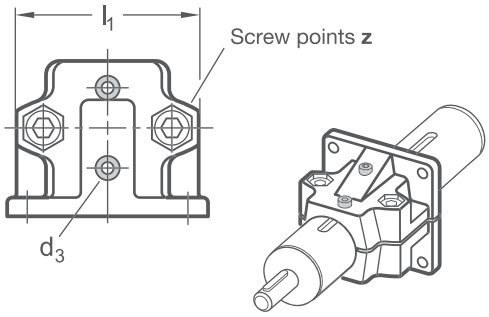
Together with the guide tube of the linear unit, the guide element bore forms a solid linear round or square guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

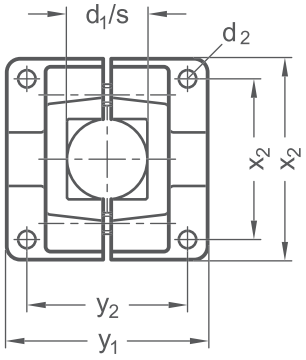
Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the guide element bore size.

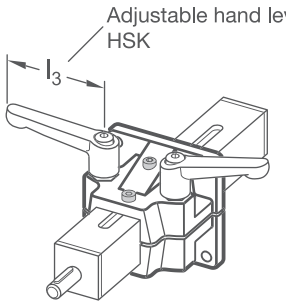
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product









Clamping point													Accessories recom. hand lever
Bore d_1	Square s	d_2	Mounting screws on the drive key d_3	Clamping length k	l_1	l_2	t	x_1	x_2	y_1	y_2	Hex socket cap screws	HSK for z lever length l_3
B 30	V 30	7	M 4	58	69	46	7	75	60	75	60	M 8-35	78
B 40	V 40	11	M 5	91	98	70	14	115	90	119	90	M 10-60	92
B 50	V 50	11	M 6	91	98	70	14	115	90	119	90	M 10-60	92

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

BM.E - d_1 / s - z - o

- Base linear unit connector
- Clamping point
- Screw points
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

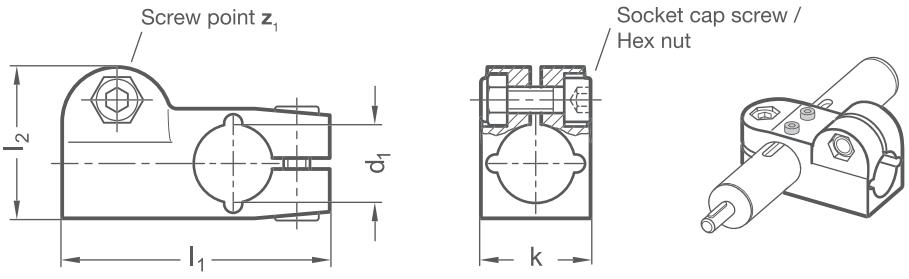
T-linear unit connectors TK.E of die-cast aluminum or precision-cast stainless steel have a slitted clamping point and guide element bore machined by cutting methods, with or without a sliding insert. Both bores are situated in a plane and arranged in a T-shape.

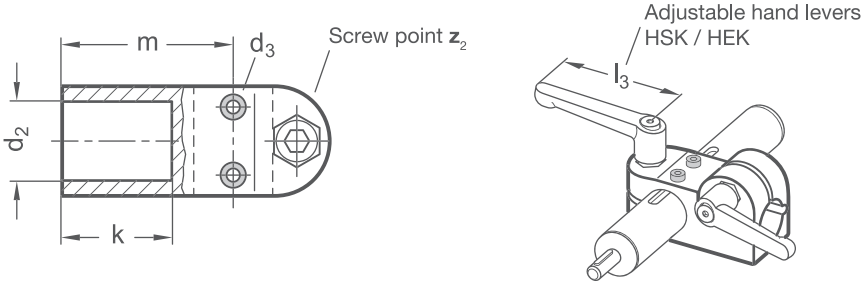
Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the guide element bore or clamping point size.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK or HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product





Clamping point 1		Clamping point 2							**Accessories** recom. hand lever			
Bore d_1									HSK for aluminum clamp		HEK for stainless steel clamp	
Without sliding insert (only alum.)	With PTFE sliding insert	Bore d_2	Mounting screws on the drive key d_3	Clamping length k	l_1	l_2	m	Hex socket cap screws z_1 / z_2	for z_1 l_3	for z_2 l_3	for z_1 l_3	for z_2 l_3
B 18	G 18	B 18	M3	25	61	34,5	39	M 6-20	-	63	63	63

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated (only for aluminum linear unit connector)
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface / material
o

2	Aluminium textured powder-coated, Black RAL 9005
8	Aluminium blasted, matt
ED	Stainless steel, blasted, matt

ORDER KEY

TK.E - d_1 - d_2 - z - o

- T-linear unit connector
- Clamping point 1
- Clamping point 2
- Screw points
- Surface / material

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*
– Stainless steel adjustable hand levers **HEK** *see page 170*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

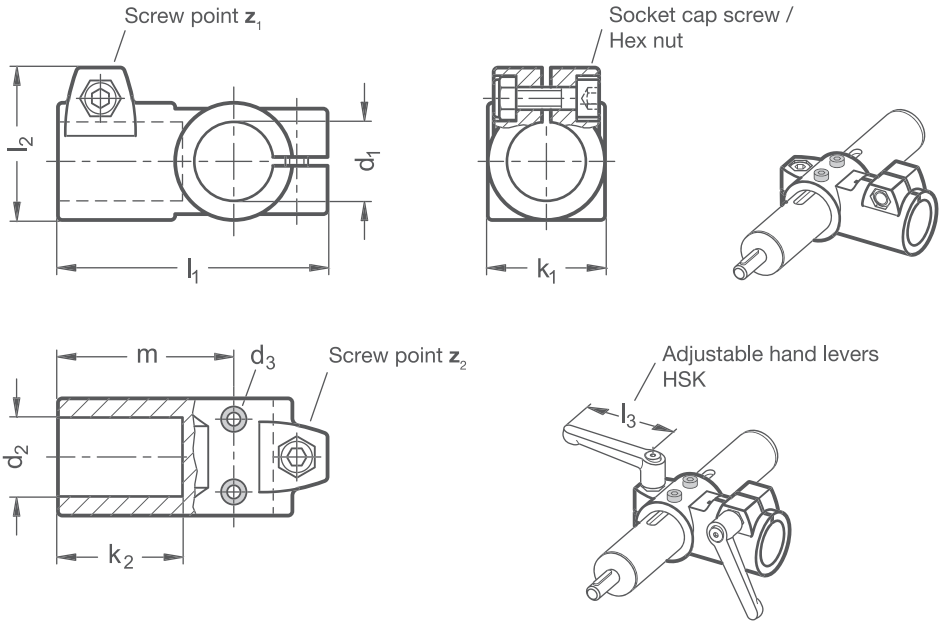
T-linear unit connectors TS.E of die-cast aluminum have a slitted clamping point and guide element bore machined by cutting methods, with or without a sliding insert. Both bores are situated in a plane and arranged in a T-shape.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, hex socket cap screws or adjustable hand levers reduce the guide element bore or clamping point size.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1		Clamping point 2									Accessories recom. hand lever	
Bore d_1											HSK	
Without sliding insert	With PTFE sliding insert	Bore d_2	Clamping length k_1	Mounting screws on the drive key d_3	Clamping length k_2	l_1	l_2	m	Hex socket cap screws z_1	Hex socket cap screws z_2	for z_1 l_3	for z_2 l_3
B 30	G 30	B 30	40	M 4	42,5	92	52	60	M 8-25	M 8-25	78	78
B 30	G 30	B 30	56	M 4	62	130	68	90	M 10-35	M 10-35	-	-
B 40	G 40	B 40	56	M 5	62	130	68	90	M 10-35	M 10-35	92	92
B 40	G 40	B 40	65	M 5	75	148	77,5	103	M 10-50	M 10-50	92	-
B 50	G 50	B 50	65	M 6	75	148	77,5	103	M 10-50	M 10-50	92	92
B 60	G 60	B 60	80	M 8	80	177	92	125	M 10-50	M 10-50	92	-

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

TS.E - d_1 - d_2 - k - z - o

- T-linear unit connector
- Clamping point 1
- Clamping point 2
- Clamping length
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

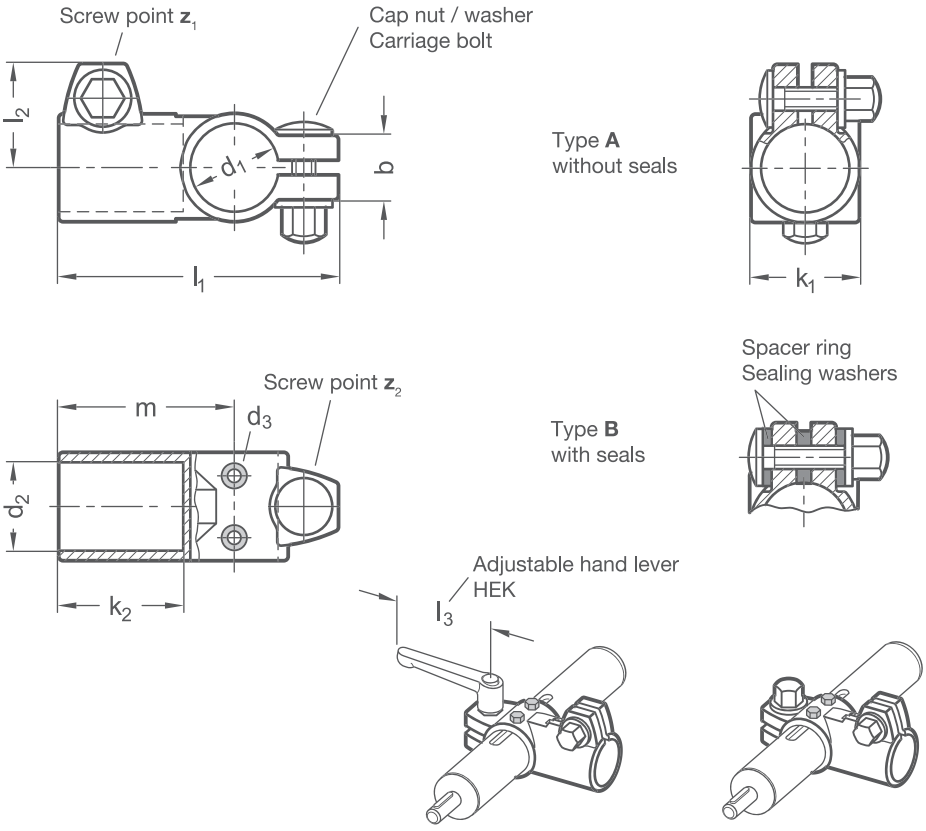
T-linear unit connectors TE.E of precision-cast stainless steel have a clamping point and a slitted bore machined by cutting methods and are fitted with a sliding insert. Both bores are situated in a plane and arranged in a T-shape.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the guide element.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw points, carriage bolts together with cap nuts or adjustable hand levers reduce the guide element bore or clamping point size. Type B is equipped with seals at the screw points.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HEK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point 1	Clamping point 2									Accessories recom. hand lever	
Bore d_1 With PTFE sliding insert	Bore d_2 Without sliding insert	b	Mounting screws on the drive key d_3	Clamping length k_1	k_2	l_1	l_2	m	Cap nut	HEK for z_1 l_3	HEK for z_2 l_3
G 30	B 30	22	M 4	37	42	96	35	60	M 8	78	78
G 50	B 50	30	M 6	65	75	151,5	48,5	103	M 10	92	92

Type t	
A	Without seals
B	With seals (sealing washer polyacetal POM, blue, spacer ring silicone 40 ... 60 Shore A, blue)

Screw points z	
4	Cap nut stainless steel DIN 917-A2 and carriage bolt stainless steel DIN 603-A2

ORDER KEY

TE.E - d_1 - d_2 - t - z

- T-linear unit connector
- Clamping point 1
- Clamping point 2
- Type
- Screw points

ACCESSORIES

– Stainless steel adjustable hand levers **HEK** *see page 170*

PRODUCT INFO

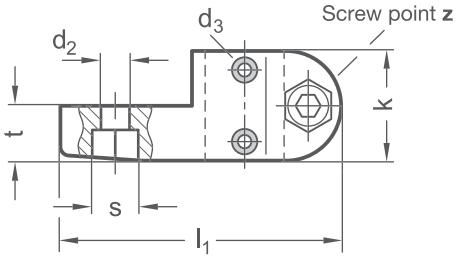
Swivel linear unit connectors LKP.E of die-cast aluminum have a slitted guide element bore machined by cutting methods, with or without sliding insert, as well as a smooth fastening lug, which is arranged at an angle of 90° to the guide element bore.

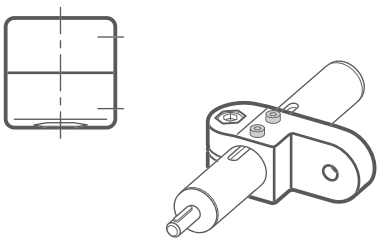
Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

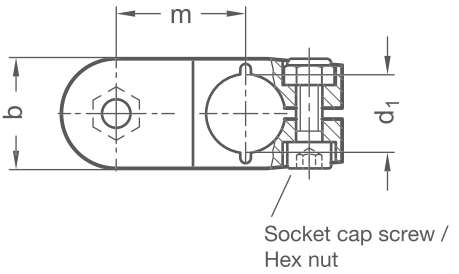
Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a hex socket cap screw or an adjustable hand lever reduces size of the guide element bore.

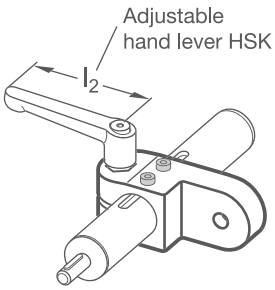
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product









Clamping point											**Accessories** recom. hand lever for z	
Bore d_1		Lug width		Mounting screws on the drive key							HSK for aluminum clamp lever length	HEK for stainless steel clamp lever length
Without sliding insert	With PTFE sliding insert	b	d_2	d_3	k	l_1	m	s	t	Hex socket cap screw	l_2	l_2
B18	G18	25	6,5	M3	25	64	29,5	10	12,5	M 6-20	63	63

Screw points z	
1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface o	
2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

LKP.E - d_1 - z - o

- Swivel linear unit connector
- Clamping point
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

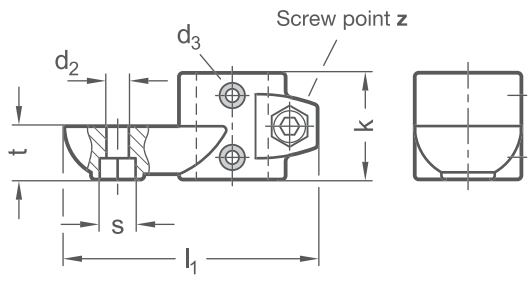
Swivel linear unit connectors LSP.E of die-cast aluminum have a slitted guide element bore machined by cutting methods, with or without sliding insert, as well as a clamping lug that may be smooth, have a centering ring or crown toothing that is either countersunk or raised. It is situated at an angle of 90° to the axis of the guide element bore.

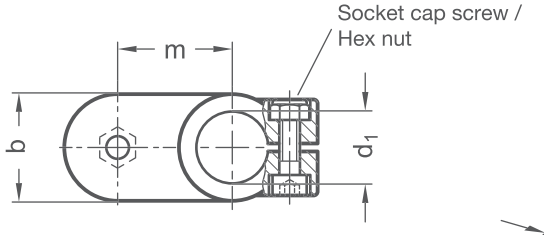
Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

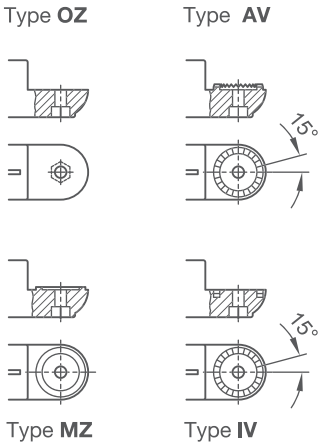
Depending on the design, the part to be moved is fastened to the guide element (e.g. as a swivel tube clamp) or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a hex socket cap screw or an adjustable hand lever reduces size of the guide element bore.

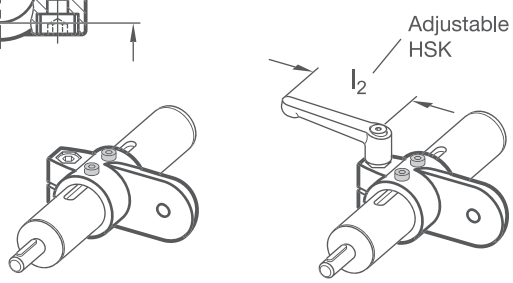
Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever due to the shorter lever length.

RoHS-compliant product









Clamping point											Accessories recom. hand lever
Bore d_1											
Without sliding insert	With PTFE sliding insert	Lug width **b**	d_2	Mounting screws on the drive key d_3	**k**	l_1	**m**	**s**	**t**	Hex socket cap screw	HSK for z lever length l_2
B 30	G 30	40	8,5	M 4	40	95	43	13	20	M 8-25	78
B 40	G 40	65	11	M 5	65	148	70	17	32,5	M 10-50	-
B 50	G 50	65	11	M 6	65	148	70	17	32,5	M 10-50	92

Type
t

OZ	Without centering step (smooth)
MZ	With centering step
AV	With external serration
IV	With internal serration

Screw point
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

LSP.E - d_1 - t - z - o

- Swivel linear unit connector
- Clamping point
- Type
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

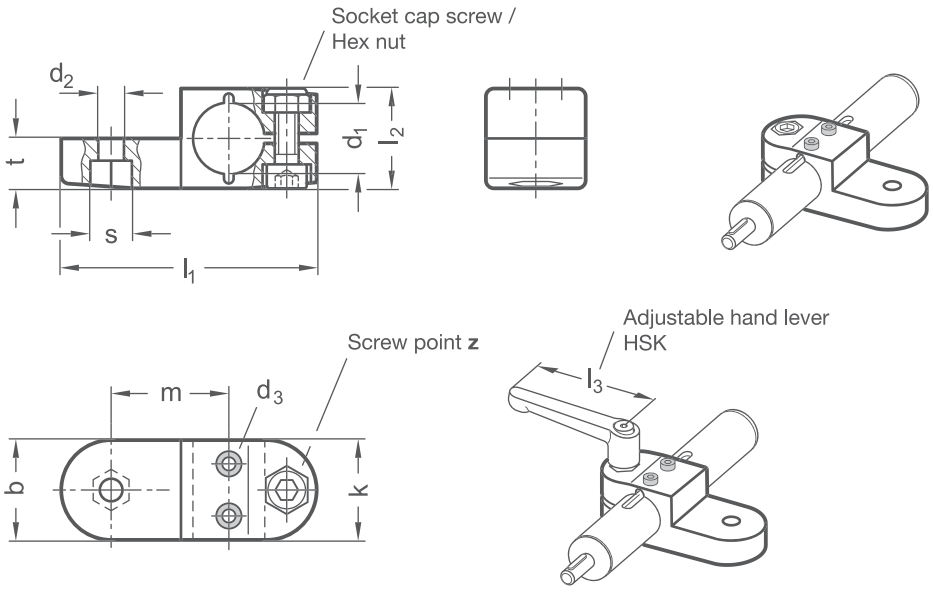
Swivel linear unit connectors LKQ.E of die-cast aluminum have a slitted guide element bore machined by cutting methods, with or without sliding insert, as well as a smooth fastening lug, which is centered and perpendicular to the guide element bore.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a hex socket cap screw or an adjustable hand lever reduces size of the guide element bore.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point		Lug width		Mounting screws on the drive key							Hex socket cap screw	**Accessories** recom. hand lever for z	
Bore d_1													
Without sliding insert	With PTFE sliding insert	**b**	d_2	d_3	**k**	l_1	l_2	**m**	**s**	**t**		HSK for aluminum clamp lever length l_3	HEK for stainless steel clamp lever length l_3
B18	G18	25	6,5	M3	25	64	25	29,5	10	12,5	M 6-20	63	63

Screw points
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

LKQ.E - d_1 - z - o

- Swivel linear unit connector
- Clamping point
- Screw point
- Surface

ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

PRODUCT INFO

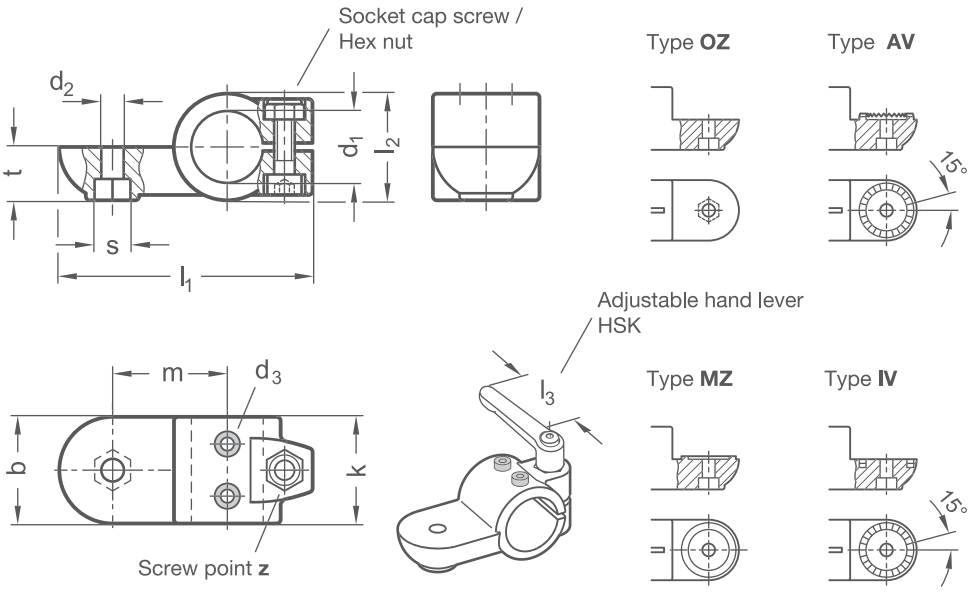
Swivel linear unit connectors LSQ.E of die-cast aluminum have a slitted guide element bore machined by cutting methods, with or without a sliding insert, as well as a clamping lug that may be smooth, have a centering ring or crown toothing that is either countersunk or raised. It is centered and perpendicular to the axis of the guide element bore.

Together with the guide tube of the linear unit, the guide element bore forms a solid linear round guide mechanism that can be adjusted and clamped for low play. Drive keys transmit the linear movement of the linear unit to the linear unit connector.

Depending on the design, the part to be moved is fastened to the guide element (e.g. as a swivel tube clamp) or the guide element itself is installed at the place of use such that the entire linear unit moves together. At the screw point, a hex socket cap screw or an adjustable hand lever reduces size of the guide element bore.

Adjustable hand levers are intended for repeated, tool-free clamping. Under the designation HSK, these are available separately for individual use and in other designs. Compared with the tool-operated hex socket cap screw, the clamping force achievable with an adjustable hand lever is lower due to the shorter lever length.

RoHS-compliant product



Clamping point												**Accessories** recom. hand lever
Bore d_1												
Without sliding insert	With PTFE sliding insert	Lug width **b**	d_2	Mounting screws on the drive key d_3	**k**	l_1	l_2	**m**	**s**	**t**	Hex socket cap screw	HSK for z lever length l_3
B 30	G 30	40	8,5	M 4	40	95	40	43	13	20	M 8-25	78
B 40	G 40	65	11	M 5	65	148	65	70	17	32,5	M 10-50	92
B 50	G 50	65	11	M 6	65	148	65	70	17	32,5	M 10-50	92

Type
t

OZ	Without centering step (smooth)
MZ	With centering step
AV	With external serration
IV	With internal serration

Screw point
z

1	Hex socket cap screw steel, zinc-plated DIN 912-8.8 and lock nut steel DIN 985-8, zinc-plated
2	Hex socket cap screw stainless steel DIN 912-A2-70 and lock nut stainless steel DIN 985-A2, glide coating

Surface
o

2	textured powder-coated, Black RAL 9005
8	blasted, matt

ORDER KEY

LSQ.E - d_1 - t - z - o

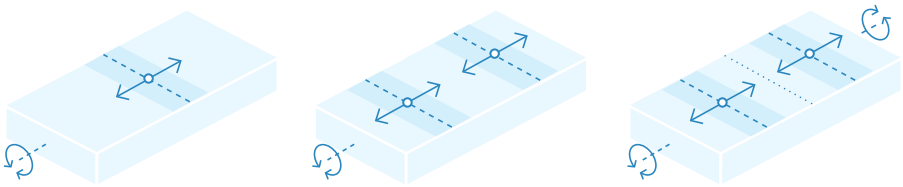
- Swivel linear unit connector
- Clamping point
- Type
- Screw point
- Surface

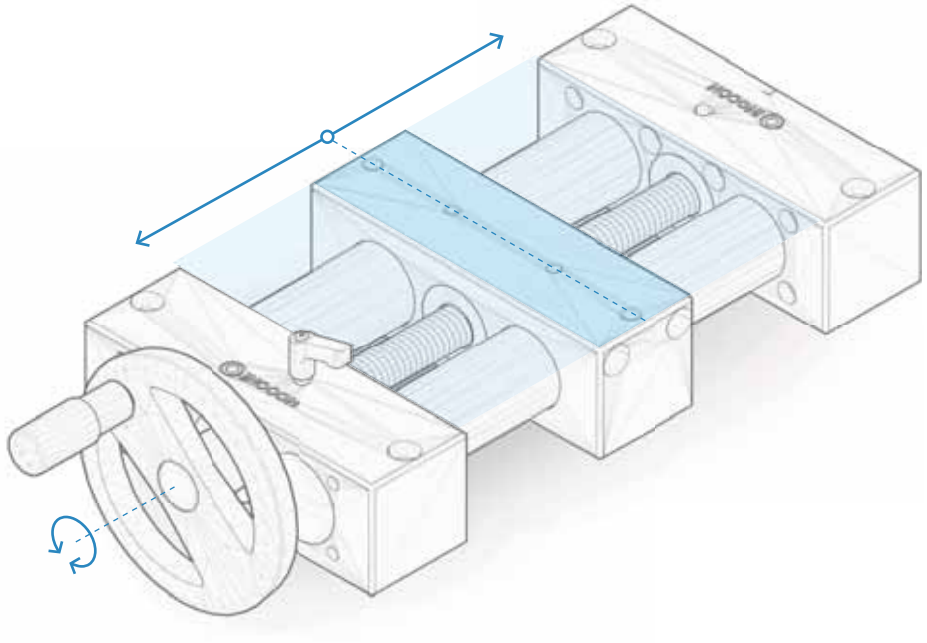
ACCESSORIES

– Adjustable hand levers **HSK** *see page 168*

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors





Double tube linear units

The product group “Double Tube Linear Units 2C” contains linear axes made of chrome-plated steel or bright stainless steel precision tubes.

If very high guide precision is required, the group also offers linear units of hard-chrome-plated or polished solid shafts.

The center spindle with ball bearings on both sides can be designed as a trapezoidal or fine thread lead screw or as a recirculating ball screw. The guide elements have either a sliding or roller guide.

Double tube linear units can be divided into three types, each available with single or double guide elements:

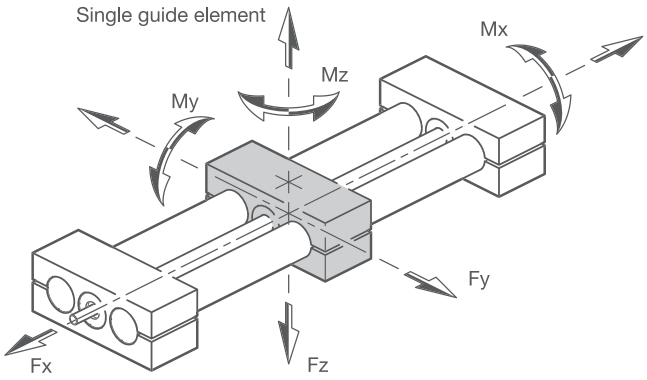
- **Linear units with one guide element:** the guide element is moved along the guide tubes by the spindle thread.
- **Linear units with two opposing guide elements:** two guide elements move symmetrically along the guide tubes due to different thread directions.
- **Linear units with two independent guide elements:** two guide elements move independently along the guide tubes due to separate spindles.

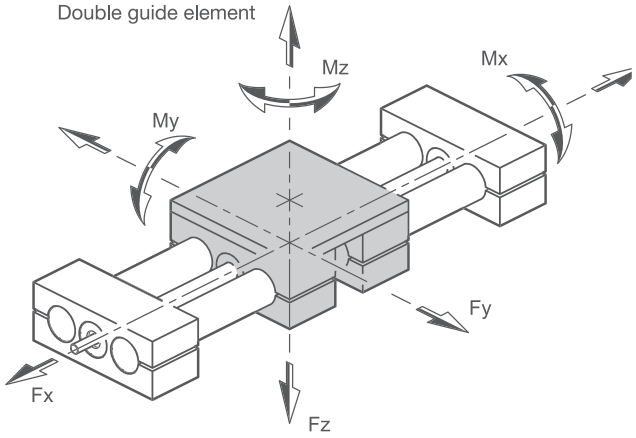
Possible accessories for the double tube linear units include hand wheels in various designs, position indicators and clamping plates for spindle clamping. The accessories are matched to the nominal diameter of the linear units and are found in group 2D.

Double tube linear units are capable of receiving high forces and torques. Depending on the features, a variety of precision levels are possible, which can be flexibly adapted to many different areas of application in machine and system building, such as for height and format adjustment.

An operating manual with instructions for assembly can be downloaded from our website at inocon.de/en/service.

	with single guide element	with double guide element	with recirculating ball screw
Double tube linear units with one guide element	**VD1E** *p. 292* 	**VD1D** *p. 296* 	
Double tube linear units with two opposing guide elements	**VD2E** *p. 300* 	**VD2D** *p. 304* 	
Double tube linear units with two independent guide elements	**VD3E** *p. 308* 	**VD3D** *p. 312* 	
Precision double tube linear units with one guide element	**PD1E** *p. 318* 	**PD1D** *p. 322* 	**PD1DK** *p. 326* 
Precision double tube linear units with two opposing guide elements	**PD2E** *p. 330* 	**PD2D** *p. 334* 	**PD2DK** *p. 338* 
Precision double tube linear units with two independent guide elements	**PD3E** *p. 342* 	**PD3D** *p. 346* 	**PD3DK** *p. 350* 





Single guide element

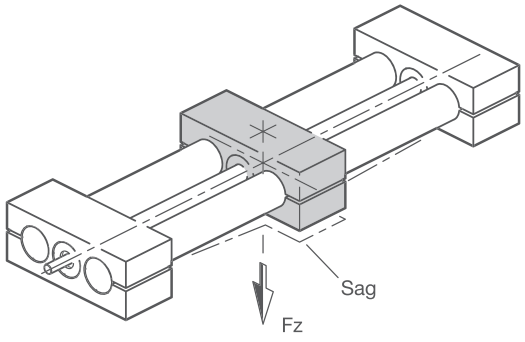
Linear unit nominal diameter	**Fx** in N	**Fy** in N			**Fz** in N			**Mx** in Nm	**My** in Nm	**Mz** in Nm
	l = 500	l = 500	l = 1000	l = 1500	l = 500	l = 1000	l = 1500			
18	425	215	110	-	105	80	-	22	35	40
30	850	1100	900	550	600	350	150	100	100	100
40	1100	3700	2800	1400	2100	600	180	150	140	170
50	1900	3850	2400	2100	3100	700	200	180	220	290
60	2700	6900	5700	5100	6300	2800	360	320	350	500

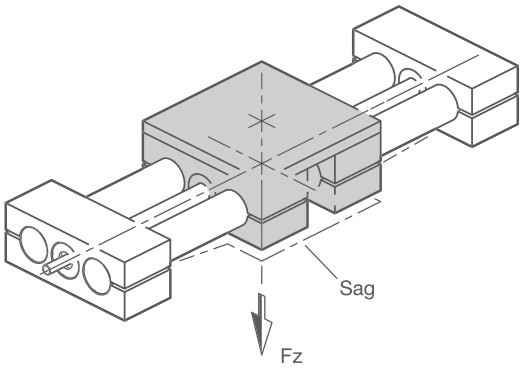
Double guide element

Linear unit nominal diameter	**Fx** in N	**Fy** in N			**Fz** in N			**Mx** in Nm	**My** in Nm	**Mz** in Nm
	l = 500	l = 500	l = 1000	l = 1500	l = 500	l = 1000	l = 1500			
18	425	290	180	-	140	105	-	42	50	75
30	850	1550	1300	800	700	550	250	150	150	200
40	1100	6400	3400	1900	2400	750	280	180	210	260
50	1900	7500	5100	2700	3400	850	340	250	350	530
60	2700	11500	9500	8200	7500	3100	610	550	650	980

Sag / elastic deformation

The maximum permissible forces and tightening torques listed in the table will result in elastic deformation of the linear unit. At the listed values, this amounts to approximately 0.4 mm for guide tubes and 0.3 mm for solid guide shafts. This deformation is shown here using the force Fz as an example.





Positioning precision

The positioning precision indicates the deviation with which a position can be reached. The table shown here lists the maximum arising deviation.

	Trapezoidal thread lead screw	Fine thread lead screw	Ball screw
Max. deviation	±0,1 mm / 300 mm Stroke	±0,1 mm / 300 mm Stroke	±0,05 mm / 300 mm Stroke

Repeatable precision

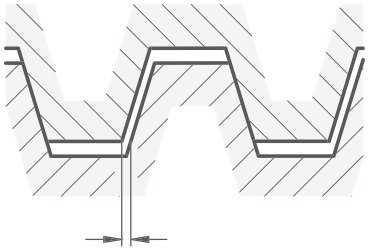
The repeatable precision indicates how precisely a position can be approached multiple times under the same conditions. In most cases, the repeatable precision is higher than the positioning precision because manufacturing tolerances have no influence on the repeatable precision. The trapezoidal and fine thread lead screws have a repeatable precision of ±0.05 mm, and the ball screw has ±0.02 mm.

Guide precision

The precision guide tubes of the linear units of steel are manufactured as per DIN EN 10305-4 and also chrome-plated. In the stainless steel version, steel precision guide tubes as per EN10216-5 are used.

Backlash on reversal

Due to the play between the thread flanks of the spindle and spindle nut, backlash (lost motion) occurs when the direction of the drive movement is changed. This backlash must be overcome before the guide element moves in the opposite direction. The backlash on reversal is required to prevent the spindle nut from seizing on the spindle. For linear units with trapezoidal and fine thread spindle, the value is 0.2 mm and for recirculating ball screws max. 0.04 mm. For recirculating ball screws, the backlash on reversal can be eliminated with pretensioning.



Self-braking

Because trapezoidal and fine thread spindles have pitch angles lower than the angle of friction, they are often self-braking. It is not possible to slide the guide element. In addition, the spindle can be secured against movement with an external spindle clamp. The clamping plates listed as accessories may be used for this.
Due to its lower rolling friction, the ball screw does not have any self-braking properties. An external spindle clamp is recommended to avoid unintentional movement.

Lifespan

The lifespan of linear units depends on the expected ambient conditions of the specific application. The following factors come into play here:

- The installation orientation
- The load to be moved
- The movement speed
- The movement frequency
- Ambient temperature
- External influences
- Compliance with the maintenance intervals

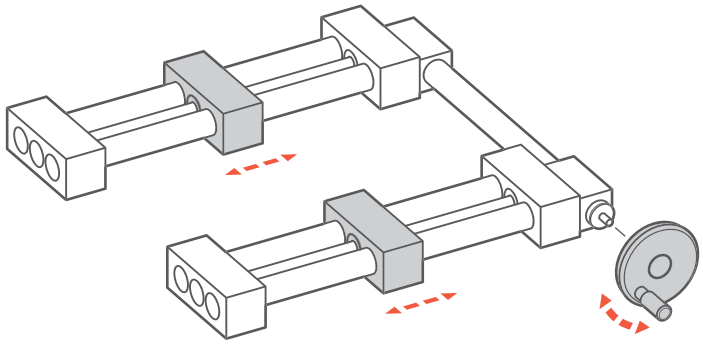
Ambient conditions

The linear units are designed for ambient temperatures from -20°C to +100°C. Large temperature fluctuations and condensing humidity should also be avoided.

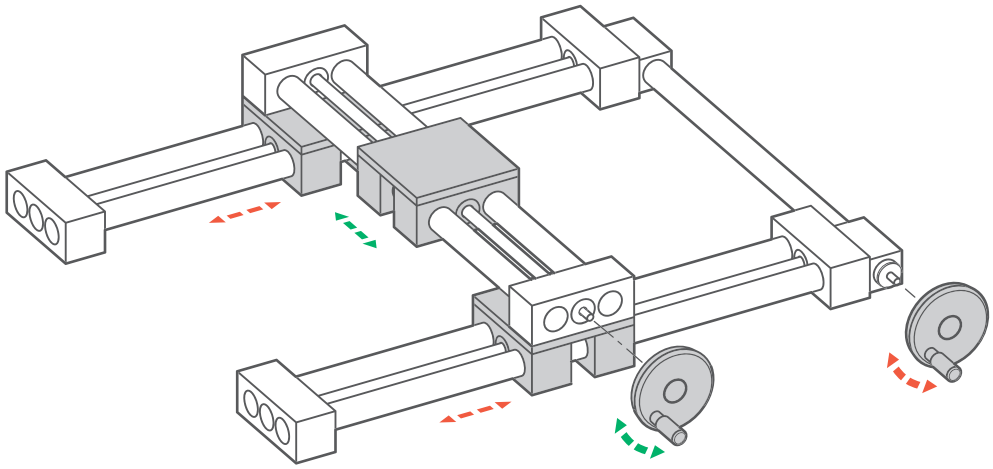
Safety device for vertical linear units

It is possible to install an additional spindle nut that is carried along as a safety nut. This holds the linear unit in position in the event of damage (such as due to overloading or wear) and prevents the guide element from falling when used in a vertical orientation.

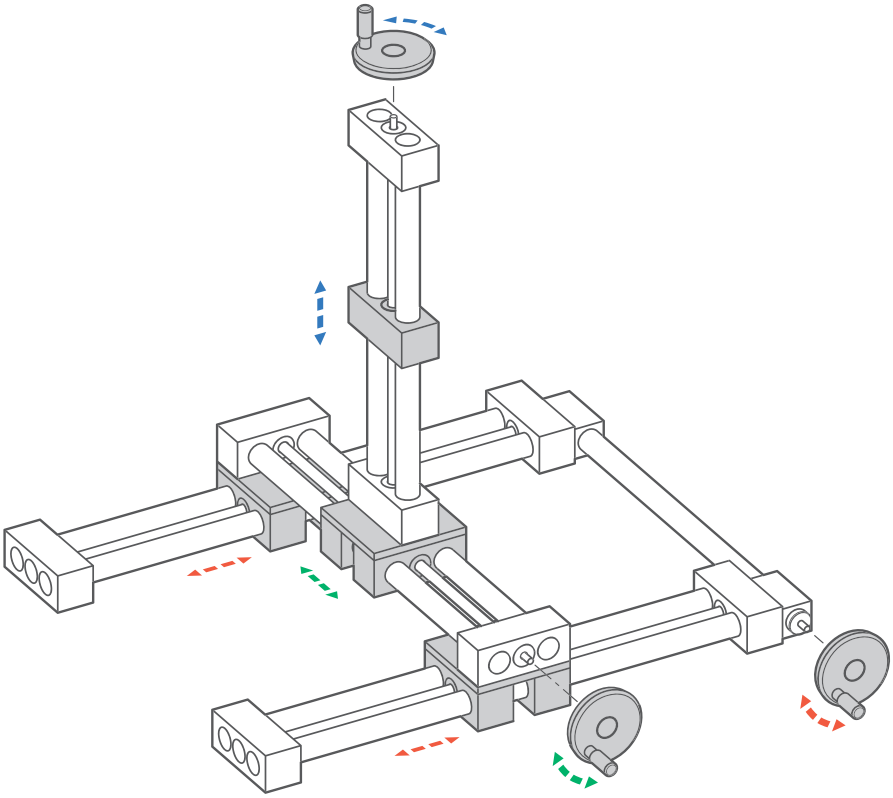
Multi-axis systems are assemblies comprised of multiple linear units. The use of angle gears and transfer units allows multiple linear units to move synchronously. To ensure smooth, even and low-wear movement of the linear units, they must be oriented exactly perpendicular or parallel to each other.



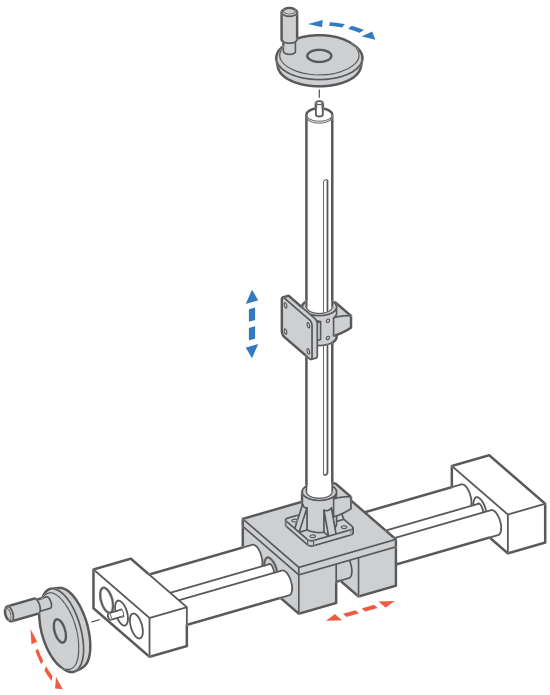
Multi-axis systems with adjustment in X direction



Multi-axis systems with adjustment in X and Y direction



Multi-axis systems with adjustment in X, Y and Z direction



Combined single and double tube linear units with moving in X and Z direction

VD1E | Double tube linear units with one single guide element

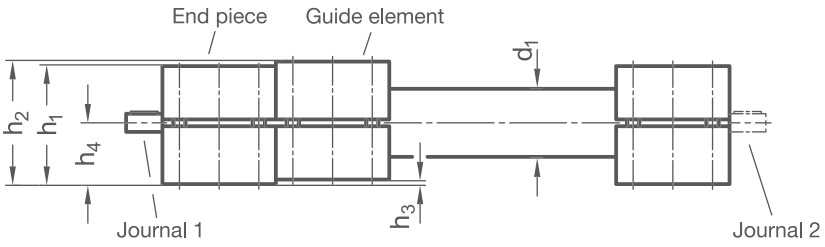
PRODUCT INFO

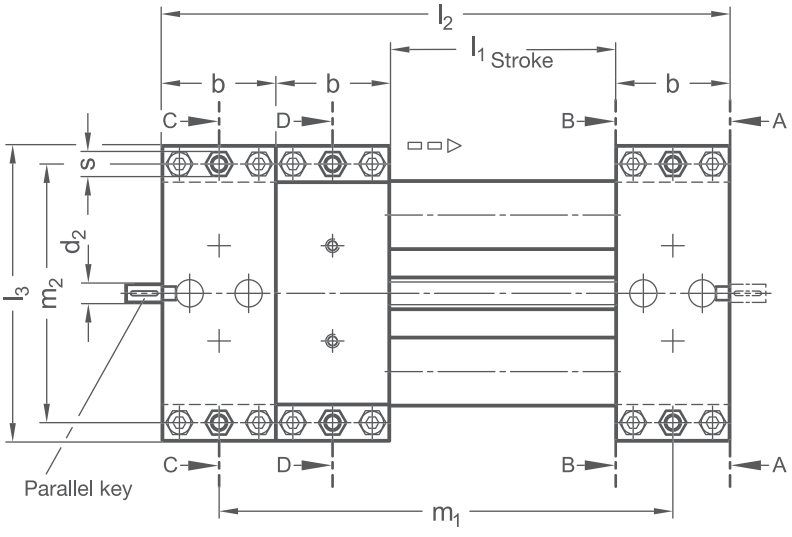
The guide tubes of the **double tube linear units VD1E** are made of chrome-plated steel or polished stainless steel precision tubes. The aluminum end pieces connect the tubes and form a solid linear guide together with the guide element. A continuous spindle with ball bearings on each side is installed in the center. Together with the single guide element, the affixed spindle nut moves linearly along the spindle thread.

Double tube linear units have high torsional stiffness and can handle high weights and torques. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

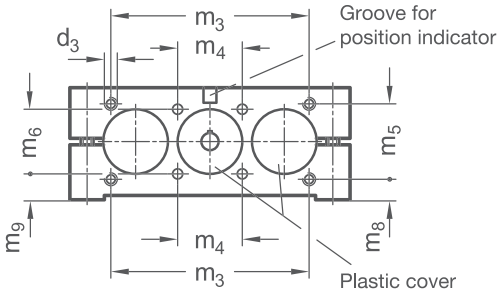
Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product

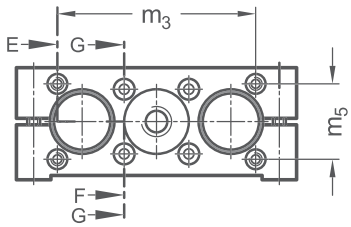




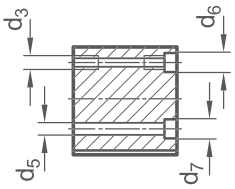
View **A-A**
(end piece outside)



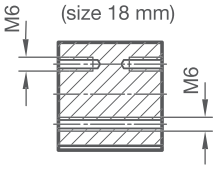
View **B-B**
(end piece inside)



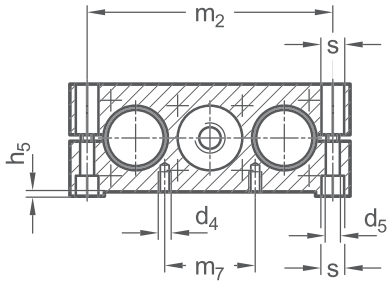
Sectional view **E-F**
(size 30 to 60 mm)



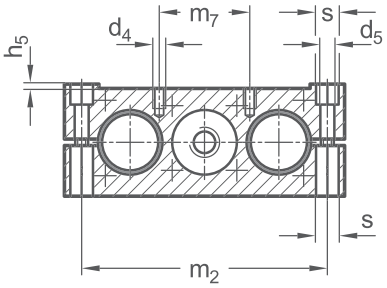
Sectional view **G-G**
(size 18 mm)



Sectional view **C-C**
(end pieces)



Sectional view **D-D**
(guide element)



d_1	Stroke l_1	b	d_2	d_3*	d_4**	d_5	d_6	For screws DIN 912	d_7	For screws DIN 912	h_1	h_2
18	...420	28	6	-	M 5	5,3	-	-	-	-	28	29
30	...1500	50	8	M 6	M 6	6,5	9	M 5	10,5	M 6	52	54
40	...2650	60	12	M 8	M 8	8,5	13,5	M 6	13,5	M 8	60	63
50	...2760	72	12	M 10	M 8	8,5	13,5	M 8	13,5	M 8	72	76
60	...2740	80	14	M 10	M 10	10,5	13,5	M 8	16,5	M 10	86	90

d_1	h_3	h_4	h_5	l_2	l_3	m_1	m_2	m_3	m_4	m_5	m_6	m_7
18	1	14,5	0,75	3xb+l_1	81	2xb+l_1	68	-	20	-	20	18
30	2	27	0,85	3xb+l_1	130	2xb+l_1	114	92	30	35	30	42
40	3	31,5	1,05	3xb+l_1	180	2xb+l_1	160	132	39	38	39	62
50	4	38	1,2	3xb+l_1	206	2xb+l_1	184	150	46	50	46	62
60	4	45	1,35	3xb+l_1	240	2xb+l_1	216	185	55	60	55	74

				Accessories:				
d_1	m_8	m_9	s	Parallel key DIN 6885	Torque support	Clamping plate	Position indicator	Handwheel
18	-	4,5	8	A2x2x12	VZDD	-	VZPM -	VZH
30	9,5	12	10	A2x2x12	-	VZK	VZPM (only for stroke ≤ 1000 mm)	VZPE VZH
40	12,5	12	13	A4x4x12	-	VZK	VZPM	VZPE VZH
50	13	15	13	A4x4x12	-	VZK	VZPM	VZPE VZH
60	14	16,5	17	A5x5x16	-	VZK	VZPM (only for trapezoidal thread)	VZPE VZH

* usable thread depth on both sides min. 2 x d_3 ** usable thread depth min. 1,5 x d_4

2C

Material
w

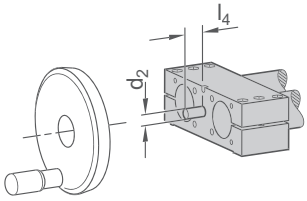
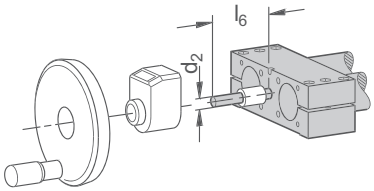
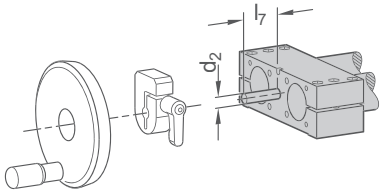
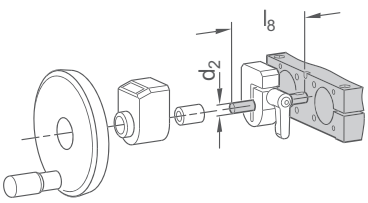
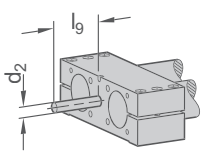
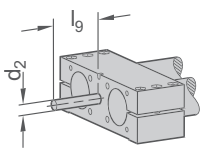
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Steel, with ball bearing
ED	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing	EDS	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

Spindle thread direction
r

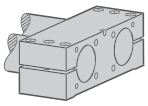
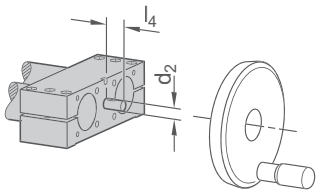
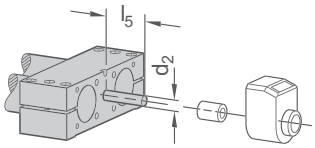
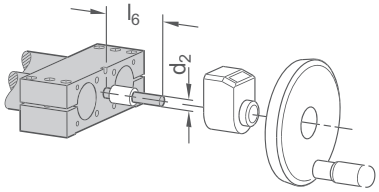
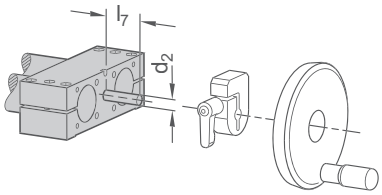
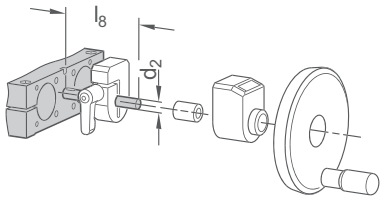
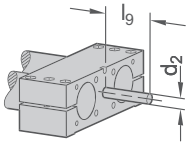
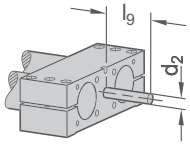
RH	Right-hand thread
LH	Left-hand thread

d_1	Spindle Ø	Spindle pitch **p** Trapezoidal thread	Spindle pitch **p** Fine thread, metric	Journal diameter d_2	Journal length B l_4	Journal length C l_5	Journal length D l_6	Journal length E l_7	Journal length F l_8	Individual journal length l_9
18	10	3	1	6	16	30	46	-	-	16...46
30	14	4	1	8	16	36	52	31	67	16...67
40	20	4	1	12	17	42	59	32	74	17...74
50	20	4	1	12	18	42	60	33	75	18...75
60	24	5	1,5	14	19	42	61	34	76	19...76

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_4		 Journal length l_6		 Journal length l_7	
F	Journal for spacer plate, position indicator und handwheel (only for $d_1 \geq 30$)	Gxx	Individual journal length with keyway (for xx, enter values from column l_9)	Hxx	Individual journal length without keyway (for xx, enter values from column l_9)
 Journal length l_8		 Journal length l_9		 Journal length l_9	

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator (torque support required for d_1 =18)
		 Journal length l_4		 Journal length l_5	
D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)	F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)
 Journal length l_6		 Journal length l_7		 Journal length l_8	
Gxx	Individual journal length with keyway (for xx, enter values from column l_9)	Hxx	Individual journal length without keyway (for xx, enter values from column l_9)		
 Journal length l_9		 Journal length l_9			

ORDER KEY

Name key | Supplemental key

$VD1E - d_1 - w - l_1 - r - p - z_1 - z_2$

- Double tube linear unit
- Tube diameter
- Material
- Stroke
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers

VD1D | Double tube linear units with one double guide element

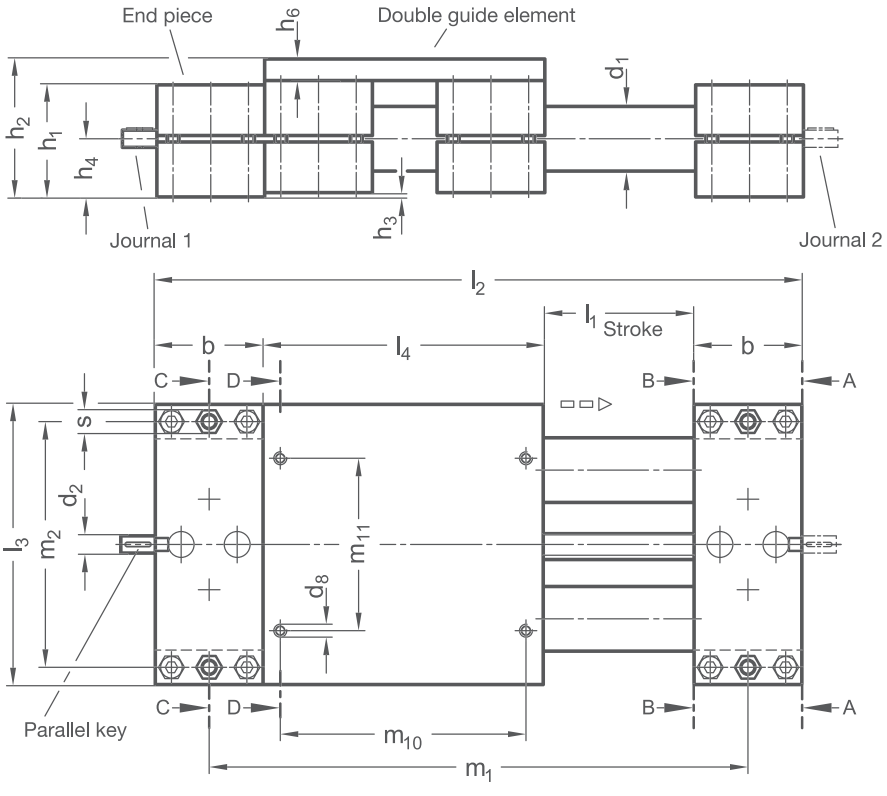
PRODUCT INFO

The guide tubes of the **double tube linear units VD1D** are made of chrome-plated steel or polished stainless steel precision tubes. The aluminum end pieces connect the tubes and form a solid linear guide together with the guide element. A continuous spindle with ball bearings on each side is installed in the center. Together with the double guide element, the affixed spindle nut moves linearly along the spindle thread.

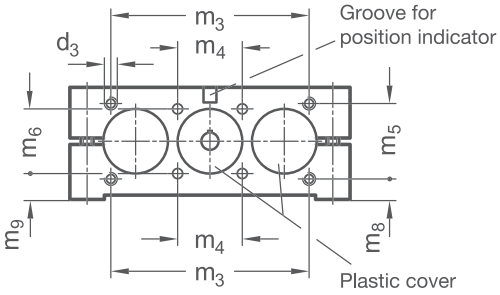
Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for higher loads. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The accessories are not included with the linear units.

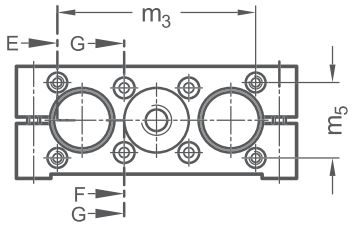
RoHS-compliant product



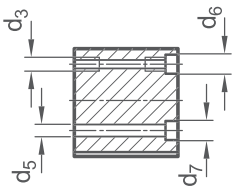
View **A-A**
(end piece outside)



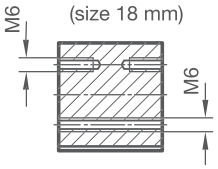
View **B-B**
(end piece inside)



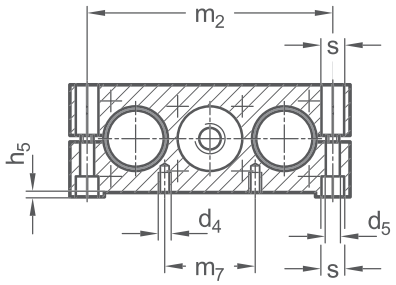
Sectional view **E-F**
(size 30 to 60 mm)



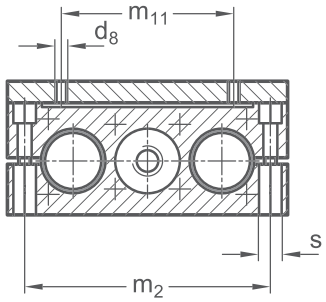
Sectional view **G-G**
(size 18 mm)



Sectional view **C-C**
(end pieces)



Sectional view **D-D**
(guide element)



d_1	Stroke l_1	b	d_2	d_3*	d_4**	d_5	d_6	For screws DIN 912	d_7	For screws DIN 912	d_8	h_1	h_2	h_3	h_4
18	...400	28	6	-	M 5	5,3	-	-	-	-	M 5	28	37	1	14,5
30	...1500	50	8	M 6	M 6	6,5	9	M 5	10,5	M 6	M 6	52	64	2	27
40	...2500	60	12	M 8	M 8	8,5	13,5	M 6	13,5	M 8	M 8	60	75	3	31,5
50	...2630	72	12	M 10	M 8	8,5	13,5	M 8	13,5	M 8	M 8	72	92	4	38
60	...2580	80	14	M 10	M 10	10,5	13,5	M 8	16,5	M 10	M 10	86	106	4	45

d_1	h_5	h_6	l_2	l_3	l_4	m_1	m_2	m_3	m_4	m_5	m_6	m_7	m_8
18	0,75	8	2xb+ l_4+l_1	81	81	b+ l_4+l_1	68	-	20	-	20	18	-
30	0,85	10	2xb+ l_4+l_1	130	130	b+ l_4+l_1	114	92	30	35	30	42	9,5
40	1,05	12	2xb+ l_4+l_1	180	180	b+ l_4+l_1	160	132	39	38	39	62	12,5
50	1,2	16	2xb+ l_4+l_1	206	206	b+ l_4+l_1	184	150	46	50	46	62	13
60	1,35	16	2xb+ l_4+l_1	240	240	b+ l_4+l_1	216	185	55	60	55	74	14

d_1	m_9	m_{10}	m_{11}	s	Accessories: Parallel key DIN 6885	Torque support	Clamping plate	Position indicator		Handwheel
18	4,5	68	52	8	A2x2x12	VZDD	-	VZPM	-	VZH
30	12	114	80	10	A2x2x12	-	VZK	VZPM (only for stroke ≤ 1000 mm)	VZPE	VZH
40	12	160	120	13	A4x4x12	-	VZK	VZPM	VZPE	VZH
50	15	184	134	13	A4x4x12	-	VZK	VZPM	VZPE	VZH
60	16,5	216	160	17	A5x5x16	-	VZK	VZPM (only for trapezoidal thread)	VZPE	VZH

* usable thread depth on both sides min. 2 x d_3 ** usable thread depth min. 1,5 x d_4

2C

Material
w

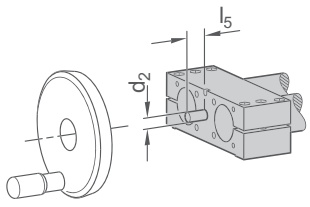
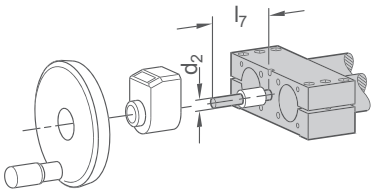
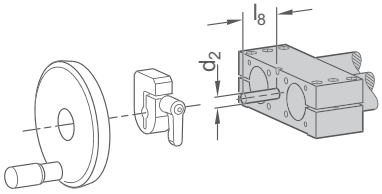
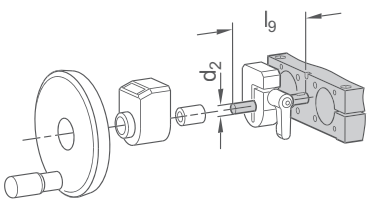
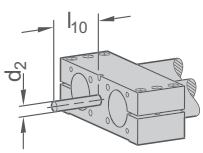
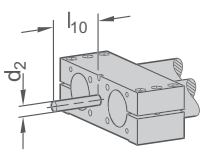
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Steel, with ball bearing
ED	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing	EDS	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

Spindle thread direction
r

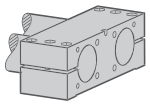
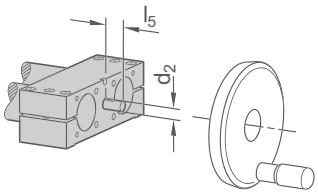
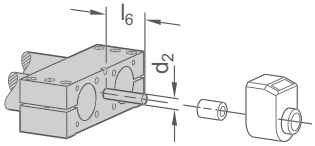
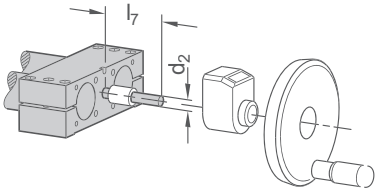
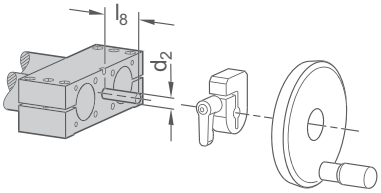
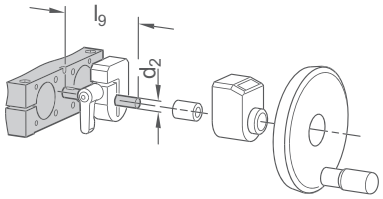
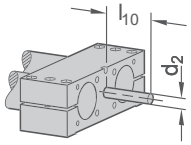
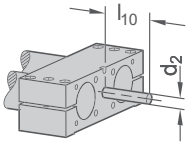
RH	Right-hand thread
LH	Left-hand thread

d_1	Spindle Ø	Spindle pitch **p** Trapezoidal thread	Spindle pitch **p** Fine thread, metric	Journal diameter d_2	Journal length B l_5	Journal length C l_6	Journal length D l_7	Journal length E l_8	Journal length F l_9	Individual journal length l_{10}
18	10	3	1	6	16	30	46	-	-	16...46
30	14	4	1	8	16	36	52	31	67	16...67
40	20	4	1	12	17	42	59	32	74	17...74
50	20	4	1	12	18	42	60	33	75	18...75
60	24	5	1,5	14	19	42	61	34	76	19...76

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_5		 Journal length l_7		 Journal length l_8	
F	Journal for spacer plate, Position indicator und handwheel (only for $d_1 \geq 30$)	Gxx	Individual journal length with keyway (for xx, enter values from column l_{10})	Hxx	Individual journal length without keyway (for xx, enter values from column l_{10})
 Journal length l_9		 Journal length l_{10}		 Journal length l_{10}	

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator (torque support required for d_1 =18)
		 Journal length l_5		 Journal length l_6	
D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)	F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)
 Journal length l_7		 Journal length l_8		 Journal length l_9	
Gxx	Individual journal length with keyway (for xx, enter values from column l_{10})	Hxx	Individual journal length without keyway (for xx, enter values from column l_{10})		
 Journal length l_{10}		 Journal length l_{10}			

ORDER KEY

Name key | Supplemental key

VD1D - d_1 - w - l_1 - r - p - z_1 - z_2

- Double tube linear unit
- Tube diameter
- Material
- Stroke
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers

VD2E | Double tube linear units with two opposing single guide elements

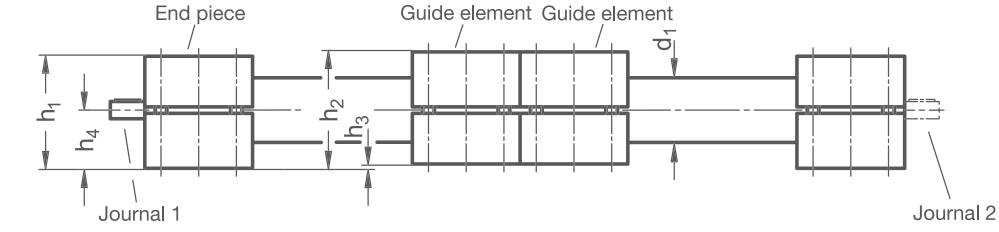
PRODUCT INFO

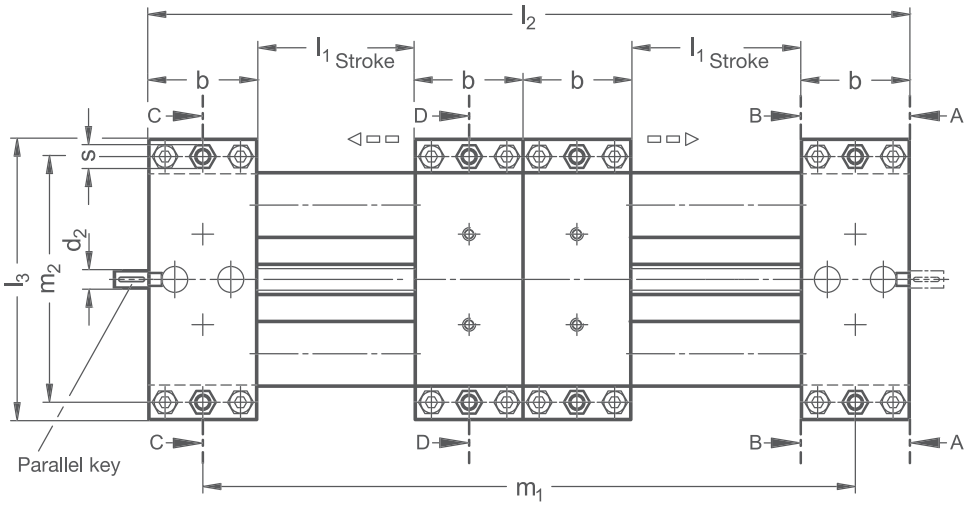
The guide tubes of the **double tube linear units VD2E** are made of chrome-plated steel or polished stainless steel precision tubes. The aluminum end pieces connect the tubes and form a solid linear guide together with the two guide elements.
A continuous spindle with ball bearings on both sides is installed in the center. This is comprised of one spindle part with left-hand thread and one with right-hand thread. Together with the single guide elements, the affixed spindle nuts move linearly in opposing directions along the spindle thread.

Double tube linear units have high torsional stiffness and can handle high weights and torques. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

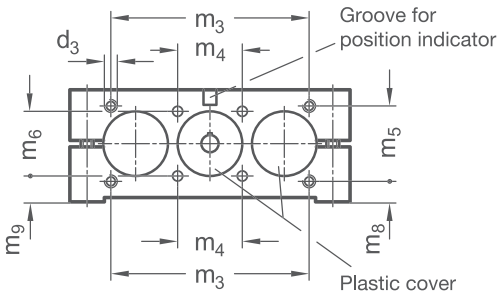
Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product

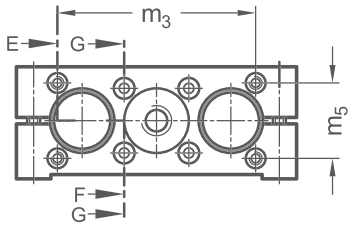




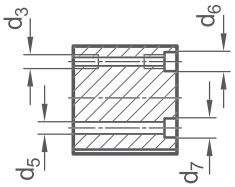
View **A-A**
(end piece outside)



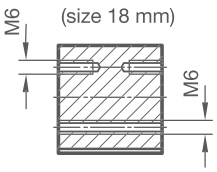
View **B-B**
(end piece inside)



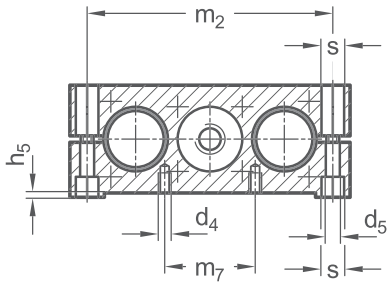
Sectional view **E-F**
(size 30 to 60 mm)



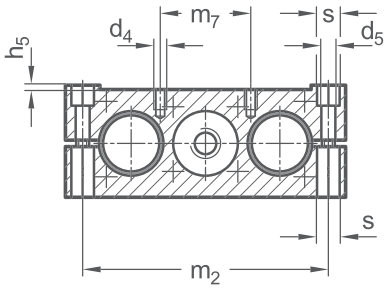
Sectional view **G-G**
(size 18 mm)



Sectional view **C-C**
(end pieces)



Sectional view **D-D**
(guide element)



d_1	Stroke l_1	b	d_2	d_3*	d_4**	d_5	d_6	For screws DIN 912	d_7	For screws DIN 912	h_1	h_2
18	...420	28	6	-	M 5	5,3	-	-	-	-	28	29
30	...750	50	8	M 6	M 6	6,5	9	M 5	10,5	M 6	52	54
40	...1250	60	12	M 8	M 8	8,5	13,5	M 6	13,5	M 8	60	63
50	...1300	72	12	M 10	M 8	8,5	13,5	M 8	13,5	M 8	72	76
60	...1350	80	14	M 10	M 10	10,5	13,5	M 8	16,5	M 10	86	90

d_1	h_3	h_4	h_5	l_2	l_3	m_1	m_2	m_3	m_4	m_5	m_6	m_7
18	1	14,5	0,75	4xb+2xl_1	81	3xb+2xl_1	68	-	20	-	20	18
30	2	27	0,85	4xb+2xl_1	130	3xb+2xl_1	114	92	30	35	30	42
40	3	31,5	1,05	4xb+2xl_1	180	3xb+2xl_1	160	132	39	38	39	62
50	4	38	1,2	4xb+2xl_1	206	3xb+2xl_1	184	150	46	50	46	62
60	4	45	1,35	4xb+2xl_1	240	3xb+2xl_1	216	185	55	60	55	74

d_1	m_8	m_9	s	Accessories: Parallel key DIN 6885	Torque support	Clamping plate	Position indicator		Handwheel
18	-	4,5	8	A2x2x12	VZDD	-	VZPM	-	VZH
30	9,5	12	10	A2x2x12	-	VZK	VZPM (only for stroke ≤ 1000 mm)	VZPE	VZH
40	12,5	12	13	A4x4x12	-	VZK	VZPM	VZPE	VZH
50	13	15	13	A4x4x12	-	VZK	VZPM	VZPE	VZH
60	14	16,5	17	A5x5x16	-	VZK	VZPM (only for trapezoidal thread)	VZPE	VZH

* usable thread depth on both sides min. 2 x d_3 ** usable thread depth min. 1,5 x d_4

2C

Material
w

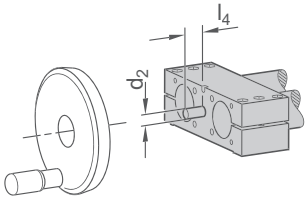
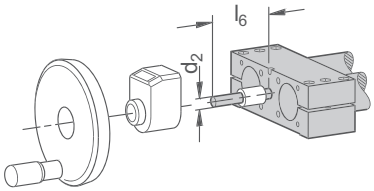
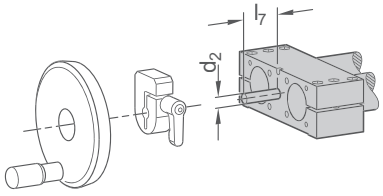
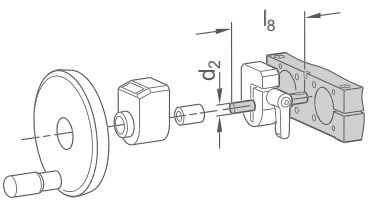
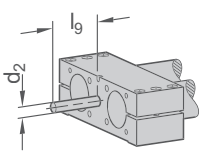
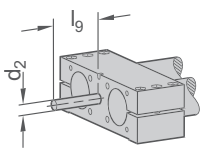
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Steel, with ball bearing
ED	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing	EDS	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

Spindle thread direction
r

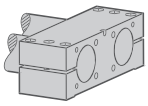
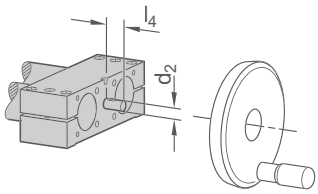
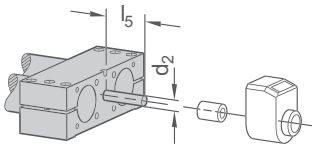
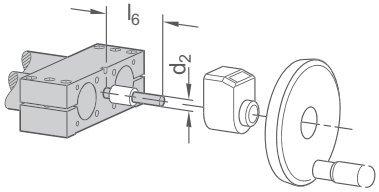
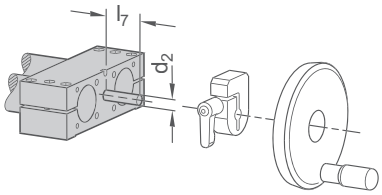
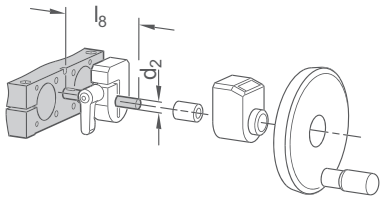
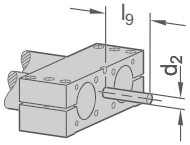
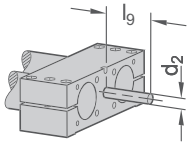
RH	Right-hand thread
LH	Left-hand thread

d_1	Spindle Ø	Spindle pitch **p** Trapezoidal thread	Spindle pitch **p** Fine thread, metric	Journal diameter d_2	Journal length B l_4	Journal length C l_5	Journal length D l_6	Journal length E l_7	Journal length F l_8	Individual journal length l_9
18	10	3	1	6	16	30	46	-	-	16...46
30	14	4	1	8	16	36	52	31	67	16...67
40	20	4	1	12	17	42	59	32	74	17...74
50	20	4	1	12	18	42	60	33	75	18...75
60	24	5	1,5	14	19	42	61	34	76	19...76

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_4		 Journal length l_6		 Journal length l_7	
F	Journal for spacer plate, Position indicator und handwheel (only for $d_1 \geq 30$)	Gxx	Individual journal length with keyway (for xx, enter values from column l_9)	Hxx	Individual journal length without keyway (for xx, enter values from column l_9)
 Journal length l_8		 Journal length l_9		 Journal length l_9	

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator (torque support required for d_1 =18)
		 Journal length l_4		 Journal length l_5	
D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)	F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)
 Journal length l_6		 Journal length l_7		 Journal length l_8	
Gxx	Individual journal length with keyway (for xx, enter values from column l_9)	Hxx	Individual journal length without keyway (for xx, enter values from column l_9)		
 Journal length l_9		 Journal length l_9			

ORDER KEY

Name key | Supplemental key

$VD2E - d_1 - w - l_1 - r - p - z_1 - z_2$

- Double tube linear unit
- Tube diameter
- Material
- Stroke
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers

VD2D | Double tube linear units with two opposing double guide elements

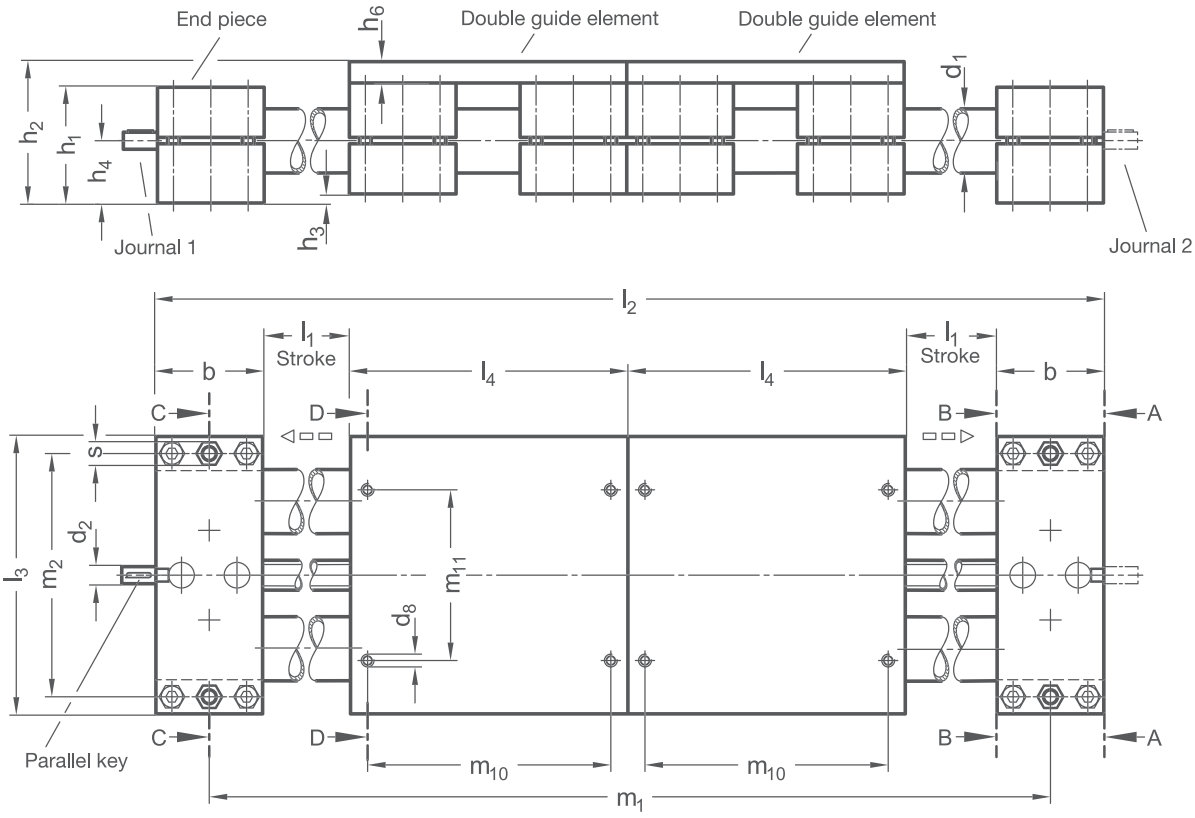
PRODUCT INFO

The guide tubes of the **double tube linear units VD2D** are made of chrome-plated steel or polished stainless steel precision tubes. The aluminum end pieces connect the tubes and form a solid linear guide together with the two guide elements. A continuous spindle with ball bearings on both sides is installed in the center. This is comprised of one spindle part with left-hand thread and one with right-hand thread. Together with the double guide elements, the affixed spindle nuts move linearly in opposing directions along the spindle thread.

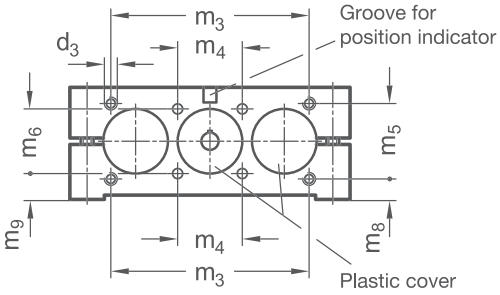
Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for higher loads. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The accessories are not included with the linear units.

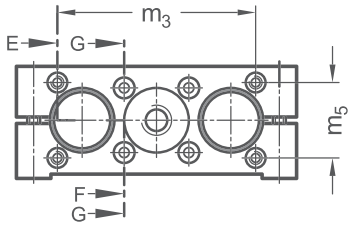
RoHS-compliant product



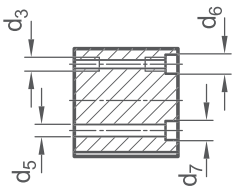
View **A-A**
(end piece outside)



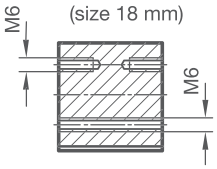
View **B-B**
(end piece inside)



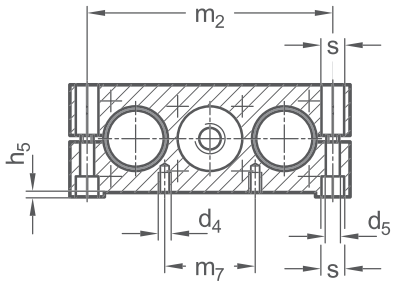
Sectional view **E-F**
(size 30 to 60 mm)



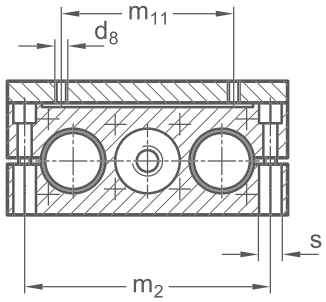
Sectional view **G-G**
(size 18 mm)



Sectional view **C-C**
(end pieces)



Sectional view **D-D**
(guide element)



d_1	Stroke l_1	b	d_2	d_3*	d_4**	d_5	d_6	For screws DIN 912	d_7	For screws DIN 912	d_8	h_1	h_2	h_3	h_4
18	...400	28	6	-	M 5	5,3	-	-	-	-	M 5	28	37	1	14,5
30	...750	50	8	M 6	M 6	6,5	9	M 5	10,5	M 6	M 6	52	64	2	27
40	...1100	60	12	M 8	M 8	8,5	13,5	M 6	13,5	M 8	M 8	60	75	3	31,5
50	...1165	72	12	M 10	M 8	8,5	13,5	M 8	13,5	M 8	M 8	72	92	4	38
60	...1170	80	14	M 10	M 10	10,5	13,5	M 8	16,5	M 10	M 10	86	106	4	45

d_1	h_5	h_6	l_2	l_3	l_4	m_1	m_2	m_3	m_4	m_5	m_6	m_7	m_8
18	0,75	8	$2xb+2xl_4+2xl_1$	81	81	$b+2xl_4+2xl_1$	68	-	20	-	20	18	-
30	0,85	10	$2xb+2xl_4+2xl_1$	130	130	$b+2xl_4+2xl_1$	114	92	30	35	30	42	9,5
40	1,05	12	$2xb+2xl_4+2xl_1$	180	180	$b+2xl_4+2xl_1$	160	132	39	38	39	62	12,5
50	1,2	16	$2xb+2xl_4+2xl_1$	206	206	$b+2xl_4+2xl_1$	184	150	46	50	46	62	13
60	1,35	16	$2xb+2xl_4+2xl_1$	240	240	$b+2xl_4+2xl_1$	216	185	55	60	55	74	14

d_1	m_9	m_{10}	m_{11}	s	Parallel key DIN 6885	**Accessories:** Torque support	Clamping plate	Position indicator		Handwheel
18	4,5	68	52	8	A2x2x12	VZDD	-	VZPM	-	VZH
30	12	114	80	10	A2x2x12	-	VZK	VZPM (only for stroke ≤ 1000 mm)	VZPE	VZH
40	12	160	120	13	A4x4x12	-	VZK	VZPM	VZPE	VZH
50	15	184	134	13	A4x4x12	-	VZK	VZPM	VZPE	VZH
60	16,5	216	160	17	A5x5x16	-	VZK	VZPM (only for trapezoidal thread)	VZPE	VZH

* usable thread depth on both sides min. 2 x d_3 ** usable thread depth min. 1,5 x d_4

2C

Material
w

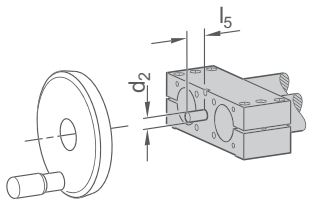
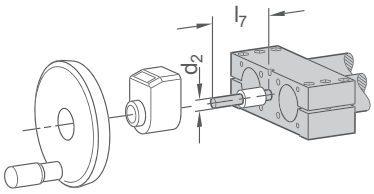
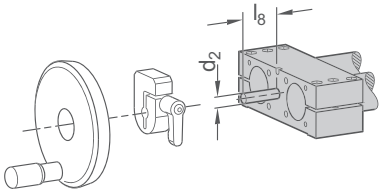
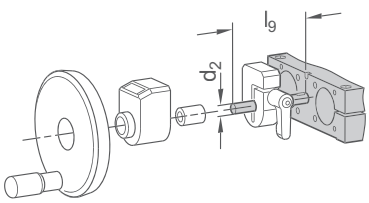
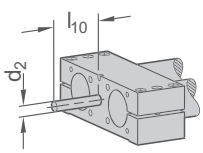
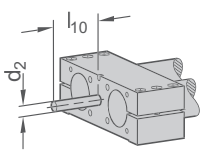
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Steel, with ball bearing
ED	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing	EDS	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

Spindle thread direction
r

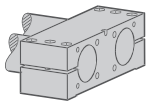
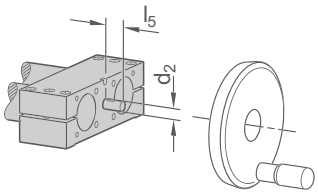
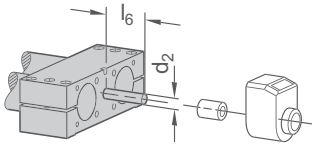
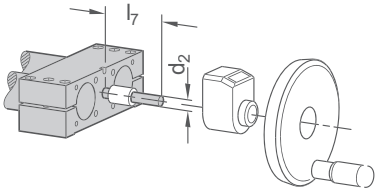
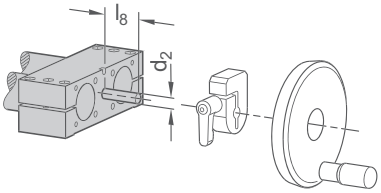
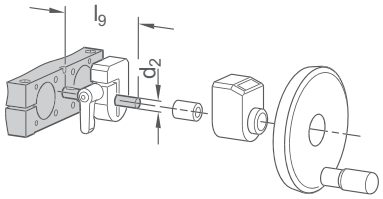
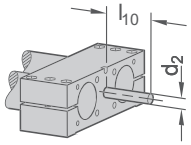
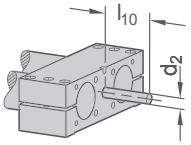
RH	Right-hand thread
LH	Left-hand thread

d_1	Spindle Ø	Spindle pitch **p** Trapezoidal thread	Spindle pitch **p** Fine thread, metric	Journal diameter d_2	Journal length B l_5	Journal length C l_6	Journal length D l_7	Journal length E l_8	Journal length F l_9	Individual journal length l_{10}
18	10	3	1	6	16	30	46	-	-	16...46
30	14	4	1	8	16	36	52	31	67	16...67
40	20	4	1	12	17	42	59	32	74	17...74
50	20	4	1	12	18	42	60	33	75	18...75
60	24	5	1,5	14	19	42	61	34	76	19...76

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_5		 Journal length l_7		 Journal length l_8	
F	Journal for spacer plate, Position indicator und handwheel (only for $d_1 \geq 30$)	Gxx	Individual journal length with keyway (for xx, enter values from column l_{10})	Hxx	Individual journal length without keyway (for xx, enter values from column l_{10})
 Journal length l_9		 Journal length l_{10}		 Journal length l_{10}	

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator (torque support required for d_1 =18)
		 Journal length l_5		 Journal length l_6	
D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)	F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)
 Journal length l_7		 Journal length l_8		 Journal length l_9	
Gxx	Individual journal length with keyway (for xx, enter values from column l_{10})	Hxx	Individual journal length without keyway (for xx, enter values from column l_{10})		
 Journal length l_{10}		 Journal length l_{10}			

ORDER KEY

Name key	Supplemental key
VD2D - d_1 - w - l_1 - r - p - z_1 - z_2	

- Double tube linear unit
- Tube diameter
- Material
- Stroke
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers

VD3E | Double tube linear units with two independent single guide elements

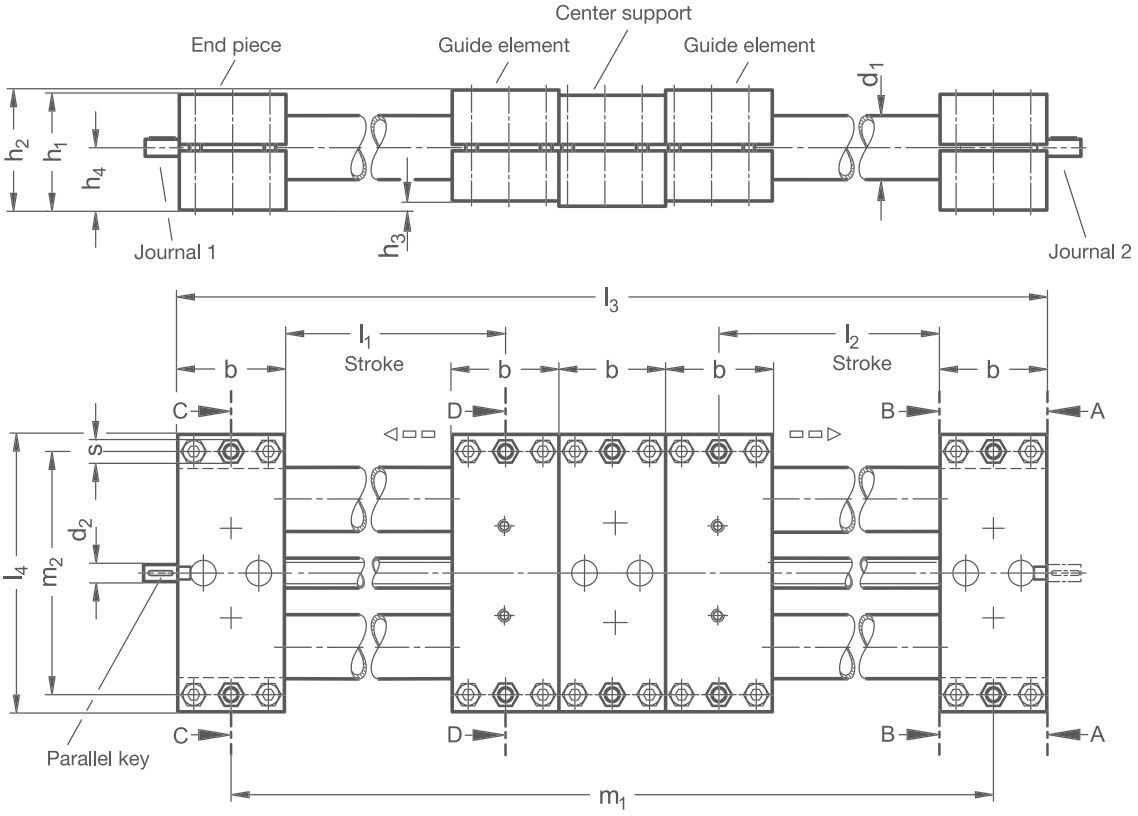
PRODUCT INFO

The guide tubes of the **double tube linear units VD3E** are made of chrome-plated steel or polished stainless steel precision tubes. The aluminum end pieces connect the tubes and form a solid linear guide together with the guide element. Two independent spindles with ball bearings on each side are installed in the center. The thread direction of the spindles can be chosen as desired for each side. Together with the single guide elements, the affixed spindle nuts move linearly along the spindle thread, independently of the opposite side.

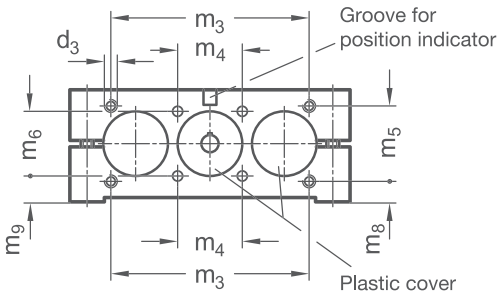
Double tube linear units have high torsional stiffness and can handle high weights and torques. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The accessories are not included with the linear units.

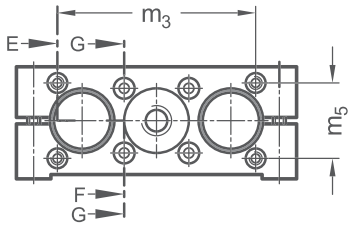
RoHS-compliant product



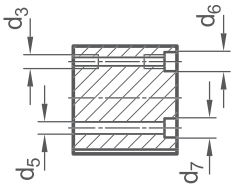
View **A-A**
(end piece outside)



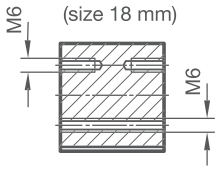
View **B-B**
(end piece inside)



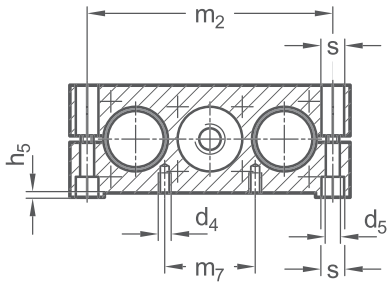
Sectional view **E-F**
(size 30 to 60 mm)



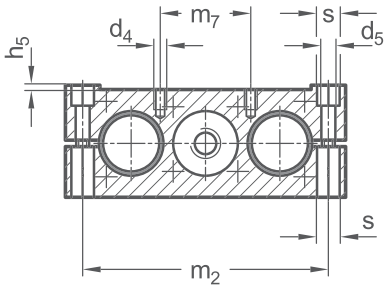
Sectional view **G-G**
(size 18 mm)



Sectional view **C-C**
(end pieces)



Sectional view **D-D**
(guide element)



d_1	Stroke l_1	Stroke l_2	b	d_2	d_3*	d_4**	d_5	d_6	For screws DIN 912	d_7	For screws DIN 912	h_1
18	...400	...400	28	6	-	M 5	5,3	-	-	-	-	28
30	...750	...750	50	8	M 6	M 6	6,5	9	M 5	10,5	M 6	52
40	...1150	...1150	60	12	M 8	M 8	8,5	13,5	M 6	13,5	M 8	60
50	...1265	...1265	72	12	M 10	M 8	8,5	13,5	M 8	13,5	M 8	72
60	...1550	...1550	80	14	M 10	M 10	10,5	13,5	M 8	16,5	M 10	86

d_1	h_2	h_3	h_4	h_5	l_3	l_4	m_1	m_2	m_3	m_4	m_5	m_6
18	29	1	14,5	0,75	$5xb+l_1+l_2$	81	$4xb+l_1+l_2$	68	-	20	-	20
30	54	2	27	0,85	$5xb+l_1+l_2$	130	$4xb+l_1+l_2$	114	92	30	35	30
40	63	3	31,5	1,05	$5xb+l_1+l_2$	180	$4xb+l_1+l_2$	160	132	39	38	39
50	76	4	38	1,2	$5xb+l_1+l_2$	206	$4xb+l_1+l_2$	184	150	46	50	46
60	90	4	45	1,35	$5xb+l_1+l_2$	240	$4xb+l_1+l_2$	216	185	55	60	55

d_1	m_7	m_8	m_9	s	Accessories: Parallel key DIN 6885	Torque support	Clamping plate	Position indicator		Handwheel
18	18	-	4,5	8	A2x2x12	VZDD	-	VZPM	-	VZH
30	42	9,5	12	10	A2x2x12	-	VZK	VZPM (only for stroke ≤ 1000 mm)	VZPE	VZH
40	62	12,5	12	13	A4x4x12	-	VZK	VZPM	VZPE	VZH
50	62	13	15	13	A4x4x12	-	VZK	VZPM	VZPE	VZH
60	74	14	16,5	17	A5x5x16	-	VZK	VZPM (only for trapezoidal thread)	VZPE	VZH

* usable thread depth on both sides min. 2 x d_3 ** usable thread depth min. 1,5 x d_4

2C

Material
w

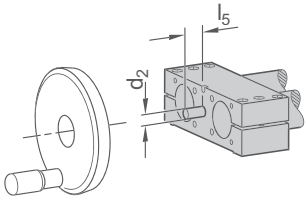
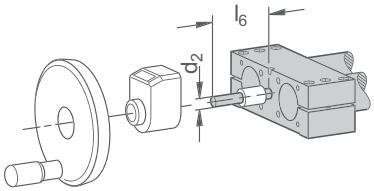
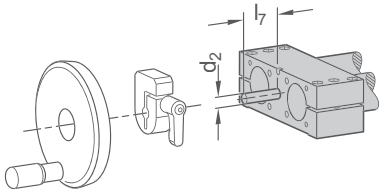
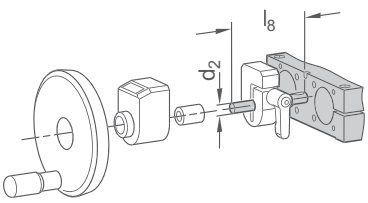
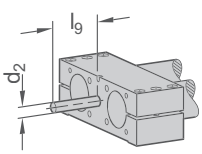
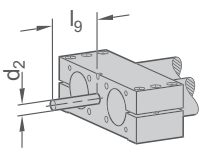
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined •Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Steel, with ball bearing
ED	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing	EDS	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

Spindle thread direction
r

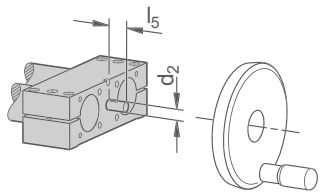
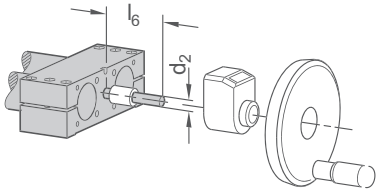
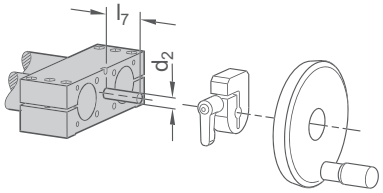
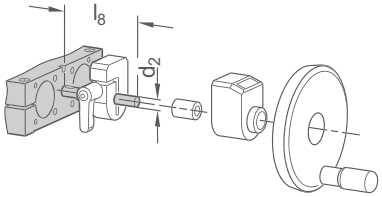
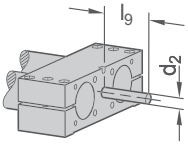
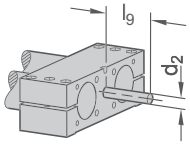
RH	Right-hand thread
LH	Left-hand thread

d_1	Spindle Ø	Spindle pitch p_1		Spindle pitch p_2		Journal diameter d_2	Journal length B l_4	Journal length D l_6	Journal length E l_7	Journal length F l_8	Individual journal length l_9
		Trapezoidal thread	Fine thread, metric	Trapezoidal thread	Fine thread, metric						
18	10	3	1	3	1	6	16	46	-	-	16...46
30	14	4	1	4	1	8	16	52	31	67	16...67
40	20	4	1	4	1	12	17	59	32	74	17...74
50	20	4	1	4	1	12	18	60	33	75	18...75
60	24	5	1,5	5	1,5	14	19	61	34	76	19...76

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator & handwheel (torque support required for d_1 =18)	E	Journal for clamping plate & handwheel (only for $d_1 \geq 30$)
 Journal length l_4		 Journal length l_6		 Journal length l_7	
F	Journal for clamping plate, position indicator & handwheel (only for $d_1 \geq 30$)	Gxx	Individual journal length with keyway (for xx, enter values from column l_9)	Hxx	Individual journal length without keyway (for xx, enter values from column l_9)
 Journal length l_8		 Journal length l_9		 Journal length l_9	

Journal
z_2

B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for clamping plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_5		 Journal length l_6		 Journal length l_7	
F	Journal for clamping plate, position indicator & handwheel (only for $d_1 \geq 30$)	Gxx	Individual journal length with keyway (for xx, enter values from column l_9)	Hxx	Individual journal length without keyway (for xx, enter values from column l_9)
 Journal length l_8		 Journal length l_9		 Journal length l_9	

ORDER KEY

Name key | Supplemental key

VD3E - d_1 - w - l_1 - l_2 - r_1 - p_1 - z_1 - r_2 - p_2 - z_2

- Double tube linear unit
- Tube diameter
- Material
- Stroke l_1
- Stroke l_2
- Thread direction r_1
- Spindle pitch p_1
- Journal z_1
- Thread direction r_2
- Spindle pitch p_2
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358/360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers

VD3D | Double tube linear units with two independent double guide elements

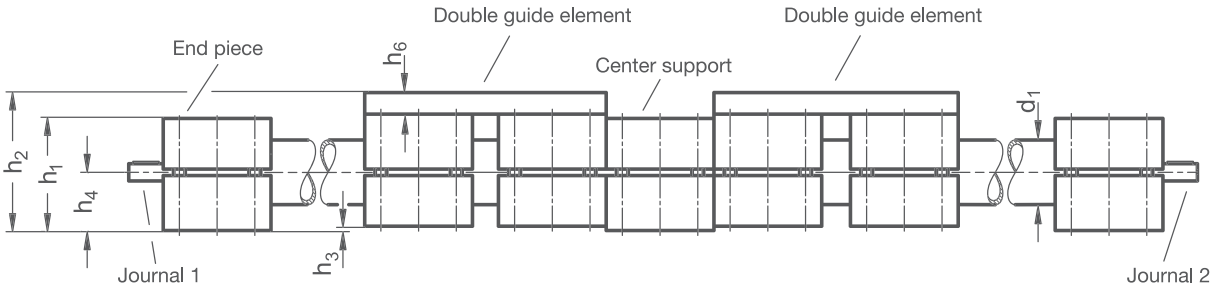
PRODUCT INFO

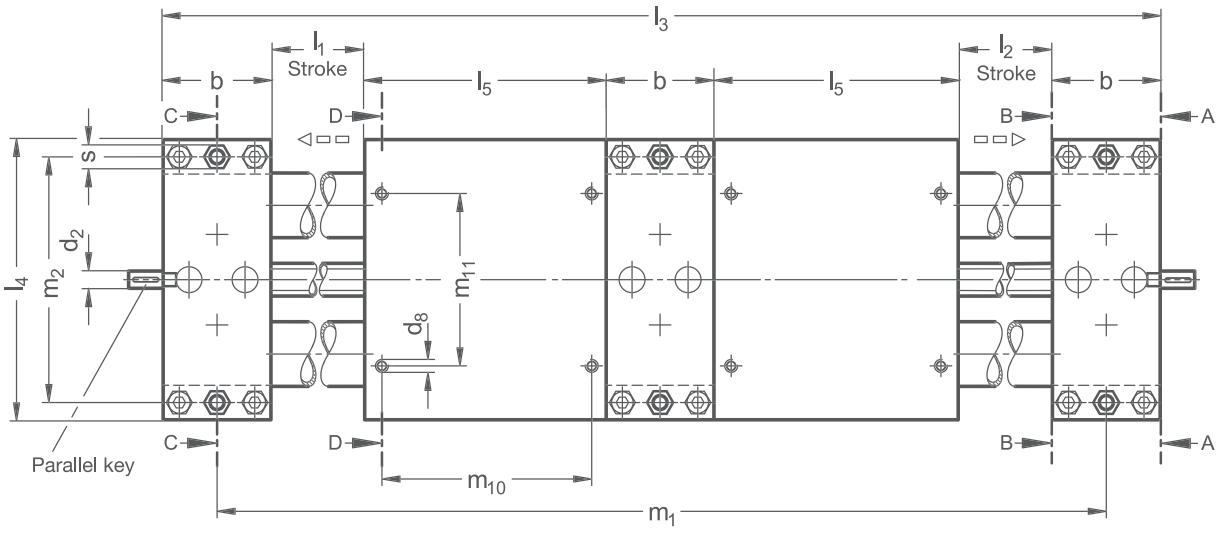
The guide tubes of the **double tube linear units VD3D** are made of chrome-plated steel or polished stainless steel precision tubes. The aluminum end pieces connect the tubes and form a solid linear guide together with the guide element. Two independent spindles with ball bearings on each side are installed in the center. The thread direction of the spindles can be chosen as desired for each side. Together with the double guide elements, the affixed spindle nuts move linearly along the spindle thread, independently of the opposite side.

Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for higher loads. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

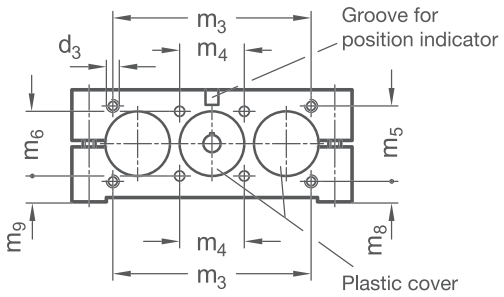
Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product

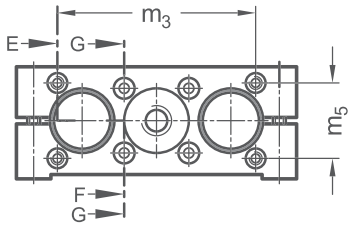




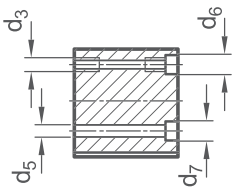
View **A-A**
(end piece outside)



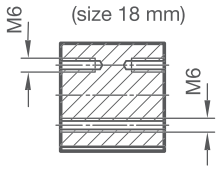
View **B-B**
(end piece inside)



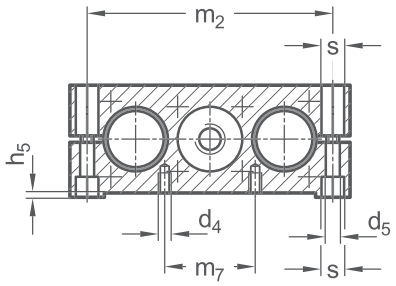
Sectional view **E-F**
(size 30 to 60 mm)



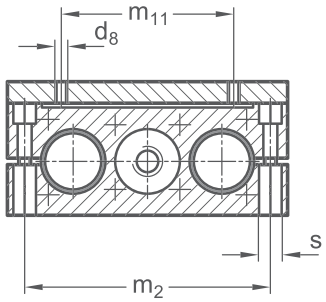
Sectional view **G-G**
(size 18 mm)



Sectional view **C-C**
(end pieces)



Sectional view **D-D**
(guide element)



d_1	Stroke l_1	Stroke l_2	b	d_2	d_3*	d_4**	d_5	d_6	For screws DIN 912	d_7	For screws DIN 912	h_1
18	...450	...450	28	6	-	M 5	5,3	-	-	-	-	28
30	...750	...750	50	8	M 6	M 6	6,5	9	M 5	10,5	M 6	52
40	...1030	...1030	60	12	M 8	M 8	8,5	13,5	M 6	13,5	M 8	60
50	...1130	...1130	72	12	M 10	M 8	8,5	13,5	M 8	13,5	M 8	72
60	...1550	...1550	80	14	M 10	M 10	10,5	13,5	M 8	16,5	M 10	86

d_1	h_2	h_3	h_4	h_5	h_6	l_3	l_4	l_5	m_1	m_2	m_3	m_4	m_5	m_6	m_7	m_8
18	37	1	14,5	0,75	8	$3xb+2xl_5+l_1+l_2$	81	81	$2xb+2xl_5+l_1+l_2$	68	-	20	-	20	18	-
30	64	2	27	0,85	10	$3xb+2xl_5+l_1+l_2$	130	130	$2xb+2xl_5+l_1+l_2$	114	92	30	35	30	42	9,5
40	75	3	31,5	1,05	12	$3xb+2xl_5+l_1+l_2$	180	180	$2xb+2xl_5+l_1+l_2$	160	132	39	38	39	62	12,5
50	92	4	38	1,2	16	$3xb+2xl_5+l_1+l_2$	206	206	$2xb+2xl_5+l_1+l_2$	184	150	46	50	46	62	13
60	106	4	45	1,35	16	$3xb+2xl_5+l_1+l_2$	240	240	$2xb+2xl_5+l_1+l_2$	216	185	55	60	55	74	14

d_1	m_9	m_{10}	m_{11}	s	Parallel key DIN 6885	**Accessories:** Torque support	Clamping plate	Position indicator		Handwheel
18	4,5	68	52	8	A2x2x12	VZDD	-	VZPM	-	VZH
30	12	114	80	10	A2x2x12	-	VZK	VZPM (only for stroke ≤ 1000 mm)	VZPE	VZH
40	12	160	120	13	A4x4x12	-	VZK	VZPM	VZPE	VZH
50	15	184	134	13	A4x4x12	-	VZK	VZPM	VZPE	VZH
60	16,5	216	160	17	A5x5x16	-	VZK	VZPM (only for trapezoidal thread)	VZPE	VZH

* usable thread depth on both sides min. 2 x d_3 ** usable thread depth min. 1,5 x d_4

2C

Material
w

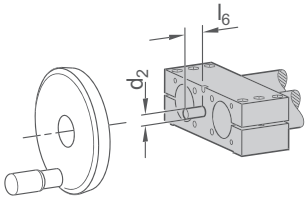
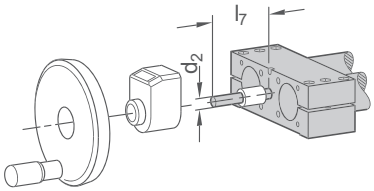
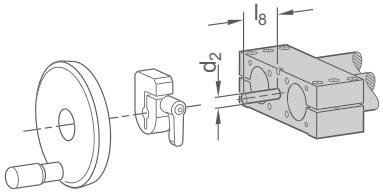
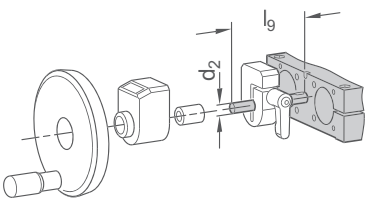
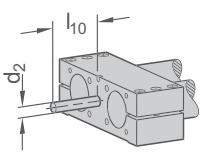
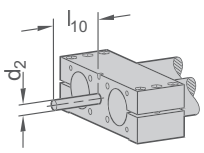
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Steel, with ball bearing
ED	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing	EDS	Aluminum - stainless steel • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, powder-coated, Black RAL 9005, Assembly surfaces: Machined bright • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

Spindle thread direction
r

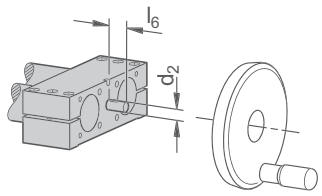
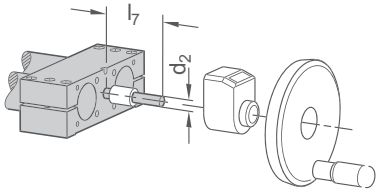
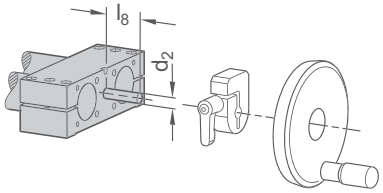
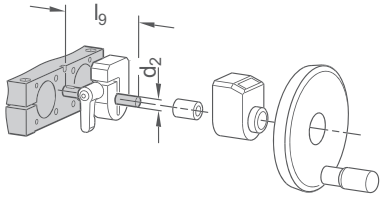
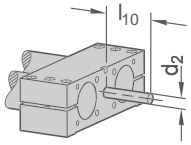
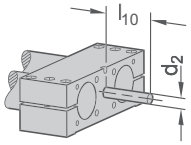
RH	Right-hand thread
LH	Left-hand thread

d_1	Spindle Ø	Spindle pitch p_1		Spindle pitch p_2		Journal diameter d_2	Journal length B l_6	Journal length D l_7	Journal length E l_8	Journal length F l_9	Individual journal length l_{10}
		Trapezoidal thread	Fine thread, metric	Trapezoidal thread	Fine thread, metric						
18	10	3	1	3	1	6	16	46	-	-	16...46
30	14	4	1	4	1	8	16	52	31	67	16...67
40	20	4	1	4	1	12	17	59	32	74	17...74
50	20	4	1	4	1	12	18	60	33	75	18...75
60	24	5	1,5	5	1,5	14	19	61	34	76	19...76

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_6		 Journal length l_7		 Journal length l_8	
F	Journal for spacer plate, Position indicator und handwheel (only for $d_1 \geq 30$)	Gxx	Individual journal length with keyway (for xx, enter values from column l_{10})	Hxx	Individual journal length without keyway (for xx, enter values from column l_{10})
 Journal length l_9		 Journal length l_{10}		 Journal length l_{10}	

Journal
z_2

B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	E	Journal for spacer plate and handwheel (only for $d_1 \geq 30$)
 Journal length l_6		 Journal length l_7		 Journal length l_8	
F	Journal for spacer plate, position indicator and handwheel (only for $d_1 \geq 30$)	Gxx	Individual journal length with keyway (for xx, enter values from column l_{10})	Hxx	Individual journal length without keyway (for xx, enter values from column l_{10})
 Journal length l_9		 Journal length l_{10}		 Journal length l_{10}	

ORDER KEY

Name key | Supplemental key

VD3D - d_1 - w - l_1 - l_2 - r_1 - p_1 - z_1 - r_2 - p_2 - z_2

- Double tube linear unit
- Tube diameter
- Material
- Stroke l_1
- Stroke l_2
- Thread direction r_1
- Spindle pitch p_1
- Journal z_1
- Thread direction r_2
- Spindle pitch p_2
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358/360*
- Clamping plates **VZK** → *see page 362*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers

If more precise guidance is required, it is recommended to use precision double tube linear units from the product group “Double tube linear units 2C”. The round guides are fastened to the end pieces with a non-positive connection by means of tapering, resulting in higher precision.

The round guides of the precision double tube linear units are available with either chrome-plated steel or bright stainless steel precision tubes or with hard-chrome-plated and polished solid shafts.

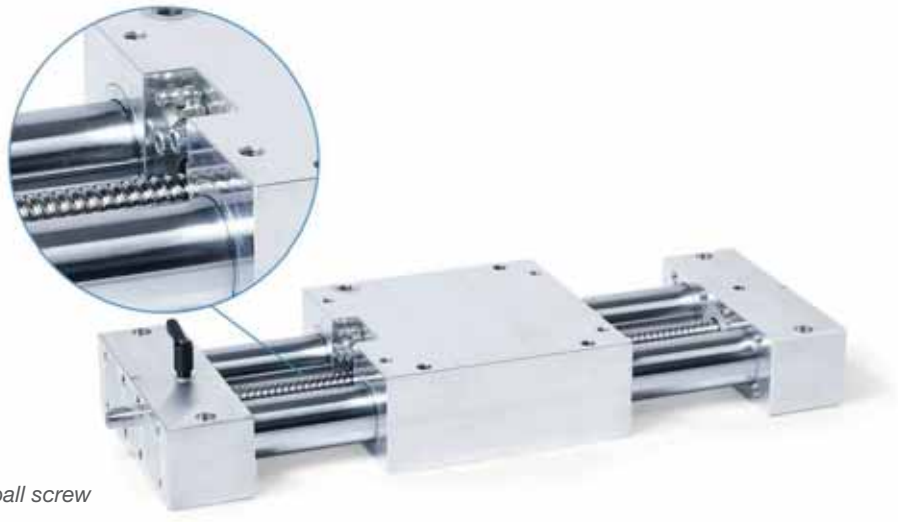
The center spindle with ball bearings on both sides can be designed as a trapezoidal or fine thread spindle or as a recirculating ball screw. The force transmission between the recirculating ball screw and the ball screw nut takes place via rolling elements. This makes it possible to adjust the ball screw to eliminate backlash and achieve higher precision movement. The lower rolling resistance also reduces wear and the required driving force.

The guide elements have either a sliding or roller guide.

Precision double tube linear units can be divided into three types, each available with single or double guide elements:

- **Linear units with one guide element:** the guide element is moved along the guide tubes by the spindle thread.
- **Linear units with two opposing guide elements:** two guide elements move symmetrically along the guide tubes due to different thread directions.
- **Linear units with two independent guide elements:** two guide elements move independently along the guide tubes due to separate spindles.

Roller slideway of the precision double tube linear units



Precision double tube linear units with recirculating ball screw

	with single guide element	with double guide element	with recirculating ball screw
Precision double tube linear units with one guide element	**PD1E** *p. 318* 	**PD1D** *p. 322* 	**PD1DK** *p. 326* 
Precision double tube linear units with two opposing guide elements	**PD2E** *p. 330* 	**PD2D** *p. 334* 	**PD2DK** *p. 338* 
Precision double tube linear units with two independent guide elements	**PD3E** *p. 342* 	**PD3D** *p. 346* 	**PD3DK** *p. 350* 

Individual customer solutions that differ from those described here can be manufactured on request.

Possible accessories for the double tube linear units include handwheels in various designs, position indicators and spacer plates for spindle clamping. The accessories are matched to the nominal diameter of the respective linear unit and are found in product group 2D.

Double tube linear units can accept high forces and torques. Depending on the features, a variety of precision levels are possible, which can be flexibly adapted to many different areas of application in machine and system building, such as for height and format adjustment.

An operating manual with instructions for assembly can be downloaded from our website at inocon.de/en/service.

PD1E | Precision double tube linear units with one single guide element

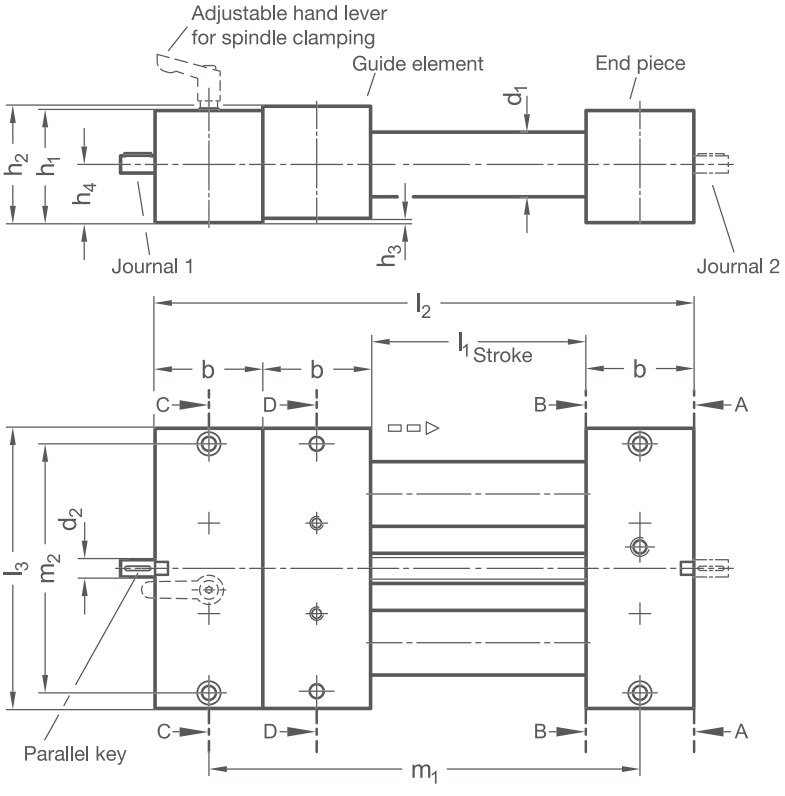
PRODUCT INFO

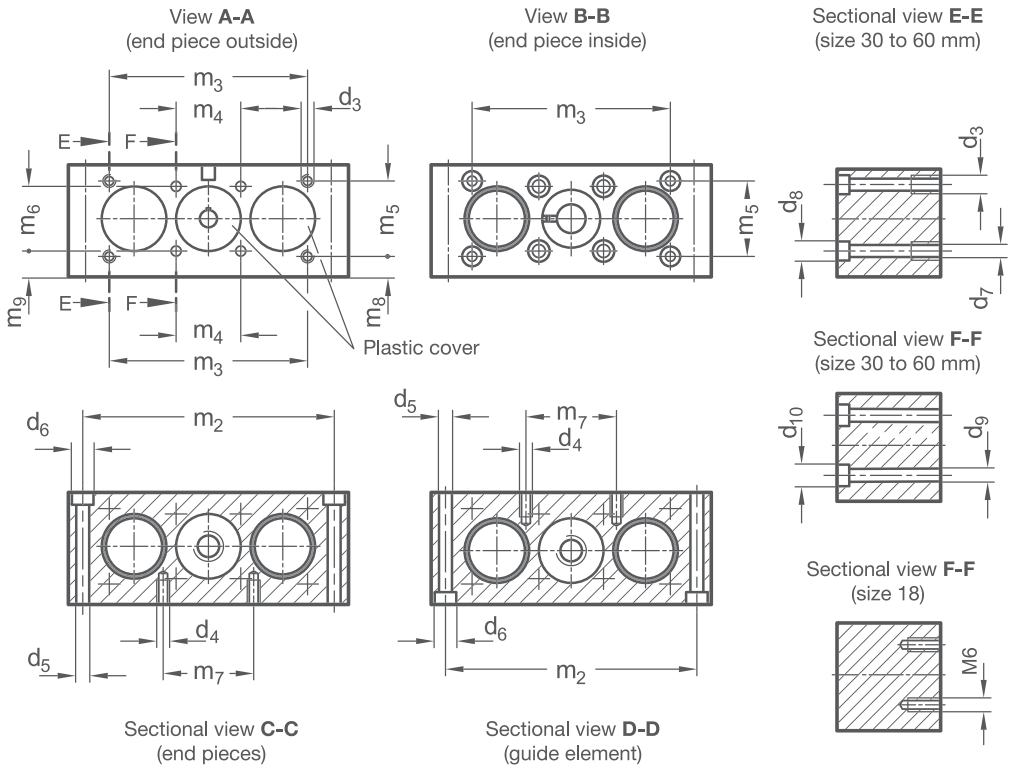
The round guides of the **precision double tube linear units PD1E** are available either as tubes or solid shafts. They are made of chrome-plated or hard-chrome-plated steel or polished stainless steel. The end pieces of aluminum connect the tubes or solid shafts and form a precise linear guide together with the guide element. The centered continuous spindle has trapezoidal or fine thread and ball bearings on both sides. The single guide element is moved linearly along the spindle thread by the integrated spindle nut. The single guide element has either a sliding or roller guide.

Double tube linear units have high torsional stiffness and can handle high weights and torques. Depending on the requirements, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures, for example, that the lengths of the journals z_1 and z_2 are correct for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product





d_1	Stroke l_1	b	d_2	d_3	d_4	d_5	d_6	For screws DIN 912	d_7	d_8	For screws DIN 912	d_9	d_{10}	For screws DIN 912
18	...420	28	6	-	M 5	5,5	10	M 5	-	-	-	-	-	-
25*	...1500	50	8	M 6	M 6	6,1	10,5	M 6	5,5	10	M 5	6,6	11	M 6
30	...1500	50	8	M 6	M 6	6,6	11	M 6	5,5	10	M 5	6,6	11	M 6
40	...2650	60	12	M 8	M 8	8,4* / 9	13,5* / 15	M 8	6,6	11	M 6	8,6	13,5	M 8
50	...2760	72	12	M 10	M 8	9	15	M 8	9	13,5	M 8	9	13,5	M 8
60	...2740	80	14	M 10	M 10	10,5	16,5	M 10	9	13,5	M 8	11	16,5	M 10

d_1	h_1	h_2	h_3	h_4	l_2	l_3	m_1	m_2	m_3	m_4	m_5	m_6	m_7
18	28	29	1	14,5	3xb+l_1	81	2xb+l_1	68	-	20	-	20	18
25*	52	54	2	27	3xb+l_1	130	2xb+l_1	114	97	30	35	30	42
30	52	54	2	27	3xb+l_1	130	2xb+l_1	114	92	30	35	30	42
40	60	63	3	31,5	3xb+l_1	180	2xb+l_1	160	138* / 132	39	38	39	52* / 62
50	72	76	4	38	3xb+l_1	206	2xb+l_1	184	150	46	50	46	62
60	86	90	4	45	3xb+l_1	240	2xb+l_1	216	185	55	60	55	74

			Accessories:			
d_1	m_8	m_9	Parallel key DIN 6885	Torque support	Position indicator	Handwheel
18	-	4,5	A2x2x12	VZDD	VZPM -	VZH
25*	9,5	12	A2x2x12	-	VZPM (only for stroke ≤ 1000 mm) VZPE	VZH
30	9,5	12	A2x2x12	-	VZPM (only for stroke ≤ 1000 mm) VZPE	VZH
40	12,5	12	A4x4x12	-	VZPM VZPE	VZH
50	13	15	A4x4x12	-	VZPM VZPE	VZH
60	15	17,5	A5x5x16	-	VZPM (only for trapezoidal thread) VZPE	VZH

* Only for version a = 2ST / 2ED

2C

Version
a

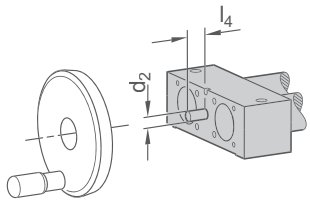
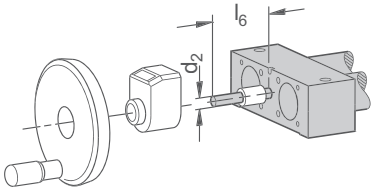
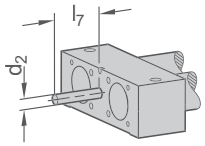
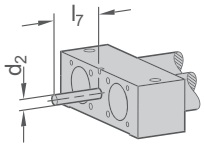
1ST	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	2ST	Double solid shaft roller slideway / trapezoidal lead screw (only for d_1 = 25 and d_1 = 40) • Solid guide shafts: Steel, polished and hard-chrome-plated • End pieces / guide elements: Aluminum, CNC-milled parts • Trapezoidal / fine thread spindle: Steel, with ball bearing
1ED	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing	2ED	Double solid shaft roller slideway / trapezoidal lead screw (only for d_1 = 25 and d_1 = 40) • Solid guide shafts: Stainless steel, induction-hardened and polished • End pieces / guide elements: Aluminum, CNC-milled parts • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

Spindle thread direction / clamping
r

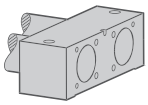
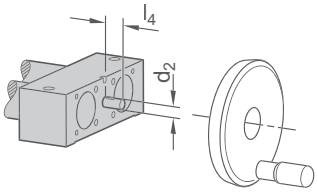
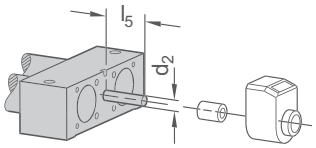
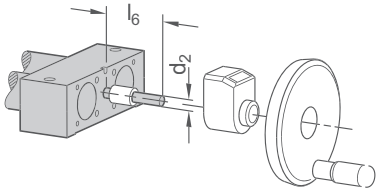
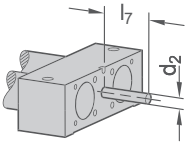
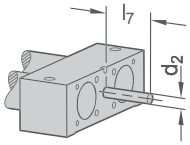
RH	Right-hand thread
RHK	Right-hand thread with clamping ring and hand lever for spindle clamping
LH	Left-hand thread
LHK	Left-hand thread with clamping ring and hand lever for spindle clamping

d_1	Spindle Ø	Spindle pitch p		Journal diameter d_2	Journal length B l_4	Journal length C l_5	Journal length D l_6	Individual journal length l_7
		Trapezoidal thread	Fine thread, metric					
18	10	3	1	6	16	30	46	16...46
25	14	4	1	8	16	36	52	16...67
30	14	4	1	8	16	36	52	16...67
40	20	4	1	12	17	42	59	17...74
50	20	4	1	12	18	42	60	18...75
60	24	5	1,5	14	19	42	61	19...76

Journal
z_1

B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_7)
	 Journal length l_4		 Journal length l_6		 Journal length l_7
Hxx	Individual journal length without keyway (for xx, enter values from column l_7)				
	 Journal length l_7				

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator (torque support required for d_1 =18)
		 Journal length l_4		 Journal length l_5	
D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_7)	Hxx	Individual journal length without keyway (for xx, enter values from column l_7)
 Journal length l_6		 Journal length l_7		 Journal length l_7	

ORDER KEY

Name key	Supplemental key
PD1E - d_1 - a - l_1 - r - p - z_1 - z_2	

- Double tube linear actuator
- Tube diameter
- Version
- Stroke
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers
- Complete linear unit of stainless steel

PD1D | Precision double tube linear units with one double guide element

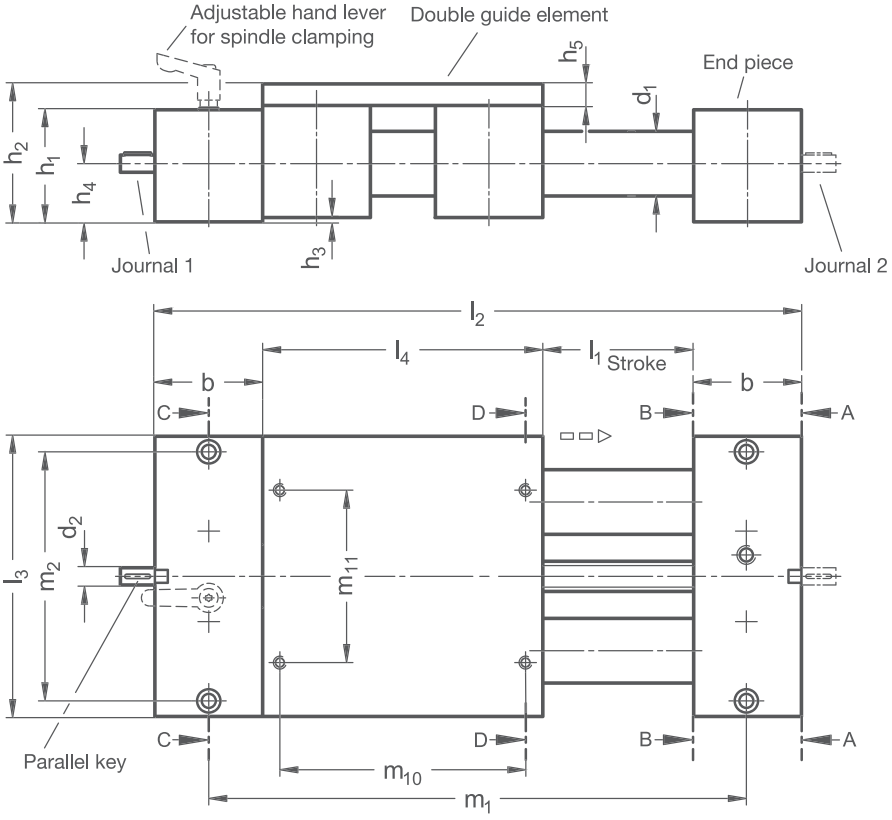
PRODUCT INFO

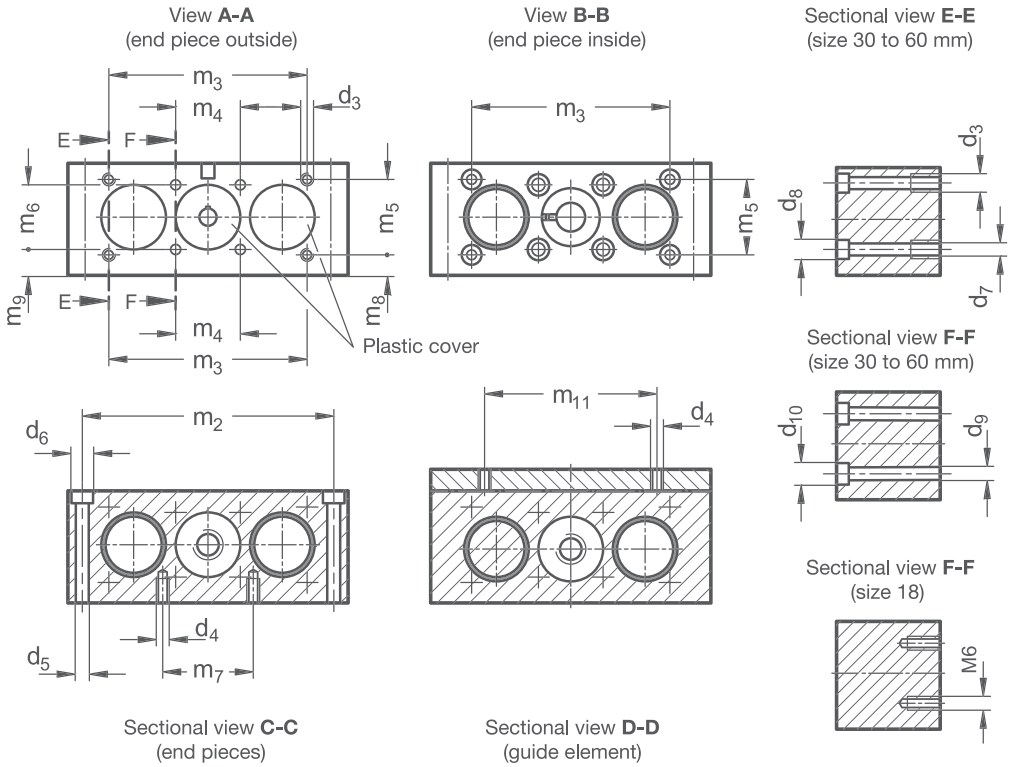
The guide tubes of the **precision double tube linear units PD1D** are made of chrome-plated steel or polished stainless steel precision tubes. The end pieces of aluminum connect the tubes and form a precise linear guide together with the guide element. The centered continuous spindle has trapezoidal or fine thread and ball bearings on both sides. The slide-guided double guide element is moved linearly along the spindle thread by the integrated spindle nut.

Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for even higher loads.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures, for example, that the lengths of the journals z_1 and z_2 are correct for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product





d_1	Stroke l_1	b	d_2	d_3	d_4	d_5	d_6	For screws DIN 912	d_7	d_8	For screws DIN 912	d_9	d_{10}	For screws DIN 912
18	...400	28	6	-	M 5	5,5	10	M 5	-	-	-	-	-	-
30	...1500	50	8	M 6	M 6	6,6	11	M 6	5,5	10	M 5	6,6	11	M 6
40	...2500	60	12	M 8	M 8	9	15	M 8	6,6	11	M 6	8,6	13,5	M 8
50	...2630	72	12	M 10	M 8	9	15	M 8	9	13,5	M 8	9	13,5	M 8
60	...2580	80	14	M 10	M 10	10,5	16,5	M 10	9	13,5	M 8	11	16,5	M 10

d_1	h_1	h_2	h_3	h_4	h_5	l_2	l_3	l_4	m_1	m_2	m_3	m_4	m_5	m_6
18	28	37	1	14,5	8	$2xb+l_4+l_1$	81	81	$b+l_4+l_1$	68	-	20	-	20
30	52	64	2	27	10	$2xb+l_4+l_1$	130	130	$b+l_4+l_1$	114	92	30	35	30
40	60	75	3	31,5	12	$2xb+l_4+l_1$	180	180	$b+l_4+l_1$	160	132	39	38	39
50	72	92	4	38	16	$2xb+l_4+l_1$	206	206	$b+l_4+l_1$	184	150	46	50	46
60	86	106	4	45	16	$2xb+l_4+l_1$	240	240	$b+l_4+l_1$	216	185	55	60	55

d_1	m_7	m_8	m_9	m_{10}	m_{11}	Parallel key DIN 6885	**Accessories:** Torque support	Position indicator		Handwheel
18	18	-	4,5	68	52	A2x2x12	VZDD	VZPM	-	VZH
30	42	9,5	12	114	80	A2x2x12	-	VZPM (only for stroke ≤ 1000 mm)	VZPE	VZH
40	62	12,5	12	160	120	A4x4x12	-	VZPM	VZPE	VZH
50	62	13	15	184	134	A4x4x12	-	VZPM	VZPE	VZH
60	74	15	17,5	216	160	A5x5x16	-	VZPM (only for trapezoidal thread)	VZPE	VZH

2C

Version
a

1ST	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing
1ED	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

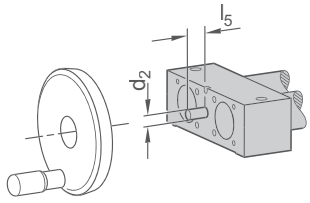
Spindle thread direction / clamping
r

RH	Right-hand thread
RHK	Right-hand thread with clamping ring and hand lever for spindle clamping
LH	Left-hand thread
LHK	Left-hand thread with clamping ring and hand lever for spindle clamping

d_1	Spindle Ø	Spindle pitch p		Journal diameter d_2	Journal length B l_5	Journal length C l_6	Journal length D l_7	Individual journal length l_8
		Trapezoidal thread	Fine thread, metric					
18	10	3	1	6	16	30	48	16...46
30	14	4	1	8	16	36	52	16...67
40	20	4	1	12	17	42	59	17...74
50	20	4	1	12	18	42	60	18...75
60	24	5	1,5	14	19	42	61	19...76

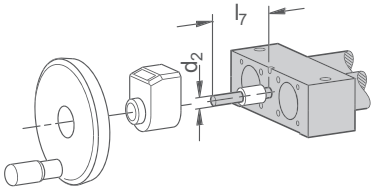
Journal
z_1

B	Journal for handwheel



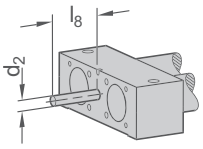
Journal length l_5

D	Journal for position indicator and handwheel (torque support required for d_1 =18)



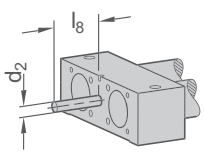
Journal length l_7

Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



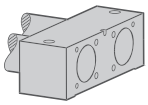
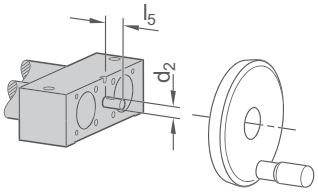
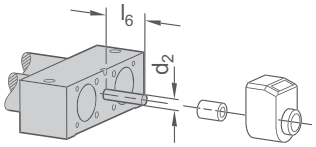
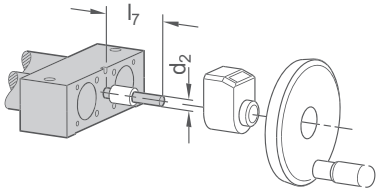
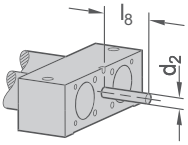
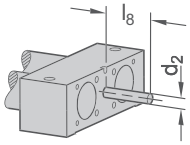
Journal length l_8

Hxx	Individual journal length without keyway (for xx, enter values from column l_8)



Journal length l_8

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator (torque support required for d_1 =18)
		 Journal length l_5		 Journal length l_6	
D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_8)	Hxx	Individual journal length without keyway (for xx, enter values from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

ORDER KEY

Name key	Supplemental key
PD1D - d_1 - a - l_1 - r - p - z_1 - z_2	

- Double tube linear actuator
- Tube diameter
- Version
- Stroke
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers
- Complete linear unit of stainless steel

PD1DK

Precision double tube linear units with one double guide element and recirculating ball screw

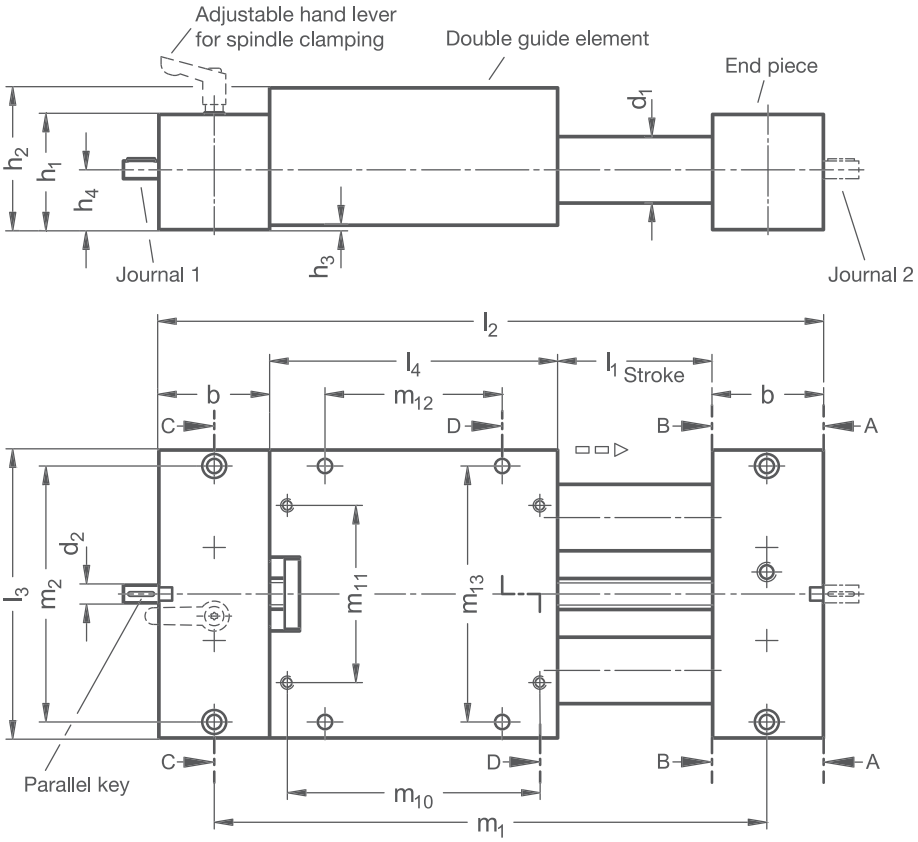
PRODUCT INFO

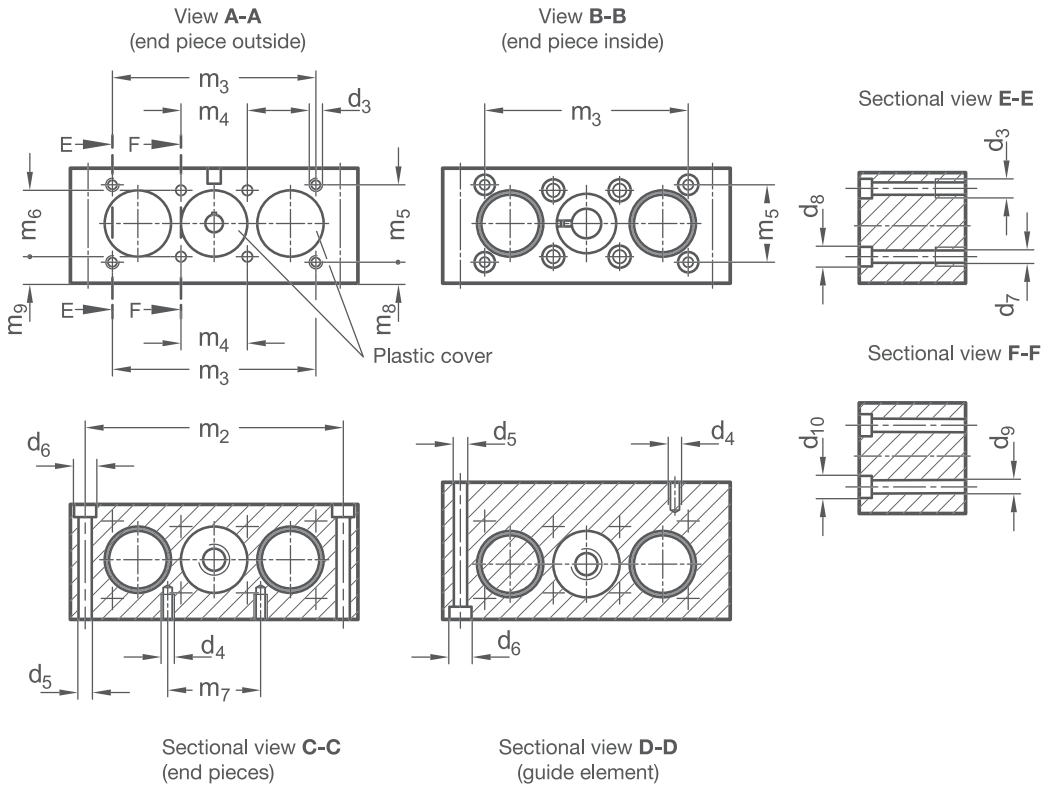
The round guides of the **precision double tube linear units PD1DK** are made of hard-chrome-plated steel or polished stainless steel solid shafts. The aluminum CNC end pieces connect the solid shafts and form a very precise linear guide together with the guide element. A continuous whirled or rolled recirculating ball screw is situated in the center. The roller-guided double guide element is moved linearly along the spindle thread by the integrated ball screw nut.

Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for even higher loads.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures, for example, that the lengths of the journals z_1 and z_2 are correct for attaching the accessories. The accessories are not included with the linear units.

RoHS-compliant product





d_1	Stroke l_1	b	d_2	d_3	d_4	d_5	d_6	For screws DIN 912	d_7	d_8	For screws DIN 912	d_9	d_{10}	For screws DIN 912
25	...1500	50	8	M 6	M 6	6,1	10,5	M 6	5,5	10	M 5	6,6	11	M 6
40	...2500	60	12	M 8	M 8	8,4	13,5	M 8	6,6	11	M 6	8,6	13,5	M 8

d_1	h_1	h_2	h_3	h_4	l_2	l_3	l_4	m_1	m_2	m_3	m_4	m_5	m_6	m_7
25	52	64	2	27	$2xb+l_4+l_1$	130	130	$b+l_4+l_1$	114	97	30	35	30	42
40	60	75	3	31,5	$2xb+l_4+l_1$	180	180	$b+l_4+l_1$	160	138	39	38	39	52

d_1	m_8	m_9	m_{10}	m_{11}	m_{12}	m_{13}	Parallel key DIN 6885	**Accessories:** Position indicator		Handwheel
25	9,5	12	114	80	80	114	A2x2x12	VZPM (only for stroke ≤ 1000 mm)	VZPE	VZH
40	12,5	12	160	120	120	160	A4x4x12	VZPM	VZPE	VZH

2C

Version
a

3ST	Double solid shaft roller slideway / ball screw • Solid guide shafts: Steel, polished and hard-chrome-plated • End pieces / guide elements: Aluminum, CNC-milled parts • ball screw: With ball bearing
3ED	Double solid shaft roller slideway / ball screw • Solid guide shafts: Stainless steel, induction-hardened and polished • End pieces / guide elements: Aluminum, CNC-milled parts • ball screw: With ball bearing

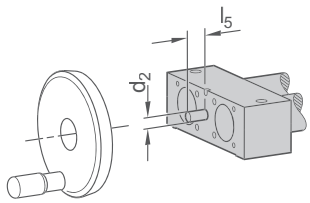
Spindle thread direction / clamping
r

RH	Right-hand thread
RHK	Right-hand thread with clamping ring and hand lever for spindle clamping
LH	Left-hand thread
LHK	Left-hand thread with clamping ring and hand lever for spindle clamping

d_1	Spindle Ø	Spindle pitch **p** Ball screw	Journal diameter d_2	Journal length B l_5	Journal length C l_6	Journal length D l_7	Individual journal length l_8
25	16	5	8	16	36	52	16...67
40	20	5	12	17	42	59	17...74

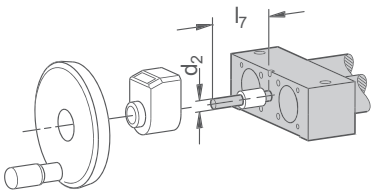
Journal
z_1

B	Journal for handwheel



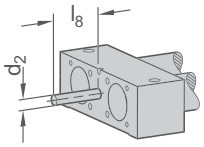
Journal length l_5

D	Journal for position indicator & handwheel (torque support required for d_1 =18)



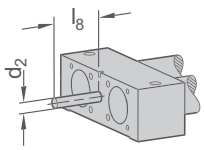
Journal length l_7

Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



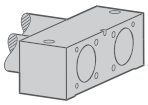
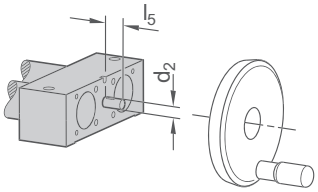
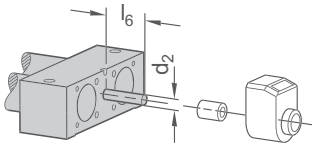
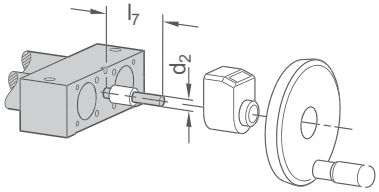
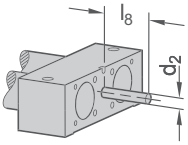
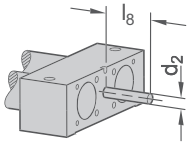
Journal length l_8

Hxx	Individual journal length without keyway (for xx, enter values from column l_8)



Journal length l_8

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator (torque support required for d_1 =18)
		 Journal length l_5		 Journal length l_6	
D	Journal for position indicator & handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_8)	Hxx	Individual journal length without keyway (for xx, enter values from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

ORDER KEY

Name key | Supplemental key

PD1DK - d_1 - a - l_1 - r - p - z_1 - z_2

- Double tube linear actuator
- Tube diameter
- Version
- Stroke
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Bellows covers
- Complete linear unit of stainless steel

PD2E

Precision double tube linear units with two opposing single guide elements

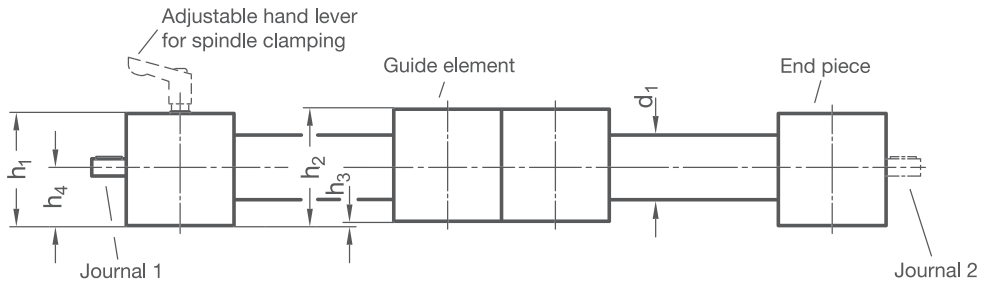
PRODUCT INFO

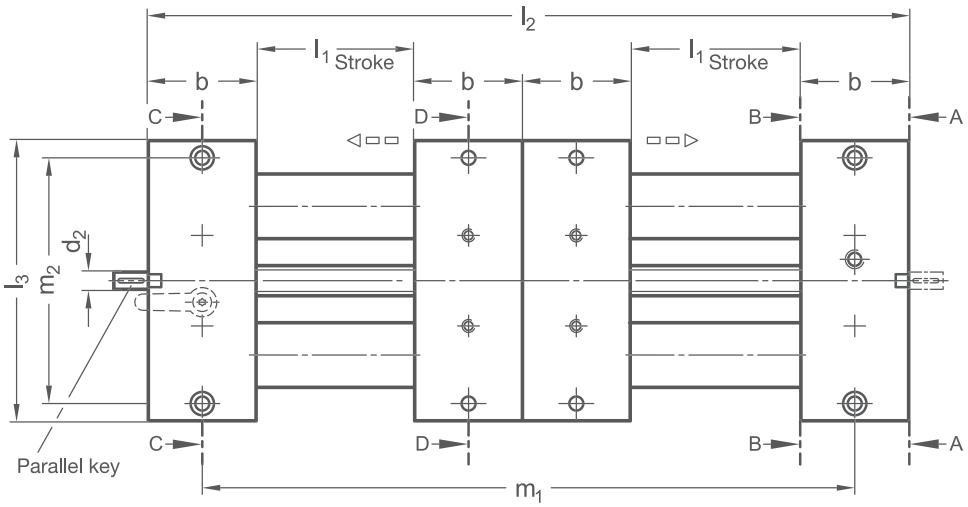
The round guides of the **precision double tube linear units PD2E** are available either as tubes or solid shafts. They are made of chrome-plated or hard-chrome-plated steel or polished stainless steel. The end pieces of aluminum connect the tubes or solid shafts and form a precise linear guide together with the guide elements. The centered continuous spindle has trapezoidal or fine thread and ball bearings on both sides. The spindle itself consists of one part with left-hand thread and one with right-hand thread. The single guide elements are moved linearly along the spindle thread in opposite directions by the integrated spindle nuts. The single guide elements have either a sliding or roller guide.

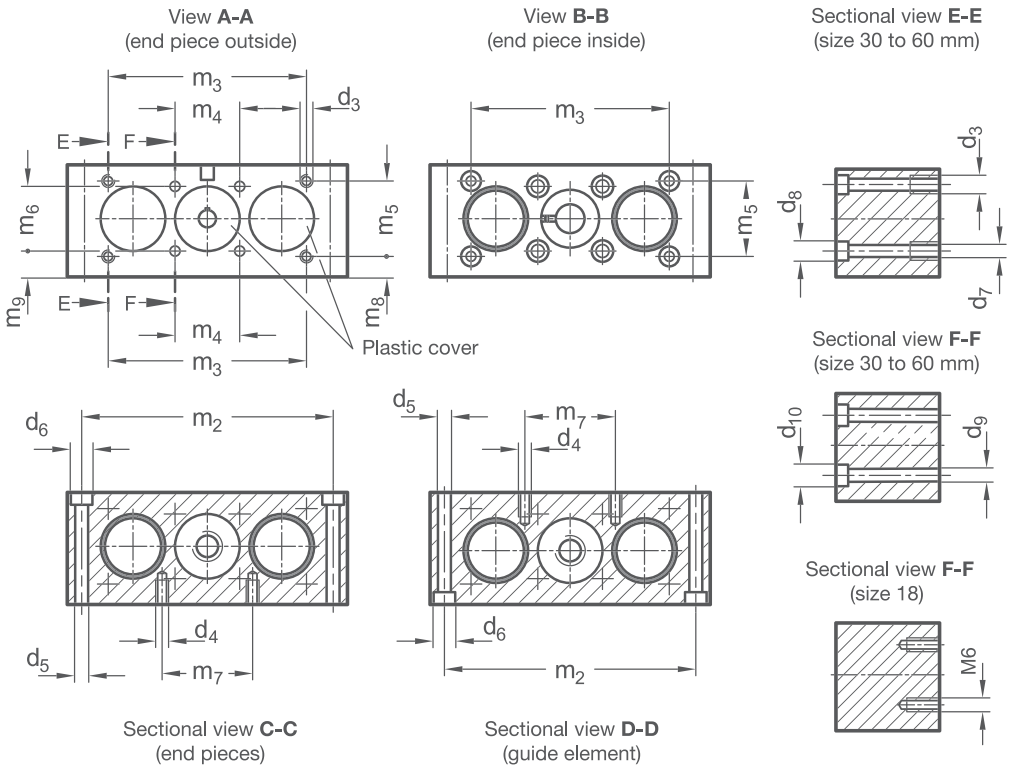
Double tube linear units have high torsional stiffness and can handle high weights and torques.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures, for example, that the lengths of the journals z_1 and z_2 are correct for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product







d_1	Stroke l_1	b	d_2	d_3	d_4	d_5	d_6	For screws DIN 912	d_7	d_8	For screws DIN 912	d_9	d_{10}	For screws DIN 912
18	...400	28	6	-	M 5	5,5	10	M 5	_	-	-	_	_	-
25*	...750	50	8	M 6	M 6	6,1	10,5	M 6	5,5	10	M 5	6,6	11	M 6
30	...750	50	8	M 6	M 6	6,6	11	M 6	5,5	10	M 5	6,6	11	M 6
40	...1250	60	12	M 8	M 8	8,4* / 9	13,5* / 15	M 8	6,6	11	M 6	8,6	13,5	M 8
50	...1300	72	12	M 10	M 8	9	15	M 8	9	13,5	M 8	9	13,5	M 8
60	...1350	80	14	M 10	M 10	10,5	16,5	M 10	9	13,5	M 8	11	16,5	M 10

d_1	h_1	h_2	h_3	h_4	l_2	l_3	m_1	m_2	m_3	m_4	m_5	m_6	m_7
18	28	29	1	14,5	4xb+2xl_1	81	3xb+2xl_1	68	-	20	-	20	18
25*	52	54	2	27	4xb+2xl_1	130	3xb+2xl_1	114	97	30	35	30	42
30	52	54	2	27	4xb+2xl_1	130	3xb+2xl_1	114	92	30	35	30	42
40	60	63	3	31,5	4xb+2xl_1	180	3xb+2xl_1	160	138* / 132	39	38	39	52* / 62
50	72	76	4	38	4xb+2xl_1	206	3xb+2xl_1	184	150	46	50	46	62
60	86	90	4	45	4xb+2xl_1	240	3xb+2xl_1	216	185	55	60	55	74

			Accessories:			
d_1	m_8	m_9	Parallel key DIN 6885	Torque support	Position indicator	Handwheel
18	-	4,5	A2x2x12	VZDD	VZPM -	VZH
25*	9,5	12	A2x2x12	-	VZPM (only for stroke ≤ 1000 mm) VZPE	VZH
30	9,5	12	A2x2x12	-	VZPM (only for stroke ≤ 1000 mm) VZPE	VZH
40	12,5	12	A4x4x12	-	VZPM VZPE	VZH
50	13	15	A4x4x12	-	VZPM VZPE	VZH
60	15	17,5	A5x5x16	-	VZPM (only for trapezoidal thread) VZPE	VZH

* Only for version a = 2ST / 2ED

2C

Version
a

1ST	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	2ST	Double solid shaft roller slideway / trapezoidal lead screw (only for d_1 = 25 and d_1 = 40) • Solid guide shafts: Steel, polished and hard-chrome-plated • End pieces / guide elements: Aluminum, CNC-milled parts • Trapezoidal / fine thread spindle: Steel, with ball bearing
1ED	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing	2ED	Double solid shaft roller slideway / trapezoidal lead screw (only for d_1 = 25 and d_1 = 40) • Solid guide shafts: Stainless steel, induction-hardened and polished • End pieces / guide elements: Aluminum, CNC-milled parts • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

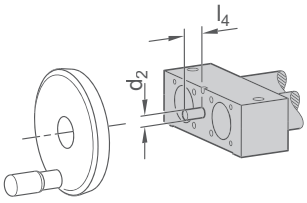
Spindle thread direction / clamping
r

RH	Right-hand thread on journal 1, left-hand thread on journal 2
RHK	Right-hand thread on journal 1, left-hand thread on journal 2 with clamping ring and hand lever for spindle clamping
LH	Left-hand thread on journal 1, right-hand thread on journal 2
LHK	Left-hand thread on journal 1, right-hand thread on journal 2 with clamping ring and hand lever for spindle clamping

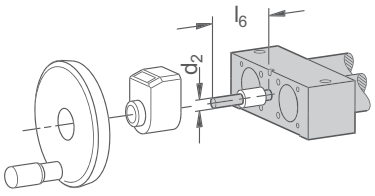
d_1	Spindle Ø	Spindle pitch **p**		Journal diameter d_2	Journal length B l_4	Journal length C l_5	Journal length D l_6	Individual journal length l_7
		Trapezoidal thread	Fine thread, metric					
18	10	3	1	6	16	30	46	16...46
25	14	4	1	8	16	36	52	16...67
30	14	4	1	8	16	36	52	16...67
40	20	4	1	12	17	42	59	17...74
50	20	4	1	12	18	42	60	18...75
60	24	5	1,5	14	19	42	61	19...76

Journal
z_1

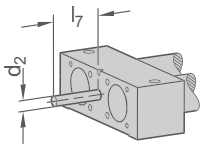
B	Journal for handwheel	D	Journal for position indicator & handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_7)



Journal length l_4

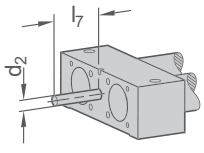


Journal length l_6



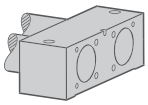
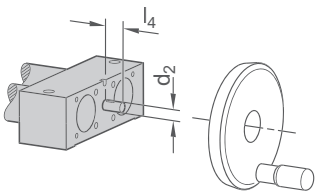
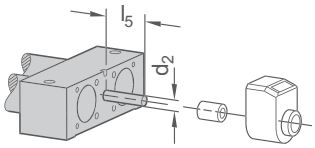
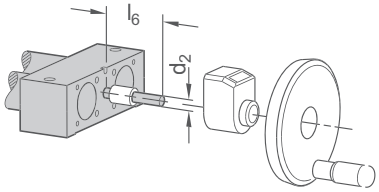
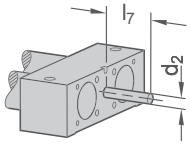
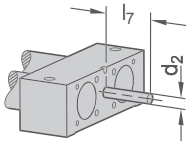
Journal length l_7

Hxx	Individual journal length without keyway (for xx, enter values from column l_7)



Journal length l_7

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator (torque support required for d_1 =18)
		 Journal length l_4		 Journal length l_5	
D	Journal for position indicator & handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_7)	Hxx	Individual journal length without keyway (for xx, enter values from column l_7)
 Journal length l_6		 Journal length l_7		 Journal length l_7	

ORDER KEY

Name key | Supplemental key

PD2E - d_1 - a - l_1 - r - p - z_1 - z_2

- Double tube linear actuator
- Tube diameter
- Version
- Stroke
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers
- Complete linear unit of stainless steel

PD2D | Precision double tube linear units with two opposing double guide elements

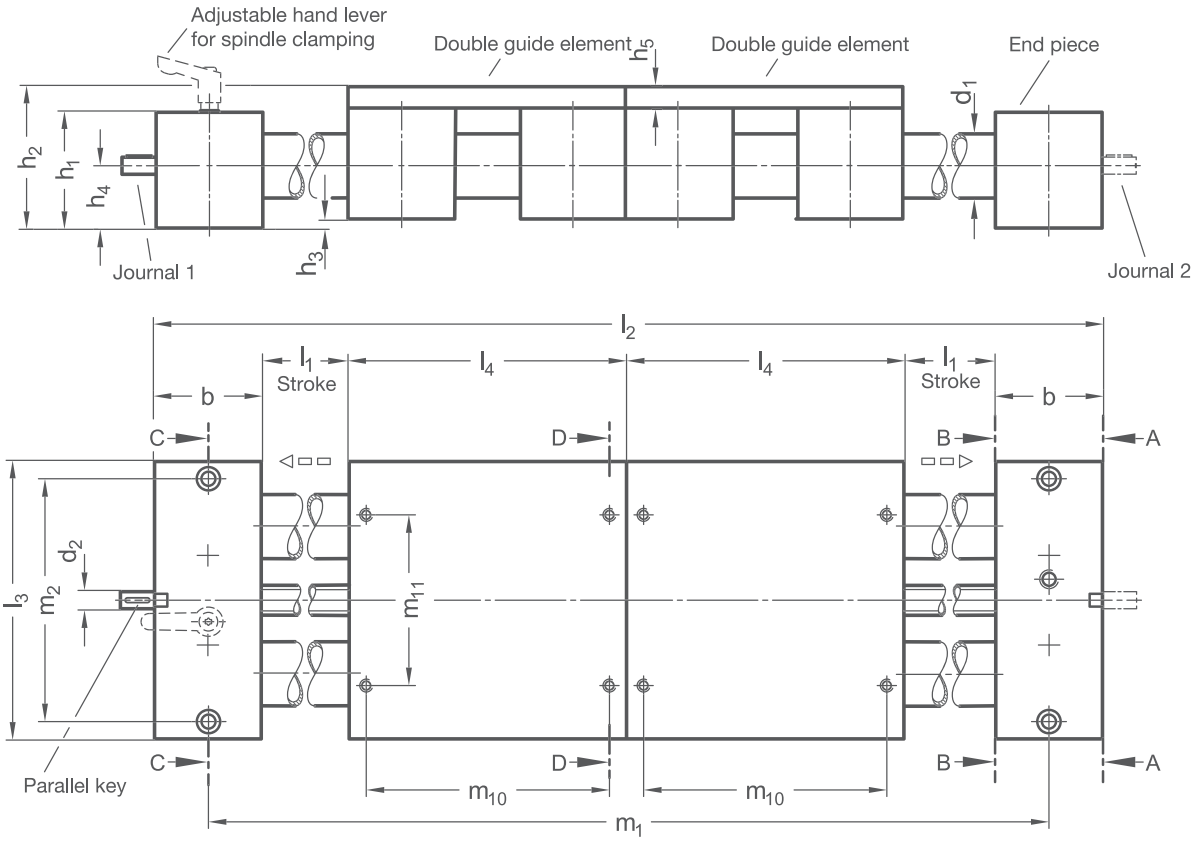
PRODUCT INFO

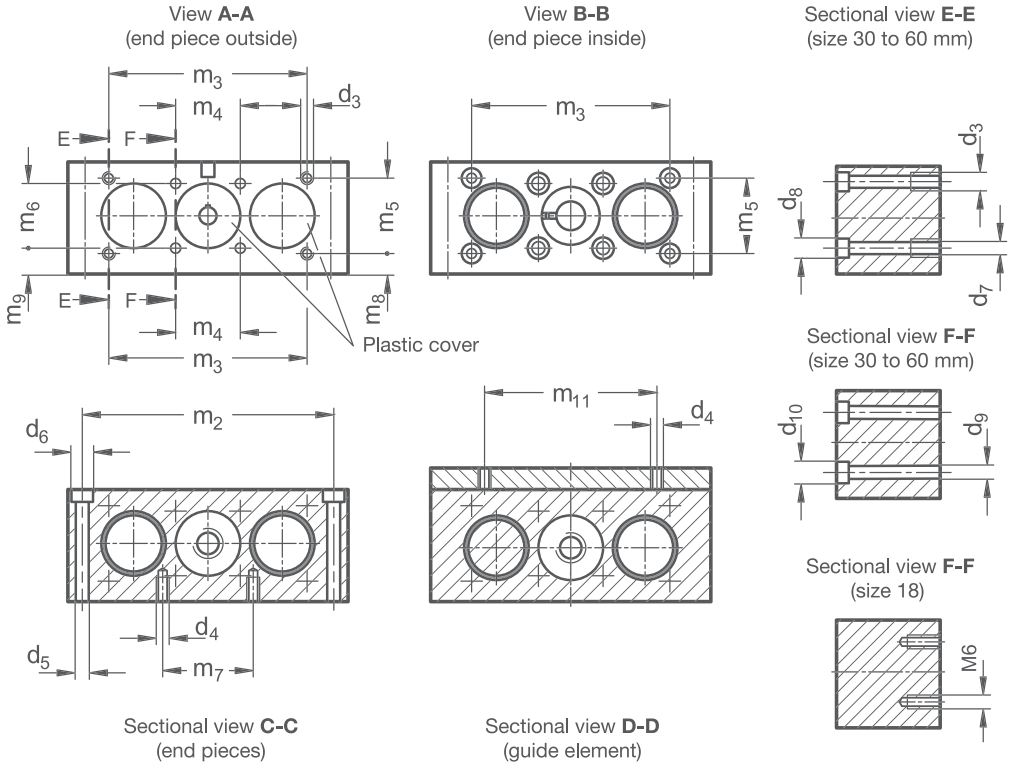
The guide tubes of the **precision double tube linear units PD2D** are made of chrome-plated steel or polished stainless steel precision tubes. The end pieces of aluminum connect the tubes and form a precise linear guide together with the guide elements. The centered continuous spindle has trapezoidal or fine thread and ball bearings on both sides. The spindle itself consists of one part with left-hand thread and one with right-hand thread. The slide-guided double guide elements are moved linearly along the spindle thread in opposite directions by the integrated spindle nuts.

Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for even higher loads.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures, for example, that the lengths of the journals z_1 and z_2 are correct for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product





d_1	Stroke l_1	b	d_2	d_3	d_4	d_5	d_6	For screws DIN 912	d_7	d_8	For screws DIN 912	d_9	d_{10}	For screws DIN 912
18	...400	28	6	-	M 5	5,5	10	M 5	-	-	-	-	-	-
30	...750	50	8	M 6	M 6	6,6	11	M 6	5,5	10	M 5	6,6	11	M 6
40	...1100	60	12	M 8	M 8	9	15	M 8	6,6	11	M 6	8,6	13,5	M 8
50	...1165	72	12	M 10	M 8	9	15	M 8	9	13,5	M 8	9	13,5	M 8
60	...1170	80	14	M 10	M 10	10,5	16,5	M 10	9	13,5	M 8	11	16,5	M 10

d_1	h_1	h_2	h_3	h_4	h_5	l_2	l_3	l_4	m_1	m_2	m_3	m_4	m_5	m_6
18	28	37	1	14,5	8	$2xb+2xl_1+2xl_4$	81	81	$b+2xl_1+2xl_4$	68	-	20	-	20
30	52	64	2	27	10	$2xb+2xl_1+2xl_4$	130	130	$b+2xl_1+2xl_4$	114	92	30	35	30
40	60	75	3	31,5	12	$2xb+2xl_1+2xl_4$	180	180	$b+2xl_1+2xl_4$	160	132	39	38	39
50	72	92	4	38	16	$2xb+2xl_1+2xl_4$	206	206	$b+2xl_1+2xl_4$	184	150	46	50	46
60	86	106	4	45	16	$2xb+2xl_1+2xl_4$	240	240	$b+2xl_1+2xl_4$	216	185	55	60	55

d_1	m_7	m_8	m_9	m_{10}	m_{11}	Parallel key DIN 6885	**Accessories:** Torque support	Position indicator		Handwheel
18	18	-	4,5	68	52	A2x2x12	VZDD	VZPM	-	VZH
30	42	9,5	12	114	80	A2x2x12	-	VZPM	VZPE	VZH
40	62	12,5	12	160	120	A4x4x12	-	VZPM	VZPE	VZH
50	62	13	15	184	134	A4x4x12	-	VZPM	VZPE	VZH
60	74	15	17,5	216	160	A5x5x16	-	VZPM (only for trapezoidal thread)	VZPE	VZH

2C

Version
a

1ST	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing
1ED	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

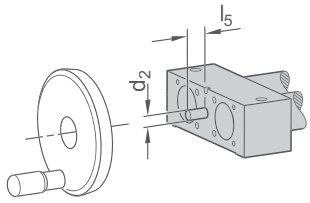
Spindle thread direction / clamping
r

RH	Right-hand thread on journal 1, left-hand thread on journal 2
RHK	Right-hand thread on journal 1, left-hand thread on journal 2 with clamping ring and hand lever for spindle clamping
LH	Left-hand thread on journal 1, right-hand thread on journal 2
LHK	Left-hand thread on journal 1, right-hand thread on journal 2 with clamping ring and hand lever for spindle clamping

d_1	Spindle Ø	Spindle pitch p		Journal diameter d_2	Journal length B l_5	Journal length C l_6	Journal length D l_7	Individual journal length l_8
		Trapezoidal thread	Fine thread, metric					
18	10	3	1	6	16	30	46	16...46
30	14	4	1	8	16	36	52	16...67
40	20	4	1	12	17	42	59	17...74
50	20	4	1	12	18	42	60	18...75
60	24	5	1,5	14	19	42	61	19...76

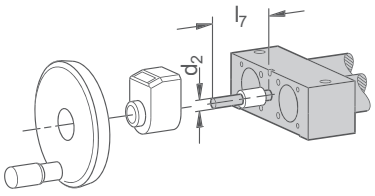
Journal
z_1

B	Journal for handwheel



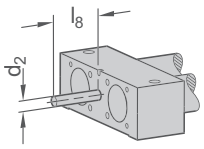
Journal length l_5

D	Journal for position indicator and handwheel (torque support required for d_1 =18)



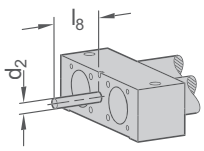
Journal length l_7

Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



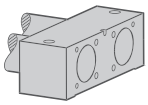
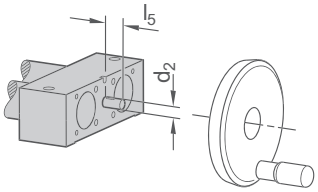
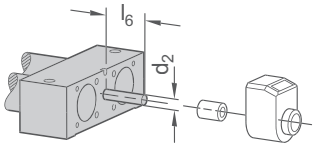
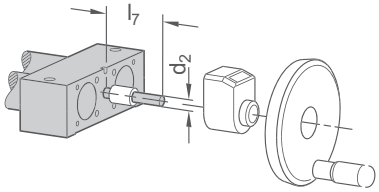
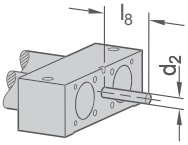
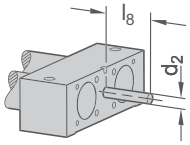
Journal length l_8

Hxx	Individual journal length without keyway (for xx, enter values from column l_8)



Journal length l_8

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator (torque support required for d_1 =18)
		 Journal length l_5		 Journal length l_6	
D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_8)	Hxx	Individual journal length without keyway (for xx, enter values from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

ORDER KEY

Name key	Supplemental key
PD2D - d_1 - a - l_1 - r - p - z_1 - z_2	

- Double tube linear actuator
- Tube diameter
- Version
- Stroke
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

ACCESSORIES

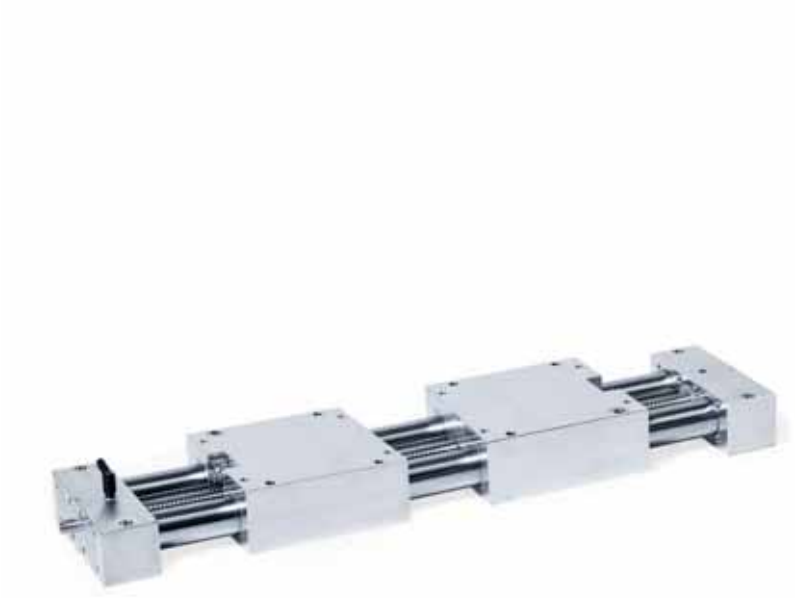
- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers
- Complete linear unit of stainless steel

PD2DK

Precision double tube linear units with two opposing double guide elements and recirculating ball screw



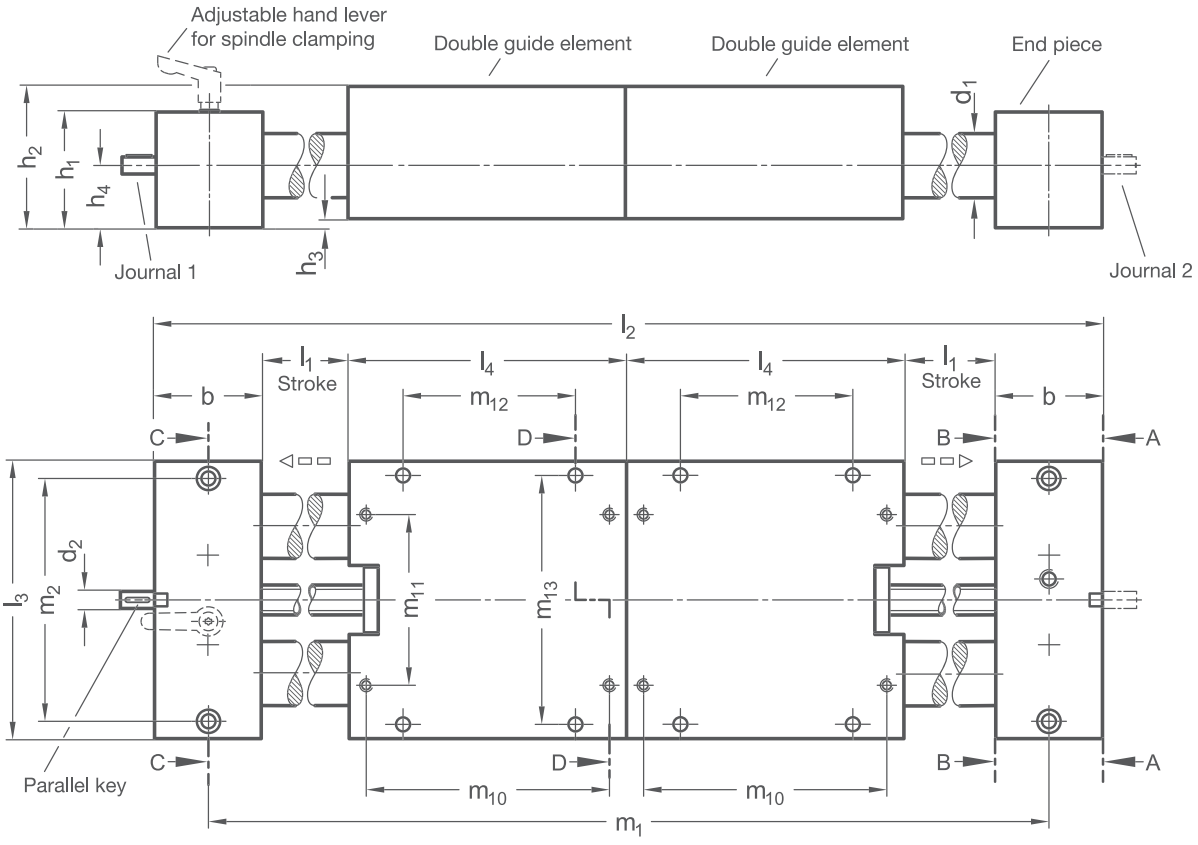
PRODUCT INFO

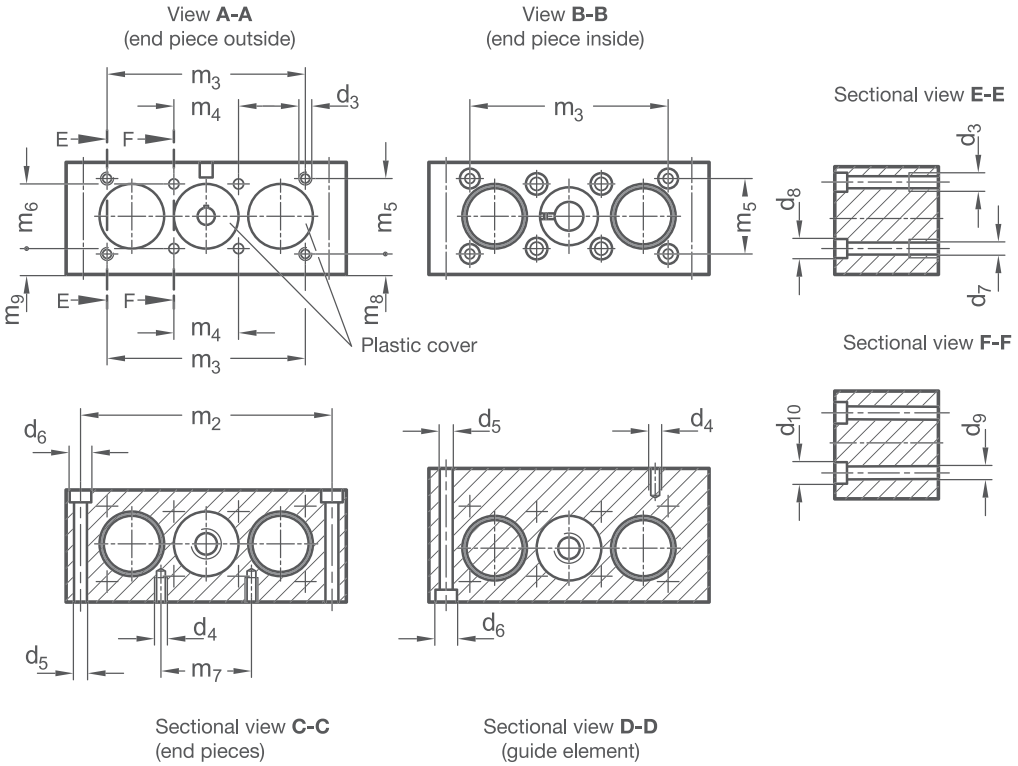
The round guides of the **precision double tube linear units PD2DK** are made of hard-chrome-plated steel or polished stainless steel solid shafts. The aluminum CNC end pieces connect the solid shafts and form a very precise linear guide together with the guide elements. A continuous whirled or rolled recirculating ball screw is situated in the center. The spindle itself consists of one part with left-hand thread and one with right-hand thread. The roller-guided double guide elements are moved by the integrated ball screw nuts in a linear fashion along the spindle threads in opposite directions.

Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for even higher loads.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures, for example, that the lengths of the journals z_1 and z_2 are correct for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product





d_1	Stroke l_1	b	d_2	d_3	d_4	d_5	d_6	For screws DIN 912	d_7	d_8	For screws DIN 912	d_9	d_{10}	For screws DIN 912
25	...750	50	8	M 6	M 6	6,1	10,5	M 6	5,5	10	M 5	6,6	11	M 6
40	...1100	60	12	M 8	M 8	8,4	13,5	M 8	6,6	11	M 6	8,6	13,5	M 8

d_1	h_1	h_2	h_3	h_4	l_2	l_3	l_4	m_1	m_2	m_3	m_4	m_5	m_6	m_7
25	52	64	2	27	$2xb+2xl_1+2xl_4$	130	130	$b+2xl_1+2xl_4$	114	97	30	35	30	42
40	60	75	3	31,5	$2xb+2xl_1+2xl_4$	180	180	$b+2xl_1+2xl_4$	160	138	39	38	39	52

d_1	m_8	m_9	m_{10}	m_{11}	m_{12}	m_{13}	Parallel key DIN 6885	**Accessories:** Position indicator		Handwheel
25	9,5	12	114	80	80	114	A2x2x12	VZPM	VZPE	VZH
40	12,5	12	160	120	120	160	A4x4x12	VZPM	VZPE	VZH

Version
a

3ST	Double solid shaft roller slideway / ball screw • Solid guide shafts: Steel, polished and hard-chrome-plated • End pieces / guide elements: Aluminum, CNC-milled parts • ball screw: With ball bearing
3ED	Double solid shaft roller slideway / ball screw • Solid guide shafts: Stainless steel, induction-hardened and polished • End pieces / guide elements: Aluminum, CNC-milled parts • ball screw: With ball bearing

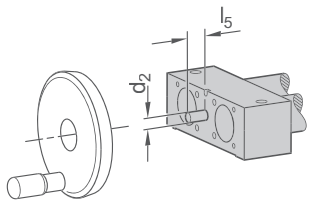
Spindle thread direction / clamping
r

RH	Right-hand thread on journal 1, left-hand thread on journal 2
RHK	Right-hand thread on journal 1, left-hand thread on journal 2 with clamping ring and hand lever for spindle clamping
LH	Left-hand thread on journal 1, right-hand thread on journal 2
LHK	Left-hand thread on journal 1, right-hand thread on journal 2 with clamping ring and hand lever for spindle clamping

d_1	Spindle Ø	Spindle pitch p Ball screw	Journal diameter d_2	Journal length B l_5	Journal length C l_6	Journal length D l_7	Individual journal length l_8
25	16	5	8	16	36	52	16...67
40	20	5	12	17	42	59	17...74

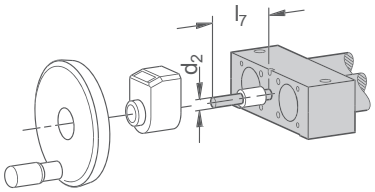
Journal
z_1

B	Journal for handwheel



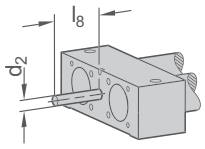
Journal length l_5

D	Journal for position indicator & handwheel (torque support required for d_1 =18)



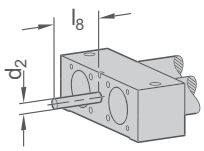
Journal length l_7

Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



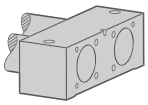
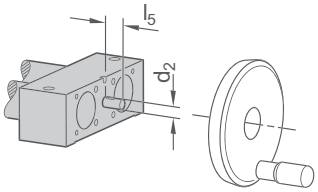
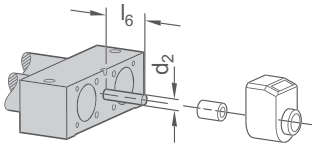
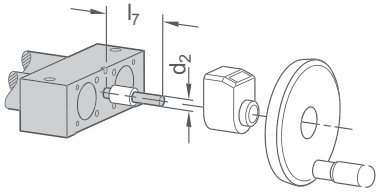
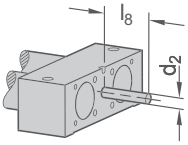
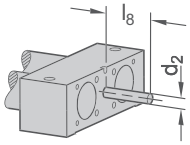
Journal length l_8

Hxx	Individual journal length without keyway (for xx, enter values from column l_8)



Journal length l_8

Journal
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator (torque support required for d_1 =18)
		 Journal length l_5		 Journal length l_6	
D	Journal for position indicator & handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_8)	Hxx	Individual journal length without keyway (for xx, enter values from column l_8)
 Journal length l_7		 Journal length l_8		 Journal length l_8	

ORDER KEY

Name key | Supplemental key

PD2DK - d_1 - a - l_1 - r - p - z_1 - z_2

- Double tube linear actuator
- Tube diameter
- Version
- Stroke
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Bellows covers
- Complete linear unit of stainless steel

PD3E | Precision double tube linear units with two independent single guide elements

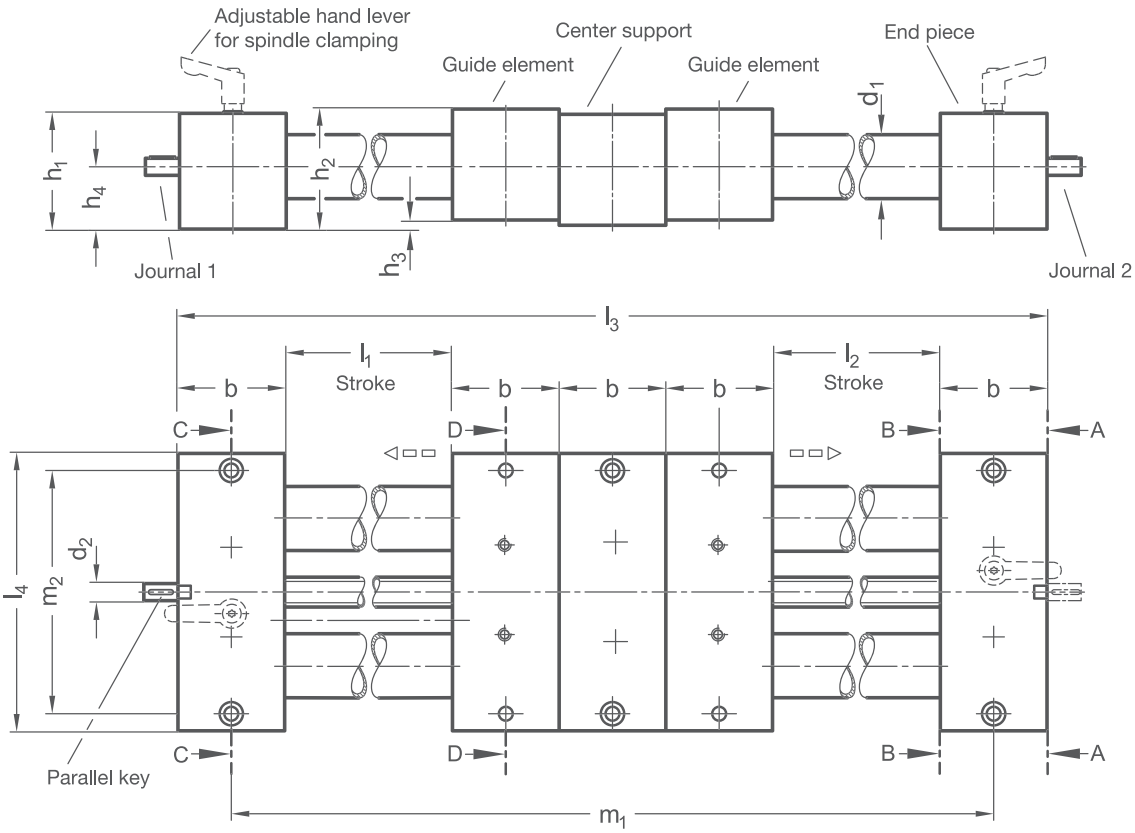
PRODUCT INFO

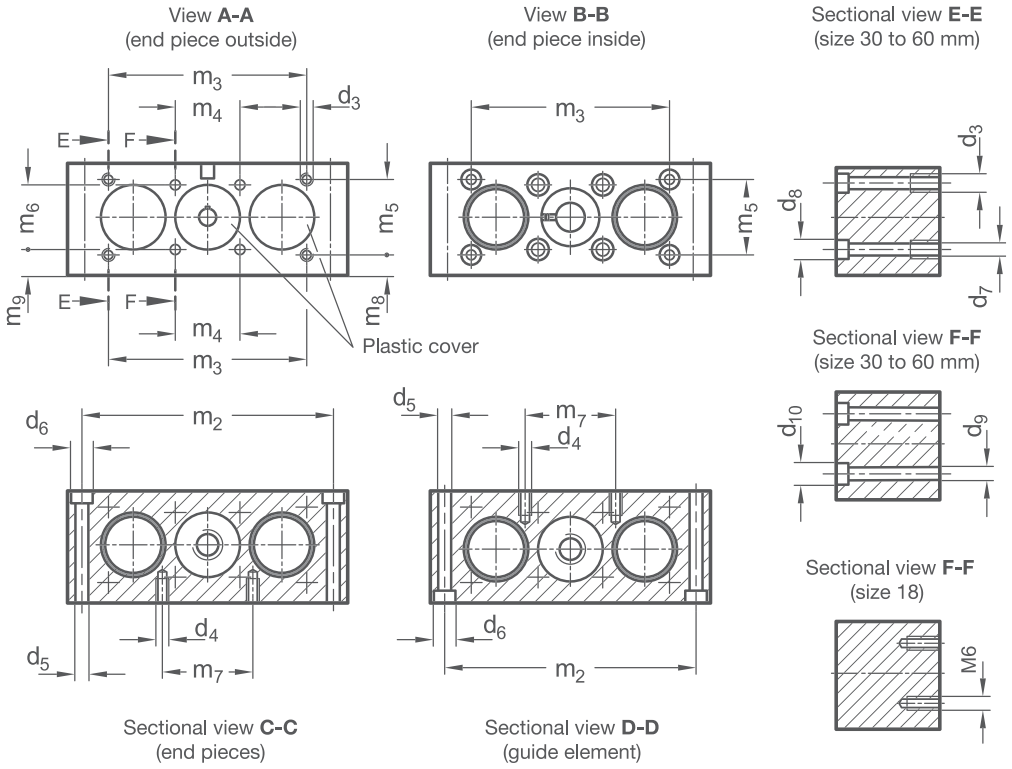
The round guides of the **precision double tube linear units PD3E** are available either as tubes or solid shafts. They are made of chrome-plated or hard-chrome-plated steel or polished stainless steel. The end pieces of aluminum connect the tubes or solid shafts and form a precise linear guide together with the guide elements. The centered independent spindles have trapezoidal or fine thread and ball bearings on both sides. The single guide elements are moved linearly along the spindle threads by the integrated spindle nuts – independently of the opposite side. The single guide elements have either a sliding or roller guide.

Double tube linear units have high torsional stiffness and can handle high weights and torques.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures, for example, that the lengths of the journals z_1 and z_2 are correct for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product





d_1	Stroke l_1	Stroke l_2	b	d_2	d_3	d_4	d_5	d_6	For screws DIN 912	d_7	d_8	For screws DIN 912	d_9	d_{10}	For screws DIN 912
18	...400	...400	28	6	-	M 5	5,5	10	M 5	-	-	-	-	-	-
25*	...750	...750	50	8	M 6	M 6	6,1	10,5	M 6	5,5	10	M 5	6,6	11	M 6
30	...750	...750	50	8	M 6	M 6	6,6	11	M 6	5,5	10	M 5	6,6	11	M 6
40	...1150	...1150	60	12	M 8	M 8	8,5* / 9	13,5* / 15	M 8	6,6	11	M 6	8,6	13,5	M 8
50	...1250	...1250	72	12	M 10	M 8	9	15	M 8	9	13,5	M 8	9	13,5	M 8
60	...1550	...1550	80	14	M 10	M 10	10,5	16,5	M 10	9	13,5	M 8	11	16,5	M 10

d_1	h_1	h_2	h_3	h_4	l_3	l_4	m_1	m_2	m_3	m_4	m_5	m_6
18	28	29	1	14,5	$5xb+l_1+l_2$	81	$4xb+l_1+l_2$	68	-	20	-	20
25*	52	54	2	27	$5xb+l_1+l_2$	130	$4xb+l_1+l_2$	114	97	30	35	30
30	52	54	2	27	$5xb+l_1+l_2$	130	$4xb+l_1+l_2$	114	92	30	35	30
40	60	63	3	31,5	$5xb+l_1+l_2$	180	$4xb+l_1+l_2$	160	138* / 132	39	38	39
50	72	76	4	38	$5xb+l_1+l_2$	206	$4xb+l_1+l_2$	184	150	46	50	46
60	86	90	4	45	$5xb+l_1+l_2$	240	$4xb+l_1+l_2$	216	185	55	60	55

d_1	m_7	m_8	m_9	Parallel key DIN 6885	**Accessories:** Torque support	Position indicator		Handwheel
18	18	-	4,5	A2x2x12	VZDD	VZPM	-	VZH
25*	42	9,5	12	A2x2x12	-	VZPM (only for stroke ≤ 1000 mm)	VZPE	VZH
30	42	9,5	12	A2x2x12	-	VZPM (only for stroke ≤ 1000 mm)	VZPE	VZH
40	52	12,5	12	A4x4x12	-	VZPM	VZPE	VZH
50	62	13	15	A4x4x12	-	VZPM	VZPE	VZH
60	74	15	17,5	A5x5x16	-	VZPM (only for trapezoidal thread)	VZPE	VZH

* Only for version a = 2ST / 2ED

2C

Version
a

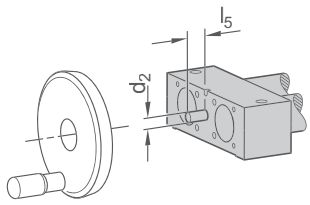
1ST	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	2ST	Double solid shaft roller slideway / trapezoidal lead screw (only for d_1 = 25 and d_1 = 40) • Solid guide shafts: Steel, polished and hard-chrome-plated • End pieces / guide elements: Aluminum, CNC-milled parts • Trapezoidal / fine thread spindle: Steel, with ball bearing
1ED	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing	2ED	Double solid shaft roller slideway / trapezoidal lead screw (only for d_1 = 25 and d_1 = 40) • Solid guide shafts: Stainless steel, induction-hardened and polished • End pieces / guide elements: Aluminum, CNC-milled parts • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

Spindle thread direction 1 **r_1**		Spindle thread direction 2 **r_2**	
RH	Right-hand thread	RH	Right-hand thread
RHK	Right-hand thread with clamping ring and hand lever for spindle clamping	RHK	Right-hand thread with clamping ring and hand lever for spindle clamping
LH	Left-hand thread	LH	Left-hand thread
LHK	Left-hand thread with clamping ring and hand lever for spindle clamping	LHK	Left-hand thread with clamping ring and hand lever for spindle clamping

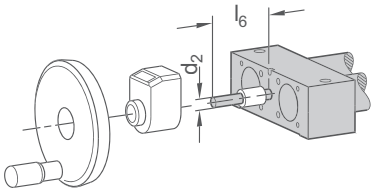
d_1	Spindle **Ø**	Spindle pitch **p_1** Trapezoidal thread	 Fine thread, metric	Spindle pitch **p_2** Trapezoidal thread	 Fine thread, metric	Journal-durchmesser **d_2**	Journal length B **l_5**	Journal length D **l_6**	Individual journal length **l_7**
18	10	3	1	3	1	6	16	46	16...46
25	14	4	1	4	1	8	16	52	16...67
30	14	4	1	4	1	8	16	52	16...67
40	20	4	1	4	1	12	17	59	17...74
50	20	4	1	4	1	12	18	60	18...75
60	24	5	1,5	5	1,5	14	19	61	19...76

Journal
z_1

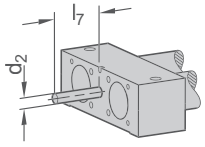
B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_7)



Journal length l_5

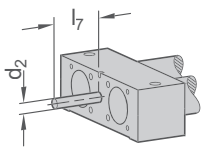


Journal length l_6



Journal length l_7

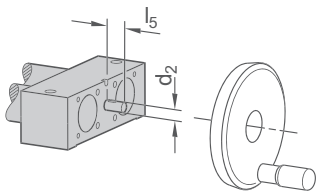
Hxx	Individual journal length without keyway (for xx, enter values from column l_7)



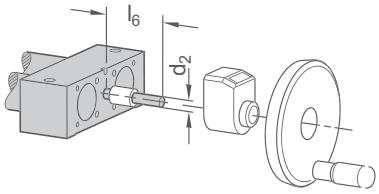
Journal length l_7

Journal
z_2

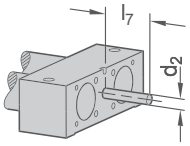
B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_7)



Journal length l_5

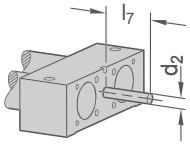


Journal length l_6



Journal length l_7

Hxx	Individual journal length without keyway (for xx, enter values from column l_7)



Journal length l_7

ORDER KEY

Name key | Supplemental key

PD3E - d_1 - a - l_1 - l_2 - r_1 - p_1 - z_1 - r_2 - p_2 - z_2

- Double tube linear unit
- Tube diameter
- Version
- Stroke l_1
- Stroke l_2
- Thread direction r_1
- Spindle pitch p_1
- Journal z_1
- Thread direction r_2
- Spindle pitch p_2
- Journal z_2

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers
- Complete linear unit of stainless steel

PD3D | Precision double tube linear units with two independent double guide elements

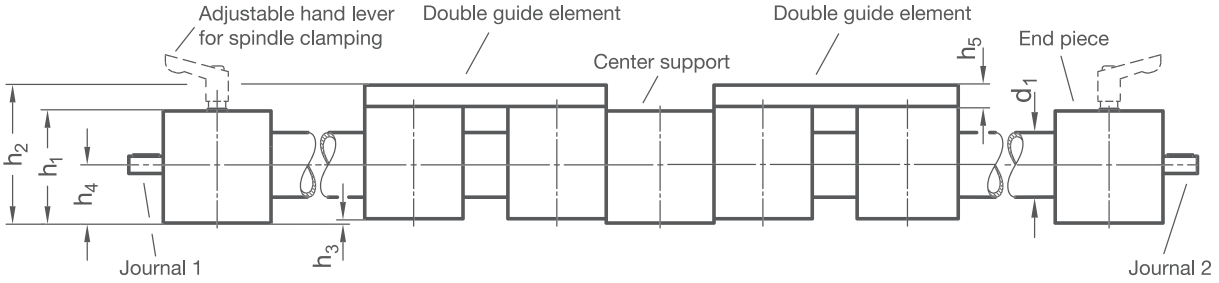
PRODUCT INFO

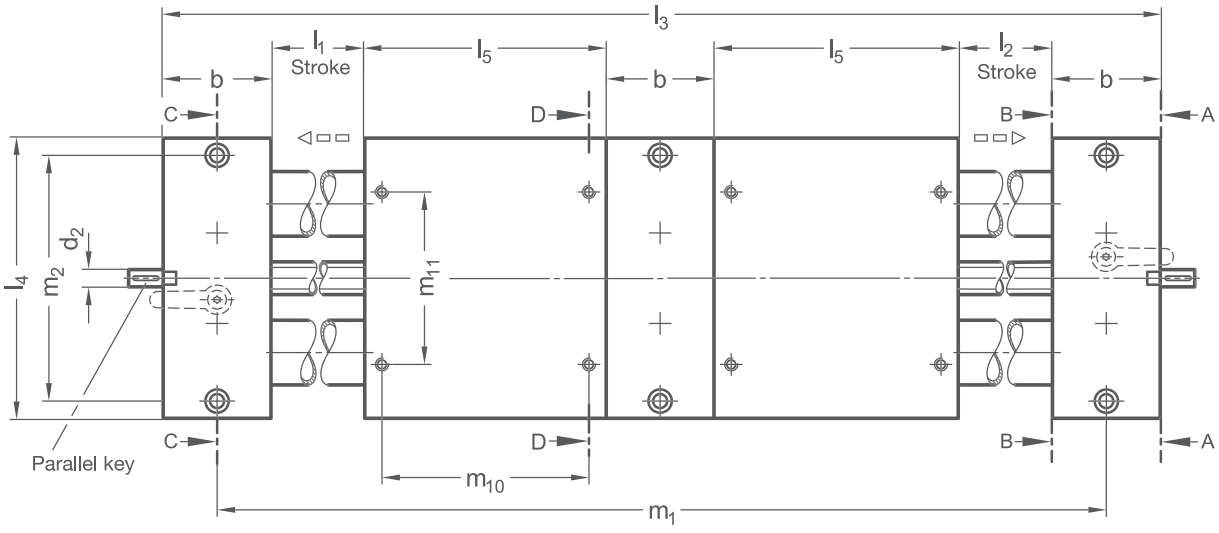
The guide tubes of the **precision double tube linear units PD3D** are made of chrome-plated steel or polished stainless steel precision tubes. The end pieces of aluminum connect the tubes and form a precise linear guide together with the guide elements. The centered independent spindles have trapezoidal or fine thread and ball bearings on both sides. The slide-guided double guide elements are moved linearly along the spindle threads by the integrated spindle nuts – independently of the opposite side.

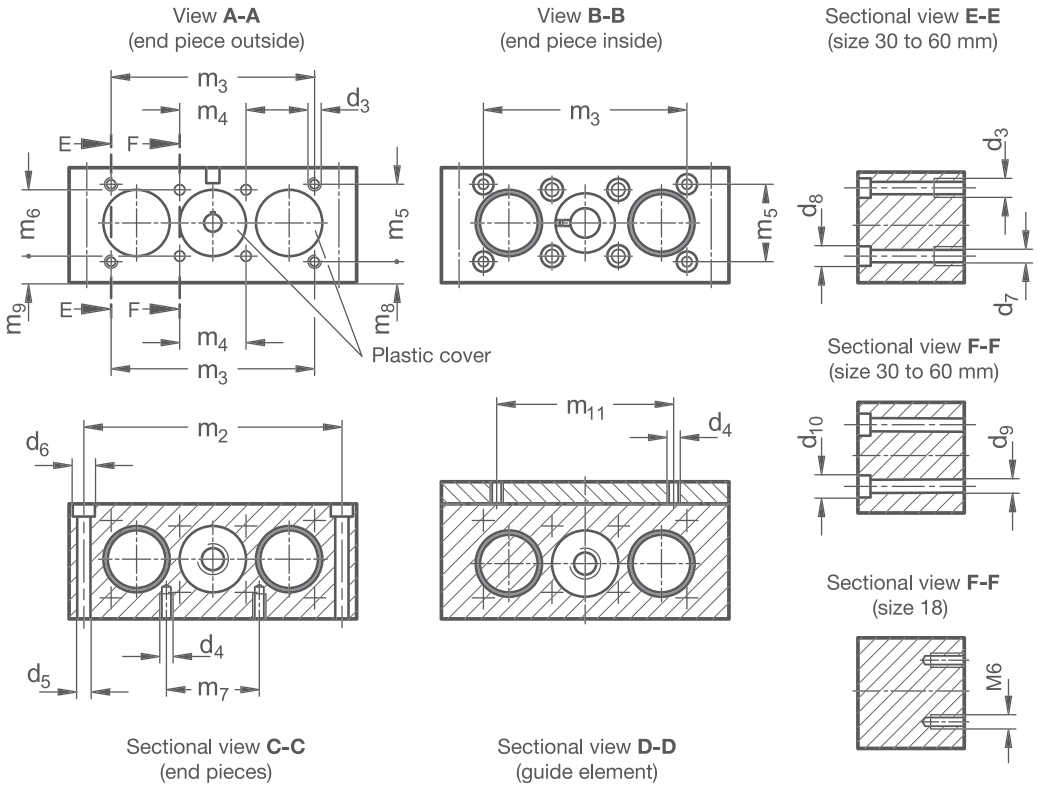
Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for even higher loads.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures, for example, that the lengths of the journals z_1 and z_2 are correct for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product







d_1	Stroke l_1	Stroke l_2	b	d_2	d_3	d_4	d_5	d_6	For screws DIN 912	d_7	d_8	For screws DIN 912	d_9	d_{10}	For screws DIN 912
18	...450	...450	28	6	-	M 5	5,5	10	M 5	-	-	-	-	-	-
30	...750	...750	50	8	M 6	M 6	6,6	11	M 6	5,5	10	M 5	6,6	11	M 6
40	...1030	...1030	60	12	M 8	M 8	9	15	M 8	6,6	11	M 6	8,6	13,5	M 8
50	...1130	...1130	72	12	M 10	M 8	9	15	M 8	9	13,5	M 8	9	13,5	M 8
60	...1390	...1390	80	14	M 10	M 10	10,5	16,5	M 10	9	13,5	M 8	11	16,5	M 10

d_1	h_1	h_2	h_3	h_4	h_5	l_3	l_4	l_5	m_1	m_2	m_3	m_4	m_5	m_6
18	28	37	1	14,5	8	3xb+ $2xl_5+l_1+l_2$	81	81	2xb+ $2xl_5+l_1+l_2$	68	-	20	-	20
30	52	64	2	27	10	3xb+ $2xl_5+l_1+l_2$	130	130	2xb+ $2xl_5+l_1+l_2$	114	92	30	35	30
40	60	75	3	31,5	12	3xb+ $2xl_5+l_1+l_2$	180	180	2xb+ $2xl_5+l_1+l_2$	160	132	39	38	39
50	72	92	4	38	16	3xb+ $2xl_5+l_1+l_2$	206	206	2xb+ $2xl_5+l_1+l_2$	184	150	46	50	46
60	86	106	4	45	16	3xb+ $2xl_5+l_1+l_2$	240	240	2xb+ $2xl_5+l_1+l_2$	216	185	55	60	55

d_1	m_7	m_8	m_9	m_{10}	m_{11}	Parallel key DIN 6885	**Accessories:** Torque support	Position indicator		Handwheel
18	18	-	4,5	68	52	A2x2x12	VZDD	VZPM	-	VZH
30	42	9,5	12	114	80	A2x2x12	-	VZPM	VZPE	VZH
40	62	12,5	12	160	120	A4x4x12	-	VZPM	VZPE	VZH
50	62	13	15	184	134	A4x4x12	-	VZPM	VZPE	VZH
60	74	15	17,5	216	160	A5x5x16	-	VZPM (only for trapezoidal thread)	VZPE	VZH

2C

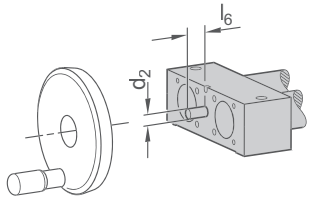
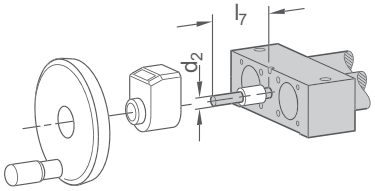
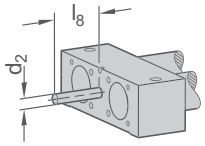
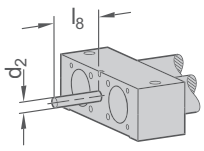
Version
a

1ST	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing
1ED	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Stainless steel AISI 304, polished • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Stainless steel AISI 303, with ball bearing

Thread direction / clamping spindle 1 **r_1**		Thread direction / clamping spindle 2 **r_2**	
RH	Right-hand thread	RH	Right-hand thread
RHK	Right-hand thread with clamping ring and hand lever for spindle clamping	RHK	Right-hand thread with clamping ring and hand lever for spindle clamping
LH	Left-hand thread	LH	Left-hand thread
LHK	Left-hand thread with clamping ring and hand lever for spindle clamping	LHK	Left-hand thread with clamping ring and hand lever for spindle clamping

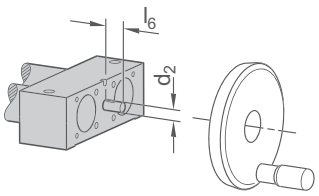
d_1	Spindle **Ø**	Spindle pitch **p_1**		Spindle pitch **p_2**		Journal diameter **d_2**	Journal length B **l_6**	Journal length D **l_7**	Individual journal length **l_8**
		Trapezoidal thread	Fine thread, metric	Trapezoidal thread	Fine thread, metric				
18	10	3	1	3	1	6	16	46	16...46
30	14	4	1	4	1	8	16	52	16...67
40	20	4	1	4	1	12	17	59	17...74
50	20	4	1	4	1	12	18	60	18...75
60	24	5	1,5	5	1,5	14	19	61	19...76

Journal
z_1

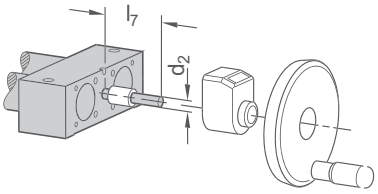
B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_8)
 Journal length l_6		 Journal length l_7		 Journal length l_8	
Hxx	Individual journal length without keyway (for xx, enter values from column l_8)				
 Journal length l_8					

Journal
z_2

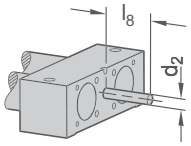
B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



Journal length l_6

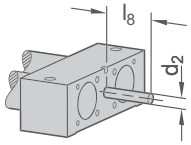


Journal length l_7



Journal length l_8

Hxx	Individual journal length without keyway (for xx, enter values from column l_8)



Journal length l_8

ORDER KEY

Name key | Supplemental key

PD3D - d_1 - a - l_1 - l_2 - r_1 - p_1 - z_1 - r_2 - p_2 - z_2

- Double tube linear unit
- Tube diameter
- Version
- Stroke l_1
- Stroke l_2
- Thread direction r_1
- Spindle pitch p_1
- Journal z_1
- Thread direction r_2
- Spindle pitch p_2
- Journal z_2

ACCESSORIES

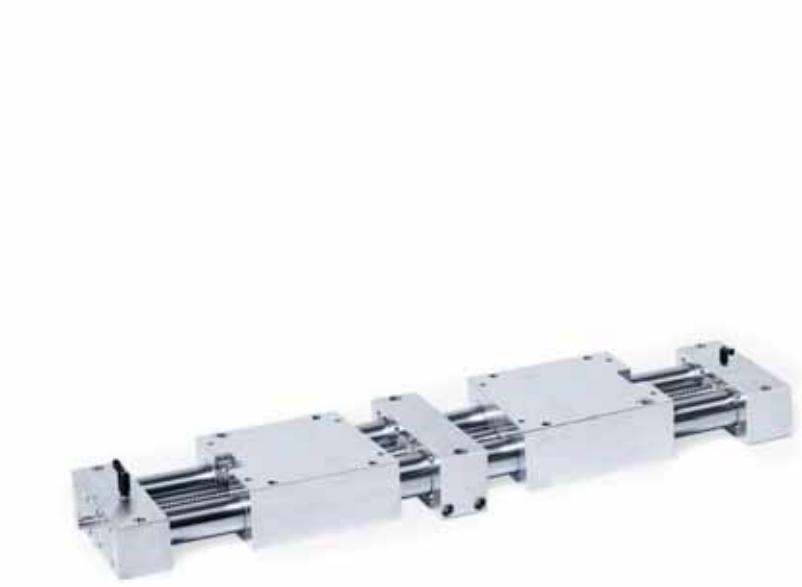
- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

- Additional following guide elements
- Guide element connector plates
- Multiple guide elements with scissors synchronization
- Bellows covers
- Complete linear unit of stainless steel

PD3DK

Precision double tube linear units with two independent double guide elements and recirculating ball screw



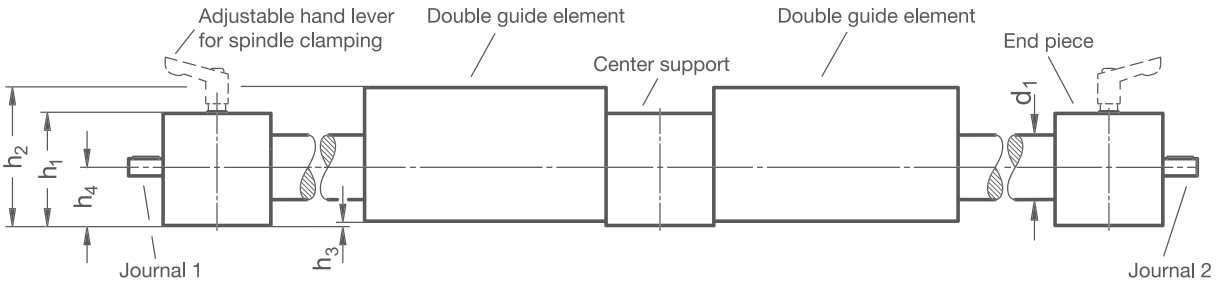
PRODUCT INFO

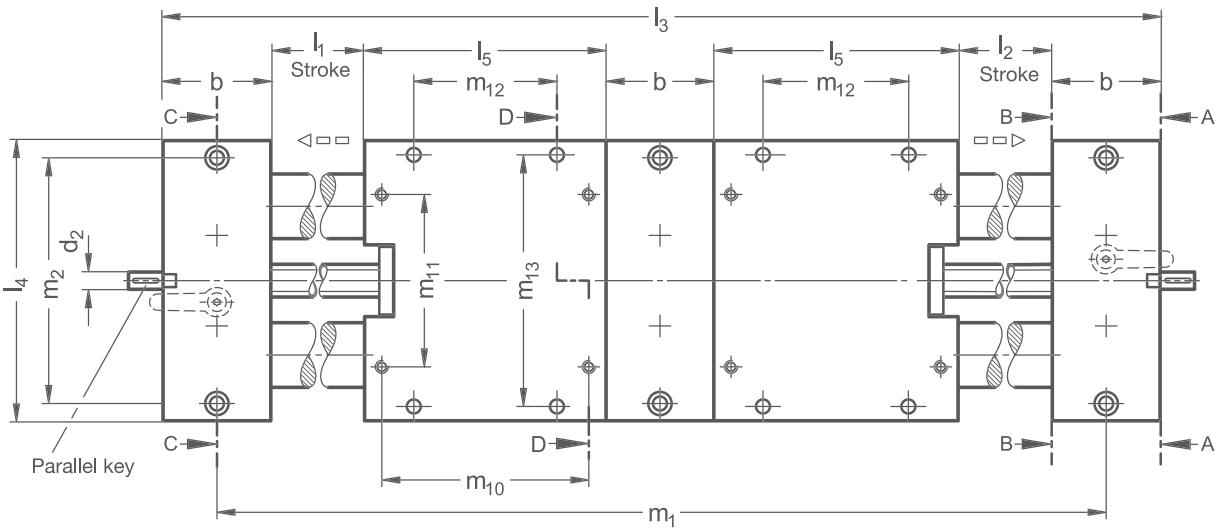
The round guides of the **precision double tube linear units PD3DK** are made of hard-chrome-plated steel or polished stainless steel solid shafts. The aluminum CNC end pieces connect the solid shafts and form a very precise linear guide together with the guide elements. Two independent whirled or rolled recirculating ball screws run through the center of the assembly. The roller-guided double guide elements are moved linearly along the spindle threads by the integrated ball screw nuts – independently of the opposite side.

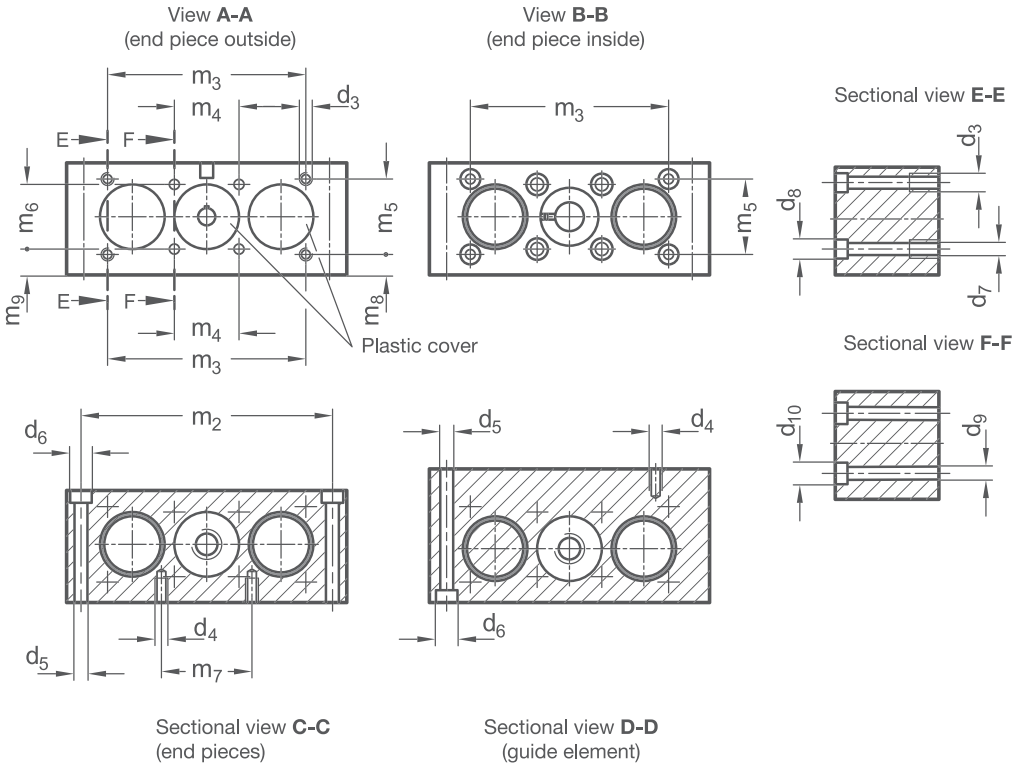
Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for even higher loads.

Accessory parts are listed in the tables and are already taken into account when selecting the linear units. This ensures, for example, that the lengths of the journals z_1 and z_2 are correct for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product







d_1	Stroke l_1	Stroke l_2	b	d_2	d_3	d_4	d_5	d_6	For screws DIN 912	d_7	d_8	For screws DIN 912	d_9	d_{10}	For screws DIN 912
25	...750	...750	50	8	M 6	M 6	6,1	10,5	M 6	5,5	10	M 5	6,6	11	M 6
40	...1030	...1030	60	12	M 8	M 8	8,4	13,5	M 8	6,6	11	M 6	8,6	13,5	M 8

d_1	h_1	h_2	h_3	h_4	l_3	l_4	l_5	m_1	m_2	m_3	m_4	m_5	m_6	m_7
25	52	64	2	27	3xb+ $2xl_5$ +l_1+l_2	130	130	2xb+ $2xl_5$ +l_1+l_2	114	97	30	35	30	42
40	60	75	3	31,5	3xb+ $2xl_5$ +l_1+l_2	180	180	2xb+ $2xl_5$ +l_1+l_2	160	138	39	38	39	52

d_1	m_8	m_9	m_{10}	m_{11}	m_{12}	m_{13}	Parallel key DIN 6885	**Accessories:** Position indicator		Handwheel
25	9,5	12	114	80	80	114	A2x2x12	VZPM	VZPE	VZH
40	12,5	12	160	120	120	160	A4x4x12	VZPM	VZPE	VZH

2C

Version
a

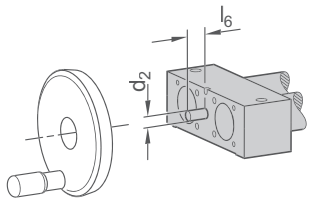
3ST	Double solid shaft roller slideway / ball screw • Solid guide shafts: Steel, polished and hard-chrome-plated • End pieces / guide elements: Aluminum, CNC-milled parts • ball screw: With ball bearing
3ED	Double solid shaft roller slideway / ball screw • Solid guide shafts: Stainless steel, induction-hardened and polished • End pieces / guide elements: Aluminum, CNC-milled parts • ball screw: With ball bearing

Thread direction / clamping spindle 1 **r_1**		Thread direction / clamping spindle 2 **r_2**	
RH	Right-hand thread	RH	Right-hand thread
RHK	Right-hand thread with clamping ring and hand lever for spindle clamping	RHK	Right-hand thread with clamping ring and hand lever for spindle clamping
LH	Left-hand thread	LH	Left-hand thread
LHK	Left-hand thread with clamping ring and hand lever for spindle clamping	LHK	Left-hand thread with clamping ring and hand lever for spindle clamping

d_1	Spindle **Ø**	Spindle pitch **p_1** Ball screw	Spindle pitch **p_2** Ball screw	Journal diameter **d_2**	Journal length B **l_6**	Journal length D **l_7**	Individual journal length **l_8**
25	16	5	5	8	16	52	16...67
40	20	5	5	12	17	59	17...74

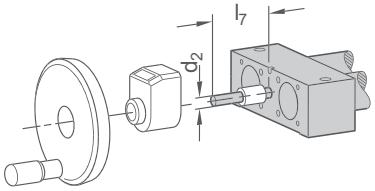
Journal
z_1

B	Journal for handwheel



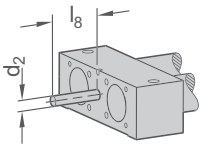
Journal length l_6

D	Journal for position indicator & handwheel (torque support required for d_1 =18)



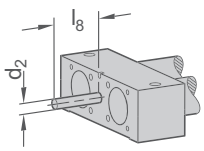
Journal length l_7

Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



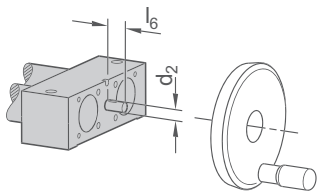
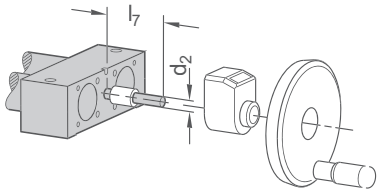
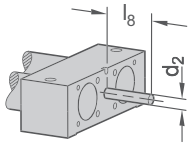
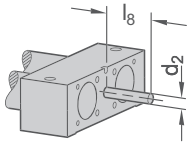
Journal length l_8

Hxx	Individual journal length without keyway (for xx, enter values from column l_8)



Journal length l_8

Journal
z_2

B	Journal for handwheel	D	Journal for position indicator & handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_8)
	 Journal length l_6		 Journal length l_7		 Journal length l_8
Hxx	Individual journal length without keyway (for xx, enter values from column l_8)				
	 Journal length l_8				

ACCESSORIES

- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

ON REQUEST

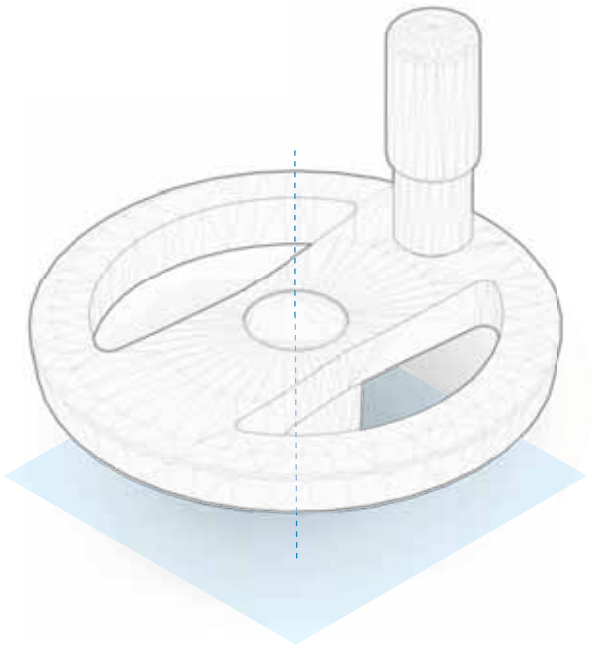
- Additional following guide elements
- Bellows covers
- Complete linear unit of stainless steel

ORDER KEY

Name key | Supplemental key

PD3DK - d_1 - a - l_1 - l_2 - r_1 - p_1 - z_1 - r_2 - p_2 - z_2

- Double tube linear unit
- Tube diameter
- Version
- Stroke l_1
- Stroke l_2
- Thread direction r_1
- Spindle pitch p_1
- Journal z_1
- Thread direction r_2
- Spindle pitch p_2
- Journal z_2



Positioning accessories

The product group “Positioning Accessories 2D” contains parts intended for extending or improving the usability of linear units.

For example, this includes handwheels for moving the linear units, position indicators for position monitoring, and clamping plates for fixation of the spindle.

The group also includes parts and assemblies used for connecting multiple linear units: drive and transfer units, bevel gears, and angle gears.

Handwheels for linear units and transfer units	**VZH** *p. 356* 							
Position indicators, mechanical or electronic	**VZPM** *p. 358* 	**VZPE** *p. 360* 						
Clamping plates	**VZK** *p. 362* 							
Torque supports	**VZDR** *p. 364* 	**VZDV** *p. 366* 	**VZDD** *p. 368* 					
Drive and transfer units	**VA** *p. 370* 							
Bevel gear wheels	**YK** *p. 372* 							
Angle gears for single tube linear units	**YLS** *p. 374* 	**YTS** *p. 376* 						
Angle gears for double tube linear units	**YLD** *p. 378* 							

VZH Handwheels, for linear units and transfer units

PRODUCT INFO

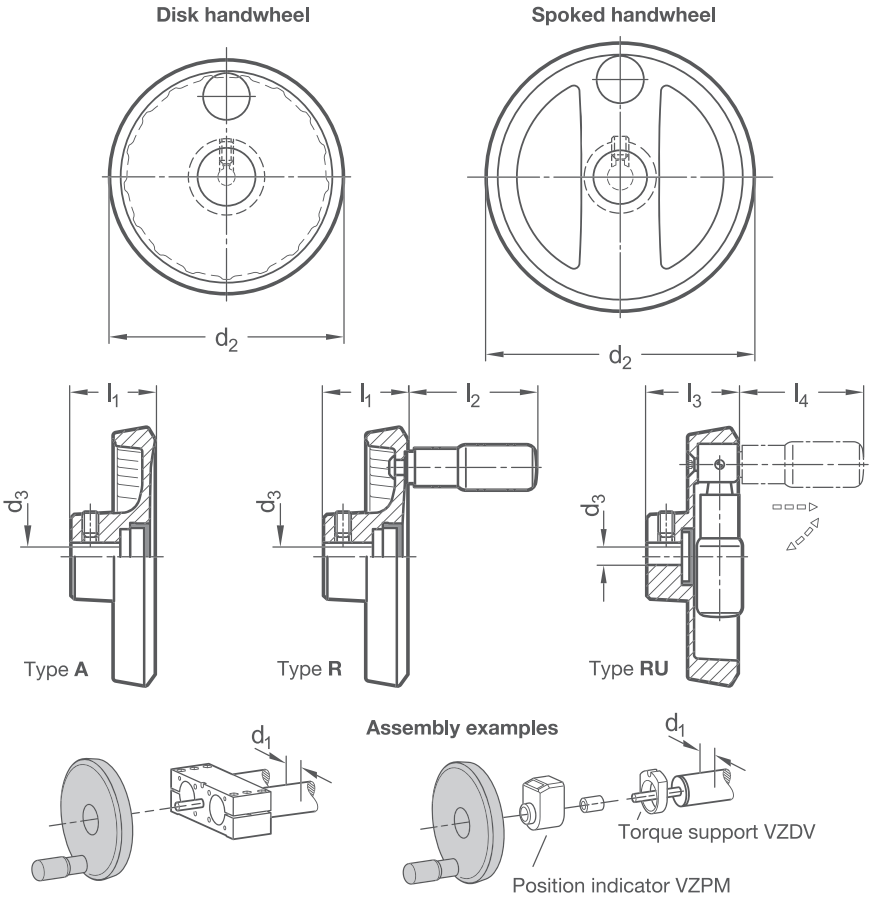
Handwheels VZH are intended for attachment to linear units as well as drive units and transfer units. The manual rotational movement is transmitted to the spindle or shaft via the keyway, resulting finally in a longitudinal movement of the guide element. A grub screw axially secures the hand wheel against the journal or spindle journal.

Dimensions such as outer diameter and hub bores are matched to the size of the respective linear, drive or transfer unit and can be found in the table. The smaller diameters are designed as disk handwheels and the larger diameters as spoked handwheels.

For each type, the handwheels can be ordered with or without revolving cylindrical handle as well as with a revolving retractable handle.

The handwheels are made of black powder-coated die-cast aluminum. The zinc-plated or black oxide-finished steel spindle parts allow the black plastic handles to rotate.

RoHS-compliant product



d_1 Linear unit nominal diameter	d_2	d_3 H7	l_1 ≈	l_2 ≈	l_3 ≈	l_4 ≈	Handwheel type	
							Disk handwheel	Spoked handwheel
18*	80	6	26	43,5	-	-	x	-
30	100	8	30	58	39	56,5	x	-
40	100	12	30	58	39	56,5	x	-
	125	12	33,5	61,5	45	60,5	-	x
50	140	12	36,5	76,5	47	75,5	-	x
60	160	14	39,5	76,5	48	75,5	-	x

Type
t

A	Without handle
R	With rotating handle
RU	With rotating, retractable handle (only available for Ø 30-60)

Surface
o

2	Textured powder-coated, Black RAL 9005

FOR USE WITH

– Single tube linear units, round

– Single tube linear units, square

– Double tube linear units

– Drive and transfer units

– Angle gears

ORDER KEY

VZH - d_1 - d_2 - t - o

Handwheel
Linear unit nominal diameter
Handwheel diameter
Type
Surface

ON REQUEST

* Plastic handwheels with Ø 50 for d_1 18

VZPM Position indicator, mechanical with adapter bushing

PRODUCT INFO

Position indicators VZPM indicate the distance travelled by linear units. They are mounted to the spindle journal of a linear unit using an adapter bushing and a grub screw.

The counter of the position indicator should be selected from the table based on the spindle thread pitch and direction and the size of the linear unit. Other options, such as installation orientation or housing color, can be defined in the article number.

The polyamide housing is ultrasonically welded, making it especially sturdy, tight and compact. The position indicator is also temperature-resistant to 80 °C and resistant to oils and solvents. The foam rubber seal provides mechanical decoupling and also acts as a seal. The hollow shaft is made of black oxide-finished steel.

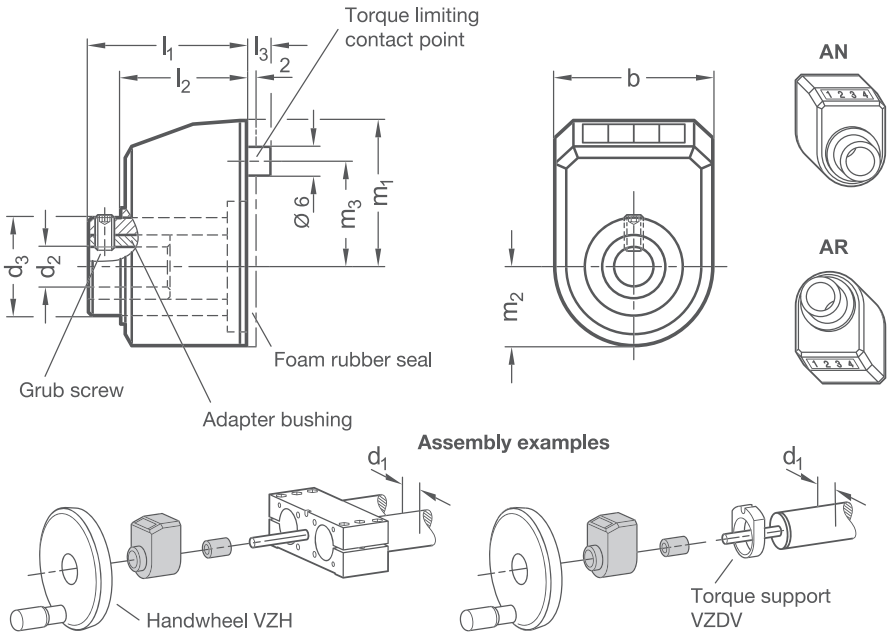
If the position indicator is attached to a single tube linear unit, a torque support VZDR or VZDV is required to prevent the position indicator from turning along. For double tube linear units, a torque support VZDD is required only for diameter 18.

As an alternative to the mechanical indicator system, a position indicator VZPE can also be used, which detects and displays the position electronically.

RoHS-compliant product

elesa

Original design DD52R, DD51, DD50



Linear unit nominal diameter **d_1**	Linear unit spindle pitch **p**	Counter **zw**	Display after one spindle turn	**b**	**d_2** H7	**d_3**	**l_1**	**l_2**	**l_3**	**m_1**	**m_3**	**m_3**	Grub screw	Max. speed rpm
18	3	003	003	24	6	14	26	21	5	28,5	10	18	M3	1500
30	4	004.0	0040	33	8	20	33	26	5,5	30,5	16,5	22	M 4	625
30	1	001.0	0010	33	8	20	33	26	5,5	30,5	16,5	22	M 4	1500
40	4	0004.0	00040	48	12	29	37	30	6	43,5	23	30	M 5	625
40	1	0001.0	00010	48	12	29	37	30	6	43,5	23	30	M 5	1500
50	4	0004.0	00040	48	12	29	37	30	6	43,5	23	30	M 5	625
50	1	0001.0	00010	48	12	29	37	30	6	43,5	23	30	M 5	1500
60	5	0005.0	00050	48	14	29	37	30	6	43,5	23	30	M 5	500

Type
t

R	Numbers increase when turned clockwise
L	Numbers increase when turned counterclockwise

Hollow shaft / adapter bushing material
w

ST	Steel black oxide-finished
EM	Stainless steel, AISI 304

Installation orientation
e

AN	Inclined, top
AR	Inclined, bottom

Surface / material
o

GR	Polyamide (PA), orange RAL 2004
OR	Polyamide (PA), gray RAL 7035

FOR USE WITH

– Single tube linear units, round, with torque support VZDR

– Single tube linear units, square, with torque support VZDV

– Double tube linear units with torque support VZDD for Ø 18

ORDER KEY

VZPM - d_1 - p - t - w - e - o

Position indicator
Linear unit nominal diameter
Linear unit spindle pitch
Type
Hollow shaft / adapter bushing material
Installation orientation
Surface / Material

ON REQUEST

– Other / doubled thread pitches

VZPE Position indicator, electronic with adapter bushing

PRODUCT INFO

Position indicators VZPE indicate the distance travelled by linear units. They are mounted to the spindle journal of a linear unit using an adapter bushing and a grub screw.

Position indicators are matched to the size of the linear unit in the table. The position indicators must be adjusted for the thread pitch and direction of the respective linear unit using the operating buttons. The energy supply is ensured by a long-life battery.

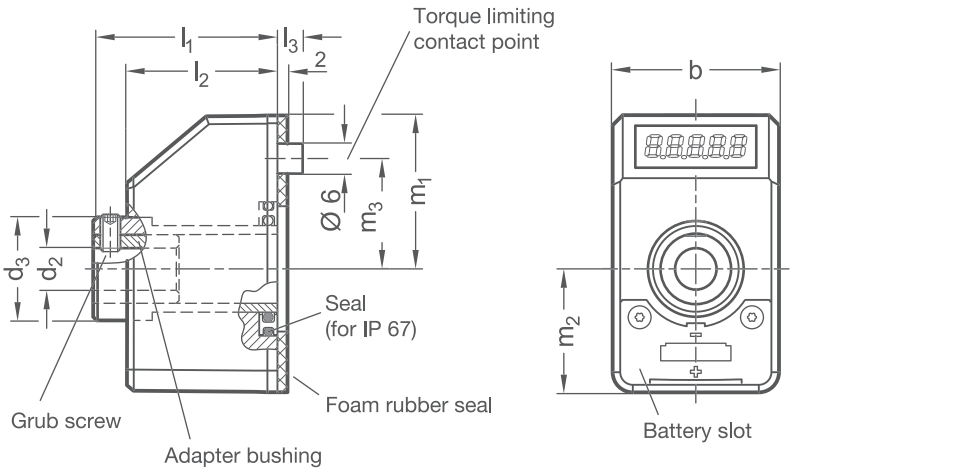
The polyamide housing is ultrasonically welded, making it especially sturdy, tight and compact. The position indicator is also temperature-resistant to 50 °C and resistant to oils and solvents. The foam rubber seal provides mechanical decoupling and also acts as a seal. The hollow shaft is made of stainless steel. In the IP 67 version, it is sealed with an NBR seal.

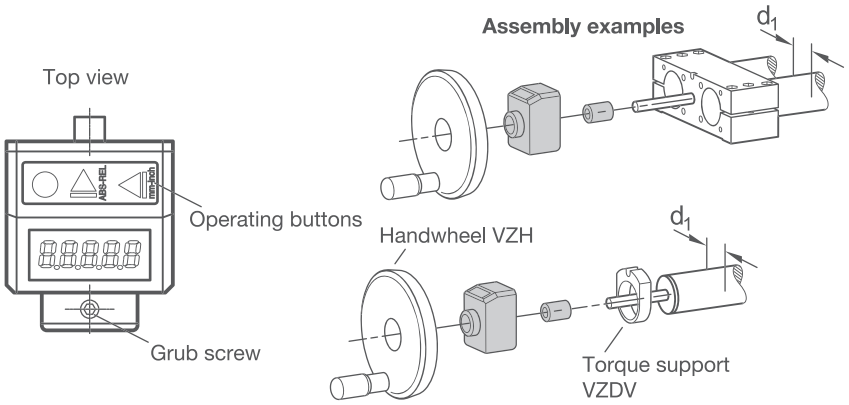
If the position indicator is attached to a single tube linear unit, a torque support VZDR or VZDV is required to prevent the position indicator from turning along.

RoHS-compliant product

elesa

Original design DD52R-E, DD51-E





Linear unit nominal diameter d_1	b	d_2 H7	d_3	l_1	l_2	l_3	m_1	m_2	m_3	Grub screw	LCD display	Max. speed rpm
30	33,5	8	19,5	34	28,5	5,5	30,5	25	22	M 4	5	1000
40	48	12	28,5	41	34	6	40	32,5	30	M 5	6	1000
50	48	12	28,5	41	34	6	40	32,5	30	M 5	6	1000
60	48	14	28,5	41	34	6	40	32,5	30	M 5	6	1000

Ambient conditions
u

1	Protection rating IP 65
2	Protection rating IP 67

Surface
o

GR	Polyamide (PA), orange RAL 2004
OR	Polyamide (PA), gray RAL 7035

FOR USE WITH

– Single tube linear units, round, with torque support VZDR

– Single tube linear units, square, with torque support VZDV

– Double tube linear units

ORDER KEY

VZPE - d_1 - u - o

Position indicator
Linear unit nominal diameter
Ambient conditions
Surface

ON REQUEST

– Position indicator with wireless data transmission

VZK Clamping plates

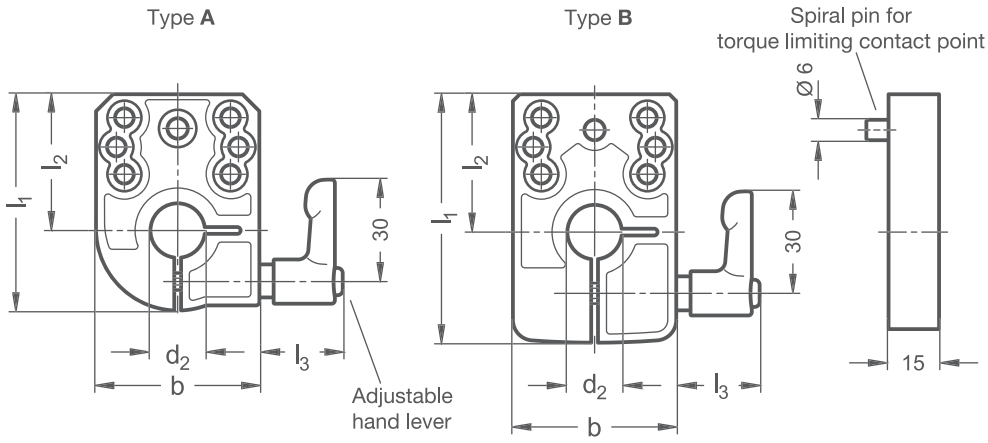
PRODUCT INFO

Clamping plates VZK can be used to clamp the spindles of linear units after completing a movement. The clamping bore diameter is sufficiently reduced by the adjustable hand lever that the spindle journal of the linear unit no longer turns, preventing accidental shifting of the established position.

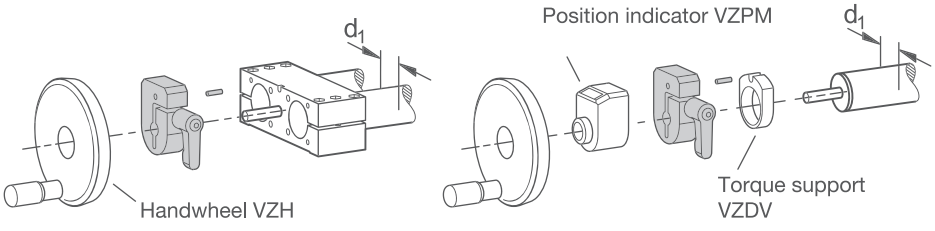
The clamping plate must be chosen based on the size of the linear unit, as indicated in the table. A torque support VZDR / VZDV or VZDD is additionally needed for Ø 18 to install a clamping plate. The spiral pin establishes a positive connection between the clamping plate and the torque support to prevent turning along.

The clamping plates and adjustable hand levers are made of black powder-coated die-cast zinc, and the clamping threaded inserts are made of zinc-plated steel.

RoHS-compliant product



Assembly examples



d_1 Linear unit nominal diameter	b	d_2	l_1		l_2		l_3	Combinable with position indicator	
			Type A	Type B	Type A	Type B		Type A	Type B
30	33	8	47	55	30,5	30,5	24,5	VZPM	VZPE
40	48	12	66,5	73	43	40,5	24,5	VZPM	VZPE
50	48	12	66,5	73	43	40,5	24,5	VZPM	VZPE
60	48	14	66,5	73	43	40,5	24,5	VZPM	VZPE

Type t	
A	For mechanical position indicators (also usable without position indicator, e. g. only with handwheel)
B	For electronic position indicators

FOR USE WITH

– Single tube linear units, round, with torque support VZDR

– Single tube linear units, square, with torque support VZDV

– Double tube linear units with torque support VZDD

ORDER KEY

VZK - d_1 - t

Clamping plate
Linear unit nominal diameter
Type

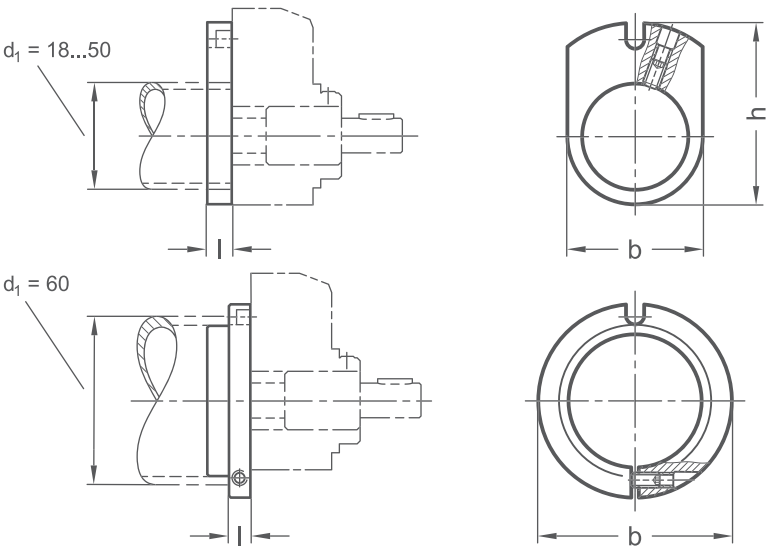
VZDR Torque supports for round linear units

PRODUCT INFO

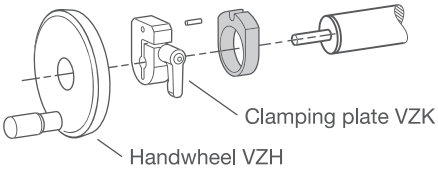
Torque supports VZDR are used together with round single tube linear units. They prevent the turning of clamping plates VZK and position indicators VZPM or VZPE attached as accessories.

The torque supports are made of black anodized aluminum and are clamped to the linear unit with a non-positive connection. They fix the position indicator or clamping plate in place via the radial groove open on one side.

RoHS-compliant product



Assembly example



d_1 Linear unit nominal diameter	b	h	l
18	24	33	10
30	35	42	10
40	47	56,5	10
50	58	61	10
60	64	-	7

Surface / Material o	
S	Aluminum, black anodized

FOR USE WITH

– Single tube linear units, round

ORDER KEY **VZDR - d_1 - o**

Torque support
Linear unit nominal diameter
Surfaces / material

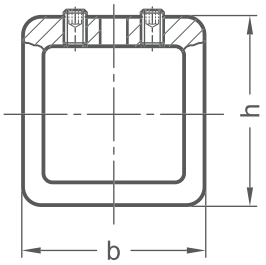
VZDV Torque supports for square linear units

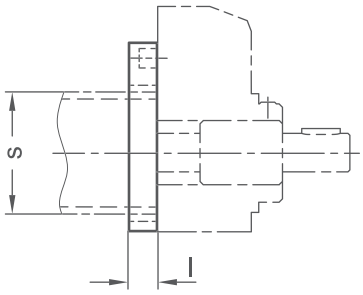
PRODUCT INFO

Torque supports VZDV are used together with square single tube linear units. They prevent the turning of clamping plates VZK and position indicators VZPM or VZPE attached as accessories.

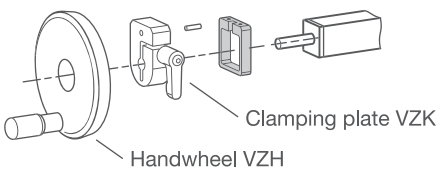
The torque supports are made of tumbled, matt aluminum and are clamped to the linear unit with a non-positive connection. They fix the position indicator or clamping plate in place via the groove on one side.

RoHS-compliant product





Assembly example



s Linear unit nominal diameter	**b**	**h**	**l**
30	35	42	12
40	47	56,5	12
50	58	61	12

Surface / material **o**	
G	Aluminum tumbled, matt

FOR USE WITH

– Single tube linear units, square

ORDER KEY **VZDV - s - o**

Torque support
Linear unit nominal diameter
Surface / material

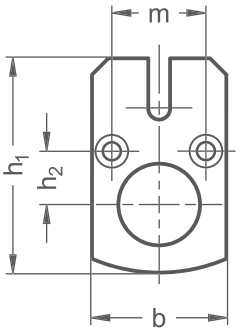
VZDD Torque support for double tube linear units Ø18

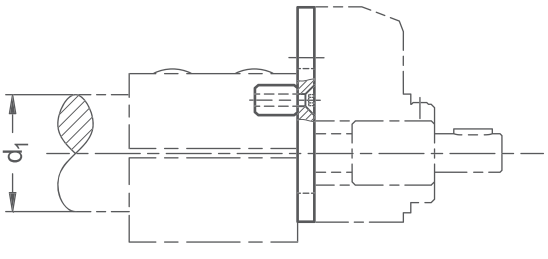
PRODUCT INFO

The **torque support VZDD** is needed only for double tube linear units with a nominal diameter of 18. It prevents the turning of clamping plates VZK and position indicators VZPM attached as accessories.

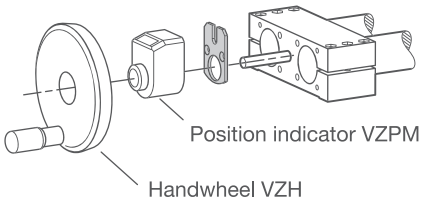
The torque support is made of black anodized aluminum and is screwed to the linear unit using the supplied fastening materials.

RoHS-compliant product





Assembly example



d_1 Linear unit nominal diameter	b	h_1	h_2	m
18	27	38,5	10	20

Surface / material o	
S	Aluminum, black anodized

FOR USE WITH

– Double tube linear units Ø18

ORDER KEY **VZDD - d_1 - o**

Torque support
Linear unit nominal diameter
Surface / material

PRODUCT INFO

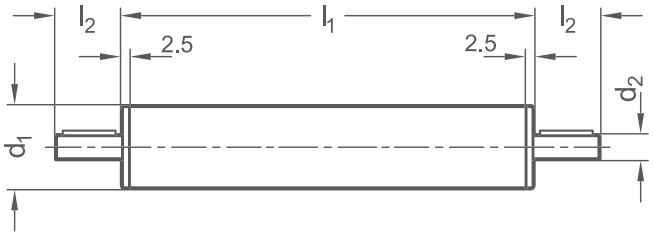
Drive and transfer units VA are used together with angle gears and T-gears to introduce rotational movements and to transmit rotational movements between two linear units.

The drive units are available in the indicated standard lengths l_1 and are intended for the installation of handwheels on angle gears.

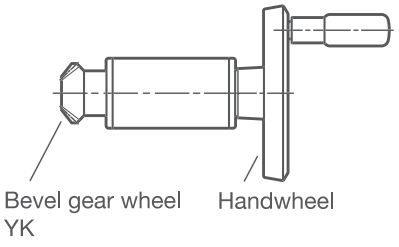
Transfer units are generally longer and are manufactured in special lengths l_1 to millimeter precision for the specific application. They transmit rotational movements over relatively large distances, e.g. between linear units, other transfer units or handwheels.

With an angle gear set of type 1, the drive and transfer units can be mounted to a single linear unit.

RoHS-compliant product



Drive unit with bevel gear wheels and handwheel



Transfer unit

d_1	l_1 Drive units standard lengths	l_1 Transmission units special manufacturing	d_2	l_2
18	47	42...500	6	16
30	60	55...2000	8	16
40	93	88...2500	12	17
50	93	88...2500	12	18
60	95	90...2800	14	19

Material **w**	
ST	Steel • Guide tube, DIN EN 10305-4 chrome-plated steel • Shaft steel, with ball bearing • End plug plastic
ED	Stainless steel • Guide tubes, EN 10216-5, stainless steel AISI 304 • Shaft stainless steel AISI 303, with ball bearing • End plug plastic

ORDER KEY **VA - d_1 - l_1 - w**

Drive and transfer unit
Outer diameter
Length
Material

ON REQUEST

– Lengths, see table

– more journal lengths, see product group 2A

YK Bevel gear wheels for angle gears

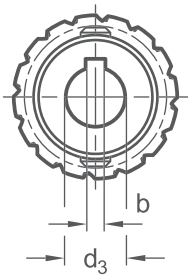
PRODUCT INFO

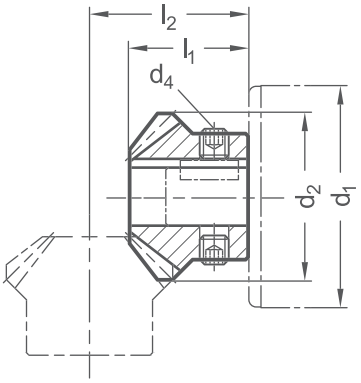
Bevel gear wheels YK are used in connection with angle gears to transmit a rotational movement offset by 90°.

The bevel gear wheels are mounted to the shaft journal of a linear, drive or transfer unit with a hub keyway and parallel key and then secured with the enclosed grub screw. The spiral toothing ensures very quiet running while also simplifying the mounting and adjustment of the engagement. The bevel gear wheels are available individually as per the table or in corresponding sets with right-hand or left-hand toothing.

Only bevel gear wheels with different toothing directions can be paired. The ratio is always 1:1 because the bevel gear wheels each have identical tooth counts. The use of selectively hardened steel results in high wear resistance.

RoHS-compliant product





Typ **R**

Typ **L**

Suitable for linear unit with nominal diameter	d_2	Bore with hub keyway d_3 H7	b	d_4	l_1	$l_2 \approx$
Ø18	14,5	6	2	M 4	11	16
Ø30	25	8	2	M 6	19	25
Ø40 / Ø50	33	12	4	M 6	23,5	31
Ø60	40	14	5	M 6	28	39

Type **t**	
R	Bevel gear wheel, right-hand pitch
L	Bevel gear wheel, left-hand pitch
W	Set of bevel gears, 2 bevel gears, 1 x right-hand, 1 x left-hand pitch
T	Set of bevel gears, 3 bevel gears, 1 x right-hand, 2 x left-hand pitch

ORDER KEY **YK - d_2 - d_3 - t**

Bevel gear wheel
Outer diameter
Hub diameter
Type

YLS L-angle gears, for single tube linear units

PRODUCT INFO

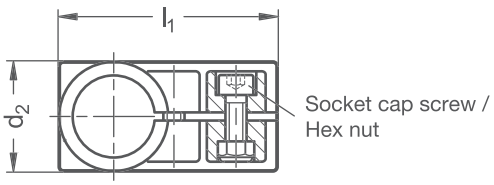
L-angle gears YLS transmit rotational movements between linear, drive or transfer units. The input and output sides are offset by 90°, and the rotational axes have a common point of intersection.

The angle gear is clamped radially to the nominal diameter of the linear unit using the slitted clamping point. The bevel gear wheels are fixed in place on the shaft journal using parallel keys and grub screws. Removing the plastic caps offers good access, making it easier to adjust the engagement of the bevel gear wheels.

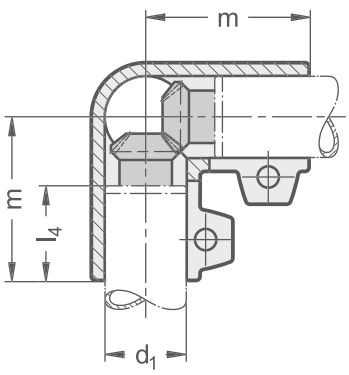
L-angle gears can be ordered with various features for different applications based on the types listed in the table. This makes it possible to combine various linear, drive or transfer units together.

The housing is made of die-cast aluminum, while selectively hardened steel is used for the bevel gear wheels. The drive unit consists of a chrome-plated steel tube, and the tube stoppers are made of plastic.

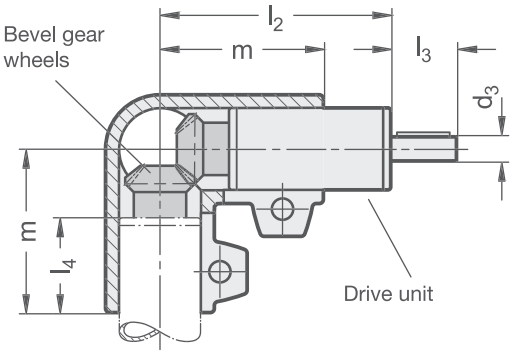
RoHS-compliant product



Type **A**



Type **B / C**



Linear unit nominal diameter d_1	d_2	d_3	l_1	$l_2 \approx$	l_3	$l_4 \approx$	m	Hex socket cap screws
30	40	8	80	85	16	35	60	M 8-25
40	65	12	135,5	124	17	72	103	M 10-50
50	65	12	135,5	124	18	72	103	M 10-50

Type
t

A	Angle gear box + bevel gear wheel set
B	Angle gear box + bevel gear wheel set + drive unit (steel chrome plated)
C	Angle gear box + bevel gear wheel set + drive unit (stainless steel)

Surface
o

2	Textured powder-coated, Black RAL 9005
8	Blasted, matt

ORDER KEY

YLS - d_1 - t - o

- L-angle gear
- Nominal diameter
- Type
- Surface

ON REQUEST

– Angle gear for nominal diameter **Ø18** and **Ø60**

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

YTS T-angle gears, for single tube linear units

PRODUCT INFO

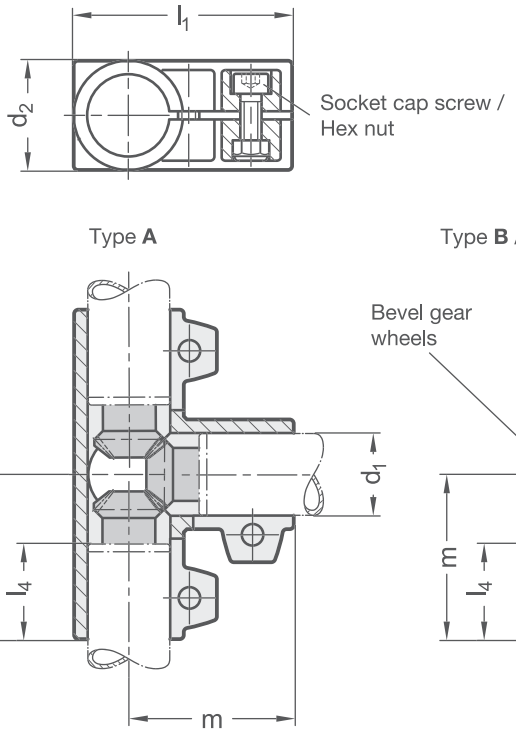
T-angle gears YTS transmit rotational movements between multiple linear, drive or transfer units. The input and output sides are offset by 90°, and the rotational axes have a common point of intersection.

The angle gear is clamped radially to the nominal diameter of a linear unit using the slitted clamping point. The bevel gear wheels are fixed in place on the shaft journal using parallel keys and grub screws. Removing the plastic caps offers good access, making it easier to adjust the engagement of the bevel gear wheels.

T-angle gears can be ordered with various features for different applications based on the types listed in the table. This makes it possible to combine various linear, drive or transfer units together.

The housing is made of die-cast aluminum, while selectively hardened steel is used for the bevel gear wheels. The drive unit is made of chrome-plated steel, and the tube stoppers are made of plastic.

RoHS-compliant product



Linear unit nominal diameter d_1	d_2	d_3	l_1	$l_2 \approx$	l_3	$l_4 \approx$	m	Hex socket cap screws
30	40	8	80	85	16	35	60	M 8-25
40	65	12	135,5	124	17	72	103	M 10-50
50	65	12	135,5	124	18	72	103	M 10-50

Type **t**	
A	Angle gear box + bevel gear wheel set
B	Angle gear box + bevel gear wheel set + drive unit (steel chrome plated)
C	Angle gear box + bevel gear wheel set + drive unit (stainless steel)

Surface **o**	
2	Textured powder-coated, Black RAL 9005
8	Blasted, matt

ORDER KEY

YTS - d_1 - t - o

- T-angle gear
- Nominal diameter
- Type
- Surface

ON REQUEST

– Angle gear for nominal diameter **Ø18** and **Ø60**

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

YLD L-angle gears, for double tube linear units

PRODUCT INFO

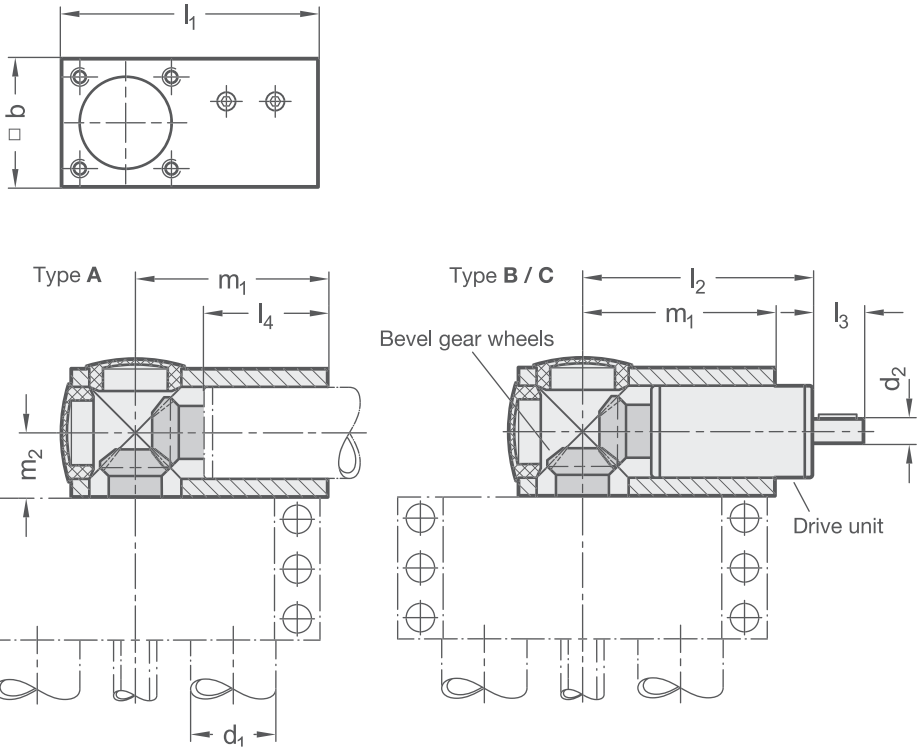
L-angle gears YLD transmit rotational movements between double tube linear units and drive or transfer units. The input and output sides are offset by 90°, and the rotational axes have a common point of intersection.

The angle gear is screwed to the front side of the double tube linear unit end piece using hex socket cap screws, the bevel gear wheels are fixed in place on the shaft journal using parallel keys and grub screws. Removing the plastic caps offers good access, making it easier to adjust the engagement of the bevel gear wheels.

L-angle gears can be ordered with various features for different applications based on the types listed in the table. This makes it possible to combine double tube linear units with different drive or transfer units. The housing is made of milled aluminum, and the bevel gear wheels are made of selectively hardened steel. The drive unit consists of a chrome-plated steel tube, and the tube stoppers are made of plastic.

Note:
The tube stopper must be removed from the journal of the double tube linear unit to install the angle gear.

RoHS-compliant product



Linear unit nominal diameter d_1	b	d_2	l_1	$l_2 \approx$	l_3	$l_4 \approx$	m_1	m_2
18	30	6	60	67	16	25	45	15
30	42	8	84	86	16	37	63	21
40	54	12	108	125	17	49	81	27
50	64	12	128	125	18	64	96	32
60	74	14	148	135	19	71	111	37

Type t	
A	Angle gear box + bevel gear wheel set
B	Angle gear box + bevel gear wheel set + drive unit (steel chrome plated)
C	Angle gear box + bevel gear wheel set + drive unit (stainless steel)

Surface o	
2	Textured powder-coated, Black RAL 9005

ORDER KEY **YLD - d_1 - t - o**

L-angle gear
Nominal diameter
Type
Surface

ON REQUEST

– Surface
ball-burnished, anodized or powder-coated in other RAL colors

Appendix

Table of contents

AISI standard	304	303	CF-8
German Material No.	1.4301	1.4305	1.4308 precision-cast
DIN / EN number	EN 10088-3	EN 10088-3	EN 10213-4
Short name	X 5 CrNi 18-10	X 8 CrNiS 18-9	GX 5CrNi 19-10
Alloy constituents in %	Cr ≤ 0,07 Cr 17,5 … 19,5 Ni 8,0 … 10,5	C ≤ 0,10 S ≤ 0,15 … 0,35 Cr 17,0 … 19,0 Ni 8,0 … 10,0	Cr ≤ 0,07 Cr 18,0 … 20,0 Ni 8,0 … 11,0
Minimum strength Rm in N/mm2	500 … 700	500 … 700	440 … 640
Yield point Rp 0.2 in N/mm2	≥ 190	≥ 190	≥ 175
Machinability	Medium	Very good	Medium
Forgeability	Good	Poor	–
Welding suitability	Excellent	Poor	Good
Special properties	Antimagnetic, austenitic structure suitable for low temperatures and usable up to 700 °C	Antimagnetic, austenitic structure	Antimagnetic, austenitic structure
Corrosion resistance	Good Corrosion-resistant in natural environment: Water, rural and urban atmospheres without significant chloride or acid concentrations, in food-processing areas and agricultural areas	Medium Due to the sulphur content reservations in environments which contain acids and chlores	Good Corrosion-resistant, the material is largely comparable with 1.4301 / AISI 304
Main areas of application	Food industry Agriculture Chemical industry Automotive industry Construction industry Machine building Decorative purposes (kitchen appliances)	Vehicle construction Electronics Decorative purposes (kitchen equipment) Machine construction	Food industry Beverage industry Packaging industry Fittings and valves Pumps Mixers

The indicated properties are intended as guide values only. No guarantee is provided in this regard. The exact usage conditions must always be taken into account.

Thermoplastic

Thermoplastics are plastics that melt when their temperature is raised above the softening point, allowing them to be deformed while warm. The material then hardens again upon cooling. This process can be repeated as often as desired. In contrast to thermoset plastics, no chemical reactions at all occur during processing.

Thermoplastics can be divided into amorphous and semi-crystalline plastics. The less pronounced texture formation of amorphous materials allows the creation of transparent parts by injection molding, including parts with glass-like clarity. Semi-crystalline thermoplastics have an internal structure that results in parts with superior mechanical properties and application temperatures.

Due to the great variety of thermoplastics and the options for modifying them, it is possible to create “custom-made” structural materials. It is possible to vary their mechanical properties, chemical resistance, and temperature resistance while applying a very wide range of colors.

Short code	**PA 6**	**PTFE**
Designation	Polyamide	Polytetrafluorethylene
Yield stress in MPa	80 / 50	4
Tensile strength in MPa	– / –	20
Tensile modulus in MPa	3000 / 1500	600
Ball impression hardness in MPa	150 / 70	26
Temperature resistance:		
Max. short-term	180 °C	300 °C
Max. longer-term	80 °C	260 °C
Min. application temp.	–40 °C	–200 °C
Resistance to: *		
Oils, greases	+	+
Solvents: Tri	+	+
Per	+	+
Acid: Weak	o	+
Strong	–	+
Alkalines: Weak	+	+
Strong	o	+
Gasoline	+	+
Alcohol	+	+
Hot water	o	+
UV light / weathering	o	+
Burning behavior (UL 94)	HB	V-0
General information	Polyamide 6 (semi-crystalline) provides universal materials for functional mechanical parts in machines. Polyamides are: - Cold-resistant - Impact-resistant with high peak load capacity - Wear-resistant	Polytetrafluoroethylene is characterized above all by very low friction coefficients and high chemical and thermal resistance. PTFE is generally used to produce sliding bearings, guides, seals, non-stick coatings, and insulators.

* + Resistant, o Limited resistance, – Not resistant

All information is intended only as general guide values and applies to typical representatives of the respective material group without any claim to completeness. The material properties can be changed with additives and other modifications and are heavily altered by environmental influences.

They should never be used as the sole basis for designs. In other words, the data is no substitute for the testing required to determine the suitability of a material for a given use.

No guarantee is provided or liability accepted for any information provided here.

Anodizing

Anodizing is one of the most widespread methods of surface treatment for aluminum workpieces. The anodizing procedure specifically oxidizes the surface of the part with electrolytes – the top layer is converted into the stable oxide compound Al2O3. By varying the process parameters, layers from 5 to 25 µm can be created in addition to organic, inorganic, or electrolytic dyeing.

The surface treatment takes place in an electrolysis bath, where the workpiece serves as the anode and the sulfur or oxalic acid filling acts as the cathode. Direct current is generally used for a weak current flow between the two electrodes. The resulting material ions produce electrochemical corrosion on the aluminum surface, and the atomic oxygen released in this way reacts with the metallic aluminum to form a hard oxide layer.

Anodizing is primarily used to give aluminum workpieces better corrosion resistance. By adding dyes to the Al2O3 layer, anodizing can also be used to apply permanent color coding
to parts or improve their appearance – for example with a black finish.

Chrome plating

Chrome layers with thicknesses between 8 and 10 µm serve decorative purposes and are offered by Inocon as glossy or matt chrome plating.

Electroplating is used to apply the coating. Chromium ions are supplied by an aqueous solution with a chromic acid base.

Combined layers are generally required, with chromium always forming the top layer. For example, Inocon uses a two-layer chrome-plating procedure with nickel as the first layer and chromium as the top layer.
The three-layer procedure is also used, in which first copper, then nickel, and finally chromium are deposited.

Electropolishing

This electrochemical method reduces surface roughness and removes impurities, micro-cracks, and texture defects on parts made of stainless steel varieties. The workpiece is placed in a bath of material-specific electrolytes, where it acts as the anode, from which a thin metallic layer is removed when a direct current is applied.

Electropolishing acts at the micrometer scale and removes pronounced rough spots, with increased removal at edges, making electropolishing suitable for fine deburring as well. The process is considered gentle on texture since it involves no thermal or mechanical loads.

In addition to decorative applications, electropolished elements are also used in the chemical and food industries, container construction and medical technology.

Powder coating

Powder coating generally refers to the electrostatic version of the process in which the powder, consisting of pigmented thermoplastic or reactive binders of epoxy, polyester or polyacrylate resins, is applied to the workpiece.

Inside the spray nozzle, the powder acquires a negative electrostatic charge and flows along the field lines to the grounded workpiece, even reaching the back side. The electrostatic charge reduces the overspray and ensures that the powder adheres to the workpiece until it has time to thermally fuse with it.

This last step is what produces the actual closed and homogeneous layer, with a thickness ranging between 80 and 160 µm. Depending on the powder type, the layers can withstand high stresses, are weather- and corrosion-resistant and can be created in a wide range of color tones. Powder coating is a commonly used method as it is easily automated and efficient. Black coatings are most commonly applied.

In a long-term salt spray test as per DIN EN ISO 9227 NSS:2017-07 conducted by an independent testing laboratory, it was shown that powder-coated aluminum parts are extremely corrosion-resistant: even after 504 hours, no corrosive alterations were discernible on the standard part.

This exceeds even the target time for the highest resistance class C5 as per DIN 55633:2009-04 by an impressive 24 hours.

Test report 20190122:

Test time	Result
240 h	No visible changes
360 h	No visible changes
504 h	No visible changes

Performed by the Institut für Galvano- und Oberflächentechnik Solingen GmbH & Co. KG on March 27, 2019

Shot blasting

Shot blasting is a method for surface finishing that removes impurities, microcavities, and burrs. Ball-shaped, stainless steel blasting material in a troughed blasting unit is accelerated by a throwing wheel to impact the part surface with high kinetic energy.

The resulting deformation in the top layer of the part results in higher strength and prevents the formation of corrosion areas. The treatment produces a homogeneous, slightly rough and matt surface.

Zinc plating

This collective term applies to various methods for applying pure zinc coatings to steel. In all cases, the goal is to protect the substrate from corrosion for as long as possible.

The most commonly used zinc-plating method at Inocon uses a bath containing an electrolyte that connects the workpiece functioning as the cathode to an anode of pure zinc.

Depending on the process parameters, the layers deposited in this way range between 2.5 and 25 µm. The method, which is standardized in DIN 50979, is primarily suited for lending corrosion protection to small parts.

The zinc present on the surface can also be subjected to corroding reactions itself, depending on the ambient conditions, which is why it is additionally protected against zinc corrosion (white rust) in a subsequent passivation step.

In addition, treatment with suitable solutions free of chromium VI creates a chromate layer that significantly improves the corrosion resistance of the zinc coating. Dyes can also be applied during this process step. Blueish or black transparent colors are encountered most frequently.

Tightening torques for clamps

The following tightening torques are recommended for fastening screws for clamps (hex socket cap screws or hex head screws):

Fastening screw	Tightening torque
M6	10 Nm
M8	25 Nm
M10	50 Nm

Information on delivery

The clamps are delivered in the following standard design:

- **Fittings per screw position**:
  One hex socket cap screw DIN 912 und one lock nut DIN 985 each (both of zinc-plated steel).

  It is also possible to use other screw types or materials as well as adjustable hand levers for the screw positions.

- **The standard surface** of the clamps is blasted (note: the images shown in the catalog may deviate from the delivered design.)

  It is also possible to apply a black coating to the clamps.

  The surface finishing methods of shot-blasting, anodizing and tumble polishing are also possible.

General information

A small quantity surcharge at a flat rate of € 15.00 is applied to orders with a **value below € 40.00 net**.

The **pricing** is fundamentally net ex works plus packaging, freight costs and statutory value-added tax.

Payment: 10 days after invoice date at 2% discount.
30 days after invoice date net.

Our general terms of business, delivery and payment otherwise apply,
see www.inocon.de

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